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Mangeliidae (Gastropoda: Conoidea) of the French West Indies and other Western Atlantic regions: a monograph

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Abstract. In this study, 159 new species of tropical western Atlantic Mangeliidae are described, based on morphological and phylogenetic analyses. Additionally, 55 possible new species are illustrated and partially described but not named because of insufficient specimens to confidently distinguish them from similar congeners. These 159 new species (or 214, including the possible 55) are in addition to 82 previously described species, most of which are redescribed with photographs of their primary types. Overall, 296 taxa, eight nomina dubia, and 31 synonyms (10 of which are newly synonymized) are addressed in this report. The large number of new species led to the creation of six new genera, marking the first time use for a Recent species of the genus *Adelocythara* Woodring, 1928, and confirming the presence of new species in two eastern Pacific genera, *Kurtzina* Bartsch, 1944, and *Kurtzia* Bartsch, 1944. Phylogenetic analysis of 50 species showed that 17 of the 19 genera with DNA sequence data from representative species are monophyletic with strong support. The inclusion of two other sequenced genera, *Suturocythara* E.F. García, 2008, and *Benthomangelia* Thiele, 1925, in Mangeliidae is not well supported and may need to be reassigned to different or new families once more DNA data from additional species becomes available. There is no DNA sequence data for representative species of six other genera – *Acmaturris* Woodring, 1928, *Bactrocythara* Woodring, 1928, *Bathyturris* Fallon gen. nov., *Rubellatoma* Bartsch & Rehder, 1939, *Saccharoturris* Woodring, 1928, and *Stellatoma* Bartsch & Rehder, 1939 – but morphologically, these are clearly supported as separate genera within the family-group Mangeliidae. Morphological traits retained at the genus level are described for each of the 25 genera, including shell surface architecture (for most) and protoconch structure. SEM images strongly suggest that shell surface sculpture is genus-specific, providing an additional aid for generic placement and confirmation. Although mangeliids from many localities have been examined, the restricted ranges of most species suggest that many more await discovery in underexplored regions.

Keywords. New species, phylogenetic analysis, shell surface SEM, radular teeth, integrative taxonomy.

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Introduction

An extensive baseline inventory of benthic fauna was conducted between 2012 and 2016 by the Muséum national d'Histoire naturelle, Paris (MNHN), around the French West Indies and French Guiana, yielding more than 1800 samples. In this geographic region, samples were collected from depths ranging from 0 to approximately 900 m, with most collected below 200 m. Collections from deeper sites were limited to stations around Guadeloupe, with an average depth of 341 m and a range of 48–898 m.

The large number of samples provided a rare opportunity to catalog benthic invertebrate species, many of which are new to science, including numerous representatives of the Mangeliidae P. Fischer, 1883. This report presents an expanded and refined classification of Mangeliidae, with nearly three times the number of known species. It also provides a necessary clarification of generic diagnoses through a comparison of differences between genera, as well as the addition of six new genera. In addition to the bulk of specimens from the baseline survey of the French West Indies, museum and private collections contributed many additional specimens that have enhanced the understanding of the diversity and geographic distribution of individual species.

All known Mangeliidae of the tropical western Atlantic (TWA) are discussed, with a few exceptions. The tropical western Atlantic is defined as the area stretching from Cape Hatteras, North Carolina, southward to Rio de Janeiro, southern Brazil, or approximately from 35°N to 22°S latitude. The family Mangeliidae is one of 17 families globally within the superfamily Conoidea, established through morphological and phylogenetic analysis. Fourteen of the 17 conoidean families were documented and addressed in a monograph by Bouchet *et al.* (2011). Since their publication, Abdelkrim *et al.* (2018) have added two additional families (Fusiturridae and Marshallenidae), and Kantor *et al.* (2012) have added one more (Bouchetispiridae). The Conoidea are distinguished from other Neogastropoda (the Buccinoidea, Mitroidea, Muricoidea, Olivoidea, Turbinelloidea, and Volutoidea) by their predatory behavior and the presence of hypodermic-like radular teeth. Well-known conoidean families include Conidae, Pseudomelatomidae, Drilliidae, Turridae, and Terebridae, among others.

This work recognizes 82 previously established species in Mangeliidae, organized into 19 genera. Thirteen of these genera were established by early taxonomists: one each by Cossmann (1899), Dall (1918a), and Thiele (1925), along with 10 by Woodring (1928). Later taxonomists identified six additional genera: two each by Bartsch & Rehder (1939) and Bartsch (1944), and one each by Fargo

(1953) and García (2008). Except for Woodring (1928), most new genera were created to categorize one or two new species, and none addressed issues related to the overall mangeliid classification. This work also introduces an additional six genera to accommodate both new and existing species. The available genera in the Mangeliidae were insufficient for the correct classification of new species.

The need to revise the classification of Mangeliidae has long been acknowledged. For example, Fargo (1953: 386) described *Pyrgocythara emeryi*, a fossil species that was placed in the genus *Pyrgocythara* Woodring, 1928, because it resembled the sympatric *Pyrgocythara hemphilli*, which was described earlier by Bartsch & Rehder (1939: 132) and erroneously placed in *Pyrgocythara*. Woodring's (1928) description of the protoconch of *Pyrgocythara* is small-tipped and consists of about three whorls. However, in Fargo's (1953) words, "The protoconch of *emery* has a blunt tip with 1½ protoconch whorls". Subsequently, seven species with large protoconch tips and only a few whorls were combined in *Pyrgocythara* by other describers who were presumably following Bartsch & Rehder (1939) and Fargo (1953): *P. vicina* (C.B. Adams, 1850), *P. crassicostata* (C.B. Adams, 1850), *P. albovittata* (C.B. Adams, 1845), *P. cinctella* (L. Pfeiffer, 1840), *P. brevis* (C.B. Adams, 1850), *P. filosa* Rehder, 1943, and *P. plicosa* (C.B. Adams, 1850), none of which meet the diagnostic criteria of *Pyrgocythara* Woodring, 1928. Thus, in this instance, clarification of the diagnosis of *Pyrgocythara* and the establishment of a new genus are indicated.

A second example of the need to revise the classification of the Mangeliidae is the lack of a precise diagnosis for most genera, which has been particularly problematic, resulting in incorrect generic placements. For instance, no diagnosis was provided for the genus *Kurtziella* when it was established, relying solely on the naming of the type, *Pleurotoma cerina* J.D. Kurtz & W. Stimpson, 1851 (Dall 1918b: 137). Consequently, species with a beaded last protoconch whorl [a characteristic of *Kurtziella cerina* (J.D. Kurtz & W. Stimpson, 1851)], a trait also found in some other genera of mangeliids, were erroneously classified in *Kurtziella* based on this single feature.

A third indication of the need to revise or clarify the classification of the Mangeliidae is the confusion surrounding the identities of some species, which has led to unnecessary proliferation of synonyms and misidentifications, particularly in popular field guides. Misidentifications are especially problematic for species described from types collected in Jamaica by C.B. Adams, which were only briefly described without illustrations in his publicartions of 1845 and 1850b. Even after Clench & Turner (1950) published photographs of Adams' types, misidentifications persisted because the quality of these types was poor and not always helpful in identifications. Unfortunately, Adams' names have become widely adopted for specimens from the western Atlantic. Other misidentifications also arise from inadequate 19th-century descriptions by other authors, and by poorly preserved, missing, or otherwise unavailable type specimens.

The extensive collection of species from Guadeloupe and Martinique serves another purpose: to enhance the understanding of the geographical range of mangeliid species by comparing assemblages at these locations with those farther away, and to test the hypothesis that most species have very limited ranges. Although no quantitative assessment of individual species is possible due to inconsistencies in collections (in terms of timing, location, collection methods, and other unspecified variables), the simple presence or absence of species, grouped by genera, from areas increasingly distant from Guadeloupe (chosen over nearby Martinique due to the larger number of species) provides greater insight into the ranges of individual genera. This, in turn, reveals the uniqueness of the populations around the French West Indies and extends this understanding to populations in other regions of the western Atlantic.

Species identification has been approached integratively, utilizing both morphological and DNA sequence data, with the latter focusing on a subset of species (47). The morphological description has been enhanced with scanning electron microscope (SEM) images that capture shell surface microsculpture and protoconch morphology. DNA sequence data play a crucial role in distinguishing morphologically similar species and confirming generic assignments. Overall, an integrative approach further improves the description of both previously named and proposed species.

Describing the mangeliids (or other marine organisms) around the French Antilles has practical uses. A baseline marine survey needs to be repeatable in the future, and species collected between 2012 and 2016 must relate to those present during any later survey to evaluate environmental impacts or natural changes. It is hoped that this work will serve this goal and establish a foundation for cataloging many more undescribed mangeliids throughout the tropical northwestern Atlantic.

Material and methods

Specimen sources

The largest source of specimens was borrowed from the Muséum national d'Histoire naturelle, Paris (MNHN). Others from Dominique Lamy, the Florida Museum of Natural History (FLMNH, the H.G. Lee collection), and from Dr Emilio F. García. Sources also include the author's collection (PF), collections at the Academy of Natural Sciences of Philadelphia, Drexel University (ANSP), and the National Museum of Natural History, the Smithsonian (NMNH). Altogether, these collections yielded specimens from the central Lesser Antilles (Guadeloupe, Martinique, and St. Vincent and the Grenadines), the northern coast of South America (French Guiana), east and west Florida (the Atlantic coast of Florida and the eastern Gulf of Mexico), and the western Gulf of Mexico. Most of these collections also had a few specimens collected from other regions (southern Brazil, Venezuela, Colombia, Panama, Honduras, Cuba, Puerto Rico, and the Bahamas). These latter areas are poorly represented in this monograph.

The largest collections are from expeditions undertaken by the MNHN to inventory marine benthic fauna of the French Antilles and French Guiana. In 2012 and again in 2015, 447 samples were collected (313 containing mangeliids) using small and large dredges, suction sampling, hard-surface brushing, and hand picking to create a comprehensive inventory of benthic habitats around Guadeloupe. A similar expedition to Martinique in 2016 collected 164 samples that yielded mangeliids, and from off French Guiana, collecting efforts in 1999, 2014, and 2017 yielded 108 samples. This large number of samples provided a unique opportunity to expand the number of known species, their ranges, and to evaluate the current classification of the Mangeliidae.

Beyond the French Antilles, the identification of species in collections from other regions provided an opportunity to understand the spatial extent of populations around the French Antilles and French Guiana, and from the examination of as many specimens as possible, to identify morphological traits retained at the genus level. More species of the same genus allow for a greater level of confidence in the identification of important diagnostic characteristics of that genus. Key among collections from other regions were the large collection of the late Harry G. Lee housed at the FLMNH and consisting of specimens amassed over about 30 years, specimens from temperate tropical waters around east and west Florida, specimens collected from offshore waters as bycatch of oyster fisheries, gut contents of fish trawled offshore, and from private donors dredging off E and W Florida and the Gulf of Mexico.

Emilio F. García, professor emeritus of the University of Louisiana at Lafayette, has generously loaned his collection, much of which was obtained incidentally during environmental impact studies funded by NSF in the Gulf of Mexico after the Deepwater Horizon oil spill in 2010.

Dominique Lamy of Guadeloupe has for years accumulated dredged specimens from around Guadeloupe and Martinique, mostly from depths of 250–350 m, depths not usually sampled but are rich in mollusks. Some Martinique specimens from R. Delannoye's collection were recently donated to the MNHN.

The author's collection (PF) of material originally collected by Gary and Margaret Macintosh over years of shallow reef SCUBA diving around the Caribbean, and of self-collected specimens from Honduras via the use of a homemade sledge.

Table 1. Sources of many of the specimens examined for this study.

Collection	Principal geographic area represented	Number of samples or lots [1]	Samples depth range (m) [2]	Number of specimens
KARUBENTHOS 2012	Guadeloupe shallow water	198 samples	1–160 (34) Median = 16	965
KARUBENTHOS 2	Guadeloupe to 800 m	115 samples	48–898 (341) Median = 350	376
Dominique Lamy coll.	Guadeloupe	111 lots	250–300	353
GUYANE 2014	French Guiana offshore	80 samples	36–240	183
GREEN 0	French Guiana offshore	6 samples	62–80	87
PROTEUS-GUYANE	French Guiana offshore	59 samples	31–149	433
MADIBENTHOS	Martinique shallow water	164 lots	0–749 (28) Median = 14	703
FLMNH ex H.G. Lee coll.	East Florida, Bahamas	285 lots	Most < 50	1221
Emilio F. García coll.	Gulf of Mexico	65 lots	27–509 Median = 77	167
P. Fallon coll., self-collected, ex G. MacKintosh, purchases	Mostly SVG, also Brazil, Honduras	Numerous misc. lots	< 20 [3]	640
NMNH Curaçao field trips	Curaçao	11 lots	84–288	16
ANSP batfish stomach lots	Dry Tortugas & Marquesas Keys	17 lots	11–14	1210
David Kirsh	Puerto Rico	14 lots	< 20 [3]	24
P. Williams coll. ex G. MacKintosh	Lesser Antilles	12 lots	5–182	12

[1] A sample may have more than one lot.
[2] Average depth in parentheses, otherwise depth range is given.
[3] Beach & SCUBA-collected shells assumed collection depth is < 20 m.

Smaller but important contributions were made by David Kirsh (Puerto Rico and Bahamas) and Peggy Williams (Lesser Antilles).

Specimens were also examined from museum collections, principally the Smithsonian and the Academy of Natural Science of Drexel University. In the former case, old, discarded bottles retrieved in two field trips aboard the submersible *Curasub*, which were part of the Deep Reef Observation Project, a long-term collaboration between the Smithsonian and the Curaçao Sea Aquarium, and led by Jerry Harasewych of the Smithsonian, contained species new to science, rarely seen deep-water mangeliids. Overall, these collection efforts have produced even more species new to science.

Sources of specimens and represented geographic areas are summarized in Table 1 above.

Sampling methods

The methods used to collect examined specimens varied, but none were quantitative, such as counting the number of specimens within a measured area or distinguishing live shells from empty ones, which would allow for an assessment of abundance. As a result, only presence or absence is considered in the analyses presented here. The largest number of lots was obtained from comprehensive surveys by MNHN during four separate expeditions. Station numbers were coded with letters to indicate gear type.

S = vacuum sampler
R = diver-collected (by sight)
M = intertidal (by sight)
B = brushing
N = fish trap
CP = beam trawl
DW = Warén dredge

Guadeloupe station numbers were assigned the prefix "G"; Martinique, "A"; and "S" for Guyane (Îles du Salut). Sample lots from sources other than the MNHN are specified on their accompanying labels, such as dredging, trawling, beach, shore, tidal flats, batfish stomachs, scallop dump, and so on. Most data labels for lots considered in this work included sample depth, collector, and location data, though the level of detail varied. The better labels included latitude and longitude.

Tissue preparation, DNA sequencing, and analysis

We analyzed the phylogenetic relationships in the TWA Mangeliidae using all available samples obtained during the expeditions GUYANE 2014, KARUBENTHOS 2012, KARUBENTHOS 2, and MADIBENTHOS (Appendix 3).

Total genomic DNA was extracted using the Qiagen DNA Mini Kit or the Macherey-Nagel NucleoSpin 96 Tissue Kit and following the manufacturer's protocol.

We amplified five gene regions, the 658 bp barcode portion of the mitochondrial cytochrome oxidase I (COI) with primers LCO1490 and HCO2198 (Folmer *et al.* 1994), a 496–515 bp portion of the large ribosomal subunit (16S) with primers 16SA and 16SB (Kessing *et al.* 1989), a 527–548 bp portion of the small ribosomal subunit (12S) with the newly designed primers 12S-DZF1 (3'-TGGTGCCAGCADYCGCGGTTANAC-5') and 12S-DZR1 (3'-TCAACGAGATYGACGGGCGATDTGT-5'), a 771–780 bp portion of the nuclear large ribosomal subunit (28S) with primers 28S-C1 (Jamieson *et al.* 2002) and 28S-ChiR1 (Houart *et al*. 2021), a 328 bp portion of the histone H3 (H3) with primers H3F1 and H3R1 (Colgan *et al*. 1998).

The amplification protocol was 94°C for 5 min, followed by 35–40 cycles of 94°C for 40 s, 50–55°C for 40 s, and 72°C for 1 min, and a final extension at 72°C for 5 min. PCR products were checked on 1.5% agarose gel stained with ethidium bromide, and the positive PCR products were sequenced by the commercial facility Eurofins.

New sequences were deposited in GenBank and BOLD (Barcode of Life Data system) (Appendix 3).

We analyzed two datasets. The first, a COI-only dataset (658 bp), includes all TWA Mangeliidae specimens in the MNHN tissue collection, supplemented by a few sequences from GenBank of specimens collected elsewhere in WA. The second is a multigene dataset that includes up to three specimens per lineage, as identified in the COI dataset. For both datasets, we also added a selection of Mangeliidae from other biogeographic regions and some Raphitomidae as outgroups (Appendix 3).

For the multigene dataset, the sequences were aligned with DNASTAR. After the exclusion of three regions in the ribosomal genes that could not be aligned unambiguously (96 bp in total), the five genes were concatenated into a single dataset of 2804 bp (COI: 658 bp, 12S: 521 bp, 16S: 495 bp, 28S: 802 bp, H3: 328 bp). The datasets were analyzed under the maximum likelihood criterion using RAxML-HPC2 (Stamatakis 2006), implemented on the CIPRES portal (Miller *et al.* 2010). We selected a GTR+Γ+I model and random starting tree, with empirical base frequencies and estimated α-shape parameters and GTR-rates. Nodal support was estimated using 100 bootstrap replicates. ASAP analysis (Puillandre *et al*. 2021) was performed on selected genera and with the K2P substitution model (Kimura 1980) on the online ASAP server (https://bioinfo.mnhn.fr/abi/public/asap/).

Genetic p-distances among specimens were calculated using the barcode fragment of the COI gene.

Radula preparation and imaging

The radulae were prepared and imaged according to the methods described in Kantor & Puillandre (2012), and the descriptions and illustrations of the radulae in this work were provided by Yuri Kantor (Principal Scientist of the A.N. Severtsov Institute of Ecology and Evolution, RAS (IEE RAS). Few specimens were suitable for radula extraction due to size or conflicts with tissue extraction for DNA analysis. Most mangeliids are small, with a length < 5 mm. Nonetheless, the successful extractions are instructive.

Measurements and counts

Shell dimensions were taken to the nearest 0.01 mm employing an ocular micrometer mounted in a Bausch and Lomb stereo-zoom binocular dissecting microscope (10–70×) for specimens less than 10 mm, and with a digital caliper with a readout in increments of 0.01 mm for specimens over 10 mm in length; both measurements were rounded to the nearest 0.1 mm. Averages, where presented, were computed with Microsoft Excel.

Whorls were counted by the number of times they intersected an imaginary line that runs from the tip of the protoconch to a tangent of the last whorl, plus any fraction of a whorl that extends beyond this line up to the edge of the aperture. The count of protoconch whorls follows the same method but stops at the beginning of the first teleoconch whorl. If the protoconch lip is not visible, then the start of the teleoconch sculpture is considered the end of the protoconch. Fractional whorls are recorded as fractions, not decimals, due to the minor inaccuracy in estimation.

Photography and SEM imaging

Photographs of most specimens were taken with a stand-mounted Nikon® D-90 or D-850 digital camera equipped with an AF-S VR Micro-Nikkor® 105 mm f/2.8G macro lens and one or more extension tubes (12, 20, or 36 mm) to achieve optimal image quality with appropriate depth of field. The light source was a Nikon close-up remote kit with dual remote speedlights mounted on a ring at the front of the lens. Individual specimen photos, saved as high-resolution JPEG files, were cropped and resized as needed, with backgrounds filled with black before being inserted into plates using Adobe® Photoshop® 2023. Zooming in on high-resolution digital images in Photoshop® often revealed key shell features and enabled quick comparisons with other photographed shells stored in libraries.

High-magnification scanning electron microscopy (SEM) images were taken to show differences in the complex shell surface microsculpture of select species across most genera. SEM images were captured using the Phenom G2 Pro desktop unit at the ANSP. The SEM was operated by Mr Paul Callomon (Collection Manager, Malacology and General Invertebrates, Academy of Natural Sciences of Drexel University, Philadelphia) or by the trained Drexel University students, Chandler J. Olson and Krasimira "Kasey" Seizova. Images were taken at around 250× magnification for protoconchs and 850×, and

sometimes higher, for shell surface microsculpture. Most morphological differences among genera can be seen under the low magnification of a stereo dissecting microscope, but SEM images of microsculpture – which are surprisingly and distinctly different among genera –are a useful tool to further distinguish them. SEM imagery has not been used to differentiate species in this study, as Rosenberg & Salisbury (2014) did for *Thala* (Costellariidae), but it was used to illustrate differences between some genera in Drilliidae (Fallon 2016), and to highlight differences in shell microsculpture among most mangeliid genera in this work, sometimes aiding in generic placement.

Live animal photography

Live specimens picked from samples in the field were immediately placed into a petri dish filled with seawater. Photographs were taken while animals were still active, before tissue clipping, employing a Canon D60 digital camera installed on a stand and fitted with a 60 or 90-mm macro lens. Photographs were cropped and sized in Adobe® Photoshop®.

Shell surface microsculpture

The 'frosted' surface of some genera of mangeliids, when viewed under high magnification with a scanning electron microscope (SEM, 350× and up), shows a surprising variety of structures among species. These are characterized as erect bundles of fibrils, or "structures" for short. The types of structures have been found to differ more among genus groups and less so among species within a genus group. In this work, structures have been qualitatively described, but little is known of the structures' function or the reason for differences among genera. The different structures may still serve to distinguish species otherwise difficult to place in a genus on morphological grounds.

Genera that lack frosted surfaces exhibit distinct microsculptural characteristics, unique to each genus. In these instances, shell surfaces may have punctae visible at much higher magnification. Or short, microscopic strings, or granules, both arranged in different patterns, also at higher magnification. Surface microsculptural details are figured at the beginning of each genus section.

Species identifications and classification

Classification of species has been undertaken using integrative taxonomic methods (Ahrens *et al.* 2021), employing DNA sequence analysis in combination with shell morphology to guide genus placement. Representative species of 19 of the 25 genera treated in this work have been sequenced (including 5 of the 6 newly proposed genera). DNA sequence analysis results are presented in the Results section. Interpretations of each of the genera are presented in the Systematics section under genera for which representative specimens of the genus group were sequenced.

Primary types of all previously named species were either examined or photographs obtained for examination and inclusion in the manuscript. Some types of species described in the 19th and early 20th centuries were of poor quality and their descriptions too brief. In such cases a full re-description was felt necessary and was based on original descriptions and examination of types, or where types were poor, on specimens believed to be the same species, which were photographed and appear in the figures. Examination of mangeliid types and review of original descriptive literature were necessary to identify new species or to review of original generic diagnoses of their correct genus assignment.

The principal characteristic that separates genera of mangeliids is protoconch morphology. The basic sculptural form is conserved within genera with minor variation in detail such as number of whorls, strength, and number of riblets and onset of riblets on the whorls, presence of spirals or carina, and size and general shape. Other characteristics include the number of axials and their shape, and pattern of primary and secondary spirals.

Synonyms, non-original uses, and incorrect uses of taxa

The literature on TWA Mangeliidae was reviewed for descriptions, synonyms, and species occurrences. Most taxonomic literature was accessible online through the Biodiversity Heritage Library. Very recent publications were purchased or acquired with the courtesy of their authors. The original source of the taxon appears immediately under the species heading, followed by synonyms, then non-original uses of the taxon. Lastly, a list of incorrect uses of the taxon appears before the Differential Diagnosis heading. The list of non-original uses of the taxon is not intended to be comprehensive but aims to provide a useful chronological history of its usage in more widely known references. Additionally, the inclusion of a non-original use of the taxon does not affirm the correct identification of the taxon; however, instances where it is likely incorrect are indicated accordingly.

Differential diagnoses

Differential diagnosis at the beginning of species descriptions is given to distinguish similar species in the same genus group. Generally, only the most readily observed differences are compared.

Type material

Information on the number of specimens, measurements, locality, depth, collector, and catalog number is provided for the holotype and paratype(s) in each category, when available. Most specimens from the type series of previously named species have been examined for this work, although not all, depending on accessibility. In some cases, such as when the author explicitly states that there are no paratypes, the word 'None' is noted under the heading 'Paratypes'. If only a single type is included in the description, but other specimens are mentioned by the author without being explicitly part of the type series, then the statement 'None known' is noted. It is possible that another specimen may be discovered in a museum collection in the future.

Other material examined

Lots that have been examined but are not part of the type series for various reasons (such as condition issues, variants, and specimen localities far from the type locality) are listed under this section. Lots mentioned in the literature for previously named species that have not been examined are listed under a separate heading, 'Other material (not examined)'. Similar to the listing of type lots, each lot includes the number of specimens, measurements, locality, depth, collector, and catalog number, if available.

Descriptions, conventions, and terminology

Except for the six newly proposed genera, all genus diagnoses are based on those published by the original authors, modified as needed to clarify descriptions and standardize terminology for easier comparison with other genera. Reassignments of genera were necessary but expected, given the confusion surrounding some diagnoses and the importance of certain characters that define each genus. Clarifying TWA genera was crucial for accurately placing the new species described here. species sharing the same generic diagnosis are collectively referred to as belonging to a genus.

Descriptions are formulaic; that is, individual morphological features are repeated and presented in the same order for each species to allow for easy cross-comparison, and to show that the description is complete. If a morphological feature is absent, for instance, a varix, it is noted as such so that the reader is not left wondering if its presence was overlooked.

A brief explanation of the terminology used to describe mangeliids follows. Since the terminology may differ slightly among describers, an explanation of the terminology used in this work would be helpful.

Shell gross morphology may be described as either fusiform, biconic, elliptical, elongate oval, etc., and includes whorl count of the type specimen, including protoconch whorls, and whorl profile. The description of the whorl profile may include the degree of convexity, angularity, position of whorl periphery, and the length of last whorl as a percent of shell length including anterior canal. W/L ratio, or width to length ratio, is a useful measure with which to compare some species. The shape of the aperture, its size as measured from the suture to the end of the anterior canal is included in shell's gross morphology.

Protoconchs are an important diagnostic characteristic for the species and extend to the genus level. They vary greatly in the Mangeliidae and comprise one to four in length. Differences among genera and among species within species of a genus are found in relative size, form, and ornamentation. Differences in form are seen in whether the first whorl is free (sides are unattached to subsequent whorl), recumbent, symmetrical or asymmetrical. Ornamentation on one or more of the last protoconch whorls may include riblets alone, riblets crossed by grooves, or by a spiral thread; the latter may develop into a peripheral carina, where nodules or paddles are formed at the intersection of the spiral with riblets.

Axial sculpture is another diagnostic characteristic, varying in strength, cross-sectional shape (ridged, round-crested, etc.), and its profile may be convex, angled mid-whorl, or sub-medially. The axials define the shape of the whorls; the adapical portion of the axials, where they angle into the suture, is considered the whorl's shoulder.

Varices in mangeliids are usually apertural and can be narrow and weak or strong and broad, and may project above the suture of the last whorl and extend to the stromboid notch or the end of the anterior canal. Some genera lack a varix altogether.

Spiral sculpture is described in terms of the presence or absence and strength of primary, secondary, or tertiary spirals. For some species, the spiral pattern is diagnostic. Spirals may also be frosted, minutely segmented, or smooth.

Sulcus is the area on the whorl just below the suture, shaped by the growth of the shell's anal sinus—particularly noticeable on the latter part of the teleoconch—and often appears as a distinct channel with few or no axial features. Usually, the sulcus does not extend to the shell's periphery, which marks the outer boundary of the shoulder, or ramp, as they are the same in mangeliids.

Although it is not always clearly separated from the whorl shoulder's sculptural pattern in most mangeliids, the sinus is often indicated by recurved ribs and incremental growth lines.

Outer lip structure on fully developed specimens is characteristic of a genus group. It may be varicose, strengthened by the last axial, or plain (thin) without a varix or strengthening rib. species with a varicose lip or lip strengthened by the terminal rib may also possess an anal tooth and/or lyrae, both on the underside of the lip below the sinus (anal tooth) or inside the aperture (lyrae).

Anal sinus can be very shallow, marked by a slight indentation of the edge of the outer lip beginning at the suture and extending to the edge of the shoulder, a deeper but narrower notch near the edge of the shoulder, or U-shaped, usually deep, sides parallel, divergent, or convergent. The sinus can be spout-like in mature specimens of some genera, with the sinus nearly perpendicular to the shell's axis.

Inner lip may, depending on the genus, be an excavation, an unemarginate, or emarginate area (with a ridge formed by the deposition of glazed shell thicker than the adjacent parietal or columellar wall, usually narrow but may widen on the parietal wall) and sometimes with a short, margined area along the anterior canal even if a ridge is absent. The inner lip may possess dentition next to the anal sinus, plicae on the columella, and a callus also on the parietal wall area of the anal sinus.

Anterior canal can vary within genus groups and is either poorly differentiated in width from the aperture, short, or moderately long. 'Short' usually means there is no inflection or bend in the edge of the outer lip near the anterior end of the canal. The canal may be straight or curved. The anterior fasciole is the dorsal, or external, side of the canal and may have oblique spirals similar to the pattern on the shell base or lack sculptural details. The end of the canal may be notched or not.

Range and habitat

Following the description, a summary of range and habitat is made of examined specimens, and in the case of re-descriptions, reports in the literature of specimens from localities that have not been confirmed during this project are sometimes included.

Acronyms

All museum specimens are listed with the appropriate acronym and catalog number. Following are the names of institutions whose acronyms were used in the body of this work:

AMNH = American Museum of Natural History, New York, USA
ANSP = Academy of Natural Sciences of Drexel University, Philadelphia, USA
BMNSM = Bailey-Matthews National Shell Museum & Aquarium, Sanibel, Florida, USA
DMNH = Delaware Museum of Nature & Science, Wilmington, Delaware, USA
EFG = Emilio F. García collection
FLMNH = Florida Museum of Natural History, Gainesville, Florida, USA
FMNH = Field Museum of Natural History, Chicago, USA
FSBC 1 = Florida Department of Natural Resources Marine Research Laboratory, St. Petersburg, Florida, USA
IBUFRJ = Instituto de Biologia da Universidade Federal do Rio de Janeiro, Brazil
IDO = Instituto de Oceanología, La Habana, Cuba
IEE RAS = A.N. Severtsov Institute of Ecology and Evolution
IES = Instituto de Ecología y Sistemática, La Habana, Cuba
LACM = Los Angeles County Museum of Natural History, Los Angeles, California, USA
MCZ = Museum of Comparative Zoology, Harvard University, Cambridge, USA
MHNS = Museo de Historia Natural de Santiago de Compostela (coll. E. Rolán)
MNCN = Museo Nacional de Ciencias Naturales, Madrid, Spain
MNHN = Muséum national d'Histoire naturelle, Paris, France
MNRJ = Museu Nacional da Universidade Federal do Rio de Janeiro, Brazil
MUNA = Museo de Ciencias Naturales de Tenerife, Canary Islands
MZUSP = Museu de Zoologia da Universidade de São Paulo, Brazil
NHMUK = The Natural History Museum, London, UK
PRI = Paleontological Research Institution, Ithaca, NY
SVG = St. Vincent and the Grenadines
UF = University of Florida, acronym used with catalog numbers by the FLMNH
USNM = National Museum of Natural History, Washington D.C., USA
ZMA = Zoölogish Museum Amsterdam, The Netherlands (note that all ZMA material is now in Naturalis, Leiden, The Netherlands, RMNH)
ZMB = Museum für Naturkunde, Berlin, Germany

Abbreviations

Abbreviations used throughout this document have the following meaning:

Co. = county (USA)
coll. = collection
DNR = Department of Natural Resources
exped. = expedition
fms = fathoms
ft = feet
ICZN = International Commission on Zoological Nomenclature
leg. = follows the name or entity that collected the lot
PCSM = Petit Cul-de-Sac Marin (Guadeloupe)
R/V = research vessel
SEM = scanning electron microscope
spec. = specimen
specs = specimens
stn = station
syn. = synonym
TWA = Tropical Western Atlantic
unid. = unidentified
W/L = width/length

Repositories and private collections

The many specimens examined for this work are housed in institutions, including all primary types and most paratypes, and so are expected to be available for further study. Most, if not all, those in private collections (including the collection of P. Fallon) will eventually be deposited in an institution, and so more paratypes and non-types listed in this work will then become available for study.

Results

Over 7400 specimens of mangeliids have been examined from various sources, some presented in Table 1, yielding 159 new species and 55 additional unnamed taxa that may be new species, representing the 25 genera listed in Table 2. An additional 82 previously named species are also recognized, along with 31 synonyms. Synonyms are listed in Table 3. A few species from most genera have been sequenced, and their analyses have yielded an improved classification that supports most of the 25 genera, including 6 new genera. The details of the analysis are presented in the phylogeny section and summarized in Figs 1–2 and Appendix 3. The number of newly described and unnamed species in each genus is presented in Table 2, located in the section on the number of taxa. In addition to the diagnosis of genera and the morphological description of species in the main, or systematics, section of this report, SEM imaging has been employed to demonstrate differences in shell-surface microsculpture and to aid in differentiating genera. A summary of differences in microsculptural morphology among genera is presented in Table 4. Nomenclatural actions that include lectotypes designated in this work and *nomina dubia*, proposed herein or declared by others and accepted in this work, are presented in the section on nomenclatural actions. Nomina dubia are summarized in Table 5.

Knowing the areas from which the species addressed in this work were collected is essential to understanding how representative this monograph may be of the true diversity of western Atlantic mangeliids. Although most of the 159 new species are described from the listed sources, the absence of collections from many areas strongly suggests that many species remain to be discovered. As discussed later, 55 likely new species from sources listed in the table and illustrated in this work remain unnamed due to insufficient specimens or condition issues with existing ones. This supports the notion that even

in sampled areas, the inventory of mangeliids is incomplete. Few specimens have been examined from the western Caribbean, northern coast of South America, Brazil, Bahamas, Greater Antilles, and northern islands of the Lesser Antilles (British & U.S. Virgin Islands). All these areas are likely to yield new species.

DNA sequence analysis results: phylogeny of the western Atlantic Mangeliidae

Numerous specimens addressed in this work were available for tissue extraction and gene sequencing. Bold and Genbank numbers of the sequenced specimens employed in the DNA sequence analyses are provided in Appendix 3. While the DNA sequence analysis of the COI gene fragment alone has been invaluable in helping to establish the genus boundaries and to confirm species identifications, species descriptions are based on morphological criteria.

The COI tree identifies monophyletic, bootstrap supported lineages for all but two species (Fig. 1). The position of *Cryoturris simplex* Fallon & Bouchet sp. nov. in the COI topology, nested within *Cryoturris usitata* Fallon & Bouchet sp. nov. with a long branch, seems to be more of an artifact because it is resolved as neatly distinct in the concatenated dataset (Fig. 2). Intraspecific genetic divergences are modest (mean p-distance range: 0–1.39%). Relationships among species are generally poorly resolved, most genera are not supported and two genera, *Cryoturris* and *Glyphoturris*, are polyphyletic.

The concatenated dataset offers a better resolution of relationships in the TWA Mangeliidae (Fig. 2). All but two species form a single, strongly supported monophyletic group indicating that these species represent a single, biogeographically separate radiation. Only *Suturocythara guadalupensis* (Espinosa & Ortea, 2017) comb. nov. and *Benthomangelia puillandrei* Fallon & Bouchet sp. nov. form distinct lineages that in our tree are closer to Pacific taxa. Although, with a multi-gene dataset all genera are recovered monophyletic, mostly with 100% bootstrap support, most nodes connecting the generic lineages within the core TWA mangeliid radiation remain not supported. Nonetheless, the few nodes with bootstrap support agree with morphological traits: a smooth shell surface appearance is shared by the pairs *Bactrocythara* Woodring, 1928 and *Psilocythara* Fallon gen. nov., *Cryptomangelia* Fallon gen. nov. and *Mandiana* Fallon gen. nov., *Pyrgocythara* and *Vitricythara*, while it's frosted in the pair *Cryoturris* and *Kurtziella*.

Number of taxa

With the aid of DNA sequence analysis of one or more representative species in 20 genera species and genus boundaries were delineated, and the need to erect 5 new genera was demonstrated. Representative species of the 6th new genus *Bathyturris* Fallon gen. nov. were not sequenced but otherwise demonstrated to merit genus-level classification on morphological grounds. DNA sequence analysis has also revealed the existence of initially overlooked species, close morphologically but shown to be sufficiently different genetically to merit splitting as separate species. Examples are demonstrated within the *Adelocythara* genus group in the Systematics section.

159 new species, 82 previously named species recognized in this work, and 55 unnamed species that may be new species (296 altogether) are distributed among the 25 genera listed in Table 2.

The argument that the number of species addressed in this work is far short of the actual number of TWA species is supported by the presence of 55 unnamed species on the list, representing 35% above the number of 159 new species proposed, The logic being that if 55 likely species were almost missed (having obtained only a single specimen of most) then there could be a sizeable number that were missed altogether, especially considering that species described in this report were collected from within limited areas of the greater WA, as demonstrated by the list of specimen sources in Table 1.

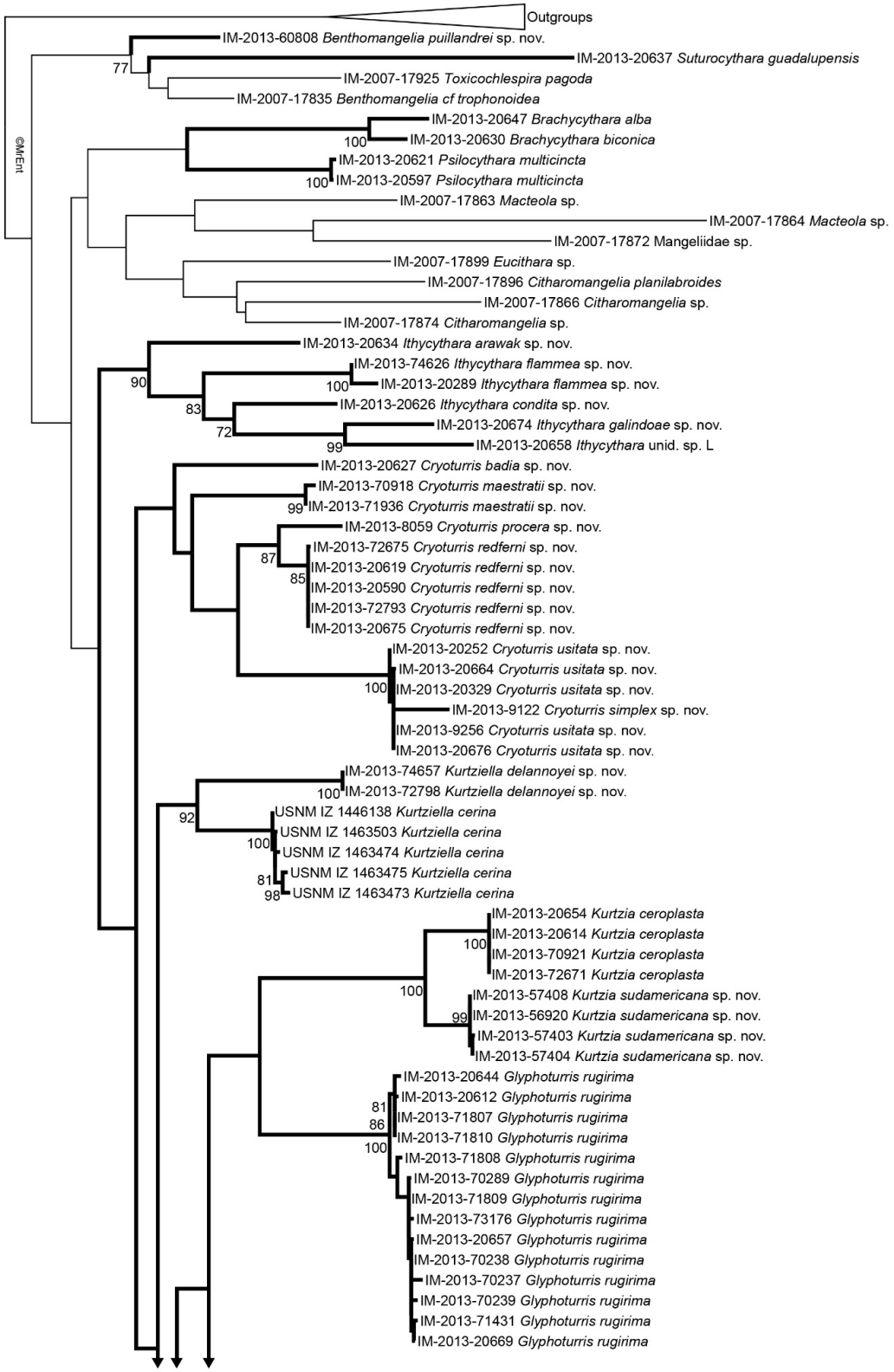


Fig. 1 (continued on next two pages). Phylogenetic relationships (Maximum Likelihood) of tropical western Mangeliidae P. Fischer, 1883 based on the COI gene fragment. TWA species are highlighted by thick branches, and bootstrap values > 70% are indicated at the nodes. All "IM" catalog numbers start with "MNHN" here left off for to conserve space. The trees have been edited in MrEnt ver. 2.5 (Zuccon & Zuccon 2014).

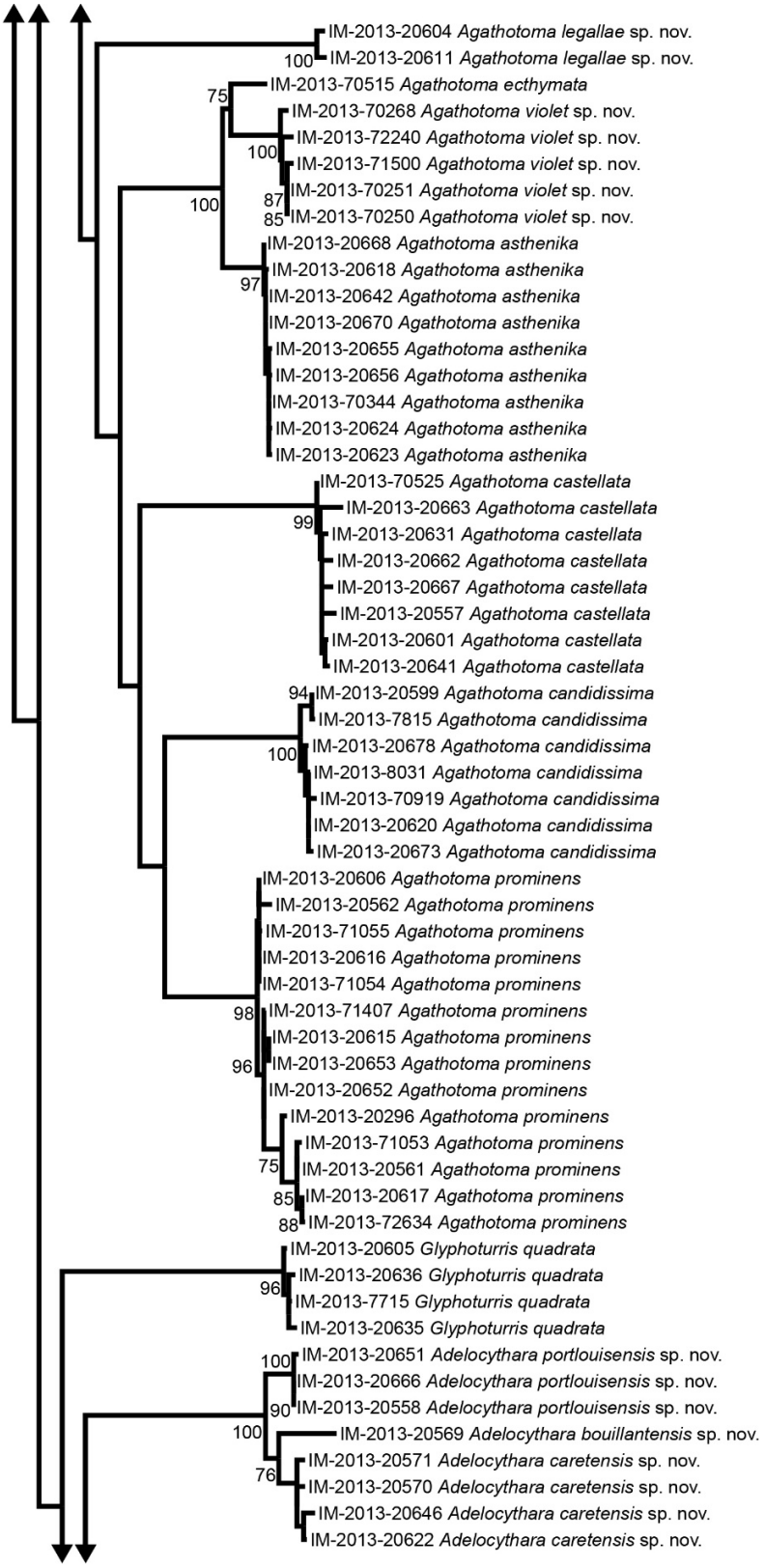


Fig. 1 (continued). Phylogenetic relationships (Maximum Likelihood) of tropical western Mangeliidae P. Fischer, 1883 based on the COI gene fragment. TWA species are highlighted by thick branches, and bootstrap values > 70% are indicated at the nodes. All "IM" catalog numbers start with "MNHN" here left off for to conserve space. The trees have been edited in MrEnt ver. 2.5 (Zuccon & Zuccon 2014).

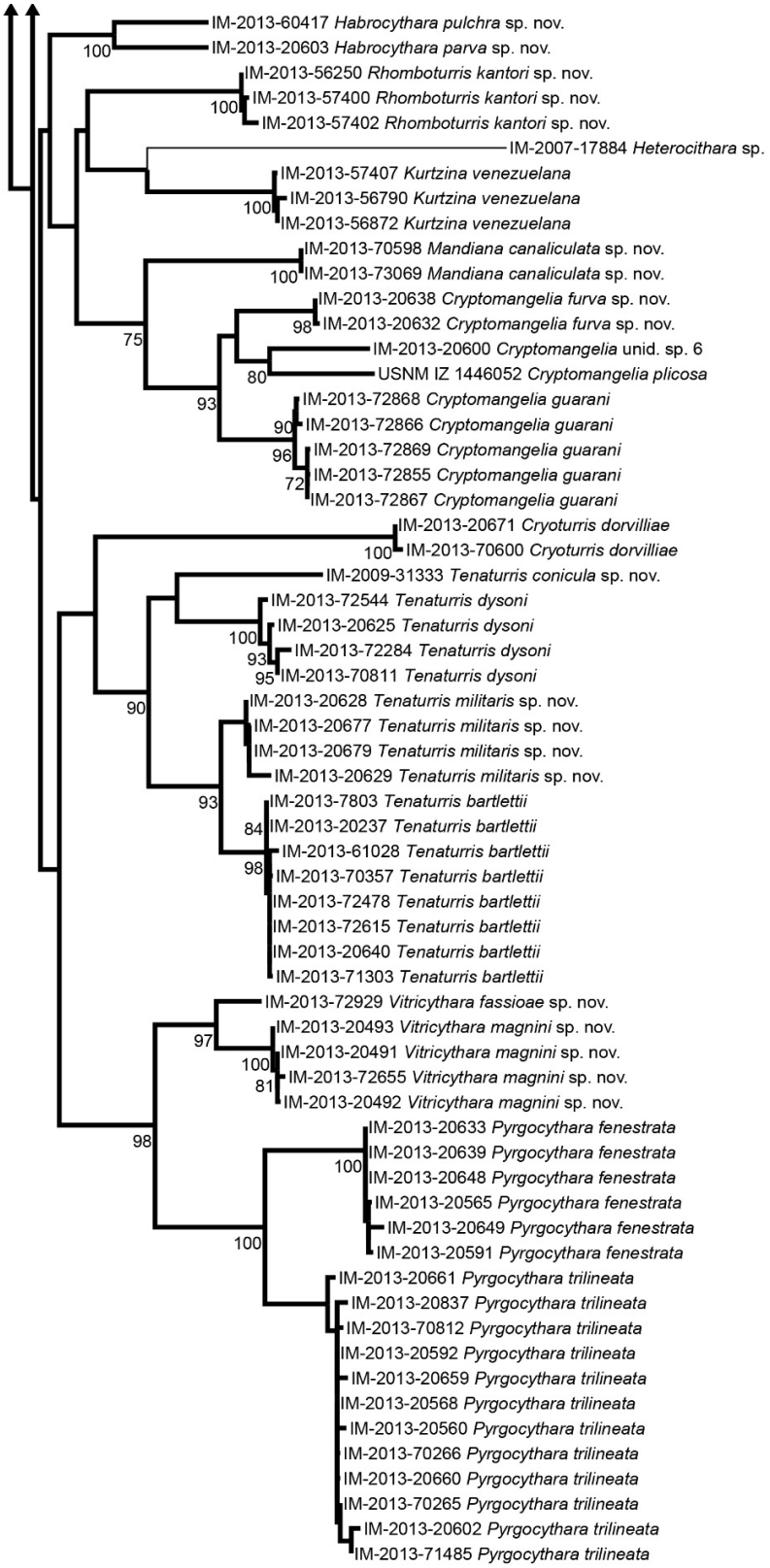


Fig. 1 (continued). Phylogenetic relationships (Maximum Likelihood) of tropical western Mangeliidae P. Fischer, 1883 based on the COI gene fragment. TWA species are highlighted by thick branches, and bootstrap values > 70% are indicated at the nodes. All "IM" catalog numbers start with "MNHN" here left off for to conserve space. The trees have been edited in MrEnt ver. 2.5 (Zuccon & Zuccon 2014).

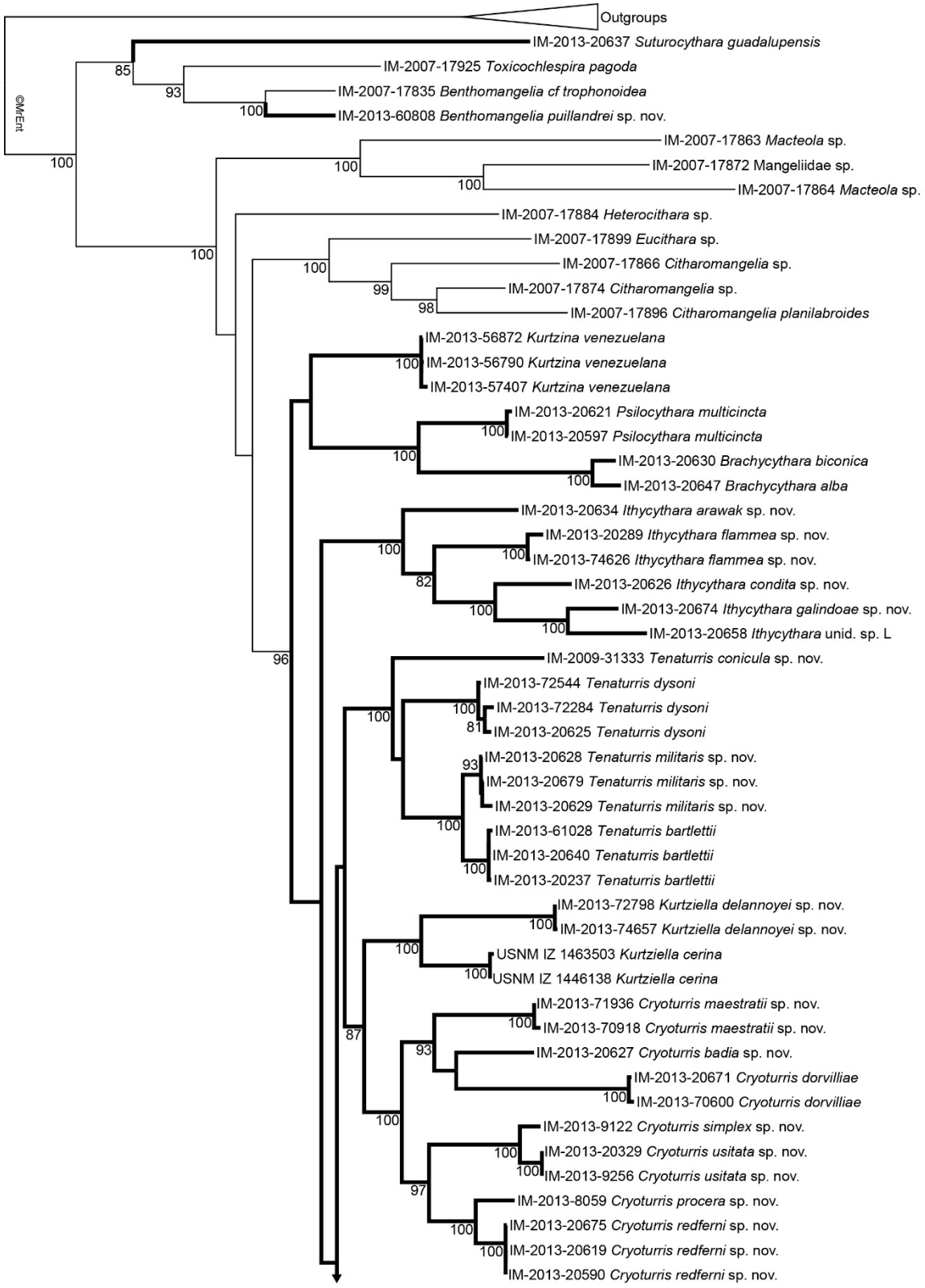


Fig. 2 (continued on next page). Phylogenetic relationships (Maximum Likelihood) of tropical western Mangeliidae P. Fischer, 1883 based on the concatenated dataset for a selection of Atlantic specimens. TWA species are highlighted by thick branches, bootstrap values > 70% are indicated at the nodes. All "IM" catalog numbers start with "MNHN"; here, it is left off to conserve space.

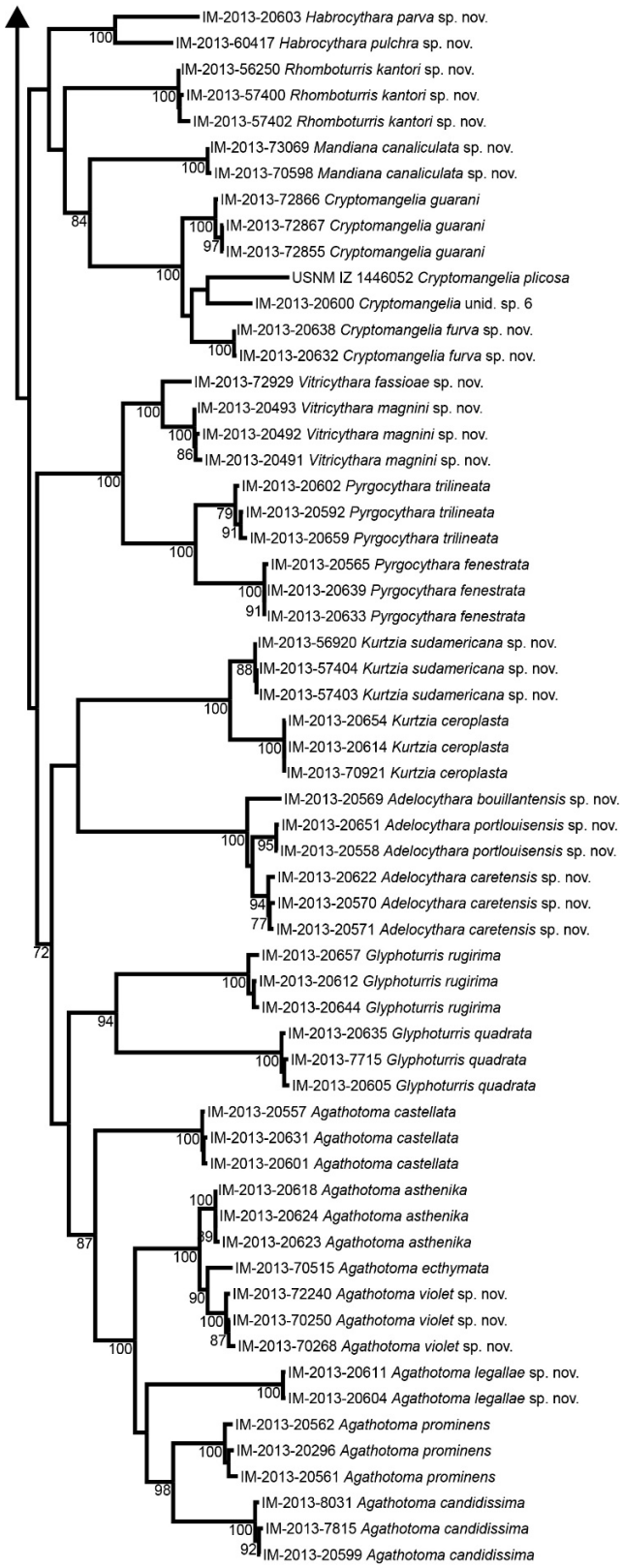


Fig. 2 (continued). Phylogenetic relationships (Maximum Likelihood) of tropical western Mangeliidae P. Fischer, 1883 based on the concatenated dataset for a selection of Atlantic specimens. TWA species are highlighted by thick branches, bootstrap values > 70% are indicated at the nodes. All "IM" catalog numbers start with "MNHN"; here, it is left off to conserve space.

Table 2. Number of species (previously described and proposed herein) and unnamed species by genus group.

Genus	Number of species proposed	Number previously described	Number of unnamed species
Acmaturris Woodring, 1928	6	4	0
Adelocythara Woodring, 1928	8	0	5
Agathotoma Cossmann, 1899	5	8	0
Bactrocythara Woodring, 1928	5	3	0
Bathyturris Fallon gen. nov.	6	3	1
Benthomangelia Thiele, 1925	1	4	1
Brachycythara Woodring, 1928	1	2	0
Cryoturris Woodring, 1928	20	5	7
Cryptomangelia Fallon gen. nov.	9	11	11
Glyphoturris Woodring, 1928	2	3	0
Habrocythara Fallon gen. nov.	2	1	0
Ithycythara Woodring, 1928	39	10	15
Kurtzia Bartsch, 1944	5	3	1
Kurtziella Dall, 1918	11	5	2
Kurtzina Bartsch, 1944	2	1	0
Mandiana Fallon gen. nov.	2	0	0
Psilocythara Fallon gen. nov.	3	2	0
Pyrgocythara Woodring, 1928	1	3	1
Rhomboturris Fallon gen. nov.	3	0	0
Rubellatoma Bartsch & Rehder, 1939	7	3	0
Saccharoturris Woodring, 1928	2	1	0
Stellatoma Bartsch & Rehder, 1939	5	2	6
Suturocythara García, 2008	1	3	0
Tenaturris Woodring, 1928	9	3	5
Vitricythara Fargo, 1953	4	2	0
Totals	**159**	**82**	**55**

New, dropped, and excluded genera

The available generic names of the western Atlantic Mangeliidae were not suitable for some species when they were compared to primary types and authors' diagnoses, including some earlier named species improperly placed for the same reason. Six of the 25 genera treated in this work are newly proposed. In addition, *Adelocythara* Woodring, 1928 is based on a fossil type species and used for the first time for an extant species; two more are first-time or the first confirmed application of eastern Pacific genera to western Atlantic mangeliids (*Kurtzia* Bartsch, 1944 and *Kurtzina* Bartsch, 1944). Three genera applied in the past by other researchers are not applicable to known western Atlantic mangeliids treated in this report: *Mangelia* Risso, 1826 (eastern Atlantic), *Platycythara* Woodring, 1928 (fossil), and *Granoturris* Fargo, 1953 (fossil). Three genera, *Oenopota* Mörch, 1852, *Propebela* Iredale, 1918, and *Curtitoma* Bartsch, 1941 are boreal and not treated in this work.

Synonyms

Most synonyms are a result of the poor communication between 19th century taxonomists, combined with insufficient description and lack of published photographs or drawings. The 31 synonyms listed here

Table 3 (continued on next page). Synonyms, their accepted names, and the source of synonymization.

Synonyms	Accepted name	Source of synonymy
Mangelia hornbeckii Reeve 1846b	*Agathotoma candidissima* cf. (C.B. Adams, 1845). Holotype a gerontic specimen?	herein
Agathotoma kirshi Rolán, Fernández-Garcés & Redfern, 2012	*Agathotoma millestriata* (E.A. Smith, 1882)	herein
Mangelia densestriata C.B. Adams, 1850	*Agathotoma candidissima* (C.B. Adams, 1845)	Rosenberg (2009)
Mangilia (*Cythara*) *asarca* Dall & Simpson, 1901	*Bactrocythara candeana* (d'Orbigny, 1853)	herein
Pleurotoma caribaea d'Orbigny, 1847	*Cryptomangelia cinctella* (L. Pfeiffer, 1840)	Rosenberg (2009)
Pleurotoma costata Reeve, 1845	*Pyrgocythara. trilineata* (C.B. Adams, 1845) comb. nov.	Krebs (1864)
Pleurotoma (*Mangilia*) *decora* E.A. Smith, 1882	*Pyrgocythara. trilineata* (C.B. Adams, 1845) comb. nov.	de Jong & Coomans (1988)
Murex accinctus Montagu, 1808 non Born, 1778	*Cryoturris dorvilliae* (Reeve, 1845)	herein
Pleurotoma forthiensis Reeve, 1845	*Cryoturris dorvilliae* (Reeve, 1845)	herein
Pleurotoma quadrilineata C.B. Adams, 1850	*Cryoturris dorvilliae* (Reeve, 1845)	herein
Kurtziella longa Nowell-Usticke, 1969	*Cryoturris dorvilliae* (Reeve, 1845)	Maes (MS) in Rosenberg (2009)
Pleurotoma trifasciata Reeve, 1845	*Pyrgocythara. trilineata* (C.B. Adams, 1845) comb. nov.	Tryon (1884)
Kurtziella caribbeana Weisbord, 1962	*Cryoturris dorvilliae* (Reeve, 1845)	Maes (MS) in Rosenberg (2009)
Mangilia ephamila K.J. Bush, 1885	*Kurtzia atrostyla* (Tryon, 1884)	Dall (1889a)
Pleurotoma diminuta C.B. Adams, 1850	*Glyphoturris quadrata* (Reeve, 1845)	Tryon (1884)
Cryoturris cruzana Nowell-Usticke, 1969	*Glyphoturris quadrata* (Reeve, 1845)	Nowell-Usticke (1971)
Pleurotoma albida C.B. Adams, 1845	*Glyphoturris quadrata* (Reeve, 1845)	herein
Pleurotoma fusiformis C.B. Adams, 1850	*Glyphoturris quadrata* (Reeve, 1845)	herein
Pleurotoma obesicostata Reeve, 1846a	*Cryptomangelia guarani* (d'Orbigny, 1841)	Tryon (1884)
Clathurella jewetti Stearns, 1873	*Cryptomangelia plicosa* (C.B. Adams, 1850)	Dall (1890b)
Pleurotoma brunnea Perkins, 1869	*Cryptomangelia plicosa* (C.B. Adams, 1850)	A.E. Verrill (1873b)
Mangelia crassicostata C.B. Adams, 1850	*Cryptomangelia fusca* (C.B. Adams, 1845)	Clench & Turner (1950) "may be a synonym of *fusca*"

Table 3 (continued). Synonyms, their accepted names, and the source of synonymization.

Synonyms	Accepted name	Source of synonymy
Ithycythara kellumi Fargo, 1953	*Ithycythara psila* (K.J. Bush, 1885)	Rosenberg (2009)
Mangelia balteata Reeve, 1846b	*Ithycythara lanceolata* (C.B. Adams, 1850).	de Jong & Coomans (1988)
Mangelia muricoides C.B. Adams, 1850	*Ithycythara lanceolata* (C.B. Adams, 1850).	Maes (MS) in Rosenberg (2009)
Mangilia (*Cythara*) *asarca* Dall & Simpson, 190	*Bactrocythara candeana* (d'Orbigny, 1853)	herein
Ithycythara fasciata Paulmier, 2019	*Ithycythara lanceolata* (C.B. Adams, 1850).	herein
Pleurotoma incincta R.B. Watson, 1881	*Benthomangelia antonia* (Dall, 1881)	Bouchet & Warén (1980)
Pleurotomella diomedeae A.E. Verrill & Smith in A.E. Verrill, 1884	*Benthomangelia antonia* (Dall, 1881)	Bouchet & Warén (1980)
Pleurotoma mericiacum Locard, 1897	*Benthomangelia antonia* (Dall, 1881)	Bouchet & Warén (1980)
Mangelia innocens Thiele, 1925	*Benthomangelia antonia* (Dall, 1881)	Bouchet & Warén (1980)

were designated by other researchers and accepted without their re-examination, principally because the types are not available or because the source is trusted. A few synonyms, so named by others, have not been accepted and are addressed as valid species in the body of this work. Additional information on the synonymized taxa in the table is provided in the descriptions of the accepted names.

Shell surface microsculpture

High magnification images of an area of shell surface of select specimens of most genera are presented for comparative purposes. Differences among genera are potentially diagnostic.

The purpose of the structures and other microsculptural details is unknown. This study illustrates differences among genera, but no effort has been made to quantify them, or to examine structures for more than a single representative of a species. Because of the close resemblance of species within genus groups, and resemblance among genera greater it is a useful diagnostic tool for generic placement.

Shell surface microsculpture may aid in singling out species that are incorrectly assigned to a genus. A summary of surface microsculpture by genus is presented in Table 4 below.

The summaries in Table 4 do not include all details but provide a general overview of the variety of patterns among the genera and their potential as diagnostic characteristics when combined with other morphological characteristics. For instance, past confusion among taxonomists regarding the assignment of species to *Kurtziella* and *Cryoturris* is resolved by differences in their microsculptural elements in image magnifications between 650–850×. Round, or erect short bundles without fanning in the former, flattened, stalked bundles with fanning in the latter. Similarly, the difference between *Tenaturris* and *Pyrgocythara* is evident with the presence of rippled spirals in the former, and their absence in the latter. *Bathyturris* Fallon gen. nov. can be distinguished from the similar-looking *Cryoturris* by the presence of bundles of fibrils that do not fan out at their apices (as opposed to those that do in *Cryoturris*).

Table 4. Summary of shell surface microsculpture by genus group.

Genus	Surface appearance	Gross microsculptural detail 350 or 850 × or as otherwise stated	Number of species imaged
Acmaturris Woodring, 1928	Frosted	Loose bundles, compact and arched or loose bouquets	6
Adelocythara Woodring, 1928	Frosted	Small bundles packed pancake-like across growth increments on spirals	3 + 5
Agathotoma Cossmann, 1899	Frosted	Brushes that fan out parallel to growth lines at their intersection with spirals	6
Bactrocythara Woodring, 1928	Smooth, dull to glossy	No detail, or bands of short, microscopic strings arranged in parallel rows or randomly	6
Bathyturris Fallon gen. nov.	Frosted	Bundles, compact	7
Benthomangelia Thiele, 1925	Smooth	Surface smooth, as depicted in Figueira & Absalão (2010)	0
Brachycythara Woodring, 1928	Dull, granular	Spirally aligned bundles pinched by growth lines	3
Cryoturris Woodring, 1928	Frosted	Flat bunches of short fibrils fan out from atop of a short basal trunk	22
Cryptomangelia Fallon gen. nov.	Smooth, dull or glossy	Parallel rows of jagged microscopic strings	11
Mandiana Fallon gen. nov.	Smooth, glossy	Microscopic strings grouped in parallel rows; granules in intercalary space	1
Glyphoturris Woodring, 1928	Frosted	Stalked rows of bundles, fanned at apices	4
Habrocythara Fallon gen. nov.	Translucent, glossy	Smooth, faint, random microscopic punctae	3
Ithycythara Woodring, 1928 Type A	Smooth, glossy	Banded, no distinct elements at 1000–2500 ×	8
Ithycythara Woodring, 1928 Type B	Coarse spiral grooves	Raised 'hedges' with punctate top surfaces	8
Ithycythara Woodring, 1928 Type C	Smooth, glossy	With or without punctae, if present, random or in bands	8
Kurtzia Bartsch, 1944	Frosted	Bifurcated, compact erect bundles	8
Kurtziella Dall, 1918	Frosted	Bundles of fibers, round or oblong, without fanning	11
Kurtzina Bartsch, 1944	Frosted	Small, stalked bundles	
Psilocythara Fallon gen. nov.	Smooth	Punctae at high magnification, channels, or microscopic spiral grooves	5
Pyrgocythara Woodring, 1928	Smooth, translucent	Non-random microscopic granules throughout	2
Rhomboturris Fallon gen. nov.	Smooth	Granules at 2250–3000 ×	2
Rubellatoma Bartsch & Rehder, 1939	Smooth to glossy	Wide and narrow bands, granules cover wide bands	8
Saccharoturris Woodring, 1928	Frosted	Pipes, single and manifolded	3
Stellatoma Bartsch & Rehder, 1939	Smooth, dull to glossy	Broad rows of dense and less dense microscopic strings	5
Suturocythara E.F. García, 2008	Smooth	Irregular microscopic spiral threads bunched in parallel rows	3
Tenaturris Woodring, 1928	Smooth to glossy	Rippled spirals; punctate surface	10
Vitricythara Fargo, 1953	Smooth, translucent	Irregular microscopic granules overall, smaller and denser on spiral surfaces	5

Table 5. Nomina dubia, reason for declaration, and presumed genus.

Nomina dubia	Reason	Genus
Columbella edonida Duclos, 1848	Poor condition of type, insufficient description	*Cryptomangelia*
Columbella cledonida Duclos, 1846	Poor condition of type, insufficient description	*Glyphoturris*
Pleurotoma (*Clathurella*) *adamsii* E.A. Smith, 1884	Type specimens were lost in 1986, no photographs, insufficient description	? *Rubellatoma*
Pleurotoma laqueata Reeve, 1846a	Missing type	*Cryptomangelia*
Mangelia astricta Reeve, 1846b	Missing type	*Cryptomangelia*
Pleurotoma luteofasciata Reeve, 1845	Missing type	*Cryptomangelia*
Pleurotoma rubricata Reeve, 1846a	Missing type, insufficient description, no photograph.	*Ithycythara*
Pleurotoma hexagonum Pfeiffer, 1840	On account of its poor state of preservation (Faber 2004: 56, figs 121–122).	*Agathotoma*

Another species (ANSP 332067) illustrates how microsculptural detail aids in generic placement. *Mangelia nanodes* Melvill, 1923, was most recently classified in *Brachycythara* (Williams 2005: #5554), but the species clearly has the microsculpture characteristic of *Cryptomangelia* Fallon gen. nov. (see Fig. 48C). The genus *Cryptomangelia* has been erected to separate species previously lumped in the genus *Pyrgocythara*. The two have different microsculptures: parallel rows of microscopic, jagged strings versus microscopic granules (microscopic even at 850× in SEM images).

More work is needed to link the structures' function to their appearance and, perhaps, the reason for differences among genera. The consistent differences among genera suggest, however, that there is a genetic basis at the level of genus, and if so, the form of the structures will serve to identify the genus of otherwise difficult-to-place species on gross morphological grounds alone.

Nomenclatural actions

In addition to the proposed 6 new genera and 159 new species, *nomina dubia*, and lectotype designations proposed herein or by others recognized in this work are summarized in Table 5 above and proposed lectotypifications are listed in Table 6.

Nomina dubia

The principal reason for the declaration of a nomen dubium is the loss of type specimens or absence of a good photograph, drawing or detailed description of the lost type or type series. Also, a poorly preserved type may be indistinguishable from one or more of its congeners and reason for its inclusion in this category. More detail of the rationale for *nomina dubia* declarations is given at the beginning of the indicated genus section of the table. None of the six *nomina dubia* are considered candidates for the naming of neotypes at the present time because they too little is known about them to select a substitute type.

Table 6. Lectotypes designated for species in this work.

Taxon	Catalog number(s) of type series	Original no. of syntypes	Present combination New catalog number or lectotype measurement
Pleurotoma (*Mangilia*) *millestriata* (E.A. Smith, 1882)	NHMUK 20230894	3	*Agathotoma* Specimen with red dot and closest match in size.
Mangilia (*Mangilia*) *cerinella* Dall, 1898	USNM 35975, 35980, 86909 Not this species USNM 125535, 134452, 35359, 35826, 41548, 41560, 41572, 44442, 45137, 45138, and 887516	8	*Cryoturris* Largest of the 2 in USNM 86909: 11.9 × 3.8 mm.
Pleurotoma auberiana d'Orbigny, 1853	NHMUK 1854.10.4.425	5	*Ithycythara* 6.5 mm SL specimen is the closest to the stated size by d'Orbigny of 7 mm. The other 4 do not appear to be the same species.
Daphnella atrostyla Tryon, 1884	ANSP 15526, ANSP 15510 & USNM 86905	8	*Kurtzia* 8.1 × 3.2 mm specimen in ANSP 15526.
Pleurotoma cerinum Kurtz & Stimpson in Stimpson, 1851	MCZ 156181	9	*Kurtziella* 7.5 × 2.6 mm specimen from among the 9 most closely matches author's description.
Drillia limonitella Dall, 1884	USNM 35979	3	*Kurtziella* 5.5 × 2.2 mm specimen most closely matches author's description.
Pleurotoma dysoni Reeve, 1846c	NHMUK 20180546	2	*Tenaturris* 7.0 × 2.9 mm specimen, the best preserved specimen.
Mangilia (Cythara) bartlettii Dall, 1889	USNM 87417, 86915, 87418. MCZ 7100, 7101, 7102.	7	*Tenaturris* Specimen in USNM 87417 most closely matches Dall's description and has a red dot.

Lectotype designations

The following table lists nominal taxa for which lectotypifications have been made. See under the respective species description for full rationale.

Problematic species

Dall (1927) introduced nine names that may belong in Mangeliidae (some of his "*Mangilia*" and "*Daphnella*?") collected in 1885–86 from the continental slope at R/V *Albatross* stn 2668 off Fernandina Florida, in 538 m and at R/V *Albatross* stn 2415, off the coast of Georgia, in 805 m. However, none have characteristics that meet the current diagnosis of the family, primarily due to the lack of typical mangeliid protoconch sculpture. Twelve other species of Dall's "*Mangilia"* and "*Daphnella*?" in this publication have since been tentatively placed in other families (see WoRMs). Both surface and protoconch sculpture of the nine putative mangeliids (SEM images supplied by the Smithsonian and available on their data

portal were examined) are absent compared to all other species treated in this report, so it is difficult at best to assign them to existing genera based on morphology alone. Assignment to genera may have to wait until DNA sequence data becomes available. The nine are itemized here.

- *Daphnella*? *epomis* Dall, 1927: holotype, 538 m, stn 2668, USNM 107966
- *Daphnella*? *sagena* Dall, 1927: 2 syntypes, 805 m stn 2415, USNM 108311
- *Mangilia crossata* Dall, 1927: 6 syntypes, 538 m, stn 2668, USNM 107959
- *Mangilia cryera* Dall, 1927: ca 50 syntypes, 538 m, stn 2668, USNM 107960
- *Mangilia lastica* Dall, 1927: 25 syntypes, 538 m, stn 2668, USNM 107967
- *Mangilia loraeformis* Dall, 1927: 30 syntypes, 805 m, stn2415, USNM 108308
- *Mangilia*? *rhabdea* Dall, 1927: holotype, 538 m, stn 2668, USNM 107949
- *Mangilia*? *subcircularis* Dall, 1927: 2 syntypes, 805 m, stn 2415, USNM 333450
- *Mangilia*? *tachnodes* Dall, 1927: holotype, 538 m, stn 2668, USNM 333446

Results of all the taxa treated in this work are detailed in the systematics section that follows.

Systematics

This portion of the report addresses 82 previously described accepted species, 159 newly proposed species, and 55 unnamed but possibly new species. Additionally, it discusses 31 synonyms and 8 nomina dubia, resulting in 335 assessed taxa. To facilitate navigation through numerous descriptions, the genera are listed in alphabetical order, with each genus further divided into two or more parts. Within each part, species are generally organized by morphological similarity, allowing for easier comparison, with figures located at the end of each section. A key to genera is provided in Appendix 2, which may assist in determining a specimen's genus group. For *Ithycythara*, the largest genus, species are grouped into one or more parts based on geographical area rather than morphological similarity. A specimen from a known locality significantly narrows down the possible species since most have very limited ranges. At the beginning of the *Ithycythara* section, a table lists the part numbers (1–13) corresponding to species descriptions of specific regions. An index of specific names is included in Appendix 1.

Family **Mangeliidae** P. Fischer, 1883

The Mangeliidae are distinguished from other families of the superfamily Conoidea by the following bounds of variable morphological characteristics:

- length small, up to about 12 mm, but usually 6 mm or less.
- fusiform in shape, usually with a spire about the same height as the last whorl, sometimes higher or lower. Some genera are mostly conical, while others have only a few conical species. An anterior canal that is very short to moderate in length. Subsutural cords and distinct ramps are lacking.
- a protoconch of one to up to three plus a fraction of whorls, consisting of a smooth nuclear whorl followed by the remaining whorls that may be plain but always end with riblets. Riblets may be on one or more of the remaining whorls. Fine grooves or threads may cross these, thus appearing beaded, or by riblets reduced and keel-like on the periphery of a compressed whorl. Spiral elements may be lacking.
- the teleoconch is sculptured with axial ribs and fine spiral threads or stronger cords. Spiral elements may appear granulose or be described as frosted, depending on their sub-microscopic structure. Axial ribs can be broad or narrow, extending the full length of the whorl or not, and are usually recurved on the whorl shoulders, reflecting past positions of the anal sinus. An axial rib may enlarge into a varix, usually located near or at the aperture of the shell. Both axial ribs, varix, and spiral elements may be obsolete or nearly so on later whorls.

- the aperture may be plain or have dentition, including lyrae, teeth, calluses, etc. The outer lip may appear varicose, presenting a swollen edge or an enlarged rib formed by a rolled-over rib, and it possesses the same surface sculpture as the preceding shell surface. The anal sinus, located on the shoulder of the last whorl, may range from nearly obsolete to a deep groove, with surrounding calluses on the parietal wall or near the edge of the outer lip.

Genus ***Acmaturris*** Woodring, 1928

Type species

Acmaturris comparata Woodring, 1928, by original designation.

The species appears to lack frosted primary spirals and lacks secondaries altogether. These may have been worn down in the fossil representative. However, the remaining morphological features of the fossil strongly suggest that it is closely related to modern species.

Summary diagnostic characteristics

Shell fusiform, angular to rounded shoulders, with a long, moderately narrow aperture, and a moderately long anterior canal differentiated by a gradual narrowing of the last whorl.

Protoconch of 1⅞–2½ whorls, the last with arched riblets and some species with a keel formed by peripherally swollen riblets that terminate before the suture. Minute tubercles are sometimes present near the suture.

Outer lip varicose, edge crenated by primary spirals.

Anal notch with a round apex, straight or divergent sides, etched into the face of the varix, denticle lacking.

Sculpture of narrow ribs and primary spirals of nearly equal strength that form a wide reticulate pattern. All spirals are ‘frosted’.

Color of straw, sometimes with brown spiral bands and/or lines.

Shell surface microsculpture

Shell surface SEM images of representative specimens in magnifications ranging from 740× to 880× appear in Fig. 3. Microsculptural structures (‘frosting’) arise at the intersection of secondary spirals with incremental growth lines and vary from ‘waves’ to lose bundles of fibrils arched over lamellar-like growth lines. Primary spirals have a different arrangement of structures: minute bundles of fibrils compactly arranged in rows that cross the surface of the spiral obliquely (reflecting the crossover of oblique incremental growth lines), appearing as if wound around the spiral cord.

Difference from other genera

Some readily observed differences from similar-looking genera are as follows:

Tenaturris Woodring, 1928 has an anal sinus immediately adjoining the suture, not offset from the parietal wall, and the shell has a less reticulate sculpture.

Pyrgocythara Woodring, 1928, possesses a small-tipped nucleus, not a broad-tipped one, has weaker ribs overridden by frosted spirals of different orders of magnitude, not narrow ribs with strong spiral primaries and microscopic frosted secondaries between. It also has a wider aperture and a denticle on the outer lip below the anal sinus, which are lacking in *Acmaturris*.

Bathyturris Fallon gen. nov. differs from *Acmaturris* in having a trochoid protoconch of 3¼–3½ whorls, not a broad-tipped one with 1⅞–2½ whorls, and in possessing two or more whorls with riblets, which have spiked ridges.

Remarks

Acmaturris brisis Woodring, 1928 has been reported in Recent samples by Brazilian workers: Rios (1983, 1985, 1994, 2009: 337, fig. 867), Absalão *et al.* (2005: 30, fig. 68), and with reservation, by de Jong & Coomans (1988: 115, pl. 44 fig. 613). The specimen in de Jong & Coomans (1988) appears to be *Adelocythara caquetio* Fallon sp. nov.; the specimen depicted in Rios (2009: 337, fig. 867) may be *Vitricythara formosa* Fallon & Bouchet sp. nov. as does the specimen in fig. 68 of Absalão *et al.* (2005). In short, there has been no definitive report of *A. brisis* in the Recent fauna and so its description is not within the scope of this monograph. The holotypes of *A. brisis*, and *Cythara metria* Dall, 1903 are depicted in Fig. 128W, and Fig. 128A–B respectively, of *Vitricythara* Part 1 for comparison. Differences between the fossil and recent specimens of *V. formosa* are discussed under the description of that species.

Daphnella? *sagena* Dall, 1927 has been combined in *Acmaturris* (Rosenberg 2009) but lacks most diagnostic characteristics of the genus, and may instead belong in Mitromorphidae, which are not treated in this work.

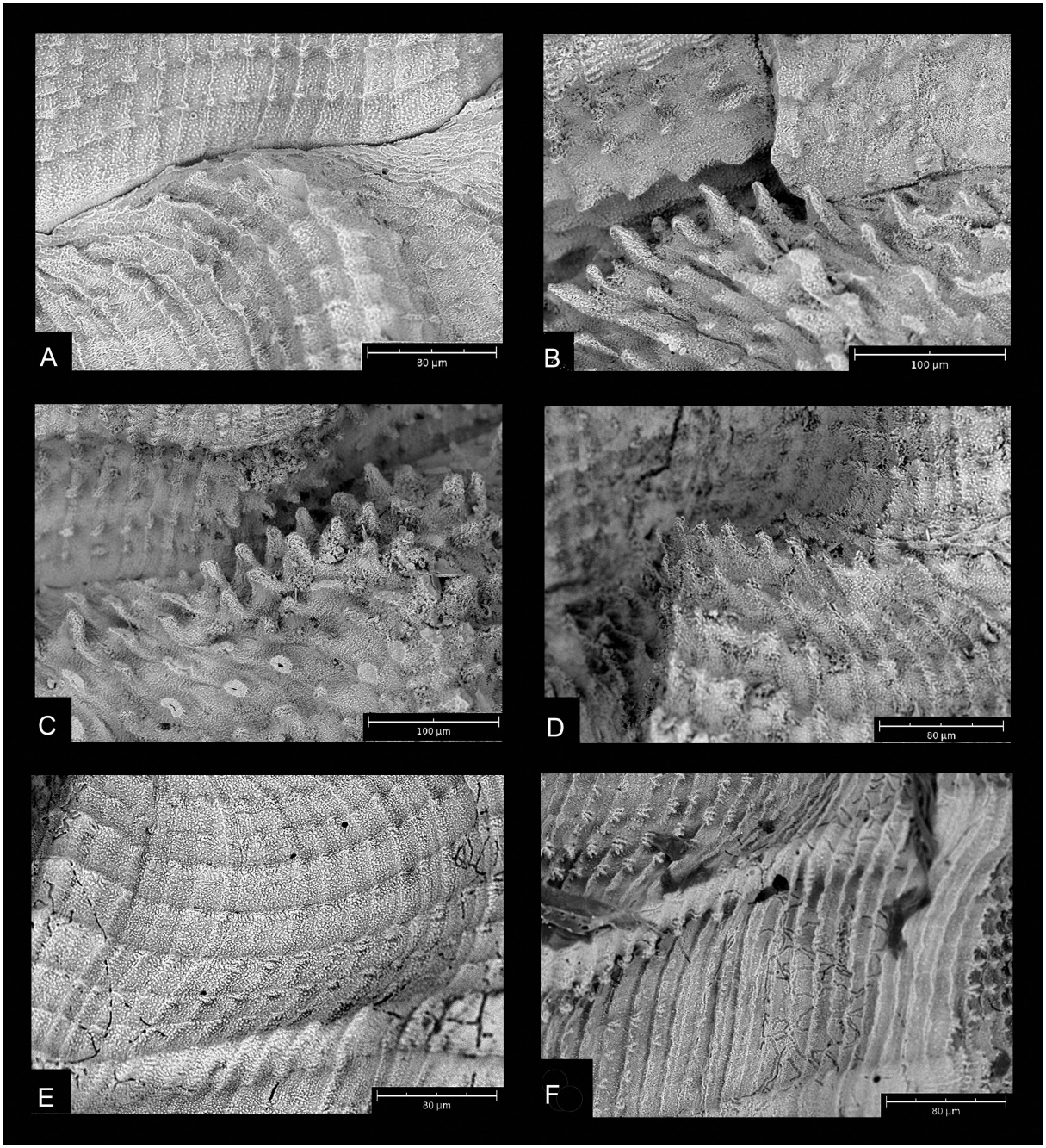
Fig. 3 (next page). Species of *Acmaturris* Woodring, 1928, shell surface microsculpture. SEM images around the area of the penultimate whorl, ventral side, from suture to shell base. **A**. *Acmaturris brevissima* Fallon & Bouchet sp. nov., holotype, 5.0 × 2.2 mm (MNHN-IM-2000-39475), S of La Désirade, Guadeloupe. Secondary spiral structures subdued, consisting of small, loose bundles of fibrils arched over incremental growth lines. Secondaries widely separated, and variable in strength. Shell surface covered with minute papillae-like structures. **B**. *Acmaturris bicincta* Fallon & Bouchet sp. nov., holotype, 5.4 × 2.3 mm (MNHN-IM-2000-39472), S of La Désirade, Guadeloupe. View of suture area. Secondary spiral structures prominent, wave-like, crowded, especially prominent in the sheltered area close to suture. Spiral cord (in upper left) with rows of minute, bundles of erect short fibrils arranged perpendicular to the axis of the cord, appearing bamboo-like. **C**. *Acmaturris tricincta* Fallon & Bouchet sp. nov., holotype, 7.3 × 2.5 mm (MNHN-IM-2000-39478), S of La Désirade, Guadeloupe. Very similar to the microsculpture of *A. bicincta* Fallon & Bouchet sp. nov. The primary spiral (not shown) has compacted bundles of fibrils arranged obliquely across the surface of the cord, appearing like it is wound around it. **D**. *Acmaturris lineata* Fallon & Bouchet sp. nov., holotype, 8.6 × 3.2 mm (MNHN-IM-2000-39477), E of La Désirade, Guadeloupe. Structures along secondary spiral); growth line intersections are webbed together along the spiral appearing somewhat wave-like, but the component fibrils are somewhat disorganized and do not provide a clear form of their structure. The growth lines appear like exposed rows of bunched fibrils that rise only a little above the shell surface. **E**. *Acmaturris angularis* Fallon & Bouchet sp. nov., holotype, 10.0 × 3.5 mm (MNHN-IM-2012-9057), behind Fajou Island, Guadeloupe. Microsculpture consists of minute structures, widely separated secondary spirals. Structures comprised of loose bundles of erect fibrils that arch over incremental growth lines where they intersect secondary spirals. Primary spirals with oblique rows of compactly spaced minute bundles of fibrils. Surface of shell densely covered with crystalline material, appearing like spikes under higher magnification. **F**. *Acmaturris mairelae* (Fernández-Garcés & Rolán, 2010) comb. nov., spec., 3.2 × 1.4 mm (MNHN-IM-2012-7446), Rocroy sud, Guadeloupe. Structures minute, of small bouquets of fibrils at secondary spiral intersections with incremental growth lines that are lamellar, thin ribbons of shell that extend above the surface of the shell. The visible primary spiral visible in the image has oblique rows of compacted structures, following growth lines that cross obliquely over the primary spiral. Scale bars: A, D–F = 80 µm; B–C = 100 µm.

Acmaturris spp. Part 1

Acmaturris brevissima Fallon & Bouchet sp. nov.
urn:lsid:zoobank.org:act:DFB8ACC7-27FF-4150-83CE-DC35AD97FD4B
Figs 3A, 4B–J

Differential diagnosis

Acmaturris brevissima Fallon & Bouchet sp. nov. is unique among its congeners in possessing round shoulders, taller than wide whorls, and a short anterior canal.



Etymology

Acmaturris brevissima Fallon & Bouchet sp. nov., from the feminine form of the Latin adjective '*brevissimus*', referencing its short anterior canal and overall stature.

Type material

Holotype

GUADELOUPE • 5.0 × 2.2 mm; S of La Désirade; depth 250 m; 2016; dredged; ex D. Lamy coll.; MNHN-IM-2000-39475.

Paratypes (9 specs)

GUADELOUPE • 1 spec., 5.0 × 1.9 mm; off Marie-Galante; depth 250 m; 2017; D. Lamy coll. • 1 spec., 5.0 × 2.0; S of La Désirade; depth 250 m; 2016; dredged; D. Lamy coll. • 4 specs, 5.1 × 2.0, 5.3 × 2.2, 5.7 × 2.3, and 5.4 × 2.3 mm; S of Marie-Galante; 15°51′ N, 61°18′ W; depth 250–254 m; 29 Jun. 2015; KARUBENTHOS 2; stn DW4646; MNHN-IM-2000-39476 • 1 spec., 4.0 × 1.9 mm; W of La Désirade; 16°08′ N, 61°19′ W; depth 400–420 m; 19 Jun. 2015; KARUBENTHOS 2; stn DW4582, UF 589670 • 1 spec., 3.0 × 1.4 mm; W of Marie-Galante; 15°53′ N, 61°25′ W; depth 262–266 m; 22 Jun. 2015; KARUBENTHOS 2; stn DW4599; USNM 1715401 • 1 spec., length = 5.35 mm; W of Marie-Galante; 15°50′ N, 61°26′ W; depth 265–268 m; 27 Jun. 2015; KARUBENTHOS 2; stn DW4635; USNM 1715402.

Description

Shell small (holotype length = 5.0 mm, largest paratype length = 5.7 mm), stoutly fusiform, of 6 convex impressed whorls, shoulders round, relatively tall (each successive whorl noticeably larger in diameter than previous ones, lending them the appearance of being stacked). Sculpture of axial ribs and spiral cords in a reticulate pattern; aperture oval, about 50% of shell length, anterior canal short for genus. *Protoconch* of 2⅛ glossy smooth whorls, the first recumbent and bulbous, the second tall, like teleoconch whorls, with about 6 fine riblets near end; color dark brown at first but fading to base shell color. *Axial sculpture* of narrow, round ribs from suture to suture on spire whorls, to anterior fasciole on last, intercostal space about as wide as ribs, of which there are 14 on penultimate and 11 on last whorl to varix. *Varix* apertural, extends from above suture line on shoulder in a smooth arc to the anterior canal, edge frilled by spirals. *Spiral sculpture* of primary spirals about half as strong as the axials and swollen over axials, 4 on penult whorl, 5 more on shell base. Very fine, microscopic spirals lie between the spirals. Spirals are microscopically frosted along growth striae and, as such, appear axially aligned. *Sulcus* not present, however axials between the suture and first spiral cord slightly curved as contrasted with the remainder of the whorl where they are straight. *Outer lip* varicose, with a narrow extension of shell projecting from base of varix; stromboid notch lacking. *Anal sinus* a notch in the outer lip with a shallow excavation of the varix, separated from the suture by a weak parietal callus. *Inner lip* narrow, etched into the columella along its length, parietal callus adjoining anal sinus weak. *Columella* narrowly sigmoidal. **Anterior canal** very short, barely defined, straight, slightly notched. *Anterior fasciole* is not swollen; its surface has 5 primary spirals. *Color* dirty white with a brown band in intercostal spaces on whorl shoulders and two light brown bands visible on dorsum of last whorl.

Remarks

The 10 type specimens have an average length = 4.9 mm (range = 3.0–5.7 mm). Three of the 10 are sub-adult (range = 3.0–5.1 mm); their elimination would bring the adult (fully formed lip) average length to 5.7 mm (range = 4.0–5.7 mm). Mid-whorl and shoulder color bands vary in intensity.

Range and habitat

Off Guadeloupe; depth 250–420 m.

Acmaturris bicincta Fallon & Bouchet sp. nov.
urn:lsid:zoobank.org:act:7777F008-5A67-4204-AF09-6CF2FCDEA5FD
Figs 3B, 4K–Q

Differential diagnosis

Acmaturris bicincta Fallon & Bouchet sp. nov. is readily identified by its narrow shell with a relatively long anterior canal. These characteristics are shared by the similar *Acmaturris tricincta* Fallon & Bouchet sp. nov., but see under that species for differences.

Etymology

Acmaturris bicincta Fallon & Bouchet sp. nov., the two-spiraled *Acmaturris*, from the Latin adjective '*bi* + *cinctus*', meaning 'two encircled', a reference to the two primary spirals on its spire whorls.

Type material

Holotype
GUADELOUPE • 7.9 × 2.8 mm; S of La Désirade; depth 250 m; dredged; ex D. Lamy coll.; MNHN-IM-2000-39472.

Paratypes (15 specs)
GUADELOUPE • 4 specs, 5.8 × 2.2, 5.7 × 2.1, 4.6 × 1.9 and 5.8 × 2.2 mm; S of La Désirade; depth 250 m; dredged; ex D. Lamy coll.; USNM 1715381 • 4 specs, 5.7 × 2.1, 5.6 × 2.1, 5.1 × 2.0 and 4.9 × 2.0 mm; S of La Désirade; depth 250 m; dredged; D. Lamy coll. • 3 specs 5.7 × 2.2, 5.7 × 2.3 and 5.7 × 2.3 mm; S of La Désirade; depth 250 m; 2016; dredged; ex D. Lamy coll.; ANSP 498778 • 1 spec., 5.4 × 2.0 mm; S of La Désirade; depth 200–250 m; dredged; ex D. Lamy coll.; UF 589671 • 1 spec., 6.7 × 2.5 mm; Pointe des Châteaux; depth 250 m; 2013; dredged; ex D. Lamy coll.; UF 589672 • 1 spec., 4.9 × 2.0 mm; W of Marie-Galante; 15°56′ N, 61°23′ W; depth 208–210 m; 22 Jun. 2015; KARUBENTHOS 2; stn DW4597; MNHN-IM-2000-39473 • 1 spec., 5.2 × 2.2 mm; W of Marie-Galante; 16°00′ N, 61°23′ W; depth 204–251 m; 21 Jun. 2015; KARUBENTHOS 2; stn DW4586; MNHN-IM-2000-39474.

Description

Shell small (holotype length = 7.9 mm), narrowly fusiform (W/L = 0.3544) with about 6 convex whorls, sutures impressed, the last about 66% of shell length including anterior canal; aperture narrow, barely differentiated from canal, about 51% of shell length including canal. *Protoconch* of about 1⅞ smooth round whorls, tip recumbent and the first bulbous, with 8–10 fine curved riblets at the end of the last whorl that do not reach the suture. *Axial sculpture* of narrow ribs that run from suture to suture on spire whorls, to anterior fasciole on last, recurved on shoulder, number 13 on penultimate, and 7 on last whorl to varix; intercostal space is as wide as ribs, progressively wider on dorsum of last whorl. *Varix* strong, on outer lip, outer edge crenated, may be preceded by an earlier varix on older specimens. *Spiral sculpture* consists of primary and secondary spirals; 2 primaries are present on spire whorls, the first at the shoulder edge, the second below mid-whorl, and 5 more on the last whorl to the anterior fasciole. Primaries are rounded, pass over the riblets and form elongate swellings or nodules on rib crests. Shoulders lack cords. Microscopic, frosted spirals fill the space between primaries, frosting aligned with the growth striae give the appearance of axially aligned striae since the frosting is more visible than the secondary spirals. *Sulcus* flat, angled about 50° from and set off the suture by a narrow flat ridge coinciding with the distance of the anal sinus from the suture, ribs are reduced, and recurved, only microscopic spirals present. *Outer lip* varicose, crenated by primary spirals, with a narrow outer shell extension, its edge forming a low arc from suture to anterior canal; stromboid notch absent. *Anal sinus* is a broad U-shape notch a little removed from the suture, closer to the shoulder's edge and

extending to the face of the varix. *Inner lip* narrow, unemarginate, etched into columella, and without a parietal callus.

Columella is slightly sigmoid. *Anterior canal* open, relatively long for genus, angled slightly to the right at its end when viewed ventrally; unnotched. *Anterior fasciole* not swollen, with 5 or 6 spirals. *Color* white with a faint brown band on whorl shoulders and a wide, mid-whorl band, darkest at lip's edge, and a dark brown 3rd cord, which coincides with the suture line and is visible on the base of the last whorl.

Remarks

Examined specimens have an average length = 5.6 mm (range = 4.6–7.9 mm, n = 17). The holotype is the largest and almost a full teleoconch whorl, greater than the others (6¾ versus 5½–6 whorls).

Range and habitat

Off Guadeloupe; depth 204–251 m.

Acmaturris tricincta Fallon & Bouchet sp. nov.
urn:lsid:zoobank.org:act:FEFBB606-C248-43E6-BD11-F524D566EAA3
Figs 3C, 4R–U

Differential diagnosis

Acmaturris tricincta Fallon & Bouchet sp. nov. differs from *A. bicincta* Fallon & Bouchet sp. nov. in the shape of the protoconch, in the number of primary spirals (three versus two on the penultimate), in the shape of the anterior canal (straight versus angled to the right), and in shell color (almost all white with only faint brown primary spirals versus white with broad brown bands). *Acmaturris lineata* Fallon & Bouchet sp. nov. also has brown primary spirals but its shell is larger, broader in form, and possesses a shorter anterior canal. It has a 2½-whorl protoconch with a brown tip (versus a 2-whorl protoconch with a white tip).

Etymology

Acmaturris tricincta Fallon & Bouchet sp. nov., the three-spiraled *Acmaturris*, from the Latin adjective '*tri* + *cinctus*', meaning 'thrice encircled', a reference to the two primary spirals on its spire whorls.

Type material

Holotype
GUADELOUPE • 7.3 × 2.5 mm; S of La Désirade; depth 250 m; 2016; dredged; ex D. Lamy coll.; MNHN-IM-2000-39478.

Paratype (1 spec.)
GUADELOUPE • 1 spec., 4.5 × 1.8 mm; W of Marie-Galante; 16°00′ N, 61°23′ W; depth 204–251 m; 21 Jun. 2015; KARUBENTHOS 2; stn DW4586; MNHN-IM-2000-39479.

Description

Shell small (holotype length = 7.3 mm), narrowly fusiform (W/L = 0.3425) with about 7 convex whorls with impressed sutures, a relatively long and tapered last whorl, which is about 64% of shell length, including anterior canal; aperture narrow, barely differentiated from canal, about 48% of shell length including canal. *Protoconch* of 2 round whorls, a minute white tip, expanding rapidly such that the first whorl is bulbous, then the 2nd with about 10 arched riblets on the last portion of the protoconch that do not reach the suture. *Axial sculpture* of narrow ribs that run from suture to suture on spire whorls, to

anterior fasciole on last, recurved on shoulder, slightly opisthocline below, number 13 on penultimate, and 7 on last whorl to varix; intercostal space is as wide as ribs, progressively wider on dorsum of last whorl. *Varix* strong, apertural, crenate, spirals extend over face of varix to edge of aperture. *Spiral sculpture* consists of primary and secondary spirals; 3 primaries are present on spire whorls the first at the shoulder's edge, the last two on whorl side, and 6 more on the last whorl to the anterior fasciole. Primaries are rounded in cross section, pass over the ribs and form elongate swellings or nodules on rib crests. Shoulders lack primaries. Microscopic, frosted spirals fill the space between primaries, frosting is aligned with the growth striae giving the appearance of axially aligned growth striae since the frosting is more visible than the microscopic spirals. *Sulcus* flat, sloped about 50° from the perpendicular to the shell axis, ribs are reduced and recurved, only secondary spirals present in the sulcus. *Outer lip* varicose, outer edge forming a low arc from suture to anterior canal, stromboid notch absent. *Anal sinus* is a broad U-shape notch a little removed from the suture, closer to the shoulder's edge and extending to the face of the varix. *Inner lip* narrow, unemarginate, etched into columella, without a parietal callus. *Columella* straight. *Anterior canal* open, relatively long for genus, unnotched. *Anterior fasciole* not swollen, with 6 primary spirals. *Color* white, primary spirals light brown.

Range and habitat

Off Guadeloupe; depth 204–251 m.

Acmaturris curacaoensis Fallon sp. nov.
urn:lsid:zoobank.org:act:1E567D50-4C8B-46F3-83D5-210A2AF1417C
Fig. 4V–X

Differential diagnosis

Acmaturris brevissima Fallon & Bouchet sp. nov. has fewer spiral cords, a more streamlined body, and rounder shoulders. *Bathyturris aurolineata* Fallon & Bouchet gen. et sp. nov. has fewer spiral cords on the penultimate whorl, and a protoconch with more whorls, more whorls with riblets, and is smaller. *Bathyturris clausa* Fallon & Bouchet gen. et sp. nov. is a smaller species with a different protoconch. *Bathyturris solata* Fallon gen. et sp. nov. has more angular whorls, a different protoconch, and is colored differently.

Etymology

Acmaturris curacaoensis Fallon sp. nov., the Curaçao *Acmaturris*, named after the country of its type locality.

Type material

Holotype

NETHERLANDS ANTILLES • 10.6 × 4.0 mm; Curaçao, Willemstad, Bapor Kibra, off Sea Aquarium; 12°05.0′ N, 68°53' 56.9′ W; depth 244–274 m; 8 Feb. 2013; Smithsonian field trip; stn 13-05; found in glass bottle retrieved by submersible *Curasub*; USNM 1231385.

Paratypes

None.

Description

Shell small (length = 10.6 mm), strong, fusiform (W/L = 0.3774) of 7½ whorls, the last whorl 63.5% of shell length. Teleoconch whorl sides straight with flat shoulders, sloping about 45° off shell axis; sculpture of strong ribs and numerous spirals; aperture elongate oval, with a short anterior canal, together

about 50% of shell length. *Protoconch* mostly eroded but of approximately 2¼ round whorls, the first appears bulbous, and a portion of the last with riblets. *Axial sculpture* of narrow ribs that extend from suture to suture, narrower and recurved on shoulder, evanesce on base prior to the anterior fasciole. Ribs number 12 on penultimate and 9 on shell base to varix, intercostal space about 2–3 times wider than ribs. *Varix* apertural, broad and crenate, extends a little above suture, and then in a low, continuous arc to anterior canal. Stromboid notch absent. *Spiral sculpture* of primary, secondary, and tertiary spirals: secondary spirals on the shoulder have tertiaries packed between, the first primary appears at the whorl periphery and is followed by 5 irregularly spaced primaries on whorl sides. Single secondaries and multiple tertiaries fill the intercalary space. There are 7 primaries on the shell base, the anterior-most one beaded by the terminations of the ribs. The space between the primaries widens anteriorly, with the intercalary space packed with one secondary for some, and tertiaries for all. The spirals override ribs, which are made nodulous by the primaries, and all are minutely "frosted". *Sulcus* absent, recurved ribs on shoulder mark past presence of the sinus. *Outer lip* varicose with a narrow strip of shell forward of its base; a low denticle inside is at base of anal sinus. *Anal sinus* a wide notch on shoulder and carved into varix with a depression in the varix behind the sinus apex. *Inner lip* a narrow but thick glaze, margined, without a parietal callus. *Columella* straight. *Anterior canal* short, open, straight, unnotched; beginning of the canal is marked by a constriction at the anterior end of the aperture. *Anterior fasciole* is not swollen, sculpted with about 8 weaker primaries. *Color* off-white, a faded brown mid-whorl spiral band present, darkest on the varix.

Remarks

Acmaturris curacaoensis Fallon sp. nov. has some but not all the diagnostic characteristics of the genus: it is not reticulated with a square pattern by subequal ribs and primary spirals as most of its congeners but instead has more numerous primary spirals and much stronger ribs. It also bears a denticle on the outer lip, which is not characteristic. Because of these differences, it is placed in *Acmaturris* with some reservation. Although only a single specimen was available, its uniqueness merits description here. The most significant difference from its congeners lies in the pattern of primary and secondary spirals, including the larger number of primaries.

Range and habitat

Known only from the type locality.

Fig. 4 (next page). Species of *Acmaturris* Woodring, 1928. Part 1. – **A**. *Acmaturris comparata* Woodring, 1928, holotype, 9.4 × 3.5 mm (USNM 369399), Bowden, Jamaica, Late/Upper Pliocene, type species of the genus. – **B–J**. *Acmaturris brevissima* Fallon & Bouchet sp. nov. **B–E**. Holotype, 5.0 × 2.2 mm, 3 views and SEM image of protoconch (MNHN-IM-2000-39475), S of La Désirade, Guadeloupe. **F**. Paratype, 5.0 × 2.0 mm (D. Lamy coll.), S of La Désirade, Guadeloupe. **G**. Paratype, 4.0 × 1.9 mm (UF 589670), W of La Désirade, Guadeloupe. **H–J**. Paratypes, 5.7 × 2.3, 5.4 × 2.3 and 5.3 × 2.2 mm (MNHN-IM-2000-39476), S of Marie-Galante, Guadeloupe. – **K–Q**. *Acmaturris bicincta* Fallon & Bouchet sp. nov. **K–N**. Holotype, 7.9 × 2.8 mm, 3 views and SEM image of protoconch (MNHN-IM-2000-39472), S of La Désirade, Guadeloupe. **O–Q**. Paratypes, 5.7 × 2.2, 5.7 × 2.3 and 5.7 × 2.3 mm (ANSP 498778), S of La Désirade, Guadeloupe. – **R–U**. *Acmaturris tricincta* Fallon & Bouchet sp. nov., holotype, 7.3 × 2.5 mm, 3 views and SEM image of protoconch (MNHN-IM-2000-39478), S of La Désirade, Guadeloupe. – **V–X**. *Acmaturris curacaoensis* Fallon sp. nov., holotype, 10.6 × 4.0 mm, ventral, dorsal and apical views (USNM 1231385), Curaçao, Netherlands Antilles. Credits: E, N, U. SEM images courtesy of Paul Callomon. Scale bars: A–D, F–M, O–T, V–X = 2 mm; E, N, U = 300 μm.

2mm
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Acmaturris spp. Part 2

Acmaturris lineata Fallon & Bouchet sp. nov.
urn:lsid:zoobank.org:act:DDF65441-C2EE-4CD4-B4A6-F7FFA683547E
Figs 3D, 5A–L

Differential diagnosis

Acmaturris lineata Fallon & Bouchet sp. nov. is close to *A. angularis* Fallon & Bouchet sp. nov.; see under Diagnosis of that species for differences.

Acmaturris bicincta Fallon & Bouchet sp. nov. and *A. tricincta* Fallon & Bouchet sp. nov. both have longer anterior canals and a protoconch with fewer whorls (2 or less versus 2½). They are also colored differently.

Etymology

Acmaturris lineata Fallon & Bouchet sp. nov., the lined *Acmaturris*, derives its name from the Latin adjective '*lineatus*', meaning 'lined', due to its dark golden yellow primary spirals.

Type material

Holotype
GUADELOUPE • 8.6 × 3.2 mm; E of La Désirade; 16°25′ N, 60°50′ W; depth 210–240 m; 25 Jun. 2015; KARUBENTHOS 2; stn DW4613; MNHN-IM-2000-39477.

Paratypes (9 specs)
GUADELOUPE • 1 spec., 8.5 × 3.4 mm; off La Désirade; depth 250 m; D. Lamy coll. #5135 • 1 spec., 9.6 × 3.6 mm; S of La Désirade; depth 250 m; D. Lamy coll. #5261.

NETHERLANDS ANTILLES • 2 specs, 9.2 × 3.3 and 10.1 × 3.9 mm; Curaçao, Willemstad, Bapor Kibra, off Sea Aquarium; 12°04.87′ N, 68°53.75′ W; depth 288 m; May 2012; Smithsonian field trip; *Curasub* stn 4; in glass bottle by submersible; USNM 1199838 • 1 spec., 8.3 × 3.3 mm; Curaçao, Willemstad, Bapor Kibra, off Sea Aquarium; 12°04.99′ N, 68° 53.94′ W; depth 244–274 m; 8 Feb. 2013; Smithsonian field trip; *Curasub* stn 13-4; in glass bottle retrieved by submersible; USNM 1231386 • 2 specs, 7.2 × 2.7 and 7.0 × 3.0 mm; Curaçao, Willemstad, Bapor Kibra, off Sea Aquarium; 12°04.87′ N, 68°53.75′ W; depth 233 m; May 2012; Smithsonian field trip; *Curasub* stn 2; in glass bottle retrieved by submersible; USNM 1199837 • 2 specs, 7.6 × 3.0 and 7.6 × 3.0 mm; Curaçao, Willemstad, Bapor Kibra, off Sea Aquarium; 12°04.87′ N, 68°53.75′ W; depth 130–168 m; May 2012; Smithsonian field trip; *Curasub* stn 1; in glass bottle retrieved by submersible; USNM 1199839.

Other material examined (1 spec.)

GUADELOUPE • 1 spec., 7.4 × 3.1 mm; Pointe des Châteaux; depth 90 m; ANSP 498779.

Description

Shell small (holotype length = 8.6 mm, paratype lengths to 10.1 mm), solid, fusiform (W/L = 0.3721) with about 7 turreted teleoconch rectilinear whorls, angled 15° off the perpendicular to shell axis, with flat shoulders sloped about 50°, and impressed sutures; last whorl about 66% of shell length; aperture narrowly oval about 48% of shell length, including anterior canal. *Protoconch* of 2½ round whorls, tip minute, brownish, arising from about the whorls center then rapidly expanding, last with crowded arched opisthocline riblets. *Axial sculpture* of 14 slightly opisthocline, narrow ribs on the penultimate and 13 on the last whorl to the varix that run from suture to suture and evanesce before anterior fasciole on the last whorl; intercostal space ranges from as wide to wider than the ribs; numerous very fine growth striae present throughout, most visible in the intercostal space. *Varix* apertural, slightly arched above suture and

narrows to the anterior canal. Outer edge is created by primary spirals that run over the face of the varix to the edge of the aperture. *Spiral sculpture* of primary spirals that override ribs, 3 on the penultimate, 5 on shell base, and 7 on anterior fasciole, secondary spirals occasionally appear between these; spirals become progressively closer anteriorly; microscopic spirals over the entire teleoconch, override ribs, forming microscopic nodules on their intersection with growth striae thus appearing to be axial rather than spiral in orientation because nodules are more visible. *Sulcus* absent, recurved ribs mark past presence of the anal sinus, only microscopic spirals present shoulder. *Outer lip* strongly varicose with a frilled edge, adapical end rises slightly above the suture; a very narrow, post varicose lip follows that is pinched at the ends of primary spiral cords along its rim producing a lightly scalloped edge, no stromboid notch present. *Anal sinus* is a wide notch close to but not adjoining the suture, its apex coincides with a groove in the face of and curvature of the varix. *Inner lip* narrow, weakly margined, without calluses or ′denticles. *Columella* is very slightly sinusoidal. *Anterior canal* wide, open, barely distinct from the aperture, turned to the right when viewed ventrally, unnotched. *Anterior fasciole* not swollen, with 6 or 7 primary spirals. *Color* of base shell is yellowish with faint bands of light golden brown mid-whorl and on shoulder, primary spirals dark golden yellow, varix and anterior canal base color whitish. Mid whorl and shoulder spiral bands may be a darker brown.

Remarks

Eleven specimens have been examined, 7 from Curaçao and 4 from Guadeloupe. Except for an all-white specimen, those from Guadeloupe have the color pattern exhibited by the holotype, as do the 3 Curaçao specimens. The remaining Curaçao specimens have darker banding but are otherwise the same. The 11 specimens have an average length = 8.3 mm (range = 7.0–10.1 mm).

Range and habitat

Netherlands Antilles (Curaçao) and Guadeloupe (off La Désirade); depth 130–288 m.

Acmaturris angularis Fallon & Bouchet sp. nov.
urn:lsid:zoobank.org:act:0C936FF2-E4D2-491C-8021-20BFD90955E2
Figs 3E, 5M–W

Differential diagnosis

This species differs from *Acmaturris lineata* Fallon & Bouchet sp. nov. in possessing a protoconch with riblets swollen into a median beaded keel on the last whorl, its teleoconch whorls are angled 19° off the perpendicular to shell axis, not 15°, its primary spirals are not yellowish brown, and it has stronger and fewer ribs (12 versus 14); compare apical views of both species in Fig. 5.

Etymology

Acmaturris angularis Fallon & Bouchet sp. nov., the angular *Acmaturris*, derives its name from the Latin adjective '*angularis*', meaning 'having corners', as it is named for the nearly right angles of its spire whorls' shoulders and sides.

Type material

Holotype
GUADELOUPE • 10.0 × 3.5 mm; behind Fajou Island; 16°22.48′ N, 61°35.46′ W; depth 85 m; 24 May 2012; KARUBENTHOS 2012; stn GD55; MNHN-IM-2012-9057.

Paratypes (4 specs)
GUADELOUPE • 2 specs, lengths = 10.2 and 9.3 mm; E of Fajou Island; depth 80–90 m; 2012; D. Lamy coll. • 1 spec., 11.1 × 3.8 mm; E of Fajou Island; depth 80–90 m; 2012; ex D. Lamy coll.; ANSP 498777.

NETHERLANDS ANTILLES • 1 spec., 9.6 × 3.5 mm; Curaçao, Willemstad, Bapor Kibra, off Sea Aquarium; 12°04.87′ N, 68°53.75′ W; depth 130–168 m; 24 May 2012; Smithsonian field trip; stn 1; in glass bottle retrieved by submersible *Curasub*; USNM 1199836.

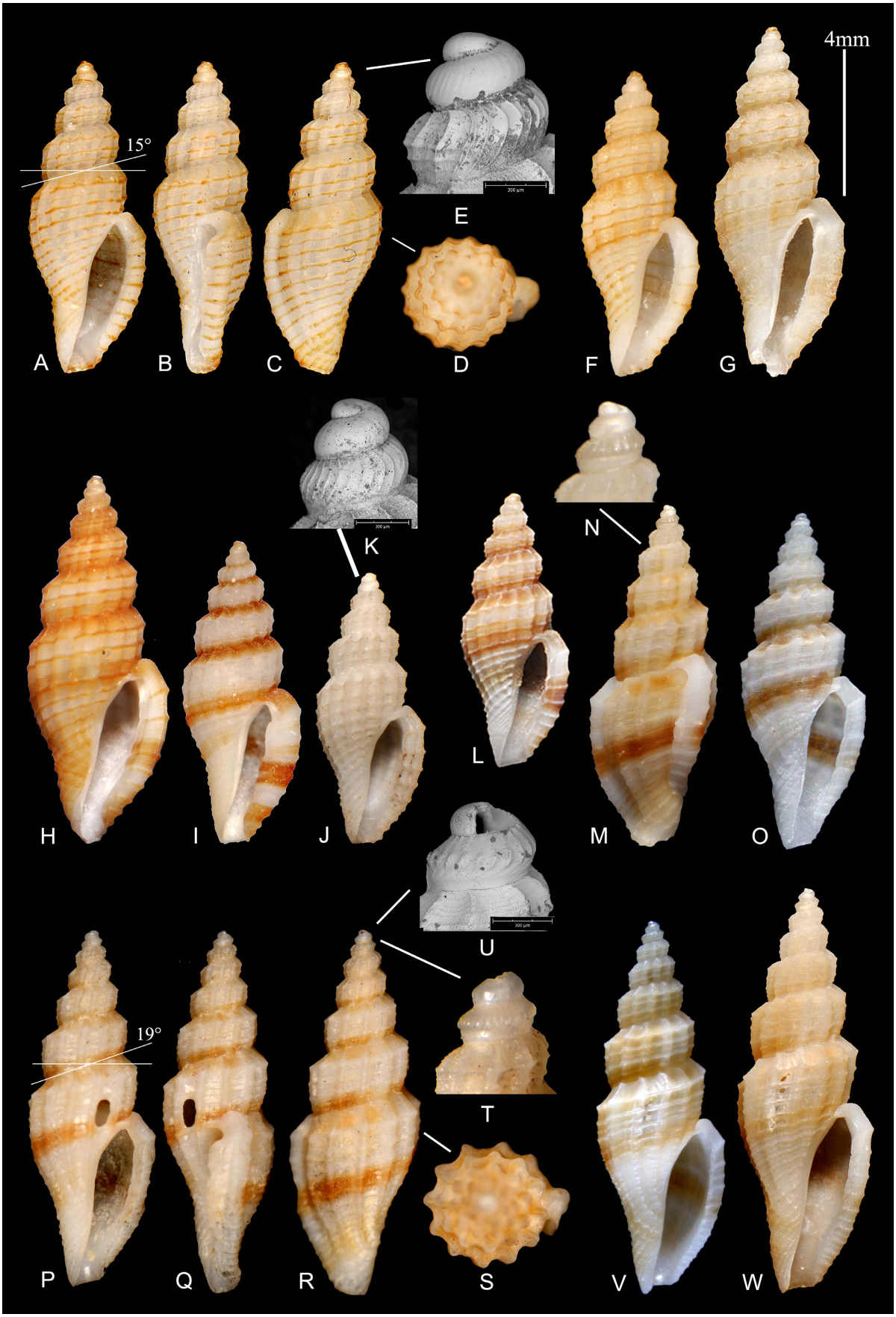
Description

Shell small (holotype length = 10.0 mm), fusiform (W/L = 0.3500), of 7¾ nearly turreted whorls with flat shoulders sloped about 50°. Whorls rectilinear and rather tall, angled 19° off perpendicular to shell axis, the last 66% of shell length; aperture narrow, only slightly wider at its center, anterior canal moderately long, both together about 51% of shell length. *Protoconch* of 2¼–2½ whorls, the last has densely packed riblets with peripheries swollen into a median beaded keel, riblets very fine above and oblique to obsolete below the keel and the area, near the suture, sprinkled with minute tubercles, visible in high magnification. *Axial sculpture* of narrow but strong, cord-like ribs that extend from suture to suture on spire whorls and evanesce on shell base, 12 on the penult, 9 on the last to the varix, and intercostal distance about the same as their width except greater on the dorsum of the last whorl. *Varix* apertural, rib-like but twice or more as large, extending above the suture line posteriorly to the anterior canal with its outer edge crenated by spirals. An earlier varix present. *Spiral sculpture* of 4 primary spirals on the penultimate and 6 on the last from suture line to anterior fasciole, a single secondary spiral appears between some primaries, and very fine microscopic spirals lie overall with microscopic nodules present at intersections with growth striae. Microscopic spirals only on shoulder; primaries slightly swollen on rib crests, the strongest spiral and swellings at whorl periphery. *Sulcus* absent but recurved ribs on shoulder reflect past positions of the anal sinus. *Outer lip* varicose with a narrow strip of shell extending from the base of the varix, running from the sinus to the anterior canal, stromboid notch absent. *Anal sinus* broad, round, offset a little from the suture and its width extends to the edge of the shoulder, in front of and partially etched into the face of the varix, which is recurved. *Inner lip* narrow, unemarginate. *Columella* is weakly sinusoidal. *Anterior canal* is relatively long, open, barely differentiated from the aperture, and unnotched. *Anterior fasciole* not swollen, with 7 broadened spirals. *Color* of base shell is very light golden brown, primary spirals darker, protoconch, anterior canal, and shoulder of varix white; a light reddish brown spiral band runs mid-whorl partially above suture line, and light reddish brown stains are present between axials on the shoulder.

Remarks

The five examined specimens have an average length = 10.0 mm (range = 9.3–11.1 mm). Variation is chiefly in spiral band color intensity, which ranges from reddish brown to light reddish brown.

Fig. 5 (next page). Species of *Acmaturris* Woodring, 1928. Part 2. – **A–L**. *Acmaturris lineata* Fallon & Bouchet sp. nov. **A–E**. Holotype, 8.6 × 3.2 mm, ventral, lateral, dorsal, apical views and SEM image of protoconch, 240 × (MNHN-IM-2000-39477), E of La Désirade, Guadeloupe. **F**. Paratype, 8.5 × 3.4 mm (D. Lamy coll. 0122), off La Désirade, Guadeloupe. **G**. Paratype, 9.6 × 3.6 mm (D. Lamy coll. 0138), S of La Désirade, Guadeloupe. **H**. Paratype, 10.1 × 3.9 mm (USNM 1199838), Curaçao, Netherlands Antilles. **I**. Paratype, 8.3 × 3.3 mm (USNM 1231386), Curaçao, Netherlands Antilles. **J–K**. Spec. 7.4 × 3.1 mm (all white variant), and SEM image of protoconch, 240 × (ANSP 498780, ex D. Lamy coll.), Pointe des Châteaux, Guadeloupe. **L**. Paratype, 7.6 × 3.0 mm, ventral view, and expanded view of protoconch (not to scale) (USNM 1199839), Curaçao, Netherlands Antilles. – **M–W**. *Acmaturris angularis* Fallon & Bouchet sp. nov. **M–N**. Paratype, 9.6 × 3.5 mm (USNM 1199836), dorsal view showing earlier varix and expanded view of protoconch (no scale), Curaçao, Netherlands Antilles. **P–U**. Holotype, 10.0 × 3.5 mm, ventral, lateral, dorsal, protoconch (not to scale), apical views and SEM image of protoconch (missing tip) (MNHN-IM-2012-9057), from behind Fajou Island, Guadeloupe. **O, V–W**. Paratypes, lengths are 9.3 mm and 10.2 mm (D. Lamy coll.), 11.1 × 3.8 mm, E of Fajou Island, Guadeloupe (ANSP 498777). Credits: E, K, U: SEM images courtesy of Paul Callomon; O, V: photographs (4451 and 4606) courtesy of D. Lamy. Scale bars: A–D, F–J, L–T, V–W = 4 mm; E, K, U = 300 μm.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The presence of a medially swollen keel on the last whorl of the protoconch is unusual for species of *Acmaturris*. The presence of secondary spirals between the primaries also appears to be unique. The differences merit a phylogenetic analysis in the future to determine whether these differences rise to the level of species, or perhaps to demonstrate a closer alliance with a different genus.

Range and habitat

Guadeloupe and Netherlands Antilles (off SW Curaçao); depth 80–168 m.

***Acmaturris* spp. Part 3**

Acmaturris juliocesari (Fernández-Garcés & Rolán, 2010) comb. nov.
Fig. 6A–B

Pyrgocythara juliocesari Fernández-Garcés & Rolán, 2010: 71–72, figs 6–9.

Differential diagnosis

Differences from *Acmaturris mairelae* (Fernández-Garcés & Rolán, 2010) comb. nov., *A. annaclaireleeae* E.F. García, 2008, and *A. pelicanus* E.F. García, 2008 are described in the sections under those species.

Type material

Holotype
CUBA • length = 2.7 mm; Cienfuegos Bay, Cuba; MNCN.

Paratypes (at least 4 specs)
CUBA • 1 spec.; Cienfuegos, Rancho Luna; depth 30–54 m; MNHN-IM-2010-22412.

OTHER REPOSITORIES • 1 spec.; MHNS • 1 spec.; IES • 1 spec.; collection of Fernández-Garcés.

Description

See Fernández-Garcés & Rolán (2010) for the original description, which is not redescribed here.

Remarks

Acmaturris juliocesari was originally described in *Pyrgocythara* Woodring, 1928. This species lacks several diagnostic characteristics of that genus: a protoconch with the last 2 whorls bearing riblets, (only about 6 riblets present on the last whorl); an anal denticle, and the shell surface is frosted, a characteristic lacking in species of *Pyrgocythara*. Also, the spiral sculpture of *A. juliocesari* more closely matches the primary and microscopic secondary spiral combination of *Acmaturris*.

This very small species, 2.8 mm or less when fully developed, has ribs significantly stronger than its spiral cords, thus lacking an obvious reticulate pattern of sculpture characteristic of *Acmaturris*.

Range and habitat

Known only from the type locality.

Acmaturris annaclaireleeae E.F. García, 2008
Fig. 6C–D

Acmaturris annaclaireleeae E.F. García, 2008: 2–3, figs 1–4.

Pyrgocythara annaclaireleeae – Fernándes-Garcés & Rolán 2010: 73, figs 10–14.

Differential diagnosis

Acmaturris pelicanus E.F. García, 2008 is similar but larger (lengths to 4.4 versus 3.0 mm), "… is relatively wider (W/L ratio 0.45 versus 0.43), has a stronger reticulated pattern, and a coarser microsculpture." (García 2008: 2–3). *Acmaturris mairelae* (Fernández-Garcés & Rolán, 2010) comb. nov., is also very similar but larger, has a protoconch with ½ more whorls, and "… the microsculpture is formed by axial and spiral lines with micro tubercles at the crossing points, instead of predominant spiral lines." (Fernández-Garcés & Rolán 2010: 73). *Acmaturris juliocesari* (Fernández-Garcés & Rolán, 2010) comb. nov. has fewer axial ribs at the end of its protoconch and fewer ribs on the teleoconch (Fernández-Garcés & Rolán 2010: 74).

Type material

Holotype
NETHERLANDS ANTILLES • 3.0 × 1.3 mm; Klein Bonaire; depth 43 m.; UF 412553.

Paratype (1 spec.)
BAHAMAS • 1 spec., length = 2.9 mm; off Cape Eleuthera, Eleuthera Island; depth 39 m; BMSM 15496.

Other material (not examined)

CUBA• 4 specs, three published lengths = 2.7, 2.4, 2.5 mm; Cienfuegos Bay (Fernández-Garcés & Rolán 2010: 73, figs 10–14); MHNS.

Description

The original description appears in García (2008).

Range and habitat

Netherlands Antilles (Klein Bonaire), Bahamas (Eleuthera Island), and Cuba (Cienfuegos Bay); depth 39–43 m.

Acmaturris mairelae (Fernández-Garcés & Rolán, 2010) comb. nov.
Figs 3F, 6E–K

Pyrgocythara mairelae Fernández-Garcés & Rolán, 2010: 70–71, figs 1–5.

Differential diagnosis

Acmaturris juliocesari (Fernández-Garcés & Rolán, 2010) comb. nov. is smaller, has a protoconch with fewer whorls (2¼ versus 2½) and fewer riblets at its termination (6 versus 10) according to Fernández-Garcés & Rolán (2010: 72).

Comparisons with *Acmaturris annaclaireleeae* E.F. García, 2008, and *A. pelicanus* E.F. García, 2008 are made in the descriptions of those species.

Type material

Holotype
CUBA • length = 3.1 mm; Rancho Luna, Cienfuegos; depth 30–54 m; MNCN.

Paratypes (16 specs)
CUBA • 1 spec.; same data as for holotype; USNM 1150949 • 1 spec.; same data as for holotype; MNHN-IM-2010-22411 • 1 spec., same data as for holotype; MHNS • 1 spec.; same data as for holotype;

IES • 10 specs; same data as for holotype; collection of Fernández-Garcés • 2 specs; from Maria la Gorda, W Cuba; MHNS.

Material examined (6 specs)

The types were not examined. The following specimens were examined.

GUADELOUPE • 2 specs, 2.9 × 1.3 and 3.2 × 1.4 mm; Rocroy sud; 16°02.38′ N, 61°45.71′ W; depth 17 m; 10 May 2012; KARUBENTHOS 2012; stn GB08; MNHN-IM-2012-7446 • 1 spec., 3.0 × 1.3 mm; Rocroy sud; 16°02.38′ N, 61°45.71′ W; depth 17 m; 10 May 2012; KARUBENTHOS 2012; stn GS11; MNHN-IM-2012-7445 • 1 spec., 2.9 × 1.3 mm; Grand Cul-de-Sac Marin, Passe à Caret; 16°22.3′ N, 61°38.1′ W; depth 29 m; 23 May 2012; KARUBENTHOS 2012; stn GS29; MNHN-IM-2012-9078 • 1 spec., 3.3 × 1.5 mm; Lizard Point; 16°08.43′ N, 61°46.92′ W; depth 29 m; 7 May 2012; KARUBENTHOS 2012; stn GR10; MNHN-IM-2012-9077 • 1 spec., 2.25 × 1.1 mm; tombant de Port-Louis; 16°23.74′ N, 61°32.07′ W; depth 49 m; 15 May 2012; KARUBENTHOS 2012; stn GS18; MNHN-IM-2012-8718.

Description

The original description is in Fernández-Garcés & Rolán (2010).

Remarks

Acmaturris mairelae has the diagnostic characteristics of the genus *Acmaturris* rather than *Pyrgocythara*. See the Remarks under the description of *Acmaturris juliocesari* (Fernández-Garcés & Rolán, 2010) comb. nov.

Range and habitat

Cuba (Cienfuegos Bay and Maria la Gorda) and Guadeloupe; depth 17–54 m.

Acmaturris pelicanus E.F. García, 2008
Fig. 6L–M

Acmaturris pelicanus E.F. García, 2008: 3, figs 5–9.

Differential diagnosis

Acmaturris juliocesari (Fernández-Garcés & Rolán, 2010) is smaller and less robust (length = 2.7 versus 4.4 mm). *Acmaturris mairelae* (Fernández-Garcés & Rolán, 2010) comb. nov. is smaller and less robust (length = 3.1 versus 4.4 mm). *Acmaturris annaclaireleeae* E.F. García, 2008 is smaller and less robust (length = 3.3 versus 4.4 mm).

Type material

Holotype

UNITED STATES OF AMERICA • 4.4 × 2.0 mm; off Louisiana, Sackett Bank; 28°38.16′ N, 89°33.19′ W; depth 60–70 m; ANSP 416413.

Paratypes

None.

Description

The original description appears in García (2008).

Range and habitat

Known only from the type locality.

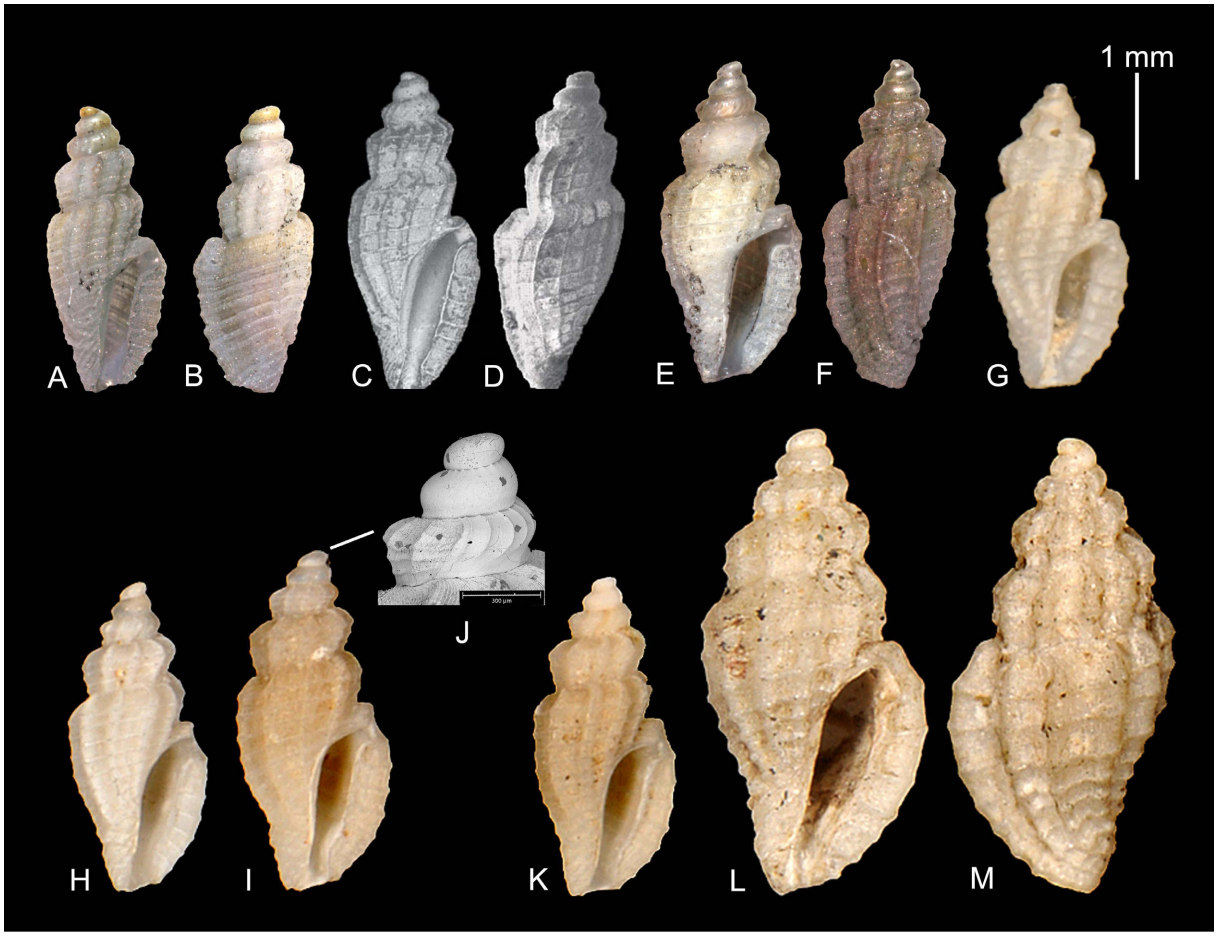


Fig. 6. Species of *Acmaturris* Woodring, 1928. Part 3. – **A–B**. *Pyrgocythara juliocesari* Fernández-Garcés & Rolán, 2010, paratype, length = ca 2.7 mm (MNHN-IM-2010-22412), Rancho Luna, Cienfuegos, Cuba. – **C–D**. *Acmaturris annaclaireleeae* E.F. García, 2008, holotype, length = 3 mm (UF 412553), Klein Bonaire, Netherlands Antilles. – **E–F**. *Pyrgocythara mairelae* Fernández-Garcés & Rolán, 2010, paratype, length = 2.9 mm, ventral and dorsal views (MNHN-IM-2010-22411), Rancho Luna, Cienfuegos Bay, Cuba. – **G–K**. *Acmaturris mairelae* (Fernández-Garcés & Rolán, 2010) comb. nov. **G**. Spec., 2.9 × 1.3 mm (MNHN-IM-2012-9078), Grand Cul-de-Sac Marin, Passe à Caret, Guadeloupe. **H–J**. Specs, 2.9 × 1.3 and 3.2 × 1.4 mm, ventral view and SEM image of protoconch (MNHN-IM-2012-7446), Rocroy sud, Guadeloupe. **K**. Spec., 3.0 × 1.3 mm (MNHN-IM-2012-7445), Rocroy Sud, Guadeloupe. – **L–M**. *Acmaturris pelicanus* E.F. García, 2008, holotype, 4.4 × 2.0 mm (ANSP 416413), Sackett Bank, Louisiana. Credits: A–B, E–F: Courtesy of MNHN, Paris. Collection: Molluscs (IM); C–D: From García (2008: figs 1, 3); J: SEM image courtesy of Chandler J. Olson. Scale bars: A–I, K–M = 1 mm; J = 300 µm.

Genus ***Adelocythara*** Woodring, 1928

Type species

Adelocythara primolevis Woodring, 1928, by original designation.

Summary diagnostic characteristics

Shell small, stocky, with a short turreted spire, and about 5–6 whorls.

Protoconch is a simple, usually a rectilinear twist of 1¼–2 whorls, some with a few riblets close to the lip.

Aperture narrowly oval, varicose and crenated by primary spirals, with a denticle inside the outer lip.

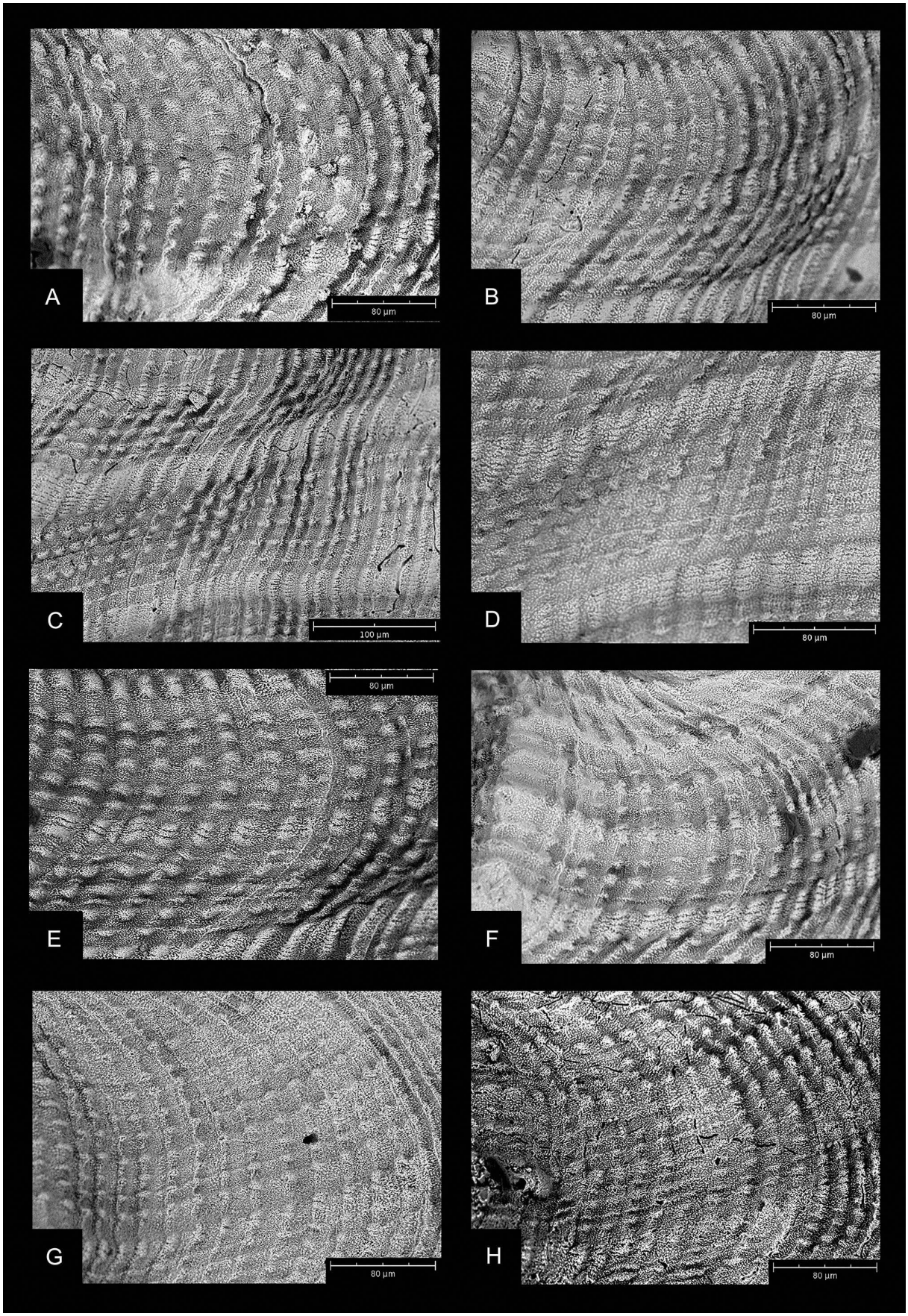
Anterior canal short.

Sculpture of moderately strong ribs with numerous strong overriding primary spirals and microscopic secondary spirals between, both 'frosted'.

Shell surface microsculpture

Shell surface SEM images of 850–1000 × magnification of representative specimens from most species appear in Fig. 7. The microsculptural elements ('frosting') of both primary and secondary spirals that arise at their intersection with incremental growth lines, which are raised and generally stronger than secondary spirals (but not primaries), consist of individual bundles of fibrils packed pancake-like (on wider secondary spirals) that span the width of incremental growth lines. The number of 'pancakes' in each pack increases with the width of the spiral.

Fig. 7 (next page). Species of *Adelocythara* Woodring, 1928. Part 1, shell surface microsculpture. SEM images 850 × unless otherwise stated. **A**. *Adelocythara bouillantensis* Fallon & Bouchet sp. nov., paratype, 5.0 × 2.2 mm (MNHN-IM-2012-9009), Lizzard Point, Guadeloupe. Growth lines are more prominent than spiral secondaries. Secondaries consist of small loops of fibrils bunched together to about the width of the spiral and crossed over incremental growth lines. Bunches of fibril loops vary in number in proportion to the width of the spiral. **B**. *Adelocythara portlouisensis* Fallon & Bouchet sp. nov., paratype, 3.7 × 1.7 mm (MNHN-IM-2012-9019), outside Port-Louis, Guadeloupe. Like the preceding species, bunched loops arch over the growth lines, which are more prominent and regular in strength than spirals. **C**. *Adelocythara caretensis* Fallon & Bouchet sp. nov., paratype, 4.0 × 1.7 mm (MNHN-IM-2012-9007), Caret Island pass, Grand Cul-de-Sac Marin, off NE Basse-Terre, Guadeloupe. **D**. *Adelocythara* unid. sp. 1d. SEM image 1000 ×. Spec., 4.6 × 1.9 mm (MNHN-IM-2012-9000), South Rocroy, Basse-Terre, Guadeloupe. Two well defined primary spirals are shown. More loops are bunched together and consequently run obliquely over the spiral as they follow the growth line. **E**. *Adelocythara* unid. sp. 1e. Spec., 5.1 × 2.1 mm (MNHN-IM-2012-9015), Fontaine Point (Bertand Cove), Guadeloupe. The type of structures the same as preceding species. **F**. *Adelocythara* unid. sp. 1f. Spec., 4.6 × 2.0 mm (MNHN-IM-2012- 8996), Tête à l'Anglais, Guadeloupe. The type of structures the same as that of preceding species. The secondary spiral widths vary. **G**. *Adelocythara* unid. sp. 1g. SEM image 860 ×. Spec., 4.3 × 1.8 mm (MNHN-IM-2012-9014), Point on Baille-Argent Bay, Guadeloupe. The types of structures are the same as preceding species. in this species the secondary spirals are more uniform in size and growth lines are not noticeably more prominent than spirals. **H**. *Adelocythara* unid. sp. 1h. Spec., 4.1 × 1.8 mm (MNHN-IM-2012-8988), off Fajou Island, Guadeloupe. Although the structures are like all preceding species, the bunches of fibrils in the arches are less organized, appearing frayed. Credits: SEM images courtesy of Krasimira "Kasey" Seizova. Scale bars: A–B, E–H = 80 µm; C–D = 100 µm.


A
80 µm
B
80 µm
C
100 µm
D
80 µm
E
80 µm
F
80 µm
G
80 µm
H
80 µm

Primary spirals are wider than the secondaries so have many more 'pancakes' of fibrils over crossing an incremental growth line, and since the incremental growth lines cross obliquely over the spirals the bundles as though they are wound around the primary spiral.

Differences among species of this genus are not readily quantified. The microsculptural elements arising from the intersection of spirals and growth lines appear to be similar, indicative of their close relationship. Compare these elements to *Acmaturris*, which has a morphologically similar shell but different surface microsculpture.

Under a stereo dissecting microscope, secondary spirals are shown to have miniscule nodules at growth striae intersections. Since nodules are aligned along incremental growth lines, they create the appearance of presence of beaded axials, an effect partly due to raised growth lines, which are stronger than the spirals in some species. Also, spirals but not the nodules are translucent, as is the base shell, and so are nearly invisible.

Differences from other genera

Acmaturris Woodring, 1928 has a protoconch of 1⅞–2½ whorls with riblets on the last whorl (not 1¼–2 whorls with just a few riblets at the end of the last whorl) and lacks a denticle below the anal sinus inside the outer lip.

Pyrgocythara Woodring, 1928 possesses a trochoid-shaped protoconch of about 3 whorls, the tip minute and the remaining whorls becoming progressively larger in diameter; the last two with riblets.

Bathyturris Fallon gen. nov. has a protoconch of 3¼–3½ whorls with a bulging last whorl, and with more riblets. Also, the outer lip of the teleoconch is thinner and lacks a denticle.

Remarks

This is the first documented report of extant species of this genus known previously only from the fossil record.

The analysis of DNA sequence data reveals the presence of 3 cryptic species of *Adelocythara* originally mistaken during this project as a single species. They are morphologically difficult to distinguish with any degree of certainty, yet they are well differentiated in the COI sequences (p-distance range: 3.3–4.4%), each COI lineage appears to have a very limited, distinct geographical range, and the ASAP analysis strongly supports three partitions (p-value: 5.03e-01; W-rank: 4.80e-03). The 3 separate species around Guadeloupe occur on the western side of Basse-Terre, on the western side of Grande-Terre near the vicinity of Port-Louis, and the third on the northeastern side of Basse-Terre west of Caret Island and as far east as off the northern side of Fajou Island in the Grand Cul-de-Sac Marin. specimens taken from 5 localities outside of these three areas have not been sequenced and therefore could not be definitively assigned to one or the other species by morphological examination, i.e., specimens from the southwest end of Basse-Terre, north end of Grand-Terre, and north end of Basse-Terre. Therefore, they are currently grouped separately into 5 geographical localities and assigned distinct alpha-numeric designations. Some or all may be the same as one or the other of their nearest neighbors. species of *Adelocythara* from more distant geographical areas, i.e., Netherlands Antilles (Aruba), St. Vincent and the Grenadines (St. Vincent Island), and Honduras (Roatán Island), although not sequenced, are morphologically distinguishable and so are described as separate species. More species of this genus group are likely to be discovered in future surveys.

Phylogenetic relationships

The DNA sequence data support the monophyly of the genus *Adelocythara*, with all three sequenced species forming a well-supported clade. The lineage is recovered as a sister to the genus *Kurtzia*, albeit with low bootstrap support.

***Adelocythara* spp. Part 1**

Adelocythara bouillantensis Fallon & Bouchet sp. nov.
urn:lsid:zoobank.org:act:5B144BE1-AF58-4A62-95F0-B7EBC37674D5
Figs 7A, 8C–I, 9P:1a

Differential diagnosis

This species has been distinguished from *Adelocythara portlouisensis* Fallon & Bouchet sp. nov. and *A. caretensis* Fallon & Bouchet sp. nov. by analysis of DNA sequence data. specimens of the 5 similar but unnamed species, *Adelocythara* unid. sp. 1d, 1e., 1f., 1g, and 1h, grouped separately by locality, are morphologically indistinguishable from one another, have not been sequenced, and so have been left unnamed.

Etymology

Adelocythara bouillantensis Fallon & Bouchet sp. nov., is named after the commune that encompasses Pigeon Point, the type locality. Commune Bouillante lies on the west central coast of Basse-Terre, Guadeloupe.

Type material

Holotype
GUADELOUPE • 4.1 × 1.9 mm; off W Basse-Terre, off Pigeon Point; 16°08.43′ N, 61°46.92′ W; depth 12 m; 7 May 2012; KARUBENTHOS 2012; stn GS07; sequenced; MNHN-IM-2013-20569.

Paratypes (7 specs)
GUADELOUPE • 4 specs, 4.5 × 2.0, 4.1 × 1.8, 3.7 × 1.7 and 3.8 × 1.8 mm, live caught, preserved in ethanol; off W Basse-Terre, Pigeon Point; 16°08.43′ N, 61°46.92′ W; depth 12 m; 7 May 2012; KARUBENTHOS 2012; stn GS07; MNHN-IM-2019-34699 • 1 spec., 4.3 × 1.9 mm, live caught, preserved inethanol; W Basse-Terre, off Pigeon Point; 16°08.43′ N, 61°46.92′ W; depth 12 m; 7 May 2012; KARUBENTHOS 2012; stn GS07; MNHN-IM-2019-34688 • 2 specs, 4.0 × 1.7 and 4.7 × 2.0 mm; W Basse-Terre, off Pigeon Point; 16°08.43′ N, 61°46.92′ W; depth 12 m; 7 May 2012; KARUBENTHOS 2012; stn GS07; MNHN-IM-2012-9009.

Other material examined (4 specs)

GUADELOUPE • 2 specs, 3.9 × 1.9 and 3.8 × 1.8 mm; W Basse-Terre, off north point of Bouillante Bay; 16°08.48′ N, 61°47.03′ W; depth 54 m; 8 May 2012; KARUBENTHOS 2012; stn GD10; MNHN-IM-2012-9017 • 1 spec., 4.2 × 1.9 mm; W Basse-Terre, off Pigeon Point; 16°08.43′ N, 61°46.92′ W; depth 29 m; 7 May 2012; KARUBENTHOS 2012; stn GR10; MNHN-IM-2012-9012 • 1 spec., 4.2 × 1.8 mm; off Malendure Point; 16°05.95′ N, 61°47.5′ W; depth 8 m; 11 May 2012; KARUBENTHOS 2012; stn GS14; MNHN-IM-2012-8972.

Description

Shell small (holotype length = 4.1 mm, a sub-adult specimen, other specimen lengths to 4.7 mm), stoutly fusiform (W/L = 0.4634), with 5 convex whorls, last whorl disproportionately large (about 63% of shell length); sculptural elements of axial ribs, strong primary spirals, and microscopic secondary spirals, shell translucent between sculptural elements; aperture narrowly oval, with a short, undifferentiated (from aperture) anterior canal, together about 50% of shell length. *Protoconch* of about 1⅓ rapidly expanding whorls, rectilinear, first whorl protruding, last whorl noticeably narrower in diameter than first teleoconch whorl. *Axial sculpture* of narrow ribs that run from suture-to-suture on spire whorls, and to anterior fasciole on last whorl, ribs recurved on shoulder, intercostal space about as wide as ribs; 10 ribs on the penult, 8 to the varix on the last, microscopic growth striae present on the ribs and intercostal

space. *Varix* thick, wide, and flattened on edge of outer lip, extends from slightly above suture to end of anterior canal, its edge scalloped by primary spirals. *Spiral sculpture* consists of primary spirals that override axials and are widely spaced, 3 on the penultimate whorl sides, the strongest on whorl periphery, and two finer primaries on the shoulder, 6 additional primaries on shell base. Shell surfaces are made nodulose by slightly swollen primary spirals on rib crests. Shell surface covered with microscopic secondaries that have minute nodules at their intersection with incremental growth striae. *Sulcus* absent, slightly recurved ribs on shoulder mark past positions of anal sinus. *Outer lip* varicose, with a narrow lip that extends in a low arch from the anal sinus to the anterior canal. Denticle present on inside of lip below anal sinus; stromboid notch absent. *Anal sinus* is a deep and broad notch nearly the width of the shoulder, its apex extended by a concavity in the face of the varix, and is separated from suture by a weak bridge of a parietal callus. *Inner lip* a narrow glaze, margined anteriorly, with a parietal callus at the anal sinus. *Columella* is slightly sigmoid. *Anterior canal* is very short, open, unnotched. *Anterior fasciole* is not swollen, with about 5 primary spirals. *Color* straw with white protoconch, varix, and anterior canal; reddish brown spiral band mid whorl and fainter reddish-brown on shoulders between ribs.

Remarks

12 measured specimens average length = 4.1 mm (range = 3.7–4.7 mm).

Range and habitat

Guadeloupe (W Basse-Terre, off Pigeon Point); depth 8–54 m.

Adelocythara portlouisensis Fallon & Bouchet sp. nov.
urn:lsid:zoobank.org:act:7766690D-20F0-42B0-9173-3598BC741061
Figs 7B, 8J–O, 9P:1b

Differential diagnosis

This species has been distinguished from *Adelocythara bouillantensis* Fallon & Bouchet sp. nov. and *A. caretensis* Fallon & Bouchet sp. nov. by analysis of DNA sequence data.

Etymology

Adelocythara portlouisensis Fallon & Bouchet sp. nov., named after the type locality, off Port-Louis, a commune on the northwest coast of Grande-Terre, Guadeloupe.

Type material

Holotype

GUADELOUPE • 3.6 × 1.7 mm; leaving Port-Louis; 16°23.74′ N, 61°32.07′ W; depth 49 m; 15 May 2012; KARUBENTHOS 2012; stn GS18; sequenced; MNHN-IM-2013-20666.

Paratypes (14 specs)

GUADELOUPE • 1 spec., 4.3 × 1.7 mm; bouée PCA; 16°22.57′ N, 61°31.74′ W; depth 8 m; 15 May 2012; KARUBENTHOS 2012; stn GS19; sequenced; MNHN-IM-2013-20651 • 9 specs, (5 measured) 3.6 × 1.6, 3.7 × 1.6, 3.5 × 1.6, 3.7 × 1.7 and 3.9 × 1.7 mm, preserved in ethanol; leaving Port-Louis; 16°23.74′ N, 61°32.07′ W; depth 49 m; 15 May 2012; KARUBENTHOS 2012; stn GS18; MNHN-IM-2012-9019 • 1 spec., 3.6 × 1.6 mm, preserved in ethanol; leaving Port-Louis; 16°23.74′ N, 61°32.07′ W; depth 49 m; 15 May 2012; KARUBENTHOS 2012; stn GS18; MNHN-IM-2019-34709 • 1 spec., 3.7 × 1.7 mm, preserved in ethanol; leaving Port-Louis; 16°23.74′ N, 61°32.07′ W; depth 49 m; 15 May 2012; KARUBENTHOS 2012; stn GS18; MNHN-IM-2019-34711 • 1 spec., 3.4 × 1.5 mm, preserved in ethanol; leaving Port-Louis; 16°23.74′ N, 61°32.07′ W; depth 49 m; 15 May 2012; KARUBENTHOS 2012; stn GS18; MNHN-IM-2019-34710 • 1 spec., 3.0 × 1.5 mm; Grand Cul-de-Sac Marin, Port-Louis

(W of Petit Canal); 16°22.6′ N, 61°31.7′ W; depth 8 m; 15 May 2012; KARUBENTHOS 2012; stn GS19; MNHN-IM-2012-9001.

Other material examined (12 specs)

GUADELOUPE • 1 spec., 2.6 × 1.4 mm; Pointe d'Antigues (Port-Louis); 16°25.99′ N, 61°32.92′ W; depth 45 m; 17 May 2012; KARUBENTHOS 2012; stn GS22; sequenced; MNHN-IM-2013-20558 • 1 spec., 3.7 × 1.6 mm; leaving Port-Louis; 16°23.74′ N, 61°32.07′ W; depth 49 m; 15 May 2012; KARUBENTHOS 2012; stn GB14; MNHN-IM-2012-9010 • 1 spec., 2.3 × 1.2 mm; Pointe d'Antigues (Port-Louis); 16°25.99′ N, 61°32.92′ W; depth 45 m; 17 May 2012; KARUBENTHOS 2012; stn GS22; MNHN-IM-2012-9016 • 2 specs, 4.2 × 1.8 and 4.0 × 1.8 mm; Pointe d'Antigues (Port-Louis); 16°25.99′ N, 61°32.92′ W; depth 45 m; 17 May 2012; KARUBENTHOS 2012; stn GS22; MNHN-IM-2012-8989 • 1 spec., 4.2 × 1.8 mm, live caught, preserved in ethanol; Pointe d'Antigues (Port-Louis); 16°25.99′ N, 61°32.92′ W; depth 45 m; 17 May 2012; KARUBENTHOS 2012; stn GS22; MNHN-IM-2019-34717 • 2 specs, 3.9 × 1.8 and 3.1 × 1.5 mm; Grand Cul-de-Sac Marin, Port-Louis (épave avion); 16°25.6′ N, 61°32.6′ W; depth 14 m; 14 May 2012; KARUBENTHOS 2012; stn GB12; MNHN-IM-2012-9004 • 1 spec., 2.8 × 1.5 mm; Pointe d'Antigues (Port-Louis); 16°25.99′ N, 61°32.92′ W; depth 45 m; 17 May 2012; KARUBENTHOS 2012; stn GB18; MNHN-IM-2012-9008 • 1 spec., 3.2 × 1.4 mm; Grand Cul-de-Sac Marin, Port-Louis (épave avion); 16°25.6′ N, 61°32.6′ W; depth 25 m; 14 May 2012; KARUBENTHOS 2012; stn GS16; MNHN-IM-2012-9013 • 1 spec., 2.8 × 1.3 mm; Grand Cul-de-Sac Marin, Pointe Gris-Gris; 16°23.3′ N, 61°31.8′ W; depth 13 m; 16 May 2012; KARUBENTHOS 2012; stn GB17; MNHN-IM-2012-8993 • 1 spec., 2.8 × 1.3 mm; Grand Cul-de-Sac Marin, Pointe Gris-Gris; 16°23.3′ N, 61°31.8′ W; depth 14 m; 16 May 2012; KARUBENTHOS 2012; stn GS21; MNHN-IM-2012-9003.

Description

Shell small (holotype length = 3.6 mm, other specimen lengths to 4.3 mm), stoutly fusiform (W/L = 0.4722), with about 5 whorls, last whorl disproportionately large (about 72% of shell length); sculptural elements of broad axial ribs, strong primary spirals, and microscopic secondary spirals; aperture narrowly oval, varicose, 53% of shell length including an undifferentiated anterior canal with a wide anal sinus. *Protoconch* of about 1½ whorls, rectilinear, first whorl protruding, riblets near protoconch lip absent, protoconch noticeably narrower in diameter than first teleoconch whorl. *Axial sculpture* of broad ribs that run from suture-to-suture on spire whorls, and to anterior fasciole on last whorl, ribs recurved on shoulder ramp, intercostal space about as wide as ribs; 10 ribs on the penultimate whorl, 8 up to the varix on the last; very fine growth striae present on ribs and in intercostal space. *Varix* thick, cord-like, on edge of outer lip, extends from suture, or a little above, to end of anterior canal, curved around anal sinus, and its edge crenated by primary spirals. *Spiral sculpture* of widely spaced primary spirals overriding axials, 3 on the penultimate whorl, strongest on whorl periphery, 2 weaker ones on shoulder, 5 additional primary spirals on shell base. Shell surface made nodulose by slightly swollen primary spirals on rib crests. Shell surface covered with microscopic secondary spirals that produce minute nodules at their intersection with growth striae. *Sulcus* absent; recurved ribs on the shoulder that are slightly narrower than their anterior extent mark past positions of the anal sinus. *Outer lip* varicose, with a very narrow lip on the inside edge of the varix that extends from the anal sinus to the anterior canal, with a denticle on inside of the lip below anal sinus; stromboid notch absent. *Anal sinus* is a wide, somewhat laterally directed notch on the shoulder, separated from the suture by bridging parietal callus and cut in the face of the varix. *Inner lip* a narrow glaze along the columella with a parietal callus at the anal sinus. *Columella* is slightly sigmoid. *Anterior canal* is very short, open, unnotched. *Anterior fasciole* is not swollen, with about 5 primary spirals. *Color* straw with white protoconch, inner lip and anterior fasciole, a reddish brown spiral band mid whorl.

Remarks

27 measured specimens have an average length = 3.5 mm (range = 2.3–4.2 mm).

Range and habitat

Guadeloupe (NW of Grande-Terre, in the vicinity of Port-Louis); depth 8–49 m.

Adelocythara caretensis Fallon & Bouchet sp. nov.
urn:lsid:zoobank.org:act:EF50BBEC-2B28-42D5-B4C6-F01475022D06
Figs 7C, 8P–W, 9P:1c

Differential diagnosis

This species has been distinguished from *Adelocythara bouillantensis* Fallon & Bouchet sp. nov. and *A. portlouisensis* Fallon & Bouchet sp. nov. only by analysis of DNA sequence data.

Etymology

Adelocythara caretensis Fallon & Bouchet sp. nov., the Caret Pass *Adelocythara*, is named after the type locality, the nearby passe à Caret, Grand Cul-de-Sac Marin, Guadeloupe.

Type material

Holotype

GUADELOUPE • 4.0 × 1.8 mm; Grand Cul-de-Sac Marin, Caret Pass; 16°22.28′ N, 61°38.14′ W; depth 29 m; 23 May 2012; KARUBENTHOS 2012; stn GS29; sequenced; MNHN-IM-2013-20622.

Paratypes (19 specs)

GUADELOUPE • 11 specs, 3.6 × 1.7, 3.3 × 1.5, 3.9 × 1.7, 3.7 × 1.7, 3.7 × 1.7, 4.0 × 1.8, 4.2 × 1.8, 3.6 × 1.6, 3.5 × 1.5, 2.8 × 1.4 and 4.0 × 1.8 mm; Grand Cul-de-Sac Marin, passe à Caret; 16°22.3′ N, 61°38.1′ W; depth 29 m; 23 May 2012; KARUBENTHOS 2012; stn GS29; MNHN-IM-2012-9007 • 1 spec., 3.9 × 1.6 mm; Grand Cul-de-Sac Marin, slope facing Fajou Island; 16°21,72′ N, 61°36.35′ W; depth 22 m; 5 May 2012; KARUBENTHOS 2012; stn GS05; sequenced; MNHN-IM-2013-20571 • 1 spec., 4.1 × 1.8 mm; Grand Cul-de-Sac Marin, slope facing Fajou Island; 16°21.72′ N, 61°36.35′ W; depth 22 m; 5 May 2012; KARUBENTHOS 2012; stn GS05; sequenced; MNHN-IM-2013-20570 • 2 specs, (1 measured) 4.3 × 1.9 mm; Grand Cul-de-Sac Marin, facing Fajou Island; 16°21.7′ N, 61°36.4′ W; depth 22 m; 5 May 2012; KARUBENTHOS 2012; stn GS05; MNHN-IM-2012-9005 • 1 spec., 3.9 × 1.8 mm; Grand Cul-de-Sac Marin, slope facing Fajou Island; 16°21.75′ N, 61°36.07′ W; depth 23 m; 6 May 2012; KARUBENTHOS 2012; stn GS06; sequenced; MNHN-IM-2013-20646 • 3 specs, (1 measured) 3.0 × 1.5 mm; Grand Cul-de-Sac Marin, slope facing Fajou Island; 16°21.75′ N, 61°36.07′ W; depth 23 m; 6 May 2012; KARUBENTHOS 2012; stn GS06; MNHN-IM-2012-8986.

Other material examined (7 specs)

GUADELOUPE • 1 spec., 3.8 × 1.8 mm; Grand Cul-de-Sac Marin; 16°21.72′ N, 61°36.35′ W; depth 22 m; 5 May 2012; KARUBENTHOS 2012; stn GB03; MNHN-IM-2012-9020 • 1 spec., 4.1 × 1.8 mm; Grand Cul-de-Sac Marin; 16°21.75′ N, 61°36.07′ W; depth 24 m; 6 May 2012; KARUBENTHOS 2012; stn GB04; MNHN-IM-2012-8991 • 5 specs, (1 measured) 3.9 × 1.8 mm; Grand Cul-de-Sac Marin, passe à Caret; 16°22.28′ N, 61°38.14′ W; depth 29 m; 23 May 2012; KARUBENTHOS 2012; stn GB26; MNHN-IM-2012-9002.

Description

Shell small (holotype length = 4.0 mm, other specimen lengths to 4.3 mm), stoutly fusiform (W/L = 0.4500), with about 5¼ whorls, last whorl disproportionately large (about 68% of shell length); sculptural element of broad axial ribs and strong primaries, and microscopic secondaries between; aperture narrowly oval, varicose, 50% of shell length, with an undifferentiated anterior canal and wide anal sinus posteriorly. *Protoconch* is rectilinear, of about 1½ rapidly expanding whorls, first whorl

protruding, riblets near protoconch lip absent, protoconch noticeably narrower in diameter than first teleoconch whorl. *Axial sculpture* of broad ribs that run from suture-to-suture on spire whorls, and to anterior fasciole on last whorl, ribs opisthocline, recurved on shoulder ramp, intercostal space about as wide as ribs; 10 ribs on the penult, 7 to the varix on the last, very fine growth striae present on the ribs and intercostal space. *Varix* apertural, thick, flattened, extends from a little above suture, to end of anterior canal, curved around anal sinus, and its edge crenated by spiral cords. *Spiral sculpture* of 3 widely spaced primaries overriding axials on the penultimate whorl side, strongest on whorl periphery, 1 weaker primary on shoulder, and 4 additional primaries on shell base. Shell surface nodulose from slightly swollen primaries on rib crests. Shell surface covered with microscopic secondaries with minute nodules at their intersection with growth striae. *Sulcus* absent; recurved ribs on the shoulder that are slightly narrower than their anterior extent mark past positions of the anal sinus. *Outer lip* varicose, with a very narrow lip extension on the outside edge of the varix that extends from the anal sinus to the anterior canal, with a denticle on inside of the lip below anal sinus; stromboid notch absent. *Anal sinus* is a wide, somewhat laterally directed notch on the shoulder, separated from the suture by bridging parietal callus and cut in the face of the varix, which is concave behind the sinus. *Inner lip* a narrow glaze along the columella with a parietal callus at the anal sinus. *Columella* is slightly sigmoid. *Anterior canal* is very short, open, unnotched. *Anterior fasciole* is not swollen, with about 6 spiral cords. *Color* straw with a whitish inner lip and anterior fasciole, a reddish brown spiral band mid whorl.

Remarks

20 measured specimens have an average length = 3.8 mm (range = 2.8–4.3 mm).

Range and habitat

Guadeloupe (Northeast Basse-Terre, Grand Cul-de-Sac Marin); depth 22–29 m.

Adelocythara unid. sp. 1d
Figs 7D, 8X–DD, 9P:1d

These specimens are from samples taken on the SW side of Basse-Terre, an area located about 11 km south of Lizzard Point, the type locality of *Adelocythara bouillantensis* Fallon & Bouchet sp. nov.

Diagnosis

These specimens are morphologically indistinguishable from *Adelocythara bouillantensis* Fallon & Bouchet sp. nov. and may be the same but kept unnamed here because of the geographic distance from Pigeon Point, the type locality of *A. bouillantensis*. Phylogenetic analysis may prove they are yet another one of the highly geographically restricted species found at other Basse-Terre locations (Fig. 9P).

Material examined (71 specs)

GUADELOUPE • 1 spec., 4.2 × 1.9 mm; SW of Basse-Terre, off the Rivière Sens marina; 15°59.0′ N, 61°43.1′ W; depth 25 m; 21 May 2012; KARUBENTHOS 2012; stn GB25; MNHN-IM-2012-9006 • 10 specs, 4.6 × 1.9, 4.0 × 1.9, 4.3 × 1.9, 4.0 × 1.6, 3.8 × 1.7, 4.2 × 1.9, 4.3 × 1.8, 3.4 × 1.5, 2.7 × 1.4 and 3.5 × 1.5 mm; off south Rocroy Beach; 16°02.38′ N, 61°45.71′ W; depth 17 m; 10 May 2012; KARUBENTHOS 2012; stn GB08; MNHN-IM-2012-9000 • 11 specs, (4 measured) 4.0 × 1.8, 4.1 × 1.8, 4.2 × 1.9 and 4.2 × 1.9 mm; off south Rocroy Beach; 16°02.38′ N, 61°45.71′ W; depth 17 m; 10 May 2012; KARUBENTHOS 2012; stn GS11; MNHN-IM-2012-8987 • 47 specs, (12 measured) 4.1 × 1.7, 4.6 × 1.5, 3.8 × 1.8, 4.1 × 1.8, 3.8 × 1.7, 3.8 × 1.7, 4.0 × 1.9, 4.0 × 1.7, 3.8 × 1.8, 3.9 × 1.8, 4.2 × 1.8 and 4.0 × 1.9 mm; Pigeon Island; 16°02.4′ N, 61°45.6′ W; depth 50 m; 11 May 2012; KARUBENTHOS 2012; stn GS13; MNHN-IM-2012-9021 • 2 specs, 4.5 × 2.0 and 3.7 × 1.7 mm; Pigeon Island; 16°02.4′ N, 61°45.6′ W; depth 15 m; 11 May 2012; KARUBENTHOS 2012; stn GR19; MNHN-IM-2012-9011.

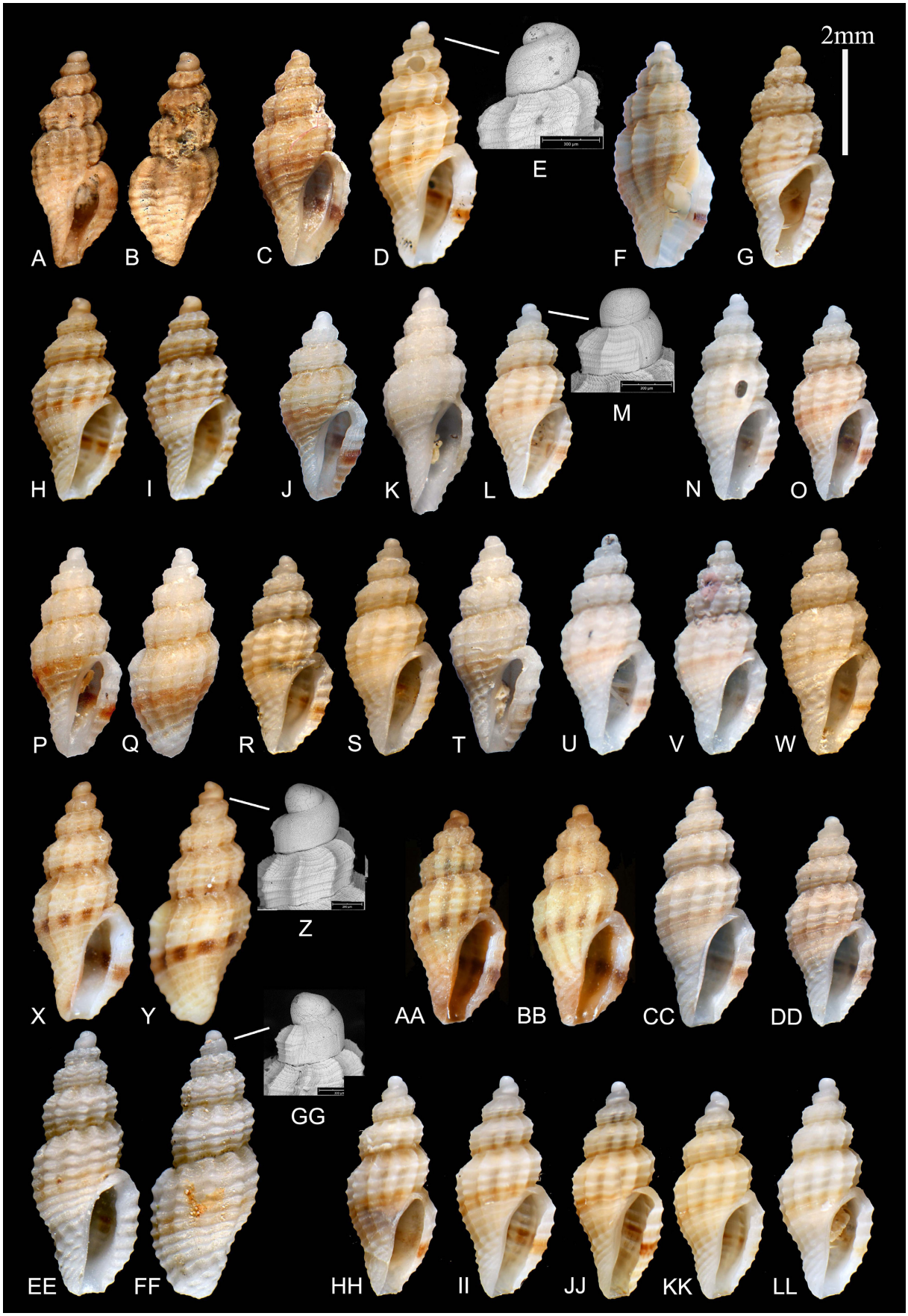
Description

The shell is like others in the unidentified species groupings: small (length up to 4.6 mm among 71 specimens), with sloping, slightly convex shoulders and of about 5½ whorls total, the body whorl about 65% of length. Protoconch rectilinear, and about 1½ whorls. Sculpture of about 10 ribs on the penultimate, 7 on the last, with a wide, flat crenated apertural varix; of 4 spiral primaries on the penultimate whorl side, 4 on the last, and 1 weak primary on the shoulder, all slightly swollen on rib apices; microscopic secondaries, beaded at the intersection of growth striae, fill the intercalary spaces. Anterior canal is very short, barely differentiated from the aperture. Color light to dark straw with a reddish-brown mid-whorl spiral band.

Remarks

29 measured specimens have an average length = 4.0 mm (range = 2.7–4.6 mm).

Fig. 8 (next page). Species of *Adelocythara* Woodring, 1928. Part 1. – **A–B**. *Adelocythara primolevis* Woodring, 1928, holotype, type of genus, 4.1 × 1.7 mm, ventral and dorsal views (USNM 369385), Bowden Formation, Jamaica, Upper Pliocene (3.6–2.6 Ma). – **C–I**. *Adelocythara bouillantensis* Fallon & Bouchet sp. nov. **C**. Holotype, 4.1 × 1.9 mm, sequenced (MNHN-IM-2013-20569), Pigeon Point, off W Basse-Terre, Guadeloupe. **D–E**. Paratype, 4.7 × 2.0 mm, ventral and SEM image of protoconch (MNHN-IM-2012-9009), Pigeon Point, off W Basse-Terre, Guadeloupe. **F**. Paratype, 4.3 × 1.9 mm, ethanol preserved (MNHN-IM-2019-34688), Pigeon Point, off W Basse-Terre, Guadeloupe. **G**. Spec., 4.2 × 1.8 mm (MNHN-IM-2012-8972), Malendure Pt., off W Basse-Terre, Guadeloupe. **H–I**. Specs, 3.9 × 1.9 and 3.8 × 1.8 mm (MNHN-IM-2012-9017), North Point, Bouillante Bay, off W Basse-Terre, Guadeloupe. – **J–O**. *Adelocythara portlouisensis* Fallon & Bouchet sp. nov. **J**. Holotype, sequenced, 3.6 × 1.7 mm (MNHN-IM-2013-20666), Port-Louis, off NW Grande-Terre, Guadeloupe. **K**. Paratype, sequenced, 4.3 × 1.7 mm (MNHN-IM-2013-20651) bouée PCA, off NW Grande-Terre, Guadeloupe. **L–O**. Paratypes, 3.7 × 1.7 mm ventral view and SEM image of protoconch, 3.9 × 1.7 and 3.7 × 1.6 mm (MNHN-IM-2012-9019), Port-Louis, off NW Grande-Terre, Guadeloupe. – **P–W**. *Adelocythara caretensis* Fallon & Bouchet sp. nov. **P–Q**. Holotype, sequenced, 4.0 × 1.8 mm, ventral and dorsal views (MNHN-IM-2013-20622), Caret Island pass, Grand Cul-de-Sac Marin, off NE Basse-Terre, Guadeloupe. **R**. Spec., 3.8 × 1.8 mm (MNHN-IM-2012-9020), Grand Cul-de-Sac Marin, off NE Basse-Terre, Guadeloupe. **S**. Spec., 4.1 × 1.8 mm (MNHN-IM-2012-8991), Grand Cul-de-Sac Marin, off NE Basse-Terre, Guadeloupe. **T**. Paratype, sequenced, 4.1 × 1.8 mm (MNHN-IM-2013-20570), W off Fajou Island, Grand Cul-de-Sac Marin, off NE Basse-Terre, Guadeloupe. **U–V**. Paratypes, 3.9 1.7 and 3.7 × 1.7 mm (MNHN-IM-2012-9007), Caret Island pass, Grand Cul-de-Sac Marin, off NE Basse-Terre, Guadeloupe. **W**. Paratype, 4.3 × 1.9 mm (MNHN-IM-2012-9005), W off Fajou Island, Grand Cul-de-Sac Marin, off NE Basse-Terre, Guadeloupe. – **X–DD**. *Adelocythara* unid. sp. 1d. **X–Z**. Spec., 4.6 × 1.9 mm, ventral and dorsal views, and SEM image of protoconch (MNHN-IM-2012-9000), off south Rocroy Beach, off SW Basse-Terre, Guadeloupe. **AA–BB**. Specs, 4.1 × 1.8 and 4.2 × 1.9 mm (MNHN-IM-2012-8987), off south Rocroy Beach, off SW Basse-Terre, Guadeloupe. **CC–DD**. Specs, 4.6 × 1.5 and 4.1 × 1.7 mm (MNHN-IM-2012-9021), Pigeon Island, off SW Basse-Terre, Guadeloupe. – **EE–LL**. *Adelocythara* unid. sp. 1e. **EE–GG**. Spec., 5.1 × 2.1 mm, ventral and dorsal views, and SEM image of protoconch (MNHN-IM-2012-9015), Pointe de la Fontaine (Anse-Bertand), N of Grande-Terre, Guadeloupe. **HH–LL**. Specs, 4.2 × 1.8, 4.2 × 1.9, 4.2 × 1.8, 4.0 × 1.7 and 4.2 × 1.8 mm (MNHN-IM-2000-39484), N of Grande-Terre, Guadeloupe. Credits: E, M, Z, GG: SEM images courtesy of Paul Callomon. Scale bars: A–D, F–L, N–Y, AA–FF, HH–LL = 2 mm; E, M, Z, GG = 300 μm.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LL

Adelocythara unid. sp. 1e
Figs 7E, 8EE–LL, 9P:1e

This group of 26 specimens is from off the north coast of Grande-Terre; depth 12–80 m.

Diagnosis

These are geographically closest to that of *Adelocythara portlouisensis* Fallon & Bouchet sp. nov., located on the northwestern coast of Grande-Terre (Fig. 9P) but sufficiently distant to exclude them from the *A. portlouisensis* species-group without confirmatory DNA sequence data.

Material examined (26 specs)

GUADELOUPE • 1 spec., 5.1 × 2.1 mm; Pointe de la Fontaine (Anse-Bertand); 16°27.74′ N, 61°31.84′ W; depth 9 m; 18 May 2012; KARUBENTHOS 2012; stn GR34; MNHN-IM-2012-9015 • 2 specs, 3.5 × 1.6 and 3.4 × 1.5 mm; Grande-Terre, Pointe de la Vigie (Montagnier Point); 16°30.6′ N, 61°28.5′ W; depth 12 m; 19 May 2012; KARUBENTHOS 2012; stn GB22; MNHN-IM-2012-9018 • 13 specs, (7 measured) 4.2 × 1.8, 4.2 × 1.9, 4.2 × 1.8, 4.0 × 1.7, 4.2 × 1.8 and 3.9 × 1.8 mm; N of Grande-Terre; 16°29.7′ N, 61°31.4′ W; depth 60–82 m; 14 Jun. 2015; KARUBENTHOS 2 stn DW4545; MNHN-IM-2000-39484 • 5 specs, 4.3 × 1.9, 4.1 × 1.7, 4.0 × 1.7, 4.0 × 1.7 and 3.2 × 1.4 mm; Port-Louis, entrance to the Barracuda Cave; 16°27.34′ N, 61°32.07′ W; depth 19 m; 16 May 2012; KARUBENTHOS 2012; stn GB16; MNHN-IM-2012-8965 • 4 specs, 4.1 × 1.8, 3.8 × 1.7, 3.2 × 1.6 and 2.7 × 1.3 mm; Port-Louis, entrance to the Barracuda Cave; 16°27.34′ N, 61°32.07′ W; depth 19 m; 16 May 2012; KARUBENTHOS 2012; stn GS20; MNHN-IM-2012-8994 • 1 spec., 4.1 × 1.7 mm; Grand Cul-de-Sac Marin, Port-Louis (L'Oeil); 16°26.8′ N, 61°32.4′ W; depth 16 m; 18 May 2012; KARUBENTHOS 2012; stn GB20; MNHN-IM-2012-8992.

Description

The shell is like others in the groupings, small (length to 5.1 mm from among 26 specimens), with sloping, slightly convex shoulders, and about 6 whorls total, the body whorl about 69% of shell length. Protoconch rectilinear, and about 1½ whorls. Sculpture of about 10 ribs on the penultimate, 7 on the last, with a wide, flat crenate varix at the lip; of 4 spiral primaries on the penultimate, 4 on the last, and 2 weak primaries on the shoulder, all slightly swollen on rib apices; microscopic secondaries, beaded at the intersection of growth striae, fill the intercalary spaces. The anterior canal is very short, barely differentiated from the aperture. Color light to dark straw with a reddish-brown mid-whorl spiral band.

Remarks

20 measured specimens have an average length = 3.7 mm (range = 2.7–5.1 mm).

Range and habitat

Guadeloupe (N coast of Grande-Terre); depth 12–80 m.

***Adelocythara* spp. Part 2**

Adelocythara unid. sp. 1f
Figs 7F, 9A–E, P:1f

These specimens are from samples taken from near Tête à l'Anglais, which is off the northern end of Basse-Terre, a bare rock that juts out from the sea. This locality is about 27 km north of Lizzard Point (just north of Bouillante), the type locality of *Adelocythara bouillantensis* Fallon & Bouchet sp. nov.

Diagnosis

They are morphologically like *A. bouillantensis* Fallon & Bouchet sp. nov. and may be the same but kept separate because of the geographic distance between their localities, and as such may be a different species as explained in the introduction earlier.

Material examined (15 specs)

GUADELOUPE • 3 specs, 4.4 × 1.9, 4.2 × 2.0 and 3.5 × 1.5 mm; off Tête à l'Anglais; 16°22.9′ N, 61°45.94′ W; depth 23 m; 8 May 2012; KARUBENTHOS 2012; stn GB06; MNHN-IM-2012-8997 • 12 specs, (6 measured) 4.6 × 2.0, 4.7 × 1.9, 4.2 × 1.7, 4.1 × 1.9, 3.8 × 1.8 and 3.5 × 1.6 mm; off Tête à l'Anglais; 16°22.9′ N, 61°45.94′ W; depth 23 m; 8 May 2012; KARUBENTHOS 2012; stn GS08; MNHN-IM-2012-8996.

Description

The shell is like others in the groupings, very small (length to 4.7 mm from among 16 specimens), with sloping, slightly convex shoulders and of about 5½ whorls total, the last whorl about 67% of shell length. Protoconch rectilinear, and about 1½ whorls. Sculpture of about 10 narrow ribs on the penultimate, 8 on the last, with a wide, flat, and crenate apertural varix, of 4 primary spirals on the penultimate, 5 on the last and 2 finer spirals on the shoulder and all slightly swollen on rib apices; microscopic secondary spirals, beaded at the intersection of growth striae, fill in the intercalary spaces. Anterior canal very short, barely differentiated from aperture. Color light to dark straw with a reddish-brown mid-whorl spiral band.

Remarks

9 measured specimens have an average length = 4.1 mm (range = 3.5–4.7 mm).

Range and habitat

Guadeloupe (near Tête à l'Anglais, off N Basse-Terre); depth 23 m.

Adelocythara unid. sp. 1g
Figs 7G, 9F–J, P:1g

These specimens are from samples taken from around Baille-Argent Bay on the NW side of Basse-Terre, which is located about 14 km north of Lizzard Point (just north of Bouillante), the type locality of *Adelocythara bouillantensis* Fallon & Bouchet sp. nov.

Diagnosis

These are morphologically very similar to *A. bouillantensis* Fallon & Bouchet sp. nov. and so may be the same species but are kept separate here because of the geographic distance separating them, as explained in the introduction to the genus *Adelocythara*. There are some morphological differences not seen in examined specimens of *A. bouillantensis*, fewer primary spirals on spire whorl sides (2 versus 3) and their absence on whorl shoulders. However, this difference may not rise to the level of a species.

Material examined (13 specs)

GUADELOUPE • 4 specs, 4.4 × 1.7, 3.6 × 1.6, 3.7 × 1.7 and 4.3 × 1.8 mm; point on Baille-Argent Bay; 16°15.55′ N, 61°48.8′ W; depth 40 m; 12 May 2012; KARUBENTHOS 2012; stn GD21; MNHN-IM-2012-9014 • 6 specs, 2.4 × 1.3, 3.1 × 1.5, 4.7 × 2.0, 4.2 × 1.8, 4.2 × 1.6 and 4.0 × 1.7 mm; Sec Ferry; 16°17.5′ N, 61°49.0′ W; depth 27 m; 12 May 2012; KARUBENTHOS 2012; stn GS15; MNHN-IM-2012-8990 • 3 specs, 3.2 × 1.5, 3.0 × 1.4 and 4.9 × 2.1 mm; Côte Ferry; 16°17.69′ N, 61°48.23′ W; depth 10 m; 12 May 2012; KARUBENTHOS 2012; stn GB11; MNHN-IM-2012-8995.

Description

This shell is the same as others, small (length to 4.9 mm from among 13 specimens), with sloping, slightly convex shoulders, and 5½ whorls, the last whorl about 70% of shell length. Protoconch rectilinear, and about 1½ whorls. Sculpture of about 10 narrow ribs on the penultimate, 8 on the last, with a wide, flat crenate apertural varix; of 2 primary spirals on the penultimate whorl sides, 5 on the last and 2 fine primaries on the shoulder, all slightly swollen on rib apices; microscopic secondaries, beaded at the intersection of growth striae, fill in the intercalary spaces. Anterior canal is very short, barely differentiated from aperture. Color light to dark straw with a reddish-brown mid-whorl, spiral band.

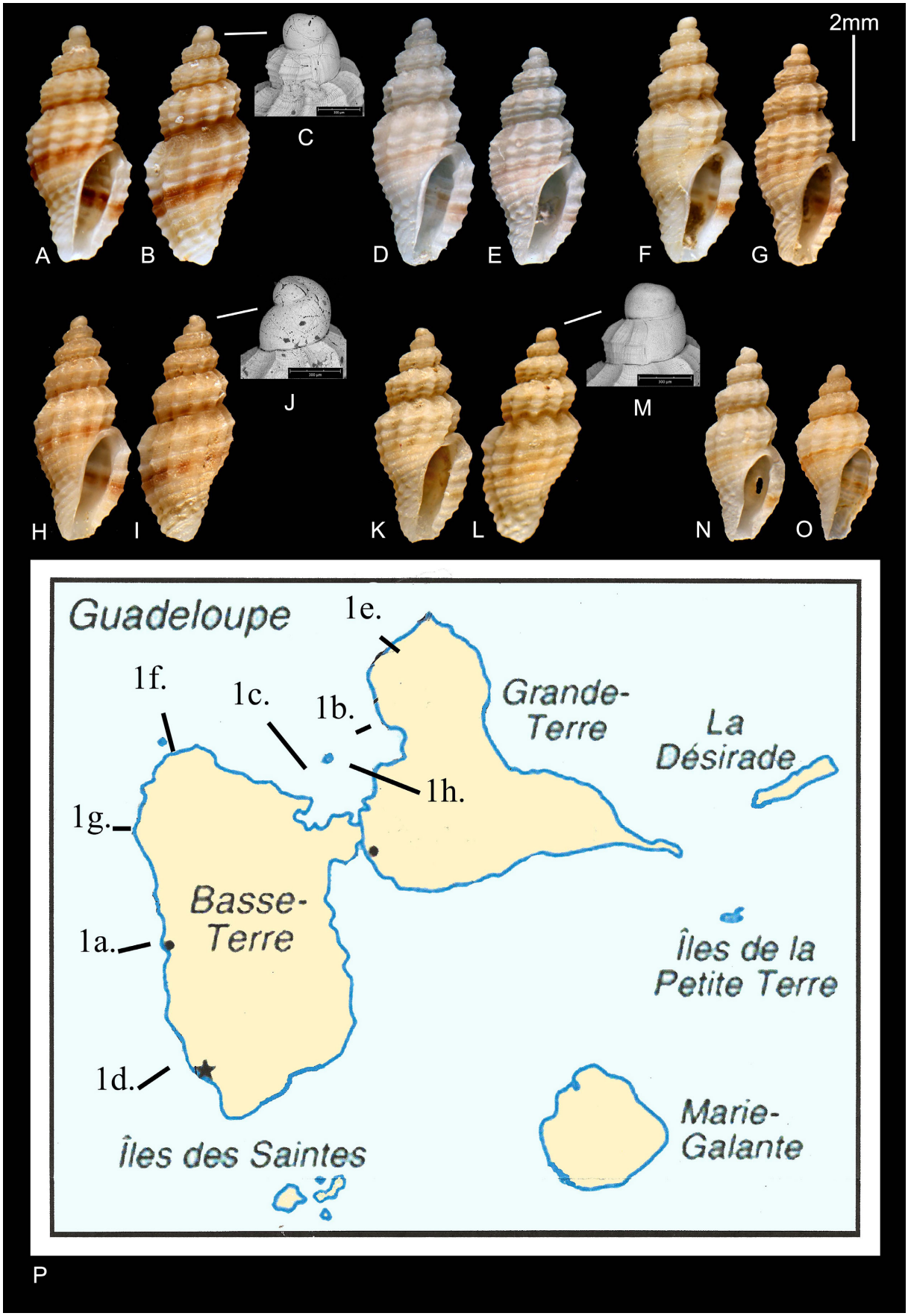
Remarks

13 measured specimens have an average length = 3.8 mm (range = 2.4–4.9 mm).

Range and habitat

Guadeloupe (NW Basse-Terre, from Côte Ferry to Baille-Argent Bay, about 4.2 km along the coastline); depth 10–40 m.

Fig. 9 (next page). Species of *Adelocythara* Woodring, 1928. Part 2. – **A–E**. *Adelocythara* unid. sp. 1f. Specs, 4.6 × 2.0, ventral and dorsal views, and SEM image of protoconch, 4.7 × 1.9 and 4.1 × 1.9 mm (MNHN-IM-2012-8996), off Tête à l'Anglais, off N Basse-Terre, Guadeloupe. – **F–J**. *Adelocythara* unid. sp. 1g. **F**. Spec., 4.7 × 1.0 mm (MNHN-IM-2012-8990), Sec Ferry, off N Basse-Terre, Guadeloupe. **G–J**. Specs, 4.3 × 1.8 and 4.4 × 1.7 mm, ventral and dorsal views, and SEM image of protoconch (MNHN-IM-2012-9014), Point on Baille-Argent Bay, off N Basse-Terre, Guadeloupe. – **K–O**. *Adelocythara* unid. sp. 1h. **K–M**. Spec., 4.1 × 1.8 mm, ventral and dorsal views, and SEM image of protoconch (MNHN-IM-2012-8988), off Fajou Island, Grand Cul-de-Sac Marin, Guadeloupe. **N**. Spec., 3.7 × 1.5 mm (MNHN-IM-2012-8999), behind Fajou Island, Grand Cul-de-Sac Marin, Guadeloupe. **O**. Spec., 3.3 × 1.6 mm (MNHN-IM-2012-8998), Colas Island channel, Grand Cul-de-Sac Marin, Guadeloupe. – **P**. Guadeloupe: diagram of species localities. Symbols are environs of the following: **1a**. *Adelocythara bouillantensis* Fallon & Bouchet sp. nov. Lézard Pt., off W Basse-Terre (type locality). **1b**. *Adelocythara portlouisensis* Fallon & Bouchet sp. nov., leaving Port-Louis, off NW Grande-Terre (type locality). **1c**. *Adelocythara caretensis* Fallon & Bouchet sp. nov., Caret Island pass, Grand Cul-de-Sac Marin, off NE Basse-Terre (type locality). **1d**. *Adelocythara* unid. sp. 1d, off south Rocroy Beach, SW Basse-Terre. **1e**. *Adelocythara* unid. sp. 1e, off N Grande-Terre. **1f**. *Adelocythara* unid. sp. 1f, off Tête à l'Anglais, N Grande-Terre. **1g**. *Adelocythara* unid. sp. 1g, Point on Baille-Argent Bay, off NW Basse-Terre. **1h**. *Adelocythara* unid. sp. 1h, behind Fajou Island, Grand Cul-de-Sac Marin. Credits: C, J, M: SEM images courtesy of Paul Callomon and Chandler J. Olson. Scale bars: A–B, D–I, K–L, N–O = 2 mm; C, J, M. = 300 μm.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Guadeloupe
1e.
1f.
1c.
1b.
Grande-
Terre
La
Désirade
1h.
1g.
Basse-
Terre
1a.
Îles de la
Petite Terre
1d.
Îles des Saintes
Marie-
Galante

Adelocythara unid. sp. 1h
Figs 7H, 9K–O, P:1h

These specimens are from samples taken off the north and northeast sides of Fajou Island, Grand Cul-de-Sac Marin. Sample locations are geographically closest to specimens from the western side of Fajou Island and the northwestern side of Grande-Terre (Fig. 9P).

Diagnosis

Since these two nearby localities have been shown to host separate species by DNA sequence analysis, and since these specimens could not be reliably assigned to one species or the other based on morphology alone, they have been placed in this unidentified species group.

Material examined (3 specs)

GUADELOUPE • 1 spec., 3.3 × 1.6 mm; Grand Cul-de-Sac Marin, Chenal ilet à Colas; 16°20.94′ N, 61°34.39′ W; depth 15 m; 3 May 2012; KARUBENTHOS 2012; stn GS02; MNHN-IM-2012-8998 • 1 spec., 3.7 × 1.5 mm; Grand Cul-de-Sac Marin, behind Fajou Island; 16°21.6′ N, 61°34.7′ W; depth 29 m; 24 May 2012; KARUBENTHOS 2012; stn GS31; MNHN-IM-2012-8999 • 1 spec., 4.1 × 1.8 mm; Grand Cul-de-Sac Marin, off Fajou Island; 16°22.57′ N, 61°34.12′ W; depth 80 m; 4 May 2012; KARUBENTHOS 2012; stn GD01; MNHN-IM-2012-8988.

Description

This shell is the same as others, small (length to 4.1 mm from among 3 specimens), with sloping, slightly convex shoulders, and a total of 5½ whorls, the last whorl about 68% of shell length. Protoconch rectilinear, and about 1½ whorls. Sculpture of about 10 strong ribs on the penultimate, 7 on the last, and with a wide, flat crenate varix at the lip; of 3 primary spirals on the penultimate whorl side, 5 on the last and 2 weak primaries on the shoulder, all slightly swollen on rib apices; microscopic secondaries, beaded at the intersection of growth striae, fill the intercalary spaces. Anterior canal very short, barely differentiated from aperture. Color straw with a light reddish-brown mid-whorl, spiral band.

Remarks

The 3 measured specimens have an average length = 3.7 mm (range = 3.3–4.1 mm).

Range and habitat

Guadeloupe (off the N and E side of Fajou Island, Grand Cul-de-Sac Marin); depth 15–80 m.

***Adelocythara* spp. Part 3**

Adelocythara youloumani Fallon sp. nov.
urn:lsid:zoobank.org:act:F9E28DEA-6AAF-4830-BD77-12F4F8AC80AD
Fig. 10A–B

Differential diagnosis

Adelocythara aliceae Fallon & Bouchet sp. nov. differs in color (all white with faint brown spots versus yellowish white with a reddish-brown mid-whorl band) and is larger (average lengths = 5.5 versus 4.8 mm). *Adelocythara bouillantensis* Fallon & Bouchet sp. nov., *A. portlouisensis* Fallon & Bouchet sp. nov., and *A. caretensis* Fallon & Bouchet sp. nov., are all smaller (average lengths < 4.2 versus 4.8 mm) and have a different color (light to dark straw versus dirty white base color).

Etymology

Adelocythara youloumani Fallon sp. nov., named after Youlouman Island, the name given to St Vincent Island, of St. Vincent and the Grenadines by the pre-Columbian natives.

Type material

Holotype
ST. VINCENT AND THE GRENADINES • 4.8 × 2.1 mm; St. Vincent Island; depth 8–10 m; ex J. Colomb coll.; MNHN-IM-2000-39485.

Paratype (1 spec.)
ST. VINCENT AND THE GRENADINES • 1 spec., 4.8 × 2.0; St. Vincent Island; depth 8–10 m; ex J. Colomb coll.; MNHN-IM-2000-39486.

Description

Shell small (holotype length = 4.8 mm), stoutly fusiform (W/L = 0.4500), with 5½ shouldered whorls, last whorl about 70% of shell length; sculptural element of axial ribs and weaker spirals; aperture narrowly oval, 50% of shell length with a barely differentiated anterior canal and wide anal sinus posteriorly. *Protoconch* partially missing in type specimens, but remaining portion appears to be the rectilinear, type of about 1½ whorls. *Axial sculpture* of strong, narrow ribs that run from suture-to-suture on spire whorls, and evanesce before anterior fasciole on last whorl, intercostal space a little wider than ribs; 9 ribs on the penultimate whorl, 7 to the varix on the last, very fine growth striae present on the ribs and in intercostal space. *Varix* apertural, rises slightly above suture and extends to end of anterior canal, its edge crenated by primary spirals. *Spiral sculpture* of primaries overriding axials, 4 on the penultimate whorl (2nd from shoulder edge weak), 3 weak primaries on shoulder, and 4 on shell base. Primaries slightly swollen on rib crests. Shell surface covered with microscopic secondaries that have minute nodules at their intersection with growth striae. *Sulcus* absent. *Outer lip* varicose, with a narrow strip of shell that extends from the anal sinus to the anterior canal. Denticle present on inside of lip below anal sinus; stromboid notch absent. *Anal sinus* is separated from suture by weak parietal callus, is a deep and broad notch nearly the width of the shoulder ramp, its apex is a concave depression in the face of the varix. *Inner lip* a narrow glaze, with a parietal callus at the anal sinus. *Columella* is slightly sigmoid. *Anterior canal* is very short, open, unnotched. *Anterior fasciole* is not swollen, with 3 or more primary spirals. *Color* yellowish white with reddish brown spiral band mid whorl. Band has a distinct adapical margin and an indistinct abapical one.

Range and habitat

Known only from the type locality.

Adelocythara caquetio Fallon sp. nov.
urn:lsid:zoobank.org:act:101A4613-4991-4F5E-BE40-B02D1969FB9E
Fig. 10C–E

non *Acmaturris* cf. *brisis* Woodring, 1928 – de Jong & Coomans 1988: 115, pl. 44 fig. 613 (misidentification that is likely this species).

Differential diagnosis

Adelocythara youloumani Fallon sp. nov. is smaller (length = 4.8 versus 5.5 mm) and has a different color (yellowish white versus white base color).

Etymology

Adelocythara caquetio Fallon sp. nov., the Caquetio *Adelocythara* (name in apposition), refers to the Spanish name of the native inhabitants of Aruba at the time of its conquest in about 1500 AD (source: https://en.wikipedia.org/wiki/Caquetio [accesssed 3 Jun. 2026]).

Type material

Holotype
NETHERLANDS ANTILLES • 5.5 × 2.3 mm; Aruba, Oranjestad; 12°32′ N, 070°02′ W; ex coll. J. Bijur; ANSP 349138.

Paratypes
None.

Description

Shell small (holotype length = 5.5 mm), stoutly fusiform (W/L = 0.4182), with about 6 shouldered whorls, last whorl about 68% of shell length; sculptural element of axial ribs and weaker spiral primaries and microscopic secondaries; aperture narrowly oval, 53% of shell length with a barely differentiated anterior canal and wide anal sinus posteriorly. *Protoconch* rectilinear, 1½ round whorls. *Axial sculpture* of strong, narrow ribs that run from suture-to-suture on spire whorls, and evanesce before anterior fasciole on last whorl, intercostal space about twice as wide as ribs; 9 ribs on the penult, 7 to the varix on the last, microscopic growth striae present on the ribs and in intercostal space. *Varix* apertural, thick, extends from slightly above suture to end of anterior canal, its edge crenated by primary spirals. *Spiral sculpture* of primaries overriding axials, 3 on the penultimate whorl side, 1 weak primary on shoulder, and 5 on shell base. Shell surface otherwise covered with microscopic secondaries that have minute nodules at their intersection with growth striae. *Sulcus* absent. *Outer lip* varicose, with a narrow strip of shell that extends from the anal sinus to the anterior canal. Denticle present on inside of lip below anal sinus; stromboid notch absent. *Anal sinus* separated from suture by weak parietal callus, is a deep and broad notch in front of the varix, nearly the width of the shoulder. *Inner lip* a thick, narrow glaze, margined, with a parietal callus at the anal sinus. *Columella* is slightly sigmoid. *Anterior canal* short, only slightly narrower than that aperture. *Color* white with reddish brown spiral band mid whorl.

Remarks

This single shell merits description because of its larger size (than similarly banded species) and geographic locality. *Adelocythara caquetio* Fallon sp. nov. has all the characteristics of the genus: a small, solid, turreted shell with the last whorl more than half of the length, a narrowly oval, varicose aperture with an anal tooth, and a short canal; a protoconch of 1¼–2 smooth whorls; a teleoconch sculpted with strong ribs and overriding strong primary spirals with intercalary microscopic secondaries.

Range and habitat

Known only from the type locality.

Adelocythara aliceae Fallon & Bouchet sp. nov.
urn:lsid:zoobank.org:act:9DFA484A-6735-44B2-8598-179FCBE6DB1D
Fig. 10F–N

Differential diagnosis

Adelocythara bouillantensis Fallon & Bouchet sp. nov. and its close congeners (*A. portlouisensis* Fallon & Bouchet sp. nov., *A. caretensis* Fallon & Bouchet sp. nov., and unidentified species *A.* unid. 1d, *A.* unid. 1e, *A.* unid. 1f, *A.* unid. 1g, and *A.* unid. 1h) differ principally in being smaller and possessing a reddish-brown spiral band. They all possess proportionally broader ribs than *A. aliceae* Fallon & Bouchet sp. nov. *Adelocythara youloumani* Fallon sp. nov. is smaller (average length = 4.8 mm versus 5.5 mm) and possesses a reddish brown mid-whorl spiral band. *Adelocythara caquetio* Fallon sp. nov. possess a reddish brown mid-whorl spiral band.

Etymology

Adelocythara aliceae Fallon & Bouchet sp. nov. is named in honor of Alice Leblond for her contributions to the smooth administration, fundraising, and logistics of the KARUBENTHOS, MADIBENTHOS, and French Guiana expeditions.

Type material

Holotype
MARTINIQUE • 6.0 × 2.5 mm; ex J. Colomb coll.; MNHN-IM-2000-39480.

Paratypes (14 specs)
GRENADA • 1 spec., 5.1 × 2.3 mm; Mabouya Island; depth 9 m; 23 Dec. 2006; G. Mackintosh leg., night SCUBA with suction and screening equipment, ex P. Fallon coll.; USNM 1715428 • 2 specs, 5.5 × 2.3 and 5.4 × 2.4 mm; S side of Molinier Point; depth 7.3 m; 27 Jan. 2007; G. Mackintosh leg.; night SCUBA; ANSP 498845.

GUADELOUPE • 1 spec., 6.1 × 2.7 mm, ethanol preserved; Pigeon Island; 16°02.4′ N, 61°45.6′ W; depth 50 m; 11 May 2012; KARUBENTHOS 2012; stn GS13; MNHN-IM-2019-34700 • 1 spec., 4.95 × 2.1 mm; N of Grand-Terre; 16°29.7′ N, 61°31.4′ W; depth 60–82 m; 14 Jun. 2015; KARUBENTHOS 2; stn DW4545; MNHN-IM-2000-39482.

MARTINIQUE • 2 specs, 6.0 × 2.5 and 6.5 × 2.6 mm; Anse d'Arlet; depth 2.0–2.5 m; MNHN-IM-2022-17809, MNHN-IM-2022-17810 • 3 specs, 4.7 × 2.0, 6.1 × 2.7 and 7.0 × 2.7 mm; SW of Vétiver; 14°37.5′ N, 61°08.3′ W; depth 74 m; 2 Oct. 2016; MADIBENTHOS; stn AD290; MNHN-IM-2000-39483.

ST. VINCENT AND THE GRENADINES • 1 spec., 5.1 × 2.2 mm; Union Island, Chatham Bay; depth 19.8 m; 6 Apr. 2007; G. Mackintosh leg.; night SCUBA; P. Fallon coll.

Other material examined (1 spec.)

GUADELOUPE • 1 spec., 7.2 × 2.9 mm; W of Basse-Terre; 16°15′ N, 61°51′ W; depth 660–690 m; 7 Jun. 2015; KARUBENTHOS 2; stn DW4510; MNHN-IM-2000-39481.

Description

Shell small (holotype length = 6.0 mm, other specimen lengths to 7.2 mm), stoutly fusiform (W/L = 0.4167), with 5¾ shouldered whorls with a slope of about 50°, last whorl disproportionately large (about 66% of shell length – sculptural elements of axial ribs and smaller primary and secondary spirals,

shell translucent between sculptural elements; aperture narrowly oval, 49% of shell length including an undifferentiated anterior canal. *Protoconch* of about 1½ whorls, rectilinear, first whorl protruding, tip expands rapidly, with about 6 riblets on last ¼-whorl. *Axial sculpture* of ribs that run from suture-to-suture on spire whorls, to anterior fasciole on last whorl, ribs recurved on shoulder ramp, intercostal space wider than ribs; 10 ribs on the penult, 8 up to the varix on the last, very fine growth striae present on the ribs and intercostal space. *Varix* apertural, thick, cord-like, rises slightly above the suture posteriorly and extends anteriorly to end of canal, and is crenated by primary spirals. *Spiral sculpture* of primaries that override axials and are widely spaced, 3 primaries on penultimate whorl, 5 additional ones on shell base. Shell surface nodulose where spirals cross over ribs, and surface covered with microscopic spirals that produce minute nodules at their intersection with growth striae. *Sulcus* is on shoulder, sloped about 50°, width delineated by the inner and outer margins of the anal sinus, with microscopic secondaries only that cross over ribs. *Outer lip* varicose, with a narrow strip of shell extending out from the base of the varix that extends in a low arch from the anal sinus to the anterior canal. Denticle present inside lip below anal sinus (see expanded view, Fig. 10J), stromboid notch absent. *Anal sinus* is separated from suture by weak parietal callus, is deep and about as wide as the shoulder, its apex aligned with the groove in the face of the varix. *Inner lip* a narrow glaze, margined anteriorly, with a parietal callus at the anal sinus. *Columella* is slightly sigmoid. *Anterior canal* is short, open, slightly notched. *Anterior fasciole* is not swollen, with about 6 spiral cords. *Color* white with faint light brown spots on rib sides.

Remarks

Sixteen examined specimens have an average length = 5.5 mm (range = 3.6–7.2 mm). All-white, white with light brown spots, and straw-colored specimens are known, some depicted in Fig. 10F–N.

Range and habitat

Off Guadeloupe, Martinique, St. Vincent and the Grenadines (St. Vincent Island), Grenada, and the Netherlands Antilles (Aruba): depth 2–82 m. A single live-collected specimen was dredged at 50 m, and an eroded empty shell was dredged between 660–690 m, both off Guadeloupe.

Adelocythara isabelensis Fallon sp. nov.
urn:lsid:zoobank.org:act:A643E2B0-A3B8-4132-B302-8A40637F7855
Fig. 10O–T

Differential diagnosis

Adelocythara youloumani Fallon sp. nov. differs in coloration and is slightly stockier (W/L = 0.4500 versus 0.4318 of holotypes). *Adelocythara bouillantensis* Fallon & Bouchet sp. nov., *A. portlouisensis* Fallon & Bouchet sp. nov., and *A. caretensis* Fallon & Bouchet sp. nov., all have protoconchs with slightly fewer whorls (1⅓–1½ versus 1¾–2). They are slightly stockier (W/L = 0.4500–0.4722 versus 0.4318 of their respective holotypes).

Etymology

Adelocythara isabelensis Fallon sp. nov., named after the administrative division of Isabela, Puerto Rico, for its beaches on the northwest corner of the island, from which all the specimens described here were found.

Type material

Holotype

PUERTO RICO • 4.4 × 1.9 mm; Isabela, Isabela Beach; in beach drift; Apr. 2016; D. Kirsh leg.; ANSP 498846.

Paratypes (5 specs)
PUERTO RICO • 1 spec., 4.0 × 1.9 mm; Isabela, Isabela Beach; depth 0 m; Apr. 2016; D. Kirsh leg.; in beach drift; D. Kirsh coll. • 1 spec., 4.8 × 2.0 mm; Isabela, Middles Beach; depth 0 m; Apr. 2021; D. Kirsh leg.; in beach drift; ANSP 498847 • 3 specs, 4.3 × 1.7, 4.1 × 2.0 and 3.4 × 1.6 mm; Isabela, Middles Beach; depth 0 m; Apr. 2021; D. Kirsh leg.; in beach drift; D. Kirsh coll.

Description

Shell small (length = 4.4 mm), stoutly fusiform (W/L = 0.4318), with 5½ whorls total, teleoconch whorls turreted with sloping, convex shoulders, sutures impressed, last whorl about 73% of shell length; sculptural elements of axial ribs and weaker spirals; aperture narrowly oval, sides parallel, with an anterior canal undifferentiated from the aperture, both aperture and canal 51% of shell length; anal sinus wide. *Protoconch* of 1¾–2 smooth round whorls. *Axial sculpture* of strong, narrow ribs that run from suture-to-suture on spire whorls, and evanesce before anterior fasciole on last whorl, intercostal space about twice as wide as ribs; 10 ribs on the penultimate whorl, 7 to the varix on the last, very fine growth striae present in intercostal space, about the same strength as microscopic secondaries. *Varix* is apertural, extends from a little above suture to end of anterior canal, its edge crenated by primary spirals. *Spiral sculpture* of primaries overriding axials, 1 weak primary (barely stronger than secondaries) on whorl shoulder, 3 strong primaries on the penultimate whorl side, and 4 on shell base. Primaries slightly swollen on rib crests. Shell surface covered with microscopic secondaries that have minute nodules at their intersection with growth striae. *Sulcus* absent. *Outer lip* varicose, with a narrow lip that extends from the anal sinus to the anterior canal. Denticle present on inside of lip below anal sinus; stromboid notch absent. *Anal sinus* is separated from suture by weak parietal callus, is a moderately deep and broad notch nearly the width of the shoulder ramp, its apex coincident with a concave depression in the face of the varix, its sides divergent. *Inner lip* a narrow glaze, with a weak parietal callus at the anal sinus. *Columella* is slightly sigmoid. *Anterior canal* short, open, end unnotched. *Anterior fasciole* is not swollen, with 4 primary spirals. *Color* translucent light brownish yellow with a narrow reddish brown mid-whorl band, a translucent white band above the narrow reddish brown band, white protoconch, and white anterior fasciole.

Range and habitat

Puerto Rico (NW coast); depth assumed to be shallow water.

Adelocythara troyolsoni Fallon sp. nov.
urn:lsid:zoobank.org:act:499A8B15-2A63-4C23-AC05-57706C4735A6
Fig. 10U–W

Differential diagnosis

Adelocythara aliceae Fallon & Bouchet sp. nov. differs in possessing all white with faint brown spots versus dirty white with a reddish-brown mid-whorl band and is larger (average length = 5.5 versus 3.8 mm). *Adelocythara bouillantensis* Fallon & Bouchet sp. nov., *A. portlouisensis* Fallon & Bouchet sp. nov., and *A. caretensis* Fallon & Bouchet sp. nov., all have a rectilinear protoconch.

Etymology

Adelocythara troyolsoni Fallon sp. nov. is named in honor of my (PF) late son-in-law, Troy Olson, who was killed in his prime by an act of nature.

Type material

Holotype

HONDURAS • 3.8 × 1.7 mm; Bay Islands, Roatán Island; depth 200 m; Sep. 1998; dredged by research boat; ANSP 498848.

Paratypes

None.

Description

Shell small (length = 3.8 mm), stoutly fusiform (W/L = 0.4474), with 5 impressed whorls total, teleoconch whorls turreted with sloping shoulders, last whorl about 71% of shell length; sculptural elements of axial ribs and weaker spirals; aperture narrowly oval, with a barely differentiated anterior canal, both aperture and canal 50% of shell length; anal sinus wide. *Protoconch* of 1½ smooth round whorls, the first ½ partially immersed in last. *Axial sculpture* of strong, narrow ribs that run from suture-to-suture on spire whorls, and evanesce before anterior fasciole on last whorl, intercostal space about twice as wide as ribs; 14 ribs on the penultimate whorl, 11 to the varix on the last, very fine growth striae present on the ribs and intercostal space. *Varix* apertural, extends from suture to end of anterior canal, its edge crenated by primary spirals. *Spiral sculpture* of primaries overriding axials, 3 weak (barely stronger than secondaries) on whorl shoulders, 3 on the penultimate whorl side, and 4 on shell base. Primaries slightly swollen on rib crests. Shell surface covered with microscopic secondaries that have minute nodules at their intersection with growth striae. *Sulcus* absent. *Outer lip* varicose, with a narrow lip at its base that extends in a low arch from the anal sinus to the anterior canal. Denticle present on inside of lip below anal sinus, stromboid notch absent. *Anal sinus* is separated from suture by weak parietal callus, is a moderately deep and broad notch nearly the width of the shoulder ramp, its apex coincident with a concave depression in the face of the varix, its sides divergent. *Inner lip* a narrow glaze, with a weak parietal callus at the anal sinus. *Columella* is slightly sigmoid. *Anterior canal* is short, open, end slightly notched. *Anterior fasciole* not swollen, with 3 or more primary spirals. *Color* translucent white with brownish-yellow bands on the shoulder adjacent to the suture, mid-whorl, and on anterior fasciole.

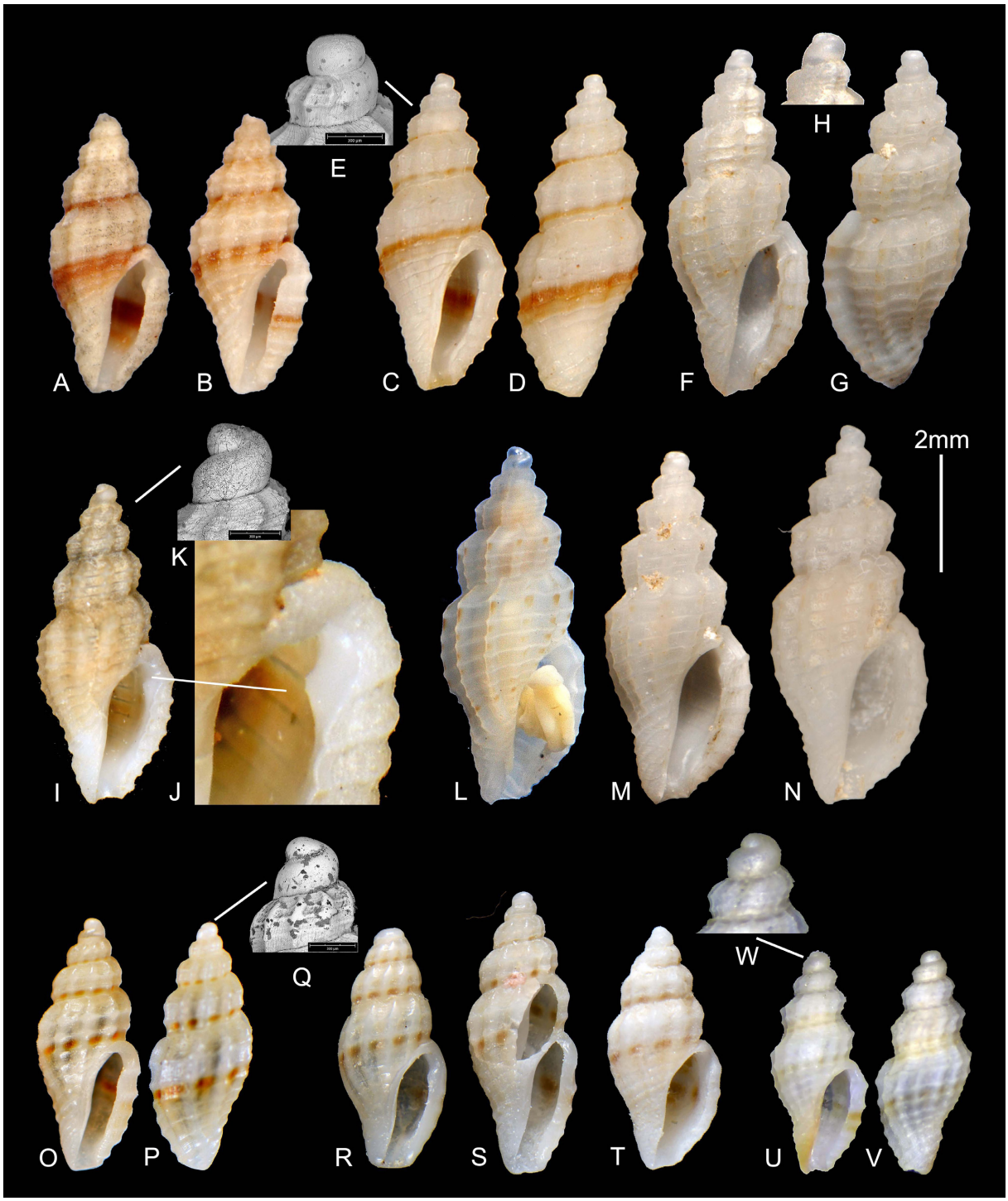
Fig. 10 (next page). Species of *Adelocythara* Woodring, 1928. Part 3. – **A–B**. *Adelocythara youloumani* Fallon sp. nov. **A**. Holotype, 4.8 × 2.1 mm (MNHN-IM-2000-39485), Saint Vincent Island, Saint Vincent and the Grenadines. **B**. Paratype, 4.8 × 2.1 mm (MNHN-IM-2000-39486), Saint Vincent Island, Saint Vincent and the Grenadines (the type locality). – **C–E**. *Adelocythara caquetio* Fallon sp. nov., holotype, 5.5 × 2.3 mm, ventral and dorsal views, and SEM image of protoconch (ANSP 349138), Oranjestad, Aruba, Netherlands Antilles. – **F–N**. *Adelocythara aliceae* Fallon & Bouchet sp. nov. **F–H**. Holotype, 6.0 × 2.5 mm, ventral and dorsal views, and protoconch (expanded view, not to scale) (MNHN-IM-2000-39480, ex J. Colomb coll.), Martinique. **I–K**. Paratype, 5.5 × 2.3 mm, ventral view, expanded view of sinal area showing denticle (not to scale) and SEM image of protoconch (ANSP 498845), Molinier Pt., Grenada. **L**. Paratype, ethanol-preserved, 6.1 × 2.7 mm (MNHN-IM-2019-34700), bluish tint from translucent shell on original blue background, live caught specimen showing shell and color markings, Pigeon Island, Guadeloupe. **M–N**. Paratypes, 6.0 × 2.5 and 6.5 × 2.6 mm (MNHN-IM-2022-17809 and MNHN-IM-2022-17810), Anse d'Arlet, Martinique. – **O–T**. *Adelocythara isabelensis* Fallon sp. nov. **O–Q**. Holotype, 4.4 × 1.9 mm, ventral and dorsal views, and SEM of protoconch (ANSP 498846), Playa Isabela, Puerto Rico. Color enhanced to show natural pattern. **R–S**. Paratypes, 4.1 × 2.0 (D. Kirsh coll.) and 4.8 × 2.0 mm (ANSP 498847), Middles Beach, Puerto Rico. **T**. Paratype, 4.0 × 1.9 mm (D. Kirsh coll.), Playa Isabela, Puerto Rico (the type locality). – **U–W**. *Adelocythara troyolsoni* Fallon sp. nov., holotype, 3.8 × 1.7 mm, ventral and dorsal views, and expanded view of the protoconch (not to scale) (ANSP 498848), off Roatán Island, Bay Islands, Honduras. Credits: E, K, Q: SEM images courtesy of Paul Callomon and Chandler J. Olson. Scale bars: A–D, F–J, L–P, R–W = 2 mm; E, K, Q = 300 μm.

Remarks

This single specimen is described because its protoconch shape is unique to the genus *Adelocythara*, and its different geographic locality.

Range and habitat

Known only from the type locality.



Genus ***Agathotoma*** Cossmann, 1899

Mangilia (*Agathotoma*) Cossmann, 1899: 45, nom. nov. pro *Ditoma* Bellardi, 1877 (non Illinger, 1807).

Type species

Raphitoma angusta Bellardi, 1847.

Landau *et al*. (2023: 48–49, pl. 1 figs 1–4) discuss *Raphitoma angusta* and treat the authorities Bellardi (1847, 1877) as referencing the same species.

Summary diagnostic characteristics

Shell small, fusiform, with a body whorl as long or longer than spire, spire whorls strongly shouldered.

Protoconch of between 1–3 smooth or microscopically papillose whorls with riblets starting at the end of the first.

Axial sculpture of strong ribs, usually narrow, blade-like, slightly recurved on shoulders, and disappear before, or more commonly are 'gathered' on the anterior fasciole into folds.

Spiral sculpture of microscopic, frosted secondaries of uniform strength that override ribs, primaries absent.

Aperture narrowly oval, tapering to a short anterior canal, which is slightly flared at its end.

Outer lip with a broad flat varix, with a round, laterally directed, deep anal notch, narrowing at aperture, in front of and sometimes partially excavated into the face of the varix. In the type species the anal sinus is directed laterally and spout-like.

Shell surface microsculpture

Shell surface SEM images taken at 800–850× magnification of a representative specimen from some species appear in Fig. 11. The coarseness of 'frosting' varies among species; however, the structures are similar, described here as 'brushes', or bundles of fibers that fan out laterally, parallel to growth lines and appearing from above to arch over spirals. The direction of fanning is perpendicular to the spiral. There are no primary spirals, just secondaries, so the structures are the same over the surface of the shell. Brushes vary among species in the density of their component fibrils, or in sticking with the brush analogy, the number of bristles in the brush. Most of the species imaged have exceedingly small crystal-like grains scattered in intercalary space.

Differences from other genera

Pyrgocythara Woodring, 1928 has a small-tipped protoconch of 3 whorls, an anal sinus with a denticle, and spiral sculpture that consists of both primary and secondary spirals.

Adelocythara Woodring, 1928 has a broad-tipped protoconch of 1½–2 whorls usually without riblets, sculpture consisting of ribs and primary spirals in a reticulate pattern, microscopic secondaries between, and an anal sinus with a denticle inside the outer lip. Shell surface microsculptural structures arch over incremental growth lines, not over spirals as in *Agathotoma*.

Glabrocythara Fargo, 1953, a fossil genus, has a different protoconch, possessing cancellated sculpture on its last part, and weak, flattened spiral cords on the teleoconch. It also lacks microscopic spiral secondaries.

Remarks

According to Faber (2004: 56) the type species may not be closely related to the western Atlantic *Agathotoma*. A photo of a specimen of *Agathotoma angusta* (Bellardi, 1847), the type species of the genus, appears in Fig. 13A–C. This fossil species lacks strongly shouldered whorls, rib plaits on the anterior fasciole, has a spout-like anal sinus, unlike the shallow notched sinus of western Atlantic species, and a protoconch of 4.2 whorls (versus 1–2½ whorls). On the other hand, Landau *et al*. (2023: 48–49, pl. 1) show more clearly that diagnostic features of *A. angusta* are similar in Recent species of the genus group. These include axial riblets on the last protoconch whorl, teleoconch with narrow opisthocline ribs, axial folds on the anterior fasciole, and fine irregular cordlets covered with fine micropustules in SEM images. Faber referred *A. candidissima* (C.B. Adams, 1845) to the genus *Pseudorhaphitoma* Boettger, 1895, but both Fernández-Garcés & Rolán (2010: 69) and Absalão *et al.* (2005: 33) later chose *Pyrgocythara* Woodring, 1928. Neither of these options is a suitable replacement for species presently in *Agathotoma*. Rolán *et al.* (2012: 45) recognized the unsuitability of available genera for their newly named species from Cuba and the Bahamas (*A. asthenika*, *A. eduardoi*, *A. prominens*, all by Rolán *et al.* (2012)) and chose to continue with the current genus *Agathotoma* for western Atlantic species until more anatomical and genetic information is available. Similarly, we prefer to continue the use of *Agathotoma* as a valid genus for TWA species.

Agathotoma is one of the most abundant mangeliid genera in samples collected from around Guadeloupe and Martinique, comprising about 873 specimens. Many of these belong to species recently described by Rolán *et al.* (2012): *Agathotoma asthenika* and *A. prominens*. *Agathotoma ecthymata* E.F. García, 2008 has also been found in abundance. The treatments by these authors are recent and complete, so only notes on observed variability, their comparison to newly proposed species, and additional habitat information is offered here, as well as DNA sequence information.

Suturocythara apocrypha E.F. García, 2008, recombined in *Agathotoma* by Rolán *et al.* (2012), is not followed here on morphological grounds; no live specimens were taken in this study for DNA sequence analysis.

Phylogenetic relationships

The DNA sequence data support the monophyly of the genus *Agathotoma*, with the seven sequenced species forming a well-supported clade. The lineage is recovered as a sister to the genus *Glyphoturris*, albeit with no bootstrap support. All sequenced species show a modest intraspecific variability (average intraspecific p-distance range: 0.3–1.4%).

Nomina dubia

Pleurotoma hexagonum L. Pfeiffer, 1840 non Sowerby, 1834 is of uncertain synonymy in *A. candississima* (C.B. Adams, 1845) according to Rosenberg (2009) and considered a nomen dubium by Faber (2004: 56, figs 121–122) on account of its poor state of preservation. Faber's figs 121–122 of the lectotype of *P. hexagonum* is not *P. candidissima*, although likely belongs in *Agathotoma.* Since it cannot be assigned to a species treated in this work it remains a nomen dubium. The type locality is Cuba ["Nordküste", Pfeiffer 1839: 349]. The lectotype is in ZMB 109.677 (Faber 2004: 56, figs 121–122).

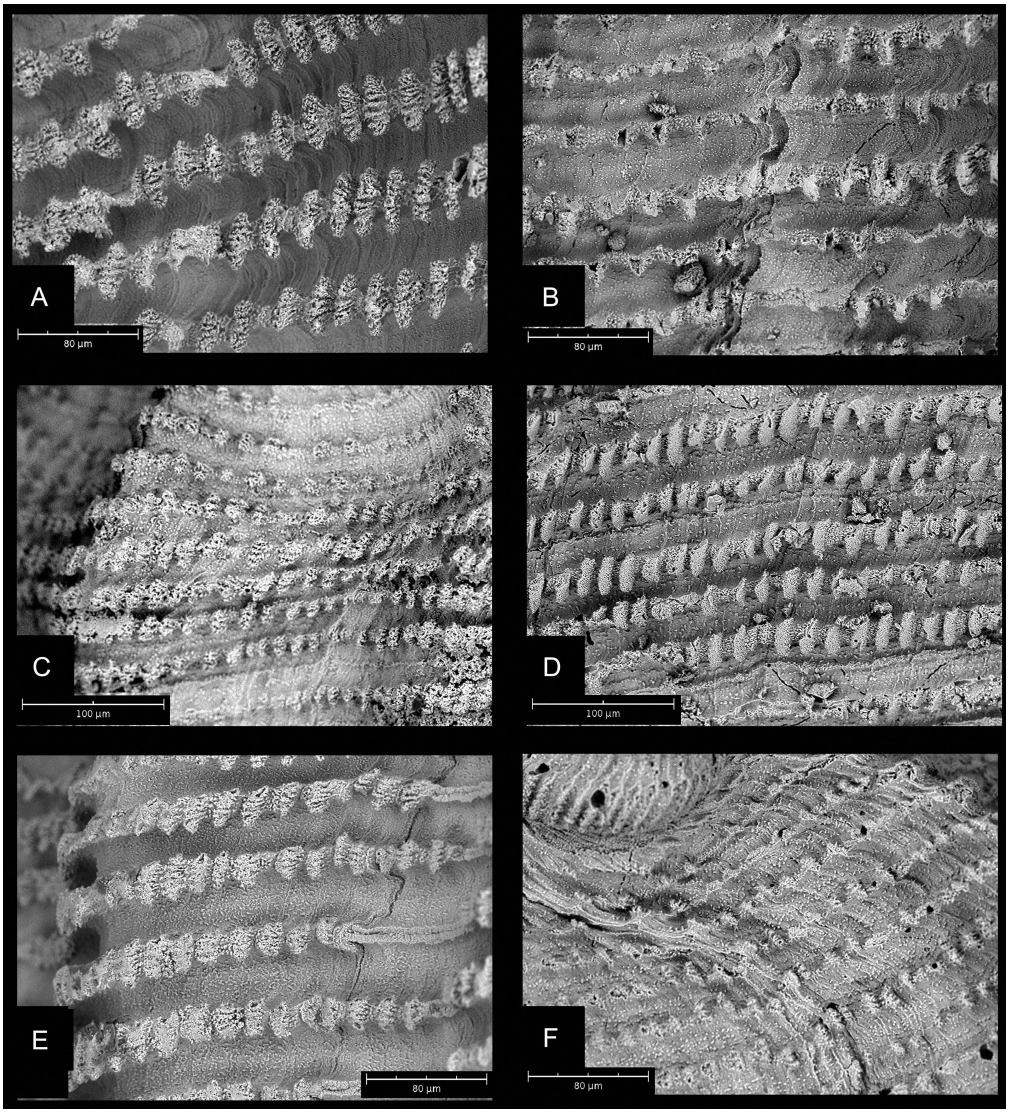


Fig. 11. Species of *Agathotoma* Cossmann, 1899, shell surface microsculpture. SEM images 850× unless otherwise stated. **A**. *Agathotoma candidissima* (C.B. Adams, 1845). Spec., 7.6 × 3.3 mm (MNHN-IM-2012-7691), Grand Cul-de-Sac Marin, Guadeloupe. Evenly spaced rows of brush-like structures, their fanning is oriented parallel to and coincides with growth lines, perpendicular to spirals. **B**. *Agathotoma legallae* Fallon & Bouchet sp. nov., paratype, 9.0 × 3.4 mm (MNHN-IM-2012-7687), Côte Ferry, Guadeloupe. Most of the brushes distorted or damaged in this image, but few are visible on the right side of the image. **C**. *Agathotoma asthenika* Rolán, Fernández-Garcés & Redfern, 2012, SEM image 800×. Spec., 4.0 × 1.7 mm (MNHN-IM-2012-9007), entrance to Barracuda Cave, Port-Louis, Guadeloupe. Brushes are less well organized than in A. Intercalary space speckled with minute crystals. **D**. *Agathotoma hieui* Fallon & Bouchet sp. nov. SEM image 800×, paratype, 3.9 × 1.6 mm (USNM 1715393), off Macouba, Guadeloupe. Brushes not as wide as in A appear to be comprised of a greater number of fibrils. Spirals strong, visible underneath, between brushes. Intercalary space speckled with minute crystal-like granules. **E**. *Agathotoma violet* Fallon & Bouchet sp. nov., holotype, 3.4 × 1.5 mm (MNHN-IM-2013-70251), Vétiver, Martinique. Brushes not as wide as those of *A. candidissima* in A, but somewhat more compact; nonetheless, spirals underneath narrower than the width of the structures. **F**. *Agathotoma inornata* Fallon & Bouchet sp. nov., holotype, 5.2 × 2.2 mm (MNHN-IM-2000-39498), SW of Vétiver, Martinique. Brushes are smaller, weaker, less organized and spirals more widely spaced than in A. Spirals weaker than in D and appear to be comprised of fewer fibrils. Intercalary space speckled with minute crystals. Credits: A–F: SEM images courtesy of Chandler J. Olson and Krasimira "Kasey" Seizova. Scale bars: A–B, E–F = 80 µm; C–D = 100 µm.

***Agathotoma* spp. Part 1**

Agathotoma dubia (C.B. Adams, 1845) comb. nov.
Fig. 13D–E

Pleurotoma dubia C.B. Adams, 1845: 4, non Cristofori & Jan, 1832, nec Deshayes, 1834 (primary homonymy, ICZN Art. 53.3).

Mangelia dubia – C.B. Adams 1850a: 55. — Jay 1850: 326. — H. & A. Adams 1858: 100. — Tryon 1884: 248. — Nowell-Usticke 1959: 82, specimen in UF 158121.
Pyrgocythara dubia – Porter 1974: 262.
Pleurotoma dubia – Paetel 1888: 62. — Clench & Turner 1950: 275, pl. 31 fig. 2.
Daphnella dubia – Paetel 1888: 89.
Tenaturris dubia – Williams 2005: #5762, photo of lectotype.

non *Pyrgocythara dubia* – Redfern 2001: 134, pl. 60 fig. 552; 2013: 214, fig. 595 (misidentifications that are likely an unnamed species of *Cryptomangelia* Fallon gen. nov.).

Differential diagnosis

Agathotoma candidissima (C.B. Adams, 1845) is similar but has a stouter shell with a less tapered spire, more ribs, heavier folds on the anterior fasciole, and a smaller diameter protoconch (400 versus 500 μm). *Agathotoma legallae* Fallon & Bouchet sp. nov. is larger, has rib shoulders slightly elevated above whorl sutures, and heavier folds on the anterior fasciole.

Type material

Lectotype
The lectotype was designated by Clench & Turner (1950: pl. 31 fig. 2).

JAMAICA • 6.3 × 2.5 mm; MCZ 177031.

Paralectotypes (2 specs)
JAMAICA • 2 specs, 5.8 × 2.5 and 7.1 × 2.7 mm; MCZ 186141.

Material examined (3 specs)

The lectotype (MCZ 177031) and paralectotypes (MCZ 18141) have been examined, all are in poor condition. No additional specimens have been found in examined samples during this project that match this species.

Description

The lectotype of *Agathotoma dubia* (C.B. Adams, 1845) is the basis of this redescription. *Shell* small (length = 6.3 mm), fusiform, of about 7 whorls, with whorl shoulders narrow, convex, and at about the same level as the sutures (not rising above them), whorl sides convex, the last, including a short anterior canal, about 65% of shell length. Aperture narrowly-oval, sides nearly parallel. *Protoconch* of about 2 round whorls and about 500 μm in diameter. *Axial sculpture* of 8–9 strong ribs that are a little narrower than their interspaces, recurved on shoulders, and gathered into folds on the anterior fasciole. *Spiral sculpture* of numerous frosted secondaries. *Outer lip* with a broad and flat varix that extends from a little above the suture to the end of the anterior canal. *Anal sinus* moderately deep, its apex round, in front of the varix, and set off from the suture. *Inner lip* a narrow glaze along anterior canal and parietal wall, margined. *Anterior canal* short, delineated by an abrupt narrowing of the aperture. Its end slightly flared out. *Color* is yellowish white, surface soiling obscures color markings on the lectotype.

Remarks

The taxon *Pleurotoma dubia* C.B. Adams, 1845 is preoccupied and thus invalid. None of the referenced sources in the above listed uses of the taxon are verifiable as C.B. Adams' species and no synonyms of *P. dubia* C.B. Adams, 1845 have been identified, perhaps because of the poor quality of the types and the absence of specimens of the genus *Agathotoma* from Jamaica, the most likely source of additional specimens. Since none of the specimens examined in this project can be confirmed as the same as *P. dubia* by comparison to the lectotype, no new name is proposed at this time because there is an outside chance that *P. dubia* is a variant of one of the validly named species, which might be a candidate replacement name.

Range and habitat

Known only from the type locality.

Agathotoma candidissima (C.B. Adams, 1845)
Figs 11A, 12, 13H–O

Pleurotoma candidissima C.B. Adams, 1845: 4.

Mangelia hornbeckii Reeve, 1846b: pl. 6, species 47, **syn. nov.** The type locality is St. Thomas, West Indies; a lectotype and paralectotype are in NHMUK 1963460 (lectotype selection by Kilburn 1993. The type specimens are exceptionally large for the species. Photographs of the 2 types were provided by the NHMUK (Fig. 13F–G).

Mangelia densestriata C.B. Adams, 1850b: 65. The type locality is Jamaica, the holotype is in MCZ 177027. The photo of the holotype in Clench & Turner (1950: pl. 31 fig. 8) appears to be an incompletely developed specimen, but rib configuration and size (length = 7 mm) suggest that it is *Agathotoma candidissima.* Abbott (1974: 284) states that this species is larger, has wider ribs and a more elongate aperture and body whorl than *A. candidissima*.

Pleurotoma candidissima – Clench & Turner 1950: 263, pl. 30 fig. 5, pl. 49 fig. 1.

Mangelia candidissima – Krebs 1864: 13. — Olsson & McGinty 1958: 18. — Nowell-Usticke 1959: 82.

Mangilia candidissima – Tryon 1884: 226, 248.

Daphnella candidissima – Paetel 1888: 87.

Mangelia densestriata – Dall & Simpson 1901: 388.

Pyrgocythara candidissima – Waller 1973: 38, fig. 29. — Abbott 1974: 283. — Rios 1975: 139, pl. 42 fig. 637; 1985: 148, pl. 50 fig. 694; 1994: 175, pl. 58 fig. 806. — Vokes & Vokes 1983: 59, pl. 29 fig. 14 (photo of holotype). — García & Luque 1986: 48. — Turgeon *et al*. 1988: 100. — Odé 1992a: 55. — Absalão *et al.* 2005: 33, figs 84, 111.

Pyrgocythara densestriata – Vokes & Vokes 1983: 59, pl. 29 fig. 16 (photo of holotype). — Odé 1992a: 54.

Agathotoma candidissima – de Jong & Coomans 1988: 114, pl. 17–18, 44, fig. 604. — Diaz & Puyana 1994: 227, pl. 67 fig. 898. — Turgeon *et al.* 1998: 104. — Redfern 2001: 130, pl. 58 figs 537a–e, pl. 112 fig. 537f; 2013: 205. — García & Lee 2002: 12. — Rolán *et al.* 2012: 46, figs 1a–f, 10a, 11a–b, table 1.

non *Mangelia badia* Reeve, 1846b: pl. 8, fig. 60 – de Jong & Coomans 1988: 114, pl. 44 fig. 605 (mischaracterization as a white color form of *A. candidissima*). *Mangelia badia* Reeve, 1846 is a west coast species; the type locality is given as "Gulf of California" for the 4 syntypes are in NHMUK 1989166.

non *Pyrgocythara coxi* Fargo 1953: 384, pl. 20 figs 3, 3a – Warmke & Abbott 1961: pl. 25 fig. t (likely a misidentification of *Pyrgocythara coxi*, which may instead be *A. candidissima*). — Abbott 1958: 97. — Nowell-Usticke 1959: 83. — Rice & Kornicker 1965: 126. — Houbrick 1968: 17. — Sarasúa

1970: 1. — Ekdale 1974: 651. — Treece 1980: 562. — García & Lee 2002: 12. — Grace 2007: 28. Most of these authors do not include photographs for identification confirmation.

non *Pleurotoma* (*Mangilia*) *millestriata* E.A. Smith, 1882 is a senior synonym of *Agathotoma kirshi* Rolán, Fernández-Garcés & Redfern, 2012 (see separate description of this species). It has been erroneously synonymized by de Jong & Coomans (1988: 114). The type locality is St. Thomas, West Indies (E.A. Smith 1882: 217). The lectotype and paralectotypes are in NHMUK 20230894.

Differential diagnosis

Agathotoma candidissima (C.B. Adams, 1845) has shoulders level with sutures, one of the distinctive features that set apart from its congeners. *Agathotoma legallae* Fallon & Bouchet sp. nov. differs in the following respects: it is generally larger (average length = 6.7 versus 4.4 mm), is narrower, and has a proportionally taller spire with whorl shoulders higher than sutures, it has a longer anterior canal, and its protoconch is 2¼, not 2½ whorls, with fewer riblets. *Agathotoma peggywilliamsae* Fallon sp. nov. is larger, has thinner ribs, and a single distinct mid-whorl reddish-brown band.

Type material

Holotype (lost)

JAMAICA • length = 4.7 mm; MCZ 186002. A photograph of the holotype appears in Clench & Turner (1950: pl. 30 fig. 5).

Paratypes

None known.

Material examined (137 specs)

GUADELOUPE • 1 spec., 7.6 × 3.0 mm; Petit Cul-de-Sac Marin before the marine biological lab; 16°13.41′ N, 61°31.83′ W; depth 1 m; 2 May 2012; KARUBENTHOS 2012 stn GM01; sequenced; MNHN-IM-2013-20620 • 1 spec., 4.8 × 1.8 mm; Lizzard Point; 16°08.43′ N, 61°46.92′ W; depth 12 m; 7 May 2012; KARUBENTHOS 2012; stn GS07; sequenced; MNHN-IM-2013-20599 • 1 spec., 6.8 × 3.0 mm; Ilot Cochon; 16°13.4′ N, 61°32.97′ W; depth 2 m; 20 May 2012; KARUBENTHOS 2012; stn GD45; sequenced; MNHN-IM-2013-7815 • 1 spec., 5.2 × 2.2 mm; Petit Cul-de-Sac Marin; 16°13.62′ N, 61°32.38′ W; depth 3 m; 21 May 2012; KARUBENTHOS 2012; stn GD49; sequenced; MNHN-IM-2013-20678 • 1 spec., 5.8 × 2.4 mm; Petite Terre; 16°09.71′ N, 61°07.73′ W; depth 15 m; 26 May 2012; KARUBENTHOS 2012; stn GB31; sequenced; MNHN-IM-2013-20673 • 1 spec., 6.9 × 3.0 mm; Grand Cul-de-Sac Marin; 16°17.34′ N, 61°33.32′ W; depth 1 m; 19 May 2012; KARUBENTHOS 2012; stn GD39; sequenced; MNHN-IM-2013-8031 • 1 spec., 3.7 × 1.7 mm, ethanol-preserved; Grand Cul-de-Sac Marin, external slope facing Fajou; 16°21.72′ N, 61°36.35′ W; depth 22 m; 5 May 2012; KARUBENTHOS 2012; stn GS05; MNHN-IM-2019-34681 • 1 spec., 4.0 × 1.9 mm, ethanol-preserved; Grand Cul-de-Sac Marin, external slope facing Fajou Island; 16°21.72′ N, 61°36.35′ W; depth 22 m; 5 May 2012; KARUBENTHOS 2012; stn GS05; MNHN-IM-2019-34680 • 1 spec., 4.3 × 1.9 mm, ethanol-preserved; Petite Terre; 16°09.71′ N, 61°07.73′ W; depth 15 m; 26 May 2012; KARUBENTHOS 2012; stn GS34; MNHN-IM-2019-35023 • 1 spec., length = 6.1 mm, ethanol-preserved; Banc Frotte-ton-cul (GCSM); 16°17.35′ N, 61°34.74′ W; depth 2 m; 19 May 2012; KARUBENTHOS 2012; stn GM24; MNHN-IM-2019-34726 • 1 spec., 4.1 × 1.9 mm, ethanol-preserved; Lizzard Point; 16°08.43′ N, 61°46.92′ W; depth 12 m; 7 May 2012; KARUBENTHOS 2012; stn GS07; MNHN-IM-2019-34689 • 1 spec., 6.8 × 2.8 mm, ethanol-preserved; Ilot Cochon; 16°13.4′ N, 61°32.97′ W; depth 2 m; 20 May 2012; KARUBENTHOS 2012; stn GD45; MNHN-IM-2019-34729 • 1 spec., 5.7 × 2.3 mm, ethanol-preserved; Petite Terre; 16°09.71′ N, 61°07.73′ W; depth 15 m; 26 May 2012; KARUBENTHOS 2012; stn GS34; MNHN-IM-2019-34743 • 1 spec., 4.3 × 1.9 mm, ethanol-preserved; Grand Cul-de-Sac Marin; 16°21.72′ N, 61°36.35′ W; depth 22 m; 5 May 2012; KARUBENTHOS 2012; stn GB03;

MNHN-IM-2019-34673 • 3 specs, 6.0 × 2.5, 5.7 × 2.4 and 5.3 × 2.2 mm, ethanol-preserved; Ilot Cochon; 16°13.4′ N, 61°32.97′ W; depth 2 m; 20 May 2012; KARUBENTHOS 2012; stn GD45 MNHN-IM-2019-34738 • 4 specs, 4.6 × 1.9, 3.7 × 1.8, 4.5 × 2.0 and 4.1 × 1.8 mm, ethanol-preserved; Caye Plate PCSM; 16°10.97′ N, 61°32.41′ W; depth 14 m; 25 May 2012; KARUBENTHOS 2012; stn GS33; MNHN-IM-2019-34735 • 1 spec., 7.6 × 3.3 mm; Grand Cul-de-Sac Marin; 16°17.34′ N, 61°33.32′ W; depth 1 m; 19 May 2012; KARUBENTHOS 2012; stn GD39; MNHN-IM-2012-7691.

MARTINIQUE • 1 spec., 4.4 × 1.9 mm; Presqu'Île de la Caravelle, SE of Caracoli Point; 14°44.1′ N, 60°50.8′ W; depth 29 m; 18 Sep. 2016; MADIBENTHOS; stn AS252; sequenced; MNHN-IM-2013-70919 • 3 specs, 5.3 × 2.2, 5.1 × 2.2, and 5.4 × 2.3 mm; Bay of Fort-de-France, Le Lamentin, bout de la piste; 14°35.2' N, 61°01.4' W; depth 10 m; 6 Oct. 2016; MADIBENTHOS; stn AD606; MNHN-IM-2022-17579.

UNITED STATES OF AMERICA • 1 spec.; Florida Keys, Monroe Co., bayside of Whale Harbor Channel/Windley Key, Cotton Key; 24°57.84′ N, 80°37.40′ W; 0.5–5 ft [0.2–1.5 m]; 18 Sep. 1998; R. Bieler and P.M. Mikkelsen, leg.; snorkeling among *Thalassia*, R/V *FLORIDAYS*; FMNH FK-173.

About an additional 107 specimens were examined, 66 from Guadeloupe samples (1–54 m), 28 from Martinique samples (1–66 m), and 13 from other localities.

Description

Shell small (length = 7.6 mm or less), stout, has a spire relatively short for the genus, whorl sides slightly convex, high shoulders level with whorl sutures, each whorl with 8–9 straight ribs that are narrower than their interspaces and gathered into heavy folds on the anterior fasciole. *Protoconch* of 2½ round whorls, about the last half with riblets [according to Rolán *et al.* (2012), diameter = 400 μm]. *Spiral sculpture* of numerous frosted secondaries. It has an elongate-oval aperture with a moderately deep, round anal sinus in front of the varix, set off from the suture, and a short anterior canal. *Color* is a yellowish white with three narrow, brown spiral bands, evenly distributed over the whorl and darkened into dots on rib crests. Bands are usually faded on older specimens.

Animal

The animal (Fig. 12) is translucent white with small opaque yellowish spots on the siphon and a few diffuse opaque white spots on the foot. A cephalic tentacle, not clearly visible in the photograph, appears to have the same coloration as the foot. The biramous foot is visible on the left, and the tapered posterior in the right images.

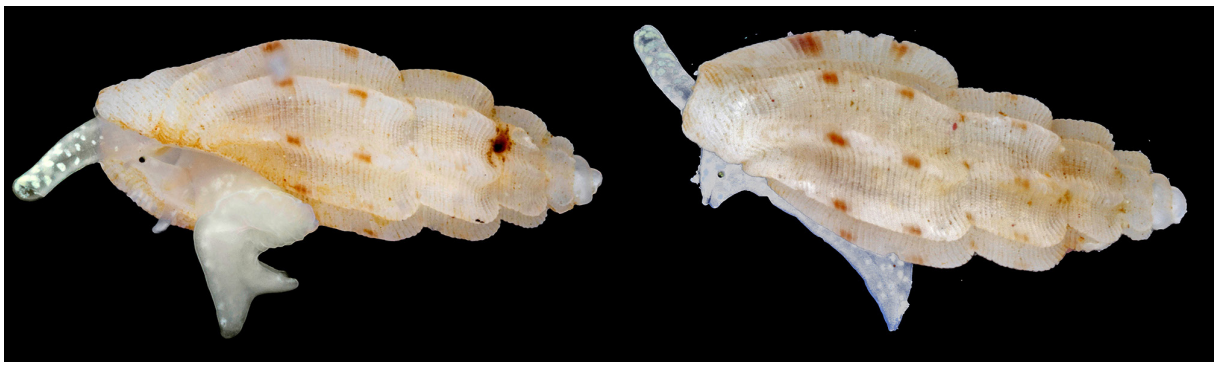


Fig. 12. *Agathotoma candidissima* (C.B. Adams, 1845) (MNHN-IM-2013-70919), live animal. Images by Colin Redfern.

Remarks

Pyrgocythara coxi Fargo, 1953 was synonymized with *A. candidissima* by Abbott (1974: 284) and de Jong & Coomans (1988: 114). Type locality: Pliocene of N St. Petersburg, Florida, holotype in ANSP 19148 (Fargo 1953: 384, pl. 20 figs 3, 3a). *Agathotoma coxi* has ribs that rise above the suture, are thin, and sigmoidal (versus level with the suture, strong, and nearly straight). Not mentioned in Fargo's (1953: 384) description are the folded ribs over the anterior fasciole of *A. candissima*, which is not seen in fig. 3 of *A. coxi* in Fargo (1953: pl. 20 figs 3, 3a). For these differences, *A. coxi* is here considered a separate species.

Mangelia badia described by Reeve (1846b: pl. 8 fig. 60) has been synonymized with *A. candidissima* by some authors but the 4 syntypes in NHMUK 1989166 do not resemble this species nor any other in the western Atlantic genus group. It is likely a west coast species.

Measured specimens (n = 90) of *A. candidissima* have an average length = 4.4 mm (range = 1.9–7.6 mm).

Range and habitat

United States (off Louisiana, Florida Keys), Jamaica (type locality), Dominican Republic, Guadeloupe, Martinique, St. Vincent and the Grenadines, and Grenada, depth 1–66 m. Because of the uncertainty of identifications of specimens reported from other localities, only those examined specimens are listed.

Agathotoma legallae Fallon & Bouchet sp. nov.
urn:lsid:zoobank.org:act:2DFCCC44-B913-4E0E-82CB-FF4E9CA05CBC
Figs 11B, 13P–X

Agathotoma sp. – Zhang 2011: 149–150, fig. 562 (from the W coast of Antigua is likely this species).

non *Agathotoma candidissima* – Lamy & Pointier 2017: 478, pl. 165 figs 9, 11 (from Guadeloupe is likely this species).

Differential diagnosis

Agathotoma candidissima (C.B. Adams, 1845) is generally smaller, up to 7.6 mm, has a proportionally shorter spire with whorls level with the suture, not rising above, has a shorter anterior canal, and is white not a light yellowish-brown. Its protoconch is 2½ not 2¼ whorls and has more riblets. *Agathotoma castellata* (E.A. Smith, 1888) has a more pronounced shoulder and is smaller. *Agathotoma coxi* (Fargo, 1953) is smaller and has weaker ribs and varix.

Etymology

Agathotoma legallae Fallon & Bouchet sp. nov. is named in honor of Line Le Gall, chief diver of the KARUBENTHOS 2012 and MADIBENTHOS expeditions, and herself a specialist of coralline algae.

Type material

Holotype
GUADELOUPE • 8.0 × 3.1 m; Lizzard Point; 16°08.43′ N, 61°46.92′ W; depth 12 m; 7 May 2012; KARUBENTHOS 2012; stn GS07; sequenced; MNHN-IM-2013-20611.

Paratypes (15 specs)
GRENADA • 1 spec., 8.4 × 3.2 mm; Molinier Pt., S side; depth 7 m; 25 Jan. 2007; G. Mackintosh leg.; night SCUBA diving; UF 589673.

GUADELOUPE • 1 spec., 5.8 × 2.4 mm; same data as for holotype, Lizzard Point; 16°08.43′ N, 61°46.92′ W; depth 12 m; 7 May 2012; KARUBENTHOS 2012; stn GS07; sequenced; MNHN-IM-2013-20604 • 3 specs, 9.0 × 3.4, 9.5 × 3.7 and 8.3 × 3.6 mm; Côte Ferry; 16°17.69′ N, 61°48.23′ W; depth 10 m; 12 May 2012; KARUBENTHOS 2012; stn GB11; MNHN-IM-2012-7687 • 2 specs, 7.2 × 3.0 and 8.5 × 3.5 mm; Caye Plate (PCSM); 16°10.97′ N, 61°32.41′ W; depth 14 m; 25 May 2012; KARUBENTHOS 2012; stn GS33; MNHN-IM-2012-7695 • 1 spec., 8.4 × 3.3 mm; E of Fajou Island; depth 80–90 m; dredged; D. Lamy coll.

MARTINIQUE • 1 spec., 7.4 × 2.9 mm; S of Pointe Pimantée, Trois Rivières; 14°27.5′ N, 60°58.2′ W; depth 17–19 m; 9 Oct. 2016; MADIBENTHOS; stn AS579; MNHN-IM-2000-39501 • 1 spec., 8.2 × 3.2 mm; Monsigny, Baie de Fort-de-France; 14°34.3′ N, 61°02.7′ W; depth 7 m; 7 Oct. 2016; MADIBENTHOS; stn AB394; MNHN-IM-2000-39502 • 2 specs, 7.3 × 2.7 and 6.4 × 2.4 mm; Épave du Rouraima, Baie de St-Pierre; 14°44.5′ N, 61°10.8′ W; depth 44–47 m; 8 Oct. 2016; MADIBENTHOS; stn AS572; MNHN-IM-2000-39504 • 1 spec., 7.9 × 3.1 mm; S Pointe Pimantée, Trois Rivières; 14°27.5′ N, 60°58.2′ W; depth 17 m; 9 Oct. 2016; MADIBENTHOS; stn AB578; MNHN-IM-2000-39503.

UNITED STATES OF AMERICA • 1 spec., 9.5 × 3.7 mm; Florida Keys, SW edge of Big Pine Key; depth 1 m; hand screened from sediment in an eel grass bed; USNM 1715430.

ST. VINCENT AND THE GRENADINES • 1 spec., 9.6 × 3.5 mm; Union Island, Chatham Bay; depth 20 m; 6 Apr. 2007; G. Mackintosh leg.; night SCUBA diving; ANSP 498871.

Other material examined (34 specs)

Localities of 34 other examined specimens include Guadeloupe (22), Martinique (6), St. Vincent and the Grenadines (2), Grenada (2), Venezuela (1), and Trinidad and Tobago (1).

Description

Shell small (holotype length = 8.0 mm, largest paratype length = 9.5 mm), fusiform (W/L = 0.3875), of 5¼ teleoconch whorls with narrow shoulders, whorl sides nearly straight, ribs arched above deeply impressed sutures; aperture a narrow elongate oval, varicose, with a short anterior canal and broad notch posteriorly, the last whorl 65% of shell length including anterior canal. *Protoconch* of 2¼ round whorls, tip minute, first whorl white, last ¼-whorl with 6–10 widely spaced, strong riblets. *Axial sculpture* of thin, nearly straight, high, narrow ribs on spire whorls that rise slightly above the suture, and extend to the following suture, and on shell base to the inner lip where they are abruptly gathered on the anterior fasciole. Ribs on whorl shoulders rounded, slightly excavated on their ventral sides, and recurved. There are 9 ribs on the penultimate whorl, 6 on the last to the varix, intercostal space much wider than ribs, gradually increasing toward varix. An older varix is often present on larger specimens. *Varix* apertural, broadly flattened, extends from a little above the suture, curves behind anal sinus on whorl shoulder, and to the anterior canal. *Spiral sculpture* of microscopic secondaries that override and are slightly flattened on rib apices and beaded by growth striae throughout. Beads are elongated, packed closely, space between rows of spirals narrower than their width. *Sulcus* absent; previous positions of anal sinus indicated by recurved ribs and occasional partially absorbed anal sinuses on shoulder. *Outer lip* varicose, with a narrow strip of shell along base of varix, extending from anal sinus to anterior canal with a broad shallow stromboid notch anteriorly. *Anal sinus* a notch with a round apex, set off the suture with varix shallowly excavated by sinus. *Inner lip* thin, emarginated, recumbent, without a noticeable callus at the anal sinus. *Columella* is very slightly sigmoid. *Anterior canal* is short, open, end flared and upturned, slightly notched. *Anterior fasciole* is not swollen, instead covered with overlapped, flattened ends of the gathered ribs. *Color* light yellowish-brown with 3 indistinct reddish-brown spiral bands,

darkest on ribs, bands positioned just below the shoulder on whorl apices, mid-whorl, and a faint one near anterior end of shell base.

Remarks

40 measured specimens have an average length = 6.7 mm (range = 1.9–9.6 mm).

Range and habitat

United States (Florida Keys), Guadeloupe, Martinique, St. Vincent and the Grenadines, Grenada, Trinidad and Tobago, and Venezuela (Isla Coche); depth 1–90 m, live caught depth 12 m.

Agathotoma peggywilliamsae Fallon sp. nov.
urn:lsid:zoobank.org:act:CC29823E-1C55-4036-9803-79281BC59827
Fig. 13Y–DD

Differential diagnosis

Agathotoma legallae Fallon & Bouchet sp. nov. is similar but is smaller and narrower, has wider ribs that do not extend as much over the suture line, and is colored differently, with brown, not reddish brown bands. The thin, vane-like ribs that extend well above the suture line are unique to this species.

Etymology

Agathotoma peggywilliamsae Fallon sp. nov., named in honor of the late Peggy Williams, an avid shell collector who shared her interests and knowledge with many, and contributed the type specimens described here.

Type material

Holotype
TRINIDAD AND TOBAGO • 11.1 × 4.3 mm; Tobago Island, Parlatuvier Bay; depth 9 m; 14 Oct. 1994; night SCUBA diving; G. Mackintosh leg.; ex P. Williams' coll.; UF 589674.

Paratypes (3 specs)
ST. VINCENT AND THE GRENADINES • 1 spec., 9.8 × 3.8 mm; St. Vincent Island, Young Island; depth 5 m; 24 Jul. 1998; G. Macintosh leg.; night SCUBA diving; P. Williams' coll. • 1 spec., 10.1 × 4.1 mm; St. Vincent Island, Young Island; depth 5 m; 23 Jul. 1998; G. Macintosh leg.; night SCUBA diving; ex P. Williams' coll.; UF 589675 • 1 spec., 10.6 × 4.0 mm; St. Vincent Island, Young Island; depth 5 m; 10 Sep. 2000; G. Macintosh leg.; night SCUBA diving; ex P. Williams' coll.; UF 589676.

Description

Shell small (length = 11.1 mm), fusiform (W/L = 0.3874), of 7½ whorls, the last whorl is 59% of shell length, sutures deeply impressed, shoulders narrow, whorl sides rectilinear; aperture varicose, a narrow oval, with a short anterior canal and deep anal notch. *Protoconch* partially missing and eroded on all types. *Axial sculpture* of thin, nearly straight, vane-like ribs that extend well above the suture, and run to the succeeding suture on spire whorls, then to the inner lip, their ends abruptly gathered in folds on the fasciole. 12 ribs on the penultimate whorl, 9 on the last to the varix. *Varix* with a broad face, extends full length of aperture, rising a little above the level of the suture and extending to the end of the anterior canal, lightly scooped out behind anal sinus. *Spiral sculpture* of microscopic secondaries, separated by their width, override, and are slightly flattened on rib apices, microscopically beaded by growth striae throughout. *Sulcus* absent. Ribs on shoulder slightly excavated and recurved, mark former positions of anal sinus. *Outer lip* varicose, with a narrow strip of shell along base of varix extending from anal sinus

to anterior canal. *Anal sinus* is a deep, narrow notch, apex round and broadly excavated into face of varix. *Inner lip* thin, emarginated, erect on anterior canal, recumbent elsewhere, with a callus at the anal sinus. *Columella* is slightly sigmoid. *Anterior canal* is short, open, its end slightly notched and skewed by the greater extension of the canal on the columella side than on the outer lip side. *Anterior fasciole* is not swollen, covered with the gathered ends of most of the ribs. *Color* white and yellowish white with 3 reddish-brown spiral bands, just below the shoulder on whorl sides, mid-whorl, and a faint band near anterior end of shell base.

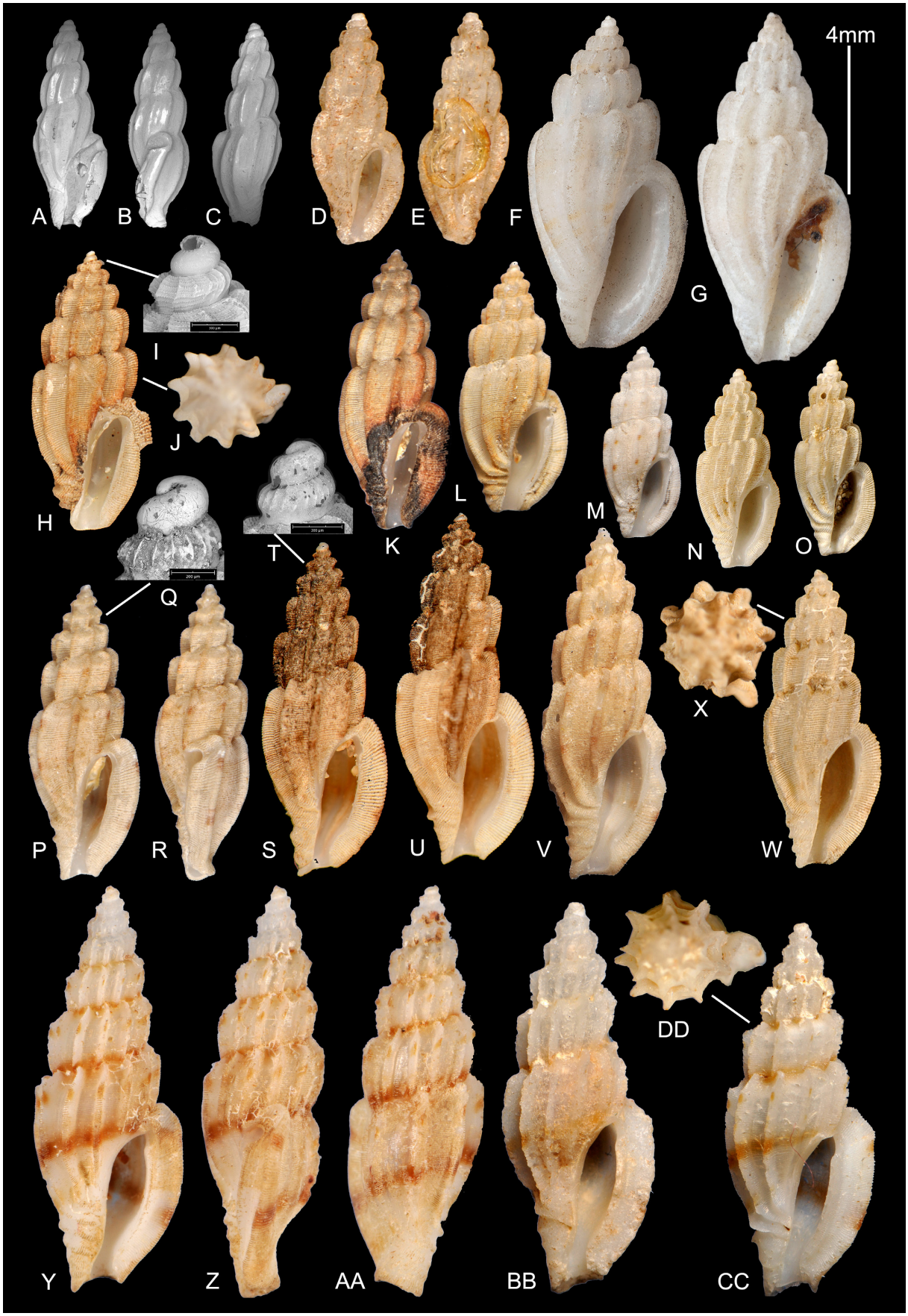
Remarks

The 4 examined specimens have an average length = 10.4 mm (range = 9.8–11.1 mm).

Range and habitat

Trinidad and Tobago (Tobago Island) and St. Vincent and the Grenadines (Young Island); depth 5–9 m.

Fig. 13 (next page). Species of *Agathotoma* Cossmann, 1899. Part 1. – **A–C**. *Agathotoma angusta* (Bellardi, 1847). Spec., length = 5.7 mm, ventral, lateral and dorsal views, Lower Pliocene of central Mediterranean, Italy, type species of the genus. – **D–E**. *Pleurotoma dubia* C.B. Adams, 1845, lectotype, 6.3 × 2.5 mm (MCZ 177031), Jamaica. – **F–G**. *Mangelia hornbeckii* Reeve, 1846, lectotype, length = 9.1 mm and paralectotype, length = 9.6 mm (NHMUK 1963460/1 and /2), St Thomas, U.S. Virgin Islands. A junior synonym of *A. candidissima*. – **H–O**. *Agathotoma candidissima* (C.B. Adams, 1845), examples of small and large specimens. **H–J**. Spec., 7.6 × 3.3 mm, ventral and apical views, and SEM image of protoconch (MNHN-IM-2012-7691), Grand Cul-de-Sac Marin, Guadeloupe. **K**. Sequenced voucher, 7.6 × 3.0 mm (MNHN-IM-2013-20620), Grand Cul-de-Sac Marin in front of the marine biology lab, Guadeloupe. **L**. Sequenced voucher, 6.8 × 3.0 mm (MNHN-IM-2013-7815), Cochon Island, Guadeloupe. **M**. Sequenced voucher, 5.6 × 2.2 mm (MNHN-IM-2013-20678), Petit Cul-de-Sac Marin, Guadeloupe. **N–O**. Spec., 5.3 × 2.2 and 5.4 × 2.3 mm (MNHN-IM-2022-17579), Bay of Fort-de-France, Le Lamentin, bout de la piste, Martinique. – **P–X**. *Agathotoma legallae* Fallon & Bouchet sp. nov. **P–R**. Holotype, sequenced voucher, 8.0 × 3.1 mm, ventral and lateral views, and SEM image of protoconch (MNHN-IM-2013-20611), Lizard Point, Guadeloupe. **S–U**. Paratypes, 9.0 × 3.4 mm, ventral view and SEM image of protoconch, and 9.5 × 3.7 mm (MNHN-IM-2012-7687), Côte Ferry, Guadeloupe. **V**. Paratype, 9.6 × 3.5 mm (ANSP 498871), Union Island, Saint Vincent and the Grenadines. **W–X**. Paratype, 8.2 × 3.2 mm, ventral and apical views (MNHN-IM-2000-39502), Fort-de-France Bay, Martinique. – **Y–DD**. *Agathotoma peggywilliamsae* Fallon sp. nov. **Y–AA**. Holotype, 11.1 × 4.3 mm, ventral, lateral and dorsal views (UF 589674), Parlatuvier Bay, Tobago Island, Trinidad and Tobago. **BB**. Paratype, 10.6 × 4.0 mm (UF 589676), Young Island, Saint Vincent Island, Saint Vincent and the Grenadines. **CC–DD**. Paratype, 10.1 × 4.1 mm, ventral and apical views (UF 589675), Young Island, Saint Vincent Island, Saint Vincent and the Grenadines. Credits: A–C: courtesy of Emilio García of a specimen supplied by Bernard Landau, Albufeira, Portugal, and SEM image by L. Ann Hume, University of Louisiana, Lafayette; F–G: copyright of NHMUK; Kevin Webb, NHMUK Photographic Unit, took these images; I, Q, T: protoconch SEM images courtesy of Paul Callomon. Scale bars: A–H, J–P, R–CC = 4 mm; I, T = 300 µm; Q = 200 µm.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***Agathotoma* spp. Part 2**

Agathotoma asthenika Rolán, Fernández-Garcés & Redfern, 2012
Figs 11C, 14, 17A–I.

Agathotoma asthenika Rolán *et al*., 2012: 54, figs 6a–e, 10g, k–l, 11g, table 1.

Agathotoma asthenika – Lamy & Pointier 2017: 478, pl. 165 fig. 8a–b.

Differential diagnosis

Agathotoma ecthymata E.F. García, 2008 is very similar in appearance but has a micro-tuberculate protoconch of only about 1½ whorls, the last cylindrical in shape, versus 2 non-micro-tuberculate whorls, the last whorl with convex sides. *Agathotoma eduardoi* Rolán, Fernández-Garcés & Redfern, 2012 has a micro-tuberculate protoconch of a little more than 1 whorl, the last cylindrical in shape, versus 2 non-micro-tuberculate whorls, the last whorl with convex sides. *Agathotoma violet* Fallon & Bouchet sp. nov. has a micro-tuberculate protoconch of a little more than 1 whorl, the last cylindrical in shape, versus 2 non-micro-tuberculate convex-sided whorls. It is smaller (average length = 3.2 versus 4.3 mm), and a different color, brown and violet versus light brown.

Type material

Holotype
CUBA • length = 3.9 mm; Cienfuegos, Faro Luna, Los Laberintos; depth 30 m; MNCN 15.05/60008.

Paratypes (6 specs)
CUBA • 1 spec.; Cienfuegos, Faro Luna, Los Laberintos; depth 30 m; MNHN-IM-2000-24830 • 1 spec.; Cienfuegos, Faro Luna, Los Laberintos; depth 30 m; MHNS 100567 • 1 spec.; IES • 1 spec.; Cienfuegos, Faro de los Colorados; depth 40–65 m; Fernández-Garcés coll. • 1 spec.; Cienfuegos, Faro de los Colorados; depth 40–65 m; C. Redfern coll. • 1 spec.; La Habana; depth 12 m; USNM 1184119.

Material examined (122 specs)

Neither the types, nor other Cuban specimens have been examined for direct comparison. Instead, the description and images appearing in the original publication were compared.

GUADELOUPE • 1 spec., 8.4 × 3.3 mm; E of Fajou Island; depth 80–90 m; dredged; D. Lamy coll. • 1 spec., 5.1 × 1.9 mm; Grand Cul-de-Sac Marin; 16°21.87′ N, 61°31.78′ W; depth 5 m; 20 May 2012; KARUBENTHOS 2012; stn GS27; sequenced; MNHN-IM-2013-20623 • 1 spec., 4.3 × 1.8 mm; Grand Cul-de-Sac Marin; 16°21.87′ N, 61°31.78′ W; depth 5 m; 20 May 2012; KARUBENTHOS 2012; stn GS27; sequenced; MNHN-IM-2013-20624 • 1 spec., 4.4 × 1.8 mm; off Anse à la Barque; 16°05.39′ N, 61°46.48′ W; depth 50 m; 10 May 2012; KARUBENTHOS 2012; stn GD15; sequenced; MNHN-IM-2013-20618 • 1 spec., 5.0 × 1.9 mm; Petit Cul-de-Sac Marin; 16°13.62′ N, 61°32.38′ W; depth 3 m; 21 May 2012; KARUBENTHOS 2012; stn GD49; sequenced; MNHN-IM-2013-20670 • 1 spec., 4.7 × 2.0 mm; passe à Caret; 16°22.28′ N, 61°38.14′ W; depth 29 m; 23 May 2012; KARUBENTHOS 2012; stn GS29; sequenced; MNHN-IM-2013-20668 • 1 spec., 4.5 × 1.8 mm; Port-Louis, Barracuda Cave entrance; 16°27.34′ N, 61°32.07′ W; depth 19 m; 16 May 2012; KARUBENTHOS 2012; stn GS20; sequenced; MNHN-IM-2013-20656 • 1 spec., 4.1 × 1.6 mm; Grand Cul-de-Sac Marin, external slope facing Fajou; 16°21,75′ N, 61°36,07′ W; depth 23 m; 6 May 2012; KARUBENTHOS 2012; stn GS06; sequenced; MNHN-IM-2013-20655 • 1 spec., 4.7 × 1.7 mm; Tête à l'Anglais; 16°22,9′ N, 61°45,94′ W; depth 23 m; 8 May 2012; KARUBENTHOS 2012; stn GS08; sequenced; MNHN-IM-2013-20642 • 1 spec., 4.1 × 1.5 mm, ethanol-preserved; Pointe d'Antigues (Port-Louis); 16°25.99′ N, 61°32.92′ W;

depth 45 m; 17 May 2012; KARUBENTHOS 2012; stn GS22; MNHN-IM-2019-34720 • 1 spec., 4.4 × 1.7 mm, ethanol-preserved; passe à Caret; 16°22.28′ N, 61°38.14′ W; depth 29 m; 23 May 2012; KARUBENTHOS 2012; stn GS29; MNHN-IM-2019-34742 • 2 specs, 3.9 × 1.6 and 3.7 × 1.5 mm, ethanol-preserved; Antigues Point (Port-Louis); 16°25.99′ N, 61°32.92′ W; depth 45 m; 17 May 2012; KARUBENTHOS 2012; stn GS22; MNHN-IM-2019-34719 • 1 spec., 3.9 × 1.4 mm, ethanol-preserved; Antigues Point (Port-Louis); 16°25.99′ N, 61°32.92′ W; depth 45 m; 17 May 2012; KARUBENTHOS 2012; stn GS22; MNHN-IM-2019-34721 • 2 specs, 4.9 × 2.0 and 5.1 × 2.0 mm, ethanol-preserved; Cochon Islet; 16°13.4′ N, 61°32.97′ W; depth 2 m; 20 May 2012; KARUBENTHOS 2012; stn GD45; MNHN-IM-2019-34737 • 1 spec., 5.2 × 1.9 mm, ethanol-preserved; Grand Cul-de-Sac Marin; 16°19.92′ N, 61°33.45′ W; depth 4 m; 19 May 2012; KARUBENTHOS 2012; stn GD43; MNHN-IM-2019-34728 • 2 specs, 4.3 × 1.6 and 3.8 × 1.4 mm, ethanol-preserved; Port-Louis, Barracuda Cave entrance; 16°27.34′ N, 61°32.07′ W; depth 19 m; 16 May 2012; KARUBENTHOS 2012; stn GS20; MNHN-IM-2019-34714 • 1 spec., length = 4.0 mm; Port-Louis, Barracuda Cave entrance; 16°27.34′ N, 61°32.07′ W; depth 19 m; 16 May 2012; KARUBENTHOS 2012; stn GS20; MNHN-IM-2012-7743.

MARTINIQUE • 1 spec., 5.0 × 2.0 mm; Grande Anse du Diamant; 14°28.5′ N, 61°01.1′ W; depth 7 m; 9 Sep. 2016; MADIBENTHOS; stn AD216; sequenced; MNHN-IM-2013-70344.

An additional 77 specimens were examined from Guadeloupe samples (depth 2–251 m) and 25 from Martinique samples (depth 5–80 m).

Description

Agathotoma asthenika Rolán, Fernández-Garcés & Redfern, 2012 has been described by its authors as a very small (length = 3–4 mm), ovoid, pointed shell with a protoconch of about 2 whorls, the last with convex sides, and the last ½ of the last whorl ribbed, a teleoconch of about 4 whorls with prominent shoulders rising to just below whorl sutures, each whorl with 8–9 ribs that are narrower than their interspaces, and spiral sculpture of numerous irregular frosted secondaries. It has an elongate-oval aperture with a deep anal sinus posteriorly and short anterior canal. Its color is white with tan between the ribs and around the sutural area.

Animal

The animal (Fig. 14) is translucent white with small opaque yellowish spots in the siphon and cephalic tentacles.

Remarks

106 specimens were examined from Guadeloupe and Martinique samples, 40 of these have an average length = 4.3 mm (2.3–5.3 mm). Color falls into two pattern types: a light reddish brown with 3 dark brown spiral bands, the widest at the whorl suture and the other two narrower bands midway on the whorl and just above the anterior fasciole, neither are visible on spire whorls, and a single, wide, mid-whorl dark brown band that is sharply margined anteriorly but diffuse posteriorly and is visible in the shell aperture.

No DNA sequence differences have been observed between the eight sequenced specimens from Guadeloupe and one from Martinique.

Range and habitat

Cuba, Guadeloupe, and Martinique; depth 2–251 m. 80% of specimens were taken in samples at depths of 10–50 m.

Fig. 14. *Agathotoma asthenika* Rolán, Fernández-Garcés & Redfern, 2012 (MNHN-IM-2013-70344), live animal. Photo by C. Redfern.

Agathotoma hieui Fallon & Bouchet sp. nov.
urn:lsid:zoobank.org:act:D2BAACCB-1A47-4A3D-BEF1-A35B588E24C4
Figs 11D, 17J–Q

Differential diagnosis

Agathotoma asthenika Rolán Fernández-Garcés & Redfern, 2012 has more angular shoulders that end just below whorl sutures and a protoconch of about 2 whorls (versus 2⅓). *Agathotoma ecthymata* E.F. García, 2008 has more angular shoulders and that narrow anteriorly and a protoconch of 1½ whorls (versus 2⅓), the last whorl of which is nearly flat-sided, not round.

Etymology

Agathotoma hieui Fallon & Bouchet sp. nov. is named in honor of Nathan Hieu, MNHN collection technician, to acknowledge his meticulous matching of the lists of material examined for this report with catalogued MNHN material.

Type material

Holotype

MARTINIQUE • 4.0 × 1.8 mm; Fond Boucher; 14°55′ N, 61°08.9′ W; depth 78–80 m; 24 Sep. 2016; MADIBENTHOS; stn AD263; MNHN-IM-2000-39487.

Paratypes (8 specs)
MARTINIQUE • 3 specs, 4.0 × 1.5, 3.4 × 1.5 and 3.4 × 1.5 mm; off Macouba; 14°55′ N, 61°08.9′ W; depth 80 m; 27 Sep. 2016; MADIBENTHOS; stn AD275;

MNHN-IM-2000-39489 • 2 specs, 3.7 × 1.6 and 3.4 × 1.4 mm; off Macouba; 14°55.1′ N, 61°09′ W; depth 80 m; 24 Sep. 2016; MADIBENTHOS; stn AD261; ANSP 498834 • 2 specs, 3.9 × 1.6 and 2.4 × 1.2 mm; off Macouba; 14°54.9′ N, 61°08.9′ W; depth 77 m; 25 Sep. 2016; MADIBENTHOS; stn AD267; USNM 1715393 • 1 spec., 4.1 × 1.7 mm; Gribouldin Point, The Preacher; 14°48.5′ N, 61°13.8′ W; depth 56 m; 8 Oct. 2016; MADIBENTHOS; stn AS574; MNHN-IM-2000-39488.

Description

Shell small (holotype length = 4.0 mm), fusiform, 5⅞ whorls total, with a short spire, and with a tall last whorl tapered gradually to a short anterior canal, together about 67.5% of shell length; teleoconch shoulders round, elevated to a little above suture level, sutures slightly constrict sides such that the whorl sides are convex; sculpture consists of round-crested narrow ribs and overriding spirals; aperture an elongate oval and together with canal about 53% of shell length. *Protoconch* of 2 ⅓ round whorls that expand regularly, the last ⅓-whorl with arched riblets that grow stronger toward the end. *Axial sculpture* of narrow ribs that extend from suture to suture, recurved on shoulder, round over edge, gathered on anterior fasciole on the last whorl, 6 ribs on penultimate and 4 on last whorl to varix, intercostal space 2 or 3 times width of ribs, wider on dorsum of last. Ribs are 'gathered' by a sharp turn to the anterior fasciole where they terminate. *Varix* apertural, flattened, rises above suture, and forms a low arc to the end of the anterior canal, is widest medially and narrows anteriorly. *Spiral sculpture* consisting of minute spirals, evenly spaced, and frosted, over the entire teleoconch. *Sulcus* absent; previous positions of anal sinus indicated by recurved ribs on the shoulder, slightly excavated on their ventral side by the sinus. *Outer lip* varicose, with a thin narrow strip of shell along the base of the varix, without a stromboid notch. *Anal sinus* a notch with a round apex, set off the suture by a callus and with the varix shallowly excavated behind. *Inner lip* a thin, glossy strip along the columella and parietal wall, margined anteriorly. *Columella* is very slightly sigmoid. *Anterior canal* is short, narrow, nearly tubular, and angled to the left of the shell axis viewed ventrally, end slightly flared, unnotched. *Anterior fasciole* not swollen, instead overridden by a few gathered ribs. *Color* a light yellowish brown with 3 weak, evenly space brown spiral bands, protoconch tip white.

Remarks

Nine measured specimens have an average shell length of 3.6 mm (range = 2.4–4.1 mm).

Range and habitat

Martinique; depth 56–80 m.

Agathotoma ecthymata E.F. García, 2008
Figs 15, 17R–AA

Agathotoma ecthymata E.F. García, 2008: 3–4, figs 10–18.

Differential diagnosis

This species is one of the three smallest members of the genus *Agathotoma*, which also have microtuberculate protoconchs. *Agathotoma castellata* (E.A. Smith, 1888) has shoulders that rise above the suture line, narrower ribs, and a broader shell. *Agathotoma asthenika* Rolán, Fernández-Garcés & Redfern, 2012 is narrower and has a different protoconch, with 2+ whorls rather than 1½ whorls, and with more riblets on the last whorl that lack a micro-tuberculate surface. *Agathotoma eduardoi* Rolán,

Fernández-Garcés & Redfern, 2012 has a protoconch of a little more than 1 whorl without riblets, versus about 1½ whorls, with 2–3 riblets. *Agathotoma kirshi* Rolán, Fernández-Garcés & Redfern, 2012 has a similar micro-tuberculate flat-sided protoconch of about 1½ whorls but the teleoconch is larger and has more angulate whorls. *Agathotoma violet* Fallon & Bouchet sp. nov. is slightly smaller (3.2 versus 3.7 mm average length), is violet-brown (versus yellowish to golden brown), has a more angular shoulder, and denser frosting. The frosting of *A. violet* nearly bridges the space between spirals, and because of the dark background color of the shell, lends a whitish cast to the shell surface.

Type material

Holotype

BAHAMAS • 5 × 2 mm; Abaco Island, Treasure Cay; 26°40.00′ N, 077°18.15′ W; depth 0–1 m; ANSP 416414.

Paratypes (11 specs)

BAHAMAS • 3 specs; Abaco Island, Treasure Cay; C. Redfern coll. 3320, 3368, 3334 • 1 spec.; 26°40.00′ N, 077°18.15′ W; depth 0–1 m; BMSM 15497 • 1 spec.; Abaco Island, Treasure Cay; 26°39.45′ N, 077°17.55′ W; depth 1 m; C. Redfern coll. 3367 • 1 spec.; Abaco Island, S of "Don't Rock"; 26°40.31′ N, 077°15.16′ W; depth 3.5 m; C. Redfern coll. 12494 • 1 spec.; Abaco Island, Guana Cay; 26°40.50′ N, 077°08.05′ W; depth 2 m live; USNM 1109964 • 1 spec.; Exuma, Norman's Cay; H.G. Lee coll. • 1 spec.; Guana Cay, Abaco Island; 26°41.15′ N, 077°10.10′ W; C. Redfern coll. 8072.

MEXICO • 1 spec.; Gulf of Mexico, Campeche Bay; 20°51.49′ N, 92°21.44′ W; depth 63–65 m; E.F. García coll. 28091.

UNITED STATES OF AMERICA • 1 spec.; E Florida, St Johns Co., E of St Augustine; depth 40 m; H.G. Lee coll.

Other material examined (220 specs)

In addition to the holotype, 220 specimens were examined in the present study; 36 are listed below.

MARTINIQUE • 1 spec., 4.1 × 1.7 mm, ethanol-preserved; Borgnesse Point, Marin Pass; 14°26.9′ N, 60°54′ W; depth 15 m; 11 Sep. 2016; MADIBENTHOS; stn AS066; MNHN-IM-2013-70513 • 1 spec., 4.0 × 1.6 mm, ethanol-preserved; Borgnesse Point, Marin Pass; 14°26.9′ N, 60°54′ W; depth 15 m; 11 Sep. 2016; MADIBENTHOS; stn AS066; MNHN-IM-2013-70518 • 1 spec., 4.1 × 1.4 mm, ethanol-preserved; Borgnesse Point, Marin Pass; 14°26.9′ N, 60°54′ W; depth 15 m; 11 Sep. 2016; MADIBENTHOS; stn AS066; MNHN-IM-2013-70514 • 1 spec., 4.0 × 1.6 mm; Borgnesse Point, Marin Pass; 14°26.9′ N, 60°54′ W; depth 15 m; 11 Sep. 2016; MADIBENTHOS; stn AS066; sequenced; MNHN-IM-2013-70515 • 8 specs, (2 measured) 4.8 × 1.8 and 2.6 × 1.7 mm; Grande Anse du Diamant; 14°28.5′ N, 61°01.1′ W; depth 7 m; 9 Sep. 2016; MADIBENTHOS; stn AD216; MNHN-IM-2000-39497 • 1 spec., 3.5 × 1.5 mm; Borgnesse Point, Marin Pass; 14°26.8′ N, 60°54.3′ W; depth 15 m; 9 Sep. 2016; MADIBENTHOS; stn AB165; MNHN-IM-2000-39493 • 13 specs, (2 measured) 3.9 × 1.5 and 2.3 × 1.0 mm; La Caravelle Peninsula, SE of Caraci Point; 14°44.1′ N, 60°50.8′ W; depth 29 m; 18 Sep. 2016; MADIBENTHOS; stn AS253; MNHN-IM-2000-39492 • 1 spec., 4.8 × 1.8 mm; Rocher du Diamant; 14°26.7′ N, 61°02.4′ W; depth 14 m; 14 Sep. 2016; MADIBENTHOS; stn AB175; MNHN-IM-2000-39494 • 2 specs, 5.4 and 5.2 mm; Banc du Diamant; 14°26.4′ N, 61°01.8′ W; depth 23 m; 15 Sep. 2016; MADIBENTHOS; stn AS073; MNHN-IM-2000-39495 • 1 spec., 5.0 mm; Trésor Island, Caravelle Peninsula; 14°45.5′ N, 60°52.8′ W; depth 2 m; 22 Sep. 2016; MADIBENTHOS; stn AB149; MNHN-IM-2000-39496 • 1 spec., 3.2 × 1.3; SW of Vétiver; 14°37.5′ N, 61°08.3′ W; depth 74 m; 2 Oct. 2016; MADIBENTHOS; stn AD290; MNHN-IM-2000-39491 • 5 specs, (2 measured)

4.0 × 1.6 and 3.7 × 1.5 mm; Borgnesse Point, Marin Pass; 14°26.9′ N, 60°54′ W; depth 15 m; 11 Sep. 16; MADIBENTHOS; stn AS066; MNHN-IM-2000-39490.

An additional 184 specimens were examined.

Description

According to García (2008: 3–4), this species is small (holotype length = 5 mm), has a turreted shell with a micro-tuberculate flat-sided protoconch of about 1½ whorls, with 2–3 riblets at its end, a teleoconch of about 4½ strongly shouldered whorls with 9 or 10 ribs that are about as wide as their interspaces, and spiral sculpture of numerous frosted secondaries. It has an elongated aperture, the outer lip reinforced by a strong, flattened varix with a wide but shallow anal sinus posteriorly, and a short anterior canal. Its shell color is white with 3 equidistant, indistinct, narrow reddish bands: just below the shoulder, at mid-body, and at the beginning of the anterior canal.

Animal

The animal (Fig. 15) is translucent white with small opaque yellowish spots on the foot, siphon, and cephalic tentacle.

Remarks

The average length of 93 measured specimens is 3.7 mm (range = 2.0–4.5 mm).

Range and habitat

Mexico (Campeche Bay), United States (E Florida), Bahamas (Abaco Island, Exuma), Guadeloupe, and Martinique; depth 0–90 m (81% were taken at depth 0–20 m).

Fig. 15. *Agathotoma ecthymata* E.F. García, 2008 (MNHN-IM-2013-70518), live animal. Photo by P. Maestrati.

Agathotoma violet Fallon & Bouchet sp. nov.
urn:lsid:zoobank.org:act:804DA789-8A93-4D73-AA70-F07835914ADF
Figs 11E, 16, 17BB–JJ

Differential diagnosis

Agathotoma violet Fallon & Bouchet sp. nov. is very similar to *A. ecthymata* E.F. García, 2008 and *A. eduardoi* Rolán Fernández-Garcés & Redfern, 2012. All three have micro-tuberculate protoconchs of less than 2 whorls with at most a few riblets. *A. eduardoi* Rolán, Fernández-Garcés & Redfern, 2012 is slightly larger (length = 4.2 mm versus average length = 3.2 mm) and whitish in color (versus brown with a violet aperture) and has a protoconch of 1–1⅓ whorls (versus 1¼–1½ whorls). *Agathotoma ecthymata* is slightly larger (length = 3.7 versus average length = 3.2 mm), is a yellowish to golden brown color (versus violet-brown), has a less angular shoulder, and weaker frosting. The frosting of *A. violet* nearly bridges the space between spirals, and due to its light color, it lends a whitish cast to the shell surface. *Agathotoma asthenika* Rolán, Fernández-Garcés & Redfern, 2012 has approximately 2 non-microtuberculate, round-sided whorls versus 1¼–1½ flat-sided, microtuberculate whorls. It is larger (length = 4.3 versus average length = 3.2 mm) and has a different color.

Etymology

Agathotoma violet Fallon & Bouchet sp. nov., the violet *Agathotoma*, is named after its deep violet color, particularly evident in the protoconch; name in apposition.

Type material

Holotype
MARTINIQUE • 3.4 × 1.5 mm; Vétiver; 14°37.9′ N, 61°07.7′ W; depth 10 m; 8 Sep. 2016; MADIBENTHOS; stn AS054; sequenced; MNHN-IM-2013-70251.

Paratypes (45 specs)
MARTINIQUE • 1 spec., 2.4 × 1.2 mm; Schoelcher, Fond Bellemare; 14°37.7′ N, 61°07.2′ W; depth 4 m; 27 Sep. 2016; MADIBENTHOS; stn AB460; MNHN-IM-2000-39508 • 1 spec., 4.0 × 1.7 mm; Grande Anse d'Arlet, facing the Sucrerie House; 14°29.9′ N, 61°05′ W; depth 0–1 m; 9 Sep. 2016; MADIBENTHOS; stn AM007; sequenced; MNHN-IM-2013-70268 • 1 spec., 3.1 × 1.3 mm; Schoelcher, Fond Bellemare; 14°37.7′ N, 61°07.2′ W; depth 4 m; 27 Sep. 2016; MADIBENTHOS; stn AB460; sequenced; MNHN-IM-2013-71500 • 1 spec., 3.3 × 1.3 mm; Vétiver; 14°37.9′ N, 61°07.7′ W; depth 10 m; 8 Sep. 2016; MADIBENTHOS; stn AS054; sequenced; MNHN-IM-2013-70250 • 1 spec., 5.1 × 1.9 mm; Rocher du Diamant; 14°26.7′ N, 61°02.3′ W; depth 19–21 m; 9 Sep. 2016; MADIBENTHOS; stn AS057; sequenced; MNHN-IM-2013-72240 • 10 specs, (only 1 measured) length = 3.2 mm; St-Pierre Bay, Rouraima wreck; 14°44.5′ N, 61°10.8′ W; depth 44–47 m; 8 Oct. 2016; MADIBENTHOS; stn AS572; USNM 1715392 • 13 specs, (9 measured) 3.6 × 1.4, 3.2 × 1.4, 3.2 × 1.4, 3.2 × 1.4, 3.1 × 1.4, 3.3 × 1.4, 3.3 × 1.4, 3.0 × 1.3 and 2.1 × 1.0 mm; The Preacher, Belleville Cove; 14°49.1′ N, 61°13.8′ W; depth 20–25 m; 8 Oct. 2016; MADIBENTHOS; stn AS576; MNHN-IM-2000-39510 • 1 spec., 3.5 × 1.5 mm; Fond Boucher; 14°39.3′ N, 61°09.6′ W; depth 37–40 m; 1 Oct. 2016; MADIBENTHOS; stn AD283; MNHN-IM-2000-39507 • 4 specs, 3.5 × 1.5, 2.7 × 1.2, 3.1 × 1.3 and 3.3 × 1.4 mm; Bellefontaine, Cheval Blanc; 14°39.7′ N, 61°09.6′ W; depth 9 m; 30 Sep. 2016; MADIBENTHOS; stn AS373; MNHN-IM-2000-39511 • 4 specs, 3.4 × 1.5, 3.3 × 1.4, 3.0 × 1.4 and 3.2 × 1.5 mm; The Preacher, Gribouldin Point; 14°48.5′ N, 61°13.8′ W; depth 56 m; 1 Oct. 2016; MADIBENTHOS; stn AS574; MNHN-IM-2000-39506 • 2 specs, 3.5 × 1.3 and 3.4 × 1.5 mm; The Preacher, The Abymes; 14°48.4′ N, 61°13.6′ W; depth 15 m; 10 Oct. 2016; MADIBENTHOS; stn AS378; MNHN-IM-2000-39512 • 4 specs, (2 measured) 3.3 × 1.4 and 1.9 × 1.0 mm; The Preacher, The Abymes; 14°48.4′ N, 61°13.6′ W; depth 21 m; 1 Oct. 2016; MADIBENTHOS; stn AB377; ANSP 498835 • 1 spec., 3.5 × 1.5 mm; Vétiver; 14°37.9′ N, 61°07.7′ W; depth 10 m; 8 Sep. 2016; MADIBENTHOS; stn AS054; MNHN-IM-2000-39509.

Description

Shell small (length = 3.4 mm), fusiform, turreted, 5 whorls total, teleoconch shoulders sloped slightly down from suture level, edges rounded, whorl sides straight, last whorl large, last whorl tapered gradually to a short anterior canal, together about 74% of shell length; sutures slightly constrict sides such that the whorls are wider at their peripheries; sculpture of narrow ribs and overriding spiral secondaries; aperture a narrow oval and together with canal about 53% of shell length. *Protoconch* of 1¼–1½ flat, rectilinear, micro-tuberculate whorls, the first protruding, the last with a few riblets. *Axial sculpture* of narrow, round-crested ribs that extend from suture to suture, recurved and narrower on shoulder, rounded at shoulder edge, fade to the anterior fasciole on the last whorl, 10 ribs on penultimate and 6 on last with a wide space between the last rib and varix. *Varix* apertural, flattened somewhat and extending from just above suture to end of anterior canal. *Spiral sculpture* of frosted secondaries (primaries lacking), the frosting nearly closing the gap between spirals. *Sulcus* absent; previous positions of anal sinus indicated by recurved ribs on the shoulder, slightly excavated on their ventral side by the previous sinus. *Outer lip* varicose, a thin extension of shell along the base of the varix runs from the suture, around the apex of the sinus, and to the end of the anterior canal. *Anal sinus* a shallow round notch set off from the suture, sides slightly divergent. *Inner lip* a thin, glaze along the columella, without a callus. *Columella* straight. *Anterior canal* a slight narrowing of the anterior portion of the aperture and very short, open, unnotched. *Anterior fasciole* is not swollen, sculpture as the shell base. *Color* violet-brown; spirals lighter, giving the shell surface a frosted look, aperture dark brown; 2 dark brown bands on body whorl; protoconch dark violet-brown, nearly black.

Animal

The animal (Fig. 16) is translucent milky-white with small opaque white spots in the foot, irregular clusters of small opaque yellowish spots in the siphon and cephalic tentacle. The foot is biramous and eye spots at the end of the fleshy portion of the tentacle.

Fig. 16. *Agathotoma violet* Fallon & Bouchet sp. nov. (MNHN-IM-2013-71500), live animal. Photo by C. Redfern.

Remarks

Rib ends are not gathered into folds over the anterior fasciole, as is characteristic of most of the genus. 32 measured specimens have an average length = 3.2 mm (range = 1.9–5.1 mm). The 5.1 mm specimen is an outlier; the next largest specimen has a length of 4.0 mm.

Range and habitat

Martinique; depth 0–56 m.

Agathotoma eduardoi Rolán, Fernández-Garcés & Redfern, 2012
Fig. 17KK–MM

Agathotoma eduardoi Rolán *et al*., 2012: 48, figs 3a–e, 11d, table 1.

Differential diagnosis

Agathotoma asthenika Rolán, Fernández-Garcés & Redfern, 2012 has a different protoconch (2 whorls versus a little more than 1 whorl, lacks micro-tubercules, that are present in *A. eduardoi*, and has riblets). *Agathotoma ecthymata* E.F. García, 2008 is wider and more robust, and its shoulders are less angular (Rolán *et al.* 2012: 54, 58). *Agathotma violet* Fallon & Bouchet sp. nov. has a different protoconch (1¼–1½ whorls versus a little more than 1 whorl), and is a different color (violet-brown versus whitish). *Agathotoma hieui* Fallon & Bouchet sp. nov. has a different protoconch (2⅓ whorls with riblets on the last ⅓ versus a little more than 1 whorl), and shoulders elevated a little above the level of suture, not even with the sutures.

Type material

Holotype
CUBA • length = 4.2 mm; Nicaragua, Cayo Witties; depth 12 m; MNCN 15.05/60009.

Paratypes (7 specs)
CUBA • 1 spec., length = ca 3.7 mm; Cienfuegos, Rancho Luna; MNHN-IM-2000-24831 • 5 specs; Rancho Luna, Cienfuegos; MHNS 100568 • 1 spec.; Cienfuegos, Rancho Luna; IES • 1 spec.; Cienfuegos, Rancho Luna; Fernández-Garcés coll.

Material examined

No specimens were readily available for examination. This summary description is based on the description and photographs in Rolán *et al.* (2012).

Description

According to Rolán *et al.* (2012: 54), the *shell* is small (holotype length = 4.2 mm), has a turreted shell of a little over 5 whorls, the last about 70% of shell length, with prominent shoulders that are level with whorl sutures, and rounded at their edges. Aperture is elongate-oval with a short anterior canal and deep sinus just off the suture, in front of a wide flattened varix. *Protoconch* is micro-tuberculate, rectilinear, and of little more than 1 whorl. *Axial sculpture* of strong ribs, narrower than their interspaces, slightly opisthocline and about 9–10 per whorl. *Spiral sculpture* of numerous irregular frosted secondaries. *Color* is whitish with several faint brown bands, less faint on rib crests.

Remarks

This species lacks the characteristic rib end folds on its anterior fasciole, which are characteristic of larger congeners.

Range and habitat

Cuba and Nicaragua; depth 12 m.

Agathotoma inornata Fallon & Bouchet sp. nov.
urn:lsid:zoobank.org:act:34B63D49-A9AC-48F8-9951-EA51B6203F46
Figs 11F, 17NN–TT

Differential diagnosis

The immature fossil specimen of *Pyrgocythara coxi* Fargo, 1953 has a close resemblance to *Agathotoma inornata* Fallon & Bouchet sp. nov.; not so the adult illustrated by Fargo (1953: pl. 20 fig. 3). According to Fargo (1953), ribs are thin and rise above the suture line. The ribs of *A. inornata* are not as described, neither thin nor rise above the suture line. *Agathotoma legallae* Fallon & Bouchet sp. nov. has rounder and higher shoulders that are not as broad, and two narrow brown spiral bands, which are absent in *A. inornata*.

Etymology

Agathotoma inornata Fallon & Bouchet sp. nov., from the feminine form of the Latin adjective '*inornatus*', meaning 'unadorned', so named because of a lack of distinct coloration and varix.

Type material

Holotype
MARTINIQUE • 5.2 × 3.2 mm; off Macouba; 14°55′ N, 61°08.9′ W; depth 80 m; 27 Sep. 2016; MADIBENTHOS; stn AD275; MNHN-IM-2000-39498.

Paratypes (3 specs)
MARTINIQUE • 1 spec., 2.6 × 1.7 mm; Grande Anse du Diamant; 14°28.5′ N, 61°01.1′ W; depth 7 m; 9 Sep. 2016; MADIBENTHOS; stn AD216; MNHN-IM-2000-39499 • 2 specs, 3.4 × 1.6 and 2.9 × 1.5 mm; SW of Vétiver; 14°37.5′ N, 61°08.3′ W; depth 74 m; 2 Oct. 2016; MADIBENTHOS; stn AD290; MNHN-IM-2000-39500.

Description

Shell small (length = 5.2 mm), fusiform, 6¼ whorls total, with a short spire, and tall last whorl, about 69% of shell length, tapered gradually to a short anterior canal; teleoconch whorls turreted, shoulders nearly flat, at a 90° angle to shell axis, sutures slightly constrict sides such that the whorls are wider at their peripheries; sculpture of narrow ribs and overriding spirals; aperture a narrow oval, together with canal about 48% of shell length. *Protoconch* of 2¼ round whorls, the first protruding, the last ¼-whorl with well-spaced arched riblets. *Axial sculpture* of narrow ribs that extend from suture to suture, recurved on shoulder, angled sharply at the shoulder edge, gathered on anterior fasciole on the last whorl, 9 ribs on both penultimate and last whorls, intercostal space 2 or 3 times width of ribs, the last serving as varix is little different than preceding ribs. Ribs are 'gathered' by a sharp turn to the anterior fasciole where they terminate. *Varix* is lacking on holotype, likely not a fully developed specimen, instead, the last rib, the strongest, is positioned at the lip edge. *Spiral sculpture* Spirals consisting of minute secondaries, evenly spaced and frosted, over the entire teleoconch. *Sulcus* absent; previous positions of anal sinus indicated by recurved ribs on the shoulder, slightly excavated on their ventral side by the sinus. *Outer lip* consists of the last rib without any additional shell growth beyond. *Anal sinus* a shallow round notch, shoulder width. *Inner lip* a thin, excavated strip along the columella, without a callus. *Columella* is very slightly sigmoid. *Anterior canal* short, open, end flared, unnotched. *Anterior fasciole* not swollen, instead covered with overlapped, gathered ribs. *Color* a yellowish white, protoconch white.

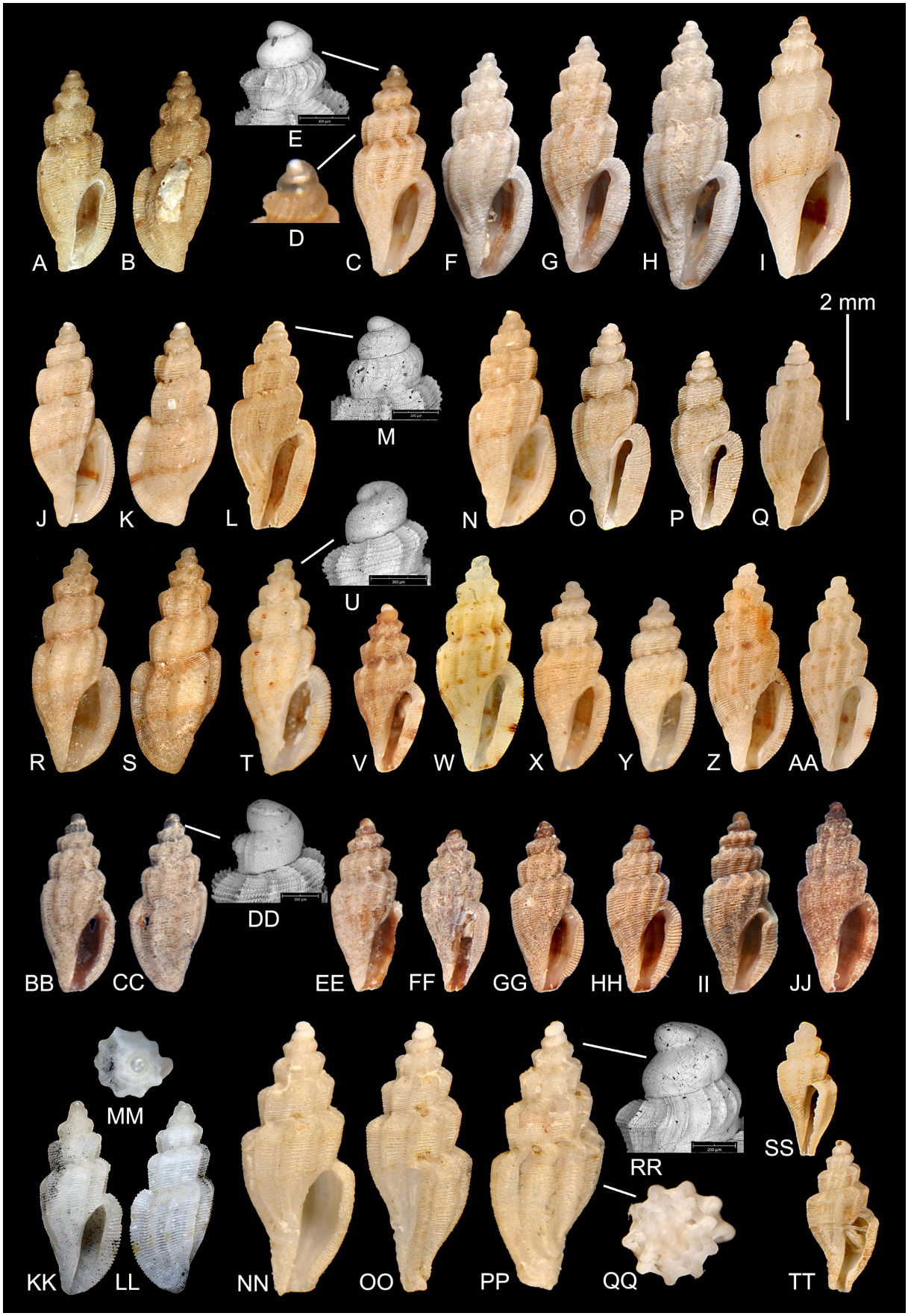
Remarks

The types do not appear fully mature because they lack varices.

Range and habitat

Martinique; depth 7–80 m.

Fig. 17 (next page). Species of *Agathotoma* Cossmann, 1899. Part 2. – **A–I**. *Agathotoma asthenika* Rolán, Fernández-Garcés & Redfern, 2012. **A–B**. Paratype, 3.9 × 1.5 mm, ventral and dorsal views (MNHN-IM-2000-24830), Los Laberintos, Faro Luna, Cienfuegos, Cuba. **C–E**. Spec., 4.0 × 1.7 mm, ventral and protoconch (not to scale) views, and SEM of protoconch (MNHN-IM-2012-7743), Barracuda Cave entrance, Port-Louis, Guadeloupe. **F**. Sequenced voucher, 4.3 × 1.8 mm (MNHN-IM-2013-20623), Grand Cul-de-Sac Marin, Guadeloupe. **G**. Sequenced voucher, 4.5 × 1.8 mm (MNHN-IM-2013-20656), Barracuda Cave entrance, Port-Louis, Guadeloupe. **H**. Sequenced voucher, 5.1 × 1.9 mm (MNHN-IM-2013-20624), Grand Cul-de-Sac Marin, Guadeloupe. **I**. Sequenced voucher, 5.0 × 2.0 mm (MNHN-IM-2013-70344), Grand Dimond Cove, Martinique. – **J–Q**. *Agathotoma hieui* Fallon & Bouchet sp. nov. **J–K**. Holotype, 4.0 × 1.8 mm, ventral and dorsal views (MNHN-IM-2000-39487), Fond Boucher, Martinique. **L–M**. Paratype, 3.9 × 1.6 mm, ventral view, and SEM of protoconch (USNM 1715393), off Macouba, Martinique. **N**. Paratype, 4.1 × 1.7 mm (MNHN-IM-2000-39488), Le Prêcheur, Point Gribouldin, Martinique. **O–P**. Paratypes, 4.0 × 1.5 and 3.4 × 1.5 mm (MNHN-IM-2000-39489), off Macouba, Martinique. **Q**. Paratype, 3.7 × 1.6 mm (ANSP 498834), off Macouba, Martinique. – **R–AA**. *Agathotoma ecthymata* E.F. García, 2008. **R–S**. Holotype, 4.3 × 2.2 mm, ventral and dorsal views (ANSP 416414), Abaco Island, Bahamas. **T–U**. Sequenced voucher, 4.1 × 1.7 mm, ventral view, and SEM image of protoconch 275 × (MNHN-IM-2013-70515), Borgnesse Point, Marin Pass, Martinique. **V**. Spec., 3.2 × 1.3 mm (MNHN-IM-2000-39491), SW of Vétiver, Martinique. **W**. Spec., ethanol-preserved, 4.1 × 1.7 mm (MNHN-IM-2013-70513), Passe du Marin, Borgnesse Point, Martinique. **X–Y**. Specs, 3.6 × 1.5 and 3.4 × 1.4 mm (MNHN-IM-2000-39492), Presqu'Île de la Caravelle, SE of Caracoli Point, Martinique. **Z–AA**. Specs, 4.0 × 1.6 and 3.7 × 1.5 mm (MNHN-IM-2000-39493), Sailor Pass, Borgnesse Point, Martinique. – **BB–JJ**. *Agathotoma violet* Fallon & Bouchet sp. nov. **BB–DD**. Holotype, sequenced voucher, 3.4 × 1.5 mm, ventral and dorsal views, and SEM of protoconch 280 × (MNHN-IM-2013-70251), Vétiver, Martinique. **EE**. Paratype, sequenced voucher, 3.3 × 1.3 mm (MNHN-IM-2013-70250), Vétiver, Martinique. **FF**. Paratype, sequenced voucher, 3.1 × 1.3 mm (MNHN-IM-2013-71500), Schoelcher, Fond Bellemare, Martinique. **GG–HH**. Paratypes, 3.4 × 1.5 and 3.3 × 1.4 mm (MNHN-IM-2000-39506), Le Prêcheur, Gribouldin Point, Martinique. **II**. Paratype, 3.5 × 1.5 mm (MNHN-IM-2000-39509), Vétiver, Martinique. **JJ**. Paratype, 3.6 × 1.4 mm (MNHN-IM-2000-39510), Le Prêcheur, Belleville Cove, Martinique. – **KK–MM**. *Agathotoma eduardoi* Rolán Fernández-Garcés & Redfern, 2012, paratype, length = 3.7 mm, ventral, dorsal and apical views (MNHN-IM-2000-24831), Rancho Luna, Cienfuegos, Cuba. – **NN–TT**. *Agathotoma inornata* Fallon & Bouchet sp. nov. **NN–RR**. Holotype, 5.2 × 3.2 mm, ventral, lateral, dorsal and apical views, and SEM of protoconch, 285 × (MNHN-IM-2000-39498), SW of Vétiver, Martinique. **SS**. Juvenile, length = 2.6 mm (MNHN-IM-2000-39499), Grand Anse du Diamant, Martinique. **TT**. Juvenile, 2.9 × 1.5 mm (MNHN-IM-2000-39500), off Macouba, Martinique. Credits: A̧–B, KK–MM: courtesy of MNHN Collection: Mollusks (IM); E, M, U, DD, RR: SEM images courtesy of Paul Callomon. Protoconch scale bars: A–D, F–L, N–T, V–CC, EE–QQ, SS–TT = 2 mm; E, M, U, DD, RR = 300 μm.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***Agathotoma* spp. Part 3**

Agathotoma prominens Rolán, Fernández-Garcés & Redfern, 2012
Figs 18, 20A–I

Agathotoma prominens Rolán *et al*., 2012: 58, figs 8a–d, 10i–j, 11i, table 1.

Agathotoma prominens – Lamy & Pointier 2017: 478, text fig.

non *Agathotoma candidissima* (C.B. Adams, 1845) – de Jong & Coomans 1988: pl. 18 fig. 604 (misidentification, in part that is likely this species).

Differential diagnosis

The acutely angular whorls and stout shell (W/L = 0.4697–0.5294, range of measured shells) readily distinguish this species from its congeners. *Glyphoturris rugirima* (Dall, 1889) is similar in appearance, size, and has acutely angular whorls, but differs in possessing much stronger spirals, and in coloration.

Type material

Holotype
CUBA • length = 4.1 mm; Cienfuegos, Faro de los Colorados; depth 20 m; MNCN 15.05/60010.

Paratypes (18 specs)
CUBA • 1 spec., 4.7 × 2.4 mm; Cienfuegos, Faro de los Colorados; depth 20 m; MNHN-IM-2000-24832 • 3 specs; Cienfuegos, Faro de los Colorados; MHNS 100569 • 2 specs; Faro de los Colorados, Cienfuegos; IES • 1 spec.; Cienfuegos, Faro de los Colorados; USNM 1184120 • 2 specs; Cienfuegos, Faro de los Colorados; Fernández-Garcés coll. • 3 specs; Canon de la bahia de Cienfuegos; depth 12 m; Fernández-Garcés coll. • 2 specs; Faro Luna; depth 20 m; Fernández-Garcés coll. • 1 spec.; Bajo de Sancho Pardo; depth 15 m; C. Redfern coll. • 2 specs; Cayo Maria la Gorda; depth 12 m; MHNS 100569. NICARAGUA • 1 spec.; Cayo Witties; depth 12 m; MHNS 100569.

Material examined (151 specs)

None of the types were examined. The following data are on 14 sequenced and 8 ethanol-preserved specimens not in the type series that were examined for this work.

GUADELOUPE • 1 spec., 4.3 × 2.1 mm; Grand Cul-de-Sac Marin, external slope facing Fajou; 16°21.75′ N, 61°36.07′ W; depth 23 m; 6 May 2012; KARUBENTHOS 2012; stn GS06; sequenced; MNHN-IM-2013-20617 • 1 spec., 4.05 × 2.0 mm; Grand Cul-de-Sac Marin, external slope facing Fajou; 16°21.75′ N, 61°36.07′ W; depth 23 m; 6 May 2012; KARUBENTHOS 2012; stn GS06; sequenced; MNHN-IM-2013-20616 • 1 spec., 4.4 × 2.2 mm; Grand Cul-de-Sac Marin, external slope facing Fajou; 16°21.75′ N, 61°36.07′ W; depth 23 m; 6 May 2012; KARUBENTHOS 2012; stn GS06; sequenced; MNHN-IM-2013-20615 • 1 spec., 4.9 × 2.3 mm; Lizard Point; 16°08.43′ N, 61°46.92′ W; depth 12 m; 7 May 2012; KARUBENTHOS 2012; stn GS07; sequenced; MNHN-IM-2013-20296 • 1 spec., 5.1 × 2.4 mm; Lizard Point; 16°08.43′ N, 61°46.92′ W; depth 12 m; 7 May 2012; KARUBENTHOS 2012; stn GS07; sequenced; MNHN-IM-2013-20606 • 1 spec., 4.7 × 2.3 mm; Oil (Port-Louis); 16°26.78′ N, 61°32.41′ W; depth 16 m; 18 May 2012; KARUBENTHOS 2012; stn GS24; sequenced; MNHN-IM-2013-20653 • 1 spec., 4.6 × 2.2 mm; Oil (Port-Louis); 16°26.78′ N, 61°32.41′ W; depth 16 m; 18 May 2012; KARUBENTHOS 2012; stn GS24; sequenced; MNHN-IM-2013-20652 • 1 spec., 3.9 × 1.8 mm; Grand Cul-de-Sac Marin, external slope facing Fajou; 16°21.72′ N, 61°36.35′ W; depth 22 m; 5 May 2012; KARUBENTHOS 2012; stn GS05; sequenced; MNHN-IM-2013-20562 • 1 spec.,

3.6 × 1.8 mm; Grand Cul-de-Sac Marin, external slope facing Fajou Island; 16°21.72′ N, 61°36.35′ W; depth 22 m; 5 May 2012; KARUBENTHOS 2012; stn GS05; sequenced; MNHN-IM-2013-20561 • 1 spec., 5.2 × 2.3 mm, ethanol-preserved; Lizard Point; 16°08.43′ N, 61°46.92′ W; depth 12 m; 7 May 2012; KARUBENTHOS 2012; stn GS07; MNHN-IM-2019-34697 • 1 spec., 4.6 × 2.2 mm, ethanol-preserved; Oil (Port-Louis); 16°26.78′ N, 61°32.41′ W; depth 16 m; 18 May 2012; KARUBENTHOS 2012; stn GS24; MNHN-IM-2019-34723 • 1 spec., 4.2 × 2.0 mm, ethanol-preserved; Pointe Grigri; 16°23.26′ N, 61°31.79′ W; depth 14 m; 16 May 2012; KARUBENTHOS 2012; stn GS21; MNHN-IM-2019-34701 • 1 spec., 3.8 × 1.9 mm, ethanol-preserved; Grand Cul-de-Sac Marin; 16°21.75′ N, 61°36.07′ W; depth 24 m; 6 May 2012; KARUBENTHOS 2012; stn GB04; MNHN-IM-2019-34682 • 5 specs, 5.2 × 2.2, 4.8 × 2.3, 4.5 × 2.0, 4.5 × 2.1 and 4.5 × 2.1 mm, ethanol-preserved; Caye Plate (PCSM); 16°10.97′ N, 61°32.41′ W; depth 14 m; 25 May 2012; KARUBENTHOS 2012; stn GS33; MNHN-IM-2019-34734.

MARTINIQUE • 1 spec., 4.9 × 2.1 mm; E of Le Robert, W of Cayes Mitan; 14°40.1′ N, 60°51.1′ W; depth 16 m; 18 Sep. 2016; MADIBENTHOS; stn AS255; sequenced; MNHN-IM-2013-71055 • 1 spec., 3.4 × 1.8 mm; E of Le Robert, W of Cayes Mitan; 14°40.1′ N, 60°51.1′ W; depth 16 m; 18 Sep. 2016; MADIBENTHOS; stn AS255; sequenced; MNHN-IM-2013-71053 • 1 spec., 4.8 × 2.3 mm; NE of Pointe du Vauclin, Cayes de Sans-Soucis; 14°34.9′ N, 60°48.4′ W; depth 18–20 m; 26 Sep. 2016; MADIBENTHOS; stn AS409; sequenced; MNHN-IM-2013-71407 • 1 spec., 4.4 × 2.2 mm; E of Le Robert, W of Cayes Mitan; 14°40.1′ N, 60°51.1′ W; depth 16 m; 18 Sep. 2016; MADIBENTHOS; stn AS255; sequenced; MNHN-IM-2013-72634 • 1 spec., 4.6 × 2.1 mm; E of Le Robert, W of Cayes Mitan; 14°40.1′ N, 60°51.1′ W; depth 16 m; 18 Sep. 2016; MADIBENTHOS; stn AS255; sequenced; MNHN-IM-2013-71054.

An additional 128 specimens were examined, 92 from Guadeloupe samples, 31 from Martinique samples, 3 from St. Vincent and the Grenadines, and 1 from Grenada (P. Fallon coll.).

Description

Partial description here taken from Rolán *et al.* (2012: 58). *Shell* very small (length to 5.2 mm) rhomboidal in profile, with angular shoulders just below sutures, with an elongate oval aperture and short anterior canal, and deep anal sinus; with a protoconch of 2¼ whorls, the last ½ with 11 riblets; and teleoconch sculpture of strong narrow ribs, narrower than their interspaces, and spiral sculpture of numerous and variable frosted secondaries. Color cream with 3 irregular brown bands.

Animal

The animal (Fig. 18) is translucent white with opaque white and yellowish spots in foot, siphon, and cephalic tentacle.

Remarks

Of the approximately 150 specimens examined in this study, the largest was 5.8 mm (Carriacou Island, Grenada, 7¼ whorls total). The average length of 41 specimens is 4.4 mm (range = 2.4–5.8 mm). Some specimens have a fourth spiral band between the usual two posterior bands.

Range and habitat

Nicaragua, Bahamas, Cuba, Guadeloupe, Martinique, St. Vincent and the Grenadines, and Grenada; depth 2–77 m.

Fig. 18. *Agathotoma prominens* Rolán, Fernández-Garcés & Redfern, 2012 (MNHN-IM-2013-72634), live animal. Photo by C. Redfern.

Agathotoma castellata (E.A. Smith, 1888)
Figs 19, 20J–R

Pleurotoma (*Mangilia*) *castellata* E.A. Smith, 1888: 312–313.

Agathotoma costellata [sic] – Kaicher 1984: card 3939 (misspelling noted by Rosenberg & Petit 2003: 114).
Pseudorhaphitoma castellata – Kilburn 1993: 357, fig. 71.
Agathotoma castellata – Zhang 2011: 149, 150, fig. 563. — Rolán *et al*. 2012: 58, figs 8a–d, 10i–j, 11i, table 1. — Redfern 2013: 205, fig. 272. — Lamy & Pointier 2017: 478, pl. 165 fig. 10a–b.

non *Pyrgocythara candidissima* (C.B. Adams, 1845) – Waller 1973: 38, fig. 29 (misidentification according to Tippett's research notes, 1995–1996). — Rios 1994: 175, fig. 806 (likely a misidentification, according to Rolán *et al.* 2012: 48). — Redfern 2001: 130, fig. 537a (likely a misidentification, according to Rolán *et al.* 2012: 48). — García 2008: fig. 23 (likely a misidentification, according to Rolán *et al.* 2012: 48).
non *Agathotoma candidissima* C.B. Adams, 1845 – Leal 1991b: pl. 24 fig. a (misidentification, according to Rolán *et al*. 2012: 52).

Differential diagnosis

Agathotoma candidissima (C.B. Adams, 1845) has shoulders level with sutures (versus rising above sutures).

Type material

Lectotype
The lectotype was designated by Kilburn (1993: 357).

UNKNOWN • length = 6.5 mm; habitat unknown; NHMUK 1854.6.30.136–7.

Paralectotypes (at least 1)
One is known from the same lot as the lectotype.

Other material examined (27 specs)

The lectotype was not examined. Data on 27 other specimens, including 9 sequenced, 17 ethanol-preserved, and 1 other figured specimens, follow.

FRENCH GUIANA • 1 spec., 5.5 × 2.3 mm; offshore; 5°46′ N, 51°23′ W; depth 115 m; 27 Jul. 2014; GUYANE 2014; stn CP4348; MNHN-IM-2012-43489.

GUADELOUPE • 1 spec., 4.1 × 1.9 mm; bouée PCA; 16°22.57′ N, 61°31.74′ W; depth 8 m; 15 May 2012; KARUBENTHOS 2012; stn GS19; sequenced; MNHN-IM-2013-20631 • 1 spec., 4.5 × 2.0 mm; Lizzard Point; 16°08.43′ N, 61°46.92′ W; depth 12 m; 7 May 2012; KARUBENTHOS 2012; stn GS07; sequenced; MNHN-IM-2013-20601 • 1 spec., 5.7 × 2.3 mm; Petite-Terre; 16°09.71′ N, 61°07.73′ W; depth 15 m; 6 May 2012; KARUBENTHOS 2012; stn GS34; sequenced; MNHN-IM-2013-20667 • 1 spec., 4.5 × 2.2 mm; bouée PCA; 16°22.57′ N, 61°31.74′ W; depth 8 m; 15 May 2012; KARUBENTHOS 2012; stn GS19; sequenced; MNHN-IM-2013-20663 • 1 spec., 4.6 × 2.1 mm; Oil (Port-Louis); 16°26.78′ N, 61°32.41′ W; depth 16 m; 18 May 2012; KARUBENTHOS 2012; stn GS24; sequenced; MNHN-IM-2013-20662 • 1 spec., 4.7 × 2.0 mm; bouée PCA; 16°22.57′ N, 61°31.74′ W; depth 8 m; 15 May 2012; KARUBENTHOS 2012; stn GS19; sequenced; MNHN-IM-2013-20641 • 1 spec., 4.0 × 1.9 mm; Grand Cul-de-Sac Marin, external slope facing Fajou Island; 16°21.72′ N, 61°36.35′ W; depth 22 m; 5 May 2012; MNHN Karabenthos exped.; stn GS05; sequenced; MNHN-IM-2013-20557 • 1 spec., 3.9 × 1.8 mm, ethanol-preserved; Grand Cul-de-Sac Marin, external slope facing Fajou Island; 16°21.75′ N, 61°36.07′ W; depth 23 m; 6 May 2012; KARUBENTHOS 2012; stn GS06; MNHN-IM-2019-34687 • 1 spec., 4.1 × 1.9 mm, ethanol-preserved; Grand Cul-de-Sac Marin, external slope facing Fajou Island, Guadeloupe; 16°21.75′ N, 61°36.07′ W; depth 23 m; 6 May 2012; KARUBENTHOS 2012; stn GS06; MNHN-IM-2019-34686 • 1 spec., 4.3 × 2.0 mm, ethanol-preserved; Grand Cul-de-Sac Marin, external slope facing Fajou; 16°21.75′ N, 61°36.07′ W; depth 23 m; 6 May 2012; KARUBENTHOS 2012; stn GS06; MNHN-IM-2019-34685 • 1 spec., 4.0 × 1.8 mm, ethanol-preserved; Grand Cul-de-Sac Marin, external slope facing Fajou Island; 16°21.75′ N, 61°36.07′ W; depth 23 m; 6 May 2012; KARUBENTHOS 2012; stn GS06, MNHN-IM-2019-34684 • 1 spec., 4.0 × 2.0 mm, ethanol-preserved; Grand Cul-de-Sac Marin, external slope facing Fajou Island; 16°21.75′ N, 61°36.07′ W; depth 23 m; 6 May 2012; KARUBENTHOS 2012; stn GS06; MNHN-IM-2019-34683 • 1 spec., 4.7 × 2.5 mm, ethanol-preserved; Les 3 arches (Port-Louis); 16°23.26′ N, 61°31.79′ W; depth 10 m; 14 May 2012; KARUBENTHOS 2012; stn GB13; MNHN-IM-2019-34702 • 5 specs, 4.2 × 1.9, 4.2 × 1.9, 4.0 × 1.8, 4.1 × 1.8 and 3.8 × 1.9 mm, ethanol-preserved; Grand Cul-de-Sac Marin, external slope facing Fajou Island; 16°21.72′ N, 61°36.35′ W; depth 22 m; 5 May 2012; KARUBENTHOS 2012; stn GS05; MNHN-IM-2019-34679 • 1 spec., 5.0 × 2.3 mm, ethanol-preserved; Les 3 arches (Port-Louis); 16°23.26′ N, 61°31.79′ W; depth 10 m; 14 May 2012; KARUBENTHOS 2012; stn GB13; MNHN-IM-2019-34705 • 1 spec., 4.5 × 1.9 mm, ethanol-preserved; Oil (Port-Louis); 16°26.78′ N, 61°32.41′ W; depth 16 m; 18 May 2012; KARUBENTHOS 2012; stn GS24; MNHN-IM-2019-34724 • 1 spec., 4.2 × 2.0 mm, ethanol-preserved; bouée PCA; 16°22.57′ N, 61°31.74′ W; depth 8 m; 15 May 2012; KARUBENTHOS 2012; stn GS19; MNHN-IM-2019-34707 • 1 spec., 5.0 × 1.9 mm, ethanol-preserved; Les 3 Arches (Port-Louis); 16°23.26′ N, 61°31.79′ W; depth 10 m; 14 May 2012; KARUBENTHOS 2012; stn GB13; MNHN-IM-2019-34703 • 1 spec., 4.7 × 2.0 mm, ethanol-preserved; Les 3 arches (Port-Louis); 16°23.26′ N, 61°31.79′ W; depth 10 m; 14 May 2012; KARUBENTHOS 2012; stn GB13; MNHN-IM-2019-34704 • 1 spec., 4.0 × 1.8 mm, ethanol-preserved; bouée PCA; 16°22.57′ N, 61°31.74′ W; depth 8 m; 15 May 2012; KARUBENTHOS 2012; stn GS19; MNHN-IM-2019-34708.

MARTINIQUE • 1 spec., 4.6 × 2.2 mm; Borgnesse Point, Marin Pass; 14°26.9′ N, 60°54′ W; depth 15 m; 11 Sep. 2016; MADIBENTHOS; stn AS066; sequenced; MNHN-IM-2013-70525 • 1 spec., 6.1 × 2.5 mm; Mouillage de Ste Anne; depth 5 m; 7 May 2002; G. Mackintosh leg.; night SCUBA diving; UF 589577 • 1 spec., 4.5 × 2.0 mm; off Macouba; 14°55.1′ N, 61°09′ W; depth 80 m; 27 Sep. 2016; MADIBENTHOS; stn AD274; MNHN-IM-2013-71564.

An additional 262 specimens were examined, 106 from Guadeloupe samples, 78 from Martinique samples, 45 from French Guiana samples, and 33 from other localities.

Description

A detailed re-description is given in Rolán *et al.* (2012: 48, 52, figs 4a–g). Some notes based on specimens examined for this work are presented here. Shell small (length = to 6.1 mm), stout, turreted with prominent convex shoulders that rise above the suture line, with an elongate oval aperture and short anterior canal. Protoconch of 2½ whorls, the last ½ with riblets. Teleoconch sculpture of strong narrow ribs, narrower than their interspaces, and of spiral sculpture of numerous microscopic, frosted secondaries. Aperture bordered by a strong varix that rises above the suture and arcs around the anal sinus to the end of anterior canal. Anal sinus is a deep notch with a round apex in the face of the varix and set off from the suture, almost perpendicular to the axis of the shell. Color cream with several faint narrow brown bands, usually faded, with darkened spots on rib crests that are sometimes faded.

Animal

The animal (Fig. 19) is translucent white crowded with small opaque yellowish spots on foot, siphon, and cephalic tentacles.

Fig. 19. *Agathotoma castellata* (E.A. Smith, 1888) (MNHN-IM-2013-71564), live animal. Photo by Colin Redfern.

Remarks

88 of the measured specimens have an average length = 4.3 mm (range = 2.1–6.1 mm).

Range and habitat

Widespread. Examined specimens were from: Guadeloupe, Martinique, St. Vincent and the Grenadines (Mayreau Island, Union Island, Canouan Island), Grenada (St. George's, Mabouya Island, Molinier Pt.), Panama (San Blas Islands), Honduras (Morat Island, Bay Islands), Aruba (Kaicher 1984), French Guiana, depth 2–80 m.

Specimens reported in the literature but not examined include Bermuda (Waller 1972), Bahamas, Abaco (Redfern 2001), Cuba (Rolán *et al.* 2012).

Agathotoma millestriata (E.A. Smith, 1882)
Fig. 20Q–V

Pleurotoma (*Mangilia*) *millestriata* E.A. Smith, 1882: 217.
Agathotoma kirshi Rolán, Fernández-Garcés & Redfern, 2012: 52, figs 5a–h, 11 f, table 1, **syn. nov.**, is a junior synonym. The holotype is in BMSM 17948, and the type locality is Chub Rocks, Abaco I, Bahamas (paratype, Fig. 20S–T).

Agathotoma sp. – Zhang 2011: 149, 150, fig. 562.
Agathotoma kirshi – Redfern 2013: 206, fig. 574.

non *Agathotoma candidissima* (C.B. Adams, 1845) – de Jong & Coomans 1988: 114, pl. 44 fig. 604b (not fig. 604a) (misidentification, in part, that may be this species).

Differential diagnosis

Agathotoma asthenika Rolán Fernández-Garcés & Redfern, 2012 has a similar shoulder profile but is smaller (length to only about 5 versus 11.9 mm) and has a protoconch of about 2 round-sided versus 1½ straight-sided whorls. *Agathotoma ecthymata* E.F. García, 2008 has a similar micro tuberculate protoconch as *A. millestriata* but is also smaller (length to about 5.4 mm).

Type material

Lectotype (here designated)
The following specimen is marked with a red dot and is closest to E.A. Smith's (1882) stated size, so is here designated the lectotype. The two remaining syntypes (paralectotypes) are smaller than the stated size.

U.S. VIRGIN ISLANDS • 10.6 × 4.0 mm [11.0 × 3.5 mm according to E.A. Smith (1882)]; St Thomas; NHMUK 20230894.

Paralectotypes (2 specs)
U.S. VIRGIN ISLANDS • 2 specs, lengths = 7.9 and 8.0 mm; St. Thomas; NHMUK 20230894.

Material examined (7 specs)

Photographs of the lectotype and 2 paralectotypes (Fig. 20Q–R) were examined. Also, photographs of the holotype and 2 paratypes of *Agathotoma kirshi*, and their description in Rolán *et al.* (2012: 52–53, fig. 5a–h) were reviewed. The following 9 non-type specimens were examined:

BAHAMAS • 1 spec., length = 8 mm; Abaco Island, Chub Rocks; depth 12 m; BMSM 17948.

GRENADA • 1 spec., 7.7 × 2.7 mm; Dragon Bay; depth 24 m; 18 May 1998; G. Mackintosh leg.; night SCUBA diving; P. Williams coll. • 1 spec., 6.3 × 2.6 mm; St. Georges, off W Point; 12°02.822′ N, 61°43.302′ W; depth 5 m; 23 Apr. 2015; G. Mackintosh leg.; SCUBA, suctioned, screened; USNM 1715429.

MARTINIQUE • 2 specs, lengths = 6.5 and 11.9 mm; Chancel Island, Robert Bay; 14°42′ N, 60°53.8′ W; depth 2 m; 24 Sep. 2016; MADIBENTHOS; stn AB452; MNHN-IM-2000-39505.

ST. VINCENT AND THE GRENADINES • 1 spec., 9.1 × 3.3 mm; St. Vincent Island, Young Island; depth 5 m; 23 Jul. 1998; G. Mackintosh leg.; night SCUBA diving; P. Williams coll. • 1 spec., 6.3 × 2.5 mm; NW end of Quatre Island; depth 6 m; 25 Jul. 2004; G. Mackintosh leg.; SCUBA, suctioned, screened; USNM 1715429 • 1 spec., 8.2 × 3.2 mm; Petit Nevis; depth 7.6 m; 14 Jul. 1996; G. Mackintosh leg.; night SCUBA; P. Williams coll.

TURKS AND CAICOS ISLANDS • 1 spec., length = 9 mm; North Caicos, Pelican Point; intertidal; D. Kirsh coll. BAHAMAS • 1 spec., length = 7 mm; Abaco Island, Sandy Cay; depth 7 m; MNHN-IM-2000-24829.

Description

E.A. Smith (1882) remarked on the right-angle turn of the penultimate and preceding 3 or 4 ribs at the base of the body whorl. This characteristic and straight anterior canal are consistent traits of the species. The description in Rolán *et al*. (2012: 52), in addition to that of E.A. Smith (1882), has also been used

Fig. 20 (next page). Species of *Agathotoma* Cossmann, 1899. Part 3. – **A–I**. *Agathotoma prominens* Rolán, Fernández-Garcés & Redfern, 2012. **A–B**. Paratype, 4.7 × 2.4 mm, ventral and dorsal views (MNHN-IM-2000-24832), Faro de los Colorados, Ciefuegos, Cuba. **C**. Sequenced voucher, 4.4 × 2.2 mm (MNHN-IM-2013-20615), Grand Cul-de-Sac Marin, external slope facing Fajou, Guadeloupe. **D**. Sequenced voucher, 4.8 × 2.3 mm (MNHN-IM-2013-71407), NE of Vauclin Point, Cayes de Sans-Soucis, Martinique. **E**. Sequenced voucher, 4.1 × 2.0 mm (MNHN-IM-2013-20616), Grand Cul-de-Sac Marin, external slope facing Fajou, Guadeloupe. **F**. Sequenced voucher, 4.4 × 2.2 mm (MNHN-IM-2013-72634), E of Le Robert, W of Cayes Mitan, Martinique. **G**. Sequenced voucher, 4.9 × 2.1 mm (MNHN-IM-2013-71055), E of Le Robert, W of Cayes Mitan, Martinique. **H**. Sequenced voucher, 5.1 × 2.4 mm (MNHN-IM-2013-20606), Lizzard Point, Guadeloupe. **I**. Sequenced voucher, 4.9 × 2.3 mm (MNHN-IM-2013-20296), Lizzard Point, Guadeloupe. – **J**. *Pleurotoma* (*Mangilia*) *castellata* E.A. Smith, 1888, lectotype, length = 6.5 mm (NHMUK 1854.6.30.136-7), locality unknown. – **K–P**. *Agathotoma castellata* (E.A. Smith, 1888). **K**. Sequenced voucher, 4.5 × 2.2 mm (MNHN-IM-2013-20663), bouée PCA, Guadeloupe. **L**. Sequenced voucher, 5.7 × 2.3 mm (MNHN-IM-2013-20667), Petite-Terre, Guadeloupe. **M**. Spec., 6.1 × 2.5 mm (UF 589677), Mouillage de Ste Anne, Martinique. **N**. Spec., 5.5 × 2.3 mm (MNHN-IM-2012-43489), offshore, French Guiana. **O**. Sequenced voucher, 4.6 × 2.2 mm (MNHN-IM-2013-70525), Marin Pass, Pointe Borgnesse, Martinique. **P**. Sequenced voucher, 4.1 × 1.9 mm (MNHN-IM-2013-20631), bouée PCA, Guadeloupe. – **Q–R**. *Pleurotoma* (*Mangilia*) *millestriata* E.A. Smith, 1882. **Q**. Lectotype, 10.6 × 4.0 mm (NHMUK 20230894), St Thomas, U.S. Virgin Islands. An exceptionally large specimen. **R**. Paralectotype, length = 8 mm (NHMUK 20230894C), St Thomas, U.S. Virgin Islands. **S–T**. *Agathotoma kirshi* Rolán, Fernández-Garcés & Redfern, 2012, paratype, length = 7 mm, ventral and dorsal views (MNHN-IM-2000-24829), Sandy Cay, Abaco, Bahamas, a junior synonym. – **U–V**. *Agathotoma millestriata* (E.A. Smith, 1882). **U**. Spec., 7.7 × 2.7 mm (P. Williams coll.), Dragon Bay, Grenada. **V**. Spec., 9.1 × 3.3 mm (P. Williams coll.), Young Island, Saint Vincent Island, Saint Vincent and the Grenadines. Credits: A–B, S–T : courtesy MNHN Collection: Molluscs (IM); J: from Kilburn (1993: fig. 71); Q–R: copyright of NHMUK, images taken by Kevin Webb, NHMUK Photographic Unit. Scale bar = 2 mm.

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in this brief redescription. *Shell* small (length to 11.9 mm), solid, turreted with rounded shoulders and straight sides, of about 6½ whorls, the last appearing much wider, especially in some specimens when dual varices are present at 180° apart. *Protoconch* of 1½ micro-tuberculate whorls, the last straight-sided (as shown by Rolán *et al.* 2012). *Axial sculpture* of 7 narrow, low, ribs that are level with the sutures, and on the last whorl are gathered onto the anterior fasciole. The presence of a previous varix leaves a deep crease on the anterior fasciole. *Spiral sculpture* of fine frosted secondaries. Aperture is a narrow oval that narrows to the anterior canal, both bordered by a wide varix that extends from a little above the suture to the end of the anterior canal. *Anal sinus* is a round notch in front of the varix, a little off the suture. This is the only known species of *Agathotoma* that regularly exhibits a second growth phase after the formation of the first varicose lip.

Remarks

The 12 measured specimens (including the published of the *Agathotoma kirshi* type specimens and 3 *A. millestriata* types) have an average length = 8.2 mm (range = 6.3–11.9 mm). Not all specimens show evidence of a second varix formation.

Range and habitat

Bahamas (Abaco), Turks and Caicos Islands (North Caicos), U.S. Virgin Islands (St. Thomas, the type locality), Martinique, St. Vincent and the Grenadines (Young Island, St. Vincent, Quatre Island), and Grenada; depth 0–24 m.

Genus ***Bactrocythara*** Woodring, 1928

Type species

Cythara obtusa Guppy, 1896, by original designation.

Summary diagnostic characteristics

Shell small, to about 6.5 mm but most less than 5 mm, fusiform, spire shorter than last whorl, which tapers gradually to the end of a short anterior canal, spire whorls slightly to moderately convex, aperture narrow.

Protoconch relatively large, about 2½–3 symmetrical, rapidly expanding whorls, the first minute, and the last 1–2 whorls with curved riblets.

Outer lip thickened, stromboid notch broad and shallow.

Anal sinus is a narrow notch offset a short distance from the suture and directed laterally, sometimes spout-like.

Inner lip margined, with a thick, bridging callus at anal sinus.

Axial sculpture of numerous narrow opisthocline or slightly sigmoidal ribs usually strongly recurved on shoulder.

Spiral sculpture of strong, weak, or obsolete secondaries, and rarely of primaries, that override ribs.

Shell surface microsculpture

Shell surface SEM images taken at 600× or 850× magnification of representatives of some species. *Bactrocythara* lacks frosting; that is, the grouping of fibrils into distinct, organized forms that rise above the shell surface and are then repetitively arranged at the intersections of spirals and incremental growth

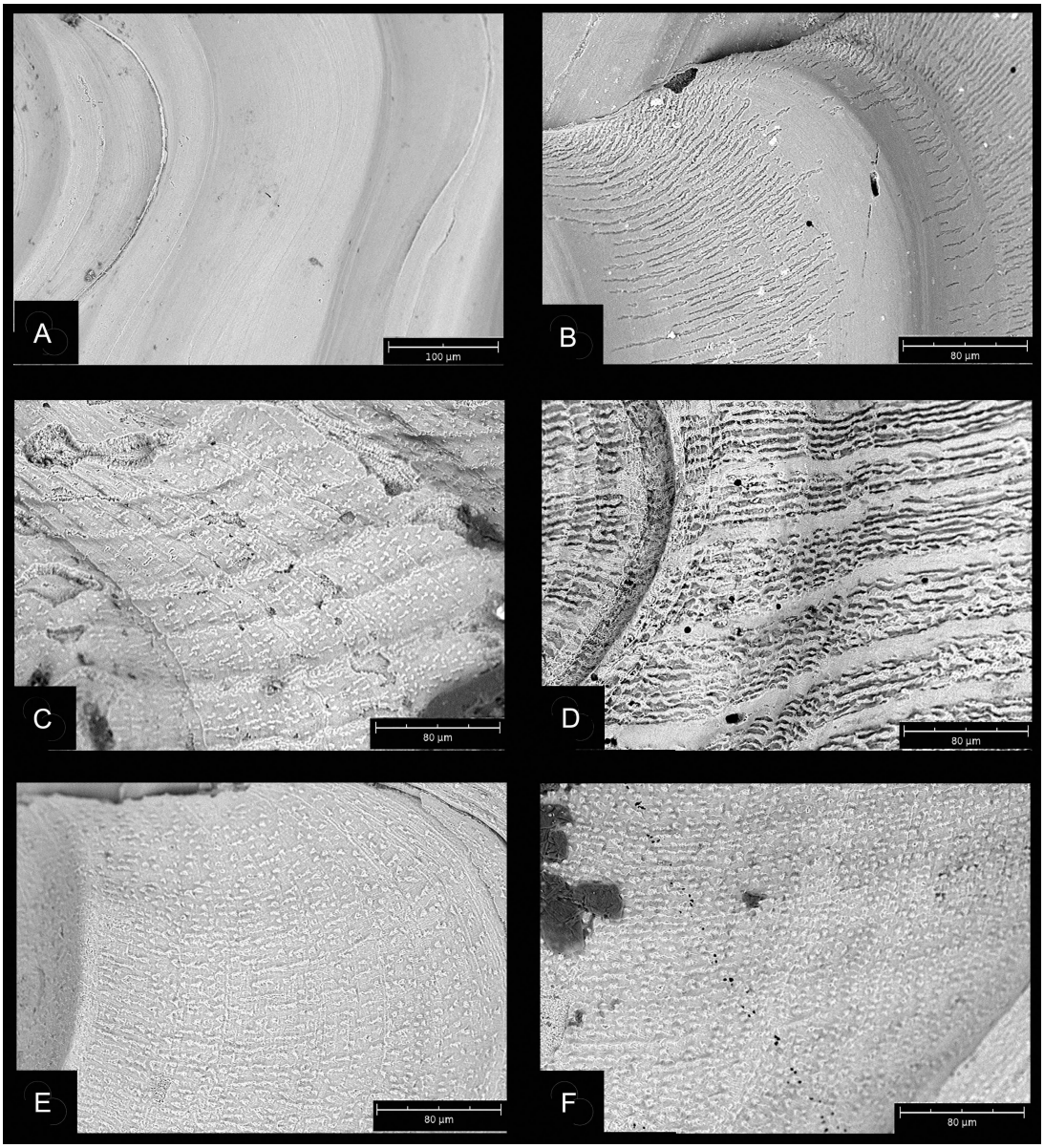


Fig. 21. Species of *Bactrocythara* Woodring, 1928, shell surface microsculpture. SEM images 850× unless otherwise stated. **A**. *Bactrocythara obtusa* (Guppy, 1896). SEM image of surface of penultimate whorl shoulder, 600×. Spec., 3.8×1.4 mm (MNHN-IM-2012-7394). Smooth, no microsculptural structures. **B**. *Bactrocythara brachytera* Fallon & Bouchet sp. nov., holotype, 3.7×1.5 mm (MNHN-IM-2000-39513), W of Marie-Galante, Guadeloupe. Surface smooth but with dense, parallel 'stretch marks' in intercostal space. **C**. *Bactrocythara singularis* Fallon sp. nov., holotype, 4.7×2.0 mm (ANSP 498799), SW of Sand Key, W of Key West. Intercalary space with scattered, irregularly shaped microscopic spirals, primary and secondary spirals composed of tightly packed microscopic fibrils. **D**. *Bactrocythara pruvosti* Fallon & Bouchet sp. nov., holotype, 5.6×2.2 mm (MNHN-IM-2000-39518), S of La Désirade, Guadeloupe. Wide intercalary spaces with irregular, elongated, coalesced fibrils arranged in parallel; spirals composed of tightly packed elongated fibrils. **E**. *Bactrocythara chordata* Fallon & Bouchet sp. nov., holotype, 5.7×2.2 mm (MNHN-IM-2000-39516), N of Marie-Galante, Guadeloupe. Surface uniformly covered with microscopic fibrils loosely arranged in parallel rows. **F**. *Bactrocythara floridensis* Fallon sp. nov., holotype, 6.5×2.6 mm (ANSP 498797), off SW Florida, Gulf of Mexico. Surface uniformly covered with mostly knots of short, microscopic fibrils arranged in parallel rows. Credits: SEM images were taken courtesy of Paul Callomon and Krasimira "Kasey" Seizova. Scale bars = 80 µm.

lines, producing a shell surface characteristic of the "frosted" group of genera. Instead, microscopic strings or fibrils, lie on the shell surface, independent of growth increments and much smaller and more abundant than the frosted structures, each contorted into a different shape. Patterns of microscopic fibril distribution differ among species of this genus group. Some lack fibrils altogether, the surface smooth [*B. obtusa* (Guppy, 1896) and *B. brachytera* Fallon & Bouchet sp. nov.]. But those with fibrils have a pattern of sparse fibrils in wide intercalary spaces and condensed fibrils into narrow spirals forming the primary and secondary spirals noted in individual descriptions (*B. pruvosti* Fallon & Bouchet sp. nov. and *B. singularis* Fallon sp. nov.). In a third general pattern, they may be more evenly distributed (*B. chordata* Fallon & Bouchet sp. nov. and *B. floridensis* Fallon sp. nov.).

Differences from other genera

Suturocythara E.F. García, 2008 has a proportionally smaller protoconch, typically consisting of only 1–2¼ smooth whorls. The sculpture features fewer, broader ribs that rise above the suture, along with more prominent primary spirals with secondaries positioned between them.

Remarks

Rolan *et al*. (1993) transferred two west African species to *Bactrocythara*, *B. haullevillei* (Dautzenberg, 1912), from *Clathurella* Carpenter, 1857, and named a new species *B. agachada* Rolan *et al*., 1993. *B. haullevillei* and *B. agachada* may belong in *Suturocythara*, but both merit further examination, especially their protoconchs, before changing their genus assignment.

***Bactrocythara* spp. Part 1**

Bactrocythara candeana (d'Orbigny, 1853)
Fig. 22A–P

Pleurotoma candeana d'Orbigny, 1853 in R. de la Sagra 1841–1853: 175, pl. 24 figs 10–12.
Mangilia (*Cythara*) *asarca* Dall & Simpson, 1901: 388, pl. 57 fig. 14, **syn. nov.**, is a junior subjective synonym. Type locality is Mayaguez, Porto [Puerto] Rico; 3 syntypes are in USNM 159688, the best preserved syntype measures 4.7 × 1.7 mm (Fig. 22A–B).

Pleurotoma candeana – Gray 1854: 31 (#376). — Beau 1858: 8. — Krebs 1864: 8. — Arango y Molina 1878: 218. — Dall 1885: 233.
Clathurella candeana – Tryon 1884: 279, pl. 20 fig. 93.
Defrancia candeana – Paetel 1888: 79.
Mangelia asarca – Warmke & Abbott 1961: 140, pl. 29 fig. j.
Bactrocythara asarca – Powell 1966: 117. — Kaicher 1984: card 3888. — Turgeon *et al.* 1988: 96; 1998: 105. — Odé 1992a: 51; 1993: 68, fig. 2. — Díaz & Puyana 1994: 229, fig. 907. — Williams 2005: #5520. — García 2007: 8.
Bactrocythara candeana – Williams 2005: #5521.

Differential diagnosis

Bactrocythara obtusa (Guppy, 1896) is narrower in profile, has more ribs that are not obsolete on the last whorl. *Bactrocythara brachytera* Fallon & Bouchet sp. nov. is less elongated, smaller (average shell length = 3.3 versus 4.1 mm) and white in color.

Type material

Syntypes (2 specs)
MARTINIQUE AND GUADELOUPE • 2 specs, lengths = 3.9 and 3.5 mm (for *Pleurotoma candeana*); NHMUK 1854.10.4.430.

Material examined (26 specs)

A photograph of the syntypes of *Pleurotoma candeana* d'Orbigny, 1853, supplied by the NHMUK, the 3 syntypes of *Mangilia* (*Cythara*) *asarca* Dall & Simpson, 1901, in USNM 159688, and 23 non-type specimens were examined. Data on the non-types follows.

GUADELOUPE • 1 spec., 4.4 × 1.55 mm; 16°23.21′ N, 61°32.39′ W; depth 70 m; 5 May 2012; KARUBENTHOS 2012; stn GD04; MNHN-IM-2012-7395 • 1 spec., 3.8 × 1.4 mm; 16°22.57′ N, 61°34.12′ W; depth 80 m; 4 May 2012; KARUBENTHOS 2012; stn GD01; MNHN-IM-2012-7390 • 1 spec., 2.15 × 1.0 mm; Port-Louis, Grand Cul-de-Sac Marin; 16°25.0′ N, 61°32.8′ W; depth 80 m; 14 May 2012; KARUBENTHOS 2012; stn GD23; MNHN-IM-2012-7396 • 1 spec., 4.1 × 1.55 mm; tombant Port-Louis; 16°23.74′ N, 61°32.07W; depth 49 m; 15 May 2012; KARUBENTHOS 2012; stn GB14; MNHN-IM-2012-7391 • 6 specs, (1 measured) length = 4.7 mm; off Anse à la Barque; 16°05.4′ N, 61°46.5′ W; depth 50 m; 10 May 2012; KARUBENTHOS 2012; stn GD15; MNHN-IM-2012-7399 • 10 specs, (2 measured) 5.3 × 1.9 and 3.5 mm; Basse-Terre, Anse à la Barque; 16°05.5′ N, 61°46.6′ W; depth 45 m; 9 May 2012; KARUBENTHOS 2012; stn GD12; MNHN-IM-2012-7400 • 1 spec., 3.9 × 1.45 mm; 16°23.16′ N, 61°32.02′ W; depth 50 m; 5 May 2012; KARUBENTHOS 2012; stn GD03; MNHN-IM-2012-7398.

MARTINIQUE • 1 spec., length = 5.1 mm; Schoelcher, Anse Madame; 14°37.1′ N, 61°06.8′ W; depth 90 m; 7 Oct. 2016; MADIBENTHOS; stn AD610; MNHN-IM-2000-39514 • 1 spec., 5.0 × 1.9 mm; Case-Pilote; 14°38.5′ N, 61°08.8′ W; depth 56 m; 10 Oct. 2016; MADIBENTHOS; stn AS482; MNHN-IM-2000-39515.

UNITED STATES OF AMERICA • 1 spec., length = 4.0 mm; off Alabama; 29°19.62′ N, 87°46.19′ W; depth 97–108 m; 30 Jun. 2006; E.F. García leg.; dredged from aboard R/V *Pelican*; E.F.G coll. #27848.

Description

The specimen depicted in Fig. 22C–D was examined to augment this description. *Shell* small (largest measured length = 5.3 mm), translucent, elongate oval, glossy, of about 5¾ whorls, including 2½ of protoconch, teleoconch whorls slightly convex with deeply impressed sutures, the last about 70% of shell length. Aperture narrow, a short anterior canal differentiated by a slight narrowing at the stromboid notch, aperture about 54% of shell shell length. *Protoconch* of 2½ glossy smooth whorls, the first minute, then rapidly expanding, the last partially submerged and with riblets that progressively become hooked on the shoulder toward the end of the protoconch. *Axial sculpture* of narrow, weak, opisthocline ribs that extend from suture to suture and hooked left in the sulcal area on spire whorls, are mostly obsolete below the shoulder on the last whorl; 11 on the penultimate, and 9 on the last whorl to the varix. *Varix* thick, cordlike, near edge of the aperture, runs from slightly above the suture, then narrows from the stromboid notch to the end of the anterior canal. *Spiral sculpture* obsolete on most of the shell surface, about 11 fine spirals from the base of the shell to the end of the anterior fasciole. *Sulcus* not differentiated from whorl shoulder but marked by hooked ribs. *Outer lip* varicose, a thin extension of shell from the base of the varix may be present in mature specimens. ***Anal sinus*** a deep, laterally directed notch on the shoulder with a round apex. *Inner lip* a thin gloss on the columella, narrow anteriorly then wide on parietal wall, with a callus at the anal sinus. *Anterior canal* short, narrow but open, end notched. *Anterior fasciole* not swollen, sculpture as on shell base but spirals more thread-like. *Color* light lavender with 3 faint brownish spiral bands.

Remarks

A widely applied name for this species is *Bactrocythara asarca* (Dall & Simpson, 1901). However, the best of two syntypes of *B. candeana* (d'Orbigny, 1853), in NHMUK 1854.10.4.430, appears to be the same and, since having been published 48 years earlier, has priority. While the type of *B. asarca* is larger,

the size and body shape of the species is variable. Several smaller specimens that are morphologically identical are depicted in Fig. 22, along with larger specimens shown in the same figure.

The specimen in Fig. 22F–G is worn, highlighting low ribs below the shoulder that are not readily visible on fresh, glossy specimens. The more usual condition is a smoother shell with ribs only perceptible on the upper half of the whorls. The average length of 12 measured specimens is 4.1 mm (range = 2.2–5.3 mm).

Range and habitat

Reports are widespread from United States (Texas) to Colombia. Examined specimens are from United States (off Alabama), Puerto Rico (*Mangilia asarca* type series), Guadeloupe, and Martinique; depth 45–90 m.

Bactrocythara obtusa (Guppy, 1896)
Figs 21A, 22Q–Y

Cythara obtusa Guppy in Guppy & Dall, 1896: 306–307, pl. 27 fig. 7.

Bactrocythara obtusa – Woodring 1928: 174, pl. 6 figs 15–16 (Bowden, Jamaica).

Differential diagnosis

Bactrocythara obtusa (Guppy, 1896) is the type species of the genus.

In *Bactrocythara candeana* (d'Orbigny, 1853) ribs are less numerous and obsolete, or nearly so on the last whorl; and its whorls are more convex. *Bactrocythara chordata* Fallon & Bouchet sp. nov. has more convex whorls, coarser spirals, and is colored all white, not tan. *Bactrocythara pruvosti* Fallon & Bouchet sp. nov. has more convex whorls, a broader shell with a more spout-like anal sinus and is white with a brown mid-whorl spiral band. *Bactrocythara brachytera* Fallon & Bouchet sp. nov. is smaller, broader (L/W = 0.4054 versus 0.3125) and a different color.

Type material

Holotype
JAMAICA • Bowden, Late Pliocene fossil; 5.5 mm; USNM 107088.

Paratypes
None

Material examined (5 specs)

The holotype and a 4.7 mm fossil specimen in USNM 369387, figured by Woodring (1928), also Bowden, Jamaica were examined. The following list includes possible Recent specimens that were also examined:

GUADELOUPE • 1 spec., 3.8 × 1.4 mm; Port-Louis; 16°24′ N, 61°33′ W; depth 130 m; 16 May 2012; KARUBENTHOS 2012; stn GD33; MNHN-IM-2012-7394.

JAMAICA • 1 spec., Bowden of Jamaica, Late Pliocene fossil; 4.7 mm; USNM 369387.

MARTINIQUE • 1 spec., 4.8 × 1.5 mm; Schoelcher, Case Navire, Face à la Rivière; 14°36.9′ N, 61°06.7′ W; depth 80 m; 30 Sep. 2016; MADIBENTHOS; stn AD279; MNHN-IM-2000-39517.

PANAMA • 1 spec., 4.0 × 1.5 mm; off Escudo de Veraguas Island; depth 820 ft [250 m]; 2005; dredged; UF 589681.

Description

The following description has been augmented from that of Woodring (1928: 174) by examining Recent specimens. It differs slightly from the characteristics of 3 examined specimens: in protoconch whorls (2½–3 versus 3), in rib count (18–19 versus 12–14) and spiral cord appearance (overriding ribs versus lying between ribs). These differences may be attributable to natural variation or genetic drift over geologic time. Spirals are very delicate and only in the freshest specimens can they be seen to override the ribs on the shell base. Ribs are absent on the anterior fasciole, so spirals are more obviously entire, albeit oblique to those on the shell base. *Shell* small (largest specimen length = 4.8 mm), translucent, elongate oval, glossy, of 6 whorls, including protoconch; the teleoconch whorls slightly convex and deeply impressed, the last whorl 73% of shell length. Aperture narrow, sides mostly straight, anterior canal barely differentiated, aperture about 52% of shell length. *Protoconch* has the of 2½ submerged whorls as described by Guppy (1896) (3 whorls are on Woodring's specimen in USNM 369387), rapidly expanding, and the last with fine arched riblets that progressively become hooked on the shoulder toward the end of the protoconch. *Axial sculpture* of narrow opisthocline axials that extend from suture to suture and hooked left in the sulcal area; 18 on the penultimate, and 19 on the last whorl to the varix. *Varix* thick, cordlike, near edge of outer lip, runs from the suture, then around behind the anal sinus reaching slightly above the suture line, and then to the anterior canal, absent on canal side. *Spiral sculpture* consists of fine spirals in the intercostal space between ribs from below the whorl shoulder to the anterior fasciole, about 6 on the penult, 11 on the shell base, and about 5 unbroken oblique spirals on the fasciole. *Sulcus* marked by hooked ribs and the absence of intercostal spirals. *Outer lip* varicose, with a short, narrow strip of shell at the base of the varix, extending from anal sinus on shoulder to stromboid notch. ***Anal*** sinus a deep, laterally directed notch on the shoulder with a round apex. *Inner lip* margined, recumbent, wide anteriorly and narrowing on parietal wall, with a bridging callus at the anal sinus. *Anterior canal* barely differentiated by an abrupt narrowing of the aperture, end slightly notched. *Anterior fasciole* not swollen, sculpture as on shell base. *Color* light lavender shell with 3 faint brownish spiral bands.

Remarks

The identification of Recent specimens as *Bactrocythara obtusa* is made with reservation considering the span of time separating the type from Recent specimens, and the paucity of specimens, both fossil and Recent for a closer comparison of variability. Guppy (1896: 307) states that the Holotype is 6 × 1.5 mm, which is at odds with Woodring's (1928) measurement of 5.4 × 1.9 mm.

Range and habitat

This is the first published report of this species in the Recent fauna. specimens examined for this work from off Martinique (in 80 m), Guadeloupe (in 130 m) and Panama (in 250 m) suggest a wide distribution in the southern Caribbean.

Bactrocythara brachytera Fallon & Bouchet sp. nov.
urn:lsid:zoobank.org:act:6E700450-B959-4FA4-8837-42A3A92ABC41
Figs 21B, 22Z–II

Differential diagnosis

Bactrocythara chordata Fallon & Bouchet sp. nov. is larger (length = 5.7 versus 3.7 mm of largest specimen) and has stronger spirals. *Bactrocythara pruvosti* Fallon & Bouchet sp. nov. is larger (length = 5.6 versus 3.7 mm of largest specimen), broader, and possesses reddish-brown spiral bands.

Etymology

Bactrocythara brachytera Fallon & Bouchet sp. nov., the shorter *Bactrocythara*, after its size, shorter than most of its congeners. From the Greek adjective '*brachys*', meaning 'short'.

Type material

Holotype

GUADELOUPE • 3.7 × 1.5 mm; W of Marie-Galante; 15°53′ N, 61°25′ W; depth 262–266 m; 22 Jun. 2015; KARUBENTHOS 2; stn DW4599; MNHN-IM-2000-39513.

Paratypes (6 specs)

GUADELOUPE • 1 spec., 3.7 × 1.5 mm; Port-Louis; 16°25′ N, 61°33′ W; depth 150 m; 15 May 2012; KARUBENTHOS 2012; stn GN21; MNHN-IM-2012-7393 • 1 spec., 2.7 × 1.3 mm; Grand Cul-de-Sac Marin, off Fajou Island; 16°22.41′ N, 61°35.57′ W; depth 80 m; 3 May 2012; KARUBENTHOS 2012; stn GN01; MNHN-IM-2012-7392 • 1 spec., 3.7 × 1.5 mm; W of Marie-Galante; 15°56′ N, 61°23′ W; depth 208–210 m; 22 Jun. 2015; KARUBENTHOS 2; stn DW4597; ANSP 498819 • 2 specs, 3.6 × 1.5 and 2.5 × 1.3 mm; W of Marie-Galante; 16°00′ N, 61°23′ W; depth 204–251 m; 21 Jun. 2015; KARUBENTHOS 2; stn DW4586; USNM 1715403 • 1 spec., 3.5 × 1.4 mm; S of La Désirade; depth 250 m; 2016; dredged; D. Lamy coll.

Other material examined (2 specs)

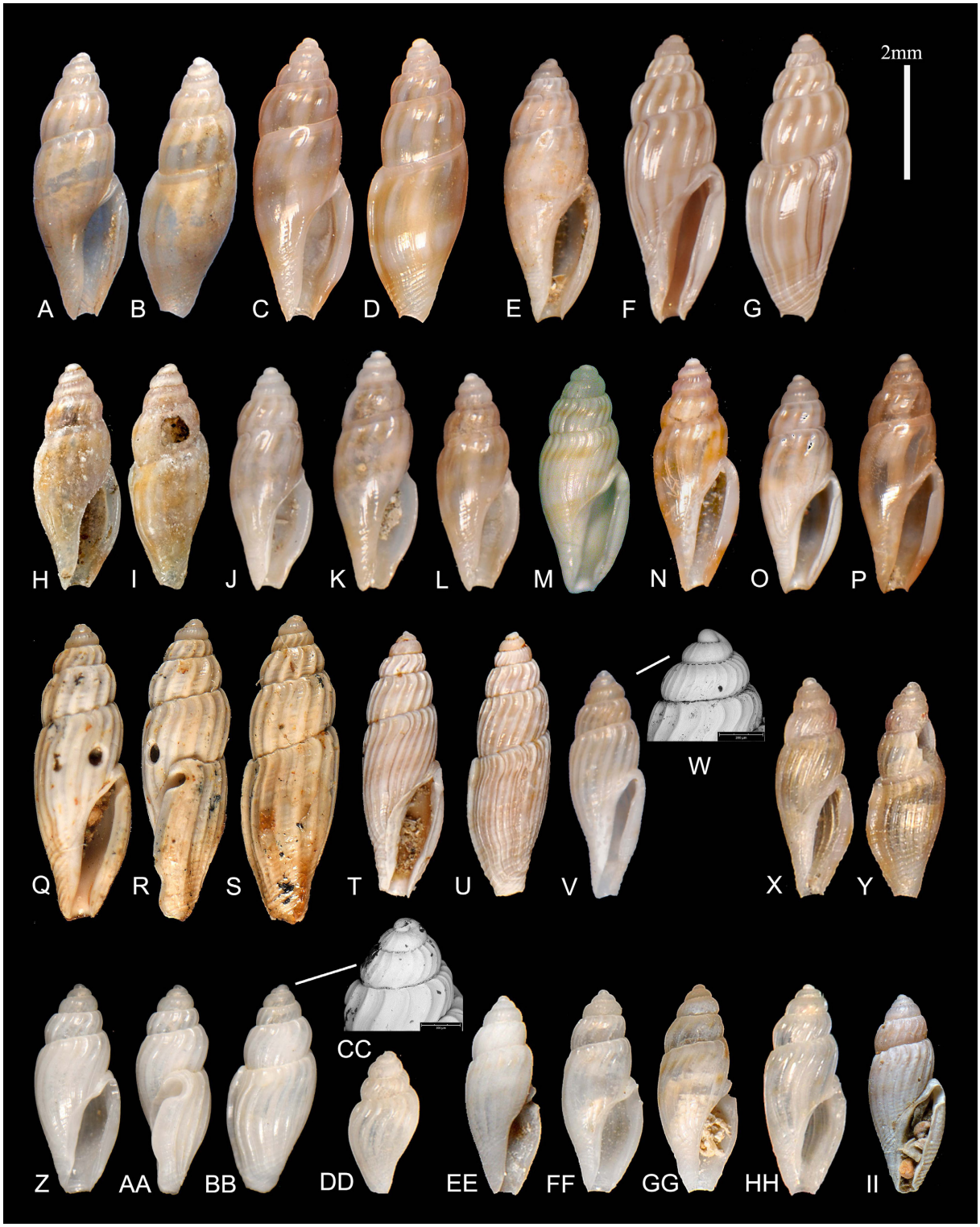
UNITED STATES OF AMERICA • 2 specs, 3.5 × 1.3 and 3.2 × 1.3 mm; off Louisiana; 28°03.439′ N, 92°26.978′ W; depth 71–74 m; 30 Jun. 2001; E.F. García leg.; dredged from aboard R/V *Pelican*; UF 589680.

Description

Shell small (holotype length = 3.7 mm, W/L = 0.4054), elliptical, of 5 whorls altogether, spire much shorter than body whorl, which is 78% of shell length, teleoconch whorls deeply impressed round-

Fig. 22 (next page). Species of *Bactrocythara* Woodring, 1928. Part 1. – **A–B**. *Mangilia* (*Cythara*) *asarca* Dall & Simpson, 1901, syntype, 4.7 × 1.7 mm, ventral and dorsal views (USNM 159688), Mayaguez, Puerto Rico, junior synonym of *Pleurotoma candeana* d'Orbigny, 1853. – **C–G**. *Bactrocythara candeana* (d'Orbigny, 1853). **C–D**. Spec., 5.0 × 1.9 mm, ventral and dorsal views (MNHN-IM-2000-39515), Case-Pilote, Martinique. **E**. Spec., 4.7 mm, ventral and dorsal views (MNHN-IM-2012-7399), off Anse à la Barque, Guadeloupe. **F–G**. Spec., 5.1 mm (MNHN-IM-2000-39514), Schoelcher, Anse Madame, Martinique. – **H–I**. *Pleurotoma candeana* d'Orbigny, 1853, syntype, 3.9 mm, ventral and dorsal views (NHMUK 1854.10.4.430), Martinique and Guadeloupe. – **J–P**. *Bactrocythara candeana* (d'Orbigny, 1853). **J–L**. Specs, 4.0, 4.2 and 3.8 mm (MNHN-IM-2012-7400), off Anse à la Barque, Basse-Terre, Guadeloupe. **M**. Spec., 4 mm (E García coll. #27848), off Alabama. **N**. Spec., 4.1 × 1.6 mm (MNHN-IM-2012-7391), dropping off from Port-Louis, Guadeloupe. **O–P**. Specs, 3.9 and 4.2 mm (MNHN-IM-2012-7399), off Anse à la Barque, Guadeloupe. – **Q–S**. *Cythara obtusa* Guppy, 1896, Guppy's figured type, 5.4 × 1.9, ventral, lateral and dorsal views (USNM 107088), Bowden, Jamaica (fossil). – **T–Y**. *Bactrocythara obtusa* (Guppy, 1896). **T–U**. Spec., 4.8 × 1.5, ventral and dorsal views (MNHN-IM-2000-39517), Schoelcher, Face à la Rivière Case Navire, Martinique. **V–W**. Spec., 4.0 × 1.5 mm, ventral view, and SEM of protoconch (UF 589681), off Escudo de Veraguas Island, Panama. **X–Y**. Spec., 3.8 × 1.4 mm, ventral and dorsal views (MNHN-IM-2012-7394), Port-Louis, Guadeloupe. – **Z–II**. *Bactrocythara brachytera* Fallon & Bouchet sp. nov. **Z–CC**. Holotype, 3.7 × 1.5 mm, ventral, lateral, dorsal views, and SEM image of protoconch (MNHN-IM-2000-39513), W of Marie-Galante, Guadeloupe. **DD**. Spec., 2.5 × 1.3 mm (USNM 1715403), W of Marie-Galante, Guadeloupe. **EE**. Paratype, 3.5 × 1.4 mm (D. Lamy coll.), S of La Désirade, Guadeloupe. **FF**. Paratype, 3.6 × 1.5 mm (USNM 1715403), W of Marie-Galante, Guadeloupe. **GG**. Paratype, 3.7 × 1.5 mm (ANSP 498819), W of Marie-Galante, Guadeloupe. **HH**. Paratype, 3.7 × 1.5 mm (MNHN-IM-2012-7393), Port-Louis, Guadeloupe. **II**. Spec., 3.5 × 1.3 mm (UF 589680), off Louisiana. Credits: H–I: courtesy of Harry Taylor, Photographic Unit, copyright NHMUK; M: photograph courtesy of Emilio García; W, CC: SEM images courtesy of Krasimira "Kasey" Seizova and Paul Callomon. Scale bars: A–V, X–BB, DD–II = 2 mm; W, CC = 300 µm.

shouldered and somewhat lopsided due to their rapid expansion; aperture narrow, about 59% of shell length. *Protoconch* of about 3 partially submerged whorls, trochoid-shaped, first whorl, smooth, minute then whorls rapidly expand. The last 2 whorls have arched riblets that progressively become recurved to the end of the protoconch, then blend into the teleoconch ribs. *Axial sculpture* of low, narrow ribs that run from suture to suture on spire whorls and to anterior fasciole on last, intercostal space about as wide as ribs, ribs opisthocline, weakly sinusoidal, and 'hooked' on shoulder, 15 ribs on penultimate and



16 to varix on last. *Varix* a thickened edge of the outer lip, extending from the suture, arching slightly around the anal sinus, then ending at the stromboid notch. *Spiral sculpture* of about 8 spirals on shell base and fasciole, obsolete elsewhere. *Sulcus* absent but past positions of varix or apertural lip defined by the hooked ribs on the whorl shoulder. *Outer lip* varicose, an extension of shell beyond the varicose rib extends in a low arc from the anal sinus to the stromboid notch. *Anal sinus* a deep notch with a round, slightly flared opening on the shoulder, set off the suture by a parietal callus. *Inner lip* a thin glaze on the columella, margined, widest on columella, narrower on parietal wall, ending in a parietal callus at the anal sinus. *Columella* straight. *Anterior canal* short, straight, open, barely differentiated from the aperture by a slight constriction of the aperture, its end with a slight notch. *Anterior fasciole* not swollen, with about 5 oblique spirals. *Color* translucent white with faint brown spiral bands on some.

Remarks

The average length of 12 specimens is 3.3 mm (range = 2.5–3.7 mm).

Range and habitat

United States (off Louisiana), Mexico (Gulf of Mexico), and Guadeloupe; depth 71–266 m.

***Bactrocythara* spp. Part 2**

Bactrocythara singularis Fallon sp. nov.
urn:lsid:zoobank.org:act:E40A0128-FE87-4E48-98A6-94F41D9C46F0
Figs 21C, 23A–G

Differential diagnosis

Kurtzina spp. have a similarly shaped shell with a large trochoid protoconch, but they differ in that the last whorl of the protoconch is beaded rather than ribbed. The teleoconch whorls are angular, not convex; ribs are stronger and fewer, and spirals are frosted.

Etymology

Bactrocythara singularis Fallon sp. nov., the singular *Bactrocythara*, derives its name from the Latin adjective '*singularis*', feminine form, meaning 'unique'. It is so named due to the species' apparent lack of a varicose lip with a spout-like anal sinus, characteristics typically found in members of the genus group.

Type material

Holotype

UNITED STATES OF AMERICA • 4.7 × 2.0 mm; Florida Keys, 12 mi. [19 km] W of Key West, SW of Sand Key; depth 122 m; F. Fumar leg.; EFG 28307; ANSP 498799.

Paratypes (8 specs)

MEXICO • 3 specs, 4.4 × 1.9, 4.1 × 1.8 and 3.5 × 1.7 mm; off Campeche; 20°51.49′ N, 92°21.44′ W; depth 63–65 m; 10 Jun. 2005; E.F. García leg.; dredged by R/V *Pelican*; UF 589682.

UNITED STATES OF AMERICA • 1 spec., 4.0 × 2.0 mm; E Florida, Miami-Dade Co., 7 mi. [11 km] SE off Fowey Rocks Light; 25°28′ N, 80°05′ W; depth 150 fms [274 m]; 17 Apr. 1886; W.H. Rush leg.; ANSP 119261 • 1 spec., 4.1 × 1.7 mm; Florida Keys, Monroe Co., Sand Key; 24°24.256′ N, 81°53.367′ W; depth 108.2 m; 25 Jul. 2001; R. Bieler, P.M. Mikkelsen *et al.* leg.; R/V *Eugenie Clark* cruise, Infaunal Mollusk Survey; transect stn S-22-FK-500; mud; small pipe dredge; FMNH 333976 • 1 spec., 3.8 × 1.6 mm; Florida Keys, Monroe Co., off Ramrod Key; 24°29.024′ N, 81°25.865′ W; depth 115.8 m; 23 Jul. 2001;

R. Bieler *et al.* leg.; R/V *Eugenie Clark* cruise, Infaunal Mollusk Survey; transect stn R-28-FK-472; on green mud; small pipe dredge; FMNH 333975 • 1 spec., 3.5 × 1.7 mm; off Alabama; 29°14′ N, 88°15′ W; depth 67 fms [123 m]; 1995; E.F. García leg.; dredged from R/V *Pelican*; UF 589683 • 1 spec., 2.6 × 1.5 mm; off Louisiana; 26°03.439′ N, 92°26.978′ W; depth 71–74 m; 30 Jun. 2001; E.F. García leg.; dredged by R/V *Pelican*; UF 589684.

Other material examined (9 specs)

MEXICO • 1 spec., length = 3.5 mm; Gulf of Mexico; EFG 26632.

UNITED STATES OF AMERICA • 8 specs, 5.2 × 2.2 (largest) to 3.1 × 1.6 mm (smallest); Florida Keys, off Alligator Reef Light; depth 600 ft [183 m]; 1965; J. Moore leg.; dredged; ANSP 312598.

Description

Shell small (holotype length = 4.7 mm), elliptical (W/L = 0.4255), of 6 whorls altogether, spire shorter than body whorl, which is 68% of shell length teleoconch whorls deeply impressed and strongly convex; aperture oval and anterior canal short, together about 46% of shell length; sculpture of narrow ribs and fine spirals. *Protoconch* of about 3¾ partially immersed whorls (like stacked inverted bowls of increasing diameter), first whorl minute, angled, then whorls rapidly increase in diameter, 1¾ of the last 2 whorls with curved riblets that do not reach the suture. *Axial sculpture* of low ribs that run from suture to suture on spire whorls and to anterior fasciole on last, slightly thinner and recurved on shoulder and broader on last ½-whorl, intercostal space less than width of ribs, 16 ribs on penultimate and 12 to varix on last. *Varix* a slightly enlarged rib set a little behind lip edge. *Spiral sculpture* of primary and secondary spirals that override ribs, about 6 primaries on penultimate and 10 on shell base, and a variable number of secondaries present between. *Sulcus* absent. Hooked ribs on whorl shoulders mark past presence of anal sinus. *Outer lip* edge is plain, examined specimens lack the typical varix with laterally directed spout-shaped anal sinus. *Anal sinus* a wide, shallow notch, its apex on shoulder near the whorl periphery; without a bridging parietal callus. **Inner lip** a thin glaze etched into the columella, not margined, without a parietal callus at the anal sinus. *Columella* straight. *Anterior canal* short, barely differentiated from the aperture, directed to the left from the aperture when viewed ventrally, unnotched. *Anterior fasciole* not swollen, with about 6 oblique spirals. *Color* light yellowish brown, ribs lighter, with a white anterior canal.

Remarks

Specimens of *Bactrocythara singularis* Fallon sp. nov. examined so far (11) are not a perfect fit in the genus. While it exhibits the typical large protoconch, numerous ribs, and overriding spirals, examined specimens lack a varicose lip and a spout-like anal sinus, traits diagnostic of the genus.

The average length of 8 measured specimens is 3.9 mm (range = 3.4–4.7 mm).

Range and habitat

Mexico (off Campeche), United States (off Louisiana, off Alabama, off E Florida, off Florida Keys, and off South Carolina, this latter locality identified from a photo); depth 63–274 m.

Bactrocythara pruvosti Fallon & Bouchet sp. nov.
urn:lsid:zoobank.org:act:889A5FAC-5BB1-4C41-8882-744E7F406E17
Figs 21D, 23H–O

Differential diagnosis

Bactrocythara chordata Fallon & Bouchet sp. nov. has stronger spirals and lacks brownish-yellow spiral bands. *Bactrocythara brachytera* Fallon & Bouchet sp. nov. is narrower, smaller and has a weaker varix. It also lacks brownish-yellow spiral bands.

Etymology

Bactrocythara pruvosti Fallon & Bouchet sp. nov. honors Laurent Pruvost for his contributions to the dredging effort during the KARUBENTHOS 2012 expedition and his subsequent independent dredge samples off La Désirade; specimens from his dredgings are reported herein as part of the collection of D. Lamy.

Type material

Holotype

GUADELOUPE • 5.6 × 2.2 mm; S of La Désirade; depth 250 m; 2016; dredged; ex D. Lamy coll.; MNHN-IM-2000-39518.

Paratypes (4 specs)

GUADELOUPE • 2 specs, 4.6 × 1.9 and 4.0 × 15 mm; S of La Désirade; depth 250 m; 2016; dredged; D. Lamy coll. • 1 spec., 4.1 × 1.7 mm; S of La Désirade; dredged in 250 m; D. Lamy coll. • 1 spec., 4.0 × 1.7 mm; N of Grande-Terre; 16°31′ N, 61°32′ W; depth 268–306 m; 14 Jun. 2015; KARUBENTHOS 2; stn DW4546; ANSP 498821.

Description

Shell small (holotype length = 5.6 mm), stoutly fusiform (W/L = 0.3929), of 6¼ whorls altogether, spire much shorter than body whorl, which is 71% of shell length, teleoconch whorls deeply impressed round-shouldered; sculpture of numerous ribs crossed by spirals; aperture narrow, about 54% of shell length, with a varicose lip and laterally directed spout-like anal sinus. *Protoconch* of about 3 whorls, the first minute, protruding, then whorls rapidly expand, the first 2 smooth, the last partially submerged with arched riblets. *Axial sculpture* of narrow ribs that run from suture to suture on spire whorls and to anterior fasciole on last, intercostal space about as wide as ribs, ribs slightly opisthocline, recurved on shoulder, 12 ribs on penultimate and 11 to varix on last. *Varix* apertural, strong, extending from and a little above the suture to the anterior canal, forming a nearly low arc, its ridge finely crenated by primary spiral. *Spiral sculpture* of about 15 primary spirals on the penultimate whorl, some with a single microscopic secondary spiral between. *Sulcus* absent; recurved ribs on shoulder mark the past presence of the anal sinus. *Outer lip* varicose, with a narrow width of shell along the base of the varix extending from the anal sinus to the stromboid notch, stromboid notch wide and shallow. *Anal sinus* is a deep notch cut within the varix spout-like and nearly closed, directed laterally, and joined to the suture by a strong parietal callus. *Inner lip* a thin glaze on the columella, margined, ending in a strong parietal callus that bridges the inner and outer lips at the anal sinus. *Columella* straight. *Anterior canal* short, straight, open, differentiated by a gradual narrowing of the aperture, end bent slightly to the right viewed ventrally, tip notched. *Anterior fasciole* is not swollen, densely packed with oblique secondary spirals. *Color* a semi-translucent white with a light brownish-yellow spiral band mid-whorl and another faint one on the shoulder. The bands are only visible between ribs, the darkest appearing on the crest and face of the varix.

Range and habitat

Guadeloupe; depth 250–306 m.

Bactrocythara chordata Fallon & Bouchet sp. nov.
urn:lsid:zoobank.org:act:50543B02-67B4-4EB1-A465-C7BCE001C520
Figs 21E, 23P–V

Differential diagnosis

This species is easily differentiated from all others by the presence of strong primary spirals over most of the shell. *Bactrocythara obtusa* (Guppy, 1896) has more ribs, a narrower shell, and is colored differently. In *Bactrocythara candeana* (d'Orbigny, 1853) ribs are obsolete on the anterior portion of the last whorl, only fine spirals are present on the anterior portion of the last whorl, and the shell is a different color.

Etymology

Bactrocythara chordata Fallon & Bouchet sp. nov., the corded *Bactrocythara*, from the Latin '*chordata*' meaning 'rope or cord', referring to the presence of strong spirals on its shell base.

Type material

Holotype

GUADELOUPE • 5.7 × 2.2 mm; N of Marie-Galante; 16°09′ N, 61°19′ W; depth 233–396 m; 19 Jun. 2015; KARUBENTHOS 2; stn DW4583; MNHN-IM-2000-39516.

Paratypes (3 specs)

GUADELOUPE • 1 spec., 3.8 × 1.5 mm; E of La Désirade; 16°24′ N, 60°51′ W; depth 100–258 m; 15 Jun. 2015; KARUBENTHOS 2; stn DW4555; ANSP 498820 • 1 spec., 3.8 × 1.7 mm; W of Marie-Galante; 15°49′ N, 61°28′ W; depth 376–393 m; 27 Jun. 2015; KARUBENTHOS 2; stn DW4632; USNM 1715404 • 1 spec., 3.7 × 1.6 mm; E of La Désirade; 16°17′ N, 61°01′ W; depth 208–362 m; 17 Jun. 2015; KARUBENTHOS 2; stn DW4568; MNHN-IM-2000-39864.

Description

Shell small (holotype length = 5.7 mm), elliptical (W/L = 0.3860), of 6 convex whorls, spire whorls dorsoventrally compressed, sutures deeply incised with high round shoulders, body whorl disproportionally large at 74% of shell length aperture narrowly oval, about 56% of shell length, anterior canal short, not differentiated from aperture. *Protoconch* of 3 partially submerged whorls, minute at tip then rapidly expanding, the first 1½ smooth, the last 1½ with arched riblets that progressively become hooked and merge with the teleoconch. *Axial sculpture* of narrow ribs that run from suture to suture on spire whorls and to anterior fasciole on last, hooked on whorl shoulders in sulcal area, intercostal space about as wide as ribs; 15 ribs are on the penult, 14 on the last whorl to the varix. *Varix* thick, cordlike, very close to edge of outer lip, runs from the suture, then around behind the anal sinus reaching slightly above the suture line, and then to the anterior canal, absent on canal edge. *Spiral sculpture* of well-spaced strong spirals, the first just below the sulcal area of the shoulder, then evenly spaced to the anterior fasciole, 5 on the penultimate, 11 on the shell base from suture line to anterior fasciole, all overriding ribs giving the shell a prickly look. *Sulcus* marked on whorl shoulders as recurved ribs and the near absence of spiral cords. *Outer lip* a short, narrow strip of shell at edge of aperture in front of the varix, extending from anal sinus on shoulder to stromboid notch. *Anal sinus* a deep notch with a round apex, parallel sides on whorl shoulder and lying in front of the varix. *Inner lip* margined, recumbent on columella, free on parietal wall with a callus at the apex of the aperture that connects the inner lip and varix. *Columella* is slightly sigmoid. *Anterior canal* very short, straight, open, barely differentiated from the aperture, unnotched. *Anterior fasciole* not swollen, with about 6 oblique spiral cords. *Color* white with an amber protoconch.

Remarks

Little variation is seen except in size. specimens in Fig. 23T–V have partial sinuses and varices, are 5⅛ and 5⅜ whorls but only ⅔ the size of the type (6 whorls).

Range and habitat

Off Guadeloupe; depth 100–396 m.

Bactrocythara cubana Espinosa, Ortea & Moro, 2017
Fig. 23W–X

Bactrocythara cubana Espinosa, Ortea & Moro, 2017: 7–8, 20, pl. 2 figs a–b.

Differential diagnosis

The minute size and arched spire of this species are unique, not easily confused with other members of the genus. The very thin ribs and spirals of nearly the same strength are also distinctive.

Type material

Holotype

CUBA • 2.25 × 0.43 mm; María la Gorda; IES [catalog number not specified].

Paratypes

Unknown number. Espinosa *et al.* (2017) reported collecting specimens at península de Guanahacabibes, Pinar del Río, Quiebra Hacha, and Artemisa y en playa Rancho Luna, Cienfuegos, Cuba without designating them as paratypes or their number.

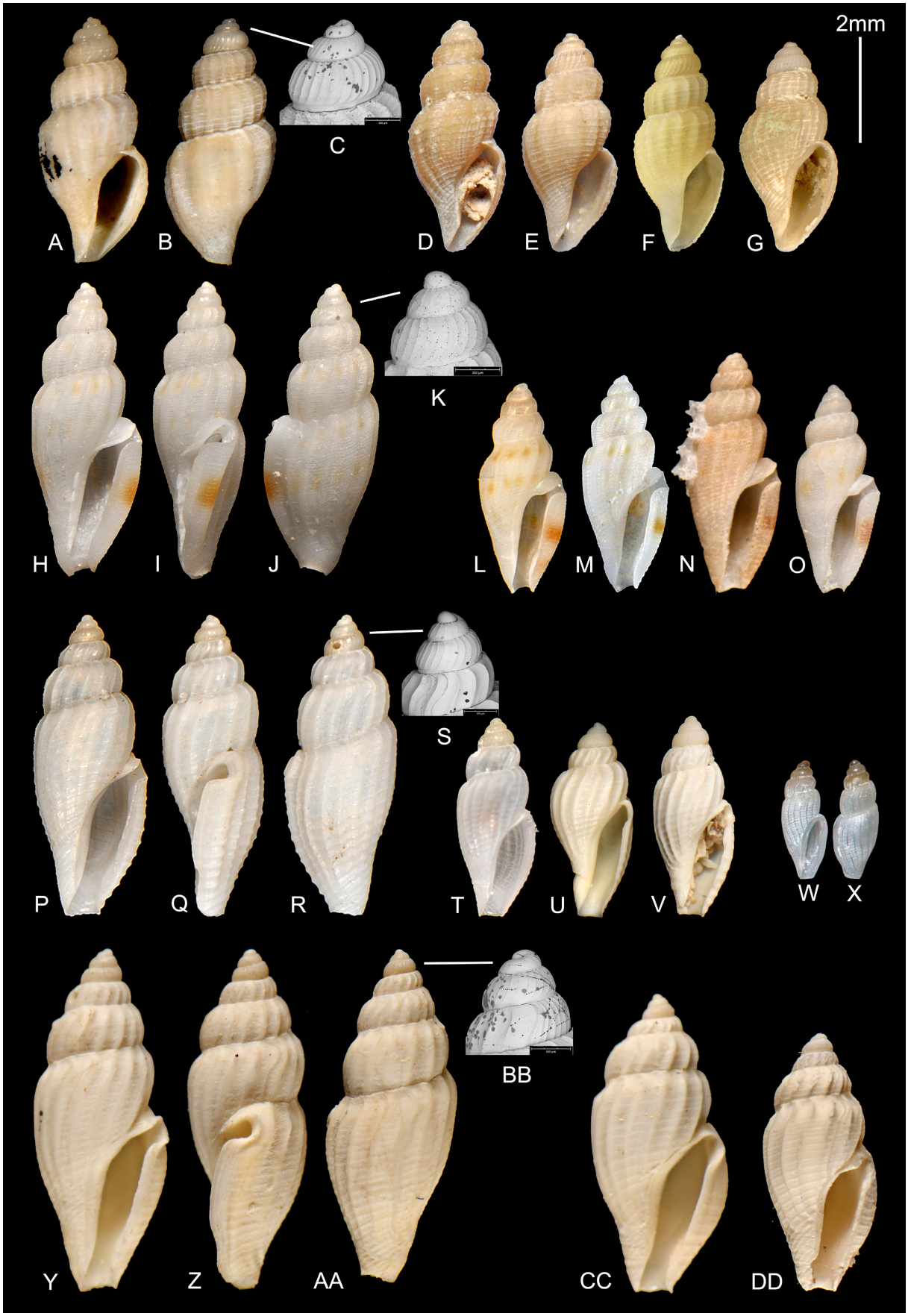
Description

The original description is in Espinosa *et al.* (2017: 7–8, pl. 2 figs a–b). Since specimens were not observed in this work, no further data on other specimens can be offered.

Remarks

Bactrocythara cubana Espinosa, Ortea & Moro, 2017 is exceptionally small for the genus, at only 60% of the height of a similarly mature specimen of the next smallest species, *B. brachytera* Fallon & Bouchet sp. nov. Nonetheless, it possesses all the characteristics of the genus: listed at the beginning of Part 1.

Fig. 23 (next page). Species of *Bactrocythara* Woodring, 1928. Part 2. – **A–G**. *Bactrocythara singularis* Fallon sp. nov. **A–C**. Holotype, 4.7 × 2.0 mm, ventral and dorsal views, and SEM of protoconch (ANSP 498799), SW of Sand Key, W of Key West. **D**. Paratype, 4.4 × 1.9 mm (UF 589682), Campeche Bay, Gulf of Mexico. **E**. Paratype, 4.1 × 1.8 mm (UF 589682), Campeche Bay, Gulf of Mexico. **F**. Paratype, 4.1 × 1.7 mm (FMNH 333976), Sand Key, Florida Keys. **G**. Paratype, 4.0 × 2.0 mm (ANSP 119261) 7 mi. [11 km] SE off Fowey Rocks Light, E Florida. – **H–O**. *Bactrocythara pruvosti* Fallon & Bouchet sp. nov. **H–K**. Holotype, 5.6 × 2.2 mm, ventral, lateral, dorsal views, and SEM of protoconch (MNHN-IM-2000-39518, ex D. Lamy coll.), S of La Désirade, Guadeloupe. **L**. Paratype, 4.0 × 1.7 mm (D. Lamy coll.), N of Grande-Terre, Guadeloupe. **M**. Paratype, 4.1 × 1.7 mm (D. Lamy coll.), S of La Désirade, Guadeloupe. **N–O**. Paratypes, 4.6 × 1.9 and 4.0 × 1.6 mm (D. Lamy coll.), S of La Désirade, Guadeloupe. – **P–V**. *Bactrocythara chordata* Fallon & Bouchet sp. nov. **P–S**. Holotype, 5.7 × 2.2 mm, ventral, lateral, dorsal, views and SEM of protoconch (MNHN-IM-2000-39516), N of Marie-Galante, Guadeloupe. **T**. Paratype, 3.8 × 1.5 mm (ANSP 498820), E of La Désirade, Guadeloupe. **U**. Paratype, 3.7 × 1.6 mm (MNHN-IM-2000-39864), E of La Désirade, Guadeloupe. **V**. Paratype, 3.8 × 1.7 mm (USNM 1715404), W of Marie-Galante, Guadeloupe. – **W–X**. *Bactrocythara cubana* Espinosa, Ortea & Moro, 2017, holotype, 2.25 × 0.43 mm (IES Havana), María la Gorda, Cuba. – **Y–DD**. *Bactrocythara floridensis* Fallon sp. nov. **Y–BB**. Holotype, 6.5 × 2.6 mm, ventral, lateral, dorsal views, and SEM of protoconch (ANSP 498797), off SW Florida, Gulf of Mexico. **CC**. Paratype, 5.7 × 2.8 mm (EFG 25318), off SW Florida, Gulf of Mexico. **DD**. Paratype, 4.9 × 2.2 mm (EFG 25295), off SW Florida, Gulf of Mexico. Credits: C, K, S, BB: SEM images courtesy of Krasimira "Kasey" Seizova and Paul Callomon; W–X: from Espinosa *et al.* (2017: pl. 2). Scale bars: A–B, D–J, L–R, T–AA, CC–DD = 2 mm; C, K, S, BB = 300 µm.


2mm
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Range and habitat

Cuba; depth not specified.

Bactrocythara floridensis Fallon sp. nov.
urn:lsid:zoobank.org:act:D688B9B4-BEDB-4116-B231-A6C2C673B3AC
Figs 21F, 23Y–DD

Differential diagnosis

Bactrocythara chordata Fallon & Bouchet sp. nov. has stronger, more widely spaced primary spirals. *Bactrocythara brachytera* Fallon & Bouchet sp. nov. is narrower, smaller and has a weaker varix. *Bactrocythara pruvosti* Fallon & Bouchet sp. nov. is narrower and has a different protoconch and shell surface microsculpture.

Etymology

Bactrocythara floridensis Fallon sp. nov. is named after the type locality, which is located off SW Florida, specifically at bathyal depths.

Type material

Holotype
UNITED STATES OF AMERICA • 6.5 × 2.6 mm; off SW Florida; 24°35.29′ N, 83°41.86′ W; depth 496–509 m; 6 Feb. 2004; E.F. García leg.; dredged from R/V *Pelican*; ex coll. EFG 25318A; ANSP 498797.

Paratypes (2 specs)
UNITED STATES OF AMERICA • 1 spec., 5.7 × 2.8 mm; off SW Florida; 24°35.29′ N, 83°41.86′ W; depth 496–509 m; 6 Feb. 2004; E.F. García leg.; dredged from R/V *Pelican*; EFG 25318B • 1 spec., 4.9 × 2.2 mm; off SW Florida, 27°51.79′ N, 84°59.82′ W; depth 308–323 m; 6 May 2004; E.F. García leg.; dredged from R/V *Pelican*; EFG 25295.

Description

Shell small (holotype length = 6.5 mm), stoutly fusiform (W/L = 0.4000), of 6¾ whorls altogether, spire shorter than body whorl, which is 72% of shell length including a short anterior canal, teleoconch whorls impressed and wider than tall; sculpture of numerous ribs crossed by well-spaced spiral; aperture narrow with a varicose lip and laterally directed spout-like anal sinus, and together with the anterior canal, about 51% of shell length. *Protoconch* trochoid, of 3 whorls, the first minute, then whorls rapidly expand, the last 2 whorls partially submerged with arched riblets. *Axial sculpture* of narrow ribs that run from suture to suture on spire whorls and fade on the anterior fasciole of the last, intercostal space about as wide as ribs, ribs slightly opisthocline, arched, and recurved on shoulder, 16 ribs on penultimate and 12 to varix on last. *Varix* an enlarged rib near the outer lip, extending from the suture to the anterior canal, forming a low, nearly flat arc, its edge crenated by primary spirals. *Spiral sculpture* of about 8 evenly spaced primaries on the penultimate whorl, very weak or absent on shoulder, and spirals on base also well-spaced, some with a single microscopic secondary between. *Sulcus* absent; recurved ribs on shoulder mark the past presence of the anal sinus. *Outer lip* varicose, with a narrow strip of shell at the base of the varix, extending from the anal fasciole to anterior canal; stromboid notch wide and shallow. *Anal sinus* a deep, round notch in front of the varix with a spout-like rim, directed laterally and joined to the suture by a strong parietal callus. *Inner lip* a thin glaze along the columella, margined, ending in a bridging parietal callus at the anal sinus. *Columella* is slightly sigmoid. *Anterior canal* short, straight, open, differentiated by a slight narrowing of the aperture, tip slightly notched. *Anterior fasciole* is not swollen, densely packed with about 12 oblique spirals. *Color* is off-white.

Range and habitat

United States (off SW Florida); depth 308–509 m.

Genus ***Bathyturris*** Fallon gen. nov.
urn:lsid:zoobank.org:act:E29F4810-68F0-4111-B511-FB8B0AF6BF2C

Type species

Bathyturris aurolineata Fallon & Bouchet gen. et sp. nov.

Diagnosis

Shell small (length usually less than 10 mm), fusiform with shouldered whorls and straight sides, body whorl greater than half the length of the shell. Protoconch trochoid with 3–3½ regularly expanding whorls, tip small, all but the first ½–1 whorl with crowded riblets, the last whorl bulging, with riblets that do not reach the suture abapically, usually with microscopic spikes along riblet crests. Teleoconch aperture narrowly oval, anterior canal short to medium length, unnotched. Outer lip weakly to strongly varicose, crest of varix crenated by primary spirals, with a narrow post-varicose lip on fully developed specimens; inner lips and inside outer lips without accessory teeth, denticles, or significant calluses. Anal sinus on shoulder adjacent to suture, wide, open, in front of or etched into varix. Sculpture usually reticulate, with narrow cord-like axial ribs overridden by strong primary spirals but weaker than axials, and fine spiral secondaries between. All spirals are frosted. Color is typically monochromatic, ranging from white to off-white, but some may exhibit light reddish-brown spiral bands or staining around the aperture and outer lip.

Etymology

Bathyturris Fallon gen. nov., the bathyal turris, gender feminine. Most species in this genus have been collected at bathyal depths (> 200 m).

Summary diagnostic characteristics

The combination of traits that separate this genus from all others is as follows:

Shell with shouldered whorls, angled or round, aperture narrowly oval, anterior canal short to moderately long.

Protoconch trochoid, of 3–3½ whorls, the first minute, the last whorl bulging, with riblets that abapically become strongly opisthocline and disappear before reaching the suture. Riblets typically have microscopic spikes on their crests, which are visible in SEM images.

Outer lip may be weakly varicose in some species and strongly so in others, and it is crenate.

Anal sinus on shoulder, wide and open and without an anal tooth on outer lip.

Sculpture of strong cord-like ribs and strong primary spirals in a reticulate pattern with frosted microscopic secondary spirals in intercalary space.

Shell surface microsculpture

SEM images of the shell surface of representative specimens appear in Fig. 24. The microsculpture or ‘frosting’, resulting from the intersection of secondary spirals and growth lines consists of compact upright microscopic fibril bundles, approximately round in diameter and flat-topped, or with loose fibrils at their tops, as seen in images of mostly 850× magnification. Spiral primaries are much stronger than secondaries and have multiple smaller bundles aligned tightly in rows on the surface of the primary, following growth lines that are perpendicular to or oblique to the primary’s axis, thus appearing as though wound around it. Microscopic granules are present throughout, densest in intercalary space.

Difference from other genera

Following are a few morphological differences of similar-appearing genera:

Rhomboturris Fallon gen. nov. differs in the absence of a frosted shell surface, absence of varices, in the presence of flattened spirals that are nodulose at rib intersections, not thread-like and frosted, and in having narrower apertures.

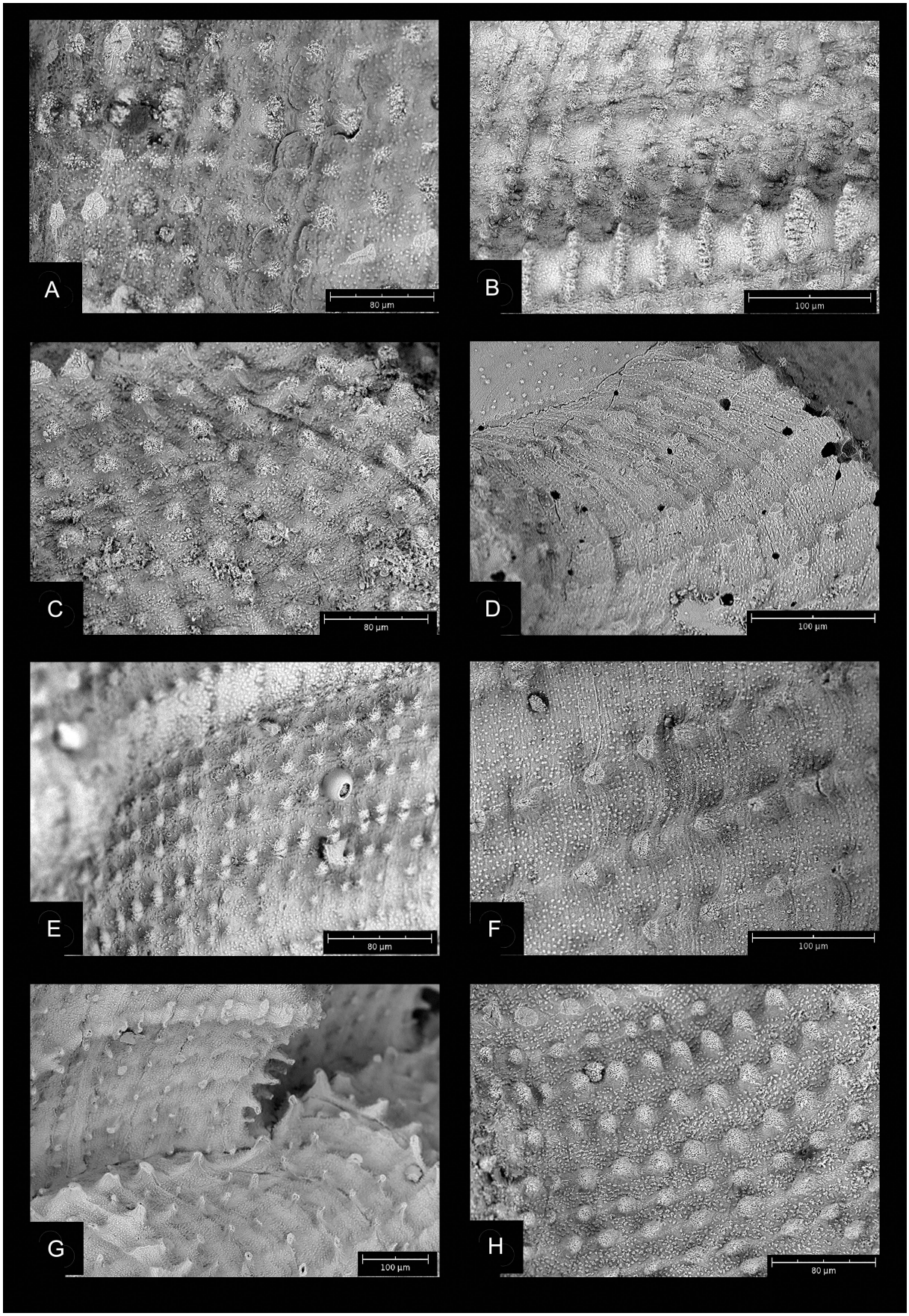
Pyrgocythara Woodring, 1928 shell surface microsculpture lacks upright, compact microscopic bundles of fibrils, but instead has microscopic nodules. Frosting is entirely lacking; consequently, the shell surface is smooth between primary spirals.

Cryoturris Woodring, 1928 has a plain outer lip and lacks a varix altogether. Whorls are angular or convex mid-whorl, not shouldered.

Acmaturris Woodring, 1928 has a protoconch with fewer whorls, up to only 2½ whorls, a narrower shell with a more distinct reticulate pattern formed by axial ribs and strong primary spirals, and usually with a brown spiral band rare in *Bathyturris* Fallon gen. nov.

Adelocythara Woodring, 1928 has an anal tooth inside the outer lip, absent in *Bathyturris*, and a smaller protoconch of about 1½ whorls.

Fig. 24 (next page). Species of *Bathyturris* Fallon gen. nov., shell surface microsculpture. SEM images 850× unless otherwise stated. **A**. *Bathyturris aurolineata* Fallon & Bouchet gen. et sp. nov., paratype, 9.4 × 3.9 mm (USNM 1715405), E of La Désirade, Guadeloupe. Structures are upright bundles, not well compacted, though evenly spaced along the secondary spirals. Spirals vary in strength. **B**. *Bathyturris aurolineata* Fallon & Bouchet gen. et sp. nov. Spec., 7.5 × 2.8 mm (E. García coll. #27792), off Alabama. The image shows the microsculpture of a primary spiral, or cord, with a compact row of fibrils that follow the obliquely crossing growth line. **C**. *Bathyturris deseada* Fallon & Bouchet gen. et sp. nov., holotype, 6.2 × 2.7 mm (MNHN-IM-2000-39530), E of La Désirade, Guadeloupe. Structures are moderately compact and vary in diameter according to the strength of the spiral. Spirals are not distinct and somewhat obscure. **D**. *Bathyturris clausa* Fallon & Bouchet gen. et sp. nov. SEM image 810×, paratype, 2.8 × 1.5 mm, juvenile (MNHN-IM-2000-39529), N of Grande-Terre, Guadeloupe. Secondary spirals run from the lower left to the upper right in this image, growth lines in the crosswise direction. Structures are tight, flat-topped bundles. **E**. *Bathyturris solata* Fallon gen. et sp. nov., holotype, 9.8 × 3.9 mm (MNHN-IM-2000-39539), S of La Désirade, Guadeloupe. Structures are loosely organized bundles with frayed fibril tops. **F**. *Bathyturris serga* (Dall, 1881) gen. et comb. nov. SEM image 800×. Spec., 7.5 × 3.0 mm (MNHN-IM-2000-39538), W of Basse-Terre, Guadeloupe. Structures are tightly bundled fibrils with flat tops, relatively even in diameter in this image. Structures are larger than similar ones seen in the image of *Bathyturris clausa* Fallon & Bouchet gen. et sp. nov. **G**. *Bathyturris bicarinata* Fallon & Bouchet gen. et sp. nov. SEM image 450×, holotype, 7.9 × 3.2 mm (MNHN-IM-2000-39525), E of La Désirade, Guadeloupe. Structures are tightly bundled fibrils but generally taller than other species imaged, taken at a lower magnification to emphasize this characteristic. Granules are present overall and are visible at higher magnification. **H**. *Bathyturris rhodostoma* Fallon & Bouchet gen. et sp. nov., paratype, 5.0 × 2.1 mm (ANSP 498783), S of La Désirade, Guadeloupe. Structures are compact bundles, round in diameter but with domed, not flat, tops. Spiral secondaries vary only slightly in strength. Credits: SEM images courtesy of Paul Callomon. Scale bars: A, C, E, H = 80 µm; B, D, F–G = 100 µm.


A
80 µm
B
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C
80 µm
D
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G
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80 µm

Bathyturris Fallon gen. nov. spp. Part 1

Bathyturris aurolineata Fallon & Bouchet gen. et sp. nov.
urn:lsid:zoobank.org:act:DCAF0D49-8E5B-4E9E-B497-796376D00F2D
Figs 24A–B, 25A–J

Differential diagnosis

Bathyturris bicarinata Fallon & Bouchet gen. et sp. nov. has 2, not 3, primaries on the penultimate whorl, and lacks the brown spiral primary and accompanying band or staining. *Bathyturris serga* (Dall, 1881) gen. et comb. nov. has a coarser sculpture with spikes at rib/spiral primary intersections, coarser spiral secondary frosting, a body whorl with a longer taper, and 2 (versus 3) primaries on spire whorls. It also lacks a mid-whorl primary. *Bathyturris deseada* Fallon & Bouchet gen. et sp. nov. is smaller, lacks the brown mid-whorl spiral primary, lacks the cord-like ribs, and lacks a brown protoconch.

Etymology

Bathyturris aurolineata Fallon & Bouchet gen. et sp. nov., from the feminine form of the Latin noun '*auro*' ('gold') + '*lineatus*' ('lined'), in this case, meaning the "gold-threaded" *Bathyturris*, a reference to the single dark primary spiral at the suture line.

Type material

Holotype
GUADELOUPE • 9.8 × 4.0 mm; E of St. François; depth 350 m; ex D. Lamy coll.; MNHN-IM-2000-39519.

Paratypes (29 specs)
GUADELOUPE • 1 spec., 9.2 × 4.0 mm; E of St. François; depth 350 m; D. Lamy coll. • 1 spec., 8.1 × 3.3 mm; N of Grande-Terre; 16°37′ N, 61°31′ W; depth 432–482 m; 14 Jun. 2015; KARUBENTHOS 2; stn DW4550; ANSP 498822 • 1 spec., 8.7 × 3.6 mm; E La Désirade; 16°21′ N, 60°56′ W; depth 300–370 m; 15 Jun. 2015; KARUBENTHOS 2; stn DW4554; MNHN-IM-2000-39522 • 2 specs, 8.2 × 3.4 and 6.9 × 3.0 mm; N of Grande-Terre; 16°38′ N, 61°37′ W; depth 413–423 m; 13 Jun. 2015; KARUBENTHOS 2; stn DW4544; MNHN-IM-2000-39524 • 1 spec., 8.5 × 3.5 mm; E of La Désirade; 16°25′ N, 60°50′ W; depth 278–446 m; 16 Jun. 2015; KARUBENTHOS 2; stn DW4561; MNHN-IM-2000-39521 • 1 spec., 10.0 × 4.0 mm; W of Marie-Galante; 15°48′ N, 61°26′ W; depth 304–310 m; 27 Jun. 2015; KARUBENTHOS 2; stn DW4634; MNHN-IM-2000-39863 • 1 spec., 9.8 × 4.0 mm; W of Marie-Galante; 15°48′ N, 61°28′ W; depth 379–428 m; 27 Jun. 2015; KARUBENTHOS 2; stn DW4630; MNHN-IM-2015-812 • 1 spec., 7.8 × 3.2 mm; N of Grande-Terre; 16°40′ N, 61°28′ W; depth 323–347 m; 12 Jun. 2015; KARUBENTHOS 2; stn DW4536; MNHN-IM-2000-39520 • 1 spec., 9.4 × 4.8 mm; E of La Désirade; 16°24′ N, 60°51′ W; depth 100–258 m; 15 Jun. 2015; KARUBENTHOS 2; stn DW4555; USNM 1715405 • 1 spec., 8.0 × 3.6 mm; N of Grande-Terre; 16°37′ N, 61°31′ W; depth 432–482 m; 14 Jun. 2015; KARUBENTHOS 2; stn DW4550; MNHN-IM-2000-39523 • 1 spec., 7.7 × 3.5 mm; S of La Désirade; depth 350 m; dredged; D. Lamy coll.

MEXICO • 5 specs, 6.3 × 2.6, 5.4 × 2.6, 4.9 × 2.2, 4.2 × 2.0, and 3.8 × 2.0 mm; Campeche; 20 51.16′ N, 92 26.28′ W; depth 93–94 m; 10 Jun. 2005; E.F. García leg.; dredged on granular sediment; UF 589746.

UNITED STATES OF AMERICA • 2 specs, 8.8 × 3.5 and 6.4 × 2.6 mm; off W Florida, Hillsborough Co., SW of Egmont Key; depth 366–421 m; D. Steger leg.; dredged; ANSP 306329 • 10 specs, (5 measured) 7.0 × 3.0, 8.9 × 3.5, 8.8 × 3.5, 7.7 × 2.9 and 6.8 × 2.8 mm; off Louisiana; 27°53.65′ N, 91°21.48′ W to 27°53.3′ N, 91°21.2′ W; depth 219–221 m; 17 May 2019; E.F. García leg. dredged in mud from R/V *Pelican*; E.F. García coll. 32418.

Other material examined (91 specs)

An additional 91 specimens from various collections were examined, 71 from off Guadeloupe, and 20 from the Gulf of Mexico.

Description

Shell small (holotype length = 8.7 mm, length to 9.9 mm), fusiform (W/L = 0.4082), translucent, of 8 turreted whorls, spire whorls flat-shouldered to slightly convex, last whorl sloped about 45° and about 62% of shell length. Aperture a narrow oval, barely differentiated from the anterior canal; both aperture and canal about 45% of shell length. *Protoconch* of 3¼ whorls, the first minute, protruding, then whorls expand regularly, approximately the last 2 whorls with fine arcuate riblets that end just short of the suture with 2 spiral rows of clusters of enlarged papillae crossing over riblets sub-medially near end of last whorl, spacing of riblets and their strength increasing toward end. Riblets have smaller microscopic papillae along their crests, visible in SEM images at 250×. *Axial sculpture* of strong, narrow cord-like ribs that run from suture-to-sure on spire whorls and to anterior fasciole on last. Ribs are recurved on whorl shoulders, straight on sides, and spaced more than twice their width. The apical view in Fig. 25C and E illustrates the cord-like nature of the ribs (well-rounded crests). *Varix* is apertural, extends from suture to anterior canal. Several of the preceding ribs appear to be earlier varices. *Spiral sculpture* of strong primaries, but weaker than axial ribs, 3 on penultimate and 6 on shell base to anterior fasciole that override ribs forming nodules on rib crests. Finely beaded, 6–9 microscopic secondaries lie between primaries, also overriding ribs; beading aligns along growth striae giving the appearance of microscopic axial spirals. *Sulcus* absent; recurved ribs on shoulder mark past positions of anal sinus. *Outer lip* varicose, edge of varix crenated by strong primary spirals; a thin strip of shell along the base of the varix extends from anal sinus to anterior canal; stromboid notch absent. *Anal sinus* a shallow, round notch the full width of the shoulder from suture to whorl periphery (first primary spiral). *Inner lip* a narrow, thin, unemarginate glaze along the columella and parietal wall. *Columella* weakly sigmoidal. *Anterior canal* is short, open, unnotched, slightly skewed to the right when viewed ventrally. *Anterior fasciole* is not swollen, with about 6 weak primary spirals with a few microscopic secondaries between them. *Color* off white translucent shell with a brown mid-whorl primary centered in a light brown band, or staining, and a brown-tiped protoconch.

Remarks

Shell base color varies from white to yellowish brown, mid-whorl band may be light reddish-brown to absent, but the brown spiral primary is rarely absent. The average length of 32 measured specimens is 7.8 mm (range = 3.8–10.0 mm). specimens from off the west coast of Florida have very light bands, and the brown banding or brown spiral cord may be absent.

Range and habitat

United States (W Florida, Louisiana, Mississippi, Alabama), Mexico (Campeche), Guadeloupe; depth 219–482 m; sub-fossil shells have been dredged at 800 m.

Bathyturris deseada Fallon & Bouchet gen. et sp. nov.
urn:lsid:zoobank.org:act:59712BD4-F90D-4386-833F-BC862994982D
Figs 24C, 25K–R

Differential diagnosis

Bathyturris bicarinata Fallon & Bouchet gen. et sp. nov. has 2, not 3 spiral primaries on the penultimate whorl. *Bathyturris rhodostoma* Fallon & Bouchet gen. et sp. nov. is similar, possessing 3 spiral primaries on the penultimate but differs in the brown staining on the columella and outer lip, which is lacking in

B. deseada Fallon & Bouchet gen. et sp. nov. *Bathyturris aurolineata* Fallon & Bouchet gen. et sp. nov. is larger and has a brown line and associated light brown band that are absent in *B. deseada.*

Etymology

Bathyturris deseada Fallon & Bouchet gen. et sp. nov., the Deseada *Bathyturris*, after the original Spanish name (La Deseada) given upon its discovery by Columbus in 1493, the first island sighted by Christopher Columbus on his second voyage. Name in apposition.

Type material

Holotype

GUADELOUPE • 6.2 × 2.7 mm; East of La Désirade; 16°25′ N, 60°52′ W; depth 185–250 m; 16 Jun. 2015; KARUBENTHOS 2; stn DW4560; MNHN-IM-2000-39530.

Paratypes (8 specs)

BAHAMAS • 1 spec., 3.9 × 1.9 mm; Grand Bahama Island, off Freeport; depth 290 m; T. Askew leg.; ANSP 372146.

GUADELOUPE • 1 spec., 4.3 × 2.1 mm; E of La Désirade; 16°21′ N, 60°53′ W; depth 79–165 m; 18 Jun. 2015; KARUBENTHOS 2; stn DW4575; MNHN-IM-2015-809 • 3 specs, 2.8 × 1.5, 3.4 × 1.7 and 4.4 × 2.0 mm; W of Marie-Galante; 16°00′ N, 61°23′ W; depth 204–251 m; 21 Jun. 2015; KARUBENTHOS 2; stn DW4586; USNM 1715420 • 1 spec., 3.8 × 1.8 mm; N of Grande-Terre; 16°27′ N, 61°35′ W; depth 275–292 m; 11 Jun. 2015; KARUBENTHOS 2; stn DW4530; MNHN-IM-2015-815 • 1 spec., 4.7 × 2.2 mm; S of La Désirade; depth 320 m; 2018; dredged; D. Lamy coll. • 1 spec., 5.2 × 2.4 mm; Marie-Galante; depth 250 m; 2018; dredged; D. Lamy coll.

Description

Shell small (holotype length = 6.2 mm), fusiform (W/L = 0.4355), 6¾ total whorls, the last 66% of shell length, sutures impressed and scalloped by axials; teleoconch whorl shoulders with about a 45° convex slope. Aperture oval, anterior canal short, delineated by a narrowing of the anterior portion of the shell. *Protoconch* of about 3¼–3½ whorls, tip minute, fragile, the first ½ whorl smooth, the remaining with arcuate riblets and the last bulging a little below midline, with a small gap between rib terminations and succeeding whorl's suture; protoconch lip well marked. Riblets have microscopic tubercles on their crests. *Axial sculpture* of round-crested ribs that run from suture to suture, slightly recurved on shoulder, and end at anterior fasciole on last whorl. Ribs spaced about as wide as their width, or greater on dorsum of last. *Varix* apertural, rib-like and larger than preceding rib, extends from suture to anterior fasciole. *Spiral sculpture* of primaries and microscopic secondaries, 3 primaries on penultimate, the first on shoulder edge marking whorl periphery, 2 more on the side of the whorl with 4–11 microscopic secondaries between primaries below periphery. Secondaries are finely beaded at intersection with growth increments. *Sulcus* absent; recurved ribs on shoulder mark previous positions of anal sinus. Microscopic spirals are present but not primaries. *Outer lip* with a strong varix; a thin strip of shell extends along the varix base from anal sinus to end of anterior canal; stromboid notch absent. *Anal sinus* is a shallow notch, sides divergent, adjacent to the suture, about as wide as the shoulder. *Inner lip* a narrow glaze margined along anterior canal, impressed on parietal wall, without calluses. *Columella* is slightly sigmoid. *Anterior canal* short, open, bent to the right when viewed ventrally, unnotched. *Anterior fasciole* not swollen, with 7 weak primaries. *Color* white.

Remarks

Color of examined specimens is uniformly white. specimens with a fully developed varix vary from about 2¾–4 teleoconch whorls. Larger individuals have a more pronounced anterior canal curvature. The average length of 17 measured specimens is 4.1 mm (range = 2.7–6.2 mm).

Range and habitat

Guadeloupe and Bahamas; depth 79–465 m.

Bathyturris clausa Fallon & Bouchet gen. et sp. nov.
urn:lsid:zoobank.org:act:08703BE1-8096-4EC4-B467-20E07C1F8DBB
Figs 24D, 25S–Z

Differential diagnosis

This species differs from most of its congeners in lacking lattice-like sculpture. *Bathyturris solata* Fallon gen. et sp. nov. also lacks a distinct lattice-like sculpture but is larger (length = 9.8 versus 6.85 mm), has fewer ribs (11 versus 13 on the penultimate), fewer spiral cords (4 versus 6 on the penultimate), and is a different color. *Bathyturris aurolineata* Fallon & Bouchet gen. et sp. nov. has fewer and weaker ribs, fewer primary spirals (3 versus 6 on the penultimate) and is larger.

Etymology

Bathyturris clausa Fallon & Bouchet gen. et sp. nov., derived from the feminine form of the Latin adjective '*clausus*', meaning 'closed', a reference to its lack of 'windows' or latticed sculpture.

Type material

Holotype

GUADELOUPE • 6.8 × 3.0 mm; N of Grande-Terre; 16°40′ N, 61°28′ W; depth 323–347 m; 12 Jun. 2015; KARUBENTHOS 2; stn DW4536; MNHN-IM-2000-39528.

Paratypes (2 specs)

GUADELOUPE • 1 spec., 2.8 × 1.5 mm juvenile; N of Grande-Terre; 16°31′ N, 61°32′ W; depth 268–306 m; 14 Jun. 2015; KARUBENTHOS 2; stn DW4546; MNHN-IM-2000-39529.

MEXICO • 1 spec., 5.5 × 2.4 mm; Gulf of Mexico, Campeche; 20°51.49′ N, 92°21.44′ W; depth 63–65 m; 10 Jun. 2005; E.F. García leg.; dredged in mud from R/V *Pelican*, ex E.F. García coll. 26602B; ANSP 498800.

Description

Shell small (holotype length = 6.85 mm), fusiform, moderately stout (W/L = 0.4380), of approximately 7⅛ round-shoulder whorls, sutures impressed, last whorl approximately 67% of shell length; aperture narrow, elongate, with a wide posterior anal notch, and a short anterior canal. *Protoconch* trochoid, of about 3¼ whorls, the first minute, protruding into center of shell axis, then whorls regularly expand, the last 2 with fine arcuate riblets that end shy of the succeeding whorl's suture leaving a narrow band; spacing of riblets and their strength increase toward the end. Riblets have microscopic tubercles along their crests. *Axial sculpture* of strong, cord-like ribs that run from suture to suture and to the anterior fasciole on the last whorl, 13 on the penultimate and 11 on the last whorl, are recurved on shoulder and straight on whorl sides. Ribs increase in strength with shell growth. *Varix* apertural, like an enlarged rib, recurved on shoulder. The penultimate rib and earlier ribs probably served as varices as evidenced by their excavated faces and traces of previous anal sinuses on the shoulders. *Spiral sculpture* of 5 or 6 primaries on the penultimate and 9 more on shell base to anterior fasciole, all with 2-4 intercalary secondaries, about 5 primaries on anterior fasciole with a single secondary between some; all override axials and are frosted at intersections with growth lines. *Sulcus* absent, but recurved ribs on the shoulder, which are slightly excavated on the forward side, mark past positions of the anal sinus. *Outer lip* varicose, with a narrow strip of shell at the base of the varix, its edge forms a continuous flat arc from the anal sinus to the anterior canal; without a stromboid notch. *Anal sinus* is a broad and shallow notch adjacent

to the suture and the width of the shoulder, round at its apex, which is partially etched in the varix. *Inner lip* a narrow glaze margined along anterior canal, impressed on parietal wall, without calluses. *Anterior canal* open, short, and hardly distinguishable from aperture, unnotched. *Anterior fasciole* not swollen, with 7 spiral cords. *Columella* slightly sigmoidal from the anal sinus to the anterior canal. *Color* dull white with a very faint golden brown band mid-whorl.

Remarks

The single adult specimen described here is distinctive enough from its congeners to merit description at this time.

Range and habitat

Campeche, Gulf of Mexico and Guadeloupe (N of Grande-Terre); depth 63–347 m.

Bathyturris solata Fallon gen. et sp. nov.
urn:lsid:zoobank.org:act:30FDF92B-A48A-4E96-BACB-5B38A2C98B24
Figs 24E, 25AA–FF

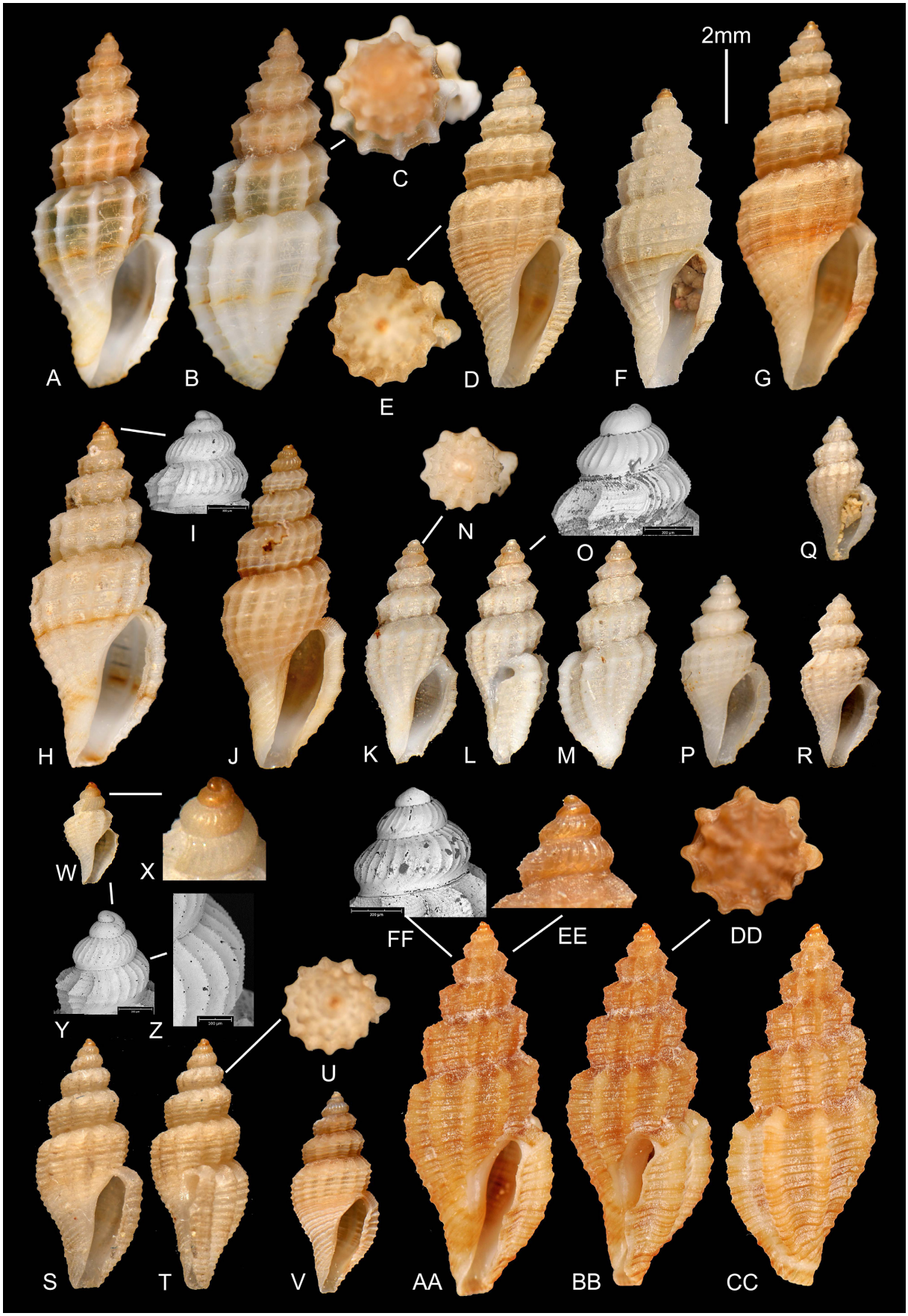
Differential diagnosis

This species is readily separated from its congeners by its burnt orange color, square shoulders, and alternating pattern of strong and weak spirals. It is closest to *Bathyturris aurolineata* Fallon & Bouchet gen. et sp. nov. but differs in possessing more angular shoulders, weaker primary spirals, and having a different coloration.

Etymology

Bathyturris solata Fallon gen. et sp. nov., from the feminine form of the Latin adjective '*solatus*', meaning 'sunburnt', the sunburnt *Bathyturris*, named for the color of the shell.

Fig. 25 (next page). Species of *Bathyturris* Fallon gen. nov. Part 1. – **A–J**. *Bathyturris aurolineata* Fallon & Bouchet gen. et sp. nov. **A–C**. Holotype, 9.8 × 4.0 mm, ventral, dorsal and apical views (MNHN-IM-2000-39519), E of St François, Guadeloupe. **D–E**. Paratype, 8.7 × 3.6 mm, ventral and apical views (MNHN-IM-2000-39522), E of La Désirade, Guadeloupe. **F**. Paratype, 8.1 × 3.3 mm (ANSP 498822), N of Grande-Terre, Guadeloupe. **G**. Paratype, 10.0 × 3.8 mm (MNHN-IM-2000-39863), W of Marie-Galante, Guadeloupe. **H–I**. Paratype, 9.4 × 3.9 mm, ventral view, and SEM of protoconch (USNM 1715405), E of La Désirade, Guadeloupe. **J**. Paratype, 8.8 × 3.5 mm (ANSP 306329), SW of Egmont Key, Hillsborough Co., W Florida. – **K–R**. *Bathyturris deseada* Fallon & Bouchet gen. et sp. nov. **K–O**. Holotype, 6.2 × 2.7 mm, ventral, lateral, dorsal and apical views, SEM of protoconch (MNHN-IM-2000-39530), E of La Désirade, Guadeloupe. **P**. Paratype, 5.2 × 2.4 mm (D. Lamy coll.), off Marie-Galante, Guadeloupe. **Q**. Paratype, 3.9 × 1.9 mm (ANSP 372146), off Freeport, Grand Bahama Island, Bahamas. **R**. Paratype, 4.7 × 2.2 mm (D. Lamy coll.), S of La Désirade, Guadeloupe. – **S–Z**. *Bathyturris clausa* Fallon & Bouchet gen. et sp. nov. **S–U**. Holotype, 6.8 × 3.0 mm, ventral, lateral, apical views, and SEM of protoconch (not to scale) (MNHN-IM-2000-39528), N of Grande-Terre, Guadeloupe. **V**. Paratype, 5.5 × 2.4 mm (E. García coll. #26602B), Campeche, Gulf of Mexico. **W–Z**. Paratype, 2.8 × 1.5 mm, juvenile, ventral and protoconch (not to scale) views, SEM of protoconch and enlarged view of riblets showing serrations on crests (MNHN-IM-2000-39529), N of Grande-Terre, Guadeloupe. – **AA–FF**. *Bathyturris solata* Fallon gen. et sp. nov., holotype, 9.8 × 3.9 mm, ventral, lateral, dorsal and apical views, photographic views of protoconch (not to scale), and SEM image of protoconch (MNHN-IM-2000-39539), S of La Désirade, Guadeloupe. Credits: SEM images of protoconchs courtesy of Paul Callomon. Scale bars: A–H, J–N, P–X, AA–EE = 2 mm; I, O, Y, FF = 300 µm; Z = 100 µm.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Type material

Holotype

GUADELOUPE • 9.8 × 3.9 mm; S of La Désirade; depth 250 m; ex D. Lamy coll.; MNHN-IM-2000-39539.

Paratypes

None.

Description

Shell small (holotype length = 9.8 mm), fusiform (W/L = 0.3980), 8 whorls, teleoconch whorls turreted, including the last, which is 64% of shell length, including the short canal. Aperture narrowly oval, about 47% of shell length including canal, and is delineated from the canal by a bend in the columella, which angles to the left, viewed ventrally. *Protoconch* trochoid, of 3¼ regularly expanding whorls, tip minute, fragile, protruding, the first 1¼ whorls smooth, the last 2 bulging, with arcuate riblets that run short of the suture, leaving a narrow, smooth supra-sutural band. Riblets have microscopic tubercles along their crests. *Axial sculpture* of cord-like ribs from suture to suture on spire whorls, to anterior fasciole on last. Ribs slightly recurved on shoulder, sharply angled at shoulder edge, and end at the anterior fasciole on last whorl. Ribs number 11 on penultimate and 8 to varix on last whorl, intercostal space a little wider than ribs but increases toward lip. *Varix* apertural, rib-like but stronger than preceding rib, extends from suture to anterior fasciole at end of anterior canal; recurved and face slightly excavated behind anal sinus. *Spiral sculpture* of primaries and secondaries; a paired primary straddle the shoulder angle, followed by 3 primaries with a centrally located slightly weaker primary between them on the penultimate whorl, 7 in the same pattern on shell base, Fewer microscopic secondaries fill the intercalary space advancing anteriorly. Primaries and microscopic secondaries, frosted by growth striae, override ribs, the primaries also forming elongate nodules along the crests of ribs, the largest at the shoulder angle. *Sulcus* absent; ribs on shoulder slightly recurved mark past positions of anal sinus. Microscopic spirals fill the space from the suture to the first cord at the shoulder angle. *Outer lip* varicose, with a short extension of shell at varix base that extends from anal sinus to end of anterior canal; stromboid notch absent. *Anal sinus* a notch adjacent to the suture, as wide as the shoulder; varix slightly excavated behind. Two earlier ribs have similar excavations and thus indicating service as earlier varices. *Inner lip* a narrow glaze margined along anterior canal, impressed on parietal wall, without calluses. *Columella* is slightly sigmoid. *Anterior canal* short, straight, unnotched. *Anterior fasciole* is not swollen, with 6 weak spiral primaries without secondaries. *Color* a uniform burnt orange with a darker band on shoulder in intercostal spaces and darker spiral cords.

Remarks

This species appears to be unique because of its pattern of spirals, so its description is warranted from the single available specimen.

Range and habitat

Known only from the type locality.

***Bathyturris* Fallon gen. nov. spp. Part 2**

Bathyturris corallina (R.B. Watson, 1881) gen. et comb. nov.
Fig. 26A–D

Pleurotoma (*Mangelia*) *corallina* R.B. Watson, 1881: 435–436, not figured.

Pleurotoma (*Mangelia*) *corallina* – R.B. Watson 1886: pl. 23 fig. 1a–d.
Kurtziella cf. *corallina* – Rios 1975: 138; pl. 41 fig. 630.
Cryoturris corallina – Sander & Lalli 1982: 317.
Kurtziella corallina – Rios 1985: 145, pl. 49 fig. 675 (Watson's fig.). This taxon does not appear in Rios (1994, 2009).

non *Pleurotoma serga* Dall, 1881 – Dautzenberg & Fischer 1896: 417–418, pl. 17 fig. 9 (likely misidentification). — Dautzenberg 1927: 40, pl. 2 fig. 2 (likely misidentification).
non *Mangilia serga* (Dall, 1881) – Locard 1897: 233, pl. 11 figs 13–14 (likely misidentification). — Bouchet & Warén 1980: 30, figs 42, 80, 214 (likely misidentification). — Poppe & Goto 1991: 171, pl. 1 fig. 19 (likely misidentification).
non *Kurtziella serga* (Dall, 1881) – Gofas *et al.* 2021: 19, 65, 68, fig. 27a–b (likely misidentification).
non *Raphitoma nuperrima* var. *corallinoides* and var. *pseudoacanthodes* Sturany, 1896: 63: 1–36, pls 1–2 (likely misidentifications).
non *Mangilia serga* var. *longa* Locard, 1897: 233, pl. 11 figs 7–12 (likely a misidentification).

Differential diagnosis

Watson (1881: 435–436) compared *Bathyturris corallina* (R.B. Watson, 1881) gen. et comb. nov. to *Pleurotoma* (*Mangelia*) *acanthodes* R.B. Watson, 1881 [= *Bathyturris serga* (Dall, 1881) gen. et comb. nov.], stating that the latter species is taller and narrower and is not as square in outline and ribbing. *Bathyturris corallina* also has a different protoconch, 4 not 3 whorls, and appears, from the photograph, to lack a mid-whorl keel of swellings, or paddles, on the last whorl, and lacks a narrow supra-sutural band where riblets are obsolete.

Type material

Holotype
U.S. VIRGIN ISLANDS • 8.1 × 3.3 mm; North of Culebra Island; 18° 38.5′ N, 65° 5.5′ W; depth 702 m; 25 Mar. 1873; Challenger stn 24; pteropod ooze; NHMUK 1887.2.9.1061.

Paratypes
None known.

Material examined (2 specs)

A photograph of the type provided by the NHMUK and an SEM image of the protoconch by V.O. Maes held at the ANSP were examined. Information about the latter is:

UNITED STATES OF AMERICA • 1 spec.; Gulf of Mexico, off Tampa Bay Florida; depth 1500 ft [457 m]; dredged; ex C.L. Richardson coll.; ANSP 335422.

Description

The original description is in Watson (1881: 435–436). This summary description is based on Watson's original and on the photograph provided by the NHMUK. *Shell* small (length = 8.1 mm), fusiform, of about 8 whorls in all, the last is 63% of shell length. Whorls squarish, keeled by a strong spiral, with flat

shoulders sloped about 45°; surface sculpted with narrow ribs and spirals of varying strengths; aperture narrow, with a shallow anal sinus and tapering to a short anterior canal, aperture and canal together about 49% of shell length. *Protoconch* trochoid, of 4 rounded, slightly depressed whorls, the last two or so ribbed. *Axial sculpture* of narrow cord-like ribs that run from suture to suture, lower and curved on the shoulder, strongest at the periphery, and evanescent on the shell base. Whorls with about 13 ribs, with an intercostal distance about 3× their width. *Varix* absent; the last rib serves as a varix and runs from the anal sinus to the anterior canal. *Spiral sculpture* of strong primaries and fine secondaries frosted at their intersections with growth lines. The strongest primary is at whorl periphery/edge of shoulder, followed by one just above suture (none on shoulder), then 4 on shell base. About 10-11 secondaries of varying strengths are on the shoulder, 8 between the shoulder edge and first strong primary on whorl side, and 3 or 4 between subsequent primaries on shell base. Tubercles are formed where spirals cross ribs. *Sulcus* absent; recurved ribs on the shoulder mark the previous locations of the anal sinus. *Outer lip* bears a rib that serves as a varix, with a thin strip of shell beyond; teeth and calluses are absent. *Anal sinus* is shallow, round, nearly as wide as the shoulder. *Inner lip* a thin, narrow glaze on the upper (adapical) portion of the columella; callus absent. *Anterior fasciole* not swollen, with 6 fine secondaries. *Columella* is slightly sigmoid. *Anterior canal* slightly oblique to shell axis, not well differentiated from the aperture, short, unnotched. *Color* white.

Range and habitat

European records, as reported by the authors listed above, are likely of this species. Western Atlantic occurrences include Puerto Rico and United States (off Tampa Bay, W Florida); depth 457–702 m. Reported by Sander & Lalli (1982) from off Barbados; depth 225 m.

Bathyturris serga (Dall, 1881) gen. et comb. nov.
Figs 24F, 26E–K

Pleurotoma (*Drillia*) *serga* Dall, 1881 (Aug.): 65–66.
Pleurotoma (*Mangelia*) *acanthodes* R.B. Watson, 1881: 433–435 [Oct.] is a synonym according to Dall (1889a: 114). Type locality is Challenger stn 56, depth 1935 m. Syntypes are in NHMUK 1887.2.9.1059 and 1887.2.9.1060.
Mangilia serga var. *longa* Locard 1897: 233, pl. 11 figs 7–12 (synonym according to Bouchet & Warén 1980: 30).

Drillia serga – Tryon 1884: 213.
Mangilia acanthodes – Tryon 1884: 249.
Pleurotoma (*Drillia*) *serga* – Dall 1885: 239.
Pleurotoma (*Mangelia*) *acanthodes* – Watson 1886 342: pl. 23 fig. 3a–d.
Mangilia serga – Dall 1889a: 113–114; 1889b: 102–103, pl. 9 fig. 4.
Mangelia serga – Peile 1926: 84. — Johnson 1934: 142.
Mangelia acanthodes– Peile 1926: 84.
Kurtziella serga – Abbott 1974: 281, fig. 3247 (Dall's fig.) – Vokes & Vokes 1983: 58, pl. 21 fig. 18 (Dall's fig.). — Robinson & Montoya 1987: 391. — Espinosa *et al.* 1995: 44. — García & Lee 2002: 12. — Williams 2005: #5656. — García 2007: 8.
Kurtziella acanthodes – Rios 1975: 137, pl. 41 fig. 629.
Cryoturris serga – Rios 1985: 144, pl. 49 fig. 674 (Dall's fig.). — Odé 1992a: 60. — Diaz & Puyana 1994: 230, pl. 68 fig. 911. — Absalão *et al.* 2005: 31, fig. 73.

Differential diagnosis

Bathyturris bicarinata Fallon & Bouchet gen. et sp. nov. protoconch does not possess well defined paddle-like projections on the periphery of the last whorl; the teleoconch nodules on the crests of ribs are more elongate, not points, there are more intercalary spirals (6–9 versus 3–4 on penultimate whorl), and finer frosting overall.

Bathyturris corallina (R.B. Watson, 1881) gen. et comb. nov. protoconch lacks peripheral paddles and has 4, not 3 whorls, and the pattern of primary spirals on the teleoconch differs, as do other more minor differences.

Bathyturris rhodostoma Fallon & Bouchet gen. et sp. nov. is smaller and has reddish-brown staining on the outer and inner lips.

Type material

Holotype

May have been lost (Bouchet & Warén 1980: 30; Tippett's research notes of 30 Sep. 1993). Since no photograph of the type is known to exist, the illustration in Dall (1886: pl. 9 fig. 4) is used to represent the type (Fig. 26E).

CUBA • ca 9.0 × 3.3 mm; between Cuba and Florida, bed of the Gulf Stream; depth 447 fms [817 m]; MCZ 7128.

Paratypes

None known.

Material examined (96 specs)

Approximately 96 specimens were examined from MNHN Guadeloupe samples; 58 specimens in 12 of the lots are listed below.

GUADELOUPE • 8 specs; W of Basse-Terre; 16°13′ N, 61°54′ W; depth 409–532 m; 8 Jun. 2015; KARUBENTHOS 2; stn CP4512; MNHN-IM-2000-39537 • 3 specs; W of Basse-Terre; 16°13′ N,61°54′ W; depth 406–644 m; 8 Jun. 2015; KARUBENTHOS 2; stn CP4513; MNHN-IM-2012-35788 • 1 spec.; W of Basse-Terre; 16°13′ N, 61°51′ W; depth 749–768 m; 8 Jun. 2015; KARUBENTHOS 2; stn CP4516; MNHN-IM-2012-35794 • 2 specs; N Grande-Terre; 16°37′ N, 61°47′ W; depth 650–716 m; 9 Jun. 2015; KARUBENTHOS 2; stn CP4522; MNHN-IM-2000-39536 • 1 spec.; W of Basse-Terre; 16°13′ N, 61°52′ W; depth 700–750 m; 7 Jun. 2015; KARUBENTHOS 2; stn DW4507; MNHN-IM-2012-35805 • 22 specs; W of Basse-Terre; 16°12′ N, 61°51′ W; depth 792–800 m; 8 Jun. 2015; KARUBENTHOS 2; stn DW4514; MNHN-IM-2012-35806 • 1 spec.; W of Basse-Terre; 16°13′ N, 61°51′ W; depth 761–768 m; 8 Jun. 2015; KARUBENTHOS 2; stn DW4515; MNHN-IM-2000-39534 • 2 specs; N of Grande-Terre; 16°34′ N, 61°37′ W; depth 426–441 m; 9 Jun. 2015; KARUBENTHOS 2; stn DW4518; MNHN-IM-2012-35804 • 4 specs; N of Grande-Terre; 16°29′ N, 61°42′ W; depth 527–548 m; 10 Jun. 2015; KARUBENTHOS 2; stn DW4523; MNHN-IM-2000-39538 • 1 spec.; N of Grande-Terre; 16°38′ N, 61°35′ W; depth 343–402 m; 14 Jun. 2015; KARUBENTHOS 2; stn DW4549; MNHN-IM-2012-35802 • 2 specs; E of La Désirade; 16°25′ N, 60°47′ W; depth 549–677 m; 16 Jun. 2015; KARUBENTHOS 2; stn DW4562; MNHN-IM-2012-35800 • 11 specs; N of Marie-Galante; 16°03′ N, 61°21′ W; depth 519–614 m; 21 Jun. 2015; KARUBENTHOS 2; stn DW4585 MNHN-IM-2000-39535.

Description

The type was unavailable, so this re-description is based partially on Dall's description and examination of specimens identified as this species. *Shell* small (type length = 9.0 mm), fusiform (W/L = 0.3611), 8 whorls, teleoconch with steeply sloping flat shoulders and impressed sutures, the last whorl is 61% of shell length. Aperture is narrow, sides are nearly parallel, and a short anterior canal is barely differentiated from the canal, about 43% of shell length. *Protoconch* of about 3 whorls, the third developed with a mid-whorl bulge, riblets begin on the second whorl and are modified, paddle-like, on the periphery of the third, riblets are absent below the bulge of the third whorl. *Axial sculpture* of 8–12 slightly opisthocline ribs that run from suture to suture on spire whorls, evanesce at the anterior fasciole on last, and are recurved on whorl shoulders. *Spiral sculpture* of 2 primary spirals on spire whorls and 9 on the last, 4 on the shell base, 5 on the anterior canal. The adapical spiral marks the whorl periphery; primary spirals produce sharp points where they intersect axials. Microscopic spirals (3 or 4) lie between primary spirals, which are granulated at intersections with growth striae. *Outer lip* is thin, except where the edge coincides with a rib, without a varix. *Anal sinus* a shallow round notch as wide as shoulder. *Inner lip* has a narrow glaze, margined along anterior canal, and impressed on parietal wall, without calluses. *Anterior canal* is short, open, slightly recurved, end unnotched. *Color* yellowish white.

Remarks

Dall (1881) stated that the thin lip of his type specimen would probably be "thickened in a perfectly mature adult". None of the 96 specimens (length up to 9.5 mm) had well-developed varices. The outermost rib, usually the strongest, serves as a varix. Dall also described the protoconch as having 2½ whorls; however, intact specimens examined here and identified as this species have 3 whorls, and furthermore, riblets have paddle-like swellings at the periphery of the whorl.

Approximately 96 specimens from the deep-water samples collected around Guadeloupe have been identified as Dall's (1881) species (compare Fig. 26E with Fig. 26F–K) based on their match to the teleoconch of Dall's drawing. The protoconch, as stated by Dall, has "transverse wrinkles on the periphery of the second whorl", here interpreted as the riblets on the periphery of the bulge of the last whorl, which is typical of the *Bathyturris* protoconch, and riblets that do not extend to the suture. Also matching Dall's description are 2 primary spirals on spire whorls, and 9 on the last whorl, all having "sharp points where they cross the ribs". Based on Dall's (1881) description and drawing, the specimens identified here as *Bathyturris serga* gen. et comb. nov. are believed to be correctly identified as such.

Historically, *Pleurotoma* (*Drillia*) *serga* Dall, 1881 has been assigned to several genera. Bouchet & Warén (1980: 30) placed it in *Mangelia*, as did Peile (1926: 84); Abbott and other authors placed it in *Kurtziella* (Abbott 1974: 281; Rios 1985: 140; Odé 1992a; Diaz & Puyana 1994), and Robinson & Montoya (1987) placed it in *Cryoturris.*

Bathyturris serga (Dall, 1881) gen. et comb. nov. exhibits all the diagnostic features of the genus listed at the beginning of Part 1. The protoconch sculpture and the complete absence of a varix, however, resemble members of the genus *Cryoturris*, which also have paddle-like swellings on the periphery of the third whorl and lack a varix. Despite this difference, *Pleurotoma* (*Drillia*) *serga* is best assigned to *Bathyturris* Fallon gen. nov. based on its microsculpture and prominent spiral primaries, which more closely resemble members of this genus group.

Range and habitat

Guadeloupe; depth 343–800 m.

Bathyturris bicarinata Fallon & Bouchet gen. et sp. nov.
urn:lsid:zoobank.org:act:B9B09C66-427B-40AB-98AF-4FF38284B0B8
Figs 24G, 26L–V

Differential diagnosis

Cryoturris citronella (Dall, 1886) is like *Bathyturris bicarinata* Fallon & Bouchet gen. et sp. nov. but Dall's single type has been missing since at least August of 1977, so it was not possible to make a direct comparison. In his description of the species, Dall (1889a: 112) states that it has 4 protoconch whorls, the first a minute brown protruding nucleus followed by 3 trochoid whorls, and the shell is a brilliant yellow. The specimen in Dall's illustration has reticulate sculpture, with two spiral chords on spire whorls, just as in *B. bicarinata*, but the shell lacks a varix, as noted by Dall. *B. bicarinata* differs from Dall's description of *C. citronella* in a few respects: it has a white, not a brown protoconch and is not protruding, it possesses a varix, stated to be absent in Dall's description, but common in specimens of *B. bicarinata* described here that are of similar size as the specimen in Dall's drawing, and only white specimens have been observed, not yellow as stated by Dall.

Bathyturris serga (Dall, 1881) gen. et comb. nov. differs in the following respects: it has fewer intercalary spirals (3 or 4 versus 6–9 on penultimate whorl); it has coarser spirals and frosting overall; it lacks a varix, and as such has nearly straight, not appreciably recurved axials on whorl shoulders (the varix of *B. bicarinata* Fallon & Bouchet gen. et sp. nov. curves around the rear of the anal sinus, creating a stronger, rounder rib), it has narrower ribs, and sharper spikes at primary spiral/rib intersections.

Bathyturris corallina (R.B. Watson, 1881) gen. et comb. nov. has flat, not convex whorl sides, a protoconch that lacks the third whorl supra-sutural band, and a different pattern of spirals.

From its other congeners, *B. bicarinata* Fallon & Bouchet gen. et sp. nov. differs in possessing two, not three or more, spiral cords on the penultimate whorl of the teleoconch.

Etymology

Bathyturris bicarinata Fallon & Bouchet gen. et sp. nov., the two-carina *Bathyturris*, from the Latin adjective '*bi* + *carina*', meaning 'two-keeled', a reference to the two primary spirals on spire whorls.

Type material

Holotype
GUADELOUPE • 7.9 × 3.2 mm; E of La Désirade; 16°19′ N, 61°00′ W; depth 286–343 m; 17 Jun. 2015; KARUBENTHOS 2; stn DW4570; MNHN-IM-2000-39525.

Paratypes (14 specs)
GUADELOUPE • 1 spec., 6.2 × 2.8 mm; E of La Désirade; 16°19′ N, 61°00′ W; depth 286–343 m; 17 Jun. 2015; KARUBENTHOS 2; stn DW4570; MNHN-IM-2000-39526 • 1 spec., 7.1 × 2.8 mm; E of La Désirade; 16°19′ N, 60°55′ W; depth 396–399 m; 17 Jun. 2015; KARUBENTHOS 2; stn DW4572; MNHN-IM-2000-39527 • 2 specs, 9.6 × 3.6 and 8.6 × 3.4 mm; N of Grande-Terre; 16°38′ N, 61°31′ W; depth 495–570 m; 12 Jun. 2015; KARUBENTHOS 2; stn DW4537; USNM 1715419 • 1 spec., 5.6 × 2.5 mm; N of Grande-Terre; 16°38′ N, 61°37′ W; depth 413–423 m; 13 Jun. 2015; KARUBENTHOS 2; stn DW4544; USNM 1715406 • 1 spec., 6.9 × 2.9 mm; N of Grande-Terre; 16°34' N, 61°37' W; depth 426–441 m; 9 Jun. 2015; KARUBENTHOS 2; stn DW4518; MNHN-IM-2000-39865 • 2 specs, 7.1 × 2.9 and 6.4 × 2.9 mm; S of La Désirade; depth 250 m; dredged; D. Lamy coll. • 2 specs, 6.1 × 2.8 and 6.4 × 2.9 mm; Banc de Vaisseaux; depth 300 m; dredged; D. Lamy coll. • 4 specs, 6.5 × 3.0, 6.5 × 3.0, 6.6 × 3.0 and 6.4 × 2.9 mm; off Marie-Galante; depth 250 m; 2017; dredged; ANSP 498781.

Other material examined (137 specs)

An additional 137 specimens were examined, all from various locations around Guadeloupe.

Description

Shell small (holotype length = 7.9 mm, measured specimen lengths to 9.6 mm), fusiform (W/L = 0.4051), with 7⅝ convex whorls, teleoconch with sloping, convex shoulders and deeply impressed sutures, the last whorl 63% of shell length, sculpture clathrate with a frosted microsculpture. Aperture narrowly oval with a short anterior canal barely distinguishable from the aperture (aperture and canal about 48% of shell length). *Protoconch* of approximately 3¼ regularly expanding whorls, tip minute, first ½ whorl smooth, remaining whorls with riblets fine at first but strengthening with the increasing size of the whorls; last 2 whorls bulge a little below mid-whorl, and on the last whorl riblets hook under the bulge then terminate before the succeeding suture, leaving a smooth supra-sutural band. Riblets have microscopic tubercles on their crests. The supra-sutural band has 2 very fine frosted secondaries visible on fresh specimens. *Axial sculpture* of strong, narrow ribs, widely spaced, runs from suture to suture on spire whorls, evanesce prior to the anterior fasciole of the last, and are recurved on whorl shoulders. Ribs number 15 on the penult and 10 on the last whorl to the varix. *Varix* near aperture, stronger than preceding ribs, cord-like, and extends from suture to anterior fasciole, its crest frilled by the spiral cords. The varix is curved and slightly excavated on its face behind the anal sinus. *Spiral sculpture* of 2 primary spirals on spire whorls, the adapical one marks the whorl periphery; spirals produce elongated nodules where they intersect axials. A varying number (5-9) of microscopic secondaries between primaries. Primaries are segmented, and microscopic secondaries are frosted on intersections with growth striae. *Sulcus* absent; recurved and excavated on leading side of ribs (varix and some preceding ribs), mark of the past presence of the anal sinus. *Outer lip* is varicose, with a narrow strip of shell at the base of the varix extending from the anal sinus to the end of the anterior canal, narrowing anteriorly. *Stromboid notch* absent. *Anal sinus* is a wide, rounded notch in the outer lip in front of the varix, as wide as the shoulder, spanning from the suture to the periphery of the whorl. *Inner lip* has a narrow glaze. margined along anterior canal, and impressed on parietal wall, without calluses. *Columella* slightly sigmoid. *Anterior canal* short, open, only a little narrower than the aperture, unnotched. *Anterior fasciole* not swollen, with 6 weak oblique spirals. *Color* off white.

Remarks

The average length of 27 = 6.6 mm (range = 5.5–9.6 mm).

Range and habitat

Off Guadeloupe; depth 79–570 m.

Bathyturris citronella (Dall, 1886) gen. et comb. nov.
Fig. 26W

Pleurotoma (*Mangilia*) *citronella* Dall, 1886: pl. 9 fig. 5.
Cryoturris cruzana Nowell-Usticke 1969: 29, pl. 6 fig. 1204 (later synonymized by Nowell-Usticke 1971: 26). The holotype, by monotypy (ICZN Art. 73.1.2.), according to Boyko & Cordeiro (2001: 51), is in AMNH 192518; the type locality is St. Croix, U. S. Virgin Islands.

Mangilia citronella – Dall 1889a: 112, original text description; 1889b: 102–103, pl. 9 fig. 5.
Pleurotoma (*Mangilia*) *citronella* – Tucker 2004: 208.
Cryoturris citronella – Porter 1974: 248. — Abbott 1974: 280, fig. 3233 (Dall's fig.). — Turgeon *et al*. 1988: 96. — Odé 1992a: 61. — Rios 1994: 173, pl. 58 [sic = 57] fig. 794. — Espinosa *et al.* 1995: 44. — Shelton 1997: 14. — Absalão *et al.* 2005: 31, fig. 75. — Dutra *et al.* 2005: 132.
Kurtziella citronella – Turgeon *et al.* 1998: 107, 263. — García 2007: 8.

non *Kurtziella citronella* – Kaicher 1984: card 3889 (possibly *Bathyturris aurolineata* Fallon & Bouchet gen. et sp. nov.). — Williams 2005: #5655 (= Kaicher's photo).

Differential diagnosis

Bathyturris bicarinata Fallon & Bouchet gen. et sp. nov. is very similar in overall appearance and may be found to be conspecific if a full examination of Dall's type were possible. Some differences based on Dall's description are explained in the Identification section of *B. bicarinata* above. species descriptions generally have subjective elements, i.e., Dall's reference to a fourth larval whorl (see his description quoted below). Are we to conclude that the protoconch of *B. citronella* (Dall, 1886) gen. et comb. nov. has 4 full whorls? Or do the 3¼ regularly expanding whorls of *B. bicarinata* about the same if the last ¼-whorl (part of the teleoconch) is considered the fourth whorl? Another observation of Dall's species is the shape of spire whorl sides. Dall's fig. 9 shows flat-sided whorls, whereas those of *B. bicarinata* angle into the abapical suture. Is the drawing an accurate depiction of the original? So, since the range of examined specimens of *B. bicarinata* is more southerly (Guadeloupe) and depth of habitat likely greater (79–570 m, average 350 m), it is likely that they are separate species.

Type material

Holotype

Missing since August 1977 (note in specimen tray).

ANGUILLA • 6.25 × 4.25 mm; off Sombrero Island; depth 70 fms [128 m]; USNM 87423.

Paratypes

None known.

Other material examined

None.

Description

According to Dall (1889a: 112): "*M. citronella* has a very minute brown protruding nucleus followed by three trochoid larval whorls; a spire markedly shorter than the last whorl, with inflated whorls; twelve riblets, no varix, and a very faint sutural notch, while the suture is distinct and not appressed. The four larval whorls are prettily marked with transverse concave ripples."

Range and habitat

None of the cited occurrences of *B. citronella* (Dall, 1886) gen. et comb. nov. in the literature could be confirmed.

Sombrero Island (Anguilla, the type locality); depth 128 m.

Bathyturris rhodostoma Fallon & Bouchet gen. et sp. nov.
urn:lsid:zoobank.org:act:F54370C8-35E6-48F4-829F-9D788F8360DC
Figs 24H, 26X–EE

Differential diagnosis

This species resembles *Bathyturris bicarinata* Fallon & Bouchet gen. et sp. nov., which has a similar protoconch but only 2 primary spirals on spire whorls. *Bathyturris aurolineata* Fallon & Bouchet gen. et sp. nov. has three major spirals per spire whorl but a different (smaller) protoconch.

Etymology

Bathyturris rhodostoma Fallon & Bouchet gen. et sp. nov., from the Greek '*rhodo* + *stoma*', meaning 'red-mouthed', after the reddish-brown staining around its aperture.

Type material

Holotype

GUADELOUPE • 6.4 × 2.5 mm; S of Marie-Galante; 15°51′ N, 61°18′ W; depth 250–254 m; 29 Jun. 2015; KARUBENTHOS 2; stn DW4646; MNHN-IM-2000-39531.

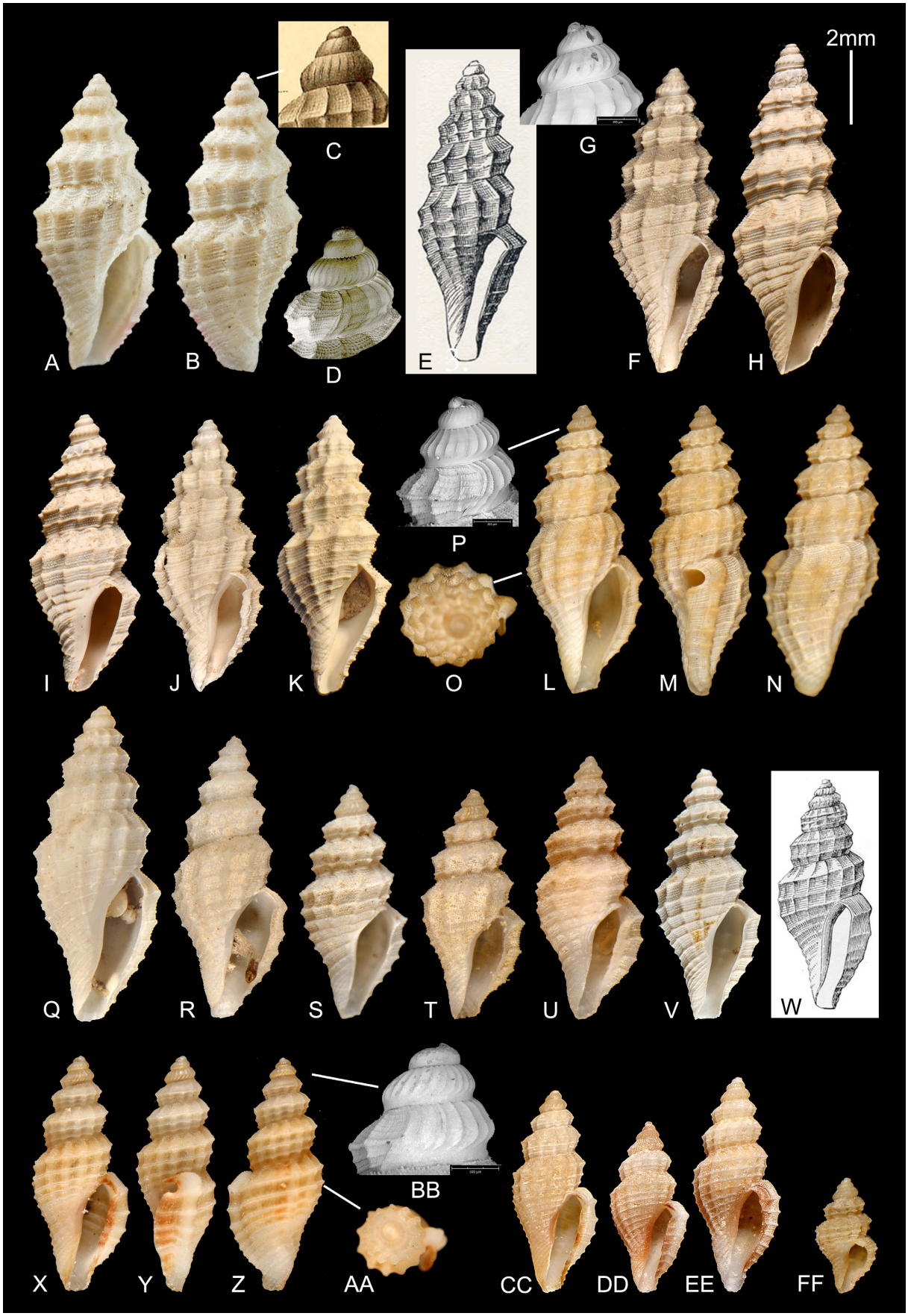
Paratypes (18 specs)

GUADELOUPE • 2 specs, 5.6 × 2.4 and 2.8 × 1.7 mm; W of Marie-Galante; 16°00′ N, 61°23′ W; depth 204–251 m; 21 Jun. 2015; KARUBENTHOS 2; stn DW4586; MNHN-IM-2000-39532 • 1 spec., 5.7 × 2.4 mm; off La Désirade; depth 250 m; 2017; dredged; D. Lamy coll. • 2 specs, 5.6 × 2.5 and 3.5 × 1.7 mm; W of Marie-Galante; 15°50′ N, 61°26′ W; depth 265–268 m; 27 Jun. 2015; KARUBENTHOS 2; stn DW4635; MNHN-IM-2000-39533 • 1 spec., 5.0 × 2.1 mm; S of La Désirade; depth 250 m; 2016; dredged; ANSP 498783 • 8 specs, 5.8 × 2.4, 5.6 × 2.4, 5.9 × 2.4, 5.0 × 3.3, 4.7 × 2.1, 4.7 × 2.1, 5.2 × 2.2 and 5.0 × 2.1 mm; S of La Désirade; depth 250 m; 2016; dredged; ANSP 498782 • 2 specs, 5.6 × 2.2 and 4.8 × 2.1 mm; S of La Désirade; depth 250 m; 2018; dredged; D. Lamy coll. • 2 specs, N of Grande-Terre; 16°00’ N, 61°23’ W; depth 204–251 m; 21 Jun. 2015; KARUBENTHOS 2; stn DW4586; USNM 1715427.

Other material examined (10 specs)

Another 10 specimens examined are not included in the type series.

Fig. 26 (next page). Species of *Bathyturris* Fallon gen. nov. Part 2. – **A–C**. *Pleurotoma* (*Mangelia*) *corallina* R.B. Watson, 1881. **A–B**. Holotype, 8.1 × 3.3 mm, ventral and dorsal views (NHMUK 1887.2.9.1061), N of Culebra Island, U.S. Virgin Islands. **C**. Drawing of protoconch from Watson (1886: pl. 23 fig. 1c). – **D**. *Bathyturris corallina* (R.B. Watson, 1881) gen. et comb. nov. Spec., ANSP 335422, W of Tampa Bay Florida, Gulf of Mexico, SEM of protoconch only. – **E**. *Pleurotoma* (*Drillia*) *serga* Dall, 1881, drawing from Dall (1886: pl. 9 fig. 4). – **F–K**. *Bathyturris serga* (Dall, 1881) gen. et comb. nov. **F–G**. Spec., 8.2 × 3.3 mm, ventral view, and SEM image of protoconch (MNHN-IM-2000-39536), W of Grande-Terre, Guadeloupe. **H–I**. Specs, 9.0 × 3.0 and 7.5 × 3.0 mm (MNHN-IM-2000-39537), W of Basse-Terre, Guadeloupe. **J**. Spec., 7.5 × 3.0 mm (MNHN-IM-2000-39538), N of Grande-Terre, Guadeloupe. **K**. Spec., 7.6 × 3.1 mm (MNHN-IM-2012-35806), W of Basse-Terre, Guadeloupe. – **L–V**. *Bathyturris bicarinata* Fallon & Bouchet gen. et sp. nov. **L–P**. Holotype, 7.9 × 3.2 mm, ventral, lateral, dorsal and apical views, SEM image of protoconch (MNHN-IM-2000-39525), E of La Désirade, Guadeloupe. **Q**. Paratype, 8.6 × 3.4 mm (USNM 1715419), N of Grande-Terre, Guadeloupe. **R**. Paratype, 7.1 × 2.8 mm (MNHN-IM-2000-39527), E of La Désirade, Guadeloupe. **S**. Paratype, 5.6 × 2.5 mm (USNM 1715406), N of Grande-Terre, Guadeloupe. **T**. Paratype, 6.2 × 2.8 mm (MNHN-IM-2000-39526), E of La Désirade, Guadeloupe. **U**. Paratype, 7.1 × 2.9 mm (D. Lamy coll.), S of La Désirade, Guadeloupe. **V**. Paratype, 6.9 × 2.9 mm (MNHN-IM-2000-39865), N of Grande-Terre, Guadeloupe. – **W**. *Pleurotoma* (*Mangilia*) *citronella* (Dall, 1886), holotype, drawing from Dall (1886: pl. 9 fig. 5). **X–EE**. *Bathyturris rhodostoma* Fallon & Bouchet gen. et sp. nov. **X–BB**. Holotype, 6.4 × 2.5 mm, ventral, lateral, dorsal and apical views, and SEM image of protoconch (MNHN-IM-2000-39531), S of Marie-Galante, Guadeloupe. **CC**. Paratype, 5.5 × 2.4 mm (MNHN-IM-2000-39532), W of Marie-Galante, Guadeloupe. **DD–EE**. Paratypes, 4.7 × 2.1 and 5.9 × 2.4 mm (D. Lamy coll.), S of La Désirade, Guadeloupe. – **FF**. *Bathyturris* Fallon gen. nov. unid. sp. A. Spec., 3.1 × 1.7 mm (UF 589745), off Louisiana, Gulf of Mexico. Credits: A–B: courtesy of Harry Taylor, Photographic Unit, copyright NHMUK; D: SEM image by Virginia O. Maes, courtesy ANSP; E, W: drawings from Dall (1886: pl. 9 figs 4 and 5); G, P, BB: SEM images courtesy of Paul Callomon. Scale bars: A–B, E–F, H–O, Q–AA, CC–FF = 2 mm; G, P, BB = 300 µm. The scale of C and D is unknown.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Description

Shell small (holotype length = 6.4 mm), turreted (W/L = 0.3906), of 7 whorls, teleoconch whorls acutely angled, sutures impressed, diameter less than whorl periphery, last whorl about 67% of shell length and its shoulder sloped about 45°. Aperture narrowly oval, with a wide notch posteriorly, and a short anterior canal, both aperture and canal about 50% of shell length. *Protoconch* of approximately 3¼–3½ regularly expanding whorls, tip minute, first whorl protruding, smooth, remaining whorls with riblets fine at first then strengthen with increasing diameter of the whorls; last 2 whorls bulge a little below mid-whorl, and on the last whorl riblets hook under the bulge, then terminate before the succeeding suture leaving a smooth supra-sutural band below. First ½ whorl fragile, missing on most specimens. Riblets have microscopic spikes on their crests. *Axial sculpture* of strong, cord-like ribs that run from suture-to-sure on spire whorls and to anterior fasciole on last. Ribs are recurved on whorl shoulders, straight on sides, and spaced about the same as their width. Ribs number 12 on penultimate and 7 on last whorl, ribs obsolete on last ⅓ of body whorl. *Varix* apertural, cord-like but stronger than ribs, extends from suture to anterior fasciole; recurved and face slightly excavated behind anal sinus, and its crest crenated by the spiral cords. *Spiral sculpture* of strong primaries, 3 on spire whorls, the first (adapical) defines the edge of the shoulder and whorl periphery, the second and third are successively smaller in diameter, 5 primaries follow on the shell base, microscopic secondaries fill the intercalary space with fewer ones advancing anteriorly. Primaries are segmented, and microscopic secondaries beaded by growth striae, all override ribs; primaries produce elongate nodules on rib crests. *Sulcus* absent; recurved and excavated on leading side of ribs (varix and some preceding ribs) are marks of the past presence of the anal sinus. *Outer lip* varicose, with a narrow strip of shell at the base of the varix, extending from the suture (as a swelling on the parietal side of the anal sinus) to anterior canal, widest mid-aperture, narrowing anteriorly; stromboid notch lacking. *Anal sinus* a wide round notch in the outer lip in front of the varix and as wide as the shoulder. *Inner lip* a narrow glaze along the columella, margined along the anterior canal, without a callus on the parietal wall. *Columella* straight. *Anterior canal* is short, open, only a little narrower than the aperture and with a slight bend to the right viewed ventrally, unnotched. *Anterior fasciole* not swollen, with 8 weak spiral primaries, one to a few microscopic secondaries lying between; end unnotched. *Color* buff with reddish-brown staining on outer lip, rim of anal sinus, columella, and variably in intercostal spaces of a few earlier ribs/varices; varix and primaries lighter.

Remarks

Some variation occurs in the amount of reddish-brown staining on the outer and inner lips. The average length of 18 measured specimens is 5.1 mm (range = 3.9–6.4 mm).

Range and habitat

Guadeloupe; depth 204–292 m.

Bathyturris Fallon gen. nov. unid. sp. A.
Fig. 26FF

Differential diagnosis

This species resembles *Bathyturris rhodostoma* Fallon & Bouchet gen. et sp. nov. but is smaller and has stronger ribs. Spiral primaries are fewer on the whorl sides and more varied in strength. Finally, the last whorl is more acutely tapered than *B. rhodostoma*, although like that species it has a stained columella. The similarity of these two species precludes the full description and naming of *Bathyturris* Fallon gen. nov. unid. sp. A until more specimens become available.

Material examined (2 specs)

UNITED STATES OF AMERICA • 2 specs, 2.8 × 1.6 and 3.1 × 1.7 mm; off Louisiana; 28°05.61′ N, 91°02.205′ W to 28°05.524′ N, 91°02.036′ W; depth 58 m; 27 May 2000; E.F. García leg.; dredged from R/V *Pelican* on coralline rubble; UF 589745.

Partial description

Protoconch, relatively large, trochoid, of 3¼ whorls, the first minute, last with closely spaced arched ribs that reach to the adapical suture. *Axial sculpture* is strong, about as wide as intercostal space. 9 ribs on penultimate whorl, 10 on the last. *Spiral sculpture* of primaries and secondaries, all frosted, the strongest on the periphery and midway on whorl sides, secondaries between these. All spirals override ribs and are slightly swollen on rib crests.

Range and habitat

United States (Louisiana); depth 58 m.

Genus ***Benthomangelia*** Thiele, 1925

Synonyms (after Bouchet & Warén 1980: 45)

Clinuropsis Thiele, 1931, non *Clinuropsis* Vincent, 1913 (type *Clinura monochordata* Dall, 1908).
Anticlinura Thiele, 1935, nomen novum pro *Clinuropsis* Thiele, 1931.
Clinuromella Beets, 1943, nomen novum pro *Clinuropsis* Thiele, 1931.
Metuonella Sorgenfrei, 1958 (type *Daphnella grippi* Kautsky, 1925).

Type species

Surcula trophonoidea Shepman, 1913 by original designation.

Summary diagnostic characteristics

Shell small, thin but strong, glossy, and fusiform with a tall spire and tapered body whorl with sloping shoulder, and a moderately long to long anterior canal.

Protoconch of 3–4 translucent trochoid whorls, the first smooth, the last with riblets.

Subsutural fold is usually present and marked with axial terminations.

Outer lip is thin with a shallow sinus about the width of the shoulder.

Axial sculpture of numerous opisthocline ribs that run from the subsutural fold and evanesce below the periphery of the last whorl, varix absent.

Spiral sculpture of flat spirals on whorl sides, separated by grooves, shoulder usually without spirals. Peripheral spiral forms spikes on rib crests.

Shell surface is not frosted.

Radula

A representative of this genus, *Benthomangelia puillandrei* Fallon & Bouchet sp. nov., MNHN-IM-2013-61345, was imaged (Fig. 27). Its description is as follows: hypodermic marginal teeth simple, semi-enrolled and trough-shaped, medium long, length about 130 mm. Tooth edges do not overlap but are closer in middle part. Base rather narrow, solid, concave and attenuated, constituting about ¼ of tooth

Fig. 27. Marginal radular teeth of *Benthomangelia puillandrei* Fallon & Bouchet sp. nov. (MNHN-IM-2013-61345). Image by Y. Kantor.

length and with a strong spur. Tip pointed with slightly thickened tooth edges and weak and short blade on the convex side.

Difference from other genera

Some key differences of genus groups with similar-looking species:

Gymnobela A.E. Verrill, 1884 of the family Raphitomidae has similar-looking species. They possess cross-hatched protoconchs absent in *Benthomangelia*.

Saccharoturris Woodring, 1928 whorls are strongly constricted at sutures, protoconch keeled, and shell surface frosted.

Glyphoturris Woodring, 1928 whorls are more angulate, spiral cords stronger, outer lip varicose with a denticle below the notch, and shell surface is frosted.

Cryoturris Woodring, 1928 is generally smaller (< 10 mm), lacks a subsutural fold, and has a frosted shell surface.

Remarks

This is a genus comprised of bathyal species. All are white or near white, thin-shelled, and lack apertural dentition and varices.

Phylogenetic relationships

The DNA sequence data show that the only *Benthomangelia* sequenced, *B. puillandrei* Fallon & Bouchet sp. nov., does not belong to the large TWA Mangeliid radiation. Instead, it forms a clade with *Benthomangelia* cf. *trophonoidea*, a Pacific species and the type species of the genus. An expanded dataset extended to other biogeographic areas will provide a better understanding of the relationships of this genus.

Benthomangelia puillandrei Fallon & Bouchet sp. nov.
urn:lsid:zoobank.org:act:F26E3392-5406-4234-872F-8B13A05D7969
Figs 27, 28A–J

Differential diagnosis

Benthomangelia bandella (Dall, 1881) is broader (W/L = 0.4382 versus 0.3302), has stronger, more prominent ribs, and stronger peripheral nodules. *Benthomangelia antonia* (Dall, 1881) is stouter and has weaker spirals that extend ¾ the distance to the anterior fasciole; the riblets on the protoconch are more closely spaced. *Benthomangelia macra* (R.B. Watson, 1881) has a sculpturally similar protoconch (Bouchet & Warén 1980: figs 212–213) but its whorls are more dorsoventrally compressed; peripheral nodules of the teleoconch are weaker.

Etymology

Benthomangelia puillandrei Fallon & Bouchet sp. nov. honors Nicolas Puillandre for his ongoing success in unraveling the phylogeny and classification of the mythical and extraordinarily complex ‘turrids’ of the world.

Type material

Holotype

GUADELOUPE • 10.6 × 3.5 mm; E of La Désirade; 16°20′ N, 60°54′ W; depth 456–545 m; 18 Jun. 2015; KARUBENTHOS 2; stn DW4576; sequenced; MNHN-IM-2013-60808.

Paratypes (28 specs)

GUADELOUPE • 1 spec., 7.3 × 3.0 mm, ethanol-preserved; W of Marie-Galante; 15°49′ N, 61°28′ W; depth 376–393 m; 27 Jun. 2015; KARUBENTHOS 2; stn DW4632; MNHN-IM-2013-61345 • 6 specs, (2 measured) 5.4 × 2.3 and 6.5 × 2.5 mm; N of Grande-Terre; 16°31′ N, 61°32′ W; depth 268–306 m; 14 Jun. 2015; KARUBENTHOS 2; stn DW4546; USNM 1715421 • 3 specs, 10.6 × 3.4, 8.7 × 3.2 and 9.4 × 3.3 mm; E of La Désirade; 16°20′ N, 60°54′ W; depth 456–545 m; 18 Jun. 2015; KARUBENTHOS 2; stn DW4576; MNHN-IM-2000-39543 • 8 specs, 13.9 × 5.1, 12.1 × 4.5, 12.2 × 4.4, 12.9 × 4.1, 12.3 × 4.3, 10.0 × 3.8, 9.0 × 3.4 and 7.9 × 2.9 mm; W of La Désirade; 16°08′ N, 61°19′ W; depth 400–420 m; 19 Jun. 2015; KARUBENTHOS 2; stn DW4582; MNHN-IM-2000-39541 • 4 specs, 9.1 × 3.2, 8.0 × 2.7, 8.4 × 3.1 and 5.6 × 2.6 mm; N of Grande-Terre; 16°38′ N, 61°37′ W; depth 413–423 m; 13 Jun. 2015; KARUBENTHOS 2; stn DW4544; MNHN-IM-2000-39542 • 1 spec., 8.6 × 3.1 mm; E of La Désirade; 16°19′ N, 60°55′ W; depth 396–399 m; 17 Jun. 2015; KARUBENTHOS 2; stn DW4572; MNHN-IM-2000-39540 • 5 specs, 7.1 × 2.7, 8.5 × 3.2, 9.2 × 3.1, 9.0 × 3,2 and 10.0 × 3.5 mm; S of La Desirade; depth 350 m; dredged; D. Lamy coll.

Other material examined (107 specs)

An additional 107 specimens were examined from MNHN expedition samples, all from Guadeloupe.

Description

Shell small (holotype length = 10.6 mm), thin-shelled, translucent white, and turreted with a moderately long anterior canal and narrow, oval aperture (W/L = 0.3302); whorls about 9, the last about 59% of the shell length; whorls have sloping, flat shoulders sharply demarcated by a peripheral row of nodules at its edge; aperture less than half the length of the shell, including the anterior canal together about 42% of shell length. Shell sculpture consists of weak ribs and flattened spirals. *Protoconch* trochoid, of 3¾ evenly expanding whorls. Under high magnification (250×) the first 1½ whorls are patterned with fibrils, at first aligned in neat rows, then becoming less organized, the next 1¼ whorls are smooth, and the last whorl is marked with strong ribs that terminate above the suture. Randomly placed fibrils again appear in band between rib terminations and suture. *Axial sculpture* of about 16 opisthocline ribs that run from the subsutural cord to the following suture and fade before the anterior fasciole, intercostal space about the same as rib width more so on dorsum of last whorl. Ribs are most prominent at whorl periphery and are much reduced and recurved on the shoulder. *Varix* absent. *Spiral sculpture* of slightly flattened cords that override ribs, interspaces about equal in width except two peripheral cords that are closer, about 26 on the last whorl to the end of the anterior canal, obsolete on the shoulder. The peripheral cord forms round nodules at the edge of the shoulder at crossing ribs. A subsutural cord, closely appressed to the suture, is nodulose at rib terminations. *Sulcus* absent; width of the shoulder corresponding to the width of the anal sinus is marked by curved growth striae and reduced ribs. *Outer lip* thin, without dentition. *Anal sinus* a shallow notch the width of the shoulder; without a parietal callus. *Inner lip* a thin glaze along a moderately wide area along the columella and parietal wall; without a callus. *Columella* is slightly sigmoid. *Anterior canal* moderately long, curved slightly to the right viewed ventrally, end unnotched. *Anterior fasciole* not swollen, sculpted the same as the shell base, slightly flattened spiral cords, here oblique to shell long axis. *Color* translucent white, with a dark protoconch.

Remarks

The average length of 79 specimens is 8.4 mm (range = 3.0–15.6 mm). The number of axials is variable.

Range and habitat

Bathyal. Guadeloupe: depth 139–800 m, live caught depth 268–545 m.

Benthomangelia bandella (Dall, 1881)
Fig. 28K–L

Pleurotoma (*Mangilia*) *bandella* Dall, 1881: 59.
Pleurotoma diomedeae A.E. Verrill, 1884: 152–154, pl. 31 fig. 5, 5a. In the same paper, on p. 250, Verrill compared his species with Dall's *P. bandella* and concluded that they were identical, and so placed *P. diomedea* in junior synonymy with *P. bandella*. Bouchet & Warén 1980: 45 list *P. diomedea* in junior synonymy with *Benthomangelia antonia* (Dall, 1881) without explanation, an action not supported here.

Daphnella (*Raphitoma*) *bandella* – Tryon 1884: 312.
Daphnella bandella – Paetel 1888: 87.
Mangilia bandella – Dall 1889a: 116, pl. 10 fig. 3; 1889b: 102. — Maury 1922.
Mangelia bandella – Clarke 1962: 7–40. — Turgeon *et al.* 1988. — Odé 1992a: 49.
Pleurotomella bandella – Odhner 1960: 391. — Powell 1966: 131.
Mangelia (*Benthomangelia*) *bandella* – Abbott 1974, species 3180 (not the fig., which is from Dall 1889a: pl. 10 fig. 4 of *P. antonia*).
Benthomangelia bandella – Bouchet & Warén 1980: 45, not figured. — Turgeon *et al*. 1998: 105. — Williams 2005: #5531, right drawing only, which is from Dall (1889a: pl. 10 fig. 3). — García 2019: 10, fig. 21.

Differential diagnosis

Benthomangelia puillandrei Fallon & Bouchet sp. nov., see comparison with *B. bandella* in the diagnosis paragraph of that species. *Benthomangelia antonia* (Dall, 1881) is slimmer, has finer axials with weaker peripheral nodules that evanesce a short distance from whorl peripheries. *Benthomangelia macra* (R.B. Watson, 1881) is sculpturally similar (Bouchet & Warén 1980: figs 212–213) but is stouter, peripheral nodules are weaker, and the protoconch whorls are shorter.

Type material

Holotype

Holotype by monotypy (ICZN Art. 73.1.2.).

UNITED STATES OF AMERICA • 8.9 × 3.9 mm [length measurement made for this work; Dall (1881) states length = 9.7 mm]; off Mississippi Delta; 28°42′ N, 88°40′ W; depth 321 fms [587 m]; Dec. 1877–Mar. 1878; R/V *Blake* exped. stn 47; MCZ 7132.

Paratypes

None.

Description

This re-description is based on examination of the holotype, and on descriptive text in Dall (1881: 59) and Verrill (1884). *Shell* small (holotype length = 9.7 mm), thin-shelled, translucent white, and turreted with a long anterior canal and narrowly oval aperture (W/L = 0.4382); whorls about 8, the last about 65% of the shell length including anterior canal; whorls have sloping, slightly concave shoulders sharply demarcated by a peripheral row of nodules at its edge; aperture about half the length of the shell, including the anterior canal. Shell sculpture consists of strong ribs and flattened spiral cords. *Protoconch*

of trochoid, of 3¾ of evenly expanding whorls (partially missing on holotype), the first minute, the last 1–1½ whorls with strong well-spaced riblets. *Axial sculpture* of about 18 opisthocline ribs that run from the subsutural cord to the following sutures and evanesce on the last whorl about ½ the distance to the anterior fasciole. Ribs are most prominent at whorl periphery where they rise into points and are much reduced and recurved on the shoulder. *Varix* is absent. *Spiral sculpture* of flattened cords, interspaces about equal in width, that override ribs, about 20–23 on the last whorl to the end of the anterior canal, absent on the shoulder. The peripheral cord forms spikes on the edge of the shoulder where crossing ribs. A subsutural cord, closely appressed to the suture, is spiked at rib terminations. *Sulcus* is the width of the shoulder and corresponds to the width of the anal sinus, is slightly concave and marked by curved growth striae and reduced ribs. *Outer lip* thin, without dentition. *Anal sinus* a shallow notch the width of the shoulder; without a parietal callus. *Inner lip* a thin glaze along a moderately wide area from the columella to the parietal wall; without a callus. *Columella* is slightly sigmoid. *Anterior canal* moderately long, straight, end unnotched. *Anterior fasciole* is not swollen, sculpted as the shell base with oblique flattened spiral cords. *Color* white, polished.

Remarks

The reason for the discrepancy between the measument for this work (8.9 mm) and Dall's (1881) (9.7 mm) measurement of the holotype is unknown. Dall's (1881) description is otherwise consistent with the specimen (specimen measuring 8.9 mm) in MCZ 7132.

Range and habitat

Specimen localities reported elsewhere by Dall (1881, 1889a): Gulf of Mexico, United States (off E Florida) and St. Vincent & the Grenadines (Bequia); depth 1200–2100 fms [2195–3840 m]. The report from off Bequia, St. Vincent & the Grenadines, should be confirmed.

Benthomangelia enceladus Figueira & Absalão, 2010
Fig. 28M–N

Differential diagnosis

According to Figueira & Absalão (2010: 735), the protoconch of *B. enceladus* has thinner riblets than *B. bandella*, extending to the abapical suture, instead of running short of the suture as in *B. bandella*. Additionally, riblets on the protoconch are much thinner and more closely spaced. The aperture of *B. enceladus* is proportionally larger, the spiral cords fewer and spaced further apart than those of *B. bandella*.

Type material

Holotype
BRAZIL • length = 4.6 mm; SE Brazil, Campos Basin; 22°02.85′ S, 39°52.37′ W; depth 1048 m.; stn OPII #50A; IBUFRJ 18233.

Paratypes (5 specs)
BRAZIL • 1 spec., length = 2.26 mm; 22°10.53′ S, 39°52.18′ W; depth 1039 m; stn OPII #45; IBUFRJ 18363 • 1 spec., length = 4.26 mm; 22°26.28′ S, 39°58.53′ W; depth 1046 m; stn OPII #84; MCZ 362498 • 1 spec., length = 4.9 mm; 22°04.33′ S, 39°52.04′ W; depth 1050 m; stn OPII #50; MZUSP 90703 • 1 spec., length = 4.38 mm; 22°02.51′ S, 39°52.22′ W; depth 1048 m; stn OPII #50A; MNRJ 13551 • 1 spec., length = 5.64 mm; 22°26.28′ S, 39°58.53′ W); depth 1046 m; stn OPII #84; MNHN-IM-2010-16432.

Description

No specimens were examined. Instead, the MNHN data portal photo was used for this brief description. See Figueira & Absalão (2010: 735) for a full description of this species. For purposes of comparison to species described herein, some salient points from their description are noted here. *Shell* short (length to 5.64 mm), turreted with a short anterior canal, spire with angled whorls. Suture shallow. Aperture narrowly ovate. *Protoconch* of 3½ whorls, first whorl with irregular spiral cords, last 2 with curved riblets, extending from the adapical suture to just above the abapical suture; *Axial sculpture* with about 14 narrow and strong axial ribs that run from suture to suture and on the last whorl to the anterior fasciole. *Spiral sculpture* consists of evenly spaced spirals of equal strength that continue at the base. There are 3-4 faint spirals on the shoulder and 3-4 stronger spirals on the whorl sides, and about 15 on the shell base. Small nodules are present at rib-spiral intersections, the most prominent on the peripheral spiral. *Anal sinus* shallow. *Anterior canal* ***is*** short but well defined. *Color* white, protoconch light yellow.

Range and habitat

Brazil; depth 1039–1050 m.

Benthomangelia antonia (Dall, 1881)
Fig. 28O–P

Pleurotoma (*Mangilia*) *antonia* Dall, 1881: 59–60 [Aug.] is the senior-most name of the junior synonym *P. incincta* R.B. Watson, 1881 [Oct.].

Pleurotoma incincta R.B. Watson, 1881: 438. The type locality is Challenger Stn 78, off San Miguel, Azores; the holotype is in NHMUK 1887.2.9.1069.

Pleurotomella diomedeae A.E. Verrill & Smith in A.E. Verrill, 1884: 152, pl. 31 fig. 5, 5a (synonymized by Bouchet & Warén 1980: 45, but is not supported here based on Dall's (1881) descriptions of the two species). The type locality is USFC Stn 2041. The holotype is in USNM 34828.

Pleurotoma mericiacum Locard, 1897: 199–200, pl. 9 figs 7–11 (synonym according to Bouchet & Warén 1980: 45). The type locality is off Cape Meric, Sahara, 19° 12' N, 17° 57' W, in 2324 m. Two syntypes are in MNHN-IM-2000-3105.

Mangelia innocens Thiele, 1925: 187–188 [221–222], 320 [354], pl. 27 [39] fig. 11 (synonym according to Bouchet & Warén 1980: 45). The type locality is 2°00′ N, 8°04' E, in 2492 m. Syntypes are in ZMHU (catalog number unknown).

Daphnella (*Raphitoma*) *antonia* – Tryon 1884: 312.

Pleurotoma incincta – R.B. Watson 1886: 346, pl. 24 fig. 7 (synonym according to Bouchet & Warén 1980: 45).

Mangilia antonia – Dall 1889: 116, pl. 10 fig. 4, pl. 11 fig. 11. Note: the captions of pl. 10 fig. 4 and pl. 11 fig. 11 appear to be reversed.

Benthomangelia antonia – Bouchet & Warén 1980: 45, fig. 106. — Clain & Rex 2000: 93, figs 2, 4. — García & Lee 2004: 22, fig. 58. — Williams 2005: #5530 (not the left photo). — Figueira & Absalão 2010: 735.

Pleurotomella meriacum auct. – Rios 1985: 151 (misspelling of *mericiacum*).

Pleurotoma (*Mangilia*) *antonia* – Tucker 2004: 78.

non *Mangilia* (*Mangilia*) *antonia* – Dall 1890a: 304, pl. 5 fig. 11 (considered by Figueira & Absalão 2010: 735 as an unidentified species, a conclusion with which we agree).

non *Mangelia antonia* – Sunderland & Sunderland 1993: 14.

Differential diagnosis

According to Dall (1889a: 116) *Benthomangelia bandella* (Dall, 1881) is slenderer and has stronger spirals and riblets on the protoconch are more widely spaced. *Benthomangelia puillandrei* Fallon & Bouchet sp. nov. is slimmer (W/L = 0.3302 versus 0.5217) and has 16 versus 13 ribs on the penultimate whorl.

Type material

Holotype

CUBA • 5.75 × 3.0 mm; off Cape San Antonio; depth 640 fms [1170 m] (USCSS Blake exped. 1877); MCZ 7133.

Paratypes

None known.

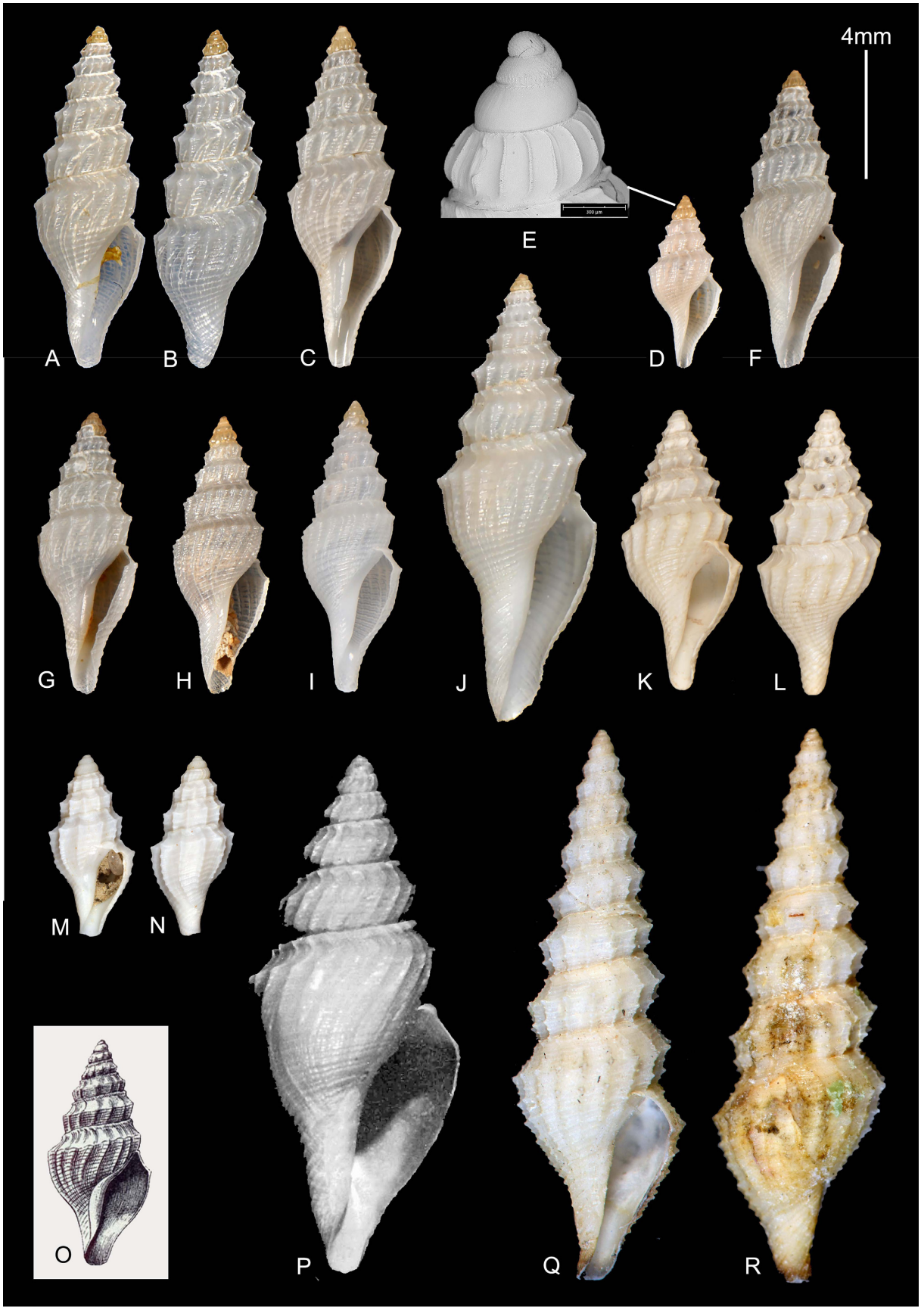
Material examined

The holotype was out on loan and not available for examination during the period of this project. No other specimens were available for direct examination.

Description

The holotype (MCZ 7133) was out on loan (as of Dec. 2019) so in lieu of its examination this description is based on Dall 1889a: 116, pl. 10, and fig. 3, which is reproduced in Fig. 28O. *Shell* of the holotype is 5.75 × 3.00 mm (W/L = 0.5217), has 6 whorls and a turreted spire. The *protoconch* is translucent brown, trochoid in shape and of about 3 whorls, the first minute, the last with strong narrow closely set riblets. *Axial sculpture* of 13 ribs on the last whorl, which extend ¾ the distance to the anterior canal, and are strongest at the shoulder; *spiral sculpture* consists of a strong subsutural cord ("ante-sutural revolving rib") followed by irregularly spaced flattened cords beginning a little before the edge of the shoulder and extending to the anterior fasciole. Raised points are formed at the edge of the shoulder where spiral cords cross over ribs. *Shell color* is white with a brown protoconch.

Fig. 28 (next page). Species of *Benthomangelia* Thiele, 1925. – **A–J**. *Benthomangelia puillandrei* Fallon & Bouchet sp. nov. **A–B**. Holotype, 10.6 × 3.5 mm, ventral and dorsal views (MNHN-IM-2013-60808), E of La Désirade, Guadeloupe. **C**. Paratype, 10.6 × 3.4 mm (MNHN-IM-2000-39543), E of La Désirade, Guadeloupe. **D–E**. Paratype, 5.4 × 2.3 mm, ventral view, and SEM image of protoconch (USNM 1715421), N of Grand-Terre, Guadeloupe. **F–G**. Paratypes, 9.4 × 3.3 and 8.7 × 3.2 mm (MNHN-IM-2000-39543), E of La Désirade, Guadeloupe. **H**. Paratype, 8.6 × 3.1 mm (MNHN-IM-2000-39540), E La Désirade, Guadeloupe. **I**. Paratype, 9.1 × 3.2 mm (MNHN-IM-2000-39542), N of Grande-Terre, Guadeloupe. **J**. Paratype, 13.9 × 5.1 mm (MNHN-IM-2000-39541), W of La Désirade, Guadeloupe, an exceptionally large specimen. – **K–L**. *Pleurotoma* (*Mangilia*) *bandella* Dall, 1881, holotype, 8.9 × 3.9 mm, ventral and dorsal views (MCZ 7132), off the Mississippi River Delta, Louisiana. – **M–N**. *Benthomangelia enceladus* Figueira & Absalão, 2010, paratype, length = 5.62 mm (MNHN-IM-2010-16432), Campos Basin, SE Brazil. – **O–P**. *Benthomangelia antonia* (Dall, 1881). **O**. Drawing, 7.0 mm, catalog number unknown, possibly from USFC stn 163 near Guadeloupe. This species, *P. bandella* Dall, 1881, is distinct from *P. antonia* Dall, 1881. **P**. Spec., 16.3 mm, E Atlantic, BIOGAS stn CP01 (47°35′ N, 08°39′ W). – **Q–R**. *Benthomangelia* unid. sp. A. Spec., 17.2 × 5.3 mm, ventral and dorsal views (USNM 96519), S of Saint Kitts. Is not *B. antonia* as identified by Dall (1890a: 304, pl. 5 fig. 11). Credits: E: SEM image courtesy of Krasimira "Kasey" Seizova; M–N: photo from MNHN data portal; O: from Dall (1889a: pl. 10 fig. 4); P: from Bouchet & Warén (1980: fig. 106). Scale bars: A–D, F–R = 4 mm; E = 300 µm.


4mm
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Remarks

Dall has published three different illustrations of this species. Their sizes are stated to be 5.75, 7.00, and 18.00 mm in length. The 5.75 mm specimen (the holotype), which is figured by Dall (1889a: pl. 10 fig. 4), is the same specimen in Dall (1889a: pl. 11 fig. 11). The legends have been switched; the specimen in pl. 10 fig. 4 is larger than the pl. 11 fig. 11 specimen and so is assumed to be the 7.00 mm specimen.

Later, in Dall (1890a: 304, pl. 5 fig. 11) an 18 mm specimen from St. Kitts is stated to be an adult of the same species, which it is not, most obviously from sculptural and spire angle differences. A 16.3 mm specimen is depicted by Bouchet & Warén (1980: fig. 106) that agrees with the *B. antonia* spire angle and sculpture but is much larger than the type (length = 16.30 versus 5.75 mm) and thus is suspect without closer examination.

Range and habitat

Off Cape San Antonio, Cuba, in 640 fms. Three specimens reported by Dall from USFC Stn 2751, south of St. Kitts, in 687 fms (USNM 96519), and USFC Stn 163 off Guadeloupe, in 769 fms (USNM 87440 and 87466), are not this species. The specimen from USFC Stn 2754, east of Tobago, 11°40′ N, 58°33′ W; depth 880 fms (Dall 1890a: 304) has not been examined for confirmation. Other reports are from the western Atlantic at depths ranging from 124 m (Rios 1985) to 3834 m (Clain & Rex 2000). Greater depths (up to 4825 m) have been reported in the mid and eastern Atlantic (Bouchet & Warén 1980). The depth reported by Rios is unusually shallow and requires confirmation; most reports exceed 1000 m. Also, Dall's specimen from south of St. Kitts is not this species, as explained above. The habitat has been characterized as lower bathyal by Clain & Rex (2000), and abyssal by Bouchet & Warén (1980). No specimens were found in MNHN expedition deep water sediment samples collected at depths of up to 898 m.

Benthomangelia unid. sp. A.
Fig. 28Q–R

Mangilia antonia auct. non Dall (1881) – Dall 1890a: 304, pl. 5 fig. 11 (misidentification according to Figueira & Absalão 2010: 735, it is referred to by these authors as *Benthomangelia* sp.).

Differential diagnosis

See Figueira & Absalão (2010: 735) for differences from *B. antonia* (Dall, 1881), *B.* cf. *macra* (R.B. Watson, 1881), and *B. enceladus* Figueira & Absalão, 2010.

Material examined (1 spec.)

ST. KITTS AND NEVIS • 1 spec., 17.2 × 5.3 mm; S of St. Kitts in 687 fms [1256 m]; 1887–1888; stn 2751; U.S. Fish Commission; USNM 96519. This is the only known specimen.

Description

Shell medium sized (length = 17.2 mm), turreted with a high spire (W/L = 0.3081), of about 12 whorls total, the last about 48% of shell length narrowing into an anterior canal of moderate length; teleoconch whorls acutely angled mid-whorl, with flat shoulders and sides angled into succeeding suture. Sculpture of narrow ribs and primary and secondary spirals, primaries spiked on whorl crests. Aperture oval without dentition. *Protoconch* of 3¼ smooth whorls, the first minute, last 2¼ with arched riblets. *Spiral sculpture* of a strong primary spiral at whorl periphery, followed by a second sub-medial spiral on whorl sides. Intermediate-sized spirals and secondaries lie between the whorl sides, and secondaries are on the shoulders.

Remarks

This species differs from the diagnostic characteristics of this genus in possessing spirals on the shoulder and spikes on rib crests at spiral crossings.

Range and habitat

Known only from the specimen's locality.

Genus ***Brachycythara*** Woodring, 1928

Type species

Cythara gibba Guppy, 1896 in Guppy & Dall, 1896, by original designation.

Summary of diagnostic characteristics

The original diagnosis (Woodring 1928: 175) is modified here to include species with 1½–2¼-whorled protoconchs with few or no axial riblets (versus species with 3 whorls, the last whorl with crowded riblets, now in *Psilocythara* Fallon gen. nov.). Most other characteristics originally ascribed to *Brachycythara* are unchanged and the combination of which is as follows, with some clarification:

- shell biconic with shouldered whorls, a rapidly tapered body whorl, and a short anterior canal. Surface glossy to dull, not frosted.
- protoconch tip minute, with up to 2¼ rapidly expanding round whorls that may have riblets on the last portion.
- inner lip narrow, lightly margined, with thickened parietal callus at anal sinus, surfaces of both may be microscopically granular.
- outer lip, when mature, is strengthened by a thickened rib and an open anal sinus bordered by a thick parietal callus and low denticle inside the outer lip.
- axial sculpture of numerous strong ribs that evanesce on the shell base.
- spiral sculpture consists of granulose spirals of different strengths.
- color of straw with a brown band on shoulder and white or brown bands on whorl sides.

Shell surface microsculpture

Shell surface SEM images taken at 800–1250× magnification of representatives of some species appear in Fig. 29. *Brachycythara* lacks frosting; instead, there are spirally aligned recumbent bundles of fibrils (secondary spirals) of different strengths that are grooved by growth lines in some species. In this case, growth lines are grooves, producing a basket-weave pattern: the spirals are depressed at the growth line and then rise over the groove to the next growth line. Otherwise, the aggregated fibrils appear as spirals in low magnification.

Differences from other genera

Psilocythara Fallon gen. nov. has a very similar biconic body shape but has a larger protoconch of 2½–3 whorls, the last is beaded by spiral grooves; the teleoconch lacks spirals altogether, although rarely may have spiral grooves.

Kurtzina Bartsch, 1944, has angular whorls rather than shouldered ones, fewer and stronger ribs, and a longer anterior canal.

Bela Leach, 1847, is an eastern Atlantic genus that can be confused with *Brachycythara*. Two West African species were placed in this genus by Rolán & Otero-Schmitt (1999: 21). Subsequently, Mariottini *et al*. (2012) have shown that *Bela* has a dome-shaped multispiral protoconch of three whorls, the last of

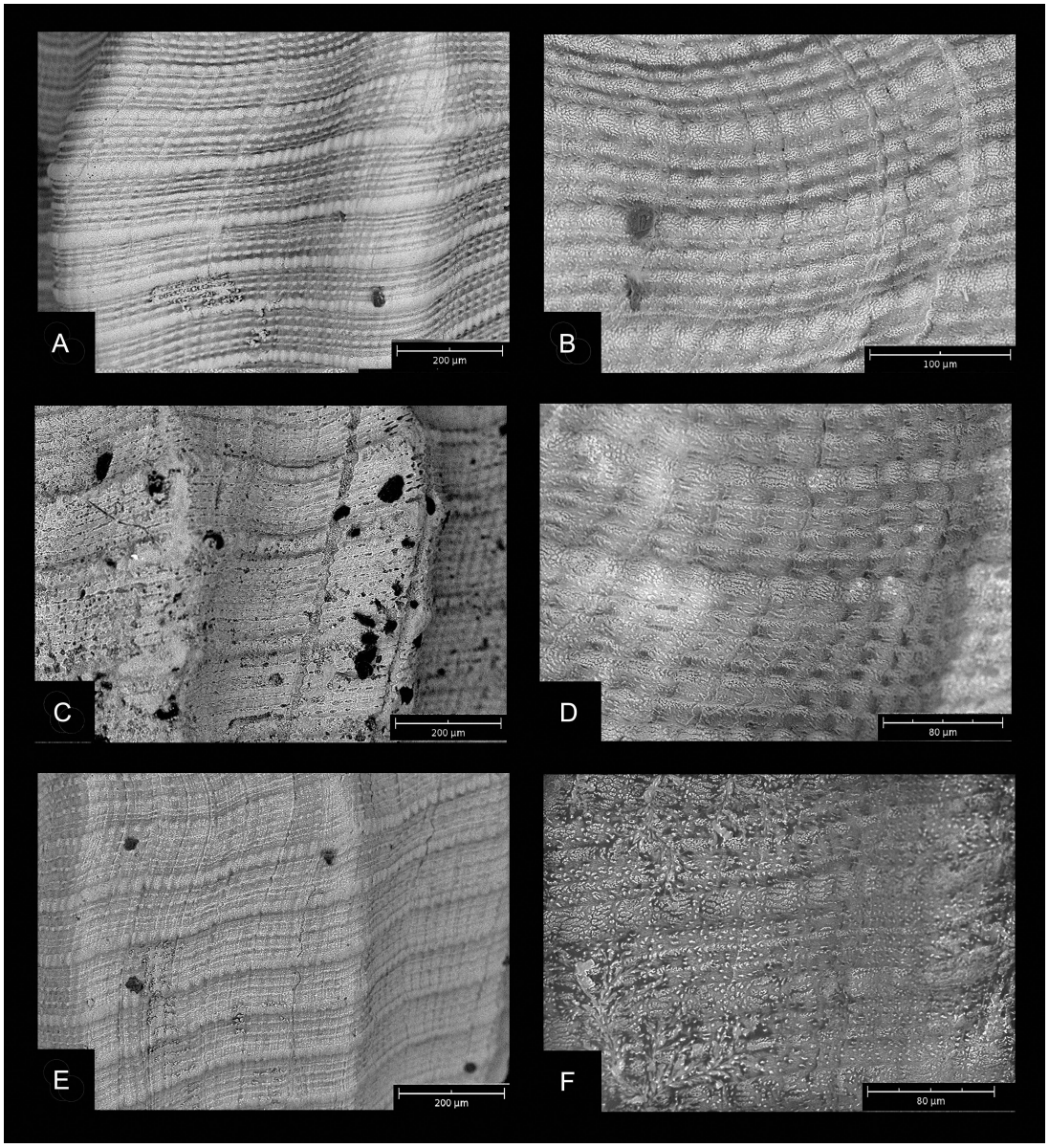


Fig. 29. Species of *Brachycythara* Woodring, 1928, shell surface microsculpture. **A**. *Brachycythara biconica* (C.B. Adams, 1850). SEM image of surface of penultimate whorl. Spec., 3.5 × 1.8 mm (MNHN-IM-2000-39555), Passe du Marin, Pointe Borgnesse, Martinique. Rows (spirals) alternate with 3–5 secondaries for each primary spiral. Intersection of spirals by growth lines creates a nodulose appearance. **B**. Same as preceding specimen. Enlarged view of the surface. **C**. *Brachycythara alba* (C.B. Adams, 1850). SEM image of surface of penultimate whorl. Spec., 4.7 × 2.3 mm (MNHN-IM-2012-5798), W of Fajou Island, Guadeloupe. Spirals, or rows of bundles of fibrils also vary in strength, up to 10 weaker spirals with each stronger one is seen on the right side of the image. The left side has been eroded. Spirals are more crowded than in *B. biconica*. **D**. Same specimen as preceding, 850 ×. Enlarged view of the surface. **E**. *Brachycythara guadeloupensis* Fallon & Bouchet sp. nov., SEM image of surface of penultimate whorl, holotype, 3.8 × 1.9 mm (MNHN-IM-2012-5775), off Anse à la Barque, Guadeloupe. About 4 secondary spirals between each primary, spaced in a manner like those of *B. biconica*. **F**. Same as preceding specimen. Enlarged view of the surface illustrates the spread of microscopic nodules, which seem to be concentrated in intercalary spaces. Nodules like these are not observed in *B. biconica*. Credits: SEM images courtesy of Paul Callomon and Krasimira "Kasey" Seizova. Scale bars: A, C, E = 200 µm; B = 100 µm; D, F = 80 µm.

which has reticulated riblets crossed with spiral rows of tubercles, which are lacking in *Brachycythara*. The teleoconch of *Bela* has an axial sculpture of 8–10 regularly spaced ribs with broader interspaces, fewer than the 10–14 of *Brachycythara*. *Bela* has a spiral sculpture of numerous very fine threads that alternate with wider interspaces. *Brachycythara*, *B. biconica* (C.B. Adams, 1850), for example, has more, with 16 primaries on the penultimate whorl and 3–5 secondary spiral rows between. Also, spirals are made nodulous by fine growth increments. The subsutural thread of *Bela* has well-marked denticles, but *Brachycythara* has nodules similar to those on the subsequent spirals of the shoulder, and these are not modified.

Remarks

Fossil *Brachycythara* differ in important ways from Recent species. The type species of the genus, *Brachycythara gibba* (Guppy, 1896), and the non-type *Brachycythara galae* Fargo, 1953, have mid-whorl angular, versus round-shouldered whorls, a proportionally longer body whorl, and a proportionally larger, 3-whorled protoconch not exhibited by Recent species placed in this genus. Shared traits include a biconic profile, a non-varicose outer lip, a short, undifferentiated anterior canal, a low denticle inside the outer lip, and a thickened parietal callus. A single published report of the occurrence of *B. galae* in Recent fauna by Vokes & Vokes (1983: 58) in Yucatan samples has not been confirmed (published photo therein is of holotype, not of a local specimen). So, if fossil species are extant, then the standing of known species should be reconsidered.

Two common *Brachycythara* in MNHN samples from the French Antilles are very similar and might otherwise be difficult to tell apart except they have different protoconchs, one of 1½ whorls (found exclusively in Guadeloupe samples), and the other with 2¼ whorls (found in Martinique and Guadeloupe samples). The latter is *B. biconica*, the former is new, *B. guadeloupensis* Fallon & Bouchet sp. nov. Both are described herein.

Phylogenetic relationships

The DNA sequence data support the monophyly of the genus *Brachycithara*, with the two sequenced species forming a well-supported clade. The lineage is recovered sister to the genus *Psilocythara* Fallon gen. nov., with 100% bootstrap support.

Brachycythara biconica (C.B. Adams, 1850)
Figs 29A–B, 30A–M

Mangelia biconica C.B. Adams, 1850b: 65.
Mangilia (*Cythara*) *biconica* var. *alta* Dall & Simpson, 1901: 389 (synonym according to Rosenberg 2009).

Mangilia biconica – Tryon 1884: 248. — Dall 1889b: 100. — Maury 1922: 69.
Pleurotoma biconica – Simpson 1887: 54.
Defrancia biconica – Paetel 1888: 78.
Daphnella biconica – Paetel 1888: 87.
Mangelia biconica – Clench & Turner 1950: 260, pl. 32 fig. 2. — Coomans 1958: 101. — Warmke & Abbott 1961: 137, pl. 25 fig. k. — Rios 1970: 127. — Ekdale 1974: 650. — Abbott 1974: 278. — Treece 1980: 562. — García & Luque 1986: 47. — Espinosa & Ortea 2001: 34.
Mangelia (*Brachycythara*) *biconica* – Abbott 1958: 98, pl. 3 fig. p.
Brachycythara biconica – Nowell-Usticke 1959: 83. — Powell 1966: 117. — Radwin 1969: 232. — McGinty 1970: 65. — Rios 1975: 139, pl.42 fig. 640; 1994: 172, pl. 57 fig. 786. — Turgeon *et al.* 1988: 96; 1998: 105. — de Jong & Coomans 1988: 117, pl. 18 fig. 625, pl. 475 fig. 625. — Odé 1992b: 75–76. — Rolán & Espinosa 1999: 45, figs 1–2, 8–12. — Redfern 2001: 129, pl. 58 fig. 534a–b, pl.

112 fig. 534c. — Lee 2003a: http://www.jaxshells.org; 2003b: http://www.jaxshells.org/peanut.htm; 2003c: http://www.jaxshells.org/cedarkey.htm. — Absalão *et al*. 2005: 31, fig. 72. — García 2007: 8. — Grace 2007: 27. — Redfern 2013: 207, fig. 577a–c.

This is a partial list of the taxon's usage. The original combination of *biconica* in *Mangelia* has been used as late as by Espinosa & Ortea (2001: 34). The earliest use of *Brachycythara* (as a subspecies) of a Recent species was by Abbott (1958: 98) and at the full generic level by Nowell-Usticke (1959), but only since 2001 has *Brachycythara* been consistently used at the generic level.

Differential diagnosis

Brachycythara alba (C.B. Adams, 1850) is generally larger, has a less acutely tapered body whorl, and most significantly, a protoconch of only 1½ whorls (versus 2¼ whorls).

Brachycythara guadeloupensis Fallon & Bouchet sp. nov. differs principally in protoconch structure, which is asymmetrical with only a few indistinct faint wrinkles on the last ¼-whorl (*B. biconica* has a symmetrical protoconch with distinct riblets) and *B. guadeloupensis* possess 1½ protoconch whorls versus 2¼ protoconch whorls in *B. biconica*. The shell is also smaller. See under *B. alba* for differences between *B. guadeloupensis* and *B. alba*, both of which have a 1½-whorl protoconch.

Type material

Lectotype

The lectotype was designated by Clench & Turner (1950: 368).

JAMAICA • 5.1 × 2.5 mm; MCZ 177377.

Paralectotypes (4 specs)

JAMAICA • 4 specs, (2 measured) 4.2 × 2.2 and 4.4 × 2.2 mm; ANSP 6498.

Material examined (94 specs)

GUADELOUPE • 1 spec., 4.0 × 2.1 mm; Petit Cul-de-Sac Marin; 16°13.62′ N, 61°32.38′ W; depth 3 m; 21 May 2012; KARUBENTHOS 2012; stn GD49; sequenced; MNHN-IM-2013-20630.

MARTINIQUE • 2 specs, lengths = 3.5 and 2.5 mm; Fort-de-France Bay, E of Grande Sèche; 14°34.6′ N, 61°03.3′ W; depth 6 m; 9 Oct. 2016; MADIBENTHOS; stn AB398; MNHN-IM-2000-39546 • 1 spec., length = 3.8 mm; Fort-de-France Bay, Monsigny; 14°34.3′ N, 61°02.7′ W; depth 7 m; 7 Oct. 2016; MADIBENTHOS; stn AB394; MNHN-IM-2000-39557 • 2 specs, lengths = 4.2 and 4.0 mm; Fort-de-France Bay Monsigny; 14°34.3′ N, 61°02.7′ W; depth 7 m; 7 Oct. 2016; MADIBENTHOS; stn AB394; MNHN-IM-2000-39544 • 1 spec., 3.5 × 1.9 mm; Anse des Galets; 14°51.4′ N, 61°12.8′ W; depth 14–26 m; 7 Oct. 2016; MADIBENTHOS; stn AS568; MNHN-IM-2000-39545 • 1 spec., length = 3.7 mm; Schoelcher, Face à la Rivière Case Navire; 14°36.9′ N, 61°06.3′ W; depth 4 m; 30 Sep. 2016; MADIBENTHOS; stn AD278; MNHN-IM-2000-39547 • 2 specs, 4.3 × 2.3 and 3.8 × 2.0 mm; Caravelle Peninsula, Grand-Jean Bay; 14°44.5′ N, 60°53.5′ W; depth 5–12 m; 17 Sep. 2016; MADIBENTHOS; stn AD241; MNHN-IM-2000-39548 • 4 specs, 3.9 × 1.8, 3.7 × 1.9, 3.5 × 1.7, and 3.4 × 1.8 mm; Anse Noire, Sortie Rivière; 14°31.7′ N, 61°05.3′ W; depth 5–10 m; 7 Sep. 2016; MADIBENTHOS; stn AD208; MNHN-IM-2000-39549 • 3 specs, 3.9 × 1.9, 3.8 × 1.4 and 2.8 × 1.5 mm; Fort-de-France Bay, Caye de Gros Îlet; 14°33.2′ N, 61°01.6′ W; depth 6 m; 6 Oct. 2016; MADIBENTHOS; stn AB390; MNHN-IM-2000-39550 • 2 specs, 4.3 × 2.1 and 3.9 × 1.9 mm; Fort-de-France Bay, Fond blanc de l'Îlet à Ramiers; 14°33.4′ N, 61°04.3′ W; depth 11 m; 9 Oct. 2016; MADIBENTHOS; stn AS581; MNHN-IM-2000-39551 • 2 specs, 5.3 × 2.7 and 4.9 × 2.4 mm; Cul-de-Sac Petite Grenadine Ile, Petite Grenade; 14°34′ N, 60°50.2′ W; depth 0 m; 7 Oct. 2016; MADIBENTHOS; stn AM046; MNHN-IM-2000-39552 • 2 specs, 3.6 × 2.0 and 3.6 × 1.9 mm; Fort-de-France Bay, Banc Mitan; 14°35′ N, 61°04.6′ W; depth 13 m; 7 Oct. 2016; MADIBENTHOS; stn AB392; MNHN-IM-2000-39553 • 2 specs, 4.1 × 2.2 and 4.0 × 2.0 mm;

Fort-de-France Bay, Le Lamentin, bout de la piste; 14°35.2′ N, 61°01.4′ W; depth 10 m; 6 Oct. 2016; MADIBENTHOS; stn AD606; MNHN-IM-2000-39554 • 1 spec., 3.5 × 1.8 mm; Passe du Marin, Pointe Borgnesse; 14°26.9′ N, 60°54′ W; depth 15 m; 11 Sep. 2016; MADIBENTHOS; stn AD067; MNHN-IM-2000-39555 • 1 spec., 3.0 × 1.6 mm; Fort-de-France Bay, Pointe des Nègres; 14°35.9′ N, 61°05.7′ W; depth 60 m; 9 Sep. 2016; MADIBENTHOS; stn AN212; MNHN-IM-2000-39556.

ST. VINCENT AND THE GRENADINES • 8 specs, 5.2 × 2.3, 5.0 × 2.4, 4.2 × 2.0, 4.5 × 2.5, 4.5 × 2.4, 4.3 × 2.4, 4.2 × 2.1 and 4.6 × 2.3 mm; Petit St. Vincent; depth 14 m; 24 May 2004; G. Mackintosh leg.; night SCUBA; P. Fallon coll. • 2 specs, 4.2 × 2.1 and 3.7 × 1.9 mm; Corbec Bay, Canouan Island; depth 8 m; 8 Jun. 2004; G. Mackintosh leg.; night SCUBA on rock and sand; P. Fallon coll. • 2 specs, 4.8 × 2.2 and 4.3 × 2.0 mm; W side of Frigate Island, Union Island; depth 4 m; 29 Apr. 2004; G. Mackintosh leg.; night SCUBA; P. Fallon coll. • 1 spec., 3.3 × 1.7 mm; Mayreau Island, S of Nord d'Oest; depth 18 m; 2 Jul. 2004; G. Mackintosh leg.; night SCUBA, screened; P. Fallon coll. • 1 spec., 4.0 × 2.1 mm; Canouan Island, Corbec Bay; depth 7 m; 9 Jun. 2004; G. Mackintosh leg.; night SCUBA; P. Fallon coll. • 18 specs, (12 measured) 5.1 × 2.4, 4.6 × 2.4, 4.8 × 2.4, 4.7 × 2.4, 4.9 × 2.5, 4.8 × 2.7, 4.4 × 2.2, 4.9 × 2.5, 4.8 × 2.4, 4.7 × 2.3, 4.9 × 2.3 and 4.4 × 2.3 mm; Petit Nevis; depth 4 m; 18 Dec. 2006; G. Mackintosh leg.; night SCUBA; on white sand with some seagrass; ANSP 498874 • 1 spec., 4.5 × 2.2 mm; W end of Quatre Island; depth 12 m; 21 Jul. 2005; G. Mackintosh leg.; night SCUBA; P. Fallon coll.

UNITED STATES OF AMERICA • 21 specs, (10 measured) 4.2 × 2.0, 3.7 × 1.9, 3.7 × 2.2, 4.0 × 2.2, 3.4 × 2.0, 3.9 × 2.0, 3.7 × 2.2, 3.4 × 1.9, 3.7 × 2.0 and 3.8 × 2.0 mm; off Louisiana, Mississippi R.; depth 30–61 m; Aug. 1974; T. McGinn leg.; trawled; ex batfish stomachs; UF 589685 • 5 specs, 5.0 × 2.5, 3.9 × 2.1, 4.3 × 2.2, 4.0 × 2.3 and 4.4 × 2.4 mm; E Florida, Palm Beach Co., Delray Beach, Dunes Park, Atlantic side; in beach drift; 1973–1976; J. Lightfoot leg.; beach renourishment; UF 589686 • 2 specs, 4.4 × 2.2 and 4.2 × 2.1 mm; E Florida, Palm Beach Co., Peanut Island, ¼ mi. [0.4 km] S of Riviera Beach; depth 0.3–1.2 m; 12 Jul. 1995; M. Krisberg leg.; hand dredged; on sand and sparse seagrass; UF 589687 • 2 specs, 4.0 × 2.2 and 3.4 × 2.1 mm; W Florida, Levy Co., off Cedar Key; J.M. Keeler leg.; trawled, ex batfish stomach; UF 589688 • 3 specs, 4.7 × 2.2, 4.4 × 2.1 and 4.3 × 2.2 mm; inner SE shore of Calliaqua Bay; depth 1–2 m; Feb. 1972; V.O. Maes leg.; from on silty sand; ANSP 332067A.

VENEZUELA • 1 spec., 4.2 × 2.3 mm; Las Aves Archipelago; depth 25–30 m; Sep. 1999; G. Mackintosh leg.; hand dredged; P. Fallon coll.

Description

The original description appears in Adams (1850: 65). Recently, additional descriptive material appears in Rolán & Espinosa (1999: 45) and Redfern (2001: 129; 2013: 207). These authors provide more information about the morphology of *Brachycythara biconica* and *B. alba*. *Shell s*mall, length = 6 mm or less, usually less than 5 mm, biconic (W/L usually between 0.5 and 0.6) with a short spire where whorls are wider than high, round-shouldered, the last whorl much larger, approximately ¾ shell length and with a lower shoulder than spire whorls; aperture narrow with an open anterior canal and a wide, shallow anal sinus posteriorly. *Protoconch* of 2¼ whorls beginning with a minute nucleus and then rapidly and symmetrically expanding up to the end of the 1st whorl. approximately ½–¾ whorl faint riblet appear that grow stronger and further apart to the end. *Axial sculpture* of strong, round-crested ribs extending from suture to suture, intercostal space slightly less than rib width, ribs slightly recurved and lower on shoulder, straight on whorl sides, and evanesce on the anterior fasciole. Ribs vary from 11 to 14 on the penultimate, fewer on the last whorl, the last ribs are usually stronger and serving to strengthen the aperture. *Spiral sculpture* of fine primary and secondary spirals, about 6 primaries on penult, and about 10 on shell base, with about 3 secondaries between each primary. Primaries are only slightly stronger than secondaries and lie a little proud of them, all spirals microscopically granulose, override and are slightly swollen on rib crests. *Color* straw with spiral brown bands of different widths and intensities,

the darkest on shoulder, the others spaced along whorl sides, below two peripheral white bands separated by a thin brown line. Bands are usually darker between ribs and may coalesce into a single wider band in some specimens, or variously absent but always with two white bands just below the shoulder. A dark brown stain present midway along outer lip visible in the aperture.

Remarks

The average length of 94 measured specimens is 4.1 mm (2.3–5.3 mm). Color is variable and probably influenced by habitat, e.g., 18 specimens taken from on white sand at Petit Nevis, St. Vincent and the Grenadines have very pale bands in place of darker brown ones. specimens from Guadeloupe and Martinique were generally more intensely colored, and slightly smaller. The average length of the smaller specimens from Guadeloupe and Martinique (39 measured specimens) = 3.7 mm (range = 2.3–5.3 mm). Abbott (1958: 98) gives a 5–6 mm size range for *B. biconica* from Grand Cayman Island.

Range and habitat

Widespread. Confirmed specimen localities include Jamaica (type locality), United States (off W Florida, E Florida), Martinique, St. Vincent and the Grenadines, Venezuela (Las Aves archipelago), and a few other localities in the Caribbean. Other published reports include North Carolina and Brazil, in 0–229 m, but most frequently at depths less than 30 m.

Brachycythara alba (C.B. Adams, 1850)
Figs 29C–D, 30N–S

Mangelia biconica var. *alba* C.B. Adams, 1850b: 65.

Brachycythara biconica subsp. *alba* – Nowell-Usticke 1959: 83.
Mangelia biconica alba – Treece 1980: 562.
Brachycythara alba – Rolán & Espinosa 1999: 45, figs 5, 13–15. — Redfern 2001:129, pl. 58 fig. 533a–b; 2013: 207, fig. 576a–c. — Williams 2005: #5550.

Differential diagnosis

Brachycythara biconica (C.B. Adams, 1850) is somewhat smaller (4.1 versus 4.9 mm average length) has a more acutely tapered body whorl, and most significantly, a protoconch of 2¼ whorls (versus 1½ whorls). Rolán & Espinosa (1999) demonstrated that this species is distinct from *B. alba* based on its microsculpture. See under *Brachycythara guadeloupensis* Fallon & Bouchet sp. nov. for differences from that species

Type material

Lectotype
The lectotype was designated by Clench & Turner (1950: pl. 32 fig. 1).

JAMAICA • 6.2 × 2.9 mm; MCZ 186008.

Paralectotype (1 spec.)
JAMAICA • 1 spec.; MCZ 186016.

Material examined (10 specs)

The lectotype and the following 9 specimens were examined.

BAHAMAS • 1 spec., 4.2 × 2.0 mm; Eleuthera, airport beach; in beach drift; 1999; C.M. Lloyd leg.; UF 589690.

GUADELOUPE • 1 spec., 4.4 × 2.2 mm; Grand Cul-de-Sac Marin; 16°21.25′ N, 61°35.08′ W; depth 3 m; 2 May 2012; KARUBENTHOS 2012; stn GS01; sequenced; MNHN-IM-2013-20647 • 2 specs, 5.0 × 2.4 and 4.7 × 2.3 mm; white bottom W of Fajou Island; 16°21.35′ N, 61°35.79′ W; depth 2 m; 24 May 2012; KARUBENTHOS 2012; stn GS32; MNHN-IM-2012-5798.

TRINIDAD AND TOBAGO • 2 specs, 5.2 × 2.4 and 5.2 × 2.5 mm; Tobago Island, Speyside; in beach drift; J. Boyle leg.; UF 589692.

UNITED STATES OF AMERICA • 2 specs, 4.6 × 2.3 and 4.2 × 2.3 mm; Florida Keys, Monroe Co., No Name Key; depth 1.5–3 m; Aug. 1959; dredged; E. Marcott leg.; UF 589689 • 1 spec., 5.6 × 2.8 mm; Florida Keys, Monroe Co., SE edge of Little Duck Key; subtidal; 16 Apr. 1996; P. Poland leg.; in silty sand, shell rubble; UF 589691.

Description

The original description appears in C.B. Adams (1850c: 65). Recently, additional descriptive material appears in Rolán & Espinosa (1999: 45) and Redfern (2001: 129; 2013: 207). These authors provide additional information about the morphology of *B. biconica* and *B. alba*.

This description is based on specimens examined in this study, including the lectotype. Adams did not prepare a separate description of *B. alba*, only noting that it was a pure white variety of *B. biconica*. There are subtle morphological differences as pointed out by Rolán & Espinosa (1999) and incorporated here. *Shell* small, up to at least length = 6.2 mm, biconic (W/L usually between 0.46 and 0.50) with a short spire of whorls that are wider than high, round-shouldered, the last whorl much larger with a lower shoulder than spire whorls, and approximately 70% of shell length, including anterior canal. Aperture a narrow oval with an open anterior canal and a wide, shallow anal sinus posteriorly. *Protoconch* of 1½ whorls, somewhat globose with faint riblets near the end. *Axial sculpture* of strong, round-crested ribs extending from suture to suture, intercostal space slightly about the same as rib width, ribs slightly recurved and lower on shoulder, straight on whorl sides, and evanesce on the anterior fasciole. Rib numbers up to about 14 on the penultimate, fewer on the last whorl. *Varix* absent; the last rib is usually much stronger and serving to strengthen the aperture. *Spiral sculpture* of very fine primary and secondary spirals, with about 3–5 secondaries between each primary, all spirals microscopically granulose and override ribs. *Shell color* grayish white with 2 white spiral bands at whorl periphery, separated by a narrow grayish white band. Light brown bands may be found on the shoulder and below the white band on some specimens [see illustrations in Redfern (2013: 207)]. If present, the darkest brown occurs on the shoulder.

Remarks

This species does not appear to be as abundant as *B. biconica*. Confirmed identifications of *B. alba* are from shallow depths (0–3 m), while *B. biconica* is commonly found between 5–30 m. The average length of 10 measured specimens is 4.9 mm (range = 4.2–6.2 mm).

Range and habitat

Widespread. Examined specimens are from Jamaica (type locality), United States (Florida Keys), Bahamas, and Guadeloupe; depth 0–3 m (live in 3 m). Other identifications include specimens from Cuba and the Dominican Republic (Rolán & Espinosa 1999).

Brachycythara guadeloupensis Fallon & Bouchet sp. nov.
urn:lsid:zoobank.org:act:79C4E4C7-E51A-456F-9AE4-9D39A14B1759
Figs 29E–F, 30T–JJ

Differential diagnosis

Brachycythara biconica (C.B. Adams, 1850) is larger (4.1 mm versus 3.2 mm average total length) has a more symmetrical 2¼-whorl protoconch ending in distinct riblets, not one with 1½ whorls, and with only a few faint wrinkles on the last ¼-whorl.

Brachycythara alba (C.B. Adams, 1850) is larger, with an average total length of 4.9 mm compared to 3.2 mm, and has a lighter-colored spiral banding, ranging from grayish white to light brown, versus light golden brown to brown.

Etymology

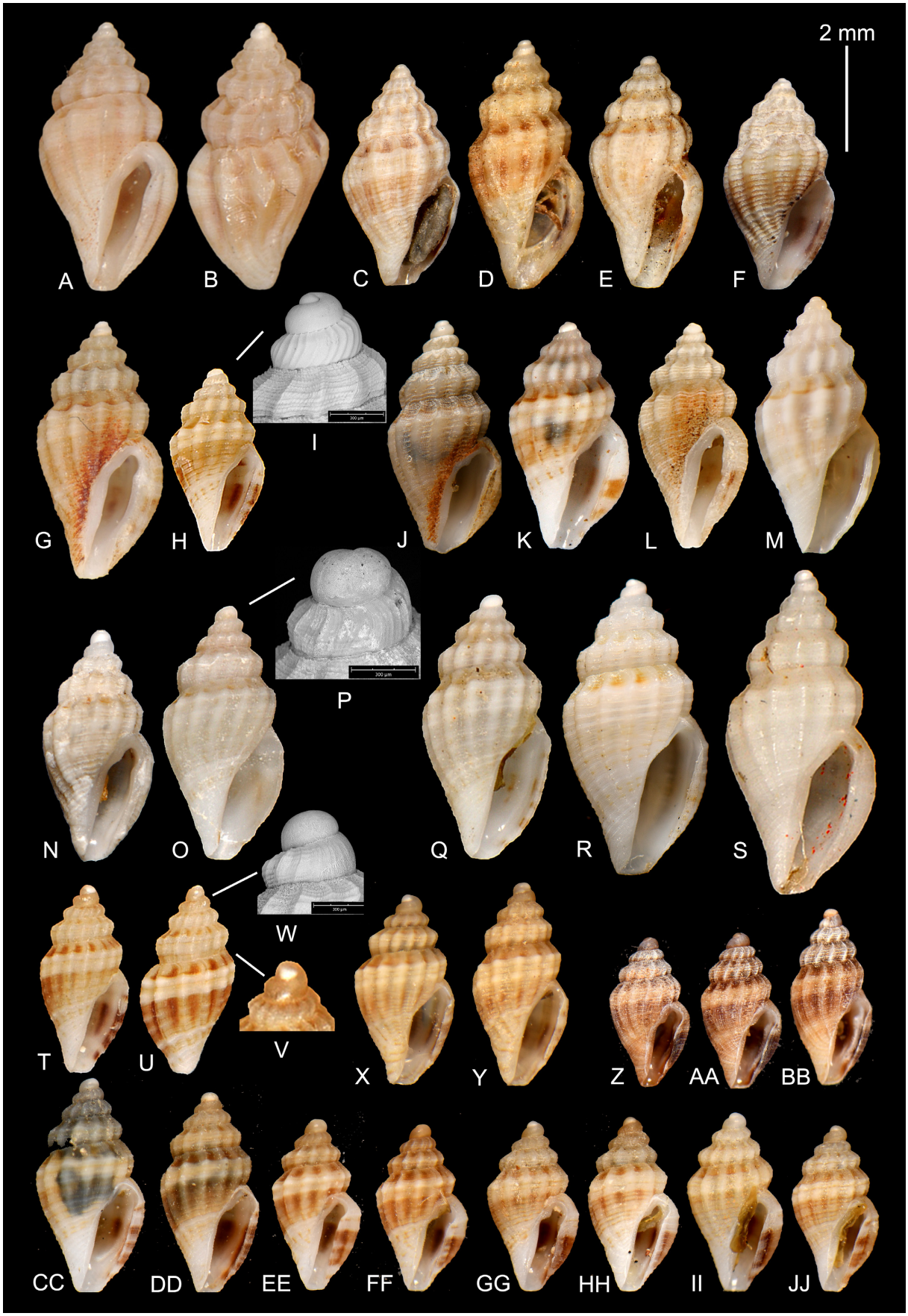
Brachycythara guadeloupensis Fallon & Bouchet sp. nov. is named after the island of Guadeloupe, which is the locality of all known specimens.

Type material

Holotype

GUADELOUPE • 3.6 × 1.75 mm; Anse à la Barque; 16°05.72′ N, 61°46.26′ W; depth 14 m; 9 May 2012; KARUBENTHOS 2012; stn GD11; MNHN-IM-2012-5775.

Fig. 30 (next page). Species of *Brachycythara* Woodring, 1928. – **A–C**. *Mangelia biconica* C.B. Adams, 1850. **A–B**. Lectotype 5.1 × 2.5 mm (MCZ 177377), Jamaica. **C**. Paralectotype 4.2 × 2.2 mm (ANSP 6498), Jamaica. – **D–M**. *Brachycythara biconica* (C.B. Adams, 1850). Specimens from several localities. **D**. Spec., 4.7 × 2.2 mm (ANSP 332067), Calliaqua Bay, Saint Vincent Island. **E**. Spec., 4.4 × 2.2 mm (ANSP 329135), Montego Bay, Jamaica. **F**. Sequenced voucher, 4.0 × 2.1 mm (MNHN-IM-2013-20630), Petit Cul-de-Sac Marin, Guadeloupe. **G**. Spec., 4.9 × 2.4 mm (MNHN-IM-2000-39552), Martinique. **H–I**. Spec., 3.5 × 1.8 mm, ventral view, and SEM of protoconch (MNHN-IM-2000-39555), Passe du Marin, Pointe Borgnesse, Martinique. **J**. Spec., 4.4 × 2.2 mm (UF 589687), S of Riviera Beach, Peanut Island, Palm Beach Co., E Florida. **K**. Spec., 4.5 × 2.4 mm (P. Fallon coll.), Petit Saint Vincent Island, Saint Vincent and the Grenadines. **L**. Spec., 4.3 × 2.1 mm (MNHN-IM-2000-39551), Baie de Fort-de-France, Martinique. **M**. Spec., 4.9 × 2.3 mm (P. Fallon coll.), Petit Nevis, Saint Vincent and the Grenadines. – **N–R**. *Brachycythara alba* (C.B. Adams, 1850). **N**. Sequence voucher, 4.4 × 2.2 mm (MNHN-IM-2013-20647), Grand Cul-de-Sac Marin, Guadeloupe. **O–Q**. Specs, 4.7 × 2.3 and 5.0 × 2.4 mm, ventral views, and SEM of protoconch (MNHN-IM-2012-5798), W of Fajou Island, Guadeloupe. **R**. Spec., 5.6 × 2.8 mm (UF 589691), SE edge of Little Duck Key, Monroe Co., Florida Keys. – **S**. *Mangelia biconic*a var. *alba* C.B. Adams, 1850, lectotype, 6.2 × 2.9 mm (MCZ 186008), Jamaica. – **T–JJ**. *Brachycythara guadeloupensis* Fallon & Bouchet sp. nov. **T–W**. Holotype, 3.8 × 1.9 mm, ventral, dorsal, protoconch (not to scale) views, and SEM of protoconch (MNHN-IM-2012-5775), Anse à la Barque, Guadeloupe. **X–Y**. 2 paratypes (lengths = 2.3 and 3.8 mm) (MNHN-IM-2012-5791), Tête à l'Anglais, Guadeloupe. **Z–BB**. Paratypes, 3 of 11 (2.1–3.35 mm) (MNHN-IM-2012-5800), Vieux Habitant, Guadeloupe. **CC–DD**. Paratypes, 2 of 12 (1.7–4.2 mm) (MNHN-IM-2012-5802), Petite Anse, Guadeloupe. **EE–FF**. Paratypes, 2 of 10 (2.5–4.0 mm) (MNHN-IM-2012-5783), Point on bay of Baille-Argent, Guadeloupe. **GG–JJ**. Paratypes, 4 of 11 (2.8–3.8 mm) (MNHN-IM-2000-39797), Anse à la Barque, Guadeloupe. Credits: I, P, W: SEM images courtesy of Paul Callomon and Krasimira "Kasey" Seizova. Scale bars: A–H, J–O, Q–V, X–JJ = 2 mm; I, P, W = 300 µm.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Paratypes (81 specs)

GUADELOUPE • 11 specs, 2.9–3.8 mm, most live-caught; Anse à la Barque; 16°05.72′ N, 61°46.26′ W; depth 14 m; 9 May 2012; KARUBENTHOS 2012; stn GD11; MNHN-IM-2000-39797 • 10 specs, 2.9–3.4 mm, most live-caught; Pointe sur baie de Baille-Argent; 16°15.55′ N, 61°48.8′ W; depth 40 m; 12 May 2012; KARUBENTHOS 2012; stn GD21; MNHN-IM-2012-5783 • 12 specs, 3.2–4.3 mm; Petite Anse, 16°05.72′ N, 61°46.26′ W; depth 5 m; 10 May 2012; KARUBENTHOS 2012; stn GD13; MNHN-IM-2012-5802 • 11 specs, 2.8–3.4 mm; Vieux Habitant; 16°03.25′ N, 61°46.17′ W; depth 23 m; 9 May 2012; KARUBENTHOS 2012; stn GS10; MNHN-IM-2012-5800 • 11 specs, 3.1–3.9 mm; Tête à l'Anglais; 16°22.9′ N, 61°45.94′ W; depth 23 m; 8 May 2012; KARUBENTHOS 2012; stn GS08; MNHN-IM-2012-5791 • 1 spec., ethanol-preserved, 3.2 × 1.7 mm; Anse à la Barque; 16°05.72′ N, 61°46.26′ W; depth 14 m; 9 May 2012; KARUBENTHOS 2012; stn GD11; MNHN-IM-2019-35027 • 8 specs, ethanol-preserved, smallest and largest measured, 3.1 × 1.5 and 3.6 × 1.7 mm; Lizzard Point; 16°08.43′ N, 61°46.92′ W; depth 12 m; 7 May 2012; KARUBENTHOS 2012; stn GS07; MNHN-IM-2019-35026 • 1 spec., ethanol-preserved, 3.0 × 1.8 mm; Sens River Marina; 15°59′ N, 61°43.08′ W; depth 25 m; 21 May 2012; KARUBENTHOS 2012; stn GB25; MNHN-IM-2019-35029 • 1 spec., ethanol-preserved, 3.1 × 1.6 mm; Caret Pass; 16°22.28′ N, 61°38.14′ W; depth 29 m; 23 May 2012; KARUBENTHOS 2012; stn GS29; MNHN-IM-2019-35028 • 1 spec., ethanol-preserved, 3.5 × 1.7 mm; Lizzard Point; 16°08.43′ N, 61°46.92′ W; depth 12 m; 7 May 2012; KARUBENTHOS 2012; stn GS07; MNHN-IM-2019-35024 • 11 specs; Caribbean Bay interior; 16°12.4′ N, 61°47.03′ W; depth 3 m; 12 May 2012; KARUBENTHOS 2012; stn GD18; MNHN-IM-2012-5781 • 3 specs, length range = 3.4–4.0 mm; Port-Louis, Grand Cul-de-Sac Marin; 16°25.13′ N, 61°32.37′ W; depth 16 m; 14 May 2012; KARUBENTHOS 2012; stn GD22; MNHN-IM-2012-5784.

Other material examined (295 specs)

An additional 295 specimens were examined; data on 9 lots with a total of 213 of those specimens are as follows:

GUADELOUPE • 17 specs; Anse à la Barque; 16°05.72′ N, 61°46.26′ W; depth 14 m; 9 May 2012; KARUBENTHOS 2012; stn GD11; MNHN-IM-2000-39789 • 29 specs; Pointe sur baie de Baille-Argent; 16°15.55′ N, 61°48.8′ W; depth 40 m; 12 May 2012; KARUBENTHOS 2012; stn GD21; MNHN-IM-2000-39790 • 33 specs; Petite Anse; 16°05.72′ N, 61°46.26′ W; depth 5 m; 10 May 2012; KARUBENTHOS 2012; stn GD13; MNHN-IM-2000-39792 • 49 specs; Vieux Habitant; 16°03.25′ N, 61°46.17′ W; depth 23 m; 9 May 2012; KARUBENTHOS 2012; stn GS10; MNHN-IM-2000-39791 • 31 specs; Tête à l'Anglais; 16°22.9′ N, 61°45.94′ W; depth 23 m; 8 May 2012; KARUBENTHOS 2012; stn GS08; MNHN-IM-2000-39788 • 35 specs; Guadeloupe; 16°12.42′ N, 61°47.12′ W; depth 35 m; 8 May 2012; KARUBENTHOS 2012; stn GD08; MNHN-IM-2012-5801 • 2 specs, 4.5 × 2.2 mm; inside Caraïbe Bay; 16°12.4′ N, 61°47.03′ W; depth 3 m; 12 May 2012; KARUBENTHOS 2012; stn GD18; MNHN-IM-2000-39787 • 12 specs; Anse à la Barque, Basse-Terre; 16°05.7′ N, 61°46.3′ W; depth 10 m; 10 May 2012; KARUBENTHOS 2012; stn GD14; MNHN-IM-2012-5777 • 12 specs; Tête à l'Anglais; 16°22,9′ N, 61°45,94′ W; depth 23 m; 8 May 2012; KARUBENTHOS 2012; stn GB06; MNHN-IM-2012-5770 • 2 specs, 3.8 × 1.9 and 3.2 × 1.7 mm; Grande-Terre, banc de Vaisseaux; 16°09.0′ N, 61°17.3′ W; depth 33 m; 27 May 2012; KARUBENTHOS 2012; stn GD68; MNHN-IM-2012-5820 • 4 specs, (2 measured) 4.2 and 3.6 mm; Ilet Gosier; 16°11.31′ N, 61°29.59′ W; depth 22 m; 23 May 2012; KARUBENTHOS 2012; stn GD50; MNHN-IM-2012-5818 • 2 specs, (1 measured) length = 3.6 mm; Petit Terre; 16°13.62′ N, 61°32.38′ W; depth 3 m; 21 May 2012; KARUBENTHOS 2012; stn GD49; MNHN-IM-2012-5785 • 4 specs, (2 measured) lengths = 4.2 and 2.3 mm; Grand Cul-de-Sac Marin; 16°18.02′ N, 61°33.03′ W; depth 5 m; 20 May 2012; KARUBENTHOS 2012; stn GS28; MNHN-IM-2012-5797.

Description

Shell exceptionally small, holotype 3.6 × 1.8 mm, very few over 4.0 mm, biconic (W/L = 0.5000), of 5 whorls, sutures impressed, spire whorls wider than high, last whorl large, about 69% of total shell length, with well-rounded shoulders angulated a little above mid-whorl and body tapering sharply to a short anterior canal; sculpture of strong ribs and spirals that override ribs; aperture narrow, its length including canal about 51% of total shell length. *Protoconch* of 1½ whorls, the first ½-whorl often opaque white, last ¼-whorl with a series of faint wrinkles or growth marks, not distinct riblets. *Axial sculpture* of ribs that extend from suture to suture, narrow and opisthocline on early whorls, round-crested and straight on penultimate whorl, slightly recurved on shoulder, and curved to anterior fasciole on last. Ribs number 14 on penultimate (10–14 on paratypes) and 10 on last whorl to varix. *Varix* is a thickened rib close to the edge of outer lip, extending from suture to end of the anterior canal. *Spiral sculpture* of primary and secondary spirals, with 4 or 5 secondaries between each primary; all spirals granulose. *Sulcus* absent, but recurved ribs on the shoulder from just off the suture to the first primary spiral near the edge of the shoulder mark the past presence of the anal sinus. Only the finer, secondary spirals present. *Outer lip* is thin, strengthened by an enlarged last rib, and tapering off to the wide, shallow stromboid notch. *Anal sinus* nearly as wide as shoulder, sides divergent, set off from suture by parietal callus, apex of sinus against enlarged rib closest to aperture. *Inner lip* a narrow glaze along the columella and parietal wall, granulose, with parietal callus at the anal sinus and a denticle just below it. *Anterior fasciole* not swollen, with primaries and secondaries in a pattern like the shell base except more primaries and fewer secondaries. *Color* light golden brown with two broad brown bands, one on shoulder and another mid-whorl, bands darker in intercostal spaces; white bands at whorl periphery and below mid-whorl brown band; darker primaries present overall; tip of protoconch and anterior fasciole white.

Remarks

Some specimens lack a denticle on the inner lip and are lighter in color (i.e., those from Tête à l'Anglais). This difference is considered a variant. The average total length of 54 measured specimens is 3.2 mm (1.7–4.6 mm).

Range and habitat

Guadeloupe; depth 5–50 m.

Genus ***Cryoturris*** Woodring, 1928

Granoturris Fargo, 1953 is a junior synonym. The type species is *G. padolina* Fargo, 1953, holotype ANSP19174 from North St. Petersburg, Florida Pliocene. See below the differences from other genera for comparison of the type with the diagnostic characteristics of *Cryoturris*.

Type species

Cryoturris engonia Woodring, 1928, by original designation (Fig. 36A–D).

Summary diagnostic characteristics

Shell fusiform, slender to moderately robust or biconic, whorls shouldered or angled mid whorl, last whorl rapidly tapers to anterior canal.

Protoconch of 2 to 3 conical, minute tip, rapidly expanding whorls, the last with a peripheral bulge with either arcuate, unmodified riblets or riblets with median swellings on the last ½–1 whorl that form a carina. in either case riblets does not always extend to the abapical suture.

Axial sculpture of ribs that run from suture to suture, varix absent but the last rib may be the largest thus serving to protect the apertural edge.

Spiral sculpture of primaries and secondaries of different strengths that are frosted and override ribs.

Outer lip is simple, with a wide and shallow anal sinus, its apex near whorl periphery, parietal callus absent.

Anterior canal barely differentiated from aperture and of short or moderate length.

Shell surface microsculpture

Shell surface SEM images of representative specimens appear in Figs 32–34. The microstructure associated with 'frosting' consists of small erect bundles of short, microscopic fibrils that fan out from a short basal attachment, or trunk, and positioned at growth line–secondary spiral intersections seen in images of 540–850 × magnification. Stronger secondary spirals have larger bundles.

Primary spirals are much wider than secondaries and have multiple smaller bundles aligned in rows on their surface, perpendicular to or slightly oblique to the primary's axis, and appearing as though wound around it.

Although differing in ratios of primaries and secondaries, the microsculpture of species of *Cryoturris* appear to share some similarities: erect structures on secondaries fan out in varying degrees in a single plane parallel to growth striae, and structures on primaries that are broader, equal to the width of the primary and parallel to growth lines. Because of the larger diameter of the primary, they appear wound around the primary.

Radula

A representative of a single species of this genus (*Cryoturris maestratii* Fallon & Bouchet sp. nov., MNHN-IM-2013-70364, paratype) was imaged (Fig. 31). Its description is as follows: hypodermic marginal teeth simple, small, length about 60 mm (2.8% of AL), with rather long attenuated solid base, constituting about ¼ of total tooth length. Tooth conical, gradually narrowing toward simple tip without barbs and blades and with large oval terminal opening. Base with broad lateral basal opening and with a distinct spur.

Differences from other genera

Kurtziella Dall, 1918 has 3 to 4 rows of beads across riblets on the last whorl of the protoconch whereas the that of *Cryoturris* has plain riblets or riblets with a single row of modified peripheral swellings that because of the dense number of riblets appear as a single beaded spiral. in addition, axial ribs on the *Cryoturris* teleoconch run from suture to suture, unlike in *Kurtziella* where a subsutural band of spirals separates ribs from the suture.

Saccharoturris Woodring, 1928 is similar but the protoconch has an almost complete reduction of riblets with just a row of peripheral swellings on the last whorl. Teleoconch whorls are more acutely angled than *Cryoturris* and frosting coarser yet. Shell spire is taller than the last whorl in *Saccharoturris* and the outer lip is rounded at whorl periphery, not angled as in most *Cryoturris*.

Kurtzia Bartsch, 1944 has a proportionally larger last protoconch whorl with 3 rows of beads, the middle row most prominent. That of *Kurtziella* is more moderately sized without a prominent whorl. Ribs on the teleoconch end at the suture.

Kurtzina Bartsch, 1944 has a proportionally larger last protoconch whorl and the teleoconch has fewer but stronger ribs that run to the suture.

Granoturris Fargo, 1953 has a smooth protoconch of 1½ to 2 whorls, "the tip immersed or not, at first loosely coiled, rapidly enlarging, becoming high and bulbous on the second turn. Sometimes a few weak axial riblets on the last turn, followed by a weak sub-median peripheral keel preceding the sculpture of the conch." This latter portion of the description, beginning with "followed by…" is considered the

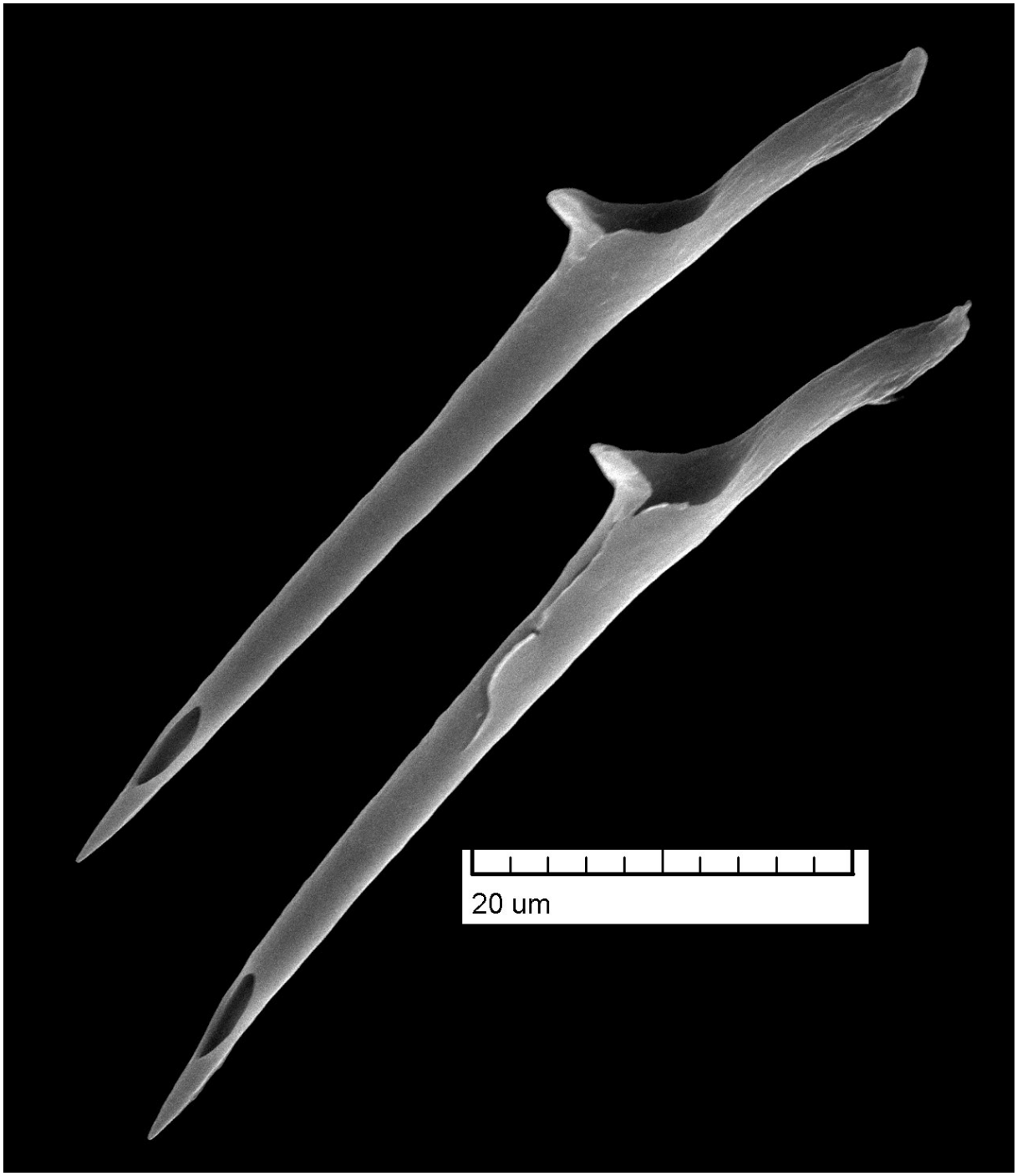


Fig. 31. Marginal teeth of the radula of *Cryoturris maestratii* Fallon & Bouchet sp. nov. (MNHN-IM-2013-70364). Image by Y. Kantor.

last and the third whorl of the protoconch, which aligns with the description of species of *Cryoturris*. The type species of *Granoturris* is *G. padolina*. Yet, a close examination of this fossil species proved it to belong in *Cryoturris* Woodring, 1928 in all respects. Hence, *Granoturris* is a junior synonym of *Cryoturris*.

Remarks

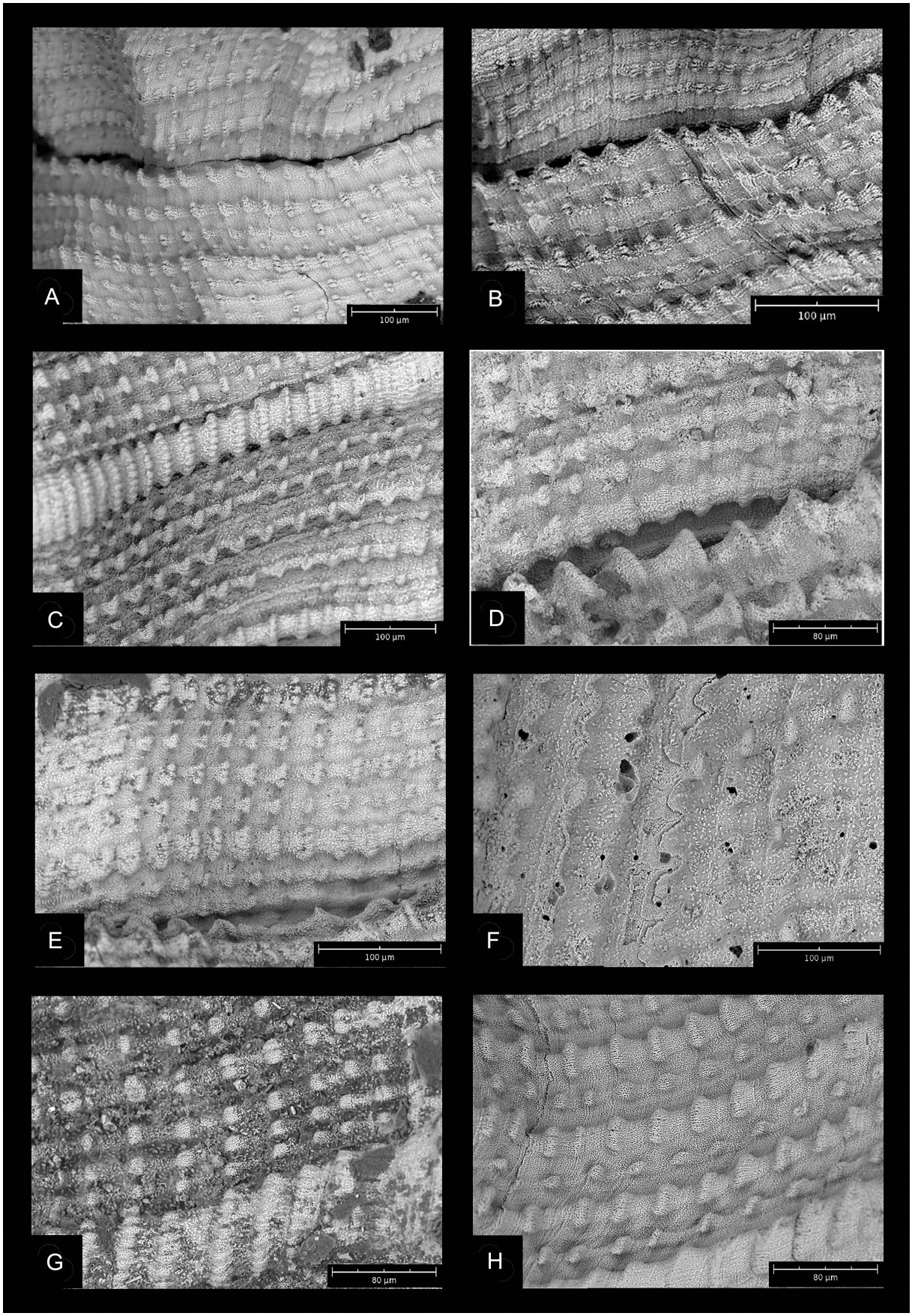
Cryoturris Woodring, 1928, is a widely misunderstood taxon; most species currently combined in this genus lack important diagnostic characteristics specified by Woodring and so belong elsewhere. Below is a list of *Cryoturris* species in WoRMS that are proposed to be combined in other genera (accessed on 13 May 2019). The proposed changes are explained in the respective genus sections.

Cryoturris citronella Dall, 1886 is now in *Bathyturris* Fallon gen. nov.

Cryoturris edithae Uskicke, 1971 is now in *Rubellatoma*.

Cryoturris lavalleana d'Orbigny, 1853 is now in *Vitricythara*.

Fig. 32 (next page). Species of *Cryoturris* Woodring, 1928, shell surface microsculpture. Part 1. **A**. *Cryoturris badia* Fallon & Bouchet sp. nov., paratype, 5.0 × 1.9 mm (USNM 1715384), S of Pimantée Point, Three Rivers, Martinique. Structures consist of minute bundles of erect fibrils, only minimally fanned, and just slightly wider than the width of the spiral. 1–3 weak secondary spirals run between each stronger one. No primary spirals shown. **B**. *Cryoturris maestratii* Fallon & Bouchet sp. nov., holotype, 5.4 × 2.3 mm (MNHN-IM-2013-71936), SW of Vétiver, Martinique. Structures fine, fanning out of fibrils is moderate. Strength of spirals quite variable, the strongest positioned against the whorl's suture. **C**. *Cryoturris eburnea* Fallon & Bouchet sp. nov., holotype, 6.2 × 2.5 mm (MNHN-IM-2000-39566), S of Marie-Galante, Guadeloupe. Structures on secondary spirals have minimal fanning in the direction of the growth lines. Where growth lines cross obliquely over secondary spirals, structures also fan out obliquely giving the spirals the appearance of stretched out springs. Primary spirals (2 shown) are composed of much larger bundles of fibrils, but much smaller, more numerous, and closely packed structures that run over the surface of the primary. Also, the fanning of the tips of the structures is parallel to the primary spiral, not to the growth line, as is with the secondaries. **D**. *Cryoturris usitata* Fallon & Bouchet sp. nov., paratype, 10.5 × 3.6 mm (D. Lamy coll.), E of Fajou Island, Guadeloupe. Fanning of the tips of the structures is minimal; spirals vary in width. Primary spiral structure (lower half of image) fanning occurs at the upper portion of the structures. **E**. *Cryoturris simplex* Fallon & Bouchet sp. nov., paratype, 9.2 × 3.6 mm (MNHN-IM-2012-09076), banc de Vaisseaux, Grande-Terre, Guadeloupe. Fanning of tips of structures moderate, strengths of spirals variable. A strong secondary that lies against the suture is visible at bottom of image. **F**. *Cryoturris rapa* Fallon & Bouchet sp. nov., holotype, 13.6 × 5.1 mm (MNHN-IM-2000-39578), E of La Désirade, Guadeloupe. Growth lines wavy and ridged; 2 spirals with compact structures, with minimal fanning shown; widely spaced. The shell's surface is worn, so structures are damaged. **G**. *Cryoturris lizae* Fallon sp. nov., holotype, 9.8 × 3.5 mm (MNHN-IM-2000-39571), S of La Désirade, Guadeloupe. Structures are round bundles on secondary spirals with no fanning. Primary (bottom of image) with smaller bundles lined up along growth lines, also without fanning of tips. **H**. *Cryoturris dorvilliae* (Reeve, 1845). Spec., 5.8 × 2.2 mm (MNHN-IM-2000-39561), Grand River, Souffleur Point, Martinique. Spirals variable in width, fanning of bundles is minimal. Credits: SEM images courtesy of Krasimira "Kasey" Seizova. Scale bars: A–C, E–F = 100 μm; D, G–H = 80 μm.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Species of uncertain placement

Cryoturris serta Fargo, 1953 is a fossil species, possibly belonging in *Bathyturris* Fallon gen. nov., accepted under *Kurtziella* in WoRMS, but not addressed herein because Recent specimens have not been found.

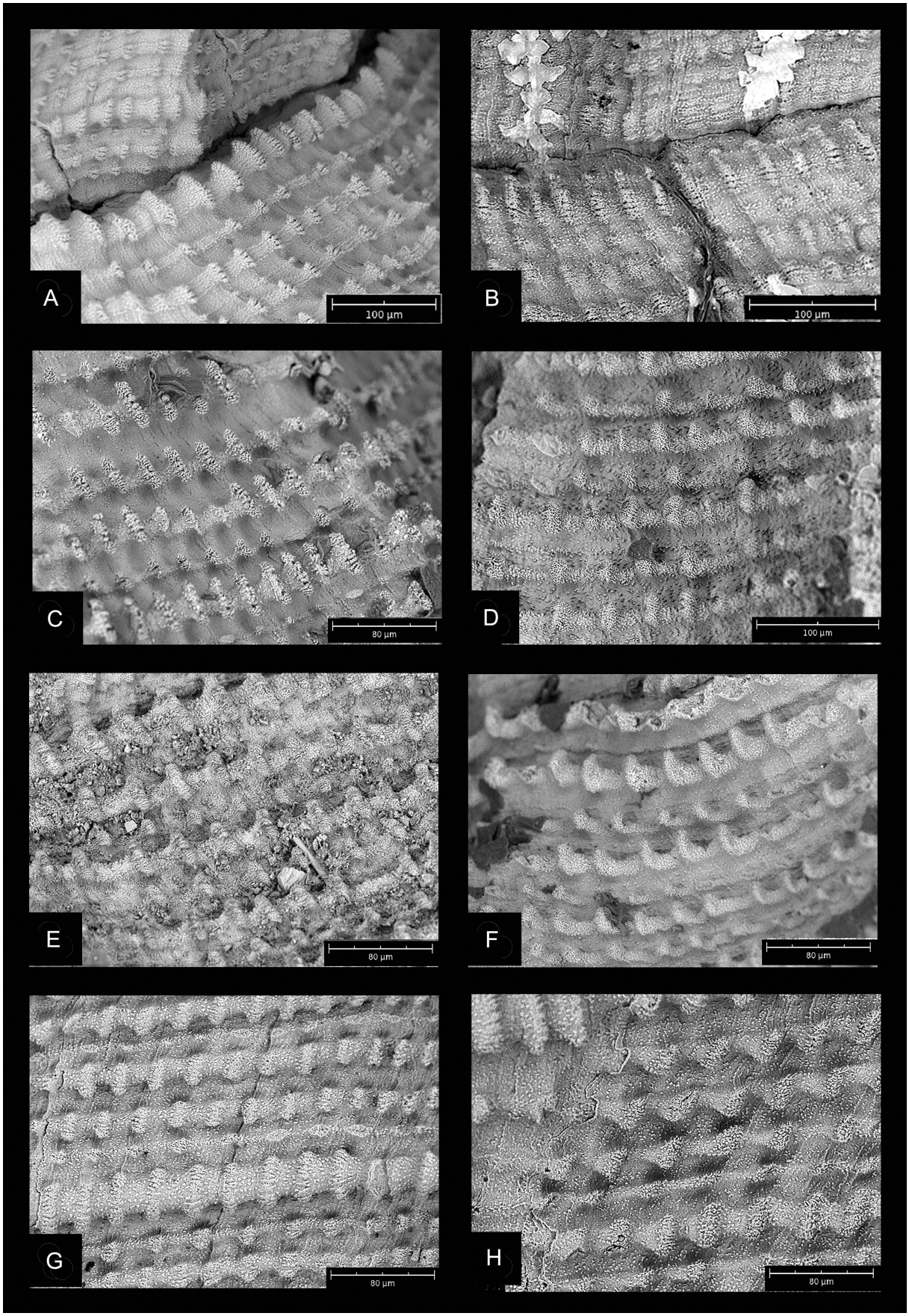
One species has been recombined in *Cryoturris* from *Granoturris* Fargo, 1953, viz. *Granoturris presleyi* (W.G. Lyons, 1972).

One species presently combined in *Cryoturris* is proposed as nomen dubium, viz. *Pleurotoma* (*Clathurella*) *adamsii* E.A. Smith, 1884, see under genus *Rubellatoma.*

Phylogenetic relationships

The DNA sequence data support the monophyly of the genus *Cryoturris*, with all seven sequenced species forming a well-supported clade. The lineage is recovered sister to the genus *Kurtziella*, but without bootstrap support. All sequenced species show a modest intraspecific variability (average intraspecific p-distance range: 0.06–0.60%).

Fig. 33 (next page). Species of *Cryoturris* Woodring, 1928, shell surface microsculpture. Part 2. **A**. *Cryoturris voluta* Fallon sp. nov., holotype, 4.4 × 2.1 mm (UF 589699), St Johns Co., E Florida. Wide fanning parallel to growth striae. A strong spiral secondary at the suture has larger structures and consequently wider fanning; nearby spirals vary in strength. No primaries shown. **B**. *Cryoturris olsoni* Fallon & Bouchet sp. nov., holotype, 5.0 × 2.1 mm (MNHN-IM-2012-8866), Banc de Vaisseaux, Guadeloupe. Structures low and spirals vary in width with correspondingly variable structures. **C**. *Cryoturris redferni* Fallon & Bouchet sp. nov., paratype, 6.6 × 2.3 mm (MNHN-IM-2012-8775), Basse-Terre, Guadeloupe. Structures tall with a wide fanning of tips, spirals and associated structures variable in strength. **D**. *Cryoturris delicatior* Fallon & Bouchet sp. nov., holotype, 7.0 × 2,7 mm (MNHN-IM-2000-39560), W of Basse-Terre, Guadeloupe. Structures are more uniform in strength among spirals than in preceding images, but with moderate fanning at their tips. **E**. *Cryoturris robusta* Fallon & Bouchet sp. nov., holotype, 9.5 × 3.8 mm (MNHN-IM-2000-39582), off Macouba, Martinique. Structures variable in width among spirals, and with moderated to wide fanning at their tips. **F**. *Cryoturris procera* Fallon & Bouchet sp. nov., paratype, 11.1 × 3.8 mm (D. Lamy coll.), S of La Désirade, Guadeloupe. Structures are not compact, instead slope to the base of the spirals, and along the spiral appear like pulled-out springs. Tips of spirals moderately fanned; spirals vary in strength. **G**. *Cryoturris fargoi* McGinty, 1955, holotype, 11.6 × 4.7 mm (ANSP 194062), off Destin, Okaloosa Co. Less fanning of structure tops, secondary spirals seen as variable in strength. The visible primary has a single broad structure parallel to growth increments. **H**. *Cryoturris septentrionalis* Fallon sp. nov., holotype, 10.9 × 4.3 mm (UF 589739), 50–60 mi. [80–97 km] E of Ponte Vedra, St Johns Co., NE Florida. Spirals are close together on the shoulder of the shell. Structures appear along growth lines at their intersection with spirals and have a moderate spread at their tips. Most are damaged in this image. Credits: SEM images courtesy of Krasimira "Kasey" Seizova. Scale bars: A–B, D = 100 µm; C, E– H = 80 µm.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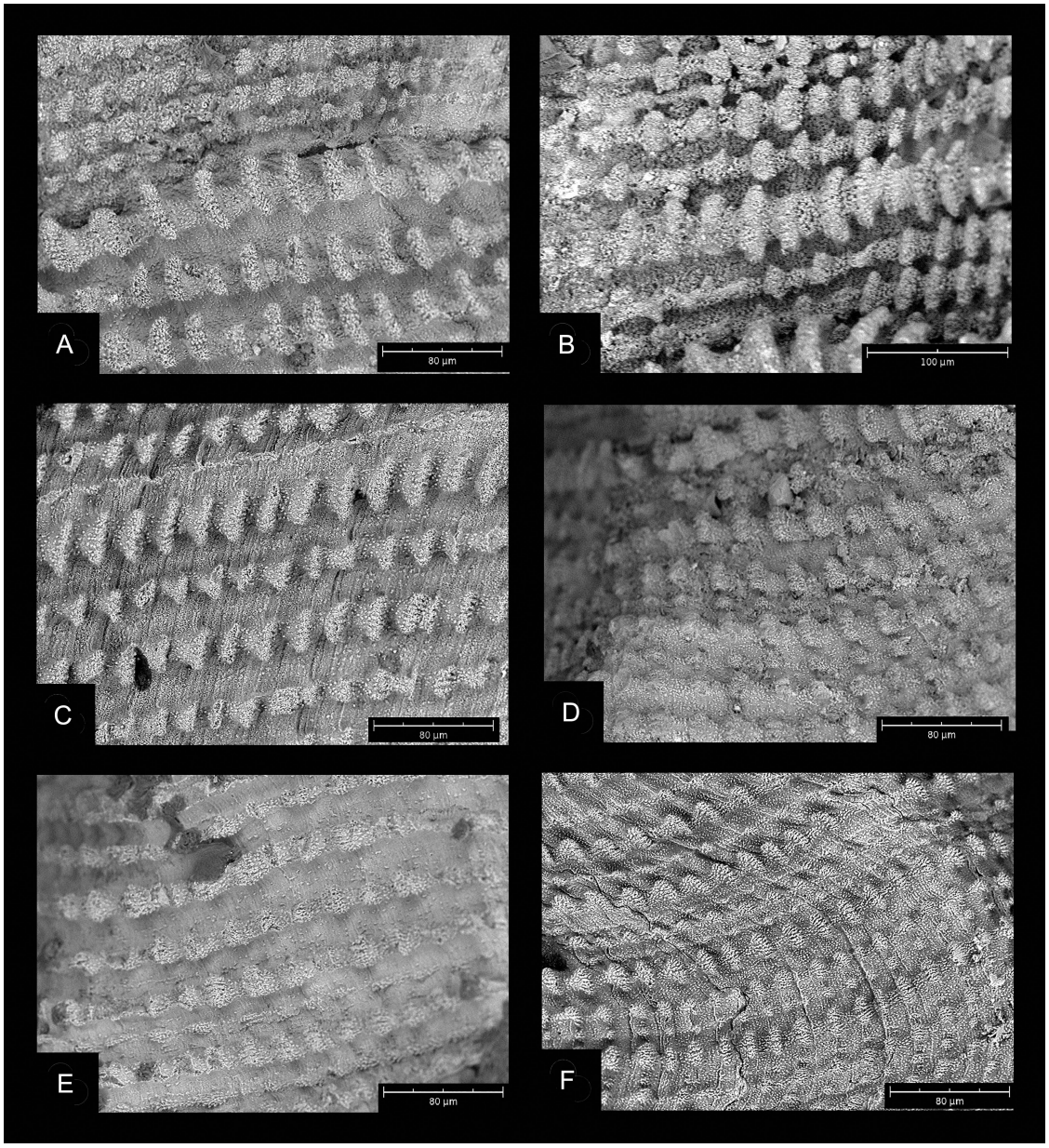

Fig. 34. Species of *Cryoturris* Woodring, 1928, shell surface microsculpture. Part 3. **A**. *Cryoturris texana* Fallon sp. nov., holotype, 9.7 × 3.5 mm (FLMNH 589738), scallop dump, Port St Joe, Gulf Co., NW Florida, 850 ×. Structures are largest along whorl suture, fanning wide. **B**. *Cryoturris pelican* Fallon sp. nov., holotype, 6.5 × 2.8 mm (FLMNH 589733), off Bradenton, Manatee Co., W Florida, 800 ×. Structures variable in strength, fanning wide. **C**. *Cryoturris tortugana* Fallon sp. nov., holotype, 8.5 × 2.9 mm (FLMNH 589731), off Dry Tortugas, Monroe Co., Florida Keys, 850 ×. Structure fanning about twice the width of spirals; spiral widths variable. **D**. *Cryoturris holimanae* Fallon sp. nov., holotype, 10.8 × 3.8 mm (FLMNH 589724), scallop dump, Xalvis Island, Duval Co., NE Florida, 850 ×. Structure fanning only slightly wider than diameter of spiral; spiral width variable. **E**. *Cryoturris seizovae* Fallon sp. nov., holotype, 7.5 × 2.6 mm (FLMNH 589715), Jacksonville Beach, Duval Co., NE Florida, 850 ×. Structures not as compressed as in preceding species (bundles of fibrils are almost round), fanning minimal, spiral width variable. **F**. *Cryoturris presleyi* (W.G. Lyons, 1972) comb. nov. Specimen, 4.7 × 1.8 mm (MNHN-IM-2012-8761), Grand Cul-de-Sac Marin: Port-Louis (Oeil), Guadeloupe, 800 ×. Structures are distinct, fanning variable, dependent on strength of spirals. Credits: SEM images courtesy of Krasimira "Kasey" Seizova. Scale bars: A, C–F = 80 µm; B = 100 µm.

***Cryoturris* spp. Part 1**

Cryoturris badia Fallon & Bouchet sp. nov.
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Figs 32A, 36E–P

Differential diagnosis

This species is close to the fossil *Cryoturris engonia* Woodring, 1928, the type species of the genus. It differs in having slightly less angular whorls, more rounded rib crests, a longer, more gently tapered body whorl, and weaker spiral elements.

Cryoturris maestratii Fallon & Bouchet sp. nov. has stronger primary spirals, possesses a reddish-brown inner lip, and lacks a reddish-brown mid-whorl spiral band.

Etymology

Cryoturris badia Fallon & Bouchet sp. nov., from the feminine form of the Latin adjective '*badius*', meaning 'reddish-brown', after the color of bands on fresh specimens.

Type material

Holotype

GUADELOUPE • 4.8 × 2.0 mm; Port-Louis, entrance to Barracuda Cave; 16°27.34′ N, 61°32.07′ W; depth 19 m; 16 May 2012; KARUBENTHOS 2012; stn GS20; sequenced; MNHN-IM-2013-20627.

Paratypes (9 specs)

GUADELOUPE • 1 spec., 4.3 × 1.8 mm; Ilet Gosier; 16°11.31′ N, 61°29.59′ W; depth 22 m; 23 May 2012; KARUBENTHOS 2012; stn GD50; MNHN-IM-2012-8757 • 1 spec., 5.2 × 2.0 mm; 16°22.57′ N, 61°34.12′ W; depth 80 m; 4 May 2012; KARUBENTHOS 2012; stn GD01; MNHN-IM-2012-8758 • 1 spec., 3.6 × 1.6 mm; Basse-Terre, Anse à la Barque; 16°05.7′ N, 61°46.3′ W; depth 10 m; 10 May 2012; KARUBENTHOS 2012; stn GD14; MNHN-IM-2012-8773 • 1 spec., 3.3 × 1.5 mm, ethanol-preserved; Pointe d'Antigues, Port-Louis; 16°25.99′ N, 61°32.92′ W; depth 45 m; 17 May 2012; KARUBENTHOS 2012; stn GS22; MNHN-IM-2019-34718.

MARTINIQUE • 1 spec., 5.0 × 1.9 mm; S of Pointe Pimantée, Trois Rivières; 14°27.5′ N, 60°58.2W; depth 17–19 m; 9 Oct. 2016; MADIBENTHOS; stn AS579; USNM 1715384 • 3 specs, lengths = 3.2, 2.7 and 2.5 mm; Anse des Galets; 14°51.4′ N, 61°12.8W; depth 14–26 m; 7 Oct. 2016; MADIBENTHOS; stn AS568; MNHN-IM-2000-39558 • 1 spec., 3.65 × 1.7 mm; Case-Pilote, La batterie; 14°38.6′ N, 61°08.5′ W; depth 8 m; 8 Sep. 2016; MADIBENTHOS; stn AD109; MNHN-IM-2000-39559.

Other material examined (11 specs)

GRENADA • 1 spec., length = 5.2 mm; Mabouya Island; depth 9 m; 23 Dec. 2006; G. Mackintosh leg.; night SCUBA; P. Fallon coll.

GUADELOUPE • 2 specs, 4.35 × 2.2 and 3.4 × 1.7 mm; Petite Anse; 16°05.72′ N, 61°46.26′ W; depth 5 m; 10 May 2012; KARUBENTHOS 2012; stn GD13; MNHN-IM-2012-9024 • 1 spec., 3.6 × 1.5 mm; Pointe sur baie de Baille-Argent; 16°15.55′ N, 61°48.8′ W; depth 40 m; 12 May 2012; KARUBENTHOS 2012; stn GD21; MNHN-IM-2012-8756 • 1 spec., 4.9 × 1.9 mm; Pointe sur baie de Baille-Argent; 16°15.55′ N, 61°48.8′ W; depth 40 m; 12 May 2012; KARUBENTHOS 2012; stn GD21; MNHN-IM-2012-8755 • 1 spec., 4.2 × 1.8 mm; Basse-Terre, Anse à la Barque; 16°05.5′ N, 61°46.6′ W; depth 45 m; 9 May 2012; KARUBENTHOS 2012; stn GD12; MNHN-IM-2012-8764 • 1 spec., 3.4 × 1.6 mm; Vieux-Bourg (Les Abymes); 16°22.8′ N, 61°33.44′ W; depth 60 m; 18 May 2012; KARUBENTHOS

2012; stn GD37; MNHN-IM-2012-8762 • 1 spec., 2.7 × 1.3 mm; Grand Cul-de-Sac Marin, off Fajou; 16°22.41′ N, 61°35.57′ W; depth 80 m; 3 May 2012; KARUBENTHOS 2012; stn GN01; MNHN-IM-2012-8759 • 1 spec., 3.8 × 1.7 mm; off Anse à la Barque; 16°05.4′ N, 61°46.5′ W; depth 50 m; 10 May 2012; KARUBENTHOS 2012; stn GD15; MNHN-IM-2012-8763 • 1 spec., 4.7 × 1.9 mm; Vieux Habitant; 16°03.25′ N, 61°46.17′ W; depth 23 m; 9 May 2012; KARUBENTHOS 2012; stn GS10; MNHN-IM-2012-8765.

MARTINIQUE • 1 spec., 3.6 × 1.6 mm; Schoelcher, Anse Madame; 14°37.1′ N, 61°06.8′ W; depth 90 m; 7 Oct. 2016; MADIBENTHOS; stn AD610; MNHN-IM-2000-39871.

Description

Shell small (holotype length = 4.8 mm, largest length = 6.2 mm), fusiform (W/L = 0.4167), 7 whorls total, with acutely angled spire whorls and shoulders extending to almost mid-whorl. The last whorl angled less, base constricted to a short, distinct anterior canal, both about 61% of shell length. Aperture oval with a wide shallow notch on shoulder, about 42% of shell length; sculpture of numerous narrow ribs and fine frosted spirals. *Protoconch* of about 2½ round whorls, the first with a minute tip, protruding, then whorls evenly expand, the last ½-whorl with crowded, opisthocline arcuate riblets that terminate just below the whorl's periphery. *Axial sculpture* of narrow, low ribs that run from suture to suture on spire whorls and to anterior fasciole on the last, ribs fade at suture, are angulate and strongest on whorl periphery, number 13 on penultimate and 9 on last whorl, and are spaced about the same as their width except on dorsum of last whorl where intercostal space and rib size are greater. *Varix* absent; the last rib, the strongest, acts to strengthen the outer lip. *Spiral sculpture* of mostly fine spirals (secondaries) of varying strengths. A single strong primary defines the whorl periphery. A strong secondary lies next to the whorl suture, followed by weaker secondaries of varying strengths to the edge of the shoulder. The periphery is marked by a strong primary, which overrides ribs and is nodulose on rib crests. There are 4 strong secondaries on whorl sides and about 4–6 weaker secondaries between them. The pattern changes on the shell base, where there are more strong secondaries and fewer weaker ones advancing anteriorly. *Sulcus* absent; past positions of the sinus are indicated by the recurved ribs on the shoulder. The arc of the ribs is greatest near the shoulder's edge and reflects the apices of the sinus. *Outer lip* is thin, simple; lip edge traces a low arc from anal sinus to anterior canal margin, where it flexes in to follow the canal edge. Stromboid notch absent. *Anal sinus* a wide, shallow, simple notch on the shoulder, apex close to whorl periphery. *Inner lip* is narrow, etched into columella, without a parietal callus. *Columella* straight. *Anterior canal* of moderate length, well defined, turned slightly to the right when viewed ventrally, unnotched. *Anterior fasciole* not swollen, sculpture of tightly packed oblique primary spirals. *Color* white to yellowish white with a broad reddish-brown mid-whorl spiral band and a narrower one on the shoulder at the suture; band is darkest on rib crests and edge of outer lip of last whorl.

Remarks

The average total length of 19 specimens is 4.1 mm (2.7–6.4 mm). The intensity and width of the reddish-brown bands vary in width among specimens. The pattern of spirals varies among specimens: there may be only 1 or up to 3 strong secondaries against the suture on the whorl shoulder, followed by closely packed weaker secondaries of varying strengths to the edge of the shoulder.

Range and habitat

Guadeloupe and Martinique; depth 5–90 m, live-collected at 19 and 45 m.

Cryoturris maestratii Fallon & Bouchet sp. nov.
urn:lsid:zoobank.org:act:17533310-CF98-40A1-833E-47C0D2558144
Figs 31, 32B, 35, 36Q–X

Differential diagnosis

Cryoturris badia Fallon & Bouchet sp. nov. has weaker primary spirals, lacks a reddish-brown inner lip and columella, but possesses a reddish-brown mid-whorl band.

Etymology

Cryoturris maestratii Fallon & Bouchet sp. nov. is named in honor of Philippe Maestrati, the indefatigable coordinator of the sorting of so many MNHN expeditions' samples, including samples from the KARUBENTHOS, MADIBENTHOS, and French Guiana expeditions mentioned in this report.

Type material

Holotype
MARTINIQUE • 5.4 × 2.3 mm, SW Vétiver; 14°37.5′ N, 61°08.3′ W; depth 74 m; 2 Oct. 2016; MADIBENTHOS; stn AD290; sequenced; MNHN-IM-2013-71936.

Paratypes (11 specs)
MARTINIQUE • 3 specs, 5.7 × 2.1, 5.2 × 2.1, and length = 3.8 mm; off Macouba; 14°55.1′ N, 61°09′ W; depth 80 m; 24 Sep. 2016; MADIBENTHOS; stn AD261; USNM 1715383 • 1 spec., 4.8 × 1.9 mm, ethanol-preserved; Passe du Marin, SW of Pointe Borgnesse; 14°26.1′ N, 60°54.5′ W; depth 60 m; 10 Sep. 2016; MADIBENTHOS; stn AD218; MNHN-IM-2013-70364 • 1 spec., 5.7 × 2.2 mm; N of Caravelle Peninsula; 14°52.1′ N, 60°53.7′ W; depth 59 m; 18 Sep. 2016; MADIBENTHOS; stn; AD244; sequenced; MNHN-IM-2013-70918 • 1 spec., 4.6 × 1.8 mm; SW of Vétiver; 14°37.6′ N, 61°08.3′ W; depth 60 m; 30 Sep. 2016; MADIBENTHOS; stn AD280; MNHN-IM-2000-39572 • 4 specs, 5.2 × 2.0, 4.5 × 1.3, 4.2 × 1.7 and 4.3 × 1.7 mm; off Macouba; 14°55′ N, 61°08.9′ W; depth 80 m; 27 Sep. 2016; MADIBENTHOS; stn AD275; MNHN-IM-2000-39573 • 1 spec., 5.0 × 2.0 mm; N of Caravelle Peninsula; 14°53.1′ N, 60°53.4′ W; depth 60 m; 18 Sep. 2016; MADIBENTHOS; stn AD245; ANSP 498836.

Other material examined (2 specs)

MARTINIQUE • 1 spec., 4.3 × 1.7 mm; off Macouba; 14°55′ N, 61°08.9′ W; depth 80 m; 27 Sep. 2016; MADIBENTHOS; stn AD275; MNHN • 1 spec., 5.6 × 2.3 mm; Caravelle Peninsula, NW of Rocher de la Caravelle; 14°49.4′ N, 60°53.7′ W; depth 60 m; 18 Sep. 2016; MADIBENTHOS; stn AD242; MNHN-IM-2000-39872.

Description

Shell small (holotype length = 5.4 mm, largest measured length = 5.7 mm), fusiform (W/L = 0.4259), 7 whorls total, with acutely angled spire whorls and shoulders extending to almost mid-whorl. The last whorl angled less, its base tapered to a short, distinct anterior canal, both about 65% of shell length. Aperture narrowly oval with a wide shallow notch on shoulder, about 43% of shell lengtth; sculpture of numerous narrow ribs and strong frosted spirals. *Protoconch* of about 2¾ round whorls, the first with a minute tip, protruding, then whorls expand, the last with crowded, opisthocline arcuate riblets that strengthen advancing, terminating before the suture. *Axial sculpture* of strong narrow ribs that run from suture to suture on spire whorls and to anterior fasciole on the last, number 14 on penultimate and 11 on last whorl. Ribs are recurved and narrower on shoulder and are spaced about the same as their width except on dorsum of last whorl where intercostal space is wider and rib size greater. *Varix* absent; however, strong ribs near edge of outer lip serve to strengthen the lip. *Spiral sculpture* of primary and

secondary spirals of variable strengths overall. There are 3 primaries on penultimate whorl side, 3 on the shell base, and fine secondaries lie in intercalary space. The peripheral primary is the boundary between the and whorl sides, overrides ribs and is nodulose on rib crests. There is a strong secondary at the suture, followed by weaker but varying sized secondaries to the shoulder edge. *Sulcus* absent; past positions of the sinus indicated by the recurved ribs on the shoulder. *Outer lip* is thin, simple; lip edge forms an arc from anal sinus to anterior canal margin where it flexes in to follow the canal edge. Stromboid notch absent. *Anal sinus* is a wide notch positioned closer to the edge of the shoulder than the suture. *Inner lip* a thin, narrow, margined glaze, without a parietal callus. *Columella* straight. *Anterior canal* of moderate length, well defined, turned slightly to the right when viewed ventrally, unnotched. *Anterior fasciole* not swollen, sculpture of packed primary spirals. *Color* of light golden yellow, darker in intercostal space, reddish-brown along inner lip, columella, ventral side of canal, and tip of protoconch.

Animal

The animal (Fig. 35) has brown and white foot and translucent proboscis and cephalic tentacles with opaque white mottling.

Remarks

The average total length of 14 measured specimens is 4.9 mm (4.2–5.7 mm). No other significant variation in either form or color pattern was observed among these specimens.

Range and habitat

Martinique; depth 59–80 m, live-taken at depths of 59, 60 and 74 m.

Fig. 35. *Cryoturris maestratii* Fallon & Bouchet sp. nov. (MNHN-IM-2013-71936), live animal. Photo by C. Redfern.

Cryoturris eburnea Fallon & Bouchet sp. nov.
urn:lsid:zoobank.org:act:63D0AE9A-EF58-43B9-9F4E-4ABA518061E0
Figs 32C, 36Y–EE

Differential diagnosis

This species is easily identified by its short but hooked anterior canal and its all-white shell color.

Adelocythara aliceae Fallon & Bouchet sp. nov. is all white but has stronger spirals, a plain, broad-tipped protoconch, a varicose lip, and a straight anterior canal.

Etymology

Cryoturris eburnea Fallon & Bouchet sp. nov., from the feminine form of the Latin adjective '*eburneus*', meaning 'ivory-colored', named for the color of its shell.

Type material

Holotype

GUADELOUPE • 6.2 × 2.5 mm; S of Marie-Galante; 15°51′ N, 61°18′ W; depth 250–254 m; 29 Jun. 2015; KARUBENTHOS 2; stn DW4646; MNHN-IM-2000-39566.

Paratypes (17 specs)

GUADELOUPE • 1 spec., 5.7 × 2.4 mm; S of Marie-Galante; 15°51′ N, 61°18′ W; depth 250–254 m; 29 Jun. 2015; KARUBENTHOS 2; stn DW4646; MNHN-IM-2000-39569 • 1 spec., 6.1 × 2.5 mm, live-caught, ethanol-preserved; W of Marie-Galante; 15°51′ N, 61°26′ W; depth 263–264 m; 29 Jun. 2015; KARUBENTHOS 2 stn DW4647; MNHN-IM-2013-61562 • 3 specs, 6.2 × 2.6, 5.5 × 2.2 and 5.3 × 2.1 mm; S of La Désirade; depth 250 m; 2016; dredged; ANSP 498784 • 1 spec., 4.1 × 1.9 mm; S of La Désirade; depth 250 m; 2018; dredged; D. Lamy coll. • 1 spec., 4.4 × 2.1 mm; S of Marie-Galante; 15°50′ N, 61°19′ W; depth 305–312 m; 28 Jun. 2015; KARUBENTHOS 2; stn DW4638; MNHN-IM-2000-39567 • 1 spec., 4.4 × 2.0 mm; W of Marie-Galante; 15°58′ N, 61°23′ W; depth 200–206 m; 22 Jun. 2015; KARUBENTHOS 2 stn DW4594; ANSP 498824 • 1 spec., 3.7 × 1.6 mm; W of Marie-Galante; 15°59′ N, 61°27′ W; depth 150–221 m; 21 Jun. 2015; KARUBENTHOS 2; stn DW4589; MNHN-IM-2000-39568 • 1 spec., 4.2 × 2.0 mm; N of Grande-Terre; 16°31′ N, 61°32′ W; depth 268–306 m; 14 Jun. 2015; KARUBENTHOS 2; stn DW4546; ANSP 498823 • 2 specs, 4.3 × 2.0 and 3.7 × 1.7mm; S of Marie-Galante; 15°52′ N, 61°20′ W; depth 217–225 m; 28 Jun. 2015; KARUBENTHOS 2; stn DW4637; USNM 1715422 • 2 specs, 4.4 × 1.9 and 5.3 × 2.1 mm; S of La Désirade; depth 250 m; 2017; dredged; D. Lamy coll. • 1 spec., length = 5.3 mm; off Marie-Galante; depth 350 m; 2016; dredged; ANSP 498785 • 1 spec., length = 6.0 mm; off Marie-Galante; depth 250 m; 2017; dredged; D. Lamy coll.

UNITED STATES OF AMERICA • 1 spec., 6.3 × 2.3 mm; off San Blas, S of Apalachicola Bay, Gulf of Mexico; depth 203 m; USNM 323902.

Description

Shell small (holotype length = 6.2 mm), fusiform (W/L = 0.4032), 7½ whorls total, with medially angled spire whorls and shoulders extending to mid-whorl. The last whorl angled less, its base tapered to a short, distinct anterior canal, both about 62% of shell length. Aperture widely oval, about 32% of shell length with a wide shallow anal sinus; sculpture of strong ribs and frosted spirals of varying strengths. *Protoconch* of about 3 round whorls, the first with a minute protruding tip followed by evenly expanding whorls that develop a mid-whorl bulge toward the end. The first 1½ whorls smooth, the last 1½ crowded with opisthocline arcuate riblets that grow stronger and terminate before the suture. *Axial sculpture* of

strong narrow ribs that run from suture to suture on spire whorls and to anterior fasciole on the last, number 11 on penultimate and 7 on last whorl. Ribs are recurved and narrower on shoulders and spaced about the same as their width except on dorsum of last whorl where intercostal space is wider and ribs stronger. *Varix* absent; a strong rib near edge of outer lip serve to strengthen the lip. *Spiral sculpture* of primaries and secondaries of variable strengths. There are 2 primaries on the penultimate whorl side, the strongest on the whorl periphery where it overrides ribs forming weak spikes on rib crests. A second, weaker primary is midway on the whorl side with secondaries between. Whorl shoulders have a strong secondary at the suture, that under high magnification resembles a stretched-out spring coil. Following the strong secondary are alternating secondaries of varying strengths. The shell base has alternating primary and secondary spirals. *Sulcus* absent; past positions of the sinus indicated by the recurved ribs on the shoulder. *Outer lip* is thin, simple; lip edge forms an arc from anal sinus to anterior canal margin where it flexes out to follow the canal edge. Stromboid notch absent. *Anal sinus* a plain, wide, shallow V-shaped notch at the outer edge of the shoulder. *Inner lip* is a thin, narrow glaze, without a parietal callus at the anal sinus. *Columella* straight. *Anterior canal* short but distinct, open, hooked to the right with an "elbow" at the bend, unnotched. *Anterior fasciole* slightly swollen at the bend in the anterior canal, sculpted with packed primary spirals. *Color* white.

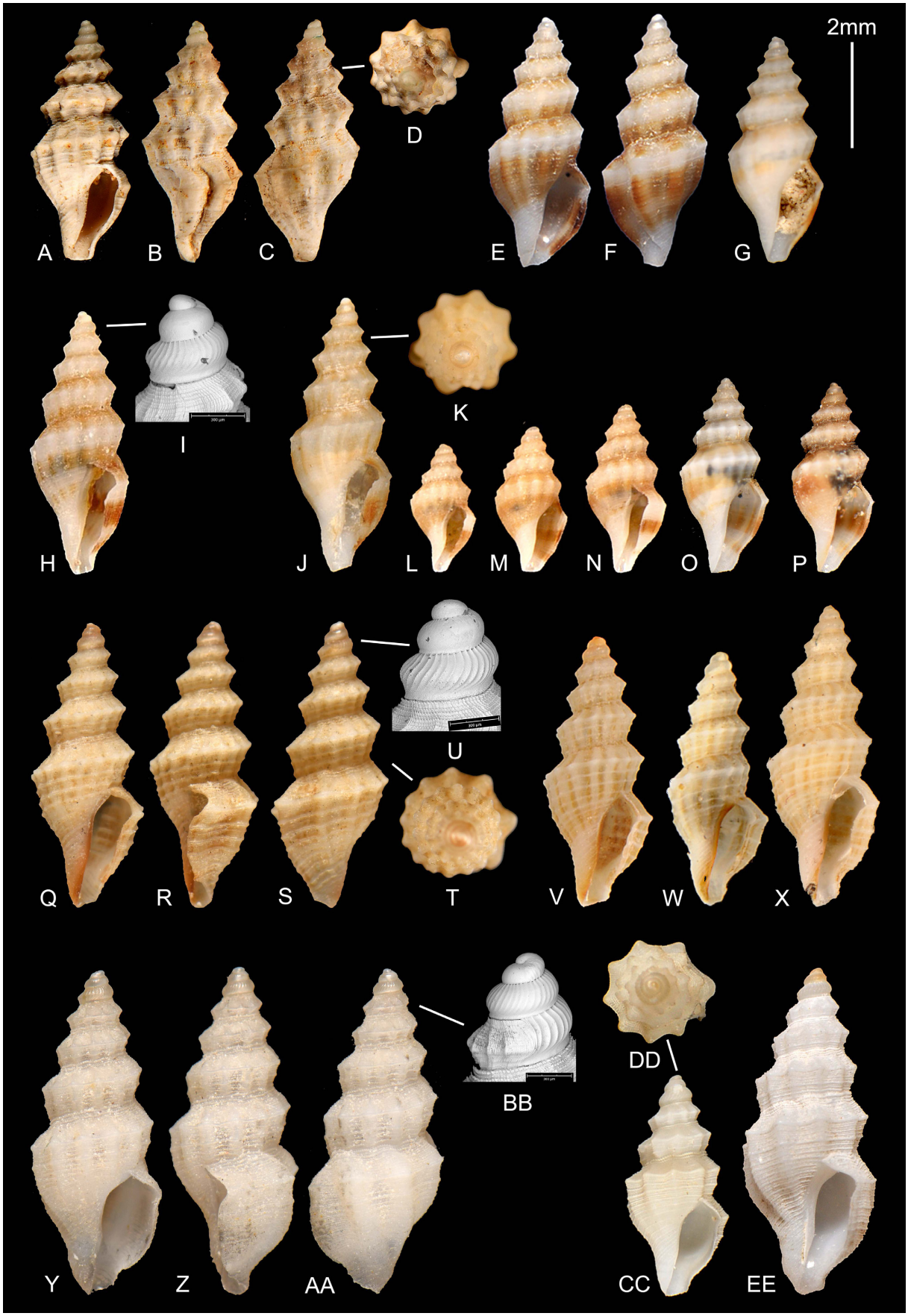
Remarks

The average total length of 14 measured specimens is 5.0 mm (3.7–6.3 mm). No significant variation in morphological characteristics was observed in the 14 specimens examined.

Range and habitat

W Florida (off Apalachicola Bay) and Guadeloupe; depth 150–312 m, live caught depth 263–264 m.

Fig. 36 (next page). Species of *Cryoturris* Woodring, 1928. Part 1. – **A–D**. *Cryoturris engonia* Woodring, 1928, holotype, type of genus, 4.6 × 1.9 mm, ventral, lateral, dorsal and apical views (USNM 135391), fossil, Bowden Jamaica. – **E–P**. *Cryoturris badia* Fallon & Bouchet sp. nov. **E–F**. Holotype, 4.8 × 2.0 mm, ventral and dorsal views (MNHN-IM-2013-20627), near entrance to Barracuda Caves, Port-Louis, Guadeloupe. **G**. Paratype, 4.3 × 1.8 mm (MNHN-IM-2012-8757), Ilet Gosier, Guadeloupe. **H–I**. Paratype, 5.0 × 1.9 mm, ventral view, and SEM image of protoconch (USNM 1715384), Trois Rivières, S of Pimantée Point, Martinique. **J–K**. Paratype, 5.2 × 2.0 mm, ventral and apical views (MNHN-IM-2012-8758), Great Marine Cul-de-Sac, Guadeloupe. **L–N**. Paratypes, lengths = 2.5, 2.7 and 3.2 mm (MNHN-IM-2000-39558), Anse des Galets, Martinique. **O**. Paratype, 3.7 × 1.7 mm (MNHN-IM-2000-39559), Case-Pilote, La batterie, Martinique. **P**. Paratype, 3.6 × 1.6 mm (MNHN-IM-2012-8773), Anse à la Barque, Basse-Terre, Guadeloupe. – **Q–X**. *Cryoturris maestratii* Fallon & Bouchet sp. nov. **Q–U**. Holotype, 5.4 × 2.3 mm, sequence voucher, ventral, lateral, dorsal and apical views, and SEM image of protoconch (MNHN-IM-2013-71936), SW of Vétiver, Martinique. **V**. Paratype, 5.2 × 2.1 mm (USNM 1715383), off Macouba, Martinique. **W**. Paratype, 4.8 × 1.9 mm, ethanol-preserved (MNHN-IM-2013-70364), Passe du Marin, SW of Borgnesse Point, Martinique. **X**. Paratype, 5.7 × 2.2 mm, sequence voucher (MNHN-IM-2013-70918), N of Caravelle Peninsula, Martinique. – **Y–EE**. *Cryoturris eburnea* Fallon & Bouchet sp. nov. **Y–BB**. Holotype, 6.2 × 2.5 mm, ventral, lateral, dorsal views, and SEM image of protoconch (MNHN-IM-2000-39566), S of Marie-Galante, Guadeloupe. – **CC–DD**. Paratype, 4.2 × 2.0 mm, ventral and axial views (ANSP 498823), N of Grande-Terre, Guadeloupe. **EE**. Paratype, 6.2 × 2.6 mm (ANSP 498784), S of La Désirade, Guadeloupe. Credits: I, U, BB: SEM images courtesy of Krasimira "Kasey" Seizova. Protoconch scale bars: A–H, J–T, V–AA, CC–EE = 2 mm; I, U, BB = 300 μm.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Cryoturris spp. Part 2

Cryoturris usitata Fallon & Bouchet sp. nov.
urn:lsid:zoobank.org:act:B2A8148F-3C01-43C6-AB7A-8101B2063380
Figs 32D, 37, 38A–G

Differential diagnosis

Cryoturris fargoi McGinty, 1955, comb. nov. is very similar but differs in protoconch sculpture (beaded mid-whorl versus arched riblets) and has a larger and more robust shell.

Cryoturris simplex Fallon & Bouchet sp. nov. lacks a strong peripheral thread to mark the boundary of the shoulder and has convex whorls.

Cryoturris holimanae Fallon sp. nov. has more angular whorls and fewer and broader ribs.

Cryoturris redferni Fallon & Bouchet sp. nov. is generally smaller, has coarser frosting, and a protoconch with riblets swollen on the crest of a median keel on the last whorl.

Cryoturris delicatior Fallon & Bouchet sp. nov. has a protoconch with riblets swollen on the crest of a median keel on the last whorl, and a shoulder that extends more than half the height of spire whorls.

Cryoturris robusta Fallon & Bouchet sp. nov. has a protoconch with riblets swollen on the crest of a median keel on the last whorl, has broader ribs, and coarser spirals with nodules, or spikes, where primary spirals cross rib crests.

Etymology

Cryoturris usitata Fallon & Bouchet sp. nov., feminine form of the Latin adjective '*usitatus*' meaning 'common', the common *Cryoturris*, named for its relative abundance in Guadeloupe samples.

Type material

Holotype

GUADELOUPE • 8.2 × 3.0 mm; off Vieux Bourg, Grande-Terre; 16°23′ N, 61°33′ W; depth 130 m; 6 May 2012; KARUBENTHOS 2012; stn GD06; sequenced; MNHN-IM-2013-20329.

Paratypes (25 specs)

GUADELOUPE • 1 spec., 7.5 × 2.7 mm; Vieux-Bourg (Les Abymes); 16°22.8′ N, 61°33.44′ W; depth 60 m; 18 May 2012; KARUBENTHOS 2012; stn GD37; sequenced; MNHN-IM-2013-20664 • 1 spec., 5.8 × 2.6 mm; Vieux-Bourg (Les Abymes); 16°22.8′ N, 61°33.44′ W; depth 60 m; 18 May 2012; KARUBENTHOS 2012; stn GD37; sequenced; MNHN-IM-2013-20676 • 1 spec., 9.0 × 3.4 mm, live-taken; Grand Cul-de-Sac Marin, off Fajou Island; 16°23.16′ N, 61°32.02′ W; depth 50 m; 5 May 2012; KARUBENTHOS 2012; stn GD03; MNHN-IM-2013-20252 • 1 spec., 6.8 × 2.5 mm; Port-Louis; 16°23.88′ N, 61°32.47′ W; depth 80 m; 16 May 2012; KARUBENTHOS 2012; stn GD32; sequenced; MNHN-IM-2013-20650 • 1 spec., 6.7 × 2.6 mm; Grand Cul-de-Sac Marin, off Fajou Island; 16°23,16′ N, 61°32,02′ W; depth 50 m; 5 May 2012; KARUBENTHOS 2012; stn GD03; sequenced; MNHN-IM-2013-9256 • 1 spec., 9.3 × 3.2 mm; Vieux-Bourg (Les Abymes); 16°22.8′ N, 61°33.44′ W; depth 60 m; 18 May 2012; KARUBENTHOS 2012; stn GD37; MNHN-IM-2012-9075 • 1 spec., 7.8 × 2.7 mm; W of Marie-Galante; 15°55′ N, 61°30′ W; depth 182–203 m; 26 Jun. 2015; KARUBENTHOS 2; stn DW4622; MNHN-IM-2000-39584 • 1 spec., 8.4 × 3.1 mm; N Grande-Terre; 16°29.7′ N, 61°31.4′ W; depth 60–82 m; 14 Jun. 2015; KARUBENTHOS 2; stn DW4545; MNHN-IM-2000-39585 • 1 spec., 5.2 × 2.2 mm; Grand Cul-de-Sac Marin, off Fajou Island; 16°23.21′ N, 61°32.39′ W; depth 70 m; 5 May

2012; KARUBENTHOS 2012; stn GD04; MNHN-IM-2012-8778 • 1 spec., 5.6 × 2.2 mm; Grand Cul-de-Sac Marin, off Fajou; 16°23′ N, 61°34′ W; depth 140 m; 5 May 2012; KARUBENTHOS 2012; stn GN09; MNHN-IM-2012-8780 • 1 spec., 6.2 × 2.4 mm; Grand Cul-de-Sac Marin; 16°22.6′ N, 61°34.1′ W; depth 80 m; 4 May 2012; KARUBENTHOS 2012; stn GD02; MNHN-IM-2012-8781 • 3 specs, 9.4 × 3.3, 8.3 × 3.1 and 7.5 × 2.8 mm; 16°23,16′ N, 61°32,02′ W; depth 50 m; 5 May 2012; KARUBENTHOS 2012; stn GD03; MNHN-IM-2012-8779 • 1 spec., 8.2 × 3.2 mm; behind Fajou Island; 16°22.2′ N, 61°35.01′ W; depth 60 m; 24 May 2012; KARUBENTHOS 2012; stn GD54; MNHN-IM-2012-9074 • 1 spec., 10.7 × 3.9 mm; northern tip of Bouillante Bay; 16°08,48′ N, 61°47.03′ W; depth 54 m; 8 May 2012; KARUBENTHOS 2012; stn GD10; MNHN-IM-2012-9073 • 2 specs, (1 measured) 8.4 × 3.0 mm; W of Marie-Galante; 15°58′ N, 61°23′ W; depth 200–206 m; 22 Jun. 2015; KARUBENTHOS 2; stn DW4594; MNHN-IM-2000-39586 • 1 spec., 10.5 × 3.7 mm; off Fajou Island; depth 80–90 m; 2013; dredged; D. Lamy coll. • 1 spec., 9.1 × 3.3 mm; E of Fajou Island; depth 80–90 m; 2012; dredged; D. Lamy coll.

GRENADA • 1 spec., length = 10.7 mm; N end of Flamingo Bay; depth 45 ft [14 m]; 15 Apr. 2004; G. Mackintosh leg.; night SCUBA; ANSP 498891.

MARTINIQUE • 1 spec., 8.9 × 3.1 mm; Schoelcher, Anse Madame; 14°37.1′ N, 61°06.8′ W; depth 90 m; 7 Oct. 2016; MADIBENTHOS; stn AD610; USNM 1715385 • 2 specs, 8.1 × 3.0 and 3.8 × 1.8 mm; Schoelcher, Anse Madame; 14°37.3′ N, 61°07′ W; depth 57 m; 7 Oct. 2016; MADIBENTHOS; stn AD611; USNM 1715395.

Other material examined (5 specs)

GRENADA • 1 spec., 7.9 × 2.8 mm; Flamand Bay; depth 29 m; 3 Aug. 2003; G. Mackintosh leg.; night SCUBA; on muddy, soft sand; UF 589808 • 1 spec., 8.5 × 3.0 mm; Flamand Bay; depth 24 m; 25 Jul. 2003; G. Mackintosh leg.; night SCUBA; on muddy, soft sand; UF 589809.

GUADELOUPE • 2 specs, 7.5 × 2.8 and 5.6 × 2.6 (broken) mm; E of Fajou Island; depth 80–90 m; 2012; dredged; D. Lamy coll.

HONDURAS • 1 spec., 10.7 × 3.9 mm; Bay Islands, 2.5 mi. E of Roatán Island, S coast of Helena Island; 16°25.6′ N, 86°11.48′ W; depth 37 m; 31 Aug. 2010; R. Masino leg.; night SCUBA; on soft sand; P. Fallon coll.

Description

Shell small (holotype length = 8.2 mm, largest paratype length = 10.7 mm), fusiform (W/L = 0.3474) whorls moderately inflated, of about 8⅛ whorls total, teleoconch whorls impressed, medially angulate with steeply sloping, slightly convex shoulders, the last about 62% of length that constricts to a short anterior canal. Aperture oval, about 42% of length, including canal. *Protoconch* of about 2¼ whorls, the first 1½ are smooth with a protruding tip, the last ¾-whorl bulges and with faint, crowded, riblets that gradually strengthen toward the end of the protoconch. Riblets end above the suture. *Axial sculpture* of low, round-crested ribs that run from suture to suture on spire whorls, are slightly recurved and weaken toward the suture on the whorl shoulder and evanesce prior to the anterior fasciole, ribs spaced a little more than their width, number 15 on the penultimate and 11 on the last whorl. On mature shells the last few ribs are stronger and more widely spaced. *Varix* absent. *Spiral sculpture* of primaries and secondaries of varying strengths over the whole shell that override ribs, the largest is a single strong primary on the whorl periphery that marks the end of the shoulder and is nodulous on rib crests. Three strong primaries lie adjacent to and follow the suture. Approximately 15 uniform secondaries are present on the shoulder; on whorl sides a feeble primary and secondary pattern of 4 or 5 primaries and 2-4 or more secondaries between each are present, all overriding the axials. This general pattern of spirals is the same on the shell

base and anterior fasciole. Fine growth increments give the whole surface a frosted appearance where they intersect spirals. *Sulcus* absent, the earlier positions of the anal sinus are indicated by recurved ribs on the whorl shoulder. *Anal sinus* a shallow notch on whorl shoulder that angles from just off the suture to the whorl periphery where it is the deepest. *Outer lip* thin, edge nearly a flat arc from the sinus to the anterior canal. Stromboid notch absent. *Inner lip* unemarginate, a narrow glaze extends from the suture to the anterior canal. *Columella* straight. *Anterior canal* short but distinct, open, unnotched. *Anterior fasciole* not swollen, with the same sculpture as shell base. *Color* straw, anterior canal and columella white, protoconch tip brown.

Animal

A live specimen is shown in Fig. 37. The foot, proboscis, and cephalic tentacle are translucent milky white densely filled with opaque white spots. Proboscis with yellowish spots and appears bilobed at tip. Cephalic tentacle with black eye spots at end of fleshy portion of the tentacle.

Fig. 37. *Cryoturris usitata* Fallon & Bouchet sp. nov. (MNHN-IM-2013-20252), live animal. Photo by C. Redfern.

Remarks

The average total length of 28 specimens is 7.8 mm (3.8–10.7 mm). Little difference in color is present among fresh specimens.

Range and habitat

Guadeloupe, Martinique, Grenada, and Curaçao; depth 24–213 m, live depth 50–130 m.

Cryoturris simplex Fallon & Bouchet sp. nov.
urn:lsid:zoobank.org:act:E22EB237-2F5A-4624-9289-C2C86AB490A3
Figs 32E, 38H–L

Differential diagnosis

This species can be distinguished from its congeners by its nearly uniform convex whorls that lack a strong spiral primary delimiting the edge of the shoulder, and unique pattern of primary and secondary spirals on the shell surface.

Cryoturris usitata Fallon & Bouchet sp. nov. has a strong spiral primary that marks the boundary of the shoulder, and obtusely angled whorls.

Etymology

Cryoturris simplex Fallon & Bouchet sp. nov. derives its name from the Latin adjective '*simplex*', which means 'the simple *Cryoturris*' due to its plain form.

Type material

Holotype

GUADELOUPE • 6.2 × 2.4 mm; Tarare Cove; 16°15.97′ N, 61°10.18′ W; depth 60 m; 28 May 2012; KARUBENTHOS 2012; stn GD69; sequenced; MNHN-IM-2013-9122.

Paratypes (3 specs)

BAHAMAS • 1 spec., 9.5 × 3.8 mm; Grand Bahama Island, Dundee Bay; 26°29.25′ N, 78°43.5′ W; depth 9 m; Geoff Marsh leg.; ANSP 369090.

GUADELOUPE • 1 spec., 9.2 × 3.6 mm; Grande-Terre, Bank of Ships; 16°15.97′ N, 61°10.18′ W; depth 60 m; 28 May 2012; KARUBENTHOS 2012; stn GD68; MNHN-IM-2012-9076.

ST. VINCENT AND THE GRENADINES • 1 spec., 8.5 × 3.2 mm; Union Island, Chatham Bay; depth 20 m; 6 Apr. 2007; G. Mackintosh leg.; night SCUBA; ANSP 498880.

Description

Shell small (holotype length = 6.2 mm; the single paratype larger, length = 9.2 mm), fusiform, moderately inflated (W/L = 0.3871), of about 8⅛ almost uniformly convex whorls that have a barely perceptible angulation mid-whorl that defines the periphery, the last whorl is about 63% of shell length then constricts to a well-defined short anterior canal. Whorl sutures are impressed. Aperture oval, about 45% of shell length, including canal. *Protoconch* of 2¼–2½ whorls, first 1½ are smooth, then faint, crowded opisthocline riblets appear on the last whorl and gradually strengthen to the end of the protoconch. The last whorl bulges mid-whorl, riblets sweep forward and fade beneath the bulge. *Axial sculpture* of low, broad ribs that run from suture to suture on spire whorls, are slightly recurved and diminish in size on the shoulder toward the suture and evanesce on the shell base, intercostal space about as wide as ribs but increasingly wider toward the aperture, number 14 on the penultimate and 12 on the last whorl. On

mature shells the last few ribs are stronger and more widely spaced. *Varix* absent but last rib, the strongest may serve to strengthen the outer lip. *Spiral sculpture* of weak primaries and microscopic secondaries between. The shoulder has 1–4 primaries adjacent to the suture, followed by microscopic secondaries to the whorl periphery; on the side of the penultimate are 4 evenly spaced primaries and secondaries in the intercalary space. All spirals override ribs, none are nodulose on rib crests. The general pattern of spirals, of primaries with secondaries between, continue on the shell base to the anterior fasciole with fewer secondaries between the primaries; the fasciole has packed primaries with only a few secondaries. Fine growth increments give the whole surface a frosted appearance. Frosting is very fine on all spirals, except those adjacent to the suture where the frosting is stronger. *Sulcus* absent; the past presence of the anal sinus is indicated by slightly recurved ribs on whorl shoulders. *Outer lip* is thin, edge forming a low arc from the sinus to the end of the anterior canal. Stromboid notch absent. *Anal sinus* not developed in specimens examined but a slightly recurved rib and growth lines suggest that a shallow indentation extending from below the suture and deepening to the edge of the shoulder, would be present on intact shells. *Inner lip* unemarginate, a narrow glaze extends from the suture to the anterior canal. *Columella* straight. *Anterior canal* short, open, but well defined, end unnotched. *Anterior fasciole* not swollen, with packed spiral microscopic secondaries. *Color* white with a broad, diffuse yellow-orange band mid-whorl, band lighter on rib crests.

Remarks

The COI sequences of *Cryoturris simplex* Fallon & Bouchet sp. nov. differ from those of *C. usitata* Fallon & Bouchet sp. nov., the closet species, by 3.6-3.8%. The best ASAP score obtained analyzing the genus identifies six partitions (p-value: 2.32e-03; W-rank: 8.42e-03), merging *C. simplex* and *C. usitata* into the same partition, while the second best score (p-value: 3.95e-02; W-rank: 6.82e-03) supports the recognition of the two species as distinct. After weighing the morphological differences between the two taxa and the similar scores in the two best ASAP partitions we consider it appropriate to recognize this species as distinct.

Range and habitat

Bahamas, Guadeloupe, and St. Vincent and the Grenadines; depth 9–60 m, live taken at 60 m.

Cryoturris lizae Fallon sp. nov.
urn:lsid:zoobank.org:act:41DE3B31-91D9-4408-ABC6-F908709E54FF
Figs 32G, 38M–O

Differential diagnosis

Cryoturris rapa Fallon & Bouchet sp. nov. also has a moderately long anterior canal but is stouter (W/L = 0.3750 versus 0.3571), has stronger ribs, and coarser primary spirals.

Etymology

Cryoturris lizae Fallon sp. nov., Liz's *Cryoturris*, is named in honor of my wonderful daughter.

Type material

Holotype

GUADELOUPE • 9.8 × 3.5 mm; S of La Désirade; depth 250 m; 2016; dredged; ex D. Lamy coll.; MNHN-IM-2000-39571.

Paratypes

None.

Description

Shell small (holotype length = 9.8 mm), fusiform, moderately inflated (W/L = 0.3571), about 8½ whorls altogether, teleoconch whorls medially angulate with steeply sloping, flat shoulders, the last whorl, about 61.2% of shell length, rapidly tapers to a moderately long, well defined canal. Aperture oval, about 43.9% of shell length including canal. Whorl sutures are appressed. *Protoconch* of about 3 whorls, the first protruding, the second smooth, then faint, crowded arcuate riblets appear on the last ¾-whorl that gradually strengthen to the end. The last whorl has a peripheral bulge with riblets below the bulge arching acutely toward the end of the protoconch. *Axial sculpture* of straight, low, broad ribs that run from suture to suture on spire whorls, are slightly recurved and fade to the suture on the shoulder and evanesce the shell base, intercostal space about as wide as ribs but increasingly wider toward the aperture, number 13 on the penultimate and 11 on the last whorl. On mature shells the last few ribs are stronger and more widely spaced. *Varix* absent. *Spiral sculpture* of packed spirals in a tertiary system; two primaries lie adjacent to the suture the shoulder has 2–4 tertiaries between each of about 7 secondaries, the whorl periphery is marked by the largest primary, which is swollen on rib crests, then on whorl sides are about 6 secondaries with 2–6 tertiaries between, the number diminishing anteriorly. All spirals override ribs. The general pattern of spirals continues on the shell base to the anterior fasciole with fewer and fewer secondaries between primaries; about 7 primaries with a few secondaries are present on the fasciole. Fine growth increments give the whole surface a frosted appearance. Frosting is very fine on all spirals, except the 2 adjacent to the suture where the frosting is heavier, spirals appearing somewhat scabrous, in contrast to the peripheral spiral, which is almost smooth. *Sulcus* is absent; the past presence of the anal sinus is indicated by the slightly recurved ribs on the shoulder. *Outer lip* thin, edge forming a nearly flat arc from the sinus to the end of the anterior canal; stromboid notch absent. *Anal sinus* not present. *Inner lip* is a narrow glaze extending from the suture to the anterior canal; unemarginate. *Columella* straight. *Anterior canal* is moderately long, open, but well defined, end unnotched. *Anterior fasciole* not swollen, with about 7 oblique spirals. *Color* white, earlier whorls take on a light brown color; tip of protoconch brown.

Remarks

This single specimen is sufficiently different from its closest congener, *Cryoturris rapa* Fallon & Bouchet sp. nov., to merit description.

Range and habitat

Known only from the type locality.

Cryoturris rapa Fallon & Bouchet sp. nov.
urn:lsid:zoobank.org:act:9FF6E4CA-841E-4530-BCF4-5A9DC0B87341
Figs 32F, 38P–T

Differential diagnosis

This species is the largest of the genus group with a well-inflated body whorl that comprises, together with its anterior canal, about ⅔of shell length.

Cryoturris usitata Fallon & Bouchet sp. nov. has finer spirals.

Cryoturris simplex Fallon & Bouchet sp. nov. has finer spirals and evenly convex whorls, not obtusely angled ones.

Cryoturris lizae Fallon sp. nov., also has a moderately long anterior canal but is slimmer (W/L = 0.3571 versus 0.3750), has weaker ribs, and smoother primary spirals.

Etymology

Cryoturris rapa Fallon & Bouchet sp. nov., derived from the Latin noun '*rapa*', meaning 'turnip' (noun in apposition), is named for its shape, which resembles that of the vegetable.

Type material

Holotype

GUADELOUPE • 13.6 × 5.1 mm; E of La Désirade; 16°25′ N, 60°52′ W; depth 185–250 m; 16 Jun. 2015; KARUBENTHOS 2; stn DW4560; MNHN-IM-2000-39578.

Paratypes (5 specs)

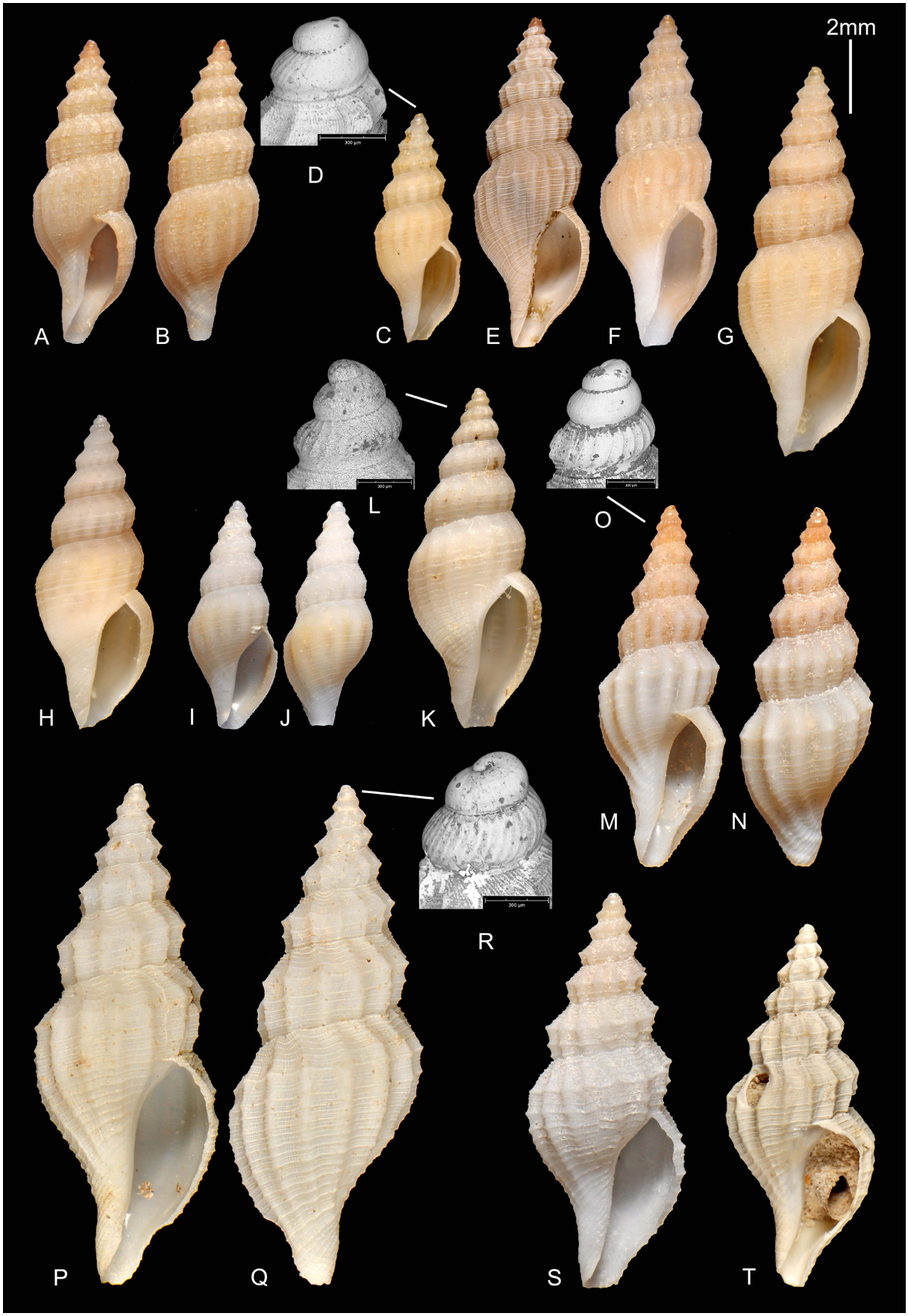
GUADELOUPE • 1 spec., 9.8 × 4.0 mm; E of La Désirade; 16°17′ N, 61°01′ W; depth 208–362 m; 17 Jun. 2015; KARUBENTHOS 2; stn DW4568; MNHN-IM-2000-39579 • 1 spec., 10.7 × 4.2 mm; W of La Désirade; depth about 350 m; 2018; dredged; ANSP 498788 • 1 spec., 16.9 × 6.3 mm; off La Désirade; depth 250 m; 2017; dredged, ex D. Lamy coll.; USNM 1715378 • 1 spec., 10.0 × 4.0 mm; off Marie Galante; depth 250 m; 2017; dredged; D. Lamy coll.

UNITED STATES OF AMERICA • 1 spec., 14.3 × 5.1 mm; W of Florida Middle Grounds, W Florida; depth 366 m; J. Moore leg.; trawled; ANSP 498877.

Description

Shell small (holotype 13.6 × 5.1 mm), fusiform, moderately inflated (W/L = 0.3750), of about 8¾ medially obtuse angular whorls with a steeply sloping flat shoulder, the last whorl about 66.2% of shell length that is constricted anteriorly to a short canal. Whorl sutures impressed and slightly undulant over previous whorls' ribs. Aperture oval, about 47.8% of shell length, including canal. **Protoconch** of about 2½ whorls, first 1½ smooth, tip protruding, then last 1¼-whorl has faint, crowded arched riblets that extend from suture to suture and then gradually strengthen to the end of the protoconch. Last whorl has a slight bulge. *Axial sculpture* of narrow but strong ribs that run from suture to suture on spire whorls, are slightly recurved on the shoulder and then evanesce the shell base before anterior fasciole, ribs spaced about twice their width, number 12 on penultimate and 13 on the last whorl. *Varix* absent. *Spiral sculpture* of primary and secondary spirals of varying strengths that override ribs, the strongest spiral, which is nodulose on rib crests, also defines the whorl periphery and marks the end of the shoulder. One to 2

Fig. 38 (next page). Species of *Cryoturris* Woodring, 1928. Part 2. – **A–G**. *Cryoturris usitata* Fallon & Bouchet sp. nov. **A–B**. Holotype, 8.2 × 3.0 mm (MNHN-IM-2013-20329), off Vieux Bourg, Grande-Terre, Guadeloupe. **C–D**. Paratype, 6.2 × 2.4 mm, ventral view, and SEM image of protoconch, 255 × (MNHN-IM-2012-8781), Grand Cul-de-Sac Marin, Guadeloupe. **E**. Paratype, 8.9 × 3.1 mm (USNM 1715385), Schoelcher, Anse Madame, Martinique. **F**. Paratype, 9.0 × 3.4 mm, live-taken (MNHN-IM-2013-20252), Guadeloupe. **G**. Paratype, 10.5 × 3.6 mm (D. Lamy coll.), E of Fajou Island, Guadeloupe. – **H–L**. *Cryoturris simplex* Fallon & Bouchet sp. nov. **H**. Paratype, 8.5 × 3.2 mm (ANSP 498880), Chatham Bay, Union Island Saint Vincent and the Grenadines. **I–J**. Holotype, 6.2 × 2.4 mm, live-caught, sequenced (MNHN-IM-2013-9122), Anse Terare, Guadeloupe. **K–L**. Paratype, 9.2 × 3.6 mm, ventral view, and SEM image of protoconch, 245 × (MNHN-IM-2012-09076), banc de Vaisseaux, Grande-Terre, Guadeloupe. – **M–O**. *Cryoturris lizae* Fallon sp. nov., holotype, 9.8 × 3.5 mm, ventral and dorsal views, and SEM image of protoconch, 255 × (MNHN-IM-2000-39571), S of La Désirade, Guadeloupe. – **P–T**. *Cryoturris rapa* Fallon & Bouchet sp. nov. **P–R**. Holotype, 13.6 × 5.1 mm, ventral and dorsal views, and SEM image of protoconch, 245 × (MNHN-IM-2000-39578), E of La Désirade, Guadeloupe. **S**. Paratype, 10.7 × 4.2 mm (D. Lamy coll.), W of La Désirade, Guadeloupe. **T**. Paratype, 9.8 × 4.2 mm (MNHN-IM-2000-39579), E of La Désirade, Guadeloupe. Credits: D, L, O, R: SEM images courtesy of Paul Callomon. Protoconch scale bars: A–C, E–K, M–N, P–Q, S–T = 2 mm; D, L, O, R = 300 μm.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additional primaries, also nodulose, are present on the whorl sides, with about 5 secondaries between each. This contrasts with a pattern of about 3 secondaries between each primary on the shoulder. On the shell base, the same pattern of spirals on spire whorl sides continues to the anterior fasciole. Fine growth increments give the whole surface a frosted appearance. Frosting is very fine on all spirals except for the primaries on the shoulder where frosting is heavy. *Sulcus* is absent; the past presence of the anal sinus is indicated by the slightly recurved ribs on the shoulder. *Outer lip* thin, edge forming a nearly flat arc from the sinus to the anterior canal. Stromboid notch absent. *Anal sinus* is not present in specimens examined but a slightly recurved rib and growth lines suggest a shallow notch almost the width of the shoulder is characteristic. *Inner lip* unemarginate, a narrow glaze extends from the suture to the anterior canal. *Columella* straight. *Anterior canal* short but distinct, open, unnotched. *Anterior fasciole* not swollen, with 10 spirals. *Color* white.

Remarks

The average total length of 4 specimens is 12.8 mm (9.8–16.9 mm).

Range and habitat

United States, Guadeloupe and St. Vincent and the Grenadines; depth 185–366 m.

***Cryoturris* spp. Part 3**

Cryoturris dorvilliae (Reeve, 1845)
Figs 32H, 39, 40A–J

Murex accinctus Montagu, 1808: 114, non Born, 1778, **syn. nov.**, "Firth of Forth", 2 syntypes NHMUK 20001350 (Oliver *et al*. 2017: 372, fig. 1). *Murex accinctus* Montagu, 1808, is a junior homonym of *Murex accinctus* Born, 1778 [= *Pisania pusio* (Linnaeus, 1758)]. Although the senior homonym does not appear to have been used as a valid name after 1899, the junior homonym has not been used 25 times or more in the last 50 years as the valid name of a species, so the condition of Art. 23.9.1.2 is not met and the name *Murex accinctus* Montagu, 1808, is invalid. Under the Principle of Priority (ICZN Article 23.3.5) it must be replaced by the next oldest name among its synonyms. The next two synonyms, *Pleurotoma dorvilliae* and *Pleurotoma forthiensis*, were published simultaneously by Reeve (1845). We act as First Revisers and give precedence to the name *Pleurotoma dorvilliae* over *P. forthiensis*.

Pleurotoma dorvilliae Reeve, 1845: pl. 28 fig. 249, St. Vincents [sic], West Indies (3 syntypes in NHMUK 1875.4.26.20). Tomlin (1934: 39) erroneously stated that the types of *P. dorvilliae* were the same as those of *P. forthiensis* and *M. accinctus.*

Pleurotoma forthiensis Reeve, 1845, pl. 28 fig. 246, **syn. nov.**, "Firth of Forth" (3 syntypes in NHMUK 1874.10.31.2; Oliver *et al*. 2017: figs 2.1–2.3). Oliver *et al*. (2017: 372) surmise that Montagu's (1808) and Reeve's (1845) specimens originated from the same source (both incorrectly stated from the Firth of Forth [Scotland]). The types of both taxa appear to be the same species (Fig. 40B–D) and are so regarded here.

Pleurotoma quadrilineata C.B. Adams, 1850b: 64, **syn. nov.**, Jamaica (lectotype in MCZ186007; Fig. 40F).

Kurtziella caribbeana Weisbord, 1962: 441–442, pl. 42 figs 1–2, is a synonym (of *dorvilliae*) according to Maes (MS, per Rosenberg 2009). The type locality is the Playa Grande formation (Maiquetía member) at W-26 in Quebrada Las Bruscas, about 120 m upstream from its junction with Quebrada Las Pailas, Venezuela.

Kurtziella quadrilineata var. *longa* Nowell-Usticke, 1969, is a synonym (of *dorvilliae*) according to Maes (MS, per Rosenberg, 2003). The type locality is St. Croix (Ham Bay), the locality of the lectotype selected by Boyko & Cordeiro (2001).

Pleurotoma dorvilliae – d'Orbigny 1853: 171. — Gray 1854: 31. — Beau 1858: 8. — Krebs 1864: 9. — Arango y Molina 1878: 218. — Paetel 1888: 62. — Dall 1885: 235. — de Jong & Coomans 1988: 116.
Defrancia forthiensis – Paetel 1888: 80.
Pleurotoma quadrilineata – Krebs 1864: 11. — Dall 1885: 239. — Clench & Turner 1950: 336, pl. 29 fig. 12.
Daphnella (*Raphitoma*) *accincta* – Tryon 1884: 310, pl. 18 fig. 37.
Mangilia quadrilineata – Tryon 1884: 248.
Mangilia (*Cythara*) *dorvilliae* – Tryon 1884: 267, pl. 16 fig. 65 (Reeve's fig.).
Daphnella accincta – Paetel 1888: 86.
Defrancia quadrilineata – Paetel 1888: 84.
Mangilia (*Mangilia*) *dorvilliae* – Dall 1889b: 102–103.
Drillia quadrilineata – Dall 1890b: 33.
Daphnella (*Bellardiella*) *accinctus* – Cossmann 1896a: 73, pl. 4 fig. 19.
Raphitoma accincta – Dautzenberg 1900: 169.
Drillia quadrifasciata var. *quadrilineata* – Dall 1903: 1606.
Mangelia dorvilliae – Melvill 1923: 168. — Peile 1926: 84. — Johnson 1934: 141.
Murex accinctus – Tomlin 1934: 39. — E.H. Vokes 1971: 12, noting homonymy with Born's name.
Kurtziella quadrilineata – Olsson & McGinty 1958: 18. — Nowell-Usticke 1959: 83.
Mangelia (*Cryoturris*) cf. *quadrilineata* – Abbott 1958: 98.
Kurtziella longa – Nowell-Usticke 1971: 25–26. — Redfern 2013: 208.
Kurtziella (*Rubellatoma*) *accincta* – Abbott 1974: 281.
Kurtziella dorvilliae – Rios 1975: 137, pl. 41 fig. 628; 1985: 145, pl. 49 fig. 677; 1994: 174, pl. 58 fig. 800. — Kaicher 1984: card 3891. — Diaz & Puyana 1994: 230, pl. 68 fig. 913. — Turgeon *et al*. 1998: 107, 263. — Williams 2005: #5661.
Kurtziella accincta – Turgeon *et al*. 1988: 16; 1998: 26. — Williams 2005 #5652. — Oliver *et al*. 2017: 372.
Cryoturris dorvilliae – Odé 1992a: 60. — Redfern 2001: 133, pl. 60 fig. 549a–b. — Lee 2003a: http://www.jaxshells.org; 2003b: http://www.jaxshells.org/peanut.htm. — Dutra *et al.* 2005: 132.
Cryoturris forthiensis – Lee 2003a: http://www.jaxshells.org.

Differential diagnosis

Cryoturris presleyi (W.G. Lyons, 1972), comb. nov. also has brown spirals but has more angular whorls. See under that species for additional differences.

Some *Kurtziella* spp. may resemble the shape of *C. dorvilliae*, but the former has beaded rows on the last whorl of the protoconch and other morphological differences.

Type material

Syntypes (3 specs)
ST. VINCENT AND THE GRENADINES • 3 specs; West Indies, St. Vincents [sic]; NHMUK 1875.4.26.20.

Material examined (48 specs)

Photographs of the syntypes of *Pleurotoma dorvilliae* Reeve, 1845 supplied by the NHMUK, and photographs of *Murex accinctus* Montagu, 1808, and *Pleurotoma forthiensis* Reeve, 1845 in Oliver *et al*. (2017) were examined. The lectotypes of *Pleurotoma quadrilineata* C.B. Adams, 1850 and *Kurtziella longa* Nowell-Usticke, 1969 were examined directly. Most types have worn or missing protoconchs, so other morphological characteristics were used to assess their similarity.

A total of 48 specimens were examined from MNHN and other collections. Details of those in 11 lots (27 specimens) are listed here.

GUADELOUPE • 1 spec., 5.5 × 2.2 mm; Grand Cul-de-Sac Marin; 16°21.87′ N, 61°31.78′ W; depth 5 m; 20 May 2012; KARUBENTHOS 2012; stn GS27; sequenced; MNHN-IM-2013-20671 • 1 spec., 5.5 × 2.1 mm, live-taken; Anse à la Barque; 16°05.44′ N, 61°46.02′ W; depth 1 m; 9 May 2012; KARUBENTHOS 2012; stn GM09; MNHN-IM-2013-9012 • 1 spec., 6.1 × 2.3 mm, ethanol-preserved; Petite Terre; 16°09,71′ N, 61°07,73′ W; depth 15 m; 26 May 2012; KARUBENTHOS 2012; stn GS34; MNHN-IM-2019-34736 • 1 spec., 5.6 × 2.2 mm, ethanol-preserved; Oil (Port-Louis); 16°26.78′ N, 61°32.41′ W; depth 16 m; 18 May 2012; KARUBENTHOS 2012; stn GS24; MNHN-IM-2019-34725.

MARTINIQUE • 1 spec., 6.7 × 2.5 mm; Ste-Luce, Pointe les Fous; 14°27.9′ N, 60°56.4′ W; depth 0–1 m; 11 Sep. 2016; MADIBENTHOS; stn AM009; sequenced; MNHN-IM-2013-70600 • 13 specs, 4.6 × 2.0, 4.8 × 2.0, 3.3 × 1.5, 4.8 × 2.0, 3.5 × 1.6, 5.8 × 2.2 (illus. spec.), 4.4 × 2.0, 4.6 × 1.9, 4.8 × 2.0, 5.4 × 2.2, 5.4 × 2.0, 5.8 × 2.1, and 5.5 × 2.1 mm, 10 specs live caught; Grand Rivière, Pointe du Souffleur; 14°52′ N, 61°11.7′ W; depth 6 m; 3 Oct. 2016; MADIBENTHOS; stn AS557; MNHN-IM-2000-39561 • 1 spec., 6.5 × 2.4 mm; Ste-Luce, Pointe les Fous; 14°27.9′ N, 60°56.4′ W; depth 0–1 m; 11 Sep. 2016; MADIBENTHOS; stn AM009; MNHN-IM-2000-39562 • 1 spec., 4.7 × 2.0 mm; Bellefontaine; 14°40.4′ N, 61°10.6′ W; depth 70 m; 4 Oct. 2016; MADIBENTHOS; stn AD298; MNHN-IM-2000-39563 • 5 specs, (2 measured) 3.8 × 1.6 to 5.1 × 2.2 mm; Anse à Voile; 14°51′ N, 61°12.9′ W; depth 5–7 m; 7 Oct. 2016; MADIBENTHOS; stn AS570; MNHN-IM-2000-39564 • 1 spec., 8.2 × 3.0 mm; Banc du Diamant; 14°26.4′ N, 61°01.7′ W; depth 18 m; 15 Sep. 2016; MADIBENTHOS; stn AB177; MNHN-IM-2000-39565.

BAHAMAS • 1 spec., 4.9 × 2.0 mm; West Grand Bahama, District Dead Man's Reef; 26°34.75′ N, 78°51.75′ W; beach drift; 1981; J. Worsfold leg.; ANSP 372337.

Description

Shell small (length to 8.5 mm), fusiform with 8 whorls total, spire whorls obtusely angled or convex with little or no angulation, the last about 60% of shell length; aperture narrowly oval, anterior canal short; sculpture of ribs and fine spirals. *Protoconch* of 2¾ smooth round whorls, the first recumbent, not minute, the last ½ whorl with fine recurved riblets that do not extend to the suture. *Axial sculpture* of ribs from suture to suture on spire whorls, evanesce on last. Ribs about as wide as intercostal space, 12 on penultimate whorl and 11 on last. *Varix* absent. *Spiral sculpture* of primary, secondary, and tertiary spirals, the strongest primary is on the whorl periphery and 2 additional, weaker primaries on whorl sides. About 7 secondary spirals on penultimate, and 9 more on shell base with 2–3 microscopic spirals between each. Spirals override axials and all are frosted. *Sulcus* absent, weakly recurved ribs on whorl shoulders mark past positions of anal sinus. *Outer lip* is thin, its edge a low arc from sinus to anterior canal, lightly flexed at canal. *Anal sinus* a wide, shallow notch nearly the width of the shoulder, offset slightly closer to whorl periphery than suture. *Inner lip* a narrow glaze etched into the columella but margined along the anterior canal, without a parietal callus. *Columella* straight. *Anterior canal* short, open, straight, deep and notched at end. *Anterior fasciole* is not swollen, surface with about 9 secondary spirals. *Color* of straw with brown spirals, in a pattern of 3 on shell base just above anterior fasciole, 3 at mid-whorl visible on spire whorls, and 6 on whorl shoulder, all evenly spaced about 1 thread width apart. The pattern is variable among specimens, even in a single lot. Protoconch opaque white.

Animal

The sequenced specimen is shown photographed live (Fig. 39H). Although only partially emergent from its shell, it appears opaque white. The cephalic tentacles with black eye spots and a short filamentous antenna are also visible in this photo.

Fig. 39. *Cryoturris dorvilliae* (MNHN-IM-2013-70600), live animal. Photo by L. Charles.

Remarks

There is no appreciable difference among the taxa listed as synonyms of *Cryoturris dorvilliae* (Reeve, 1845). Inasmuch as most of the types are worn, that protoconch structure, shell micro-sculpture, color, and type localities are variously absent, gross clues such as shell facies, size, general sculpture, and traces of brown spiral are used for their comparison, and because no adequate descriptions of any of the synonyms are available, re-description is in order. Fresh and live caught specimens, commonly identified as *Cryoturris quadrilineata*, exhibit all the characteristics of Reeve's species and so are referred to in the description the species.

The average total length of 58 measured specimens, mostly from Guadeloupe and Martinique but including a few from St. Vincent and the Grenadines, is 5.5 mm (3.0–9.6 mm). specimens vary slightly in width to length ratio; brown spirals vary slightly in number, often missing one or more from each of the zones, especially in younger specimens.

Range and habitat

Widespread in shallow reefs. Examined specimens are from Bahamas, United States (Florida Keys), St. Kitts, Puerto Rico, St. Vincent and the Grenadines, Trinidad and Tobago, Guadeloupe, and Martinique; depth 0–35 m with one empty shell at depth 70 m. Literature reports also include Campeche Bank, and Western Caribbean from the Yucatan Peninsula to Panama.

Cryoturris voluta Fallon sp. nov.
urn:lsid:zoobank.org:act:022C2394-4C72-455C-BD5D-86D10D95F58D
Figs 33A, 40K–U

non *Cryoturris forthiensis* (Reeve, 1845) – Lee 2009: 131, sp. 635 (misidentification).

Differential diagnosis

Cryoturris voluta Fallon sp. nov. has numerous but significantly reduced ribs, the most similar species being:

Cryoturris olsoni Fallon & Bouchet sp. nov. lacks a peripheral keel and possesses a distinct mid-whorl brown spiral band.

Cryoturris badia Fallon & Bouchet sp. nov. also has acutely angled whorls, but has a more elongate shell and stronger ribs.

Cryoturris maestratii Fallon & Bouchet sp. nov. also has acutely angled whorls but a taller spire, proportionally narrower shell, and stronger spiral cords.

Etymology

Cryoturris voluta Fallon sp. nov., the rolled *Cryoturris*, from the feminine form of the Latin adjective '*volutus*', meaning 'rolled', evoking the spiral outline of the shell's periphery.

Type material

Holotype
UNITED STATES OF AMERICA • 4.4 × 2.1 mm; E Florida, St. Johns Co., 50 mi. [80 km] E of Ponte Vedra; depth 130–150 ft. [40–46 m]; Mar.–Apr. 1988; H.G. Lee leg.; trawled by scallop boats; extracted from batfish stomachs; UF 589699.

Paratypes (20 specs)
UNITED STATES OF AMERICA • 18 specs, 5.6 × 2.4, 3.3 × 1.7, 4.5 × 2.0, 3.4 × 1.5, 2.9 × 1.4, 4.4 × 2.0, 4.1 × 1.7, 3.2 × 1.5, 3.0 × 1.4, 2.9 × 1.3, 3.4 × 1.6, 5.2 × 2.4, 3.7 × 1.7 mm, and 5 more not measured; same data as for holotype; UF 589701 • 2 specs 5.1 × 2.1 and 3.3 × 1.5 mm; same data as for holotype; ANSP 499892.

Other material examined (2 specs)

UNITED STATES OF AMERICA • 2 specs, 5.3 × 2.3 and 4.4 × 2.0 mm; W Florida, Levy Co., off Cedar Key; 1983; J. Keeler leg.; ex batfish; UF 589700.

Description

Shell small (holotype length = 4.4 mm, largest measured length = 5.6 mm), biconic (W/L = 0.4773), of 6½ total whorls, teleoconch spire whorls acutely angled and keeled, the last whorl rounded with the keel persisting and base constricted to a short, distinct anterior canal, both about 68% of shell length. Aperture oval with a wide, shallow anal sinus on the shoulder, about 48% of shell length; sculpture of numerous narrow ribs and fine frosted spirals. *Protoconch* of about 3 round whorls, the tip slightly immersed (not erect), the last with a mid-whorl bulge, above which are fine curved riblets, faint at first then growing stronger, below the bulge, riblets are weaker and oblique. *Axial sculpture* of fine rudimentary ribs, like thin lines most evident where they cross the keel forming minute nodules. Axials quickly fade on the shoulder before reaching the suture and evanesce on the base shortly below the keel. Ribs number about 22 on the penultimate and last whorl. *Spiral sculpture* of a single keel-like primary, which is beaded at rib

intersections, and microscopic secondaries of varying strengths. A single strong secondary lies against the suture and 3 weak primaries on the penultimate whorl side with 3–4 microscopic secondaries between. About 7 more primaries on the shell base with 2–4 microscopic secondaries between. Entire surface of the teleoconch covered with frosted spirals; under magnification, tiny beads are aligned along growth striae, which parallel the line of the anal notch and the line of the outer lip. *Sulcus* absent; recurved ribs on the shoulder mark past positions of the anal sinus. *Outer lip* is thin, simple, lip edge forms an arc from anal sinus to anterior canal margin where it flexes to follow the canal edge. Stromboid notch absent. *Anal sinus* shallow, a wide V-shape with the apex at the keel. *Inner lip* a thin, narrow margined glaze, without a parietal callus. *Columella* straight. *Anterior canal* short but well defined, tubular, unnotched. *Anterior fasciole* not swollen, sculpture of packed primary spirals. *Color* a semi-translucent pale straw, peripheral cord lighter, reddish brown inner lip.

Remarks

Shells vary somewhat in their breadth but are otherwise uniform in coloration. The average total length of 18 specimens is 4.0 mm (2.9–5.6 mm). specimens from W Florida (Fig. 40S–U) differ slightly from the E Florida specimens. They have a white spiral band mid-whorl and a slightly more convex body whorl. They differ somewhat from the ones collected from E Florida, but their differences are not believed to rise to the level of species.

Range and habitat

United States (off NE Florida and off W Florida); depth ca 40–46 m.

Cryoturris olsoni Fallon & Bouchet sp. nov.
urn:lsid:zoobank.org:act:E6C186D6-A19B-494D-BB42-A97C6577D908
Figs 33B, 40V–CC

Cryoturris sp. B – Redfern 2013: 208, fig. 581 may be this species.

Differential diagnosis

Several small mangeliid species with mid-whorl brown spiral bands may be confused with this species. *Kurtziella intercedens* (Melvill, 1923) differs principally in protoconch sculpture with the typical beaded last whorl of that genus, and its teleoconch whorls are convex, not shouldered.

Adelocythara bouillantensis Fallon & Bouchet sp. nov. has much coarser sculpture, a varicose lip, and a broad-tipped protoconch of less than 2 whorls.

Cryoturris badia Fallon & Bouchet sp. nov. has a taller spire and fewer and stronger ribs.

Cryoturris voluta Fallon sp. nov. differs in possessing a narrower shoulder, and in lacking a peripheral keel.

Etymology

Cryoturris olsoni Fallon & Bouchet sp. nov., named in honor of Chandler J. Olson, former Drexel University biology student, who produced some of the SEM images used in this monograph.

Type material

Holotype

GUADELOUPE • 4.95 × 2.1 mm; Banc des Vaisseaux; 16°09.03′ N, 61°17.31′ W; depth 33 m; 27 May 2012; KARUBENTHOS 2012; stn GD68; MNHN-IM-2012-8866.

Paratypes (24 specs)

GUADELOUPE • 1 spec., 5.9 × 2.4 mm; Les 3 arches (Port-Louis); 16°23.26′ N, 61°31.79′ W; depth 11 m; 17 May 2012; KARUBENTHOS 2012; stn GB19; MNHN-IM-2012-8865.

ST. VINCENT AND THE GRENADINES • 1 spec., 5.8 × 2.4 mm; Canouan Island, Corbec Bay; depth 7.6 m; 26 May 2005; G. Mackintosh leg.; night SCUBA; UF 589703 • 3 specs, 4.4 × 1.9, 4.2 × 2.0 and 4.1 × 1.9 mm; Canouan Island, Corbec Bay; depth 7.6 m; 8 Jun. 2004; G. Mackintosh leg.; night SCUBA; USNM 1715431• 5 specs, 3.8 × 1.8, 3.5 × 1.6, 3.4 × 1.5, 3.1 × 1.6 and 2.5 × 1.2 mm; Mayreau Island, S of Nord d'Oest; Jun. 2004; G. Mackintosh leg.; night SCUBA; ANSP 498875.

TURKS AND CAICOS ISLANDS • 1 spec., length = 2.4 mm; French Cay, The G Spot; depth 18 m; 28 Nov. 2003; Mike Loper leg.; grab sample; UF 589704.

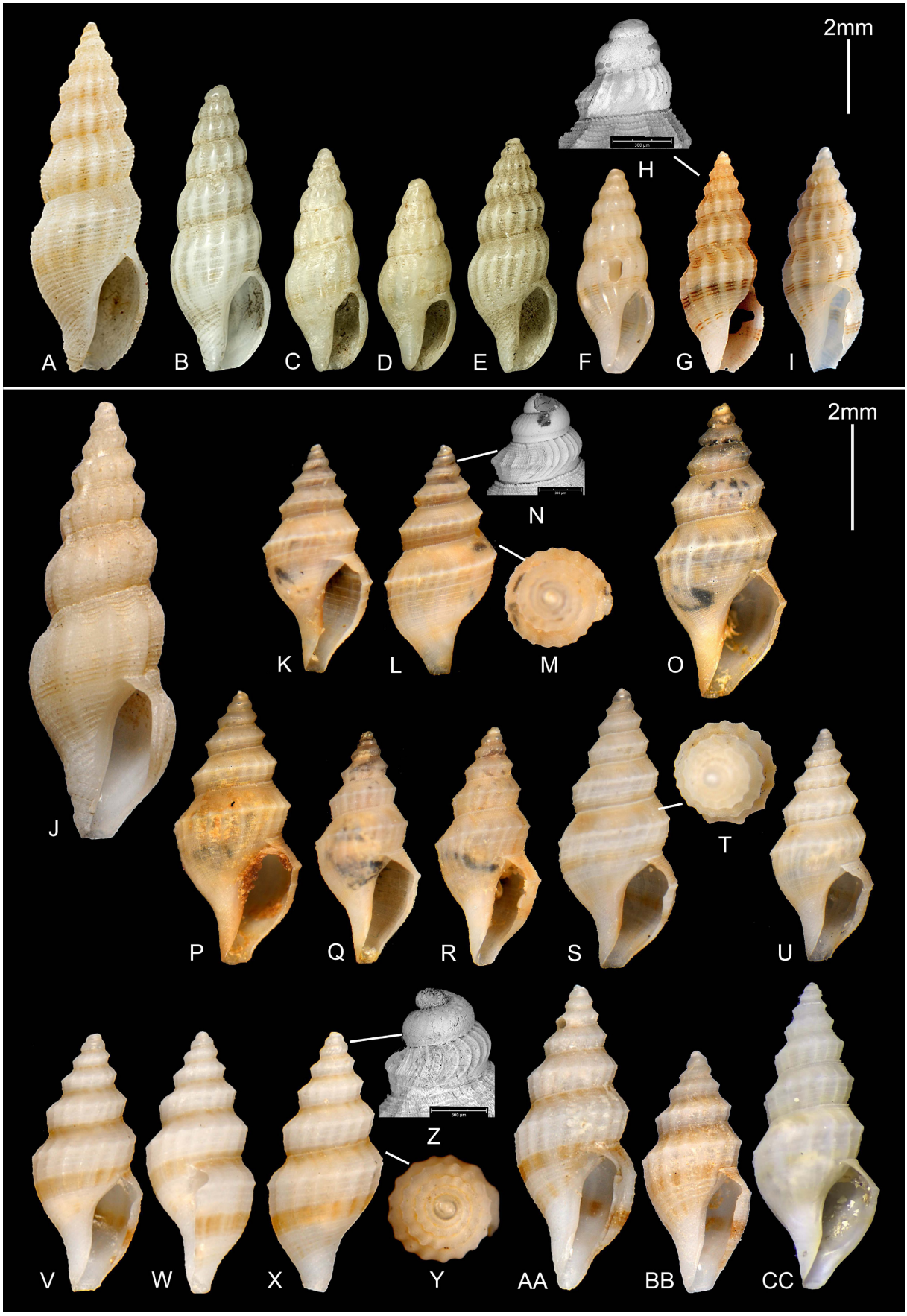
UNITED STATES OF AMERICA • 11 specs, 5.8 × 2.4, 4.9 × 2.4, 4.8 × 2.2, 4.7 × 2.2, 4.1 × 2.0, 4.6 × 2.0, 3.9 × 1.7, 3.8 × 1.7, 3.5 × 1.6, 3.5 × 1.4 and 3.2 × 1.5 mm; Florida Keys, between Marquesas Keys and Dry Tortugas; depth 35–40 ft [11–12 m]; pre 1981; Wayne Sadler leg.; ex batfish stomachs; ANSP 482229F • 2 specs, 4.7 × 2.1 and 4.0 × 1.8 mm; E Florida, Duval Co., Xalvis Island; Nov. 1985; June Dawley leg.; Camp Alamacani scallop tailings; UF 589702.

Other material examined (5 specs)

COLOMBIA • 1 spec., 4.0 × 1.6 mm; Catalina Island, NW of Providencia, near Blue Hole; depth 80 ft [24 m]; 16 Aug. 1998; E.F. García leg.; dredged; UF 589705.

ST. VINCENT AND THE GRENADINES • 1 spec., 4.6 × 2.1 mm; St. Vincent Island; depth 8–10 m; J. Colomb leg.; MNHN-IM-2000-39870 • 2 specs, lengths = 4.8 and 5.7 mm; Union Island, W side of Frigate Island; depth 4 m; 29 Apr. 2004; G. Mackintosh leg.; night SCUBA; UF 589706 • 1 spec., length = 5.3 mm; Petit St. Vincent Island; depth 14 m; 24 May 2004; G. Mackintosh leg.; night SCUBA; P. Fallon coll.

Fig. 40 (next page). Species of *Cryoturris* Woodring, 1928. Part 3. – **A**. *Pleurotoma dorvilliae* Reeve, 1845, syntype, 9.6 × 3.3 mm (NHMUK 75.4.26.20). – **B**. *Murex accinctus* Montagu 1808, syntype, 7.0 × 2.5 mm (NHMUK 20001350-1). Synonym of *C. dorvilliae*. – **C–E**. *Pleurotoma forthiensis* Reeve, 1845, syntypes, largest length = ca 6.4 mm (NHMUK 1874.10.31.2), West Indies. Synonym of *C. dorvilliae*. – **F**. *Pleurotoma quadrilineata* C.B. Adams, 1850, syntype, 5.6 × 2.2 mm (MCZ186007) Jamaica. Synonym of *C. dorvilliae*. – **G–I**. *Cryoturris dorvilliae* (Reeve, 1845). **G–H**. Spec., 5.8 × 2.2 mm, ventral views, and SEM image of protoconch (MNHN-IM-2000-39561), Grand River, Pointe du Souffleur, Martinique. **I**. Spec., 6.1 × 2.3 mm, live-caught, ethanol-preserved (MNHN-IM-2019-34736), Petite Terre, Guadeloupe. – **J**. *Kurtziella quadrilineata* var. *longa* Nowell-Usticke, 1969, lectotype, 8.3 × 2.8 mm (AMNH 195469) Ham Bay, St Croix, U.S. Virgin Islands Synonym of *C. dorvilliae*. – **K–U**. *Cryoturris voluta* Fallon sp. nov. **K–N**. Holotype, 4.4 × 2.1 mm, ventral, dorsal, apical view, and SEM of protoconch, 245 × (UF 589699), E of Ponte Vedra, St Johns Co., E Florida. **O–R**. Specs, 5.6 × 2.4, 5.2 × 2.4, 4.4 × 2.0 and 4.5 × 2.0 mm (UF 589701), all from the type locality. **S–U**. Specs, 5.3 × 2.3, with apical view, and 4.4 × 2.0 mm (UF 589700), off Cedar Key, Levy Co., W Florida. W Florida variants. – **V–CC**. *Cryoturris olsoni* Fallon & Bouchet sp. nov. **V–Z**. Holotype, 5.0 × 2.1 mm, ventral, lateral, dorsal and apical views, and SEM image of protoconch, 245 × (MNHN-IM-2012-8866), Banc des Vaisseaux, Guadeloupe. **AA**. Paratype, 5.9 × 2.4 mm (MNHN-IM-2012-8865), Les 3 arches (Port-Louis), Guadeloupe. **BB**. Spec., 4.6 × 2.1 mm (MNHN-IM-2000-39870), Saint Vincent Island, Saint Vincent and the Grenadines. **CC**. Paratype, 5.8 × 2.4 mm (ANSP 482229F), between Marquesas Keys and Dry Tortugas, Florida Keys. Credits: B–E: from Oliver *et al*. (2017: figs 1.1, 2.1, 2.2 and 2.3); H, N, Z: SEM images courtesy of Paul Callomon. Scale bars: A–G, I–M, O–Y, AA–CC: 2 mm; H, N, Z = 300 μm.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Description

Shell small (holotype length = 4.95 mm, the largest specimen length = 5.9 mm), stoutly fusiform (W/L = 0.4242), of 6¼ turreted whorls total the last whorl angled less, its base abruptly tapered to a short, distinct anterior canal, both about 69% of shell length. Aperture narrowly oval with a wide shallow notch on shoulder, about 46% of shell length; sculpture of numerous narrow ribs and microscopic frosted spirals. *Protoconch* of (2½–3) whorls, the tip blunt, not minute, about the first 2 whorls smooth, somewhat loosely coiled whorls and the last ½ whorl with distinct recurved riblets that terminate before the suture. *Axial sculpture* of numerous low, narrow ribs that run from suture to suture on spire whorls, 17 on the penult and 14 on the last whorl. Ribs recurved on the shoulder and faded out on the shell base. *Varix* none. *Spiral sculpture* of primaries and microscopic secondaries, primaries are separated by 4 or 5 secondaries, the strongest primary is on the whorl periphery, and overrides ribs. This pattern of primaries separated by 4 or 5 secondaries is the same over the entire surface of the shell. *Sulcus* absent; past positions of the sinus indicated by the recurved ribs on the shoulder. *Outer lip* is thin, simple; lip edge forms an arc from anal sinus to anterior canal margin where it flexes out to follow the canal edge. Stromboid notch absent. *Anal sinus* is a wide notch with a round apex positioned on the shoulder closer to its edge than the suture. *Inner lip* a thin, narrow margined glaze, without a parietal callus. *Columella* straight. *Anterior canal* short, defined by the gradual constriction of the shell base, open, unnotched. *Anterior fasciole* not swollen, sculpted with close primary spirals. *Color* white with a mid-whorl brown spiral band. Another brown band, narrower, is on the shoulder at the suture.

Remarks

The average total length of 7 specimens is 4.85 mm (4.00–5.90 mm). Little variation in color, color pattern, or shape was seen in the examined specimens.

Range and habitat

Widespread. Bahamas (Abaco), United States (E Florida, Florida Keys), Guadeloupe, St. Vincent and the Grenadines, and Colombia (off Providencia); depth 8–33 m.

***Cryoturris* spp. Part 4**

Cryoturris redferni Fallon & Bouchet sp. nov.
urn:lsid:zoobank.org:act:F9BB885E-B463-4AE1-979A-9F86793F6395
Figs 33C, 41, 42A–L

Differential diagnosis

This species is close to some members of the genus *Kurtziella* but most differs in protoconch sculpture as described in key diagnostic characteristics of *Cryoturris*.

Cryoturris procera Fallon & Bouchet sp. nov. has a protoconch of 2¾ (versus 2¼) whorls; the first whorl smooth, the last 1¾ whorls with riblets that become angular medially, the last whorl with well-developed paddle-like extensions that form a carina (versus a weak, less angular carina – spiral sculpture of primaries and secondaries, 5 primaries on shoulder, with an increasing number of secondaries between them toward the edge of the shoulder where a strong primary defines the whorl periphery; an additional 4 primaries on whorl sides with 5 or so secondaries between them.

Cryoturris delicatior Fallon & Bouchet sp. nov. has a protoconch of 3 whorls (not 2¼), the last whorl bulging, with crowded riblets with paddle-like mid-whorl swellings, forming a strong median carina on about the last ½-whorl (not a weak carina as in *C. redferni* Fallon & Bouchet sp. nov.), steeply sloping spire whorl shoulders ⅔ the height of whorls (versus ½ the height of shoulders – spiral sculpture

consisting of 5 primaries on shoulder, 3 close to the suture with single secondaries between then 2 primaries with 3–4 secondaries between, a strong peripheral primary; the penultimate whorl side has 1 primary with 8–9 secondaries on either side (versus 5 primaries on primary whorl side).

Cryoturris robusta Fallon & Bouchet sp. nov. has a protoconch of 2½ whorls (not 2¼ whorls), the last full whorl with convex riblets that develop paddle-like swellings forming a median carina on last ½-whorl; spiral sculpture of 2 primaries at the suture followed by 5 more primaries with 3–4 microscopic secondaries between on shoulder (versus single alternating primaries and secondaries), and whorl sides with 4 primaries with 4–9 secondaries between each.

Cryoturris slapcinskyi Fallon & Bouchet sp. nov., see the Differential diagnosis section under that species for differences.

Etymology

Cryoturris redferni Fallon & Bouchet sp. nov. is named in honor of the late Colin Redfern for his joyful spirit during his participation in the MADIBENTHOS expedition and for being the author of the landmark volumes on the mollusks of Abaco Island, Bahamas.

Type material

Holotype

GUADELOUPE • 7.0 × 2.6 mm live caught; Petit Cul-de-Sac Marin; 16°13.62’ N, 61°32.38’ W; depth 3 m; 21 May 2012; KARUBENTHOS 2012; stn GD49; sequenced; MNHN-IM-2013-20675.

Paratypes (20 specs)

GUADELOUPE • 2 specs, 6.6 × 2.3 and 7.4 × 2.5 mm; Basse-Terre, off Anse à la Barque; 16°05.5′ N, 61°46.6′ W; depth 45 m; 9 May 2012; KARUBENTHOS 2012; stn GD12; MNHN-IM-2012-8775 • 1 spec., 7.3 × 2.7 mm; Petit Cul-de-Sac Marin; 16°11.21′ N, 61°32.51′ W; depth 27 m; 21 May 2012; KARUBENTHOS 2012; stn GD48; MNHN-IM-2012-8782 • 1 spec., 5.65 × 2.3 mm; Sud Anse Caraïbe; 16°11.98′ N, 61°47.57′ W; depth 40 m; 12 May 2012; KARUBENTHOS 2012; stn GN18; MNHN-IM-2012-8776 • 1 spec., 6.7 × 2.6 mm, live caught; off Anse à la Barque; 16°05.39′ N, 61°46.48′ W; depth 50 m; 10 May 2012; KARUBENTHOS 2012; stn GD15; sequenced; MNHN-IM-2013-20619 • 2 specs, 6.8 × 2.5 and 6.9 × 2.7 mm; off Anse à la Barque; 16°05.4′ N, 61°46.5′ W; depth 50 m; 10 May 2012; KARUBENTHOS 2012; stn GD15; MNHN-IM-2012-8777 • 1 spec., 6.9 × 3.8 mm, live caught; Petit Cul-de-Sac Marin; 16°13.62′ N, 61°32.38′ W; depth 3 m; 21 May 2012; KARUBENTHOS 2012; stn GD49; sequenced; MNHN-IM-2013-20590.

MARTINIQUE • 1 spec., 6.6 × 2.5 mm; Bellefontaine, off the power plant; 14°39.9′ N, 61°09.9′ W; depth 60 m; 2 Oct. 2016; MADIBENTHOS; stn AD287; sequenced; MNHN-IM-2013-72793 • 1 spec., 4.3 × 1.9 mm; N Loup Ministre; 14°49.4′ N, 60°56′ W; depth 60 m; 20 Sep. 2016; MADIBENTHOS; stn AD251; sequenced; MNHN-IM-2013-72675 • 1 spec., 7.9 × 2.9 mm; NE Le Lorrain; 14°51.3′ N, 61°01.7′ W; depth 49 m; 21 Sep. 2016; MADIBENTHOS; stn AD256; MNHN-IM-2000-39581 • 2 specs, 6.7 × 2.5 and 6.4 × 2.3 mm; Caravelle Peninsula, NW Rocher de la Caravelle; 14°49.4′ N, 60°53.7′ W; depth 60 m;18 Sep. 2016; MADIBENTHOS; stn AD242; ANSP 498837 • 6 specs, (2 measured) 7.3 × 2.7 and 6.6 × 2.4 mm; N Loup Ministre; 14°49.4′ N, 60°56′ W; depth 60 m; 20 Sep. 2016; MADIBENTHOS; stn AD251; USNM 1715394 • 1 spec., 9.1 × 3.3 mm; Schoelcher, Anse Madame; 14°37.3′ N, 61°07′ W; depth 57 m; 7 Oct. 2016; MADIBENTHOS; stn AD611; MNHN-IM-2000-39580.

Other material examined (20 spec.)

An additional 20 specimens were examined from off Martinique, French Guiana, and Brazil.

Description

Shell small (holotype length = 7.0 mm, measured specimens to 9.1 mm), fusiform (W/L = 0.3714), strong, of about 8 whorls, the last about 58% of shell length; whorls obtusely angled about mid-whorl, sutures appressed, slightly undulant; sculpture of weak axials and crowded spiral secondaries of varying strengths; aperture oval with an anterior canal of medium length. *Protoconch* of 2¼ whorls with a blunt tip, recumbent, the first whorl smooth, the last with dense riblets that develop mid-whorl swellings on the last ½-whorl, their peripheries forming a weak carina. The upper side of the carina has recurved riblets that extend to the suture, the lower side has finer, straight riblets that sweep sharply toward the left (toward protoconch lip) and do not extend to the suture. A supra-sutural spiral secondary is present on the last whorl. *Axial sculpture* of straight ribs that extend from suture to suture on spire whorls and curve toward the anterior fasciole on the last. Ribs weaken toward the suture and below the periphery, number 12 on the penultimate and 11 on the last and are about as wide as intercostal space. *Varix* absent. *Spiral sculpture* of primaries and secondaries of varying strengths with primaries only a little stronger than secondaries. One strong primary lies against the suture, then alternating primaries (about 7 altogether) and secondaries on remaining shoulder save 2 secondaries between the last shoulder primary, which is a strong primary; 5 primaries are on whorl sides (2 strong and 3 weaker) with 3 secondaries between, and 3 or fewer secondaries between primaries on shell base. Anterior fasciole with 1–2 secondaries between each primary. All spirals override ribs. Secondaries are heavily frosted, forming longitudinal nodules at intersections with growth striae, primaries also frosted but worn on rib crests. *Sulcus* absent. *Outer lip* is thin, edge a low arc extending from anal sinus to beginning of anterior canal. *Anal sinus* a broad but shallow V-shaped notch present just above whorl periphery. *Inner lip* a narrow glaze, unemarginate on columella, impressed on parietal wall, without a callus. *Columella* straight. *Anterior canal* of medium length, open, straight, unnotched. *Anterior fasciole* not swollen, with about 10 weak spiral cords, 1–2 secondaries between. *Color* yellowish gray; paratypes to light grayish yellow, protoconch usually brown. Heavy frosting produces a white cast overall.

Animal

A live animal is translucent milky white with a white-spotted proboscis and narrow milky-white cephalic tentacles, eye spot midway (Fig. 41).

Fig. 41. *Cryoturris redferni* Fallon & Bouchet sp. nov. (MNHN-IM-2013-72675), live animal. Photo by C. Redfern.

Remarks

The average total length of 28 measured specimens is 6.5 mm (3.8–9.1 mm). The sequence of primary and secondary primaries varies among individuals. For instance, on the shoulder there may be 2 or 3 primaries next to the suture and as many as 3 secondaries just before the strong peripheral primary at the whorl periphery. The distinction is the alternating strength of spirals over most of the shoulder.

Range and habitat

Guadeloupe, Martinique, French Guiana, and Brazil; depth 3–150 m; live caught depth 3 m and 50–60 m.

Cryoturris delicatior Fallon & Bouchet sp. nov.
urn:lsid:zoobank.org:act:3A203589-3725-49C2-AD9E-A5BB4F56D8FE
Figs 33D, 42M–R

Differential diagnosis

Cryoturris delicatior Fallon & Bouchet sp. nov. has a single primary spiral on whorl sides (below whorl peripheral spiral) compared with the similar *Cryoturris redferni* Fallon & Bouchet sp. nov. which has 2 or more. It also has more ribs (14 versus 12 on the penultimate whorl).

Cryoturris septentrionalis Fallon sp. nov., has a protoconch of 2½ whorls versus 3, and 9 weak primary spirals on the shoulder with 1–2 secondaries between.

Cryoturris texana Fallon sp. nov., has a protoconch of 2½ whorls versus 3, and 20 weak primaries on the shoulder versus 9 weak primary spirals on the shoulder with 1–2 secondaries between.

Cryoturris pelican Fallon sp. nov., has a protoconch of 2½ whorls versus 3, and 6 weak primaries followed by 6 secondaries on the shoulder.

Etymology

Cryoturris delicatior Fallon & Bouchet sp. nov. from the feminine form of the Latin comparative '*delicatior*', which means the daintier *Cryoturris*, referencing its finer sculpture and narrower profile.

Type material

Holotype

GUADELOUPE • 7.1 × 2.6 mm; W of Basse-Terre; 16°13′ N, 61°54′ W; depth 406–644 m; 8 Jun. 2015; MNHN exped.; stn CP4513; MNHN-IM-2000-39560.

Paratypes (2 specs)

GUADELOUPE • 1 spec., 8.6 × 3.0 mm; S of La Désirade; depth 250 m; 2017; dredged; D. Lamy coll.

UNITED STATES OF AMERICA • 1 spec., 7.6 × 2.9 mm; W Florida, Hillsborough Co., W of Egmont Key; depth 55 m; 1960; J. Moore leg.; dredged; R/V *Cavalier*; ex D. Tippett coll; UF 589707.

Description

Shell very small (holotype length = 7.1 mm, largest length = 8.6 mm), fusiform (W/L = 0.3662), partially translucent, with 7½ whorls, teleoconch whorls obtusely angled with impressed sutures and with shoulder extending a little beyond mid-whorl, last whorl about 63% of total shell length; sculpture of narrow weak ribs and dense spiral secondaries; aperture oval, with a medium length anterior canal, about 42% of shell length, including canal. *Protoconch* of 3 regularly expanding round whorls; the tip recumbent, not minute, then rapidly expands to the last whorl, which bulges with crowded riblets that become medially

angular, and on about the last ½-whorl peripheral swelling of riblets form a carina. The upper side of the carina has recurved riblets that extend to the suture, the lower side has finer, straight riblets that sweep sharply toward the left (toward protoconch lip) and do not extend to the suture. *Axial sculpture* of weak narrow ribs that run from the suture to the anterior fasciole of the last whorl; ribs fade near suture, are strongest mid-whorl. Ribs grow in strength, on the last whorl, the last 3 are largest with wider intercostal spacing. Ribs number 14 on the penultimate and 11 on the last whorl, are about half as wide as their intercostal space. *Varix* absent; last few ribs are stronger and serve to strengthen the lip. *Spiral sculpture* of delicate primary and secondary spirals of varying strengths; 5 primaries on shoulder, 3 are close to the suture with single secondaries between, and two more with 3–4 secondaries between, then a strong primary defines the whorl periphery and edge of shoulder and is nodulous on rib crests; an additional primary midway on the whorl side with 8–9 secondaries on either side of the primary. Shell base has about an additional 8 primaries with 4–9 secondaries between decreasing in number anteriorly. Both primaries and secondaries are heavily frosted and override ribs. Intersections of primaries form nodules, most strongly on whorl peripheries. *Sulcus* absent. *Outer lip* thin, edge straight, or nearly so; stromboid notch lacking. *Anal sinus* a weak V-shaped notch at Junction of shoulder and whorl side. *Inner lip* a narrow callus that runs along the length of the columella, absent from the parietal wall. *Columella* straight. *Anterior canal* open, straight, of medium length, unnotched. *Anterior fasciole* not swollen, with about 10 weak primaries and 1–3 secondaries between; end unnotched. *Color* monochromatic white to yellowish white.

Remarks

The specimen from Florida is a golden yellow, those from Guadeloupe white to off white. Size of the 3 specimens varies from length range = 7.1–8.6 mm with a mean of 7.8 mm.

Range and habitat

United States (W Florida) and Guadeloupe; depth 55–644 m.

Cryoturris robusta Fallon & Bouchet sp. nov.
urn:lsid:zoobank.org:act:EF34357A-4E5A-47F3-873C-E738727F7363
Figs 33E, 42S–Y

Differential diagnosis

This species differs from most of its congeners in having strong ribs, a more robust form, and a generally larger size. Differences from its closest congeners:

Cryoturris procera Fallon & Bouchet sp. nov. has a protoconch with riblets on the last 2 whorls (versus just the last) and with slightly more whorls (2¾–3 versus 2½). The average length of 13 *C. procera* specimens is greater than that of 20 *C. robusta* Fallon & Bouchet sp. nov. specimens (9.29 versus 8.75 mm). *C. procera* has been found mainly in samples around Guadeloupe while *C. robusta* in samples from more southerly areas between Martinique and French Guiana.

Cryoturris holimanae Fallon sp. nov. is similar but is less stout (W/L = 0.3519 versus 0.4000 of holotypes), has weaker frosting, a different pattern of spirals, and is more northerly in its distribution (E Florida versus the Lesser Antilles from Guadeloupe south to French Guiana).

Etymology

Cryoturris robusta Fallon & Bouchet sp. nov. is derived from the feminine form of the Latin adjective *robustus*, which means firm or robust, in reference to its solid and sturdy appearance.

Type material

Holotype

MARTINIQUE • 9.5 × 3.8 mm; off Macouba; 14°55.1′ N, 61°08.9′ W; depth 80 m; 25 Sep. 2016; MADIBENTHOS; stn AD265; MNHN-IM-2000-39582.

Paratypes (17 specs)

GRENADA • 1 spec., 8.7 × 3.6 mm; Carriacou Island; depth 8 m; 14 May 2004; G. Mackintosh leg.; night SCUBA; UF 589708 • 1 spec., 10.4 × 4.1 mm; Dragon's Bay; depth 29 m; 14 Aug. 2003; G. Mackintosh leg.; night SCUBA; USNM 1715435 • 2 specs, 7.4 × 2.9 and 6.1 × 2,7 mm; Mabouya Island; depth 9 m; 23 Dec. 2006; G. Mackintosh leg.; night SCUBA; USNM 1715434.

GUADELOUPE • 1 spec., 10.0 × 3.5 mm; off Fajou Island; depth 80–90 m; 2013; dredged; D. Lamy coll. • 1 spec., 9.1 × 3.6 mm; N Grande-Terre; 16°37′ N, 61°48′ W; depth 703–724 m; 9 Jun. 2015; KARUBENTHOS 2; stn DW4521; MNHN-IM-2000-39583.

ST. VINCENT AND THE GRENADINES • 2 specs, 10.0 × 3.8 and 7.5 × 2.9 mm; Canouan Island, Corbec Bay; depth 7.6 m; 8 Jun. 2004; G. Mackintosh leg.; night SCUBA; USNM 1715433 • 4 specs, 6.3 × 2.6, 8.9 × 3.3, 9.9 × 3.9, and 9.8 × 3.7 mm; Quatre Island; depth 15 m; 1 Aug. 2004; G. Mackintosh leg.; night SCUBA; UF 589709 • 1 spec., 11.1 × 4.0 mm; Bequia Island, Admiralty Bay; depth 15 m; 3 Jul. 1996; G. Mackintosh leg.; night SCUBA; P. Fallon coll.

TRINIDAD AND TOBAGO • 1 spec. 9.2 × 3.5 mm; Tobago Island, 0.5 mi. [0.8 km] W of Pigeon Pt.; R. Masino leg.; night SCUBA; from on soft sand; ANSP 498879 • 1 spec., length = 10.1 mm; Tobago Island, Store Bay; depth 15 m; 8 Nov. 1999; P. Fallon leg.; night SCUBA; from on silty sand; ANSP 498878.

VENEZUELA • 2 specs, 10.5 × 3.6 and 11.5 × 4.2 mm; Cubagua Island, W side of Punta Charagato; depth 11 m; 7 Nov. 1999; G. Mackintosh leg.; night SCUBA; UF 589710.

Other material examined (1 spec.)

FRENCH GUIANA • 1 spec., 9.3 × 3.3 mm; offshore; 5°1.4′ N, 51°22.3′ W; depth 62 m; 18 Apr. 1999; GREEN 0; stn D12; MNHN-IM-2000-40014.

Description

Shell small (holotype length = 9.5 mm, paratype lengths to 11.6 mm), fusiform (W/L = 0.4000), strong, of about 8½ whorls, the last about 61% of shell length, whorls obtusely angled about mid-whorl, sutures appressed, made slightly undulant by previous whorls' ribs; sculpture of moderately strong axials and crowded spirals of varying strengths; aperture oval with an anterior canal of medium length and together about 43% of shell length. *Protoconch* of about 2½ whorls with a recumbent tip, the first 1½ whorls smooth, diameter slightly smaller than the last whorl, which has convex riblets with peripheral bead-like swellings forming a sub-medial carina beginning on the last ½-whorl. The upper side of the carina has recurved riblets that extend to the suture; the underside has finer, straight riblets that sweep sharply toward the left (toward protoconch lip) and do not reach the suture. *Axial sculpture* of strong, narrow ribs that run from suture to suture and to the anterior fasciole on the last whorl. Ribs angled sharply at whorl periphery, increase in strength toward lip, number 12 on penultimate, 10 on last whorl, intercostal space about as wide as ribs, wider toward lip. *Varix* absent. Ribs become progressively stronger, the last is strongest and serves to strengthen the lip. *Spiral sculpture* of primaries and secondaries, both vary in strength. On shoulder, 2 primaries at suture are followed by 5 more primaries with 3-4 microscopic secondaries between; a strong primary is present on the whorl periphery, followed by 3 primaries with 4–9 secondaries between each on the whorl side. The shell base has a similar pattern of about 11 primaries of varying strengths with numerous microscopic secondaries packed between each. Primaries

and secondaries are strongly frosted and override ribs; primaries form a narrow, elongate nodule, or spike, on crests of primaries. *Sulcus* absent. *Outer lip* is thin, edge forms a low arc from periphery to anterior canal. *Anal sinus* a shallow, wide V-notch at the Junction of the shoulder and whorl side. *Inner lip* a narrow band of smoothed shell from suture to anterior canal, unemarginate, without a parietal callus. *Columella* straight. *Anterior canal* is moderately long, open, and unemarginate. *Anterior fasciole* not swollen, with about 7 weak primary spirals. *Color* of cream, light yellowish-brown between ribs and apex, anterior and crests of later ribs whitish.

Remarks

The average length of 19 specimens is 9.23 mm (range = 6.10–11.50 mm).

Range and habitat

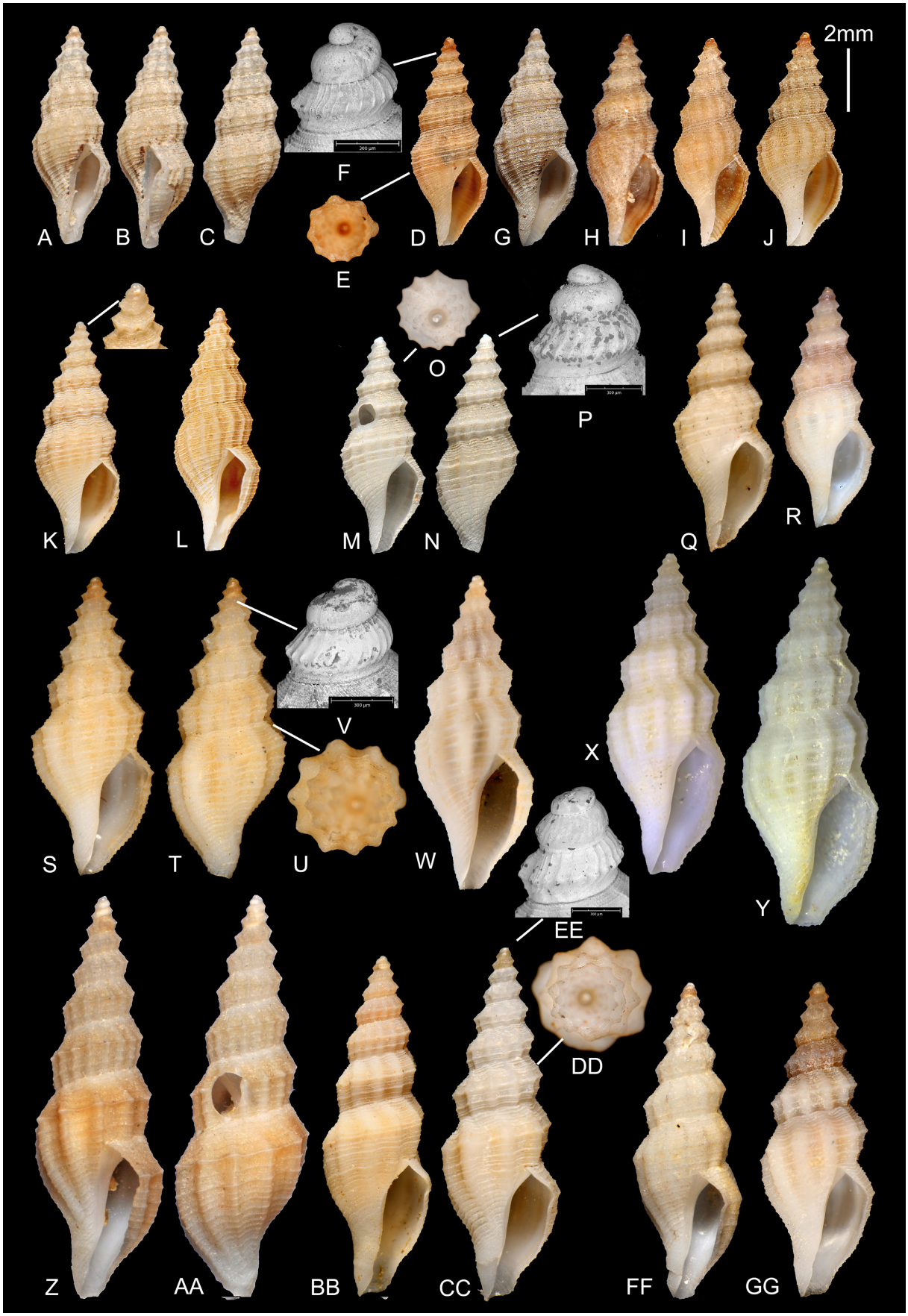
Guadeloupe, Martinique, St. Vincent and the Grenadines, Grenada, Trinadad and Tobago (Tobago Island), French Guiana, and Venezuela (Cubagua Island); depth 7.6–90 m. One specimen (N of Grande-Terre, Guadeloupe) was taken at depths of 703–724 m.

Cryoturris procera Fallon & Bouchet sp. nov.
urn:lsid:zoobank.org:act:75197B2A-6157-4608-98B7-50C35C39F3DB
Figs 33F, 42Z–GG

Differential diagnosis

This species differs from most of its congeners by its strong ribs, more robust form, and generally larger size.

Fig. 42 (next page). Species of *Cryoturris* Woodring, 1928. Part 4. – **A–L**. *Cryoturris redferni* Fallon & Bouchet sp. nov. **A–C**. Holotype, 7.0 × 2.6 mm, sequence voucher, ventral, lateral and dorsal views (MNHN-IM-2013-20675), Petit Cul-de-Sac Marin, Guadeloupe. **D–F**. Paratype, 6.6 × 2.3 mm, ventral view, and SEM image of protoconch (MNHN-IM-2012-8775), Basse-Terre, Guadeloupe. **G**. Paratype, 6.9 × 3.8 mm, sequence voucher (MNHN-IM-2013-20590), Petit Cul-de-Sac Marin, Guadeloupe. **H**. Paratype, 6.7 × 2.6 mm, sequence voucher (MNHN-IM-2013-20619), off Anse à la Barque, Guadeloupe. **I**. Paratype, 6.6 × 2.5 mm, sequence voucher (MNHN-IM-2013-72793), Bellefontaine, SW of centrale EDF, Martinique. **J**. Paratype, 6.9 × 2.7 mm (MNHN-IM-2012-8777), off Anse à la Barque, Guadeloupe. **K**. Paratype, 7.3 × 2.6 mm (MNHN-IM-2012-8782), off Guadeloupe. **L**. Paratype, 7.9 × 2.9 mm (MNHN-IM-2000-39581), NE of Le Lorrain, Martinique. – **M–R**. *Cryoturris delicatior* Fallon & Bouchet sp. nov. **M–P**. Holotype, 7.0 × 2,7 mm, ventral, dorsal and apical views, and SEM image of protoconch (MNHN-IM-2000-39560), W of Basse-Terre, Guadeloupe. **Q**. Paratype, 8.6 × 3.2 mm (D. Lamy coll.), S of La Désirade, Guadeloupe. **R**. Paratype, 7.6 × 2.9 mm (UF 589707), off Hillsborough Co., W Florida. – **S–Y**. *Cryoturris robusta* Fallon & Bouchet sp. nov. **S–V**. Holotype, 9.5 × 3.8 mm, ventral, dorsal and apical views, and SEM image of protoconch (MNHN-2000-39582), off Macouba, Martinique. **W**. Paratype, 10.0 × 3.8 mm (USNM 1715433), Canouan Island, Saint Vincent and the Grenadines. **X**. Paratype, length = 10.1 mm (ANSP 498878), Store Bay, Tobago, Trinidad and Tobago. **Y**. Paratype, 11.1 × 4.0 mm (P. Fallon coll.), Admiralty Bay, Bequia Island, Saint Vincent and the Grenadines. – **Z–GG**. *Cryoturris procera* Fallon & Bouchet sp. nov. **Z–AA**. Holotype, 12.7 × 4.2 mm, sequence voucher, ventral and dorsal views (MNHN-IM-2013-8059), Port-Louis, Guadeloupe. **BB**. Paratype, 10.7 × 3.6 mm (D. Lamy coll.), Port-Louis, Guadeloupe. **CC–EE**. Paratype, 11.1 × 3.8 mm, ventral, apical views, and SEM image of protoconch (D. Lamy coll.), S of La Désirade, Guadeloupe. **FF**. Paratype, 9.9 × 3.3 mm (USNM 1231392), Curaçao, Netherlands Antilles. **GG**. Paratype, 9.9 × 3.6 mm (D. Lamy coll.), La Désirade, Guadeloupe. Credits: F, P, V, EE: SEM images courtesy of Paul Callomon. Scale bars: A–E, G–O, Q–U, W–DD, FF–GG = 2 mm; F, P, V, EE = 300 µm.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Cryoturris robusta Fallon & Bouchet sp. nov. has fewer protoconch whorls (2¼–2½ versus 2¾–3) and riblets only on the last whorl (versus last 1½ whorls).

Cryoturris holimanae Fallon sp. nov. has fewer protoconch whorls (2¼ versus 2¾–3) and so far, appears to be more northerly in distribution (NE Florida versus Guadeloupe to Netherlands Antilles).

Etymology

Cryoturris procera Fallon & Bouchet sp. nov. from the feminine form of the Latin adjective '*procerus*', meaning 'tall or high', in reference to the relatively high spire of this species.

Type material

Holotype

GUADELOUPE • 12.7 × 4.2 mm; Pig Island; 16°12.97′ N, 61°32.18′ W; depth 5 m; 20 May 2012; KARUBENTHOS 2012.; stn GN29; sequenced; MNHN-IM-2013-8059.

Paratypes (10 specs)

GUADELOUPE • 1 spec., 11.1 × 3.8 mm; S of La Désirade; depth 250 m; 2018; dredged; D. Lamy coll. • 1 spec., 8.9 × 3.2 mm; W of Marie-Galante; 15°56′ N, 61°23′ W; depth 208–210 m; 22 Jun. 2015; KARUBENTHOS 2; stn DW4597; MNHN-IM-2000-39576 • 1 spec., 8.1 × 2.7 mm; W of Marie-Galante; 15°58′ N, 61°22′ W; depth 201–214 m; 22 Jun. 2015; KARUBENTHOS 2; stn DW4592; MNHN-IM-2000-39575 • 1 spec., 9.7 × 3.5 mm; E La Désirade; 16°22′ N, 60°51′ W; depth 212–255 m, 16 Jun. 2015; KARUBENTHOS 2; stn DW4565; MNHN-IM-2000-39574 • 2 specs, lengths = 6.9 and 6.8 mm; W of Marie-Galante; 15°58' N, 61°23' W; depth 200–206 m; 22 Jun. 2015; KARUBENTHOS 2; stn DW4594; MNHN-IM-2000-39577 • 1 spec., 9.9 × 3.6 mm; S of La Désirade; depth 250 m; 2018; dredged; ANSP 498787 • 1 spec., 9.4 × 3.4 mm; off Marie-Galante; depth 250 m; 2017; dredged; D. Lamy coll. • 1 spec., 10.7 × 3.6 mm; Port-Louis; depth 150 m; dredged; ANSP 498786.

NETHERLANDS ANTILLES • 1 spec., 9.9 × 3.3 mm; Curaçao, off Sea Aquarium; 12°04.99′ N, 68°53.94′ W; depth 244–274 m; 8 Feb. 2013; Smithsonian Field Survey; *Curasub* stn 13-04; USNM 1231392.

Other material examined (6 specs)

Six additional specimens from Guadeloupe and Venezuela were identified as this species.

Description

Shell small (holotype length = 12.7 mm), fusiform (W/L = 0.3307), strong, of about 9¾ whorls with sutures impressed, whorls rather tall, altogether forming a tall spire, the last whorl with a rounded base, tapered to an anterior canal of moderate length, both aperture and canal about 56% of length; spire whorls obtusely angled with a flat shoulder extending about mid-whorl at an angle of about 63° from a perpendicular to the shell axis; aperture oval with a wide shallow anal sinus on shoulder, about 38% of shell length including canal; sculpture of ribs and fine frosted spirals. *Protoconch* of about 2¾–3 whorls with a recumbent tip, first 1½ whorls smooth, the remaining ones with riblets, faint and numerous at first, then fewer but stronger. The riblets on the last become medially angular with well-developed paddle-like extensions that form a medial carina. Riblets above the carina are strong, arched mid-way, those below are straight, finer, and sweep toward the protoconch lip. The carina becomes the peripheral cord of the teleoconch. *Axial sculpture* of strong, round-crested ribs that run from suture to suture and to the anterior fasciole on the last whorl, ribs reduced on shoulder fading to the suture, most prominent at whorl periphery, and become progressively stronger on last whorl. Ribs number 11 on penultimate, 10 on last, and intercostal space about as wide as ribs, wider on last whorl. *Varix* absent, the last and strongest

rib serves to strengthen the lip. *Spiral sculpture* of primaries and secondaries of varying strengths, 5 primaries on shoulder, with an increasing number of secondaries between them toward the edge of the shoulder where a strong primary defines the whorl periphery. An additional 4 primaries are on whorl sides with 5 or so secondaries between them. On shell base about an additional 9 primaries with 3–5 secondaries between, decreasing in number anteriorly. Both primaries and secondaries are frosted, and override ribs. Intersections of primaries form nodules, most strongly on whorl peripheries. *Sulcus* absent. *Outer lip* is thin, and the edge forms a low arc from periphery to anterior canal. *Anal sinus* is a very shallow, wide, V-notch at the junction of the shoulder and whorl side. *Inner lip* a narrow, thin glaze from suture to anterior canal, unemarginate, without a parietal callus. *Columella* straight. *Anterior canal* of moderate length, open, end slightly notched. *Anterior fasciole* is not swollen, with about 9 weak spiral primaries and 0–2 microscopic secondaries between. *Color* light golden yellow with darker tones between ribs on later whorls; anterior canal whitish.

Remarks

The average length of 13 measured specimens is 9.3 mm (range = 6.3–12.7 mm). The pattern of primary and secondaries varies. For instance, there may be up to 8 primaries on the shoulder with only 1–3 secondaries between, not 5 or more.

Range and habitat

Guadeloupe, Netherlands Antilles (Curaçao), Venezuela, and French Guiana; depth 100–274 m, live caught depth 135 m.

***Cryoturris* spp. Part 5**

Cryoturris fargoi McGinty, 1955
Figs 33G, 43A–F

Cryoturris fargoi McGinty, 1955: 76, pl. 1 fig. 7

Cryoturris fargoi – Powell 1966: 101. — Abbott 1974: 280, fig. 3234 (holotype). — Porter 1974: 248. — Reed & Mikkelsen 1987: 126. — Lyons 1989: 27, pl. XI fig. 1. — Diaz & Puyana 1994: 229; pl. 68 fig. 909. — Turgeon *et al*. 1998: 106. — Lee 2003a: http://www.jaxshells.org. — Tucker 2004: 368. — Williams 2005: #5564. — García 2007: 8.

Differential diagnosis

Cryoturris fargoi McGinty, 1955 is closely related to a group of about 8 species. The important differences of each are given below for comparison. It is the collective total of these attributes, not any single one, that separates the species. A summary of the attributes of *C. fargoi* follows. It has convex to obtusely angled whorls, a protoconch of 2¼ whorls, the last 1¼-whorls, mid-whorl carina with paddle-like swellings; spiral sculpture of 9 primaries with 1–3 secondaries between on whorl shoulders, and 8–9 primaries with 3–4 secondaries between each on the side of the penultimate whorl.

Cryoturris septentrionalis Fallon sp. nov. has a protoconch of 2½ whorls, the last with a mid-whorl bulge over which are fine riblets that have slight swellings (not paddle-like ones) on the periphery on the bulge of last ¾-whorl and riblets that end a little above the suture, spiral sculpture of 9 weak primaries on the shoulder with 1–2 secondaries between (mostly 1), 5 primaries (3 of these are strong, 2 weak) with 3–8 secondaries between, on the whorl side. The strongest is the peripheral primary.

Cryoturris texana Fallon sp. nov. has a protoconch of 2½ whorls; the first 1½ whorls round, not submerged, the last whorl with strong well-spaced riblets with a mid-whorl carina of paddle-like

swellings; spiral sculpture of about 20 weak primaries on the shoulder that tend to diminish in the strength from suture to the edge of the ramp, the peripheral spiral is the strongest, with tightly packed frosting and nodules on rib crests. The side of the penultimate whorl has 2 weak primaries with 3–9 secondaries between them.

Cryoturris pelican Fallon sp. nov. has a protoconch of 2½ whorls; the first 1½ whorls round, not submerged, the last whorl with moderately strong, dense riblets with a mid-whorl carina of paddle-like swellings and riblets that end a little above the suture. It is also smaller; spiral sculpture consists of primaries and secondaries, suture bordered by a strong undulant primary, followed by 6 weaker primaries, then 6 secondaries to the shoulder edge that are only slightly weaker than the preceding primaries. A strong primary defines the whorl periphery and projecting nodules form where it crosses over rib crests. The whorl sides have an additional 2 primaries with 9 microscopic secondaries between them.

Cryoturris procera Fallon & Bouchet sp. nov. has a protoconch of 2¾ whorls; the first whorl smooth, the last 1¾ whorls with riblets that become angular medially, the last whorl with riblets that form a carina of well-developed paddle-like extensions; spiral sculpture of primaries and secondaries, 5 primaries on shoulder, with an increasing number of secondaries between them toward the edge of the shoulder where a strong primary defines the whorl periphery; an additional 4 primaries on whorl sides with 5 or so secondaries between them.

Cryoturris redferni Fallon & Bouchet sp. nov. has a protoconch of 2¼ whorls; the first whorl smooth, slightly protruding, the last whorl with dense convex riblets that are swollen medially (not quite paddle-like) forming a carina; spiral sculpture of primaries and secondaries, 2–3 primaries against suture, then alternating primaries and secondaries on remaining shoulder save 2 secondaries between the last 2 primaries; 5 primaries on whorl face with 3 secondaries between.

Cryoturris holimanae Fallon sp. nov. has a protoconch of 2¼ whorls; the first 1½ whorls smooth, not partially submerged, and the last ¾-whorl with a mid-whorl bulge with weakly swollen riblets forming a weak median carina; spiral sculpture of primaries and secondaries, about 9 primaries on the shoulder alternate with 3–4 secondaries, followed by a strong, somewhat flattened primary on the perimeter; then 2 primaries with 8 secondaries between on the side of the penultimate whorl.

Cryoturris delicatior Fallon & Bouchet sp. nov. has steeply sloping spire whorl shoulders, and a protoconch of 3 regularly expanding round whorls; the first slightly protruding, the last whorl bulging, with crowded riblets that become paddle-like, forming a median carina on about the last ½-whorl; spiral sculpture of delicate primary and secondaries of varying strengths; 5 primaries on shoulder, 3 close to the suture with single secondaries between then 2 primaries with 3–4 secondaries between, a strong primary, nodulous on rib crests, defines the whorl periphery; the penultimate whorl side has 1 primary with 8–9 secondaries on either side of the primary.

Cryoturris robusta Fallon & Bouchet sp. nov. has a protoconch of 2½ whorls; the first 1½ whorls smooth, the last full whorl with convex riblets that develop paddle-like swellings forming a median carina on the last ½-whorl; spiral sculpture of 2 primaries at suture on the shoulder followed by 5 more primaries with 3–4 microscopic secondaries between, a strong primary is present on the whorl periphery, followed by 4 primaries with 4–9 secondaries between each of the primaries on whorl sides.

Type material

Holotype

UNITED STATES OF AMERICA • 11.5 × 4.7 mm; NW Florida, Okaloosa Co., off Destin; depth 14 fms [26 m]; 1941; T.L. McGinty leg.; ANSP 194062.

Paratypes (3 specs)

UNITED STATES OF AMERICA • 8.0 × 3.4 mm; same data as for holotype; ANSP 194064 • 1 spec.; same data as for holotype; MCZ 207196 • 1 spec.; same data as for holotype; MCZ 226784.

Other material examined (7 specs)

UNITED STATES OF AMERICA • 4 specs, 10.9 × 4.1, 4.8 × 2.2, 5.0 × 2.3 and 3.0 × 1.7 mm; W Florida, Pinellas Co.,WSW of Johns Pass; depth 49 m; 1965; D. Steger leg.; dredged; ANSP 306246 • 1 spec., 11.1 × 4.3 mm; NW Florida, SW of Cape San Blas; depth 43–55 m; 1969; J. Moore leg.; dredged; ANSP 317229 • 1 spec., 10.2 × 4.0 mm; W Florida, Hillsborough Co., 90 mi. [145 km] WSW of Egmont Key; depth 73 m; J. Moore leg.; dredged; ANSP 314381 • 1 spec., 17.6 × 5.5 mm; NW Florida, Bay Co., off Panama City; depth 24–30 m; Jun. 1989; B. Becfreid leg.; trawled; from aboard a scallop boat; UF 589743.

Description

The original description appears in McGinty (1955: 76). This redescription is based on the type material and with some observations on specimens that are otherwise consistent with the original description. *Shell* is small, up to length = 17.6 mm, fusiform with a tall spire (W/L = 0.31–0.41) a little shorter than body whorl; whorls convex to obtusely angled mid-way, sutures impressed, the last whorl approximately 53–64% of shell length (by measure of different shell forms); aperture oval with an open anterior canal and a wide, shallow anal sinus posteriorly. The *protoconch* has 2¼ whorls, the first smooth, round, then rapidly and symmetrically expanding, the last 1¼-whorls with well-spaced riblets that develop paddle-like swellings mid-whorl that strengthen to form a distinctive carina on the last ½–¾ whorl. Arched riblets occur above the bulge and fine oblique riblets below. *Axial sculpture* of round-crested ribs extending from suture to suture, intercostal space about the same as rib width, ribs slightly recurved and lower on shoulder, straight on whorl sides, and evanesce before the anterior fasciole. Ribs number 12 on the penultimate, 11 on the last whorl. *Spiral sculpture* of 9 primaries with 1–3 intercalary secondaries on shoulder, and 8–9 primaries with 3–4 secondaries in intercalary space on the side of the penult whorl, 3 of the primaries are stronger, the strongest at whorl periphery. Spirals override ribs, and are sharply nodulose on rib crests, especially at the periphery. Spirals are frosted. *Color* tan or light yellowish brown, ribs lighter, a slightly darker band just below the sutures and on the anterior canal may be present. Some specimens are darkened inside the outer lip, just under the last rib.

Range and habitat

United States (W and NW Florida); depth 23–73 m. Published reports also include North Carolina (Porter 1974), E Florida (Lyons 1989; Lee 2003a), eastern Bay of Campeche (García 2007), and Colombia (Diaz & Puyana 1994). Most reports on museum lot labels are from off W Florida, from Okaloosa Co. to Lee Co. Reports of its occurrence outside of W and NW Florida need to be confirmed.

Cryoturris septentrionalis Fallon sp. nov.
urn:lsid:zoobank.org:act:473F71DA-28D9-48D1-A0A1-A8C5E4992AC3
Figs 33H, 43G–N

non *Cryoturris fargoi* McGinty, 1955 – Lee 2009: 130, sp. 634 (a possible misidentification that may be this species).

Differential diagnosis

Cryoturris texana Fallon sp. nov. has obtusely, not acutely, angled whorls, shoulders with more primary spirals (20 weak ones versus 9 weak ones alternating with 1–2 secondaries), protoconch riblets fewer

and stronger, shell less robust. This species has so far been found in samples from northern GOM (*C. septentrionalis* Fallon sp. nov. is from NE Florida).

Cryoturris pelican Fallon sp. nov. teleoconch whorls are also acutely angled, but shoulders with a suture bordered by a strong primary spiral, which is absent in *C. septentrionalis*, then with 6 primaries followed by 6 weaker primaries to shoulder edge. This species is smaller on average (7.4 versus 9.6 mm) and has so far been found in samples from W Florida, off Alabama, and off Campeche, Mexico (*C. septentrionalis* is known from NE Florida).

Cryoturris holimanae Fallon sp. nov. teleoconch whorls are obtusely, not acutely, angled, shoulders have 9 primaries with 3–4 secondaries between, penultimate whorl side below perimeter primary has 2 primaries with 8 secondaries between (versus 5 primaries with 3–8 secondaries between them), and penultimate whorl has fewer ribs (9 versus 12).

Additional differences from these and other close congeners appear in the differential diagnosis of *C. fargoi* McGinty, 1955.

Etymology

Cryoturris septentrionalis Fallon sp. nov., from the Latin adjective '*septentrionalis*' meaning 'northern', after its known range off NE Florida.

Type material

Holotype

UNITED STATES OF AMERICA • 10.9 × 4.3 mm; E Florida, St. Johns Co., 50–60 mi. [80–97 km] E of Ponte Vedra Beach; depth 130–150 ft [40–46 m]; 12 Mar. 1983; H.G. Lee leg.; trawled from scallop boat; ex batfish stomachs; UF 589739.

Paratypes (10 specs)

UNITED STATES OF AMERICA • 3 specs, 9.7 × 4.0, 8.8 × 3.9 and 9.0 × 4.0 mm; same data as for holotype; UF 589740 • 2 specs, 9.3 × 4.2 and 12.8 × 4.6 mm; E Florida, Duval Co., Xalvis Island, Camp Alamacani scallop dump; Feb. 1985; B. Holiman leg.; UF 589742 • 5 specs, 9.9 × 3.9, 10.3 × 4.2, 9.7 × 4.0, 7.7 × 3.6 and 7.9 × 3.5 mm; E Florida, Duval Co., Xalvis Island, Camp Alamacani scallop dump; Dec. 1986; N. Bulock leg.; UF 589741.

Description

Shell small (holotype length = 10.9 mm, largest length = 12.8 mm), fusiform (W/L = 0.3945), with 7½ whorls, sutures impressed; teleoconch whorls acutely angled with shoulders extending about mid-whorl, last whorl about 60% of shell length, the last whorl is convex and tapers sharply to a short, narrow anterior canal, aperture and canal about 41% of shell length; sculpture of moderately strong ribs and dense spirals. *Protoconch* of 2½ whorls; the first whorl protruding in, the last with a mid-whorl bulge over which are fine riblets that have slight swellings on the periphery on the bulge of last ¾-whorl. Fine curved riblets occur above the bulge and finer oblique riblets below. *Axial sculpture* of moderately strong ribs that run from suture to suture, fade near adapical suture and on the last whorl near anterior fasciole, are nodulose and sharply angled mid-whorl. Ribs grow in strength on the last whorl, such that the last 3 are largest with wider intercostal spacing. Ribs number 12 on the penultimate and 11 on the last whorl, are about as wide as intercostal space. *Varix* absent; last few ribs are stronger and serve to strengthen the outer lip. *Spiral sculpture* of primary and microscopic secondary spirals, about 9 weak primaries on shoulder with 1–2 secondaries between (mostly 1), on the whorl side are 5 primaries (3 of these are strong, 2 weak) with 3–8 secondaries between, the strongest primary on the periphery, and about 8 weaker ones on shell base with 3–6 secondaries between. Spirals override ribs and are frosted. *Sulcus*

absent. *Outer lip* thin, edge straight, or nearly so; stromboid notch lacking. *Anal sinus* a weak V-shaped notch at Junction of shoulder and whorl side. *Inner lip* a thin glaze along the columella, not margined, parietal callus absent. *Columella* slightly sinusoidal. *Anterior canal* short, semi-tubular in cross section, slightly twisted to the right viewed ventrally, end unnotched. *Anterior fasciole* repaired and without sculpture on holotype, with about 9 packed, frosted, primary spirals on intact paratypes. *Color* light golden brown, darker spiral bands below whorl periphery, sculptural elements lighter; protoconch brown.

Remarks

The average length of 11 specimens is 9.6 mm (range = 7.7–12.8 mm).

Range and habitat

United States (off Duval and St. Johns Counties, NE Florida); depth 40–46 m.

Cryoturris texana Fallon sp. nov.
urn:lsid:zoobank.org:act:48A177C8-1BF5-4600-9025-C35722E04349
Figs 34A, 43O–U

Differential diagnosis

The penultimate whorl of the teleoconch of *Cryoturris septentrionalis* Fallon sp. nov. has 9 weak primaries and 1–2 secondaries between the primaries, versus 20 weak ones that diminish in strength toward the perimeter on *C. texana* Fallon sp. nov. Its protoconch riblets are more numerous and weaker, and the teleoconch shell is more robust. This species has been taken in samples from NE Florida versus the northern GOM from NW Florida to Campeche, Mexico of *C. texana*.

Cryoturris pelican Fallon sp. nov. spire whorls are acutely angled, with whorl sutures bordered by a strong primary spiral absent in *C. texana* Fallon sp. nov., then with 6 primaries followed by 6 weaker primaries to the shoulder edge, versus 20 weak ones that diminish in strength toward the shoulder edge. This species is smaller (length = 6.5 versus holotype = 9.7 mm of *C. texana*) and has been taken in shallower depths (18–56 m versus 73–152 m)

Cryoturris holimanae Fallon sp. nov. teleoconch penultimate shoulder has 9 primaries with 3–4 secondaries between, penultimate whorl side below perimeter primary has 2 primaries with 8 secondaries between (versus 4 primaries with 3–8 secondaries between), and penultimate whorl has fewer ribs (9 versus 11).

Etymology

Cryoturris texana Fallon sp. nov., after the Latinized form of the state of Texas, after one of its common localities in the northwest Gulf of Mexico.

Type material

Holotype

UNITED STATES OF AMERICA • 9.7 × 3.5 mm; NW Florida, Gulf Co., off Port St. Joe; depth unknown; 1994; Bob Granada leg.; scallop tailings; UF 589738.

Paratypes (3 specs)

MEXICO • 1 spec., 8.0 × 3.1 mm; off Yucatan; 22°15.12′ N, 90°41.63′ W; depth 51–56 m; 18 Jun. 2005; E. García leg.; dredged from aboard R/V *Pelican*; EFG 26614.

UNITED STATES OF AMERICA • 1 spec., 4.7 × 2.1 mm; Gulf of Mexico, S Texas coast; 26°43.03′ N, 97°16.60′ W; depth 18 m; 22 Apr. 1976; Bureau of Economic Geology, Texas; stn 592; ANSP 358394 • 1 spec., 5.1 × 2.3 mm; Gulf of Mexico, S Texas coast; 27°09.80′ N, 97°17.32′ W; depth 20 m; 15 Mar. 1976; Bureau of Economic Geology, Texas; stn 942; ANSP 358395.

Description

Shell small (holotype length = 9.7 mm), fusiform (W/L = 0.3608), with 9⅛ whorls, sutures impressed and slightly undulant; teleoconch whorls obtusely angled with flat to slightly concave shoulders extending about mid-whorl and whorl sides angled in toward the suture, last whorl about 60% of shell length, has a round base that tapers to a short, narrow anterior canal about 41% of shell length including aperture and canal; sculpture of strong narrow ribs and dense spirals. *Protoconch* of 2½ whorls; the first 1½ whorls round, not submerged, the last whorl with strong well-spaced riblets with paddle-like swellings mid-whorl that grow to form a distinctive carina on the last ¾-whorl. Curved riblets occur above the bulge and fine, oblique riblets below. *Axial sculpture* of strong narrow ribs that run from suture to suture, fade near suture and near anterior fasciole, are sharply angled mid-whorl at periphery. Ribs increase in strength such that the last 3 are largest with wider intercostal spacing. Ribs number 11 on the penultimate and 10 on the last whorl, are about as wide as intercostal space. *Varix* absent; last few ribs are stronger and serve to strengthen the outer lip. *Spiral sculpture* of primaries and secondaries of varying strengths, about 20 secondaries on the shoulder that lessen in strength from suture to the edge of the shoulder, the peripheral spiral is the strongest, with tightly packed frosting and nodules on rib crests. The side of the penultimate whorl has weak primaries and secondaries of variable strengths with 4 weak primaries separated by 3–8 secondaries, the shell base has 13 strong secondaries with about 3 weaker ones between; all spirals override ribs and are 'frosted'. *Sulcus* absent. *Outer lip* missing. *Anal sinus* unknown, outer lip missing. *Inner lip* a thin glaze along the columella, unemarginate; parietal callus absent. *Columella* straight. *Anterior canal* short, semi-tubular in cross section, nearly straight, end slightly notched. *Anterior fasciole* with about 8 weak primaries with 1–3 weak secondaries between, all delicately 'frosted'. *Color* light golden brown, slightly darker protoconch and intercostal space.

Remarks

The size disparity among the 4 type specimens is due to differences in shell growth, the holotype has 9 whorls, the two smallest paratypes 7 whorls.

Range and habitat

United States (NW Florida, Texas) and Mexico (Yucatan); depth 18–56 m.

Cryoturris pelican Fallon sp. nov.
urn:lsid:zoobank.org:act:899AD2FB-440E-4B91-824A-C8865ACA7FBC
Figs 34B, 43V–JJ

Differential diagnosis

The shell of *Cryoturris septentrionalis* Fallon sp. nov. is more robust and larger (length = 9.6 versus 6.5 mm). The shoulder of the teleoconch penultimate whorl has 9 weak primaries and 1–2 secondaries between them versus whorl sutures bordered by a strong primary spiral, absent in *C. septentrionalis*, then with 6 primaries followed by 6 weaker primaries to shoulder edge. The protoconch riblets are weaker.

Cryoturris texana Fallon sp. nov. has obtusely, not acutely, angled whorls, shoulders with more primary spirals, 20 weak ones then 6 primaries followed by 6 weaker primaries to shoulder edge. The sutures of *C. pelican* Fallon sp. nov. are bordered by a strong, undulant primary, followed by six weaker ones, then

6 secondaries to the shoulder edge that are only slightly weaker than the preceding primaries. Protoconch riblets are fewer and stronger, the teleoconch shell larger (holotype lengths = 9.7 versus 6.5 mm).

Cryoturris holimanae Fallon sp. nov. teleoconch penultimate shoulder has 9 primaries with 3–4 secondaries between, penultimate whorl side below perimeter primary has 2 primaries with 8 secondaries between. *C. pelican* Fallon sp. nov. has whorl sutures bordered by a strong primary spiral, absent in *C. holimanae*, then with 6 primaries followed by 6 weaker primaries to shoulder edge, and is larger on average (length = 8.7 versus 7.4 mm).

Additional differences from these and other close congeners appear in the differential diagnosis of *C. fargoi* McGinty, 1955.

Etymology

Cryoturris pelican Fallon sp. nov. is named after the R/V *Pelican*, the research vessel from which most of the type series was collected; noun in apposition.

Type material

Holotype

UNITED STATES OF AMERICA • 6.5 × 2.8 mm; W Florida, Manatee Co., off Bradenton; depth 73 m; Aug. 1962; J. Moore leg.; dredged; R/V *Cavalier*; UF 589733.

Paratypes (27 specs)

MEXICO • 7 specs, 11.4 × 4.3, 9.4 × 3.3, 10.6 × 4.0, 9.2 × 3.2, 8.9 × 3.2, 7.6 × 3.1 and 7.3 × 2.7 mm; off Campeche, Campeche Bank; 20°51.16′ N, 92°26.28′ W; depth 93–94 m; 10 Jun. 2005; E.F. García leg.; dredged from aboard R/V *Pelican* under NSF.II.35 grant; on granular sediment; E.F. García coll. 26606 • 7 specs, 6.7 × 2.8, 7.9 × 3.0, 7.9 × 2.9, 6.9 × 2.9, 7.0 × 2.8, 6.4 × 2.7 and 4.8 × 2.4 mm; off Campeche, Campeche Bank; 20°51.16′ N, 92°26.28′ W; depth 93–94 m; 10 Jun. 2005; E. García leg.; dredged from aboard R/V *Pelican*, under NSF.II.35 grant; UF 589736 • 5 specs, 7.1 × 2.8, 7.5 × 3.0, 6.7 × 2.6, 6.6 × 2.8 and 6.7 × 2.7 mm; off Campeche, Campeche Bank; 20°52.40′ N, 92°24.83′ W; depth 77–81 m; 10 Jun. 2005; trawled from aboard R/V *Pelican* under NSF.II.35 grant; UF 589737 • 2 specs, 7.0 × 2.7 and 5.4 × 2.2 mm; off Campeche; depth 93–94 m; Jun. 2005; E.F. García leg.; dredged from aboard R/V *Pelican*; from on granular sediment; USNM 1715432.

UNITED STATES OF AMERICA • 2 specs, 5.8 × 2.6 and 5.6 × 2.3 mm; same data as for holotype; UF 589734 • 1 spec., 6.7 × 2.9 mm; off Alabama; 29°24.43′ N, 87°58.63′ W; depth 72–74 m; 29 Jun. 2006; E.F. García leg.; dredged from aboard R/V *Pelican*; in mud; E.F. García coll. 27794 • 2 specs, 7.9 × 3.2 and 6.0 × 2.4 mm; W Florida, Hillsborough Co., W of Tampa Bay; depth 152 m; C. Richardson leg.; dredged; ANSP 359988 • 1 spec., 5.6 × 2.6 mm; NW Florida, Gulf Co., off Port St. Joe; scallop tailings; 1994; R. Granada leg.; UF 589735.

Description

Shell small (holotype length = 6.5 mm, paratypes to 11.4 mm), fusiform (W/L = 0.4308), strong, of about 8¼ whorls, sutures impressed, made slightly undulant by previous whorls' ribs, whorls acutely angled with shoulders extending mid-whorl, last whorl about 60% of shell length, gradually tapers to a short but well-defined anterior canal; aperture oval with a shallow anal sinus along edge of shoulder and an anterior canal of medium length; shell sculpture of moderately strong axials and crowded spirals of varying strengths. *Protoconch* of 2¾–3 whorls; the first 1½ whorls round, tip not submerged, the last whorl with moderately strong, dense riblets with paddle-like swellings mid-whorl that grow to form a distinctive carina on the last whorl. The upper side of the carina has slightly curved riblets that extend to the suture and project a little above and below the carina; riblets are much finer and hook sharply

toward the left (toward the protoconch lip). *Axial sculpture* of strong, narrow ribs that run from suture to suture and to the anterior fasciole on the last whorl. Ribs angled sharply at whorl periphery, nodulous, increase in strength toward lip, number 9 on penultimate, 9 on last whorl, intercostal space about as wide as ribs, wider toward lip. *Varix* absent. Ribs become progressively stronger, the last is strongest and serves to strengthen the lip. *Spiral sculpture* of primaries and secondaries that vary in strength. The suture is bordered by a strong, undulant primary, followed by six weaker ones, then 6 secondaries to the shoulder edge that are only slightly weaker than the preceding primaries. A strong primary defines the whorl periphery and projecting nodules form where it crosses over rib crests. An additional 2 primaries with about 9 microscopic secondaries between primaries are on the side of the whorl face. The shell base has a similar pattern of about 9 primaries of varying strengths with numerous microscopic secondaries packed between each primary, decreasing in number anteriorly. Primaries and secondaries are 'frosted' and override ribs. *Sulcus* absent. *Outer lip* is thin, edge forms a low arc from whorl periphery to anterior canal, stromboid notch absent. *Anal sinus* is a very shallow, wide, V-notch near whorl periphery. *Inner lip* a narrow band of glazing from suture to anterior canal, unemarginate, without a parietal callus. *Columella* straight. *Anterior canal* of medium length, open, unnotched. *Anterior fasciole* not swollen, with about 7 weak spiral primaries. *Color* light golden yellow with slightly darker intercalary spaces with brown protoconch, to all-white.

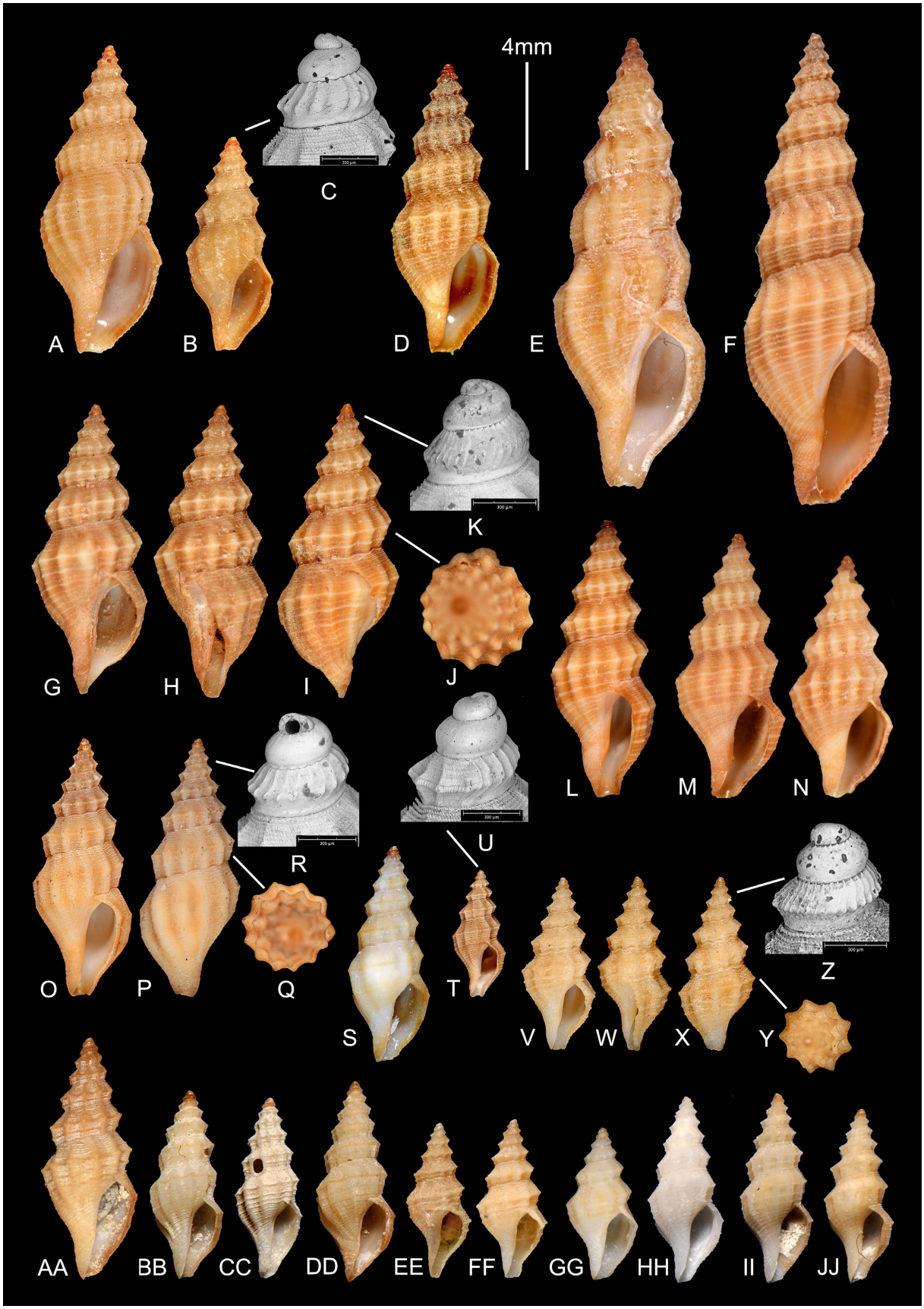
Remarks

The average length of 25 measured specimens is 7.4 mm (range = 4.8–11.4 mm). The number of spirals and pattern of primaries and secondaries varies somewhat between individuals.

Range and habitat

United States (off W Florida, off Alabama) and Mexico (Campeche Bank); depth 73–152 m.

Fig. 43 (next page). Species of *Cryoturris* Woodring, 1928. Part 5. – **A–F**. *Cryoturris fargoi* McGinty, 1955 **A**. Holotype, 11.5 × 4.7 mm (ANSP 194062), off Destin, NW Florida. **B–C**. Paratype, 8.0 × 3.4 mm, ventral view, and SEM image of protoconch (ANSP 194064), off Destin, NW Florida. **D**. Spec., 10.9 × 4.1 mm (ANSP 306246), WSW of Johns Pass, Pinellas Co., W Florida. **E**. Spec., 16.9 × 5.6 mm (P. Williams coll.), Gulf of Mexico, W of Florida. **F**. Spec., 17.6 × 5.5 mm (UF 589743), off Panama City, Bay Co., NW Florida. – **G–N**. *Cryoturris septentrionalis* Fallon sp. nov. **G–K**. Holotype, 10.9 × 4.3 mm, ventral, lateral, dorsal and apical views, and SEM of protoconch (UF 589739), 50–60 mi. E of Ponte Vedra, St Johns Co., NE Florida. **L**. Paratype, 10.3 × 4.2 mm (UF 589741), scallop dump, Xalvis Island, Duval Co., NE Florida. **M–N**. Paratypes, 9.7 × 4.0 and 8.8 × 3.9 mm (UF 589740), 50–60 mi. [80–97 km] E of Ponte Vedra, St Johns Co., NE Florida. – **O–U**. *Cryoturris texana* Fallon sp. nov. **O–R**. Holotype, 9.7 × 3.5 mm, ventral, dorsal and apical views, and SEM image of protoconch (UF 589738), scallop dump, Port St Joe, Gulf Co., NW Florida. **S**. Paratype, 8.0 × 3.1 mm (EFG 26614), off Yucatan, Gulf of Mexico. **T–U**. Paratype, 4.7 × 2.1 mm, ventral view, and SEM image of protoconch (ANSP 358394), Texas S coast, Gulf of Mexico. – **V–JJ**. *Cryoturris pelican* Fallon sp. nov. **V–Z**. Holotype, 6.5 × 2.8 mm, ventral, lateral, dorsal and apical views, and SEM image of protoconch (UF 589733), off Bradenton, Manatee Co., W Florida. **AA**. Paratype, 7.9 × 3.2 mm (ANSP 359988), W of Tampa Bay, Hillsborough Co., W Florida. **BB–DD**. Paratypes, 7.1 × 2.8, 6.7 × 2.6 and 7.5 × 3.0 mm (UF 589737), Campeche Bank, Campeche, Mexico. **EE–FF**. Paratypes, 5.6 × 2.3 and 5.8 × 2.6 mm (UF 589734), off Bradenton, Manatee Co., W Florida. **GG**. Paratype, 5.6 × 2.6 mm (UF 589735), scallop dump, Port St Joe, Gulf Co., NW Florida. **HH–JJ**. Paratypes, 6.9 × 2.9, 7.0 × 2.8 and 6.4 × 2.7 mm (UF 589736), Campeche Bank, Campeche, Mexico. Credits: C, K, R, U, Z: SEM images courtesy of Paul Callomon. Scale bars: A–B, D–J, L–Q, S–T, V–Y, AA–JJ = 4 mm; C, K, R, U, Z = 300 μm.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Cryoturris spp. Part 6

Cryoturris tortugana Fallon sp. nov.
urn:lsid:zoobank.org:act:F3541C5A-4A04-4AB6-B2F8-75DE1CF9A16B
Figs 34C, 44C–L

Differential diagnosis

This species is like *Cryoturris seizovae* Fallon sp. nov., but its protoconch consists of 2¼ whorls, rather than 2½. Additionally, the last whorl of the teleoconch tapers more gradually to the anterior canal, with ribs that are broader and less numerous.

Cryoturris redferni Fallon & Bouchet sp. nov. has coarser frosting, a longer anterior canal, and is colored differently.

Cryoturris robusta Fallon & Bouchet sp. nov. has coarser frosting, more angular whorls (less obtusely angled), and a different coloration.

Etymology

Cryoturris tortugana Fallon sp. nov. is the feminine adjective derived from the type locality, the Dry Tortugas in the Florida Keys.

Type material

Holotype
UNITED STATES OF AMERICA • 8.5 × 2.9 mm; Florida Keys, Monroe Co., off Dry Tortugas; depth 33 m; 1974; R. Wagner leg.; ex batfish stomachs trawled by shrimp boat; UF 589731.

Paratypes (45 specs)
UNITED STATES OF AMERICA • 30 specs, (5 measured) 7.5 × 2.7, 7.45 × 2.7, 7.0 × 2.5, 7.4 × 2.5, 8.1 × 3.0 mm; same data as for holotype; UF 589732 • 11 specs, 8.6 × 3.0, 9.3 × 3.0, 9.3 × 3.4, 9.2 × 3.0, 8.3 × 3.1, 8.5 × 3.2, 8.3 × 3.1, 8.5 × 3.1, 8.6 × 3.0, 8.9 × 3.1 and 7.7 × 3.0 mm; Florida Keys, Monroe Co., between Marquesas Keys and Dry Tortugas; depth 35–40 ft [11–12 m]; prior to 1981; Wayne Sandler leg.; trawled, ex batfish stomachs; ANSP 482229B • 1 spec., 8.4 × 3.1 mm; Florida Keys, Monroe Co., S of Key West; depth 35–40 ft [11–12 m]; Ann Young leg.; ANSP 498883 • 1 spec., 8.9 × 3.1 mm; Florida Keys, Monroe Co., Key West, W side of Fleming Key; depth 6 m; 18 Jan. 1996; G. Mackintosh leg.; night SCUBA; ANSP 498882 • 1 spec., length = 6.6 mm; Florida Keys, Monroe Co., S of Key West; depth 15–40 ft [4.6–12 m]; Ann Young leg.; trawled, ex batfish stomachs; USNM 1715438 • 1 spec., length = 7.9 mm; Florida Keys, Key West, Fleming Key, W side; depth 20 ft [6 m]; 4 Jan. 1996; G. Mackintosh leg.; SCUBA; USNM 1715437.

Other examined material

UNITED STATES OF AMERICA • 105 specs, length up to 8.8 mm; Florida Keys, Monroe Co., between Marquesas Keys and Dry Tortugas; depth 35–40 ft [11–12 m]; prior to 1981; W. Sandler leg.; trawled, ex batfish stomachs; ANSP 482229A.

Description

Shell small (holotype length = 8.5 mm), fusiform (W/L = 0.3412), strong, of about 8½ whorls, the last about 59% of shell length, whorls obtusely angled with periphery a little more than mid-whorl, shoulders flat and sides angled slightly in to sutures, sutures appressed, undulant by previous whorl's ribs; sculpture of moderately strong axials and crowded fine spirals of varying strengths; aperture oval, about 40% of

shell length including canal, body whorl tapers gradually to a short anterior canal. *Protoconch* of 2¼ whorls, the tip protruding inward, the first 1½-whorl smooth, and the last ¾-whorl with convex riblets that become angular medially on last ½-whorl, their peripheries with modifications forming a carina. The upper side of the carina with opisthocline, nearly straight riblets that extend to and a little above the suture and below the carina, finer riblets hook sharply to the left (toward protoconch lip) and do not reach the suture. *Axial sculpture* of low, broad ribs that run from suture to suture, are narrower and slightly recurved on the shoulder, strength toward outer lip. Ribs are highest at the whorl periphery and evanesce by the anterior fasciole on the last whorl, there are 9 on penultimate and 6 on last whorl, intercostal space narrower than ribs. *Varix* absent. *Spiral sculpture* of primaries and microscopic secondaries that vary in strength. About 12 secondaries extend from the suture on the shoulder, most separated by 0–1 microscopic secondaries, a strong primary marks the whorl periphery and 2 weaker primaries are on whorl sides, one midway and another close to the suture line, up to10 microscopic secondaries present between primaries. The shell base has about 12 weak primaries with about 3 to 4 microscopic secondaries between each. Primaries and microscopic secondaries are 'frosted' and override ribs. *Sulcus* absent; ribs are narrower and slightly recurved on shoulder, marking the former positions of the anal sinus. *Outer lip* is thin, edge forms a low arc from whorl periphery to beginning of anterior canal. *Anal sinus* a shallow, wide, notch with a curved apex at the Junction of the shoulder and whorl side. *Inner lip* a narrow glaze on columella to anterior canal, unemarginate, without a parietal callus. *Columella* straight. *Anterior canal* short but well defined, open, unnotched. *Anterior fasciole* not swollen, with weak, poorly defined spirals. *Color* white with a pale yellowish apex and broad pink-hued mid-whorl indistinct spiral band. Older shells are usually all-white.

Remarks

The average shell length of the 30 measured specimens is 7.0 mm (5.0–8.5 mm).

Range and habitat

United States (off Marquesas Keys and Dry Tortugas, Monroe Co., lower Florida Keys, ex batfish stomachs); depth 11–33 m.

Cryoturris holimanae Fallon sp. nov.
urn:lsid:zoobank.org:act:BB211270-0762-425F-90BB-DB0C8021DFB5
Figs 34D, 44M–U

non *Cryoturris serta* Fargo, 1953 – Lee 2009: 131, sp. 636 (likely a misidentification that may be this species).

Differential diagnosis

Cryoturris serta Fargo, 1953, a fossil species from the Pliocene of North Petersburg, Florida (Fig. 44A–B), has narrower ribs and less angular whorls.

Cryoturris septentrionalis Fallon sp. nov. teleoconch has a penultimate whorl shoulder with 9 weak primaries and 1–2 secondaries between versus 9 primaries with 3–4 secondaries between, a stouter shell (W/L = 0.3945 versus 0.3519), and has more ribs (penultimate whorl with 12 versus 9).

Cryoturris texana Fallon sp. nov. has more primary spirals on shoulders (20 weak ones versus 9 primaries with 3–4 secondaries between), fewer but stronger protoconch riblets with a more prominent carina. This species has so far been found in samples from northern GOM (*C. holimanae* Fallon sp. nov. is from NE Florida).

Cryoturris pelican Fallon sp. nov. teleoconch spire whorls are acutely angled, with shoulders having a suture bordered by a strong primary spiral, absent in *C. holimanae* Fallon sp. nov., then with 6 primaries followed by 6 weaker primaries to the shoulder edge. This species is smaller on average (7.4 versus 8.7 mm) and has so far been found in samples from W Florida, off Alabama, and off Campeche, Mexico (*C. holimanae* occurs off NE Florida).

Cryoturris robusta Fallon & Bouchet sp. nov., is very similar. See the differences described under that species.

Cryoturris procera Fallon & Bouchet sp. nov. has a protoconch of 2¾ whorls, not 2¼, and more strongly developed swellings at the periphery of the carina. It also has a more southerly distribution.

Cryoturris slapcinskyi Fallon & Bouchet sp. nov. differs in the number of ribs on the penultimate whorl (15 versus 9) and is colored differently.

Etymology

Cryoturris holimanae Fallon sp. nov. is named in honor of the late Bonnie Holiman of Jacksonville, Florida, for her enthusiastic and persistent search for mollusks in scallop dumps; for her collection of the holotype and some paratypes of this species (from the coll. of H.G. Lee, now in the FLMNH); and for sharing her enthusiasm in the publication "*Shelling the scallop boats: exciting and sobering*" (Holiman 1974).

Type material

Holotype

UNITED STATES OF AMERICA • 10.8 × 3.8 mm; NE Florida, Xalvis Island, scallop fishing grounds off St. Johns and Duval Counties; depth 30–50 m; Bonnie Holiman leg.; Camp Alamacani scallop dump; UF 589724. Approximate location of scallop fishing grounds from Lee (2009: 7, 10).

Paratypes (21 specs)

UNITED STATES OF AMERICA • 2 specs, 7.8 × 3.2 and 8.8 × 3.6 mm; E Florida, St. Johns Co., 3.5 mi. [5.6 km] ESE of Ponte Vedra Inn; depth 50 ft. [15 m]; 22 May 1990; C. Lloyd leg.; dredged on sand, shell, rock rubble; UF 589725 • 3 specs, 10.1 × 3.6, 9.0 × 3.5 and 10.0 × 3.5 mm; NE Florida, Duval Co., Xalvis Island; Camp Alamacani scallop dump; Mar. 1985; Bonnie Holiman leg.; UF 589726 • 2 specs, 11.1 × 4.6 and 9.7 × 3.9 mm; NE Florida, Duval Co., Xalvis Island; Camp Alamacani scallop dump; Mar. 1985; Bonnie Holiman leg.; ANSP 361032 • 1 spec., 10.2 × 3.6 mm; NE Florida, St. Johns Co., 40–60 mi. [64–97 km] E of Ponte Vedra; depth 130–150 ft. [40–46 m]; 12 Mar. 1984; H.G. Lee leg.; trawled by scallop boat; UF 589727 • 10 specs, 10.1 × 3.5, 9.2 × 3.5, 9.8 × 3.6, 9.3 × 3.5, 7.2 × 2.9, 7.0 × 2.6, 7.1 × 2.5, 6.8 × 2.7, 4.4 × 1.8 and 4.9 × 2.1 mm; NE Florida, St Johns Co., St. Augustine, 1 mi. [1.6 km] SE of jetty; depth 50 ft. [15 m]; Jun. 1972; H. McCullagh leg.; dredged; UF 589728 • 2 specs, 10.1 × 3.7 and 8.0 × 2.7 mm; E Florida, St. Johns Co., St. Augustine, 1 mi. [1.6 km] SE of jetty; depth 50 ft. [15 m]; Jun. 1972; H. McCullagh leg.; dredged; UF 589729 • 1 spec., 6.0 × 2.3 mm; E Florida, Duval Co., off Big Talbot Island; depth about 18 m; 1965–1975; W. Skipper leg.; trawled, ex *Astropecten articulatus* stomachs; UF 589730.

Description

Shell small (holotype length = 10.8 mm), fusiform (W/L = 0.3519), strong, of about 9¼ whorls, the last about 58% of shell length, whorls acutely angled with periphery about mid-whorl, sutures appressed, undulant by previous whorl's ribs; sculpture of moderately strong axials and crowded spirals of varying strengths; aperture oval, about 39% of shelllength including canal, body whorl tapers to an anterior canal of medium length. *Protoconch* of 2¼ whorls; the first 1½-whorls smooth, not partially submerged, and

the last ¾-whorl with a mid-whorl bulge with riblets weakly swollen forming a weak median carina. The upper side of the bulge with opisthocline riblets that extend to and a little above the suture and below the bulge, finer riblets bent sharply to the left (toward protoconch lip) that do not reach the suture. *Axial sculpture* of strong ribs with rounded crests that run from suture to suture, are broadest and angular mid-whorl, narrow, lower, and slightly recurved on the ramp, and evanesce before the anterior fasciole on the last whorl. Ribs number 9 on penultimate, 8 on last whorl, intercostal space about as wide as the ribs. Ribs grow in strength such that on the last whorl, the last few are largest with wider intercostal spacing. *Varix* absent. *Spiral sculpture* of weak primaries and secondaries of nearly equal strengths. From the suture, about 9 primaries alternate with 3–4 secondaries. A somewhat flattened primary marks the whorl perimeter and is followed by 2 primaries with 8 secondaries between on the side of the penultimate whorl, then about 10 primaries with 3–4 secondaries between on shell base. Spirals are weak and variable in strength, so distinguishing primaries from secondaries is difficult. Spirals override ribs and are 'frosted'. *Sulcus* absent; ribs narrower and slightly recurved marking the former positions of the anal sinus. *Outer lip* is thin, edge forms a low arc from whorl periphery to beginning of anterior canal. *Anal sinus* a shallow, wide, notch with a curved apex at the Junction of the shoulder and whorl face. *Inner lip* a narrow glaze on columella to anterior canal, unemarginate, without a parietal callus. *Columella* straight. *Anterior canal* short but well defined, open, unnotched. *Anterior fasciole* is not swollen, with weak, poorly defined spirals in a pattern like shell base. *Color* a light golden brown with a broad darker golden brown spiral band mid-whorl in intercostal space that ends at the outer lip with a reddish brown patch, shell base lighter, and columella white.

Remarks

The average shell length of 21 specimens is 8.65 mm (4.40–11.10 mm).

Range and habitat

United States (NE Florida); depth 15–50 m.

Cryoturris unid. sp. E
Fig. 44V

Differential diagnosis

Cryoturris robusta Fallon & Bouchet sp. nov. has a protoconch with fewer, but stronger riblets, a stronger carina, and 2½ not 2 whorls.

Cryoturris holimanae Fallon sp. nov. has a protoconch with 2¼ whorls, not 2.

Cryoturris procera Fallon & Bouchet sp. nov., possesses a 2¾-whorl protoconch (not 2 whorls) and the last 2 whorls have riblets, not the last ½-whorl. The teleoconch has narrower, more numerous ribs and is slimmer (W/L = 0.3307 versus 0.3587).

Cryoturris tortugana Fallon sp. nov. is smaller, 70 specimens averaged 7.0 mm (5.0–8.5 mm). The single specimen of *Cryoturris* unid. sp. E is 9.3 mm. The protoconch is 2¼ whorls, not 2.

Material examined (1 spec.)

UNITED STATES OF AMERICA • 1 spec., 9.2 × 3.3 mm; Florida Keys, Key West, W side of Fleming Key; depth 20 ft [6 m]; Jan. 1996; G. Mackintosh leg.; night SCUBA, from on fine sand among turtle grass; ANSP 498890.

Partial description

Shell is small, of 8¼ whorls, teleoconch whorl shoulders deeply sloped to about whorl middle, sides flat, angled slightly into abapical suture. Sculpture of ribs and of primary and secondary spirals. Aperture, with a short anterior canal, slightly twisted, end notched. *Protoconch* of 2 whorls, tip of the first minute, first full whorl round, and the last ½ with numerous fine riblets with a weak mid-whorl carina formed by weak swellings, riblets above the carina slightly recurved, below are finer, and oblique. *Axial sculpture* of 7 strong, round-crested ribs on the penultimate and 7 on the last whorl, that grow stronger toward aperture; intercostal spaces about as wide as ribs. Ribs extend from suture to suture on spire whorls and evanesce before anterior fasciole on last. *Spiral sculpture* of frosted primaries and secondaries, whorl side with 3 primaries, including the strongest, the peripheral whorl, with fine secondaries between. *Color* white, intercostal spaces translucent white.

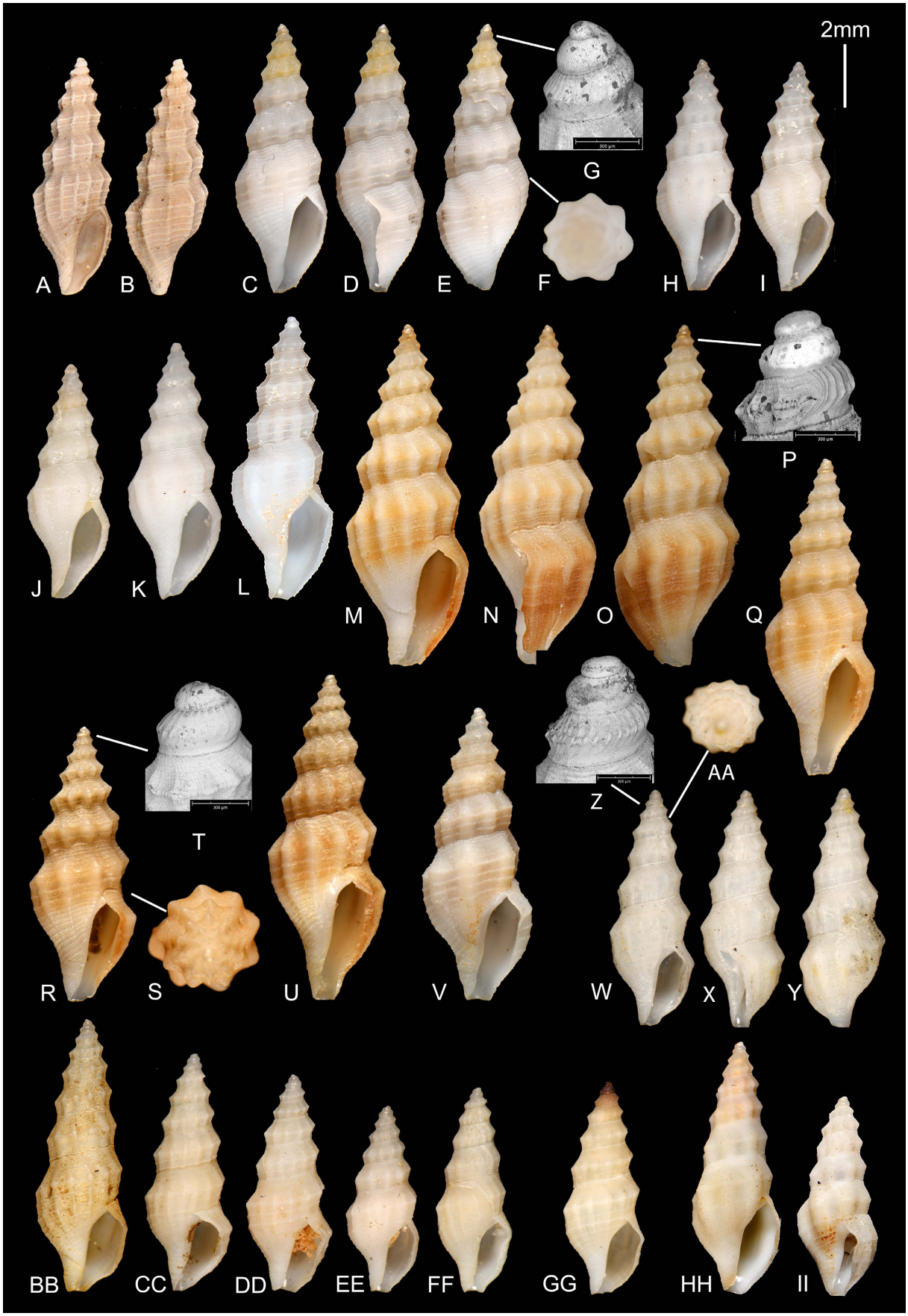
Remarks

Additional specimens are necessary to verify the distinctiveness of this specimen from its close congeners.

Range and habitat

Known only from a single specimen's locality.

Fig. 44 (next page). Species of *Cryoturris* Woodring, 1928. Part 6. – **A–B**. *Cryoturris serta* Fargo, 1953, holotype, 7.5 × 2.5 mm (ANSP 19173), Pliocene of North St Petersburg. Not encountered in Recent samples. Shown here for comparison to its congeners. – **C–L**. *Cryoturris tortugana* Fallon sp. nov. **C–G**. Holotype, 8.5 × 2.9 mm, ventral, lateral, dorsal and apical views, and SEM image of protoconch (UF589731), off Dry Tortugas, Monroe Co., Florida Keys. **H–K**. Paratypes, 7.5 × 2.7, 7.5 × 2.7, 7.4 × 2.5 and 8.1 × 3.0 mm (UF 589732), off Dry Tortugas, Monroe Co., Florida Keys. **L**. Paratype, 8.9 × 3.1 mm (ANSP 498882), W side of Fleming Key, Key West, Monroe Co., Florida Keys. – **M–U**. *Cryoturris holimanae* Fallon sp. nov. **M–P**. Holotype, 10.8 × 3.8 mm, ventral, lateral, dorsal views, and SEM image of protoconch (UF 589724), scallop dump. Xalvis Island, Duval Co., NE Florida. **Q**. Paratype, 10.1 × 3.6 mm (UF 589726), scallop dump. Xalvis Island, Duval Co., NE Florida. **R–T**. Paratype, 8.8 × 3.6 mm, ventral, apical views, and SEM image of protoconch (UF 589725) 3.5 mi. [5.6 km] ESE of Ponte Vedra Inn, St Johns Co., NE Florida. **U**. Paratype, 10.2 × 3.6 mm (UF 589727), 40–60 mi. [64–97 km] E of Ponte Vedra, St Johns Co., NE Florida. – **V**. *Cryoturris* unid. sp. E. Spec., 9.2 × 3.3 mm (ANSP 498890),, W side of Fleming Key, Key West, Florida Keys. – **W–II**. *Cryoturris seizovae* Fallon sp. nov. **W–AA**. Holotype, 7.5 × 2.6 mm, ventral, lateral, dorsal and apical views, and SEM of protoconch (UF 589715) Jacksonville Beach, Duval Co., NE Florida. **BB**. Paratype, 8.6 × 2.9 mm (UF 589719), 1 mi. [1.6 km] off SE Jetty, St Augustine, St Johns Co., NE Florida. **CC–FF**. Paratypes, 7.6 × 2.7, 7.0 × 2.7, 6.0 × 2.3 and 6.5 × 2.5 mm (UF 589717), off Big Talbot Island, Duval Co., NE Florida. The next 3 specimens are geographic variants not in the type series. **GG**. Spec., 6.7 × 2.5 mm, brown protoconch (UF 589721), W end, Cedar Key, Levy Co., W Florida. **HH**. Spec., 8.0 × 2.7 mm, fewer and stronger ribs (UF 589722), Peanut Island, Palm Beach Co., E Florida. **II**. Spec., 6.3 × 2.6 mm (UF 589718), Peanut Island, Palm Beach Co., E Florida. Credits: G, P, T, Z: SEM images courtesy of Paul Callomon. Scale bars: A–F, H–O, Q–S, U–Y, AA–II = 2 mm; G, P, T, Z = 300 μm.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Cryoturris seizovae Fallon sp. nov.
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Figs 34E, 44W–II

non *Cryoturris dorvilliae* (Reeve, 1845) – Lee 2009: 130, sp. 633 (misidentification). The figured specimen is the holotype of *C. seizovae* Fallon sp. nov. described below.

Differential diagnosis

Some members of the genus *Kurtziella* may be confused with this species because of its narrow shell, tall spire, and obsolete ribs near the suture. Their respective protoconchs are very different, however.

Cryoturris tortugana Fallon sp. nov. has a longer anterior canal, its ribs are broader and less numerous (9 versus 13 on the penultimate whorl).

Etymology

Cryoturris seizovae Fallon sp. nov. is named in honor of Krasimira "Kasey" Seizova, Academy of Natural Sciences of Drexel University, Philadelphia, who provided valuable time and expertise in creating many of the SEM images appearing in this work.

Type material

Holotype
UNITED STATES OF AMERICA • 7.5 × 2.6 mm; NE Florida, Duval Co., 16th Ave. S, Jacksonville Beach; drift; 1981; N. Bulock leg.; UF 589715.

Paratypes (13 specs)
UNITED STATES OF AMERICA • 5 specs, 6.5 × 2.5, 5.1 × 2.0, 3.3 × 1.6, 3.3 × 1.7 and 3.4 × 1.6 mm; NE Florida, Duval Co., Jacksonville beach, 16th Ave. S; drift; 1981; N. Bulock leg.; UF 589716 • 4 specs, 7.6 × 2.7, 7.0 × 2.7, 6.0 × 2.3 and 6.5 × 2.5 mm; NE Florida, Duval Co., off Big Talbot Island; depth 9–19 m; 1965–1975; W. Skipper leg.; trawled, ex blue starfish; UF 589717 • 1 spec., 8.0 × 2.7 mm; E Florida, Palm Beach Co., Peanut Island; depth 0 m; 31 May 1992; P. Poland leg.; UF 589722 • 2 specs, 8.6 × 2.9 and 6.6 × 2.5 mm; NE Florida, St. Johns Co., St. Augustine, 1 mi. [1.6 km] SE of jetty; depth 15 m; Jun. 1972; H. McCullagh leg.; dredged; UF 589719 • 1 spec., 6.0 × 2.2 mm; between Marquesas Keys and Dry Tortugas; depth 35–40 ft [11–12 m]; pre 1981; Wayne Sadler leg.; ex batfish stomachs; ANSP 482229D.

Other material examined (9 specs)

The following were of poorer quality or are variants.

UNITED STATES OF AMERICA • 5 specs, 7.0 × 2.7, 6.7 × 2.2, 5.7 × 2.0, 4.2 × 2.0, 3.9 × 1.4 and 6.7 × 2.5 mm; NE Florida, Duval Co., off Big Talbot Island; depth 9–19 m; 1965–1975; W. Skipper leg.; trawled, ex flat blue starfish; UF 589720 • 2 specs, 6.3 × 2.6 and 5.8 × 2.5 mm; E Florida, Riviera Beach, N side of Peanut Island; depth 0.3–1.2 m; 9 Jul. 1995; M. Krisberg leg.; hand dredged; UF 589718 • 1 spec., 6.7 × 2.5 mm; W Florida, Levy Co., W end of Cedar Key; depth 0 m; 1982; J. Keeler leg.; UF 589721 • 1 spec., 6.8 × 2.7 mm; NE Florida, St. Johns Co., 3.5 mi. [5.6 km] ESE Ponte Vedra Inn; depth 15 m; 20 May 1990; C. Lloyd leg.; dredged; UF 589723.

Description

Shell small (holotype length = 7.5 mm), fusiform (W/L = 0.3467), strong, of about 8½ whorls, the last about 55% of shell length, whorls obtusely angled, shoulder flat, with periphery mid-whorl, sutures

appressed; sculpture of moderately strong axials and crowded spirals of varying strengths; aperture oval, about 35% of shell length including canal, last whorl appears "squarish" on account of a strong sutural spiral, then tapers abruptly to a short anterior canal. *Protoconch* of 2½ whorls, the first 1¾-whorl smooth, and the ¾-whorl with convex riblets that become angular medially on last ½-whorl, their peripheries with swellings forming a carina. The upper side of the carina with opisthocline, nearly straight riblets that extend to and a little above the suture, and below the carina, finer riblets hook sharply to the left (toward protoconch lip) and do not reach the suture. *Axial sculpture* of narrow ribs that run from suture to suture, broadest and nodulous mid-whorl, narrow and becoming obsolete at suture, and evanesce by the anterior fasciole on the last whorl. Ribs, number 13 on penultimate, 10 on last whorl, intercostal space about as wide as ribs, wider on last whorl. *Varix* absent. *Spiral sculpture* of primaries and microscopic secondaries that vary in strength. Spirals on the shoulder are sub-equal, except the first, next to the suture, which is stronger; the peripheral spiral is the strongest, and is followed by 2 primaries on whorl sides, one faint spiral about midway separated by microscopic secondaries, and the second, stronger one at the suture line. Both peripheral and sutural primaries are nodulose at rib crossings. The shell base has 3 additional primaries separated by 3 or 4 secondaries. Primaries and secondaries are frosted and override ribs. *Sulcus* absent. *Outer lip* thin, edge straight from whorl periphery to beginning of anterior canal. *Anal sinus* a shallow, wide, notch with a curved apex near the Junction of the shoulder edge and whorl face. *Inner lip* a narrow glaze on columella to anterior canal, unemarginate, without a parietal callus. *Columella* straight. *Anterior canal* short but well defined, open, unnotched. *Anterior fasciole* is not swollen, with weak, poorly defined spirals. *Color* white.

Remarks

The average shell length of 22 measured specimens is 6.0 mm (3.3–8.6 mm). specimens shown in Fig. 44GG–II are believed to be geographic variants; spec. GG is from the west coast of Florida, has a brown protoconch (as does a specimen from the Florida Keys, not shown) but otherwise are the same, and the specimens in HH & II, from Peanut Island, Palm Beach Co. have fewer and stronger ribs.

Range and habitat

United States (Duval Co., St. Johns Co, and Palm Beach Co., E Florida, Monroe Co., Florida Keys, and Levy Co., W Florida); depth 0–19 m.

***Cryoturris* spp. Part 7**

Cryoturris presleyi (W.G. Lyons, 1972) comb. nov.
Figs 34F, 45A–K

Granoturris presleyi W.G. Lyons, 1972: 4, 6, figs 5–6.

Granoturris presleyi – Turgeon *et al*. 1988: 97; 1998: 106. — Lyons 1989: 27. — Redfern 2001: 789. — Williams 2005: #5586. — Zhang 2011: 151, fig. 571.

non *Granoturris padolina* Fargo, 1953 – Redfern 2001: 133 (misidentification); 2013: 209 (misidentification). *Granoturris padolina* Fargo, 1953 has not been found in Recent fauna in this study.

Differential diagnosis

Cryoturris dorvilliae (Reeve, 1845) has several distinct brown spirals mid-whorl (typically 3 or 4) and a more variable number on its shoulder (versus just one dark spiral with more fainter spirals), has convex spire whorls, not sharply angled, has weaker ribs, and has a shorter anterior canal.

Cryoturris tortugana Fallon sp. nov. lacks brown spirals altogether on the last whorl.

Type material

Holotype

UNITED STATES OF AMERICA • 4.7 × 1.8 mm; W Florida, off Egmont Key; 27°37′ N, 83°07′ W; depth 18 m; 20 Nov. 1967; DNR Marine Research Laboratory Project Hourglass; stn B; USNM 707005.

Paratypes (3 specs)

UNITED STATES OF AMERICA • 1 spec.; W Florida, off Egmont Key; 27°37′ N, 83°07′ W; depth 18 m; 20 Nov. 1967; DNR Marine Research Laboratory Project Hourglass; stn B; ANSP 324018 • 2 specs; W Florida, off Egmont Key; 27°37′ N, 83°07′ W; depth 18 m; 20 Nov. 1967; DNR Marine Research Laboratory Project Hourglass; stn B; FSBC 1.

Material examined (6 specs)

The holotype and the paratype in ANSP, and the following 4 other specimens were examined:

GUADELOUPE • 2 specs, 4.7 × 1.8 and 5.1 × 2.0 mm; Grand Cul-de-Sac Marin, Port-Louis (Oeil); 16°26.8′ N, 61°32.4′ W; depth 16 m; 18 May 2012; MNHN Guadeloupe exped.; stn GB20; MNHN-IM-2012-8761.

ST. VINCENT AND THE GRENADINES • 1 spec., 4.9 × 1.9 mm; Canouan Island, Corbec Bay; depth 8 m; 8 Jun. 2004; G. Mackintosh leg.; night SCUBA on rock and sand; ANSP 498876 • 1 spec., 5.4 × 2.0 mm; Isle de Quatre; depth 22 ft [7 m]; 26 Jun. 2005; G. Mackintosh leg.; SCUBA with suction gear; UF 589805.

Description

Based on Lyons (1972b: 4, 6) and on examination of the holotype. *Shell* small (length = 4.7 mm), fusiform, turreted with about 7 whorls, sharply angled mid-whorl, sutures appressed, the last whorl about 62% of shell length; sculpture of moderately strong axials and crowded frosted spirals of varying strengths, varix lacking; aperture oval with an anterior canal of medium length, both comprising about 44% of shell length. *Protoconch* of about 2½ smooth whorls, tip protruding, the last whorl with arched riblets that run shy of the whorl's suture. *Axial sculpture* of moderately strong ribs that run from suture to suture on spire whorls and evanesce at sutures and on shell base; whorls with 11 or 12 straight ribs, broadest and angled at whorl periphery, slightly recurved on whorl shoulders. *Varix* absent. *Spiral sculpture* of primary and microscopic secondary frosted spirals that override ribs. The strongest primary, slightly nodulous on rib crests, is at whorl periphery, 2 weaker primaries spaced on whorl sides, with microscopic secondaries between, which are closely spaced and alternate in strength. *Sulcus* absent; anal sinus shallow, which is reflected in the barely recurved ribs on the shoulder. *Outer lip* is thin, edge forming a low arch from anal sinus to anterior canal, without a stromboid notch and without an anal tooth. *Anal sinus* a shallow arch about the width of the shoulder, with an apex about mid-way on the shoulder. *Inner lip* a narrow glaze along the columella and parietal wall, without a parietal callus. *Anterior fasciole* is not swollen, sculptured with spirals as on base, only more obliquely. *Columella* straight. *Anterior canal* open, of medium length, end slightly notched. *Color* of teleoconch whorls semi-translucent milky white, with about 5 brown spirals beginning with the darkest one immediately posterior to suture; followed by 3 fainter brown spirals near mid-whorl, and 5 even weaker brown spirals closest to anterior canal. The area between the brown spirals is shaded a light yellowish brown.

Remarks

Cryoturris presleyi (W.G. Lyons, 1972) comb. nov. has all the diagnostic characteristics of the genus listed at the beginning of Part 1. As further evidence of its affinity with the genus *Cryoturris*, a SEM

image of surface microsculpture has structures like those of others in this genus (compare the SEM image of its microsculpture in Fig. 34 to that of *C. tortugana* Fallon sp. nov., also in Fig. 34). Compare the shell morphology of *C. presleyi* in Fig. 45 to that of *C. tortugana* in Fig. 44. Both are quite similar and have similar protoconchs.

Specimens of *Cryoturris presleyi* (n = 5) shell length range = 4.7–5.4 mm. The Guadeloupe specimen (Fig. 45F–G has a slightly shorter anterior canal, slightly less enlarged second whorl, and coarser riblets on the last whorl of the protoconch compared to the holotype. The specimen from St. Vincent and the Grenadines has the same differences except anterior canal length is more like the holotype Fig. 45H–I. These differences are believed to be attributable to species variability. *Cryoturris* unid. sp. B and *Cryoturris* unid. sp. G are closely related to *C. presleyi* but show greater differences.

Range and habitat

United States (W Florida), Guadeloupe, and St. Vincent and the Grenadines (Canouan Island); depth 7–18 m. Other unconfirmed but possible localities include E Florida (Lyons 1989), Bahamas (Redfern 2001, 2013), Grand Cayman Island (ANSP coll.), and Antigua (Zhang 2011).

Cryoturris unid. sp. G
Fig. 45L

Differential diagnosis

The available specimen is morphologically like *Cryoturris presleyi* (W.G. Lyons, 1972) comb. nov., but differs in the following respects: it has flat to slightly convex shoulders and whorl peripheries are sub medial. Like *C. presleyi* it possesses a brown spiral thread at the suture line and light brown banding on the shell base and shoulder. Curiously, it also has some light brown spirals on shoulders and shell base like *Cryoturris*.

Material examined (1 spec.)

BRAZIL • 1 spec., 5.8 × 2.2 mm; Bahia State; depth 20–30 m; 2003; diver collected; P. Fallon coll.

Partial description

Shell small, of 7 whorls total, teleoconch whorls obtusely angled to convex with flat to slightly convex shoulders. Sculpture of narrow but strong ribs, intercostal space about equal to or wider than ribs, and frosted spirals of varying strengths. Aperture a narrow oval, with a short anterior canal. *Protoconch* of about 2½ whorls, with riblets on the last ½ whorl. *Axial sculpture* of 10 ribs on the penultimate whorl and 7 on the last. Ribs extend from suture to suture on spire whorls and to the anterior fasciole on last. *Spiral sculpture* of 'frosted' primaries and microscopic spirals overall. *Color* white with a light brown shoulder and shell base below the sutural thread, a few minor spirals present on upper shoulder and shell base.

Remarks

Because of this specimen's similarity to *Cryoturris presleyi* (W.G. Lyons, 1972) comb. nov., it would be prudent to examine more specimens before describing it as new. If it is determined to be conspecific with *C. presleyi* the distribution of that species would extend to Brazil.

Range and habitat

Known only from the locality of the single specimen.

Cryoturris unid. sp. B
Fig. 45M–N

Differential diagnosis

The available specimen is morphologically very similar to *Cryoturris presleyi* (W.G. Lyons, 1972) comb. nov., but differs in the following respects: it has a larger, more bulbous protoconch that lacks riblets and possesses a protoconch of only 1½ whorls, teleoconch whorl shoulders that are convex, not concave, and less angular whorl peripheries. Like *C. presleyi* it possesses a brown spiral thread and light brown banding on the shell base and shoulder.

Material examined (2 specs)

MEXICO • 1 spec., 5.6 × 2.2 mm; Quinta Roo, Puerto Juarez; 0 m; Dec. 1995; P. Williams leg.; beach-collected; ANSP 498886.

UNITED STATES OF AMERICA • 1 spec. 5.0 × 2.0 mm; Lower Florida Keys, Graig Key; depth shallow water; Dec. 1994; John Wise leg.; in grunge obtained by rock-shaking, EFG 14810; ANSP 498801.

Partial description

Shell is small, of 6 whorls total, teleoconch whorls obtusely angled to convex with slightly convex shoulders. Sculpture of narrow but strong ribs and frosted spirals of varying strengths. Aperture is a narrow oval, with a short anterior canal. *Protoconch* of about 1½ bulbous whorls, without visible terminal riblets. *Axial sculpture* of 12 ribs on the penultimate whorl and 9 on the last. Ribs extend from suture to suture on spire whorls and to the anterior fasciole on last. *Spiral sculpture* of 'frosted' primaries and microscopic spirals overall. *Color* white with a light golden brown shoulder and skirt, both with a brown spiral thread on their posterior margins.

Remarks

Because of this specimen's similarity to *Cryoturris presleyi* (W.G. Lyons, 1972) comb. nov., it would be prudent to examine more specimens before describing it as new.

Range and habitat

United States (Florida Keys) and Mexico (Quintana Roo); depth, shallow water.

Cryoturris unid. sp. A
Fig. 45O–Q

Differential diagnosis

The form of its protoconch suggests close affinity with *Cryoturris presleyi* (W.G. Lyons, 1972) comb. nov. or *Cryoturris* unid. sp. B, to which better preserved specimens should be compared.

Material examined (5 specs)

BAHAMAS • 2 specs, 4.8 × 1.8 and 3.3 × 1.6 mm; Eleuthera, Island Governor's Harbor; in drift; P. Fallon leg.; ANSP 498885.

UNITED STATES OF AMERICA • 3 specs, 5.6 × 2.1, 5.1 × 2.2 and 3.4 × 1.5 mm; Florida Keys, Lower Matecumbe Key; 3 Mar. 1998; P. Fallon leg.; in drift following storm; ANSP 498884.

Partial description

Shell is small, of about 6 whorls total, teleoconch whorls convex with sloping, slightly flattened shoulders. Sculpture of numerous weak, narrow ribs that evanesce near the anterior fasciole. Spirals weak, of varying strengths. Aperture a narrow oval, with a short anterior canal. *Protoconch* of about 2 whorls, the first large, protruding, the last tall and without visible terminal riblets, perhaps worn off. *Color* translucent white.

Remarks

Available specimens are all worn, such that surface sculpture of frosting, spiral sculpture, and possibly shell coloration are lacking so that a full description is not possible.

Range and habitat

Bahamas (Eleuthera Island) and United States (Florida Keys); depth, shallow water.

Cryoturris cerinella (Dall, 1898)
Fig. 45R–W

Mangilia (*Mangilia*) *cerinella* Dall, 1889a: 112–113.

Mangilia cerinella – Dall 1889b: 102–103; 1903: 1615. — Maury 1922: 156. — M. Smith 1945: 136–137, pl. 52 figs 5, 5a; 1951: 136–137, pl. 52 fig. 5. — Parker 1955: 207.
Pleurotoma cerinella – Simpson 1887: 54.
"*Mangilia*" *cerinella* – Woodring 1928: 182.
Mangelia cerinella – C.W. Johnson 1934: 141. — Morris 1973: 249, pl. 70 fig. 5. — Porter 1974: 256.
Kurtziella cerinella – Perry 1940: 167, pl. 38 fig. 267. — Perry & Schwengel 1955: 185, pl. 38 fig. 267. — Powell 1966: 16, 103, fig. f147. — Tunnell & Chaney 1970: 199. — Lyons *et al*. 1971: 14.
Cryoturris cerinella – Gardner 1948: 272, pl. 37 fig. 8. — DuBar 1962: 35. — Abbott 1974: 280, fig. 3232. — Campbell *et al*. 1975: 118. — Andrews 1977: 138. — Rehder 1981: 622, fig. 180. — Vokes & Vokes 1983: 31, 58, pl. 29 fig. 7. — Turgeon *et al*. 1988: 96; 1998: 106. — Odé 1992a: 59; 1993: 69, fig. 3. — Shelton 1997: 14. — Gundersen 1998: 13. — Lee 2003c: http://www.jaxshells.org/cedarkey.htm; 2009: 130, spec. no. 632, text photo. — Williams 2005 #5563. — García 2007: 8.

Differential diagnosis

Some species of *Kurtziella* resemble this species (high spires, narrow shells with short apertures and canals) but have different protoconchs (rows of minute beads on the last whorl). The form of *Cryoturris cerinella* (high spire, only 6 or 7 ribs) is otherwise unique among its congeners.

Type material

Of the 14 lots of syntypes (USNM 125535, 134452, 35359, 35826, 35975, 35980, 41548, 41560, 41572, 44442, 45137, 45138, 86909, and 887516) from North Carolina, W Florida, and Texas, only those from the west coast of Florida were confirmed as this species (USNM 86909, 35980 and 35975). Of the two Texas lots, the specimen in USNM 125535 was worn but is not *Cryoturris cerinella*. The other Texas lot, USNM 134452 was not examined. The North Carolina lots are *Kurtziella cerina* (J.D Kurtz & W. Stimpson, 1851). The W Florida specimens closely match Dall's description of *C. cerinella*, i.e., "it has only six or at most seven ribs", which is unique when compared by Dall to other "Kurtziella" species. All have more than 7 ribs, and all are sufficiently different to be placed in other genera.

Lectotype (here designated)
Of the 3 lots in the type series from W Florida that most closely match the description of *Mangilia cerinella*, Dall's measurements most closely fit the largest specimen in USNM 86909, from Punta Rassa, Lee Co., W Florida measuring 11.9 × 3.8 mm (Dall's published measurement is 11.75 × 3.75 mm). So, this specimen is here declared the lectotype. The smaller companion in the lot measures 9.2 × 3.0 mm and is a paralectotype.

UNITED STATES OF AMERICA • 11.9 × 3.8 mm; W Florida, Lee Co., Punta Rassa; depth 2–4 m; Feb. 1884; H. Hemphill leg.; USNM 86909.

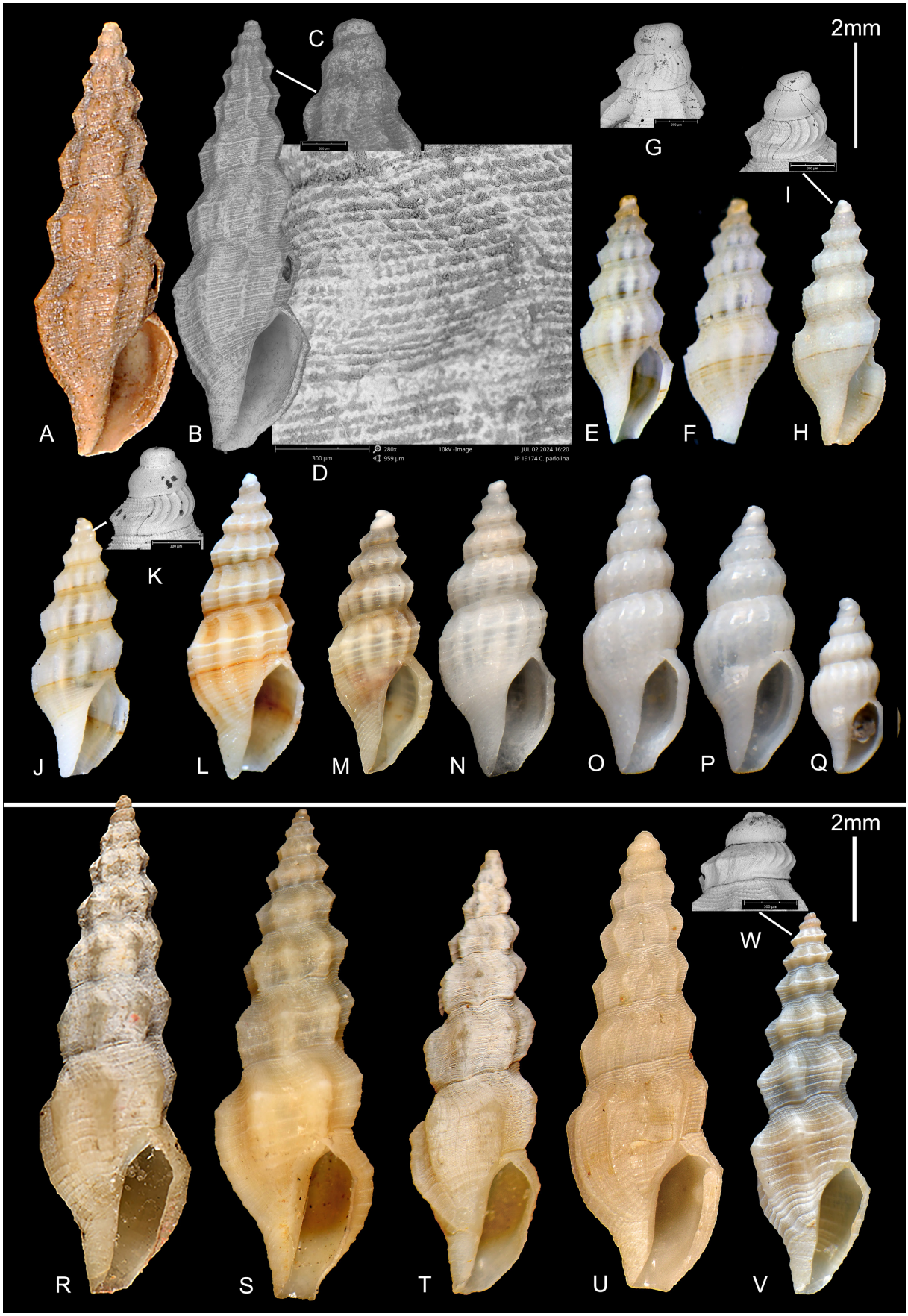
Paralectotypes (7 specs of *C. cerinella*)
UNITED STATES OF AMERICA • 1 spec., 9.2 × 3.0 mm; W Florida, Lee Co., Punta Rassa; depth 2–4 m; Feb. 1884; H. Hemphill leg.; USNM 86909 • 3 specs, 10.4 × 3.4, 9.8 × 3.4, and 7.7 × 2.8 mm; W Florida, Levy Co., Cedar Key; H. Hemphill leg.; USNM 35980 • 3 specs, 8.2 × 3.5, 10.1 × 3.5, and 8.2 × 2.9 mm; W Florida, Sarasota Co., Sarasota Bay; H. Hemphill leg.; USNM 35975.

Eight of the remaining lots of Dall's syntypes are from North Carolina and are likely *Kurtziella cerina* (J.D. Kurtz & W. Stimpson, 1851). See under that species for further information. The identity of the 2 Texas lots has not been determined.

Other material examined (36 specs)

UNITED STATES OF AMERICA • 3 specs, 9.8 × 3.0, 10.4 × 3.4 and 11.2 × 3.2 mm; Sanibel Island; C.A. Perry leg.; USNM 363923 • 1 spec., 9.1 × 3.1 mm; W Florida, Taylor Co., Keaton Beach, public

Fig. 45 (next page). *Cryoturris* Woodring, 1928 spp. Part 7. – **A–D**. *Granoturris padolina* Fargo, 1953. **A**. Holotype, 8.2 × 2.9 mm, ventral view (ANSP 19174), North St Petersburg Pliocene, W Florida. **B**. SEM image of same specimen showing clearer detail of spiral sculpture. **C**. SEM image of the worn protoconch. The few riblets at the end are not visible in this image. **D**. SEM image of shell surface showing even greater detail of the shell surface. The spiral rows of dark blotches are the dust-filled, damaged micro-structures, the light areas are the shell surface. The micro-structures are loaded with fine dust, obscuring fibril detail but are nonetheless reminiscent of those of the genus *Cryoturris* (compare to images in Figs 32–34). – **E–G**. *Granoturris presleyi* W.G. Lyons, 1972. **E–F**. Holotype, 4.8 × 1.9 mm, ventral and dorsal views (USNM 707005), off Egmont Key, Hillsborough Co., W Florida. **G**. Paratype, expanded view (not to scale), of protoconch only (ANSP 324018). – **H–K**. *Cryoturris presleyi* (W.G. Lyons, 1972) comb. nov. **H–I**. Spec., 4.7 × 1.8 mm, ventral view, and SEM image of protoconch (MNHN-IM-2012-8761), Port-Louis (Oeil), Guadeloupe. **J–K**. Spec., 4.9 × 1.9 mm, ventral view, and SEM image of protoconch (ANSP 498876), Corbec Bay, Canouan Island, Saint Vincent and the Grenadines. – **L**. *Cryoturris* unid. sp. G. Spec. 5.8 × 2.2 mm (P. Fallon coll.), Bahia State, Brazil. – **M–N**. *Cryoturris* unid. sp. B. **M**. Spec. 5.0 × 2.0 mm (E. García coll.), Craig Key, Lower Florida Keys. **N**. Spec. 5.6 × 2.2 mm (ANSP 498886), Puerto Juarez, Quinta Roo, Mexico. – **O–Q**. *Cryoturris* unid. sp. A. 3 specs, 5.6 × 2.1, 5.1 × 2.2 and 3.4 × 1.5 mm (ANSP 498884), Lower Matacumbe Key, Florida Keys. – **R**. *Mangilia* (*Mangilia*) *cerinella* (Dall, 1889), lectotype, 11.9 × 3.8 mm (USNM 86909), Punta Rassa, Lee Co., W Florida. –**R–W**. *Cryoturris cerinella* (Dall, 1889). **S**. Spec., 11.7 × 3.5 mm (ANSP 221713), Punta Gorda Beach, Pinellas Co., W Florida. **T**. Spec., 9.8 × 3.3 mm (ANSP 267265), Boca Ciega Bay, Pinellas Co., W Florida. **U**. Spec., 10.9 × 3.4 mm (UF 589711), just W of Atsena Otie Key, Cedar Keys, Levy Co., W Florida. **V–W**. Spec., 9.0 × 3.0 mm, ventral view, and SEM image of protoconch (UF 589711), W of Atsena Otie Key, Cedar Keys, Levy Co., W Florida. Credits: A: **f**rom Fargo (1953: pl. 23 fig. 5a); B–D: SEM images courtesy of Paul Callomon; G, I, K, W: SEM images courtesy of Krasimira "Kasey" Seizova and Chandler J. Olson. Scale bars: A–B, E–F, H, J, L–V = 2 mm; C–D G, I, K, W = 300 μm.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park at boat ramp; intertidal mud flat; 21 Sep. 1986; H.G. and R.H. Lee leg.; UF 589712 • 1 spec., 10.0 × 3.4 mm; W Florida, Taylor Co., 1 mi. [1.6 km] W of Steinhatchee River estuary; depth 1.5–2.4 m; 21 Sep. 1986; H.G. Lee leg.; dredged on shell grit and grassy bottom; UF 589713 • 2 specs, 10.5 × 3.5 and 10.0 × 3.2 mm; W Florida, Gulf Co., St. Joe Bay, 4 mi. [6.4 km] N of Cape San Blas; depth 1.2 m; Jul. 1986; H.G. Lee leg.; in sand at edge of *Thalassia* bed; UF 589714 • 21 specs, (5 measured) 10.9 × 3.4, 8.5 × 2.6, 8.9 × 2.8, 9.5 × 3.2 and 9.5 × 3.2 mm; W Florida, Levy Co., Cedar Keys, just W of Atsena Otie Key; depth 1.8 m; 4 Dec. 1982; H.G. Lee leg.; dredged on mud/seagrass; UF 589711 • 4 specs, 10.6 × 3.1, 9.8 × 3.3, 9.5 × 3.3 and 7.7 × 2.8 mm; W Florida, Pinellas Co., Boca Ciega Bay; ANSP 267265 • 3 specs, 11.7 × 3.8, 11.8 × 3.7 and 11.7 × 3.5 mm; W Florida, Pinellas Co., Punta Gorda Beach; ANSP 221713 • 1 spec., 10.1 × 2.9 mm; W Florida, Levy Co., Cedar Keys, North Key; Mar. 1958; Ruth Craine leg.; ANSP 216236 • 1 spec., length = 9.1 mm; W Florida, Levy Co., Cedar Key, in bay near town; on sand bar at low tide; 2 Nov. 1992; P. Williams leg.; P. Fallon coll.

Description

Shell small (lectotype length = 11.9 mm), fusiform with a tall spire and short aperture (W/L = 0.3193), of 8 obtusely angled whorls, the last less than half the shell length (48%), sutures appressed and slightly undulant; whorls with 7 ribs angled mid-whorl; aperture short, about 27% of shell length including canal. *Protoconch* of about 2¼ whorls, the tip of the first minute and smooth then expands rapidly into the remaining whorls, the last ½-whorl with riblets. A peripheral spiral appears mid-whorl on the last ¼-whorl of the protoconch that is in line with that of the teleoconch. *Axial sculpture* of 6 to 7 broad ribs that run from suture to suture on spire whorls and fade on last before the anterior fasciole. Ribs low near sutures, angled and highest mid-whorl, nodulose at rib crests on whorl peripheries. *Varix* absent. *Spiral sculpture* of fine, frosted primary and secondary spirals that override the ribs. A strong primary lies at and undulates with the suture; two more are close together at the whorl periphery where they may appear as one if worn; the space between the suture and periphery has alternating weak primaries and secondaries one to one. Spire sides have an additional 2 strong primaries, one mid-way the other near the suture of the succeeding whorl with about 6 fine secondaries of varying strengths between. The shell base has a series of primaries to the anterior fasciole with 3-6 secondaries between. *Sulcus* absent; growth lines bend at the whorl periphery reflecting past positions of the sinus. *Outer lip* is thin, edge with a low arc from the anal sinus to the anterior canal. *Anal sinus* is a shallow, wide V-shape with its apex just above the shoulder angle. *Inner lip* a thin, narrow glaze along the columella. *Anterior fasciole* is not swollen, with oblique weak primary spirals without or with few intercalary secondaries. *Columella* straight. *Anterior canal* short, straight, end unnotched. *Color* a uniform creamy yellow; primary spirals lighter.

Remarks

The average shell length of 19 specimens is 10.1 mm (7.7–11.9 mm).

Range and habitat

United States (W Florida); depth intertidal to 2.4 m. Published localities also include Yucatan (Vokes & Vokes 1983); Texas (Parker 1955; Odé 1993); eastern Bay of Campeche (García 2007); Alabama (Shelton 1997); North Carolina (Porter 1974); E Florida (Lee 2009); "Tortuga" [Dry Tortugas] (Simpson 1889). specimens from these other localities have not been confirmed.

***Cryoturris* spp. Part 8**

Cryoturris slapcinskyi Fallon & Bouchet sp. nov.
urn:lsid:zoobank.org:act:A38C0B6A-9CC5-462B-95B0-EDCB89AEC03A
Fig. 46A–K

Differential diagnosis

Cryoturris slapcinskyi Fallon & Bouchet sp. nov. from French Guiana and southern Brazil is difficult to distinguish from *C. redferni* Fallon & Bouchet sp. nov. from Guadeloupe and Martinique. *Cryoturris slapcinskyi* has a larger protoconch than *C. redferni* (632 µm versus 500 µm average basal diameter, n = 13, range = 545–686 µm versus n = 12, range = 471–529 µm, respectively). Additionally, the frosting of *C. slapcinskyi* is generally less coarse. DNA sequence analysis will likely show that these two geographically separate populations are distinct enough to be considered different species.

Cryoturris procera Fallon & Bouchet sp. nov. is similar but has a shorter aperture and anterior canal. The holotypes of *C. procera* and *C. slapcinskyi* Fallon & Bouchet sp. nov. are 38% and 44% of shell length, respectively.

Cryoturris robusta Fallon & Bouchet sp. nov. has fewer (12 versus 15 on the penultimate whorl of holotypes of *C. robusta* and *C. slapcinskyi*, respectively) and broader ribs, is stockier (W/L = 0.4000 versus 0.3670), and lacks a dark subsutural band.

Cryoturris holimanae Fallon sp. nov. is similar but has fewer ribs (9 versus 15 on the penultimate whorl) that are broader and is colored differently.

Etymology

Cryoturris slapcinskyi Fallon & Bouchet sp. nov. is named in honor of Mr. John Slapcinsky, Invertebrate Zoology Collection Manager, Florida Museum of Natural History, for his generous loan of mangeliid specimens, many of which are new to science.

Type material

Holotype
BRAZIL • 10.9 × 4.0 mm; São Paulo State, off Santos; depth 100–120 m; Jun. 1999; local fishermen leg.; trawled; UF 589806.

Paratypes (10 specs)
BRAZIL • 1 spec., 9.8 × 3.3 mm; from the holotype lot; UF 589807 • 1 spec., 11.7 × 4.1 mm; Maranhão State, Pinheiro; depth 30 m; ca 1980; dredged in mud; ANSP 498881 • 2 specs, 10.0 × 3.5 and 8.9 × 3.2 mm; Rio de Janeiro, off Ilha Grande; depth 60–80 m; Aug. 2000; local fishermen leg.; trawled; UF 589744 • 1 spec., 7.8 × 3.0 mm; off Rio de Janeiro; depth 45 m; 1966; local fishermen; trawled; ANSP 353336 • 1 spec., 8.9 × 3.3 mm; Rio de Janeiro, off Ilha Grande; depth 60–80 m; Aug. 2000; local fishermen leg.; trawled; USNM 1715436.

FRENCH GUIANA • 2 specs, 8.7 × 3.2 and 5.1 × 2.4 mm; offshore; 6°52.2′ N, 53°02.6′ W; depth 94 m; 30 Jul. 2014; GUYANE 2014; stn DW4359; MNHN-IM-2012-3715 • 1 spec., 8.9 × 3.2 mm; offshore; 5°59.6′ N, 52°11.3′ W; depth 66–67 m; 8 Aug. 2014; GUYANE 2014; stn CP4399; MNHN-IM-2012-43483 • 1 spec., 6.7 × 2.7 mm; offshore; 6°15.4′ N, 52°13.5′ W; depth 81–82 m; 4 Dec. 2017; PROTEUS-GUYANE; stn DW5099; MNHN-IM-2000-40020.

Other examined material

An additional 6 specimens from French Guiana were examined.

Description

Shell small (length = 10.9 mm), fusiform (W/L = 0.3670), of about 9 whorls with steep, flat shoulders extending to about mid-whorl, and straight sides slightly inclined into the abapical suture. Last whorl with a round base, tapering to an anterior canal of moderate length about 61% of shell length; aperture oval with a wide shallow anal sinus on shoulder, both aperture and canal about 44% of shell length; sculpture of ribs and fine frosted spirals. *Protoconch* of about 2¼ whorls, the first whorl smooth, the last whorl with fine riblets with swellings that form a mid-whorl carina on about the last ½-whorl, which becomes the peripheral cord on the teleoconch. Riblets below the carina are finer than above it and sweep toward the protoconch lip. *Axial sculpture* of round-crested ribs that run from suture to suture and to the anterior fasciole on the last whorl, ribs reduced on shoulder almost obsolete at suture, most prominent at whorl periphery, and fade on shell base. Ribs number 15 on penultimate, 14 on last, and intercostal space about as wide as ribs. *Varix* absent. *Spiral sculpture* of primaries and secondaries of varying strengths, a primary at suture followed by weak primaries (about 7 altogether), and secondaries with an increasing number of secondaries between the weak primaries up to edge of shoulder where a strong primary defines the whorl periphery; whorl sides with a strong medial primary, and a weak primary dividing the intervening space on either side, with 3–7 secondaries between both weak and strong primaries. On shell base about an additional 9 primaries with 3–5 secondaries between, decreasing in number anteriorly. Both primaries and secondaries are frosted, and all override ribs. Intersections of primaries with ribs form nodules, most strongly on whorl peripheries. *Sulcus* absent. *Outer lip* is thin, edge forms a low arc from periphery to anterior canal. *Anal sinus* an almost imperceptible indentation along width of the shoulder. *Inner lip* a narrow, thin glaze from suture to anterior canal, unemarginate, without a parietal callus. *Columella* straight. *Anterior canal* of moderate length, open, end unnotched. *Anterior fasciole* not swollen, with weak spiral primaries and 1–3 microscopic secondaries between. *Color* light orange brown with darker subsutural band and tones between ribs.

Remarks

The average shell length of 16 specimens is 7.0 mm (3.5–11.7 mm). The number of axial ribs varies (15 penultimate ribs on the holotype versus 11 on the Pinheiro specimen, respectively).

Range and habitat

French Guiana, northern and southern Brazil; depth 30–120 m.

Fig. 46. Species of *Cryoturris* Woodring, 1928. Part 8. – **A–K**. *Cryoturris slapcinskyi* Fallon & Bouchet sp. nov. – **A–B**. Holotype, 10.9 × 4.0 mm, ventral and dorsal views (UF 589806), off Santos, São Paulo State, Brazil. **C**. Paratype, 9.8 × 3.3 mm (UF 589807) from the type locality. **D**. Paratype, 11.7 × 4.1 mm (ANSP 498881), Pinheiro, Brazil. **E–F**. Paratypes, 10.0 × 3.5 and 8.9 × 3.2 mm (UF 589744), off Ilha Grande, Rio de Janeiro, Brazil. **G**. Spec., 7.6 × 3.0 mm (ANSP 353336), off Rio de Janeiro, Brazil. **H–I**. Specs, 8.7 × 3.2 and 5.1 × 2.4 mm (MNHN-IM-2012-3715), off French Guiana. **J**. Spec., 8.9 × 3.2 mm (MNHN-IM-2012-43483), off French Guiana. **K**. Spec., 6.7 × 2.7 mm (MNHN-IM-2000-40020), off French Guiana. – **L–M**. *Cryoturris* unid. sp. C. Spec., 10.5 × 3.5 mm, ventral and dorsal views (ANSP 49887), Tayrona Park, Colombia. – **N–O**. *Cryoturris* unid. sp. F. Spec., 17.6 × 5.9 mm (ANSP 498802), off Playa Forti, NW Curaçao, Netherlands Antilles. – **P–Q**. *Cryoturris* unid. sp. D. Spec., 12.5 × 4.6 mm (ANSP 498889), W side of Punta Charagato, Cubagua Island, Venezuela. Scale bar: A–Q = 2 mm.

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Cryoturris unid. sp. C
Fig. 46L–M

Differential diagnosis

This species should be compared to the similar species *Cryoturris redferni* Fallon & Bouchet sp. nov. and *C. holimanae* sp. nov., to name few.

Material examined (2 specs)

BRAZIL • 1 spec., length = 10.0 mm; off Cabo Frio, Rio de Janeiro; depth 120–150 m; local fishermen leg.; in fish nets; ANSP 498888.

COLOMBIA • 1 spec., 10.5 × 3.5 mm; Tayrona Park; depth 18 m; dredged; on soft sand; ANSP 498887.

Description

Shell small, of 9¼ whorls total, teleoconch whorls obtusely angled midway, whorl sides straight as are shoulders. Sculpture of narrow but strong ribs and frosted spirals of varying strengths. Aperture a narrow oval, with a moderately long anterior canal. *Protoconch* of about 2¼ whorls, the first small, the first full whorl round, and the last ¾ with riblets and a strong carina ribs above the carina slightly curved, below are finer, and oblique. *Axial sculpture* of 15 ribs on the penultimate whorl and 10 on the last. Intercostal spaces are about as wide as ribs on penultimate but widen on the last. Ribs extend from suture to suture on spire whorls and to the anterior fasciole on last. *Spiral sculpture* of frosted primaries and secondaries, suture with a strong frosted primary followed by (on penultimate shoulder) 6–7 weak primaries and 1–2 secondaries between. Whorl side with 3 primaries and a weak primary midway, with 4 secondaries between each of the strong and weak primaries. *Color* light golden brown with white ribs and anterior canal, and a translucent dark golden brown protoconch.

Cryoturris unid. sp. F
Fig. 46N–O

Differential diagnosis

When sufficient specimens are available, this species may prove to be an exceptionally large *Cryoturris usitata* Fallon & Bouchet sp. nov. or a specimen of *C. robusta* Fallon & Bouchet sp. nov.

Material examined (1 spec.)

NETHERLANDS ANTILLES • 1 spec., 17.6 × 5.9 mm; NW Curaçao, off Playa Forti; depth 213 m; ANSP 498802.

Partial description

Shell small, of 9¼ whorls, teleoconch whorls initially obtusely-angled grading to convex with deeply angled shoulders ending above whorl medians. Sculpture of ribs and of primary and secondary spirals. Aperture oval, with a broad anal notch mid-shoulder and an anterior canal of moderate length. *Protoconch* of about 2½ whorls, tip of the first minute, first full whorl round, and the last ¾ with fine riblets that grow stronger toward the end and are without significant mid-whorl swellings. *Axial sculpture* of 14 narrow ribs on the penultimate and 9 on the last whorl, intercostal spaces wider than ribs. Ribs extend from suture to suture on spire whorls and evanesce before anterior fasciole on last. *Spiral sculpture* of frosted primaries and secondaries, whorl side with 3 strong primaries and 2 weak primaries midway, with 1–2 secondaries between each of the primaries. *Color* white.

Cryoturris unid. sp. D
Fig. 46P–Q

Differential diagnosis

When sufficient specimens are available, this species should be compared to *Cryoturris robusta* Fallon & Bouchet sp. nov. and *C. procera* Fallon & Bouchet sp. nov., to confirm its uniqueness. It differs from *C. robusta* in possessing a 2¾-whorl protoconch (not 2¼ whorls) and from *C. procera* in size and robustness.

Material examined (1 spec.)

VENEZUELA • 1 spec., 12.5 × 4.6 mm; Cubagua Island, W side of Punta Charagato; depth 7.6 m; 4 Nov. 1999; G. Mackintosh leg.; night SCUBA on coarse sand; ANSP 498889.

Partial description

Shell small (length = 12.5 mm) of 8¾ whorls, teleoconch whorls obtusely angled sub-medially, shoulders deeply sloped, whorl sides angled into abapical suture. Sculpture of ribs and of primary and secondary spirals. Aperture, with a moderately long anterior canal, slightly twisted, end notched. *Protoconch* of about 2¾ whorls, tip of the first minute, first full whorl round, and the last ¾ with riblets and a strong carina with ribs above the carina slightly curved, below are finer, and oblique. *Axial sculpture* of 9 ribs on the penultimate and 10 on the last whorl, intercostal spaces about as wide as ribs. Ribs extend from suture to suture on spire whorls and evanesce before anterior fasciole on last. *Spiral sculpture* of frosted primaries and secondaries, whorl side with 3 primaries and a weak primary midway, with 4 secondaries between each of the strong and weak primaries. *Color* white with yellowish-brown in intercostal spaces, and a translucent dark golden brown protoconch.

Genus ***Cryptomangelia*** Fallon gen. nov.
urn:lsid:zoobank.org:act:F8FF661C-3623-482E-9090-50B8F5FB8DD0

Type species

Pleurotoma guarani d'Orbigny, 1841 by original designation.

Diagnosis

Shell small, usually less than 6 mm, stoutly fusiform with a short anterior canal undifferentiated from the aperture, or nearly so, and an apertural varix with a deep laterally directed anal sinus, anal tooth, and parietal callus. Whorls convex with little or no angled shoulder and deeply impressed sutures. Protoconch of 2–2½ whorls, the last with fine riblets crossed by a median carina beaded at intersection with riblets. Sculpture of strong ribs that stretch from suture to suture on spire whorls, to anterior fasciole on shell base, and are highest (and narrowest) and slightly recurved on whorl shoulders. Spiral sculpture of a few primaries on some species, intercalary space and shoulder packed with exceptionally fine to microscopic secondaries overall, fine enough to give the shell surface a glossy appearance. Spirals override ribs. Color white with bands of brown or reddish brown, or occasionally all brown or reddish brown.

Etymology

Cryptomangelia Fallon gen. nov.: '*Crypto-*' from the Greek '*krypto*', 'hide, cover, conceal'; '*-mangelia*', a generic name applied to these small mangeliids by 19th and early 20th century taxonomists. The white-and brown-banded shells of most species in this genus are likely cryptic, serving to camouflage individuals in shallow reefal environments.

Summary diagnostic characteristics

Shell small, fusiform, stout, with a body whorl larger and broader than its spire, and whorls convex, usually without a distinct angulation marking the edge of the shoulder.

Aperture oval, with a short anterior canal barely differentiated from the aperture.

Protoconch of about 1¼–2½ whorls, the last fully or partially marked with fine riblets that usually crossed by one or two fine spirals.

Outer lip varicose with a laterally directed wide anal sinus, parietal callus, and a strong denticle at base of anal sinus.

Axial sculpture of strong ribs right up to and slightly above whorl sutures, highest and narrowest on shoulders forming concave intercostal spaces on the shoulder.

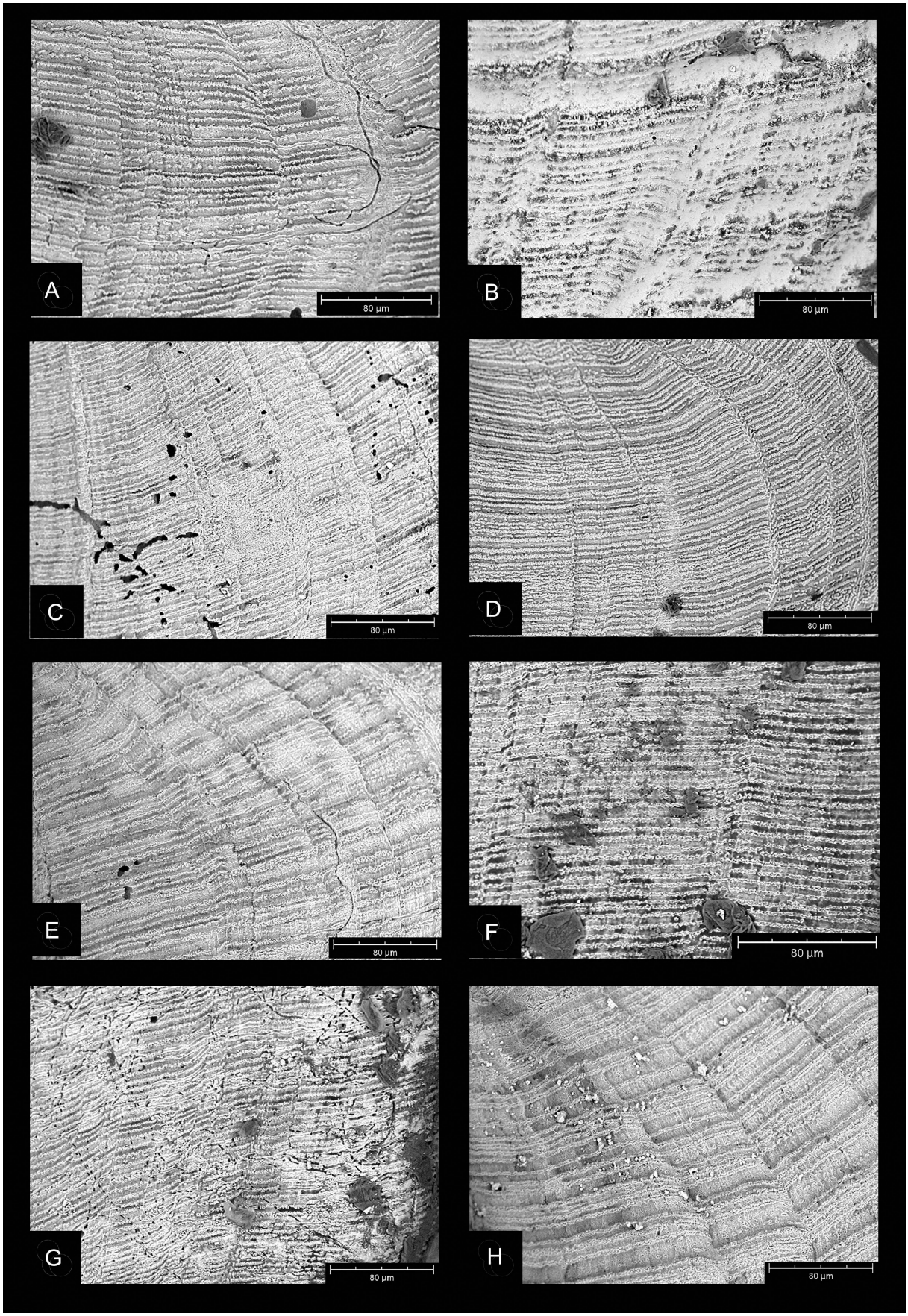
Spiral sculpture of well-separated primary spirals that override ribs, and of densely packed microscopic spirals between. Spirals not 'frosted'.

Color white with brown or reddish brown bands, or all brown or reddish brown.

Shell surface microsculpture

Microscopic spirals are barely visible under a stereo dissecting microscope at 70× resolve into continuous rows of irregular, jagged, sub-microscopic calcareous structures that are independent of incremental growth lines under SEM 850× magnification. Rows have variable widths and compactness of their constituent structures and may also be grouped into sets of 3 to 5 rows, with wider space between sets than between rows.

Fig. 47 (next page). Species of *Cryptomangelia* Fallon gen. nov., shell surface microsculpture. Part 1. SEM images of shell surface in the penultimate whorl shoulder, 850×. **A**. *Cryptomangelia furva* Fallon & Bouchet gen. et sp. nov., paratype, 3.8 × 1.7 mm (MNHN-IM-2012-7291), Anse à la Barque, Guadeloupe. Unevenly spaced rows of microscopic spirals composed of highly irregular, jagged sub-microscopic calcareous structures not made so by growth lines. **B**. *Cryptomangelia eleutherae* Fallon gen. et sp. nov., holotype, 5.4 × 2.5 mm (UF 589747), 300 mi. N of Current Cut, Current, Eleuthera Island, Bahamas. Same general pattern of rows of microscopic spirals observed in *C. furva*, with a weak primary spiral visible in the upper portion of the image. Shell wear has obscured detail of the microscopic secondary spirals. **C**. *Cryptomangelia mellosa* Fallon & Bouchet gen. et sp. nov., holotype, 5.2 × 2.4 mm (UF 589752), Porto Belo, Santa Catarina State, Brazil. Unevenly spaced rows of microscopic spirals of the same construction are present as those in *C. furva*. **D**. *Cryptomangelia pumila* Fallon & Bouchet gen. et sp. nov., holotype, 3.9 × 1.6 mm (MNHN-IM-2000-39595), Sailing Cove, Martinique. Unevenly spaced rows of microscopic spirals of the same construction as those in *C. furva*. The irregular, jagged sub-microscopic calcareous structures are more tightly packed within the rows in this species than in *C. furva*. **E**. *Cryptomangelia guarani* (d'Orbigny, 1841) gen. et comb. nov. Spec., 5.4 × 2.6 mm (MNHN-IM-2013-72866), Le Vauclin, Cul-de-Sac de Paquemar, Martinique. Microscopic spirals construction about the same as *C. furva* except rows are more widely spaced. **F**. *Cryptomangelia pulchella* Fallon & Bouchet gen. et sp. nov., paratype, 4.7 × 1.8 mm (MNHN-IM-2012-7287), Caye Plate (PCSM), Guadeloupe. Microscopic spiral construction about the same as *C. furva* except rows are more evenly spaced. **G**. *Cryptomangelia colombiana* Fallon gen. et sp. nov., holotype, 4.9 × 2.1 mm (ANSP 498895), Tayrona Park, Colombia. Microscopic spiral construction is about the same as *C. furva.* **H**. *Cryptomangelia castanea* Fallon gen. et sp. nov., holotype, 5.9 × 2.5 mm (UF 589754), Porto Belo, Santa Catarina State, Brazil. Microscopic spirals construction is in others with groups of 4 or 5 spirals separated by wide spaces, like the pattern of *C. guarani*. Scale bars: A–H = 80 μm.


A
80 µm
B
80 µm
C
80 µm
D
80 µm
E
80 µm
F
80 µm
G
80 µm
H
80 µm

Differences from other genera

Pyrgocythara Woodring, 1928 has a slender, translucent shell with narrow, weaker, more numerous axials and stronger, more numerous spirals. It has a protoconch with 3–3¼ whorls possessing a minute tip and ending with about 1¾–2⅛ whorls with curved riblets, versus 1¼–2½ whorls, the last with fine riblets. *Pyrgocythara* lacks microscopic intercalary spirals and usually lacks the deep brown or reddish-brown coloration seen on *Cryptomangelia* Fallon gen. nov.

Stellatoma Bartsch & Rehder, 1939 is similar in many respects but differs in the following characteristics: protoconchs have only a few riblets at its terminus versus ½–1 whorls of riblets, and riblets are not crossed by 1 to 2 spirals; teleoconch ribs diminish at and do not rise above the suture; the outer lip is more highly glazed, and shell color generally lacks the brown and white cryptic banding of *Cryptomangelia* Fallon gen. nov.

Vitricythara Fargo, 1953 differs even further than *Pyrgocythara* from any resemblance to *Cryptomangelia* Fallon gen. nov. in possessing a translucent shell, a long narrow aperture, a reticulate sculpture of axials and spirals about the same strength, and sometimes with swellings or spikes on rib crests.

Agathotoma Cossmann, 1899 has some small brownish species but its protoconch may be papillose and with just a few riblets, without median spirals, and the teleoconch lacks spirals. species are generally lighter in color, have angular shoulders, and weaker ribs.

Pachycythara Woodring, 1928 differs in that the protoconch lacks one or two fine spirals that usually cross the last whorl as in *Cryptomangelia* Fallon gen. nov. Also, axial ribs do not run right up to and slightly above whorl sutures; spirals are weaker; and a strong denticle at the base of the anal sinus is lacking.

Remarks

The following species presently in *Pyrgocythara* Woodring, 1928 are recombined into *Cryptomangelia* Fallon gen. nov. herein:
Mangelia vicina C.B. Adams, 1850
Mangelia crassicostata C.B. Adams, 1850
Pleurotoma albovittata C.B. Adams, 1845
Mangelia brevis C.B. Adams, 1845
Pleurotoma multilineata C.B. Adams, 1845
Pleurotoma cinctellum L. Pfeiffer, 1840
Pleurotoma guarani d'Orbigny, 1841
Pleurotoma plicosa C.B. Adams, 1850
Pyrgocythara filosa Rehder, 1943

Phylogenetic relationships

The DNA sequence data support the monophyly of the genus *Cryptomangelia* Fallon gen. nov., with all four sequenced species forming a well-supported clade. The lineage is recovered sister to the genus *Mandiana* Fallon gen. nov., with bootstrap support (84%). All sequenced species show a modest intraspecific variability (average intraspecific p-distance range: 0.3-0.8%).

Nomina dubia

The type material for the taxa *Pleurotoma laqueata* Reeve, 1846a, *Mangelia astricta* Reeve, 1846b could not be found at the NHMUK (email to P. Fallon from Andreia Salvador, Senior Curator of Marine Gastropods, dated 23 Oct. 2018) and no additional descriptive information or photographs were found in a search of the literature. As such, both are considered nomina dubia. The description of *Pleurotoma luteo-fasciata* Reeve, 1845 is ambiguous, with no known habitat, no known published photograph, and the type has likely been lost (as inferred from its absence on the NHMUK data portal), so it is also considered to be a nomen dubium here. Adams (1850a: 55) states that it is a junior synonym of *Mangelia albovittata* C.B. Adams, 1845.

Columbella edonida Duclos, 1846 may also belong in *Cryptomangelia* Fallon gen. nov. (see Fig. 41R–S). The high ribs and general form are typical of *Cryptomangelia*, but the specimen's poor condition makes it unsuitable for description and so is considered a nomen dubium here.

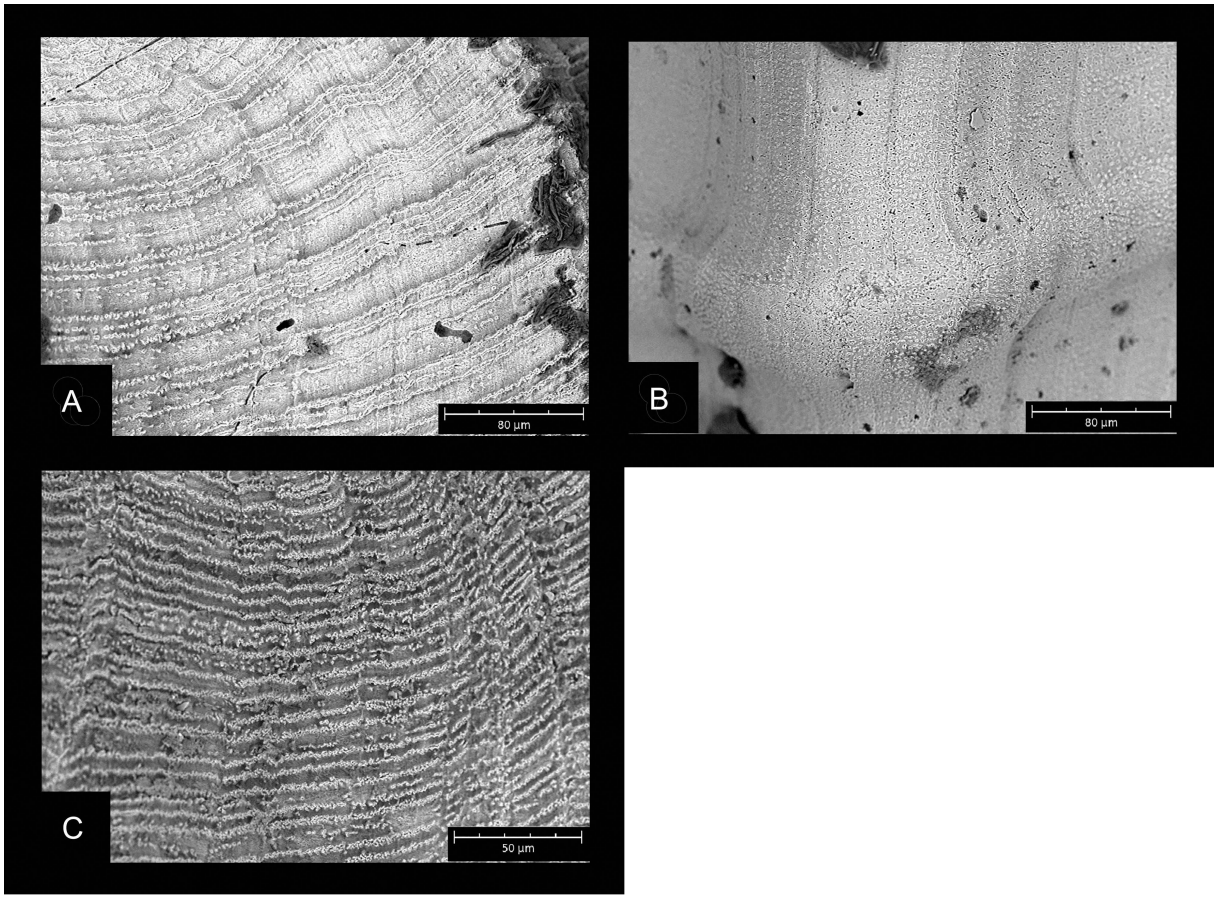


Fig. 48. Species of *Cryptomangelia* Fallon gen. nov., shell surface microsculpture. Part 2. SEM images, 850×. **A**. *Cryptomangelia fulgens* (E.A. Smith, 1888) gen. et comb. nov. Spec., 4.9×2.1 mm (ANSP 498898), Corumbau, Bahia, Brazil. Rows of microscopic spirals appear in groupings of 3 to 5 rows with a scattering of fragments between the groupings. **B**. *Cryptomangelia plicosa* (C.B. Adams, 1850) gen. et comb. nov. Spec., 4.5×2.0 mm (ANSP 498899), Old Tampa Bay, W Florida. The primary spiral of the whorl perimeter is visible. Intercalary space smooth. **C**. *Cryptomangelia nanodes* (Melvill, 1923) gen. et comb. nov. SEM image of surface of penultimate whorl shoulder, 1250×. Spec., 3.7×1.9 mm (ANSP 332067B), Calliaqua Bay, Saint Vincent Island. At a higher magnification, this smooth-shelled species reveals closely spaced, narrow rows of fibrils. Typical of the genus. Credits: SEM images courtesy of Chandler J. Olson. Scale bars: A–B = 80 µm; C = 50 µm.

Cryptomangelia Fallon gen. nov. spp. Part 1

Cryptomangelia cinctella (L. Pfeiffer, 1840) gen. et comb. nov.
Fig. 49A–C

Pleurotoma cinctellum L. Pfeiffer, 1840: 258, sp. 175.
Pleurotoma caribaea d'Orbigny, 1847 in R. de la Sagra 1841–1853: 172–173, pl. 23 figs 32–34 is a junior subjective synonym, according to Rosenberg (2009), and this is supported here. See also Fig. 49C. Four syntypes are in NHMUK 1854.10.4.428. Only 1 of the 4 syntypes is this species, the one depicted. Type localities for the type series are given as Martinique, Guadeloupe, and Cuba. It is not known from which of these localities the figured syntype is derived.

Pleurotoma caribaea – d'Orbigny 1853: 172–173, figs 32–34. — Gray 1854: 31. — Dall 1885: 234. — Simpson 1887: 54, as *caribbaea* [sic].
Mangilia caribaea – Krebs 1864: 8. — Dall 1889b: 111.
Mangelia cinctella – H. & A. Adams 1853: vol. 1; 87.
Mangilia cinctella – Tryon 1884: 248.
Clathurella caribaea – Tryon 1884: 279, pl. 20 fig. 87.
Daphnella cinctella – Paetel 1888: 87.
Defrancia caribaea – Paetel 1888: 79.
Pyrgocythara caribaea – Rios 1975: 139, pl. 42 fig. 638; 1985: 148, pl. 50 fig. 695; 1994: 175, pl. 58 fig. 807. — Williams 2005: #5714.
Pyrgocythara sp. – Redfern 2001: 134, sp. 555, is this species, according to Faber (2004: 56). Later amended by the author to *Pyrgocythara cinctella*.
Pygocythara cinctellus – Faber 2004: 56–57, 68, figs 109–120.
Pyrgocythara cinctella – Redfern 2013: 214, sp. 594.
Pyrgocythara cinctellum – Zhang 201: 153, sp. 580.

non *Pleurotoma fusca* C.B. Adams, 1845: 4. — Clench & Turner 1950: 283, pl. 29 fig. 9.

Differential diagnosis

Cryptomangelia eleutherae Fallon gen. et sp. nov. is larger (length = 5.4 versus 3.8 mm of holotype and lectotype, respectively).

Cryptomangelia fusca (C.B. Adams, 1845) gen. et comb. nov. has a distinct angulation at the shoulder, more sloping shoulders [not as high as *C. cinctella* (L. Pfeiffer, 1840) gen. et comb. nov.], a broader shell, and weaker primary spirals.

Cryptomangelia pumila Fallon & Bouchet gen. et sp. nov. has a protoconch with more whorls (2¼–2½ versus about 1½) and has lower shoulders.

Cryptomangelia psylla Fallon & Bouchet gen. et sp. nov. has a protoconch with more whorls (2¼ versus about 1½) and nearly evenly convex whorls versus high-shouldered whorls.

Type material

Lectotype
The lectotype was designated by Faber (2004: 56).

CUBA • 3.8 × 1.75 mm; ["Nordküste", Pfeiffer 1839: 349]; now in ZMA; originally ZMB 109.676.

Paralectotypes (19 specs)
Not examined.

Material examined

A photograph of the synonym, *Pleurotoma caribaea* d'Orbigny, 1853, was examined. The following lots are likely *Cryptomangelia cinctella* (L. Pfeiffer, 1840) gen. et comb. nov.

BAHAMAS • 2 specs, 4.1 × 1.8 and 2.6 × 1.4 mm; Grand Bahama Island; depth 1 ft [0.3 m]; 1981; J. Worsfold leg.; ANSP 355573 • 1 spec., not measured; Grand Bahama Island, Freeport, Caravel Beach; depth 0.5 m; 6 Jan. 1990; J. Worsfold leg.; in sediment under rocks; ANSP 375943.

Description

This description is based on a close examination of the photograph of the lectotype in Faber (2004). *Shell* small (3.8 × 1.75 mm), strong, fusiform with a short spire (W/L = 0.4605), of about 6 convex whorls with convex shoulders and impressed sutures, last whorl is 66% of shell length. Aperture narrowly oval, about 45% of shell length, and weakly demarcated from the short, open canal; sculpture of strong ribs and weak spirals. *Protoconch* of about 1½ round whorls, with fine axial riblets. *Axial sculpture* of strong ribs with round crests that extend from a little above the suture to the following suture on spire whorls and end at the anterior fasciole on the last whorl, intercostal distance greater than rib width, and greatest on dorsum of last whorl. Ribs slightly recurved on shoulder. *Varix* at aperture, broad, extends from suture to end of canal, narrowing anteriorly, and sculpted the same as shell surface. *Spiral sculpture* of weak primary and microscopic secondaries, 2 primaries on penultimate, the first strongest and defining whorl periphery and shoulder edge, another below about mid-way on whorl side, 5 additional primaries on shell base: one on suture line the others increasingly closer advancing anteriorly. Microscopic spirals packed into intercalary space. *Sulcus* absent. Recurved ribs on shoulder mark past positions of anal sinus. *Outer lip* varicose, a thin extension of the shell from the base of the varix; without stromboid notch. *Anal sinus* a deep notch carved into face of varix with a round apex and straight sides, laterally directed about 45° from shell axis, with a callus on the parietal wall, and a tooth inside the outer lip at the outer margin of the sinus. *Inner lip* a thin etched-in glaze along the columella, unemarginate. *Columella* straight. *Anterior canal* short, differentiated from aperture by a slight inflection of the shell base; channel, straight, unnotched. *Anterior fasciole* not swollen, with fine oblique spirals. *Color* a yellowish brown with a white shoulder band below the suture and white primary spirals. Protoconch and first teleoconch whorl are brown.

Remarks

The generic placement of *Cryptomangelia cinctella* (L. Pfeiffer, 1840) gen. et comb. nov. has been unsettled because of the absence of an appropriate available genus. The genus most recently applied, *Pyrgocythara*, is unsuitable for reasons explained in the introduction of this genus.

Faber (2004) placed *Pleurotoma fusca* C.B. Adams, 1945 in junior synonymy with *Pyrgocythara cinctella*, which is not supported here. *Cryptomangelia cinctella* (L. Pfeiffer, 1840) gen. et comb. nov. has all the diagnostic characteristics of the genus outlined at the beginning of this part.

Range and habitat

Based on the published literature and museum listings, *Cryptomangelia cinctella* (L. Pfeiffer, 1840) gen. et comb. nov. would appear to be widespread. However, it is likely that most are misidentified, therefore, the accepted range includes the north coast of Cuba (type locality) and, as reported for the synonym *Pleurotoma caribaea* by d'Orbigny, 1853 Martinique, Guadeloupe, or Cuba.

Cryptomangelia Fallon gen. nov. unid. sp. 6
Fig. 49D

Differential diagnosis

Cryptomangelia psylla Fallon & Bouchet gen. et sp. nov. is smaller and not biconic.

Cryptomangelia cinctella (L. Pfeiffer, 1840) gen. et comb. nov. has taller whorls, higher shoulders, and weaker spirals.

Material examined (1 spec.)

GUADELOUPE • 1 spec., 4.3 × 2.2 mm; Baie-Mahault; 16°16.17′ N, 61°35.1′ W; depth 1 m; 3 May 2012; KARUBENTHOS 2012; stn GM03; sequenced; MNHN-IM-2013-20600.

Partial description

Shell small, biconic, strong, with convex whorls, a narrow oval aperture and short anterior canal. *Protoconch* worn. *Axial sculpture* of strong, narrow ribs that number 10 on the penultimate and 8 on the last whorl. *Spiral sculpture* of primaries and secondaries, a strong primary lies at the whorl perimeter a weaker one on whorl side, with another strong primary at the suture line. Secondary spirals are microscopic.

Remarks

The available specimen appears to be sub-adult, so it is not possible to give a full description currently.

Cryptomangelia Fallon gen. nov. unid. sp. 6 has all the diagnostic characteristics of the genus outlined at the beginning of this part and appears in the *Cryptomangelia* clade of the Bayesian tree (Fig. 2).

Cryptomangelia furva Fallon & Bouchet gen. et sp. nov.
urn:lsid:zoobank.org:act:750007A3-E678-4AD5-B137-B1F3F386AA98
Figs 47A, 49E–P

Differential diagnosis

This species is larger than *Cryptomangelia pumila* Fallon & Bouchet gen. et sp. nov. (length = 3.9 versus 3.6 mm) but that species differs in possessing a taller body whorl (holotypes 65% versus 61% of shell length), has weaker primary spirals, less convex spire whorls, and a different color pattern (brown with lighter colored shoulders versus all brown).

Cryptomangelia psylla Fallon & Bouchet gen. et sp. nov. has a protoconch of 2½ versus 2–2¼ whorls with a median beaded spiral versus a solid sub-median one and is a different color.

Cryptomangelia albovittata (C.B. Adams, 1845) Gen. et comb. nov. has a broad white band on whorl sides.

Cryptomangelia multilineata (C.B. Adams, 1845) gen. et comb. nov. lacks primary spirals.

Cryptomangelia vicina (C.B. Adams, 1850) gen. et comb. nov. has less convex whorls, higher and narrower shoulders, and is colored differently.

Cryptomangelia plicosa (C.B. Adams, 1850) gen. et comb. nov., has more and coarser primary spirals and is larger (length = 5.3 versus average length = 3.9 mm of *C. furva*).

Cryptomangelia cinctella (L. Pfeiffer, 1840) gen. et comb. nov., has higher, broader shoulders, weaker spiral primaries, and a broader shell.

Etymology

Cryptomangelia furva Fallon & Bouchet gen. et sp. nov., the dark-colored *Cryptomangelia*, derives its name from the feminine form of the Latin adjective '*furvus*', meaning 'dark-colored', which refers to its nearly black color when fresh.

Type material

Holotype

GUADELOUPE • 3.6 × 1.6 mm; Tête à l'Anglais; 16°22.9′ N, 61°45.94′ W; depth 23 m; 8 May 2012; KARUBENTHOS 2012, stn GS08; sequenced; MNHN-IM-2013-20638.

Paratypes (14 specs)

GUADELOUPE • 1 spec., 3.2 × 2.0 mm; Caye Plate (PCSM); 16°10.97′ N, 61°32.41′ W; depth 14 m; 25 May 2012; KARUBENTHOS 2012; stn GS33; sequenced; MNHN-IM-2013-20632 • 1 spec., 3.8 × 1.7 mm; Anse à la Barque; 16°05.72′ N, 61°46.26′ W; depth 14 m; 9 May 2012; KARUBENTHOS 2012; stn GD11; MNHN-IM-2012-7291 • 3 specs, 4.0 × 1.6, 4.1 × 1.7 and 3.7 × 1.6 mm; Basse-Terre; 16°12.42′ N, 61°47.12′ W; depth 35 m; 8 May 2012; KARUBENTHOS 2012; stn GD08; MNHN-IM-2012-7293 • 3 specs, 4.2 × 1.8, 3.5 × 1.5 and 2.7 × 1.3 mm; Tête à l'Anglais; 16°22.9′ N, 61°45.94′ W; depth 23 m; 8 May 2012; KARUBENTHOS 2012; stn GB06; MNHN-IM-2012-7294 • 4 specs, 4.4 × 1.8, 4.2 × 1.7, 3.8 × 1.6 and 3.9 × 1.6 mm; Basse-Terre, inside Caraïbe Bay; 16°12.4′ N, 61°47.03′ W; depth 3 m; 12 May 2012; KARUBENTHOS 2012; stn GD18; MNHN-IM-2012-14886 • 1 spec., 4.2 × 1.7 mm, ethanol-preserved; 16°12.42′ N, 61°47.12′ W; depth 35 m; 8 May 2012; KARUBENTHOS 2012; stn GD08; sandy bottoms with *Halophila stipulacea*; MNHN-IM-2019-34694 • 1 spec., 4.9 × 1.8 mm, ethanol-preserved; 16°12.42′ N, 61°47.12′ W; depth 35 m; 8 May 2012; KARUBENTHOS 2012; stn GD08; sandy bottoms with *Halophila stipulacea*; MNHN-IM-2019-34695.

Other material examined (3 specs)

An additional 3 specimens from Guadeloupe were examined.

Description

Shell small, strong, fusiform with a short spire (3.6 × 1.6 mm, W/L = 0.4444), of 6 convex whorls, last whorl 61% of shell length, suture impressed, shoulder ends at first spiral cord; aperture narrowly oval, about 44% of shell length with a very short, open canal; sculpture of strong ribs and a few weak primary spiral. *Protoconch* of 2–2¼ whorls, 2nd whorl with more than a ¼-round profile, tip minute then expanding rapidly, the last 1¼ whorl with fine axial riblets crossed by a sub-median spiral forming a weak carina. Riblets above carina arched, those below straight, slightly opisthocline. The tip to first ½ whorl opaque white, the remainder translucent brown. *Axial sculpture* of strong ribs that round over shoulders and extend from suture to suture on spire whorls and end at the anterior fasciole on the last whorl, intercostal distance about rib width, except on dorsum of last whorl where ribs are spaced further apart. Ribs narrower and recurved on shoulder. *Varix* apertural, broad, extends from a little above suture to end of canal, grooved behind giving it a rope-like appearance. *Spiral sculpture* of primary and microscopic secondary spirals, 2 primaries on penultimate, one at periphery, another below, 5 primaries on shell base: one on suture line the others increasingly closer advancing anteriorly. Microscopic secondaries crowd intercalary space, so fine the shell appears glossy. *Sulcus* absent. Recurved ribs on shoulder mark past positions of anal sinus. *Outer lip* varicose, without stromboid notch, a tooth present on the underside of the lip below the anal sinus. *Anal sinus* a deep notch angled laterally, carved into face of varix with a round apex and straight sides, offset from suture by a parietal callus. *Inner lip* a thin etched-in glaze

along the columella, unemarginate, with a parietal callus posteriorly. *Columella* straight. *Anterior canal* short, differentiated from aperture by a slightly narrowing channel, straight, unnotched. *Anterior fasciole* not swollen, with about 4 oblique spiral primaries. *Color* a dark reddish brown.

Remarks

18 measured specimens have an average length = 3.9 mm (range = 3.2–4.9 mm).

Range and habitat

Guadeloupe: depth 3–35 m, live taken at depth 14–35 m.

Cryptomangelia psylla Fallon & Bouchet gen. et sp. nov.
urn:lsid:zoobank.org:act:8B53A03D-5690-44FE-89CF-519D171DF80F
Fig. 49Q–X

Differential diagnosis

Cryptomangelia psylla Fallon & Bouchet gen. et sp. nov. differs from its congeners in the following manner:

Cryptomangelia furva Fallon & Bouchet gen. et sp. nov. has a protoconch of 2–2¼ versus 2½ whorls with a solid sub-median spiral versus a median beaded one, and is a different color.

Cryptomangelia albovittata (C.B. Adams, 1845) gen. et comb. nov. is larger (length of holotypes = 6.2 versus 3.6 mm), and has less convex whorls.

Cryptomangelia multilineata (C.B. Adams, 1845) gen. et comb. nov. is larger, has fewer convex whorls, and lacks primary spirals.

Cryptomangelia vicina (C.B. Adams, 1850) gen. et comb. nov. lacks primary spirals.

Cryptomangelia plicosa (C.B. Adams, 1850) gen. et comb. nov. has more and coarser primary spirals and is larger (length = 5.3 versus 3.5 mm).

Cryptomangelia cinctella (L. Pfeiffer, 1840) gen. et comb. nov. has higher, broader shoulders, weaker spiral primaries, and a broader shell.

Etymology

Cryptomangelia psylla Fallon & Bouchet gen. et sp. nov. is a name in apposition for the Greek noun, in its feminine form for the flea, referencing its small size and abundance in samples.

Type material

Holotype

MARTINIQUE • 3.6 × 1.5 mm; Bellefontaine, Fond Boucher; 14°39.3′ N, 61°09.4′ W; depth 14 m; 27 Sep. 2016; MADIBENTHOS; stn AS363; MNHN-IM-2000-39588.

Paratypes (18 specs)

MARTINIQUE • 1 spec., 3.6 × 1.5 mm; Fort-de-France Bay, Nègres Point; 14°35.9′ N, 61°05.7′ W; depth 60 m; 9 Sep. 2016; MADIBENTHOS; stn AN212; MNHN-IM-2000-39591 • 1 spec., 3.5 × 1.5 mm; Fort-de-France Bay, E Grande Sèche; 14°34.6′ N, 61°03.3′ W; depth 6 m; 9 Oct. 2016; MADIBENTHOS; stn AB398; MNHN-IM-2000-39589 • 5 specs, 3.9 × 1.7, 2.9 × 1.3, 3.4 × 1.4, 3.1 × 1.5, and 3.7 × 1.7 mm;

Anse Noire, Sortie Rivière; 14°31.7′ N, 61°05.3′ W; depth 5–10 m; 7 Sep. 2016; MADIBENTHOS; stn AD208; USNM 1715396 • 1 spec., 3.4 × 1.5 mm; Fort-de-France Bay, Pointe des Nègres; 14°35.9′ N, 61°05.5′ W; depth 8 m; 9 Oct. 2016; MADIBENTHOS; stn AR418; MNHN-IM-2000-39593 • 1 spec., 3.2 × 1.4 mm; Passe du Marin, Pointe Borgnesse; 14°26.9′ N, 60°54′ W; depth 15 m; 11 Sep. 2016; MADIBENTHOS; stn AD067; MNHN-IM-39590 • 1 spec., 4.5 × 2.1 mm; Baie du Robert, Pointe du Sable Blanc; 14°39.9′ N, 60°53.9′ W; depth 0–2 m; 24 Sep. 2016; MADIBENTHOS; stn AM028; MNHN-IM-2000-39592 • 1 spec., 3.8 × 1.6 mm; Fort-de-France Bay, Pointe du Bout; 14°33.7′ N, 61°03.1′ W; depth 2 m; 9 Oct. 2016; MADIBENTHOS; stn AD623; ANSP 498838 • 7 specs, (3 measured) 3.7 × 1.5, 3.1 × 1.4 and 3.2 × 1.4 mm; Fort-de-France Bay, Banc Mitan; 14°35′ N, 61°04.6′ W; depth 13 m; 7 Oct. 2016; MADIBENTHOS; stn AB392. MNHN-IM-2000-39594.

Description

Shell small, strong, fusiform with a short spire (3.6 × 1.5 mm, W/L = 0.4167), of 6 convex whorls, last whorl 67% of shell length suture impressed, shoulder ends at first spiral cord; aperture narrowly oval with a very short, open canal, about 50% of shell length including canal; sculpture of strong ribs and a few weak primary spirals. *Protoconch* of 2½ whorls, 2nd whorl profile ¼-round, tip minute then expanding rapidly, riblets present on last whorl, last ½ with a median spiral forming a weak beaded carina where spiral crosses riblets, with riblets below almost obsolete. The tip to first ½ whorl opaque white, the remainder translucent brown. *Axial sculpture* of strong ribs that round over shoulders and extend from suture to suture on spire whorls and end at the anterior fasciole on the last whorl, with an intercostal distance about rib width, except on dorsum of last whorl, where ribs are spaced further apart. Ribs narrower and recurved on shoulder. *Varix* apertural, broad, extends from a little above suture to end of canal, grooved behind giving it a rope-like appearance. *Spiral sculpture* of primary and microscopic secondary spirals, 2 primaries on penultimate, one at periphery, another midway below, 5 primaries on shell base: one on suture line the others increasingly closer advancing anteriorly, all slightly swollen on ribs. Microscopic secondaries crowd intercalary space, that are so fine the shell appears glossy. *Sulcus* absent. Recurved ribs on shoulder mark past positions of anal sinus. *Outer lip* varicose, without stromboid notch, a tooth present on the underside of the lip below the anal sinus. Outer rim of varix crenated by primary spirals. *Anal sinus* a deep notch angled laterally, carved into face of varix with a round apex and straight sides, offset from suture by a parietal callus. *Inner lip* a thin etched-in glaze along the columella, unemarginate, with a parietal callus posteriorly. *Columella* straight. *Anterior canal* short, hardly differentiated from aperture, straight, unnotched. *Anterior fasciole* not swollen, with about 4 oblique spiral. *Color* a light to dark golden brown, the darker color in bands on shoulder and shell base, still others white with a dark mid-whorl band.

Remarks

16 measured specimens have an average shell length of 3.5 mm (2.9–4.5 mm).

Range and habitat

Martinique; depth to 60 m, live depth 2–35 m.

Cryptomangelia eleutherae Fallon gen. et sp. nov.
urn:lsid:zoobank.org:act:222D0B6F-160C-4C50-9CF1-3A54BCA18E96
Figs 47B, 49Y–FF

Differential diagnosis

Cryptomangelia mellosa Fallon & Bouchet gen. et sp. nov. has a protoconch of 2¼–2½ whorls (versus 2) and more closely set riblets that are not arched above the carina. It has narrower rib crests on the

teleoconch and is colored differently: a light golden brown with a white shoulder band, white primary spirals, and white protoconch.

Etymology

Cryptomangelia eleutherae Fallon gen. et sp. nov., the Eleuthera *Cryptomangelia*, after the type locality, Eleuthera Island, Bahamas.

Type material

Holotype

BAHAMAS • 5.4 × 2.5 mm; Eleuthera Island, Current, 300 m N of Current Cut; May 1978; H.G. Lee leg.; from beach drift; UF 589747.

Paratypes (8 specs)

BAHAMAS • 6 specs, 5.2 × 2.3, 4.8 × 2.2, 4.4 × 2.0, 5.0 × 2.2, 5.1 × 2.3 and 4.7 × 2.2 mm; same data as for holotype; UF 589748 • 2 specs, 5.3 × 2.1 and 4.5 × 2.1 mm; Eleuthera Island, Airport Beach; 1999; C.M. Lloyd leg.; from drift; UF 589749.

Description

Shell small (length = 5.4 mm), strong, fusiform with a short spire (W/L = 0.4630), of about 6½ convex whorls with broad, convex shoulders and impressed, undulant sutures, last whorl is 61% of shell length, including anterior canal. Aperture narrowly oval, about 41% of shell length and weakly demarcated from the short, open canal, sculpture of strong ribs primary and secondary spirals. *Protoconch* of about 1¼–1½ smooth, round whorls, recumbent around a narrow umbilicus, the tip rapidly expands to the last ¼–⅜ whorl that has fine riblets, crossed by a pair of spirals, about mid-whorl, on last ¼-whorl. Riblets above the carina are arched; those below are straight. *Axial sculpture* of strong ribs that extend from slightly above sutures to the following suture on spire whorls and evanesce at the anterior fasciole on the last whorl; intercostal distance about the same or less than rib width, except on dorsum of last whorl, where ribs are spaced further apart. Ribs round, narrower and slightly recurved on shoulder. *Varix* at aperture, broad, extends from suture to end of canal, narrowing anteriorly, and sculpted the same as shell surface. *Spiral sculpture* of thread-like primaries, about 4 on the penultimate, 4–5 on the base, and 2 weak primaries on shoulder; 0–3 secondaries appear in intercalary space, between primaries. *Sulcus* absent. Slightly recurved ribs on shoulder mark past positions of anal sinus. *Outer lip* varicose; sculpted as last whorl. *Anal sinus* a deep notch carved into face of varix with a round apex and straight sides, laterally directed about 45° from shell axis, rimmed with a thin lip, with a callus on the parietal wall, and a tooth inside the outer lip at the outer margin of the sinus. *Inner lip* a thin glaze etched along the columella, unemarginate. *Columella* straight. *Anterior canal* short, barely differentiated from aperture by a slight inflection of the shell base, channel, straight, slightly notched. *Anterior fasciole* not swollen, with fine oblique spirals. *Color* a yellowish brown with a white shoulder band below the suture and at mid-whorl below the suture line, visible on the shell base.

Remarks

The yellowish brown color may be sun-bleached samples; the brown specimens from Airport Beach, Eleuthera, may represent fresher ones, if not a brown color form. The average shell length of 9 specimens is 4.9 mm (range = 4.4–5.4 mm).

Range and habitat

Bahamas (Eleuthera Island); depth: shallow water (assumed; all specimens collected from beach drift).

Cryptomangelia espresso Fallon gen. et sp. nov.
urn:lsid:zoobank.org:act:9FEC1A71-2AA2-460B-AE8F-01315B922822
Fig. 49GG–KK

Differential diagnosis

Cryptomangelia eleutherae Fallon gen. et sp. nov. has a different spiral sculpture, of thread-like primaries and microscopic secondaries, and whorls are shouldered, not angular mid-whorl. The diameter of its protoconch is smaller.

Etymology

Cryptomangelia espresso Fallon gen. et sp. nov., the espresso *Cryptomangelia*, is a noun in apposition. This name refers to its coffee bean-colored base and cream-colored whorl shoulders, the color of the foam atop of the freshly made beverage.

Type material

Holotype

BAHAMAS • 4.3 × 2.0 mm; Exumas, off Great Guana Cay; depth 10–12 m; Apr. 2005; T. McCleery leg.; night SCUBA; in a rubble bottom; ANSP 498896.

Paratypes (3 specs)

BAHAMAS • 1 spec., 4.4 × 2.1 mm; same data as for holotype; ANSP 498897.

UNITED STATES OF AMERICA • 2 specs, 4.8 × 2.1 and 4.3 × 1.9 mm; Florida Keys, Monroe Co., off Dry Tortugas; depth 30 m; 1974; P.L. Wagner leg.; trawled, ex batfish stomachs; UF 589751.

Description

Shell small (length = 4.3 mm), stoutly fusiform with a short spire (W/L = 0.4651), of about 5½ whorls, teleoconch whorls obtusely angular mid-whorl with impressed sutures, last whorl largest, 67% of shell length including anterior canal. Aperture narrowly oval, about 47% of shell length, and weakly demarcated from the short, open canal; sculpture of strong spirals. *Protoconch* of about 1¼–1½ smooth whorls, tip small, tucked in below level of remaining first whorl, then expands rapidly; a narrow umbilicus present; last ¼–½-whorl with fine riblets; mid-whorl spiral begins at protoconch/teleoconch boundary, not on protoconch. *Axial sculpture* of strong ribs that extend from slightly above sutures to the following suture on spire whorls and evanesce at the anterior fasciole on the last whorl; intercostal distance about the same or greater than rib width, except on dorsum of last whorl where ribs are spaced further apart. Ribs round, narrower, and slightly recurved on shoulder, 9 on the penultimate and 8 on the last whorl. *Spiral sculpture* of flattened primary spirals of varying widths, 3 on penultimate whorl side and 5 on shell base. Intercalary space with few or no microscopic spirals. 2 of which on the penultimate are very slightly less flattened and slightly swollen on rib crests, the peripheral one the most. *Sulcus* absent. Slightly recurved ribs on shoulder mark past positions of anal sinus. *Outer lip* varicose; sculpted as dorsal surface of last whorl. *Anal sinus* a deep notch carved into face of varix with a round apex and straight sides, laterally directed about 45° from shell axis, rimmed with a thin lip, with a callus on the parietal wall, and tooth inside the outer lip at the outer margin of the sinus. *Inner lip* a thin glaze etched along the columella, unemarginate. *Columella* straight. *Anterior canal* short, barely differentiated from aperture by a slight inflection of the shell base, channel, straight, slightly notched. *Anterior fasciole* not swollen, with fine oblique spirals. *Color* a dark brown with a wide whitish peripheral band and 2 white peripheral spirals within the band.

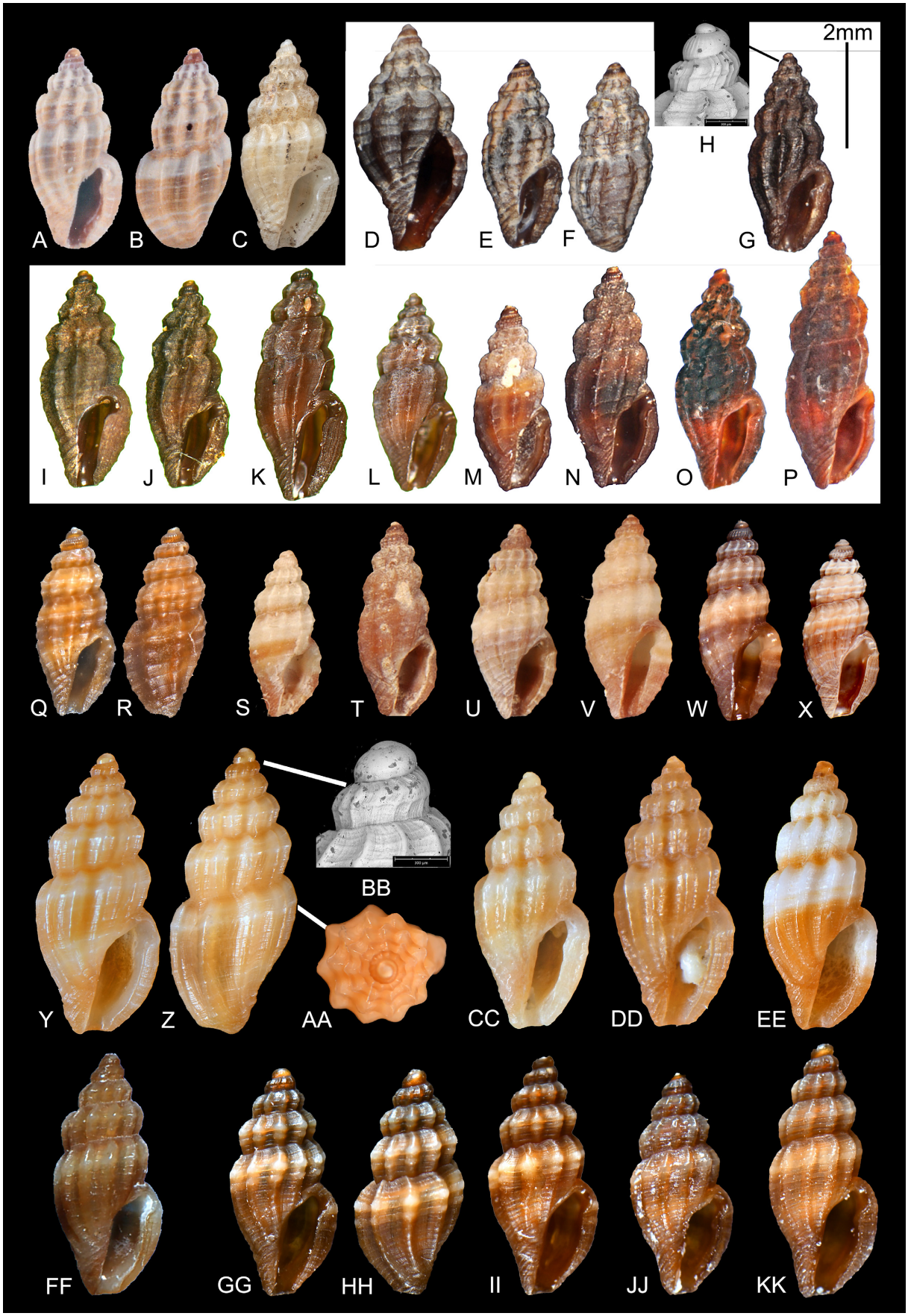
Remarks

From this small sample set, peripheral spirals are stronger and more swollen on Dry Tortugas specimens (Fig. 49GG–II) than those from Great Guana Cay (Fig. 49JJ–KK), and whorls slightly more angular. Nonetheless, the shared characteristic of unique flattened spirals is one indication that the specimens from these two localities are likely conspecific.

Range and habitat

Bahamas (Great Guana Cay, Exumas) and United States (Dry Tortugas, Florida Keys); depth 10–30 m.

Fig. 49 (next page). Species of *Cryptomangelia* Fallon gen. nov. Part 1. – **A–B**. *Pleurotoma cinctellum* L. Pfeiffer, 1840, lectotype, length = 3.8 mm, ventral and dorsal views (ZMUB 109.676). – **C**. *Pleurotoma caribaea* d'Orbigny, 1853, syntype, 4.0 × 1.8 mm (NHMUK 1854.10.4.428), Martinique, Guadeloupe, and Cuba, a junior subjective synonym of *P. cinctellum*. – **D**. *Cryptomangelia* Fallon gen. nov. unid sp. 6. Spec. 4.3 × 2.2 mm, sequence voucher (MNHN-IM-2013-20600), Baie-Mahault, Guadeloupe. – **E–P**. *Cryptomangelia furva* Fallon & Bouchet gen. et sp. nov. **E–F**. Holotype, sequenced voucher, 3.6 × 1.6 mm, ventral and dorsal views (MNHN-IM-2013-20638), Tête à l'Anglais, Guadeloupe. **G–H**. Paratype, 3.8 × 1.7 mm, ventral view, and SEM image of protoconch (MNHN-IM-2012-7291), Anse à la Barque, Guadeloupe. The medial protoconch spiral is seen in the image in H. **I–J**. Paratypes, 4.1 × 1.7 and 4.0 × 1.6 mm (MNHN-IM-2012-7293), Basse-Terre, Guadeloupe. **K–L**. Paratypes, 4.4 × 1.8 and 3.8 × 1.6 mm (MNHN-IM-2012-14886), inside Caribbean Bay, Basse-Terre, Guadeloupe. **M–N**. Paratypes, 3.5 × 1.5 and 4.2 × 1.8 mm (MNHN-IM-2012-7294), Tête à l'Anglais, Guadeloupe. **O**. Paratype, 4.2 × 1.7 mm, ethanol-preserved (MNHN-IM-2019-34694), sandy bottoms with *Halophila stipulacea*, Guadeloupe. **P**. Paratype, 4.9 × 1.8 mm, ethanol-preserved (MNHN-IM-2019-34695), sandy bottoms with *Halophila stipulacea*, Guadeloupe. – **Q–X**. *Cryptomangelia psylla* Fallon & Bouchet gen. et sp. nov. **Q–R**. Holotype, 3.6 × 1.5 mm, ventral and dorsal views (MNHN-IM-2000-39588), Bellefontaine, Fond Boucher, Martinique. **S–T**. Spec., 3.2 × 1.4 and 3.7 × 1.5 mm (MNHN-IM-2000-39594), Fort-de-France Bay, Banc Mitan, Martinique. **U–V**. Spec., 3.7 × 1.7 and 3.9 × 1.7 mm (USNM 1715396), Anse Noire, Sortie Rivière, Martinique. **W**. Spec., 3.8 × 1.6 mm (ANSP 498838), Fort-de-France Bay, Pointe du Bout, Martinique. **X**. Spec., 3.4 × 1.5 mm (MNHN-IM-2000-39593), Fort-de-France Bay, Nègres Point, Martinique. – **Y–FF**. *Cryptomangelia eleutherae* Fallon gen. et sp. nov. **Y–BB**. Holotype, 5.4 × 2.5mm, ventral, dorsal and apical views, and SEM image of protoconch (UF 589747), 300 mi. N of Current Cut, Current, Eleuthera Island, Bahamas. Protoconch turned in the image so that the pair of spirals and fine riblets are barely visible on the left side. **CC–EE**. Paratypes, 4.8 × 2.2, 5.0 × 2.2 and 5.2 × 2.3 mm (UF 589748), 300 mi. N of Current Cut, Current, Eleuthera Island, Bahamas. **FF**. Paratype, 4.5 × 2.1 mm (UF 589749) Airport Beach, Eleuthera Island, Bahamas. – **GG–KK**. *Cryptomangelia espresso* Fallon gen. et sp. nov. **GG–HH**. Holotype, 4.3 × 2.0 mm, ventral and dorsal views (ANSP 498896), off Great Guana Cay, Exumas, Bahamas. **II**. Paratype, 4.4 × 2.1 mm (ANP 498897), off Great Guana Cay, Exumas, Bahamas. **JJ–KK**. Paratypes, 4.3 × 1.9 and 4.8 × 2.1 mm (UF 589751), off Dry Tortugas, Florida Keys. Credits: A–B: photo courtesy of Marien Faber; C: image copyright of the NHMUK, photograph taken by Kevin Webb, NHMUK Photographic Unit; H, BB: SEM images courtesy of Chandler J. Olson. Scale bars: A–G, I–AA, CC–KK = 2 mm; H, BB = 300 μm.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Cryptomangelia Fallon gen. nov. spp. Part 2

Cryptomangelia mellosa Fallon & Bouchet gen. et sp. nov.
urn:lsid:zoobank.org:act:451BFA79-3387-4154-B245-56A30E93BBDF
Figs 47C, 51A–H

Differential diagnosis

Cryptomangelia eleutherae Fallon gen. et sp. nov. is similar but differs in possessing a smaller protoconch (about 1¼–1½ versus 2¼–2½ whorls), more widely spaced ribs, rounder rib crests, and is a different color (a yellowish brown with a white shoulder band below the suture versus light golden brown with a narrow white peripheral band, white primary spirals, a darker sutural band, and a white protoconch).

Etymology

Cryptomangelia mellosa Fallon & Bouchet gen. et sp. nov., the honey colored *Cryptomangelia*. Derived from the feminine form of the Latin adjective '*mellosus*', meaning 'honey-colored', the color of examined specimens.

Type material

Holotype
BRAZIL • 5.2 × 2.4 mm; Santa Catarina State, Porto Belo; May 1988; J.C. Tarasconi leg.; from intertidal grit; UF 589752.

Paratypes (5 specs)
BRAZIL • 3 specs, 5.2 × 2.2, 5.0 × 5.2 and 5.0 × 2.3 mm; same data as for holotype; UF 589753 • 1 spec. not measured; Santa Catarina State, Porto Belo; J.C. Tarasconi leg.; from intertidal grit; USNM 903231.

FRENCH GUIANA • 1 spec., 4.2 × 2.1 mm; off French Guiana; 6°09.8′ N, 53°01.7′ W; depth 93–96 m; 3 Dec. 2017; PROTEUS-GUYANE; stn DW5088; MNHN-IM-2000-40021.

Other material

BRAZIL • 1 spec., length = 8.0 mm; Espirito Santo State, Anchieta, Praia Castelhano; D. Kirsh coll.; accessed 13 Oct. 2021; posted on Jaxshells.org., an exceptionally large specimen.

Description

Shell small (length = 5.4 mm), strong, fusiform (W/L = 0.4615), of 6¾ broad-shouldered whorls, with nearly flat sides, last whorl 65% of shell length, suture impressed, undulant; aperture narrowly oval, varicose, about 44% of shell length with a short, open canal; sculpture of strong ribs and a few weak primary spirals. *Protoconch* of about 2¼–2½ whorls, the first minute, partially immersed, rapidly expands to the second whorl, riblets appear on the last full whorl with a median spiral on the last ½-whorl that forms a carina. *Axial sculpture* of strong ribs with round shoulders that extend from suture to suture on spire whorls and end at the anterior fasciole on the last whorl, intercostal distance about the same as rib width, except on dorsum of last whorl where ribs are spaced further apart. Ribs 10 on penultimate and 7 on the last whorl to the varix, are narrower with narrowed crests, and recurved on shoulder. *Varix* apertural, broad, extending from suture to end of canal, narrowing anteriorly. *Spiral sculpture* of primary and microscopic secondary spirals, 2 primaries on penultimate, peripheral spiral swollen on rib crests, the second midway on whorl side; 5 to 6 primaries on shell base, one on suture line the others increasingly closer advancing anteriorly. Microscopic secondaries packed into intercalary space, so fine the shell appears glossy. *Sulcus* absent. Recurved ribs on shoulder mark past positions of anal sinus. *Outer lip* varicose, with a narrow strip of shell along the base of the varix, without stromboid notch,

a tooth present on the underside of the lip below the anal sinus. *Anal sinus* a deep notch carved into face of varix and laterally directed, with a round apex and straight sides, bridged to suture by a parietal callus. *Inner lip* a narrow glaze along the columella, margined along parietal wall, with a parietal callus posteriorly. *Columella* straight. *Anterior canal* short, undifferentiated from aperture, straight, slightly notched at its end. *Anterior fasciole* not swollen, with about 6 oblique primary spirals. *Color* a light golden brown with a white shoulder band, white primary spirals, and white protoconch.

Range and habitat

Southern Brazil and off French Guiana; depth, intertidal (S Brazil), 93–96 m (off French Guiana).

Cryptomangelia pumila Fallon & Bouchet gen. et sp. nov.
urn:lsid:zoobank.org:act:D24B8F95-6EF8-4AA9-99A2-8E035DA7F3D8
Figs 47D, 51I–Z

Differential diagnosis

Cryptomangelia psylla Fallon & Bouchet gen. et sp. nov. differs in the following manner: it has stronger primary spirals, more convex spire whorls, is slightly larger on average (3.9 versus 3.6 mm), has a proportionally smaller body whorl (holotypes 61% versus 65% of shell length), and has a different and more variable color.

Etymology

Cryptomangelia pumila Fallon & Bouchet gen. et sp. nov. derives its name from the comparative form of the Latin adjective '*pumilio*', meaning 'dwarf", which refers to the species' small size.

Type material

Holotype
MARTINIQUE • 3.9 × 1.6 mm; Anse à Voile; depth 5–7 m; 7 Oct. 2017; MADIBENTHOS; stn AS570; MNHN-IM-2000-39595.

Paratypes (47 specs)
MARTINIQUE • 16 specs, 3.7 × 1.5, 4.0 × 1,8, 3.2 × 1.5, 4.3 × 1.6, 4.0 × 1.7, 4.5 × 1.8, 3.9 × 1.6, 3.0 × 1.4, 4.0 × 1.6, 3.5 × 1.6, 4.6 ×1.8, 3.6 × 1.7, 3.8 × 1.6, 2.9 × 1.5, 3.5 × 1.6 and 4.2 × 1.7 mm; Grand Rivière, Pointe du Souffleur; 14°52′ N, 61°11.7′ W; depth 6 m; 3 Oct. 2016; MADIBENTHOS; stn AS557; MNHN-IM-2000-39598 • 7 specs, 3.4 × 1.4, 3.5 × 1.5, 3.9 × 1.6, 3.5 × 1.6, 3.7 × 1.7. 2.4 × 1.2 and 3.4 × 1.6 mm; Le Lorrain, Rocher Burgaux; 14°50.7′ N, 61°03.8′ W; depth 11–14 m; 6 Oct. 2016; MADIBENTHOS; stn AS565; MNHN-IM-2000-39599 • 1 spec., 3.6 × 1.5 mm; Le Carbet; 14°42.3′ N, 61°11.6′ W; depth 77 m; 3 Oct. 2016; MADIBENTHOS; stn AD295; MNHN-IM-2000-39596 • 14 specs, 4.4 × 1.9, 4.0 × 1.6, 3.7 × 1.6, 3.8 × 1.6, 4.0 × 1.7, 3.3 × 1.5, 2.3 × 1.3, 2.9 × 1.4, 3.4 × 1.5, 3.4 × 1.5, 3.4 × 1.5, 3.7 × 1.6, 3.7 × 1.6 and 3.5 × 1.5 mm; Anse à Voile; 14°51′ N, 61°12.9′ W; depth 5–7 m; 7 Oct. 2016; MADIBENTHOS; stn AS570; MNHN-IM-2000-39601 • 2 specs, 3.7 × 1.6 and 3.7 × 1.6 mm; Macouba, Pointe de Macouba; 14°52.9′ N, 61°08.5′ W; depth 15 m; 3 Oct. 2016; MADIBENTHOS; stn AS554; USNM 1715397 • 1 spec., 3.6 × 1.5 mm; Caravelle Peninsula, N of Loup Ministre; 14°48.2′ N, 60°55.8′ W; depth 14 m; 4 Oct. 2016; MADIBENTHOS; stn AB559; MNHN-IM-2000-39597 • 3 specs, 3.6 × 1.6, 2.5 × 1.2 and 3.3 × 1.5 mm; Macouba, N of Pointe de Macouba; 14°53.1′ N, 61°09.1′ W; depth 22 m; 22 Sep. 2016; MADIBENTHOS; stn AD258; MNHN-IM-2000-39600 • 2 specs, 3.6 × 1.6 and 3.5 × 1.5 mm; Anse des Galets; 14°51.4′ N, 61°12.8′ W; depth 0–10 m; 7 Oct. 2016; MADIBENTHOS; stn AB567; ANSP 498839 • 1 spec., 4.4 × 1.7 mm; Anse d'Arlet, 2 m; R. Delannoye leg.; from under a coral slab; MNHN-IM-2022-17814.

Other material examined (8 specs)

GUADELOUPE • 1 spec., length = 3.5 mm; inner Caraïbe Bay; 16°12.4′ N, 61°47.03′ W; depth 3 m; 12 May 2012; MADIBENTHOS; stn GD18; MNHN-IM-2012-7449.

ST. KITTS AND NEVIS • 2 specs, lengths = 3.8 and 3.6 mm; Nevis Island, Gallows Bay; 2005; S. Hewitt leg.; from beach drift; S. Hewitt coll. • 1 spec., length = 4.5 mm; Nevis Island, Cades Bay; 2005; S. Hewitt leg.; from beach drift; S. Hewitt coll. • 2 specs, lengths = 3.7 and 3.5 mm; Nevis Island, Pinneys Beach S of Beachcomber Rest.; 25–26 Apr. 2001; S. Hewitt leg.; from beach drift; S. Hewitt coll. • 2 specs, lengths = 3.7 and 4.0 mm; Nevis Island, Charlestown, "Rest Haven"; 7 May 2006; S. Hewitt leg.; from beach drift; S. Hewitt coll.

Description

Shell small (holotype length = 3.9 mm, largest length = 4.6 mm), fusiform, stout (W/L = 0.4103) of 6 whorls total, 3½ convex teleoconch whorls with deeply incised, undulant sutures (ribs not reduced at sutures and rise above the suture line), last whorl comprising 65% of shell length; aperture narrowly oval, about 45% of shell length with a very short, open canal; sculpture of strong ribs and weak spirals. *Protoconch* consists of 2¼–2½ glossy whorls, rounded on their shoulders and nearly flat below their periphery. The last 1–1¼ whorls have riblets with a median spiral, a second developing above it afterwards. The spirals are initially weak, then strengthen and continue beyond the riblets onto the adult sculpture. Riblets above the spirals are arched, those below straight, oblique. Protoconch diameter is smaller than the first teleoconch whorl. Microscopic spirals begin on the first teleoconch whorl. *Axial sculpture* of strong, slightly sinusoidal ribs with narrow crests and intercostal space about the same or a little less than rib width, wider on dorsum of last whorl. Ribs run from suture to suture on spire whorls and to the anterior fasciole on the last; 11 ribs on the penultimate and 7 on the last to the varix. *Varix* apertural, broad, extending from suture to end of canal, its height narrowing anteriorly. *Spiral sculpture* of weak primaries and microscopic secondaries. Approximately 4 or 5 faint primaries on the shoulder from the suture to the whorl periphery, 5 primaries on the penultimate whorl side, and 7 on shell base. *Sulcus* absent. Recurved ribs on shoulder mark past positions of anal sinus. *Outer lip* varicose, with a is a narrow strip of shell along the base of the varix, with a narrow channel underneath, between the lip edge and base of varix, that extends the length of the lip; a tooth is present on the underside of the lip below the anal sinus; without a stromboid notch. *Anal sinus* a deep, laterally directed notch carved into face of varix with a round apex and straight sides. *Inner lip* a thin glaze along the columella, margined, with a parietal callus at the anal sinus. *Columella* straight. *Anterior canal* short, straight, undifferentiated from aperture l, slightly notched at tip. *Anterior fasciole* not swollen, with about 9 strong, oblique primary spirals. *Color* is dark reddish to golden brown with a lighter shoulder band; faded, or beach-collected shells, are lighter, a brownish red with a white shoulder band.

Remarks

The average length of 56 specimens is 3.6 mm (2.3–4.6 mm). specimens are variable in their coloration, light to dark brown with lighter shoulders. Beach-collected and assumed to be bleached specimens (those from St. Kitts) are reddish with white shoulders. Some specimens are almost all brown with little shoulder lightning.

Range and habitat

Martinique, Guadeloupe, and St. Kitts and Nevis (Nevis Island); depth 5–77 m, empty shells occur in beach drift.

Cryptomangelia guarani (d'Orbigny, 1841) gen. et comb. nov.
Figs 47E, 50, 51AA–GG

Pleurotoma guarani d'Orbigny, 1841: 445–446, pl. 77 figs 13–14.
Pleurotoma obesicostata Reeve, 1846a: pl. 39 fig. 265 is considered a synonym by Tryon (1884) but of uncertain synonymy by Rosenberg (2009). The type locality is West Indies. The type lot could not be found at the NHMUK (email message from Andreia Salvador, curator of marine gastropods, dated 23 Oct. 2018).

Defrancia obesicostata – H. & A. Adams 1853: 96.
Pleurotoma obesicostata – Krebs 1864: 11.
Daphnella guarani – Paetel 1888: 90.
Mangilia guarani – M. Smith 1951: 137, pl. 52 fig. 12.
Pyrgocythara guarani – Rios 1975: 139, pl. 42 fig. 639; 1985: 148, pl. 50 fig. 696; 1994: 175, pl. 58 fig. 808. — Williams 2005: #5712. — Dutra *et al*. 2005: 132.

Differential diagnosis

Cryptomangelia mellosa Fallon & Bouchet gen. et sp. nov. has the same general form and is also from Brazil but differs principally in coloration.

Type material

Holotype
BRAZIL • 5.0 × 2.5mm; Rio de Janeiro; depth not stated; NHMUK 1854.12.4.354.

Paratypes
None known.

Material examined (6 specs)

Only a photograph of the worn, protoconch lacking holotype was examined. Six other specimens were examined that are believed to be this species.

MARTINIQUE • 1 spec., 5.4 × 2.6 mm; Cul-de-Sac de Paquemar, Le Vauclin; 14°30.9′ N, 60°49.8′ W; depth 0 m; 4 Oct. 2016; MADIBENTHOS; stn AM042; sequenced; MNHN-IM-2013-72866 • 1 spec., 5.2 × 2.2 mm; Cul-de-Sac de Paquemar, Le Vauclin; 14°30.9′ N, 60°49.8′ W; depth 0 m; 4 Oct. 2016; MADIBENTHOS; stn AM042; sequenced; MNHN-IM-2013-72855 • 1 spec., 2.6 × 1.6 mm, juvenile; 14°30.9′ N, 60°49.8′ W; depth 0 m; 4 Oct. 2016; MADIBENTHOS; stn AM042; sequenced; MNHN-IM-2013-72868 • 1 spec., 4.9 × 2.1 mm, ethanol-preserved; N of La Caravelle Peninsula; 14°51.9′ N, 60°50.7′ W; depth 57 m; 19 Sep. 2016; MADIBENTHOS; stn AD247; sequenced; MNHN-IM-2013-72667 • 1 spec., 4.3 × 2.3 mm, juvenile; Cul-de-Sac de Paquemar, Le Vauclin; 14°30.9′ N, 60°49.8′ W; depth 0 m; 4 Oct. 2016; MADIBENTHOS; stn AM042; sequenced; MNHN-IM-2013-72869 • 1 spec., 5.0 × 2.3 mm; Cul-de-Sac de Paquemar, Le Vauclin; 14°30.9′ N, 60°49.8′ W; depth 0 m; 4 Oct. 2016; MADIBENTHOS; stn AM042; sequenced; MNHN-IM-2013-72867 • 1 spec., 5.2 × 2.3 mm; Cul-de-Sac de Paquemar, Le Vauclin; 14°30.9′ N, 60°49.8′ W; depth 0 m; 4 Oct. 2016; MADIBENTHOS; stn AM042; MNHN-IM-2000-39587.

Description

The single type specimen is worn, and the original published description insufficiently detailed for purposes here, so the following redescription is based partially on the specimen in MNHN-IM-2013-72866. Although the facies of the examined specimens closely match the type, there is the possibility that they are not the same, especially given the geographical distance separating the holotype

and the examined specimens (Rio de Janeiro and Martinique, respectively). *Shell* small, strong, (holotype length = 5.0 mm, without its protoconch), stoutly fusiform (W/L = 0.4815), of 7⅛ convex whorls, spire whorls noticeably wider than high, suture impressed, undulant, last whorl largest, 63% of shell length; aperture oval, with a very short, open canal, together with canal about 44% of shell length; sculpture of strong ribs and a few weak spiral cords. *Protoconch* of 2¼ translucent round whorls, tip minute, rapidly enlarging, first 1¼ whorl smooth, the last whorl with axial riblets and a mid-whorl carina slightly nodulose where it intersects riblets. *Axial sculpture* of strong, round, high-shouldered ribs that extend from suture to suture on spire whorls and end at the anterior fasciole on the last whorl, intercostal distance less that rib width, except on dorsum of last whorl where ribs are spaced further apart. Ribs narrow on shoulder and extend slightly above suture line. *Varix* apertural, extending from a little above the suture, then narrowing to the end of the anterior canal. *Spiral sculpture* of primaries and very fine secondaries; 2 primaries on penultimate, one at periphery, another below, 5 primaries on shell base, one on suture line, others increasingly closer advancing anteriorly. *Sulcus* absent. Recurved ribs on shoulder mark past positions of anal sinus. *Outer lip* varicose, with a narrow strip of shell along the base of the varix and a narrow channel underneath, between the outer lip and base of varix that extends the length of the lip; a tooth present on the underside of the lip below the anal sinus; without a stromboid notch. *Anal sinus* a deep laterally directed notch carved into face of varix, offset from suture by a parietal callus. *Inner lip* a thin etched in glaze along the columella, unemarginate, with a parietal callus posteriorly. *Columella* straight. *Anterior canal* short, straight, slightly notched. *Anterior fasciole* not swollen, with 6 spiral cords, first 2 with a single thread between. *Color* base an off white with a wide brown mid-whorl spiral band, its width extending symmetrically above and below the sutural line, and a narrow band on the shoulder next to the suture; a less distinct, lighter band present anteriorly; protoconch, and spiral cords white.

Animal

Photograph of live animal shows foot, proboscis, and cephalic tentacle as translucent white with numerous opaque white spots, and end of foot with a thin translucent, chitinous operculum (Fig. 50). Eyespot visible at the end of the fleshy part of the cephalic tentacle.

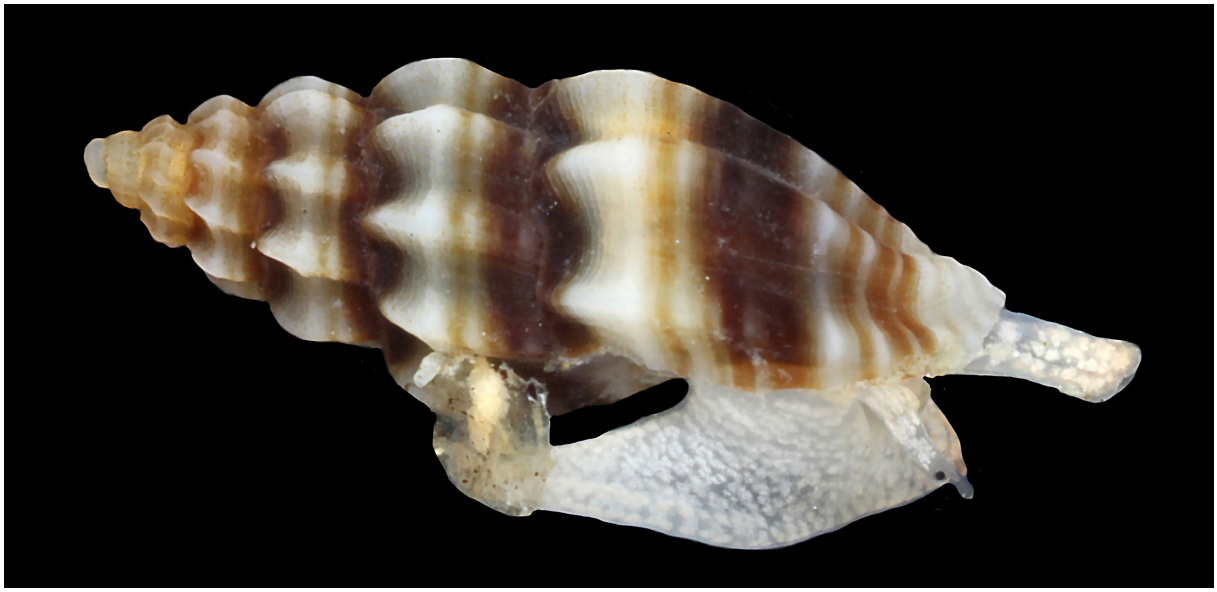


Fig. 50. *Cryptomangelia guarani* (d'Orbigny, 1841) gen. et comb. nov. (MNHN-IM-2013-72866), live animal. Photo by L. Charles.

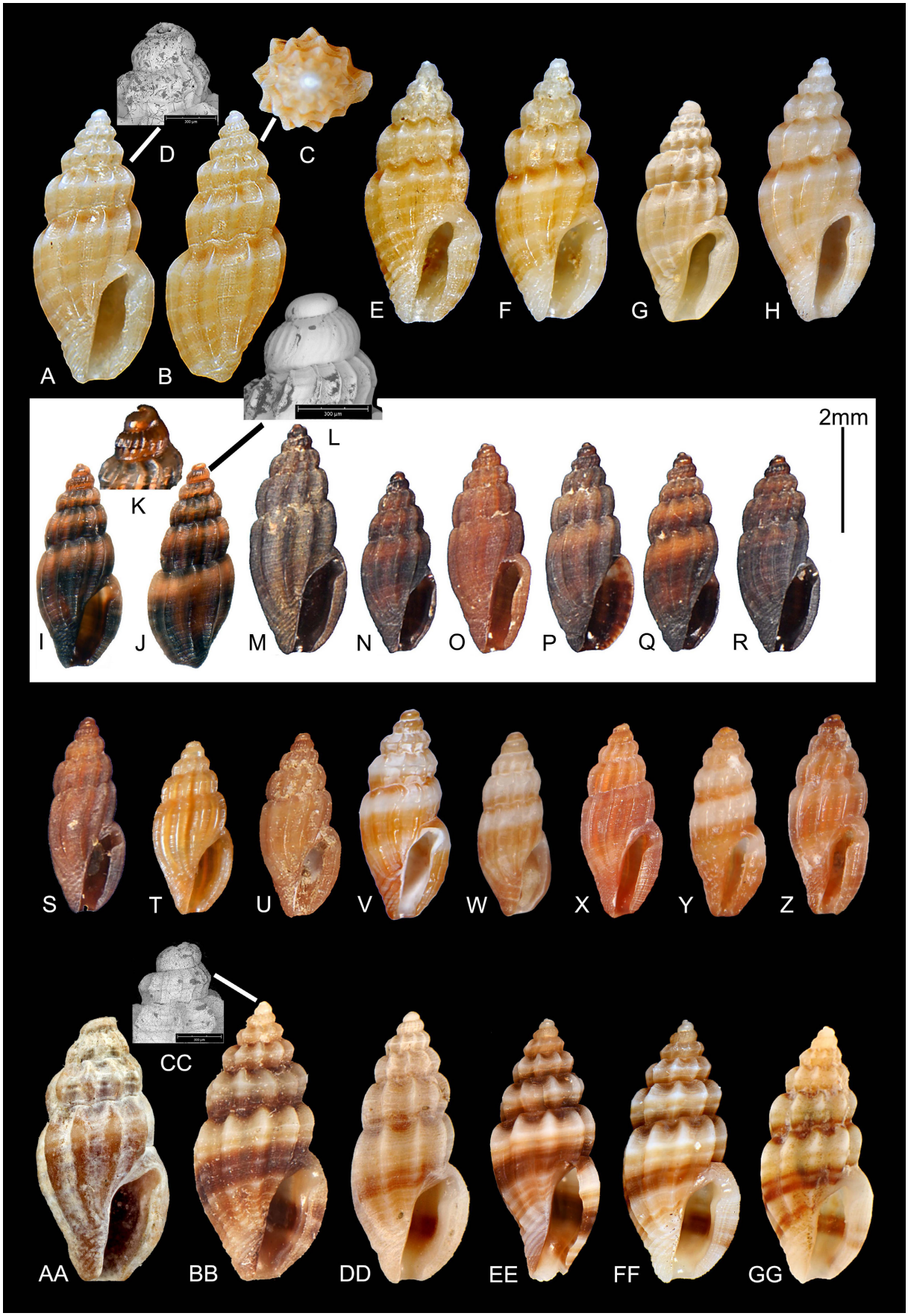
Remarks

The average length of 12 measured specimens is 4.8 mm (range = 2.6–5.5 mm). The width of the dark spiral band varies. Most examined specimens are from Martinique; those from Guadeloupe have an additional dark band on the lower half of the shell base and anterior fasciole.

Range and habitat

Brazil (Rio de Janeiro), Guadeloupe, and Martinique; depth 0–57 m, live depth 0–57 m.

Fig. 51 (next page). Species of *Cryptomangelia* Fallon gen. nov. Part 2. – **A–H**. *Cryptomangelia mellosa* Fallon & Bouchet gen. et sp. nov. **A–D**. Holotype, 5.2 × 2.4 mm, ventral, dorsal and apical views, SEM image of protoconch (UF 589752), Porto Belo, Santa Catarina State, Brazil. **E–F**. Paratypes, 5.2 × 2.2 and 5.0 × 5.2 mm (UF 589753), Porto Belo, Santa Catarina State, Brazil. **G**. Paratype 4.2 × 2.1 mm (MNHN-IM-2000-40021), off French Guiana. **H**. Paratype, not measured (USNM 903231), Porto Belo, Santa Catarina State, Brazil. – **I–Z**. *Cryptomangelia pumila* Fallon & Bouchet gen. et sp. nov. **I–L**. Holotype, 3.9 × 1.6 mm, ventral and dorsal views, expanded view of protoconch (not to scale), and SEM of protoconch (MNHN-IM-2000-39595), Anse à Voile, Martinique. The riblets' spiral is better seen in the photograph than in the angle of the SEM image. **M–S**. Paratypes, 4.4 × 1.9, 4.0 × 1.6, 4.0 × 1.7, 3.4 × 1.5, 3.4 × 1.5, 3.4 × 1.5 and 3.5 × 1.5 mm (MNHN-IM-2000-39601), Anse à Voile, Martinique. **T**. Paratype, 3.3 × 1.5 mm (MNHN-IM-2000-39600), Macouba, N Point of Macouba, Martinique. **U**. Spec., length = 3.5 mm (MNHN-IM-2012-7449), interior Caribbean Bay, Guadeloupe. **V**. Spec., length = 4.0 mm (S. Hewitt coll.) "Rest Haven", Charlestown, Nevis Island, Saint Kitts and Nevis. **W–X**. Specs, lengths = 3.5 and 3.7 mm (S. Hewitt coll.), Pinney's Beach, S of Beachcomber Rest., Nevis Island, Saint Kitts and Nevis. **Y–Z**. Specs, lengths = 3.6 and 3.8 mm (S. Hewitt coll.), Gallows Bay, Nevis Island, Saint Kitts and Nevis. – **AA**. *Pleurotoma guarani* d'Orbigny, 1841, holotype, 5.0 × 1.5 mm (MHNUK 1854.12.4.354). – **BB–GG**. *Cryptomangelia guarani* (d'Orbigny, 1841) gen. et comb. nov. **BB–CC**. Sequence voucher, 5.4 × 2.6 mm, ventral view, and SEM of protoconch (MNHN-IM-2013-72866), Le Vauclin, Cul-de-Sac de Paquemar, Martinique. **DD**. Spec., 5.2 × 2.3 mm (MNHN-IM-2000-39587), Le Vauclin, Cul-de-Sac de Paquemar, Martinique. **EE**. Sequence voucher, 5.2 × 3.2 mm (MNHN-IM-2013-72855), Le Vauclin, Cul-de-Sac de Paquemar, Martinique. **FF**. Sequence voucher, 5.0 × 2.3 mm (MNHN-IM-2013-72867), Le Vauclin, Cul-de-Sac de Paquemar, Martinique. **GG**. Spec., 4.9 × 2.1 mm, ethanol-preserved (MNHN-IM-2013-72667), N of La Caravelle Peninsula, Martinique. Credits: D, L, CC: SEM images courtesy of Chandler J. Olson; AA: courtesy of Harry Taylor, Photographic Unit, copyright NHMUK. Scale bars: A–C, E–K, M–BB, DD–GG = 2 mm; D, L, CC = 300 μm.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Cryptomangelia **Fallon gen. nov. spp. Part 3**

Cryptomangelia pulchella Fallon & Bouchet gen. et sp. nov.
urn:lsid:zoobank.org:act:5E732A8B-30ED-4C4E-8649-A3321B2CCDCD
Figs 47F, 52A–H

non *Pyrgocythara cinctellum* (L. Pfeiffer, 1840) – Zhang 2011: 153, fig. 580[1–2], may be this species.

Differential diagnosis

Cryptomangelia colombiana Fallon gen. et sp. nov. differs as follows: the protoconch has more riblets, below-carina riblets are straight, not oblique, and the color pattern of the shell differs, the shell base has a diffuse whitish band not a solid white band on the side of the whorl.

Cryptomangelia castanea Fallon gen. et sp. nov. differences are noted under the description of that species.

Etymology

Cryptomangelia pulchella Fallon & Bouchet gen. et sp. nov., from the feminine form of the Latin adjective '*pulchellus*', meaning 'the pretty' *Cryptomangelia*, after its striking coloration.

Type material

Holotype
GUADELOUPE • 4.7 × 1.9 mm; off Basse-Terre, Tête à l'Anglais; 16°22.9′ N, 61°45.94′ W; depth 23 m; 8 May 2012; KARUBENTHOS 2012; stn GS08; MNHN-IM-2012-7289.

Paratypes (7 specs)
GUADELOUPE • 2 specs, 4.3 × 1.8 and 3.8 × 1.6 mm; same data as for holotype; MNHN-IM-2000-39796 • 1 spec., 4.5 × 1.9 mm, ethanol-preserved; Caret Island; 16°21.26′ N, 61°37.79′ W; depth 2 m; 23 May 2012; KARUBENTHOS 2012; stn GS30; MNHN-IM-2019-34730 • 1 spec., 4.7 × 1.8 mm; Caye Plate (PCSM); 16°10.97′ N, 61°32.41′ W; depth 16 m; 25 May 2012; KARUBENTHOS 2012; stn GB30; MNHN-IM-2012-7287 • 3 specs, 4.1 × 1.8, 3.5 × 1.5 and 4.0 × 1.6 mm, ethanol-preserved; Caye Plate (PCSM), 16°10.97′ N, 61°32.41′ W; depth 14 m; 5 May 2012; KARUBENTHOS 2012; stn GS33; MNHN-IM-2019-34732.

Description

Shell small (length = 4.7 mm), fusiform, stout (W/L = 0.4043) of 6½ whorls, the 4 teleoconch whorls are convex with deeply incised, undulant sutures (ribs not reduced at sutures and rise above the suture line), last whorl 64% of shell length; aperture narrowly oval, about 44% of shell length including a short, open canal; sculpture of strong ribs and weak spirals. *Protoconch* of 2½ translucent whorls, the last with riblets crossed at first by 1 then 2 spirals, beginning about ½ whorl from protoconch termination. Riblets above the spirals are arched, below straight. *Axial sculpture* of strong ribs that extend from suture to suture on spire whorls and to anterior fasciole on the last, 11 on the penultimate, and 7 on last to varix. Ribs are narrow-crested, rise high on the whorl shoulder, and reduce rapidly to the anterior fasciole. Intercostal space is about as wide as the ribs, which along with the ribs is marked by fine growth striae. *Varix* apertural, broad, extending from suture to end of canal, narrowing anteriorly. *Spiral sculpture* of primary and microscopic secondary spirals, 3 primaries on the penultimate, 1 on whorl shoulder, 2 on whorl sides, the peripheral one strongest, 4 on shell base, 1 on suture line, and 3 below; spirals override ribs, and are slightly swollen on rib crests. Intercalary space is packed with microscopic spirals. *Sulcus* absent. Recurved ribs on shoulder mark past positions of anal sinus. *Outer lip* varicose, with a very narrow strip of shell off its base and a narrow channel on the underside of the lip, between the outer edge

and underside base of varix that extends the length of the lip; a tooth is present on the underside of the lip below the anal sinus; stromboid notch shallow. *Anal sinus* a deep laterally directed notch carved into face of varix with a round apex and straight sides, offset from suture by a parietal callus. *Inner lip* a thin etched-in glaze along the columella, not margined, with a parietal callus posteriorly. *Columella* straight. *Anterior canal* short, straight, not differentiated from the aperture; unnotched. *Anterior fasciole* not swollen, with about 4 oblique primary spirals. *Color* brown with a white peripheral band on the shoulder and a diffuse brownish-white band below it; some primary spirals white.

Remarks

The average length of 8 specimens is 4.2 mm (range = 3.5–4.7 mm). There are 2 color forms, a brown with white and brownish-white bands and a mostly all-brown form. Both forms have been taken in a single sample from the type locality and appear to be otherwise morphologically the same.

Range and habitat

Guadeloupe: depth 2–23 m, live-collected in 2 m.

Cryptomangelia colombiana Fallon gen. et sp. nov.
urn:lsid:zoobank.org:act:44B5EEC2-A8BE-43FF-B80C-C48BFE5A280F
Figs 47G, 52I–M

Differential diagnosis

Cryptomangelia pulchella Fallon & Bouchet gen. et sp. nov. protoconch has fewer riblets, below-carina riblets are oblique, not straight, and the color pattern of the shell differs. Its shell base possesses a narrow peripheral band and diffuse brownish-white band below it versus a wide peripheral white band and no band below it.

Cryptomangelia castanea Fallon gen. et sp. nov. differences are noted under the description of that species.

Etymology

Cryptomangelia colombiana Fallon gen. et sp. nov., the Colombian *Cryptomangelia*, after the country of the type locality.

Type material

Holotype
COLOMBIA • 4.9 × 2.1 mm; Tayrona Park; depth 18 m; dredged; from on sand; ANSP 498895.

Paratypes (2 specs)
COLOMBIA • 2 specs, 5.3 × 2.2 and 5.2 × 2.2 mm; same data as for holotype; ANSP 498894.

Description

Shell small (length = 4.9 mm), fusiform, stout (W/L = 0.4282) of about 6½ whorls, the 4½ teleoconch whorls are convex with deeply impressed, undulant sutures (ribs not reduced at sutures and rise above the suture line), last whorl 63% of shell length; aperture narrowly oval, about 45% of shell length including a short, open canal; sculpture of strong ribs and weak spirals. *Protoconch* of 2¼ translucent whorls, the last with riblets crossed at first by one then two mid-whorl spirals, beginning about ½ whorl from protoconch termination, forming a weak carina. Riblets above the carina are arched, below oblique. *Axial sculpture* of strong ribs that extend from suture to suture on spire whorls and to anterior fasciole on the last, 9 on the penultimate, and 6 on the last to the varix. Ribs are narrow-crested, rise high on the

whorl shoulder, and are straight, then curve to the fasciole. Intercostal space is about as wide as the ribs. *Varix* apertural, broad, extending from suture to end of canal, narrowing anteriorly. *Spiral sculpture* of primary and microscopic secondary spirals; 2 primaries on the penultimate, 1 on the whorl periphery, one on the lower whorl side; the peripheral one strongest; 4 on shell base; spirals override ribs and are slightly swollen on rib crests. Intercalary space is packed with microscopic spirals. *Sulcus* absent. Recurved ribs on shoulder mark past positions of anal sinus. *Outer lip* varicose with a narrow strip of shell off the base of the varix, and with a narrow channel underneath the lip, between the edge of the lip and base of varix, that extends the length of the lip; a tooth is present at the anal sinus and another under the lip at the anterior end of the aperture; stromboid notch very shallow. *Anal sinus* a deep laterally directed notch carved into face of varix with a round apex and straight sides, offset from suture by a parietal callus. *Inner lip* a narrow glaze along the columella, not margined, with a parietal callus posteriorly. *Columella* straight. *Anterior canal* short, straight, differentiated from the aperture by a small tooth inside the outer lip; slightly notched. *Anterior fasciole* is not swollen, with about 5 or 6 fine oblique spirals. *Color* brown with a single broad white band on upper part of the whorl side.

Range and habitat

Known only from the type locality.

Cryptomangelia albovittata (C.B. Adams, 1845) gen. et comb. nov.
Fig. 52N–O

Pleurotoma albo-vittata C.B. Adams, 1845: 4.
Pleurotoma luteo-fasciata Reeve, 1845: pl. 27 fig. 239. Stated herein as a nomen dubium (see introduction to genus) because the type is missing and cannot be confirmed as *C. albovittata*.

Mangelia albo-vittata – C.B. Adams 1850a: 55. — Jay 1850: 324 (cat.). — H. & A. Adams 1853: 99.
Pleurotoma luteo-fasciata – Tryon 1884: 248, pl. 21 fig. 32, noted synonymy with *P. albovittata* C.B. Adams, 1845.
Daphnella albovittata – Paetel 1888: 86.
Pleurotoma albo-vittata – Clench & Turner 1950: 254, pl. 30 fig. 3 (of holotype).
Pyrgocythara albovittata – Olsson & McGinty 1958: 18. — Nowell-Usticke 1959: 83.
Pyrgocythara albovittata – Dutra *et al.* 2005: 132. — García 2010: 12.
Kurtziella? *albovittata* – Vokes & Vokes 1983: 59, pl. 21 fig. 19 (= photo of holotype). — Espinosa *et al.* 1995: 44.

non *Defrancia luteofasciata* – H. & A. Adams 1853: 96. — Krebs 1864: 14. — Hutton 1878: 17, as a New Zealand shell later identified as *Clathurella sinclairi* (Gillies, 1882) by Tryon (1884: 248). — Paetel 1888: 82 (mis-attributed author as Hutton). — Suter 1899 (as a New Zealand shell).
non *Pyrgocythara albovittata* – Rios 1975: 139, pl. 42 fig. 636; 1985: 148, pl. 50 fig. 693; 1994: 175, pl. 58 fig. 805; 2009: 342, fig. 883. — Williams 2005: #5704 (Rios' figure). — Zhang 2011: 151, fig. 575.
non *Eucithara albovittata* (C.B. Adams, 1845) – C.-K. Chang 2001: 166, fig. 208.

Few reports of the occurrence of *Cryptomangelia albovittata* (C. B. Adams, 1845) gen. et comb. nov. have included photographs to aid in the confirmation of authors' identifications. Those without photographs should be considered potential sources, although stated localities outside of Jamaica are suspect. Those with figures that are not recognizable as *C. albovittata* include Rios (1975, 1985, 1994, 2009), wherein the same specimen, which is not *C. albovittata* but likely *C. castanea* Fallon gen. et sp. nov. is illustrated in all 4 publications. Rios cites Bahia to Santa Catarina, Brazil, as the distribution area; specimens of *C. castanea* Fallon gen. et sp. nov. are also from within the same geographic range.

Differential diagnosis

Cryptomangelia pulchella Fallon & Bouchet gen. et sp. nov. has convex whorls with higher shoulders.

Cryptomangelia colombiana Fallon gen. et sp. nov. has more convex whorls with higher shoulders.

Beach-worn specimens of *Cryptomangelia castanea* Fallon gen. et sp. nov. from southern Brazil may be mistaken for this species.

Type material

Holotype

Listed as the holotype by Clench & Turner (1950: pl. 30 fig. 3), possibly by monotypy (ICZN Art. 73.1.2.).

JAMAICA • 6.2 × 2.4 mm; MCZ 177358.

Paratypes

None known.

Material examined (1 spec.)

The holotype was examined.

Remarks

Cryptomangelia albovittata (C.B. Adams, 1845) gen. et comb. nov. confirms that it possesses most of the characteristics diagnostic of the genus listed at the beginning of Part 1. The protoconch morphology, obscured by wear, could not be ascertained but all other characteristics support this species' inclusion in the genus *Cryptomangelia*. The holotype is a worn specimen about which critical details of its surface sculpture and protoconch have been obscured. Its color, pale reddish-brown with a white band mid-whorl, may be faded. Similar but fresher specimens, preferably topotypes, should be examined before a necessary re-description can be written. in the meantime, we are left with C.B. Adams' worn specimen and the briefest of descriptions.

Range and habitat

Jamaica; depth not stated. None of the lots examined in museums collections have been identified as this species.

Cryptomangelia castanea Fallon gen. et sp. nov.
urn:lsid:zoobank.org:act:A8095C80-6160-42D4-9CF2-18E807E4F90A
Figs 47H, 52P–U

non *Pyrgocythara albovittata* (C.B. Adams, 1845) – Rios 1975: 139, pl. 42 fig. 636; 1985: 148, pl. 50 fig. 693; 1994: 175, pl. 58 fig. 805; 2009: 342, fig. 883. — Williams 2005: #5704 (the same as Rios' fig.).

Differential diagnosis

Cryptomangelia pulchella Fallon & Bouchet gen. et sp. nov. has color forms that closely resemble *C. castanea* Fallon & Bouchet gen. et sp. nov., but *C. pulchella* has a protoconch with more whorls (2½ versus 1½–1¾), a teleoconch with fewer primaries on the shell base (4 versus 8), primaries slightly swollen over most ribs, and possessing more ribs (11 versus 9) on the penultimate whorl.

Cryptomangelia colombiana Fallon gen. et sp. nov. has a protoconch with more whorls (2¼ versus 1½–1¾), a teleoconch with fewer primaries on the shell base (4 versus 8), and a different color pattern.

Etymology

Cryptomangelia castanea Fallon gen. et sp. nov., derived from the feminine Latin noun '*castanea*', meaning 'chestnut', is named for its chestnut color.

Type material

Holotype

BRAZIL • 6.1 × 2.4 mm; Santa Catarina State, Porto Belo; intertidal; 9 Jul. 1986; J.C. Tarasconi leg.; UF 589754.

Paratypes (5 specs)

BRAZIL • 2 specs, 6.4 × 2.7 and 6.3 × 2.5 mm; same data as for holotype; UF 589755 • 2 specs, 6.1 × 2.5 and 5.5 × 2.2 mm; Santa Catarina State, Bonbinhas; in drift; 1994; J.C. Tarasconi leg.; UF 589756 • 1 spec., length = 4.9 mm; Bahia State, Salvador, Itapua Beach; drift; Jan. 1989; G. Pomponet leg.; ANSP 498893.

Description

Shell small (length = 6.1 mm), fusiform, stout (W/L = 0.3934) of about 7 whorls, the teleoconch whorls are convex with round shoulders and deeply impressed, slightly undulant sutures, last whorl 65% of shell length; aperture narrowly oval, about 44% of shell length including a short, open canal; sculpture of strong ribs and weak spiral. *Protoconch* about 1½–1¾ translucent whorls (all type specimens missing protoconch tip), the last whorl with riblets crossed a mid-whorl spiral, beginning about ½ whorl from protoconch termination, forming a carina. Riblets above the carina are arched; those below are straight. *Axial sculpture* of strong ribs that extend from suture to suture on spire whorls and to anterior fasciole on the last, 9 on the penultimate, and 6 on the last to the varix. Ribs are narrow-crested, excavated on ventral sides, rise high and recurved on the shoulder, and curved to the fasciole. Intercostal space is about as wide as the ribs, wider on dorsum of last whorl. *Varix* apertural, broad, extending from suture to end of canal, narrowing anteriorly. *Spiral sculpture* of primary and microscopic secondary spirals; 2 primaries on the penultimate whorl side (none on shoulder), and 8 on shell base; spirals override ribs and are not swollen on rib crests. Intercalary space is packed with irregularly spaced microscopic spirals (see SEM image in Fig. 47H). *Sulcus* absent. Recurved ribs on shoulder mark past positions of anal sinus. *Outer lip* varicose with a narrow strip of shell along the base of the varix, and with a narrow channel underneath the lip, between the edge of the lip and base of varix, that extends the length of the lip; an anal tooth is present as is a swelling at the anterior end of the aperture, also inside the outer lip; stromboid notch shallow. *Anal sinus* a deep laterally directed notch carved into face of varix with a round apex and straight sides, offset from suture by a parietal callus. *Inner lip* a narrow glaze along the columella, margined, with a parietal callus at the anal sinus. *Columella* straight. *Anterior canal* short, straight, differentiated from the aperture by a swelling inside the outer lip; tip slightly notched. *Anterior fasciole* not swollen, with about 6 or 7 fine oblique spirals. *Color* light to dark chestnut brown with a wide, darker band mid-whorl.

Remarks

The peripheral primary spiral may be white and slightly swollen on rib crests of some specimens.

Range and habitat

Brazil (Santa Catarina and Bahia States); empty shells from drift and intertidal sediment.

Cryptomangelia fulgens (E.A. Smith, 1888) gen. et comb. nov.
Figs 48A, 52V–Z

Pleurotoma (*Mangilia*) *fulgens* E.A. Smith, 1888: 309.

Tenaturris fulgens – Rios 1985: 143, pl. 49 fig. 668; 1994: 176, pl. 58 fig. 811; 2009: 344, fig. 890. — de Barros *et al*. 2005: 146–147, fig. 1g. — Williams 2005: 5766. — Leite *et al*. 2009: 1.

Differential diagnosis

Cryptomangelia pumila Fallon & Bouchet gen. et sp. nov. has a protoconch of 2¼–2½ whorls (versus 1½–2) and is colored a dark reddish brown (versus white).

Cryptomangelia psylla Fallon & Bouchet gen. et sp. nov. has a protoconch of 2¼ whorls (versus 1½–2), has a length range of 3.2–4.9 mm (versus 4.8–5.7 mm), and is colored brown with a broad white band, or solid brown (versus white).

Cryptomangelia pulchella Fallon & Bouchet gen. et sp. nov. is colored differently, brown with white and brownish-white bands.

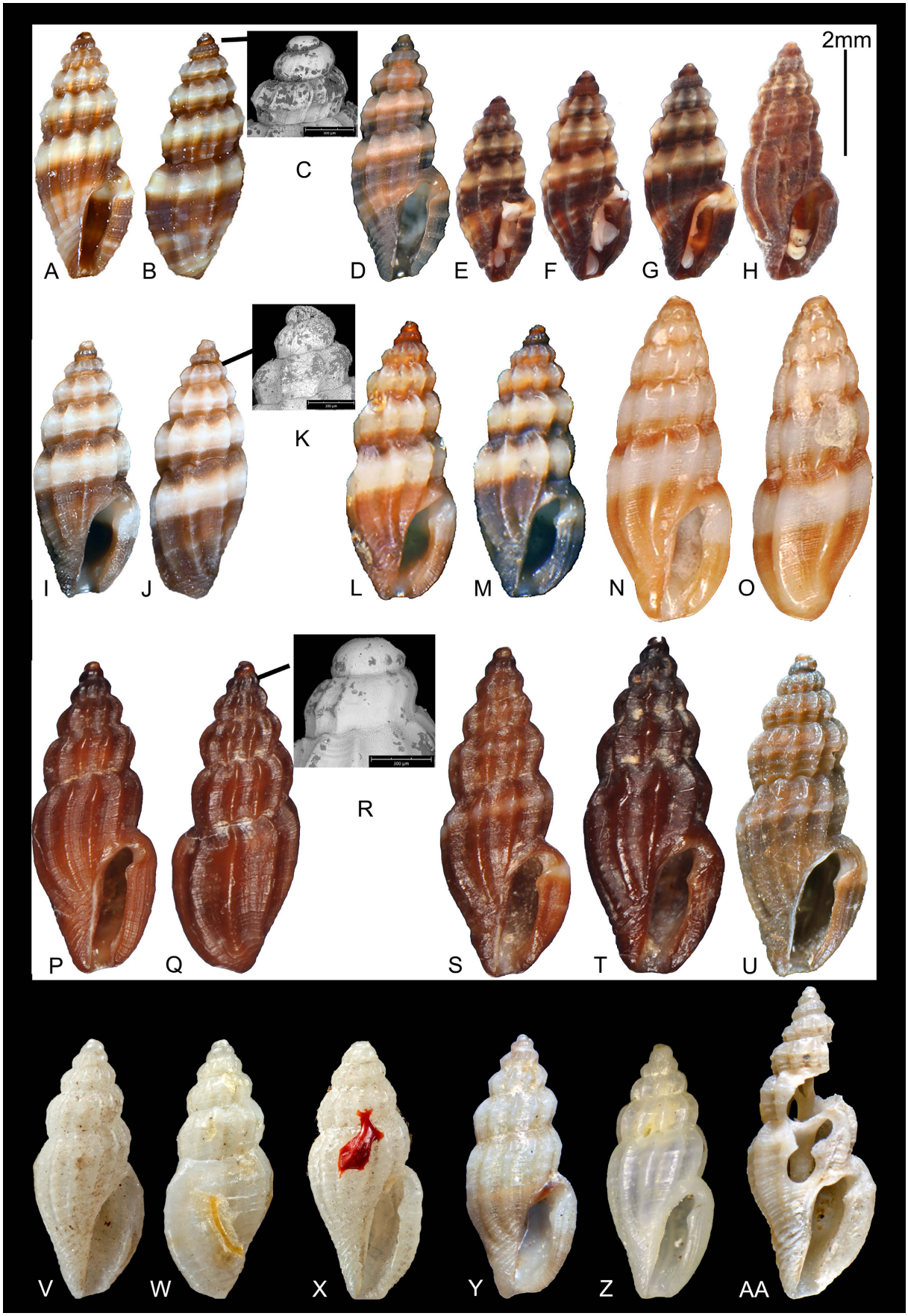
Type material

Syntypes (3 specs)
BRAZIL • 3 specs, lengths = 5.0, 4.9 and 4.5 mm; type locality unknown; NHMUK 18.74.5.26.34.

Material examined

Type specimens were not examined; instead, a photograph of the 3 syntypes provided by the NHMUK was used to aid in the identification of this species. Three other specimens believed to be this species were examined.

Fig. 52 (next page). Species of *Cryptomangelia* Fallon gen. nov. Part 3. – **A–H**. *Cryptomangelia pulchella* Fallon & Bouchet gen. et sp. nov. **A–C**. Holotype, 4.7 × 1.9 mm, ventral and dorsal views, and SEM image of protoconch (MNHN-IM-2012-7289), Tête à l'Anglais, off Basse-Terre, Guadeloupe. **D**. Paratype, 4.7 × 1.8 mm (MNHN-IM-2012-7287), Caye Plate (PCSM), Guadeloupe. **E–G**. Paratypes, 4.1 × 1.8, 3.5 × 1.5 and 4.0 × 1.6 mm, ethanol-preserved (MNHN-IM-2019-34732), Caye Plate (PCSM), Guadeloupe. **H**. Paratype, 4.5 × 1.9 mm, ethanol-preserved (MNHN-IM-2019-34730), Caret Island, Guadeloupe. **I–M**. – *Cryptomangelia colombiana* Fallon gen. et sp. nov. **I–K**. Holotype, 4.9 × 2.1 mm, ventral and dorsal views, and SEM of protoconch (ANSP 498895), Tayrona Park, Colombia. **L–M**. Paratypes, 5.3 × 2.2 and 5.2 × 2.2 mm (ANSP 498894), Tayrona Park, Colombia. – **N–O**. *Pleurotoma albovittata* C.B. Adams, 1845, holotype, 6.2 × 2.4 mm (MCZ 177358), Jamaica. – **P–U**. *Cryptomangelia castanea* Fallon gen. et sp. nov. **P–R**. Holotype, 6.1 × 2.4 mm, ventral and dorsal views, and SEM of protoconch (UF 589754), Porto Belo, Santa Catarina State, Brazil. **S–T**. Paratypes, 6.4 × 2.5 and 6.3 × 2.5 mm (UF 589755), Bonbinhas, Santa Catarina State, Brazil. **U**. Paratype, 6.1 × 2.4 mm (UF 589755), Porto Belo, Santa Catarina State, Brazil. – **V–X**. *Pleurotoma* (*Mangilia*) *fulgens* E.A. Smith, 1888, syntypes, length = 5.0 mm, ventral and lateral views, and length = 4.9 mm (NHMUK 18.74.5.26.34), habitat unknown. – **Y–Z**. *Cryptomangelia fulgens* (E.A. Smith, 1888) gen. et comb. nov. **Y**. Spec., 4.9 × 2.1 mm (ANSP 498898), Corumbau, Bahia, Brazil. **Z**. Spec., 4.8 × 2.0 mm (D. Kirsh coll.), Rendezvous Bay, Anguilla. – **AA**. *Cryptomangelia* Fallon gen. nov. unid. sp. L. Spec., 6.0 × 2.4 mm (MNHN-IM-2000-40045), from French Guiana. Specimen heavily "mined" but important details preserved. Credits: C, K, R: SEM images courtesy of Chandler J. Olson; V–X: Courtesy of Harry Taylor, Photographic Unit, copyright NHMUK. Scale bars: A–B, D–J, L–Q, S–AA = 2 mm; C, K, R = 300 μm.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ANGUILLA • 1 spec., 4.8 × 2.0 mm; Rendezvous Bay; depth 0 m; D. Kirsh leg.; from beach drift; D. Kirsh coll.

BRAZIL • 2 specs, 4.9 × 2.1 and 5.7 × 2.6 mm; Bahia State, Corumbau; depth 2–5 m; A. Jorio and L. Couto; leg.; by net; ANSP 498898.

Description

A non-type specimen (length = 4.9 mm) was used to supplement sculptural detail not seen in the photograph of syntypes. *Shell* small (length = 4.9 mm, red dot syntype), fusiform, stout (W/L = 0.4237) of about 7 whorls, the teleoconch whorls are convex with round shoulders and deeply impressed, slightly undulant sutures, last whorl 65% of shell length; aperture narrowly oval, about 44% of shell length including a short, open canal; sculpture of strong ribs and weak spirals. *Protoconch* of about 1½–2 translucent whorls with a small umbilicus, the first ½ whorl small, protruding, the last ½ whorl with riblets crossed by a mid-whorl spiral forming a carina. Riblets above the carina are arched over shoulder, below it, straight. *Axial sculpture* of strong ribs that extend from suture to suture on spire whorls and evanesce on the last, 12 on the penultimate and 7 on the last to the varix. Ribs are cord-like (nearly round in cross-section), are strong and recurved on the shoulder, slightly opisthocline on whorl sides, and curved toward the columella on the shell base. Intercostal space wider than the ribs, wider on dorsum of last whorl. *Varix* apertural, high and round like the ribs but stronger, extending from suture to end of canal, narrowing anteriorly. *Spiral sculpture* of weak primaries and microscopic secondaries. 3 primaries are on penultimate whorl side (none on shoulders) 8 on shell base; intercalary space with microscopic secondaries. *Sulcus* absent. Ribs on shoulder slightly recurved and narrowed mark past positions of anal sinus. *Outer lip* varicose, with a narrow strip of shell off the varix and a narrow channel underneath, between the edge of the outer lip and base of varix, that extends the length of the lip; an anal tooth is present below the anal sinus; stromboid notch shallow. *Anal sinus* a deep laterally directed notch carved into face of varix with a round apex and opening slightly constricted by outer lip and parietal lobe. *Inner lip* a narrow glaze along the columella, margined, with a parietal callus at the anal sinus. *Columella* straight. *Anterior canal* short, straight, differentiated by a slight constriction at the base of the aperture, tip unnotched. *Anterior fasciole* not swollen, with about 16 oblique secondaries. *Color* white. Non-type specimens have a faint narrow band of yellowish brown at the suture, along the suture line of the body whorl, and a golden brown parietal callus.

Range and habitat

Anguilla and Brazil (Bahia); depth 2–5 m.

Cryptomangelia Fallon gen. nov. unid. sp. L
Fig. 52AA

Differential diagnosis

This species resembles an *Agathotoma*, but its protoconch morphology and surface sculpture place it within the genus group *Cryptomangelia.*

Cryptomangelia fulgens (E.A. Smith, 1888) gen. et comb. nov. is larger and has a proportionally higher spire.

Material examined (1 spec.)

FRENCH GUIANA • 1 spec., 6.0 × 2.4 mm; offshore; 6 10.7′ N, 052 03.0′ W; depth 96–101 m; 3 Dec. 2017; PROTEUS-GUYANE; stn DW5097; MNHN-IM-2000-40045.

Partial description

Shell is small, of 8 whorls total, teleoconch whorls convex, shouldered, sides nearly straight, suture impressed, undulant; ribs strong, rise a little above suture; aperture narrowly oval, narrows to a short anterior canal, outer lip strongly varicose, anal tooth present. *Protoconch* of 3 glossy whorls, the first minute, the last with fine riblets that are crossed by a mid-whorl spiral on the last ½-whorl, a weak carina of fine beads forms where the spiral crosses riblets. *Spiral sculpture* of 3 or 4 strong primaries on whorl sides, and secondaries of alternating strengths between. Primaries are somewhat flattened, slightly swollen on rib crests.

***Cryptomangelia* Fallon gen. nov. spp. Part 4**

Cryptomangelia brevis (C.B. Adams, 1850) gen. et comb. nov.
Fig. 53A–B

Mangelia brevis C.B. Adams, 1850: 66.

Tenaturris spec. 2 – de Jong & Coomans 1988: 115, pl. 6 fig. 611.
Mangelia brevis – H. & A. Adams 1853: vol.: 100. — Krebs 1864: 13. — Dall 1885: 155. — Clench & Turner 1950: 262, pl. 31 fig. 14. — Tucker 2004: 152.
Mangilia brevis – Tryon 1884: 248.
Daphnella brevis – Paetel 1888: 87.
Brachycythara brevis var. — Nowell-Usticke 1959: 83. — Campbell *et al*. 1975: 91.
Pyrgocythara brevis – Williams 2005: #5705 (is C&T photo of holotype). — Zhang 2011: 153, fig. 578.

Differential diagnosis

This species is distinctive because it is quite stout (W/L = 0.5143), its breadth a little more than half its height. *Cryptomangelia* Fallon gen. nov. unid. sp. J and *Cryptomangelia* Fallon gen. nov. unid. sp. K (Fig. 53C–E, O–P) are similarly stout but differ from *C. brevis* in the manner discussed in the differential diagnosis section of those species.

Type material

Lectotype
The lectotype was designated by Clench & Turner (1950: pl. 31 fig. 14).

JAMAICA • 3.5 × 1.8 mm; MCZ 155934.

Paralectotypes (2 specs)
Two "paratypes" are listed in MCZ 186015; however, it is not known whether these are the same species as the lectotype because they have not been examined.

Material examined (1 spec.)

The lectotype was examined.

Original description

The original description (C.B. Adams, 1850: 66): "Shell short, fusiform, orange or wax yellow, white along the upper part of the whorls and anteriorly: with very strong transverse ribs, about nine on each whorl, smooth on the summits, with unequal microscopic spiral elevated lines: apex subacute: spire with very convex outlines: whorls about six, moderately convex or subangular, with a lightly impressed suture: aperture quite narrow: labrum much thickened by the last rib: sinus rather large: canal very short."

Range and habitat

Jamaica; depth not stated.

Cryptomangelia Fallon gen. nov. unid. sp. J
Fig. 53C–E

Differential diagnosis

Cryptomangelia brevis (C.B. Adams, 1850) gen. et comb. nov. is larger, has whorls that are slightly less convex, and a larger protoconch. Because of this close resemblance, it would be prudent to examine more specimens to confirm the constancy of its traits before describing this specimen as a separate species.

Material examined (2 specs)

FRENCH GUIANA • 1 spec., 3.0 × 1.4 mm; off French Guiana; 6°10.5′ N, 52°02.6′ W; depth 96–98 m; 3 Dec. 2017; PROTEUS-GUYANE; stn DW5096; MNHN-IM-2000-40043 • 1 spec., 3.5 × 1.8 mm, eroded specimen; offshore; 6°09.5′ N, 52°01.4′ W; depth 92–94 m; 3 Dec. 2017; PROTEUS-GUYANE; stn DW5089; MNHN-IM-2000-40044.

Partial description

Shell tiny, stoutly fusiform with strongly convex whorls, a narrowly oval aperture and short anterior canal. *Protoconch* of about 2¼ whorls, the last ¾-whorl with riblets and a median spiral. *Axial sculpture* of strong ribs that number 11 on the penultimate and 7 on the last whorl. *Spiral sculpture* of primaries and secondaries, a strong primary lies at the whorl perimeter and weaker ones follow on the whorl sides; secondaries are microscopic.

Remarks

This is the smallest known species of the genus *Cryptomangelia* Fallon gen. nov.

Cryptomangelia Fallon gen. nov. unid. sp. N
Fig. 53F–H

Differential diagnosis

Cryptomangelia brevis (C.B. Adams, 1850) gen. et comb. nov. is similar but whorls are not as convex and the shell is broader (W/L = 0.5143 versus 0.500). More specimens will be necessary to ascertain whether this specimen is within the normal variation of the species.

Material examined (1 spec.)

GRENADA • 1 spec., 3.4 × 1.7 mm; S Grenada, E of Mt. Hardman; depth 0 m; Jan.–Feb. 1964; R. Ostheimer leg.; on algae-covered rock in mangrove; ANSP 297220B.

Partial description

Shell small, biconic, (W/L = 0.5000), of 5½ whorls, sutures impressed, undulant over previous whorls' ribs, teleoconch whorls round-shouldered, spire whorls rather short); each wider than high; last whorl larger than spire; sculpture of a few modest spiral cords and microscopic spirals that override ribs; aperture narrow, with a short, open anterior canal and a wide and shallow anal sinus posteriorly. *Protoconch* of 2¼–2½ evenly expanding round whorls, the first smooth, the last with curved riblets, faint at first, stronger closer to the protoconch lip, and crossed by a median spiral on the last ½-whorl. *Axial sculpture* of strong ribs extending from suture to suture, intercostal space about the same as rib width, on shoulder ribs are high but narrower with concave intercostal spaces, and then ribs evanesce on the anterior fasciole. Ribs 9 on penult, 10 on last. *Varix* specimen without a varix, possibly sub-adult. **Spiral sculpture** of primaries and microscopic secondaries; 2 primaries on penultimate whorl, the strongest

marks the edge of the shoulder and whorl periphery; the second is weaker and mid-way on whorl side; about 4 more evenly space weak primaries on shell base, with compact rows of frosted microscopic spirals between them. *Sulcus* absent. *Outer lip* varicose, without a stromboid notch. *Anal sinus* a wide shallow notch the width of the shoulder, sides slightly divergent. *Inner lip* a narrow glaze, unemarginate, with a weak callus at the anal sinus. *Anterior fasciole* not swollen, sculpture of about 7 oblique spirals. *Color* light brown with a broad reddish-brown band below shell periphery, rib crests on shoulder white, and protoconch white.

Cryptomangelia nanodes (Melvill, 1923) gen. et comb. nov.
Figs 48C, 53I–N

Mangelia nanodes Melvill, 1923: 169, pl. 5 fig. 15.

Mangelia nanodes – Trew 1987: 53. — Williams 2005: #5554.

Differential diagnosis

The greatly inflated last whorl and short spire are unique to this species.

Type material

Holotype
CUBA • 5.5 × 3.0 mm; locality unknown; NHMUK 1982085.

Paratypes
None.

Material examined (2 specs)

A photograph of the holotype was provided by the NHMUK, the actual specimen was not examined. The following two specimens are provisionally identified as this species.

BAHAMAS • 1 spec. 1.7 × 1.0 mm; W Grand Bahama District, Dead Man's Reef beach; 26°34.75′ N, 78°51.75′ W; Jun. 1982; J. Worsfold leg.; ANSP 372336.

ST. VINCENT AND THE GRENADINES • 1 spec., 3.7 × 1.9 mm; St. Vincent Island, Calliaqua Bay; depth 1–1.8 m; Feb. 1972; V.O. Maes leg.; on silty sand; ANSP 332067B.

These differ from the type in possessing a smaller shell and protoconch. Too few specimens have been examined to determine whether differences are within the range of the natural variation of this species. Their distinctive shell shape suggests placement here for now.

Description

The original description appears in Melvill (1923: 169). No other descriptive material has been found. This description is based on Melvill's, description, on an inspection of a photograph of the holotype provided by the NHMUK, and on the 3.7 mm St. Vincent and the Grenadines specimen, which is believed to be the same species. *Shell* small (holotype length = 5.5 mm), biconic, of 6 whorls, with a very tumid last whorl of about 70% of shell length. The short spire is composed of a few whorls, wider than high with a rounded mid-whorl periphery; sutures impressed and undulant; aperture is oval, gradually narrowing to the end of the anterior canal. *Protoconch* prominent, with about 2¼–2½ evenly expanding round whorls. *Axial sculpture* of strong ribs extending from suture to suture, intercostal space about the same as rib width, on shoulder ribs slightly recurved, and excavated on their ventral

side, ribs slightly opisthocline on whorl sides, and end at the anterior fasciole, 9 on penult, 10 on last whorl. *Varix* apertural, the last rib serves to strengthen the outer lip. *Spiral sculpture* of a primary spiral at whorl periphery followed by well-separated secondaries. *Sulcus* absent, past positions of anal sinus indicated by slightly recurved, narrower ribs on the whorl shoulders. *Outer lip* thin, edge straight, jagged, without a strong varix, without a stromboid notch. *Anal sinus* a broad shallow notch about the width of the shoulder. *Inner lip* a narrow glaze, unemarginate, with a weak callus at the anal sinus. *Anterior canal* short, straight, and open. *Color* is yellowish white; protoconch darker.

Remarks

Although originally confused with *Brachycythara* because of its biconic form, the SEM shell microsculpture image (of the 3.7 mm specimen) clearly aligns the specimen with the genus *Cryptomangelia* Fallon gen. nov.

Range and habitat

Cuba, St. Vincent and the Grenadines, Bahamas; depth, shallow water.

Cryptomangelia Fallon gen. nov. unid. sp. K
Fig. 53O–P

Differential diagnosis

Cryptomangelia brevis (C.B. Adams, 1850) gen. et comb. nov. is smaller, has less convex spire whorl profiles, and a protoconch with fewer whorls.

Cryptomangelia cinctella (L. Pfeiffer, 1840) gen. et comb. nov. has weaker ribs and fewer protoconch whorls (1½ versus 3).

Cryptomangelia Fallon gen. nov. unid. sp. N has a tapered anterior canal.

Material examined (1 spec.)

MARTINIQUE • 1 spec., 4.3 × 2.0 mm; Anse Chaudière; depth 2 m; from on a sandy bottom; R. Delannoye coll.

Partial description

Shell small, stoutly fusiform with strongly convex whorls, a narrowly oval aperture, and a short anterior canal. *Protoconch* of 3 whorls, the first small, the last 2 with riblets. *Axial sculpture* of strong ribs that number 10 on the penultimate and 8 on the last whorl. *Spiral sculpture* of primaries and secondaries, a strong primary lies at the whorl perimeter, and weaker ones follow on the whorl sides; secondaries are microscopic.

Remarks

The 3-whorl protoconch is outside of the 1¼–2½-whorl range given in the diagnosis of the genus at the beginning of the *Cryptomangelia* section. If additional specimens of this species confirm the number of whorls as 3, then the diagnosis will have to be increased to a 3-whorl maximum for the genus *Cryptomangelia*.

Cryptomangelia plicosa (C.B. Adams, 1850) gen. et comb. nov.
Figs 48B, 53Q–DD

Pleurotoma plicata C.B. Adams, 1840 non Lamarck, 1804, a valid name of a fossil species. Adams changed this name to *plicosa* (Adams, 1850a: 54).
Pleurotoma plicosa C.B. Adams, 1850 is the replacement name for *P. plicata* C.B. Adams, 1840 (see Adams 1850a: 54).
Clathurella Jewetti Stearns, 1873: 346, text fig. 4, is a synonym according to Dall (1890: 41). Type locality: Rocky Point, Tampa Bay, W Florida and "other points along the shores of said bay and the adjacent keys"; the holotype is in USNM 86890; a syntype is in ANSP 15594.
Pleurotoma brunnea Perkins, 1869: 121, is an unnecessary new name for *Pleurotoma plicata* C.B. Adams, 1840 non Lamarck, 1804, as it was already renamed by Adams (1850a). As a synonym in Adams (1850a: 54).

Pleurotoma plicatum – S. Smith 1860: 151. — Kurtz 1860: 9.
Pleurotoma brunnea – Paetel 1888.
Clathurella Jewetti – Calkins 1878: 234. — Dall 1884: 329.
Bela plicata – A.E. Verrill 1873: 637 [343], pl. 21 fig. 107. — Calkins 1878: 234.
Mangilia plicosa – Dall 1889b: 100, pl. 50 fig. 14; 1890b: 41. — Mazyck 1913: 8. — C.W. Johnson 1915. — Maury 1922: 154–155. — M. Smith 1951: 137, pl. 52 fig. 2, pl. 69 fig. 14. — Perry & Schwengel 1955: 184, pl. 38 fig. 265.
Mangelia plicosa – C.W. Johnson 1934: 142. — Perry 1940: 167, pl. 38 fig. 265. — Olsson & McGinty 1958: 18. — Wass 1972: 127.
Pleurotoma plicata – Clench & Turner 1950: 326.
Pleurotoma plicosa – Clench & Turner 1950: 326.
Pyrogocythara plicosa – Lyons *et al*. 1971: 14. — Long Island Shell Club 1988: 136. — Porter 1974: 263. — Abbott 1974: 284, text fig. 3304. — Andrews 1977: 139, text fig. — Cooley 1978: 63. — Vokes & Vokes 1983: 59, pl. 29 fig. 19. — Reguero *et al*. 1991: 302, text photo. — Odé 1992a: 53. — Tippett 1995: 136, fig. 23 (radular tooth). — Shelton 1997: 15. — Gundersen 1998: 12 (captioned photo). — Williams 2005: #5713. — García 2010: 12; 2019: 10, fig. 21.

Differential diagnosis

Cryptomangelia plicosa (C.B. Adams, 1850) gen. et comb. nov. is unique and not easily misidentified with its strong ribs and nodulose spirals.

Type material

Lectotype
The lectotype was designated by Clench & Turner (1950: pl. 31 fig. 1).

UNITED STATES OF AMERICA • 0.5 × 0.25 inch [12.7 × 6.35 mm average of types according to C.B. Adams (1840: 325)]; New Bedford Harbor [Massachusetts]; MCZ 155921.

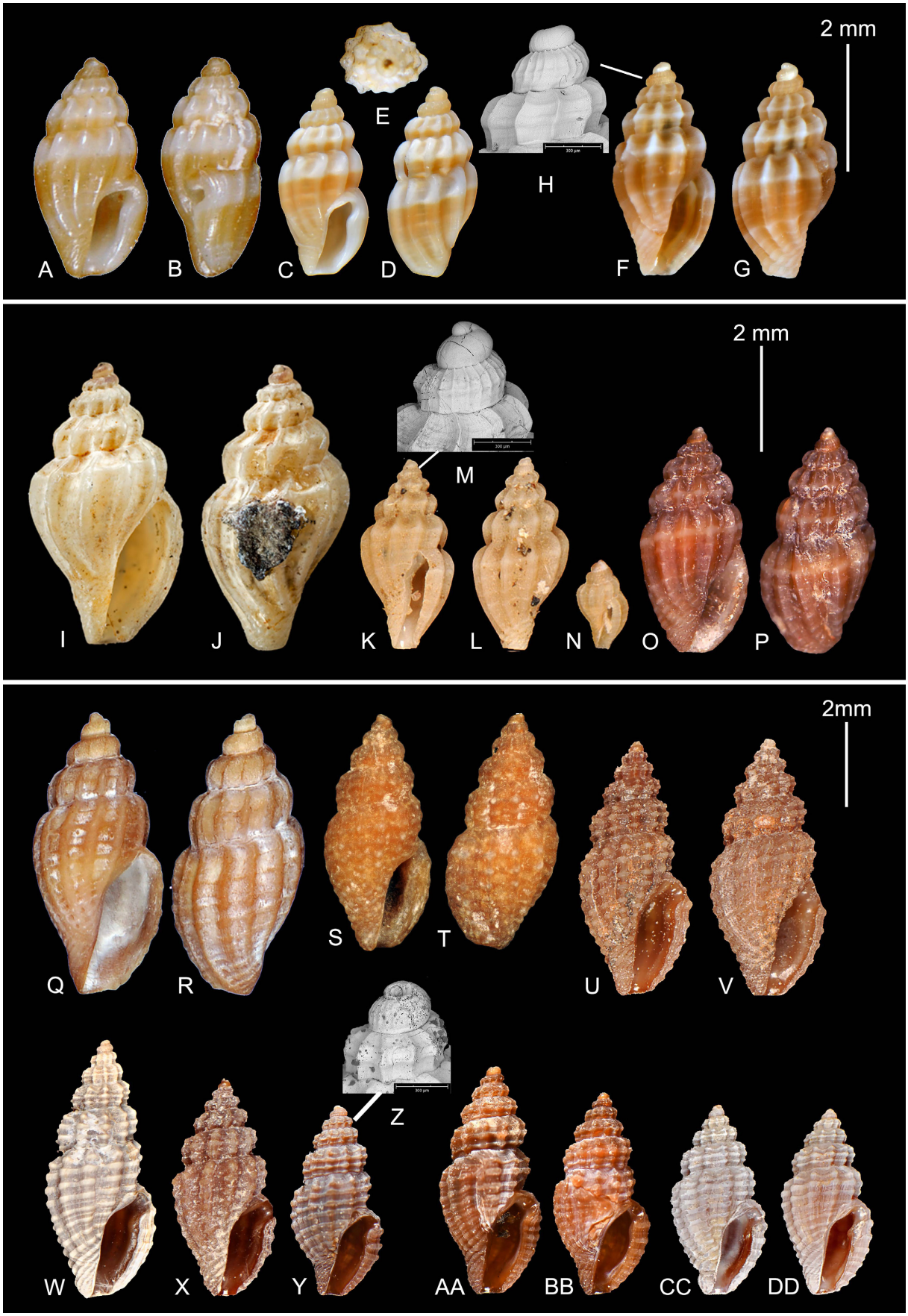
Paralectotypes (13 specs)
UNITED STATES OF AMERICA • 11 specs, not measured, out on loan; MCZ 186150 • 2 specs, 6.7 × 3.2 mm (best of 2); same data as for holotype; ex Wheatley coll.; ANSP 6465.

Material examined (72 specs)

In addition to the paralectotype in ANSP 6465, the following 72 specimens were examined:

UNITED STATES OF AMERICA • 4 specs, 4.5 × 2.2, 4.8 × 2.3, 5.4 × 2.4 and 4.7 × 2.3 mm; W Florida, Hillsborough Co., Tampa, Old Tampa Bay, SE side of the Courtney Campbell Bridge; shallow water; 4 Mar. 2007; P. Fallon leg.; from drift on surface of fine silty sand in depressions at low tide; ANSP 498899 • 38 specs, (10 measured) 5.8 × 2.7, 4.8 × 2.2, 4.9 × 2.2, 4.8 × 2.2, 4.8 × 2.1, 4.5 × 2.2, 4.2 × 2.1, 3.9 × 1.9, 47 × 2.2 and 5.6 × 3.5 mm; W Florida, Levy Co., N end of Cedar Key; depth not given; 2 Dec. 1978; John Fatis and H.G. Lee leg.; ex batfish stomachs; UF 589758 • 3 specs, 6.8 × 3.1, 6.3 × 3.3 and 6.3 × 3.2 mm; New York, Suffolk Co., Shelter Island; Oct. 2001; S. Rosenthal leg.; in beach drift; UF 589759 • 2 specs, 6.1 × 2.5 and 5.1 × 2.5 mm; E Florida, St. Lucy Co., N side of Ft. Pierce inlet; depth 0.3–1 m; 4 Jul. 1995; M. Krisberg leg.; hand dredged on hard sand and seagrass; UF 589760 • 1 spec., 3.6 × 1.8 mm; E Florida, Santa Rosa Co., edge of Gulf Breeze, SW edge of SR3995; just subtidal; 1 Jan. 1995; P.L. Poland leg.; in sand; UF 589761 • 2 specs, 8.3 × 3.2 and 6.1 × 2.6 mm; E Florida, Indian River Co., Conner Pinada Causeway; depth 0.3–0.6 m; 17 Apr. 1995; M. Krisberg leg.; in sandy pockets on coral rubble bottom; UF 589762 • 1 spec., 4.0 × 2.1 mm; W Florida, Pasco Oc., just S of Anclote Key near Tarpon Springs; in beach litter on sandbar; 28 Feb. 1976; H.G. Lee leg.; UF 589763 • 3 specs, 5.5 × 2.7, 5.3 × 2.3 and 4.5 × 2.2 mm; E Florida, Brevard Co., just S of Haulover Canal in Mosquito Lagoon; 18 Nov. 1995; M. Krisberg leg.; in soft, muddy sand, UF 589764 • 13 specs, (10 measured) 7.4 × 3.3, 5.1 × 2.2, 6.1 × 2.7, 6.2 × 2.9, 5.2 × 2.6, 5.1 × 2.7, 6.0 × 2.4, 6.0 × 2.5, 5.4 × 2.4 and 5.3 × 2.6 mm; W Florida, Gulf Co., St Joe Bay, W shore, 4 mi. [6 km] N of Cape San Blas; depth 1 m; 7 Jul. 1985; H.G. Lee and J.H. Koslan leg.; in *Thalassia* bed nearshore; UF 589765 • 1 spec., 4.9 × 3.0 mm; W Florida, Taylor Co., Keaton Beach, public access area; intertidal mud flat; 21 Sep. 1986; H. and R. Lee leg.; in grassy patch; UF 589766 • 2 specs, 4.5 × 2.3 and 4.4 × 2.2 mm; E Florida, Indian River Co., ca 1 mi. [1.6 km] S of Sebastian Inlet; depth 1–1.5 m; 22 Sep. 1995; M. Krisberg leg.; hand dredge on sand and shell bottom with sparce seagrass; UF 589767 • 1 spec., 5.2 × 2.5 mm; E Florida, Palm Beach Co., Lake Worth, just N of Peanut Island; depth 1.5–4.6 m; 26 May 1990; H.G. Lee and C. Lloyd leg.; dredged; UF 589768 • 1 spec., coastal Virginia, Accomack Co., Wachapreague, Curtis Channel; depth 1.5 m; 8 Aug. 2017; R. Aguilar leg.; 1 m beam trawl; USNM: IZ:1446052.

Fig. 53 (next page). Species of *Cryptomangelia* Fallon gen. nov. Part 4. – **A–B**. *Mangelia brevis* C.B. Adams, 1850, holotype, 3.5 × 1.8 mm, ventral and lateral views (MCZ 155934), Jamaica. – **C–E**. *Cryptomangelia* Fallon gen. nov. unid. sp. J. Spec., 3.0 × 1.4 mm, ventral, dorsal and apical views (MNHN-IM-2000-40043), off French Guiana. – **F–H**. *Cryptomangelia* fallon gen. nov. unid. sp. N. Spec., 3.4 × 1.7 mm, ventral and dorsal views, and SEM of protoconch (ANSP 297220B), E of Mt. Hardman, Grenada. – **I–J**. *Mangelia nanodes* Melvill, 1923, holotype, 5.5 × 3.0 mm, ventral and dorsal views (NHMUK 1982085), Cuba. – **K–N**. *Cryptomangelia nanodes* (Melvill, 1923) gen. et comb. nov. **K–M**. Spec., 3.7 × 1.9 mm, ventral and dorsal views, and SEM image of protoconch (ANSP 332067B), Calliaqua Bay, Saint Vincent Island. **N**. Spec., 1.7 × 1.0 mm (ANSP 372336), W Grand Bahama District, Bahamas. – **O–P**. *Cryptomangelia* Fallon gen. nov. unid. sp. K. Spec., 4.3 × 2.0 mm, ventral and dorsal views (R. Delannoye coll.), Anse Chaudière, Martinique. – **Q–R**. *Pleurotoma plicosa* C.B. Adams, 1850, paralectotype, 6.7 × 3.2 mm, ventral and dorsal views (ANSP 6465), Jamaica. – **S–T**. *Clathurella jewetti* Stearns, 1873, syntype, 5.6 × 2.5 mm, ventral and dorsal views (ANSP 15594), Rocky Point, Tampa Bay, W Florida. A Junior subjective synonym of *P. plicosa*. – **U–DD**. *Cryptomangelia plicosa* (C.B. Adams, 1850) gen. et comb. nov. **U–V**. Specs, 6.1 × 2.7 and 6.2 × 2.9 mm (UF 589765), 4 mi. N of Cape San Blas, W shore, St Joe Bay, Gulf Co., W Florida. **W–X**. Specs, 6.1 × 2.5 and 5.1 × 2.5 mm (UF 589760), N side of Ft. Pierce inlet, St Lucy Co., E Florida. **Y–BB**. Specs, 4.5 × 2.2, ventral view and SEM image of protoconch, 5.4 × 2.4 and 4.8 × 2.3 mm (ANSP 498899), Old Tampa Bay, Tampa, W Florida. **CC–DD**. Specs, 4.5 × 2.3 and 4.4 × 2.2 mm (UF 589767), ca 1 mi. [1.7 km] S of Sebastian Inlet, Indian River Co., E Florida. Credits: I–J: courtesy of Harry Taylor, Photographic Unit, copyright NHMUK; H, M, Z: SEM images courtesy of Chandler J. Olson and Paul Callomon; S–T: courtesy of ANSP. Scale bars: A–G, I–L, N–Y, AA–DD = 2 mm; H, M, Z = 300 μm.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Description

The lectotype was out on loan, and since the type series is comprised of poorly preserved specimens, non-type specimens in good condition were examined in the preparation of this description. *Shell* small (paralectotype in ANSP 6465 length = 6.7 mm), stoutly fusiform (W/L = 0.4776), of 6 narrow, round-shouldered whorls with appressed sutures undulant over prior whorl's ribs; last whorl 72% of shell length; whorl sides slightly convex; sculpture of moderately strong ribs and strong spirals nodulose on rib crests; aperture narrowly oval, about 52% of shell length; anal sinus deep, anterior canal short. *Protoconch* of about 2 glossy-smooth whorls, the tip minute then rapidly expanding with riblets on the last ½ whorl (about 10 riblets), which are crossed by a mid-whorl spiral near its end. *Axial sculpture* with 10 to 12 longitudinal ribs, extending to the canal, either continuous or alternating with those on the penultimate whorl. *Varix* apertural, behind a narrow lip and only slightly stronger than preceding ribs. *Spiral sculpture*, of strong primary spirals and microscopic secondary spirals. About 3 or 4 primaries on the penultimate flattened in intercostal space, slightly swollen on rib crests, and 4 or 5 on the shell base, with a single weak primary between them; microscopic secondaries are packed between. *Sulcus* absent. *Outer lip* varicose with a narrow strip of shell extending from the base of the varix and along the outer edge of the aperture, with a narrow channel underneath that extends the length of the lip; stromboid notch shallow. *Anal sinus* a notch nearly as deep as wide, directed laterally and carved into the face of the varix. A tooth is present at its base, inside the outer lip, and a callus at the parietal wall side. *Inner lip* a narrow glaze along the inside of the aperture, along the columella and on the parietal wall to the callus. *Anterior fasciole* not swollen, with about 7 oblique spirals. *Color* dark brown, aperture glazed dark reddish brown.

Animal

From S. Smith (1860: 141) on specimens from Peconic and Gardiner's Bays, Long Island, New York: "The animal has the foot white below, not very narrow, capable of being extended to two-thirds the length of the shell. Tentacles short, bearing the eyes near their extremity, and suddenly narrowing beyond. Siphon yellowish, short."

Remarks

Cryptomangelia plicosa (C.B. Adams, 1850) gen. et comb. nov. has most of the diagnostic characteristics of the genus listed at the beginning of Part 1. Its ribs do not rise above sutures, but in other respects, it bears the diagnostic characteristics of the genus.

The average length of 40 specimens is 5.3 mm (range = 3.6–8.3 mm).

Range and habitat

United States (Cape Cod, Massachusetts, south to Florida and Texas [Long Island Shell Club 1988]). This is a widely distributed Virginian and temperate tropical water species. Most lots examined for this project are from the southernmost extent of its range, E and W Florida. The report by Olsson & McGinty (1958: 18) of its occurrence in Panama should be confirmed.

***Cryptomangelia Fallon* gen. nov. spp. Part 5**

Cryptomangelia filosa (Rehder, 1943) gen. et comb. nov.
Fig. 54A–D

Pyrgocythara filosa Rehder, 1943a: 203, pl. 20 fig. 2

Pyrgocythara filosa – Powell 1966: 118. — Radwin 1969: 232. — Abbott 1974: 284. — Kaicher 1984: card 3960 (= holotype photo). — Diaz & Götting 1988: 159. — Turgeon *et al*. 1988: 100; 1998: 109. — Díaz *et al*. 1990: 196. — Tippett 1995: 136, fig. 25 (radula). — Redfern 2001: 134, fig. 553a–b; 2013: 214, fig. 596. — Tucker 2004: 377. — Williams 2005: #5708 (= holotype photo). — Frank 2008: http://www.jaxshells.org.
Mangelia filosa – Radwin 1969: 232.

non *Pyrgocythara filosa* – Vokes & Vokes 1983: 59, pl. 29 fig. 17.

Differential diagnosis

Stellatoma hemphilli (Bartsch & Rehder, 1939) is larger (holotypes 8.9 versus 6.5 mm), has a rounder aperture, a narrower white shoulder band, and rounder, steeper shoulders.

Type material

Holotype
UNITED STATES OF AMERICA • 6.5 × 2.8 mm; W Florida, Marco; Hemphill leg.; USNM 27637.

Paratype (1 spec.)
UNITED STATES OF AMERICA • 1 spec., from the holotype lot; repository unknown.

Other material examined (3 specs)

UNITED STATES OF AMERICA • 1 spec., 6.4 × 2.8 mm; Florida Keys, Middle Torch Key; depth not given; E. Shuller coll. • 1 spec., 6.7 × 2.7 mm; Florida Keys, Big Pine Key, Coupon Bight; depth not given; D. Kirsh leg.; in ghost shrimp rubble; D. Kirsh coll. • 1 spec., length = 6.7 mm; Florida Keys, Key Largo, Monroe Co., bayside, in front of Popp's Motel (MM 95.5); 25°03.16' N, 80°29.07' W; depth 0 m; 6–13 Apr. 1999; R. Bieler and P.M. Mikkelsen, leg.; by hand, sand/wrack line, intertidal; FMNH 288145.

Description

Shell small (length = 6.5 mm), fusiform (W/L = 0.4308), about 6 whorls total; spire narrow compared to the body whorl, which is large, about 64% of shell length. Teleoconch shoulders convex, whorl sides nearly flat; sutures deeply impressed, undulant (ribs not reduced but narrow toward sutures and rise above the suture line); aperture narrowly oval with an anal sinus and short anterior canal; sculpture of strong ribs and weak spirals; aperture, about 43% of shell length including canal. *Protoconch* of 1½ whorls, blunt in appearance, the tip laterally placed, somewhat immersed, with several riblets at the end. *Axial sculpture* of strong ribs (10 on the penultimate whorl), round at the shoulder; extend from suture to suture on spire whorls, evanesce before anterior fasciole on last; intercostal space about as wide as ribs, more so on dorsum of last whorl. *Varix* apertural, extending from suture to end of canal, narrowing anteriorly. *Spiral sculpture* of early whorls consisting of a primary on the shoulder, swollen on rib crests, and several below; on the last two whorls they increase in number but weaken anteriorly. Microscopic secondaries fill the intercalary space. All spirals override ribs. *Sulcus* absent. Recurved ribs on shoulder mark past positions of anal sinus. *Outer lip* is varicose with a narrow strip of shell at its base has a narrow channel on the underside of the aperture's outer lip that extends the length of the lip; stromboid notch shallow. *Anal sinus* a deep laterally directed notch carved into face of varix with a round

apex and straight sides, offset from the suture by a parietal callus. *Inner lip* a narrow strip of glaze along the columella and parietal wall with the parietal callus at the anal sinus. *Columella* straight. *Anterior canal* short, straight, undifferentiated from the aperture; tip unnotched. *Anterior fasciole* not swollen, with about 9 fine oblique spirals. *Color* a brown color with a broad, yellowish-white spiral band on the shoulder and reddish brown aperture.

Remarks

Rehder (1943a: 203) states that one paratype was in the lot with the type but fails to provide any further detail, or its location.

This species may be variable in color patterning and form to the degree that it is difficult to confirm only 2 other specimens as the same species as the type specimen. A larger number of specimens would be helpful.

Range and habitat

United States (W Florida, Florida Keys). Reports of specimens from the Bahamas (Redfern 2001, 2013), Panama (Radwin 1969), and Colombia (Diaz *et al*. 1990) should be confirmed.

Cryptomangelia vicina (C.B. Adams, 1850) gen. et comb. nov.
Fig. 54E–F

Mangelia vicina C.B. Adams, 1850b: 66.

Mangelia vicina – H. & A. Adams 1853: vol. 1, 100. — Krebs 1866: 396. — Clench & Turner 1950: 356, pl. 31 fig. 13. — Tucker 2004: 1059.
Daphnella vicina – Paetel 1888.
Pyrgocythara vicina – Williams 2005: #5707. — Wiedrick 2006: 6, fig. 15.

Differential diagnosis

Cryptomangelia multilineata (C.B. Adams, 1845) gen. et comb. nov., is similar and may, upon examination of more specimens, be synonymous. The white shoulder band of *C. vicina*, absent in the type and examined specimens of *C. multilineata*, may represent a variant of the same species.

Cryptomangelia eleutherae Fallon gen. et sp. nov., *Cryptomangelia* Fallon gen. nov. unid. sp. H. and *C. pumila* Fallon & Bouchet gen. et sp. nov. have variants with white-banded shoulders but differ in whorl profile and other morphological characteristics.

Cryptomangelia albovittata (C.B. Adams, 1845) gen. et comb. nov. is larger (length = 6.2 versus 4.2 mm of types), has fewer ribs, and a wider white band that is positioned a little below the suture, leaving a narrow brown band at the suture.

Type material

Lectotype

The lectotype was designated by Clench & Turner (1950; pl. 31 fig. 13).

JAMAICA • 4.2 × 2.0 mm; MCZ 177374.

Paralectotype (1 spec.)

JAMAICA • 1 spec., MCZ 186017.

Material examined (3 specs)

The lectotype and two additional lots were examined.

BAHAMAS • 1 spec., 4.2 × 1.8 mm; Grand Bahama Island; stn JWO 90; J. Worsfold leg.; ANSP 374485.

JAMAICA • 1 spec., 4.0 × 1.7 mm; Port Royal; ANSP 371997.

Description

The original description (C.B. Adams 1850b: 66): "Shell fusiform, moderately elongated: dull brownish red, white along the upper part of the whorls and anteriorly: with strong transverse ribs, smooth on the summits, about ten on each whorl; with unequal spiral microscopic striae: apex acute: spire with rather convex outlines: whorls about six, moderately convex, with a distinct suture: aperture rather narrow: labrum well thickened by the last rib: sinus rather large: canal very short."

Remarks

Cryptomangelia vicina (C.B. Adams, 1850) gen. et comb. nov. has the diagnostic characteristics of the genus outlined at the beginning of Part 1; however, the morphology of the protoconch is unknown because of wear. All other characteristics are consistent with the diagnosis of the genus. A redescription was not attempted because of the poor quality of the type and lack of candidate specimens.

Range and habitat

Jamaica and Bahamas (Grand Bahama Island); depth not given.

Cryptomangelia multilineata (C.B. Adams, 1845) gen. et comb. nov.
Fig. 54G–M

Pleurotoma multilineata C.B. Adams, 1845: 3–4.
Mangelia polyzonata H. & A. Adams, 1858: 100. An unnecessary new name.

Mangelia multilineata – Jay 1850: 324. — Krebs 1864: 14. — Tryon 1884: 248. — Dall 1885: 155.
Mangelia polyzonata – Paetel 1888: 69. — Tucker 2004: 780.
Pleurotoma multilineata – Clench & Turner 1950: 312, pl. 29 fig. 10. — Tucker 2004: 653.
Tenaturris multilineata – Williams 2005: #5768.

non *Pyrgocythara dubia* (C.B. Adams, 1845) – Redfern 2001: 134; pl. 60 fig. 552; 2013: 214, fig. 595. May be this species.

Differential diagnosis

Cryptomangelia vicina (C.B. Adams, 1850) gen. et comb. nov. looks similar, but has whorls that are slightly less convex, ribs that extend up higher over the suture, and a broad white shoulder band. These differences may be attributable to intraspecific variability. Examination of more specimens *C. vicina* from Jamaica may resolve the question of synonymy.

Cryptomangelia fusca (C.B. Adams, 1845) gen. et comb. nov. is broader and has subangulate whorls rather than shouldered whorls.

Type material

Holotype

JAMAICA • 4.7 × 1.8 mm; MCZ 177030.

Paratypes
None known.

Material examined (5 specs)

The following 2 lots are provisionally identified as this species.

BAHAMAS • 3 specs, 5.0 × 2.2, 4.3 × 1.7 and 4.2 × 1.9 mm; Eleuthera Island, airport beach; depth 0 m; C.M. Lloyd leg.; in beach drift; UF 589750 • 2 specs, 5.1 × 2.1 and 3.9 × 1.7 mm; Eleuthera Island, Millar's Beach; depth 0 m; D. Kirsh leg.; in beach drift; D. Kirsh coll.

Description

Adams' (1845) description is short: "P. t. minima, flavido-fusca, albo-multilineata; anf. 6, singulatim costis 8 ad 10 latis, ad basim expansis, et striis creberrimis decurrentibus inequalibus-instructis; sutura profunda; sinu magna; canali brevissimo."

Roughly translated from the Latin: small, yellowish brown, multi-lineated; 6 whorls and 8 to 10 broad ribs; body whorl large, packed with many unequal grooves; whorl sutures deeply impressed, sinus large; anterior canal short.

Range and habitat

Jamaica, Bahamas; depth 0 m (beach drift, actual habitat unknown).

Cryptomangelia fusca (C.B. Adams, 1845) gen. et comb. nov.
Fig. 54N–P

Pleurotoma fusca C.B. Adams, 1845: 4, non Calcara: 1839. The senior homonym *Pleurotoma fusca* Calcara, 1845, to the best of our knowledge, has not been used as a valid name after 1899. Calcara's name has been placed in synonymy with *Ginnania fuscata* (Deshayes, 1835) by Monterosato (1884: 127 [783]) and with *Mangelia sicula* Reeve, 1846 by Tryon (1884: 344). The former taxon, *Ginnania fuscata* (Deshayes, 1835), is now accepted as *Bela fuscata* (Deshayes, 1835). The holotype of *P. fusca* is worn (as seen in Clench & Turner 1950: pl. 29 fig. 9).

Mangelia crassicostata C.B. Adams, 1850b: 66 – Clench & Turner 1950: 270, pl. 31 fig. 12, type locality Jamaica, lectotype in MCZ 155933 (erroneously stated as holotype in the figure), 22 paralectotypes are in MCZ 155932, and 2 in ANSP 6497. Clench & Turner state that this species may be a variety of *P. fusca*. *Mangelia crassicostata* is of about the same size, shape, color, and with the same spiral detail visible between ribs. It is also from Jamaica, so is here accepted as a subjective junior synonym.

Mangelia fusca – C.B. Adams 1850a: 55. — H. & A. Adams 1853: 100. — Warmke & Abbott 1961: 137, pl. 25 fig. e. — Houbrick 1968: 17. — Rios 1970: 127; 1985: 142, pl. 48 fig. 661; 1994: 172, pl. 57 fig. 784. — Morris 1973: 250, pl. 70 fig. 8. — Ekdale 1974: 651. — Humfrey 1975: 203. — Cosel 1986: 273, fig. 177. — Espinosa & Fernández Garcés 1987: 3. — Greenway 1994: 724. — de Barros *et al.* 2005: 146, fig. h.

Mangilia crassicostata – Krebs 1864: 13. — Tryon 1884: 247, pl. 21 fig. 41. As a synonym of *Mangilia badia* Reeve, 1846b. *Mangilia badia* is an eastern Pacific species.

Daphnella crassicostata – Paetel 1888: 88.

Mangilia fusca – Tryon 1884: 248.

Daphnella fusca – Paetel 1888: 90.

Pleurotoma fusca – Clench & Turner 1950: 283, pl. 29 fig. 9. — Tucker 2004: 257. — Rios 1975: 137, pl. 41 fig. 625.

Mangelia crassicostata – Clench & Turner 1950: 270, pl. 31 fig. 12. — H. & A. Adams 1853: 100. — Dall 1885: 155. — Tucker 2004: 257.
Mangelia (*Agathotoma*) *fusca* – Weisbord 1962: 445, pl. 42 figs 9–10.
Pyrgocythara fusca – Vokes & Vokes 1983: pl. 29 fig. 18. — Robinson & Montoya 1987: 391.
Tenaturris fusca – de Jong & Coomans 1988: 114, pl. 18 fig. 610. — Díaz 1994: 40. — Díaz & Puyana 1994: 227, fig. 902.
Pyrgocythara crassicostata – Williams 2005: #5706. — Zhang 2011: 153, fig. 576.

Differential diagnosis

Cryptomangelia cinctella (L. Pfeiffer, 1840) gen. et comb. nov. is smaller [length = 3.9 versus 5.6 mm of types of *C. cinctella* and *C. fusca* (C.B. Adams, 1840) gen. et comb. nov., respectively], lacks a distinct angulation of the whorl that defines the edge of the shoulder, and has higher shoulders.

Type material

Holotype
JAMAICA • 4.7 × 2.9 mm; MCZ 177044.

Paratypes
None.

JAMAICA • 4.7 × 2.9 mm; MCZ 177044.

Material examined

A photograph of the syntype of *Mangelia crassicostata* C.B. Adams, 1850 in ANSP 6497, and the lectotype of *M. crassicostata* in MCZ 155933, were examined.

Description

The original description (Adams 1845: 4): "P. t. parva, fusca; sutura profunda; anf. 5, singulatim costis 8 vel 9, et multis striis decurrentibus inequidistantibus instructis; labro expanso; sinu parvo; canali brevissimo. Div. 35° ad 25°; spirae long. .12 poll.; long. tot. .22 poll.; lat. .1 poll."

Roughly translated from the Latin: small, black; sutures deep; 5 whorls with 8 or 9 ribs and many unequal spiral lines running in parallel; outer lip wide; anal sinus small, anterior canal short. Spire = 0.12 pollux [3 mm], shell length = 0.22 pollux [5.6 mm], width = 0.1 pollux [2.5 mm].

Remarks

Cryptomangelia fusca (C.B. Adams, 1845) gen. et comb. nov. has been synonymized with *Cryptomangelia cinctella* (L. Pfeiffer, 1840) gen. et comb. nov. by Faber (2004) and Redfern (2013), and with *Pleurotoma caribaea* d'Orbigny, 1853 by Williams (2005) and Rios (2009).

Range and habitat

Jamaica and Antigua. Photographs of *Pyrgocythara crassicostata* from Antigua (Zhang, 2011) appear to be *C. fusca*. Other localities given in the list of references above need to be verified.

Cryptomangelia Fallon gen. nov. unid. sp. I.
Fig. 54Q

Differential diagnosis

Cryptomangelia Fallon gen. nov. unid. sp. I. resembles *C. fusca* (C.B. Adams, 1845) gen. et comb. nov. but has stronger ribs and higher, more convex shoulders.

Material examined (1 spec.)

GUADELOUPE • 1 spec., 5.4 × 2.4 mm, ethanol-preserved; small Cul-de-Sac in front of the marine biology lab; 16°13.41′ N, 61°31.83′ W; depth 1 m; 2 May 2012; KARUBENTHOS 2012; stn GM01; MNHN-IM-2019-34674.

Partial description

Shell fusiform, thick, with convex whorls and a narrowly oval aperture and short anterior canal undifferentiated from the aperture. *Axial sculpture* of strong ribs that number 10 on the penultimate and 6 on the last whorl. *Spiral sculpture* of primaries and secondaries, a strong primary lies at the whorl perimeter and weaker ones follow on the whorl sides; secondaries are microscopic.

Cryptomangelia Fallon gen. nov. unid. sp. A
Fig. 54T

Differential diagnosis

The protoconch of *Cryptomangelia* Fallon gen. nov. unid. sp. A has a greater diameter than *C. eleutherae* Fallon gen. et sp. nov. (not measured but set side-by-side for comparison). Also, weaker ribs and a different color pattern.

Material examined (1 spec.)

MEXICO • 1 spec., 4.6 × 2.1 mm; Coco Beach, harbor side, Isla Mujeres, Quintana Roo; depth 0 m; Mar. 1983; R. Jensen leg.; in beach drift; UF 589769.

Partial description

Shell small, of 5¼ whorls total, teleoconch whorls evenly convex. *Protoconch* of 1¼–1⅜ smooth round whorls with fine, equally-spaced riblets on the last ¼–3/8 whorl and a faint spiral on the last ¼ whorl; protoconch tip, not small relative to the following whorl, turned down toward a shallow, narrow umbilicus. *Spiral sculpture* of weak primaries, 3 on shoulders, 5 on the penultimate whorl side and 6 on shell base. No microscopic intercalary spirals were observed.

Cryptomangelia Fallon gen. nov. unid. sp. E
Fig. 54U

Differential diagnosis

Cryptomangelia Fallon gen. nov. unid. sp. E has higher shoulders, stronger primary spirals, and a different color than *C. eleutherae* Fallon gen. et sp. nov.

Material examined (2 specs)

BAHAMAS • 2 specs, 4.9 × 2.1 and 3.8 × 1.6 mm; Eleuthera Island, Current, 300 m N of Current Cut; depth 0 m; May 1978; H.G. Lee leg.; from drift on sandy beach; UF 589770.

Partial description

Shell small, whorls strongly convex with broad shoulders; whorl diameters at sutures narrower than whorl peripheries. *Protoconch* of 1¼ smooth round whorls, without distinct riblets on last whorl; tip recumbent, not small relative to the following whorl, no umbilicus. *Spiral sculpture* of strong primary spirals, slightly flattened, with 1–2 fine secondaries in narrow intercalary spaces. Largest spiral on shell periphery, swollen on rib crests.

Cryptomangelia Fallon gen. nov. unid. sp. D
Fig. 54V

Differential diagnosis

Cryptomangelia Fallon gen. nov. unid. sp. D has a shorter spire, stronger primary spirals, and is colored differently than *C. eleutherae* Fallon gen. et sp. nov.

Material examined (1 spec.)

VENEZUELA • 1 spec., 4.3 × 2.1 mm; Amuay Bay, Paraguana Peninsula; depth 5–10 m; Dec. 2007; T. McCleery leg.; dredged; ANSP 498900.

Partial description

Shell small, whorls convex with narrow shoulders along an impressed suture. *Protoconch* of about 1¼ whorls, riblets unknown (protoconch surface eroded). *Spiral sculpture* of strong primary spirals slightly flattened. About 3 primaries on penultimate whorl side (none on shoulder), and 5 more on shell base, growing weaker anteriorly; intercalary space with some evidence of microscopic secondaries (wear predominates). Spirals are colored white.

Cryptomangelia Fallon gen. nov. unid. sp. H
Fig. 54W

Differential diagnosis

Cryptomangelia eleutherae Fallon gen. et sp. nov. has more ribs, straighter whorl sides, and wider shoulders.

Material examined (1 spec.)

GUADELOUPE • 1 spec., 4.5 × 2.0 mm; Basse-Terre, Tête à l'Anglais; 16°22.9′ N, 61°45.94′ W; depth 23 m; 8 May 2012; MNHN exped.; stn GS08; MNHN-IM-2012-7286.

Partial description

Shell small, of 6¾ whorls with moderately convex sides and incised sutures. *Protoconch* of about 1½ round whorls, sculptural detail obscured by surface erosion. *Axial sculpture* of strong slightly sigmoidal ribs, 8 on the penultimate whorl, 5 on the last. Ribs slightly recurved, rise slightly above suture forming crests less rounded than on whorl sides. *Spiral sculpture* of weak primary and microscopic spirals. About 3 primaries are on penultimate whorls, separated midway by weaker primaries and microscopic spirals on either side.

Cryptomangelia Fallon gen nov. unid. sp. G
Fig. 54X

Differential diagnosis

Cryptomangelia Fallon gen. nov. unid. sp. G has higher and broader shoulders and a different color than *C. eleutherae* Fallon gen. et sp. nov. If the protoconch is only 1½ whorls, then this species may possibly belong in the genus *Adelocythara*.

Material examined (1 spec.)

UNITED STATES OF AMERICA • 1 spec., 4.7 × 2.2 mm; W Florida, Sarasota Co., SW side of Longboad Key, Turtle Beach; depth 0 m; 24 Apr. 1985; Jane Zager leg.; in drift; UF 589757.

Partial description

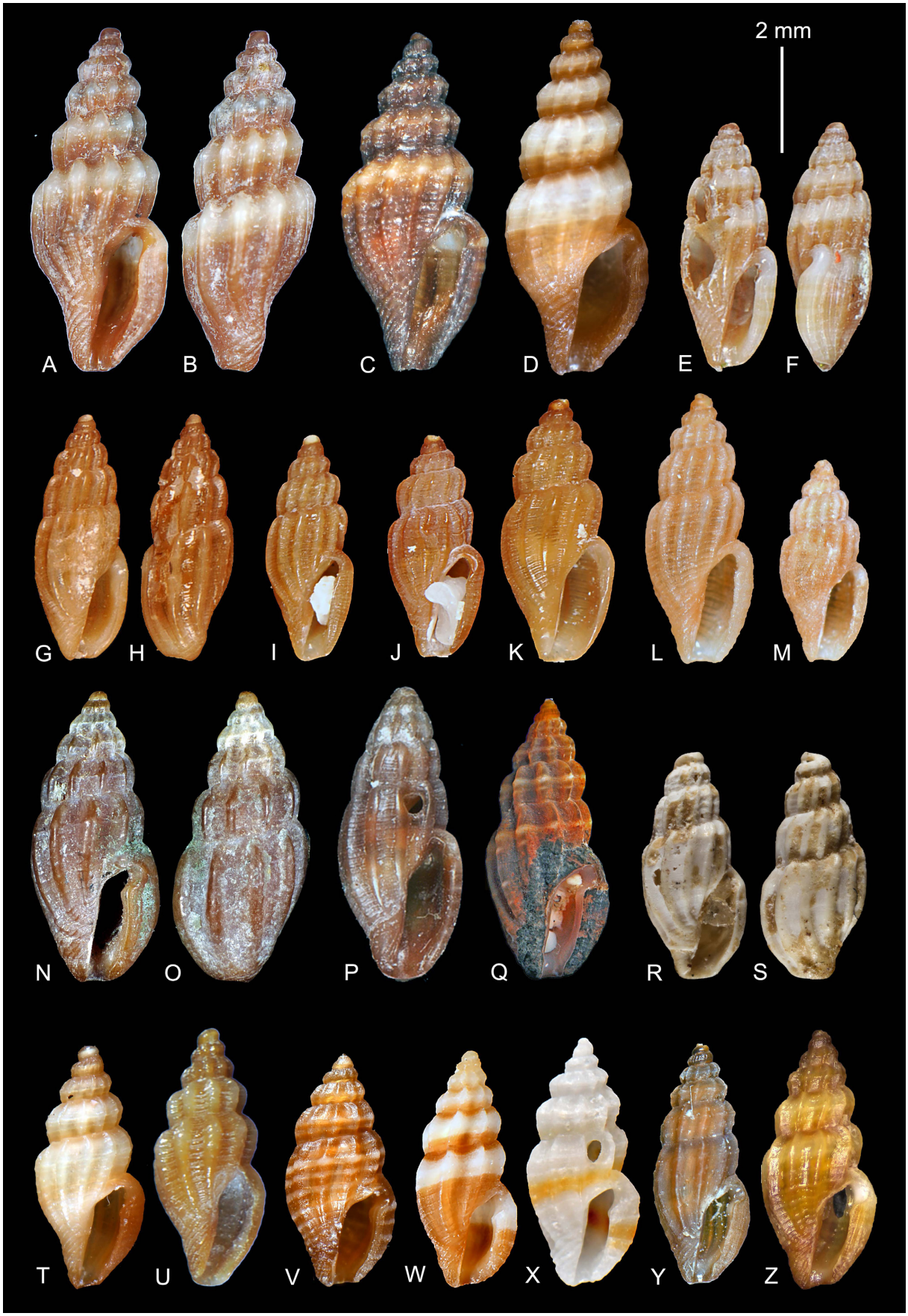
Shell small, of 6¼ whorls, teleoconch whorls convex with broad shoulders. *Protoconch* of about 1½ whorls (eroded), tip erect, last whorl tall. *Spiral sculpture* mostly obscured by erosion. Weak primaries with microscopic secondaries seen in limited areas.

Cryptomangelia Fallon gen. nov. unid. sp. M
Fig. 54Y

Differential diagnosis

Cryptomangelia Fallon gen. nov. unid. sp. N has fewer spirals and is smaller than *C. fusca* (C.B. Adams, 1845) gen. et comb. nov. but otherwise appears the same.

Fig. 54 (next page). Species of *Cryptomangelia* Fallon gen. nov. Part 5. – **A–B**. *Pyrgocythara filosa* Rehder, 1943, holotype, 6.5 × 2.8 mm, ventral and dorsal views (USNM 27637), Marco, W Florida. – **C–D**. *Cryptomangelia filosa* (Rehder, 1943) gen. et comb. nov. **C**. Spec., 6.4 × 2.8 mm (E. Shuller coll.), Middle Torch Key, Florida Keys. **D**. Spec., 6.7 × 2.7 mm (D. Kirsh coll.), Coupon Bight, Big Pine Key, Florida Keys (in ghost shrimp rubble). – **E–F**. *Mangelia vicina* C.B. Adams, 1850, lectotype, 4.2 × 2.0 mm, ventral and lateral views (MCZ 177374) Jamaica. – **G–H**. *Pleurotoma multilineata* C.B. Adams, 1845, holotype, 4.7 × 1.8 mm, ventral and dorsal views (MCZ 177030) Jamaica. – **I–M**. *Cryptomangelia multilineata* (C.B. Adams, 1845) gen. et comb. nov. **I–K**. Specs, 4.3 × 1.7, 4.2 × 1.9 and 5.0 × 2.2 mm (UF 589750) airport beach, Eleuthera Island, Bahamas. **L–M**. Specs. 5.1 × 2.1 and 3.9 × 1.7 mm (D. Kirsh coll.), Millar's Beach, Eleuthera Island, Bahamas. – **N–P**. *Mangelia crassicostata*, junior synonym of *Pleurotoma fusca* C.B. Adams, 1845. **N–O**. Syntype**,** length = 5.5 mm, ventral and dorsal views (ANSP 6497) Jamaica. – **P**. Holotype, 5.6 × 2.5 mm (MCZ 155933) Jamaica. – **Q**. *Cryptomangelia* Fallon gen. nov. unid. sp. I. Spec., 5.4 × 2.4 mm, ethanol-preserved (MNHN-IM-2019-34674), Guadeloupe. – **R–S**. *Columbella edonida* Duclos, 1848, syntype, 4.3 mm (MNHN-IM-2000-6917) locality unknown. A mangeliid and considered a nomen dubium on account of its poor condition. – **T**. *Cryptomangelia* Fallon gen. nov. unid. sp. A. Spec., 4.6 × 2.1 mm (UF 589769), Coco Beach, harbor side, Isla Mujeres, Quintana Roo, Mexico. – **U**. *Cryptomangelia* Fallon gen. nov. unid. sp. E. Spec., 4.9 × 2.1 mm (UF 589770) 300 m N of Current Cut, Current, Eleuthera Island, Bahamas. – **V**. *Cryptomangelia* Fallon gen. nov. unid. sp. D. Spec., 4.3 × 2.1 mm (ANSP 498900) Amuay Bay, Paraguana Peninsula, Venezuela. – **W**. *Cryptomangelia* Fallon gen. nov. unid. sp. H. Spec., 4.5 × 2.0 mm (MNHN-IM-2012-7286), Tête à l'Anglais, Basse-Terre, Guadeloupe. – **X**. *Cryptomangelia* Fallon gen. nov. unid. sp. G. Spec., 4.7 × 2.2 mm (UF 589757), Turtle Beach, SW side of Longboat Key, Sarasota Co., W Florida. – **Y**. *Cryptomangelia* Fallon gen. nov. unid. sp. N. Spec., 4.6 × 1.9 mm (MNHN-IM-2012-7288), Petite Anse, Basse-Terre, Guadeloupe. – **Z**. *Cryptomangelia* Fallon gen. nov. unid. sp. O. Spec., 4.9 × 1.9 mm (P. Fallon coll.), off Alcobaca, Bahia, Brazil. Credits: N–O: ANSP online database specimen photograph; R–S: MNHN online database photograph. Scale bars: A–Z = 2 mm.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Material examined (1 spec.)

GUADELOUPE • 1 spec., 4.6 × 1.9 mm; Basse-Terre, Petite Anse; depth 5 m; 10 May 2012; 16°05.72′ N, 61°46.26′ W; KARUBENTHOS 2012; stn GD13; MNHN-IM-2012-7288.

Partial description

Shell small, of 7 whorls, teleoconch with round shoulders and slightly convex sides, sutures incised; aperture oval with a deep, laterally directed anal sinus and short anterior canal; sculpture of strong ribs, spirals few and faint. *Protoconch* of about 2½ whorls, tip minute, last whorl with riblets that are crossed by a mid-whorl spiral on the last ½-whorl. *Axial sculpture* of strong and straight ribs that narrow on the last and end at the anterior faciole, 10 on the penultimate whorl, 6 on the last. *Spiral sculpture* of 2 weak primaries on the penultimate and 4 on the base of the last whorl.

Cryptomangelia Fallon gen. nov. unid. sp. O
Fig. 54Z

Differential diagnosis

Cryptomangelia Fallon gen. nov. unid. sp. O has stronger and fewer ribs than *C.* unid. sp. A slightly broader shoulders than *Cryptomangelia* Fallon gen. nov. unid. sp. H but narrower shoulders than *C. cinctella* (L. Pfeiffer, 1840) gen. et comb. nov.

Material examined (1 spec.)

BRAZIL • 1 spec., 4.9 × 1.9 mm; Bahia State, off Alcobaca; depth 3 m; A. Jorio leg.; handnet; P Fallon coll.

Partial description

Shell small, of about 6½ whorls (tip missing), teleoconch glossy with round shoulders, sides convex, sutures incised; aperture oval with a laterally directed anal sinus and short anterior canal; sculpture of strong ribs. *Protoconch* of about 2½ whorls, tip minute, last whorl with riblets that are crossed by a mid-whorl spiral on the last ½-whorl. *Axial sculpture* of strong but narrow ribs, recurved on shoulder, and end strong and slightly above the suture. 10 present on penultimate, 6 on the last whorl. *Spiral sculpture* faint on upper portion of whorl, stronger on shell base, of 2 primaries on the penultimate and about 8 on the base of the last whorl.

Genus ***Glyphoturris*** Woodring, 1928

Type species

Mangilia quadrata var. *rugirima* Dall, 1889 by original designation.

Summary diagnostic characteristics

Shell small, strong, and stout, with spire whorls sharply angled about mid-whorl.

Protoconch of 2¼–3¼ round whorls, the first whorl minute, the last with a carina of strong impeller blade-like riblets.

Sculpture of strong axial ribs overridden by primary and secondary spirals, both variable in strength and heavily ‘frosted’.

Aperture short, oval, and outer lip strongly varicose with a shallow anal sinus and 1 or 2 denticles, one inside the outer lip below the notch and sometimes another on the columella at the beginning of the canal.

Anterior canal is usually short, and the anterior of shell strongly constricted.

Shell surface microsculpture

SEM images of the surface of representative specimens of 4 species appear in Fig. 55. The microstructure of spirals, or 'frosting', of *Glyphoturris* consists of bundles of fibrils formed at the intersection of incremental growth lines, each bundle flattened and fanned out perpendicularly over the surface of

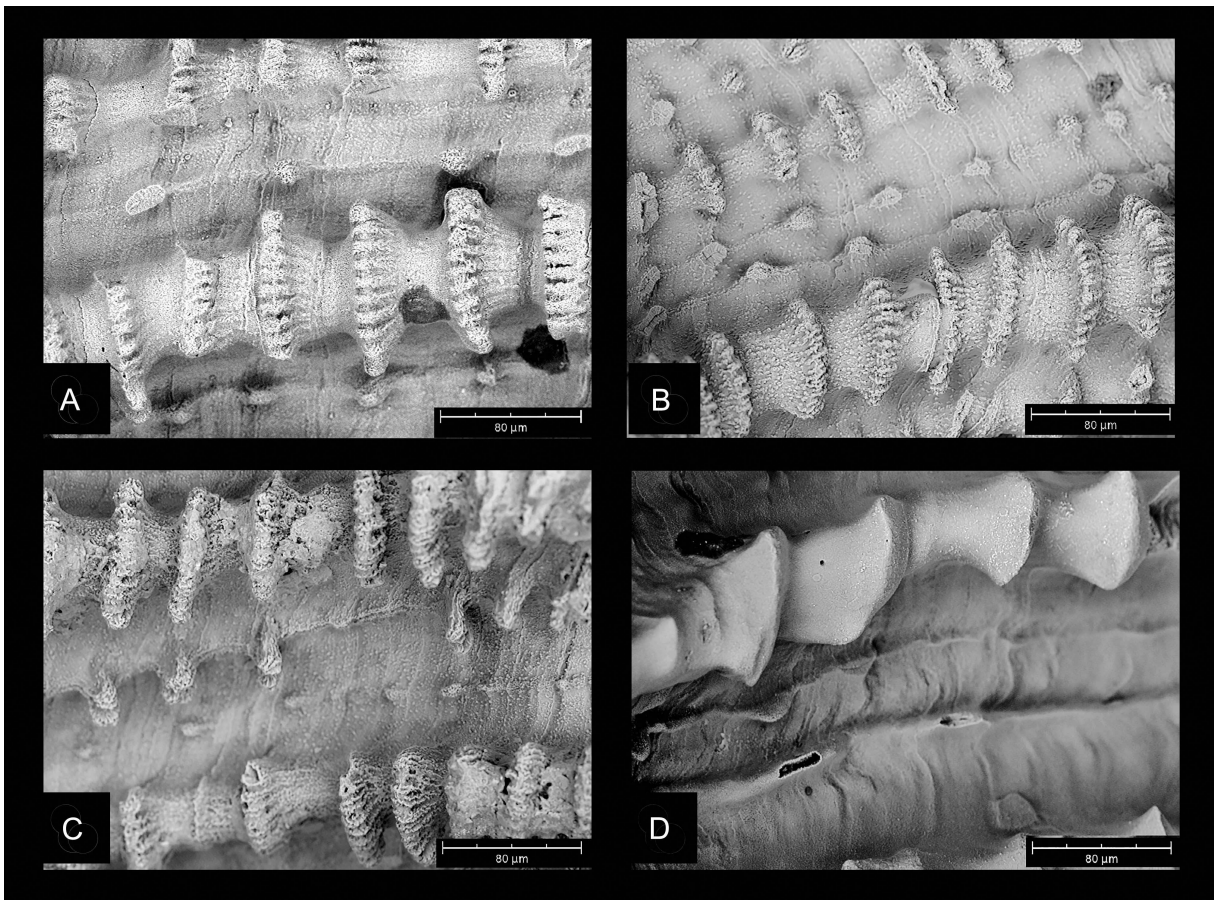

Fig. 55. Species of *Glyphoturris* Woodring, 1928, shell surface microsculpture. SEM images 850×, unless otherwise stated. **A**. *Glyphoturris quadrata* (Reeve, 1845). Image 860×. Spec., 8.9×3.9 mm (UF 589773), W of Egmont Key, Hillsborough Co., W Florida. Primary, secondary and tertiary spirals have compressed bundles fanned out grass-rake-like across the surface of the spirals. Tertiaries with poorly formed structures are present between the primary and secondary spirals. **B**. *Glyphoturris rugirima* (Dall, 1889). Spec., 4.4×2.3 mm (MNHN-IM-2013-70289), Passe du Marin, Pointe Borgnesse, Martinique. Structures like *G. quadrata*. **C**. *Glyphoturris ignota* Fallon sp. nov., paratype, 4.9×2.4 mm (UF 589781), off Guarapari, Brazil. Structures like *G. quadrata*. **D**. *Glyphoturris laminata* Fallon sp. nov., holotype, 11.2×4.1 mm (UF 589782), Chacachcare Island, Trinidad, Trinidad and Tobago. Structures are quite a bit modified from those of *G. quadrata.* Instead, they are solid and shovel-like (spreading and cupping at their terminations), with no fanning of smaller groups of fibrils at their apices. Tertiary spirals are also highly modified, the image showing 2 mound-like rows of tertiaries next to a primary spiral with thin lamellae arising from them. Credits: SEM images courtesy of Chandler J. Olson. Scale bars: A–D=80 µm.

primary and secondary spirals, their apices split into uniformly sized smaller bundles like the teeth of a grass rake. Tertiary spirals have small, poorly formed structures along considerably smaller spirals. Tertiary spirals are not mentioned in descriptions since they are not readily visible with a binocular dissecting microscope at 70×.

Difference from other genera

Saccharoturris Woodring, 1928 has sharply angled whorls and heavy 'frosting' like *Glyphoturris* but a taller spire, lacks a varicose lip and denticles. When closely examined, the 'frosting' of *Saccharoturris* is pipe-like, not the apical fanning of fibrils characteristic of *Glyphoturris*.

Nomen dubium

The taxon *Columbella cledonida* Duclos, 1846 (holotype MNHN-IM-2000-6927, type locality unknown), is a glyphoturrid. Unfortunately, its condition precludes definite identification, and so here is declared a nomen dubium (depicted in Fig. 56A–B).

Phylogenetic relationships

The DNA sequence data support the monophyly of the genus *Glyphoturris*, with the two sequenced species forming a well-supported clade. The lineage is recovered sister to the genus *Agathotoma*, albeit with no bootstrap support. All sequenced species show a modest intraspecific variability (average intraspecific p-distance range: 0.7-1.2%).

***Glyphoturris* spp. Part 1**

Glyphoturris eritima (K.J. Bush, 1885)
Fig. 56C–D

Mangilia eritima K.J. Bush, 1885a: 456–457.

Mangelia eritima – Dall 1885: 155. — Mansfield 1936: 666. — Porter 1974: 257.
Mangilia eritima – Dall 1892: 211; 1903: 1606. — Bush 1893: 240, pl. 1 fig. 1. — Gardner & Aldrich 1919: 17. — R.I. Johnson 1989: 36, pl. 13 fig. 4.
Pleurotoma eritima – Simpson 1887: 54.
Daphnella eritima – Paetel 1888: 89.
Mangelia quadrata eremita [sic] – C.W. Johnson 1934: 142. — Dall 1890b: 40.
Mangelia aff. *eritima* – Mansfield 1939: 24.
Kurtziella eritima – Gardner 1948: 270, pl. 37 fig. 13. — DuBar & Solliday 1961: 25. — DuBar 1962: 36. — DuBar & Howard 1964: 31. — Powell 1966.
Mangelia (*Glyphoturris*) *quadrata* subsp. *eritima* – Abbott 1974: 278.
Glyphoturris ertima [sic] – Campbell *et al*. 1975: 119.
Glyphoturris eritima – Turgeon *et al*. 1988: 97; 1998: 106. — García 2002: 10. — García & Lee 2002: 12; 2003: 26; fig. 307. — Williams 2005: #5570.

Differential diagnosis

Glyphoturris rugirima (Dall, 1889) is smaller (length rarely exceeding 6.2 mm), and with its two very strong spirals give the body whorl a squarish outline. It also has a shorter anterior canal and lacks the red-colored aperture.

Glyphoturris quadrata (Reeve, 1845) has a convex shoulder and lacks the red-colored aperture.

Glyphoturris ignota Fallon sp. nov. has a squarish body whorl, a shorter anterior canal, and lacks the red-colored aperture.

Type material

Holotype

UNITED STATES OF AMERICA • 7.4 × 3.2 mm; North Carolina, off Cape Hatteras; depth 14–17 fms [26–31 m]; 19 Oct. 1884; USFC R/V *Albatross* stn 2280; large beam trawl; USNM 44758.

Paratypes

None known.

Material examined (1 spec.)

The holotype has been examined.

Description

This description is based on an examination of the holotype and from Bush (1885a: 456–457). *Shell* small (length = 7.4 mm), fusiform with 8 angular whorls, the teleoconch with slightly concave shoulders lending whorls a pagoda-like appearance, the last whorl about 61% of shell length. Sutures impressed and marked with a strong primary from the preceding whorl. Sculpture of strong ribs and heavily frosted spirals of varying strengths. Aperture narrow-ovate, about 42% of shell length, with a narrow anterior canal of moderate length. *Protoconch* of 2½ glossy whorls, the fist 1½ smooth, the last with riblets. *Axial sculpture* of strong, straight ribs, a little wider than their interspaces, run from suture to suture, are angled at whorl periphery and evanesce on the shell base. Ribs alternate from whorl to whorl with deeply concave interspaces, number 9 on the last whorl. *Varix* is not present on the type specimen, which may be in its growth phase and not yet formed. *Spiral sculpture* of strongly frosted primary and microscopic secondaries that override ribs. About 9 secondaries present on the shoulder. A pair of primaries are present at whorl periphery, and 3 more on whorl sides, roughly equally spaced beginning just below the second peripheral spiral. Secondaries of different strengths are present in intercalary space, with the strongest midway between them. The shell base has another 4 primaries, including the strong sutural spiral that is visible at the suture of spire whorls, and all have microscopic secondaries of varying strengths between. *Sulcus* absent. *Outer lip* is a narrow extension from the base of the last rib that extends from the anal sinus to the anterior canal. *Anal sinus* is a shallow notch about as wide as the shoulder. *Inner lip* a narrow glaze along the columella. *Anterior fasciole* not swollen, with about 5 strong oblique spirals. *Columella* slightly curved. *Anterior canal* narrowly constricted, of moderate length, unnotched. *Color* of shell is a light-yellow-brown, aperture, and inner lip a conspicuous red color.

Range and habitat

United States (North Carolina, Cape Hatteras); depth 26–31 m. Other published occurrences are principally from the fossil record.

Glyphoturris quadrata (Reeve, 1845)
Figs 55A, 56H–T

Pleurotoma albida C.B. Adams, 1845, non Perry, 1811, nec Deshayes, 1835, **syn. nov.**, is likely this species. According to Tippett's research notes (vol. "Mang. 2" MS: 139, notes of 24 May 1994) and based on his direct examination of MCZ 177360 (Fig. 56E), protoconch of 1¾ whorls, the last ¼-whorl with riblets, 5 teleoconch whorls with 9 axials, spirals present over shell, some frosted, the peripheral one slightly noduled, and a tooth on lower lip below sinus. The morphology is consistent with that of the genus *Glyphoturris*. Also, except for the protoconch whorl count, Tippett's observations match that of Reeve's species as described below. Adams' type is worn, possibly the protoconch lost ¾ whorl or more. Because the description written by Tippett of *P. albida* closely matches *G. quadrata* and because of the close resemblance of its shell form to *G. quadrata* (see Fig. 56), *P. albida* is considered a senior synonym but was unavailable for examination during this study and is unavailable to replace Reeve's name because it is preoccupied.

Pleurotoma quadrata Reeve, 1845: pl. 28 fig. 253 is the next available name.

Pleurotoma fusiformis C.B. Adams, 1850, non Anton, 1838, **syn. nov.**, is a junior subjective synonym of *P. albida* Adams, 1845 based on Kreb's comment (1866: 397) that appears to be the same as *P. albida*. Also, according to Tippett (vol. "Mang. 2" MS: 141, notes of 24 May 1994), a direct comparison of the holotypes indicates that they are the same (same spiral and axial sculpture, and frosting present). The holotype is in MCZ 177379, and a photo of the holotype is in Clench & Turner 1950: pl. 30 figs 7–8.

Pleurotoma diminuta C.B. Adams, 1850 is a junior subjective synonym, a name provisionally assigned by Adams to a specimen identical to the species figured by Reeve except ⅓ the size although he believed Reeve's figure might be magnified (Adams 1850b: 62). Tryon (1884: 278) later confirmed Adam's suspicion (and as he also states, Krebs' conviction) that the two are identical.

Cryoturris cruzana Nowell-Usticke, 1969: 29, pl. 6 fig. 1204, is a synonym according to Peggy Williams in a note accompanying the type (written sometime before 1988) and confirmed when examined for this work. The type locality is St. Croix, U.S. Virgin Islands, Holotype is in AMNH 192519.

Pleurotoma quadrata – Simpson 1887: 55; 1889: 55.
Defrancia quadrata – H. & A. Adams 1858: vol. 1: 96.
Mangelia quadrata – Krebs 1864: 14.
Clathurella quadrata – Tryon 1884: 278, pl. 18 fig. 31 (Reeve's fig.).
Pleurotoma (*Mangilia*) *quadrata* – Dall 1889a: 113.
Pleurotoma (*Mangilia*) *quadrata* var. *diminuta* – Dall 1889a: 114.
Mangilia quadrata – Dall 1890b: 40; 1903: 1606. — Maury 1922: 71. — Johnson 1934: 142. — M. Smith 1945: 137; 1951: 137.
Mangilia quadrata var. *quadrata/eritima* – Dall & Simpson 1901: 390.
Mangelia millestriata var. *diminuta* – Peile 1926: 84.
Mangelia quadrata quadrata – Johnson 1934: 142. — Coomans 1958: 101. — Warmke & Abbott 1961: 140.
Mangelia quadrata dimidiata [sic] – C.W. Johnson 1934: 14.2. — Porter 1974: 258.
Pseudoraphitoma (*Glyphoturris*) *quadrata* – Wenz 1943–1944: vol. 1, 142.
Glyphoturris diminuta – Olsson & McGinty 1958: 18. — Nowell-Usticke 1959: 83. — Kaicher 1984: card 3894. — de Jong & Coomans 1988: 114, pl. 18 fig. 606. — Diaz *et al*. 1990: 196.
Mangilia (*Glyphoturris*) *quadrata* subsp. *diminuta* – Abbott 1974: 278, fig. 3184.
Mangelia quadrata var. *quadrata* – Porter 1974: 258.
Mangelia (*Glyphoturris*) *quadrata* – Abbott 1974: 278, fig. 3183.
Pleurotoma diminuta – Treece 1980: 562.
Mangelia (*Glyphoturris*) *diminuta* – Vokes & Vokes 1983: 31, pl. 27 fig. 3. — Espinosa & Ortea 2001: 34.
Glyphoturris quadrata – Rios 1983: 114; 1985: 143, pl. 48 fig. 664; 1994: 172, pl. 57 fig. 788. — Turgeon *et al*. 1988: 97; 1998: 106. — Faber 1988: 76. — Odé 1992a: 58. — Diaz & Puyana 1994: 231, pl. 68 fig. 915. — Abbott & Morris 1995: 258. — García & Lee 2002: 12. — Williams 2005: #5571. — Lee 2009: 131. — Zhang 2011: 149.
Mangelia diminuta – Robinson & Montoya 1987: 391.

Differential diagnosis

Glyphoturris rugirima (Dall, 1889) is smaller, has acutely angled spire whorls, and two strong primaries, one at whorl periphery and the other at the suture line, giving the last whorl a squarish outline. *G.lyphoturris quadrata* has obtusely angled whorls and only a single strong primary, which is doubled at whorl periphery. Its sutural primary is weaker.

Type material

The type material could not be located at the NHMUK (email from Andreia Salvador to P. Fallon dated 23 Oct. 2018). The type locality is stated as unknown by Reeve.

The drawing of *Pleurotoma quadrata* in Reeve is unsuitable as a representation of the type. Instead, the photo of the lectotype of the junior synonym of *Pleurotoma diminuta* C.B. Adams, 1850, depicted in Clench & Turner (1950: 275, pl. 31 fig. 3) was used to represent the species.

Material examined (99 specs)

The following 20 specimens, including sequenced ethanol-preserved material and other specimens, are among those examined.

FRENCH GUIANA • 2 specs, 8.8 × 3.5 and 9.6 × 3.8 mm; offshore; 6°10.2′ N, 52°00.1′ W; depth 99–105 m; 2 Dec. 2017; PROTEUS-GUYANE, stn DW5078; MNHN-IM-2000-40046 • 1 spec., 5.4 × 2.5 mm; offshore; 6°18' N, 52°13.3' W; depth 95–97 m; 8 Aug. 2014; GUYANE 2014; stn CP4402; dredged; MNHN-IM-2012-43486.

GUADELOUPE • 1 spec., 6.3 × 2.8 mm; Tête à l'Anglais; 16°22.9′ N, 61°45.94′ W; depth 23 m; 8 May 2012; KARUBENTHOS 2012; stn GB06; sequenced; MNHN-IM-2013-20636 • 1 spec., 8.5 × 3.7 mm; Grand Cul-de-Sac Marin; 16°21.87′ N, 61°31.78′ W; depth 5 m; 20 May 2012; KARUBENTHOS 2012; stn GS27; MNHN-IM-2013-20635 • 1 spec., 5.4 × 2.4 mm; Lizzard Point; 16°08.43′ N, 61°46.92′ W; depth 12 m; 7 May 2012; KARUBENTHOS 2012; stn GS07; sequenced; MNHN-IM-2013-20605 • 1 spec., 7.8 × 3.4 mm; Les 3 arches (Port-Louis); 16°23.26′ N, 61°31.79′ W; depth 11 m; 11 May 2012; KARUBENTHOS 2012; stn GB19; sequenced; MNHN-IM-2013-7715 • 1 spec., 5.3 × 2.5 mm; ethanol-preserved; Barracuda Cave entrance, Port-Louis; 16°27.34′ N, 61°32.07′ W; depth 19 m; 16 May 2012; KARUBENTHOS 2012; stn GS20; MNHN-IM-2019-34716 • 1 spec., 6.4 × 2.9 mm, ethanol-preserved; Grand Cul-de-Sac Marin; 16°21.87′ N, 61°31.78′ W; depth 5 m; 20 May 2012; KARUBENTHOS 2012; stn GS27; MNHN-IM-2019-34739.

UNITED STATES OF AMERICA • 1 spec., 7.2 × 3.3 mm; E Florida, Palm Beach Co., Lake Worth, S edge of Peanut Island; 26°46′ N, 80°03′ W; depth near low water; 8 Feb. 1997; UF 589771 • 9 specs, 9.4 × 4.0, 10.1 × 4.2, 10.0 × 4.6, 9.5 × 4.1, 9.3 × 4.3, 7.6 × 3.4, 6.5 × 3.1, 3.7 × 1.8 and 9.7 × 4.5 mm; E Florida, Duval Co., 30 mi. [48 km] E of Mayport; depth 30 m; 28 Jul. 1979; J. Yergin leg.; dredged; UF 589772 • 1 spec., 8.9 × 3.9 mm; W Florida, Hillsborough Co., W of Egmont Key; depth 73 m; 1963; Jim Moore leg.; dredged; R/V *Cavalier*; UF 589773.

An additional 80 specimens were examined in samples from Louisiana, E Florida, W Florida, Guadeloupe, Martinique, and French Guiana.

Description

Specimens matching the photograph of *P. diminuta* (in Clench & Turner 1950: pl. 31 fig. 3), some of which are depicted in Fig. 56, and the descriptions of Reeve and C.B. Adams are used as the basis of this description. *Shell* small (largest measured length = 10.1 mm), strong, fusiform (W/L = 0.4639) of 9 whorls; teleoconch whorls with angled shoulders, sutures impressed, diameters at sutures less than periphery; sculpture of strong ribs and heavily frosted spirals of varying strengths. Aperture strongly constricted, narrow-ovate, short, about 35% of shell length, with a narrow anterior canal of moderate length. *Protoconch* of about 2½–2¾ round whorls, the first minute; the last whorl with riblets. *Axial sculpture* of strong ribs that run from suture to suture on spire whorls and to anterior fasciole on last. Ribs are strong right up to the suture, barely recurved on shoulder, angled and highest on periphery, and straight and gradually reduce in height on shell base. Ribs number 10 on penultimate whorl, 5 on the last to the varix. Ribs more widely spaced on last whorl. *Varix* apertural, wide and crenated by spirals; outline flattened over shoulder region, behind anal sinus. *Spiral sculpture* of frosted primary and secondary spirals; a pair of the strongest primaries are at the whorl periphery. About 6 weak primaries present on the shoulder, up to 4 primaries on the whorl sides that grow weaker toward the suture, the 2 closest to the periphery the strongest, and 7 or 8 others, beginning with one on the suture line and ending at the anterior

fasciole. Secondaries vary in strength from specimen to specimen, from 2 to 5 are in the intercalary space. Spirals override ribs, and stronger primaries are nodulous on rib crests. ***Ramp*** has barely recurved ribs that mark past presence of anal sinus. *Outer lip* varicose, with a thin narrow extension from the base of the varix and a tooth below anal sinus. *Anal sinus* weak, round apex, divergent sides, located about midway on the shoulder and in front of the varix. *Inner lip* a narrow glaze etched into columella, unemarginate. *Anterior fasciole* not swollen, with about 5 oblique spirals. *Columella* straight, without a tooth at the beginning of the anterior canal. *Anterior canal* straight, end notched. *Color* off white to pale golden yellow, primary spirals and varix lighter, a narrow spiral band at suture line, chestnut brown, usually faded on shell base but just visible on spire whorls, and inside aperture a vertical brown band on columella, behind inner lip.

Remarks

The average length of 38 measured specimens is 6.2 mm (range = 3.0–10.1 mm). Several specimens from French Guiana samples have less angular whorls, but not sufficiently different to rise to the species level. Two are shown in Fig. 56S–T.

Range and habitat

Widespread. Examined specimens are from the United States (E Florida, W Florida, Florida Keys), Guadeloupe, Martinique, and French Guiana. Published reports and museum lot identifications, which need to be confirmed, include United States [North Carolina (ANSP; Porter 1974), Louisiana (Odé 1992a; García & Lee 2002), Texas (Odé 1992a), Puerto Rico (FLMNH), U.S. Virgin Islands (AMNH, ANSP, FLMNH; Nowell-Usticke 1959)], Br. Virgin Islands (ANSP), Jamaica (C.B. Adams; FLMNH), Puerto Rico (Warmke & Abbott 1961), Grenada (ANSP), Netherlands Antilles (de Jong & Coomans 1988), Colombia (Diaz & Puyana 1994), Panama (Olsson & McGinty 1958; FLMNH), Bermuda (Peile 1926), Brazil (Rios), Mexico (Campeche Bank: Treece 1980; Vokes & Vokes 1983); Costa Rica (Robinson & Montoya 1987; Espinosa & Ortea 2001); Belize (ANSP, USNM). Depth of examined lots: 2–115 m, live collected depth 5–23 m.

Fig. 56 (next page). Species of *Glyphoturris* Woodring, 1928**.** Part 1. – **A–B**. *Columbella cledonida* Duclos, 1846, syntype, length = 4.4 mm (MNHN-IM-2000-6927), locality unknown. A *Glyphoturris* but condition precludes identification, so here declared a nomen dubium. – **C–D**. *Mangilia eritima* K.J. Bush, 1885, holotype, 7.4 × 3.2 mm (USNM 44758), off Cape Hatteras, North Carolina. – **E**. *Pleurotoma albida* C.B. Adams, 1845, holotype, length 6.6 mm (MCZ 177360), Jamaica. Preoccupied (unavailable) senior synonym. – **F**. *Pleurotoma diminuta* C.B. Adams, 1850, lectotype, 6.3 × 2.95 mm (MCZ 186148), Jamaica. Junior synonym of *Glyphoturris quadrata* (Reeve, 1845). – **G**. *Cryoturris cruzana* Nowell-Usticke, 1969, holotype, 5.0 × 2.3 mm (AMNH 192518), St Croix, U.S. Virgin Islands. Junior synonym of *Glyphoturris quadrata*. – **H–T**. *Glyphoturris quadrata*, specimens from various localities. **H–I**. Spec., 6.6 × 2.9 and 6.1 × 2.9 mm (UF 589774), E edge of Blind Pass, St Pete Beach, Pinellas Co., W Florida. **J**. Spec., length = 5.4 mm (MNHN), Passe du Marin, SW Pointe Borgnesse, Martinique. **K**. Spec., 5.4 × 2.5 mm (MNHN-IM-2012-43486), offshore, French Guiana. **L**. Spec., 6.3 × 2.8 mm, sequence voucher (MNHN-IM-2013-20636), Tête à l'Anglais, Guadeloupe. **M**. Spec., 7.2 × 3.3 mm (UF 589771), S edge of Peanut Island, Lake Worth, Palm Beach Co., E Florida. **N**. Spec., 9.7 × 4.5 mm (UF 589772), 30 mi. [48 km] E of Mayport, Duval Co., E Florida. **O**. Spec., 8.5 × 3.7 mm (MNHN-IM-2013-20635), Grand Cul-de-Sac Marin, Guadeloupe. **P–Q**. Spec., 8.9 × 3.9 mm, ventral view, and SEM image of protoconch (UF 589773), W of Egmont Key, Hillsborough Co., W Florida. **R**. Sequence voucher, 7.8 × 3.4 mm (MNHN-IM-2013-7715), Les 3 arches (Port-Louis), Guadeloupe. **S–T**. Specs. 8.8 × 3.5 and 9.6 × 3.8 mm (MNHN-IM-2000-40046), offshore, French Guiana. Credits: A–B: courtesy of MNHN Collection: Molluscs (IM); E–F. Clench & Turner (1950: pl. 30 fig. 2 (e), pl. 31 fig. 3 (f)); Q: SEM image courtesy of Chandler J. Olson. Scale bars: A–P, R–T = 2 mm; Q = 300 µm.

2 mm
A
B
C
D
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K
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Glyphoturris spp. Part 2

Glyphoturris rugirima (Dall, 1889)
Figs 55B, 57, 58A–L

Mangilia quadrata var. *rugirima* Dall, 1889a: 114

Mangilia quadrata var. *rugirima* – Dall 1889b: 217. — M. Smith 1951: 137, pl. 52 fig. 4.
Glyphoturris rugirima – Perry 1940: 171, pl. 39 fig. 273. — Perry & Schwengel 1955: 189, pl. 39 fig. 273. — Powell 1966: 101, pl. 15 fig. 22. — McGinty 1970: 65. — Sykes & Hall 1970: 304. — Campbell *et al*. 1975: 106. — Rios 1983: 114; 1985: 143, pl. 49 fig. 665; 1994: 172, pl. 57 fig. 789. — Reed & Mikkelsen 1987: 126. — Turgeon *et al*. 1988: 97; 1998: 106. — Redfern 2001: 130, pl. 58 fig. 536. — García & Lee 2002: 12. — Absalão *et al*. 2005: 32, fig. 78. — Williams 2005: #5572. — Grace 2007: 28. — Rolán *et al*. 2012: 59, fig. 9a–c. — Lee 2009: 132. — Zhang 2011: 149–150, sp. 560.
Glyphoturris quadrata rugirima – Warmke & Abbott 1961: 138, pl. 26 fig. w. — Rice & Kornicker 1962: 377; 1965: 128, pl. 7 fig. 12. — Waller 1973: 43. — Morris 1973: 252, pl. 69 fig. 9. — Treece 1980: 562. — Greenway 1995.
Mangelia rugirima – Abbott 1974: 278, #3182. — Lamy *et al*. 1984: 15.
Mangelia (*Glyphoturris*) *rugirima* – Porter 1974: 34. — Vokes & Vokes 1983: 31, pl. 29 fig. 4.

Differential diagnosis

Glyphoturris quadrata (Reeve, 1845) and *G. rugirima*, can be difficult to distinguish because of their variability in form. Generally, *G. quadrata* is larger, has fewer angular whorls, and lacks the strong sutural primaries that give the body whorl of *G. rugirima* a squarish look.

Type material

Holotype
UNITED STATES OF AMERICA • 5.1 × 2.5 mm; Florida Keys, Key West; USNM 86914.

Paratypes
None known.

Material examined (310 specs)

Approximately 310 specimens in 111 lots were examined in addition to the holotype. The following are data on 130 specimens, some of which are figured, sequenced or ethanol-preserved.

BERMUDA • 100 specs, (12 measured, 1 figured) 6.0 × 2.9, 5.5 × 2.5, 5.4 × 2.7, 5.4 × 2.7, 4.5 × 2.3, 6.7 × 3.0, 5.8 × 2.8, 4.8 × 2.5, 5.4 × 2.9, 4.7 × 2.5, 5.3 × 2.6 and 5.4 × 2.9 mm; between Charles and Rugby Islands; depth 4 m; Aug. 1988; A.T. Guest leg.; dredged; UF 589779.

GUADELOUPE • 1 spec., 5.0 × 2.2 mm; Ilet Fortune; 16°09′ N, 61°33.67′ W; depth 1 m; 5–6 May 2012; KARUBENTHOS 2012; stn GM06; sequenced; MNHN-IM-2013-20612 • 1 spec., 5.2 × 2.7 mm; Petit Cul-de-Sac Marin; 16°11.8′ N, 61°29.66′ W; depth 6 m; 3 May 2012; KARUBENTHOS 2012; stn GS03; MNHN-IM-2013-20588 • 1 spec., 4.2 × 2.4 mm; bouée PCA (sud Port-Louis, Ouest Petit Canal); 16°22.57′ N, 61°31.74′ W; depth 8 m; 15 May 2012; KARUBENTHOS 2012; stn GS19; MNHN-IM-2013-20669 • 1 spec., 4.5 × 2.3 mm; bouée PCA (sud Port-Louis, Ouest Petit Canal); 16°22.57′ N, 61°31.74′ W; depth 8 m; 15 May 2012; KARUBENTHOS 2012; stn GS19; sequenced; MNHN-IM-2013-20657 • 1 spec., 4.6 × 2.6 mm; Lizzard Point; 16°08.43′ N, 61°46.92′ W; depth 12 m; 7 May 2012; KARUBENTHOS 2012; stn GB05; sequenced; MNHN-IM-2013-20644 • 1 spec., 5.5 × 2.9 mm,

ethanol-preserved; entrée grotte aux barracudas (Port-Louis); 16°27.34′ N, 61°32.07′ W; depth 19 m; 16 May 2012; KARUBENTHOS 2012; stn GS20; MNHN-IM-2019-34715 • 1 spec., 6.2 × 3.3 mm, ethanol-preserved; Petit Cul-de-Sac Marin; 16°13.41′ N, 61°31.83′ W; depth 1 m; 2 May 2012; KARUBENTHOS 2012; stn GM01; MNHN-IM-2019-34675 • 1 spec., 4.8 × 2.3 mm, ethanol-preserved; Grand Cul-de-Sac Marin; 16°21.87′ N, 61°31.78′ W; depth 5 m; 20 May 2012; KARUBENTHOS 2012; stn GS27; MNHN-IM-2019-34740.

DOMINICAN REPUBLIC • 1 spec., 5.0 × 2.4 mm; Dominica Republic, Las Salinas; depth 1 m; Jun. 1992; Glenn Duffy leg.; under coral rubble; UF 589775

MARTINIQUE • 1 spec., 4.9 × 2.3 mm; Case-Pilote; 14°38.3′ N, 61°08.4′ W; depth 12 m; 8 Sep. 2016; MADIBENTHOS; stn AB159; sequenced; MNHN-IM-2013-70239 • 1 spec., 4.4 × 2.3 mm; Passe du Marin, Pointe Borgnesse; 14°26.6′ N, 60°54.3′ W; depth 15 m; 9 Sep. 2016; MADIBENTHOS; stn AB058; sequenced; MNHN-IM-2013-70289 • 1 spec., 5.1 × 2.9 mm; Anse Couleuvre, Sous-Marin; 14°50.4′ N, 61°13.4′ W; depth 7 m; 1 Oct. 2016; MADIBENTHOS; stn AB463; sequenced; MNHN-IM-2013-71807 • 1 spec., 5.4 × 3.0 mm; Case-Pilote; 14°38.3′ N, 61°08.4′ W; depth 12 m; 8 Sep. 2016; MADIBENTHOS; stn AB159; sequenced; MNHN-IM-2013-70238 • 1 spec., 4.7 × 2.4 mm; Case-Pilote; 14°38.3′ N, 61°08.4′ W; depth 12 m; 8 Sep. 2016; MADIBENTHOS; stn AB159; sequenced; MNHN-IM-2013-70237 • 1 spec., 4.8 × 2.4 mm; Baie de Fort-de-France, E Grande Sèche; 14°34.6′ N, 61°03.3′ W; depth 6 m; 9 Oct. 2016; MADIBENTHOS; stn AB398; sequenced; MNHN-IM-2013-73176 • 1 spec., 7.0 × 3.5 mm; Anse Couleuvre, Sous-Marin; 14°50.4′ N, 61°13.4′ W; depth 7 m; 1 Oct. 2016; MADIBENTHOS; stn AB463; sequenced; MNHN-IM-2013-71808 • 1 spec., 5.8 × 2.6 mm; Anse Couleuvre, Sous-Marin; 14°50.4′ N, 61°13.4′ W; depth 7 m; 1 Oct. 2016; MADIBENTHOS; stn AB463; sequenced; MNHN-IM-2013-71809 • 1 spec., 4.5 × 2.5 mm; Anse Couleuvre, Sous-Marin; 14°50.4′ N, 61°13.4′ W; depth 7 m; 1 Oct. 2016; MADIBENTHOS; stn AB463; sequenced; MNHN-IM-2013-71810 • 1 spec., 5.5 × 2.9 mm; W Petite Anse des Salines, Canal de Ste Lucie; 14°24.46′ N, 60°53.06′ W; depth 60 m; 11 Sep. 2016; MADIBENTHOS; stn AD226; MNHN-IM-2000-39602 • 1 spec., 7.1 × 3.0 mm; Trésor Bay, Caravelle Penisula; 14°45.9′ N, 60°52.9′ W; depth 0–2 m; 21 Sep. 2016; MADIBENTHOS; stn AM026; sequenced; MNHN-IM-2013-71431.

TRINIDAD AND TOBAGO • 1 spec., 5.7 × 2.8 mm; Chaguaramas Island; depth 8–12 m; 16 Apr. 2005; G. Mackintosh leg.; night SCUBA with suctioning gear; P. Fallon coll.

ST. VINCENT AND THE GRENADINES • 2 specs, 5.7 × 2.9 and 5.5 × 2.9 mm; Quatre Island; P. Fallon coll.

UNITED STATES OF AMERICA • 1 spec., 2.9 × 1.8 mm; offshore Louisiana; 28°05.61′ N, 91°02.205′ W to 28°05.524′ N, 91°02.036′ W; depth 58 m; 27 May 2000; E García leg.; dredged in coralline rubble from R/V *Pelican*; UF 589776 • 5 specs (1 figured), 5.8 × 3.0, 5.4 × 2.8, 4.7 × 2.3, 4.4 × 2.3 and 4.2 × 2.2 mm; E Florida, Palm Beach Co., Delray Beach, Dunes Park; 1973–76; J. Lightfoot leg.; from beach renourishment; UF 589777 • 1 spec., 5.2 × 2.8 mm; Florida Keys, Monroe Co., Key Vaca, S of Marathon Key; depth 61 m; 1988; Ted Kalafut leg.; dredged; UF 589778

Description

Shell small, rarely reaching length = 6.0 mm, strong, stoutly fusiform (W/L of holotype = 0.4902) with about 5 teleoconch whorls acutely angled mid-whorl, the last whorl 61% of shell length. Sutures impressed, undulant over previous whorl's ribs. Sculpture of strong ribs and heavily frosted spirals of varying strengths. Aperture strongly constricted, narrow-ovate, about 42% of shell length, with a narrow anterior canal of moderate length. *Protoconch* of 2½–2¾ round whorls, the last ½-whorl with riblets that terminate about ⅔ the distance to the suture on about the last ¼-whorl, forming a bulge at the whorl periphery. *Axial sculpture* of strong ribs that run from suture to suture on spire whorls and to anterior

fasciole on last. Ribs are strong right up to the suture, barely recurved on shoulder, widen into triangular extensions at the shoulder periphery, are straight and gradually reduce in

strength toward the anterior fasciole. *Varix* at aperture, wide and crenated by spirals; curvature of outline flattened in shoulder region, behind anal sinus. *Spiral sculpture* of frosted primary and secondary spirals; a pair of the strongest primaries are at the edge of the shoulder and on whorl base at the whorl suture line, one of which is exposed at the sutures of the spire. About 6 weak primaries present on the shoulder, 3 primaries on the whorl sides that grow weaker toward the suture, the 2 closest to the periphery strongest, and about 5 others, beginning with the 2 on the suture line and ending at the anterior fasciole. Secondaries vary in strength from specimen to specimen, from 2–5 are in the intercalary space. Spirals override ribs, and on the stronger primaries are nodulous on rib crests; spirals on the anterior fasciole have low spikes or nodules on rib crests in some individuals. *Sulcus* absent; barely recurved ribs on shoulder mark past presence of anal sinus. *Outer lip* thin, a narrow extension from the base of the varix, with a low tooth below anal sinus. *Anal sinus* shallow, directed laterally, lip reflected, joined to inner lip/parietal wall by a narrow callus, located about midway on the shoulder and in front of the varix. *Inner lip* a narrow glaze etched into columella, unemarginate. *Anterior fasciole* not swollen, with about 5 oblique spirals. *Columella* straight. *Anterior canal* straight, end notched. *Color* off white to pale golden yellow, primary spirals and varix lighter, a light yellowish brown present in intercalary space on some specimens.

Animal

Translucent white with irregular, large opaque white spots and small orange and brown spots on both foot and siphon. The long siphon and pointed foot posterior are seen in the image (Fig. 57).

Remarks

The average length of 106 measured specimens is 5.6 mm (range = 1.2–7.1 mm).

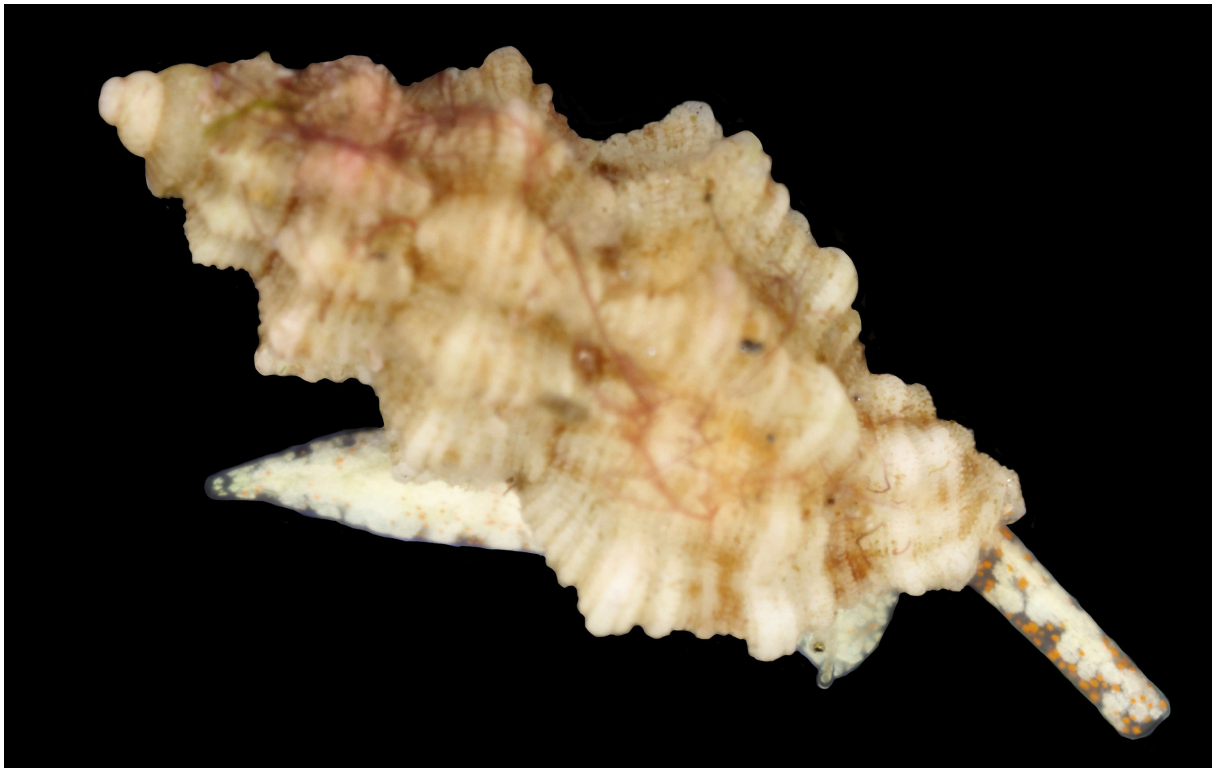


Fig. 57. *Glyphoturris rugirima* (Dall, 1889) (MNHN-IM-2013-71810), live animal. Photo by P. Maestrati.

Range and habitat

Widespread. Examined specimens are from Trinidad and Tobago, St. Vincent and the Grenadines, Martinique, Guadeloupe, Dominican Republic, Bahamas, Bermuda, United States (E Florida, Florida Keys, W Florida, and Louisiana); depth, 1–72 m (live 1–19 m). Other published localities include United States [North Carolina (Porter 1974)], Antigua (Zhang 2011), Puerto Rico (Warmke & Abbott 1961), Cuba (Rolán *et al*. 2012), Mexico [Campeche Bank (Rice & Kornicker 1965) and Yucatan (Treece 1980)], and Panama (FLMNH collection).

Glyphoturris ignota Fallon sp. nov.
urn:lsid:zoobank.org:act:974674CF-4DFA-4AAE-9744-3865C18B72D5
Figs 55C, 58M–R

Differential diagnosis

Glyphoturris rugirima (Dall, 1889) is similar but its protoconch has ribs only on ½-whorl, versus ¾-whorl, which are stronger and more closely set, and the periphery of the last ¼-whorl is not sharply angled but convex. *Glyphoturris ignota* Fallon sp. nov. is larger (the holotype is a sub-adult but in the best condition in the type series), has less angular whorls, has less undulant sutures, ribs that are not as strong at the suture, and is colored differently, brown overall except the spirals, protoconch and anterior fasciole, which are white.

Etymology

Glyphoturris ignota Fallon sp. nov. from the feminine form of the Latin adjective '*ignotus*', meaning 'unknown', the unknown *Glyphoturris*, because it is easily overlooked and mistaken for *G. quadrata.*

Type material

Holotype
BRAZIL • 5.7 × 2.7 mm; off Guarapari; depth 9–12 m; Aug. 1981; M. and J. Coltro leg.; diver collected under rocks; UF 589780.

Paratypes (3 specs)
BRAZIL • 3 specs, 4.9 × 2.4, 7.9 × 3.8 and 8.5 × 3.9 mm; same data as for holotype; UF 589781.

Description

Shell small, the largest paratype length = 8.5 mm, strong, stoutly fusiform (W/L of holotype is 0.4576) with 5 teleoconch whorls, acutely angled mid-whorl, the last whorl 62% of shell length. Sutures impressed. Sculpture of strong ribs and heavily frosted spirals of varying strengths. Aperture strongly constricted, narrow-ovate, about 44% of shell length, with a narrow anterior canal of moderate length. *Protoconch* of about 2¾ round whorls, the last ¾-whorl with riblets that become wide apart, and the last ¼-whorl with an angular periphery. *Axial sculpture* of strong ribs that run from suture to suture on spire whorls and over the anterior fasciole to the inner lip or edge of canal below the inner lip on the last whorl. Ribs fade up to the suture, are barely recurved on shoulder, angled and highest on periphery, and curved to, and gradually reduce and narrow to the inner lip and edge of canal. Ribs have round crests, are wider than their interspaces except on the dorsum of the last whorl, where the interspaces are wider; 10 ribs are present on the penultimate and 7 up to the varix on the last. Varix is not completely formed on the holotype but is on 2 paratypes. *Varix* apertural, broad and crenated by spirals; outline flattened over shoulder region, behind anal sinus. *Spiral sculpture* of frosted primary and secondary spirals; a pair of strong primaries define the whorl periphery and edge of the shoulder. About 4 weak primaries and 1 or 2 microscopic secondaries between each on the shoulder, 2 primaries on the whorl sides below the peripheral ones, with 1 or 2 secondaries between each, followed by 2 strong sutural primaries. Below the

suture are two pairs of primaries, a strong one paired with a weaker one, positioned just below the sutural pair and the other at the margin of the anterior fasciole. The fasciole has 7 strong primaries that are quite nodulose on rib crests. From 1 to 3 secondaries are present in intercalary space of shell base primaries. Spirals override ribs and are slightly swollen and nodulous on rib crests. *Sulcus* absent, barely recurved ribs on shoulder mark past presence of anal sinus. *Outer lip* varicose, with a thin, narrow extension from the base of the varix; a low tooth present below anal sinus. Tooth present on paratype, not on immature holotype. *Anal sinus* round, sides slightly divergent, located about midway on the shoulder and in front of the varix, and angled away from shell axis. *Inner lip* a narrow glaze etched into columella, a callus extension over aperture posterior with a low tooth marking the beginning of the anterior canal. *Anterior fasciole* not swollen, with about 5 compact spirals that are nodulose on rib crests lending the fasciole a spiky look, with 1 or 2 secondaries between. *Columella* straight. *Anterior canal* straight, end notched. *Color* brown overall except the spirals, protoconch and anterior fasciole, which are white.

Range and habitat

Known only from the type locality.

Glyphoturris laminata Fallon sp. nov.
urn:lsid:zoobank.org:act:59929A05-88A2-4E2D-BBDF-5DA12ED6D910
Figs 55D, 58S–U

Differential diagnosis

Glyphoturris quadrata (Reeve, 1845) is smaller (the largest length = 8.4 versus 11.2 mm), and whorl height shorter, its spirals not as uniform in strength, not lamellar, and not in a sequence of 1:1 or 2 primary to secondary spirals and is colored differently.

Etymology

Glyphoturris laminata Fallon sp. nov. is derived from the single termination Latin adjective '*laminata*', meaning the 'laminate' *Glyphoturris*, after its unique lamellar-like spirals.

Fig. 58 (next page). Species of *Glyphoturris* Woodring, 1928. Part 2. – **A–B**. *Mangilia quadrata* var. *rugirima* Dall, 1889, holotype, 5.1 × 2.5 mm, ventral and dorsal views (USNM 86914), Key West, Florida Keys. – **C–L**. *Glyphoturris rugirima* (Dall, 1889), specimens from different localities. **C**. Spec., 4.5 × 2.3 mm (MNHN-IM-2013-20657), bouée PCA (S of Port-Louis, W of Petit Canal), Guadeloupe. **D**. Spec., 4.5 × 2.5 mm (MNHN-IM-2013-71810), Couleuvre Cove, Sous-Marin, Martinique. **E**. Spec., 5.5 × 2.9 mm (MNHN-IM-2000-39602), St Lucie Canal, W of Little Cove of Salines, Martinique. **F**. Spec., 5.0 × 2.4 mm (UF 589775), Las Salinas, Dominica Republic. **G–H**. Spec., 4.4 × 2.3 mm, ventral view, and SEM image of protoconch (MNHN-IM-2013-70289), Marin Pass, Borgnesse Point, Martinique. **I**. Spec., 6.0 × 2.9 mm (UF 589779), between Charles and Rugby Islands., Bermuda. **J**. Spec., 5.8 × 3.0 mm (UF 589777) Dunes Park, Delray Beach, Palm Beach Co., E Florida. **K**. Spec., 5.7 × 2.8 mm (P. Fallon coll.), Chaguaramas, Trinidad and Tobago. **L**. Spec., 5.7 × 2.9 mm (P. Fallon coll.), Quatre Island, Saint Vincent and the Grenadines. – **M–R**. *Glyphoturris ignota* Fallon sp. nov. **M–O**. Holotype, 5.9 × 2.7 mm, ventral and dorsal views, and SEM image of protoconch (UF 589780), Guarapari, Espirito Sancto, Brazil. **P–R**. Paratypes, 4.9 × 2.4, ventral view and SEM image of protoconch and 7.9 × 3.8 mm (UF 589781), Guarapari, Espirito Sancto, Brazil. – **S–U**. *Glyphoturris laminata* Fallon sp. nov., holotype, 11.2 × 4.1 mm, ventral and dorsal views, and SEM image of protoconch (UF 589782), Chacachcare Island, Trinidad and Tobago. Credits: H, O, Q, U: SEM images courtesy of Chandler J. Olson. Scale bars: A–G, I–N, P, R–T = 2 mm; H, O, Q, U = 300 µm.

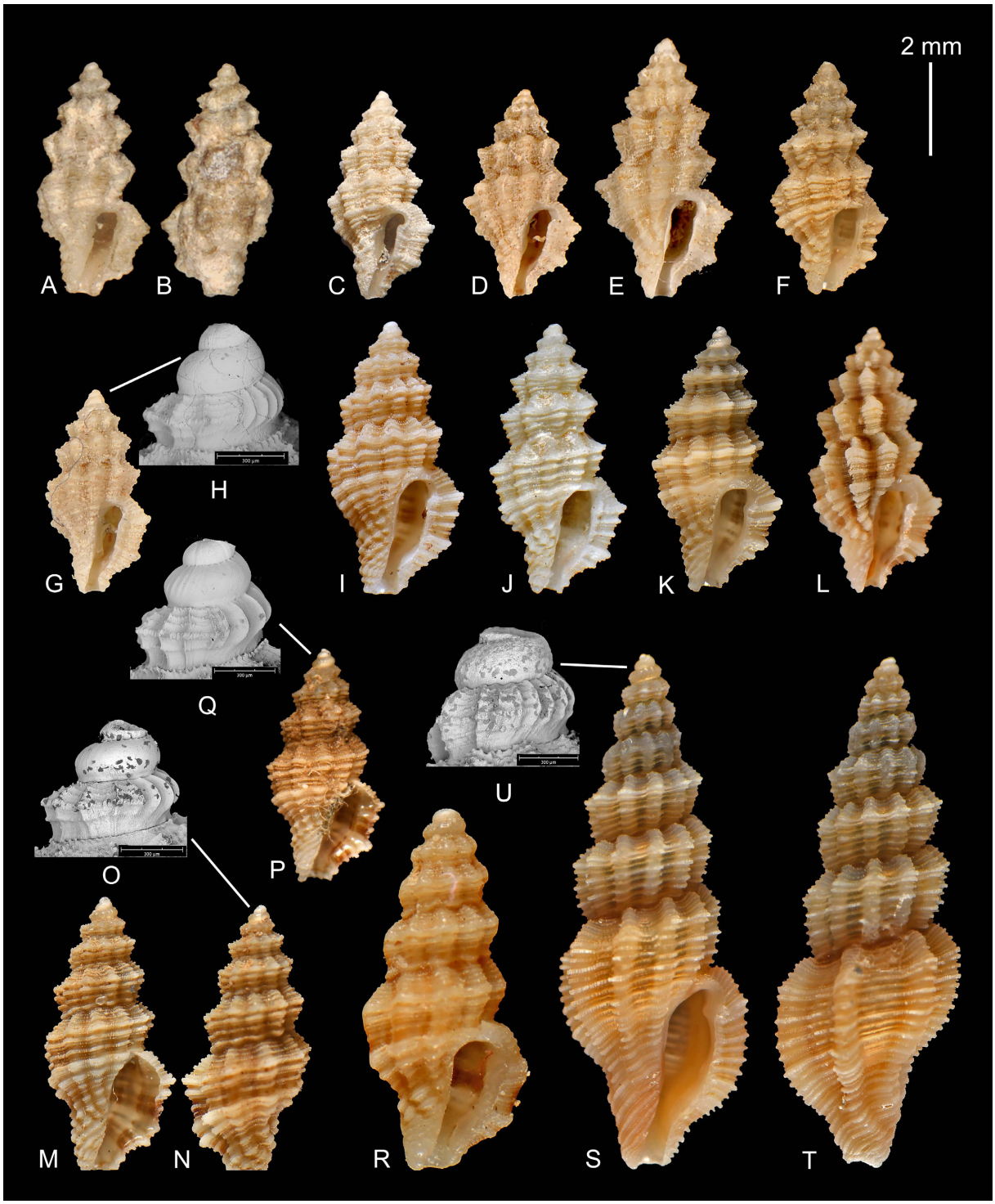
Type material

Holotype

TRINIDAD AND TOBAGO • 11.2 × 4.1 mm; Trinidad Island, Chacachcare Island; depth 18 m; 30 Dec. 1996; G. Mackintosh leg.; night SCUBA; UF 589782.

Paratypes

None.



Description

Shell small (length = 11.2 mm), translucent, fusiform (W/L = 0.3661) with 9 whorls, teleoconch shoulders angled at roughly ⅓-whorl height, the last whorl 54% of shell length. Sutures impressed, undulant. Sculpture of strong ribs and heavily frosted spirals of varying strengths. Aperture strongly constricted, narrowly ovate, about 46% of shell length including anterior canal, which is narrow and of moderate length. *Protoconch* of about 2½ round whorls, the last ¾-whorl with riblets that become wide apart and terminate before the suture. Riblet crests crossed by 2 faint spirals. *Axial sculpture* of strong cord-like ribs that run from suture to suture on spire whorls to the anterior fasciole on the last whorl. Ribs strong up to the suture, are slightly narrower but slightly recurved on shoulder, angled at periphery, and straight on whorl sides. Ribs are about as wide as their interspaces, except on the dorsum of the last whorl where the interspaces are wider; 11 ribs are present on the penultimate and 7 up to the varix on the last. *Varix* at aperture, wide, flattened, and crenated by spirals, outline strongly convex from the anal sinus to anterior canal. *Spiral sculpture* of thin and lamellar-like spirals of primary and secondary strengths; shoulder spirals of about 9 secondaries, and a pair of primaries define the whorl periphery or edge of the shoulder. Whorl sides and base have primaries and secondaries alternating in a 1 to 1 or 2 sequence, the anterior fasciole has 5 primaries with 2 secondaries between each. Spirals override ribs and are not nodulous on rib crests; spiral frosting differs from other members of the genus group in that individual structures have solid shovel-like crowns with little or no fanning of fibrils. *Sulcus* absent, barely recurved ribs on shoulder mark past presence of anal sinus. *Outer lip* varicose, with a thin, narrow extension of shell from the base of the varix; a tooth is present inside lip, below anal sinus. *Anal sinus* is a round glazed laterally projecting notch with slightly divergent sides and located about midway on the shoulder, in front of the varix. *Inner lip* has a narrow glaze etched into columella and parietal area. *Anterior fasciole* not swollen, with about 6 spirals with 1 or 2 secondaries between. *Columella* straight, without a tooth at the beginning of the anterior canal. *Anterior canal* straight, end notched. *Color* light golden brown except primary spirals, protoconch, and anterior fasciole, which are lighter or white.

Remarks

The lamellar-like spirals are unlike any other in the genus group, so a formal description of the single specimen is merited currently.

Range and habitat

Known only from the type locality.

Genus ***Habrocythara*** Fallon gen. nov.
urn:lsid:zoobank.org:act:205C4751-D42B-4B8B-B3B2-A43C41456BA7

Type species

Habrocythara pulchra Fallon & Bouchet gen. et sp. nov.

Diagnosis

Shell long and slender, polished, and translucent, with a swollen last whorl and long, elegantly tapered anterior canal; aperture long and narrow, anterior canal not distinctly differentiated from aperture, is subtubular and straightens out in a gentle curve from the base of the aperture to its end, which is unnotched. Protoconch of 1½–2½ smooth whorls that may end with riblets up to ¾-turn from the end. Sculpture of fine, narrow, widely spaced cord-like ribs that run from suture to suture on spire whorls and fade before the fasciole on the last whorl, slightly sigmoidal, thinner, and recurved on whorl shoulders; spiral sculpture of fine spiral grooves, which may be obsolete between ribs and visible as crenulated rib crests, and fine oblique spiral cords on the anterior fasciole. Outer lip arched out from base of varix, with a wide, shallow anal sinus on the shoulder and callus under the lower end of the sinus. Inner lip is a narrow glaze

without denticles or calluses. Color translucent white to light golden brown with brownish-orange or yellow bands on the shoulder usually interrupted by the ribs, and one to 3 more below.

Etymology

Habrocythara Fallon gen. nov., the graceful *Cythara*, from Greek '*habros*', meaning 'pretty, dainty, graceful'.

Summary diagnostic characteristics

Shell glassy-smooth, translucent, whorls convex without defined shoulders, a swollen last whorl and a long, evenly tapered anterior canal.

Protoconch somewhat bulbous, of 1½–2½ whorls, the first minute, the last with or without riblets.

Outer lip varicose and with a callus below a shallow anal sinus in fully developed specimens.

Sculpture of widely spaced 7 or more narrow ribs per whorl, usually finely crenulated by microscopic spiral grooves that may be obsolete between ribs.

Color translucent white to light golden brown with segmented brown bands on the shoulder and 1–3 below.

Shell surface microsculpture

Sculptural elements are absent at all magnifications examined (SEM 730–2600×). Shell surface is smooth, except for fine spiral grooves. At higher magnification (> 1000×) faint punctae appear that are distributed randomly. The density and size of punctae may be species specific.

Several species of *Ithycythara* have similar shell surfaces, smooth surfaces with randomly distributed punctae. These are the *Ithycythara psila*-like forms that possess glossy shells. Morphologically, they differ in possessing more streamlined, narrower shells with shorter anterior canals, and more apertural dentition.

Radula

Habrocythara cymella (Dall, 1889) gen. et comb. nov. was imaged as a representative species of the genus *Habrocythara* (MNHN-IM-2013-61557). Its description is as follows: hypodermic marginal teeth simple, semi-enrolled and trough-shaped, medium long, length about 150 µm. Tooth edges do not overlap but are closer in middle part. Base rather narrow, solid, attenuated, constituting about ⅕ of tooth length and with a strong spur. Tip pointed with slightly thickened tooth edges, with weak and medium long blade on the convex side, and small barb on the concave side.

Difference from other genera

Ithycythara Woodring, 1928 has a moderately deep anal notch, elongate lyrae inside the outer lip, 5–7 ribs, and ribs angulated approximately mid-whorl by a peripheral spiral cord. These characteristics are absent in *Habrocythara* Fallon gen. nov. When compared to the type species, *I. psila* (K.J. Bush, 1885), *Ithycythara* does not have the relatively short spire and bulbous body whorl and long tapered anterior canal of *Habrocythara* Fallon gen. nov.

Remarks

Habrocythara cymella (Dall, 1889) gen. et comb. nov. has been combined in the genus *Ithycythara* Woodring, 1928 since Abbot's (1974: 282) widely published usage. Authors have understood the uniqueness and the unsuitability of this combination, placing it instead in *Cythara* Schumacher, 1817,

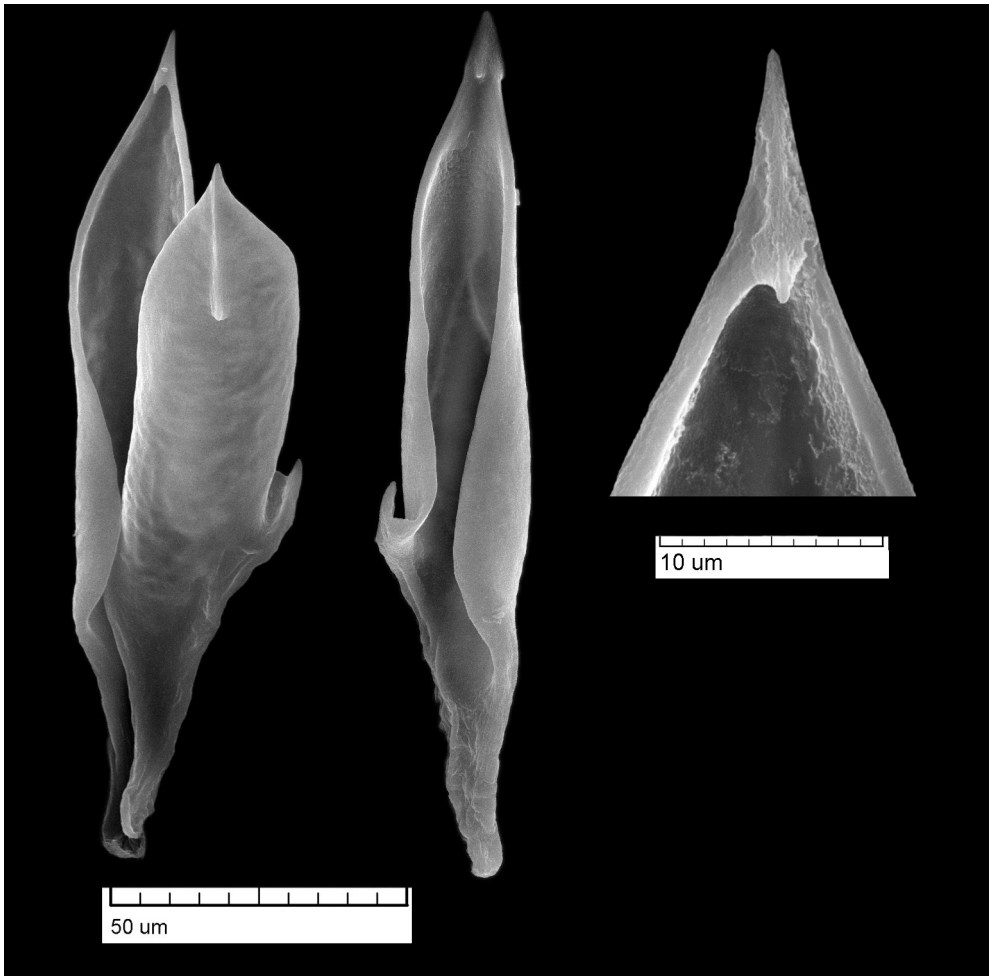


Fig. 59. Radular marginal teeth of *Habrocythara cymella* (Dall, 1889) gen. et comb. nov. (MNHN-IM-2013-61557). Image by Y. Kantor.

and *Cytharella* Monterosato, 1875 [see under *H. cymella* (Dall, 1889) gen. et comb. nov.]. The identity of *Cythara* is obscure (Powell 1966: 109), and the diagnosis of *Cytharella* does not fit. So, in recognition of its uniqueness, and supported by the analysis of gene sequencing data separating it from *Ithycythara* at the genus level, *H. cymella* (Dall, 1889) gen. et comb. nov. and two other new species described herein are assigned to this new genus.

Phylogenetic relationships

The DNA sequence data support the monophyly of the genus *Habrocythara* Fallon gen. nov. The two sequenced species cluster in a well-supported clade, forming an isolated branch within the TWA Mangeliid radiation.

Habrocythara cymella (Dall, 1889) gen. et comb. nov.
Figs 59, 60A–B, 61A–H

Mangilia (*Cythara*) *cymella* Dall, 1889a: 101, pl. 12 fig. 4.

Mangilia (*Cythara*) *cymella* – Dall 1889b: 100. — Tucker 2004: 275.

Cytharella cymella – Maury 1922: 73. — Rice & Kornicker 1965: 128, pl. 7 fig. 13.
Ithycythara cymella – Abbott 1974: 282. — Porter 1974: 254. — Turgeon *et al*. 1988: 97; 1998: 106. — Williams 2005: #3620.
"*Cythara*" *cymella* – Kaicher 1984: card 3987. — Sunderland & Sunderland 1993: 15; text photo.

Differential diagnosis

Habrocythara pulchra Fallon & Bouchet gen. et sp. nov. has a narrower protoconch of 2, not 1½ whorls, and is larger.

Habrocythara parva Fallon & Bouchet gen. et sp. nov. has a protoconch with riblets ¾-turn from its end, is 2½, not 1½, whorls, and its shell is quite a bit smaller.

Type material

Lectotype (here designated)
There are syntypes in USNM 87419, MCZ 7103 and MCZ 7104. The specimen in MCZ 7103 most closely matches Dall's description and is here designated the lectotype (Fig. 61A–C).

GRENADA • 1 spec., 12.8 × 4.2 mm; near Grenada; 12°3.25′ N, 61°46.42′ W; depth 291 m; 28 Feb. 1879; USCSS *Blake* exped.; stn 259; MCZ 7103.

Paralectotypes (2 specs)
BARBADOS • 2 specs, 7.7 × 3.0 and 6.0 × 2.3 mm; off Barbados; 13°10′ N, 59°32′ W; depth 183 m; USCSS *Blake* exped.; station not recorded; USNM 87419.

The Cuba specimens in MCZ 7104 are a different species and so are not paralectotypes.

Material examined (24 specs)

All 3 known original syntype lots were examined (MCZ 7013, MCZ 7104, and USNM 87419). In addition, the following 20 specimens from Guadeloupe and Louisiana were examined:

GUADELOUPE • 1 spec., 11.9 × 4.2 mm; ethanol-preserved; E of La Désirade; 16°17′ N, 61°01′ W; depth 208–362 m; 17 Jun. 2015; KARUBENTHOS 2; stn DW4568; MNHN-IM-2013-60717 • 1 spec., 10.5 × 3.4 mm; ethanol-preserved; S of Marie-Galante; 15°51′ N, 61°18′ W; depth 250–254 m; 29 Jun. 2015; KARUBENTHOS 2; stn DW4646; MNHN-IM-2013-61557 • 1 spec., 11.6 × 4.0 mm; N of Grande-Terre; 16°40′ N, 61°34′ W; depth 394–400 m; 13 Jun. 2015; KARUBENTHOS 2; stn DW4542; MNHN-IM-2000-39605 • 1 spec., 11.4 × 4.0 mm; E of La Désirade; 16°22′ N, 60°51′ W; depth 201–280 m; 16 Jun. 2015; KARUBENTHOS 2; stn DW4564; MNHN-IM-2000-39606 • 1 spec., 11.0 × 4.0 mm; S of Marie-Galante; 15°50′ N, 61°19′ W; depth 305–312 m; 28 Jun. 2015; KARUBENTHOS 2; stn DW4638; MNHN-IM-2012-35924 • 1 spec., 10.9 × 3.7 mm; E of La Désirade; 16°21′ N, 60°51′ W; depth 165–260 m; 16 Jun. 2015; KARUBENTHOS 2; stn DW4566; MNHN-IM-2000-39603 • 1 spec., 13.1 × 4.0 mm; E of La Désirade; 16°20′ N, 60°54′ W; depth 358–402 m; 18 Jun. 2015; KARUBENTHOS 2; stn DW4577; MNHN-IM-2000-39604 • 1 spec., 12.9 × 4.1 mm; E of La Désirade; 16°19′ N, 60°55′ W; depth 396–399 m; 17 Jun. 2015; KARUBENTHOS 2; stn DW4572; MNHN-IM-2012-35926 • 1 spec., 7.5 × 2.4 mm; N of Grande-Terre; 16°40′ N, 61°34′ W; depth 394–400 m; 13 Jun. 2015; KARUBENTHOS 2; stn DW4542; MNHN-IM-2012-35925 • 4 specs, 15.9 × 5.2, 15.7 × 5.1, 12.6 × 3.9 and 9.6 × 3.2 mm; W of Marie-Galante; 15°48′ N, 61°26′ W; depth 304–310 m; 27 Jun. 2015; KARUBENTHOS 2; stn DW4634; MNHN-IM-2000-39607 • 1 spec., 16.1 × 4.8 mm; W of La Désirade; 16°08′ N, 61°19′ W; depth 400–420 m; 19 Jun. 2015; KARUBENTHOS 2; stn DW4582; MNHN-IM-2012-35923 • 1 spec., 10.5 × 3.5 mm; E of La Désirade; 16°19′ N, 60°52′ W; depth 221–450 m; 18

Jun. 2015; KARUBENTHOS 2; stn DW4581; MNHN-IM-2012-35927 • 1 spec., 11.3 × 3.8 mm; N of Grande-Terre; 16°31′ N, 61°32′ W; depth 268–306 m; 14 Jun. 2015; KARUBENTHOS 2; stn DW4546; MNHN-IM-2000-39608 • 1 spec., 7.4 × 2.8 mm; N of Grande-Terre; 16°34′ N, 61°37′ W; depth 426–441 m; 9 Jun. 2015; KARUBENTHOS 2; stn DW4518; MNHN-IM-2015-925 • 1 spec., 11.3 × 4.0 mm; South of La Désirade; depth 350 m; 2016; dredged; D. Lamy coll.

UNITED STATES OF AMERICA • 1 spec., 10.2 × 3.5 mm; off Louisiana; 27°55.14′ N, 92°22.71′ W to 27°55.09′ N, 92°22.08′ W; depth 160–168 m; 19 May 2019; dredged; E.F. García on board R/V *Pelican*; EFG 32350 • 1 spec., 9.5 × 3.4 mm; off Louisiana; 27°53.65′ N, 91°21.48′ W to 27°53.3′ N, 91°21.2′ W; depth 219–221 m; 17 May 2019; dredged; E.F. García on board R/V *Pelican*; EFG 32430.

Description

Based on the description in Dall (1889: 101) and examination of the lectotype. *Shell* small (length = 12.8 mm), glassy, thin shelled but strong, fusiform with a long tapered last whorl and anterior canal, and a relatively short spire. About 5½ moderately convex teleoconch whorls, peripheries about mid-whorl, sutures straight and slightly appressed, the last whorl and anterior fasciole together about 73% of shell length; aperture a narrow oval, varicose, gradually narrowed to a long anterior canal; sculpture of strong narrow ribs and well-separated fine spiral grooves. *Protoconch* of 1½ glassy whorls, tip minute, rapidly expanding to a sub-globular last. *Axial sculpture* of strong rope-like ribs that extend from suture to suture on spire whorls and evanesce before the anterior fasciole on the whorl, are thin and recurved on shoulders, slightly thicker on whorl peripheries; ribs number 10 per whorl, not aligned whorl to whorl. *Varix* apertural, like preceding ribs but thicker, lies behind outer lip. ***piral sculpture*** of well-spaced, fine grooves, strongest on ribs, where they faintly crenulate the crests, and stronger on the canal where the interspaces are slightly raised and rounded. *Sulcus* absent, but recurved ribs on shoulder mark past positions of the sinus. *Outer lip* varicose, with a thin strip of shell at the base of the varix extending from suture to anterior canal, edge traces an arc from and contiguous with outer side of anal sinus to end of anterior canal, low callus at anal sinus, stromboid notch lacking. *Anal sinus* is a broad, narrow notch with divergent sides. *Inner lip* a narrow glaze along the anterior canal, columella, and parietal wall, joins outer lip at suture. *Columella* straight. *Anterior canal* long, straight, narrow, end unnotched. *Anterior fasciole* smooth, sculpture of spirals. *Color* translucent white, with faint brownish-yellowish spiral bands on suture line and on shoulder. Varix and columella are whitish.

Remarks

The average length of 30 measured specimens is 10.7 mm (range = 5.9–17.2 mm).

Range and habitat

Grenada and Barbados are localities given by Dall (1889) for specimens of the type series. His stated locality of Cuba is not *Habrocythara cymella* (Dall, 1889) gen. et comb. nov. Examined specimens are from Guadeloupe and United States (Louisiana); depth: 160–450 m. Live caught depth: 208–362 m. Reports of its occurrence that have not been verified include United States (E, W, and Florida Keys), Mexico (Campeche Bank), and St. Vincent and the Grenadines.

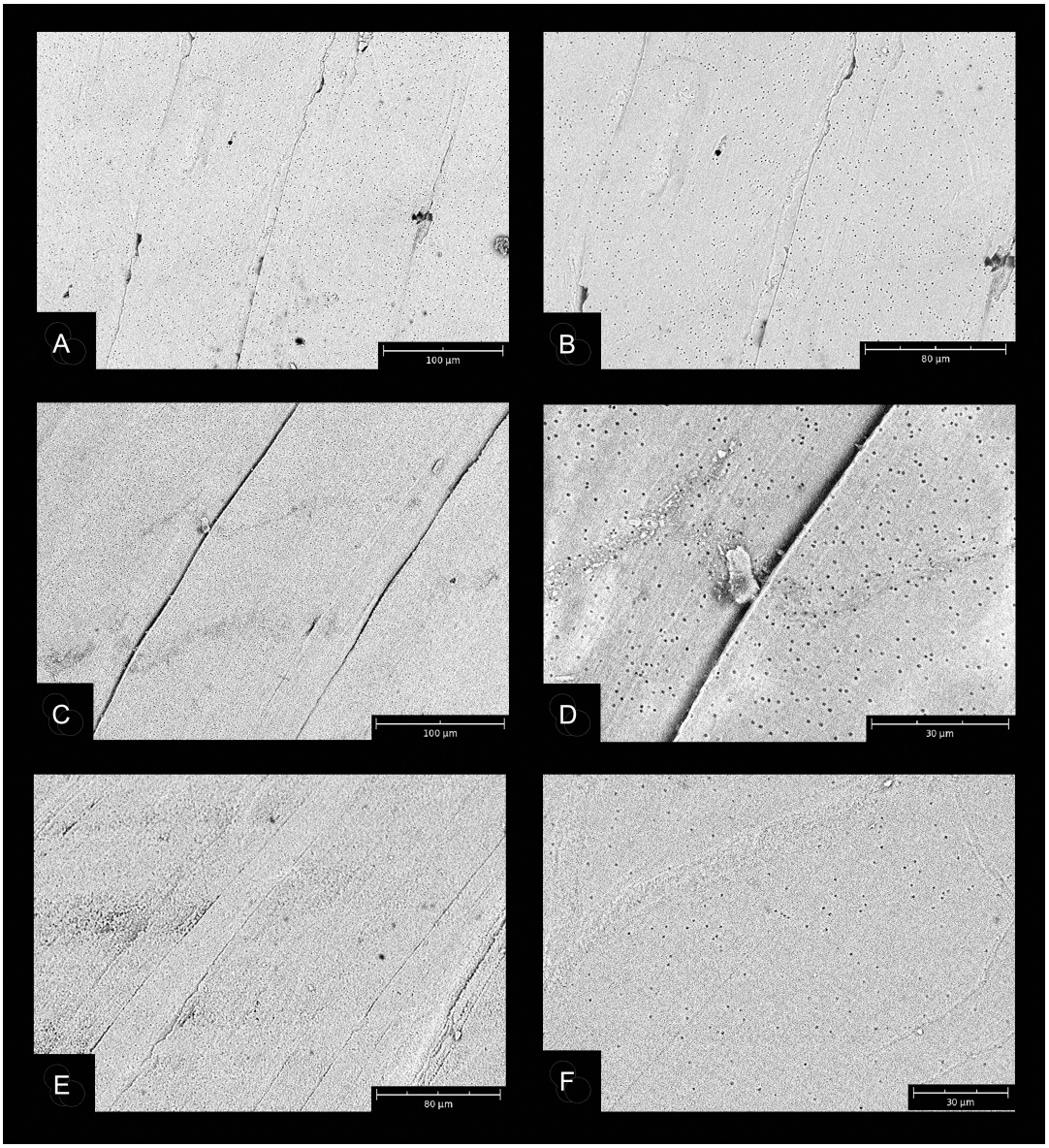


Fig. 60. Species of *Habrocythara* Fallon gen. nov., shell surface microsculpture. **A**. *Habrocythara cymella* (Dall, 1889) gen. et comb. nov. Spec., 13.1 × 4.0 mm (MNHN-IM-2000-39604), E of La Désirade, Guadeloupe. Magnification = 680 ×. Shell smooth, without sculptural features except for fine spiral grooves seen as faint lines (3 visible) that run vertically in a slight arc. **B**. Same specimen as in A. Magnification = 1000 ×. Three grooves are still visible. Microscopic punctae begin to appear at this magnification. These are random and sparse. **C**. *Habrocythara pulchra* Fallon & Bouchet gen. et sp. nov., holotype, 14.4 × 4.8 mm (MNHN-IM-2013-60417), N of Grande-Terre, Guadeloupe. Magnification = 730 ×. Shell surface smooth, without sculptural features except for two spiral grooves. **D**. Same specimen as in C. Magnification = 2600 ×. Randomly distributed punctae are more visible than at the lower magnification in B. **E**. *Habrocythara parva* Fallon & Bouchet gen. et sp. nov., holotype, 5.6 × 2.2 mm (MNHN-IM-2013-20603), Port-Louis, Guadeloupe. Magnification = 880 ×. Spiral grooves are more obscure, but three are visible that run diagonally from lower left to upper right in this image. The surface is otherwise featureless at this magnification. **F**. Same specimen as in E. Magnification = 1800 ×. Microscopic punctae, which can barely be seen at this magnification, are randomly distributed and sparse. Credits: SEM images courtesy of Paul Callomon. Scale bars: A, C = 100 µm; B, E = 80 µm; D, F = 30 µm.

Habrocythara pulchra Fallon & Bouchet gen. et sp. nov.
urn:lsid:zoobank.org:act:0F5FD420-EB9F-4C31-83DF-5E04FC1A1FBB
Figs 60C–D, 61I–P

Differential diagnosis

Habrocythara cymella (Dall, 1889) gen. et comb. nov. has a protoconch of 1½ whorls, not 2 and is generally smaller.

Habrocythara parva Fallon & Bouchet gen. et sp. nov. has a protoconch with weak riblets over ¾-turn from its end, not sub-globular in shape, and has 2½ not 2–2¼ whorls, and its shell is quite a bit smaller.

Etymology

Habrocythara pulchra Fallon & Bouchet gen. et sp. nov. derives from the feminine form of the Latin adjective '*pulcher*', which means 'pretty' and references the appearance of this species.

Type material

Holotype
GUADELOUPE • 14.4 × 4.8 mm; N of Grande-Terre; 16°31′ N, 61°32′ W; depth 268–306 m; 14 Jun. 2015; KARUBENTHOS 2; stn DW4546; sequenced; MNHN-IM-2013-60417.

Paratypes (23 specs)
GUADELOUPE • 6 specs, 12.4 × 4.2, 11.8 × 4.0, 12.4 × 4.0, 11.4 × 3.7, 8.4 × 3.2 and 8.6 × 2.9 mm; S of La Désirade; depth 250 m; 2016; dredged; D. Lamy coll. • 1 spec., 10.2 × 3.5 mm; S of La Désirade; depth 350 m; dredged; D. Lamy coll. • 1 spec., 15.5 × 4.9 mm; W of Marie-Galante; 15°58′ N, 61°23′ W; depth 200–206 m; 22 Jun. 2015; KARUBENTHOS 2; stn DW4594; USNM 1715410 • 1 spec., 12.6 × 3.5 mm; E of La Désirade; 16°20′ N, 60°54′ W; depth 358–402 m; 18 Jun. 2015; KARUBENTHOS 2; stn DW4577; MNHN-IM-2015-926 • 1 spec., 12.8 × 4.3 mm; E of La Désirade; 16°17′ N, 61°01′ W; depth 250–359 m; 17 Jun. 2015; KARUBENTHOS 2; stn DW4569; USNM 1715409 • 4 specs, 11.1 × 3.9, 9.5 × 3.2, 9.0 × 3.2 and 9.8 × 3.3 mm; Marie-Galante; depth 250 m; 2017; dredged; ANSP 498789 • 3 specs, 10.3 × 3.4, 8.3 × 2.8 and 7.1 × 2.4 mm; S of Marie-Galante; 15°51′ N, 61°18′ W; depth 250–254 m; 29 Jun. 2015; KARUBENTHOS 2; stn DW4646; ANSP 498827 • 3 specs, 10.3 × 3.5, 10.0 × 3.6 and 10.0 × 3.5 mm; W of Marie-Galante; 15°58′ N, 61°22′ W; depth 201–214 m; 22 Jun. 2015; KARUBENTHOS 2; stn DW4592; MNHN-IM-2000-39621 • 1 spec., 12.6 × 3.6 mm; E of La Désirade; 16°22′ N, 60°50′ W; depth 312–385 m; 15 Jun. 2015; KARUBENTHOS 2; stn CP4558; MNHN-IM-2000-39619 • 1 spec., 17.2 × 5.0 mm; N of Grande-Terre; 16°34′ N, 61°37′ W; depth 426–441 m; 9 Jun. 2015; KARUBENTHOS 2; stn DW4518. MNHN-IM-2000-39767 • 1 spec., 9.9 × 3.2 mm; N of Grande-Terre; 16°34′ N, 61°37′ W; depth 426–441 m; 9 Jun. 2015; KARUBENTHOS 2; stn DW4518; MNHN-IM-2000-39620.

Other examined material

Four specimens were not included in the type series.

GUADELOUPE • 1 spec., length = 11.5 mm; N of Grande-Terre; 16°37′ N, 61°31′ W; depth 432–482 m; 14 Jun. 2015; KARUBENTHOS 2; stn DW4550; MNHN-IM-2000-39616 • 2 specs, 9.6 × 3.0 and 5.9 × 2.1 mm; E of La Désirade; 16°19′ N, 60°55′ W; depth 396–399 m; 17 Jun. 2015; KARUBENTHOS 2; stn DW4572; MNHN-IM-2000-39617 • 1 spec., 8.9 × 3.1 mm; W of Marie-Galante; 15°53′ N, 61°25′ W; depth 262–266 m; 22 Jun. 2015; KARUBENTHOS 2; stn DW4599. MNHN-IM-2000-39618.

Description

Shell small (holotype 14.4 mm, measured specimens to 17.2 mm), long and slender, polished and translucent, of 7¼ whorls, the last swollen and long elegantly tapered to the anterior canal, together

comprise 74% of the shell length; aperture long and narrow, not distinctly demarcated from the anterior canal, with a wide shallow notch posteriorly. Sculpture of widely spaced narrow ribs crossed by microscopic spiral grooves. *Protoconch* of 2–2¼ smooth whorls, tip minute but whorls rapidly expand such that the last 2 are sub-globular and end with about 5 fine riblets. *Axial sculpture* of narrow, opisthocline, widely spaced cord-like ribs that run from suture to suture on spire whorls and to the anterior fasciole on the last, are recurved on whorl shoulders, with 10 on the penultimate and 10 on the last. *Varix* apertural, similar in profile to a rib only stronger and extending to near the tip of the anterior canal, recurved on shoulder behind anal sinus. *Spiral sculpture* of very fine, microscopic grooves that override ribs, rib crests crenulated. *Sulcus* absent; recurved ribs on whorl shoulders mark past positions of the sinus. *Outer lip* varicose, with a thin strip of shell at the base of the varix arched from and contiguous with anal sinus to anterior canal, without a stromboid notch. *Anal sinus* a wide, shallow notch on shoulder near suture with divergent sides, in front of the varix. *Inner lip* a narrow glaze along the columella, without a callus or denticles. *Columella* straight. *Anterior canal* not distinctly differentiated from aperture, sub-tubular, straightens out in a gentle curve from the base of the aperture to its end, which is unnotched. *Anterior fasciole* not swollen, with 12 oblique fine spiral cords. *Color* a translucent light golden brown with 4 darker bands, on the shoulder broken by the ribs, and 3 more below, anterior canal and protoconch also darker.

Remarks

The average length of 28 specimens is 10.8 mm (range = 5.9–17.2 mm).

Range and habitat

Guadeloupe; depth 200–482 m, live caught depth 268–306 m.

Habrocythara parva Fallon & Bouchet gen. et sp. nov.
urn:lsid:zoobank.org:act:A702C92A-A2DC-4D66-90D7-6DE0FD399D0B
Figs 60E–F, 61Q–X

Differential diagnosis

Habrocythara cymella (Dall, 1889) gen. et comb. nov. has a protoconch of 1½, not 2½ whorls, and is larger (average length = 10.7 versus 7.4 mm).

Habrocythara pulchra Fallon & Bouchet gen. et sp. nov. has a protoconch of 2–2¼, not 2½ whorls, with only a few crowded riblets near the end of the last whorl, not weak riblets over ¾-whorl, and with a protruding brown tip.

Etymology

Habrocythara parva Fallon & Bouchet gen. et sp. nov. from the feminine form of the Latin adjective '*parvus*', meaning 'little', which references its small size, in comparison to other members of the genus group.

Type material

Holotype

GUADELOUPE • 5.6 × 2.2 mm; Port-Louis; 16°25′ N, 61°33′ W; depth 160 m; 14 May 2012; KARUBENTHOS 2012; stn GD25; sequenced; MNHN-IM-2013- 20603.

Paratypes (21 specs)

GUADELOUPE • 1 spec., 8.4 × 3.0 mm; W of Marie-Galante; 15°56′ N, 61°32′ W; depth 212–241 m; 26 Jun. 2015; KARUBENTHOS 2; stn DW4621; ANSP 498825 • 1 spec., 6.1 × 2.5 mm; N Grande-Terre;

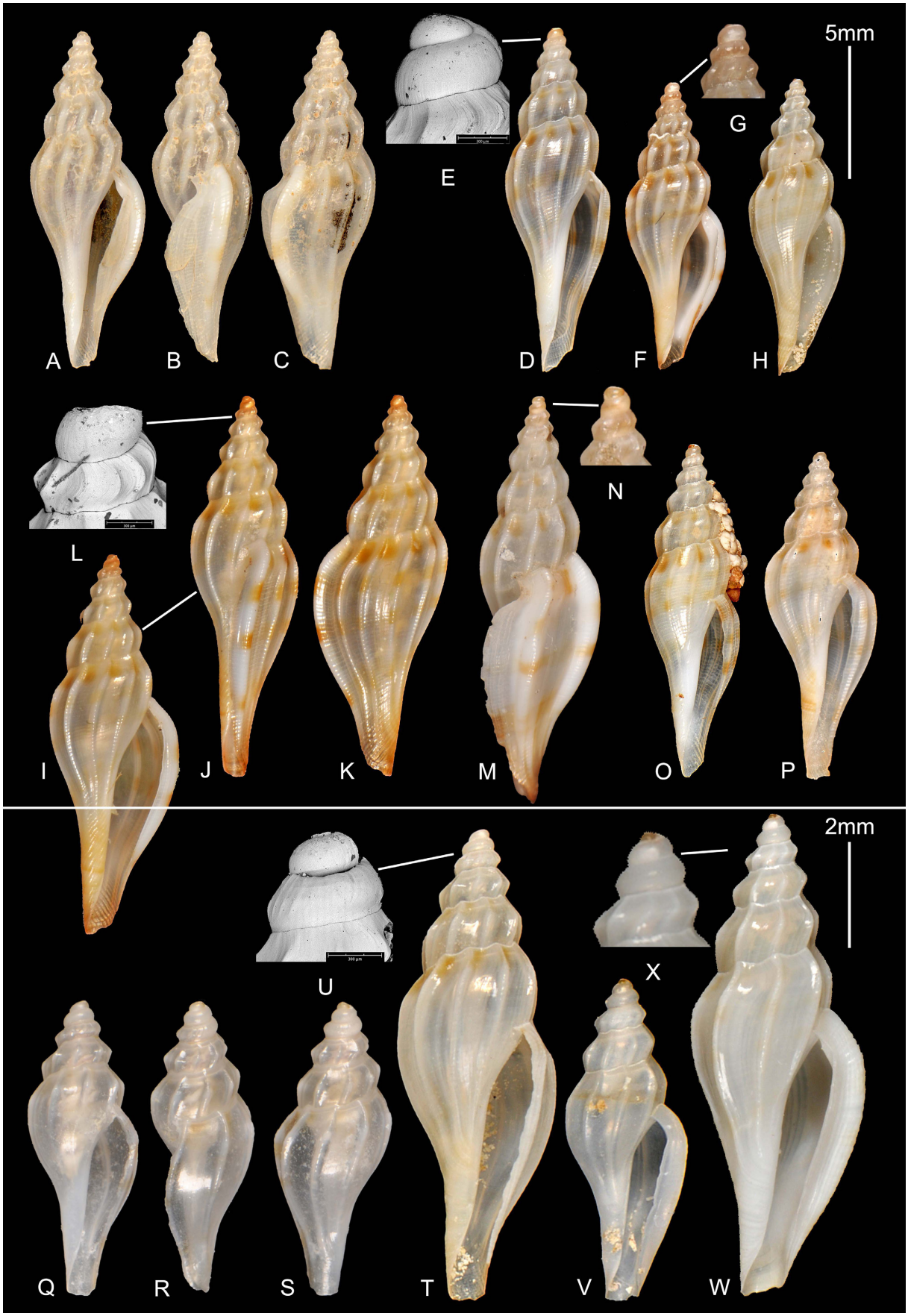
16°24′ N, 61°35′ W; depth 178–185 m; 9 Jun. 2015; KARUBENTHOS 2; stn DW45446; MNHN-IM-2000-39609 • 1 spec., length = 8.2 mm; N Grande-Terre; 16°31′ N, 61°32′ W; depth 268–306 m; 14 Jun. 2015; KARUBENTHOS 2; stn DW4546; USNM 1715408 • 1 spec., 9.1 × 3.5 mm; N Grande-Terre; 16°29′ N, 61°38′ W; depth 362–367 m; 11 Jun. 2015; KARUBENTHOS 2; stn CP4532; USNM 1715407 • 3 specs, 10.1 × 3.7, 9.0 × 3.2 and 6.8 × 2.4 mm; N Grande-Terre; 16°24′ N, 61°34′ W; depth 180–180 m; 10 Jun. 2015; KARUBENTHOS 2; stn DW4527; ANSP 498826 • 1 spec., 8.9 × 2.4 mm; W of Marie-Galante; 16°00′ N, 61°23′ W; depth 204–251 m; 21 Jun. 2015; KARUBENTHOS 2; stn DW4586; MNHN-IM-2000-39610 • 1 spec., 8.2 × 3.1 mm; N Grande-Terre; 16°31′ N, 61°32′ W; depth 268–306 m; 14 Jun. 2015; KARUBENTHOS 2; stn DW4546; MNHN-IM-2000-39614 • 1 spec., 7.2 × 2.8 mm; S of Marie-Galante; 15°50′ N, 61°19′ W; depth 305–312 m; 28 Jun. 2015; KARUBENTHOS 2; stn DW4638; MNHN-IM-2000-39613 • 1 spec., 7.7 × 3.1 mm; N Grande-Terre; 16°38′ N, 61°35′ W; depth 343–402 m; 14 Jun. 2015; KARUBENTHOS 2; stn DW4549; MNHN-IM-2000-39611 • 3 specs, 7.2 × 2.8, 6.9 × 2.5 and 7.1 × 2.5 mm; N Grande-Terre; 16°31′ N, 61°32′ W; depth 268–306 m; 14 Jun. 2015; KARUBENTHOS 2; stn DW4546; MNHN-IM-2000-39614 • 4 specs, 6.6 × 2.5 (largest) and 5.05 × 2.05 (smallest) mm; W of Marie-Galante; 15°53′ N, 61°25′ W; depth 262–266 m; 22 Jun. 2015; KARUBENTHOS 2; stn DW4599; MNHN-IM-2000-39615 • 1 spec., 6.4 × 2.5 mm; W of Marie-Galante; 16°00′ N, 61°23′ W; depth 204–251 m; KARUBENTHOS 2; stn DW4586; 21 Jun. 2015; MNHN-IM-2000-39612.

UNITED STATES OF AMERICA • 2 specs, 8.9 × 3.4 and 7.5 × 2.4 mm; W Florida, Hillsborough Co., W of Egmont Key; depth 73 m; 1963; J. Moore leg.; dredged;R/V *Cavalier*; UF 589783.

Description

Shell small (holotype length = 5.6 mm, measured specimens to 9.1 mm), long and slender, polished, and translucent, of 5¼ whorls (sub-adult), the last swollen and long elegantly tapered to the anterior canal,

Fig. 61 (next page). Species of *Habrocythara* Fallon gen. nov. – **A–C**. *Mangilia* (*Cythara*) *cymella* Dall, 1889 12.8 × 4.2 mm, lectotype and type of genus, ventral, lateral and dorsal views (MCZ 7103), Milligen Key, Grenada, in 291 m. – **D–H**. *Habrocythara cymella* (Dall, 1889) gen. et comb. nov. **D–E**. Spec., 13.1 × 4.0 mm, ventral view and SEM image of protoconch (MNHN-IM-2000-39604), E of La Désirade, Guadeloupe, at depths of 358–402 m. **F–G**. Spec., 10.9 × 3.7 mm, ventral view, and expanded view of protoconch (not to scale) (MNHN-IM-2000-39603), E of La Désirade, Guadeloupe, in 165–260 m. **H**. Spec., 11.3 × 3.8 mm (MNHN-IM-2012-39608), N of Grande-Terre, Guadeloupe, in 268–306 m. – **I–P**. *Habrocythara pulchra* Fallon & Bouchet gen. et sp. nov. **I–L**. Holotype, sequence voucher, 14.4 × 4.8 mm, ventral, bottom half of lateral, dorsal views, and SEM image of protoconch (MNHN-IM-2013-60417), N of Grande-Terre, Guadeloupe, at depths of 268–306 m. The last few protoconch riblets are seen at the very right edge of the shoulder of the last whorl in the SEM image (first whorl eroded off). **M–N**. Paratype, 15.5 × 4.9 mm, lateral view, and expanded view of protoconch (not to scale) (USNM 1715410), W of Marie-Galante, Guadeloupe, at depths of 200–206 m. **O**. Paratype, 12.6 × 3.6 mm, with external worm tube of forams (MNHN-IM-2000-39619), E of La Desirade, Guadeloupe, at depths of 312–385 m. **P**. Paratype, 12.4 × 4.2 mm (D. Lamy coll.), S of La Désirade, Guadeloupe, at a depth of 250 m. – **Q–X**. *Habrocythara parva* Fallon & Bouchet gen. et sp. nov. **Q–S**. Holotype, sequence voucher, 5.6 × 2.2 mm, sub-adult, ventral, lateral and dorsal views (MNHN-IM-2013-20603), Port-Louis, Guadeloupe, at a depth of 160 m. **T–U**. Paratype, 10.1 × 3.7 mm, ventral view, and SEM image of protoconch (ANSP 498826), N of Grande-Terre, Guadeloupe, in 180 m. Tip of protoconch eroded away in SEM image. **V**. Paratype, 6.1 × 2.5 mm (MNHN-IM-2000-39609), N of Grande-Terre, Guadeloupe, at depths of 178–185 m. **W–X**. Paratype, 9.1 × 3.5 mm, ventral view, and expanded view of protoconch (not to scale) (USNM 1715407), N of Grande-Terre, Guadeloupe, at depths of 362–367 m. Credits: E, L, U: SEM images courtesy of Paul Callomon. Scale bars: A–D, F–K, M–T, V–X = 2 mm; E, L, U = 300 µm.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together comprise 72% of the shell length (of a fully developed paratype); aperture long and narrow, not distinctly demarcated from the anterior canal, with a wide shallow anal sinus posteriorly. Sculpture of widely spaced narrow ribs crossed by microscopic spiral grooves. *Protoconch* of 2½ whorls, with last two sub-globular, then ending with weak, crowded riblets on the last ¾ whorl. *Axial sculpture* of narrow, opisthocline, widely spaced cord-like ribs that run from suture to suture on spire whorls and to the anterior fasciole on the last, are recurved on whorl shoulders, with 8 on the penultimate and 7 to the varix on the last of the fully developed paratype. *Varix* none on the sub-adult holotype; otherwise, apertural, like a strong rib on a fully developed paratype, multiple varices are present on some individuals of the type series. *Spiral sculpture* of fine, microscopic grooves that override ribs, creating a finely crenulated ridge, obsolete between ribs. *Sulcus* absent, recurved ribs on whorl shoulders mark past positions of the sinus. *Outer lip* varicose, with a thin strip of shell at the base of the varix extending from and contiguous with anal sinus to anterior canal, without a stromboid notch. *Anal sinus* absent on holotype; a shallow, curved indentation on shoulder near suture with divergent sides, in front of the varix of a fully developed paratype. *Inner lip* a narrow glaze along the columella, without a callus or denticles. *Columella* straight. *Anterior canal* not distinctly differentiated from aperture, sub-tubular, straightens out in a gentle curve from the base of the aperture to its end, which is unnotched. *Anterior fasciole* not swollen, marked with dense growth lines. *Color* translucent white with faint brown bands on the shoulder and a very faint one or two below.

Remarks

The average length of 17 specimens is 7.4 mm (range = 5.1–9.1 mm).

Range and habitat

Guadeloupe, United States (W Florida); depth 73–402 m, live caught depth 160 m.

Genus ***Ithycythara*** Woodring, 1928

Type species

Mangilia psila K.J. Bush, 1885, by original designation.

Summary diagnostic characteristics

Shell usually slender-fusiform with a narrow aperture, and a short to moderate length anterior canal.

Protoconch of 2¼–3¼ smooth whorls, the first whorl usually minute for most, the last with some axial riblets, and may be keeled.

Aperture varicose, last rib serves as a varix in some species, in which case apertural dentition may be weak or absent.

Outer lip usually has an internal anal tooth and a series of lyrae from the anal tooth to the anterior canal on the underside of the varix.

Inner lip sometimes with swelling or fold midway on the columella and another weaker tooth on the parietal wall at the anal sinus.

Anal sinus shallow to moderately deep, its apex round, set off from the suture, usually midway on shoulder, or nearer whorl periphery, and in front of the varix.

Sculpture of 5–7 narrow ribs per whorl, usually 6, widely spaced, and always aligned whorl-to-whorl and nodulose at whorl peripheries.

Table 7. Genus *Ithycythara* parts that address each geographical region.

Geographic regions	***Ithycythara* part numbers**
North Carolina to Florida Keys (Atlantic Ocean)	4 (in part), 7, 8
Florida Keys, W Florida, Louisiana (E Gulf of Mexico)	4 (in part), 7, 8 (in part), 9
Mexico, Texas (W Gulf of Mexico)	9
Honduras, Panama, San Andrés y Providencia Department, Colombia (W Caribbean)	10
Colombia, Venezuela, Aruba, Trinidad and Tobago (Southern Caribbean)	7
Cuba to Puerto Rico (Greater Antilles) and Bahamas	4 (in part), 6, 7 (in part), 13 (in part)
Virgin Is. to Grenada and Curacao (Lesser Antilles)	1, 2, 3, 4, 5, 6 (in part)
French Guiana, Brazil (South America)	11, 12, 13

Peripheral nodules may be associated with an overriding spiral cord, usually obsolete between ribs, and without overriding microscopic grooves or, if not, nodded peripheries overridden by spiral grooves.

Spiral grooves are present over entire shell and may be either obsolete, microscopic, fine, or coarse.

Shell surface microsculpture

SEM images show patterns that, for simplicity, fall into 3 categories. 8 from each of these categories have been imaged and are shown in Figs 62–64. The distinct pattern categories suggest that the genus is polyphyletic as currently defined. More genetic sequencing would be desirable to resolve this question. Unique morphological traits that may be exclusively associated with each of the 3 categories, other than shell surface microsculpture, have not yet been identified. The categories are:

- category A. Alternating light and dark bands without distinct structure, except that light bands may have a slightly convex surface. This group of species even lacks short, microscopic strings organized in rows and punctae when observed at a magnification of 1000–2500× of other species, although there may be some disorganized microscopic strings in the dark bands in some species. species exhibiting this surface characteristic are described as "banded".
- category B. Channels or wider valleys separated by raised bands, 'hedges', with punctate surfaces on the crowns of the hedged. Punctae may be aligned in rows or randomly distributed over the surface of the crowns. Channels may be narrow, deep, or even tubular, or like valleys, wider, in which case parallel microscopic strings aligned in rows are usually present. The hedges, channels or valleys are described simply as coarse spiral grooves in species' descriptions.
- category C. Smooth surface with or without minute punctae when observed at a magnification of 950–3000×. Punctae may be organized in bands, or randomly distributed over the shell surface. No other structure was observed within this magnification range. species exhibiting this surface characteristic are described as "smooth" or "glossy" in their descriptions.

Difference from other genera

Habrocythara Fallon gen. nov. has convex whorls that lack peripheral nodules, has a short spire, a long, tapered last whorl and anterior canal, lacks a varix, and lacks apertural dentition, the anal sinus bears a low callus instead.

Rubellatoma Bartsch & Rehder, 1939 differs in possessing well defined shoulders, 10 or more ribs, coarser spiral sculpture, and a long tapered funnel-shaped last whorl.

Remarks

Ithycythara Woodring, 1928 is the most diverse genus of the Mangeliidae. Sixty-four species are addressed in this section, including previously described, new, and species that are likely new but not named because of insufficient specimens.

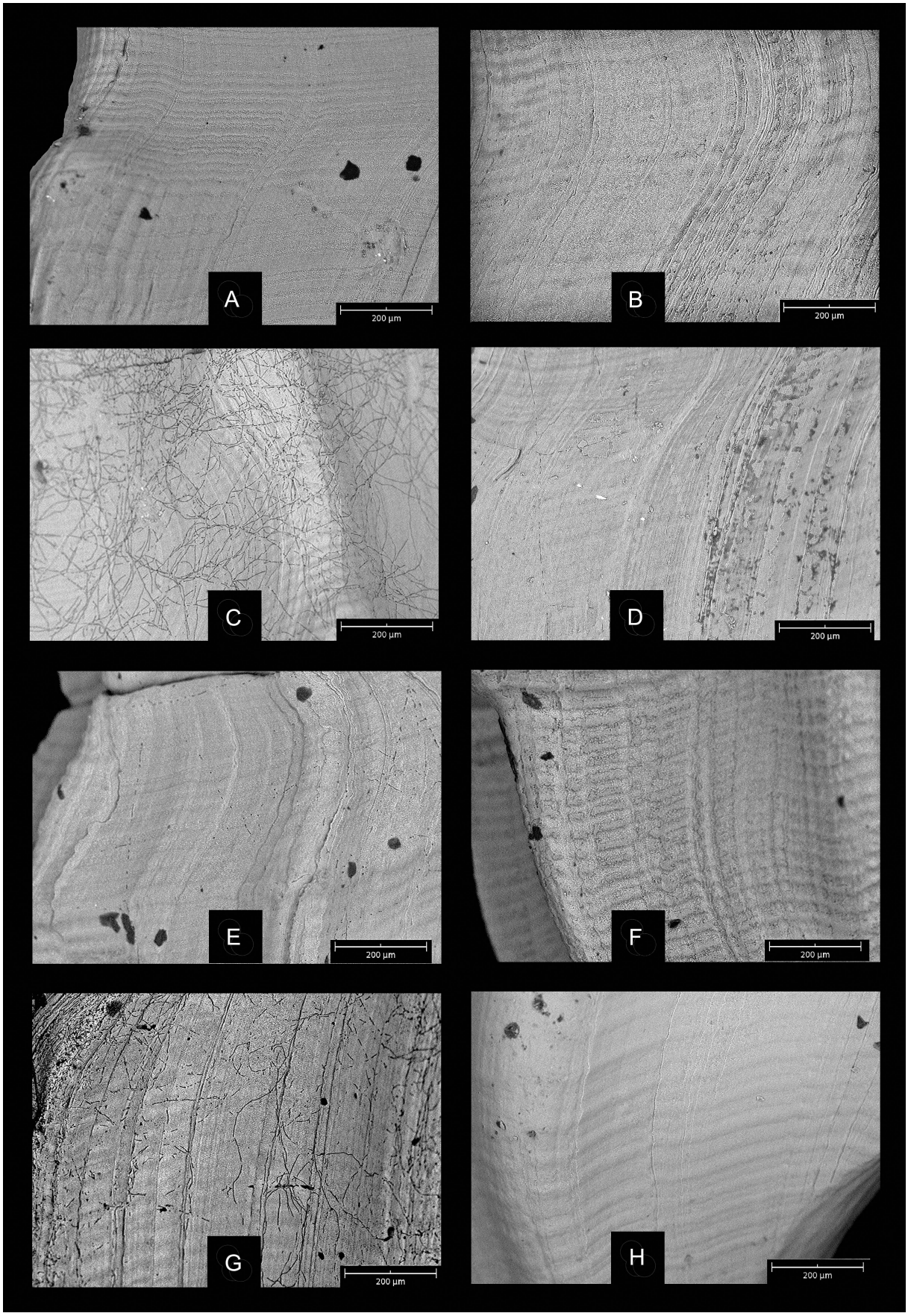
The large number of species presents a challenge for specimen identification. To assist in locating information on a species discussed in this work, species have been grouped by geographic region in the most practical way possible. The species descriptions are divided into 13 parts. The table below summarizes geographic regions and the text sections where species from those regions are found. Most species occur in only one or two regions, making the search simpler. The regional groupings do not imply any natural biogeographic boundaries or actual limits on the distribution of any single species, but rather the range of the specimens examined for this work.

Identification

It may be difficult to separate some species of *Ithycythara*. Attention to specific diagnostic characteristics is crucial to their successful identification:

- Size and general form. At maturity, shell growth generally ceases and is marked by a fully formed apertural varix and dentition. However, a few species appear to be indeterminate, never developing an apertural varix. specimens with fully developed apertures typically represent the maximum or near-maximum size of the individual. Thus, the size of a mature unknown serves as a useful measure to eliminate smaller or larger species at the same developmental stage from consideration. Regarding form, the relative length of the anterior canal and the type and strength of the varix are important.
- Whorl profile. Whorl profiles are quite varied among but uniform within species. Most species have angled whorls, though some are round-shouldered or turreted – where the edge of the shoulder forms around a 90° angle from the shell axis, the whorl side being parallel to the whorl axis. Angled whorls may be described as acute, forming near a 90° angle with sides not parallel to whorl axis, obtuse,

Fig. 62 (next page). Species of *Ithycythara* Woodring, 1928, category A shell surface SEM images of specimens with light and dark banded surfaces with little or no topographical relief and no distinct surface sculpture as observed at the specified magnifications. All images are 300×. **A**. *Ithycythara arawak* Fallon & Bouchet sp. nov., paratype, 8.7 × 3.3 mm (ANSP 498907), Chatham Bay, Union Island, Saint Vincent and the Grenadines. Light and dark bands do not resolve into discrete detail under higher magnification (1250×). **B**. *Ithycythara decolora* Fallon sp. nov., holotype, 9.3 × 3.3 mm (ANSP 498910), Coral Island, W Florida. Light and dark bands do not resolve into discrete detail under higher magnification (1650×). **C**. *Ithycythara altaspira* Paulmier, 2019. Spec., 10.4 × 3.2 mm (ANSP 498904), Chatham Bay, Union Island, Saint Vincent and the Grenadines. Light and dark bands do not resolve into discrete detail under higher magnification (2000×). A single rib appears in this image, little relief between the bands is seen on its ridge. **D**. *Ithycythara flammea* Fallon & Bouchet sp. nov., paratype, 6.4 × 2.7 mm (USNM 1715386), off Macouba, Martinique. Light and dark bands do not resolve into discrete detail under higher magnification (2250×). **E**. *Ithycythara variabilis* Fallon & Bouchet sp. nov., holotype 4.8 × 1.9 mm (MNHN-IM-2000-39659), Anse Noire, Sortie Rivière, Martinique. Light and dark bands do not resolve into discrete detail under higher magnification (1950×). **F**. *Ithycythara laciniata* Fallon sp. nov., holotype, 5.2 × 2.1 mm (UF 589794), 45 mi. [72 km] ESE of Cape Canaveral, Broward Co., E Florida. Light and dark bands do not resolve into discrete detail under higher magnification (1500×). **G**. *Ithycythara flemingkeyensis* Fallon sp. nov., holotype, 9.1 × 2.7 mm (ANSP 498912), W side of Fleming Key, Key West, Florida Keys. Light and dark bands do not resolve into discrete detail under higher magnification (1000×). **H**. *Ithycythara beta* Fallon sp. nov., paratype, 5.8 × 2.3 mm (EFG 26560), off Campeche, Mexico, the type locality. Light and dark bands do not resolve into discrete detail under higher magnification (2000×); however, some relief is visible as valleys and crests, with the crests being slightly convex, both approximately the same width. Scale bars: A–H = 200 μm.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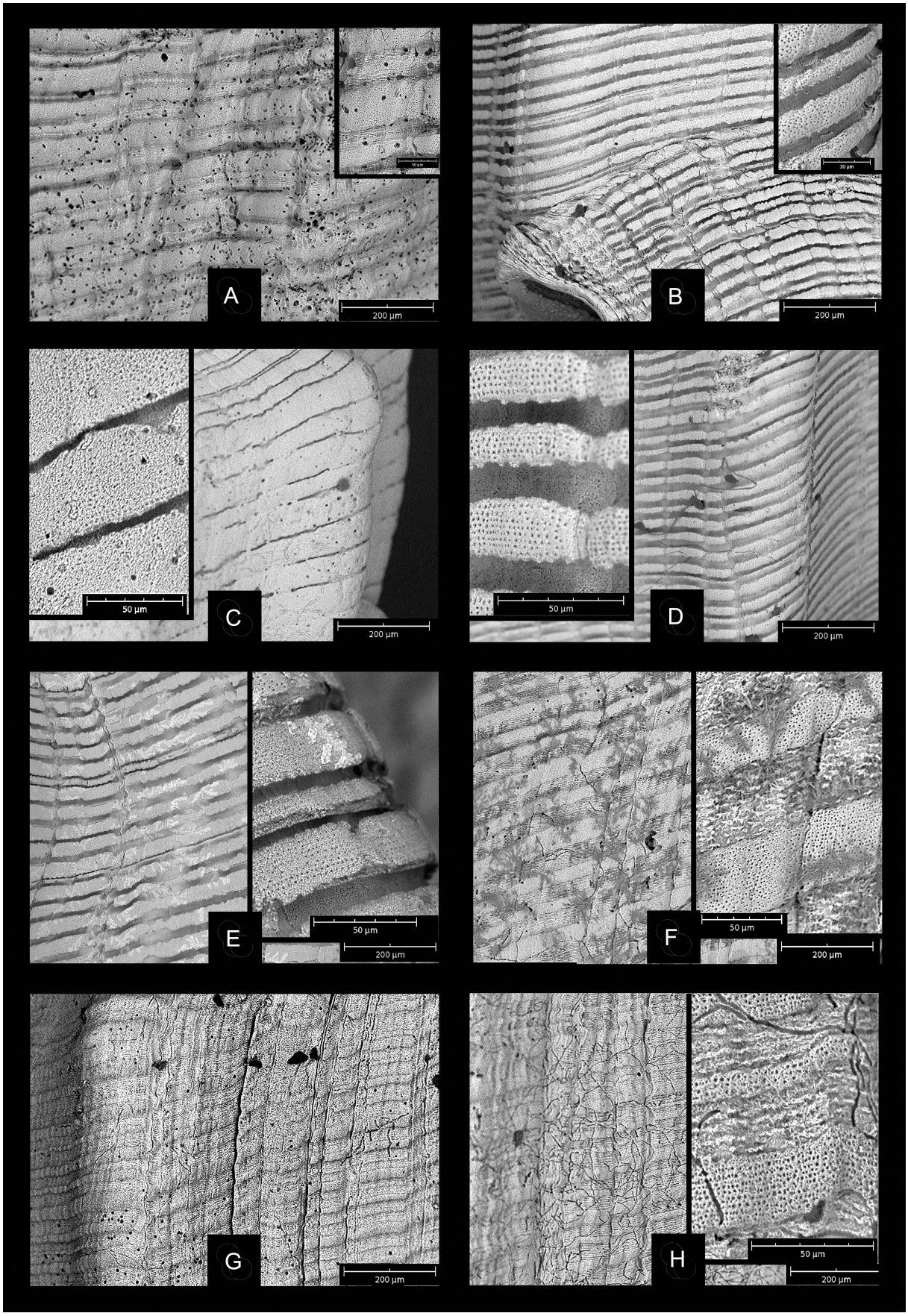
greater than a 90° angle, or convex, smoothly rounded with just a hint of an angle formed at the typical mid-whorl spiral where it intersects the ribs.

- Ribs, apical view. The apical view illustrates important distinctions between species of *Ithycythara*. Rib shape and strength, rib spacing, intercalary shell shape (convex, concave, flat), and the shape of the varix are key characteristics. When the last rib acts as a varix, its size will usually be only incrementally larger than the previous rib (which holds true for each rib as it approaches the outer lip); however, a true varix will be significantly larger (higher and thicker) than its predecessor ribs.
- Protoconch. The first 2¼ to 3¼ whorls, depending on the species, represent developmental stages of the embryonic shell. For most, differences in morphology are minor, such as the number of whorls with riblets and the shape of the riblets. However, for some, the last whorl may be subcarinate or fully carinate, with riblets peripherally swollen or further transformed into a paddle-like or bead-like form at the periphery of the whorl. These latter traits are diagnostic.

Phylogenetic relationships

The DNA sequence data support the monophyly of the genus *Ithycythara*. All six sequenced species cluster in a well-supported clade, that is sister to all the other species of the TWA mangeliid radiation, except *Kurtzina*, *Psilocythara*, and *Brachycythara*.

Fig. 63 (next page). Species of *Ithycythara* Woodring, 1928, category B shell surface SEM images of specimens with a "channels (or valleys) and hedges" surface topography. Base view at 300 × with higher magnification insets. **A**. *Ithycythara cocta* Fallon sp. nov., holotype, 5.8 × 2.4 mm (UF 589792), Long Cay, Exuma Islands, Bahamas. Surface channeled with hedges of variable widths, channels have numerous microscopic strings aligned in parallel, hedges are packed with microscopic punctae (inset 1100 ×). **B**. *Ithycythara whitneyae* Fallon sp. nov., holotype, 5.2 × 2.1 mm (UF 589790), Grenada. Surface with channels and hedges. Hedges of variable and alternating widths, their surfaces densely covered, not packed, with punctae, channel sculpture is obscured by dark film. The comparison of the channels is seen near the edge of the inset (1800 ×). **C**. *Ithycythara curiosa* Fallon sp. nov., holotype, 4.8 × 2.1 mm (UF 589785), Long Cay, Exuma Islands, Bahamas. Surface with channels and hedges. Hedges are wide relative to channels, their surfaces densely covered with punctae that are aligned in rows. Channels are narrow and almost tubular, sealed over by the sides of the hedges, their sculpture obscure (inset 1250 ×). **D**. *Ithycythara biconica* Fallon & Bouchet sp. nov., holotype, 4.8 × 1.9 mm (MNHN-IM-2000-39628), the Islet in Ramiers, Fort-de-France Bay, Martinique. Surface with channels and hedges. Hedges densely covered with punctae aligned in orderly rows; channels are narrower, their sculpture obscured by a dark film (inset 1650 ×). **E**. *Ithycythara hewittae* Fallon sp. nov., holotype, 5.3 × 2.2 mm (ANSP 498984), Ballast Bay, Saint Kitts. Surface with channels and hedges of variable widths. Hedge surfaces are densely covered, not packed, with punctae aligned in neat rows; channel sculpture is obscured by dark film. The comparison of the channels is seen near the edge of the inset (1350 ×). **F**. *Ithycythara santacatalina* Fallon sp. nov., holotype, 6.8 × 2.7 mm (ANSP 498811), W of Santa Catalina Island, near "Blue Hole", San Andrés y Providencia Department, Colombia. Surface of wide channels and hedges. Hedges densely covered with minute punctae loosely aligned in rows; channels are as wide or wider than some hedges, sculpted with short, jagged strings, also loosely aligned in rows but not connected end on end as seen in other species of this group (inset 1050 ×). **G**. *Ithycythara angusta* Fallon sp. nov., holotype, 6.9 × 2.5 mm (ANSP 498905), off St George's, Grenada. Surface of wide valleys and hedges of different widths. Hedges densely covered with minute punctae loosely aligned in rows; channels are as wide or wider than some hedges, sculpted with short, jagged strings, also loosely aligned in rows. **H**. *Ithycythara galindoae* Fallon & Bouchet sp. nov., paratype, 8.2 × 3.0 mm (ANSP 498918), S end of Baliceaux Island, Saint Vincent and the Grenadines. Surface of wide valleys and hedges of different widths. Hedges densely covered with minute punctae aligned in rows; valleys are as wide or wider than some hedges, sculpted with short, jagged strings aligned in rows (inset 1600 ×). Scale bars (excluding insets): A–H = 200 µm.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Nomina dubia and synonyms

Pleurotoma rubricata Reeve, 1846 is regarded as a nomen dubium because the type has been lost, the original description is insufficient to distinguish the species from the now known panoply of species, and because no useful photographs of the types have been found.

Mangelia balteata Reeve, 1846 is synonym of *Ithycythara lanceolata* (C.B. Adams, 1850) according to de Jong & Coomans (1988: 116). The type of *M. balteata* could not be found (email from Andreia Salvador, Senior Curator of Marine Mollusks, etc., NHMUK, dated 23 Oct. 2018). This taxon should have precedence but without the type its identification cannot be confirmed.

Mangelia muricoides C.B. Adams, 1850 is a junior synonym of *Ithycythara lanceolata* (C.B. Adams, 1850) according to Maes MS in Rosenberg (2009). The photograph of the holotype in Clench & Turner (1950: 366) does not appear to be *I. lanceolata* as described herein and should be examined more closely to confirm its synonymy.

Ithycythara kellumi Fargo, 1953 is a junior synonym of *Ithycythara psila* (K.J. Bush, 1885), according to Rosenberg (2009). No attempt was made to confirm synonymy of Recent species with fossil ones in this work.

***Ithycythara* spp. Part 1**

Ithycythara bugeae Fallon & Bouchet sp. nov.
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Figs 64C, 65A–I

Differential diagnosis

Ithycythara psila (K.J. Bush, 1885) is generally larger and has a sturdier shell (not fragile like *I. bugeae* Fallon & Bouchet sp. nov.), has lyrae on the underside of the varix, and a fold on the columella, below the sinal tooth (all lacking or nearly obsolete in *I. bugeae*), strong, elongate nodes on rib crests (narrower, almost round nodes on rib crests of *I. bugeae*), and the anterior canal is slightly longer.

Fig. 64 (next page). Species of *Ithycythara* Woodring, 1928, category C shell surface SEM images of specimens with smooth surfaces lacking topographical relief and with or without punctae. Base view at 300× with high magnification insets. **A**. *Ithycythara clathrata* Fallon sp. nov., paratype, 7.0 × 2.4 mm, sub-adult (UF 589811), off Campeche, Mexico, Gulf of Mexico. Smooth surface with wide bands of punctae (inset 2250×). **B**. *Ithycythara lamyi* Fallon & Bouchet sp. nov., paratype, 9.9 × 3.1 mm (D. Lamy coll.), off La Désirade, Guadeloupe. Smooth surface with broad bands of punctae (inset 950×). **C**. *Ithycythara bugeae* Fallon & Bouchet sp. nov., holotype, 4.9 × 2.0 mm (MNHN-IM-2000-39630), N of Grande-Terre, Guadeloupe. Smooth surface with sparse, but random punctae (inset 2250×). **D**. *Ithycythara hastata* Fallon & Bouchet sp. nov., holotype, 5.4 × 1.9 mm (MNHN-IM-2000-39646), La Caravelle Peninsula, Grand-Jean Bay, Martinique. Smooth surface with sparse but random punctae (inset 1750×). **E**. *Ithycythara alpha* Fallon sp. nov., holotype, 9.7 × 3.1 mm (ANSP 498803), off Campeche, Mexico. Smooth surface with a moderate number of punctae randomly distributed (inset 2000×). **F**. *Ithycythara saopaulensis* Fallon sp. nov., holotype, 5.5 × 1.8 mm (ANSP 498932), off Santos, São Paulo State, Brazil. Smooth surface with dense punctae somewhat vertically aligned (inset 1200×). **G**. *Ithycythara rotunda* Fallon sp. nov., holotype, 8.8 × 3.0 mm (ANSP 498929), 1.2 km SSE of Morat Island, Bay Islands, Honduras. Smooth surface, without visible punctae (inset 1750×). **H**. *Ithycythara lanceolata* (C.B. Adams, 1850). Spec., 13.3 × 3.6 mm (USNM 1715456), Jobos, Puerto Rico. Smooth surface, without visible punctae (inset 2000×). Credits: SEM images courtesy of Paul Callomon. Scale bars (excluding insets): A–H = 200 µm.

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Ithycythara brisseti Fallon & Bouchet sp. nov. is larger, has a longer, more tapered body whorl, a 2–2¼, not 3¼ whorl protoconch, and is colored differently.

Ithycythara guianensis Fallon & Bouchet sp. nov. is larger, has a wider anterior canal, and is colored differently.

Ithycythara alpha Fallon sp. nov. is larger, has a narrower, longer anterior canal, and more strongly developed apertural teeth.

Ithycythara unid. sp. O has full apertural dentition and is colored differently.

Etymology

Ithycythara bugeae Fallon & Bouchet sp. nov., named in honor of Barbara Buge, manager of the MNHN sequenced mollusk voucher collection and participant in numerous field expeditions.

Type material

Holotype

GUADELOUPE • 4.9 × 2.0 mm; N of Grande-Terre; 16°37′ N, 61°31′ W; depth 432–482 m; 14 Jun. 2015; KARUBENTHOS 2; stn DW4550; MNHN-IM-2000-39630.

Paratypes (55 specs)

GUADELOUPE • 3 specs, 5.3 × 3.1, 4.0 × 1.6 and 4.8 × 2.0 mm; N of Grande-Terre; 16°37′ N, 61°31′ W; depth 432–482 m; 14 Jun. 2015; KARUBENTHOS 2; stn DW4550; USNM 1715424 • 1 spec., 5.8 × 2.2 mm; E of La Désirade; 16°24′ N, 60°51′ W; depth 100–258 m; 15 Jun. 2015; KARUBENTHOS 2; stn DW4555; MNHN-IM-2000-39631 • 1 spec., 5.0 × 2.0 mm; Vieux Bourg; 16°23' N, 61°33' W; depth 130 m; 6 May 2012; KARUBENTHOS 2012; stn GD06; MNHN-IM-2012-7372 • 1 spec., 5.3 × 1.9 mm; W of Marie-Galante; 15°58′ N, 61°23′ W; depth 200–206 m; 22 Jun. 2015; KARUBENTHOS 2; stn DW4594; UF 589803 • 8 specs, (4 measured) 5.4 × 2.0, 4.7 × 2.0, 4.5 × 1.8 and 5.1 × 2.0 mm; E of La Désirade; 16°19′ N, 60°55′ W; depth 396–399 m; 17 Jun. 2015; KARUBENTHOS 2; stn DW4572; MNHN-IM-2000-39632 • 6 specs, (2 measured) 5.2 × 1.9 and 3.8 × 1.6 mm; N Grande-Terre; 16°38′ N, 61°35′ W; depth 343–402 m; 14 Jun. 2015; KARUBENTHOS 2; stn DW4549; MNHN-IM-2000-39633 • 5 specs, (3 measured) 3.7 × 1.5, 3.3 × 1.5 and 4.5 × 1.8 mm; N of Grande-Terre; 16°31′ N, 61°32′ W; depth 268–306 m; 14 Jun. 2015; KARUBENTHOS 2; stn DW4546; ANSP 498828 • 9 specs, (2 measured) 4.9 × 1.9 and 3.4 × 1.4 mm; N of Grande-Terre; 16°31′ N, 61°32′ W; depth 268–306 m; 14 Jun. 2015; KARUBENTHOS 2; stn DW4546; UF 589802 • 7 specs, (3 measured) 5.4 × 2.2, 5.3 × 2.0 and 4.0 × 1.8 mm; N of Grande-Terre; 16°38′ N, 61°37′ W; depth 413–423 m; 13 Jun. 2015; KARUBENTHOS 2; stn DW4544; USNM 1715423 • 8 specs, (2 measured) 5.0 × 2.1 and 4.7 × 1.9 mm; E of La Désirade; 16°17′ N, 61°01′ W; depth 208–362 m; 17 Jun. 2015; KARUBENTHOS 2; stn DW4568; MNHN-IM-2000-40016 • 5 specs, (2 measured) 3.8 × 1.5 and 3.0 × 1.3 mm; W of Marie-Galante; 16°00′ N, 61°23′ W; depth 204–251 m; 21 Jun. 2015; KARUBENTHOS 2; stn DW4586; ANSP 498829 • 1 spec., 5.0 × 2.0 mm; S of La Désirade; depth 350 m; dredged; D. Lamy coll.

Other material examined (28 specs)

Another 28 specimens, 27 from Guadeloupe and 1 from Martinique, are not included in the type series.

Description

Shell small (holotype length = 4.9 mm, paratype lengths to 5.3 mm), fusiform, translucent, glossy smooth with 7 whorls altogether, teleoconch whorls obtusely angled approximately mid-whorl on spire whorls, with appressed sutures, last whorl about 67% of shell length: sculpture of strong ribs aligned whorl-to-whorl; aperture narrow, not much wider than the anal sinus, and anterior canal about 48% of shell length. *Protoconch* trochoid, of 3¼ whorls, first whorl minute and the first 2½ whorls smooth, the last ¾ with

opisthocline riblets that shorten and swell peripherally into a median keel. *Axial sculpture* of 6 strong narrow ribs per whorl that are aligned from whorl to whorl and run from suture to suture on spire whorls and to anterior fasciole on the last, recurved on whorl shoulders, intercostal space much wider than ribs. *Varix* apertural, extends from the suture to the anterior canal. *Spiral sculpture* scarce and weak, trace of elongated nodes on rib peripheries and of microscopic spiral grooves along rib crests but neither present in intercostal space. *Sulcus* absent, recurved ribs on shoulder indicate past positions of sinus. *Outer lip* varicose, with a thin strip of shell along the base of the varix that extends from the anal sinus to the anterior canal, lyrae along the underside of the varix obsolete, as is the tooth at the base of the anal sinus; stromboid notch absent. *Anal sinus* a round notch set off from the suture, sides divergent. *Inner lip* narrow, margined, with a slight callus where it joins the outer lip above the anal sinus on the parietal wall. *Anterior fasciole* not swollen, marked with growth striae and a few faint spirals or grooves. *Columella* straight. *Anterior canal* short, partially constricted by inward roll of outer lip, end unnotched. *Color* translucent white with 3 faint brownish yellow spiral bands.

Remarks

The average length of 29 specimens is 4.7 mm (range = 5.5–6.0 mm). While some specimens have no trace of lyrae on the underside of the varix, a few have rudimentary ones underside the varix near the beginning of the anterior canal.

Range and habitat

Guadeloupe, Martinique; depth 60–482 m.

Ithycythara biconica Fallon & Bouchet sp. nov.
urn:lsid:zoobank.org:act:E4F09667-ACFB-49C2-B9A7-45A6F3712DF5
Fig. 63D, 65J–Q

Differential diagnosis

Ithycythara santacatalina Fallon sp. nov. has a flat, not concave shoulder, narrower ribs, and flat intercalary spaces.

Iithycythara galindoae Fallon & Bouchet sp. nov. has a heavier varix, more concave shoulders, and peripheral nodules that appear upturned.

Etymology

Ithycythara biconica Fallon & Bouchet sp. nov. from the feminine form of the compound Latin adjective '*bi* + *conicus*', meaning 'twice conical', due to its outline suggesting two base-to-base cones.

Type material

Holotype
MARTINIQUE • 4.8 × 1.9 mm; Fort-de-France Bay, Islet at Ramiers; 14°33.4′ N, 61°04.3′ W; depth 11 m; 9 Oct. 2016; MADIBENTHOS; stn AS581; MNHN-IM-2000-39628.

Paratype (1 spec.)
MARTINIQUE • 1 spec., 2.9 × 1.5 mm; same data as for holotype; MNHN-IM-2000-39629.

Other material examined (3 specs)

GUADELOUPE • 1 spec., 3.9 × 1.7 mm, juvenile; Petite Anse; 16°05.72′ N, 61°46.26′ W; depth 5 m; 10 May 2012; KARUBENTHOS 2012; stn GD13; MNHN-IM-2012-7448.

MARTINIQUE • 1 spec., 6.3 × 2.4 mm; Anse d'Arlet; depth 30 m; ex R. Delannoye coll.; MNHN-IM-2022-17806 • 1 spec., length = 6.4 mm; depth 5 m; D. Lamy coll. #134.

Description

Shell small (holotype length = 4.8 mm, paratype lengths to 6.4 mm), stout, biconic in outline (W/L = 0.3958), with sloping, slightly concave shouldered whorls, about 6½ total, the last whorl about 69% of shell length. Sutures appressed, periphery (edge of shoulder) about mid-whorl; aperture narrow, sides parallel, with a short, undifferentiated anterior canal, both about 48% of shell length. *Protoconch* of about 2¼ round whorls, smooth except the last ½-whorl which has fine riblets. *Axial sculpture* of 6 strong ribs per whorl that run from suture to suture, are aligned whorl to whorl, and evanesce on the anterior fasciole of the last whorl. Swollen nodules on rib peripheries with an otherwise obsolete spiral cord. *Varix* the last rib, in line with a penultimate whorl rib, is slightly larger than the preceding rib (each rib increases in size as the shell enlarges). *Spiral sculpture* of microscopic grooves that cover the shell surface, peripheral spiral cord obsolete except for peripheral nodules. *Outer lip* is thin, runs along the base of the last rib with an axial fold on its outer margin; lip edge forms a low arch from and contiguous with the outer edge of the anal sinus to the end of the anterior canal. Dentition not observed on examined specimens; stromboid notch absent. *Anal sinus* is a moderately deep notch with a round apex and divergent sides, apex of notch about mid-shoulder. *Inner lip* a narrow glaze along columella and parietal wall joins the outer lip at the sinus, a callus present at the anal sinus. *Columella* straight. *Anterior canal* short, open, undifferentiated from the aperture, end unnotched. *Anterior fasciole* not swollen; surface sculpted with oblique spiral grooves. *Color* white with spotty brown spiral lines on whorl sides (about 6 on dorsum of last whorl), spots larger on rib crests.

Remarks

Dentition (lyrae and anal tooth) were not observed inside of outer lip on examined specimens.

Range and habitat

Guadeloupe and Martinique; depth 5–11 m.

Ithycythara ellenstrongae Fallon & Bouchet sp. nov.
urn:lsid:zoobank.org:act:6D3E46FD-574F-4494-BD74-7A4E2A348AC8
Fig. 65R–X

non *Ithycythara lanceolata* (C.B. Adams, 1850) – Paulmier 2019: 8, figs 24–27 that may be this species.

Differential diagnosis

Ithycythara altaspira Paulmier, 2019 is stated as having 2 protoconch whorls (versus 3–3¼).

Ithycythara galindoae Fallon & Bouchet sp. nov. has similar facies but is much smaller and has a banded shell (alternating narrow spiral bands of opaque white and clear white shell).

Ithycythara gypsata Fallon sp. nov. has shoulders with slightly less slope, more angular whorls (less obtuse), and a last whorl proportionally smaller (61 versus 65% of shell length).

Etymology

Ithycythara ellenstrongae Fallon & Bouchet sp. nov., named in honor of Ellen Strong for coordinating the barcode bench during the KARUBENTHOS 2012 expedition.

Type material

Holotype

GUADELOUPE • 14.2 × 4.3 mm; W of Marie-Galante; 15°58′ N, 61°22′ W; depth 208–211 m; 22 Jun. 2015; KARUBENTHOS 2; stn CP4595; MNHN-IM-2000-39635.

Paratypes (26 specs)

GUADELOUPE • 1 spec., 9.5 × 3.2 mm, ethanol-preserved; W of Marie-Galante; 16°00′ N, 61°23′ W; depth 204–251 m; 21 Jun. 2015; KARUBENTHOS 2; stn DW4586; IM-2013-60885 • 1 spec., 10.9 × 3.6 mm; S of La Désirade; depth 250 m; 2016; dredged; ANSP 498791 • 3 specs, 12.0 × 3.9, 10.7 × 3.8 and 10.1 × 3.6 mm; S of La Désirade; depth 250 m; 2016; dredged; ANSP 498792 • 1 spec., 11.7 × 3.8 mm; E of Fajou Island; depth 80–90 m; dredged; D. Lamy coll. • 6 specs, 11.8 × 4.0, 11.6 × 3.6, 11.1 × 3.8, 11.4 × 3.8, 10.3 × 3.8 and 9.8 × 3.2 mm; E of Fajou Island; depth 80–90 m; 2012; dredged; D. Lamy coll. • 1 spec., 9.5 × 3.1 mm; N of Marie-Galante; 16°10′ N, 61°21′ W; depth 68–205 m; 19 Jun. 2015; KARUBENTHOS 2; stn DW4584; MNHN-IM-2000-39636 • 1 spec., 9.0 × 3.1 mm; behind Fajou Island; 16°22.2′ N, 61°35.01′ W; depth 60 m; 24 May 2012; KARUBENTHOS 2012; stn GD54; MNHN-IM-2012-7405 • 2 specs, 11.8 × 3.8 and 10.9 × 3.4 mm; Pointe nord Baie de Bouillante; 16°08.48′ N, 61°47.03′ W; depth 54 m; 8 May 2012; KARUBENTHOS 2012; stn GD10; MNHN-IM-2012-7411 • 1 spec., 8.4 × 3.4 mm; Port-Louis; 16°24′ N, 61°33′ W; depth 130 m; 16 May 2012; KARUBENTHOS 2012; stn GD33; MNHN-IM-2012-7409 • 2 specs, 11.6 × 3.7 and 6.7 × 2.6 mm; Vieux-Bourg (Les Abymes); 16°22.8′ N, 61°33.44′ W; depth 60 m; 18 May 2012; KARUBENTHOS 2012; stn GD37; MNHN-IM-2012-7403 • 1 spec., 11.1 × 3.6 mm; 16°23.21′ N, 61°32.39′ W; depth 70 m; 5 May 2012; KARUBENTHOS 2012; stn GD04; MNHN-IM-2012-7410 • 1 spec., 12.1 × 4.0 mm; Port-Louis; 16°24.03′ N, 61°32.42′ W; depth 60 m; 14 May 2012; KARUBENTHOS 2012; stn GD26; MNHN-IM-2012-7401 • 3 specs, 10.6 × 3.7, 10.3 × 3.5 and 9.2 × 3.5 mm; 16°22.57′ N, 61°34.12′ W; depth 80 m; 4 May 2012; KARUBENTHOS 2012; stn GD01; MNHN-IM-2012-7402 • 1 spec., 6.9 × 2.9 mm; Grand Cul-de-Sac, Port-Louis; 16°25.0′ N, 61°32.8′ W; depth 85 m; 16 May 2012; KARUBENTHOS 2012; stn GD31; MNHN-IM-2012-7412.

NETHERLANDS ANTILLES • 1 spec., 10.9 × 3.6 mm; SW Curaçao, off Sea Aquarium; 12°04.99′ N, 68°53.94′ W; depth 800–900 ft [244–274 m]; 8 Feb. 2013; C. Baldwin leg.; collected in bottle from aboard submersible *Curasub*; USNM 1231384.

Other material examined (30 specs)

The additional examined specimens from Guadeloupe, French Guiana, and Bermuda are not included in the type series.

Description

Shell small (holotype length = 14.2 mm), glossy-smooth, fusiform (W/L = 0.3600), of about 9¼ whorls, the last about 65% of shell length, with slightly appressed sutures undulant over previous whorls' ribs; whorls obtusely angled at about mid-whorl, shoulder flat to slightly concave, whorl sides convex, aperture narrowly oval, anterior canal long for the genus, aperture and canal together about 49% of shell length. Sculpture of strong ribs and microscopic spiral grooves, ribs aligned except on last whorl. *Protoconch* of 3–3¼ smooth whorls, tip minute, brown, about the last 1½ whorls with well-spaced riblets that grow stronger and further apart. *Axial sculpture* of ribs that run suture-to-suture and aligned whorl-to-whorl, intercostal space 2 or 3 times wider than ribs. Ribs are obtusely angle mid-whorl with minute nodules marking whorl peripheries. *Varix* apertural, large and broad, forms a smooth arc from suture to anterior canal, inside the aperture are about 12 lyrae that become more oblique anteriorly. Tooth at anal sinus prominent. *Spiral sculpture* of densely packed microscopic spirals, alternating in strength, over

shell surface, and a single spiral cord that is obsolete except for nodules on the crests of ribs. Nodules are weak. *Sulcus* absent; ribs are slightly curved on shoulder. *Outer lip* varicose, with a narrow strip of shell that projects from the base of the varix, mostly chipped away on holotype. *Anal sinus* a notch with a round apex confined to the outer lip, sides divergent not adjoining suture. *Inner lip* a thin glaze along the columella with an irregular elongate callus midway, and a tooth at the anal sinus, which is not as prominent as the tooth on the outer lip. *Anterior fasciole* not swollen, sculpted as shell base and in addition, with overlaying oblique spirals. *Columella* straight. *Anterior canal* is moderately long, tube-like, open, turned to the right when viewed ventrally such that the end in oblique to the shell's axis, and slightly notched. *Color* off white with a wide brown band just below whorl peripheries, lighter on rib crests. Very light, irregular brown flecks throughout.

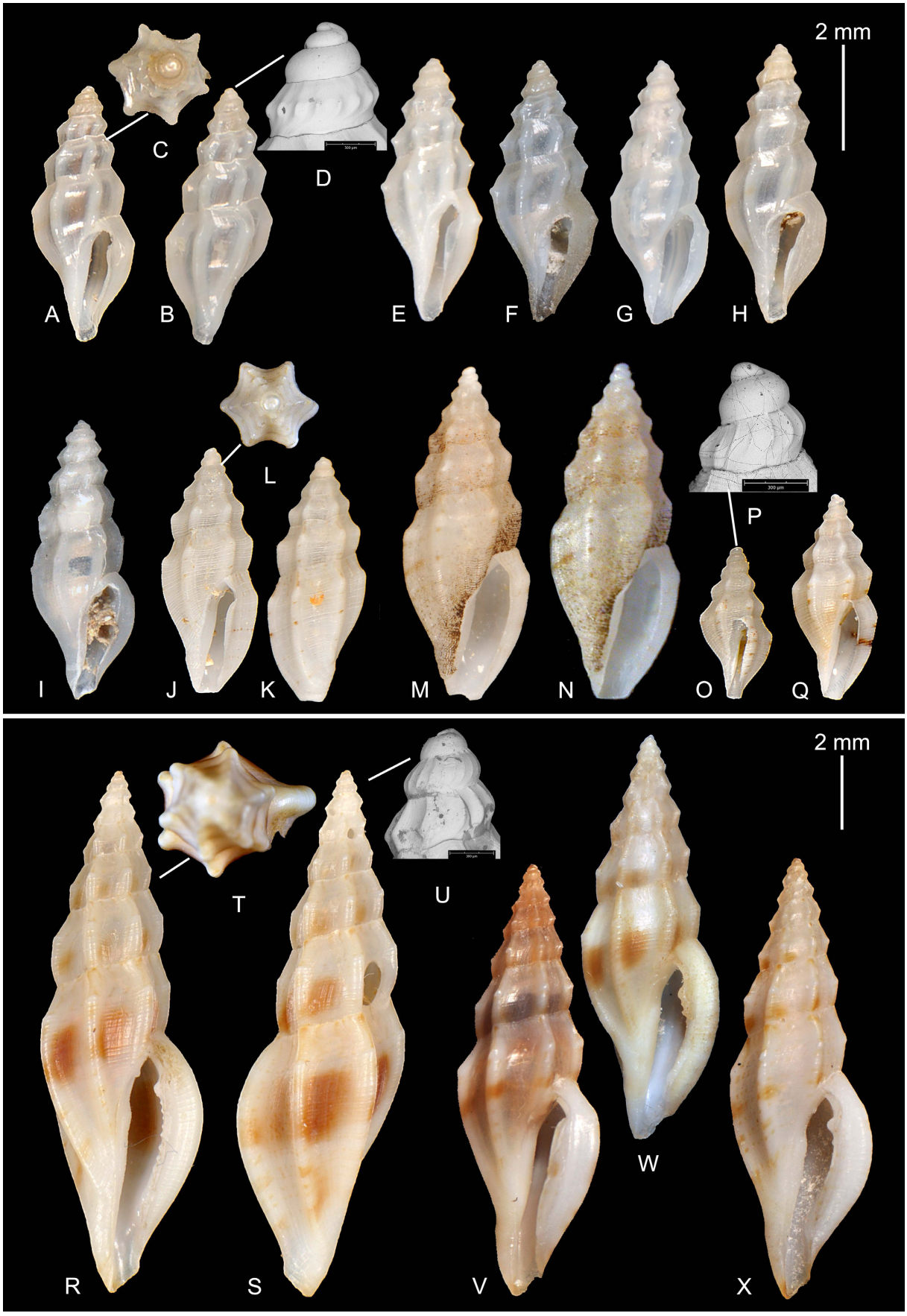
Remarks

The average length of 54 specimens is 10.0 mm (range = 6.7–14.2 mm). The crest of the varix of some specimens is not a smooth arc but rather shows a slight angulation at the whorl periphery.

Range and habitat

United States (W Florida), Bermuda, Guadeloupe, Martinique, Netherlands Antilles (Curaçao), and French Guiana; depth 13–251 m. Some poorly preserved shells were found at 496 m.

Fig. 65 (next page). Species of *Ithycythara* Woodring, 1928. Part 1. – **A–I**. *Ithycythara bugeae* Fallon & Bouchet sp. nov. **A–D**. Holotype, 4.9 × 2.0 mm, ventral, dorsal and apical views, and SEM image of protoconch (MNHN-IM-2000-39630), N of Grande-Terre, Guadeloupe. **E**. Paratype, 5.0 × 2.0 mm (D. Lamy coll.), S of La Désirade, Guadeloupe. **F**. Paratype, 5.3 × 2.0 mm (MNHN-IM-2000-40016), N of Grande-Terre, Guadeloupe. **G**. Paratype, 5.0 × 2.0 mm (MNHN-IM-2012-7372), Vieux Bourg, Guadeloupe. **H**. Paratype, 5.3 × 2.0 mm (USNM 1715423), N of Grande-Terre, Guadeloupe. **I**. Paratype, 5.3 × 1.9 mm (UF 589803), W Marie-Galante, Guadeloupe. – **J–Q**. *Ithycythara biconica* Fallon & Bouchet sp. nov. **J–L**. Holotype, 4.8 × 1.9 mm, ventral, dorsal and apical views (MNHN-IM-2000-39628), Islet in Ramiers, Fort-de-France Bay, Martinique. **M**. Spec., 6.3 × 2.4 mm (MNHN-IM-2022-17806), Arlet Cove, Martinique. **N**. Spec., length = 6.4 mm (D. Lamy coll. #134), Martinique. **O–P**. Paratype, 2.9 × 1.5 mm, juvenile (MNHN-IM-2000-39629), from the type locality. **Q**. Spec., 3.9 × 1.7 mm, juvenile (MNHN-IM-2012-7448), Little Cove, Guadeloupe. – **R–X**. *Ithycythara ellenstrongae* Fallon & Bouchet sp. nov. **R–U**. Holotype, 14.2 × 4.3 mm, ventral, dorsal and apical views (MNHN-IM-2000-39635), W of Marie-Galante, Guadeloupe. **V**. Paratype, 11.7 × 3.8 mm (D. Lamy coll.), S of La Désirade, Guadeloupe. **W**. Paratype, 10.9 × 3.6 mm (USNM 1231384), off Sea Aquarium, SW Curaçao, Netherlands Antilles. **X**. Paratype, 12.0 × 3.9 mm (D. Lamy coll.), S of La Désirade, Guadeloupe. Credits: D, P, U: SEM images courtesy of Paul Callomon. Scale bars: A–C, E–O, Q–T, V–X = 2 mm; D, P, U = 300 µm.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Ithycythara spp. Part 2

Ithycythara angulata Fallon & Bouchet sp. nov.
urn:lsid:zoobank.org:act:C4033568-492B-42F3-9064-B9357405F296
Fig. 66A–I

Differential diagnosis

Ithycythara alpha Fallon sp. nov. is sharply angular but is smaller, has stronger apertural dentition, and is all white.

Ithycythara brisseti Fallon & Bouchet sp. nov. is not sharply angled and is colored differently.

Etymology

Ithycythara angulata Fallon & Bouchet sp. nov. is from the feminine form of the Latin adjective '*angulatus*', meaning 'with angles', and named so because of its sharply angled whorls.

Type material

Holotype
GUADELOUPE • 7.8 × 2.4 mm; Banc des Vaisseaux; depth 250 m; 2013; dredged; ex D. Lamy coll.; MNHN-IM-2000-39623.

Paratypes (11 specs)
GUADELOUPE • 1 spec., 8.0 × 2.6 mm, ethanol-preserved; E of La Désirade; 16°19′ N, 60°55′ W; depth 396–399 m; 17 Jun. 2015; KARUBENTHOS 2; stn DW4572; MNHN-IM-2013-60738 • 1 spec., 7.85 × 2.6 mm; E of La Désirade; 16°19′ N, 60°55′ W; depth 396–399 m; 17 Jun. 2015; KARUBENTHOS 2; stn DW4572; MNHN-IM-2000-39624 • 3 specs, 8.1 × 2.7, 7.7 × 2.8 and 7.5 × 2.6 mm; S of La Désirade; depth 250 m; 2016; dredged; ex D. Lamy coll.; USNM 1715382 • 2 specs, 5.9 × 1.9 and 4.4 × 1.6 mm; W of Marie-Galante; 15°53′ N, 61°25′ W; depth 262–266 m; 22 Jun. 2015; KARUBENTHOS 2; stn DW4599; MNHN-IM-2000-39625 • 1 spec., 8.3 × 2.8 mm; S of La Désirade; depth 250 m; dredged; MNHN-IM-2000-39627 • 1 spec., 6.8 × 2.4 mm; S of La Désirade; depth 250 m; dredged; D. Lamy coll. • 1 spec., 7.4 × 2.6 mm; S of La Désirade; depth 250 m; 2016; dredged; D. Lamy coll. • 1 spec., 7.7 × 2.8 mm; S of La Désirade; depth 250 m; 2016; dredged; ANSP 498790.

Description

Shell small (holotype length = 7.8 mm, lengths to 8.3 mm), spindle-shaped, translucent, glossy, with 8 whorls, the last about 62% of shell length, whorls sharply angled, shoulders approximately ½-whorl height, last whorl gently tapered, with a straightening along the anterior canal. The aperture is long and narrow, about 52% of shell length, including anterior canal. *Protoconch* of 3 whorls, smooth, glossy, riblet terminations appear as just spikes above the adapical suture of the 2nd whorl (obsolete below the suture) then strong, widely spaced arched riblets that do not reach the abapical suture, forming a sub-median periphery on the last ½ whorl. *Axial sculpture* of high, thin, vane-like ribs that run from suture to suture, align whorl-to-whorl, and evanesce at anterior fasciole on last whorl. 6 axials per whorl (because axials align, the shell is 6-sided), except the last where there are 4 before the varix, the space between the 4th and varix wider than the other intercostal spaces. Axials are relatively high, varix the highest, which because it is directly opposite gives the shell an impression of being dorsoventrally compressed. *Varix* rib-like, but larger, near the edge of outer lip. *Spiral sculpture* absent. Ribs with knob-like swellings at their periphery are reminiscent of a peripheral cord that is present on some other congeners (as elongated nodules). Microscopic irregular scratches present over the shell surface. *Sulcus* absent; axials slightly recurved, thinner, with slightly concave ridges are evidence of past sinus positions. *Outer lip* inside aperture, under the varix and close to the anal sinus, is a small denticle and further along is a series of

lyrae that become denticle-like and end before the canal. *Anal sinus* deep, round, not U-shaped and is centered on shoulder lip edge, partially constricted at opening. *Inner lip* excavated except along the anterior canal where a thin lip is present, posteriorly a low callus is present on the parietal side of the anal sinus, a swelling present on columella. *Columella* straight. *Anterior canal* is narrow and moderately long, tubular but open, its end is turned to the right viewed ventrally, and end notched. *Anterior fasciole* not swollen, smooth. *Color* a pinkish pale yellow, whorl sides with faint yellowish brown spiral lines, 1–3 on spire whorls and 1–5 on last whorl, some with an additional darker line just above suture line, protoconch tip brown.

Remarks

The average length of 12 specimens is 7.3 mm (range = 4.4–8.3 mm). Some specimens have a single dark spiral line just above the suture (Fig. 66G–I).

Range and habitat

Guadeloupe; depth 200–399 m.

Ithycythara lamyi Fallon & Bouchet sp. nov.
urn:lsid:zoobank.org:act:33C94D42-7D43-4749-AC4F-E24DA95C01F9
Figs 64B, 66J–T

Differential diagnosis

Ithycythara lamyi Fallon & Bouchet sp. nov. has a unique color (lavender) among specimens of the genus group.

Ithycythara brisseti Fallon & Bouchet sp. nov. is pink (when fresh), has mid-whorl nodules on its rib crests, and is smaller (average length = 5.6 versus 7.3 mm).

Ithycythara ellenstrongae Fallon & Bouchet sp. nov. has a mid-whorl brown band, has angled whorls, not convex ones, and is larger.

Ithycythara alpha Fallon sp. nov. has more angular whorls, is smaller, and is all white in color.

Etymology

Ithycythara lamyi Fallon & Bouchet sp. nov. is named in honor of the Guadeloupe resident malacologist Dominique Lamy, who contributed numerous specimens examined for this project and authored field guides on Caribbean mollusks.

Type material

Holotype
GUADELOUPE • 9.9 × 3.1 mm; off La Désirade; depth 250 m; 2017; ex D. Lamy coll.; dredged; MNHN-IM-2000-39647.

Paratypes (17 specs)
GUADELOUPE • 3 specs, 10.1 × 2.9, 9.9 × 3.1 and 8.4 × 2.7 mm; S of La Désirade; depth 250 m; ex D. Lamy coll.; dredged; MNHN-IM-2000-39651 • 1 spec., 10.8 × 3.1 mm; S of La Désirade; depth 250 m; dredged; ANSP 498794 • 1 spec., 10.3 × 3.0 mm; Grande-Terre, off Saint-François Commune; depth 250 m; dredged; ex D. Lamy coll.; USNM 1715380 • 1 spec., 10.1 × 3.3 mm; S of La Désirade; depth 250 m; dredged; D. Lamy coll. • 1 spec., 9.8 × 3.1 mm; S of La Désirade; depth 250 m; dredged; ANSP 498793 • 1 spec., 8.8 × 2.9 mm; Pointe des Châteaux; depth 250 m; dredged; D. Lamy coll. • 7 specs,

10.5 × 3.2, 10.5 × 3.2, 10.0 × 3.3, 9.4 × 3.0, 7.6 × 2.5, 7.5 × 2.3 and 9.2 × 3.0 mm; La Désirade; depth 250 m; 2017; dredged; D. Lamy coll. • 1 spec., 9.7 × 3.2 mm; E of Marie-Galante; depth 250 m; 2017; dredged; D. Lamy coll. • 1 spec., 9.4 × 3.0 mm; S of La Désirade; depth 250 m; dredged, ex D. Lamy coll.; USNM 1715379.

Other material examined (4 specs)

The following poorly preserved specimens were not included in the type series:

GUADELOUPE • 1 spec., 10.1 × 3.1 mm; S of La Désirade; depth 250 m; dredged; D. Lamy coll. • 1 spec., 7.9 × 2.5 mm; W of Marie-Galante; 16°00′ N, 61°23′ W; depth 204–251 m; 21 Jun. 2015; KARUBENTHOS 2; stn DW4586; MNHN-IM-2000-39648 • 1 spec., 7.4 × 2.3 mm; N of Grande-Terre; 16°31′ N, 61°32′ W; depth 268–306 m; 14 Jun. 2015; KARUBENTHOS 2; stn; DW4546; MNHN-IM-2000-39649 • 1 spec., 5.8 × 2.2 mm; W of Marie-Galante; 15°53′ N, 61°25′ W; depth 262–266 m; 22 Jun. 2015; KARUBENTHOS 2; stn DW4599; MNHN-IM-2000-39650.

Description

Shell small (holotype length = 9.9 mm, lengths to 10.8 mm), glossy, narrow spindle-shaped (W/L = 0.3131), glossy-smooth with a total of 8¾ whorls, the last 62% of shell length; whorls barely convex, nearly flat, with impressed sutures and lacking a defined shoulder, periphery about mid-whorl, defined by weak nodes; aperture narrow, varicose, with a short, undifferentiated anterior canal and an anal sinus posteriorly. *Protoconch* of about 2¾ round whorls, riblet terminations as just spikes above the adapical suture beginning at the 2nd whorl (obsolete or nearly so below the suture) then as weak, widely spaced riblets on the last ½-whorl that do not reach the abapical suture. *Axial sculpture* of narrow ribs that run from suture-to-suture, aligned from whorl-to-whorl on most whorls and run to the aperture or the anterior canal on the last whorl; 6 ribs on the penultimate, 3 to the varix on the last; cross-section of shell is hexagonal. *Varix* is rib-like near the edge of the lip, but quite a bit larger and extends to the end of the anterior canal. The penultimate rib likewise runs to the end of the canal but is not as large as the varix). *Spiral sculpture* of microscopic grooves over entire shell. A peripheral cord, or its remnant as nodules, is lacking on the body whorl and nearly so on spire whorls. *Outer lip* is a thin, narrow strip of shell along the leading edge of the varix, forms a low arch from and contiguous with the outer edge of the anal sinus to the end of the anterior canal. Underneath the varix on the inside of the outer lip is a large denticle below the anal sinus and a series of smaller ones ending at the anterior canal; stromboid notch absent. *Anal sinus* is a moderately deep notch with a round apex and divergent sides located in front of the varix, set off the suture by a weak callus, and bordered by a denticle inside the outer lip. *Inner lip* is narrow and thin, a small denticle present on the parietal wall below the anal sinus, and a swelling mid-way along the columella. *Columella* straight. *Anterior canal* short, undifferentiated from the aperture, sub-tubular open; end of canal unnotched. *Anterior fasciole* with very faint, almost obsolete microscopic spirals. *Color* a pale to dark lavender with a wide yellowish-brown band mid-whorl, strongest on rib crests of dorsum, and on some specimens, a narrow band just below suture; protoconch tip brown.

Remarks

Distinct peripheral primary spiral and nodules on peripheral rib crests are lacking, a characteristic of most members of the genus group. Also, 6 ribs per whorl is the norm, but a 5-rib variant occurs in this species (Fig. 66N–O).

The average length of 21 specimens is 9.2 mm (range = 5.8–10.8 mm).

Range and habitat

Guadeloupe; depth 204–306 m.

Ithycythara arawak Fallon & Bouchet sp. nov.
urn:lsid:zoobank.org:act:97052D1C-ECF7-479A-99DB-A983166B8D4E
Figs 62A, 66U–Z

Differential diagnosis

Ithycythara galindoae Fallon & Bouchet sp. nov. has coarser, less uniform microscopic spirals that appear in groups that create light (translucent) and dark (opaque) bands. Rib intercostal spaces are flat, not concave, ribs lower and broader at their bases.

Etymology

Ithycythara arawak Fallon & Bouchet sp. nov. is the name for the indigenous inhabitants of South America and the Caribbean, known as the Arawak Indians, name in apposition.

Type material

Holotype
GUADELOUPE • 9.8 × 3.6 mm; Grande-Terre, off Saint-François Commune; depth 200 m; MNHN-IM-2000-39627.

Paratypes (5 specs)
GUADELOUPE • 1 spec., 5.8 × 2.4 mm, sub-adult, sequenced; Pointe d'Antigues (Port-Louis); 16°25.99′ N, 61°32.92′ W; depth 45 m; 17 May 2012; MNHN exped.; stn GS22; sequenced; MNHN-IM-2013-20634.

MARTINIQUE • 1 spec., 9.7 × 3.5 mm; Grande Anse d'Arlet; depth 50 ft [15 m]; 13 May 2002; G. Mackintosh leg.; night SCUBA; UF 589784.

PUERTO RICO • 1 spec., 9.6 × 3.7 mm; W of Punta Aquilla; depth 40 ft [12 m]; 22 Apr. 2000; G. Mackintosh leg.; night SCUBA; USNM 1715443.

ST. VINCENT AND THE GRENADINES • 2 specs, 8.7 × 3.3 and 7.8 × 2.8 mm; Union Island, Chatham Bay; depth 65 ft [20 m]; 6 Apr. 2007; G. Mackintosh leg.; night SCUBA on sand and rubble; ANSP 498907.

Other material examined (1 spec.)

MARTINIQUE • 1 spec., 8.3 × 2.9 mm; Anse d'Arlet; ex R. Delannoye coll.; MNHN-IM-2022-17807.

Description

Shell small (length to 9.8 mm), broadly fusiform (W/L = 0.3673), glossy, with an evenly tapered spire and large body whorl about 62% of shell length. Whorls up to 8¾ in all, teleoconch whorls are angulated, appressed, with steeply sloping flat shoulders with a low, barely discernible bump midway. Upturned nodules mark the whorl periphery and beginning of slightly convex to flat whorl sides that angle into sutures. The aperture is an elongated oval, with almost parallel sides, an anal sinus posteriorly and a short canal anteriorly, together about 44% of shell length. Surface sculpture consists of 6 narrow ribs per whorl and microscopic spiral grooves. *Protoconch* of 2¼ whorls, the first minute with a brown spot on its tip, the last ½-whorl subcarinate with slightly swollen riblets peripherally that do not reach the abapical suture. *Axial sculpture* of 6 ribs per whorl that run and are aligned suture to suture and run to the inner lip on shell base or to near the end of the anterior canal on shell dorsum (i.e., the penultimate rib): moderately wide with narrow crests in cross-section, and slightly concave intercostal space. *Varix* located behind the outer lip and anal sinus, is thicker and higher than preceding rib, and extends in a smooth arc to near the end of the anterior canal. *Spiral sculpture* of a single spiral cord at whorl periphery, nodulous

on ribs, obsolete beyond rib crests, and of closely spaced microscopic grooves. *Sulcus* absent. *Outer lip* a narrow strip of shell along the base of the varix extending from the anal sinus to the anterior canal with an axial fold along its edge. Lip forms a low arc from the outer edge of the anal sinus to the anterior canal. Dentition of a sharp, pointed anal tooth, and strong lyrae on the underside of the varix. *Anal sinus* a deep round notch mid-way on whorl shoulder sides divergent, with a slightly elevated rim around its edge. *Inner lip* a narrow glaze along the columella and parietal surface with a small callus where it joins the outer lip at the suture. *Columella* straight. *Anterior canal* short, bent slightly to the right when viewed ventrally, end angled, unnotched. *Anterior fasciole* not swollen, with strong incremental growth lines and oblique microscopic spirals. *Color* dirty white with a broad, yellowish-brown spiral band on the dorsal surface of the last whorl.

Remarks

The average length of 9 specimens is 8.7 mm (range = 5.8–9.8 mm). The yellowish-brown spiral band is narrow and visible above suture line in some specimens.

Range and habitat

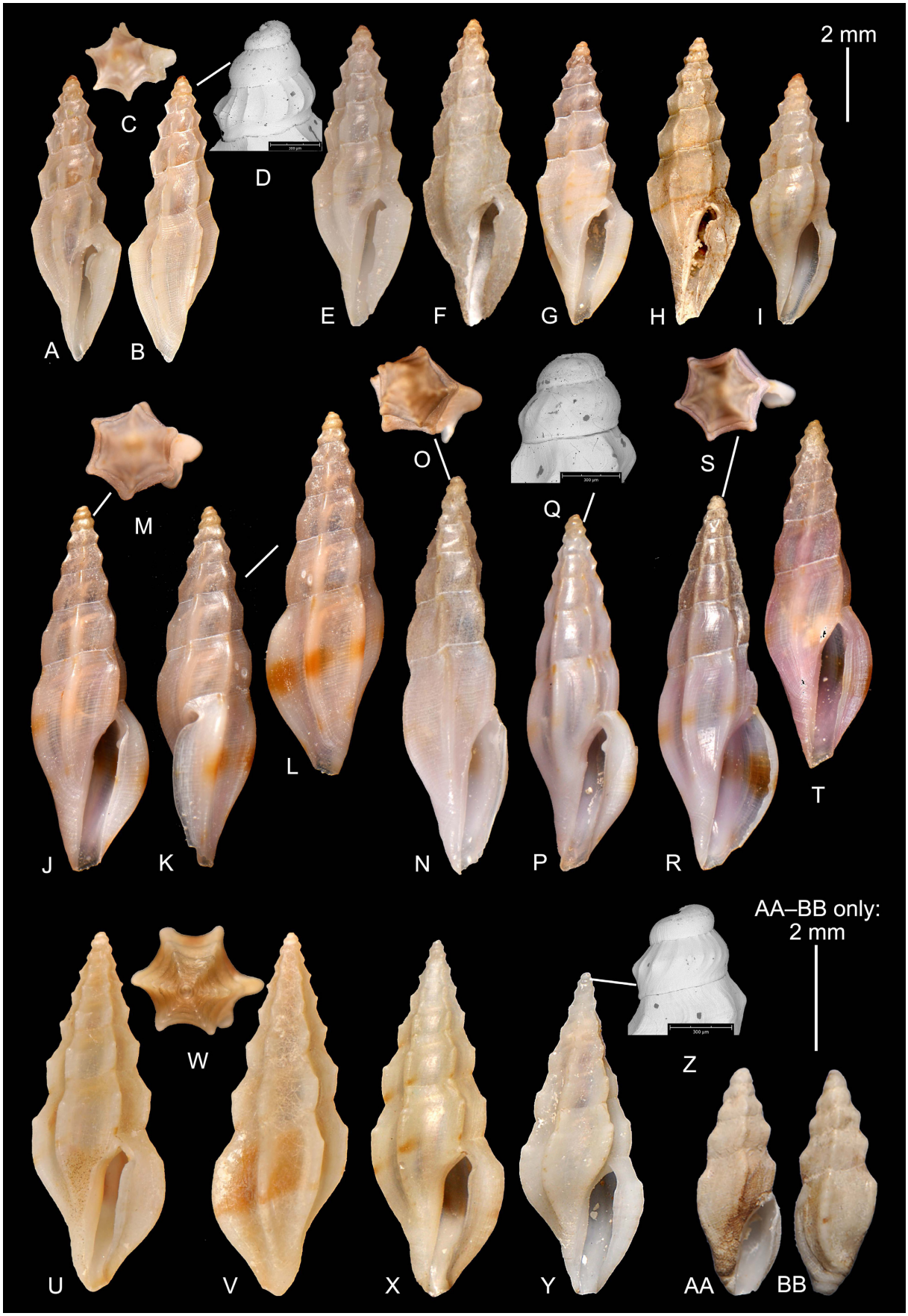
Cuba, Puerto Rico, Guadeloupe, Martinique, St. Vincent and the Grenadines; depth 12–200 m, live caught at 45 m.

Ithycythara unid. sp. L
Fig. 66AA–BB

Differential diagnosis

This specimen may be *Ithycythara parkeri* Abbott, 1955. It is within that species' size range, has 5 ribs per whorl, and is within the range (positively identified specimens of *I. parkeri* have been taken in Guadeloupe samples). It differs in lacking the narrower anterior canal of that species and has a thin periostracum also lacking in *I. parkeri*. Its porcelaneous aperture may be unique within the genus *Ithycythara*.

Fig. 66 (next page). Species of *Ithycythara* Woodring, 1928. Part 2. – **A–I**. *Ithycythara angulata* Fallon & Bouchet sp. nov. **A–D**. Holotype, 7.8 × 2.4 mm, ventral, dorsal and apical views (MNHN-IM-2000-39623), Banc des Vaisseaux, Guadeloupe. **E**. Paratype, 8.1 × 2,7 mm (USNM 1715382), S of La Désirade, Guadeloupe. **F**. Paratype, 8.3 × 2.8 mm (MNHN-IM-2000-39626), S of La Désirade, Guadeloupe. **G**. Paratype, 7.7 × 2.8 mm (ANSP 498790), S of La Désirade, Guadeloupe. **H**. Paratype, 7.9 × 2.6 mm (MNHN-IM-2000-39624), E of La Désirade, Guadeloupe. **I**. Paratype, 6.8 × 2.4 mm, sub-adult (D. Lamy coll.), S of La Désirade, Guadeloupe. – **J–T**. *Ithycythara lamyi* Fallon & Bouchet sp. nov. **J–M**. Holotype, 9.9 × 3.1 mm, ventral, lateral, dorsal and apical views (MNHN-IM-2000-39647), off La Désirade, Guadeloupe. **N–O**. Paratype, 10.8 × 3.1 mm, ventral and apical views of this pentagonal spec. (ANSP 498794), S of La Désirade, Guadeloupe. **P–Q**. Paratype, 9.8 × 3.1 mm, ventral view, and SEM image of protoconch (ANSP 498793), S of La Désirade, Guadeloupe. **R–S**. Paratype, 10.1 × 3.3 mm, ventral and apical views (D. Lamy coll.), S of La Désirade, Guadeloupe. **T**. Paratype, 9.4 × 3.0 mm (USNM 1715379), S of La Désirade, Guadeloupe. – **U–Z**. *Ithycythara arawak* Fallon & Bouchet sp. nov. **U–W**. Holotype, 9.8 × 3.6 mm, ventral, dorsal and apical views (MNHN-IM-2000-39627), off Saint-François Commune, Grande-Terre, Guadeloupe. **X**. Paratype, 9.7 × 3.5 mm (UF 589784), Grand Anse d'Arlet, Martinique. **Y–Z**. Paratype, 8.7 × 3.3 mm, ventral view, and SEM of protoconch (ANSP 498907), Chatham Bay, Union Island, Saint Vincent and the Grenadines. – **AA–BB**. *Ithycythara* unid. sp. L. Spec., 4.3 × 1.7 mm, ventral and dorsal views (MNHN-IM-2012-20658), Bouillante Bay, Guadeloupe. Credits: D, Q, Z: SEM images courtesy of Paul Callomon. Scale bars: A–C, E–P, R–Y, AA–BB = 2 mm; D, Q, Z = 300 μm.


2 mm
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AA–BB only:
2 mm

Ithycythara auberiana (d'Orbigny, 1853) has not been ruled out although the type of that species is significantly larger.

Material examined (1 spec.)

GUADELOUPE • 1 spec., 4.3 × 1.7 mm; Bouillante Bay; 16°08.07′ N, 61°46.71′ W; depth 6 m; 10 May 2012; KARUBENTHOS 2012; stn GS12; sequenced; MNHN-IM-2013-20658.

Description

Shell small (length = 4.3 mm), stoutly fusiform, whorls about 6, teleoconch whorls 5-sided, with round, sloping flat shoulders to about mid-whorl, last whorl, about 66% of shell length with oval aperture, and short anterior canal undifferentiated from aperture, together about 45% of shell length. Microscopic spiral grooves cover the shell. *Protoconch* worn morphology unknown. *Axial sculpture* of 5 cord-like ribs run and are aligned from suture to suture, then turn and evanesce over anterior fasciole. *Spiral sculpture* of closely spaced fine spiral grooves over shell surface. No peripheral spiral cord present, whorl peripheries not nodulose.

***Ithycythara* spp. Part 3**

Ithycythara fulvofasciata Fallon & Bouchet sp. nov.
urn:lsid:zoobank.org:act:A5B22E1F-46C0-4694-9315-C20216AB4530
Figs 67, 69A–J

Differential diagnosis

Ithycythara flammea Fallon & Bouchet sp. nov. is larger, its anterior canal is more abruptly tapered, the teleoconch shell has a wider brown spiral band, and last whorl is squared, not rounded as it is in *I. fulvofasciata* Fallon & Bouchet sp. nov. The animal coloration of *I. fulvofasciata* appears to be the same but the differences in shell morphology separate the species. These two species appear to be closely related.

Ithycythara ellenstrongae Fallon & Bouchet sp. nov. is larger, has a proportionally longer canal, and smaller nodules at whorl peripheries.

Etymology

Ithycythara fulvofasciata Fallon & Bouchet sp. nov. is derived from the feminine forms of the compound adjectives '*fulvo*' (from '*fulvus*', meaning 'tawny') and '*fasciata*' (from '*fascia* + *at*', meaning 'having a band'), reflecting its shell color, characterized by a tawny banded shell.

Type material

Holotype

MARTINIQUE • 5.8 × 2.5 mm; Fond Boucher; 14°55′ N, 61°08.9′ W; depth 78–80 m; 24 Sep. 2016; MADIBENTHOS; stn AD263; MNHN-IM-2000-39639.

Paratypes (7 specs)

GUADELOUPE • 3 specs, 5.3 × 2.1, 5.3 × 2.1 and 4.6 × 2.0 mm; W of Marie-Galante; 16°00′ N, 61°23′ W; depth 204–251 m; 21 Jun. 2015; KARUBENTHOS 2; stn DW458; MNHN-IM-2000-39643.

MARTINIQUE • 1 spec., 5.9 × 2.5 mm; Fond Boucher; 14°55′ N, 61°08.9′ W; depth 78–80 m; 24 Sep. 2016; MADIBENTHOS; stn AD263; MNHN-IM-2000-39642 • 1 spec., 5.6 × 2.1 mm, ethanol-preserved; off Macouba; 14°55.1′ N, 61°08.9′ W; depth 78 m; 22 Sep. 2016; MADIBENTHOS; stn AD260; MNHN-IM-2013-71215 • 1 spec., 5.7 × 2.2 mm; SW Vétiver; 14°37.5′ N, 61°08.3′ W; depth

74 m; 2 Oct. 2016; MADIBENTHOS; stn AD290; MNHN-IM-2000-39641 • 1 spec., 5.9 × 2.4 mm; Bellefontaine; 14°40.2′ N, 61°10.5′ W; depth 70 m; 2 Oct. 2016; MADIBENTHOS; stn AD289; MNHN-IM-2000-40017.

Other material examined (1 spec.)

MARTINIQUE • 1 spec., 2.0 × 1.0 mm, juvenile; NE of Caye Pinsonnelle, Le François; 14°38.5′ N, 60°46.3′ W; depth 63 m; 15 Sep. 2016; MADIBENTHOS; stn AD234; MNHN-IM-2000-39866.

Description

Shell small (holotype length = 5.8 mm, other lengths to 5.9 mm), glossy-smooth, stoutly fusiform (W/L = 0.4310), of 7¼ whorls with appressed sutures undulant over previous whorls' ribs, and sharply angled a little below mid-whorl on spire whorls and at about ⅓-whorl on last. Sculpture of strong narrow ribs highest at whorl peripheries but lower toward sutures, an obsolete spiral cord expressed as peripheral nodules, and of microscopic spiral grooves. Shoulder slightly concave and steeply sloping, whorl sides straight but angled a little in from periphery to suture. Aperture narrowly oval, with anterior canal, both together about 50% of shell length. *Protoconch* of 3 smooth whorls, tip minute, brown then increasing regularly, the last 2 whorls with well-spaced riblets, fine at first then becoming stronger. Adapical ends of riblets on the last whorl extend a little above their suture, abapical ends do not reach the suture. *Axial sculpture* of strong ribs that run suture-to-suture, are highest mid-whorl, lower on shoulder and below periphery, and evanesce before the anterior fasciole on shell base; ribs 6 ribs per whorl, aligned whorl-to-whorl, and their width quite a bit narrower than their interspaces. *Varix* apertural, robust, much heavier than preceding rib; extends from suture to end of anterior canal; 7 lyrae on its underside, from the anal denticle to beginning of anterior canal. *Spiral sculpture* of densely packed microscopic grooves over shell surface, and a single spiral cord that is obsolete except for swollen nodules on the peripheral crests of ribs. *Sulcus* absent; ribs slightly recurved behind anal sinus and along shoulder. *Outer lip* varicose, with a narrow strip of shell that projects from the base of the varix, extending from suture to end of canal, interrupted by anal sinus and narrowing to the end of the canal. A row of strong lyrae below (anterior to) the anal tooth extends to the anterior canal. *Anal sinus* an open notch a little apart from the suture and in front of and not excavating the varix, outer side divergent; a single tooth is inside outer lip at the lower margin of the sinus. *Inner lip* thin, narrow layer of shell, unemarginate, with a weak anal tooth. *Anterior fasciole* not swollen, sculpted with oblique microscopic spiral grooves. *Columella* straight. *Anterior canal* of moderate length not well differentiated from aperture, bent slightly to the right when viewed ventrally; end unnotched. *Color* white base with a brown spiral band just below whorl periphery, a brown anterior fasciole, rows of faint brown dots (as brown lines in some specimens), and white peripheral nodules.

Animal

A photograph of a live animal shows the red surface of foot, proboscis, and cephalic tentacle base (Fig. 67). The foot, which appears to be weakly bilobed anteriorly, is white below the colored dorsum. Eye spots are located at the end of the fleshy portion of the tentacles.

Remarks

The average length of 9 specimens is 5.1 mm (range = 2.0–5.9 mm). Coloration varies among specimens, even from the same lot. A sampling of this variation is presented in the figure and includes a specimen with 5 dotted lines instead of a solid spiral band.

Range and habitat

Guadeloupe and Martinique; depth 63–251 m. The type series depth 70–80 m, and one live-taken specimen depth 78–80 m.

Fig. 67. *Ithycythara fulvofasciata* Fallon & Bouchet sp. nov. (MNHN-IM-2013-71215), live animal. Photograph by C. Redfern.

Ithycythara flammea Fallon & Bouchet sp. nov.
urn:lsid:zoobank.org:act:6895A18C-3BFC-405C-AA9D-3E85A5D64841
Figs 62D, 68, 69K–Q

non *Ithycythara lanceolata* (C.B. Adams, 1850) – Lamy & Pointier (2017: 482, pl. 167 fig. 3a–b) is likely this species.

Differential diagnosis

Ithycythara fulvofasciata Fallon & Bouchet sp. nov. is smaller, its anterior canal is more evenly tapered, it has a narrower brown spiral band, and the body whorl is round, not squared.

Ithycythara ellenstrongae Fallon & Bouchet sp. nov. is larger, has a proportionally longer, more evenly tapered canal, more obtusely angled whorls, and smaller nodules at whorl peripheries.

Etymology

Ithycythara flammea Fallon & Bouchet sp. nov. derives its name from the feminine form of the Latin adjective '*flammeus*', meaning 'flaming', which refers to the flame-like color pattern of its shell and body.

Type material

Holotype

GUADELOUPE • 10.0 × 3.6 mm, sequenced; Bouillante Bay, North Point; 16°08.48′ N, 61°47.03′ W; depth 54 m; 8 May 2012; KARUBENTHOS 2012; stn GD10; sequenced; MNHN-IM-2013-20289.

Paratypes (6 specs)
MARTINIQUE • 1 spec., 7.4 × 3.0 mm; Le Carbet; 14°42.3′ N, 61°11.6′ W; depth 76 m; 3 Oct. 2016; MADIBENTHOS; stn AD294; sequenced; MNHN-IM-2013-74626 • 2 specs, 4.2 × 1.9 and 3.3 × 1.6 mm; off Macouba; 14°55′ N, 61°08.9′ W; depth 80 m; 27 Sep. 2016; MADIBENTHOS; stn AD275; MNHN-IM-2000-39638 • 1 spec., 6.8 × 2.9 mm; off Macouba; 14°55.1′ N, 61°09′ W; depth 80 m; 24 Sep. 2016; MADIBENTHOS; stn AD261; MNHN-IM-2000-39637 • 1 spec., length = 4.1 mm; off Macouba; 14°55.1′ N, 61°08.9′ W; depth 78 m; 22 Sep. 2016; MADIBENTHOS; stn AD260; ANSP 498840 • 1 spec., 6.4 × 2.7 mm; off Macouba; 14°55.1′ N, 61°09′ W; depth 80 m; 24 Sep. 2016; MADIBENTHOS; stn AD261; USNM 1715386 • 1 spec., 4.5 × 1.9 mm, in ethanol; off Macouba; 14°55′ N, 61°08.9′ W; depth 80 m; 27 Sep. 2016; MADIBENTHOS; stn AD275; MNHN-IM-2013-71645.

Other material examined (1 spec.)

One juvenile specimen from Martinique samples is not included in the type series.

Description

Shell small (holotype length = 10.0 mm), glossy-smooth, stoutly fusiform (W/L = 0.3600), of about 8½ whorls, the last about 66% of shell length and somewhat squared because of the rapid narrowing to the anterior canal; whorls obtusely angled, with appressed sutures undulant over previous whorls' ribs, their peripheries a little below mid-whorl on spire whorls and about ¼ whorl on last. Sculpture of strong, narrow ribs highest at whorl peripheries but lower toward sutures, of an obsolete spiral cord expressed as peripheral nodules, and of microscopic spirals. Shoulder slightly concave and steeply sloping, whorl sides straight but angled a little in from periphery to suture. Aperture narrowly oval, its length, with anterior canal, about 48% of shell length. *Protoconch* of about 3¼ smooth whorls, tip minute, then increasing regularly, riblet terminations appear as spikes at and above the adapical suture of the 2nd whorl (obsolete or nearly so below the suture) then on the last 1½ whorl well-spaced arched riblets appear, fine at first then becoming stronger on advancing but do not reach the abapical suture, the last ½-whorl subcarinate as a result. *Axial sculpture* of strong ribs that run suture-to-suture, are highest mid-whorl, lower on shoulder and below periphery, and evanesce before the anterior fasciole on shell base; ribs 6 ribs per whorl, aligned whorl-to-whorl, and their width 2 or 3 times narrower than their interspaces. *Varix* absent on the immature holotype. *Spiral sculpture* of densely packed microscopic spirals over shell surface, and a single spiral cord that is obsolete except for nodules on the crests of ribs. Nodules are prominent. *Sulcus* absent; ribs slightly recurved behind anal sinus and along shoulder. *Outer lip* thin, intercostal shell formed on the immature specimen. *Anal sinus* absent; the curvature of ribs on shoulder indicates a shallow sinus about the width of the ramp. *Inner lip* thin, narrow layer of glaze. *Anterior fasciole* is not swollen, sculpted with oblique microscopic spirals, a little stronger than preceding spirals on the shell base. *Columella* straight. *Anterior canal* abruptly narrowed at shell base, of medium length not well differentiated from aperture, straight with end turned slightly to the right when viewed ventrally, end very slightly notched. *Color* light brown with a wide brown band just below the shoulder on whorl sides; peripheral nodules and anterior canal white. In some specimens, the anterior fasciole and canal are brown, not white.

Animal

Live animal in MNHN-IM-2013-71645 illustrating red surface of foot, proboscis, and cephalic tentacle base (Fig. 68). The foot appears to be white below the colored dorsal layer. The two eye spots are located at the end of the fleshy portion of the cephalic tentacles.

Range and habitat

Guadeloupe and Martinique; depth 54–80 m.

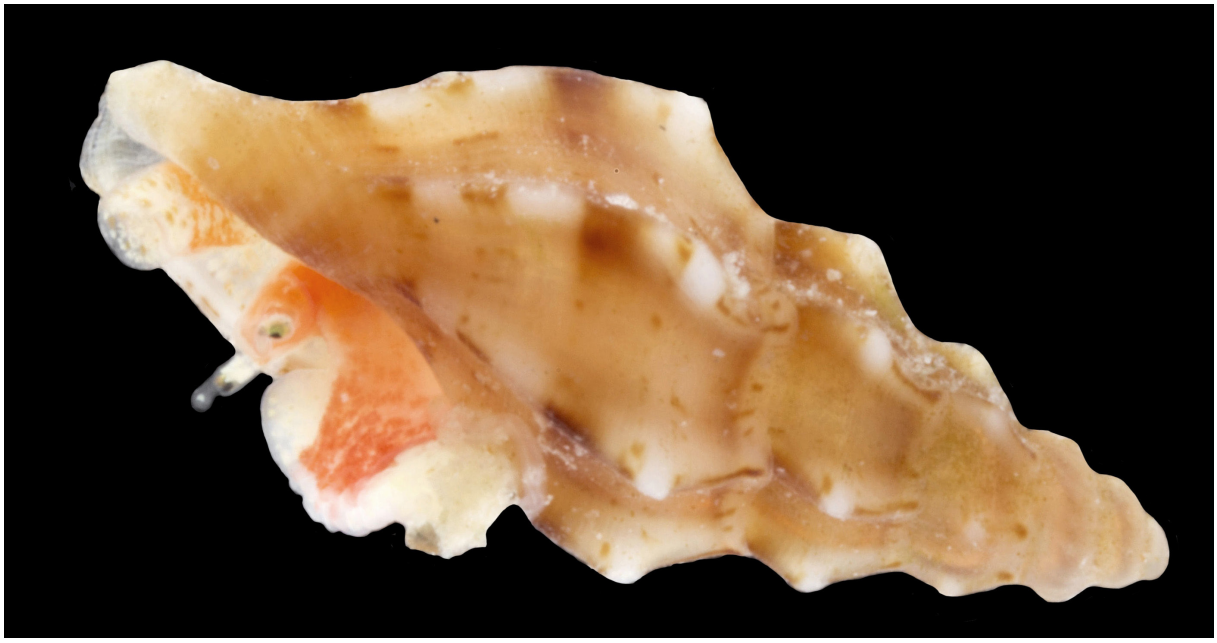

Fig. 68. *Ithycythara flammea* Fallon & Bouchet sp. nov. (MNHN-IM-2013-71645), live animal. Photograph by C. Redfern.

Ithycythara hastata Fallon & Bouchet sp. nov.
urn:lsid:zoobank.org:act:ED0B7568-1981-47EE-B7AD-4576197C1380
Figs 64D, 69R–V

non *Ithycythara psila* (K.J. Bush, 1885) – Paulmier 2019: 10, figs 32–34 may be this species. See photo of holotype of *Mangilia psila* K.J. Bush, 1885 (Fig. 73S).

Differential diagnosis

Ithycythara bahiensis Fallon sp. nov. possesses narrower ribs lacking a mid-shoulder hump, and more angular whorls. Microscopic spiral sculpture is finer, and it differs in coloration.

Ithycythara eburnea Paulmier, 2019 and *I. antillensis* Paulmier, 2019 differ in the manner discussed in the descriptions of those species.

Etymology

Ithycythara hastata Fallon & Bouchet sp. nov., from the feminine form of the Latin adjective '*hastatus*', meaning 'armed with a spear', which refers to the shell's shape.

Type material

Holotype

MARTINIQUE • 1 spec., 5.4 × 1.9 mm; Caravelle Peninsula, Grand-Jean Bay; 14°44.5′ N, 60°53.5′ W; depth 5–12 m; 17 Sep. 2016; MNHN exped.; stn AD241; MNHN-IM-2000-39646.

Paratypes

None.

Other material examined (1 spec.)

MARTINIQUE • 1 spec., 5.5 × 1.6 mm; Anse d'Artlet; L. Charles coll.

Description

Shell small (holotype length = 5.4 mm), narrowly fusiform (W/L = 0.3519), translucent, glossy smooth with 8 whorls total, teleoconch whorls obtusely angled, last whorl about 60% of shell length; sculptured with narrow ribs possessing steeply sloped shoulders with a slight hump mid-way, a single sub-median spiral cord, and microscopic spiral grooves; aperture narrow, not much wider than the anterior canal, both about 43% of shell length, including anterior canal. *Protoconch* of 2¼ round whorls glossy smooth, first whorl small, then uniformly expands, the last whorl with faint riblets that do not reach the abapical suture. *Axial sculpture* of 6 strong ribs per whorl, each with round crests that run from and are aligned suture to suture on spire whorls and evanesce on the shell base at the anterior fasciole, recurved on whorl shoulders. *Varix* apertural, an enlarged last rib that extends from the suture to the anterior canal. *Spiral sculpture* of a peripheral cord, obsolete except on ribs, sides, and crests; widely spaced shallow microscopic grooves override ribs. *Sulcus* absent, recurved ribs on shoulder indicate past positions of sinus. *Outer lip* varicose, with a narrow strip of shell that extends out from the base of the varix that runs from the suture to the anterior canal; tooth present at the base of the anal sinus, and lyrae along the underside of the varix; stromboid notch absent. *Anal sinus* is a round notch, in front of the varix, set off from the suture, extending from the fold of the joined inner and outer lips to whorl periphery, sides divergent. *Inner lip* a glaze along the columella that widens on the parietal wall and then joins the outer lip at the suture, with a tooth at the anal sinus. Edge of lip margined. *Anterior canal* is short, narrow, open, and slightly notched at its tip. *Anterior fasciole* is not swollen, marked with incremental growth lines. *Columella* straight. *Color* translucent white with a very faint mid-whorl brown spiral band.

Range and habitat

Known only from the type locality.

Ithycythara antillensis Paulmier, 2019
Fig. 69W

Ithycythara antillensis Paulmier, 2019: 5, figs 5–7.

Differential diagnosis

Ithycythara eburnea Paulmier, 2019, according to Paulmier, has a shorter spire and a more swollen protoconch.

Ithycythara hastata Fallon & Bouchet sp. nov. is smaller (length = 5.4 versus 7.9 mm), has a protoconch with 2¼ whorls (versus 2), and a proportionally shorter aperture/anterior canal (43 verses 45% of shell length). The color of *I. hastata* is white, not amber.

Type material

Holotype

MARTINIQUE • 7.9 × 2.7 mm; Fort-de-France Bay; 13°32.92′ N, 61°05.18′ W; depth 66 m; MNHN-IM-2000-34346.

Paratype (1 spec.)

MARTINIQUE • 1 spec., length = 8.3 mm; same data as for holotype; MNHN-IM-2000-34347.

Description

The following has been taken from the original description by Paulmier (2019: 5–6, figs 5–7). Neither type specimens nor other specimens have been examined. *Shell* small (length = 7.9 mm), slender fusiform (W/L = 0.3418), of 6 or 7 whorls, the last about 62% of shell length; teleoconch whorls nearly flat, with obtuse angles close to the succeeding sutures. Aperture varicose, narrowly oval, anterior canal short, both about 46% of shell length. *Protoconch* of about 2 round whorls, the first recumbent and expands, the second has oblique riblets. *Axial sculpture* of 6 strong ribs that run from and are aligned suture to suture on spire whorls and evanesce on the shell base. Intercostal spaces are convex. Growth lines are deeper on shell base, recurved on shoulder. *Varix* rib-like, thicker, and higher, extends from the suture of the penultimate whorl, between 2 ribs, in a smooth arch to the anterior canal. *Spiral sculpture* of a single spiral cord that crosses ribs sub-medially, forming elongate nodules, obsolete to nearly so between ribs. Dense microscopic grooves cover the shell's surface. *Sulcus* absent; past presence of anal sinus is indicated by recurved growth lines on whorl shoulder. *Outer lip* is thin and narrow, extending along the base of the varix. Some small denticules are present on the underside of the varix. *Anal sinus*, a round notch set off from the suture and in front of the varix that extends from the fold of the joined inner and outer lips to edge of shoulder, sides divergent. *Inner lip* a narrow glazed callus along the columella and parietal wall that joins the outer lip at the suture. *Anterior canal* short, canal wide, barely differentiated from aperture, end unnotched. *Anterior fasciole* not swollen, surface marked with growth lines. *Color* a glossy antique white with faint remnants of a light brown spiral band on dorsum.

Range and habitat

Known only from the type locality.

Ithycythara eburnea Paulmier, 2019
Fig. 69X

Ithycythara eburnea Paulmier, 2019: 6, figs 15–18.

Differential diagnosis

Ithycythara hastata Fallon & Bouchet sp. nov. has a similar whorl profile but a proportionately shorter aperture and anterior canal (43 versus 45% of shell length) and is smaller (holotype lengths = 4.4 versus 7.7 mm). Ribs on *I. hastata* are also stronger, and peripheral cord is more elongated over rib crests than nodulose.

Ithycythara antillensis Paulmier, 2019 see difference in the differential diagnosis of that species.

Type material

Holotype
MARTINIQUE • length = 7.7 mm; Le Robert; 14°40.72′ N, 60°52.23′ W; depth 24 m; top of the plateau, on a predominantly muddy substrate; MNHN-IM-2000-34348.

Paratype (1 spec.)
MARTINIQUE • 1 spec.; length = 8.2 mm; same data as for holotype; MNHN-IM-2000-34349.

Description

The following has been taken from the original description by Paulmier (2019: 6) and the accompanying figures. No types or other specimens have been examined. *Shell* small (length to 8.2 mm), fusiform, narrow (W/L = 0.3377), of 7 whorls including the protoconch, the last whorl quite large, 65% of shell length. The teleoconch has obtusely angled whorls, peripheries sub-median, with steep shoulders

and straight sides angled slightly to succeeding sutures. Aperture varicose and narrow, anterior canal of moderate length, together about 45% of shell length. *Protoconch* of 2½ whorls, the first smooth, recumbent, the second has somewhat flattened sides with a mid-whorl keel and oblique riblets on the last ½-whorl. *Axial sculpture* of 6 narrow ribs that run from and are aligned suture to suture on spire whorls and evanesce on the shell base at the anterior fasciole. Intercostal spaces are slightly convex. *Varix* rib-like, thicker, and higher, extends from the suture of the penultimate whorl, between 2 ribs, in a smooth arch to the anterior canal. *Spiral sculpture* of a single spiral cord that crosses ribs sub-medially, obsolete between ribs, and forms distinct nodules on rib crests. Dense microscopic grooves cover the surface of the shell. *Sulcus* absent. *Outer lip* is thin and narrow, extending along the base of the varix. Anal tooth present on the underside of the varix and lyrae to the anterior canal. *Anal sinus* a round notch, in front of the varix, set off from the suture, extending from the fold of the joined inner and outer lips to edge of shoulder, sides divergent. *Inner lip* a narrow glaze along the columella and parietal wall, with a small tooth at the anal sinus. *Anterior canal* is narrow, of moderate length and twisted to the right when viewed ventrally. *Anterior fasciole* not swollen, marked with growth lines. *Color* ivory white with slight nuances amber in some individuals.

Range and habitat

Martinique; depth 24–48 m.

Ithycythara hewittae Fallon sp. nov.
urn:lsid:zoobank.org:act:3F209E29-2604-4204-8880-3ACF4EED25F6
Figs 63E, 69Y–BB

Differential diagnosis

This species appears to have the characteristics of *Cryptomangelia* Fallon gen. nov., but those species always have more than 6 ribs per whorl that rise slightly above, resulting in an undulant suture. *Ithycythara hewittae* Fallon sp. nov. lacks these and other characteristics of that genus but otherwise possesses characteristics of *Ithycythara* as described below.

Ithycythara condita Fallon & Bouchet sp. nov. is larger and has a taller spire.

Etymology

Ithycythara hewittae Fallon sp. nov. is named in honor of Susan Hewitt, an avid malacologist who has studied and published on the molluscan fauna of St. Kitts, the type locality of this species.

Type material

Holotype

ST. KITTS AND NEVIS • 5.3 × 2.2 mm; St. Kitts, Ballast Bay; depth 5 ft [1.5 m]; 1 Feb. 2005; G. Mackintosh leg.; diver; from on rock; ANSP 498984.

Paratypes

None.

Description

Shell small (holotype length = 5.3 mm), stoutly fusiform, glossy, with 7 whorls total, teleoconch whorls with rounded shoulders, slightly concave above, and with flat sides, last whorl about 64% of shell length; sculptured with strong ribs and spiral grooves; aperture elongate with parallel sides, and with an anterior canal only slightly narrower, both about 26% of shell length, including anterior canal. *Protoconch* of about 2¼ smooth round whorls with fine riblets on the last ¼-whorl that do not reach the abapical suture. *Axial*

sculpture of 6 strong, high ribs/whorl, with concave intercostal spaces, that run from and are aligned suture to suture on spire whorls and evanesce on the shell base at the anterior fasciole. Ribs widest at whorl periphery and lack discrete nodules. *Varix* apertural, slightly stronger than the previous rib, extends from the suture to the beginning of the anterior canal in a round arc. *Spiral sculpture* of coarse paired secondaries that cover the surface. *Sulcus* absent. *Outer lip* varicose, with a narrow strip of shell at the base of the varix that runs from the suture to the anterior canal; dentition absent; stromboid notch absent. *Anal sinus* a round notch, in front of the varix, set off from the suture, extending from the fold of the joined inner and outer lips to whorl periphery, sides divergent. *Inner lip* a narrow glaze along the columella and parietal wall, and joins the outer lip at the suture, without dentition. *Anterior canal* short, turned a little to the right at its end when viewed ventrally; notched at its end. *Anterior fasciole* is not swollen, sculpted with incremental growth lines. *Color* white with a narrow brown spiral band along the suture line.

Remarks

Only one specimen was available for this description but because of its unique *Cryptomangelia* Fallon gen. nov.-like characteristics merits description at this time.

Range and habitat

Known only from the type locality.

Ithycythara condita Fallon & Bouchet sp. nov.
urn:lsid:zoobank.org:act:2BAFB95C-6407-450B-8DFB-9EDE1F9F9CDB
Fig. 69CC–GG

Differential diagnosis

Ithycythara galindoae Fallon & Bouchet sp. nov. has a concave shoulder with nodules at rib angles, its anterior fasciole is 'knuckled', not smooth and narrow, has an ivory white aperture, not chestnut brown, and is generally larger.

Ithycythara auberiana (d'Orbigny, 1853) has broader ribs, and is larger.

Etymology

Ithycythara condita Fallon & Bouchet sp. nov. derives from the feminine form of the Latin adjective '*conditus*', which means 'hidden' or 'concealed'. This name reflects its secretive nature, as it is rare in samples despite its shallow habitat.

Type material

Holotype
GUADELOUPE • 5.8 × 2.3 mm; Grand Cul-de-Sac Marin, Caret Island; 16°21.26′ N, 61°37.79′ W; depth 2 m; 23 May 2012; KARUBENTHOS 2012; stn GS30; sequenced; MNHN-IM-2013-20626.

Paratypes (2 specs)
GUADELOUPE • 1 spec., 5.5 × 2.2 mm, ethanol-preserved; Grand Cul-de-Sac Marin; 16°20.91′ N, 61°32.23′ W; depth 2 m; 19 May 2012; KARUBENTHOS 2012; stn GD41; MNHN-IM-2019-34727 • 1 spec., 6.0 × 2.4 mm; Grand Cul-de-Sac Marin, Caret Island; 16°21.26′ N, 61°37.79′ W; depth 2 m; 23 May 2012; KARUBENTHOS 2012; stn GS30; MNHN-IM-2012-7386.

Description

Shell small (holotype 5.8 mm), stoutly fusiform (W/L = 0.3966), with round-shouldered whorls, about 6 total, the last about 59% of shell length. Whorl shoulders flat to slightly concave, whorl sides slightly convex, sutures impressed, periphery (edge of shoulder) rounded; last whorl broad tapered toward the

canal, with an abrupt straightening along the canal; aperture narrow, heavily varicose, with a short, undifferentiated anterior canal and anal sinus on the shoulder. *Protoconch* eroded on holotype and tip missing on paratypes. *Axial sculpture* of strong ribs that run from suture-to-suture, aligned whorl-to-whorl, and run to the anterior fasciole on the last whorl; 6 ribs per whorl. *Varix* at edge of the lip, larger and stronger than preceding ribs, extends to the end of the anterior canal. *Spiral sculpture* of closely spaced fine spiral grooves that override ribs, evenly spaced and appearing as fine spirals of equal strength. Slight swellings on periphery of ribs from a mostly obsolete spiral cord. *Outer lip* is heavily varicose with only a thin narrow strip of shell that projects out from its base, most of which has been chipped away. Underneath the varix on the inside of the outer lip is a small tooth followed by a row of faint lyrae, down to the anterior canal; stromboid notch absent. *Anal sinus* is a notch with a round apex and divergent sides located in front of the varix, set off the suture, and bordered by a small tooth on the parietal wall and outer lip inside the outer lip. *Inner lip* a thin narrow glaze with a small tooth at the anal sinus. *Columella* straight. *Anterior canal* short, narrow, open, narrow, and undifferentiated from the aperture, end unnotched. *Anterior fasciole* not swollen; sculpted as shell base. *Color* of straw (live-taken ethanol-preserved specimen, holotype is encrusted) aperture and inner lip chestnut brown, dorsum of last whorl with a broad brown band. The holotype is encrusted but the paratype has, in addition to a brown band, flecks of brown overall.

Range and habitat

Guadeloupe; depth 2 m.

Ithycythara curiosa Fallon sp. nov.
urn:lsid:zoobank.org:act:A2EDC269-142C-4D10-B8B4-C254DBFF9186
Figs 63C, 69HH–LL

Differential diagnosis

Like *Ithycythara galindoae* Fallon & Bouchet sp. nov. *Ithycythara curiosa* Fallon sp. nov. also has a pattern of light and dark white bands (opaque and translucent) on its shell but it differs in possessing concave shoulders with a greater slope, has a larger shell, lacks peripheral nodules, and has 6, not 8 ribs per whorl.

Ithycythara cocta Fallon sp. nov. is similar in size, is shouldered, and similarly coarsely grooved, but has sloped shoulders, is slimmer (W/L = 0.4138 versus 0.4375, for holotypes), and has a different color pattern.

Etymology

Ithycythara curiosa Fallon sp. nov. from the feminine form of the Latin adjective '*curiosus*', meaning 'odd', which refers to unique features not found in other members of the genus group. These features are explained in the Remarks below.

Type material

Holotype
BAHAMAS • 4.8 × 2.1 mm; Exuma Islands, Long Cay; depth 0 m; Nov. 1968; Dieter Cosman leg.; in beach drift; UF 589785.

Paratype (1 spec.)
BAHAMAS • 1 spec., 5.1 × 2.3 mm; same data as for holotype; UF 589786.

Description

The types are lightly polished specimens that have some of the finer sculptural detail worn away. *Shell* small (paratype length = 5.1 mm) turreted, stout (holotype W/L = 0.4375), of 6 whorls, the last large, about

68% of shell length, shoulders broad, slightly concave, sides slightly convex; aperture oval, about 48% of shell length, varicose, and with a short anterior canal; sculpture of strong ribs and strong spiral grooves. *Protoconch* of about 1½ whorls, the last almost as tall as wide, with a few fine riblets at the end. *Axial sculpture* of 8 strong ribs per whorl with round crests that extend from suture to suture on spire whorls and on anterior fasciole of shell base, narrowed and turned over fasciole to the inner lip; ribs are not aligned whorl to whorl, are highest and nodulous at whorl periphery. Rib interspaces are concave and about as wide as ribs. *Varix* apertural, rib-like, only a little stronger than preceding rib, extending from suture to anterior canal. *Spiral sculpture* of coarse, closely spaced grooves on shell surface; peripheral nodules on rib crests are not due to swellings of a single spiral cord and are themselves overridden by several spiral grooves. *Sulcus* absent. *Outer lip* varicose with a thin, narrow strip of shell extending along the base of the last rib. A weak tooth present under the varix at the base of the anal sinus, followed by a row of lyrae extending to the anterior canal. *Anal sinus* a broad shallow notch as wide as the shoulder with its apex closer to the periphery than the suture. *Inner lip* a narrow glazed strip along the columella and parietal wall with a weak callus and the anal sinus. *Columella* straight, about 10° off the shell axis. *Anterior canal* short, channel broad, only slightly narrower than aperture; unnotched. *Anterior fasciole* slightly swollen by the convergence of evanescent ribs. Surface sculpture is the same as elsewhere. *Color* white with a wide yellowish-brown band just below periphery of last whorl, and on inner lip.

Remarks

Description of this species is merited currently because of two unique features not found in other members of the *Ithycythara* genus group: 8 axial per whorl and relatively large nodules on whorl peripheries.

Fig. 69 (next page). Species of *Ithycythara* Woodring, 1928. Part 3. A–Q (above line) are 7×, R–LL (below line) are 9×. – **A–J**. *Ithycythara fulvofasciata* Fallon & Bouchet sp. nov. **A–D**. Holotype, 5.8 × 2.5 mm, ventral, lateral, dorsal and apical views (MNHN-IM-2000-39639), off Fond Boucher, Martinique. **E–H**. Paratypes, 4.6 × 2.0, ventral and SEM image of protoconch, 5.3 × 2.1 and 5.3 × 2.1 mm (MNHN-IM-2000-39643), W of Marie-Galante, Guadeloupe. **I**. Paratype, 5.6 × 2.1 mm, ethanol-preserved (MNHN-IM-2013-71215), off Macouba, Martinique. **J**. Paratype, 5.9 × 2.4 mm (MNHN-IM-2000-39640), off Bellefontaine, Martinique. – **K–Q**. *Ithycythara flammea* Fallon & Bouchet sp. nov. **K–L**. Holotype, sequence voucher, 10.0 × 3.6 mm, ventral and dorsal views (MNHN-IM-2013-20289), North Point, Bouillante Bay, Guadeloupe. **M**. Paratype, sequence voucher, 7.4 × 3.0 mm, sequenced (MNHN-IM-2013-74626), Le Carbet, Martinique. **N**. Paratype, 6.8 × 2.9 mm (MNHN-IM-2000-39637), off Macouba, Martinique. **O–Q**. Paratype, 6.4 × 2.7 mm, ventral and apical views, and SEM of protoconch (USNM 1715386), off Macouba, Martinique. – **R–V**. *Ithycythara hastata* Fallon & Bouchet sp. nov. **R–U**. Holotype, 5.4 × 1.9 mm, ventral, dorsal and apical views and SEM of protoconch at 250 × (MNHN-IM-2000-39646), Caravelle Peninsula, Grand-Jean Bay, Martinique. **V**. Spec., 5.5 × 1.6 mm (L. Charles coll.), Anse d'Arlet, Martinique. **W**. *Ithycythara antillensis* Paulmier, 2019, holotype, 7.9 × 2.7 mm (MNHN-IM-2000-34346), Fort-de-France Bay, Martinique. – **X**. *Ithycythara eburnea* Paulmier, 2019, holotype, length = 7.7 mm (MNHN-IM-2000-34348), Le Robert, Martinique. – **Y–BB**. *Ithycythara hewittae* Fallon sp. nov., holotype, 5.3 × 2.2 mm, ventral, dorsal and apical views, and SEM of protoconch (ANSP 498984), Ballast Bay, Saint Kitts. The first whorl of the protoconch has broken off but the riblets on the last are still visible. – **CC–GG**. *Ithycythara condita* Fallon & Bouchet sp. nov. **CC–DD**. Holotype, 5.8 × 2.3 mm, sequence voucher, ventral and dorsal views (MNHN-IM-2013-20626), Caret Island, Guadeloupe. **EE**. Paratype, 5.5 × 2.2 mm, live caught, in ethanol (MNHN-IM-2019-34727), Grand Cul-de-Sac Marin, Guadeloupe. **FF–GG**. Paratype, 6.0 × 2.4 mm, ventral and apical views (MNHN-IM-2012-7386), Caret Island, Grand Cul-de-Sac Marin, Guadeloupe. – **HH–LL**. *Ithycythara curiosa* Fallon sp. nov. **HH–KK**. Holotype, 4.8 × 2.1 mm, ventral, dorsal and apical views, and SEM of protoconch at 250 × (UF 589785), Long Cay, Exuma Islands, Bahamas. **LL**. Paratype, 5.1 × 2.3 mm (UF 589786), from the type locality. Credits: F, Q, U, BB, KK: SEM images courtesy of Paul Callomon; V: courtesy of D. Lamy; W, X: from the MNHN Collection: Molluscs (IM). Scale bars: A–E, G–P, R–T, V–AA, CC–JJ, LL = 2 mm; F, Q, U, BB, KK = 300 µm.

A
B
C
D
F
E
G
H
I
J
2 mm
K
L
M
N
O
Q
P
2 mm
T
U
BB
AA
R
S
V
W
X
Y
Z
GG
JJ
KK
CC
DD
EE
FF
HH
II
LL

Ithycythara curiosa Fallon sp. nov. is, in general, an oddity, diverging from the diagnostic characteristics of the genus in several traits: shell whorls are shouldered, not angled near mid-whorl, the number of ribs is 8, not 5–7, the protoconch has only 1½ whorls, not at least 2¼, which characterizes its congeners, and a peripheral spiral cord is lacking. Nonetheless, the traits that are present suggest that it is best combined in *Ithycythara*: apertural lyrae and anal tooth present, spiral grooves overall, and the presence of a wide yellowish brown spiral band on the last whorl.

Range and habitat

Only known from the type locality.

***Ithycythara* spp. Part 4**

Ithycythara parkeri Abbott, 1958
Fig. 70A–I

Ithycythara parkeri Abbott, 1958: 96, text fig. 5.

Ithycythara parkeri – Warmke & Abbott 1961: 138; pl. 26 fig. s. — Powell 1966: 108. — Abbott 1974: 282; not figured. — Porter 1974: 254. — Vokes & Vokes 1983: 59; pl. 29, fig. 11. — García & Luque 1986: 48. — de Jong & Coomans 1988: 116. — Turgeon *et al*. 1988: 98; 1998: 107. — Díaz *et al*. 1990: 196. — Diaz & Puyana 1994: 231. — Rosenberg 2009: www.gbif.org. — Tucker 2004: 733. — Williams 2005: #5607 (photo of holotype).

non *Ithycythara parkeri* – C.-K. Chang 2001: 43, figs 5–15. — Redfern 2001: 132, pl. 59 fig. 544a–c; 2013: 213, fig. 590. — Krisberg 2009: https://olram9.wixsite.com/letstalkseashells.

Differential diagnosis

Ithycythare angusta Fallon sp. nov. is 6-sided and larger, with a broad last whorl (not narrow), and microscopic spiral grooves that produce a banded pattern of light and dark shell not seen in *I. parkeri.*

Ithycythara auberiana (d'Orbigny, 1853) has a shorter aperture and anterior canal, a broader last whorl, and broader ribs.

Type material

Holotype

CAYMAN ISLANDS • 5.7 × 1.7 mm; Grand Cayman Island, lagoon off Browse Bluff; depth 3 ft [0.9 m]; A.J. Ostheimer and J.D. Parker leg.; Nov. 1953; in sand; ANSP 198919.

Paratype (1 spec.)

CAYMAN ISLANDS • 1 spec., 4.8 × 1.8 mm; Grand Cayman Island, W end of Bluff Bay; depth 6 ft [1.8 m]; 1954; A.J. Ostheimer leg.; stn D66; ANSP 209867.

Other material examined (8 specs)

GUADELOUPE • 1 spec., 5.25 × 1.7 mm; Pointe de Malendure; 16°05.95′ N, 61°47.5′ W; depth 8 m; 11 May 2012; KARUBENTHOS 2012; stn GS14; MNHN-IM-2012-8724 • 1 spec., 5.5 × 1.9 mm; Grand Cul-de-Sac Marin; 16°21.97′ N, 61°37.98′ W; depth 11 m; 4 May 2012; KARUBENTHOS 2012; stn GS04; MNHN-IM-2012-8722.

MARTINIQUE • 2 specs, 4.4 × 1.7 and 5.6 × 2.0 mm; Anse d'Arlet; ex. R. Delannoye coll.; MNHN-IM-2000-39655 • 1 spec., 4.7 × 1.7 mm; Anse d'Arlet; depth 5–7 m; ex. R. Delannoye coll.; MNHN-IM-2000-39654 • 1 spec., 5.5 × 2.0 mm; La Caravelle Peninsula, N of Loup Ministre; 14°48.2′ N, 60°55.8′ W; depth 14 m; 4 Oct. 2016; MADIBENTHOS; stn AB559; MNHN-IM-2000-39657 • 2 specs,

5.5 × 1.8 and 4.4 × 1.6 mm; NE of Cayes Pariadis, E of Le Vauclin; 14°34.7′ N, 60°45.9′ W; depth 20 m; 16 Sep. 2016; MADIBENTHOS; stn AS078; MNHN-IM-2000-39658.

ST. VINCENT AND THE GRENADINES • 1 spec., 5.2 × 1.8 mm; St. Vincent Island; ex J. Colomb coll.; MNHN-IM-2000-39656.

Description

A redescription is presented here to facilitate comparison with its congeners. Non-type specimens identified as the same species have been examined to provide additional detail (illustrated in Fig. 70). *Shell* small (to 5.7 mm in length), lanceolate (W/L = 0.2982), teleoconch whorls 5-sided, with round, sloping slightly concave shoulders about ⅓ the distance from suture, a narrow last whorl, about 60% of shell length with a narrow aperture, and short anterior canal, which together are about 44% of shell length. *Protoconch* of 2 round whorls, the last ½-whorl with riblets. *Axial sculpture* of 5 narrow ribs from and aligned suture to suture, angled at about one-third the distance from the suture and defining the edge of the shoulder, intercostal space wide, nearly flat. *Varix* is an enlarged last rib near the edge of the outer lip that runs from suture to end of anterior canal. *Spiral sculpture* of closely spaced fine spiral grooves over shell surface, their interspaces ridged by growth striae. Although rib shoulders are nodulous, there is no evidence they are produced by an overriding spiral cord. *Sulcus* absent. *Outer lip* is a thin, narrow strip of shell in front of the last rib, the edge of which extends from, and is contiguous with, the anal sinus to the end of the anterior canal; without a stromboid notch. *Anal sinus* a wide shallow notch in front of the varix, sides divergent. *Inner lip* a narrow glaze along the columella, thickened and margined in older specimens, without a parietal wall swelling. *Anterior fasciole* is not swollen, sculpted as the rest of the shell base. *Anterior canal* is short, narrow, and not differentiated from the aperture, turns to the right at its tip in very mature specimens, when viewed ventrally; unnotched. *Color* of holotype yellowish white with an intercostal brown mid-whorl band and inner lip. Other specimens are semi-translucent off-white with random fine reddish-brown specks and streaks throughout.

Remarks

Ithycythara parkeri from Guadeloupe and Martinique appear to vary from the type specimen in some respects. They lack the brown dorsal band and inner lip. All have 5-sided whorls, so this characteristic appears to hold up as a diagnostic one. The fine, intermittent, brown-spotted spiral lines on Guadeloupe and Martinique specimens are not present on the types, possibly because of either their worn condition or variable nature of the trait.

Range and habitat

Cayman Islands (Grand Cayman Island), Guadeloupe, Martinique, St. Vincent and the Grenadines; depth 2–20 m.

Ithycythara variabilis Fallon & Bouchet sp. nov.
urn:lsid:zoobank.org:act:F05E82B0-3621-4C96-B6AF-54BE5676FC9B
Figs 62E, 70J–S

Differential diagnosis

Ithycythara whitneyae Fallon sp. nov. has a shorter, more compact, and less angular spire whorls than *Ithycythara variabilis*. *Ithycythara whitneyae* has a protoconch with 2¼ versus 2¾–3 whorls of *I. variabilis*.

Etymology

Ithycythara variabilis Fallon & Bouchet. sp. nov. from the Latin '*variabilis*', feminine form, meaning 'variable', for the variable shell colors observed in samples.

Type material

Holotype

MARTINIQUE • 4.8 × 1.9 mm; Anse Noire, Sortie Rivière; 14°31.7′ N, 61°05′ W; depth 5–10 m; 7 Sep. 2016; MADIBENTHOS; stn AD208; MNHN-IM-2000-39659.

Paratypes (38 specs)

GUADELOUPE • 2 specs, 3.8 × 1.5 and 4.7 × 1.8 mm; Grand Cul-de-Sac Marin, off Fajou Island; 16°22.57′ N, 61°34.12′ W; depth 80 m; 4 May 2012; KARUBENTHOS 2012; stn GD01; MNHN-IM-2012-7388.

MARTINIQUE • 1 spec., 3.8 × 1.8 mm; Anse Noire, Sortie Rivière; 14°31.7′ N, 61°05′ W; depth 5–10 m; 7 Sep. 2016; MADIBENTHOS; stn AD208; MNHN-IM-2000-39664 • 2 specs, 4.4 × 1.6 and 4.3 × 1.8 mm; SW of Vétiver; 14°37.5′ N, 61°08.3′ W; depth 74 m; 2 Oct. 2016; MADIBENTHOS; stn AD290; MNHN-IM-2000-39666 • 3 specs, 4.1 × 1.6, 3.9 × 1.5 and 3.3 × 1.5 mm; off Macouba; 14°55′ N, 61°08.9′ W; depth 80 m; 27 Sep. 2016; MADIBENTHOS; stn AD275; MNHN-IM-2000-39667 • 1 spec., length = 5.4 mm; Schoelcher, Face à la Rivière Case Navire; 14°36.9′ N, 61°06.7′ W; depth 80 m; 30 Sep. 2016; MADIBENTHOS; stn AD279; MNHN-IM-2000-39660 • 3 specs, lengths = 4.9, 4.7 and 4.0 mm; off Macouba; 14°55′ N, 61°08.9′ W; depth 80 m; 27 Sep. 2016; MADIBENTHOS; stn AD275; MNHN-IM-2000-39665 • 1 spec., length = 4.5 mm; N of Loup Ministre; 14°49.4′ N, 60°56′ W; depth 60 m; 20 Sep. 2016; MADIBENTHOS; stn AD251; USNM 1715387 • 1 spec., 4.2 × 1.7 mm; Caravelle Peninsula, NW of Rocher de la Caravelle; 14°49.4′ N, 60°53.7′ W; depth 60 m; 18 Sep. 2016; MADIBENTHOS; stn AD242; MNHN-IM-2000-39662 • 2 specs, 4.5 × 1.7 and 3.9 × 1.6 mm; Le Prêcheur, Anse Belleville; 14°49.1′ N, 61°13′ W; depth 20–25 m; 8 Oct. 2016; MADIBENTHOS; stn AS576; USNM 1715398 • 1 spec., 5.1 × 1.9 mm; off Macouba; 14°55.1′ N, 61°08.9′ W; depth 80 m; 25 Sep. 2016; MADIBENTHOS; stn AD265; MNHN-IM-2000-39663 • 1 spec., length = 4.4 mm; off Macouba; 14°54.9′ N, 61°08.9′ W; depth 77 m; 25 Sep. 2016; MADIBENTHOS; stn AD267; MNHN-IM-2000-39661 • 4 specs, 5.3 × 2.1, 4.7 × 1.9, 3.9 × 1.6 and 3.0 × 1.4 mm; Fond Boucher; 14°55′ N, 61°08.9′ W; depth 78–80 m; 24 Sep. 2016; MADIBENTHOS; stn AD263; MNHN-IM-2000-39668.

MEXICO • 5 specs, 4.0 × 1.8, 3.3 × 1.5, 4.0 × 1.7, 3.8 × 1.6 and 3.5 × 1.5 mm; off Campeche; 20°52.40′ N, 92°24.83′ W; depth 77–81 m; 10 Jun. 2005; E.F. García leg.; dredged from aboard R/V *Pelican* in mud, EFG 26629; ANSP 498812.

UNITED STATES OF AMERICA • 9 specs, lengths = 2.9, 3.6, 3.8, 3.2, 3.4, 3.4, 3.9, 3.2 and 3.1 mm; W Florida, W of Naples; depth 30 fms [55 m]; J. Moore leg.; dredged; ANSP 482238 • 2 specs, 4.6 × 2.0 and 4.0 × 1.7 mm; Florida Keys, Key Vaca, off Marathon; depth 200 ft [61 m]; 1978; Ted Kalafut leg.; dredged in mud; UF 589787.

Other material examined (86 specs)

An additional 86 specimens are not in the type series. Among them are specimens from Grenada (1), Martinique (23), Guadeloupe (31), E Florida (4), W Florida (3), Florida Keys (2), and Louisiana (9).

A single non-type specimen is shown in Fig. 70R:
UNITED STATES OF AMERICA • 1 spec., length = 4.3 mm; E Florida, St. Johns Co., St. Augustine; depth not stated; Mar. 1989; B. Holiman leg.; from scallop dump; UF 589788.

Description

Shell small (holotype length = 4.8 mm, other lengths to 5.4 mm), stoutly fusiform (W/L = 0.3958), translucent, whorls angled mid-whorl or slightly below, about 7 whorls total, the last about 63% of shell length. Whorls flat above periphery, angled into suture below, sutures slightly appressed, undulant; aperture narrowly oval, varicose, with a short, anterior canal, anal sinus about shoulder width; sculpture of ribs, a single peripheral primary, and microscopic grooves overall. *Protoconch* of 2¾–3 whorls, tip

minute, last whorl bulging, last ¾-whorl with arched riblets that run short of the full whorl height, becoming stronger and further apart toward the end. Riblets extend above the preceding whorl's suture. *Axial sculpture* of narrow ribs that run from suture-to-suture, aligned whorl-to-whorl, and run to the anterior fasciole on the last whorl; ribs 7 ribs per whorl. *Varix* apertural, rib-like but larger and extends to the end of the anterior canal. *Spiral sculpture* of grooves that override ribs, interspaces wider than grooves and are scratched by microscopic incremental growth lines. *Outer lip* varicose with a narrow strip of shell that projects out from the base of the leading edge of the varix and extends from the suture to the anterior canal. A small tooth followed by a row of lyrae present on the underside of the varix; stromboid notch absent. *Anal sinus* a round notch with divergent sides, located in front of the varix and about shoulder width. *Inner lip* a narrow unemarginate glazed surface that extends over the columella and parietal wall, up to the suture, an anal tooth present. *Columella* straight. *Anterior canal* is short, open, end slightly notched. *Anterior fasciole* not swollen; sculpted as shell base with spiral grooves running obliquely. *Color* of straw with a broad brown band that has a distinct anterior boundary and a diffuse posterior one. Other specimens may have different brown patterns, some are off white with brown flecks and only a trace of a brown band (usually just the darker anterior margin).

Remarks

The average length of 57 specimens is 4.4 mm (range = 2.7–5.7 mm). Color variants include white, yellow, pink, orange, reddish orange, and straw. Some have distinct brown or reddish brown bands, others with faint bands or none.

Range and habitat

Widespread and common, specimens were examined from: United States (Louisiana, E and W Florida, Florida Keys), Bahamas, Guadeloupe, Martinique, and Grenada; depth 5–160 m.

Ithycythara auberiana (d'Orbigny, 1853)
Fig. 70T–U

Pleurotoma auberiana d'Orbigny, 1853 in R. de la Sagra 1841–1853, vol.: 174, pl. 24 figs 4–6. **Note**: it appears that the Latin descriptions and French commentaries of *Pleurotoma auberiana* and *P. lavalleana* were switched because of a publishing error. The species name header and plate and figure numbers remain. So, the reference of page 174, pl. 24 figs 4–6 is correct, bearing in mind that the text for this species lies above *P. lavelleana* on the same page. That being so, the drawings do not resemble the species and as such are not detailed enough to accurately represent the species.

Pleurotoma auberiana – Gray 1854: 374. — Simpson 1886: 55. — Tucker 2004: 98.
Daphnella auberiana – Paetel 1888: 86.
Mangelia auberiana – Peile 1926: 84.
Ithycythara auberiana – Kaicher 1984: card 3890. — Reed & Mikkelsen 1987: 126. — Diaz & Puyana 1994: 231, pl. 68 fig. 916. — Turgeon *et al*. 1998: 106, 262. — Rosenberg 2009: www.gbif.org, ANSP Malacology coll. — Williams 2005: #5612. — Massemin *et al*. 2009: 208–209, unnumbered fig. — Daccarett & Bossio 2011: 135, 301, fig. 852. — Lamy & Pointier 2017: 481, pl. 167 fig. 1a–b.
Vitricythara auberiana – García & Lee 2003: 26, fig. 328 p. 29.

Differential diagnosis

Several other species have a brown band on the shell dorsum, and possess fine spiral grooves, so these traits are not unique to *I. auberiana*. The following are similar in appearance and size.

Ithycythara parkeri Abbott, 1958 has a narrower shell with 5 sides, and a more tapered anterior canal.

Ithycythara condita Fallon & Bouchet sp. nov. is broader, has a stronger varix.

Ithycythara variabilis Fallon & Bouchet sp. nov. has a proportionately wider last whorl and more angular spire whorls.

Ithycythara angusta Fallon sp. nov. has more angular whorls, a larger last whorl and larger aperture.

Ithycythara galindoae Fallon & Bouchet sp. nov. has more angular whorls with concave shoulders, a larger last whorl, a longer anterior canal, and larger aperture.

Ithycythara pentagonalis (Reeve, 1845) has 5 axials, not 6.

Type material

5 syntypes are in NHMUK 1854.10.4.425: lengths = 6.5, 3.8, 3.8, 2.8 and 2.1 mm.

Lectotype (here designated)

The length (= 6.5 mm) of this specimen in the original type series is close to the stated size of 7 mm by d'Orbigny. The 6.5 × 2.3 mm specimen is herein designated the lectotype. The precise origin of the lectotype is unknown but may be from one of d'Orbigny's stated localities of Guadeloupe, Jamaica, Cuba, or Martinique.

UNKNOWN • 6.5 × 2.3 mm; NHMUK.

Other material

The other 4 specimens in the type series are smaller and do not appear to be *I. auberiana*, as interpreted in the photograph provided by NHMUK. These also may be from Guadeloupe, Jamaica, Cuba, or Martinique.

UNKNOWN • 4 specs, lengths = 3.8, 3.8, 2.8 and 2.1 mm; NHMUK.

Description

The description by d'Orbigny (1853) is too vague to separate his species from similar ones described herein: "Pleurotoma testa elongata, subfusiformi, crassa, albida, ultimo anfractu transversim fusco maculata; anfractibus convexisculis, subangulatis, longitudinaliter tenuissime striatis, omnibus transversim sex vel septem costaits; costis elevatis, obtusis, corifluentibus apertura angustata; sinu postice distincto; canali brevissimo. Long. 7 mill." Translation: *Pleurotoma* elongated shell, sub-fusiform, thick, whitish, a transverse dark band on the last whorl; whorls convex, sub-angular, very thin spiral grooves cross all six or seven ribs; ribs elevated, obtuse, gather at the narrow aperture; sinus distinct; canal very short.

The image of the *auberiana* lectotype provided by the NHMUK shows a six-sided shell with fine spiral grooves. Kaicher (1984: card 3890) indicates the presence of spiral grooves on the lectotype (herein designated, see above), which are visible in the photograph of the syntype in the figure (Fig. 70T–U).

Remarks

The types were not examined for this project but instead a photograph of the *I. auberiana* type series provided by the NHMUK was used for purposes of these remarks, as was a photograph of a syntype of *pentagonalis* from the notes of V.O. Maes for comparative purposes.

Tomlin (1934) synonymized *Pleurotoma auberiana* d'Orbigny, 1853 with *Pleurotoma pentagonalis* Reeve, 1845, which if true, then *P. pentagonalis* would have precedence (ICZN Article 23.1). However,

the type of *P. pentagonalis* has been lost and the photograph of the syntype of the species by V.O. Maes (Fig. 70V–W) is not adequate to confirm their synonymy.

There were no specimens conclusively identified as *I. auberiana* (or *I. pentagonalis*) encountered during this project and without additional specimens for examination their synonymy remains unresolved. From the available photographs of the types, the protoconchs are not clear enough for comparative purposes.

Ithycythara pentagonalis (Reeve, 1845)
Fig. 70V–W

Pleurotoma pentagonalis Reeve, 1845: pl. 28 fig. 255.

Pleurotoma pentagonalis – Krebs 1864: 11. — Tryon 1884: 246, pl. 21 fig. 3. — Paetel 1888: 68. — Tomlin 1934: 39; placed in synonymy with *P. auberiana* (d'Orbigny, 1853), this synonymy is not recognized here (see additional explanation below). — Abbott 1974: 282. — Tucker 2004: 744.
Mangelia pentagonalis – Krebs 1864.
Mangilia pentagonalis – Tryon 1884: 246, pl. 21 fig. 3.
Daphnella pentagonalis – Paetel 1888: 94.
Ithycythara pentagonalis – Turgeon *et al*. 1988: 98; 1998: 107. — de Jong & Coomans 1988: 116. — Odé 1992a (as cf. *pentagonalis*): 55.

non *Ithycythara pentagonalis* – Rios 1975: 138, pl. 42 fig. 634; 1985: 146, pl. 49 fig. 684; 1994: 174, pl. 57 fig. 799; 2009: 341, fig. 878. — Absalão *et al*. 2005: 32, fig. 81 (possibly *Ithycythara aurantiaca* Fallon & Bouchet sp. nov.).

Differential diagnosis

Ithycythara angusta Fallon sp. nov. has 6-ribbed whorls (versus 5) and more sharply angled whorls.

Ithycythara parkeri Abbott, 1958 has 5-ribbed whorls like *I. pentagonalis* but has less angular whorls, and a narrower shell (W/L = 0.2982 versus 0.3729), and a narrower aperture and anterior canal.

Ithycythara variabilis Fallon & Bouchet sp. nov. has 7 ribs per whorl.

Ithycythara angusta Fallon sp. nov. has a more acutely tapered spire, lower whorl shoulders, and a broader varix.

Ithycythara bahamense Fallon sp. nov. has 6, not 5, ribs per whorl, weaker ribs, and is smaller, the largest length = 5.4 mm versus 5.9 mm for the syntype of *I. pentagonalis*.

Ithycythara auberiana (d'Orbigny, 1853) has 6, not 5, axial ribs, according to d'Orbigny (1847: 174). Reeve's description of 5 axials can be confirmed from the images in Figs 70V–W.

Ithycythara galindoae Fallon & Bouchet sp. nov. has 6-ribbed whorls (versus 5). Based on a comparison of the photograph of the type and only specimen of *Pleurotoma pentagonalis*, *I. galindoae* is also more robust and has a stronger varix.

Type material

Syntype (1 spec.)
ST. VINCENT AND THE GRENADINES • 1 spec., 5.9 × 2.2 mm; St. Vincent Island; NHMUK 1875.4.26.26.

A single specimen of *Pleurotoma pentagonalis* Reeve, 1845, was purchased by the NHMUK from Dr John E. Gray in 1874 (their catalog entry). This specimen was lost in 2005 (email from A. Salvador to P.F. dated 23 October 2018). Photographs (ventral and lateral) of the syntype before its loss are from V.O. Maes' *Notes* (at the ANSP) and copied as Fig. 70V–W.

Description

Reeve's (1845) description: "Species 255. (Mus. Gray.) (Magnified to three times its natural length.) *Pleurotoma pentagonalis*. *Pleur. testa oblongo-orata, lavigata, longitudinaliter pentagonali, ad angulos compresso-costata, costis ad anfractuum parte superiori mucronatis; eburnea*. The pentagonal *Pleurotoma*. Shell oblong-ovate, smooth, longitudinally five-angled, compressly ribbed at the angles, pointed at the upper part of the ribs, ivory white. Gray, MSS (private cabinet.) Habitat: St. Vincent, West Indies; Guilding. A minute species with five ribs on each whorl following one under the other."

Remarks

Tomlin (1934: 39) placed *P. pentagonalis* in synonymy with *P. auberiana*. However, d'Orbigny states: "This species [*P. auberiana*] is related to *P. pentagonalis* from the cabinet of Gray, but it is distinguished from it by six dimensions instead of five, and by its striated surface across." The image of *I. pentagonalis* in NHMUK 1875.4.26.26, photographed by Maes, shows a five-sided shell with fine spiral grooves (most readily observed on the varix), which contradicts d'Orbigny's statement. The difference between the two species is more than the number of ribs. A comparison of the photographs also reveals differences in whorl profiles and possibly in their protoconchs, which are not clearly visible. Thus, *P. pentagonalis* is treated here as a valid species, but no specimens examined for this work fully agree with Reeve's description. No new type (neotype) is named because of the lack of a candidate specimen.

Ithycythara angusta Fallon sp. nov.
urn:lsid:zoobank.org:act:EA40C10A-649D-4F8F-91DF-A8E0A195CC58
Figs 63G, 70X–BB

Differential diagnosis

Ithycythara parkeri Abbott, 1958 is five versus six-sided, and is smaller, with a narrow last whorl (not broad) that lacks regular alternating light and dark bands.

Ithycythara galindoae Fallon & Bouchet sp. nov. has a broader shell with more concave shoulders

Ithycythara auberiana (d'Orbigny, 1853) has less angular whorls, a smaller last whorl and aperture.

Ithycythara pentagonalis (Reeve, 1845) has 5-ribbed whorls (versus 6). Based on a comparison of the photograph of the type and only specimen of *Pleurotoma pentagonalis*, *I. angusta* has a more acutely tapered spire, slightly lower whorl shoulders, and a broader varix.

Etymology

Ithycythara angusta Fallon sp. nov. derives its name from the feminine form of the Latin adjective '*angustus*', meaning 'narrow', reflecting its slim shape, especially when compared to a close congener, *I. galindoae* Fallon & Bouchet sp. nov.

Type material

Holotype

GRENADA • 6.9 × 2.5 mm; St. George's; depth 7 m; 24 Jun. 2003; G. Mackintosh leg.; night SCUBA; ANSP 498905

Paratypes (2 specs)
GRENADA • 1 spec., 6.2 × 2.3 mm; outside of St. George's; depth 22 ft [7 m]; 24 Jun. 2003; G. Mackintosh leg.; night SCUBA; ANSP 498906.

NETHERLANDS ANTILLES • 1 spec., 5.0 × 2.0 mm; Aruba, Malmok; depth 4–5 m; Feb. 2017; C. Alfonso leg.; night SCUBA from on sand and algae, on rock platform; USNM 1715442.

Description

Shell small (length = 6.9 mm), fusiform (W/L = 0.3623), of 7½ whorls, teleoconch whorls appressed, with sloping flat to slightly concave shoulders and flat sides angled slightly into succeeding suture, last whorl large, about 61% of shell length; aperture varicose, narrowly oval with a with a short, undifferentiated anterior canal and wide anal sinus on the shoulder, both approximately 41% of shell length. *Protoconch* of 2¼ smooth round whorls, tip recumbent, then expands regularly, last full whorl with arched riblets that do not reach the following suture. Riblets rise above the preceding suture. *Axial sculpture* of strong, narrow ribs that run from suture-to-suture, aligned whorl-to-whorl, and run to the anterior fasciole on the last whorl, flattening over anterior fasciole; 6 ribs per whorl. Whorl peripheries marked with slightly swollen nodules not associated with a spiral cord. *Varix* rib-like, larger than the preceding rib. *Spiral sculpture* of microscopic grooves that cover the shell surface, alternating in light and dark bands; grooves override ribs. No spiral cord appears to be associated with the shoulder nodes. Dentition absent; 6.2 mm paratype with mature outer lip, a weak anal tooth and lyrae present. *Sulcus* absent. *Outer lip* a narrow strip of shell along the base of the last rib, its edge forming a low arch from and contiguous with the outer edge of the anal sinus to the end of the anterior canal. *Anal sinus* a shallow notch, sides divergent, offset from the suture, about the width of the shoulder and in front of the last rib. *Inner lip* a narrow glazed strip along the columella and parietal wall that joins the outer lip at the suture, unemarginate. Holotype in growth phase, inner lip without dentition. 6.2 mm paratype with mature inner lip with a weak anal tooth and margined by thickened glazed callus. *Anterior canal* short, open, undifferentiated from the aperture, end with a shallow notch. *Anterior fasciole* slightly swollen by the accumulation of growth lines and flattened rib terminations; spiral grooves parallel to anterior canal. *Color* white to off-while base with a wide brown band present on the dorsal surface.

Range and habitat

Grenada, Netherlands Antilles (Aruba); depth 4–7 m.

Ithycythara galindoae Fallon & Bouchet sp. nov.
urn:lsid:zoobank.org:act:44978B88-5E19-465D-A9B2-D48D344B84AF
Figs 63H, 70CC–II

Differential diagnosis

Ithycythara condita Fallon & Bouchet sp. nov. has steeply sloping, flat shoulders, and is more narrowly pinched at the anterior canal, that is, the anterior fasciole is not knuckled (and broad).

Ithycythara parkeri Abbott, 1958 has 5 ribs per whorl, not six, and a narrower shell.

Ithycythara biconica Fallon & Bouchet sp. nov., see difference notes in identification section of that species.

Ithycythara gypsata Fallon sp. nov., see difference notes in identification section of that species.

Ithycythara arawak Fallon & Bouchet sp. nov. is larger (average length = 8.3 versus 6.6 mm) and has a differently shaped protoconch.

Etymology

Ithycythara galindoae Fallon & Bouchet sp. nov., named in honor of Lee-Ann Galindo, for her contribution to the preparation of the vouchers for DNA sequencing during the KARUBENTHOS 2012 expedition.

Type material

Holotype

GUADELOUPE • 6.1 × 2.3 mm; Bay of Bouillante; 16°08″07′ N, 61°46″71′ W; depth 6 m; 10 May 2012; KARUBENTHOS 2012; stn GS12; sequenced; MNHN-IM-2013-20674.

Paratypes (16 specs)

BRITISH VIRGIN ISLANDS • 1 spec., 6.2 × 2.3 mm; Guana Island, White Bay; 18°28.40′ N, 64°34.50′ W; depth 3–4 m; Feb. 1976; V.O. Maes; from around coral heads; ANSP 355027.

CUBA • 1 spec., 7.3 × 3.0 mm; S of Cayos Aquardiente; depth 8 m; 29 Aug. 1995; G. Mackintosh leg.; night SCUBA; ANSP 498915.

GRENADA • 1 spec., 7.0 × 2.6 mm; Carriacou Island, Hillsborough Bay; depth 8 m; 14 May 2005; G. Mackintosh leg.; night SCUBA; USNM 1715448 • 1 spec., length = 7.4 mm; Canouan Island, Corbec Bay; depth 8 m; 8 Jun. 2004; G. Mackintosh leg.; night SCUBA on rock and sand; USNM 1715447.

GUADELOUPE • 1 spec., 5.7 × 2.0 mm; Basse-Terre, Sec Ferry; 16º17.5′ N, 61º49.0′ W; depth 27 m; 12 May 2012; KARUBENTHOS 2012; stn GS15; MNHN-IM-2012-7375 • 2 specs, 6.0 × 2.1 and 4.9 × 1.9 mm; 16°08.1′ N, 61°17.0′ W; depth 20 m, 27 May 2012; KARUBENTHOS 2012; stn GD65; MNHN-IM-2012-7379 • 1 spec., 6.4 mm; D. Lamy coll. #924.

MARTINIQUE • 1 spec., length = 6.3 mm; Grande Anse du Diamant; 14°28.5′ N, 61°01.1′ W; depth 7 m; 9 Sep. 2016; MADIBENTHOS; stn AD216; MNHN-IM-2000-39645 • 1 spec., 7.5 × 2.9 mm; Grande Anse d'Arlets, SE of Cap Salomon; 14°30.2′ N, 61°05.5′ W; depth 8 m; 6 Sep. 2016; MADIBENTHOS; stn AD200; MNHN-IM-2000-39644.

ST. VINCENT AND THE GRENADINES • 4 specs, 7.1 × 2.7, 6.0 × 2.3, 6.7 × 2.8 and 6.5 × 2.7 mm; Ronde Island; depth 7 m; 3 May 2005; G. Mackintosh leg.; night SCUBA; UF 589789 • 1 spec., 8.2 × 3.0 mm; S end of Baliceaux Island; depth 12 m; 25 Apr. 1997; G. Mackintosh leg.; night SCUBA; ANSP 498918 • 1 spec., 7.4 × 2.8 mm; Canouan Island, Corbec Bay; depth 8 m; 8 Jun. 2004; G. Mackintosh leg.; night SCUBA; USNM 1715447.

Other material examined (76 specs)

An additional 76 specimens from St. Vincent and the Grenadines and Grenada have been examined.

Description

Shell small (holotype length = 6.1 mm), stoutly fusiform (W/L = 0.3770), with shouldered whorls, about 7½ total, the last about 66% of shell length. Whorl shoulders concave, slightly convex on whorl sides, sutures appressed, periphery (edge of shoulder) about ⅓-whorl height; aperture narrow, heavily varicose, with a short, undifferentiated anterior canal and wide anal sinus on the shoulder. *Protoconch* of about 2½ whorls, smooth, the last ½-whorl has fine riblets. *Axial sculpture* of strong ribs that run from suture-to-suture, aligned whorl-to-whorl, and run to the anterior fasciole on the last whorl; 6 ribs per whorl. Whorl peripheries are marked with slightly upturned, swollen nodules. *Varix* apertural, stronger and larger than preceding ribs, and extends from just above the suture to the end of the anterior canal in a smooth arc. *Spiral sculpture* of microscopic grooves overall, alternating in light and dark bands; grooves override ribs and in turn are irregularly segmented by growth striae. Peripheral nodules on rib crests, cord lacking.

Outer lip varicose, with a thin, narrow strip of shell, which runs along the base of the leading edge of the varix and forms a low arch from and contiguous with the outer edge of the anal sinus to the end of the anterior canal. Underneath the varix on the inside of the outer lip is a small tooth followed by a row of faint lyrae, down to the anterior canal; stromboid notch absent. *Anal sinus* a moderately deep notch with a round apex and divergent sides, located in front of the varix, set off the suture by a callus, and bordered by a small tooth on the parietal wall and outer lip, on the underside of the outer lip. *Inner lip* is a thin narrow glaze along the columella and parietal wall with a small tooth at the anal sinus. *Columella* straight. *Anterior canal* short, open, undifferentiated from the aperture, end unnotched. *Anterior fasciole* slightly swollen 'knuckled' by accumulation of growth lines and residual rib ends; its surface sculpted the same as shell base. *Color* of straw (live-taken holotype, possibly a thin periostracum), aperture ivory white, dorsal surface of last whorl with a broad brown band.

Remarks

Nine measured specimens have an average length = 6.6 mm (range = 4.9–8.2 mm). Other specimens (dead-collected) are white with alternating narrow spiral bands of clear and opaque white, and some have sparsely scattered brown flecks with or without a faint brown band on the dorsal side. Some specimens lack the brown dorsal band.

Range and habitat

Cuba, Br. Virgin Islands, Guadeloupe, Martinique, St. Vincent and the Grenadines, and Grenada; depth 3–80 m.

Fig. 70 (next page). Species of *Ithycythara* Woodring, 1928. Part 4. – **A–I**. *Ithycythara parkeri* Abbott, 1958. **A–B**. Holotype, 5.5 × 1.7 mm (ANSP 198919), off Browse Bluff, Grand Cayman Island. **C–E**. Spec., 5.5 × 1.8 mm, ventral and apical views, and SEM of protoconch (MNHN-IM-2000-39658), E of Le Vauclin, NE Cayes Pariadis, Martinique. **F–G**. Spec., 5.5 × 1.9 mm, ventral and dorsal views (MNHN-IM-2012-8722), Grand Cul-de-Sac Marin, Guadeloupe. **H**. Spec., 5.3 × 1.7 mm (MNHN-IM-2012-8724), Malendure Point, Guadeloupe. **I**. Spec., 5.5 × 2.0 mm (MNHN-IM-2000-39657), Grand Cul-de-Sac Marin, Guadeloupe. – **J–S**. *Ithycythara variabilis* Fallon & Bouchet sp. nov. **J–M**. Holotype, 4.8 × 1.9 mm, ventral and dorsal views, and SEM of protoconch (MNHN-IM-2000-39659), Anse Noire Cove, river exit, Martinique. **N–O**. 2 specs, 3.8 × 1.5 and 4.7 × 1.8 mm (MNHN-IM-2012-7388), off Fajou Island, Grand Cul-de-Sac Marin, Guadeloupe. **P**. Spec., 5.7 × 3.1 mm (D. Lamy coll.), E of Fajou Island, Grand Cul-de-Sac Marin, Guadeloupe. **Q**. Paratype, length = 4.5 mm (USNM 1715387), N of Loup Ministre, Martinique. **R**. Spec., 4.3 × 1.8 mm (UF 589788), St Augustine, St Johns Co., E Florida. **S**. Paratype, 4.0 × 1.7 mm (ANSP 498812), off Campeche, Mexico. – **T–U**. *Pleurotoma auberiana* d'Orbigny, 1853, lectotype (herein designated), 6.5 × 2.3 mm, ventral and dorsal views (NHMUK 1854.10. 4.425), Cuba or Martinique. – **V–W**. *Pleurotoma pentagonalis* Reeve, 1845, syntype, length = 5.9 mm, ventral and lateral views (NHMUK 1875.4.26.26), Saint Vincent, West Indies. – **X–BB**. *Ithycythara angusta* Fallon sp. nov. **X–AA**. Holotype, 6.9 × 2.5 mm, ventral and apical views, and SEM of protoconch (ANSP 498905), off St George's, Grenada. **BB**. Paratype, 6.2 × 2.3 mm (ANSP 498906), outside anchorage, off St George's, Grenada. – **CC–II**. *Ithycythara galindoae* Fallon & Bouchet sp. nov. **CC–DD**. Holotype, sequence voucher, 6.1 × 2.3 mm (MNHN-IM-2013-20674), Vieux-Bourg (Les Abymes), Guadeloupe. **EE–FF**. Paratype., 7.3 × 3.0 mm, ventral and apical views (ANSP 498915), S of Cayos Aquardiente, Cuba. **GG**. Paratype, 7.5 × 2.9 mm (MNHN-IM-2000-39644), Grande Arlets Cove, SE of Cape Salomon, Martinique. **HH–II**. Paratype, 8.2 × 3.0 mm, ventral and SEM of protoconch (ANSP 498918), S end of Baliceaux Island, Saint Vincent and the Grenadines. Credits: E, M, AA, II: SEM images courtesy of Paul Callomon; T–U: courtesy of Harry Taylor, Photographic Unit, copyright NHMUK; V–W: courtesy of ANSP, ex V.O. Maes notes. Scale bars: A–D, F–L, N–Z, BB–HH = 2 mm; E, M, AA, II = 300 µm.

2 mm
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DD
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GG
HH
II

***Ithycythara* spp. Part 5**

Ithycythara whitneyae Fallon sp. nov.
urn:lsid:zoobank.org:act:95377455-67DD-46D8-94B3-45055C9E3FDE
Figs 63B, 71A–F

Differential diagnosis

Ithycythara variabilis Fallon & Bouchet sp. nov. has a proportionally shorter body whorl (63% versus 66%), has more angular shoulders, and a protoconch with 2¾ versus 2¼ whorls.

Ithycythara biconica Fallon & Bouchet sp. nov. has more angular shoulders that are concave, not steeply sloping, larger peripheral nodules, and higher ribs with concave intercostal spaces.

Etymology

Ithycythara whitneyae Fallon sp. nov., known as Whitney's *Ithycythara*, is named after the grandniece of the renowned collector of Cuban shells, C. John Finlay.

Type material

Holotype
GRENADA • 5.2 × 2.1 mm; depth 3–4 m; Dec. 1993; Pichezzi leg.; UF 589790.

Paratypes (2 specs)
ST. VINCENT AND THE GRENADINES • 1 spec., 5.0 × 2.0 mm; St. Vincent Island; MNHN-IM-2000-39669, ex J. Colomb coll. • 1 spec., 4.3 × 1.8 mm; Canouan Island, Corbec Bay; depth 8 m; 8 Jun. 2004; G. Mackintosh leg.; night SCUBA from on rock and sand; ANSP 498938.

Description

Shell small (length = 5.2 mm), stoutly fusiform (W/L = 0.4038), with obtusely angled whorls, about 7 whorls total, the last about 66% of shell length. Whorls flat above periphery, straight below, sutures impressed, peripheries about ½-whorl height; aperture a narrow oval, varicose, and with a short anterior canal, anal sinus on the shoulder; shell base gradually rounded to where it straightens along the canal. Sculpture of low, broad ribs and coarse spiral grooves overall. *Protoconch* of 2¼ whorls, the last with arched riblets that do not reach the abapical suture and extend over the adapical suture as spikes. *Axial sculpture* of low broad ribs that are aligned and run from suture-to-suture on spire whorls and evanesce on anterior fasciole on the last whorl. Ribs are widest and highest at whorl periphery where they are slightly nodulose, their interspaces flat. *Varix* apertural, stronger and broader than preceding ribs, extends in a smooth arc from suture to anterior canal, with only a hint of a shoulder. *Spiral sculpture* of a single peripheral cord that overrides ribs, obsolete in intercalary space. Surface of shell with irregularly spaced microscopic grooves (channels), their interspaces with aligned rows of punctae see SEM image). *Sulcus* absent. *Outer* lip varicose, with a thin, narrow strip of shell that runs along the base of the leading edge of the varix and extends from the suture to the anterior canal, its edge forms a low arc from and contiguous with the outer edge of the anal sinus to the end of the anterior canal. A weak anal tooth and a row of lyrae present on the underside of the varix; stromboid notch absent. *Anal sinus* is a wide notch that extends from the fold of the inner and outer lip to the edge of the shoulder, its apex near the shoulder edge, and its rim upturned. *Inner lip* a narrow glazed surface that extends over the columella and parietal wall up to the fold at the Junction of the inner and outer lips, an anal tooth present. *Columella* straight. *Anterior canal* short, open, narrower than the aperture, end slightly unnotched. *Anterior fasciole* not swollen, sculpted with oblique spiral grooves. *Color* white with a narrow brown spiral band at suture line, limited to ribs, absent between.

Remarks

Color variants include a yellowish-brown form with a caramel-colored inner lip.

Range and habitat

St. Vincent and the Grenadines and Grenada; depth 3–8 m.

Ithycythara altaspira Paulmier, 2019
Figs 62C, 71G–P

Ithycythara altaspira Paulmier, 2019: 5, figs 1–4.

Differential diagnosis

Ithycythara fusiformis Fallon sp. nov. is only slightly different: in fully grown specimens the spire is not acuminate, but rather evenly tapered; the shell length is less, on average, and the varix is stronger.

Ithycythara moratensis Fallon sp. nov.: see differences in identification section of that species.

Type material

Holotype
MARTINIQUE • length = 10.4 mm; off Le Lorraine; 14°49.23′ N, 61°00.57′ W; depth 33 m; on sandy substrate; MNHN-IM-2000-34344.

Paratype (1 spec.)
MARTINIQUE • 1 spec., length = 10.2 mm; Anse d'Arlet; 14°30.15′ N, 61°06.45′ W; depth 95 m; on sandy loam; MNHN-IM-2000-34345.

Material examined (10 specs)

The types were not examined for this work. Reliance for identification was on photographs and the original description. The discrepancy between the original description of the number of protoconch whorls, 2 versus of specimens listed below, 2½ whorls, may be due to a difference in method of counting whorls, which can be resolved by future examination of the types. Because of the discrepancy, the following are considered likely, but still tentatively identified as this species.

GRENADA • 1 spec., 9.9 × 3.4 mm; Carriacou Island, Hillsborough Bay; depth 8 m; G. Mackintosh leg.; night SCUBA; ANSP 498902 • 1 spec., 9.5 × 3.2 mm; depth 6 m; 31 Aug. 1996; G. Mackintosh leg.; night SCUBA; ANSP 498903 • 5 specs, 9.2 × 3.2, 8.5 × 3.3, 8.9 × 3.1, 7.4 × 2.5 and 6.0 × 2.3 mm; S side of Molinier Pt.; depth 7 m; 25 Jan. 2007; G. Mackintosh leg.; night SCUBA on reef; USNM 1715441.

MARTINIQUE • 1 spec., 9.9 × 3.5 mm; Fort-de-France Bay, Banc Mitan; 14°35′ N, 61°04.6′ W; depth 13 m; Oct. 2016; MADIBENTHOS; stn AB392; MNHN-IM-2000-39622.

ST. VINCENT AND THE GRENADINES • 2 specs, 10.4 × 3.2 and 9.2 × 3.3 mm; Union Island, Chatham Bay; depth 18 m; 6 Apr. 2007; G. Mackintosh leg.; night SCUBA on sand and rubble; ANSP 498904 • 1 spec., 9.9 × 3.1 mm; St. Vincent Island, Mt. Wynn Bay; depth 18 m; 27 May 1997; G. Mackintosh leg.; night SCUBA; UF 589795.

Description

This description is based on the original description and partially on examined specimens. *Shell* small (length to 10.4 mm), fusiform, with a tall acuminate spire and large body whorl about 57% of shell

length. Whorls appressed, up to 9 in all, teleoconch with steeply sloping shoulders that are flat and margined at or a little below mid-whorl by a spiral cord that marks the periphery, whorl sides slightly convex to flat. Aperture an elongate oval, with an anal sinus posteriorly and a short canal anteriorly. Surface sculpture of six narrow ribs per whorl that run from suture to suture and in line from whorl to whorl, ribs evanesce on approach to the anterior fasciole. *Protoconch* of 2½ round whorls, the first with a brown tip, the last ¾-whorl with riblets that do not reach the abapical suture. *Axial sculpture* of 6 narrow but round-crested ribs per whorl, moderately high, that broaden to shell surface, which is flat between ribs. Ribs obtusely angled about mid-whorl, steeply sloped above and slightly convex to flat below. *Varix* apertural and moderately strong on mature specimens, like preceding rib in form only a little stronger. *Spiral sculpture* of a single peripheral spiral cord, nodulose in rib crests, obsolete between. Microscopic groves over the entire shell surface, are closely spaced and subequal in strength. *Sulcus* absent. *Outer lip* varicose with a narrow strip of shell along base of varix at sometimes with an axial fold along its edge (in mature specimens). Dentition weak, lyrae present on underside of varix. *Anal sinus* a round notch about midway along shoulder, with an elevated rim along its edge. *Inner lip* a narrow glaze along the columella and parietal surface, without dentition. *Columella* straight. *Anterior canal* short, turned slightly to the right when viewed ventrally); end angled and slightly notched. *Anterior fasciole* not swollen, sculpture like shell base. *Color* milky white, intercostal space translucent, a yellowish-brown band present on dorsal surface, its intensity darkest and most distinct along its anterior edge and in intercostal space but color fades to suture.

Remarks

The average length of 12 specimens is 9.1 mm (range = 6.0–10.4 mm).

Range and habitat

Martinique, St. Vincent and the Grenadines, and Grenada; depth 6–95 m.

Ithycythara fusiformis Fallon sp. nov.
urn:lsid:zoobank.org:act:983B2147-4659-4318-8BCE-81ED10344381
Fig. 71Q–DD

Differential diagnosis

Ithycythara altaspira Paulmier, 2019 differs in having a proportionally taller spire that is acuminate, not evenly tapered, a weaker varix, and is larger, average length = 9.1 versus 6.7 mm.

Ithycythara galindoae Fallon & Bouchet sp. nov. has a more concave shoulder and a shell banded by alternating dense and sparse groups of microscopic secondary spirals.

Ithycythara decolora Fallon sp. nov. has a protoconch of 3 whorls (versus 2½) and is generally larger (average length = 8.9 versus 6.7 mm), although the largest specimen of *I. fusiformis* is comparable in size.

Etymology

Ithycythara fusiformis Fallon sp. nov. derives its name from the feminine form of the Latin adjective '*fusiformis*' (with masculine and feminine forms being the same), which means 'spindle-shaped', and is named for its tall, spire-like structure and narrow anterior.

Type material

Holotype

ST. VINCENT AND THE GRENADINES • 7.8 × 2.9 mm; St. Vincent Island, Young Island; depth 22 m; 30 Apr. 1997; G. Mackintosh leg.; night SCUBA; ANSP 498914.

Paratypes (6 specs)

ST. VINCENT AND THE GRENADINES • 4 specs, 7.7 × 3.0, 7.5 × 2.6, 6.8 × 2.8 and 6.9 × 2.6 mm; same data as for holotype; USNM 1715445 • 1 spec., 7.2 × 2.6 mm; Canouan Island, Dove Cay; depth 5 m; 6 Jun. 2004; G. Mackintosh leg.; night SCUBA; UF 589797 • 1 spec., 9.4 × 3.3 mm; St. Vincent Island, Young Island; depth 26 m; 15 May 1997; G. Mackintosh leg.; night SCUBA; P. Fallon coll.

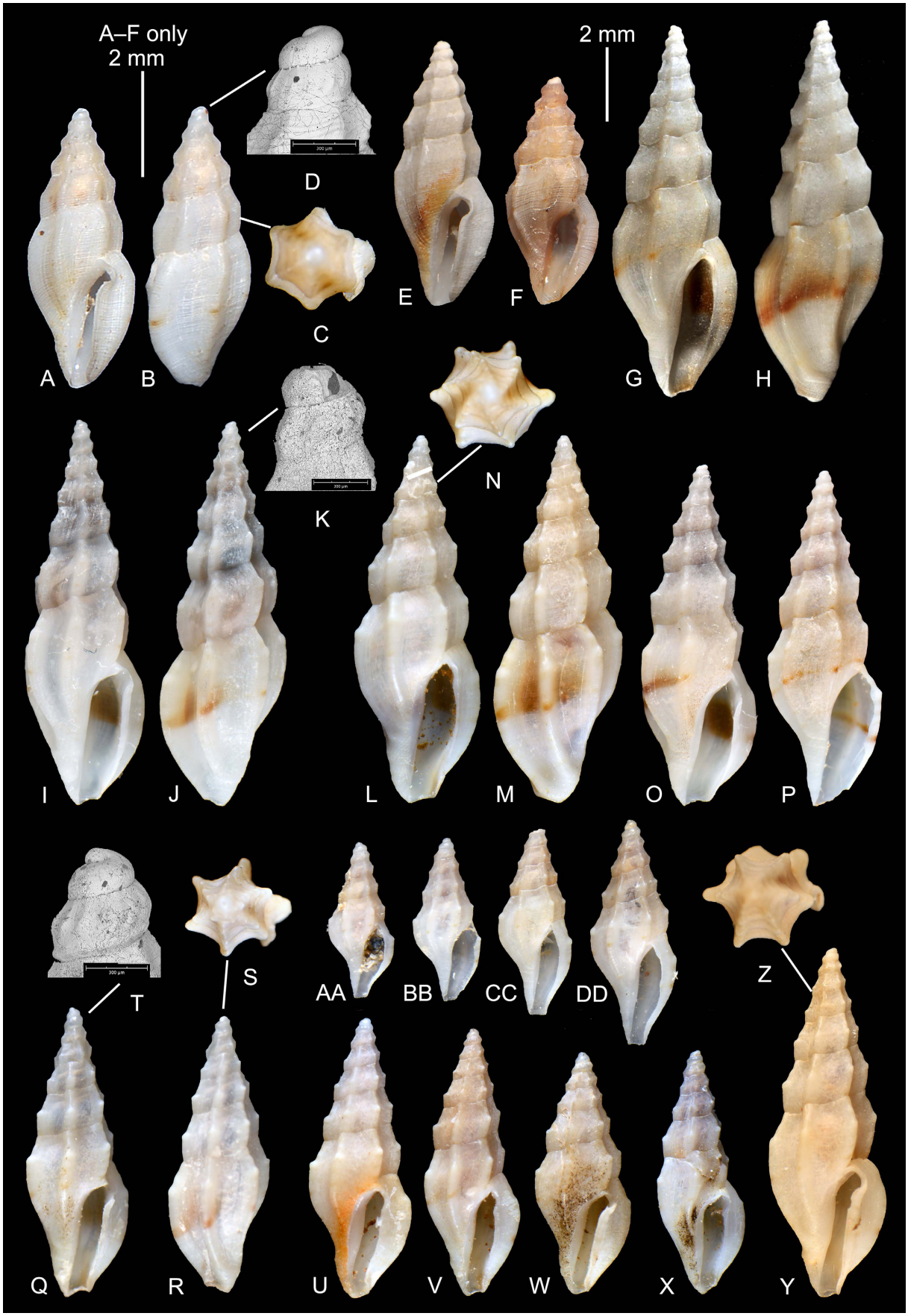
Other material examined (4 specs)

ST. VINCENT AND THE GRENADINES • 4 specs, 6.1 × 2.4, 5.2 × 2.0, 4.5 × 1.8 and 4.3 × 1.8 mm; Canouan Island, Corbec Bay; depth 8 m; 8 Jun. 2004; G. Mackintosh leg.; night SCUBA on rock and sand; ANSP 498913.

Description

Shell small (length to 9.4 mm), fusiform, with an evenly tapered spire and large body whorl about 59% of shell length. Whorls are appressed, up to 9 in all with steeply sloping flat shoulders with a low bump midway. A spiral cord marks the whorl periphery and edge of shoulder below which whorl sides are slightly convex to flat. The aperture is an elongated oval, with an anal sinus posteriorly and a short canal anteriorly. Surface sculpture consists of six narrow ribs per whorl that run and are in-line suture to suture and, ribs evanesce on approach to the anterior fasciole. *Protoconch* of 2½ whorls, the first minute with a brown spot on its tip, the last with arched riblets that do not reach the abapical suture; riblets fine at first then end strong with a spiral cord at its base, between the ends of the riblets and suture of the first teleoconch whorl and is sub-carinate the last ½-whorl. *Axial sculpture* of 6 ribs per whorl that are aligned from suture to suture and to the inner lip on shell base or to near the end of the anterior canal on shell dorsum (i.e., the penultimate rib): moderately wide with narrow crests in cross-section, intercostal space slightly concave. *Varix* apertural, behind the outer lip edge and anal sinus, is larger and thicker than preceding rib, and extends to near the end of the anterior canal. *Spiral sculpture* of a single primary spiral at whorl periphery, obsolete beyond rib crests, and of closely spaced microscopic secondaries subequal in strength. in fresh shells, microscopic spirals appear paired, with slightly wider spaces between pairs. *Sulcus* absent. *Outer lip* varicose, with a narrow strip of shell along the base of the varix extending from

Fig. 71 (next page). Species of *Ithycythara* Woordring, 1928. Part 5. – **A–F**. *Ithycythara whitneyae* Fallon sp. nov. **A–D**. Holotype, 5.2 × 2.1 mm, ventral, dorsal and apical views, and SEM of protoconch (UF 589790), Grenada. **E**. Paratype, 5.0 × 2.0 mm (MNHN-IM-2000-39669), Saint Vincent Island, Saint Vincent and the Grenadines. **F**. Paratype, 4.3 × 1.8 mm (ANSP 498938), Corbec Bay, Canouan Island, Saint Vincent and the Grenadines. – **G–P**. *Ithycythara altaspira* Paulmier, 2019. **G–H**. Holotype, length = 10.4 mm, ventral and dorsal views (MNHN-IM-2000-34344), off Le Lorrain, Martinique. **I–K**. Spec., 10.4 × 3.2 mm, ventral and dorsal views, and SEM of protoconch (ANSP 498904), Chatham Bay, Union Island, Saint Vincent and the Grenadines. Tip of protoconch eroded away and surface erosion obscures detail. **L–N**. Spec., 9.9 × 3.4 mm, ventral, dorsal and apical views (ANSP 498902), Hillsborough Bay, Carriacou Island, Grenada. **O**. Spec., 9.2 × 3.3 mm (ANSP 498904), Chatham Bay, Union Island, Saint Vincent and the Grenadines. **P**. Spec., 8.9 × 3.1 mm (USNM 1715441), S side of Molinier Pt., Grenada. – **Q–DD**. *Ithycythara fusiformis* Fallon sp. nov. **Q–T**. Holotype, 7.8 × 2.9 mm, ventral, dorsal and apical views, and SEM of protoconch (ANSP 498914), Young Island, Saint Vincent Island, Saint Vincent and the Grenadines. **U–X**. Paratypes, 7.7 × 3.0, 7.5 × 2.6, 6.8 × 2.8 and 6.9 × 2.6 mm (USNM 1715445), Young Island, Saint Vincent Island, Saint Vincent and the Grenadines. **Y–Z**. Paratype, 9.4 × 3.3 mm, ventral and apical views (USNM 1715445), Young Island, Saint Vincent Island, Saint Vincent and the Grenadines. **AA–DD**. Specs. 4.3 × 1.8, 4.5 × 1.8, 5.2 × 2.0 and 6.1 × 2.4 mm (ANSP 498913), Corbec Bay, Canouan Island, Saint Vincent and the Grenadines. Credits: D, K, T: SEM images courtesy of Paul Callomon; G–H: courtesy of MNHN Collection: Molluscs (IM). Scale bars: A–C, E–J, L–S, U–DD = 2 mm; D, K, T = 300 µm.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the anal sinus to the anterior canal with an axial fold along its edge (mature specimens). Dentition of weak lyrae on the underside of the varix, anal tooth absent. *Anal sinus* a deep round notch mid-way on whorl shoulder and angled laterally, with a slightly elevated rim around its edge (mature specimens). *Inner lip* a narrow glaze along the columella and parietal surface, without dentition. *Columella* straight. *Anterior canal* short, turned slightly to the right when viewed ventrally); end angled and slightly notched. *Anterior fasciole* not swollen, sculpted like shell base. *Color* opaque milky white with a broad, mid-whorl, yellowish-brown band on shell dorsum. Band can be narrow and restricted to ribs.

Remarks

The average length of 11 specimens is 6.7 mm (range = 4.3–9.4 mm).

Range and habitat

St. Vincent and the Grenadines; depth 5–26 m.

***Ithycythara* spp. Part 6**

Ithycythara chechoi Espinosa & Ortea, 2004
Fig. 72A–B

Ithycythara chechoi Espinosa & Ortea, 2004: 212-213, fig. 3.

Ithycythara sp. B – Redfern 2001: 133, pl. 60 fig. 547a–b is this species according to Espinosa & Ortea (2004: 212–213).

Differential diagnosis

The telescoped whorls of this species are unique among its congeners.

Type material

Holotype
CUBA • 5.95 × 2.0 mm; Havana, in front of the Institute of Oceanology; depth 25–30 m; IDO, catalog number unknown.

Paratype (1 spec.)
CUBA • 1 spec., 4.0 × 1.3 mm; MUNA, catalog number unknown.

Description

This description is taken from Espinosa & Ortea (2004: 212–213; fig. 3). Neither the types nor other specimens were examined. *Shell* small (length = 5.95 mm), very elongated and narrow, like a telescoped spiral (W/L = 0.3361), teleoconch of about five obtusely angled whorls, the last whorl about 59% of shell length, aperture oval and with a short anterior canal, about 39% of shell length. Sculpture of low, narrow ribs and microscopic spiral groves. *Protoconch* of 1½ smooth, round, and relatively large whorls. *Axial sculpture* of 5 or 6 low and narrow ribs per whorl with steeply sloped slightly concave shoulders and convex sides, ribs tend to align, and extend from suture to suture on spire whorls and evanesce on shell base. Ribs highest at whorl peripheries, which also have small nodules. *Varix* the last rib serves as a varix and is not much larger than the preceding rib. *Spiral sculpture* of microscopic spiral groves over the entire shell. *Sulcus* none. *Outer lip* thin, narrow, extending along the base of the last rib. *Anal sinus* a wide notch the width of the shoulder, sides divergent. *Inner lip* a narrow glaze along the columella. *Columella* straight. *Anterior canal* short, wide, not differentiated from apertural opening. *Anterior fasciole* is not swollen, with the same sculpture as the base. *Color* plaster white with spiral lines of small spots just above the suture, mid-whorl on ribs, and an orange-brown columella.

Remarks

The number of protoconch whorls, according to its describers, is 1½, which is less than its congeners (2¼–3¼) and an exception to the diagnosis of the genus group.

Range and habitat

Bahamas (Andros) and Cuba; depth 25–30 m.

Ithycythara cocta Fallon sp. nov.
urn:lsid:zoobank.org:act:22C88E19-A6DF-4650-8565-42259FFD5BFF
Figs 63A, 71C–H

non *Ithycythara maera* Woodring, 1928 – Redfern 2013: 589, figs a–d (misidentification that may be this species). *Ithycythara maera*, a fossil species, has sub-median whorl angulations, shoulders with a greater slope, and a solid spiral band.

Differential diagnosis

Differences from *Ithycythara curiosa* Fallon sp. nov. are noted under the differential diagnosis paragraph of that species.

Etymology

Ithcythara cocta Fallon sp. nov. is after the feminine form of the Latin adjective '*coctus*', which means 'roasted'. The name is inspired by the species' dark, flame-like color markings.

Type material

Holotype

BAHAMAS • 5.8 × 2.4 mm; Exuma Islands, Long Cay; depth 0 m; Nov. 1968; Dieter Cosman leg.; from drift; UF 589791.

Paratypes (2 specs)

BAHAMAS • 1 spec., 3.7 × 1.6 mm (poor); same data as for holotype; UF 589792 • 1 spec., 3.9 × 1.6 mm; South Riding Rocks, Cay Sal Bank; depth 60 ft [18 m]; 16 Jul. 1998; C.M. Lloyd; at base of live coral reef; UF 589793.

Description

Shell small (length = 5.8 mm), fusiform (W/L = 0.4138), of 7 whorls, suture of teleoconch whorls appressed, undulant, whorls sharply angled with slightly concave shoulders, the last whorl largest, about 68% of shell length, sides slightly convex; aperture varicose, narrow with nearly parallel sides, and with a short anterior canal, both about 45% of shell length; sculpture of strong ribs and strong spiral grooves. *Protoconch* of about 2½ whorls with fine riblets on about the last ½-whorl that end above the abapical suture. *Axial sculpture* of 7 strong ribs per whorl with round crests that extend from suture to suture on spire whorls and on anterior fasciole of shell base, where they become narrower and weaker and curve over the fasciole to the inner lip; ribs aligned whorl to whorl, highest and slightly swollen at whorl periphery. Rib interspaces are concave and about as wide as ribs. *Varix* rib-like, and stronger than preceding rib, extending from suture to end of anterior canal. *Spiral sculpture* of coarse, irregularly-spaced grooves overall, ribs are overridden by spiral grooves, including the peripheral swellings. There is no evidence of a peripheral primary spiral associated with the swellings. *Sulcus* absent. *Outer lip* is thin, narrow, extending along the base of the last rib. A weak tooth present under the varix at the base of the anal sinus, followed by a row of weak lyrae extending to the anterior canal. *Anal sinus* a shallow notch almost as wide as the shoulder with its apex closer to the periphery than the suture. *Inner lip* a

narrow glazed strip along the columella and parietal wall with a callus at the anal sinus, joining the outer lip above the sinus. *Columella* straight, about 12° off the shell axis. *Anterior canal* short, only slightly narrower than aperture, channel broad; end unnotched. *Anterior fasciole* slightly swollen by the convergence of evanescent, overriding ribs. Surface sculpture same as elsewhere on shell base. *Color* white with 2 wide yellowish-brown bands, one straddling the shoulder and whorl sides, and the other just above the anterior fasciole; the large band is obsolete on ribs and appears like a row of flammules in intercostal spaces.

Remarks

Peripheral nodules are present without evidence of an associated primary spiral and are overridden by microscopic spiral grooves.

Range and habitat

Bahamas (Cay Sal Bank, Exuma Islands, and likely Abaco), in up to 18 m.

Ithycythara unid. sp. V
Fig. 72I

Differential diagnosis

Like *Ithycythara* unid. sp. S but with more angular whorls, and a protoconch of about 2 not 3 whorls.

Ithycythara bahamense Fallon sp. nov. is smaller, has a protoconch of 1½, not 2 whorls, and has shouldered not angled whorls.

Material examined (1 spec.)

MEXICO • 1 spec., 5.0 × 1.8 mm; Quintana Roo, near Cancun Island; Feb. 1963; W.M. Heilman leg.; ANSP 285431.

Partial description

Shell small, narrowly fusiform, of 6 whorls total, teleoconch whorls angular with flat shoulders and sides slightly angled into sutures. Sculpture of narrow ribs and a single row of nodules at shoulder's edge. Aperture narrowly oval, anterior canal narrow, semi-tubular. *Protoconch* of about 2 whorls, riblets on the last ½ whorl a swollen medially forming a weak carina. *Axial sculpture* of 6 narrow ribs per whorl, low, with wide concave interspaces. Ribs are aligned from whorl to whorl and extend from suture to suture on spire whorls, are highest mid-whorl, and evanesce before the anterior fasciole. Ribs nodulose at shoulder angles. *Spiral sculpture* of faint microscopic spirals overall. Peripheral spiral cord lacking. *Color* translucent white with a yellowish-brown band on the last whorl.

Ithycythara unid. sp. P
Fig. 72J–K

Differential diagnosis

Ithycythara unid. sp. F is similar in most respects but has more sharply angled, not round-shouldered whorls, and 6, not 5 ribs per whorl.

Material examined (1 spec.)

PUERTO RICO • 1 spec., 4.2 × 1.7 mm; Playa Isabela; depth 0 m; Apr. 2021; D. Kirsh leg.; in drift; D. Kirsh coll.

Partial description

Shell is small, of about 6 ¼ whorls total, teleoconch whorls with rounded shouldered and appressed sutures. Sculpture of narrow ribs without nodules, surface with microscopic grooves. Aperture oval, anterior canal short, undifferentiated from the aperture, apertural dentition absent in this specimen. *Protoconch* of 2¼ whorls, the last with some faint riblets. *Axial sculpture* of 5 narrow, opisthocline ribs per whorl with wide interspaces. Ribs are aligned whorl to whorl and extend from suture to suture on spire whorls and become narrower on whorl shoulders. *Spiral sculpture* of densely packed, microscopic grooves overall; evidence of peripheral spiral cord is lacking.

Remarks

This is a small species with only 5 ribs, not the usual 6 on most members of the genus group.

Ithycythara lanceolata (C.B. Adams, 1850)
Figs 64H, 72L–FF

Mangelia lanceolata C.B. Adams, 1850b: 66.
Mangelia balteata Reeve, 1846b: pl. 7 fig. 57 is a synonym according to de Jong & Coomans (1988: 116) and Dall (1885: 155). The type of *M. balteata* Reeve could not be found (email from A. Salvador, curator at NHMUK, to P. Fallon dated 14 Oct. 2018) so its synonymy could not be verified.
*Mangelia muricoid*es C.B. Adams, 1850b: 65 is a junior synonym according to Maes (MS), in Rosenberg (2009). The type locality is Jamaica (Adams 1850c: 65). The lectotype is in MCZ 177378.
Ithycythara fasciata Paulmier, 2019: 8, figs 19–23, **syn. nov.**, is a junior subjective synonym. See Remarks below. The holotype is in MNHN-IM-2000-34350, locality is Robert's Bay, Martinique, in 26 m.

Mangelia lanceolata – Krebs 1864: 13–14. — Clench & Turner 1950: 301, pl. 31 fig. 9.
Mangilia (*Cythara*) *lanceolata* – Tryon 1884.
Mangilia balteata – Dall 1889b: 100–101. — Dall & Simpson 1901: 388.
Daphnella lanceolata – Paetel 1888: 91.
Ithycythara lanceolata – Nowell-Usticke 1959: 84. — Warmke & Abbott 1961: 137, pl. 26 fig. r. — Powell 1966: 108. — McGinty 1970: 65. — Rios 1970: 127; 1975: 138, pl. 41 fig. 633; 1985: 146, pl. 49 fig. 683; 1994: 174, pl. 57 fig. 798. — Sarasúa 1970: 1. — Abbott 1974: 282, fig. 3257. — Treece 1980: 562. — Vokes & Vokes 1983: 59, not pl. 29 fig. 10. — de Jong & Coomans 1988: 116. — Turgeon *et al*. 1988: 97; 1998: 107. — Redfern 2001: 131, pl. 59 figs 542a–c, pl. 113 fig. 542d. — García & Lee 2002: 12. — Tucker 2004: 544. — Absalão *et al*. 2005: 32, fig. 80. — Williams 2005: #5603. — Dutra *et al*. 2005: 132. — Grace 2007: 28. — García 2007: 8. — Lee 2009: 132, species 624. — Krisberg 2009: https://olram9.wixsite.com/letstalkseashells. — Zhang 2011: 151, species 565. — Lamy & Pointier 2017: 482, pl. 165 fig. 3a–b.

The misidentification of this species is prevalent, so the extent of its distribution is unknown. The reports of this species in the list of uses of this taxon should be verified as most are likely incorrect.

Differential diagnosis

Ithycythara lanceolata (C.B. Adams, 1850) possesses light and dark spiral banding, and lacks true varix and apertural teeth. These characteristics distinguish this species from its congeners.

Ithycythara hyacinthina Fallon sp. nov. is similar but has a shorter aperture (36% versus 39%, including anterior canal), whorls that are nearly flat with several coarser spirals, and is colored differently.

Type material

Lectotype

The lectotype was designated by (Clench & Turner 1950: pl. 31 fig. 9).

JAMAICA • 7.5 × 2.8 mm; MCZ 177380.

Paralectotypes (4 specs)

JAMAICA • 4 specs, 7.1 × 2.5, 6.7 × 2.3, 6.3 × 2.2 and 4.0 × 1.5 mm; ANSP 6442.

Material examined (10 specs)

In addition to the types, the following 9 specimens were examined.

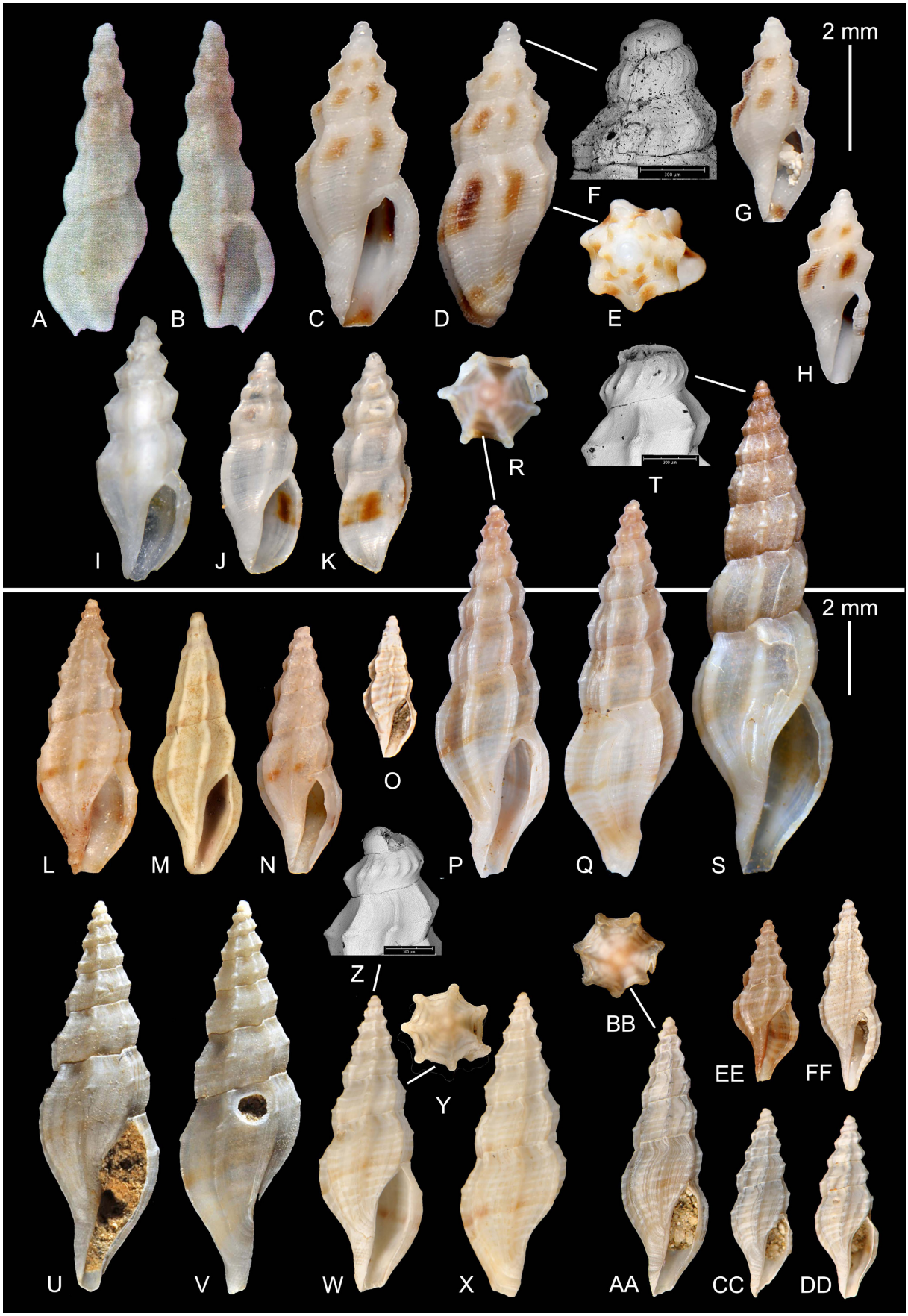
COLOMBIA • 1 spec., 10.2 × 3.0 mm; Tayrona Park; depth 18 m; dredged in soft sand; UF 589798.

GUADELOUPE • 3 specs, 5.2 × 1.8, 4.5 × 1.9 and 3.9 × 1.7 mm; Grand Cul-de-Sac Marin; 16°18.02′ N, 61°33.09′ W; depth 5 m; 20 May 2012; KARUBENTHOS 2012; stn GS28; MNHN-IM-2012-7444.

MARTINIQUE • 1 spec., 8.2 × 2.9 mm; Bellefontaine, SW of centrale EDF; 14°39.9′ N, 61°09.9′ W; depth 60 m; 2 Oct. 2016; MADIBENTHOS; stn AD287; MNHN-IM-2000-39652 • 3 specs, 7.6 × 2.5, 5.2 × 1.8 and 5.0 × 1.8 mm; Fort-de-France Bay, Le Lamentin, off the end of the runway; 14°35.2′ N, 61°01.4′ W; depth 10 m; 6 Oct. 2016; MADIBENTHOS; stn AD606; MNHN-IM-2000-39653.

PUERTO RICO • 1 spec., 13.3 × 3.6 mm; Jobos; depth 5.5 m; 27 May 1996; G. Mackintosh leg.; night SCUBA; P. Fallon coll.

Fig. 72 (next page). Species of *Ithycythara* Woodring, 1928. Part 6. – **A–B**. *Ithycythara chechoi* Espinosa & Ortea, 2004, holotype, 5.95 × 2.0 mm (Instituto de Oceanologia, La Habana, Cuba), in front of the Institute of Oceanology, Havana, Cuba. – **C–H**. *Ithycythara cocta* Fallon sp. nov. **C–F**. Holotype, 5.8 × 2.4 mm, ventral, dorsal and apical views, and SEM of protoconch (UF 589791), Long Cay, Exuma Islands, Bahamas. **G**. Paratype, 3.9 × 1.6 mm (UF 589793), South Riding Rocks, Cay Sal Bank, Bahamas. **H**. Paratype, 3.7 × 1.6 mm (poor) (UF 589792), from the type locality. – **I**. *Ithycythara* unid. sp. V. Spec., 5.0 × 1.8 mm (ANSP 285431), near Cancun Island, Quintana Roo, Mexico. – **J–K**. *Ithycythara* unid. sp. P. Spec., 4.2 × 1.7 mm, ventral and dorsal views (D. Kirsh coll.), Playa Isabela, Puerto Rico. – **L–O**. *Mangelia lanceolata* C.B. Adams, 1850. **L**. Lectotype, 7.5 × 2.8 mm (MCZ 177380), Jamaica. **M–O**. Paralectotypes, 7.1 × 2.8, 6.7 × 2.3 and 4.0 × 1.5 mm (ANSP 6442), Jamaica. These were identified as possible paralectotypes (labeled as "*M. carneolata* C.B. Ad." in the Charles M. Wheatley coll.) by G. Rosenberg, 19 Mar. 1997, "*carneolata*" being an apparent mistranscription of *lanceolata*. – **P–T**. *Ithycythara lanceolata* (C.B. Adams, 1850). **P–R**. Spec, 10.2 × 3.0 mm, ventral, dorsal and apical views (UF 589798), Tayrona Park, Colombia. **S–T**. Spec, 13.3 × 3.6 mm, ventral view, and SEM of protoconch (P. Fallon coll.), Jobos, Puerto Rico. – **U–V**. *Ithycythara fasciata* Paulmier, 2019, holotype, 10.6 × 3.2 mm (MNHN-IM-2000-34350), Robert's Bay, Martinique. A junior synonym. – **W–FF**. *Ithycythara lanceolata* (C.B. Adams, 1850). **W–Z**. Spec., 8.2 × 2.9 mm, ventral, dorsal and apical views, and SEM of protoconch (MNHN-IM-2000-39652), Bellefontaine, SW centrale EDF, Martinique. **AA–DD**. Specs, 7.6 × 2.5, ventral and apical views, 5.2 × 1.8 and 5.0 × 1.8 mm (MNHN-IM-2000-39653), off the end of the runway, Le Lamentin, Fort-de-France Bay, Martinique. **EE–FF**. Specs, 4.5 × 1.9 and 5.2 × 1.8 mm (MNHN-IM- 2012-7444), Grand Cul-de-Sac Marin, Guadeloupe. Credits: A–B: from Espinosa & Ortea (2004: pl. 1 fig. D); F, T, Z: SEM images courtesy of Paul Callomon; M: copied from ANSP Malacolog 4.1.1 online database (Rosenberg 2009); U–V: from MNHN Collection: Molluscs (IM). Scale bars: A–E, G–S, U–Y, AA–FF = 2 mm; F, T, Z = 300 µm.


2 mm
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Description

The following re-description is based on C.B. Adams' description and examination of the types. *Shell* small (holotype length = 11.2 mm [Adams' and Colombia specimen]), thin, with light and dark banding, surface glossy, fusiform, with 9 convex whorls, the largest whorl 57% of shell length. Whorls slightly angled mid-whorl the last tapering sharply at its shell base to the moderately long anterior canal; ribs narrow, aperture narrowly oval, only slightly wider than the anterior canal, both about 39% of shell length (length proportions from Colombia specimen). *Protoconch* of about 2¼–2½ whorls, the first round with a recumbent tip, the second with arched riblets on about the last ½ whorl. *Axial sculpture* of 6 or 7 strong narrow rope-like ribs per whorl extending from suture to suture and aligned whorl-to-whorl, then extending to the inner lip on the base of last whorl. Intercostal spaces slightly convex in apertural view. *Varix* is simply the last rib, aligned with the corresponding penultimate rib whorl. *Spiral sculpture* of a single peripheral cord that overrides ribs, visible on crests and rib sides but obsolete in intercostal space, not swollen on rib crests. Microscopic grooves present overall, minutely crenating rib crests. *Sulcus* none. *Outer lip* thin, extending out from the last rib and from the suture to the beginning of the anterior canal, without dentition. *Anal sinus* is a wide, shallow notch set off a short distance from the suture and extending to the end of the shoulder, sides divergent. *Inner lip* a narrow glaze along the parietal wall and columella that joins the outer lip at the suture, without dentition. *Columella* is slightly sigmoid. *Anterior canal* of moderate length, narrow, and twisted to the right when viewed ventrally, end unnotched. *Anterior fasciole* not swollen, marked with growth increments overridden by microscopic spiral grooves. *Color* semi-translucent with narrow, alternating white and light yellowish brown bands, with a narrow yellowish-brown sutural band and a darker shell apex and anterior fasciole, which may also be darker.

Remarks

In C.B. Adams' description (1850b), "fine spiral lines of white and of dark brown, which are more conspicuous on the ribs" and "darker and wider brown line along the suture" describe the alternating light and dark bands over the entire shell and the mid-whorl brown band that remains exposed just above the suture of spire whorls, and finally, the "scarcely convex" whorls, altogether neatly describe the lectotype illustrated in Fig. 72L, and distinguishes it from most of its congeners (see *I. hyacinthina* Fallon sp. nov.). Adams also describes the species as having a "canal not very short" which one can interpret as of moderate length, as exhibited by most of the paralectotypes, and a shell "brownish, tinged with purple", which may have faded in the 170-year-old shell. However, the anterior end of the lectotype is darkest.

The lectotype length is only 7.5 mm, quite a bit shorter than Adams' stated length of about 0.44 inch [ca 11.2 mm], and has 7, not 6, ribs per whorl. The 7.5 mm specimen is the same illustrated (and selected as lectotype) by Clench & Turner (1950: pl. 31 fig. 9). If the original type series had a larger specimen, now lost, it is assumed to have had the same characteristics described by C.B. Adams. In any event, our best option is to accept the specimen declared as the lectotype by Clench & Turner (1950). They state earlier in their publication that specimens in many of the type lots were sent out on exchange by C.B. Adams (Clench & Turner 1950: 248). The four paralectotypes in ANSP 6442 are shorter than 7.5 mm, and all have 7 ribs per whorl. So, C.B. Adam's count of 6 was either an error or was true of the missing 11.2 mm specimen.

The name of this species has been widely misapplied to other, similar species. Most recently, Paulmier (2019: 8, figs 24–27) identifies specimens as *I. lanceolata* that do not fit C.B. Adams' (1850b) description but are synonymized in this work with *Ithycythara ellenstrongae* Fallon & Bouchet sp. nov. Adams (1850b) stated that his species possessed light and dark bands, "spiral lines", overall, which are visible in the lectotype but absent in Paulmier's specimens. Additionally, the 7-axial whorls are narrower and lower (also, compare apical views of *I. lanceolata* and *I. ellenstrongae* Fallon & Bouchet sp. nov.).

Of the species described as new by Paulmier (2019), *Ithycythara fasciata* has all the characteristics of *I. lanceolata*. The light and dark spiral bands, mid-whorl brown band and weakly convex whorls with mid-whorl nodules are indicative. The long anterior canal is not present on the *lanceolata* lectotype. Still, Adams (1850b) gave the length of his specimen as 11.2 mm (presumed lost), which is longer than the 10.6 mm shell length of Paulmier's species and perhaps of a "canal not very short". The specimens of *I. lanceolata* studied in this work, and the 3 paralectotypes of the species all have anterior canals proportionally longer than the lectotype. Paulmier discounts *I. fasciata* as the same as *I. lanceolata* based on the biometrics of his 2 specimens; however, as shown in Fig. 72, *I. lanceolata* is quite variable in both the type series and across its range.

Of note, and perhaps characteristic of this species, is the absence of a developed varix and of apertural dentition in the examined specimens.

The relatively poor preservation of most examined specimens precludes detailed analysis of this species's variability. The lack of a true varix and the exceptional size of some specimens suggest that the growth of this species is indeterminate.

Range and habitat

Jamaica, Puerto Rico, Guadeloupe, Martinique, and Colombia (Tarona Park); depth 5–60 m.

***Ithycythara* spp. Part 7**

Ithycythara bahamense Fallon sp. nov.
urn:lsid:zoobank.org:act:CCB43FC9-FE2E-45B9-89A8-34B902CBDCDF
Fig. 73A–J

Differential diagnosis

Ithycythara unid. sp. M is similar in most respects but has angled whorls, not shouldered ones.

Ithycythara pentagonalis (Reeve, 1845) has 5, not 6 ribs per whorl, stronger ribs, and is larger (> 5.9 mm, not including a missing portion of anterior canal, versus 4.7 mm, the largest *I. bahamense* Fallon sp. nov.).

Ithycythara unid. sp. T *is larger* and has a protoconch of 2¼ not 1½, whorls.

Ithycythara unid. sp. U has 2 protoconch whorls that end with a few riblets.

Etymology

Ithycythara bahamense Fallon sp. nov., the Bahamas *Ithycythara*, is named after the country from which specimens have been collected to date.

Type material

Holotype
BAHAMAS • 3.7 × 1.4 mm; East Grand Bahama District, Gold Rock; 26°30′ N, 78°22′ W; depth 24 m; J. Worsfold leg.; ANSP 369736.

Paratypes (8 specs)
BAHAMAS • 1 spec., 3.6 × 1.3 mm; same data as for holotype East Grand Bahama District, Gold Rock; 26°30′ N, 78°22′ W; depth 24 m; J. Worsfold leg.; ANSP 369736 • 2 specs, 3.7 × 1.4 and 3.7 × 1.5 mm; Grand Bahama Island, Indian Cay; 26°42.75′ N, 78°39.25′ W; depth 24 m; J. Worsfold leg.; ANSP

366929 • 1 spec., 3.2 × 1.2 mm; Grand Bahama Island, Borco Pipelines, 5 mi. [8 km] W of Freeport; Jun. 1982; 26°30.5′ N, 78°46.5′ W; depth 35 ft [11 m]; J. Worsfold leg.; ANSP 370846 • 1 spec., 3.2 × 1.3 mm; Grand Bahama Island, Borco Pipelines, 5 mi. [8 km] W of Freeport; 26°30.5′ N, 78°46.5′ W; depth 35 ft [11 m]; Jun. 1982; J. Worsfold leg.; ANSP 370845A • 2 specs, 4.2 × 1.7 and 4.0 × 1.5 mm; Grand Bahama Island; 26°31′ N, 78°46.5′ W; J. Worsfold leg.; ANSP 374464 • 1 spec., 4.7 × 1.7 mm; Grand Bahama Island, Bootle Bay; 26°39.5′ N, 78°57′ W; depth 24 m; J. Worsfold leg.; ANSP 371869.

Description

Shell is small, of about 5 whorls total, teleoconch whorls turreted, with flat shoulders and straight sides. Sculpture of narrow ribs and a single peripheral row of nodules. Aperture narrow, with nearly parallel sides only a little wider than the short anterior canal, apertural dentition present. *Protoconch* of 1½ whorls, the tip large, the last bulbous, without riblets. *Axial sculpture* of 6 narrow, opisthocline ribs per whorl with wide interspaces. Ribs are aligned whorl to whorl and extend from suture to suture on spire whorls and evanesce on the last whorl before the anterior fasciole. *Varix* apertural, rib-like only stronger. *Spiral sculpture* of densely packed, microscopic grooves overall; weak nodules present on ribs at edge of shoulder, a distinct peripheral spiral cord lacking. *Sulcus* absent. *Outer lip* varicose, with a thin extension of shell along the base of the varix. *Anal sinus* a wide U-shaped rather shallow notch on the shoulder in front of the varix, set off the suture by a callus, sides divergent. *Inner lip* a narrow but thick, margined callus along the columella and parietal wall. *Columella* straight. *Anterior canal* short, narrow, semi-tubular, tip turned to the right when viewed ventrally, unnotched. *Color* white with a mid-whorl yellowish-brown band on last intercostal space, and traces of spiral lines of the same color below it.

Remarks

The morphology of *Ithycythara bahamense* Fallon sp. nov. has all the diagnostic characteristics of this genus outlined in beginning of Part 1, except for the number of protoconch whorls, which are less than the 2¼–3¼ that characterize most of the members of the genus *Ithycythara*.

The average length of 9 specimens is 3.8 mm (range 3.2–4.7 mm). The brown band is lacking in some specimens. One variant specimen has 7, not 6 whorls.

Range and habitat

Bahamas; depth 11–24 m.

Ithycythara unid. sp. S
Fig. 73K–L

Differential diagnosis

Like *Ithycythara bahamense* Fallon sp. nov. but larger, with less angular whorls, and a protoconch of 3 whorls with a minute tip and a carina on the last whorl.

Material examined (1 spec.)

BAHAMAS • 1 spec., 5.5 × 1.4 mm; Grand Bahama Island, Lucaya; 26°29.75′ N, 78°37.25′ W; depth over 300 m; J. Worsfold leg.; ANSP 367898.

Partial description

Shell small, of 7¼ whorls total, teleoconch whorls obtusely angled mid-whorl. Sculpture of narrow ribs and a single mid-whorl row of nodules. Aperture narrow, with nearly parallel sides only a little wider than the short anterior canal. *Protoconch* of 3 whorls with a minute tip and the last whorl compressed with

riblets forming a keel. *Axial sculpture* of 6 narrow ribs per whorl, low, with wide concave interspaces. Ribs are aligned from whorl to whorl and extend from suture to suture on spire whorls and evanesce before the fasciole of the anterior canal. *Spiral sculpture* of densely packed, microscopic grooves overall. Weakly nodulose on rib crests at whorl peripheries; peripheral spiral cord lacking.

Ithycythara unid. sp. T
Fig. 73M

Differential diagnosis

Like *Ithycythara* unid. sp. S but with paired microscopic spirals, and a protoconch of only 2¼ whorls with a weak carina on the last whorl, not 3.

Ithycythara bahamense Fallon sp. nov. is smaller and has a protoconch of 1½, not 2¼ whorls.

Material examined (1 spec.)

BAHAMAS • 1 spec., 5.4 × 1.4, mm; Grand Bahama Island, Indian Cay,; 26°42.75′ N, 78°39.25′ W; depth 24 m; J. Worsfold leg.; ANSP 366929.

Partial description

Shell small, narrowly fusiform, of 6½ whorls total, teleoconch whorls obtusely angled with flat shoulders and sides slightly angled into sutures. Sculpture of low narrow ribs and a single row of nodules at shoulder's edge. Aperture narrow, with nearly parallel sides only a little wider than the short anterior canal. *Protoconch* of 2¼ whorls, the tip minute with riblets on the last ½ whorl swollen medially forming a weak carina. *Axial sculpture* of 6 narrow ribs per whorl, low, with wide concave interspaces. Ribs are aligned from whorl to whorl and extend from suture to suture on spire whorls and evanesce before the anterior fasciole. Ribs nodulose at shoulder angles. *Spiral sculpture* of paired microscopic spirals overall. Peripheral spiral cord lacking. *Color* translucent white.

Ithycythara unid. sp. U
Fig. 73N–O

Differential diagnosis

May be conspecific with *Ithycythara bahamense* Fallon sp. nov. but appears to have a different protoconch, 2 whorls ending with a few riblets, not 1½ whorls.

Ithycythara unid. sp. M. Whorls are angled mid-whorl, not shouldered.

Material examined (1 spec.)

BAHAMAS • 1 spec., 4.4 × 1.7 mm; Eleuthera Island, Govenor's Harbor; depth 0 m; 10 Aug. 1999; P. Fallon leg.; in drift near water's edge at low tide; ANSP 498937.

Partial description

Shell small, fusiform, of 5¾ whorls total, teleoconch whorls turreted with flat shoulders and straight sides. Sculpture of narrow ribs and a single row of nodules at shoulder angle. Aperture narrow, with nearly parallel sides only a little wider than the short anterior canal. *Protoconch* rectilinear, about 2 whorls, tip not immersed, a few riblets on the last whorl. *Axial sculpture* of 6 narrow ribs per whorl, low, with wide interspaces. Ribs are aligned whorl to whorl and extend from suture to suture on spire whorls and evanesce before the anterior fasciole. *Spiral sculpture* of densely packed, paired microscopic grooves

overall. Ribs strongly nodulose on rib crests at whorl shoulders; spiral cord lacking. *Color* translucent white with a wide brown spiral band on shoulder.

Ithycythara unid. sp. M
Fig. 73P–R

Differential diagnosis

Ithycythara whitneyae Fallon sp. nov. has a proportionally larger body whorl and shorter ribs. It is also colored differently.

Ithycythara condita Fallon & Bouchet sp. nov. has larger nodes on rib peripheries and a larger varix.

Ithycythara variabilis Fallon & Bouchet sp. nov. is smaller.

Ithycythara angusta Fallon sp. nov. had a larger body whorl and a different pattern of microscopic spiral grooves.

Ithycythara bahamense Fallon sp. nov. has higher, turreted shoulders.

Material examined (1 spec.)

UNITED STATES OF AMERICA • 1 spec., 6.1 × 2.3 mm; E Florida, off St. Augustine; depth 20 fms [37 m]; May 1974; dredged; ANSP 498935.

Partial description

Shell is small, of 7¾ whorls total, teleoconch whorls obtusely angled with flat shoulders and straight sides. Sculpture of narrow ribs and a single mid-whorl row of nodules. Aperture narrow, with nearly parallel sides only a little wider than the short anterior canal. *Protoconch* of 2¼ whorls, tip partially immersed, last ½ whorl with riblets. *Axial sculpture* of 6 narrow ribs per whorl, low, with wide concave interspaces. Ribs are aligned from whorl to whorl and extend from suture to suture on spire whorls and hook over the fasciole to the inner lip. *Spiral sculpture* of densely packed, paired microscopic grooves overall. Weakly nodulose on rib crests at whorl shoulders; spiral cord lacking.

Ithycythara psila (K.J. Bush, 1885)
Fig. 73S–T

Mangilia psila K.J. Bush, 1885a: 445, pl. 95 fig. 2.
Ithycythara kellumi Fargo, 1953: 383, pl. 20 fig. 1, is a synonym according to Rosenberg (2009). Type locality is the Pliocene of North St. Petersburg, Florida, holotype ANSP 19146.

Mangilia psila – Dall 1889a: 101; 1889b: 100. — Dall & Simpson 1901: 389. — Tucker 2004: 803.
Daphnella psila – Paetel 1888: 94.
Mangilia lanceolata subsp. *psila* – M. Smith 1951: 137.
Ithycythara psila – Gardner 1948: 271, pl. 37 fig. 7. — Warmke & Abbott 1961: 138. — DuBar 1962: 36. — Powell 1966: pl. 16 fig. 23. — Radwin 1969: 232. — Porter 1974: 254. — Abbott 1974: 282, fig. 3263. — Campbell *et al*. 1975: 92. — Princz 1982: 133. — Turgeon *et al*. 1988: 98; 1998: 107. — Redfern 2001: 132, pl. 59 fig. 545; 2013: 212, fig. 591. — García & Lee 2002: 12; 2003: 26, fig. 311 (as "cf."). — Williams 2005: #5602. — Rosenberg 2009: www.gbif.org, ANSP Malacology coll. (synonymisation).
Ithycythara kellumi – Odé 1992a: 56 (as "cf.").

non *Mangilia* (*Cythara*) *cymella* Dall, 1889a, in part, is a misidentification of the specimen in MCZ 7104, one of the syntypes of *M. cymella*, which is *Mangilia psila* K.J. Bush, 1885. Because *M. cymella* in MCZ 7104 is unlikely to have been mistaken for that species, the original *M. cymella* may have been accidentally mislabeled.

Differential diagnosis

Reports of the occurrence of *Ithycythara psila* in the above listed uses of this taxon have not been verified. Those with accompanying photographs, other than the type specimen, do not appear to be of this species, i.e., photographs in Redfern *et al.* (2003) and Williams (2005). There are at least 9 newly described species in this work that appear like and might be mistaken for *I. psila*: *Ithycythara guianensis* Fallon & Bouchet sp. nov., *I. bugeae* Fallon & Bouchet sp. nov., *I. hastata* Fallon & Bouchet sp. nov., *I. angulata* Fallon & Bouchet sp. nov., *I. alpha* Fallon sp. nov., *I. bahiensis* Fallon sp. nov., *I. lilliputae* Fallon sp. nov., *I. brisseti* Fallon & Bouchet sp. nov., and *I. cuna* Fallon sp. nov.

Type material

Holotype

UNITED STATES OF AMERICA • 5.9 × 2.4 mm; North Carolina, north of Cape Hatteras, USFC Station 2269; depth 48 fms [88 m]; USNM 44756.

Paratypes

None known.

Other material examined (1 spec.)

CUBA • 1 spec., 5.0 × 1.9 mm; off Bahia Honda; 23°2.5′ N, 83°11.0′ W; depth 402 m; Jan. 1878; USCSS *Blake* exped.; stn 20. This specimen is a paralectotype of *Habrocythara cymella* (Dall, 1889) gen. et comb. nov. that is very likely *Ithycythara psila* (compare Fig. 73T to the holotype of *I. psila* in Fig. 73S).

Description

The following is taken from Bush (1885a: 455–456) and from an examination of the holotype. *Shell* small (holotype length = 5.9 mm), fusiform (W/L = 0.4068), thick with a glossy-smooth surface; about 6½ whorls obtusely angled mid-whorl, sutures undulant, last whorl about 62% of shell length; sculpture of 6 ribs that extend and are aligned whorl-to-whorl, and a single cord; aperture long, about 51% of shell length and uniformly narrow with a wide anal sinus posteriorly and short canal anteriorly. *Protoconch* of about 2½ glossy whorls, the second subcarinate with a row of riblets formed into minute nodules or beads on the periphery. *Axial sculpture* of 6 narrow ribs that extend from suture to suture on spire whorls, and curve to the inner lip on the body whorl, rib intercostal space smooth and wide. The surface is everywhere crossed by conspicuous, flexuous lines of growth. *Varix* near aperture behind anal sinus, thick and larger than preceding rib, extending from suture to end of anterior canal. *Spiral sculpture* of a single cord at whorl periphery, obsolete in intercalary space, forms oblong nodules across ribs. *Sulcus* absent. *Outer lip* is a thin, narrow strip of shell along the leading edge of the varix, contiguous with the outer edge of the anal sinus and extending to the end of the anterior canal, anal tooth and lyrae present inside the aperture, underneath the varix. *Anal sinus* is a wide, shallow notch about shoulder width. *Inner lip* a narrow strip of glaze on the columella and parietal wall, margined. *Columella* straight, with a small tooth mid-way. *Anterior fasciole* is not swollen, sculpted with growth lines and 5 or 6 faint striae. *Color* opaque yellowish white, with a smooth surface.

Range and habitat

United States (off North Carolina) and Cuba; depth 88–402 m.

Ithycythara laciniata Fallon sp. nov.
urn:lsid:zoobank.org:act:A84FA74D-3957-478C-9B5A-940FF65B6F4F
Figs 62F, 73U–W

Differential diagnosis

Like *Ithycythara psila* (K.J. Bush, 1885), *Ithycythara laciniata* Fallon sp. nov. is from off the Atlantic coast of the southern US, only a little farther south and in shallower water (44 versus 88 m). Morphologically, it differs in possessing a larger protoconch with 3, not 2½ whorls, a continuous and stronger peripheral cord, and 7 not 6 ribs per whorl.

Etymology

Ithycythara laciniata Fallon sp. nov. derives its name from the feminine form of the Latin adjective '*lacinia* + *at*', meaning 'having a fringe or skirt', a reference to its relatively prominent peripheral spiral.

Type material

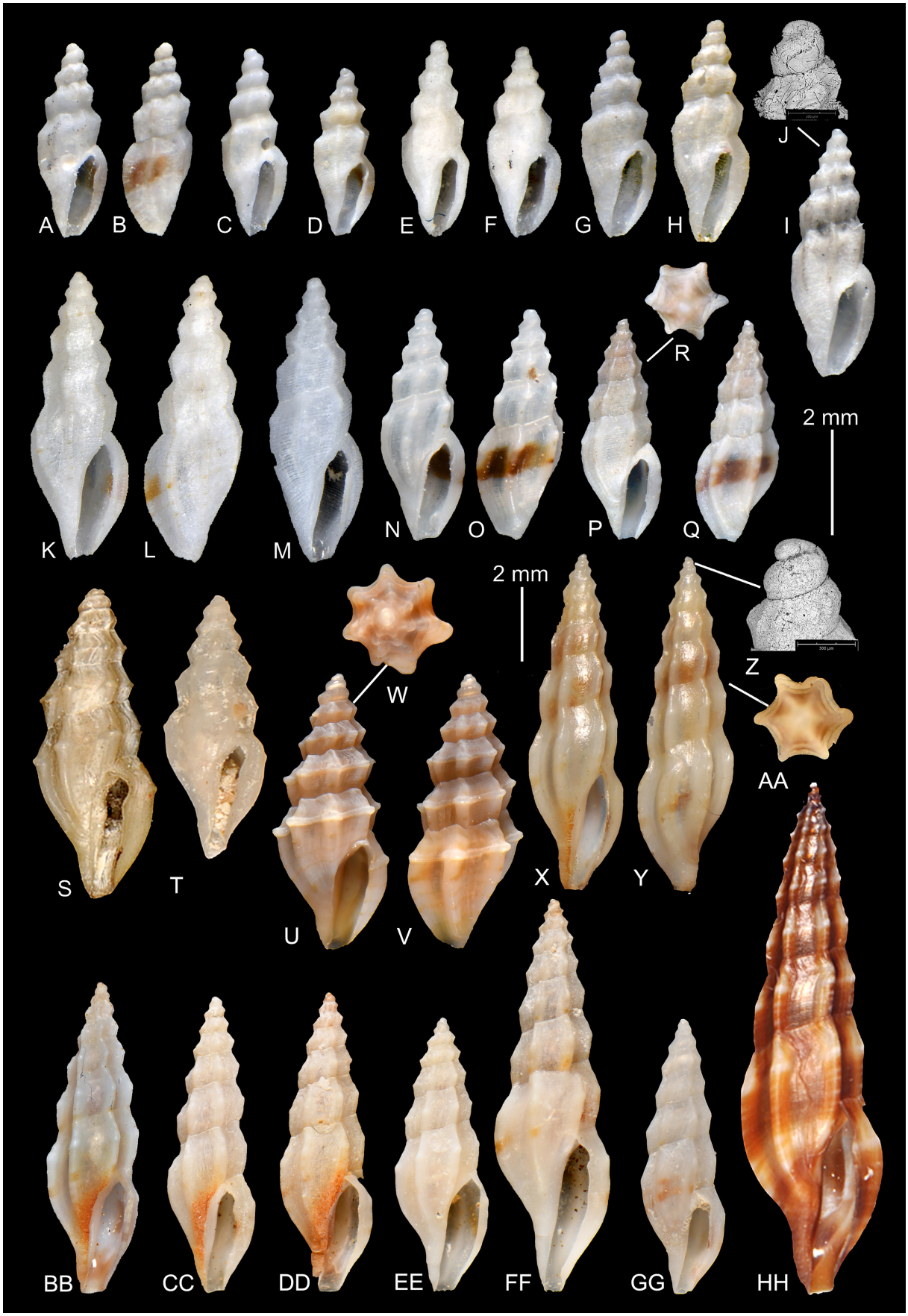
Holotype

UNITED STATES OF AMERICA • 5.2 × 2.1 mm; E Florida, Broward Co., 45 mi. [72 km] ESE of Cape Canaveral; depth 44 m; 26 Aug. 1988; H.G. Lee leg.: from aboard scallop boat; UF 589794.

Paratypes

None.

Fig. 73 (next page). Species of *Ithycythara* Woodring, 1928. Part 7. Upper scale bar for A–W, lower for X–HH. – **A–J**. *Ithycythara bahamense* Fallon sp. nov. **A–B**. Holotype, 3.7 × 1.4 mm, ventral and dorsal views (ANSP 369736), Gold Rock, Grand Bahama Island, Bahamas. **C**. Paratype, 3.6 × 1.3 mm (ANSP 369736), Gold Rock, Grand Bahama Island, Bahamas (type locality). **D**. Paratype, 3.2 × 1.2 mm (ANSP 370846), Borco Pipelines, 5 mi. [8 km] W of Freeport, Grand Bahama Island, Bahamas. **E–F**. Paratypes, 3.7 × 1.4 and 3.7 × 1.5 mm (ANSP 366929), Indian Cay, Grand Bahama Island, Bahamas. **G–H**. Paratypes, 4.0 × 1.5 and 4.2 × 1.7 mm (ANSP 374464), Grand Bahama Island, Bahamas. **I–J**. Paratype, 4.7 × 1.7 mm, ventral view, and SEM image of protoconch (ANSP 371869), Bootle Bay, Grand Bahama Island, Bahamas. This specimen has 7 ribs. – **K–L**. *Ithycythara* unid. sp. S. Spec., 5.5 × 1.4 mm, ventral and dorsal views (ANSP 367898), Lucaya, Grand Bahama Island, Bahamas. – **M**. *Ithycythara* unid. sp. T. Spec., 6.1 × 2.3 mm (ANSP 366929) Indian Cay, Grand Bahama Island, Bahamas. – **N–O**. *Ithycythara* unid. sp. U. Spec., 6.1 × 2.3 mm, ventral and dorsal views (ANSP 498937), Govnor's Harbour, Eleuthera Island, Bahamas. – **P–R**. *Ithycythara* unid. sp. M. Spec., 6.1 × 2.3 mm, dorsal, ventral and apical views (ANSP 498935), off St Augustine, E Florida. – **S–T**. *Mangilia psila* K.J. Bush, 1885. **S**. Holotype, 5.9 × 2.4 mm (USNM 44756), N of Cape Hatteras, North Carolina. **T**. Paralectotype of *Habrocythara cymella* (Dall, 1889a) gen. et comb. nov., 5.0 × 1.9 mm (MCZ 7104), off Bahia Honda, Cuba. This specimen has one less whorl than the holotype and is likely to be this species. – **U–W**. *Ithycythara laciniata* Fallon sp. nov., holotype, 5.2 × 2.1 mm, ventral, dorsal and apical views (UF 589794) 45 mi. [72 km] ESE of Cape Canaveral, Broward Co., E Florida. – **X–HH**. *Ithycythara flemingkeyensis* Fallon sp. nov. **X–AA**. Holotype, 9.1 × 2.7 mm, ventral, dorsal and apical views, and SEM of protoconch (ANSP 498912), W side of Fleming Key, Key West, Florida Keys. **BB–GG**. Paratypes, 8.0 × 2.5, 8.1 × 2.5, 8.4 × 2.6, 7.4 × 2.5, 10.6 × 3.1 and 7.4 × 2.3 mm (USNM 17154444), W side of Fleming Key, Key West, Florida Keys. Growth series of specimens with 7 to 9 whorls. **FF**. Spec., 8.8 × 2.8 mm (P. Fallon coll.), off Egmont Key, Hillsborough Co., W Florida. **HH**. Paratype, 13.9 × 3.6 mm (UF 589796), W side of Fleming Key, Key West, Florida Keys. An exceptionally large (10½ whorls) and colorful specimen. Credits: J, Z: SEM images courtesy of Paul Callomon. Scale bars: A–I, K–Y, AA–HH = 2 mm; J, Z = 300 µm.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Description

Shell small (holotype length = 5.2 mm), fusiform, strong, with 7¾ appressed, undulant whorls, acutely angled, shoulders steep, about ½-whorl height and with a slight hump mid- shoulder. Last whorl about 59% of shell length; aperture a narrow oval short with a short anterior canal, both about 39% of shell length, anterior canal not differentiated from aperture; sculpture of microscopic spirals overall. *Protoconch* of 3 regularly expanding whorls, the first minute at its tip, the 2nd and 3rd with riblets, and the third with a spiral cord between the ends of the riblets and suture of the first teleoconch whorl. *Axial sculpture* of 7 strong ribs per whorl, that extend from suture to suture, not quite aligned but rather offset slightly from whorl to whorl and evanesce on the shell base. Ribs highest mid-whorl, intercalary space concave, about as wide as ribs. *Varix* is like an expanded rib close to the edge of the aperture but behind the anal sinus that extends from the suture and evanesces near the end of the anterior canal. *Spiral sculpture* of a single strong peripheral cord that is lightly swollen on ribs but not diminished between ribs. Microscopic grooves cover the entire teleoconch. *Sulcus* absent. *Outer lip* a thin, narrow strip of shell along the leading edge of the varix, contiguous with the outer edge of the anal sinus and extending to the end of the anterior canal. Dentition absent underneath the lip. *Anal sinus* a round notch on the shoulder, in front of the varix and close to the whorl periphery, with a slightly elevated rim around its edge. *Inner lip* a narrow glaze along the parietal wall and columella that joins the outer lip in a fold at the suture. No anal tooth present. *Columella* straight. *Anterior fasciole* not swollen, sculpted with microscopic grooves and incremental growth lines. *Color* of straw, peripheral cord lighter and columella reddish brown; a faint reddish-brown band just below peripheral cord, and faint yellowish brown spiral lines present, 2 or 3 on spire whorls and 5 on the last.

Remarks

The description of this single specimen is merited on account of its uncommon features: a continuous, rather strong, peripheral cord and 7 ribs per whorl. The peripheral cord of other species in the genus *Ithycythara* is nearly or completely obsolete in intercostal spaces.

Range and habitat

Known only from the type locality.

Ithycythara flemingkeyensis Fallon sp. nov.
urn:lsid:zoobank.org:act:C2213844-1D88-4EAD-AD04-376EA69B4E93
Figs 62G, 73X–HH

Differential diagnosis

Ithycythara decolora Fallon sp. nov. has a more gradual narrowing to the anterior canal, and a protoconch of 3, not 2¼ whorls.

Etymology

Ithycythara flemingkeyensis Fallon sp. nov., the Fleming Key *Ithycythara*, is named after the island near Key West, Florida Keys, which is the type locality.

Type material

Holotype

UNITED STATES OF AMERICA • 9.1 × 2.7 mm; Florida Keys, Key West, W side of Fleming Key; depth 6 m; Dec. 1995; G. Mackintosh leg.; sieved from fine sand in turtle grass; ANSP 498912.

Paratypes (10 specs)
UNITED STATES OF AMERICA • 1 spec., 13.9 × 3.6 mm; Florida Keys, Key West, W side of Fleming Key; depth 6 m; 3 Jan. 1996; G. Mackintosh leg.; night SCUBA; ANSP 498911 • 8 specs, 10.6 × 3.1, 8.0 × 2.5, 8.1 × 2.5, 7.4 × 2.5, 7.3 × 2.5, 7.4 × 2.3, 6.3 × 3.1 and 6.0 × 2.0 mm; Florida Keys, Key West, W side of Fleming Key; depth 6 m; 3 Jan. 1996; G. Mackintosh leg.; night SCUBA; USNM 1715444 • 1 spec., 8.4 × 2.6 mm; Florida Keys, Key West, W side of Fleming Key; depth 6 m; 21 Dec. 1995; G. Mackintosh leg.; night SCUBA; UF 589796.

Other material examined (1 spec.)

UNITED STATES OF AMERICA • 1 spec., 8.8 × 2.8 mm; W Florida, Hillsborough Co., off Egmont Key; depth 15 m; 17 Mar. 1985; dredged on rubble below rock reef; P. Fallon coll.

Description

Shell small (length = 10.2 mm), fusiform, slender (W/L = 0.2967), of 9 glossy whorls; teleoconch whorls have appressed sutures, are obtusely angled with peripheries about mid-whorl; shoulders steeply sloped, flat; whorl sides straight, last whorl well rounded and abruptly narrowed to the anterior canal. Aperture a narrow almost straight-sided oval with a wide anal notch. Sculpture of ribs and a single peripheral cord. *Protoconch* of 2¼ glossy whorls, the first round with a somewhat bulbous tip, the last subcarinate with riblets swollen at periphery on last ¾-whorl; ribs do not reach the abapical suture. *Axial sculpture* of 6 moderately high, narrow ribs per whorl, aligned from whorl to whorl, and run from suture to suture on spire whorls and evanesce by the end of anterior canal on last, intercalary spaces flat. *Varix* is not specialized in form; the last rib serves to strengthen the outer lip. *Spiral sculpture* of a single peripheral cord is obsolete except on ribs, nodules on ribs are weak. Shell otherwise covered with microscopic grooves, strong on ribs, faint in intercalary spaces. *Sulcus* absent. *Outer lip* is a thin band of shell that extends from the suture to the anterior canal, joined at the suture to the inner lip. Dentition includes a weak, almost imperceptible tooth under the varix, followed by a row of lyrae extending to the anterior canal, the last lyra running parallel to the canal. *Anal sinus* is a wide notch in front of the varix offset from the suture, shallow with divergent sides. *Inner lip* ***is*** a narrow band of glazed shell along the columella and parietal wall, joining the outer lip at the suture, margined along its length. *Columella* straight. *Anterior canal* of moderate length turned slightly to the right at its end, when viewed ventrally; unnotched. *Anterior fasciole* is not swollen, sculpted with growth lines left by previous canal ends. *Color* a yellowish-white base with an intermittent, broad, mid-whorl band, and faint spiral lines of the same color elsewhere; anterior canal and fasciole similarly colored; spiral cord white.

Remarks

The average length of 12 specimens is 8.4 mm (range = 6.0–13.9 mm). The expression of this species' potential color pattern is especially vivid on the exceptionally large specimen shown in Fig. 73HH.

Range and habitat

United States (Florida Keys, W Florida); depth 6–15 m (live depth 6 m).

Ithycythara spp. Part 8

Ithycythara unid. sp. A
Fig. 74A–E

Differential diagnosis

This species is among the smallest of the genus *Ithycythara*.

Material examined (2 specs)

GUADELOUPE • 1 spec., 3.5 × 1.5 mm; off Anse à la Barque; 16°05.4′ N, 61°46.5′ W; depth 50 m; 10 May 2012; KARUBENTHOS 2012; stn GD15; MNHN-IM-2000-39793.

UNITED STATES OF AMERICA • 1 spec., 3.9 × 1.6 mm; offshore of Louisiana; 28°5.85′ N, 91°1.28′ W; depth 68.3 m; 3 Jul. 2003; E.F. García leg.; dredged from aboard R/V *Pelican*, ex coll. E.F. García 24617; ANSP 498810.

Partial description

Shell very small (lengths = 3.5 and 3.9 mm), stoutly fusiform, of 7 appressed whorls, teleoconch whorls angled slightly below mid-whorl, spire short and last whorl nearly globular above a short anterior canal, aperture oval with a rib-like apertural varix not much stronger than the preceding rib. *Protoconch* of 3¼ whorls with arched riblets on the last. *Axial sculpture* of 7 ribs that extend from suture to suture and align from whorl to whorl and extend to anterior fasciole on last. *Spiral sculpture* of a single peripheral cord, obsolete except on rib crests; microscope grooves present overall.

Remarks

The 2 specimens are not well preserved, the larger has an immature lip and the surface of the smaller is eroded obscuring the protoconch and microsculpture, hence neither is suitable for a full description.

Ithycythara clathrata Fallon sp. nov.
urn:lsid:zoobank.org:act:90F8ECB8-D6ED-43B3-914D-0AE3920FFE96
Figs 64A, 74F–K

Differential diagnosis

Ithycythara moratensis Fallon sp. nov. has a protoconch of 2¼ whorls (versus 2¾–3), broader ribs, and is colored differently.

Ithycythara beta Fallon sp. nov. has higher, narrower ribs, has a protoconch with slightly more whorls (3¼ versus 2¾ to 3), and is colored differently.

Ithycythara cuna Fallon sp. nov. has a translucent (versus opaque white) shell, proportionally broader ribs, and is colored differently (translucent white, upper portion of whorls faintly shaded with yellowish-brown versus ivory white with 2 brownish-orange spiral bands: mid-whorl and at the margin of the anterior fasciole).

Ithycythara lactea Fallon sp. nov. is larger, has fewer protoconch whorls (2¼ versus 2¾–3). And is colored differently.

Etymology

Ithycythara clathrata Fallon sp. nov., from the feminine form of the Latin adjective '*clathrus* + *at*', which means 'having bars,' is named for the broad orange spiral bands that characterize this species.

Type material

Holotype

UNITED STATES OF AMERICA • 9.0 × 3.0 mm; E Florida, Palm Beach Co., off Palm Beach; depth 131 m; 10 Dec. 1982; R.M. Kurz leg.; dredged; UF 589810.

Paratypes (2 specs)

MEXICO • 1 spec., 7.0 × 2.4 mm, sub-adult; Gulf of Mexico, off Campeche; 20°52.40′ N, 92°24.83′ W; depth 77–81 m; 10 Jun. 2005; E.F. García leg.; dredged in mud; UF 589811.

UNITED STATES OF AMERICA • 1 spec., 9.0 × 3.1 mm, surface eroded; NW Florida, Gulf Co., SSW of Cape San Blas; depth 240 ft [73 m]; 1968; dredged, EFG 17298; ANSP 498808.

Description

Shell small (holotype length = 9.0 mm), strong, surface glossy, fusiform (W/L = 0.3333) of 8¾ whorls total, teleoconch whorls obtusely angled about mid-whorl, the last whorl 61% of shell length tapered to an anterior canal of medium length; aperture narrowly oval only slightly wider than the anterior canal, both about 48% of shell length; sculpture of strong ribs and a mid-whorl spiral cord. *Protoconch* of 2¾–3 glossy, evenly expanding whorls, the first recumbent, the last ¾-whorl with strong arched riblets. *Axial sculpture* of 6 strong ribs aligned whorl to whorl that run from suture to suture on spire whorls and to anterior fasciole on the last; intercostal space is slightly concave and about twice as wide as ribs. *Varix* apertural, larger than preceding rib and leans toward aperture rather than perpendicular to shell axis as are other ribs, extends from suture to anterior canal in a smooth arc, and is aligned with penultimate whorl rib. *Spiral sculpture* of microscopic spiral grooves and a single peripheral cord present only on rib crests. obsolete between. *Sulcus* absent. *Outer lip* a thin strip of shell that extends along the base of the varix from the suture to the anterior canal, edge chipped but a portion of a narrow axial fold present, tooth present at the base of the anal sinus and lyrae along the underside of the varix. *Anal sinus* a round notch in front of the varix, its apex about mid-shoulder, its sides divergent. *Inner lip* a narrow glaze along the columella and parietal wall that extends to the suture, where it joins the outer lip in a fold; edge margined, and anal tooth present. *Anterior canal* narrow, of medium length and turned slightly to the right, viewed ventrally, end unnotched. *Anterior fasciole* not swollen, surface sculpted with incremental growth lines and microscopic grooves. *Color* ivory white with 2 brownish-orange spiral bands: mid-whorl and at the margin of the anterior fasciole. The mid-whorl band is exposed on spire whorls.

Range and habitat

United States (E Florida, NW Florida), Mexico (off Campeche, Gulf of Mexico); depth 73–131 m.

Ithycythara hyacinthina Fallon sp. nov.

urn:lsid:zoobank.org:act:78BC28B5-4C29-4B62-BEF9-D92EF476D29A

Fig. 74L–U

Differential diagnosis

Ithycythara lanceolata (C.B. Adams, 1850) is similar but is usually 7-sided rather than 6-sided, has more distinctive light and dark shell banding, different coloration, and a different rib profile. Most specimens of *I. hyacinthina* Fallon sp. nov. have a shorter spire than *I. lanceolata* (39% versus 43% of shell length for holotype versus lectotype, respectively).

Ithycythara kellumi Fargo, 1953, (a Caloosahatchee fossil) is smaller (largest of 16 = 7.1 mm versus an average of 7.5 mm of 33) and has narrower ribs. This species is not treated in this work.

Etymology

Ithycythara hyacinthina Fallon sp. nov. derives from the feminine form of the Latin adjective '*hyacinthinus*', meaning 'hyacinth-colored'. This term refers to the violet hues of the hyacinth, particularly evident on the shell base.

Type material

Holotype

UNITED STATES OF AMERICA • 10.2 × 3.3 mm; E Florida, St. Johns Co., 40–45 mi. [64–72 km] E of Ponte Vedra; depth 40–46 m; 12 Mar. 1988; H.G. Lee leg.; trawled, ex batfish stomachs; UF 589812.

Paratypes (22 specs)

UNITED STATES OF AMERICA • 3 specs, 8.9 × 3.3, 9.0 × 3.2 and 8.2 × 2.8 mm; same data as for holotype; UF 589813 • 10 specs, 8.6 × 2.7, 8.5 × 2.8, 7.7 × 2.7, 7.4 × 2.4, 8.3 × 2.6, 7.0 × 2.4, 7.2 × 2.4, 6.6 × 2.5, 6.5 × 2.4 and 5.9 × 2.1 mm; between Marquesas Keys and Dry Tortugas; depth 35–40 ft [11–12 m]; prior to 1981; Wayne Sadler; trawled, ex batfish stomachs; ANSP 482220B • 2 specs, 10.7 × 3.2 and 8.6 × 2.8 mm; Florida Keys, off Dry Tortugas; depth 20–30 m; 1972–1973; trawled, ex batfish stomachs; USNM 1715453 • 1 spec., 5.9 × 2.1 mm; Florida Keys, off Dry Tortugas; depth 20–30 m; 1972–1973; trawled, ex batfish stomach; USNM 1715454 • 2 specs, 7.5 × 2.4 and 6.0 × 2.1 mm; Florida Keys, off Dry Tortugas; depth 20–30 m; 1972–73; trawled, ex batfish stomachs; ANSP 498921 • 4 specs, 8.3 × 2.7, 7.0 × 2.5, 6.7 × 2.1 and 5.5 × 1.8 mm; Florida Keys, off Dry Tortugas; depth 20–30 m; ex batfish stomachs; USNM 1715455.

Other material examined (49 specs)

An additional 49 specimens, not in the type series, are this species:

UNITED STATES OF AMERICA • 43 specs, not measured; between Marquesas Keys and Dry Tortugas; depth 35–40 ft [11–12 m]; prior to 1981; Wayne Sadler; trawled, ex batfish stomachs; ANSP 482220A • 1 spec., 8.3 × 3.0 mm; E Florida, Dade Co., Miami, due E of Government Cut; depth 55 m; May 1957; University of Miami leg.; dredged; UF 589815 • 4 specs, 5.7 × 2.2, 5.3 × 2.1, 5.2 × 2.0 and 4.8 × 1.9 mm, juveniles; E Florida, Duval Co., Jacksonville Beach, 16th Ave. S; depth 0 m; Nov. 1981; Norma Bulock leg.; beach drift; UF 589814 • 1 spec., 5.4 × 2.0 mm; W Florida, Hillsborough Co., off Egmont Key; depth 50 ft [15 m]; 17 Mar. 1985; dredged in rubble below rock reef; ANSP 498922.

Description

Shell small (length = 10.2 mm), stoutly fusiform (W/L = with 8¾ whorls altogether, the last whorl 61% of shell length; teleoconch with obtusely angled whorls, with medial to sub-medial peripheries. Shoulders steep and flat with a slight central hump, whorl sides straight. Aperture short, oval, with short anterior canal, together about 41% of shell length. Sculpture of spiral primaries, the middle one strongest, all obsolete except on rib crests, and microscopic spiral grooves. *Protoconch* of about 2½ glossy, evenly expanding whorls, beginning round and smooth then the last bulging, with arched, opisthocline riblets swollen medially. Riblets do not reach the suture; a supra-sutural spiral thread present in the smooth band below the riblets. *Axial sculpture* of 6 low, strong, narrow ribs per whorl extending from suture to suture and aligned whorl-to-whorl on the spire and evanescent to the anterior fasciole on the shell base. *Varix* none; an apertural rib, aligned with the corresponding rib on the penultimate whorl serves to strengthen the outer lip. *Spiral sculpture* of 3 or 4 faint, flattened, indistinct primaries that override ribs, the medial one peripheral and strongest, all slightly nodulose on crests, obsolete in intercostal space. Microscopic grooves cover the shell surface. *Sulcus* none. *Outer lip* varicose, the last rib, the strongest, with a narrow strip of shell extending out from its base, extending from the suture to the beginning of the anterior canal, without dentition, without a stromboid notch. *Anal sinus* area chipped on holotype; on paratypes, it is a

wide, shallow notch set off a short distance from the suture and extending to the end of the shoulder with divergent sides. *Inner lip* a narrow glaze along the columella and parietal wall and joins the outer lip at the suture, without dentition. *Columella* is slightly sigmoid. *Anterior canal* short, narrow, and straight, end unnotched. *Anterior fasciole* not swollen, marked with growth increments and microscopic spiral grooves. *Color* pattern of faint reddish brown spiral bands below periphery, violet parietal area mixed with an overall shell color of yellowish cream and violet undertones, and a reddish brown apex.

Remarks

None of the 72 examined specimens had apertural teeth or a varix.

The average length of 33 specimens is 7.5 mm (range=4.8–11.9 mm).

Range and habitat

United States (E Florida, Florida Keys, W Florida); depth 11–55 m.

Ithycythara gypsata Fallon sp. nov.
urn:lsid:zoobank.org:act:44A7ED57-3F67-467E-8E15-2C72BA42AAEF
Fig. 74V–BB

Differential diagnosis

Ithycythara lactea Fallon sp. nov. has a protoconch of 2¼ versus 3–3¼ whorls, has angled, not turreted whorls, and is a different color.

Ithycythara galindoae Fallon & Bouchet sp. nov. has a protoconch of 2½ versus 3–3¼ whorls, has upturned peripheral nodules and more concave shoulders, narrower ribs, and is smaller, 6.6 versus 9.8 mm average length.

Ithycythara fusiformis Fallon sp. nov. has a protoconch of 2½ versus 3–3¼ whorls, has a peripheral spiral cord, and is smaller, 6.7 versus 9.8 mm average length.

Ithycythara arawak Fallon & Bouchet sp. nov. has a protoconch of 2¼ versus 3–3¼ whorls, whorls that are angulate, not turreted, slightly upturned nodules at peripheries, and a less bulging varix.

Ithycythara ellenstrongae Fallon & Bouchet sp. nov. has shoulders with a slightly greater slope, less angular whorls (more obtuse), and a last whorl proportionally larger (65 versus 61% of shell length).

Etymology

Ithycythara gypsata Fallon sp. nov., from the feminine form of the Latin adjective '*gypsatum*', which means 'gypsum-covered' and references the color of this species.

Type material

Holotype

UNITED STATES OF AMERICA • 12.5 × 4.5 mm; W Florida, Bay Co., SW of Panama City; depth 180 ft [55m]; Aug. 1963; J. Moore leg.; dredged; R/V *Cavalier*; UF 589816.

Paratypes (6 specs)

UNITED STATES OF AMERICA • 6 specs, 12.3 × 4.5, 10.2 × 3.8, 9.5 × 3.5, 9.0 × 3.2, 6.8 × 2.9 and 8.3 × 2.9 mm; same data as for holotype; UF 589817.

Description

Shell small (length = 12.5 mm), glossy, thick, whorls turreted (W/L = 0.3600), the last about 61% of shell length. About 9 whorls total, teleoconch whorls undulant over previous whorl's ribs, with about 45° sloping, flat to slightly concave shoulders, straight on whorl sides. Aperture an elongate oval, with a short canal anteriorly, together about 44% of shell length. Surface sculpture of six strong ribs per whorl, aligned and run suture to suture with microscopic spiral grooves overall. *Protoconch* of 3–3¼ whorls, the first minute, the first 1½ whorls disproportionally smaller than the last 1½-whorls, the latter have arched riblets, fine at first then ending strong and not reaching the abapical suture. The riblets of the last whorl do not reach the abapical suture. *Axial sculpture* of 6 strong but relatively low and narrow ribs per whorl that are aligned and run from suture to suture and evanesce at the anterior fasciole; intercostal space flat and about 2x the width of ribs. *Varix* strong, near edge of the apertural lip, bulging out from line of spire, shouldered like preceding ribs, then extends from suture to end of the anterior canal in a smooth arc. *Spiral sculpture* without a visible peripheral cord, though rib peripheries are nodulose, and of closely spaced microscopic secondaries overall. *Sulcus* absent. *Outer lip* is a narrow strip of shell along the base of the varix extending from the suture to the anterior canal. Dentition of a strong anal tooth and row of lyrae on the underside of the varix. *Anal sinus* a deep round notch mid-way on shoulder and angled laterally, with a slightly elevated rim around its edge and parallel sides. *Inner lip* a narrow glaze along the columella and parietal surface, joins outer lip at suture, with an anal tooth. *Columella* is slightly sigmoidal. *Anterior canal* short, turned to the right when viewed ventrally, end unnotched. *Anterior fasciole* not swollen but twisted from course of anterior canal, marked with incremental growth lines. *Color* white with a faint, intermittent, mid-whorl, brownish yellow spiral band that shows above the suture line on spire whorls.

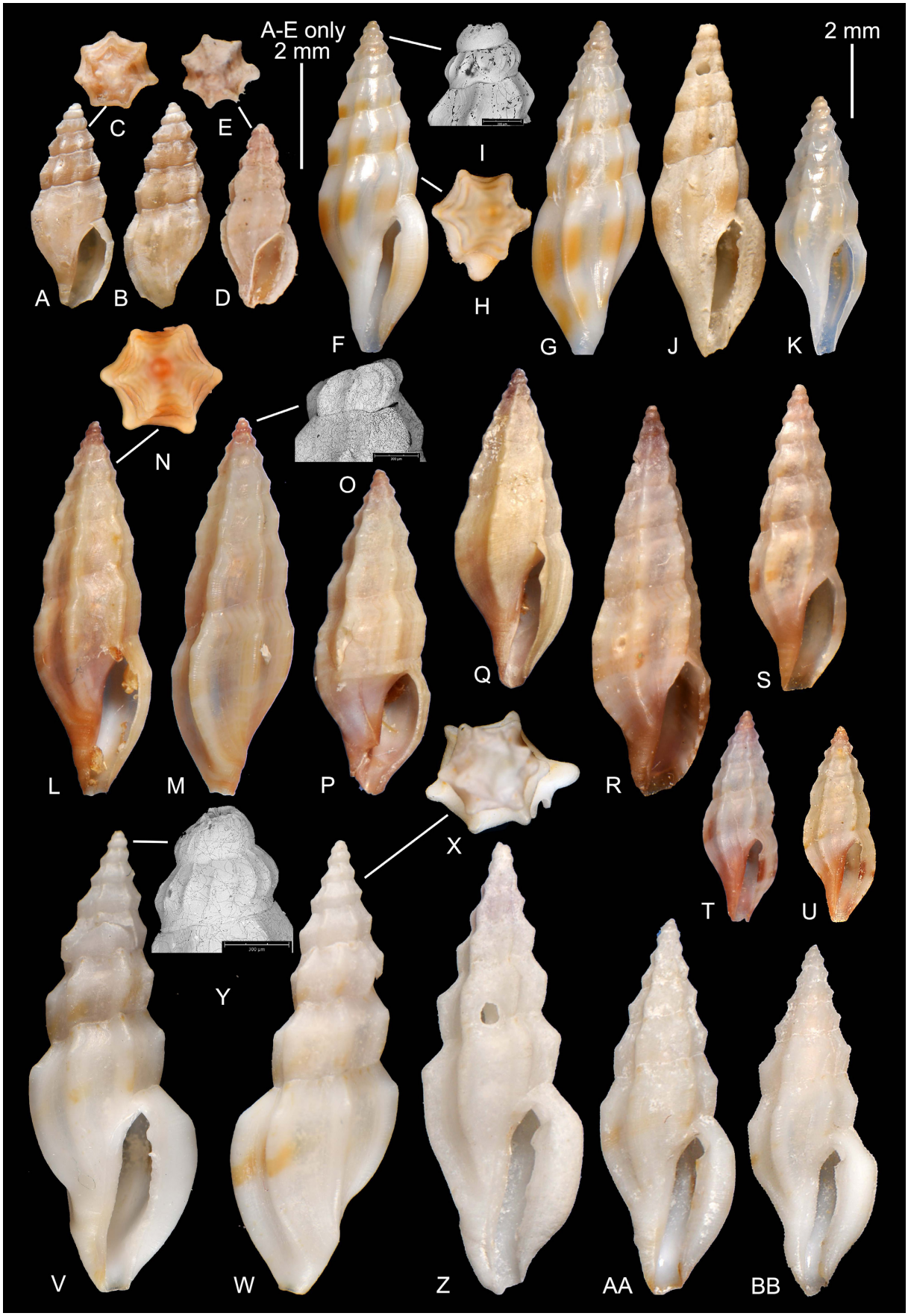
Remarks

The average length of 7 specimens is 9.8 mm (range = 8.3–12.5 mm). The presence, width, and intensity of the brown mid-whorl band may vary among specimens, and some specimens may be a light golden brown.

Range and habitat

Known only from the type locality.

Fig. 74 (next page). Species of *Ithycythara* Woodring, 1928. Part 8. – **A–E**. *Ithycythara* unid. sp. A. **A–C**. Spec., 3.9 × 1.6 mm, ventral, dorsal and apical views (ANSP 498810), offshore Louisiana. **D–E**. Spec., 3.5 × 1.5 mm, ventral and apical views (MNHN-IM-2000-39793), off Anse à la Barque, Guadeloupe. – **F–K**. *Ithycythara clathrata* Fallon sp. nov. **F–I**. Holotype, 9.0 × 3.0 mm, ventral, dorsal and apical views, and SEM of protoconch (UF 589810), off Palm Beach, Palm Beach Co., E Florida. **J**. Paratype, 9.0 × 3.1 mm, surface eroded (ANSP 498808), SSW of Cape San Blas, Gulf Co., NW Florida. **K**. Paratype, 7.0 × 2.4 mm, sub-adult (UF 589811), off Campeche, Mexico, Gulf of Mexico. – **L–U**. *Ithycythara hyacinthina* Fallon sp. nov. **L–O**. Holotype, 10.2 × 3.3 mm, ventral, dorsal and apical views, and SEM of protoconch (UF 589812), E of Ponte Vedra, St Johns Co., E Florida. Protoconch tip eroded off but riblets on last whorl visible. **P–Q**. Paratypes, 8.9 × 3.3 and 9.0 × 3.2 mm (UF 589813), E of Ponte Vedra, St Johns Co., E Florida. **R**. Paratype, 10.7 × 3.23 mm (USNM 1715453), off Dry Tortugas, Florida Keys. **S**. Paratype, 8.3 × 2.7 mm (USNM 1715455), off Dry Tortugas, Florida Keys. **T**. Paratype, 6.0 × 2.1 mm (ANSP 498921), off Dry Tortugas, Florida Keys. **U**. Spec., 5.4 × 2.0 mm (ANSP 498922), off Egmont Key, Hillsborough Co., W Florida. – **V–BB**. *Ithycythara gypsata* Fallon sp. nov. **V–Y**. Holotype, 12.5 × 4.2 mm, ventral, dorsal and apical views, and SEM of protoconch (UF 589816), SW of Panama City, Bay Co., W Florida. **Z–BB**. Paratypes, 12.3 × 4.5, 10.2 × 3.8, 9.5 × 3.5 mm (UF 589817), SW of Panama City, Bay Co., W Florida, the type locality. Credits: : I, O, Y: SEM images courtesy of Paul Callomon. Scale bars: A–H, J–N, P–X, Z–BB = 2 mm; I, O, Y = 300 µm.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Ithycythara spp. Part 9

Ithycythara lactea Fallon sp. nov.
urn:lsid:zoobank.org:act:8E1FE147-B82F-44CB-BE52-D63EE6311393
Fig. 75A–H

Differential diagnosis

This species differs from the similar *Ithycythara ellenstrongae* Fallon & Bouchet sp. nov.in the following ways: it lacks the prominent outer lip tooth below the anal sinus; and the first whorl is proportionally less of the shell height (spire is higher).

Ithycythara moratensis Fallon sp. nov. has stronger ribs and is colored differently.

Ithycythara gypsata Fallon sp. nov. has a protoconch of 3–3¼ versus 2¼ whorls, has turreted, not angled whorls, and is a different color.

Etymology

Ithycythara lactea Fallon sp. nov. is derived from the feminine form of the Latin adjective '*lacteus*', referencing the color and texture of the types.

Type material

Holotype
UNITED STATES OF AMERICA • 11.5 × 3.8 mm; W Florida, Hillsborough Co., W of Egmont Key; depth 37 m; Jun. 1968; J. Moore leg.; dredged; R/V *Cavalier*; UF 589818.

Paratypes (4 specs)
UNITED STATES OF AMERICA • 3 specs, 12 × 3.6, 10.6 × 3.0 and 9.1 × 3.0 mm; same data as for holotype; UF 589819 • 1 spec., 10.5 × 3.2 mm; W Florida, Lee Co., off Sanibel Island; dredged, ex E.F. García coll. 12698; ANSP 498809.

Other material examined (1 spec.)

UNITED STATES OF AMERICA • 1 spec., 10.5 × 3.3 mm; Gulf of Mexico, off W Florida; depth 91 m; 1962; dredged; ANSP 498924.

Description

Shell small (holotype length = 11.5 mm), thin with a glossy smooth surface, narrowly fusiform (W/L = 0.3304), whorls obtusely angled with steep, flat shoulders longer than sides, which are slightly convex, intercostal spaces concave, the last whorl convex, 61% of shell length, tapering sharply to a moderately long anterior canal; aperture narrowly oval, only slightly wider than the anterior canal, both about 43% of shell length. *Protoconch* of about 2¼ whorls, the first round with a recumbent tip, the second slightly dorsoventrally compressed, with arched riblets on about the last ½ whorl that do not reach the abapical suture. *Axial sculpture* of 6 ribs per whorl extending from suture to suture and aligned whorl-to-whorl then extending to the inner lip on base of last whorl, their profile resembling a weak curly bracket, "}", with a small nodule occurring mid-whorl. *Varix* aligned with the corresponding penultimate rib whorl and positioned after the last rib. *Spiral sculpture* of a single peripheral cord, obsolete in intercostal space, that overrides rib crests as a small round nodule. Microscopic scratches present. *Sulcus* none. *Outer lip* of thin new shell out from the varix in a low arc from the anal sinus to the stromboid notch, with an anal tooth and a row of lyrae underneath the varix, lyrae are oblique

to the shell axis and extend to the shallow stromboid notch. *Anal sinus* a round notch on the shoulder close to the whorl periphery and in front of the varix. *Inner lip* a narrow glaze along the parietal wall and columella with a small tooth at the anal sinus and low callus midway on the columella. *Columella* straight. *Anterior canal* of moderate length, narrow, and twisted to the right when viewed ventrally, end skewed and slightly notched. *Anterior fasciole* is not swollen, without spirals, only incremental growth lines and rib terminations. *Color* translucent to opaque white.

Remarks

The average length of 6 specimens is 10.7 mm (range = 9.1–12.0 mm).

Range and habitat

United States (off W Florida); depth 37–91 m.

Ithycythara alpha Fallon sp. nov.
urn:lsid:zoobank.org:act:144C56C5-A66F-4127-A05B-31B882F5A4DC
Figs 64E, 75I–P

Differential diagnosis

Ithycythara alpha Fallon sp. nov., unlike other brown-banded species, has a band that is mostly obsolete except on the outer lip.

Ithycythara bugeae Fallon & Bouchet sp. nov. has a different protoconch, a median keel on the last ¼-whorl versus the entire whorl, is smaller, has a shorter anterior canal, and weaker apertural teeth.

Ithycythara angulata Fallon & Bouchet sp. nov. protoconch has riblets on the last ½-whorl, not the entire whorl, is larger, and has weaker apertural teeth.

Etymology

Ithycythara alpha Fallon sp. nov., the alpha *Ithycythara*, a temporary epithet applied by Emilio García to one of two common species in Gulf of Mexico samples, is made permanent here. Additionally, it serves as a noun in apposition. Another species is named *I. beta* Fallon sp. nov., which is described herein.

Type material

Holotype

MEXICO • 9.7 × 3.1 mm; off Campeche; 20°51.16′ N, 92°26.28′ W; depth 93–94 m; 10 Jun. 2005; E.F. García leg.; dredged on granular sediment from aboard R/V *Pelican*; ANSP 498803.

Paratypes (48 specs)

MEXICO • 5 specs, 9.2 × 3.1, 8.1 × 2.7, 8.4 × 2.8, 9.5 × 2.8 and 7.7 × 2.6 mm; same data as for holotype; USNM 1715440 • 5 specs, 8.0 × 2.5, 6.2 × 2.3, 6.1 × 2.2, 5.4 × 1.9 and 4.8 × 1.9 mm; Gulf of Mexico; 20°00.35′ N, 92°26.10′ W; depth 73–77 m; 11 Jun. 2005; E.F. García leg.; dredged on a very muddy bottom; UF 589820 • 4 specs, 7.3 × 2.4, 5.5 × 2.2, 5.3 × 2.1 and 4.9 × 2.0 mm; off Campeche; 20°52.40′ N, 92°24.83′ W; depth 77–81 m; 10 Jun. 2005; E.F. García leg.; dredged in mud; UF 589821 • 1 spec., 6.2 × 2.4 mm; Campeche Bank, off Arcas Cays; depth 73–77 m; 2005; dredged; USNM 1715439 • 5 specs, 6.1 × 2.3, 5.4 × 2.0, 5.0 × 2.0, 5.0 × 1.9 and 4.8 × 1.9 mm; Campeche Bay, Arcas Cays; depth 73–77 m; Jun. 2005; E.F. García leg.; dredged; ANSP 498804 • 9 specs, 8.0 × 2.9, 6.2 × 2.2, 7.5 × 2.8, 6.8 × 2.3, 6.1 × 2.2, 6.8 × 2.3, 5.4 × 2.0, 5.4 × 2.3 and 4.5 × 1.8 mm; off Campeche; 20°51.16′ N, 92°26.28′ W; depth

93–94 m; 10 Jun. 2005; E.F. García leg.; dredged from aboard R/V *Pelican* on granular sediment; UF 589822 • 8 specs, 8.1 × 2.6, 8.1 × 2.8, 7.6 × 2.5, 7.9 × 2.6, 7.5 × 2.6, 7.6 × 2.5, 7.5 × 2.5 and 7.0 × 2.5 mm; off Campeche; 20°52.40′ N, 92°24.83′ W; depth 77–81 m; 10 Jun. 2005; E.F. García leg.; dredged from aboard R/V *Pelican* in mud; EFG 26579 • 6 specs, 7.9 × 2.9, 7.9 × 2.7, 7.4 × 2.7, 7.4 × 2.5, 7.1 × 2.4 and 7.6 × 2.8 mm; offshore; 20°51.49′ N, 92°21.44′ W; depth 63–65 m; 24 Nov. 1996; E.F. García leg.; dredged from aboard R/V *Pelican*; EFG coll. 26561 • 1 spec., 8.0 × 2.9 mm; offshore; 22°20.00′ N, 90°49.43′ W; depth 84–89 m; 18 Jun. 2005; E.F. García leg.; dredged from aboard R/V *Pelican*; EFG 26580.

UNITED STATES OF AMERICA • 3 specs, 7.8 × 2.6, 7.4 × 2.7 and 6.5 × 2.2 mm; off Alabama; 29°27.32′ N, 86°117.32′ W; depth 51 m; 24 Nov. 1996; E.F. García leg.; dredged from aboard R/V *Pelican*; EFG 16999 • 1 spec., 8.1 × 2.9 mm; off Mississippi; 28°37.86′ N, 89°33.35′ W; depth 68–104 m; E.F. García leg.; in gravely mud from aboard R/V *Pelican*; EFG 28284.

Description

Shell small (holotype length = 9.7 mm), thin, translucent with a glossy surface, narrowly fusiform, whorls obtusely angled mid-whorl with high, narrow ribs, the last whorl 59% of shell length tapering to a moderately long anterior canal; aperture narrowly oval only slightly wider than the anterior canal, both about 41% of shell length; sculpture of high narrow ribs and a mid-whorl spiral cord. *Protoconch* of about 3½ glossy-smooth whorls, the first minute, protruding, the second only a little larger than the first, the third much larger and carinated by riblets swollen bead-like mid-whorl. *Axial sculpture* of narrow ribs, 6 per whorl, that run from suture to suture on spire whorls and to anterior fasciole on last; ribs acutely angled on first 3 whorls then obtusely angled afterwards, are flat to slightly concave on shoulder, flat below on early whorls, convex on the penultimate and last whorls. *Varix* is the last rib on the body whorl slightly stronger than the previous but otherwise the same. *Spiral sculpture* of a single peripheral cord that overrides ribs forming nodules on rib crests, cord weak on rib sides and weaker in intercostal space of all but the last two whorls where it is obsolete. Fine microscopic grooves present on whorl sides, absent on anterior portion of shell base and on fasciole. *Sulcus* absent. *Outer lip* is thin, extends up from the base of the last rib, its edge tracing a low arc from the anal sinus to the anterior canal with a slight indentation of a stromboid notch. A tooth is present on the underside of the last rib just below the anal sinus, and a row of faint lyrae anterior to the tooth ending at the stromboid notch. *Anal sinus* a round notch in outer lip on shoulder near whorl periphery and in front of the last rib. *Inner lip* a narrow glaze along the columella and parietal wall, margined, a large tooth present about midway along the columella. *Columella* slightly sinusoidal from the parietal wall to the anterior canal. *Anterior canal* of medium length curved to the right and bent slightly to the right at its tip when viewed ventrally; unnotched. *Anterior fasciole* not swollen, smooth except for growth lines. *Color* translucent milky white, with a brown band remnant on the outer lip below whorl periphery.

Remarks

The average length of 49 specimens is 7.1 mm (range = 4.5–9.7 mm).

Range and habitat

Mexico, United States (Mississippi, Alabama, NW Florida); depth 51–104 m.

Ithycythara beta Fallon sp. nov.
urn:lsid:zoobank.org:act:4BEE9A4A-0CBB-4F4F-849C-25D3B699C549
Figs 62H, 75Q–Z

Differential diagnosis

Ithycythara decolora Fallon sp. nov. has a shorter anterior canal, a protoconch of only 3 whorls, not 3¼ whorls, the last of which is not subcarinate, a weaker varix, and is colored differently.

Ithycythara clathrata Fallon sp. nov. has lower, broader ribs, has a protoconch with slightly fewer whorls (2¾ to 3 versus 3¼), and is colored differently.

Ithycythara lactea Fallon sp. nov. is larger, has fewer protoconch whorls (2¼ versus 3¼), and is colored differently.

Etymology

Ithycythara beta Fallon sp. nov., the 'beta *Ithycythara*', a temporary epithet applied by Emilio García to one of two common species in Gulf of Mexico samples, is made permanent here. Additionally, it serves as a noun in apposition. Another species is named *I. alpha* Fallon sp. nov. herein.

Type material

Holotype
MEXICO • 9.1 × 3.2 mm; off Campeche; 20°52.40′ N, 92°24.83′ W; depth 77–81 m; 10 Jun. 2005; E.F. García leg.; dredged on mud from aboard R/V *Pelican*; ANSP 498805.

Paratypes (12 specs)
MEXICO • 2 specs, 6.0 × 2.3 and 5.8 × 2.3 mm; same data as for holotype; ANSP 489806 • 2 specs, 6.6 × 2.6 and 5.6 × 2.3 mm; off Campeche; 20°00.35′ N, 92°26.10′ W; depth 73–77 m; 11 Jun. 2005; E.F. García leg.; dredged on very muddy bottom; UF 589823 • 4 specs, 10.3 × 3.1, 6.8 × 2.6, 6.5 × 2.5 and 6.2 × 2.4 mm; off Campeche; 20°00.35′ N, 92°26.10′ W; depth 73–77 m; 11 Jun. 2005; E.F. García; dredged from aboard R/V *Pelican* on a very muddy bottom; ANSP 498807 • 2 specs, 7.5 × 2.9 and 6.2 × 2.4 mm; off Campeche; 20°51.165′ N, 92°26.26′ W; depth 93–94 m; 10 Jun. 2005; E.F. García leg.; dredged on granular sediments from aboard R/V *Pelican*; EFG 26583 • 2 specs, 5.9 × 2.3 and 5,6 × 2.0 mm; off Campeche; 20°51.49′ N, 92°21.44′ W; depth 63–65 m; 10 Jun. 2005; E.F. García leg.; dredged on mud from aboard R/V *Pelican*; EFG 26582.

Other material examined (3 specs)

UNITED STATES OF AMERICA • 1 spec., 11.0 × 3.6 mm; offshore; 27°56.835′ N, 92°01.464′ W to 27°56.594′ N, 92°01.049′ W; Louisiana; 26 Aug. 2012; E.F. García leg.; dredged from aboard R/V *Pelican*; EFG 30782 • 1 spec., 8.4 × 3.3 mm; off Louisiana, Alabama/Miss.; 29°20.5′ N, 87°44′ W; depth 115 m; 15 Oct. 1994; E.F. García leg.; dredged from aboard R/V *Pelican*; EFG 14653 • 1 spec., 6.9 × 2.6 mm; offshore; 26°03.439′ N, 92°26.978′ W; depth 63–65 m; E.F. García leg.; dredged, from aboard R/V *Pelican*; EFG 23314.

Description

Shell small (holotype length = 9.1 mm), solid, with a glossy surface, fusiform, of 8½ impressed, undulant whorls, with high, narrow ribs obtusely angled slightly below mid-whorl, the last whorl 63% of shell length tapering to a moderately long anterior canal; aperture narrowly oval only slightly wider than the anterior canal, both about 45% of shell length. *Protoconch* of about 3¼ glossy whorls, the first minute, then regularly expanding, the last 2 whorls with riblets that become stronger advancing to the end of

the protoconch. Riblets do not reach the abapical suture. *Axial sculpture* of strong narrow ribs, 6 per whorl, that are aligned and run from suture to suture on spire whorls and to inner lip on base of last; ribs obtusely angled, flat on shoulder, flat and slightly angled into suture below. *Varix* is apertural and much stronger than the previous rib, extending in a smooth arc from the suture to near the end of the anterior canal. *Spiral sculpture* of a single peripheral cord that overrides rib crests, nodulose on crests and obsolete in intercostal space. Surface of shell densely covered with microscopic grooves, crests of ribs minutely crenulated by grooves. *Sulcus* absent. *Outer lip* thin, narrow shell at the base of the varix from the suture to the anterior canal. A strong anal tooth present on the underside of the last rib just below the anal sinus, and a row of strong lyrae anterior to the tooth ending at the anterior canal. *Anal sinus* is a round notch in outer lip on shoulder near whorl periphery and in front of the last rib. *Inner lip* a narrow glaze along the columella and parietal wall, margined, a small tooth at the anal sinus and a low fold midway along the columella. *Columella* straight. *Anterior canal* of medium length bent slightly to the right at its tip when viewed ventrally; unnotched. *Anterior fasciole* not swollen, marked with spiral grooves, same as base. *Color* a semi-translucent golden brown with a wide dark reddish brown band below whorl periphery of last whorl.

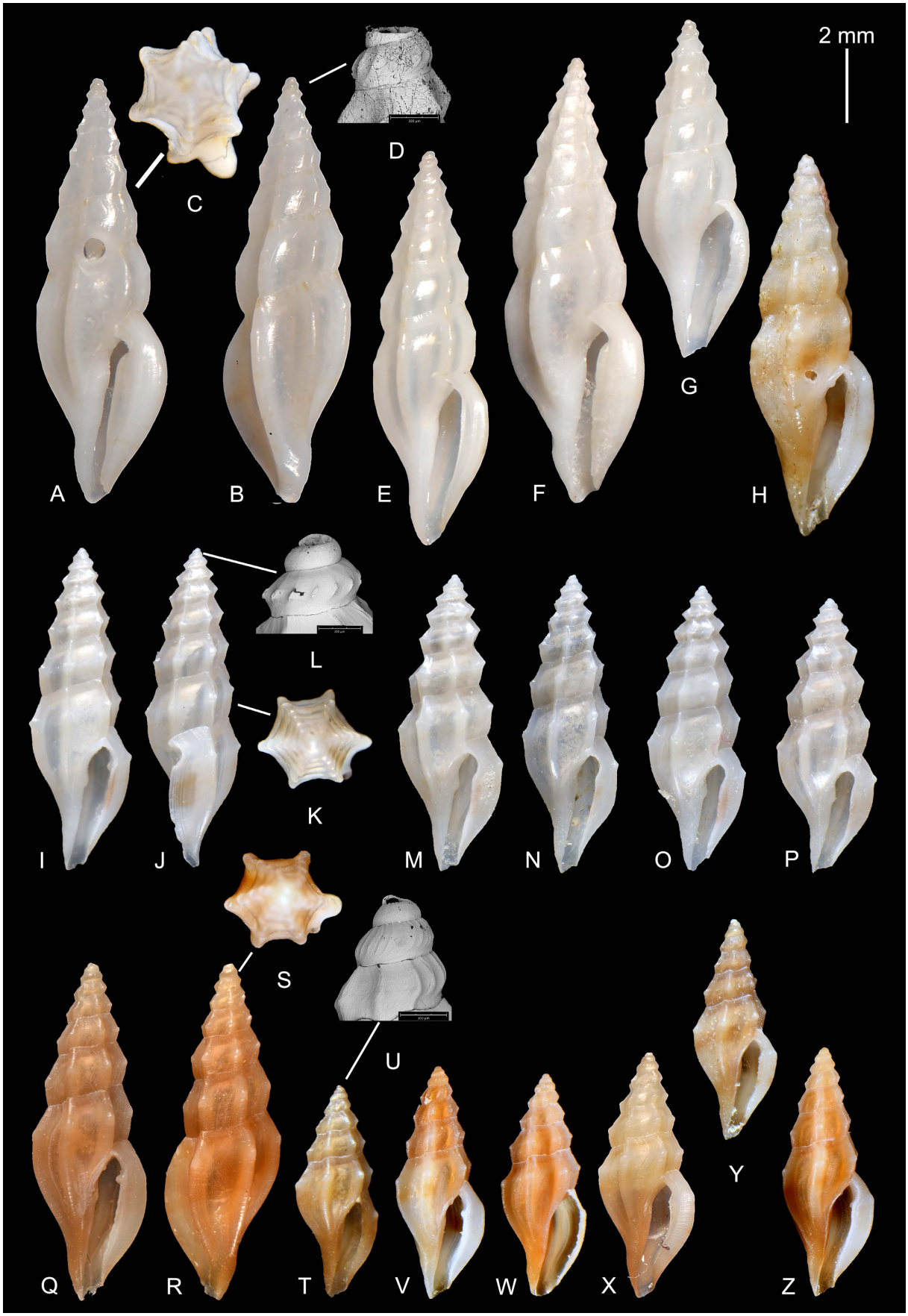
Remarks

The average length of 12 specimens is 6.8 mm (range = 5.6–10.3 mm). specimens may lack spiral bands or possess a dark band at the anterior fasciole in addition to the wide band below the whorl periphery.

Range and habitat

Mexico (N and W Gulf of Mexico), United States (Mississippi, Alabama, and W Florida; depth 63–115 m.

Fig. 75 (next page). Species of *Ithycythara* Woodring, 1928. Part 9. – **A–H**. *Ithycythara lactea* Fallon sp. nov. **A–D**. Holotype, 11.5 × 3.8 mm, ventral, dorsal and apical views, and SEM of protoconch (UF 589818), W of Egmont Key, Hillsborough Co., W Florida. The 1st whorl of the protoconch broke off during handling. **E–G**. Paratypes, 12 × 3.6, 10.6 × 3.0 and 9.1 × 3.0 mm (UF 589819), from the type locality. **H**. Spec., 10.5 × 3.3 mm, a color variant (ANSP 498924), off W Florida, Gulf of Mexico. – **I–P**. *Ithycythara alpha* Fallon sp. nov. **I–L**. Holotype, 9.7 × 3.1 mm, ventral, lateral, apical views, and SEM of protoconch (ANSP 498803), off Campeche, Mexico. The 1st whorl of the protoconch broke off during handling. **M–P**. Paratypes, 8.1 × 2.6, 8.1 × 2.8, 7.6 × 2.5, 7.9 × 2.6 mm (EFG 26579), off Campeche, Mexico. – **Q–Z**. *Ithycythara beta* Fallon sp. nov. **Q–S**. Holotype, 9.1 × 3.2 mm, ventral, dorsal and apical views (ANSP 498805), off Campeche, Mexico. **T–U**. Paratype, 5.8 × 2.3 mm, ventral view, and SEM of protoconch (ANSP 498806), off Campeche, Mexico, the type locality. **V–W**. Paratypes, 6.5 × 2.5 and 6.2 × 2.4 mm (ANSP 498807), off Campeche, Mexico. **X**. Paratype, 6.6 × 2.6 mm (UF 589823), off Campeche, Mexico. **Y–Z**. Paratypes, 6.0 × 2.3 and 6.8 × 2.6 (EFG 26560), off Campeche, Mexico, the type locality. Credits: D, L, U: SEM images courtesy of Paul Callomon. Scale bars: A–C, E–K, M–T, V–Z = 2 mm; D, L, U = 300 µm.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Ithycythara spp. Part 10

Ithycythara unid. sp. C
Fig. 76A–C

Differential diagnosis

Ithycythara aurantiaca Fallon & Bouchet sp. nov., has a protoconch of 2¾–3 whorls, not 2½.

Material examined (1 spec.)

PANAMA • 1 spec. 6.4 × 2.4 mm; more precise locality unknown; depth 120–200 m; dredged; ANSP 498934.

Partial description

Shell small, broadly fusiform. *Protoconch* of 2½ whorls, the first minute, the last with numerous fine arched riblets, the last ½–¼-whorl subcarinate with riblets formed into bead-like peripheral swellings. *Axial sculpture* of 6 cord-like ribs aligned from whorl to whorl that extend from suture to suture and anterior fasciole on the last. *Spiral sculpture* of a single peripheral cord, obsolete except on ribs; otherwise, its surface is densely covered with microscopic spiral grooves.

Remarks

This specimen is not being fully described because of its similarity to *Ithycythara aurantiaca* Fallon & Bouchet sp. nov., and possibly others. More specimens will be needed to better describe their differences.

Ithycythara unid. sp. O
Fig. 76D–F

Differential diagnosis

Should be compared with *Ithycythara saopaulensis* Fallon sp. nov., which is larger and has a different color pattern.

Material examined (1 spec.)

PANAMA • 1 spec. 4.6 × 1.5 mm; off Escudo de Veraguas Island, Bocas del Toro Prov.; depth 180 m; 2005; dredged; UF 589824.

Partial description

Shell small, fusiform, glossy, translucent. *Protoconch* of whorls, the first minute, the last with numerous fine arched riblets, the last ¼-whorl carinate with riblets formed into bead-like peripheral swellings. *Axial sculpture* of 6 cord-like ribs aligned from whorl to whorl that extend from suture to suture on spire whorls and extend to anterior fasciole on last. *Spiral sculpture* of a single peripheral cord, obsolete except on ribs; otherwise the surface of the shell is smooth, without other sculptural detail.

Remarks

The description of this single specimen is incomplete because of its similarity to other *psila*-like species, more specimens should be examined to determine whether it is unique.

Ithycythara lilliputae Fallon sp. nov.
urn:lsid:zoobank.org:act:8C1E0341-EC91-46CB-B352-6D0E82ACC590
Fig. 76G–K

Differential diagnosis

This *Ithycythara psila*-like species is easily distinguished from other *psila* look-alikes by its spindly shape and miniature size.

Etymology

Ithycythara lilliputae Fallon sp. nov., the Lilliputian *Ithycythara*. *Lilliputae*, the feminized name of Lilliput, a fictional land of miniature people, the Lilliputians, in Jonathan Swift's "*Gulliver's Travels*". An apt name for one of the smallest of the *Ithycythara*, only 4.7 mm in length.

Type material

Holotype
HONDURAS • 4.7 × 1.4 mm; Bay Islands, S of Barbareta Island; 16°25.1′ N, 86°09′ W; depth 24 m; 16 Jun. 2009; P. Fallon leg.; dredged on coral sand; ANSP 498925.

Paratype (1 spec.)
HONDURAS • 1 spec., 4.1 × 1.3 mm; same data as for holotype; ANSP 498926.

Description

Shell small (holotype length = 4.7 mm), narrowly fusiform (W/L = 0.2979), thin, translucent with a glossy surface, of 8 whorls altogether, teleoconch whorls obtusely angled, shoulders steeply sloping above a sub-median spiral cord, flat with a slight mid-way bump below, sides angled in to succeeding suture below. the last whorl 57% of shell length and tapered abruptly to an anterior canal; aperture relatively short and oval; anterior canal only slightly narrower and of moderate length, both about 38% of shell length; sculpture of narrow ribs and a sub-median spiral cord. *Protoconch* of 2½ round glossy-smooth whorls, first whorl minute, recumbent, then uniformly expands, the last ½-whorl with arched riblets, faint then growing stronger. Riblets do not reach the abapical suture. *Axial sculpture* of 6 cord-like ribs per whorl aligned whorl to whorl that run suture to suture on spire whorls and evanesce at the anterior fasciole on shell base. Ribs have round crests, are recurved on whorl shoulders, and their intercalary spaces are flat to slightly convex. *Varix* is an enlarged last rib (varicose rib) that extends from the suture to the anterior canal. *Spiral sculpture* of a peripheral cord, weak in intercalary space, strongest on ribs sides, and crests; forming elongate nodules; shallow microscopic grooves cover shell surface. *Sulcus* absent, recurved ribs on shoulder indicate past positions of sinus. *Outer lip* a thin strip of shell that extends out from the base of the varicose rib, from the suture to the anterior canal; a weak tooth present at the base of the anal sinus, lyrae along the underside of the varix few; stromboid notch absent. *Anal sinus* a wide round notch, in front of the varix, set off from the suture, extending from the fold of the joined inner and outer lips to whorl periphery, sides divergent. *Inner lip* a glaze along the columella that widens on the parietal wall and then joins the outer lip at the suture, with a callus at the anal sinus. Edge of lip margined. *Anterior canal* abruptly narrowed at shell base, of medium length hardly differentiated from aperture, straight; end unnotched. *Anterior fasciole* is not swollen, marked with incremental growth lines. *Columella* straight. *Color* translucent white (color in photograph due to inside sediment).

Range and habitat

Known only from the type locality.

Ithycythara rotunda Fallon sp. nov.
urn:lsid:zoobank.org:act:C664AB86-5F85-43B2-ADA3-7F38A180916D
Figs 64G, 76L–O

Differential diagnosis

Ithycythara moratensis Fallon sp. nov., which is also from Honduras, has stronger ribs, 6 per whorl versus 7, a stronger peripheral spiral that is elongate over axials (obsolete in intercostal space), and less convex whorls.

Ithycythara gypsata Fallon sp. nov., from off NW Florida, is larger, stockier, has stronger ribs, 6 per whorl versus 7, and whorls that are flat and angle toward the suture below whorl periphery.

Ithycythara lanceolata (C.B. Adams, 1850) has an opaque shell with a pattern of light and dark bands versus a translucent shell, whorls that are more angular, not as convex, and a less constricted anterior end.

Etymology

Ithycythara rotunda Fallon sp. nov., from the feminine form of the Latin adjective '*rotundus*', meaning 'round', is named for its distinctly convex teleoconch whorls.

Type material

Holotype

HONDURAS • 8.8 × 3.0 mm; Bay Islands, 1.2 km SSE of Morat Island; 16°25.058′ N, 86°10.896′ W; depth 20–90 ft [6–27 m]; 23 Sep. 2008; P. Fallon leg.; dredged from on carbonate sand with patches of algae; ANSP 498929.

Paratypes

None.

Description

Shell small (length = 8.8 mm), thin, glossy, and translucent, tall-spired, fusiform (W/L = 03409), of about 8½ whorls, the largest about 60% of shell length. Teleoconch whorls slightly angulated at nodules progressing from mid-whorl on the first, to upper ⅓-whorl on penultimate. Last whorl is quite convex and narrows abruptly to a moderately long anterior canal. ribs narrow, cord-like, aperture oval, narrows to anterior canal, both about 41% of shell length. *Protoconch* of about 2¼ round glossy whorls, the first round with a recumbent tip, the last ¾-whorl with arched riblets, the last ¼-whorl of which develop into a carina. The riblets do not reach the abapical suture. *Axial sculpture* of 7 narrow rope-like ribs per whorl, much narrower than their flat interspaces, aligned whorl-to-whorl, run from suture to suture on spire whorls and to the inner lip on shell base. *Varix* is the last rib, aligned with the corresponding rib on the penultimate whorl. *Spiral sculpture* of a single peripheral cord that overrides ribs, visible on crests and rib sides but obsolete in intercostal space. Microscopic grooves present overall, minutely crenating rib crests. *Sulcus* none. *Outer lip* thin, extending out from the last rib and from the suture to the beginning of the anterior canal, without dentition. *Anal sinus* not fully developed and chipped on type. *Inner lip* a narrow glazed strip along the columella and parietal wall that joins the outer lip at the suture, margined, without dentition. *Columella* is slightly sigmoid. *Anterior canal* of moderate length, narrow, and twisted to the right when viewed ventrally, end unnotched. *Anterior fasciole* not swollen, marked with growth increments overridden by microscopic spiral grooves. *Color* translucent white with a narrow, faint yellowish-brown sutural band.

Remarks

This species is described from a single specimen without a fully developed lip because of its singular form: exceptionally convex last whorl, thin axials, and seven-ribbed whorls (see apical view). These traits are uncommon in the genus *Ithycythara*.

Range and habitat

Known only from the type locality.

Ithycythara cuna Fallon sp. nov.
urn:lsid:zoobank.org:act:0833A130-30B1-45F6-B96B-8DEDC177D807
Fig. 76P–U

Differential diagnosis

Ithycythara simplicis Fallon sp. nov. has a shorter anterior canal, narrower ribs, and a different coloration.

Ithycythara beta Fallon sp. nov. is larger, has a protoconch of 3¼ whorls (versus 3) and a different coloration.

Ithycythara fusiformis Fallon sp. nov. has a proportionally narrower spire, and a protoconch of only 2½ whorls (versus 3).

Ithycythara eburnea Paulmier, 2019 has a protoconch of 2½ whorls (versus 3), and a different coloration.

Etymology

Ithycythara cuna Fallon sp. nov., the Cuna Indian *Ithycythara*, is named after the indigenous tribe of the San Blas Islands, which is the type locality; noun in apposition.

Type material

Holotype
PANAMA • 8.1 × 2.8 mm; San Blas Islands; depth 8–10 m; 2002; dredged from on dead coral; ANSP 498908.

Paratypes (2 specs)
PANAMA • 1 spec., 6.7 × 2.4 mm; same data as for holotype; ANSP 498909 • 1 spec., 6.6 × 2.3 mm; off Isla Escudo de Veraguas; depth 120 m; Jul. 2004; local people leg.; dredged; USNM 1754452.

Description

Shell small (holotype length = 8.1 mm), thin, translucent with a glossy surface, narrowly fusiform, with 8 whorls; teleoconch whorls obtusely angled sub medially, the last whorl largest, 63% of shell length tapering to a moderately long anterior canal; aperture narrow with parallel sides, only slightly wider than the anterior canal, both about 46% of shell length; sculpture of high narrow ribs and a mid-whorl spiral cord. *Protoconch* of 3 smooth round whorls, the last ½ whorl with arched riblets that grow stronger toward the end, last ¼-whorl subcarinate. Riblets do not reach the abapical suture. *Axial sculpture* of 6 moderately high ribs per whorl that are aligned and run suture to suture on spire whorls and evanesce on the shell base at the anterior fasciole. Rib shoulders flat with a bump mid-way, sides straight and angled slightly into succeeding whorl's suture, recurved on whorl shoulders, Intercalary spaces flat to slightly concave. *Varix* higher than previous rib, aligned with rib on penultimate whorl. *Spiral sculpture* of a single sub-median spiral cord obsolete in intercalary spaces and nodulous on rib crests; of microscopic grooves over shell surface, rib crests finely crenate. *Sulcus* absent, recurved ribs on shoulder indicate

past positions of sinus. *Outer lip* a thin strip of shell that extends along the base of the varix from the suture to the anterior canal; a tooth present at the base of the anal sinus and lyrae along the underside of the varix; stromboid notch absent. *Anal sinus* a round notch, in front of the varix and set off from the suture, extending from the fold of the joined inner and outer lips to whorl periphery, sides divergent. *Inner lip* a narrow glazed strip along the columella and parietal wall that joins the outer lip at the suture, margined, with an anal tooth. *Anterior canal* of moderate length, narrow, and turned to the right at its end when viewed ventrally, end unnotched. *Anterior fasciole* is not swollen, surface sculpted with oblique microscopic grooves. *Color* translucent white, upper portion of whorls faintly shaded with yellowish-brown.

Range and habitat

Panama; depth 8–120 m.

Ithycythara santacatalina Fallon sp. nov.
urn:lsid:zoobank.org:act:35CAEEA3-8676-4354-A1CF-9D84647A0F4D
Figs 63F, 76V–X

Differential diagnosis

Ithycythara curiosa Fallon sp. nov. has similar spiral micro-sculpture and the absence of a peripheral cord but possesses 8 ribs per whorl and enlarged rib nodules at whorl peripheries, neither characteristic is present in *I. santacatalina* Fallon sp. nov.

Ithycythara biconica Fallon & Bouchet sp. nov. has slightly concave shoulders, not flat ones, broader ribs, and concave intercostal spaces.

Etymology

Ithycythara santacatalina Fallon sp. nov., the Santa Catalina *Ithycythara*, is named after the Colombian island of Santa Catalina, located off the coast of Nicaragua near the type locality; it serves as a noun in apposition.

Type material

Holotype
COLOMBIA • 6.8 × 2.7 mm; W of Santa Catalina Island, San Andrés y Providencia Department, near "Blue Hole"; E.F. García leg.; dredged; ANSP 498811.

Paratype (1 spec.)
COLOMBIA • 1 spec., 7.2 × 2.6 mm, poor condition, spiral sculpture eroded off; same data as for holotype; E.F. García coll.

Description

Shell small (holotype length= 6.8 mm), thin, translucent with a glossy surface, turreted, about 7½ whorls, teleoconch whorls acutely angled on first teleoconch whorl then widening to obtuse by the last, which is about 63% of shell length shoulders flat to slightly sloping, whorl sides straight; aperture narrowly oval, only slightly wider than the short anterior canal, together about 44% of shell length; sculpture of narrow ribs, nodulose on rib peripheries, and coarse spiral grooves. *Protoconch* of about 2½ whorls, smooth except the last ½-whorl which has fine riblets, sub-carinate on last ¼-whorl. *Axial sculpture* of 6 narrow cord-like ribs per whorl that are aligned whorl-to-whorl and run from suture-to-suture and to the anterior fasciole on the last whorl. Whorl peripheries are marked with swollen nodules. *Varix* apertural,

extends to the end of the anterior canal in a smooth arc. *Spiral sculpture* of coarse grooves that cover the shell surface, clear lines caused by intermittent wider spacing; spiral cord lacking. *Outer lip* varicose, with a thin, narrow strip of shell along base of leading edge of varix extending from and contiguous with the outer edge of the anal sinus to the end of the anterior canal. Underneath the varix on the inside of the outer lip is an anal tooth followed by a row of lyrae down to the anterior canal. *Anal sinus* is a round notch with divergent sides, located in front of the varix. *Inner lip* a narrow glazed strip along the columella and parietal wall that joins the outer lip at the suture, with a callus at the anal sinus. *Columella* straight. *Anterior canal* short, open, undifferentiated from the aperture, end slightly notched. *Anterior fasciole* slightly swollen by accumulation of growth lines and residual rib ends; surface sculpted with oblique spiral grooves. *Color* white with widely spaced clear spiral lines and a narrow, mid-whorl light yellowish-brown band.

Range and habitat

Known only from the type locality.

Ithycythara moratensis Fallon sp. nov.
urn:lsid:zoobank.org:act:A4FB29F5-BA78-4DB1-B06A-308E5176BC91
Fig. 76Y–DD

Differential diagnosis

Ithycythara lanceolata (C.B. Adams, 1850) lacks a varix and has a light and dark banded shell.

Ithycythara lactea Fallon sp. nov. has weaker ribs and is colored differently.

Ithycythara ellenstrongae Fallon & Bouchet sp. nov. has a protoconch of 3–3¼ whorls (versus 2¼) and is colored differently.

Ithycythara altaspira Paulmier, 2019 has an acuminate spire, as opposed to an evenly tapered spire and narrower ribs.

Ithycythara clathrata Fallon sp. nov. has a protoconch of 3 whorls (versus 2¼), narrower ribs, and is colored differently.

Etymology

Ithycythara moratensis Fallon sp. nov. is named after Morat Island, the type locality situated off the eastern end of Roatán Island, Bay Islands, Honduras.

Type material

Holotype
HONDURAS • 11.5 × 3.5 mm; Bay Islands, 0.5 mi. [0.8 km] SSE of Morat Island; 16°25.207′ N, 86°10.601′ W; depth 90–115 ft. [27–35 m]; 25 Sep. 2008; P. Fallon leg.; dredged on silty to coarse carbonate sand with algae patches; ANSP 498927.

Paratypes (2 specs)
HONDURAS • 2 specs, 11.1 × 3.6 and 10.4 × 3.3 mm; same data as for holotype; ANSP 498928.

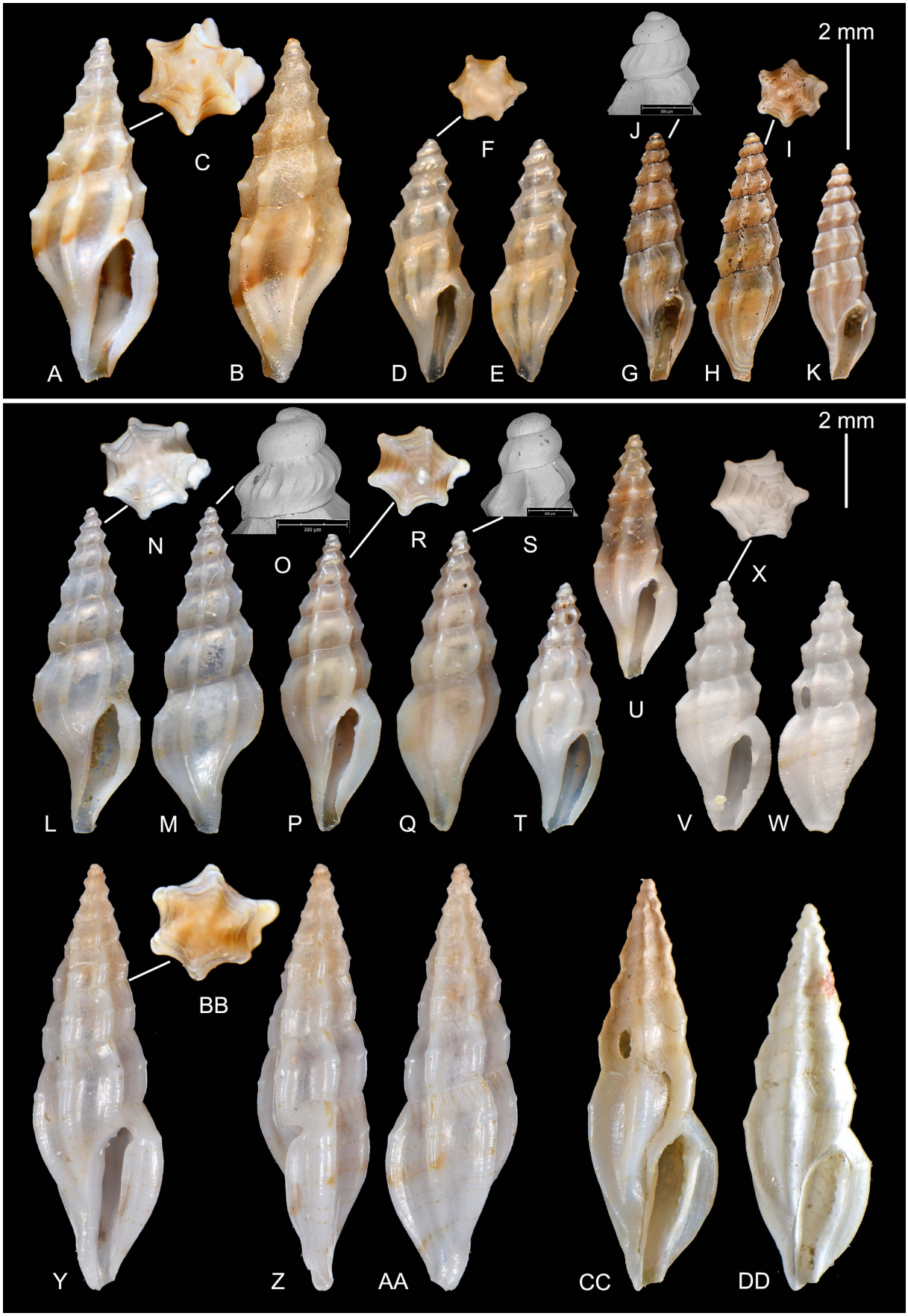
Description

Shell small (holotype length = 11.5 mm), strong, translucent with a glossy surface, narrowly fusiform (W/L = 0.3043, 9¼ whorls total, teleoconch whorls obtusely angled about mid-whorl, nearly flat, the last whorl 60% of shell length, tapered to an anterior canal of medium length; aperture narrowly oval only slightly wider than the anterior canal, both about 43% of shell length; sculpture of strong ribs and a mid-whorl spiral cord. *Protoconch* of 2¼ round whorls with riblets on about the last ½-whorl. *Axial sculpture* of 6 strong ribs aligned from whorl to whorl that run from suture to suture on spire whorls and to anterior fasciole on the last; intercostal space is concave and about as wide as ribs. Ribs form a low, nearly flat arc in profile, with a mid-whorl elongate nodule. *Varix* apertural, larger than preceding rib, extends from suture to anterior canal in a smooth arc, and is aligned with penultimate whorl rib. *Spiral sculpture* of microscopic spirals and a single peripheral cord present on rib crests and sides but obsolete between. *Sulcus* absent. *Outer lip* a thin strip of shell that extends along the base of the varix from the suture to the anterior canal, edge with a axial fold, and traces out a low arc from and contiguous with the outer side of the anal sinus to the anterior canal; tooth present at the base of the anal sinus and lyrae along the underside of the varix; stromboid notch absent. *Anal sinus* a round notch in front of the varix, its apex about mid-shoulder, its sides divergent. *Inner lip* a narrow glaze along the columella and parietal wall that extends to the suture, where it joins the outer lip; edge margined, and anal tooth present. *Anterior canal* narrow, of medium length and twisted slightly to the right, viewed ventrally, end notched. *Anterior fasciole* not swollen, surface sculpted with incremental growth lines and microscopic grooves. *Color* translucent white with narrow faint yellowish-brown narrow bands on shoulder, mid-whorl and shell base; upper spire tinted the same yellowish-brown color.

Range and habitat

Known only from the type locality.

Fig. 76 (next page). Species of *Ithycythara* Woodring, 1928. Part 10. – **A–C**. *Ithycythara* unid. sp. C. Spec. 6.4 × 2.4 mm, ventral, dorsal and apical views (ANSP 498934), locality not stated, Panama, Caribbean Sea. – **D–F**. *Ithycythara* unid. sp. O. Spec. 4.6 × 1.5 mm, ventral, dorsal and apical views (UF 589824), off Escudo de Veraguas Island, Bocas del Toro Prov., Panama. – **G–K**. *Ithycythara lilliputae* Fallon sp. nov. **G–J**. Holotype, 4.7 × 1.4 mm, ventral, dorsal and apical views, and SEM of protoconch (ANSP 498925), S of Barbareta Island, Bay Islands, Honduras. **K**. Paratype, 4.1 × 1.3 mm (ANSP 498926), from the type locality. – **L–O**. *Ithycythara rotunda* Fallon sp. nov., holotype, 8.8 × 3.0 mm, ventral, dorsal and apical views, and SEM of protoconch (ANSP 498929), 1.2 km SSE of Morat Island, Bay Islands, Honduras. – **P–U**. *Ithycythara cuna* Fallon sp. nov. **P–S**. Holotype, 8.1 × 2.8 mm, ventral, dorsal and apical views, and SEM of protoconch (ANSP 498908), San Blas Islands, Panama. **T**. Paratype, 6.7 × 2.4 mm (ANSP 498909), from the type locality. **U**. Paratype, 6.6 × 2.3 mm (USNM 1754452), off Isla Escudo de Veraguas, Panama. – **V–X**. *Ithycythara santacatalina* Fallon sp. nov., holotype, 6.8 × 2.7 mm, ventral, dorsal and apical views (ANSP 498811), W of Santa Catalina Island, near "Blue Hole", San Andrés y Providencia Department, Colombia. – **Y–DD**. *Ithycythara moratensis* Fallon sp. nov. **Y–BB**. Holotype, 11.5 × 3.5 mm, ventral, lateral, dorsal and apical views (ANSP 498927), 0.5 mi. [0.8 km] SSE of Morat Island, Bay Islands, Honduras. **CC–DD**. Paratypes, 11.1 × 3.6 and 10.4 × 3.3 mm (ANSP 498928) from the type locality. Credits: J, O, S: SEM images of protoconchs courtesy of Paul Callomon. Scale bars: A–I, K–N, P–R, T–DD = 2 mm; J, O, S = 300 µm.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Ithycythara spp. Part 11

Ithycythara brisseti Fallon & Bouchet sp. nov.
urn:lsid:zoobank.org:act:A0DF687D-40C8-4853-88EE-D56D45AD30DF
Fig. 77A–H

Differential diagnosis

Ithycythara guianensis Fallon & Bouchet sp. nov. has a protoconch with a smaller tip, and more whorls (3 versus 2–2¼ whorls), is smaller on average (length = 4.7 versus 5.6 mm), has broader ribs in apical view, and is colored differently.

Etymology

Ithycythara brisseti Fallon & Bouchet sp. nov., in honor of Julien Brisset in recognition for his management of MNHN databases on French and French overseas biodiversity.

Type material

Holotype
FRENCH GUIANA • 6.6 × 2.3 mm; offshore; 6°33.8′ N, 53°07.8′ W; depth 60–61 m; 30 Jul. 2014; GUYANE 2014; stn CP4357; MNHN-IM-2012-43480.

Paratypes (8 specs)
FRENCH GUIANA • 2 specs, 6.3 × 2.3 and 6.0 × 2.2 mm; offshore; 5°59.6′ N, 52°11.3′ W; depth 66–67 m; 8 Aug. 2014; GUYANE 2014; stn CP4399; MNHN-IM-2012-3722 • 1 spec., 4.4 × 2.0 mm; offshore; 5°49′ N, 51°28′ W; depth 102–103 m; 6 Aug. 2014; GUYANE 2014; stn DW4390; MNHN-IM-2012-3719 • 1 spec., 5.5 × 2.0 mm; offshore; 6°09.8′ N, 53°01.7′ W; depth 93–96 m; 3 Dec. 2017; PROTEUS-GUYANE; stn DW5088; MNHN-IM-2000-40024 • 1 spec., 8.2 × 2.6 mm; offshore; 6°15.4′ N, 52°13.5′ W; depth 81–82 m; 4 Dec. 2017; PROTEUS-GUYANE; stn DW5099; MNHN-IM-2000-40025 • 1 spec., 5.6 × 2.2 mm; offshore; 6°15.3′ N, 52°13.6′ W; depth 82 m; 4 Dec. 2017; PROTEUS-GUYANE; stn DW5098; MNHN-IM-2000-40026 • 2 specs, 3.3 × 1.5 and 5.6 × 2.1 mm; offshore; 6°06.8′ N, 52°06.7′ W; depth 77–80 m; 3 Dec. 2017; PROTEUS-GUYANE; stn DW5095; MNHN-IM-2000-40039.

Other material examined (2 specs)

FRENCH GUIANA • 1 spec., 4.3 × 1.8 mm; offshore; 5°46′ N, 51°23′ W; depth 115 m; 27 Jul. 2014; GUYANE 2014; stn CP4348; MNHN-IM-2012-3726 • 1 spec., 6.0 × 2.2 mm; offshore; 5°12.4′ N, 51°40.2′ W; depth 60 m; 28 Jul. 2014; GUYANE 2014; stn CP4353; MNHN-IM-2012-3728.

Description

Shell small (holotype length = 6.6 mm), fusiform, glossy smooth, of 7¼ whorls, the last about 65% of shell length, teleoconch whorls obtusely angled sub-medially, aperture narrow and varicose. anterior canal of moderate length, together about 50% of shell length; surface sculpture of narrow ribs and a single spiral cord. *Protoconch* of 2–2¼ round whorls, the last ¾-whorl has 6–8 strong opisthocline riblets, shortened just past a mid-whorl bulge. *Axial sculpture* of strong narrow ribs that extend to and are aligned from whorl to whorl on the spire and to anterior fasciole on the last; ribs are widely separated, 6 to a whorl. *Varix* is rib-like but stronger, extend to the anterior canal, and is more widely separated than previous ribs. *Spiral sculpture* of a single spiral cord, obsolete except on ribs where it appears as transverse nodules, and of microscopic grooves, also obsolete except on ribs, which are microscopically crenulated. *Sulcus* absent. *Outer lip* varicose with a thin, narrow lip at the base of the varix that extends from and is contiguous with the outer edge of the anal sinus to the anterior canal in a low arc. Dentition

includes an anal tooth and lyrae to the anterior canal. *Anal sinus* is an open notch with divergent sides, offset from the suture and in front of the varix. *Inner lip* a thin, narrow glaze, margined, with a callus on the parietal wall and a narrow ridge, beginning a little below it and extending to the anterior canal. Two smaller denticles lie between the callus and ridge. *Columella* straight. *Anterior canal* undifferentiated from aperture, narrow, moderately long, sub-tubular, turned to the right viewed ventrally. *Anterior fasciole* not swollen, marked with growth striae and microscopic grooves that are visible through the translucent shell. *Color* a translucent pink with a light brown band mid-whorl and at anterior end.

Remarks

The average length of 6 specimens is 5.6 mm (range = 4.3–6.6 mm).

Range and habitat

Off French Guiana; depth 60–115 m.

Ithycythara guianensis Fallon & Bouchet sp. nov.
urn:lsid:zoobank.org:act:BB69E6F5-89AC-4CA0-9787-34235370AD44
Fig. 77I–S

Differential diagnosis

Ithycythara brisseti Fallon & Bouchet sp. nov. has a smaller protoconch (2–2¼ whorls, not 2¾–3) with a larger protoconch tip (not minute and protruding), narrower ribs, and is colored differently.

Etymology

Ithycythara guianensis Fallon & Bouchet sp. nov., the French Guiana *Ithycythara*, is named after its type locality. This species is common in samples collected off the coast of French Guiana, reflecting its regional name.

Type material

Holotype

FRENCH GUIANA • 6.1 × 2.1 mm; offshore; 6°09.8′ N, 53°01.7′ W; depth 93–96 m; 3 Dec. 2017; PROTEUS-GUYANE; stn DW5088; MNHN-IM-2000-40017.

Paratypes (27 specs)

FRENCH GUIANA • 1 spec., 6.3 × 2.3 mm; offshore; 5°49′ N, 51°28′ W; depth 102–103 m; 6 Aug. 2014; GUYANE 2014; stn DW4390; MNHN-IM-2012-43478 • 9 specs, 4.7 × 1.8, 2.8 × 1.5, 2.9 × 1.4, 4.0 × 1.7, 3.1 × 1.4, 3.4 × 1.6, 3.7 × 1.6, 4.2 × 1.7 and 4.0 × 1.6 mm; offshore; 6°18′ N, 52°13.3′ W; depth 095–097 m; 8 Aug. 2014; GUYANE 2014; stn CP4402; MNHN-IM-2012-3721 • 1 spec., 6.2 × 2.1 mm; offshore; 6°52.2′ N, 53°02.6′ W; depth 94 m; 30 Jul. 2014; GUYANE 2014; stn DW4359; MNHN-IM-2012-3723 • 3 specs, 6.0 × 2.2, 5.5 × 2.0, and 5.3 × 1.9 mm; offshore; 5°46′ N, 51°23′ W; depth 115 m; 27 Jul. 2014; GUYANE 2014; stn CP4348; MNHN-IM-2012-3725 • 3 specs, 5.0 × 2.1, 4.0 × 1.8 and 3.9 × 1.6 mm; offshore; 6°56′ N, 53°03′ W; depth 145 m; 31 Jul. 2014; GUYANE 2014; stn DW4360; MNHN-IM-2012-3724 • 10 specs, (4 measured) 4.6 × 1.9, 3.9 × 1.6, 4.5 × 1.9 and 5.2 × 1.9 mm; offshore; 6°19.1’ N, 52°13.5’ W; depth 96–97 m; 2 Dec. 2017; PROTEUS-GUYANE; stn DW5108; MNHN-IM-2000-40040.

Other material examined (76 specs)

76 additional specimens were examined from samples collected off French Guiana during the PROTEUS-GUYANE

Description

Shell small (holotype length = 6.3 mm), fusiform, glossy, whorls total 7¾, obtusely angled submedially, the last whorl gently tapered from the periphery, then straightening along the anterior canal, together about 63% of shell length; aperture narrow, about 44% of shell length including anterior canal. *Protoconch* of 2¾–3 round whorls, the first minute, tip protruding, the last ¾-whorl with oblique riblets swollen mid whorl into a weak carina, with riblets ending well above the abapical suture. *Axial sculpture* of strong narrow ribs angled and strongest mid-whorl, extending to and are aligned from whorl to whorl on the spire and to the anterior fasciole on the last; ribs are widely separated, 6 to a whorl. *Varix* apertural, rib-like but stronger, extends from the suture to the anterior canal. *Spiral sculpture* of a single spiral cord, obsolete except on ribs where it appears as elongated nodules. *Sulcus* absent. Ribs above the whorl peripheries are thinner and recurved marking previous positions of the varicose rib. *Outer lip* varicose, and a thin, narrow lip extends from the base of the varix, is contiguous with the outer edge of the anal sinus and extends to the anterior canal in a low arc; evidence of a stromboid notch lacking. Anal tooth and a few strong lyrae present above boundary with anterior canal. *Anal sinus* is a wide, open notch with divergent sides, offset from the suture and in front of the varix. *Inner lip* a thin, narrow glaze, margined, with a parietal tooth and a low, broad tooth or ridge midway, lip edge separates from the parietal at the anal sinus. *Columella* straight. *Anterior canal* weakly differentiated from the aperture by a narrowing of the base; canal narrow, of moderate length, sub-tubular, turned to the right when viewed ventrally, unnotched. *Anterior fasciole* not swollen, smooth surface like the shell base, marked with growth striae. *Color* a light yellowish brown with a darker shade in intercostal areas.

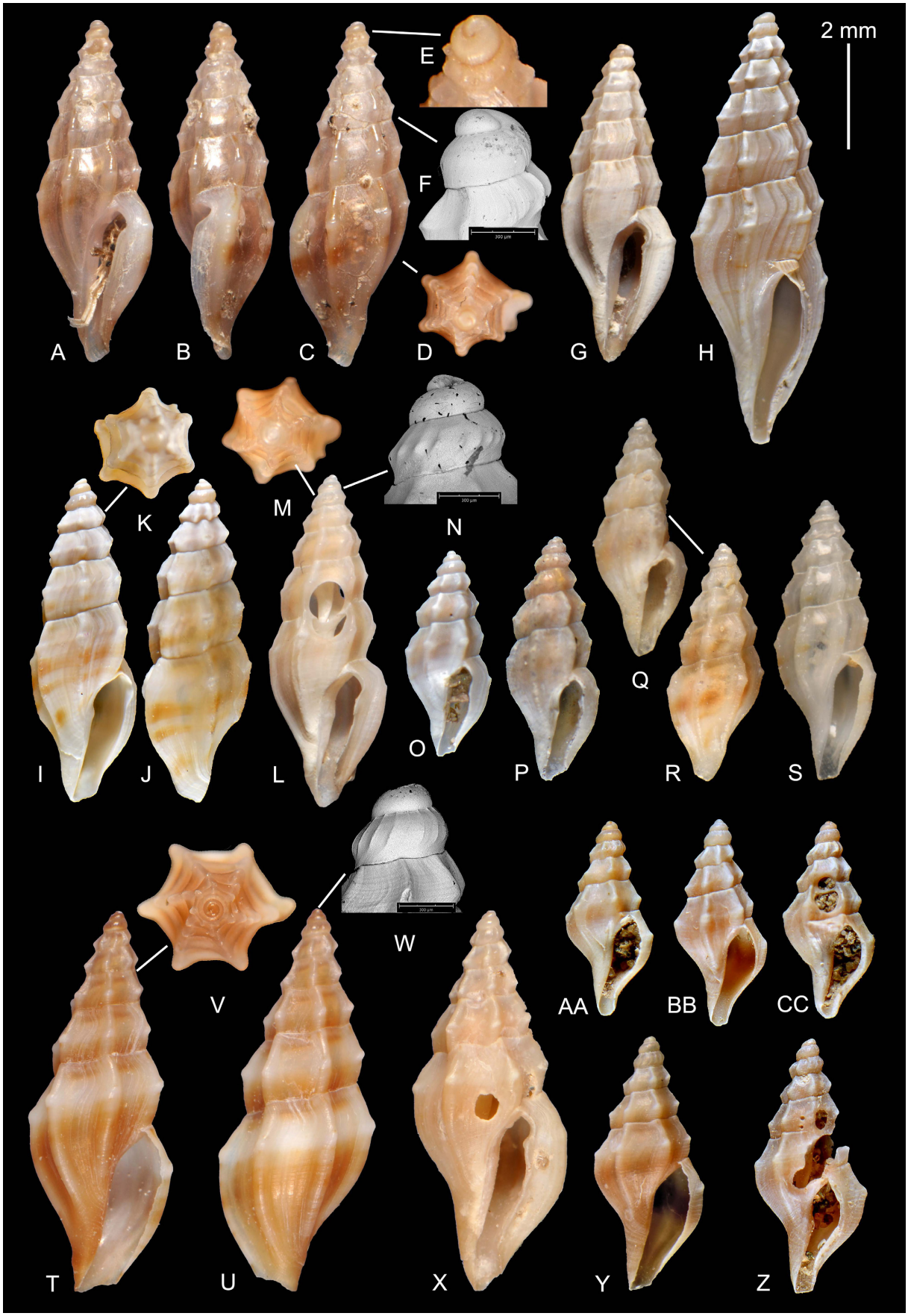
Remarks

The average length of 28 measured specimens is 4.7 mm (range = 2.8–6.5 mm).

Range and habitat

French Guiana; depth 75–149 m.

Fig. 77 (next page). Species of *Ithycythara* Woodring, 1928. Part 11. – **A–H**. *Ithycythara brisseti* Fallon & Bouchet sp. nov. **A–F**. Holotype, 6.6 × 2.3 mm, ventral, lateral, dorsal and apical views, expanded view of protoconch (not to scale), and SEM of protoconch (MNHN-IM-2012-43480), off French Guiana. **G–H**. Paratypes, 6.0 × 2.2 and 6.3 × 2.4 mm (MNHN-IM-2012-3722), off French Guiana. – **I–S**. *Ithycythara guianensis* Fallon & Bouchet sp. nov. **I–K**. Holotype, 6.1 × 2.1 mm, ventral, dorsal and apical views (MNHN-IM-2000-40017), off French Guiana. **L–N**. Paratype, 6.3 × 2.3 mm, ventral and apical views, and SEM of protoconch (MNHN-IM-2012-43478), offshore, French Guiana. **O–S**. 4 paratypes, 3.9 × 1.6, 4.6 × 1.9, 4.5 × 1.9 mm ventral and dorsal views, and 5.2 × 1.9 mm (MNHN-IM-2000-40040), offshore, French Guiana. – **T–CC**. *Ithycythara aurantiaca* Fallon & Bouchet sp. nov. **T–W**. Holotype, 7.3 × 3.0 mm, ventral, dorsal and apical views, and SEM of protoconch (MNHN-IM-2012-43475), offshore (MNHN Guiana exped.; stn CP4348), French Guiana. **X**. Paratype, 7.2 × 3.0 mm (MNHN-IM-2012-3713), off French Guiana. **Y**. Paratype, 4.8 × 2.2 mm (MNHN-IM-2000-40023), offshore, French Guiana. **Z–CC**. Paratypes, 4.8 × 2.1, 3.5 × 1.6, 3.8 × 1.8 and 3.7 × 1.7 mm (MNHN-IM-2000-40036), offshore, French Guiana. Credits: F, N, W: SEM images courtesy of Paul Callomon. Scale bars: A–E, G–M, O–V, X–CC = 2 mm; F, N, W = 300 µm.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Ithycythara aurantiaca Fallon & Bouchet sp. nov.
urn:lsid:zoobank.org:act:0D9FC553-BC04-4250-9ED7-2F82B1D22D03
Fig. 77T–CC

Differential diagnosis

Ithycythara arawak Fallon & Bouchet sp. nov. is larger, length of holotypes = 9.8 versus 7.3 mm, and a protoconch with 2¼ versus 2¾–3 whorls.

Ithycythara altaspira Paulmier, 2019 is larger, has a taller, acuminate spire (43% versus 37% of holotype shell lengths), a protoconch of 2½ versus 2¾–3 whorls, and a varicose rib rather than a strong varix.

Ithycythara fusiformis Fallon sp. nov. is larger (length of holotypes = 9.4 versus 7.3 mm), has a protoconch of 2½ versus 2¾–3 whorls, and is colored differently.

Ithycythara gypsata Fallon sp. nov. is larger (length of holotypes = 12.5 versus 7.3 mm), has turreted whorls versus obtusely angled ones, and is colored differently.

Etymology

Ithycythara aurantiaca Fallon & Bouchet sp. nov., derived from the feminine form of the Latin adjective '*aurantiacus*', meaning 'orange-colored', refers to the base color of fresh specimens.

Type material

Holotype
FRENCH GUIANA • 7.3 × 3.0 mm; offshore; 5°46′ N, 51°23′ W; depth 115 m; 27 Jul. 2014; GUYANE 2014; stn CP4348; MNHN-IM-2012-43475.

Paratypes (16 specs)
FRENCH GUIANA • 1 spec., 7.2 × 3.0 mm; offshore; 6°18′ N, 52°13.3′ W; depth 95–97 m; Aug. 2014; GUYANE 2014; stn CP4402; MNHN-IM-2012-3713 • 1 spec., 4.8 × 2.2 mm; offshore; 6°15.4′ N, 52°13.5′ W; depth 81–82 m; 4 Dec. 2017; PROTEUS-GUYANE; stn DW5099; MNHN-IM-2000-40023 • 6 specs, 4.8 × 2.1, 3.8 × 1.8, 3.5 × 1.6, 3,7 × 1.7, 3.1 × 1.5 and 3.0 × 1.5 mm; offshore; 6°10.5′ N, 52°02.5′ W; depth 96–98 m; 3 Dec. 2017; PROTEUS-GUYANE; stn DW5096; MNHN-IM-2000-40036 • 1 spec., 5.8 × 2.3 mm; offshore; 6°06.8′ N, 52°06.7′ W; depth 77–80 m; 3 Dec. 2017; PROTEUS-GUYANE; stn DW5095; MNHN-IM-2000-40022 • 2 specs, 4.9 × 2.1 and 3.9 × 18 mm; offshore; 6°09.5′ N, 52°01.4′ W; depth 92–94 m; 3 Dec. 2017; PROTEUS-GUYANE; stn DW5089; MNHN-IM-2000-40037 • 5 specs, lengths = 5.3, 4.7, 4.1, 4.9 and 4.4 mm; offshore, 6°10.7′ N, 52°03.0′ W; depth 96–101 m; 4 Dec. 2017; PROTEUS-GUYANE; stn DW5097; MNHN-IM-2000-40038.

Other material examined (5 specs)

An additional 5 specimens from the MNHN PROTEUS-GUYANE 2017 expedition were examined but not included in the type series.

Description

Holotype has an incompletely developed aperture and chipped anterior canal. Paratype exemplifies the missing features. *Shell* small (length = 7.3 mm), broad, fusiform (W/L = 0.4110), of about 7¾ whorls, the last about 63% of shell length. Whorls obtusely angular, shoulders steeply angled and flat, longer than sides (whorl periphery below middle), which are straight and slightly angled into succeeding whorl, sutures impressed; aperture narrowly oval, sides nearly parallel with an anterior canal of moderate length; aperture and canal about 44% of shell length. *Protoconch* of 2¾–3 smooth whorls, the last with arched

riblets that do not reach the abapical suture. *Axial sculpture* of 6 strong, high, narrow ribs per whorl, aligned from whorl to whorl, and extending from suture to suture on spire whorls, and evanescent at the anterior fasciole on last, intercalary spaces flat. *Varix* is not developed on holotype but apertural and strong on paratype, extending from suture and narrowing up to the end of anterior canal. *Spiral sculpture* of a single peripheral cord obsolete except for the presence of peripheral nodules on rib crests. Shell otherwise covered with dense microscopic grooves, stronger on ribs, faint in intercalary spaces. *Sulcus* absent. *Outer lip* thin, as holotype exhibits shell deposition phase; paratype ***in*** resting phase has a thin band of shell along base of varix that includes the anal sinus and extends to the anterior canal. Dentition includes a strong anal tooth and a row of lyrae extending to the anterior canal under the varix. *Anal sinus* a wide shallow notch in front of the varix offset from the suture, shallow with divergent sides. *Inner lip* a narrow band of glazed shell along the columella and parietal wall, with a weak tooth at the anal sinus; margined along its length. *Columella* is slightly sigmoidal. *Anterior canal* of moderate length turned slightly to the right at its end, when viewed ventrally; unnotched (as seen on paratypes). *Anterior fasciole* not swollen, sculpted with incremental growth lines and microscopic spiral grooves. *Color* dark orange with a broad white shoulder band below the suture and a little below whorl periphery.

Range and habitat

Off French Guiana; depth 81–115 m.

***Ithycythara* spp. Part 12**

Ithycythara unid. sp. Q
Fig. 78A–E

Differential diagnosis

This species is like *Ithycythara brisseti* Fallon & Bouchet sp. nov. but may be new because of its remarkably large (larger than either of the two other similar species) protoconch. More specimens are desirable to determine whether this trait is just a variant or is characteristic of a different species.

Material examined (1 spec.)

FRENCH GUIANA • 1 spec. 5.5 × 1.9 mm; offshore; 6°09.8′ N, 53°01.7′ W; depth 93–96 m; 3 Dec. 2017; PROTEUS-GUYANE; stn DW5088; MNHN-IM-2000-40047.

Partial description

Shell small (length = 3.5 and 3.9 mm), narrowly fusiform, of 7 appressed whorls, teleoconch whorl shoulders steep, angled below mid-whorl, last whorl 60% of shell length; aperture narrowly oval, slightly narrowing to an anterior canal of moderate length, together with about 40% of shell length. Sculpture of 6 ribs and a single peripheral cord obsolete except on ribs. *Protoconch* of 2 whorls, bulbous, with weak riblets on the last ¼-whorl; has a protoconch diameter almost equal to that of the first teleoconch whorl. *Axial sculpture* of 6 ribs that extend from suture to suture and align from whorl to whorl and evanesce on the last. *Spiral sculpture* of a single peripheral cord, obsolete except rib crossovers; microscopic grooves cover the shell.

Remarks

The description of this species has not been completed because more specimens are needed to determine whether it is a distinct species.

Ithycythara unid. sp. R
Fig. 78F–J

Differential diagnosis

This species is different from its congeners on account of its form and strong spiral grooves; however, the specimens in hand are poorly preserved, not suitable for a complete description.

Material examined (2 specs)

FRENCH GUIANA • 1 spec., 4.5 × 2.0 mm; offshore; 6°09.8′ N, 53°01.7′ W; depth 93–96 m; 3 Dec. 2017; PROTEUS-GUYANE; stn DW5088; MNHN-IM-2000-40049 • 1 spec., 3.0 × 1.4 mm; offshore; 6°09.5′ N, 52°01.4′ W; depth 92–94 m; 3 Dec. 2017; PROTEUS-GUYANE; stn DW5089; MNHN-IM-2000-40048.

Partial description

Shell small, fusiform, of about 6½ appressed whorls, teleoconch whorls obtusely angled slightly about mid-whorl, shoulders steep, slightly concave, sides vertical, slightly convex, last whorl 64% of shell length; aperture narrowly oval, slightly narrowing to a short anterior canal, together about 43% of shell length. A strong apertural varix present. Sculpture of coarse spiral grooves. *Protoconch* of 2½ whorls with arched riblets on the last. *Axial sculpture* of 6 ribs that extend from suture to suture and align from whorl to whorl and fade before the anterior fasciole on last. *Spiral sculpture* of coarse spiral grooves overall; evidence of a peripheral spiral cord or distinct peripheral nodules absent.

Ithycythara bahiensis Fallon sp. nov.
urn:lsid:zoobank.org:act:715285BD-1CB8-4962-9894-1CE8AEC971EE
Fig. 78K–P

Differential diagnosis

Ithycythara psila (K.J. Bush, 1885) is larger, broader, and has a stronger shell, has lyrae inside the outer lip. A fold on the columella, below the sinal tooth (all lacking or nearly obsolete in *I. bahiensis* Fallon sp. nov.), is present, strong, elongate nodes on rib crests (narrower, almost round nodes on rib crests of *I. bahiensis*) and is colored differently.

Ithycythara bugeae Fallon & Bouchet sp. nov. is stouter, with more angular whorls, and has three faint brownish yellow bands.

Ithycythara saopaulensis Fallon sp. nov., see differences noted in the Identification section of that species below.

Etymology

Ithycythara bahiensis Fallon sp. nov., the Bahia *Ithycythara*, from the Brazilian state of Bahia, where the type series was collected.

Type material

Holotype

BRAZIL • 5.1 × 1.7 mm; Bahia State, Salvador; in shallow water (inferred from beach-collected specimens); 1988; C. Tarasconi; leg.; UF 5869825.

Paratypes (8 specs)

BRAZIL • 5 specs, 5.1 × 1.6, 5.0 × 1.7, 4.7 × 1.6, 4.5 × 1.5 and 4.3 × 1.5 mm; Bahia State, Salvador; in shallow water (inferred from beach-collected specimens); 1988; C. Tarasconi; leg.; UF 589826 • 2 specs,

4.4 × 1.5 and 3.9 × 1.4 mm; Bahia State, Salvador; from beach drift; Jan. 1988; J.C. Tarasconi leg.; UF 589827 • 1 spec., 5.2 × 1.7 mm; Bahia State, Itaparica Island; in beach drift; Mar. 1984; G. Pomponet leg.; P. Fallon coll.

Description

Shell small (holotype length = 5.1 mm), fusiform, translucent, glossy smooth with 8 whorls with appressed sutures, teleoconch whorls obtusely angled, last whorl about 57% of shell length; sculptured with narrow ribs a single spiral mid-whorl cord, and microscopic spiral grooves; aperture narrow, not much wider than the anterior canal, both about 39% of shell length. *Protoconch* of 2½ whorls glossy smooth, first whorl minute, the last slightly bulging, and the last ½-whorl with about 6 oblique riblets. *Axial sculpture* of strong narrow cord-like ribs that run from suture to suture on spire whorls and to anterior fasciole on the last, recurved on whorl shoulders, 6 ribs per whorl. *Varix* is an enlarged last rib that extends from the suture to the anterior canal. *Spiral sculpture* of a mid-whorl cord, obsolete except on rib crests; microscopic grooves override and minutely crenate rib crests. *Sulcus* absent, recurved ribs on shoulder indicate past positions of sinus. *Outer lip* varicose, with a narrow strip of shell that extends out from the base of the varix and runs from the anal sinus to the anterior canal; tooth present at the base of the anal sinus, lyrae along the underside of the varix obscure or not developed in holotype; stromboid notch absent. *Anal sinus* a round notch, in front of the varix, set off from the suture, sides divergent. *Inner lip* narrow glaze along the columella and parietal wall that joins the outer lip at the suture, with a tooth at the anal sinus. Edge of lip margined. *Anterior fasciole* not swollen, marked with growth striae. *Columella* straight. *Anterior canal* short, narrow, straight, barely differentiated from the aperture, end with a shallow notch. *Color* translucent white with a faint brown spiral band just below whorl periphery. The band is darkest on the outer lip.

Remarks

The average length of 8 specimens is 4.6 mm (range = 3.9–5.1 mm).

Range and habitat

Brazil (Bahia State); depth shallow water (inferred from beach-collected specimens).

Ithycythara hyperlepta F. Haas, 1953
Fig. 78Q–T

Ithycythara hyperlepta F. Haas, 1953: 207–209, fig. 42.

Differential diagnosis

This species is easily distinguished from its congeners by its very slender shape, nearly obsolete ribs, and straight-sided whorls.

Type material

Holotype
BRAZIL • 7.9 × 1.8 mm; Rio de Janeiro, Ilha Grande; FMNH 43963.

Paratypes
None known.

Other material examined (3 specs)

BRAZIL • 1 spec., 6.0 × 1.6 mm; São Paulo State, off Santos; depth 50–60 m; Jul. 2000; trawled; ANSP 498923 • 1 spec., 8.5 × 2.2 mm; Santa Catarina State, Porto Belo; intertidal; 1 Aug. 1955;

J.C. Tarasconi leg.; UF 589829 • 1 spec., 6.4 × 1.7 mm; São Paulo State, off Santos; depth 50–60 m; Dec. 1999; local fishermen leg.; trawled; UF 589828.

Description

The holotype was not examined so this description is based on that of Haas (1953: 207–209) and the specimens in-hand. *Shell* small (length = 7.9 mm), extremely slender (W/L = 2.2278), of 10 whorls, teleoconch whorls slightly convex, nearly straight sided; aperture about 25% of shell length, narrow with parallel sides. *Protoconch* of about 2½ whorls, the first minute, the second large and somewhat globular, riblets present on the last ½-whorl. *Axial sculpture* of 6 extremely low ribs per whorl aligned whorl to whorl and extending from suture to suture, slightly sigmoid, intercalary spaces flat. *Varix* a strengthened last rib, slightly larger than penultimate rib. *Spiral sculpture* of an obsolete peripheral primary spiral except for faint nodules on rib crests, and of microscopic grooves. *Sulcus* absent. *Outer lip* thickened, with a low anal tooth. *Anal sinus* is a shallow notch shoulder-wide, rim slightly elevated, in front of the thickened rib. *Inner lip* a narrow glaze from columella to suture, without dentition. *Anterior canal* short, open, end unnotched. *Anterior fasciole* not swollen, with incremental growth lines. *Color* whitish brown with a waxy gloss.

Range and habitat

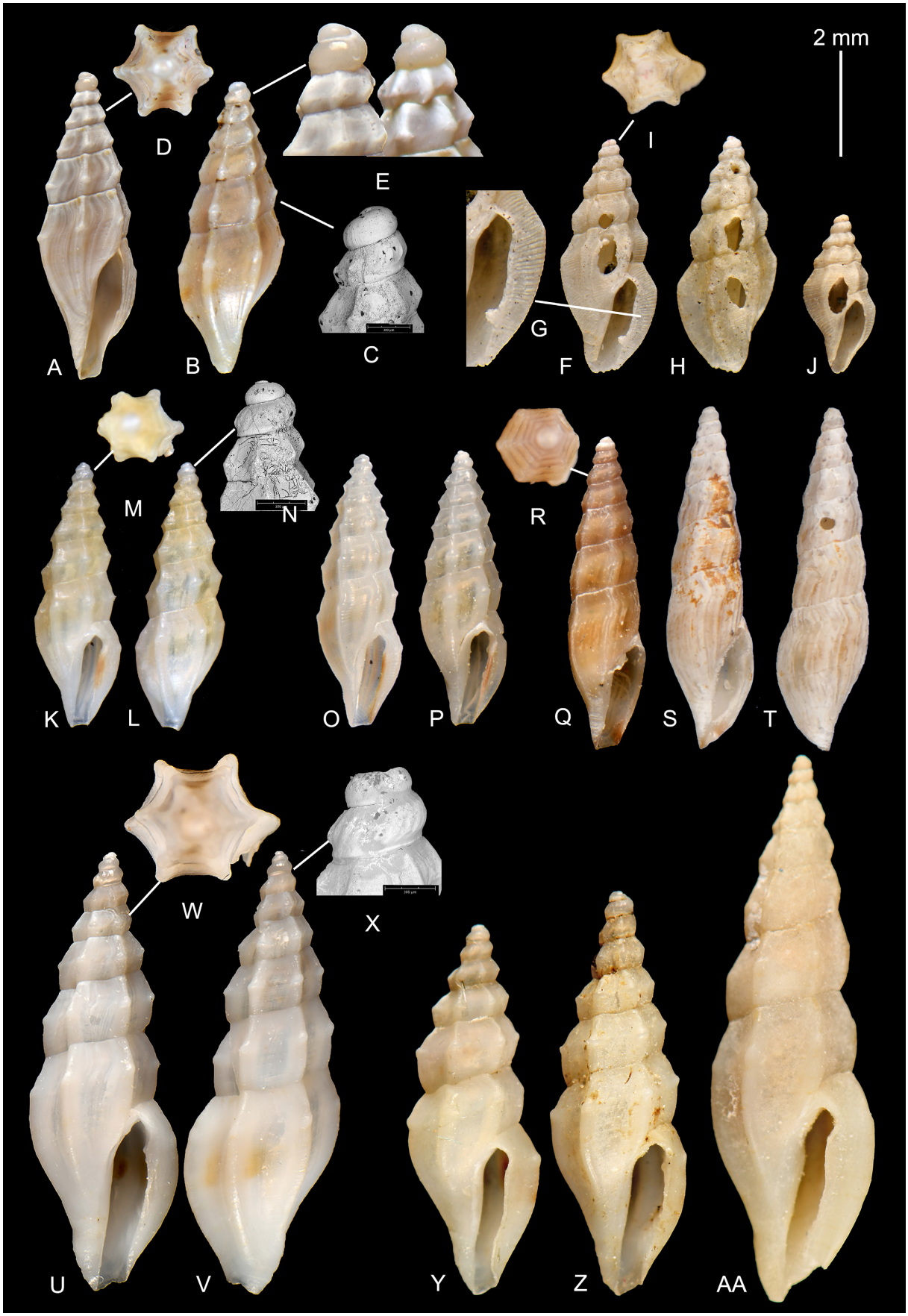
Brazil; depth 50–60 m.

Ithycythara decolora Fallon sp. nov.
urn:lsid:zoobank.org:act:DF173747-9DB4-450F-B09A-31AC00F3C67F
Figs 62B, 78U–AA

Differential diagnosis

Ithycythara simplicis Fallon sp. nov. from Brazil is like *I. decolora* Fallon sp. nov. in most respects but has narrower ribs and flat to slightly convex versus slightly concave intercostal spaces. It also appears to have more distinct, albeit intermittent, orange mid-whorl bands.

Fig. 78 (next page). Species of *Ithycythara* Woodring, 1928. Part 12. – **A–E**. *Ithycythara* unid. sp. Q. Spec., 5.5 × 1.9 mm, ventral, dorsal and apical views, and SEM image of protoconch (MNHN-IM-2000-40047), off French Guiana. Enlarged views of the protoconchs of *Ithycythara* unid. sp. Q (left) and *I. brisseti* Fallon & Bouchet sp. nov. (right) for comparison. – **F–J**. *Ithycythara* unid. sp. R. **F–I**. Spec., 4.5 × 2.0 mm, ventral view, and expanded view of varix showing spiral grooves, dorsal and apical views (MNHN-IM-2000-40049), off French Guiana. Although still intact, large portions of the specimen have eroded away. **J**. Spec., 3.0 × 1.4 mm (MNHN-IM-2000-40048), off French Guiana. A sub-adult specimen. – **K–P**. *Ithycythara bahiensis* Fallon sp. nov. **K–N**. Holotype, 5.1 × 1.7 mm, ventral, dorsal and apical views, and SEM image of protoconch (UF 589825), Salvador, Bahia, Brazil. **O**. Paratype, 5.1 × 1.6 mm (UF 589826), Salvador, Bahia, Brazil. **P**. Paratype, 5.2 × 1.7 mm (P. Fallon coll.), Itaparica Island, Bahia State, Brazil. – **Q–T**. *Ithycythara hyperlepta* F. Haas, 1953. **Q–R**. Spec., 6.0 × 1.6 mm, ventral and apical views (ANSP 498923), off Santos, São Paulo State, Brazil. **S–T**. Spec., length = 6.5 mm, ventral and dorsal views (UF 589828), off Santos, São Paulo, Brazil. – **U–AA**. *Ithycythara decolora* Fallon sp. nov. **U–X**. Holotype, 9.3 × 3.3 mm, ventral, dorsal and apical views, and SEM image of protoconch (ANSP 498910), Coral Island, W Florida. Tip of protoconch is gone but last 2 whorls show configuration of riblets. **Y–Z**. Lengths = 7.8 and 8.5 mm (ANSP 498985), Coral Island, W Florida. **AA**. Paratype, length = 11.5 mm (P. Fallon coll.), 70 mi. [113 km] W of Crystal River, W Florida. Credits: C, N, X: SEM images courtesy of Paul Callomon. Scale bars: A–B, D–M, O–W, Y–AA = 2 mm; C, N, X = 300 µm.


2 mm
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AA

Ithycythara flemingkeyensis Fallon sp. nov. has a narrower shell (W/L 0.2967 versus 0.3548 of holotypes) and a more colorful shell.

Ithycythara altaspira Paulmier, 2019 of Martinique is similar but differs possessing a 2-whorl protoconch (versus 3 whorls), a proportionally taller spire that is acuminate, not regularly enlarging, and is larger (average length = 9.1 versus 8.9 mm).

Ithycythara fusiformis Fallon sp. nov. has a protoconch of 2½ whorls (versus 3), lacks apertural dentition, and is generally smaller, although the largest specimens are comparable in size.

Ithycythara beta Fallon sp. nov. has a different protoconch possessing a subcarinate third whorl, the teleoconch has a shorter anterior canal, a stronger varix, and is colored differently (a semi-translucent golden brown with a wide dark reddish brown band versus opaque milky white with a broad, mid-whorl, faint orange band).

Etymology

Ithycythara decolora Fallon sp. nov., derived from the Latin adjective '*decolor*', meaning 'faded', is named for the apparent lack of color in this species.

Type material

Holotype

UNITED STATES OF AMERICA • 9.3 × 3.3 mm; W Florida, Coral Island; depth 40 m; Sep. 1992; ANSP 498910.

Paratypes (5 specs)

UNITED STATES OF AMERICA • 2 specs, lengths = 8.5 and 7.8 mm; W Florida, Coral Island; depth 40 m; Sep. 1992; ANSP 498985 • 1 spec., length = 11.5 mm; W Florida, Citrus Co., 70 mi. [113 km] W of Crystal River; depth 150 ft [46 m]; dredged; P. Fallon coll. • 1 spec., length = 8.4 mm; W Florida, Hillsborough Co., 100 mi. [161 km] off Egmont Key; depth 240 ft [73 m]; 1975; J. Moore leg.; dredged; P. Fallon coll. • 1 spec., length = 8.2 mm; W Florida, Hillsborough Co., WSW of Egmont Key; depth 240 ft [73 m]; 1967; J. Moore leg.; dredged; P. Fallon coll.

Other material examined (1 spec.)

UNITED STATES OF AMERICA • 1 spec., length = 8.6 mm; W Florida, Hillsborough Co., W of Egmont Key; depth 120 ft. [37 m]; 1969; J. Moore leg.; dredged; P. Fallon coll.

Description

Shell small (holotype length = 9.3 mm), fusiform (W/L = 0.3548), of 8¾ whorls, obtusely angled with mid-whorl peripheries, shoulders flat, without a hump or with only a slight hint of one mid-way, whorl sides below peripheries flat. *Protoconch* of 3 whorls, the first minute, the last with arched riblets that do not reach the abapical suture, riblets fine at first then ending strong. The last whorl subcarinate, with a spiral thread at the suture with the first teleoconch whorl. *Axial sculpture* of 6 ribs per whorl that run from suture to suture on spire whorls and evanesce on shell base: ribs aligned from whorl to whorl, moderately wide with narrow but round crests, intercostal space flat to slightly concave. *Varix* is the last rib and like the preceding rib only larger (much larger in mature or gerontic specimens). *Spiral sculpture* of a single primary spiral at whorl periphery, obsolete in intercostal spaces, and of closely spaced microscopic secondaries subequal in strength. *Sulcus* absent. *Outer lip* a narrow strip of shell along the base of the varix and extending from the anal sinus to the anterior canal. Dentition includes an anal tooth on the outer lip and a low tooth on the parietal wall. A row of lyrae is inside the aperture along the underside of the varix from the anal tooth abapically to the beginning of the anterior canal,

the first lyra is the strongest. *Anal sinus* apex lies about mid-way on shoulder (between suture and whorl periphery). *Inner lip* a narrow glaze along the columella and parietal wall, joins outer lip at suture and runs to the anterior canal. *Anterior fasciole* slightly swollen by incremental growth lines, sculptured like shell base--with microscopic secondary spirals where not obscured by the growth increments. *Anterior canal* short, straight, its end angled slightly to the right when viewed ventrally. *Color* opaque milky white (translucent in intercostal space when fresh) with a broad, mid-whorl, faint orange band on shell dorsum.

Remarks

The average length of 7 specimens is 8.9 mm (range = 7.8–11.5 mm).

Range and habitat

United States (off W Florida); depth 40–73 m.

***Ithycythara* spp. Part 13**

Ithycythara saopaulensis Fallon sp. nov.
urn:lsid:zoobank.org:act:6F266FBF-537F-456B-84CC-A3D97F2C928E
Figs 64F, 79A–I

Differential diagnosis

Ithycythara bahiensis Fallon sp. nov. is smaller (4.6 versus 5.4 mm average length of the same number of measured specimens), has rounder protoconch whorls, has weaker peripheral nodules, has no lyrae (or very weak) lyrae on the underside of the lip (versus strong lyrae), and is colored differently.

Etymology

Ithycythara saopaulensis Fallon sp. nov., the São Paulo *Ithycythara*, is named after the Brazilian state where the type specimens were collected.

Type material

Holotype

BRAZIL • 5.5 × 1.8 mm; São Paulo State, off Santos; depth 80–100 m; ANSP 498932.

Paratypes (11 specs)

BRAZIL • 1 spec., 5.7 × 1.9 and 5.6 × 2.0 mm; São Paulo State, off Santos; depth 80–100 m; ANSP 498930 • 1 spec., 5.7 × 1.9 and 5.6 × 2.0 mm; São Paulo State, off Santos; depth 80–100 m; ANSP 498931 • 3 specs, 5.4 × 2.0, 5.2 × 1.8 and 5.0 × 1.8 mm; São Paulo State, off Santos; depth 80–100 m; USNM 1715457 • 2 specs, 5.6 × 1.9 and 5.8 × 2.1 mm; São Paulo State, off Santos; depth 80–100 m; Jul. 2000; shrimpers leg.; trawled; UF 589799 • 4 specs, 5.5 × 1.9, 4.8 × 1.7, 5.4 × 2.1 and 6.2 × 2.1 mm; São Paulo State, off Santos; depth 80–100 m; Jul. 2000; shrimpers leg.; trawled; P. Fallon coll.

Description

Shell small (holotype length = 5.5 mm), fusiform, translucent, glossy smooth with 7½ whorls total, obtusely angled mid-whorl, with appressed sutures, last whorl about 64% of shell length; sculptured with narrow ribs, a single mid-whorl cord, and microscopic spiral grooves; aperture narrow, not much wider than the anterior canal, about 45% of shell length, including anterior canal. *Protoconch* of 3 glossy smooth whorls, first whorl minute, the second partially immersed, appearing like an inverted bowl, and the last carinate with bead-like riblets. *Axial sculpture* of strong narrow cord-like ribs with round crests (see apical view in Fig. 64F) that run from suture to suture on spire whorls and to inner lip on shell base, curving and flattening over the anterior fasciole, 6 ribs per whorl. *Varix* is like an enlarged

last rib that extends from the suture to the anterior canal. *Spiral sculpture* of a mid-whorl cord, obsolete except on rib crests where sharp nodules form; microscopic grooves override and minutely crenate rib crests. *Sulcus* absent, recurved ribs on shoulder indicate past positions of sinus. *Outer lip* varicose, with a narrow strip of shell that extends out from the base of the varix and runs from the anal sinus to the anterior canal; tooth present at the base of the anal sinus and distinct lyrae along the underside of the varix; stromboid notch absent. *Anal sinus* is a round notch, in front of the varix, set off slightly from the suture and occupying most of the width of the shoulder, sides divergent. *Inner lip* a narrow glaze along the columella and parietal wall, joining the outer lip at the suture. A tooth present on parietal wall at anal sinus and a fold mid-way on columella. Lip lightly margined. *Anterior fasciole* not swollen, marked with growth striae. *Columella* straight. *Anterior canal* is short, narrow, barely differentiated from the aperture, and turned slightly to the right viewed ventrally, unnotched. *Color* a light beige with light golden brown spiral bands, ribs mostly light beige, especially the peripheral nodules.

Remarks

The average length of 8 specimens is 5.4 mm (range = 5.0–5.7 mm).

Range and habitat

Brazil (off Santos and off São Paulo State); depth 80–100 m.

Ithycythara unid. sp. N
Fig. 79J

Differential diagnosis

Ithycythara simplicis Fallon sp. nov., has a shorter anterior canal and straighter columella.

Ithycythara decolora Fallon sp. nov. has slightly convex versus flat to slightly concave shoulders.

Material examined (1 spec.)

TRINIDAD AND TOBAGO • 1 spec., 8.5 × 3.1 mm; Tobago Island, ½ mile [0.8 km] W of Pigeon Pt.; R. Masino leg.; night SCUBA; on soft sand mixed with mineral sand; P. Fallon coll.

Partial description

Shell small (length = 8.5 mm), fusiform (W/L = 0.3647), translucent, of 7 whorls, obtusely angled with mid-whorl peripheries on spire whorls, shoulders flat, whorl sides below peripheries flat. Last whorl convex, sharply flexed to the anterior canal. *Protoconch* eroded. *Axial sculpture* of 6 narrow ribs per whorl that run from suture to suture on spire whorls and evanesce to anterior fasciole: ribs aligned from whorl to whorl, moderately narrow with round crests, intercostal space slightly concave to flat. *Varix* is the last rib, and like the preceding rib, it is only larger, extending to the end of the anterior canal. *Spiral sculpture* of a single primary spiral at whorl periphery, obsolete beyond rib crests. *Sulcus* absent. *Outer lip* a narrow strip of shell along the base of the varix extending from the anal sinus to the anterior canal. Dentition includes a small anal tooth inside the outer lip a row of weak lyrae along the underside of the varix from the anal tooth abapically to the beginning of the anterior canal, the first lyra is the strongest. No tooth visible on the parietal side of the anal sinus. *Anal sinus* apex is round and lies close to the outer edge of the shoulder. *Inner lip* a narrow glaze along the columella and parietal wall, joins outer lip at the suture and runs to the anterior canal. *Anterior fasciole* slightly swollen by incremental growth lines. *Anterior canal* of moderate length and slightly sigmoid. *Color* opaque milky white (translucent in intercostal space when fresh) with a broad, mid-whorl, faint orange band on shell dorsum.

Remarks

This specimen may represent a natural variation of *I. simplicis* Fallon sp. nov.

Ithycythara unid. sp. W
Fig. 79K–L

Differential diagnosis

Like *Ithycythara decolora* Fallon sp. nov., but broader (W/L = 0.3605 versus 0.3548), and with a narrower mid-whorl orange band visible on rib crests. Whorl peripheries lie slightly below mid-whorl versus at mid-whorl.

Material examined (1 spec.)

BAHAMAS • 1 spec., 8.6 × 3.1 mm; Cay Sal Bank, Middle Damas Cays; depth 28 ft [8.5 m]; 20 Feb. 1996; G. Mackintosh leg.; night SCUBA; in Turtle grass; P. Fallon coll.

Partial description

Shell small (8.6 × 3.1 mm), fusiform (W/L = 0.3605), of 8½ whorls obtusely angled with sub-medial whorl peripheries, flat, steeply sloping shoulders, without a hump, and whorl sides flat below peripheries. *Protoconch* worn. *Axial sculpture* of 6 ribs per whorl that run from suture to suture on spire whorls and evanesce on shell base: ribs aligned from whorl to whorl, moderately wide with narrow but round crests, intercostal space flat. *Varix* is the last rib and like the preceding rib, not fully developed. *Spiral sculpture* of a single primary spiral at whorl periphery, obsolete beyond rib crests. *Sulcus* absent. *Outer lip* thin with developing last rib. Dentition absent in this specimen lacking a fully developed aperture. *Anal sinus* apex lies about mid-way on shoulder (between suture and whorl periphery). *Anterior canal* short, straight, its end angled slightly to the right when viewed ventrally. *Color* opaque milky white with a narrow, faint orange band visible only on the rib crests mid-whorl of the last whorl and at the suture of the penultimate.

Remarks

This poorly preserved specimen may be a natural variation of *I. decolora* Fallon sp. nov. Additional specimens from Cay Sal Bank would be desirable.

Ithycythara simplicis Fallon sp. nov.
urn:lsid:zoobank.org:act:606DFDF9-7C56-44A0-8F43-8DA887ECD423
Fig. 79M–T

Differential diagnosis

Ithycythara altaspira Paulmier, 2019 of Martinique is similar but *I. simplicis* Fallon sp. nov. does not have an acuminate spire, characteristic of that species.

Ithycythara decolora Fallon sp. nov. of W Florida is in most respects the same but has slightly wider ribs and slightly concave versus flat to slightly convex intercostal spaces. It also appears to have less color, the orange mid-whorl band faint or lacking altogether.

Ithycythara flemingkeyensis Fallon sp. nov. of the Florida Keys has a narrower shell (W/L = 0.2967 versus 0.3529 of holotypes) and a more colorful shell.

Ithycythara fusiformis Fallon sp. nov. has a protoconch of 2½ whorls (versus 2½–3), is generally smaller (average length = 6.7 versus 9.1 mm), although the largest specimen is comparable in size, and has higher ribs (in cross section, as seen in apical view) with concave intercostal spaces.

Ithycythara beta Fallon sp. nov. has a different protoconch possessing a subcarinate third whorl, a teleoconch with a stronger varix, and is colored differently (a semi-translucent golden brown with a wide dark reddish brown band versus off-white with a light orange mid-whorl band).

Etymology

Ithycythara simplicis Fallon sp. nov., the plain *Ithycythara*, derives its name from the Latin adjective '*simplicis*', which means 'plain' or 'simple', referencing the undistinctive character of the shell.

Type material

Holotype

BRAZIL • 8.5 × 3.0 mm; Espirito Santo State, off Guarapari; local fishermen leg.; dredged; from a calcareous bottom; ANSP 498936.

Paratypes (3 specs)

BRAZIL • 2 specs, 9.1 × 2.9 and 9.1 × 3.1 mm; locality not specified; depth 45 m; trawled; ANSP 498933 • 1 spec., 9.6 × 3.1 mm; Bahia State; depth 20–30 m; diver collected; P. Fallon coll.

Description

Shell is small, of 8½ whorls total, teleoconch whorls obtusely angled with flat shoulders and convex sides. Sculpture of narrow cord-like ribs and peripheral nodes. Aperture narrow, with nearly parallel sides only a little wider than the short anterior canal. *Protoconch* of about 2½–3 round, regularly expanding whorls, the first smooth, with round sides, the last with strong, oblique arched riblets that do not reach the abapical suture. *Axial sculpture* of 6 narrow ribs per whorl, low, with wide, flat intercalary space. Ribs are aligned from whorl to whorl and extend from suture to suture on spire whorls and to inner lip on last. *Varix* apertural, the last and strongest rib. *Spiral sculpture* of microscopic grooves overall, including over peripheral nodes. *Sulcus* absent. *Outer lip* varicose, extending from the suture then gradually reducing in strength to the anterior canal. A narrow width of new shell runs along the basal edge of the varix, is erect around the apex of the anal sinus. *Anal sinus* wide, nearly the width of the shoulder, its apex in front of the varix and rimed with a narrow extension of shell. *Inner lip* a narrow, unemarginate glazed strip along the parietal wall and anterior canal. *Anterior fasciole* slightly swollen by the convergence of growth striae. *Anterior canal* straight. *Color* off white with a light orange mid-whorl band and a scattering of maculation below the band.

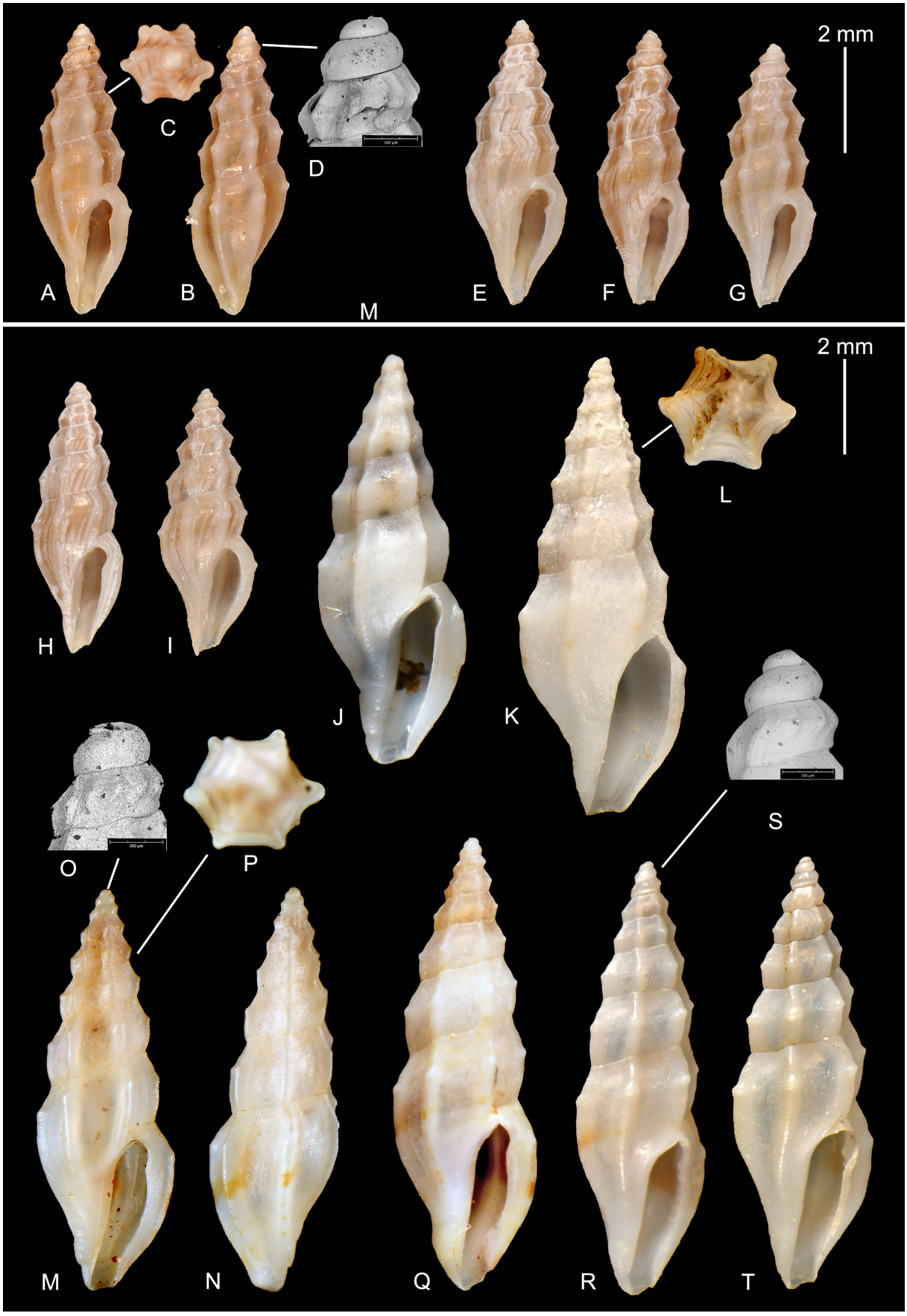
Remarks

The average length of 4 specimens is 9.1 mm (range = 8.5–9.6 mm).

Range and habitat

Brazil (Bahia and Espirito Santo States); depth 20–45 m.

Fig. 79 (next page). Species of *Ithycythara* Woodring, 1928. Part 13. – **A–I**. *Ithycythara saopaulensis* Fallon sp. nov. The top scale bar applies only to images A–G of this species. **A–D**. Holotype, 5.5 × 1.8 mm, ventral, dorsal and apical views, and SEM image of protoconch (ANSP 498932.), off Santos, São Paulo State, Brazil. **E–G**. Paratypes, 5.4 × 2.0, 5.2 × 1.8 and 5.0 × 1.8 mm (USNM 1715457), off Santos, São Paulo State, Brazil, the type locality. **H–I**. Paratypes, 5.7 × 1.9 and 5.6 × 2.0 mm (ANSP 498930 and ANSP 498931), off Santos, São Paulo State, Brazil, also the type locality. – **J**. *Ithycythara* unid. sp. N. Spec., 8.5 × 3.1 mm (P. Fallon coll.), ½ mile [0.8 km] W of Pigeon Pt., Tobago Island, Trinidad and Tobago. – **K–L**. *Ithycythara* unid. sp. W. Spec., 8.6 × 3.1 mm, ventral and apical views (P. Fallon coll.), Middle Damas Cays, Cay Sal Bank, Bahamas. – **M–T**. *Ithycythara simplicis* Fallon sp. nov. **M–P**. Holotype, 8.5 × 3.0 mm, ventral, dorsal and apical views, and SEM image of protoconch (ANSP 498936), off Guarapari, Espirito Santo State, Brazil. **Q**. Paratype, 9.6 × 3.1 mm; Bahia State, Brazil; depth 20–30 m; diver collected (P. Fallon coll.). **R–T**. Specs, 9.1 × 2.9 mm, ventral and SEM image of protoconch, and 9.1 × 3.1 mm (ANSP 498933), offshore, Brazil. Credits: D, O, S: SEM images of protoconchs courtesy of Paul Callomon. Scale bars: A–C, E–N, P–R, T = 2 mm; D, O, S = 300 µm.


2 mm
A
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2 mm
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Genus ***Kurtzia*** Bartsch, 1944

Type species

Mangilia arteaga Dall & Bartsch, 1910, by original designation.

Summary diagnostic characteristics

Shell small, fusiform, whorls angled at or near mid-whorl, shoulder convex or flat.

Anterior canal length short to moderately long, unnotched.

Protoconch small-tipped with 2½–3¼ whorls, the last with 3 rows of beads formed at the intersection of 3 spirals with riblets, the median row most prominent.

Aperture narrowly oval, anal sinus deep, wide, extending the width of the shoulder.

Outer lip varicose, with a weak denticle below sinus inside lip, inner lip a thin glaze without denticles.

Sculpture of strong ribs overridden by weak to strong spiral primaries with microscopic secondaries, narrow axials and strong primary spirals form a clathrate pattern in some species.

Spiral primaries and secondaries frosted at their intersection with incremental growth lines.

Color of straw or light golden brown, reddish brown staining on the outer and inner lips, sometimes on anterior canal, and a band on the shoulder at suture.

Shell surface microsculpture

Microscopic secondaries appear in SEM images with regularly spaced, compact, erect bifurcated bundles of fibrils (structures for short) arising directly from the surface of the spiral. Their spacing dictated by the irregularity of growth increments. Primaries appear as much larger bundles of fibrils, lying on the shell surface, with tightly packed rows of much smaller structures arising on its surface along growth lines that cross at an angle. This arrangement gives the primaries the appearance of being wrapped along its length as a regularly spaced garland because of the angularity of growth lines intersecting the primaries.

The shell surface microsculpture of most species is presented in Fig. 82 to illustrate the similarity of this characteristic among species of the genus *Kurtzia*.

Radula

Representative radulae of 2 different species of the genus *Kurtzia* viz. *Kurtzia ceroplasta* (K.J. Bush, 1885) comb. nov., MNHN-IM- 2013-71806 (Fig. 80) and *Kurtzia sudamericana* Fallon & Bouchet sp. nov., MNHN-IM-2013-57403 (Fig. 81), were imaged. Their description is as follows: hypodermic marginal teeth medium long to long, length about 110 mm (ca 4-6% of AL), with long solid base constituting about third of total tooth length and with weak thin ligaments connecting teeth base. Tooth conical, gradually narrowing toward tip with single distinct barb on the side opposite to narrow oval terminal opening. Teeth loosely enrolled with gaps between overlapping edges of the shaft and additional small holes penetrating tooth wall (in *Kurtzia sudamericana* Fallon & Bouchet sp. nov.). Base with broad lateral basal opening and with obtuse spur.

Difference from other genera

Kurtziella Dall, 1918 lacks a varicose lip and accompanying denticle below the anal sinus, as a subsutural band of spirals on the teleoconch whorls that are lacking in *Kurtzia*, and a different protoconch. The last

whorl of the protoconch of *Kurtzia* has riblets beaded by the intersection of riblets and spirals, usually three rows of beads, the median row most prominent. in *Kurtziella*, the beads are formed by two shallow spiral grooves that cut the riblets into three rows forming subequal rows of beads.

Kurtzina, Bartsch, 1944 has a proportionally larger protoconch with 4 rows of beads on the last whorl; its shell has a low spire in proportion to the body whorl; its aperture is plain, not varicose, and lacks a denticle inside below the anal sinus; it has broader ribs; and is generally smaller species.

Acmaturris Woodring, 1928 possesses a varicose lip, a denticle, strong ribs and primary and secondary spirals, but has a different protoconch, which is "broad-tipped, consisting of about two and a half whorls, the last one sculptured with curved, protractive, axial riblets that may be swollen on a peripheral keel." (Woodring 1928: 184). *Acmaturris* also lacks the dark reddish-brown staining on the anterior canal and around the aperture.

Bathyturris Fallon gen. nov. lacks a denticle on the inside of the outer lip, and has a wide shallow anal sinus, not a deep round notch.

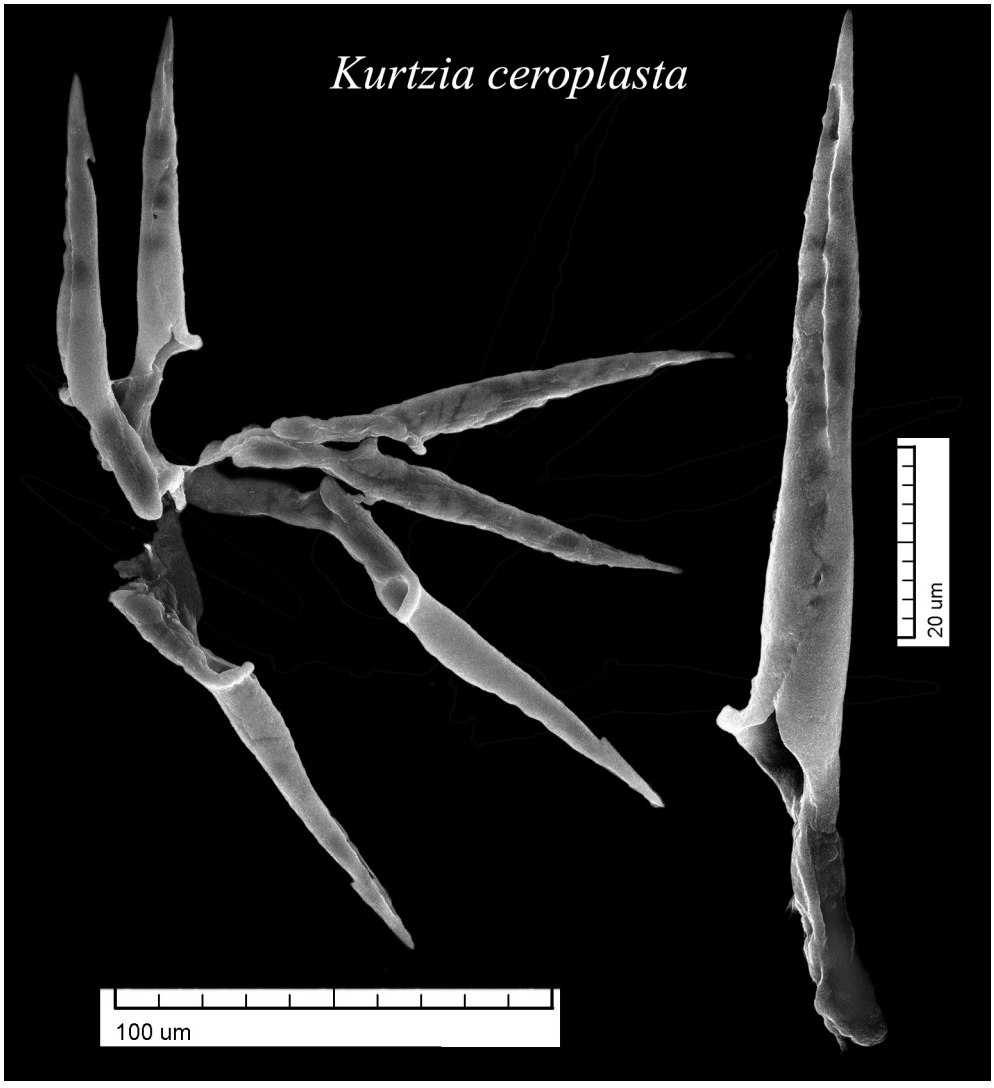


Fig. 80. Marginal radular teeth of *Kurtzia ceroplasta* (K.J. Bush, 1885) comb. nov. (MNHN-IM- 2013-71806). Image by Y. Kantor.

Remarks

Kurtzia has not been previously recognized in the western Atlantic. In this work, three named western Atlantic species belong in this genus: *Kurtziella atrostyla* (Tryon, 1884), *Kurtziella margaritifera* Fargo, 1953, and *Kurtziella ceroplasta* (K.J. Bush, 1885). The rationale for their re-combination will be given in the sections below.

Phylogenetic relationships

The DNA sequence data support the monophyly of the genus *Kurtzia*, with the two sequenced species forming a well-supported clade. The lineage is recovered sister to the genus *Adelocythara*, albeit with no bootstrap support. All sequenced species show a modest intraspecific variability (average intraspecific p-distance range: 0-0.2%).

Fig. 81. Marginal radular teeth of *Kurtzia sudamericana* Fallon & Bouchet sp. nov. (MNHN-IM-2013-57403). Image by Y. Kantor.

Kurtzia spp. Part 1

Kurtzia atrostyla (Tryon, 1884) comb. nov.
Figs 82A, 84A–E

Daphnella atrostyla Tryon, 1884: 310, pl. 34 fig. 100 (as a "slight variety" of *Daphnella cerina*).
Mangilia ephamila K.J. Bush 1885a: 457, pl. 45 figs 4, 4a; 1885b: 580. A synonym according to Dall (1889a: 111, 113) who considered the type an immature color variety. The condition of the type of *M. ephamila* is so poor it could not be confirmed as the same. Type locality: USFC Stn 2108 off Cape Hatteras, North Carolina. The holotype is in USNM 35404.

Mangilia atrostyla – Dall 1889a: 111, 113; 1889b: 102, pl. 41 figs 4, 4a. — Maury 1922: 70.
Mangelia atrostyla – Johnson 1934: 141. — Coomans 1958: 101.
Kurtziella atrostyla – Perry 1940: 167, pl. 38 fig. 266. — Perry & Schwengel 1955: 185, pl. 38 fig. 266. — Andrews 1971: 121, text fig. — Porter & Wolfe 1971: 97. — Morris 1973: 248, pl. 69, fig. 11. — Porter 1974: 254. — Abbott 1974: 281, fig. 3243. — Campbell *et al*. 1975: 118. — Andrews 1977: 136, text figure. — Keeler & Hertz 1981: 55, fig. 1. — Vokes & Vokes 1983: 58, pl. 21 fig. 16. — Kaicher 1984: card 3933. — Turgeon *et al*. 1988: 98; 1998: 107. — Lyons 1989: 27, pl. 11 fig. 4. — Odé 1992a: 6; 1993: 72, fig. 10. — Gundersen 1998: 13, text photo. — Lee 2003a: http://www.jaxshells.org; 2003b: http://www.jaxshells.org/peanut.htm; 2003c: http://www.jaxshells.org/cedarkey.htm; 2009: 132, no. 645. — Williams 2005: #5660. — Grace 2007: 28.
Mangilia ephamila – M. Smith 1951: 136, pl. 47 fig. 16, pl. 65 figs 4, 4a. — R.I. Johnson 1989: 36.

Differential diagnosis

Kurtzia ceroplasta (K.J. Bush, 1885) comb. nov. has angular shoulders, not round, and stronger spiral primaries than *K. atrostyla*.

Kurtzia sudamericana Fallon & Bouchet sp. nov. has angular shoulders, not round, and stronger spiral primaries.

Kurtziella limonitella (Dall, 1884) has weaker ribs on whorl shoulders, a subsutural band of 2 or three primaries isolating ribs from the suture, and a different pattern of primaries and secondaries over the shell surface.

Type material

Lectotype (here designated)
Tryon 1884 does not give sufficient detail to favor one or another of the syntypes as most typical of his description of the species. The 8.1 × 3.2 mm specimen in ANSP 15526A, an image of which has been copied from the ANSP Malacology Website and depicted in Fig. 84A–B is the most complete specimen and is selected here as the lectotype. The data on the lectotype is:

UNITED STATES OF AMERICA • 8.1 × 3.2 mm; W Florida, Punta Rassa; depth 2 fms [3.7 m]; H. Hemphill leg.; dredged; ANSP 15526.

Paralectotypes (7 specs)
UNITED STATES OF AMERICA • 1 spec., 7.3 × 2.9; same data as for lectotype; W Florida, Punta Rassa; depth 2 fms [3.7 m]; H. Hemphill leg.; dredged; ANSP 15526B • 2 specs, 7.3 × 2.7 and 8.1 × 3.0 mm; W Florida, Sarasota Bay; H. Hemphill leg.; ANSP 15519 • 3 specs, (1 measured, 2 very poor) 9.0 × 3.3 mm; W Florida, Punta Rasssa; H. Hemphill and J.W. Tryon leg.; USNM 86905.

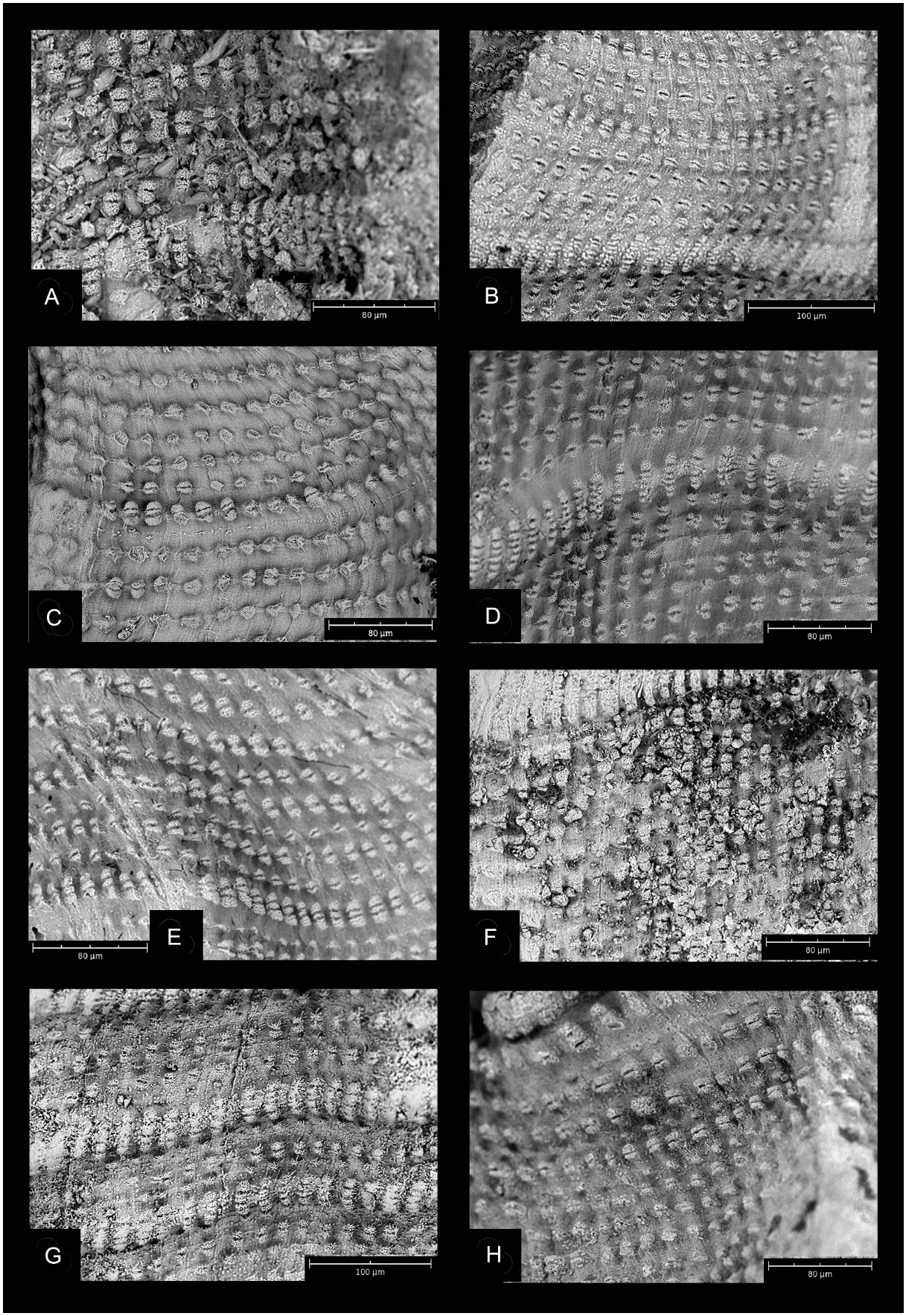
Material examined (8 specs)

The type series of *Daphnella atrostyla* Tryon, 1884 in the ANSP collections, and the holotype of *Mangilia ephamila* K.J. Bush, 1885 (USNM 35404) have been examined.

Description

This description is based on the designated lectotype in ANSP 15526. *Shell* small (length = 8.1 mm), fusiform, whorls convex (peripheries about mid-whorl), sutures deeply impressed, the last whorl 55% of shell length. Aperture narrowly oval and together with anterior canal, about 36% of shell length. *Protoconch* of about 3 whorls, the third developed with a mid-whorl bulge, riblets begin on the second whorl and on the third are modified by spirals into 3 rows of beads, the middle one prominent. *Axial sculpture* of 10 strong ribs, their interspaces less than rib width, that run from suture to suture on spire whorls, evanesce at the anterior fasciole on last, are recurved on the shoulder, and rise a little above the suture, creating intercostal depressions on whorl shoulders. *Spiral sculpture* of 4 primary spirals on spire whorls, none on shoulders, the adapical spiral is the strongest and marks whorl periphery. Frosted microscopic spiral secondaries lie between primaries. *Outer lip* varicose and weakly fimbriated by weak primary spirals; ***anal sinus*** is a shallow round notch about as wide as shoulder. *Inner lip* is a narrow glaze, impressed on parietal wall, margined along anterior canal, and without calluses. *Anterior canal* is short, open, hardly differentiated from aperture, unnotched at its end. *Color* pale yellowish white with brown stains on outer and inner lips, and a band at the suture.

Fig. 82 (next page). Species of *Kurtzia* Bartsch, 1944, shell surface microsculpture. **A**. *Kurtzia atrostyla* (Tryon, 1884), comb. nov. SEM image 1,000×, syntype, 8.1 × 3.2 mm (ANSP 15526), Punta Rassa, W Florida. Structures on spiral secondaries are erect, tight bifurcated bundles of fibrils arising at intersections of spirals with growth lines; spiral primaries have a larger diameter with tightly packed, much smaller bundles on its surface in rows along growth lines (appearing wound around the primary spiral). **B**. *Kurtzia ceroplasta* (K.J. Bush, 1885) comb. nov., SEM image 830×. Spec., 6.3 × 2.6 mm (MNHN-IM-2013-72671), Baie de Fort-de-France, Le Lamentin, end of the track, Martinique. Spiral secondaries have tight, bifurcated bundles of fibrils where they intersect growth lines, and secondaries as in Fig. 82A. Growth lines, which run from top to bottom in the image, are very faint. **C**. *Kurtzia herosae* Fallon & Bouchet sp. nov., SEM image 850×. Paratype, 4.1 × 1.8 mm (MNHN-IM-2013-43474), off French Guiana. Structures are bifid bundles of fibrils aligned evenly along the secondary spirals. **D**. *Kurtzia sudamericana* Fallon & Bouchet sp. nov. SEM image 850×, paratype, 4.7 × 2.1 mm (MNHN-IM-2012-43481), off French Guiana. Structures on spiral secondaries are compact, small and their bifid mature distinct. Some rows have bundles of fewer fibrils. A single primary is shown mid-image and has the characteristic row of smaller structures aligned along the traverse of a growth line. **E**. *Kurtzia cedarkeysarum* Fallon sp. nov., SEM image 940×. Paratype, 6.2 × 2.7 mm (UF 589831), off Cedar Keys, Levy Co., W Florida. Structures on spiral secondaries are tight, bifurcated bundles of fibrils, and in this image, rows of bundles are not uniformly sized, and in one spiral, individual structures appear trifid. **F**. *Kurtzia margaritifera* (Fargo, 1953) comb. nov., SEM image 850×. Spec., 6.8 × 2.9 mm (UF 589832), off Mississippi River delta, Louisiana. Image of a mostly damaged area of shell surface yet clearly shows some bifid bundles of fibrils on secondary spirals in an undamaged area. **G**. *Kurtzia xalvisae* Fallon sp. nov., SEM image 800×, paratype, 6.1 × 3.0 mm (UF 589833), E of Mayport, Duval Co., E Florida. Microscopic secondaries have minute bifid bundles of fibrils at spiral/growth line intersections. Primaries are shown with rows of smaller bundles along intersecting growth lines. **H**. *Kurtzia delicata* Fallon sp. nov. SEM image 850×, holotype, 5.3 × 2.2 mm (UF 589834), off Dry Tortugas, Florida Keys. Erect bifid bundles of fibrils are aligned on secondary spirals at growth line intersections. The very smallest spirals have only vestigial bundles. Credits: SEM images courtesy of Krasimira "Kasey" Seizova. Scale bars: A, C–F, H = 80 μm; B, G = 100 μm.


A
80 µm
B
100 µm
C
80 µm
D
80 µm
E
80 µm
F
80 µm
G
100 µm
H
80 µm

Remarks

The morphology of *Kurtzia atrostyla* (Tryon, 1884) comb. nov. is most often combined in *Kurtziella* but conforms to the summary diagnosis of the genus outlined above at the beginning of this part. *Kurtziella* has a different protoconch, a subsutural band on teleoconch whorls composed of 3 or more spiral primaries, and a plain, not varicose lip.

Range and habitat

United States (W Florida); depth 6 m. Unconfirmed reports from the published literature include W Atlantic from United States (North Carolina to SE Florida and Gulf of Mexico from SW Florida to Texas) and Mexico (Yucatan Peninsula).

Kurtzia ceroplasta (K.J. Bush, 1885) comb. nov.
Figs 80, 82B, 83, 84F–S

Mangilia ceroplasta K.J. Bush, 1885a: 458.

Mangilia ceroplasta – Dall 1889b.
Daphnella ceroplasta – Paetel 1888.
Mangelia ceroplasta – Parker 1956. — Abbott 1974: 278, #3181. — Turgeon *et al*. 1988: 98; 1998: 107 — R.I. Johnson 1989: 29, pl. 13 fig. 3. — Lee 2003a: http://www.jaxshells.org; 2003b: http://www.jaxshells.org/peanut.htm; 2003c: http://www.jaxshells.org/cedarkey.htm; 2009: 132 [as a possible synonym of *Kurtziella atrostyla* (Tryon, 1884)].

Differential diagnosis

Kurtzia sudamericana Fallon & Bouchet sp. nov. has stronger spiral primaries, usually with only two on the spire whorls versus 3 or more on *Kurtzia ceroplasta* (K.J. Bush, 1885) comb. nov.; the shoulder is more convex than that of *K. ceroplastn*

Kurtzia atrostyla (Tryon, 1884) has less angular whorls, a shorter anterior canal, and finer spiral primaries.

Type material

Holotype
NORTH CAROLINA • 4.3 × 1.9 mm; off Cape Hatteras; depth 10–17 fms [18–31 m]; 20 Oct. 1884; USFC stn 2290; USNM 44757.

Paratypes
None, although Bush (1885a) mentions “a few dead specimens”. There is a discrepancy between the stated size of the holotype in Bush (1885a) (5.5 × 3.0 mm) and the measurement of the holotype in USNM 44757 made in this study (4.3 × 1.9 mm). This smaller specimen, if not the original, agrees with Bush’s description.

Material examined (117 specs)

In addition to the holotype, 116 specimens have been examined, all from Guadeloupe and Martinique samples. Of these, four have been sequenced and a fifth live caught specimen preserved in ethanol.

GUADELOUPE • 1 spec., 4.9 × 2.2 mm; Vieux-Bourg (Les Abymes); 16°22.87′ N, 61°33.05′ W; depth 65 m; 18 May 2012; KARUBENTHOS 2012; stn GD36; sequenced; MNHN-IM-2012-20654 • 1 spec., 4.6 × 2.0 mm; Pointe sur baie de Baille-Argent; 16°15.55′ N, 61°48.8′ W; depth 40 m; 12 May 2012; KARUBENTHOS 2012; stn GD21; sequenced; MNHN-IM-2013-20614 • 1 spec. 5.1 × 2.1 mm; Pointe

sur baie de Baille-Argent; 16°15.55′ N, 61°48.8′ W; depth 40 m; 12 May 2012; KARUBENTHOS 2012; stn GD21; MNHN-IM-2012-8906.

MARTINIQUE • 1 spec., 5.0 × 2.2 mm; NE of Le Lorrain; 14°51.3′ N, 61°01.7′ W; depth 48 m; 21 Sep. 2016; MADIBENTHOS; stn AD255; sequenced; MNHN-IM-2013-70921 • 1 spec., 6.3 × 2.6 mm; N of Caravelle Peninsula; 14°52.1′ N, 60°53.7′ W; depth 59 m; 18 Sep. 2016; MADIBENTHOS; stn AD244; sequenced; MNHN-IM-2013-72671 • 1 spec., 3.3 × 1.6 mm, ethanol-preserved juvenile; SW of Pointe des Nègres, Fort-de-France Bay; 14°35.7′ N, 61°06′ W; depth 60 m; 30 Sep. 2016; MADIBENTHOS; stn AD276; MNHN-IM-2013-71806 • 8 specs, (3 measured) 7.9 × 2.9, 5.4 × 2.4 and 5.5 × 2.2 mm; Schoelcher, Anse Madame; 14°37.1’ N, 61°06.8’ W; depth 90 m; 7 Oct. 2016; MADIBENTHOS; stn AD610; MNHN-IM-2000-39867.

Description

The original description was published in Bush (1885a: 458–459). The following is a summary of shell morphology based on the examination of the holotype made for this study. *Shell* small (holotype

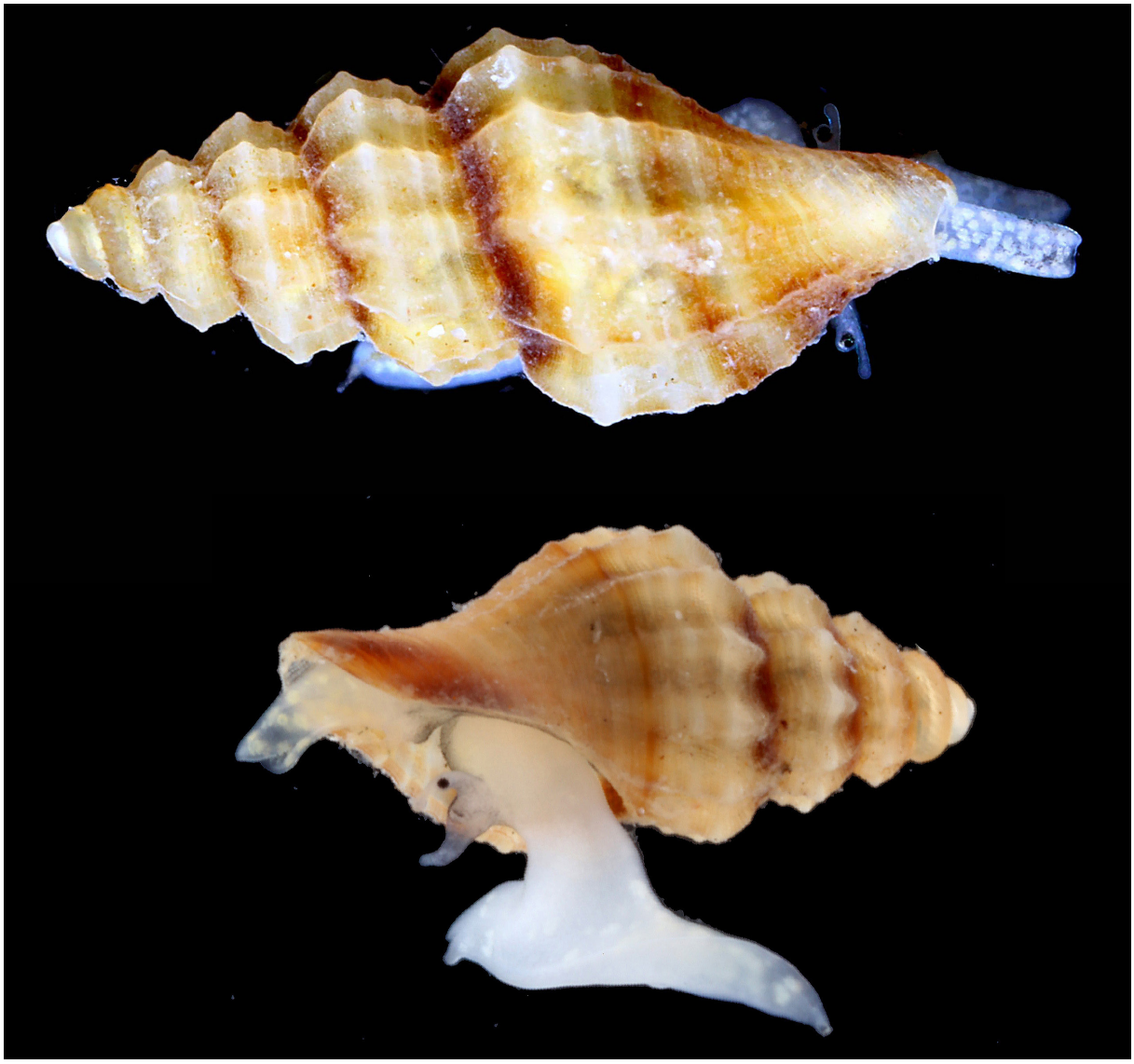


Fig. 83. *Kurtzia ceroplasta* (K.J. Bush, 1885) comb. nov. (MNHN-IM-2013-70921), dorsal and ventral views of live animal. Photo by C. Redfern.

length = 4.3 mm), fusiform with a short spire, of 6½ acutely angled whorls, their peripheries about mid-whorl, the last about 67% of shell length. Aperture is elongate-oval and together with anterior canal, about 49% of shell length. *Protoconch* of about 2¾ whorls, the third developed with a mid-whorl bulge, riblets begin on the second whorl, then on the third are modified by 3 spirals into rows of beads, the middle one prominent. *Axial sculpture* of 10 strong ribs, their interspaces less than rib width, that run from suture to suture on spire whorls, evanesce on the anterior fasciole of last, and are recurved on the shoulder. *Spiral sculpture* of 3 primary spirals on spire whorl sides, none on shoulders, the peripheral spiral is strongest, swollen into nodules where ribs are crossed. Microscopic spiral secondaries lie between primaries, which are frosted at intersections with growth striae. *Outer lip* varicose with a narrow strip of shell that extends beyond the varix, the crest of which is fimbriated by the primary spirals. *Anal sinus* a round notch as wide as the shoulder. *Inner lip* a narrow glaze without calluses. *Anterior canal* of moderate length, open, differentiated from aperture by an abrupt narrowing, end unnotched. *Color* pale golden yellow with brown stains on outer and inner lips, anterior fasciole, and a band at the suture.

Animal

The animal has a translucent white foot with opaque white mottling, a translucent proboscis and eyestalk with white mottling; its eye is about midway along the stalk when fully extended (Fig. 83).

Remarks

The average length of 42 measured specimens is 4.9 mm (range = 2.1–8.4 mm).

Range and habitat

United States (North Carolina), Guadeloupe, and Martinique; depth 1–90 m.

Kurtzia herosae Fallon & Bouchet sp. nov.
urn:lsid:zoobank.org:act:AD24F863-9869-4295-8D48-B0D6DA8C48D5
Figs 82C, 84T–X

Differential diagnosis

Kurtzia ceroplasta (K.J. Bush, 1885) comb. nov. has more angular spire whorls; the teleoconch lacks the paired peripheral primary spirals, has a longer anterior canal, and is colored differently.

Kurtzia sudamericana Fallon & Bouchet sp. nov. spire whorls are more angular; the teleoconch has stronger primary spirals, is larger, and has a different coloration.

Etymology

Kurtzia herosae Fallon & Bouchet sp. nov. is named in honor of Virginie Héros, a lifelong member of the MNHN malacology team, keeper of its type collection, participant in numerous expeditions, and provider of valuable information and edits for this work.

Type material

Holotype

FRENCH GUIANA • 4.6 × 2.0 mm; offshore; 6°09.8′ N, 53°01.7′ W; depth 93–96 m; 3 Dec. 2017; PROTEUS-GUYANE; stn DW5088; MNHN-IM-2000-40018.

Paratypes (2 specs)
FRENCH GUIANA • 1 spec., 4.1 × 1.8 mm; offshore; 6°18′ N, 52°13.3′ W; depth 95–97 m; 8 Aug. 2014; GUYANE 2014; stn CP4402; MNHN-IM-2012-43474 • 1 spec., 3.8 × 1.6 mm; offshore; 6°10.7′ N, 52°03.0′ W; depth 96–101 m; 3 Dec. 2017; PROTEUS-GUYANE; stn DW5097; MNHN-IM-2000-40027.

Description

Shell small (length = 4.6 mm), stout, fusiform (W/L = 0.4348), with 6¾ whorls total, 3¾ convex teleoconch whorls with round shoulders, the last whorl about 66% of shell length with a wide varicose lip, a short anterior canal and deep anal sinus. Sculpture of strong ribs and strong spiral primaries forming a lattice-like pattern. Aperture narrowly oval, with a short anterior canal and deep notch posteriorly, together about 49% of shell length. *Protoconch* of 2¾ whorls, tip minute, the first 1¾ whorls smooth, the last with arched riblets the last ¾ of which with 3 rows of beads formed where ribs are crossed by 3 spirals, the median one most prominent and forming the periphery of the whorl. *Axial sculpture* of strong narrow ribs that run from suture to suture and to anterior fasciole on the last, strong right up to the suture and slightly recurved on the shoulder, round over whorl periphery, and terminating at the anterior fasciole, 12 ribs on penult, 7 on last to varix. *Varix* apertural, heavy, frilled by primary spirals, rises slightly above the suture and extends to the end of the anterior canal, face of varix slightly excavated at and recurved at the anal sinus. *Spiral sculpture* of primary and microscopic secondaries. A primary covers the suture, another on the shoulder near the periphery and the strongest at the periphery. Another strong primary follows a little below on the whorl side, and a weaker one near the abapical suture; microscopic secondaries of varying strengths fill the intercalary spaces. The shell base has about 9 weaker primaries that grow closer anteriorly and have microscopic secondaries between. Primaries and secondaries are frosted at the intersection of growth striae. *Sulcus* absent; recurved ribs on the shoulder mark past presence of the anal sinus. *Outer lip* varicose with a narrow extension of shell at its base extending from the anal sinus to beginning of the anterior canal. *Anal sinus* is a round notch in the outer lip in front of the varix bordered by a parietal callus and denticle. The notch is angled about 45° from the shell axis and positioned about midway on the shoulder. *Inner lip* a narrow glaze along the columella with a callus on the parietal wall at the anal sinus. *Columella* concave in the parietal region, straight along the anterior canal. *Anterior canal* short but delineated from the aperture by anterior narrowing, straight, end unnotched. *Anterior fasciole* not swollen, with about 7 oblique spiral secondaries. *Color* a pale yellowish white with a reddish brown stained outer lip, a light reddish brown band mid-whorl and on whorl shoulders, a white primary spiral at whorl peripheries, and a white protoconch.

Remarks

The range in length of 4 specimens is 3.8–4.6 mm.

Range and habitat

Off French Guiana; depth 93–101 m.

Kurtzia sudamericana Fallon & Bouchet sp. nov.
urn:lsid:zoobank.org:act:76412BB4-573E-44F1-A872-187BBB7B93A2
Figs 81, 82D, 84Z–LL

Differential diagnosis

Kurtzia ceroplasta (K.J. Bush, 1885) comb. nov., has a shorter spire and weaker spiral primaries with 3, instead of 2, on the spire whorl sides. Some specimens also exhibit a reddish-brown spiral thread visible at the level of the suture on the whorl base, a feature not observed in *K. sudamericana* Fallon & Bouchet sp. nov.

Kurtzia atrostyla (Tryon, 1884) has weaker primary spirals, convex shoulders, rather than angular ones, and a shorter anterior canal.

Kurtzia margaritifera (Fargo, 1953) comb. nov. has fewer and weaker primary spirals and is colored differently.

Kurtzia cedarkeysarum Fallon sp. nov. is smaller and a different color.

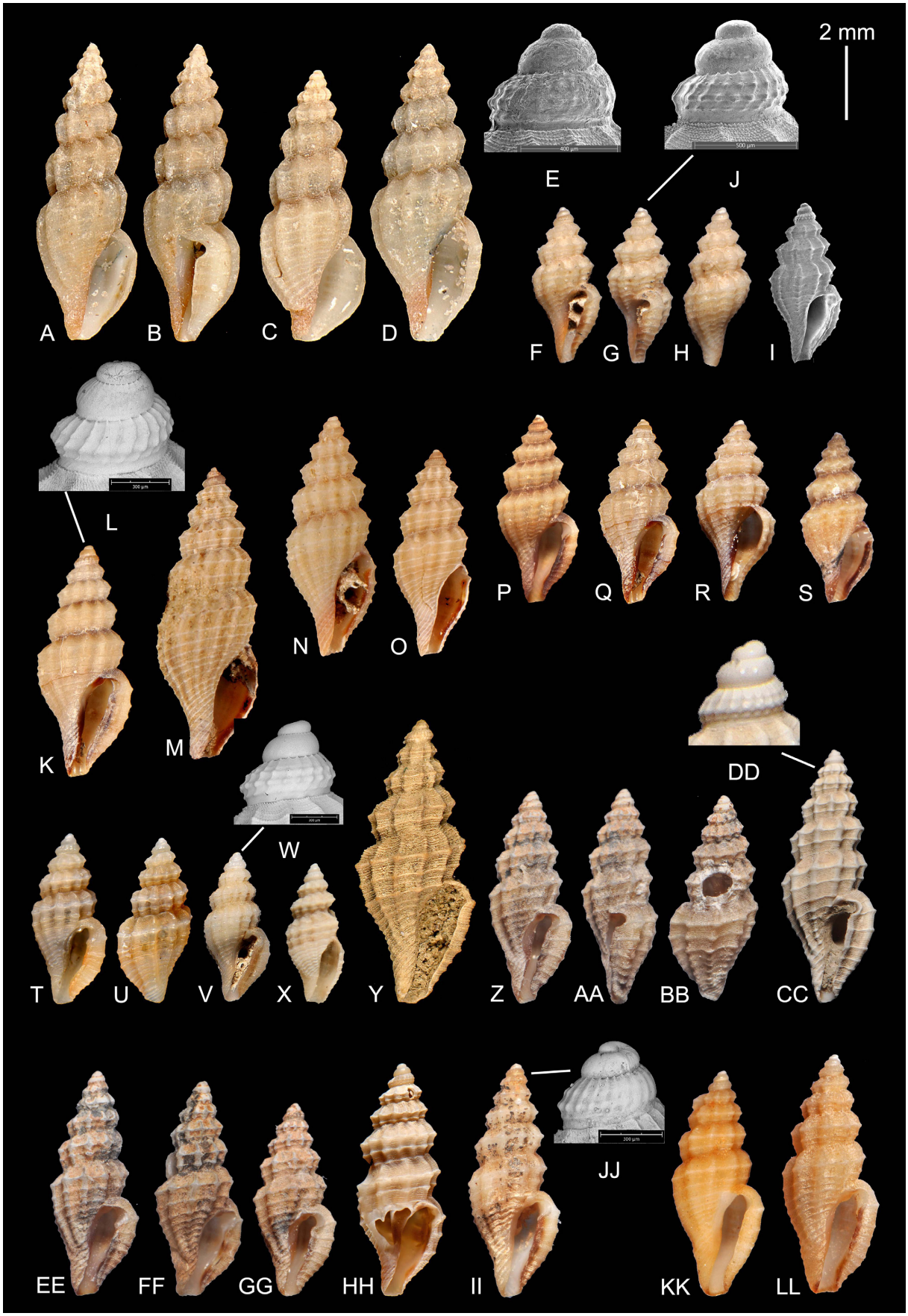
Kurtzia xalvisae Fallon sp. nov. shows a proportionally greater breadth (W/L = 0.4444 versus 0.4138 of their respective holotypes), more angular whorls, and weaker primary spirals.

Kurtzina venezuelana (Weisbord, 1962) comb. nov. lacks a varicose outer lip; it has a short spire and a proportionally larger protoconch with 4, not 3, rows of beads.

Etymology

Kurtzia sudamericana Fallon & Bouchet sp. nov., the South American *Kurtzia*, is named after the geographic location from which all specimens have been collected.

Fig. 84 (next page). Species of *Kurtzia* Bartsch, 1944. Part 1. **A–D**. *Daphnella atrostyla* Tryon, 1884. **A–B**. Lectotype, 8.1 × 3.2, ventral and lateral views (ANSP 15526), Punta Rasa, W Florida. **C–D**. Paralectotypes, 7.3 × 2.9 and 8.1 × 3.0 mm (ANSP 15526), Punta Rasa, W Florida. – **E**. *Mangilia atrostyla* (Tryon, 1884), paralectotype (USNM 86905), only SEM of protoconch shown, 100 ×. – **F–J**. *Mangilia ceroplasta* K.J. Bush, 1885, holotype, 4.3 × 9.1 mm, ventral, lateral and dorsal views, and SEM images of whole shell and protoconch (USNM 44757), off Cape Hatteras, North Carolina. – **K–S**. *Kurtzia ceroplasta* (K.J. Bush, 1885) comb. nov. **K–L**. Sequence voucher, 6.3 × 2.6 mm, ventral view, and SEM image of protoconch (MNHN-IM-2013-72671), Baie de Fort-de-France, Le Lamentin, end of the track, Martinique. **M–O**. 3 specs, 7.9 × 2.9, 5.4 × 2.4 and 5.5 × 2.2 mm (MNHN-IM-2000-39867), Schoelcher, Anse Madame, Martinique. **P**. Spec. 5.1 × 2.1 mm (MNHN-IM-2012-8906), Point on Baille-Argent Bay, Guadeloupe. **Q**. Sequence voucher, 5.0 × 2.2 mm (MNHN-IM-2013-70921), NE of Le Lorrain, Martinique. **R**. Sequence voucher, 4.9 × 2.2 mm (MNHN-IM-2013-20654), Vieux-Bourg (Les Abymes), Guadeloupe. **S**. Sequence voucher, 4.6 × 2.0 mm (MNHN-IM-2013-20614), Point on Baille-Argent Bay, Guadeloupe. – **T–X**. *Kurtzia herosae* Fallon & Bouchet sp. nov. **T–U**. Holotype, 4.6 × 2.0 mm, ventral and dorsal views (MNHN-IM-2000-40018), off French Guiana. **V–W**. Paratype, 4.1 × 1.8 mm, ventral and SEM of protoconch (MNHN-IM-2012-43474), off French Guiana. **X**. Paratype, 3.8 × 1.6 mm (MNHN-IM-2000-40027), off French Guiana. – **Y**. *Kurtzia arteaga* Dall and Bartsch, 1910. Spec., 7.7 × 2.9 mm (USNM 96589), off Pt. Loma, San Diego, California. Type species of the genus *Kurtzia* (not the type of *K. Arteaga*). – **Z–LL**. *Kurtzia sudamericana* Fallon & Bouchet sp. nov. **Z–BB**. Holotype, 5.8 × 2.4 mm, sequence voucher, ventral, lateral and dorsal views (MNHN-IM-2013-56920), off French Guiana. **CC–DD**. Paratype, 6.9 × 2.6 mm, ventral and protoconch (not to scale) views (MNHN-IM-2012-43485), off French Guiana. **EE**. Paratype, 6.1 × 2.5 mm (MNHN-IM-2013-57403), off French Guiana. **FF**. Paratype, 5.9 × 2.5 mm (MNHN-IM-2013-57408), off French Guiana. **GG**. Paratype, 5.3 × 2.3 mm (MNHN-IM-2013-57404), off French Guiana. **HH**. Paratype, 6.3 × 2.4 mm (MNHN-IM-2000-40015), GREEN 0, French Guiana. **II–JJ**. Spec., 6.4 × 2.4 mm, ventral view, and SEM image of protoconch (UF 589835), off Guarapari, Espirito Santo, Brazil. **KK–LL**. Specs, 6.3 × 2.6 and 6.5 × 2.7 mm (ANSP 498941), Corumbau City, Bahia, Brazil. Credits: A–B: photograph from the data portal of ANSP; E, I: SEM images from the data portal of the USNM; J, L, W, JJ: SEM images courtesy of Krasimira "Kasey" Seizova. Scale bars: A–D, F–I, K, M–V, X–II, KK–LL = 2 mm; E = 400 μm; J = 500 μm; L, W, JJ = 300 μm.


2 mm
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LL

Type material

Holotype

FRENCH GUIANA • 5.8 × 2.4 mm; offshore; 5°13.8′ N, 52°08.9′ W; depth 36–41 m; 8 Aug. 2014; sequenced; GUYANE 2014; CP4409; MNHN-IM-2013-56920.

Paratypes (40 specs)

FRENCH GUIANA • 1 spec., 6.1 × 2.5 mm; same data as for holotype; MNHN-IM-2013-57403 • 1 spec., 5.3 × 2.3 mm; same data as for holotype; sequenced; MNHN-IM-2013-57404 • 1 spec., 5.9 × 2.5 mm; same data as for holotype; sequenced; MNHN-IM-2013-57408 • 3 specs, 3.4 × 1.6, 4.4 × 1.9 and 4.5 × 1.9 mm; same data as for holotype; MNHN-IM-2012-3742 • 1 spec., 6.4 × 2.4 mm; same data as for holotype; MNHN-IM-2012-3795 • 1 spec., 5.5 × 2.2 mm; offshore; 5° 59.6′ N, 52°11.3′ W; depth 66–67 m; 8 Aug. 2014; GUYANE 2014; stn CP4399; MNHN-IM-2012-3794 • 1 spec., 4.1 × 1.8 mm; offshore; 5° 12.4′ N, 51° 40.2′ W; depth 60 m; 28 Jul. 2014; GUYANE 2014; stn CP4353; MNHN-IM-2012-3744 • 1 spec., 3.9 × 1.8 mm; offshore; 5°12.4′ N, 51°40.2′ W; depth 60 m; 28 Jul. 2014; GUYANE 2014; stn CP4353; MNHN-IM-2012-3734 • 6 specs, 6.9 × 2.6, 4.8 × 2.0, 5.8 × 2.3, 4.0 × 1.8, 6.4 × 2.4 and 4.4 × 1.9 mm offshore, 5° 08.7′ N, 51° 08.7′ W; depth 47 m; 26 Jul. 2014; GUYANE 2014; stn CP4344; MNHN-IM-2012-43485 • 1 spec., 3.6 × 1.7 mm offshore, 6° 52.2′ N, 53° 02.6′ W; depth 94 m; 30 Jul. 2014; GUYANE 2014; stn DW4359; MNHN-IM-2012-3747 • 2 specs, 4.8 × 2.1 and 4.1 × 1.9 mm; offshore; 5° 49′ N, 51° 28′ W; depth 102–103 m; 6 Aug. 2014; GUYANE 2014; stn DW4390; MNHN-IM-2012-3792 • 2 specs, 4.1 × 1.9 and 3.9 × 1.9 mm; offshore; 5°49′ N, 51° 28′ W; depth 102–103 m; 6 Aug. 2014; GUYANE 2014; stn DW4390; MNHN-IM-2012-3793 • 12 specs, 3.7 × 1.8, 3.7 × 1.9, 4.3 × 1.9, 3.4 × 1.6, 4.8 × 2.2, 4.0 × 1.8, 4.1 × 1.9, 2.7 × 1.5, 2.4 × 1.4, 4.7 × 2.1, 4.6 × 1.8 and 3.0 × 1.5 mm; offshore; 6° 18′ N, 52° 13.3′ W; depth 95–97 m; 8 Aug. 2014; GUYANE 2014; stn CP4402; MNHN-IM-2012-43481 • 1 spec., 3.4 × 1.9 mm; offshore; 6° 18′ N, 52° 13.3′ W; depth 95–97 m; 8 Aug. 2014; GUYANE 2014; stn CP4402; MNHN-IM-2012-3733 • 3 specs, 4.2 × 1.9, 4.1 × 1.9 and 3.7 × 1.6 mm; offshore; 5° 36.3′ N, 52° 09.2′ W; depth 57 m; 10 Aug. 2014; GUYANE 2014; stn CP4408; MNHN-IM-2012-3735 • 3 specs, 4.6 × 1.9, 4.3 × 1.9 and 4.0 × 1.8 mm; offshore; 5° 1.4′ N, 51° 22.3′ W; depth 62 m; 18 Apr 1999; GREEN 0; stn D12; small dredge; MNHN-IM-2000-40015.

Other material examined (93 specs)

An additional 89 specimens from off French Guiana were examined (PROTEUS-GUYANE expedition of 2017), and the following 4 specimens from Brazil that are believed to be this species:

BRAZIL • 1 spec., 6.4 × 2.5 mm; Espirito Santo State, off Guarapari; depth 20–30 m; Jul. 2004; A. Bodart leg.; dredged; UF 589835 • 2 specs, 6.3 × 2.6 and 6.5 × 2.7 mm; Bahia State, Corumbau City,; depth 2 m; A. Jorio leg.; net; ANSP 498941 • 1 spec., length = 5.8 mm; Rio de Janerio, off Cabo Frio; depth 100 m; local fishermen leg.; shrimp nets; ANSP 498940.

Other material

VENEZUELA • 1 spec., 6 mm; Puerto la Cruz, Anzoátegui; ex coll. W.F.A. Guilonard; NMR 70474. Accessed on WoRMS 2019-01-31, is not *Kurtziella venezuelana* Weisbord, 1962 but rather *Kurtzia sudamericana* Fallon & Bouchet sp. nov.

Description

Shell small (holotype length = 5.8 mm, paratypes to 6.9 mm), fusiform, solid, of 7¼ whorls, the last whorl 62% of shell length; teleoconch whorls with convex, shoulders and whorl sides straight to slightly convex, sutures constricted and narrower than whorl peripheries. Sculpture of strong axial and spiral elements in an open lattice-like pattern. Aperture is elongate-oval, varicose, with a wide shallow anal sinus and canal of moderate length. *Protoconch* of 2¾–3 regularly expanding glassy-smooth whorls, the

first minute, the last with fine arcuate riblets that become stronger and more widely separated toward the lip; with 3 beaded rows formed at the intersection of spirals with riblets on the last ¾-whorl, the median row the most prominent. *Axial sculpture* of narrow but strong ribs that run from suture to suture and to anterior fasciole on the last, slightly recurved on the shoulder, and terminating at the anterior fasciole on the last whorl, intercostal spaces 2 or 3 times their width. Ribs number 10 on penultimate, 6 on last to the varix. *Varix* apertural, heavy, frilled by primary spirals, rises slightly above suture and extends to near the end of the anterior canal. Face of varix slightly recurved at the anal sinus. *Spiral sculpture* of primary and microscopic secondaries; the strongest primary is at the whorl periphery where raised points form on rib crests; the shoulder lacks primaries although one or more heavily frosted secondaries lie along the suture; the side of the penultimate whorl has 9 microscopic secondaries, a primary and then 9 more microscopic secondaries to the suture line. The shell base has about 9 weak primaries with a diminishing number of microscopic secondaries between them. *Sulcus* absent; recurved ribs on the shoulder mark past presence of the anal sinus. *Outer lip* varicose with a narrow strip of shell at varix base extending from the anal sinus to beginning of the anterior canal, heavily stained. *Anal sinus* a deep round notch in outer lip on the shoulder, set off the suture near the whorl periphery. The notch is angled perpendicular to the shell axis and is rimmed by a short vertical lip. *Inner lip* a narrow, impressed glaze, unemarginate, with a low callus on the parietal wall at the anal sinus. *Columella* concave in the parietal region, straight along the anterior canal. *Anterior canal* is moderately long, delineated from the aperture by an abrupt narrowing, then bent slightly to the left when viewed ventrally, with the end turned to the right; end unnotched. *Anterior fasciole* is not swollen, packed with oblique spiral secondaries. *Color* holotype weathered a dark gray in spots from the environment but naturally a light yellow brown with reddish-brown staining on outer and inner lip, and on the shoulder at the suture.

Remarks

The average length of 43 specimens is 6.4 mm (range = 2.4–6.9 mm). Most of the French Guiana specimens appear discolored (whitish gray) with a darker stripe on the outside of the outer lip, perhaps from the condition of the environment from which they were taken. The Brazilian specimens may represent the more natural color of yellowish orange with reddish orange at sutures.

Range and habitat

Venezuela, French Guiana, and Brazil (Bahia, Espirito Santo states); depth 2–103 m.

***Kurtzia* spp. Part 2**

Kurtzia cedarkeysarum Fallon sp. nov.
urn:lsid:zoobank.org:act:01464BD5-71A8-4B02-AA67-1AD2E3C6C517
Figs 82E, 85A–I

Differential diagnosis

Kurtzia margaritifera (Fargo, 1953) comb. nov. has 2 strong primary spirals, the peripheral one and another at the abapical suture, a third, weaker primary, is mid-whorl; the peripheral one has stronger nodules on rib crests, secondary spirals are weaker, and base color of the shell is lighter.

Kurtzia xalvisae Fallon sp. nov. has more and stronger primary spirals, is larger (average length = 6.9 versus 5.2 mm), has a stouter shell (W/L = 0.4265 versus 0.4151), and its base color is lighter.

Kurtzia delicata Fallon sp. nov. has more and stronger primary spirals that are more nodulous, and its base color is lighter.

Etymology

Kurtzia cedarkeysarum Fallon sp. nov., named for the type locality (Levy County, W Florida).

Type material

Holotype

UNITED STATES OF AMERICA • 5.3 × 2.2 mm; W Florida, Levy Co., off Cedar Keys; 1984; J. Keeler leg.; ex stomachs of batfish trawled offshore; UF 589836.

Paratypes (23 specs)

UNITED STATES OF AMERICA • 23 specs, 6.2 × 2.7, 5.3 × 2.3, 5.5 × 2.5, 5.5 × 2.4, 4.6 × 2.1, 4.8 × 2.1, 5.5 × 2.4, 5.0 × 2.0, 5.4 × 2.3, 4.5 × 1.8, 4.2 × 1.9, 5.9 × 2.8, 5.4 × 2.3, 5.3 × 2.2, 5.0 × 2.0, 5.2 × 2.3, 4.3 × 1.8, 5.7 × 2.4, 4.8 × 2.1, 4.4 × 2.0, 5.5 × 2.5, 4.8 × 2.3 and 5.7 × 2.3 mm; same data as for holotype; UF 589831.

Description

Shell small (holotype length = 5.3 mm, measured specimen lengths to 6.2 mm), fusiform (W/L = 0.4151), with 7½ whorls total, 4½ convex angular teleoconch whorls with impressed sutures and slightly convex shoulders, the last with a varicose lip and about 66% of shell length, including a short anterior canal. Sculpture of strong ribs and weak spirals. Aperture narrowly oval, with a round, shallow anal sinus and a short anterior canal, together about 49% of shell length. *Protoconch* of 2¾–3 whorls, the first minute and smooth, then regularly expanding to the last ¾ whorl which has riblets crossed by 3 spirals that form beads where crossing the riblets, the median row most prominent. *Axial sculpture* of strong narrow ribs that extend from suture to suture on spire whorls and evanesce on last whorl below periphery. Ribs are obtusely angled and strongest at the periphery, and about as wide as their interspaces, number 11 on the penultimate and 9 on the last whorl. *Varix* moderately strong at outer lip edge extending from the suture to the anterior canal. *Spiral sculpture* of primaries and secondaries. A strong primary defines the whorl periphery and is weakly swollen across rib crests. About 2 or 3 strong secondaries are on whorl sides, fine secondaries fill in the space between, and above the periphery, on the shoulder, 1 or 2 strong secondaries follow the suture all other shoulder spirals are weaker. All spirals are frosted. *Sulcus* absent. Ribs on the shoulder are slightly recurved and mark the past position of the anal sinus. *Outer lip* is varicose in mature specimens; an outer strip of shell runs along the base of the varix from the anal sinus to the anterior canal. A denticle on the lower margin of the anal sinus, present on mature specimens, lies inside the lip under the varix. *Anal sinus* is a shallow round notch that occupies almost the width of the shoulder. *Inner lip* a thin glazing on the columella with a weak callus on the parietal wall at the anal sinus. *Columella* weakly concave in the parietal region, straight along the anterior canal. *Anterior canal* short and barely delineated from the aperture by a slight narrowing at the base of the aperture, is bent slightly to the left when viewed ventrally; end unnotched. *Anterior fasciole* not swollen, with about 9 oblique weak primaries with 1–3 microscopic secondaries between. The fine sculpture on the fasciole is worn off in most specimens. *Color* a reddish brown overall with a dark reddish brown staining on the inner lip and band between ribs on the shoulder. Some specimens show dark reddish brown banding on the inside of the aperture.

Remarks

The average length of 24 measured specimens is 5.2 mm (range = 4.2–6.2 mm).

Range and habitat

Known only from the type locality.

Kurtzia margaritifera (Fargo, 1953) comb. nov.
Figs 82F, 85J–Q

Kurtziella limonitella margaritifera Fargo, 1953: 392, pl. 23 figs 2–2a.

Kurtziella limonitella margaritifera – Powell 1966: 103. — Campbell *et al.* 1975: 51–124.
Kurtziella margaritifera – García & Lee 2002: 10–13. — Williams 2005: #5662. — Rosenberg *et al.* 2009: 579–699. — Lee 2009: 133, fig. 648.

Differential diagnosis

Kurtzia cedarkeysarum Fallon sp. nov. has only a single primary spiral, which is weaker and not nodulous. Its base color is darker.

Kurtzia xalvisae Fallon sp. nov. has more spiral primaries that are less nodulose and is larger (average length = 6.9 versus 5.2 mm).

Kurtzia delicata Fallon sp. nov. has more and stronger primary spirals.

Type material

Holotype
UNITED STATES OF AMERICA • 5.3 × 2.4 mm; North St. Petersburg, Pliocene fossil; ANSP 19175.

Paratypes (13 specs)
UNITED STATES OF AMERICA • 13 specs not measured; North St. Petersburg, Pliocene fossils; ANSP 19175.

Other material examined (over 533 specs)

The following Recent specimens were examined:

UNITED STATES OF AMERICA • 29 specs, 6.8 × 2.9, 6.8 × 3.0, 6.2 × 2.7, 6.4 × 2.6, 5.9 × 2.6, 6.1 × 2.6, 5.5 × 2.5, 5.4 × 2.5, 5.4 × 2.4, 5.2 × 2.4, 4.6 × 2.2, 2.9 × 1.7, 4.7 × 2.0, 4.4 × 1.9, 4.7 × 2.0, 4.5 × 1.9, 5.7 × 2.3, 4.8 × 2.0, 5.0 × 2.0, 4.4 × 1.8, 4.8 × 2.0, 5.9 × 2.4, 4.5 × 1.9, 4.8 × 2.0, 4.5 × 1.8, 5.9 × 2.4, 4.8 × 1.9, 5.0 × 2.0 and 4.9 × 2.1 mm; Louisiana, off Mississippi River delta; depth 100–200 ft [30–61 m]; Aug. 1974; Tom McGinn leg.; trawled, ex batfish stomachs; UF 589832 • 1 spec., 5.2 × 2.4 mm; Florida Keys, Monroe Co., Marathon, off Sombrero Light; depth 180 ft [55 m]; Jul. 1971; Dieter Cosman leg.; dredged; UF 589837 • 1 spec., length = 6.8 mm; Florida Keys, Monroe Co., Key West, W side of Fleming Key; depth 20 ft [6 m]; Dec. 25, 2009; G. Mackintosh leg.; night SCUBA; ANSP 498939 • 1 spec., 5.7 × 2.7 mm; NW Florida, Gulf Co., off St. Joe Bay; Apr. 1994; Bob Granda leg.; in scallop dump from offshore trawling; UF 589838 • 1 spec., 5.3 × 2.6 mm; W Florida, Hillsborough Co., W of Egmont Key; depth 180 ft [55 m]; 1960; Jim Moore leg.; dredged; R/V *Cavalier*; UF 589839 • 1 spec., 6.3 × 2.5 mm; W Florida, Sarasota Bay; H. Hemphill leg.; p/o ANSP 15527 • 500+ specs, length range = 4.5–7.8 mm; between Marquesas Keys and Dry Tortugas; depth 35–45 ft. [11–14 m]; before 1981; Wayne Sadler leg.; trawled, ex batfish stomachs; ANSP 482221.

Description

The following description is taken from Fargo (1953: 393), in part. *Shell* small (type is 5.3 mm, measured Recent specimens' length range from 2.9 to 6.8 mm), fusiform (W/L = 0.4528), with 6.9 whorls total, with about 4 convex angular teleoconch whorls with straight impressed sutures and slightly convex shoulders, the last with a varicose lip and about 66% of shell length, with a short anterior canal and round, shallow anal sinus. Sculpture of strong ribs and weak spiral primaries and microscopic secondaries. Aperture

narrowly oval, with a short anterior canal, together about 42% of shell length. *Protoconch* of about ⅞ whorls (just shy of 3), the first minute, then regularly expanding to the last ¾ whorl that has riblets crossed by 3 spirals forming beads at riblet intersections, the median row most prominent. *Axial sculpture* of strong narrow ribs that extend from suture to suture on spire whorls and evanesce on last whorl below periphery. Ribs are acutely angled and strongest at the periphery, and about as wide as their interspaces, number 10 or 11 on the penultimate and 9 or 10 on the last whorl. *Varix* apertural, extending from the suture to the anterior canal. *Spiral sculpture* of primaries and microscopic secondaries. The strongest primary is at the whorl periphery, nodulous on rib crests, and a second, somewhat weaker primary, is at the whorl's suture; midway between the two may be an even weaker primary; microscopic secondaries fill in the intercalary space and, to the suture on the shoulder. *Sulcus* absent. Ribs on the shoulder are slightly recurved and mark the past position of the sinus. *Outer lip* ***is*** strengthened by a varix in mature specimens; the lip edge runs along the base of the varix from the anal sinus to the anterior canal. A denticle on the lower margin of the anal sinus, present on mature specimens, lies inside the lip under the varix. *Anal sinus* a shallow notch lies in front of and at 45° to the shell's axis slightly excavating the face of the varix. *Inner lip* a narrow glaze along the columella, unemarginate, without a significant callus on the parietal wall at the anal sinus. *Columella* weakly concave in the parietal region, straight along the anterior canal. *Anterior canal* short and barely delineated from the aperture by a slight narrowing below the aperture, bent slightly to the left when viewed ventrally; end unnotched. *Anterior fasciole* not swollen, with about 9 oblique weak primaries with 1–3 microscopic secondaries between. The fine sculpture on the fasciole is worn off in most specimens. *Color* a dark cream-colored base with reddish brown staining in intercostal spaces and even darker staining on outer and inner lips, anterior canal (darkest along the edge of the outer lip), on anterior fasciole, and a band on the whorl shoulder at the suture.

Remarks

Kurtzia margaritifera (Fargo, 1953) comb. nov. is redescribed here to clarify the distinction between new, similar-appearing congeners. Fargo's fossil specimens appear to be smaller, have less convex shoulders, and a protoconch about ½-whorl less than modern specimens, based on Fargo's description. These differences do not merit applying a separate name to the modern form currently.

The average length of 33 measured specimens is 5.2 mm (range = 2.9–6.8 mm).

Range and habitat

United States (off Mississippi River delta, off Louisiana, off Gulf and Hillsborough Counties, W Florida, and off Sombrero Light, Marathon, Florida Keys); depth 30–61 m.

Kurtzia xalvisae Fallon sp. nov.
urn:lsid:zoobank.org:act:DAC8452D-18F8-4591-8CCD-83B3B3751517
Figs 82G, 85R–BB

Differential diagnosis

Kurtzia margaritifera (Fargo, 1953) comb. nov. has a strong spiral primary at the whorl periphery and one at or just above the suture and a single weaker primary mid-whorl. It is smaller, on average (average length = 5.2 versus 7.1 mm), and has a body whorl with a longer taper to the end of the anterior canal.

Kurtzia cedarkeysarum Fallon sp. nov. has fewer and weaker spiral primaries, is smaller on average (average length = 5.2 versus 7.1 mm), and has a narrower shell (W/L = 0. 4151 versus 0.4265). Its base color is darker.

Kurtzia delicata Fallon sp. nov. has relatively stronger spiral primaries and is smaller on average (5.7 versus 7.1 mm average length) and slimmer.

Etymology

Kurtzia xalvisae Fallon sp. nov., named for Xalvis Island (Duval County, E Florida), location of Camp Alamacani scallop dump where many of the specimens were found.

Type material

Holotype

UNITED STATES OF AMERICA • 9.0 × 4.0 mm; E Florida, Duval Co., offshore of Mayport; depth 60–100 ft [18–30 m]; UF 589840.

Paratypes (24 specs)

UNITED STATES OF AMERICA • 9 specs, 8.3 × 3.7, 7.0 × 2.8, 8.3 × 3.5, 6.8 × 2.8, 6.1 × 3.0, 4.9 × 2.4, 5.3 × 2.6, 6.6 × 2.8 and 6.6 × 3.0 mm; E Florida, Duval Co., 6 mi. [9.6 km] E of Mayport; depth ca 60 ft [18 m]; Jun. 1978; C.M. Lloyd leg.; in beach renourishment sand; UF 589833 • 8 specs, 7.9 × 3.5, 8.2 × 3.5, 7.4 × 3.1, 8.2 × 3.6, 6.0 × 2.8, 5.7 × 2.7, 4.4 × 2.2 and 5.8 × 2.6 mm; E Florida, Duval Co., Xalvis Island, Camp Alamacani; 9 Feb. 1985; H.G. Lee leg.; from scallop dump, dredged offshore; UF 589841 • 1 spec., 8.1 × 3.6 mm; E Florida, Duval Co., 20 mi. [32 km] ESE of Mayport; depth ca 30 m; 9 Feb. 1985; H.G. Lee leg.; from scallop dump, dredged offshore; USNM 903150 • 3 specs, 8.1 × 3.6, 7.6 × 3.3 and 8.0 × 3.3 mm; E Florida, Duval Co., ESE of Mayport; 9 Feb. 1985; H.G. Lee leg.; from scallop dump, dredged offshore; USNM 903157 • 3 specs, 9.2 × 3.5, 7.8 × 3.5 and 7.5 × 3.2 mm; E Florida, Duval Co., off Jacksonville; dredged by scallop boat, EFG 9982; ANSP 498814.

Other material examined (1 spec.)

UNITED STATES OF AMERICA • 1 spec., 6.8 × 2.9 mm; E Florida, off Palm Beach Co.; depth 0 m; 1973–76; J. Lightfoot leg.; in renourishment sand at Delray Beach; UF 589842.

Description

Shell small (holotype length = 9.0 mm), fusiform (W/L = 0.4444), with 8 whorls total, 5 obtusely angled teleoconch whorls with nearly flat shoulders, impressed, undulant sutures narrower than whorl periphery, and last whorl about 66% of shell length. Sculpture of strong ribs and primary and secondary spirals. Aperture oval, with a varicose lip, a short anterior canal, together about 39% of shell length. *Protoconch* of about 3 slightly compressed, round whorls, the first minute, then expanding regularly; the last whorl with riblets crossed by 3 spirals that form beads where they cross riblets, the median row most prominent. *Axial sculpture* of strong narrow ribs that extend from suture to suture on spire whorls and evanesce on last whorl before the fasciole. Ribs are angled and strongest at the periphery, and narrower than their interspaces, number 12 on the penultimate and 10 on the last whorl. *Varix* rib-like, a little stronger than the penultimate, present near the edge of the lip in fully developed individuals; extends from suture to the anterior canal. *Spiral sculpture* of frosted primaries and microscopic secondaries. The strongest primary is at the whorl periphery, nodulous on rib crests, succeeded anteriorly by 4 weaker primaries on whorl sides; midway between the first 2 of these weaker ones are even weaker primaries; very fine secondaries fill in space between primaries. A single coarsely frosted primary lies on and is undulant with the suture; the remaining width of the shoulder is covered with microscopic secondaries. The shell base below the suture line has about 11 weak primaries that grow closer anteriorly, with 1–3 microscopic secondaries between. *Sulcus* absent. Ribs on the shoulder are slightly recurved and mark the past positions of the sinus. *Outer lip* is strengthened by a varix in mature specimens; the lip edge, which is also strengthened by an axial fold on its edge, in front of the varix, runs from the anal sinus to the anterior canal. The edge of the lip forms a low arc from anal sinus to anterior canal. A denticle on the lower margin of the

anal sinus, present on mature specimens, lies inside the lip under the varix. *Anal sinus* a round notch with divergent sides centered on the shoulder. *Inner lip* a narrow glaze along the columella, without a significant callus on the parietal wall at the anal sinus; unemarginate. *Columella* weakly concave in the parietal region, straight along the anterior canal. *Anterior canal* short and barely delineated from the aperture by a slight narrowing below the aperture; end unnotched. *Anterior fasciole* not swollen, with about 10 flattened oblique weak primaries with one microscopic secondary between. *Color* a dark cream-colored base with a reddish brown stain along the outer and inner lips and anterior canal (darker along the edge of the outer lip), with reddish brown spiral bands on the whorl shoulder at the suture and a lighter one mid-whorl. Primary spirals lighter.

Remarks

The average length of 19 measured specimens is 7.1 mm (range = 4.4–9.2 mm). Variability lies mainly in the number and strength of spiral elements, especially on whorl sides, and in the color patterning.

Range and habitat

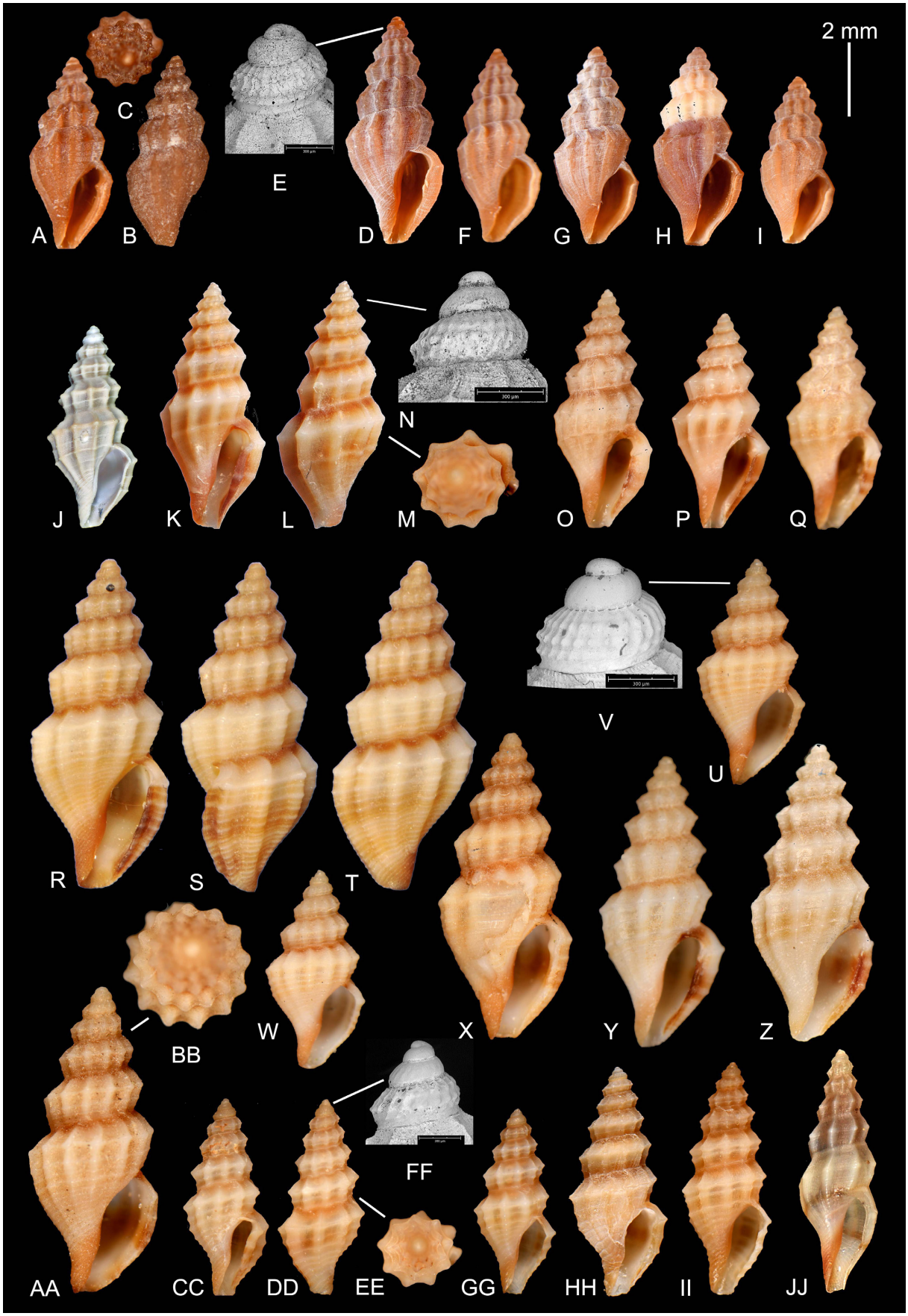
United States (off NE Florida and off E Florida); depth 18–30 m.

Kurtzia delicata Fallon sp. nov.
urn:lsid:zoobank.org:act:8A93755E-326F-4452-9AD9-61DA541598B3
Figs 82H, 85CC–II

Differential diagnosis

Kurtzia delicata Fallon sp. nov. is similar in color to *K. margaritifera* (Fargo, 1953) comb. nov. and *K. xalvisae* Fallon sp. nov., but is smaller, narrower, and has a more delicate shell, which is translucent between ribs and primary spirals.

Fig. 85 (next page). Species of *Kurtzia* Bartsch, 1944. Part 2. – **A–I**. *Kurtzia cedarkeysarum* Fallon sp. nov. **A–C**. Holotype, 5.3 × 2.2 mm (UF 589836), off Cedar Keys, Levy Co., W Florida. **D–I**. Paratypes, 6.2 × 2.7, ventral view and SEM image of protoconch, 240 ×, 5.3 × 2.3, 5.5 × 2.5, 5.5 × 2.4 and 4.6 × 2.1 mm (UF 589831), off Cedar Keys, Levy Co., W Florida. – **J**. *Kurtziella margaritifera* Fargo, 1953, holotype, 5.5 × 2.4 mm (ANSP 19175), St Petersburg Pliocene. – **K–Q**. *Kurtzia margaritifera* (Fargo, 1953) comb. nov. **K–N**. Spec., 6.8 × 2.9 mm, ventral, dorsal and apical views, and SEM of protoconch (UF 589832), off Mississippi River delta, Louisiana. **O–Q**. Specs, 6.4 × 2.6, 5.9 × 2.6 and 6.1 × 2.6 mm (UF 589832), off Mississippi River delta, Louisiana. – **R–BB**. *Kurtzia xalvisae* Fallon sp. nov. **R–T**. Holotype, 9.0 × 4.0 mm, ventral, lateral and dorsal views (UF 589840), 6 mi. [9.6 km] E of Mayport, Duval Co., E Florida. **U–X, AA–BB**. Paratypes, 6.1 × 3.0 mm ventral view, and SEM image of protoconch, 5.3 × 2.6, 8.3 × 2.7 and 8.3 × 3.5 mm, ventral and apical views (UF 589833), 6 mi. [9.6 km] E of Mayport, Duval Co., E Florida. **Y**. Paratype, 7.9 × 3.5 mm (UF 589841), scallop dump, dredged offshore, Camp Alamacani, Xalvis Island, Duval Co., E Florida. **Z**. Paratype, 8.1 × 3.6 mm (UF 589833), scallop dump, dredged offshore, 20 mi. [32 km] ESE of Mayport, Duval Co., E Florida. – **CC–II**. *Kurtzia delicata* Fallon sp. nov. **CC-FF**. Holotype, 5.3 × 2.1 mm, ventral, lateral, dorsal and apical views, and SEM image of protoconch (UF 589834), off Dry Tortugas, Florida Keys. **GG**. Paratype, 5.0 × 2.1 mm (UF 589843), off Dry Tortugas, Florida Keys. **HH**. Paratype, 6.3 × 2.6 mm (E. García coll. #26604), off Campeche, Mexico, Gulf of Mexico. **II**. Paratype, 6.3 × 2.3 mm (UF 589844), Mississippi River delta, Louisiana. – **JJ**. *Kurtzia* unid. sp. A. Spec., 6.6 × 2.2 mm (ANSP 498943), off Escudo de Veraguas Island, E Panama. Credits: E, N, V, FF: SEM images courtesy of Krasimira "Kasey" Seizova; J: courtesy of Paul Callomon. A–D, F–M, O–U, W–EE, GG–JJ = 2 mm; Scale bars: E, N, V, FF = 300 µm.


2 mm
A
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Kurtzia ceroplasta (K.J. Bush, 1885) comb. nov. has weaker spiral primaries; the peripheral one is less nodulous and has an opaque shell that is not translucent between sculptural elements.

Kurtzia sudamericana Fallon & Bouchet sp. nov. also has weaker spiral primaries, and the peripheral one is less nodulous; it has a more convex shoulder and has an opaque shell compared to some of its congeners.

Etymology

Kurtzia delicata Fallon sp. nov. derives from the feminine form of the Latin adjective '*delicatus*', which means 'delicate' due to the shell's dainty appearance.

Type material

Holotype

UNITED STATES OF AMERICA • 5.3 × 2.2 mm, Florida Keys, Monroe Co., off Dry Tortugas; depth ca 300 ft [91 m]; UF 589834.

Paratypes (11 specs)

MEXICO • 5 specs, 6.9 × 2.6, 6.8 × 2.6, 6.1 × 2.3, 5.4 × 2.1 and 4.9 × 2.0 mm; Gulf of Mexico, off Campeche; 20°51.16′ N, 92°26.28′ W; depth 93–94 m; 10 Jun. 2005; E.F. García leg.; dredged from aboard R/V *Pelican*; ex E.F. García coll. 26604; ANSP 498813.

UNITED STATES OF AMERICA • 1 spec., 5.0 × 2.1 mm; same data as for holotype; UF 589843 • 2 specs, 6.3 × 2.3 and 4.9 × 2.0 mm; Louisiana, off Mississippi River Delta; depth 30–61 m; Aug. 1974; Tom McGinn leg.; UF 589844 • 3 specs, 3.2 × 1.5, 6.1 × 2.5 and 5.3 × 2.1 mm; off Alabama; 29°24.43′ N, 87°058.63′ W; depth 74–72 m; 29 Jun. 2006; E.F. García leg.; dredged in mud from aboard R/V *Pelican*; E.F. García coll. 27703B.

Description

Shell small (holotype length = 5.3 mm), fusiform (W/L = 0.4151), with 8 whorls total, 5 convex angular teleoconch whorls with impressed, undulant sutures and slightly convex shoulders, the last about 57% of shell length, with a short anterior canal and round, anal sinus. Sculpture of strong ribs and spiral primaries and secondaries. Aperture oval, with a short anterior canal, together about 38% of shell length. *Protoconch* of 3¼ round whorls, the first very small, not embedded, the last 2 with arched riblets, those on the last whorl crossed by 3 spirals that form rows of beads at their intersections, the middle row most prominent and the periphery of the whorl. *Axial sculpture* of narrow but strong ribs that run from suture to suture and to anterior fasciole on the last, strong right up to the suture and slightly recurved on the shoulder, obtusely angled and spike-like at the periphery, terminating at the anterior fasciole. Ribs number 9 on penult, 7 on last including the varix. Ribs are narrower than their interspaces. *Varix* apertural, rises slightly above suture and extends to end of the anterior canal. Face of varix slightly recurved at the anal sinus. *Spiral sculpture* of frosted primaries and microscopic secondaries. The strongest primary lies at the periphery, nodulous on rib crests and gives the shoulder the appearance of having an overhang; 2 more evenly spaced primaries are on whorl sides, one at the suture line and the other at the middle of the side. An additional 5 primaries are on the shell base, and 5 more on the anterior fasciole. Primary spirals on the base and fasciole become closer advancing anteriorly. Microscopic secondaries fill the space between primaries. On the shoulder 2 or so strong secondaries are undulant and cover the suture, the remaining space is filled with microscopic secondaries. *Sulcus* absent; recurved ribs on the shoulder mark past presence of the anal sinus. *Outer lip* varicose in mature specimens; the lip extension from the base of the varix, which is also strengthened by an axial fold, runs along the base of the varix from the anal sinus to the anterior canal. Its edge forms a low arc from anal sinus to anterior canal. A denticle on the lower margin of the anal sinus, only present on mature specimens, lies inside the lip under the varix. *Anal sinus*

a round notch on the edge of the shoulder, closer to the periphery, in front of the varix directed laterally, sides divergent. *Inner lip* a thin glaze along columella, without a callus on the parietal wall at the anal sinus. *Columella* concave in the parietal region to the anterior canal, straight along the anterior canal. *Anterior canal* short, delineated from the aperture by a narrowing, bent slightly to the left when viewed ventrally; end unnotched. *Anterior fasciole* is not swollen, covered with 5 oblique spirals. *Color* a dark cream-colored base with reddish-brown staining on the outer and inner lips and anterior canal, and with reddish brown bands on the whorl shoulder at the suture and at mid-whorl.

Remarks

The average length of 9 measured specimens is 5.7 mm (range = 4.9–6.9 mm).

Range and habitat

Gulf of Mexico: United States (off Dry Tortugas, off Alabama, off Mississippi River Delta) and Mexico (off Campeche); depth 30–94 m.

Kurtzia unid. sp. A
Fig. 85JJ

Differential diagnosis

This shell has the typical angled whorls, beaded protoconch, and coloration); the reddish brown staining on the columella and anterior fasciole, and brown banding seen on some of the other species of the genus. Except for the presence of a peripheral spiral, it lacks strong spirals, having only microscopic spirals.

Material examined (1 spec.)

PANAMA • 1 spec., 6.6 × 2.2 mm; off Escudo de Veraguas Island; depth 200 m; ANSP 498943.

Partial description

Shell small, fusiform, of 8 convex whorls, moderately long anterior canal. The shell is not completely developed so lacks a varix and anal sinus.

Protoconch of about 2½ whorls, tip minute, last ½-whorl with beaded carina. *Axial sculpture* of moderately strong ribs angled mid-whorl, 8 on the penultimate and 7 on the last whorl. *Spiral sculpture* of a single peripheral primary and microscopic secondaries over the remaining area.

Remarks

This single shell does not appear to be fully developed and so not suitable for a full description.

Genus ***Kurtziella*** Dall, 1918

Type species

Pleurotoma cerinum J.D. Kurtz & W. Stimpson, 1851, by original designation.

Summary diagnostic characteristics

Shell small, fusiform, with shouldered or angled whorls and a short anterior canal.

Protoconch of 2–3½ whorls, riblets on the last whorl with 3 rows of bead-like protrusions on riblet crests.

Subsutural band of closely spaced 2 or more spirals that separate ribs from the suture.

Axial sculpture of numerous ribs and if whorls are angular, nodulose at the peripheral angle.

Spiral sculpture of granulose-like frosting on spirals that override ribs.

Aperture oval, relatively short, and without a varicose lip.

Anal sinus shallow, broad, about the width of the portion of the shoulder below the band, and without a parietal callus.

Shell surface microsculpture

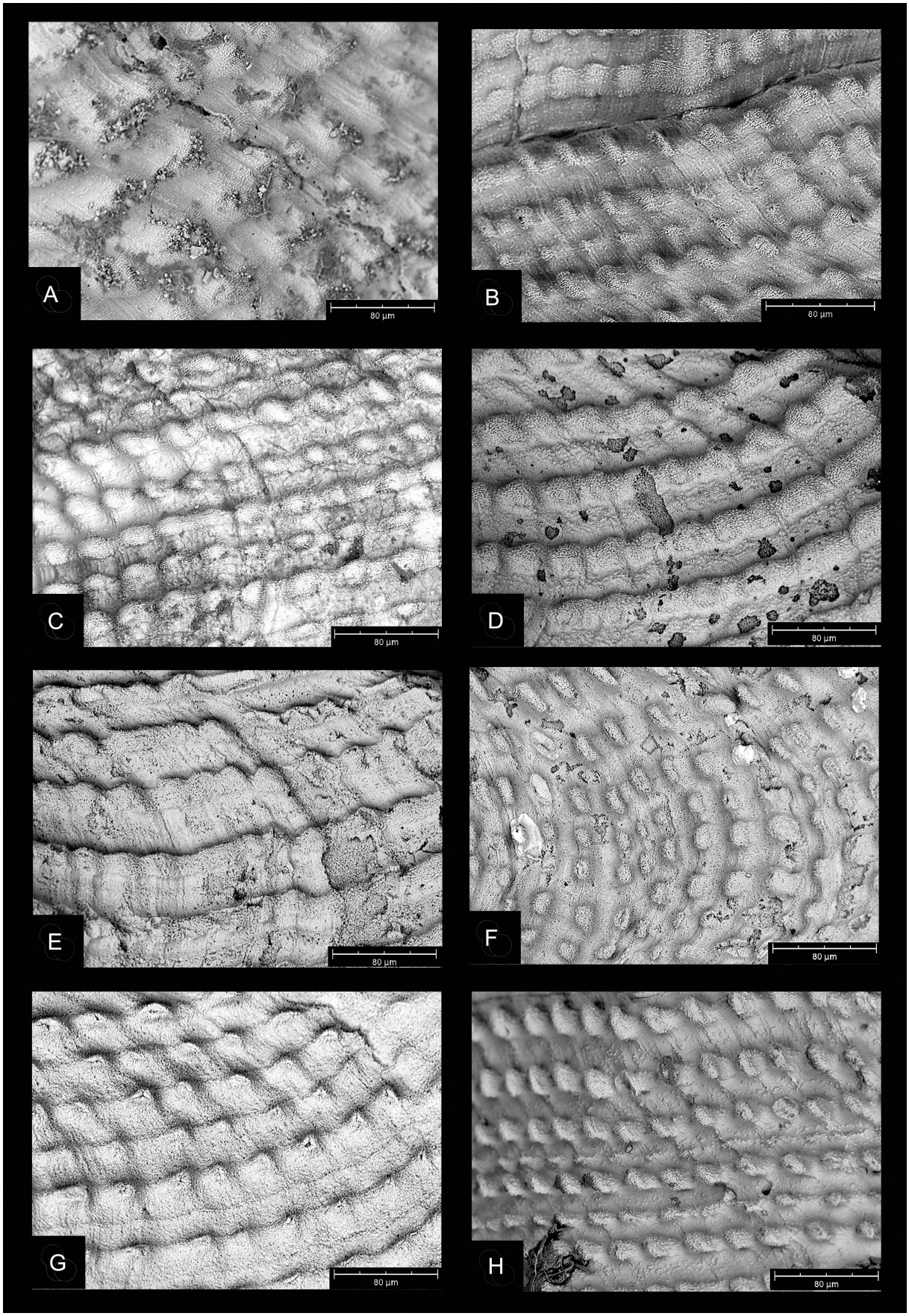
The microstructure of secondary spirals, as observed by the naked eye or low power binocular dissecting microscope, dubbed 'frosting' or 'granules' are seen under SEM power of 850× as tight bundles of fibrils, rounded over on their crowns. These appear at the intersection of growth lines and spirals, straddling the spirals, and developing a distance beyond the growth line but ending before the next. These structures take different shapes (round or oblong, short, or tall) and are of different sizes, depending on the strength of the primary or secondary spiral and on the species in question.

Images of shell surface microsculpture of 11 of the 13 species addressed in this work are illustrated in Figs 86–87.

Difference from other genera

Kurtzia Bartsch, 1944 has a varicose lip and denticle below the anal sinus, lacks a subsutural band of spirals as in *Kurtziella*, and has a different protoconch where the beads on the last whorl are formed at the intersection of riblets by spirals, the median row of beads most prominent. in *Kurtziella*, 3 rows of beads are usually about equal in size. The protoconch is proportionally smaller than the teleoconch in *Kurtziella*.

Fig. 86 (next page). Species of *Kurtziella* Dall, 1918, shell surface microsculpture, part 1. SEM images of shell surface. **A**. *Kurtziella cerina* (J.D. Kurtz & W. Stimpson, 1851). Spec., 4.7 × 1.9 mm (ANSP 159745), Woods Hole, Buzzards Bay, Massachusetts. Frosting consists of low bundles formed along growth lines that staddle spirals, here running diagonally lower left to upper right. in this image the bundles are worn. **B**. *Kurtziella delannoyi* Fallon & Bouchet sp. nov., holotype, 4.0 × 1.5 mm, live-collected (MNHN-IM-2013-74657), Grand Rivière, Pointe de la Rivière, Martinique. Low bundles are well preserved, not worn as in the preceding image. These too straddle the spirals and follow the same diagonal direction across spirals as the growth lines. **C**. *Kurtziella intercedens* (Melvill, 1923). Spec., 5.3 × 2.1 mm (UF 589694), E side of Booby Pt. Mt. Irvine Bay, Tobago Island, Trinidad and Tobago. Low bundles straddle spirals of different strengths in this image. **D**. *Kurtziella limonitella* (Dall, 1884). Spec., 6.2 × 2.3 mm (UF 589846), W end of Cedar Key, Levy Co., W Florida. Primaries at suture line are tightly packed, have low and wider bundles giving the spirals the appearance of being segmented by growth lines. **E**. *Kurtziella oriens* Fallon sp. nov., holotype, 7.1 × 2.4 mm (UF 589847), off Big Talbot Island, Duval Co., E Florida. Primaries are tightly packed and appear flattened, as do nodules with irregular widths along primary spirals. **F**. *Kurtziella hirschi* Fallon sp. nov., holotype, 5.7 × 2.5 mm (UF 589851), 95 mi. W of Egmont Key, Hillsborough Co., W Florida. Bundles are widely separated straddling recurved spirals on shoulder, behind anal sinus. These appear less flattened than those of preceding species. **G**. *Kurtziella hirschi* Fallon sp. nov., paratype, 5.4 × 2.5 mm (UF 589853), off Cedar Keys, W Florida. Same species, different specimen than image in Fig. 86F. Bundles are less flattened than in preceding but are narrower, perhaps exhibiting more wear (spirals run left to right). **H**. *Kurtziella minor* Fallon & Bouchet sp. nov., holotype, 4.8 × 1.8 mm (MNHN-IM-2012-43473), off French Guiana. Bundles are more elevated off the shell surface, and some slight fanning at tops of bundles present. These structures are reminiscent of the fanned bundles of *Cryoturris*. Scale bars: A–H = 80 µm.


A
80 µm
B
80 µm
C
80 µm
D
80 µm
E
80 µm
F
80 µm
G
80 µm
H
80 µm

Kurtzina Bartsch, 1944 possesses a proportionally larger protoconch with four rows of beads on the last whorl, a shell with a sharply tapering base, and strong, broad ribs. The protoconch of *Kurtziella* is proportionally smaller, the last whorl of the teleoconch is not sharply tapered, and its axial ribs terminate before the suture below a subsutural band of spirals. The ribs of *Kurtzina* terminate at the suture.

Cryoturris Woodring, 1928 may have a beaded carina but only a single row, and the beads are quite different in form. Some appear paddle-like with papillae (fibril extensions) at their end when viewed at high magnification, unlike the smooth "beads" of *Kurtziella*.

Bathyturris Fallon gen. nov. has a trochoid-shaped protoconch rather than a gradually expanding symmetrical one, lacks ornamentation on the protoconch's third whorl instead of having up to three rows of bead-like protrusions on riblet crests, features axials on the teleoconch that extend to the suture

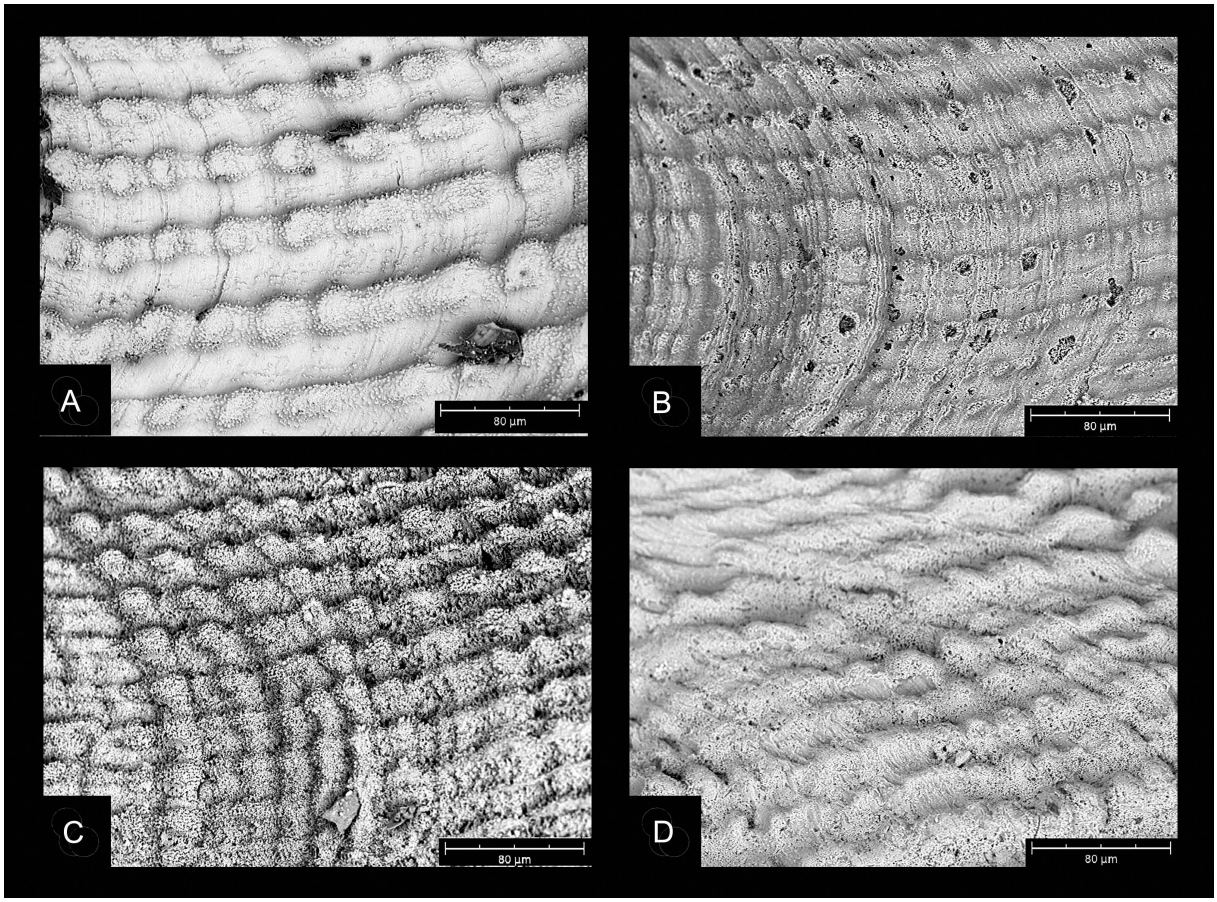


Fig. 87. Species of *Kurtziella* Dall, 1918, shell surface microsculpture, part 2. **A**. *Kurtziella guarapari* Fallon sp. nov., holotype, 6.8 × 2.6 mm (ANSP 498947), off Guarapari, Espirito Santo State, Brazil. Bundles are round or oblong along the secondary spirals of this species. **B**. *Kurtziella kalina* Fallon & Bouchet sp. nov., paratype, 3.7 × 1.6 mm (MNHN-IM-2012-3717), off French Guiana. Bundles straddle secondary spirals at growth line intersections. Bundles appear to be more numerous but smaller in diameter than the other species shown. **C**. *Kurtziella perryae* Bartsch & Rehder, 1939. Spec., 5.7 × 2.1 mm (UF 589855), S of Anclote Key, Pasco Co., W Florida. Spirals are tightly packed and bundles are closely set along the spirals. **D**. *Kurtziella albocapitanea* Fallon sp. nov., holotype, 8.2 × 3.0 mm (UF 589856), Palm Beach Co., E Florida. Growth lines run obliquely to spirals, which is reflected in the orientation of the bundles (somewhat worn in this image). Credits: SEM images courtesy of Chandler J. Olson. Scale bars: A–D = 80 µm.

rather than having cord-like axials that end at a band of subsutural spirals, has a varicose aperture instead of one with a plain lip, and frosted spirals in contrast to granulose spirals.

Remarks

There are 5 species formerly included in *Kurtziella* that belong elsewhere: *K. atrostyla* (Tryon, 1884), *K. margaritifera* Fargo, 1953, *K. ceroplasta* (K.J. Bush, 1885), *K. venezuelana* Weisbord, 1962, and *Kurtziella serga* (Dall, 1881). All lack a band of spirals between the suture and termination of the axials, and all possess a varicose lip. The first three are proposed to be combined into *Kurtzia* Bartsch, 1944*;* the fourth into *Kurtzina* Bartsch, 1944, a genus not previously identified for western Atlantic species; and the last into *Bathyturris* Fallon gen. nov.

The following 5 previously described species belong in *Kurtziella* and are addressed in this section: *K. cerina* (J.D. Kurtz & W. Stimpson, 1851, the type species of the genus), *K. intercedens* (Melvill, 1923), *K. limonitella* (Dall, 1884), *K. perryae* Bartsch & Rehder, 1939, and *K. vincula* Nowell-Usticke, 1969. in addition, 11 new and 2 unnamed species are proposed herein.

Phylogenetic relationships

The DNA sequence data support the monophyly of the genus *Kurtziella*, with the two sequenced species forming a well-supported clade. The lineage is recovered sister to the genus *Cryoturris*, with 87% bootstrap support. All sequenced species show a modest intraspecific variability (average intraspecific p-distance range: 0-0.2%).

***Kurtziella* spp. Part 1**

Kurtziella cerina (J.D. Kurtz & W. Stimpson, 1851)
Figs 86A, 89A–E

Pleurotoma cerinum J.D. Kurtz & W. Stimpson 1851: 115.

Pleurotoma cerinum – Kurtz 1860: 9. — Perkins 1869: 121. — Ravenel 1874: 18. — Smith & Prime 1870: 398.

Mangelia cerina – Verrill 1873: 637; 1874: 210. — Mazyck 1913: 8. — C.W. Johnson 1922: 11; 1934: 141. — Moore 1958a: 128. — Richards 1962: 86, pl. 21 fig. 6. — Andrews 1971: 121; text fig. (as "cf."). — Morris 1973: 249, pl. 70 fig. 6. — Porter 1974: 256. — Emerson & Jacobson 1976: 172, pl. 25 fig. 31.

Mangilia cerina – Dall 1884: 328; 1889b: 102, pl. 44 figs 16, 16a; 1892: 211; 1889a: 112–113. — Verrill 1884: 250, pl. 29 figs 16, 16a. — Bush 1885b: 580. — C.W. Johnson 1915: 141. — Maury 1922: 70. — Mansfield 1939: 40, table 4. — M. Smith 1945: 136, pl. 33 fig. 23; 1951: 136; pl. 33 fig. 23. — Campbell *et al*. 1975: 118.

Daphnella (*Raphitoma*) *cerina* – Tryon 1884: 310, pl. 22 fig. 43, pl. 34 fig. 100.

Pseudoraphitoma (*Kurtziella*) *cerina* – Wenz 1943: 1441, fig. 4076.

Kurtziella cerina – Powell 1966: 103, pl. 16 fig. 4. — Vokes & Vokes 1983: 31, 58, pl. 21 fig. 17. — Spencer & Campbell 1987: 69, pl. 15 fig. 10–11. — Long Island Shell Club 1988: 135, photo. — Turgeon *et al*. 1988: 98; 1998: 107. — Espinosa *et al*. 1995: 44. — Shelton 1997: No. 284. — Prezant *et al*. 2002: 344. — Williams 2005: #5654. — Lee 2009: 131.

Kurtziella (*Rubellatoma*) *cerina* – Abbott 1974: 281, fig. 3248.

Kurtziella (*Kurtziella*) cf. *cerina* – Andrews 1977: 137, text photo; 1981: 46, text photo.

Differential diagnosis

Kurtziella limonitella (Dall, 1884) has a smaller protoconch (2½–2¾ versus 3 whorls), is slightly stouter (W/L = 0.3571 versus 0.3467), has higher shouldered and more angular whorls, has whorls that have a smaller diameter at their sutures than their peripheries, and has more ribs (9–11 versus 12 or 13).

Kurtziella perryae Bartsch & Rehder, 1939 has a smaller protoconch (2¾ versus 3 whorls), a shorter aperture/anterior canal proportional length (34% versus 39% of shell length), and has more closely spaced, finer spirals.

Kurtziella oriens Fallon sp. nov. is on average smaller (length = 5.4 versus 7.2 mm), has a shorter aperture/anterior canal proportional length (33% versus 39% of shell length), and its habitat is off NE Florida versus Buzzards Bay, Massachusetts to Cape Hatteras, North Carolina

Type material

Lectotype (here designated, Fig. 89A–B)

The following specimen from among the syntypes most closely matches the size given in the original description (0.3 × 0.09 poll., where 1 mm = 0.04 pollux).

UNITED STATES OF AMERICA • 7.5 × 2.6 mm; Massachusetts, New Bedford Harbor [Buzzard's Bay]; W. Stimpson leg.; MCZ 156181.

Paralectotypes (8 specs)

UNITED STATES OF AMERICA • 8 specs, (5 measured) 6.5 × 2.3, 6.3 × 2.3, 6.4 × 2.5, 7.1 × 3.6 and 6.3 × 3.0 mm; same data as for holotype; MCZ 156181.

Other examined material

Dall's syntypes of *Mangilia cerinella* from North Carolina are likely *Kurtziella cerina.* Those in lots USNM 35826, 41548, 41560, and 35359 were confirmed as such. The remaining lots from North Carolina, USNM 41570, 44442, 45137, 45138 and 887516 were not examined but are likely *K. cerina*. Information on one of the examined *K. cerina* NC lots is as follows:

UNITED STATES OF AMERICA • 20 specs, syntypes of *M. cerinella*, (2 measured) 7.3 × 2.5 and 6.8 × 2.3 mm; North Carolina, off Cape Hatteras; 35°20.5′ N, 075°19.0′ W; depth 27 m; 10 Nov. 1883; USFC R/V *Albatross* stn 2113; USNM 35359 • 3 specs, not measured; Virginia, Lower Chesapeake Bay, Northampton County, inside Old Plantation Flats; depth 1 m; 3 Aug. 2016; R. Aguilar leg.; 1 m beam trawl; USNM IZ 1463474, USNM IZ 1463475, USNM IZ 1463473 • 1 spec., not measured; Virginia, Lower Chesapeake Bay, Northampton County, off William B Trower Bayshore Natural Area; depth 3.5 m; 31 Aug. 2016; R. Aguilar leg.; Ponar grab; USNM IZ 1463503 • 1 spec., not measured; Virginia, Lower Chesapeake Bay, Virginia Beach County, Lynnhaven Roads; depth 3 m; 5 Oct. 2017; R. Aguilar leg.; Ponar grab; USNM IZ 1446138.

Description

Shell small (lectotype length = 7.5 mm), with a tall spire (W/L = 0.3467), about 8 convex whorls altogether, adult whorls with appressed, undulant sutures, and steeply sloping shoulders, the last whorl is 41% of shell length; aperture short, narrowly oval with a posterior notch and anterior canal nearly as wide, both about 39% of shell length. *Protoconch* of almost 3 regularly expanding glossy whorls, tip minute, immersed, last 1½ whorls with dense riblets crossed by spiral grooves forming 3 rows of small nodules. *Axial sculpture* of strong ribs that run from the subsutural band to the suture of the succeeding whorl and evanesce before anterior fasciole on shell base, recurved on the lower half of shoulder, angular and highest at whorl periphery. Ribs number 9–11, intercostal space about 1–2 times width of ribs. *Varix*

absent. *Spiral sculpture* of primary and secondary spirals, about the first five closest to the suture are crowded primaries that form the subsutural band, then a pattern of about 3-4 secondaries between each primary follows; spirals are made granulose by growth striae; spirals all override ribs. *Sulcus* is marked by the presence of recurved ribs on the lower portion of the shoulder, below the subsutural band, and by recurved growth striae. *Outer lip* thin, curved in a low arc from and congruent with the outer edge of the anal sinus to the end of the anterior canal. Stromboid notch absent. *Anal sinus* a wide-open notch with apex close to the whorl periphery. *Inner lip* a narrow, thin glaze along the columella, unemarginate, without a callus on parietal wall. *Columella* is slightly sigmoid. *Anterior canal* short, open, only a little narrower than the aperture, slanted to the left viewed ventrally; end unnotched. *Anterior fasciole* is not swollen, smooth save for heavy growth increments. *Color* of wax, as its name suggests.

Remarks

The average length of 10 measured specimens is 6.7 mm (range = 5.9–7.5 mm).

Range and habitat

United States (Buzzards Bay, Massachusetts to Cape Hatteras, North Carolina); depth about 1–54 m. Published localities include Rhode Island (Verrill 1882); New York (Verrill 1882, 1884; Jacobson & Emerson 1961); New Jersey (Abbott 1974); North & South Carolina (Verrill 1882; Bush 1885b; Porter 1974; Kurtz & Stimpson 1851; Kurtz 1860; Mazyck 1913). No specific reference was found citing an E Florida occurrence, other than Dall's stated range of "Cape Cod to Fernandina, Florida" (Dall 1889b). The species does not appear in Lee's catalog of NE Florida species (Lee 2009), nor in Jaxshells on-line list of NE Florida marine shells, accessed on 20 Feb. 2020. The similar species *Kurtziella limonitella* (Dall, 1884) of W Florida and Gulf of Mexico may replace *K. cerina* of the Atlantic east coast.

Some other reported localities of doubtful validity need confirmation: W Florida (Dall 1883, 1884; Tryon 1884); Alabama (Shelton 1997); Texas (Maury 1922; Moore 1958; Andrews 1971; Andrews 1977; Andrews 1981; Odé 1992a); Mexico (Vokes & Vokes 1983); Cuba (Espinosa *et al*. 1995).

Kurtziella delannoyi Fallon & Bouchet sp. nov.
urn:lsid:zoobank.org:act:48C70705-F91B-4E80-B309-CA61503DB66E
Figs 86B, 88, 89F–N

Differential diagnosis

Kurtziella vincula Nowell-Usticke, 1969 has less angular whorls and axial ribs (when compared to the single worn type), and has fewer (2½) protoconch whorls, according to the description given by Nowell-Usticke, not 3 as in *K. delannoyi* Fallon & Bouchet sp. nov.

Kurtziella guarapari Fallon sp. nov. differs in the following respects: the peripheral axial swellings are stronger, the protoconch is larger, 3½ not 3 whorls, and shell size is larger on average (lengths = 6.2 versus 3.41 mm, for measured shells).

Kurtziella minor Fallon & Bouchet sp. nov. has a longer, more gradually tapered anterior canal. Its sculpture includes more distinct primary spirals and narrower ribs that create a reticulate pattern absent in *K. delannoyi* Fallon & Bouchet sp. nov. These species appear to be closely related, however.

Etymology

Kurtziella delannoyi Fallon & Bouchet sp. nov. is named in honor of Regis Delannoye, a resident of Martinique, co-author of *Mollusques continentaux de la Martinique*, and a participant in the MADIBENTHOS expedition.

Type material

Holotype

MARTINIQUE • 4.0 × 1.5 mm, live-collected; Pointe de la Rivière, Grand Rivière; 14°52.7′ N, 61°11′ W; depth 16 m; 2 Oct. 2016; MADIBENTHOS; stn AS550; sequenced; MNHN-IM-2013-74657.

Paratypes (46 specs)

MARTINIQUE • 1 spec., 3.7 × 1.7 mm, live-collected; same data as for holotype; MNHN-IM-2013-72798 • 25 specs, smallest and largest: 2.5 × 1.4 and 4.5 × 1.9 mm; same data as for holotype; MNHN-IM-2000-39674 • 10 specs, from a larger lot where specimen size range measured 2.6 × 1.3 to 4.5 × 1.9 mm; Pointe de la Rivière, Grand Rivière; 14°52.7' N, 61°11' W; depth 16 m; 2 Oct. 2016; MADIBENTHOS; stn AS550; USNM 1715399 • 10 specs, from a larger lot where specimen size range measured 2.6 × 1.3 to 4.5 × 1.9 mm; Pointe de la Rivière, Grand Rivière; 14°52.7' N, 61°11' W; depth 16 m; 2 Oct. 2016; MADIBENTHOS; stn AS550; ANSP 498841.

Other material examined (48 specs)

MARTINIQUE • 1 spec.; Fort-de-France Bay, E of Grande Sèche; 14°34.6′ N, 61°03.3′ W; depth 6 m; 9 Oct. 2016; MADIBENTHOS; stn AB398; MNHN-IM-2000-39671 • 2 specs; Le Carbet; 14°42.3′ N, 61°11.6′ W; depth 77 m; 3 Oct.; 2016; MADIBENTHOS; stn AD295; MNHN-IM-2000-39673 • 22 specs; Anse des Galets; 14°51.4′ N, 61°12.8′ W; depth 14–26 m; 7 Oct. 2016; MADIBENTHOS; stn AS568; MNHN-IM-2000-39670 • 23 specs; Pointe de Macouba; 14°52.9′ N, 61°08.5′ W; depth 15 m; 3 Oct. 2016; MADIBENTHOS; stn AS554; MNHN-IM-2000-39672.

Description

Shell small (holotype length = 4.0 mm, other lengths to 5.8 mm), thin, semi-translucent, narrowly fusiform (W/L = 0.3750), with a tall spire, 6¾ convex whorls altogether, adult whorls medially and obtusely angulate, the last whorl 58% of shell length; aperture short, narrowly oval with a posterior notch and anterior canal nearly as wide, aperture about 37% of shell length including canal. *Protoconch* of 3 regularly expanding glossy whorls, tip minute, immersed, last whorl with dense riblets with three distinct rows of "beads" on riblet crests. *Axial sculpture* of narrow, slightly opisthocline ribs, absent on sub-sutural band, recurved on shoulder, slightly swollen at peripheral angles, and evanescent before anterior fasciole on shell base. Ribs number 17 on penultimate and 17 on last whorl, intercostal space about 1 to 2 times width of ribs. *Varix* absent. *Spiral sculpture* of primary and secondary spirals, about the first five closest to the suture are crowded primaries and a darker color forming a band, then a pattern of about 3–4 secondaries between each primary follows; spirals are frosted at intersection with growth lines; spirals all override ribs. *Sulcus* is marked by the presence of recurved ribs on the lower portion of the shoulder, below the subsutural band, and by recurved growth lines. *Outer lip* is thin, edge curved in an arc from and congruent with the outer edge of the anal sinus to the end of the anterior canal. Stromboid notch absent. *Anal sinus* is a wide-open notch with a round apex offset from the suture and extending to the whorl periphery. *Inner lip* a narrow, thin glaze along the columella, unemarginate, without a callus on parietal wall. *Columella* straight. *Anterior canal* open, barely differentiated from the aperture, slanted to the left when viewed ventrally, end unnotched. *Anterior fasciole* is not swollen, with about 7 spiral secondaries of a darker color than spirals on shell base. *Color* a yellowish-white base with a wide, dark orange-yellow band on shoulder, and a variable width dark orange-yellow band on whorl sides split by narrow yellowish-white bands or lines.

Animal

The animal (holotype Fig. 88) is translucent milky white with irregular small opaque white streaks and spots. The proboscis is slightly bilobed; eyes stalked with a short fleshy finger.

Remarks

The average length of 51 specimens is 3.4 mm (range = 2.5–5.8 mm).

Fig. 88. *Kurtziella delannoyi* Fallon & Bouchet sp. nov. (holotype MNHN-IM-2013-74657), live animal. Photo by C. Redfern.

Range and habitat

Martinique; depth 6–77 m.

Kurtziella vincula Nowell-Usticke, 1969
Fig. 89O–P

Kurtziella vincula Nowell-Usticke, 1969: 29, pl. 6 fig. 1202.

Kurtziella vincula – Nowell-Usticke 1971: 26, pl. 5 fig. 1202. — de Jong & Coomans 1988: 116; pl. 44 fig. 617. — Boyko & Cordeiro 2001: 75. — Williams 2005: #5666.
Cryoturris vincula – Lee 2003c.

Differential diagnosis

Kurtziella intercedens (Melvill, 1925) most closely resembles this species but is broader and has a single, narrower mid-whorl brown band.

Type material

Lectotype

Nowell-Usticke's (1971) designation of a holotype was corrected to a lectotype designation by Boyko & Cordeiro (2001: 75) since no holotype was designated in the original description by Nowell-Usticke (1969).

ST. CROIX • 5.8 × 2.1 mm; Altona Bay; Nowell-Usticke leg.; AMNH 195470.

Paralectotypes (2 specs)

ST. CROIX • 2 specs (lengths unknown); Altona Bay; AMNH 195471.

Material examined (1 spec.)

The lectotype was examined. No other specimens were found in examined samples.

Description

The lectotype is a beach-worn shell missing important sculptural details. This description is mainly based on Nowell-Usticke's account; some details could not be confirmed, and others are missing due to the condition of the shell. *Shell* very small (length = 5.8 mm), spindle-shaped with about 8½ whorls; teleoconch whorls convex, with shoulders extending nearly mid-whorl, well-rounded with appressed sutures; last whorl 57% of shell length; shell covered with numerous ribs and very fine spirals; aperture oval, short, with a short anterior canal, together 38% of shell length. *Protoconch* of 2½ whorls, the last with 3 or 4 spirals and small riblets (worn on type). *Axial sculpture* of narrow opisthocline ribs beginning just below suture, recurved on shoulder, angled and strongest at periphery, and extending to subsequent suture on spire whorls, fading on base of shell. *Varix* absent. *Spiral sculpture* of very fine frosted spirals that override ribs (mostly worn on type). *Sulcus* absent. Recurved ribs on shoulder indicate past positions on shoulder. *Outer lip* plain (worn on type). *Anal sinus* worn on type. *Inner lip* a narrow glaze along columella, without a callus. *Anterior fasciole* (worn on type). *Columella* is slightly sigmoid. *Anterior canal* short, open, barely differentiated from aperture, oblique to axis of shell. *Color* white with a wide brown mid-whorl band and a narrower band on upper portion of shoulder. The mid-whorl band is partially visible above the suture line on spire whorls.

Range and habitat

St. Croix (Altona Bay), St. Thomas (Water Island), St. Bart's, and Antigua. Occurrence in the Netherlands Antilles (Curaçao), reported by de Jong & Coomans (1988) and by Nowell-Usticke (1969) (Aruba), need to be confirmed. No depth was given in the original description of this species.

Kurtziella intercedens (Melvill, 1923)
Figs 86C, 89Q–Y

Mangelia intercedens Melvill, 1923: 168, pl. 5 fig. 14.

Mangelia intercedens – Trew 1987: 46.
Daphnella intercedens – Hornung & Mermod 1929: 112–113.
Kurtziella intercedens – Williams 2005: #5650.

non *Granoturris vincula* (Nowell-Usticke, 1969) – Zhang 2011: 151, fig. 572 (likely a misidentification).
non *Kurtziella perryae* Bartsch & Rehder, 1939 – Zhang 2011: 151, fig. 574 (likely a misidentification).

Differential diagnosis

Kurtziella vincula Nowell-Usticke, 1969 is narrower, its aperture and anterior canal proportionally shorter, and has two brown spiral bands, the shoulder band absent on *K. intercedens*.

Cryoturris olsoni Fallon & Bouchet sp. nov. is white and possesses a single brown spiral band but has the typical protoconch of that genus and coarser sculpture.

Kurtziella albocapitanea Fallon sp. nov. is generally larger with a proportionally larger spire (46% versus 38% for a select specimen) and shorter aperture 35% versus 43% of shell length. Its whorls are obtusely angled not convex as in *K. intercedens*; and it lacks a mid-whorl brown band. Its known range is Abaco Island and SE Florida; that of *K. intercedens* is Cuba south to islands off northern South America.

Kurtziella cingulata Fallon sp. nov. differences are explained in the Differential diagnosis of that species.

Type material

Holotype
CUBA • 5.0 × 2.0 mm; NHMUK 1982083.

Paratypes
None known.

Material examined (17 specs)

The holotype of *Kurtziella intercedens* (Melvill, 1923) was not examined; however, the photographs provided by the NHMUK, in combination with Melvill's original description, were sufficient to identify other specimens as this species. Missing is a detailed description of the type's protoconch. Melvill's "microscopically striate" is somewhat ambiguous given the importance of the protoconch in species identification but may refer to the riblets on the last portion of the protoconch.

COLOMBIA • 1 spec., 6.2 × 2.5 mm; NW of Isla Providencia, W Catalina Island, near Blue Hole; depth 24 m; 16 Aug. 1998; E.F. García leg.; dredged; UF 589695.

GUADELOUPE • 4 specs, 3.9 × 1.7, 5.1 × 2.0, 4.8 × 1.9 and 3.3 × 1.5 mm; Petite Anse; 16°05.72′ N, 61°46.26′ W; depth 5 m; 10 May 2012; KARUBENTHOS 2012; stn GD13; MNHN-IM-2012-8774 • 1 spec., 5.5 × 2.2 mm, ethanol-preserved; Petite Anse; 16°05.72′ N, 61°46.26′ W; depth 5 m; 10 May 2012; KARUBENTHOS 2012; stn GD13; MNHN-IM-2019-34696.

MARTINIQUE • 2 specs in 2 lots, 5.5 × 2.3 and 6.5 × 2.3 mm; Anse d'Arlet; ex R. Delannoye coll.; MNHN-IM-2000-39677 and MNHN-IM-2000-39678 > 1 spec., 5.5 × 2.3; Anse d'Arlet; ex R. Delannoye coll.; MNHN-IM-2000-39677 • 1 spec., 6.5 × 2.3 mm; Anse d'Arlet; ex R. Delannoye coll.; MNHN-IM-2000-39678 • 1 spec., 4.0 × 1.5 mm; Anse des Galets; 14°51.4′ N, 61°12.8′ W; depth 14–26 m; 7 Oct. 2016; MNHN exped.; stn AS568; MNHN-IM-2000-39676.

ST. VINCENT AND THE GRENADINES • 1 spec.; Isle a Quatre; depth 13 m; 4 Jul. 2005; ex H.G. Lee coll.; G. Mackintosh leg.; screened from sediment; UF 589696.

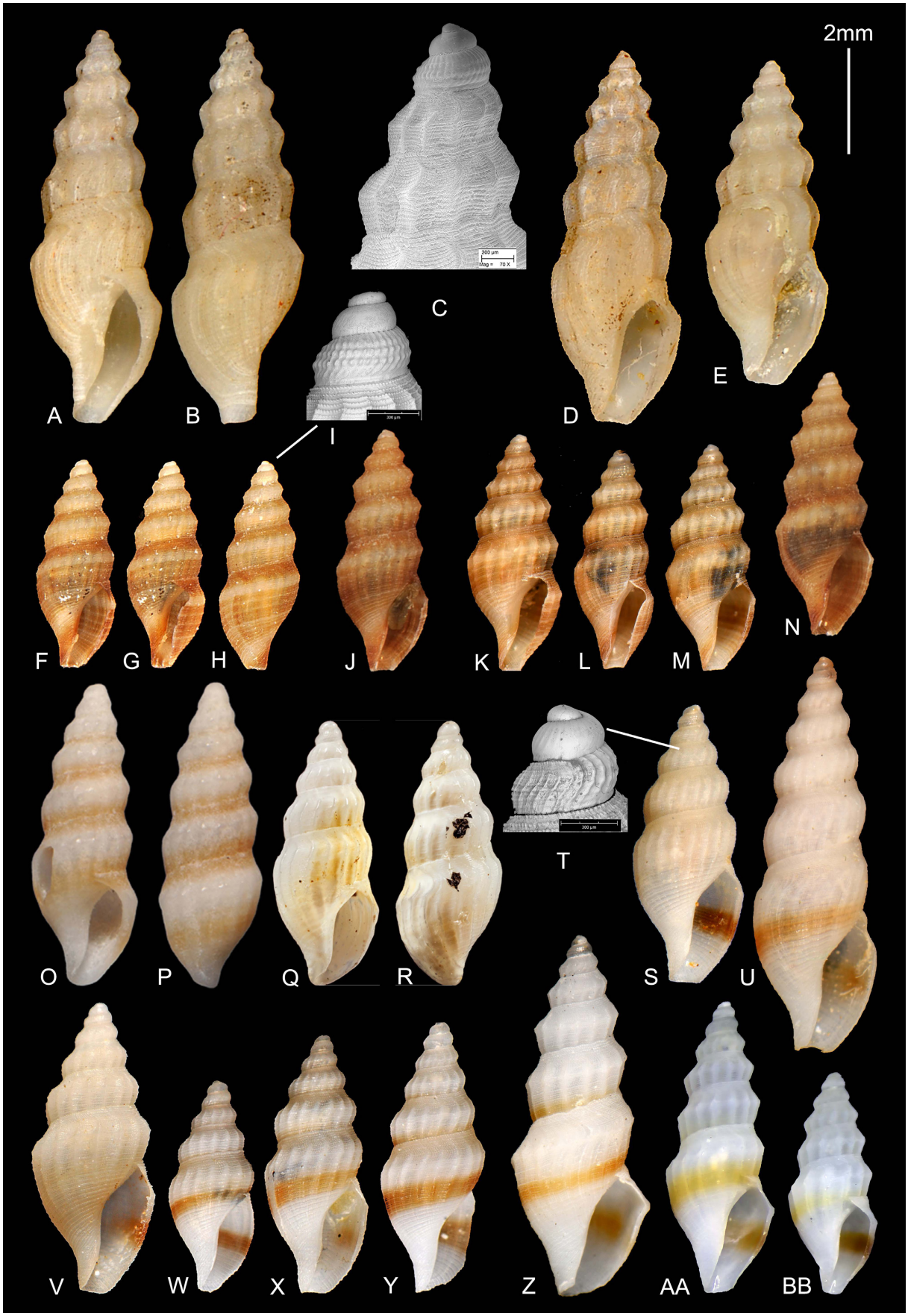
TRINIDAD AND TOBAGO • 1 spec., 5.3 × 2.1 mm; Tobago Island, Mt. Irvine Bay, E side of Booby Pt.; depth 7 m; 18 Sep. 1997; G. Mackintosh leg.; night SCUBA; UF 589694 • 4 specs, 7.5 × 2.4, 6.8 × 2.4,

6.0 × 2.3 and 5.5 × 2.1, mm; Tobago Island, Mt. Irvine Bay, E side of Booby Pt.; depth 6 m; 18 Sep. 1997; G. Mackintosh leg.; night SCUBA; ANSP 498949 • 2 specs, 5.7 × 2.1 and 4.5 × 2.0 mm; Tobago Island, Mt. Irvine Bay, E side of Booby Pt.; depth 6 m; 18 Sep. 1997; G. Mackintosh leg.; night SCUBA; ANSP 498948.

Description

Based on the original description in Melvill (1923: 168) and examination of the NHMUK photograph of the holotype. *Shell* small (specimen examined here for descriptive purposes is shown in Fig. 89S–T, length = 5.3 mm), light, fusiform with a tall spire (W/L = 0.3962), 6¾ convex whorls altogether, adult whorls appressed with a subsutural band followed by well-rounded shoulder, the last whorl 62% of shell length; aperture oval with a shallow anal notch and short, wide anterior canal, aperture about 43% of shell length including canal. *Protoconch* of 2¼ round whorls, the tip minute, the last whorl with crowded riblets with 4 rows of fine "beads" on rib crests of the last ½-whorl. *Axial sculpture* of weak, narrow ribs, 21 on the penultimate and about 18 on the last whorl, that appear below the subsutural belt on whorl shoulders and evanesce below periphery of last whorl. Ribs recurved on shoulder. *Varix* absent. *Spiral sculpture* of primary and secondary spirals, primaries only slightly stronger than secondaries, in an alternating pattern of roughly 1:1; subsutural band is comprised of approximately 8 tightly packed primaries, secondaries lacking. Spiral elements are finely granulose. *Sulcus* absent; recurved ribs and growth striae from base of subsutural band to whorl periphery mark past locations of anal sinus. *Outer lip* thin, edge marks a low arc from anal sinus to end of anterior canal. Stromboid notch absent. *Anal sinus* a wide shallow notch from the base of subsutural band to whorl periphery. *Inner lip* a thin, unemarginate, narrow glaze along the columella and parietal wall; without a callus. *Columella* straight. *Anterior canal* short, barely differentiated, open, end unnotched. *Anterior fasciole* not swollen, surface sculpture of primary spirals. *Color* white with a reddish-brown spiral band at about mid-whorl. Band darkest on last portion of last whorl; may be present on only half of the last whorl or absent altogether.

Fig. 89 (next page). Species of *Kurtziella* Dall, 1918. Part 1. – **A–B**. *Pleurotoma cerinum* J.D. Kurtz & W. Stimpson, 1851, lectotype (here designated), 7.5 × 2.6 mm, ventral, dorsal and protoconch views (MCZ 156181), Buzzards Bay, New Bedford, Massachusetts. – **C–E**. *Cryoturris cerinella* Dall, 1889 syntypes = *Kurtziella cerina* (J.D. Kurtz & W. Stimpson, 1851). **C**. Syntype of *C. cerinella*, SEM image of protoconch of specimen in USNM 35359, 70×. **D–E**. Syntypes of *C. cerinella*, 7.3 × 2.5 and 6.8 × 2.3 mm (USNM 35359), off Cape Hatteras, North Carolina. – **F–N**. *Kurtziella delannoyi* Fallon & Bouchet sp. nov. **F–I**. Holotype, 4.0 × 1.5 mm, ventral, lateral and dorsal views, and SEM of protoconch (MNHN-IM-2013-74657), Grand Rivière, Pointe de la Rivière, Martinique. **J**. Spec. (not measured) (MNHN-IM-2000-39670), Anse des Galets, Martinique. **K–M**. Paratypes, 4.5 × 1.9, 4.2 × 1.6 and 4.3 × 1.7 mm (MNHN-IM-2000-39674), Grand Rivière, Martinique. **N**. Spec. (not measured) (MNHN-IM-2000-39670), Anse des Galets, Martinique. – **O–P**. *Kurtziella vincula* Nowell-Usticke, 1969, lectoype, 5.8 × 2.1 mm (AMNH 195470), Altona Bay, St Croix. – **Q–R**. *Mangelia intercedens* Melvill, 1923, holotype, 5.0 × 2.0 mm (NHMUK 1982083), Cuba. – **S–Y**. *Kurtziella intercedens* (Melvill, 1923). **S–T**. Spec., 5.3 × 2.1 mm, ventral view, and SEM image of protoconch (UF 589694), Tobago Island, Trinidad and Tobago. **U**. Spec., 7.5 × 2.4 mm (ANSP 498948), E side of Booby Pt., Mt. Irvine Bay, Tobago Island. **V**. Spec., 5.5 × 2.3 mm (MNHN-IM-2000-39677), Anse d'Arlet, Martinique. **W–Y**. Specs, 3.9 × 1.7, 4.8 × 1.9 and 5.1 × 2.0 mm (MNHN-IM-2012-8774), Petite Anse, Guadeloupe. – **Z–BB**. *Kurtziella cingulata* Fallon sp. nov. **Z**. Holotype, 6.9 × 2.6 mm (UF 589845), W end of Cedar Key, Levy Co., W Florida. **AA–BB**. Paratypes, 5.5 × 2.1 and 4.3 × 1.7 mm (ANSP 482230), between Marquesas Keys and Dry Tortugas, Monroe Co., Florida Keys. Credits: C: SEM of shell apex courtesy of Yolanda Villacampa, USNM; I, T: SEM images courtesy of Paul Callomon and Chandler J. Olson; Q–R: courtesy of Harry Taylor, Photographic Unit, and Andreia Salvador, Senior Curator of Marine Gatropods; photo copyright NHMUK. Scale bars: A–B, D–H, J–S, U–BB = 2 mm; C = 300 µm; I, T = 300 µm.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Remarks

The 9 measured specimens have an average length = 5.5 mm (range = 3.9–7.5 mm). specimens from Tobago are slimmer and have finer spirals and frosting.

Range and habitat

Cuba (type locality), Colombia (Catalina Island), Trinidad and Tobago (Tobago Island), St. Vincent and the Grenadines, Martinique, and Guadeloupe; depth 5–26 m.

Kurtziella cingulata Fallon sp. nov.
urn:lsid:zoobank.org:act:8E1266CE-8A0E-4600-B79C-0A027ECCCD45
Fig. 89Z–BB

Differential diagnosis

Kurtziella intercedens (Melvill, 1923) has convex whorls, not angular ones, a protoconch of 2¼ whorls (versus 2¾) and more ribs on the penultimate whorl (21 versus 14), the latter two comparisons made from the non-type specimen shown in Fig. 89S–T against the holotype of *K. cingulata* Fallon sp. nov. shown in Fig. 89Z. So far, the distribution of *K. intercedens* appears to be tropical and that of *K. cingulata* temperate tropical.

Kurtziella vincula Nowell-Usticke, 1969 has convex whorls, not angular ones, has 2 brown bands, mid-whorl, and shoulder bands, and a protoconch of only 1¾, not 2¾ whorls.

Cryoturris olsoni Fallon & Bouchet sp. nov. is white and possesses a single brown spiral band but has the typical protoconch of that genus.

Kurtziella albocapitanea Fallon sp. nov. is generally larger, its mid-whorl peripheries are not as sharply angled, and it lacks a mid-whorl brown band.

Etymology

Kurtziella cingulata Fallon sp. nov. from the Latin adjective '*cingulata*', meaning 'having a belt', which refers to the mid-whorl reddish-brown spiral band.

Type material

Holotype
UNITED STATES OF AMERICA • 6.9 × 2.6 mm; W Florida, Levy Co., W end of Cedar Key; in shallow water; 1982; Jim Keeler leg.; UF589845.

Paratypes (4 specs)
UNITED STATES OF AMERICA • 4 specs, 5.5 × 2.1, 4.3 × 1.7, 4.0 × 1.7 and 3.8 × 1.7 mm; Florida Keys, Monroe Co., between Marquesas Keys and Dry Tortugas; depth 35–40 ft [11–12 m]; pre 1981; Wayne Sadler leg.; ex batfish stomachs; ANSP 482230.

Description

Shell small (length = 6.9 mm), light, fusiform with a tall spire (W/L = 0.3768), 8 whorls altogether, adult whorls angled mid-whorl, with an appressed subsutural band followed by a flat shoulder; the last whorl 57% of shell length; aperture narrow, sides almost parallel, with a shallow anal notch and short, wide anterior canal, aperture about 35% of shell length including canal. *Protoconch* of 2¾ glassy round whorls, the tip minute, the last whorl with fine, crowded riblets with 4 rows of fine 'beads' on rib crests of about the last ½-whorl. *Axial sculpture* of weak, narrow ribs, 15 on the penultimate and about 14 on the

last whorl, that appear below the subsutural belt on whorl shoulders and evanesce below periphery of last whorl. Ribs grow stronger advancing toward the outer lip, are hooked up against the peripheral primary spiral of the whorl side on a little more than the last whorl, recurved on the shoulder between band and periphery. *Varix* absent. *Spiral sculpture* of a single primary and many secondary spirals, the primary much stronger than secondaries, subsutural band is comprised of approximately 7 packed secondaries, below it, secondaries present to the edge of the shoulder. The primary is on the periphery is slightly swollen on rib crests. Spiral elements are finely granulose. *Sulcus* absent; recurved ribs and growth striae from base of subsutural band to whorl periphery mark past locations of anal sinus. *Outer lip* thin, edge marks a low arc from anal sinus to end of anterior canal. Stromboid notch absent. *Anal sinus* is a wide round notch from the base of subsutural band to whorl periphery. *Inner lip* a thin, unemarginate, narrow glaze along the columella and parietal wall; without a callus. *Columella* slightly sigmoid. *Anterior canal* short, barely differentiated, open, end unnotched. *Anterior fasciole* not swollen, surface sculpture of primary spirals. *Color* white with a reddish-brown spiral band at about mid-whorl, straddling the sutural line so that it is visible on spire whorls, to the extent that it is present. Band darkest on last portion of last whorl; may be present on only the last whorl or absent altogether.

Remarks

The 5 measured specimens have an average length = 4.9 mm (range = 3.8–6.9 mm).

Range and habitat

United States (W Florida, Florida Keys); depth shallow water–12 m.

***Kurtziella* spp. Part 2**

Kurtziella limonitella (Dall, 1884)
Figs 86D, 90A–H

Drillia limonitella Dall, 1884: 329, pl. 10 fig. 10.

Drillia limonitella – Tryon 1884: 320, pl. 34 fig. 6. — Dall 1903: 102, pl. 8 fig. 3.
Pleurotoma limonitella – Simpson 1886: 54. — Paetel 1888: 65.
Mangilia limonitella – Dall 1889a: 112; 1889b: 102, pl. 48 fig. 3; 1903: 1606. — Maury 1922: 70. — M. Smith 1951: 37, pl. 52 fig. 6, pl. 68 fig. 3.
Mangelia limonitella – Johnson 1934: 142.
Kurtziella limonitella – Bartsch & Rehder 1939: 134. — Abbott 1954: 272, fig. 57a (= Dall's fig.). — Dubar & Howard 1964: 39. — Powell 1966: 103. — McGinty 1970: 53–68. — Andrews 1971: 123, text fig. — Porter 1974: 254; 1975: 34. — Abbott 1974: 281, fig. 3242. — Campbell *et al*. 1975: 118. — Humfrey 1975: 185, pl. 22 fig. 17. — Emerson & Jacobson 1976: 172, pl. 26 fig. 1. — Cooley 1978: 63. — Treece 1980: 562. — Kaicher 1984: card #3961. — Turgeon *et al*. 1988: 98; 1998: 108. — Lyons 1989: 28, pl. 11 fig. 5. — Odé 1992a: 62; 1993: 72, fig. 9. — Shelton 1997: no. 286. — Prezant *et al*. 2002: 344. — García & Lee 2002: 12. — Lee 2003a: http://www.jaxshells.org; 2003c: http://www.jaxshells.org/cedarkey.htm. — Williams 2005: #5662. — García 2007: 8.

Differential diagnosis

Kurtzia atrostyla (Tryon, 1884) ribs are stronger on the shoulder and begin at an impressed suture (subsutural band of spirals absent) and spiral sculpture is also different: 4 primaries with intercalary secondary spirals are on whorl sides, not the alternating primary, microscopic secondary present over the entire shell of *Kurtziella limonitella*.

Kurtziella oriens Fallon sp. nov. is slimmer, has finer, more numerous spirals, including more in the subsutural band, has a proportionally shorter aperture (taller spire) and a tooth inside the outer lip.

Kurtziella cerina (J.D. Kurtz & W. Stimpson, 1851) has a larger protoconch (3 versus 2½–2¾ whorls), is larger (average length of 10 specimens is 6.7 versus 5.4 mm) and slightly slimmer (W/L = 0.3467 versus 0.3571), has lower shoulders and less angular whorls, and has fewer ribs (12 or 13 versus 9–11).

Type material

Lectotype (here designated) > please present the same way as for the paralectotypes
Of the 3 syntypes in USNM 35979, the one most closely matching Dall's (1884) description and drawing is the 5.5 × 2.2 mm specimen (Fig. 90B–C). For comparison, photos of Dall's drawing is shown in Fig. 90A. The size given in Dall's (1884) description, 6.75 × 3.75 mm, does not match any of the 3 syntypes and the largest syntype (Fig. 90E), which measures 7.0 × 2.5 mm, does not match his drawing.

Paralectotypes (2 specs)
UNITED STATES OF AMERICA • 2 specs, 5.7 × 2.3 and 7.0 × 2.5 mm; W Florida, Levy Co., Cedar Keys; on mud flats between tides; USNM 35979.

Material examined (12 specs)

The syntypes and following 9 specimens were examined:

UNITED STATES OF AMERICA • 6 specs, 6.0 × 2.3, 6.0 × 2.3, 5.0 × 2.1, 4.8 × 2.0, 4.2 × 1.7 and 3.6 × 1.8 mm; W Florida, Levy Co., off W end of Cedar Key; Dec. 1978; H.G. Lee and J. Fatis; trawled; ex batfish stomachs; UF 589846 • 3 specs, 6.4 × 2.3, 6.3 × 2.5 and 5.5 × 2.3 mm; NW Florida, Bay Co., Panama City, St. Andrew's Bay, 0.25–0.5 mi. [0.4–0.8 km] E of Alexander Apts.; EFG 11809.

Description

Shell small (lectotype length = 5.5 mm), thin, fusiform (W/L = 0.4000), with 7 whorls total, teleoconch whorls appressed and undulant at sutures, shoulders convex, sloping, and peripheries rounded. Last whorl and canal about 56% of shell length. Aperture oval and flattened posteriorly by shoulder; canal hardly differentiated from aperture and together they are about 37% of shell length. *Protoconch* of about 3 round whorls, the first protruding, the last with fine riblets that develop 3 rows of "beads". *Axial sculpture* of strong ribs with narrow crests and broad bases that run from the subsutural collar to the next suture, and fade by the anterior fasciole. Ribs are angled and strongest at whorl periphery, number 12 on penultimate whorl, 13 on the last and are as wide as intercostal space. Apices if ribs nodulous at whorl peripheries. *Varix* absent. *Spiral sculpture* of primaries and secondaries. 2 or 3 primaries run with the undulant, appressed suture then a regular pattern of equal-sized primaries, separated by 1 or 2 microscopic secondaries, extend from the base of the sub-sutural band to the anterior fasciole. *Sulcus* absent. Past presence of the anal sinus marked by recurved ribs on the shoulder. *Outer lip* is thin, except when the last rib falls at the edge. Stromboid notch absent. *Anal sinus* is a shallow, wide notch with divergent sides near the edge of the shoulder. *Inner lip* a narrow glaze along the columella and parietal wall, unemarginate and without a sinal callus posteriorly. *Anterior fasciole* not swollen, with numerous oblique weak primary spirals. *Columella* straight. *Anterior canal* straight, short, open, unnotched. *Color* translucent, lemon yellow; upper whorls a livid ashy or greenish tinge in fresh specimens, and a large reddish tinged mid-whorl band.

Remarks

The average length of 10 measured specimens is 5.4 mm (range = 3.6–7.0 mm).

Range and habitat

United States (W Florida. Published but unconfirmed localities also include N. Carolina, S. Carolina, Georgia, E Florida, Alabama, Louisiana, and Texas), Mexico (Campeche); depth 0–70 m. Less likely reports need to be verified, i.e., Jamaica (Humfrey 1975).

Kurtziella oriens Fallon sp. nov.
urn:lsid:zoobank.org:act:BAFA61A0-48F6-4A75-8B61-D7EA908CA9CE
Figs 86E, 90I–Q

Differential diagnosis

Others have identified this species as *Kurtziella perryae* Bartsch & Rehder, 1939 or as *K. limonitella* (Dall, 1884), both of which are similar. However, they are reported to be from the west coast of Florida, not the east coast, and they differ morphologically from the following two species.

Kurtziella limonitella, is stouter, with stronger and higher ribs, a coarser spiral sculpture with fewer spirals, a proportionally larger aperture, and lacks a tooth inside the outer lip at the lower margin of the anal sinus.

Kurtziella perryae has a distinct spiral pattern, with nearly equal sizes of the spire whorl sides, differing from those in the band, above the suture on the spire whorls, and those on the shell base. This stands in contrast to the 1:1 primary to secondary ratio seen in *K. oriens* Fallon sp. nov.

Etymology

Kurtziella oriens Fallon sp. nov., from the Latin adjective '*oriens*', meaning 'eastern', after the location of the type series (in the NE coast of Florida). This contrasts with its similar congener, *K. perryae*, which is found on the western coast of Florida.

Type material

Holotype
UNITED STATES OF AMERICA • 7.1 × 2.4 mm; E Florida, Duval Co., off Big Talbot Island; depth about 18 m; 1965–1975; W. Skipper leg.; trawled; ex *Astropecten articulatus* stomachs; UF 589847.

Paratypes (15 specs)
UNITED STATES OF AMERICA • 15 specs, 6.7 × 2.4, 6.3 × 2.2, 6.8 × 2.5, 5.7 × 2.1, 6.8 × 2.1, 6.2 × 2.2, 5.7 × 2.3, 6.0 × 2.0, 5.4 × 1.8, 5.2 × 2.1, 5.0 × 2.0, 4.6 × 2.0, 4.8 × 1.7, 4.4 × 1.9 and 3.4 × 1.6 mm; same data as for holotype; UF 589848.

Other material examined (11 specs)

UNITED STATES OF AMERICA • 10 specs, (6 largest measured) 6.0 × 2.0, 5.0 × 1.9, 4.5 × 1.7, 4.2 × 1.7, 4.6 × 1.8 and 3.5 × 1.5 mm; E Florida, Duval Co., Jacksonville Beach, 16th Ave. S; depth 0 m; Nov. 1981; N. Bulock; in beach drift; UF 589849 • 1 spec., 6.0 × 2.3 mm; E Florida, Nassau or Duval Cos, S end of Amelia Island or N end of Big Talbot Island; 30 May 2004; Bill Frank leg.; UF 589850.

Description

Shell small (holotype length = 7.1 mm), thin, fusiform (W/L = 0.3380), with 9 whorls altogether; teleoconch whorls appressed and slightly undulant at sutures, shoulders flat, sloping, and peripheries rounded. The last whorl and canal together are about 50% of shell length. Sculpture consisting of strong ribs angled mid-whorl, and very fine granulose spirals. Aperture oval, canal hardly differentiated from

aperture and together they are about 33% of shell length. *Protoconch* of about 3⅛ round whorls, the last 2 with fine crowded riblets, the last whorl with 3 distinct rows of 'beads'. *Axial sculpture* of broad ribs with narrow crests that extend from the subsutural band to the succeeding whorl's suture on spire whorls and evanesce on the shell base before the anterior fasciole. Ribs low and recurved on shoulder, highest, angled, and weakly nodulous at peripheries, number 12 on penultimate and 10 on base. *Varix* absent. *Spiral sculpture* of fine primary and secondary spirals; a 5–9 spiral subsutural band (primaries) is followed by about 7 primaries with a single secondary between each on the shoulder, and then a sequence of 1 or 2 (mostly 2) secondaries between about 9 primaries on whorl sides. *Sulcus* absent; past presence of anal sinus marked by recurved ribs between the lower edge of the subsutural band and the edge of the shoulder. *Outer lip* is thin, its edge traces a nearly flat curve from the anal sinus to the end of the anterior canal, with a low tooth inside. *Anal sinus* a notch set between the sutural band of spirals and edge of shoulder, its apex round with slightly divergent sides. A low tooth inside the outer lip is set back from lip edge and below the sinus. *Inner lip* a narrow strip etched into parietal area and glazed along the columella. *Anterior fasciole* not swollen, with about 12 spirals. *Columella* is slightly sigmoid. *Anterior canal* short, open, only slightly narrower than aperture; end unnotched. *Color* off-white to yellowish white.

Remarks

The average length of 23 measured specimens is 5.4 mm (range = 3.4–7.1 mm).

Range and habitat

United States (NE Florida); depth shallow water to18 m.

Kurtziella hirschi Fallon sp. nov.
urn:lsid:zoobank.org:act:0DFB4BBB-B984-4CF6-89D8-6D2C97E9606E
Figs 86F–G, 90R–CC

Differential diagnosis

Kurtziella hirschi Fallon sp. nov. is like several other species, all best differentiated by protoconch sculpture, except *Kurtziella limonitella* (Dall, 1884), which has shouldered whorls that are more rounded than the angular whorls of *K. hirschi*.

Cryoturris septentrionalis Fallon sp. nov. has riblets on the last whorl with median swellings that form a single carina, not the 3 rows of beads on the last whorl of *K. hirschi* Fallon sp. nov. The ribs of the teleoconch, although reduced, extend to the suture and do not end at the subsutural band as is the case in *Kurtziella*.*Cryoturris texana* Fallon sp. nov. differs in the same respects as *C. septentrionalis* Fallon sp. nov.

Kurtzia margaritifera (Fargo, 1953) comb. nov. has riblets on the last protoconch whorl beaded by 3 spirals, the median row most prominent. *Kurtzia xalvisae* Fallon sp. nov. also has a more prominent middle row of beads and lacks the subsutural band of spirals characteristic of *Kurtziella*.

Etymology

Kurtziella hirschi Fallon sp. nov. is named in honor of Dr Herbert I. Hirsch, the first author's cardiologist, to express my lasting gratitude for his years of essential care.

Type material

Holotype

UNITED STATES OF AMERICA • 5.7 × 2.5 mm; W Florida, Hillsborough Co., 95 mi. [153 km] W of Egmont Key; Aug.1986; J. Moore leg.; dredged; UF 589851.

Paratypes (10 specs)

UNITED STATES OF AMERICA • 3 specs, 4.9 × 2.3, 5.4 × 2.5 and 4.5 × 2.1 mm; W Florida, Levy Co., off Cedar Keys; 1984; Jim Keeler leg.; ex batfish stomachs; UF 589853 • 5 specs, 6.9 × 3.3, 6.3 × 2.9, 5.6 × 2.6, 4.6 × 2.2 and 3.5 × 1.8 mm; E Florida, Duval Co., off Jacksonville and Neptune beaches; depth 0 m; Sep. 1956; Gill Hanson leg.; in beach renourishment spoil; UF 589852 • 1 spec., 6.2 × 2.9 mm; E Florida, St. Johns Co., 50–60 mi. [80–97 km] E of Ponte Vedra; depth 40–46 m; 12 Mar. 1988; H.G. Lee leg.; dredged by scallop boat, ex batfish stomachs; UF 589854 • 1 spec., 4.4 × 2.0 mm; NW Florida, Bay Co., SW of Panama City; depth 180 ft [55 m]; dredged; E García coll. #11817B.

Description

Shell small (holotype length = 5.7 mm, largest measured length = 6.9 mm), stoutly fusiform, or biconic (W/L = 0.4386), with 7¼ whorls total, the 4 appressed, teleoconch whorls and a short anterior canal. Last whorl and canal about 60% of shell length. Teleoconch whorls with an obtuse mid-whorl angulation (acute in some specimens) marking whorl periphery and edge of shoulder. Aperture a narrow oval; anterior canal hardly differentiated from the canal, which together are about 40% of shell length. *Protoconch* of about 2⅞–3 whorls, the first minute, then whorls expand regularly, the last whorl with riblets, and the last ¾-whorl with 3 rows of beads. *Axial sculpture* of low, narrow, cord-like straight ribs that run from about midway on the shoulder, below a band of spirals, to the suture, and to the anterior fasciole on the last whorl. Ribs are hooked approaching the suture of the last whorl and are widest at the whorl periphery, intercostal space wider than ribs, which number 13 on the penultimate and 12 on the last whorl. *Varix* is absent. *Spiral sculpture* of granulose microscopic spirals of different strengths, a peripheral primary and another about midway on whorl side are mostly obsolete in intercostal space. Both primaries are nodulous on rib crests, the peripheral one most prominently so; about 5 of the strongest secondaries lie adjacent to the suture and isolate the ribs; weaker microscopic spirals are densely packed over the rest of the shell surface. *Sulcus* absent; however, hooked ribs just below shoulder reflect past positions of the anal sinus. *Outer lip* thin. *Anal sinus* is a wide but shallow notch, extending from below the subsutural band to whorl periphery. *Inner lip* a thin glaze, unemarginate, without a callus. *Columella* straight. *Anterior canal* short, slightly turned to the left viewed ventrally, unnotched. *Anterior fasciole* not swollen, sculpted with microscopic secondary spirals. *Color* a light golden brown, darker in intercostal space, first 2 whorls, and anterior canal; protoconch dark brown.

Remarks

The average length of 10 measured specimens is 5.36 mm (range = 3.50–6.90 mm). There are two interesting observations about the specimens. First, Florida east and west coast specimens appear to be nearly the same; differences however, are not believed to rise to the level of species. The bright coloration of specimens retrieved from Batfish stomachs trawled off Cedar Keys, W Florida (Fig. 90AA–DD) are consistent with the vivid coloration of other mollusk species observed in populations near the Mississippi R. Delta. Although the precise location of the Batfish specimens is unknown, it is interesting to speculate on this possibility given that specimens from off Egmont Key, Hillsborough Co., farther south along the W Florida coast (Fig. 90R–U) have the same duller color as those from off the east coast (Fig. 90V–Z).

Range and habitat

United States (NE and W Florida); depth ca 40–46 m.

Kurtziella minor Fallon & Bouchet sp. nov.
urn:lsid:zoobank.org:act:DA6B4E3F-CB1E-4CBC-9B3D-4839D1CB30E4
Figs 86H, 90DD–HH

Differential diagnosis

Kurtziella kalina Fallon & Bouchet sp. nov. has stronger and fewer ribs (14 versus 20 on the penultimate whorl), a smaller protoconch (2 7/8–3 versus 3¼ whorls), and a different ratio of primary to secondary spirals on the shell base (1:1 versus 1:3 or 4). It has a shorter anterior canal and its ribs and secondary spirals do not form a latticed pattern as seen in *K. minor* Fallon & Bouchet sp. nov.

Kurtziella delannoyi Fallon & Bouchet sp. nov. has a shorter anterior canal and exhibits stronger ribs with weaker spirals, resulting in a less evident latticed pattern compared to *K. minor* Fallon & Bouchet sp. nov.

Kurtziella guarapari Fallon sp. nov. is larger (length = 6.2 average mm versus 4.8 mm of the type specimen). It has fewer angular whorls, a shorter anterior canal, and sculpture of unequal-size ribs and spirals, such that a latticed pattern is not evident, as in *K. minor* Fallon & Bouchet sp. nov.

Etymology

Kurtziella minor Fallon & Bouchet sp. nov., the lesser *Kurtziella*, a reference to its relatively small, fragile shell.

Type material

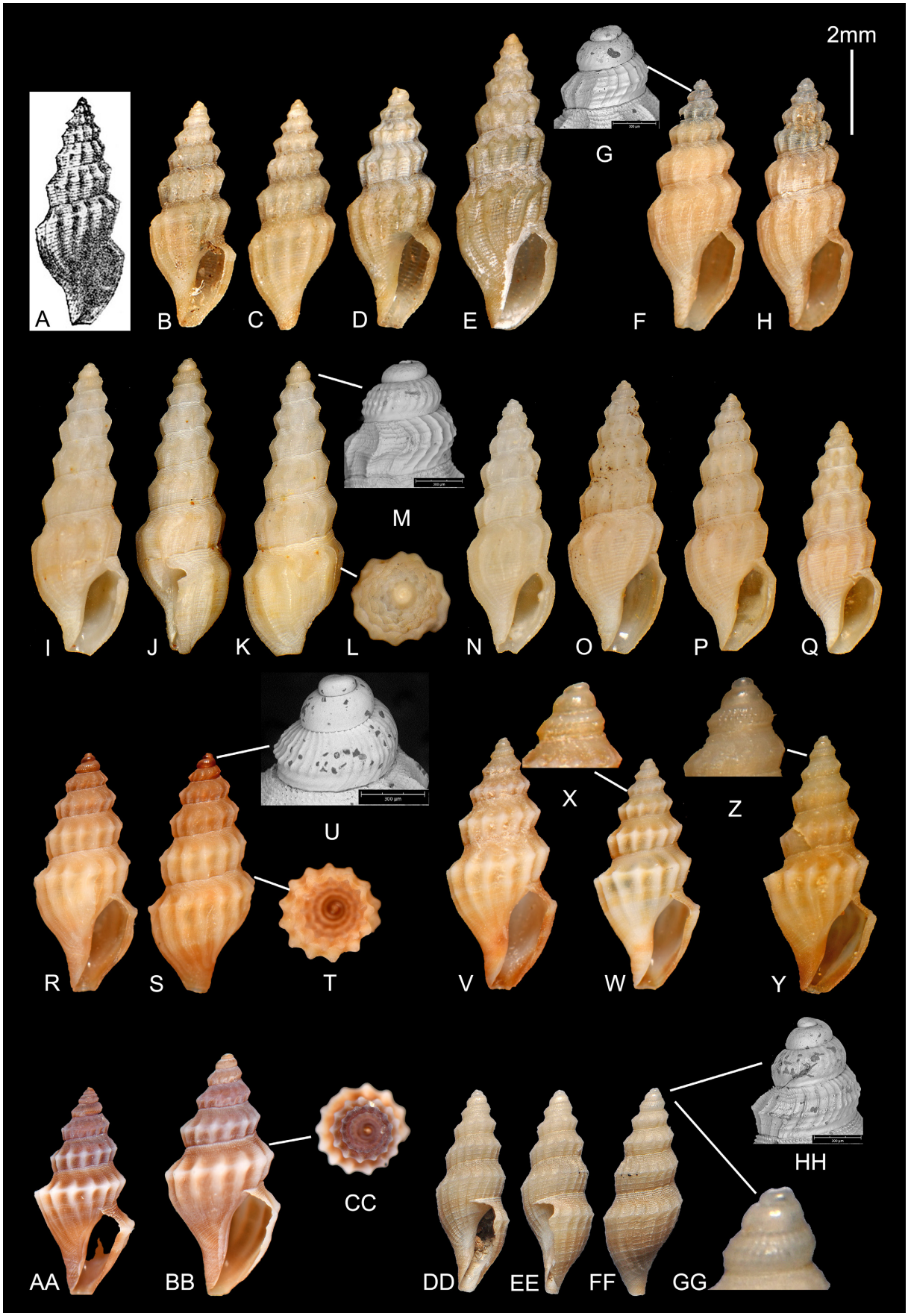
Holotype

FRENCH GUIANA • 4.8 × 1.8 mm; offshore; 6°52.2′ N, 53°02.6′ W; depth 94 m; 30 Jul. 2015; MNHN exped. Guyane; stn DW4359; MNHN-IM-2012-43473.

Paratypes

None.

Fig. 90 (next page). Species of *Kurtziella* Dall, 1918. Part 2. – **A–E**. *Drillia limonitella* Dall, 1884. **A**. Drawing from Dall (1884: pl. 10 fig. 10), here used to select the lectotype from among the 3 syntypes. **B–C**. Lectotype, 5.5 × 2.2 mm, ventral and dorsal views (USNM 35979), Cedar Keys, Levy Co., W Florida. **D–E**. Paralectotypes. 5.7 × 2.3 and 7.0 × 2.5 mm (USNM 35979), Cedar Keys, Levy Co., W Florida. – **F–H**. *Kurtziella limonitella* (Dall, 1884). **F–G**. Spec., 6.2 × 2.3 mm, ventral view, and SEM image of protoconch. **H**. 6.0 × 2.3 mm (UF 589846), W end of Cedar Key, Levy Co., W Florida. – **I–Q**. *Kurtziella oriens* Fallon sp. nov. **I–M**. Holotype, 7.1 × 2.4 mm, ventral, lateral, dorsal and apical views, and SEM image of protoconch (UF 589847), off Big Talbot Island, Duval Co., E Florida. **N–Q**. Paratypes, 6.7 × 2.1, 6.8 × 2.5, 6.7 × 2.4 and 6.2 × 2.2 mm (UF 589848), off Big Talbot Island, Duval Co., E Florida. – **R–CC**. *Kurtziella hirschi* Fallon sp. nov. **R–U**. Holotype, 5.7 × 2.5 mm, ventral, dorsal and apical views, and SEM image of protoconch (UF 589851), W of Egmont Key, W Florida. **V–X**. Paratypes, 6.9 × 3.3 and 6.3 × 2.9 mm, ventral view, and expanded view of protoconch, not to scale (UF 589852), off Duval Co., E Florida. **Y–Z**. Paratype, 6.2 × 2.9 mm, ventral view, and expanded view of protoconch, not to scale (UF 589854), off St Johns Co., E Florida. **AA–CC**. Paratypes, 4.5 × 2.1 and 5.4 × 2.5 mm, ventral and apical views (UF 589853), off Cedar Keys, W Florida. – **DD–HH**. *Kurtziella minor* Fallon & Bouchet sp. nov., holotype, 4.8 × 1.8 mm, ventral, lateral and dorsal views, expanded view of protoconch, not to scale, and SEM image of protoconch (MNHN-IM-2012-43473), off French Guiana. Credits: G, M, U, HH: SEM images courtesy of Chandler J. Olson and Krasimira "Kasey" Seizova. Scale bars: A–F, H–L, N–T, V–CC, DD–GG = 2 mm; G, M, U, HH = 300 µm.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Description

Shell small (length = 4.8 mm, holotype an empty shell, aged), fusiform (W/L = 0.3750), delicate, with 7 whorls and a moderate anterior canal. The last whorl and canal are about 61% of shell length. Teleoconch whorls are moderately convex with an obtuse mid-whorl angulation marking the whorl periphery and edge of the shoulder. Aperture is a narrow oval; a slight anterior constriction of the last whorl marks the beginning of the canal, which together are about 42% of shell length. *Protoconch* of about 3¼ whorls, the first minute, then whorls expand regularly; the last 1¼ with 3 rows of "beads" as is typical for the genus. *Axial sculpture* of low, narrow, cord-like slightly opisthocline ribs that run from about midway down the shoulder to the suture, and to the anterior fasciole on the last whorl. Ribs are hooked on the lower ramp, number 20 on the penultimate and 16 on the last whorls. *Varix* absent. *Spiral sculpture* of primaries and secondaries; a single strong primary on the periphery bears the strongest nodules, other primaries form minute nodules at rib intersections, Spirals on the shoulder are all primary strength, 5–7 separate suture from the onset of axials, another 3 primaries on the whorl side are separated by 3 or 4 secondaries. The shell base has the same pattern, beginning at the suture line with 3 or 4 secondaries between each primary, then changing to fewer secondaries between primaries and then to alternating strengths approaching the anterior fasciole. The intersection of ribs and primaries forms a reticulated pattern; all spirals are microscopically granulose. *Sulcus* absent; however, recurved ribs on the lower half of the shoulder reflect past positions of the anal sinus. *Outer lip* thin. *Anal sinus* is a wide but shallow notch, extending from suture to apex near whorl periphery. *Inner lip* a thin glaze, unemarginate, without a callus. *Columella* is slightly sigmoidal. *Anterior canal* of moderate length, tending to tubular, unnotched. *Anterior fasciole* not swollen, sculpted with numerous spirals. *Color* a monochromatic yellowish beige.

Remarks

Although only a single specimen was available, it is sufficiently different from *Kurtziella kalina* Fallon & Bouchet sp. nov. to merit its description currently.

This species is a somewhat unusual *Kurtziella* in that reduced, thread-like traces of ribs follow across the subsutural band to the suture.

Range and habitat

Known only from the type locality.

***Kurtziella* spp. Part 3**

Kurtziella guarapari Fallon sp. nov.
urn:lsid:zoobank.org:act:71DAC2C3-0B89-4D83-81A1-A80AADA9082D
Figs 87A, 91A–F

Differential diagnosis

Kurtziella delannoyi Fallon & Bouchet sp. nov. has a slightly smaller protoconch (3 not 3½ whorls) ending with one, not 1½ beaded whorls, and is smaller (average length = 3.41 versus 6.20 mm).

Kurtziella minor Fallon & Bouchet sp. nov. is smaller (length = 4.8 versus 6.8 mm for shells with an approximately comparable number of whorls), has a longer, more gradually tapered anterior canal, and axial and spiral primary spirals nearly equal in size, producing a reticulate pattern, which is not present in *K. guarapari* Fallon sp. nov.

Etymology

Kurtziella guarapari Fallon sp. nov., the Guarapari *Kurtziella*, is named after the coastal town on Brazil's SE coast (noun in apposition), off which all type specimens have been collected

Type material

Holotype

BRAZIL • 6.8 × 2.6 mm; off Guarapari, Espirito Santo State; depth 120–150 m; local fishermen leg.; fish nets; ANSP 498947.

Paratypes (6 specs)

BRAZIL • 2 specs, 6.2 × 2.4 and 5.9 × 2.3 mm; Espirito Santo State, off Guarapari; depth 40–50 m; Jul. 2004; local fishermen leg.; dredged; ANSP 498946 • 1 spec., 5.9 × 2.4 mm; Espirito Santo State, off Guarapari; depth 120–150 m; local fishermen leg.; fish nets; UF 589800 • 3 specs, 7.3 × 2.9, 5.6 × 2.3 and 3.7 × 1.7 mm; off Bahia State; depth 20–30 m; 2003; diver; P. Fallon coll.

Description

Shell small (holotype length = 6.8 mm), light, narrowly fusiform (W/L = 0.3824), with a tall spire, 7½ convex whorls altogether, adult whorls medially and obtusely, angulate, the last whorl 59% of shell length; aperture short, narrowly oval with a posterior notch and anterior canal nearly as wide, aperture about 37% of shell length including canal. *Protoconch* of 3½ regularly expanding glossy whorls, tip of the first minute, erect, last 1½ with riblets crossed by three spiral grooves forming four rows of small beads or nodules. *Axial sculpture* of narrow ribs that extend from below the sub-sutural band, recurved on shoulder, swollen at peripheral angles, slightly opisthocline on whorl sides, and evanesce on shell base before anterior fasciole. Ribs number 15 on penultimate and 17 on last whorl, intercostal space wider. *Varix* is absent. *Spiral sculpture* of raised granulose glossy spirals, about the first five closest to the suture crowded forming a band, the remaining ones evenly spaced; spirals override ribs. *Sulcus* absent; recurved ribs show evidence of past presence of anal sinus. *Outer lip* is thin, its edge forms a low arc from periphery to end of anterior canal; stromboid notch absent. *Anal sinus* a wide round notch beginning after the band of spirals at the suture and extending to shoulder periphery. *Inner lip* narrow, unemarginate, without a parietal callus. *Columella* straight. *Anterior canal* open, barely delineated, not much narrower than aperture; end unnotched. *Anterior fasciole* not swollen, covered with numerous oblique granulose spirals finer than spirals on shell base. *Color* a diffuse, dark orange-brown shell with a narrow white peripheral band and reddish brown staining on anterior fasciole and columella.

Remarks

The 7 examined specimens have an average length = 5.9 mm (range = 3.7–7.3 mm).

Range and habitat

Brazil (off Bahia and Espirito Santo states); depth 20–150 m.

Kurtziella kalina Fallon & Bouchet sp. nov.
urn:lsid:zoobank.org:act:09391B0D-89DB-4E09-A9F1-94D3F9666F6D
Figs 87B, 91G–P

Differential diagnosis

Kurtziella minor Fallon & Bouchet sp. nov. has weaker and a greater number of ribs (20 versus 14 on the penultimate whorl), a larger protoconch (3¼ versus 2¾ whorls), and a different ratio of primary to secondary spirals on the shell base (1:3 or 1:4 versus 1:1).

Kurtziella delannoyi Fallon & Bouchet sp. nov. has weaker and a greater number of ribs (17 versus 14 on the penultimate whorl), a larger protoconch (3 versus 2¾ whorls), and a different ratio of primary to secondary spirals on the shell base (1:3 or 4 versus 1:1). It also has more angular whorls.

Kurtziella guarapari Fallon sp. nov. has a larger protoconch (3½ versus 2¾ whorls) and has less angular whorls.

Etymology

Kurtziella kalina Fallon & Bouchet sp. nov., the *Kurtziella* of the Kalina, named after the native peoples of northern French Guiana (and elsewhere along the northern regions of South America); this name is in apposition.

Type material

Holotype

FRENCH GUIANA • 6.9 × 2.5 mm; offshore; 6°07.4′ N, 51°059.5′ W; depth 31–89 m; 3 Dec. 2017; PROTEUS-GUYANE; stn DW5091; MNHN-IM-2000-40019.

Paratypes (9 specs)

FRENCH GUIANA • 2 specs, 5.2 × 1.9 and 2.7 × 1.4 mm; offshore; 6°00.9′ N, 52°15′ W; depth 66–67 m; 8 Aug. 2014; GUYANE 2014; stn CP4400; MNHN-IM-2012-3716 • 3 specs, 3.8 × 1.7, 3.7 × 1.6 and 3.5 × 1.6 mm; offshore; 5°36.3′ N, 52°09.2′ W; depth 57 m; 10 Aug. 2014; GUYANE 2014; stn CP4408; MNHN-IM-2012-3717 • 1 spec., 3.6 × 1.7 mm; offshore; depth 102–103 m; 6 Aug. 2014; GUYANE 2014; stn DW4390; MNHN 2012-3718 • 1 spec., 5.1 × 2.1 mm; offshore; 6°15.4′ N, 52°13.5′ W; depth 81–82 m; 4 Dec. 2017; PROTEUS-GUYANE; stn DW5099; MNHN-IM-2000-40028 • 2 specs, 4.1 × 1.6 and 5.8 × 2.1 mm; depth 66 m; 18 Apr. 1999; Cosel and LeLoeuff leg.; GREEN 0; 5°12.8′ N, 51°17.5′ W; stn D11; MNHN-IM-2000-40013.

Other examined material

An additional 8 specimens from the MNHN Guiana expeditions were examined.

Description

Shell small (holotype length = 6.9 mm, an empty shell), fusiform (W/L = 0.3623), delicate, with 8½ whorls total, a high spire, and a short anterior canal. The last whorl and canal are about 34% of shell length. Teleoconch whorls moderately convex with an obtuse mid-whorl angulation marking whorl periphery and edge of shoulder. Sculpture of ribs and fine spirals. Aperture a narrow oval; anterior canal hardly differentiated from the canal. *Protoconch* of about 2¾–2⅞ whorls, the first minute, then whorls expand regularly, the last with riblets, the last ¾-whorl with 3 rows of beads as is typical for the genus. *Axial sculpture* of low, narrow, cord-like ribs that run from about midway on the shoulder, angled at whorl peripheries, and to the anterior fasciole on the last whorl. Ribs are recurved on the lower portion of the shoulder, strongest at whorl peripheries, and number 19 on the penultimate and 18 on the last whorl. *Varix* absent. *Spiral sculpture* of granulose primaries and secondaries, and with a single strong peripheral; primaries form minute nodules at rib intersections, the peripheral primary strongly spiked. About 5 primaries separate the suture from the onset of axials on the shoulder, and a single additional primary lies between 10 secondaries, completing the pattern to the edge of the shoulder. Below the shoulder, 2 primaries are separated by 3–6 secondaries. The shell base has a 1:1 pattern of primaries to secondaries, beginning at the suture line and ending at the anterior fasciole. The smaller paratypes lack the mid-shoulder primary where there are fewer secondaries. *Sulcus* absent; however, recurved ribs on the lower shoulder reflect past positions of the anal sinus. *Outer lip* is thin. *Anal sinus* a wide but shallow

notch, extending from the base of the sub-sutural band to whorl periphery, its apex close to the edge of the shoulder. *Inner lip* a thin glaze, unemarginate, without a callus. *Columella* straight. *Anterior canal* short, straight, unnotched. *Anterior fasciole* not swollen, sculpted with numerous secondary spirals. *Color* light yellowish brown with a white band on the periphery of the shoulder and white or lighter primary spirals. Anterior portion of the canal and fasciole stained violet.

Remarks

The average length of 10 measured specimens is 4.3 mm (range = 2.7–6.9 mm).

Range and habitat

Off French Guiana; depth 31–103 m.

Kurtziella perryae Bartsch & Rehder, 1939
Figs 87C, 91Q–U

Kurtziella perryae Bartsch & Rehder, 1939b: 134

Kurtziella perryae – Perry 1940: 167–168, pl. 38 fig. 268. — Perry & Schwengel 1955: 185, pl. 38 fig. 268. — Parker 1959: 2166. — Powell 1966: 103. — Turgeon *et al*. 1988: 98; 1998: 107. — Williams 2005: #5663.
Kurtziella (*Rubellatoma*) *perryae* – Abbott 1974: 281, no. 3246.

Differential diagnosis

Kurtziella limonitella is broader, has fewer and stronger ribs, and a coarser spiral sculpture.

Kurtziella oriens Fallon sp. nov. also has very fine spirals, but in a different pattern, 1:1 primary to secondary spirals overall. The pattern on *K. perryae* is less organized, and spirals are mostly equal in size, except those in the band, the spiral just above the suture on spire whorls, and those on the base of the shell. Its protoconch has more whorls (3⅛ versus 2¾), and *K. oriens* is known from the E Florida coast, *K. perryae* from the W coast.

Type material

Holotype
UNITED STATES OF AMERICA • 6.5 × 2.4 mm; W Florida, Lee Co., Sanibel Island; USNM 508646.

Paratypes
None.

Other material examined (2 specs)

UNITED STATES OF AMERICA • 1 spec., 5.7 × 2.1 mm; W Florida, Pasco Co., Anclote Key; depth 0 m; 20 Feb. 1976; H. Lee leg.; on sandbar flats; UF 589855 • 1 spec., 8.4 × 2.7 mm; W Florida, Pinellas Co., Madeira Beach, Johns Pass; depth 0 m; ex Kaicher coll.; on beach after a hurricane; ANSP 482240.

Description

Shell small (holotype length = 6.5 mm), elongate fusiform (W/L = 0.3692), with about 7½ whorls altogether, teleoconch whorls appressed, shoulders extending mid-whorl, slightly convex edges rounded, the last whorl and canal about 55% of shell length; Sculpture consisting of strong ribs angled mid-whorl, and very fine granulose spirals. Aperture oval, canal not differentiated from aperture and together they are

about 34% of shell length. *Protoconch* of about 2¾ whorls, the first round, smooth, the last with riblets with 3 rows of 'beads'. *Axial sculpture* of low, broad axial ribs with narrow crests that run from the base of the subsutural band to the subsequent whorl's suture; ribs are weakest and recurved on shoulder, and strongest and angled at whorl peripheries. Ribs evanesce on shell base, are about as wide as intercostal space and number 10 on the penultimate and 10 on the last whorl. *Varix* is absent. *Spiral sculpture* of very fine spirals of varying strengths; up to 9 form the subsutural band, followed by very fine closely spaced spirals on the rest of the shoulder; stronger spirals lie at the whorl periphery and just above the succeeding whorl's suture. The whorl sides have closely spaced spirals of varying strengths that are granulose at intersections with growth lines. *Sulcus* lacking; past presence of anal sinus is marked by recurved ribs on the lower half of the shoulder. *Outer lip* thin, not varicose. *Anal sinus* a round notch that lies between the base of the subsutural band and whorl periphery, sides divergent. *Inner lip* a wide, thin glaze appressed on the parietal wall, narrows considerable on. *Anterior fasciole* not swollen, with fine spirals. *Columella* short and straight. *Anterior canal* is very short, not differentiated from the aperture, unnotched. *Color* white to yellowish white.

Range and habitat

United States (W Florida); depth shallow water, as inferred from beach and sandbar-collected specimens.

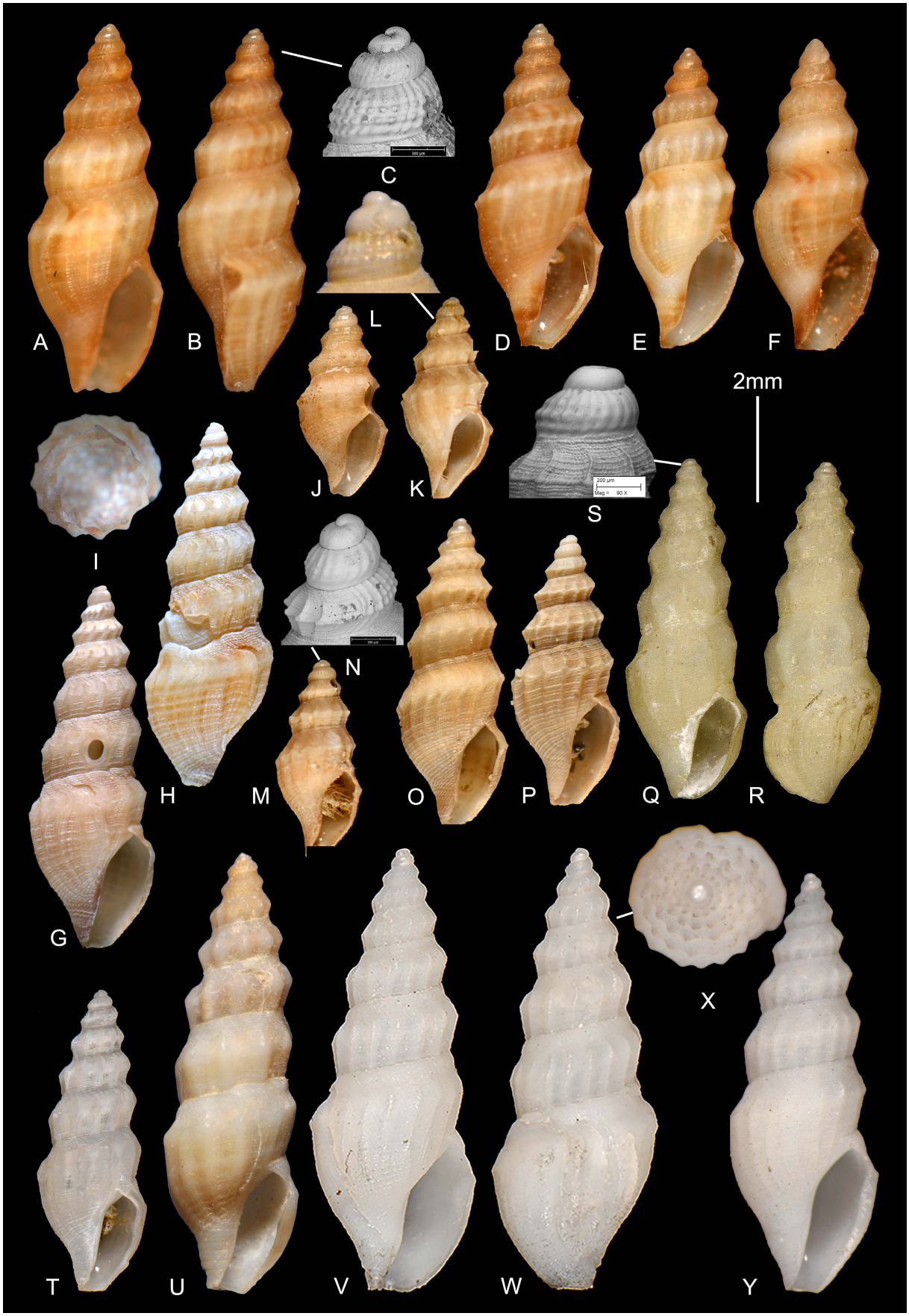
Kurtziella albocapitanea Fallon sp. nov.
urn:lsid:zoobank.org:act:E79DF37B-3B09-4035-80C5-968F6BE938DE
Figs 87D, 91V–Y

"Mangeliid sp." – Redfern 2013: 210–211, fig. 586a–b.

Differential diagnosis

Kurtziella intercedens (Melvill, 1923) is generally smaller, with a proportionally shorter spire (38% versus 46% of shell length on a select specimen) and a higher aperture (43% versus 35% of shell length). Its whorls are nearly convex, not obtusely angled as in *K. albocapitanea* Fallon sp. nov., and usually have

Fig. 91 (next page). Species of *Kurtziella* Dall, 1918. Part 3. – **A–F**. *Kurtziella guarapari* Fallon sp. nov. **A–C**. Holotype, 6.8 × 2.6 mm, ventral and lateral views, and SEM of protoconch (ANSP 498947), off Guarapari, Espirito Santo State, Brazil. **D–E**. Paratypes, 6.2 × 2.4 and 5.9 × 2.3 mm (ANSP 498946), off Guarapari, Espirito Santo State, Brazil. **F**. Paratype, 5.9 × 2.4 mm (UF 589800), off Guarapari, Espirito Santo State, Brazil. – **G–P**. *Kurtziella kalina* Fallon & Bouchet sp. nov. **G–I**. Holotype, 6.9 × 2.5 mm, ventral, dorsal and apical views (MNHN-IM-2000-40019), off French Guiana. **J**. Paratype, 3.6 × 1.7 mm (MNHN-IM-2012-3718), off French Guiana. **K–N**. Paratypes, 3.8 × 1.7 mm, expanded view of protoconch (not to scale), 3.7 × 1.6 mm, ventral view, and SEM image of protoconch (MNHN-IM-2012-3717), off French Guiana. **O**. Paratype, 5.8 × 2.1 mm (MNHN-IM-2000-40013), GREEN 0, off French Guiana. **P**. Paratype, 5.1 × 2.1 mm (MNHN-IM-2000-40028), off French Guiana. – **Q–U**. *Kurtziella perryae* Bartsch & Rehder, 1939. **Q–S**. Holotype, 6.5 × 2.4 mm, ventral and dorsal views, and SEM of protoconch (USNM 508646), Sanibel Island, Lee Co., W Florida. **T**. Spec., 5.7 × 2.1 mm (UF 589855), S of Anclote Key, Pasco Co., W Florida. **U**. Spec., 8.4 × 2.7 mm (ANSP 482240), Madeira Beach, John's Pass, Pinellas Co., W Florida. – **V–Y**. *Kurtziella albocapitanea* Fallon sp. nov. **V–X**. Holotype, 8.4 × 3.0 mm, ventral, dorsal and apical views (UF 589856), Palm Beach Co., E Florida. This appears to be a gerontic specimen based on its size and condition. **Y**. Paratype, 8.0 × 2.8 mm (UF 589857), Palm Beach Co., E Florida. Credits: C, N: SEM images courtesy Paul Callomon and Chandler J. Olson; Q–S: photos of holotype and SEM image of protoconch courtesy Yolanda Villacampa, USNM. Scale bars: A–B, D–M, O–R, T–Y = 2 mm; C, N = 300 µm; S = 200 µm.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a mid-whorl brown band lacking in *K. albocapitanea*. Its known range is more southerly, from Cuba south to islands off northern South America.

Etymology

Kurtziella albocapitanea Fallon sp. nov., from the Latin compound adjective, in its feminine form, '*albo* + *capitanea*', meaning 'white color + large size', refers to its color and relatively large size compared to its congeners.

Type material

Holotype

UNITED STATES OF AMERICA • 8.4 × 3.0 mm; E Florida, Palm Beach Co., Atlantic Dunes Park; depth 0 m; 1973–76; J. Lightfoot leg.; from beach renourishment; UF 589856.

Paratype (1 spec.)

UNITED STATES OF AMERICA • 1 spec., 8.0 × 2.8 mm; same data as for holotype; UF 589857.

Description

Shell small (holotype length = 8.4 mm), broadly fusiform (W/L = 0.3571) with a tall spire, altogether 8½ whorls, teleoconch whorls obtusely angled, appressed with a convex subsutural band followed by slightly convex to flat sloping shoulder, the last whorl 54% of shell length; sculpture of numerous axial ribs and of microscopic spirals; aperture oval with an anal notch and short, barely differentiated and only a little narrower anterior canal, aperture including canal about 35% of shell length. *Protoconch* of 2¼ round whorls, the tip minute, the last whorl with fine, crowded riblets with spiral with 3 rows of fine nodules on the last ½-whorl. *Axial sculpture* of numerous narrow ribs, beginning at the lower margin of the sub-sutural band, recurved on the lower portion of the shoulder and whorl periphery, and extending to the subsequent whorl's suture, then evanescing just below periphery of last whorl. Ribs strongest at whorl periphery, and number 16 on the penultimate and 11 on last. Several repairs on last whorl obscure what an uninterrupted count might be. *Varix* absent. *Spiral sculpture* of primary and secondary spirals, primaries only slightly stronger than secondaries; subsutural band comprised of approximately 12 tightly packed secondaries, shoulder spirals nearly uniform in strength, those on whorl sides are an alternating pattern of about 2 to 5 secondaries between primaries. Spiral elements are finely granulose. *Sulcus* absent, recurved ribs and growth striae from the lower margin of the subsutural band to whorl periphery mark past locations of anal sinus. *Outer lip* thin, edge marks a low arc from anal sinus to end of anterior canal. Stromboid notch absent. *Anal sinus* a deep notch with a round apex, sides slightly divergent, and width extending from the base of subsutural band to whorl periphery. *Inner lip* a thin narrow glaze, thinnest on parietal wall, thicker on columella; without a parietal wall callus. *Columella* straight. *Anterior canal* short, barely differentiated, open, end unnotched. *Anterior fasciole* not swollen, surface sculpture of crowded, indistinct spirals. *Color* white.

Range and habitat

United States (E Florida), Bahamas (Abaco Island); depth shallow water.

***Kurtziella* spp. Part 4**

Kurtziella rarior Fallon & Bouchet sp. nov.
urn:lsid:zoobank.org:act:A91EFA38-5F79-4AAE-9DDA-F67BE4141586
Fig. 92A–C

Differential diagnosis

Kurtziella cerina (J.D. Kurtz & W. Stimpson, 1851) is larger, has higher shoulders, and rounder whorl peripheries.

Kurtziella oriens Fallon sp. nov. is larger, has more ribs and higher shoulders.

Kurtziella albocapitanea Fallon sp. nov. has weaker and more numerous ribs and is larger.

Etymology

Kurtziella rarior Fallon & Bouchet sp. nov. from the feminine form of the Latin comparative '*rarior*', meaning 'few' and referencing its scarcity in samples.

Type material

Holotype
GUADELOUPE • 5.1 × 1.9 mm; Port-Louis; 16°17.24′ N, 61°33.46′ W; depth 3 m; 15 May 2012; KARUBENTHOS 2012; stn GD30; MNHN-IM-2012-8766.

Paratypes
None.

Description

Shell small (holotype length = 5.1 mm), thin, fusiform (W/L = 0.3725), with 9 whorls altogether; teleoconch whorls slightly appressed and slightly undulant at sutures, shoulders slightly concave, sloping, and whorl peripheries obtusely angled. Last whorl and canal about 55% of shell length. Sculpture consisting of strong ribs angled mid-whorl, and very fine granulose spirals. Aperture oval, canal hardly differentiated from aperture and together they are about 35% of shell length. *Protoconch* of about 2¾ round whorls, the last with fine crowded riblets, 3 distinct rows of "beads" on the ½-whorl. *Axial sculpture* of narrow ribs that extend from the subsutural band to the succeeding whorl's suture on spire whorls and evanesce on the shell base before the anterior fasciole. Ribs low and recurved on shoulder, highest, angled, and nodulous at peripheries, number 10 on penultimate and 9 on base. *Varix* absent. *Spiral sculpture* of fine primary and secondary spirals; a 5–6 spiral subsutural band (primaries) is followed by secondaries to the peripheral primary, which is nodulose at rib intersections, the by secondaries of variable strengths to the suture. The shell base has alternating primaries with a secondary between. *Sulcus* absent; past presence of anal sinus marked by recurved ribs between the lower edge of the subsutural band and the edge of the shoulder. *Outer lip* thin, its edge traces a nearly flat curve from the anal sinus to the end of the anterior canal. *Anal sinus* a notch set between the sutural band of spirals and edge of shoulder, its apex round with slightly divergent sides. *Inner lip* a narrow strip etched into parietal area and glazed along the columella. *Anterior fasciole* not swollen, with oblique spirals. *Columella* is slightly sigmoid. *Anterior canal* short, open, only slightly narrower than aperture; end unnotched. *Color* light yellowish brown.

Remarks

This single specimen is sufficiently different from members of its species group to merit description currently.

Range and habitat

Known only from the type locality.

Kurtziella unid. sp. A
Fig. 92D–F

Differential diagnosis

Kurtziella kalina Fallon & Bouchet sp. nov. is most similar and may be conspecific. The specimen in hand differs in possessing fewer ribs (12 versus 18 on the penultimate, peripheral nodules stronger and aperture relatively shorter.

Kurtziella delannoyi Fallon & Bouchet sp. nov. as more and less angular ribs per whorl.

Kurtziella guarapari Fallon sp. nov. is larger and has more ribs per whorl.

Kurtziella cerina (J.D. Kurtz & W. Stimpson, 1851) is larger and has higher shoulders.

Material examined (1 spec.)

PANAMA • 1 spec., 5.2 × 2.0 mm; Portobello; depth 0 m; Jan. 1997; C.M. Lloyd leg.; from beach drift; UF 589858.

Partial description

Shell small (length = 5.2 mm, an empty shell), fusiform (W/L = 0.4000), shell of 7 whorls, shoulders sloping to just below mid-whorl, whorl sides straight, angled slightly into abapical suture. Suture impressed, sub-sutural band of numerous fine secondary spirals. The last whorl and canal are about 50% of shell length. Teleoconch whorls Sculpture of weak ribs and fine spirals. Aperture a narrow oval; anterior canal hardly differentiated from the canal. *Protoconch* of about 2⅞ whorls, tip minute, protruding, last whorl with fine riblets changing to three rows of beads. *Axial sculpture* of weak ribs, 13 on the penultimate and 12 on the last. Ribs angled mid-whorl, terminate at the subsutural band of spirals, and evanesce on the shell base before the anterior fasciole. *Spiral sculpture* of a single peripheral primary with secondaries of varying strengths over the remaining surface area of the shell.

Kurtziella unid. sp. B
Fig. 92G–I

Differential diagnosis

Kurtziella intercedens (Melvill, 1923) is most similar in shape but has finer and more ribs, and a reddish-brown mid-whorl band that is absent in *Kurtziella* unid. sp. B.

Kurtziella cerina (J.D. Kurtz & W. Stimpson, 1851) is larger and has higher shoulders.

Kurtziella albocapitanea Fallon sp. nov. has weaker and more numerous ribs and is larger.

Material examined (1 spec.)

UNITED STATES OF AMERICA • 1 spec., 4.7 x1.9 mm; E Florida, Duval Co., Jacksonville Beach, 16th Ave. S; depth 0 m; N. Bulock leg.; UF 589830.

Partial description

Shell small (length = 4.7 mm), fusiform (W/L = 0.3936), of 7⅛ convex whorls, short anterior canal. Shoulders slightly convex, sloping to mid-whorl, whorl sides straight, angled slightly in to abapical suture. Suture appressed, sub-sutural band of fine secondary spirals. The last whorl and canal about 61% of shell length. Teleoconch whorls Sculpture of broad ribs and fine spirals. Aperture is a narrow oval; anterior canal is hardly differentiated from the canal. *Protoconch* of about 3 whorls, tip minute, protruding, last whorl with fine riblets changing to three rows of beads. *Axial sculpture* of broad ribs, 9 on the penultimate whorl. Ribs angled mid-whorl, terminate at the subsutural band of spirals, and evanesce on the shell base to the anterior fasciole. *Spiral sculpture* of a single peripheral primary visible as nodules on rib peripheries with secondaries of varying strengths over the remaining surface area of the shell.

Remarks

Additional specimens from E Florida might resolve the question of whether this specimen represents a new species.

Kurtziella flavolineata Fallon sp. nov.
urn:lsid:zoobank.org:act:32366E1D-7EE4-4B8A-BF49-49EC43F58E1C
Fig. 92J–P

Differential diagnosis

Kurtziella delannoyi Fallon & Bouchet sp. nov. of Martinique is similar but differs in the following respects, it is smaller on average (length = 3.41 versus 5.15 mm), has more axial ribs (15 versus 14 on the penultimate whorl) has a protoconch that has a wider diameter at its base with stronger beading on the last whorl, and more protoconch whorls (3 versus 2½ – the diameters difference is a qualitative observation of side-by-side shells.

Kurtziella minor Fallon & Bouchet sp. nov. of French Guiana has a longer, more gradually tapered anterior canal, more ribs (22 versus 15 on the penultimate whorl), and more protoconch whorls (3¼ versus 2½).

Kurtziella guarapari Fallon sp. nov. of southern Brazil is larger (average length = 6.2 versus 5.2 mm), has more protoconch whorls (3½ versus 2½), and is colored differently (dark orange-brown shell with a narrow white peripheral band and reddish brown staining on anterior fasciole and columella versus white with narrow orange-yellow subsutural band and sutural line, columella stained dark orange).

Etymology

Kurtziella flavolineata Fallon sp. nov. from the feminine form of the Latin compound word '*flavo* + *lineata*', which translates to 'golden + lined', referring to the orange-yellow lines and bands present on the examined specimens.

Type material

Holotype

ST. VINCENT AND THE GRENADINES • 5.8 × 2.2 mm; Petit St. Vincent Island; depth 4 m; 12 Dec. 2006; G. Macintosh leg.; night SCUBA, from on white sand; ANSP 498944.

Paratypes (5 specs)
ST. VINCENT AND THE GRENADINES • 2 specs, 5.0 × 1.9 and 3.4 × 1.6 mm; same data as for holotype; ANSP 498945 • 3 specs, 5.8 × 2.2, 5.8 × 2.2 and 5.1 × 2.0; same data as for holotype; USNM 1715458.

Description

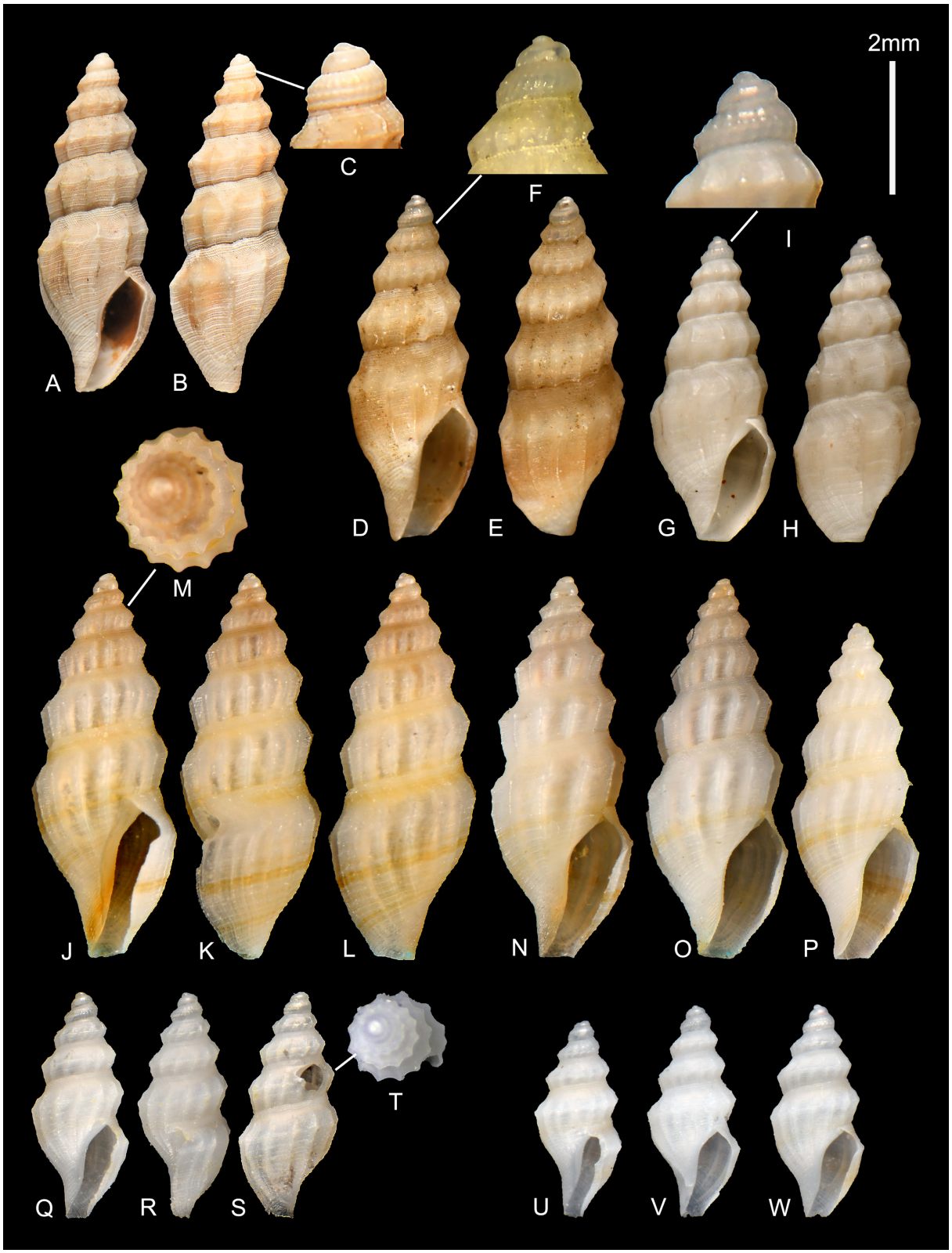
Shell small (holotype length = 5.8 mm), thin, semi-translucent, fusiform (W/L = 0.3793), with a tall spire, about 7½ convex whorls total, adult whorls medially and obtusely, angulate, the last whorl 62% of shell length; aperture short, oval with a posterior notch and anterior canal nearly as wide, aperture about 42% of shell length including canal. *Protoconch* of about 2½ round whorls, the tip minute, 1st whorl smooth, the remaining with fine dense riblets with three rows of very fine beads, the upper and lower rows faint, almost obsolete, the middle one strongest, developing into the peripheral spiral of the conch. It is difficult to determine the end of the protoconch as the middle row of beads begin to enlarge beforehand and without any break gradually transforms into the peripheral spiral of the teleoconch. *Axial sculpture* of slightly opisthocline, ribs, absent on sub-sutural band, recurved remaining portion of shoulder, slightly swollen at peripheral angles, and evanescent before anterior fasciole on shell base. Ribs number 15 on penultimate and 15 on last whorl, intercostal space about 1 to 2 times width of ribs. *Varix* absent. *Spiral sculpture* of fine primary, secondary, and tertiary spirals of variable strength, about the first 9 spirals closest to the suture form the subsutural band separating the suture from the ribs, the 3 closest to the suture are the strongest, then secondaries and tertiaries follow on the balance of the shoulder; on whorl sides, about 4 primaries, slightly nodulose on rib crests, possess secondaries between each and tertiaries between the secondaries. Spirals are frosted with microscopic nodulous bundles that override ribs, *Sulcus* is marked by the presence of recurved ribs on the lower portion of the shoulder, below the subsutural band, and by recurved growth lines. *Outer lip* is thin, edge curved in an arc from and congruent with the outer edge of the anal sinus to the end of the anterior canal. Stromboid notch absent. *Anal sinus* is a wide-open notch on the shoulder between the subsutural band and whorl periphery with a round apex and divergent sides. *Inner lip* a narrow, thin glaze along the columella, marginate, without a callus on parietal wall. *Columella* is slightly sigmoid. *Anterior canal* open, barely differentiated from the aperture, slanted to the left when viewed ventrally, end unnotched. *Anterior fasciole* is not swollen, crowded with numerous oblique secondaries and tertiaries, nodulose like spirals on overall shell surface. *Color* white with a yellow cast, with a narrow orange-yellow subsutural band and sutural line, columella stained dark orange.

Remarks

The average length of 6 specimens is 5.2 mm (range = 3.4–5.8 mm). The number of ribs varies among specimens from between 11 and 10 ribs on the penultimate and last whorl, respectively, to 15 for

Fig. 92 (next page). Species of *Kurtziella* Dall, 1918. Part 4. – **A–C**. *Kurtziella rarior* Fallon & Bouchet sp. nov., holotype, 6.8 × 2.6 mm, ventral view (MNHN-IM-2012-8766), Port-louis, Guadeloupe. – **D–F**. *Kurtziella* unid. sp. A. Spec., 5.2 × 2.0 mm, ventral, dorsal and apical (not to scale) views (UF 589858), Portobello, Panama. – **G–I**. *Kurtziella* unid. sp. B. Spec., 4.7 × 1.9 mm (ANSP 498952), 16th Ave. S Jacksonville Beach, Duval Co., E Florida. – **J–P**. *Kurtziella flavolineata* Fallon sp. nov. **J–L**. Holotype, 5.8 × 2.2 mm, ventral, lateral, dorsal and apical views (ANSP 498944), Petit Saint Vincent, Saint Vincent and the Grenadines. **N–P**. Paratypes, 5.8 × 2.2, 5.8 × 2.2 and 5.1 × 2.0 (USNM 1715458), Petit Saint Vincent, Saint Vincent and the Grenadines, the type locality. **Q–W**. *Kurtziella nana* Fallon sp. nov. **Q–T**. Holotype, 3.4 × 1.5 mm, ventral, lateral, dorsal and apical views (ANSP 498950), S of NW Mayreau Island, Saint Vincent and the Grenadines. **U–W**. Paratypes, 3.0 × 1.4, 3.2 × 1.4 and 3.3 × 1.5 mm (ANSP 498951), also from S of NW Mayreau Island, Saint Vincent and the Grenadines. Credit: I: SEM image courtesy of Paul Callomon. Scale bar: 2 mm.

both whorls. The intensity of orange-yellow spiral bands and number of orange-yellow lines on the shell base varies among individual specimens.



Range and habitat

St. Vincent and the Grenadines (Petit St. Vincent); depth 4 m.

Kurtziella nana Fallon sp. nov.
urn:lsid:zoobank.org:act:2D50EB88-896B-4964-BB7B-E3DF1C94DD17
Fig. 92Q–W

Differential diagnosis

Kurtziella delannoyi Fallon & Bouchet sp. nov. of Martinique is similar in size (average length = 3.4 versus 3.2 mm) but narrower (W/L = 0.3750 versus 0.4412), has more axial ribs (17 versus 14 on the penultimate whorl), more protoconch whorls (3 versus 2½), and is colored differently (a yellowish-white base with a wide, dark orange-yellow band on shoulder, and variable width dark orange-yellow band on whorl sides split by narrow yellowish-white bands or lines versus semi-translucent white with faint narrow, orange-yellow spiral bands on shoulder, at sutural line, and mid-whorl).

Kurtziella minor Fallon & Bouchet sp. nov. of French Guiana is slightly larger (average length = 4.8 versus 3.2 mm), is narrower (W/L = 0.3750 versus 0.4412), and has more protoconch whorls (3¼ versus 2½).

Kurtziella kalina Fallon & Bouchet sp. nov., also of French Guiana, is slightly larger (average length = 4.3 versus 3.2 mm), is narrower (W/L = 0.3623 versus 0.4412), has slightly more protoconch whorls (2¾ versus 2½), and is colored differently (light yellowish brown with a white band on the periphery of the shoulder and white or lighter primary spirals). Anterior portion of canal and fasciole stained violet versus semi-translucent white with faint narrow, orange-yellow spiral bands on shoulder, at sutural line, and mid-whorl.

Etymology

Kurtziella nana Fallon sp. nov. is derived from the feminine form of the Latin '*nanus*', meaning 'dwarf'. It is among the smallest of the genus.

Type material

Holotype

ST. VINCENT AND THE GRENADINES • 3.4 × 1.5 mm; S of NW Mayreau Island; depth 58 ft [18 m]; 2 Jun. 2004; G. Mackintosh leg.; night SCUBA; screened; ANSP 498950.

Paratypes (3 specs)

ST. VINCENT AND THE GRENADINES • 3 specs, 3.3 × 1.5, 3.0 × 1.4 and 3.2 × 1.4 mm; same data as for holotype; ANSP 498951.

Description

Shell minute (holotype length = 3.4 mm), thin, semi-translucent, stoutly fusiform (W/L = 0.4412), with a spire, about 6 convex whorls total, adult whorls sub-medially and obtusely, angulate, the last whorl 65% of shell length, aperture short, oval with a posterior notch and anterior canal nearly as wide, aperture about 45% of shell length including canal. *Protoconch* of about 2½ round whorls, the tip minute, 1st whorl smooth, the remaining with fine dense riblets cut into three rows of fine beads, all about the same strength. *Axial sculpture* of narrow, slightly opisthocline, ribs, absent on sub-sutural band, recurved remaining portion of shoulder, slightly swollen at peripheral angles where they are crossed by spiral, and evanescent before anterior fasciole on shell base. Ribs number 14 on penultimate and 13 on last whorl, intercostal space about the width of ribs. *Varix* absent. *Spiral sculpture* of fine thread-like spirals that can hardly be classed as primaries or secondaries although those closest to the suture are strongest, as

are a few regularly occurring ones, beginning at the whorl periphery, and then on whole sides that are minutely nodulose on rib crests. About the first 9 spirals closest to the suture form the subsutural band separating the suture from the ribs, the 3 closest to the suture are the strongest. Spirals are frosted with microscopic nodulous bundles that override ribs. *Sulcus* is marked by the presence of slightly recurved ribs on the lower half of the shoulder, below the subsutural band, and by recurved growth lines. *Outer lip* is thin, edge curved in a low arc from and congruent with the outer edge of the anal sinus to the end of the anterior canal. Stromboid notch absent. *Anal sinus* is a wide-open notch on the shoulder between the subsutural band and whorl periphery with a round apex and divergent sides. *Inner lip* a narrow, thin glaze along the columella, without a callus on parietal wall. *Columella* is slightly sigmoid. *Anterior canal* open, barely differentiated from the aperture, slanted to the left when viewed ventrally, end unnotched. *Anterior fasciole* is not swollen, crowded with numerous oblique spirals, nodulose like spirals on overall shell surface. *Color* semi-translucent white with faint narrow orange-yellow spiral bands on shoulder, at sutural line and mid-whorl.

Remarks

The average length of 4 specimens is 3.2 mm (range = 3.0–3.4 mm).

Range and habitat

St. Vincent and the Grenadines (Mayreau Island); depth 18 m.

Genus ***Kurtzina*** Bartsch, 1944

Type species

Mangelia (*Kurtziella*?) *beata* [sic = *beta*] Dall, 1919, by original designation.

Summary diagnostic characteristics

Shell small, usually with a short spire and a large last whorl with a sharply tapered base and short anterior canal.

Protoconch large for shell size, of about 3 whorls, the last with 3 or 4 rows beaded, tip minute.

Axial sculpture of strong, medially angulate, or convex ribs, without a varix.

Outer lip is simple, with a wide shallow anal sinus lacking a parietal callus or anal tooth.

Spiral sculpture of primaries and secondaries of different strengths, all frosted.

Shell surface microsculpture

The microstructure of spiral secondaries, as observed by the naked eye or low power binocular dissecting microscope, dubbed ‘frosting’ or ‘granules’, is seen under SEM power of 850 × as tight bundles of fibrils that expand slightly at their crowns, oblong in shape, rounded over on their tops, and are as wide or somewhat wider than secondary spirals. The structures appear at the intersection of growth lines and spirals. Smaller structures align compactly in rows over the surface of primaries along growth lines, usually in an oblique direction.

Difference from other genera

Kurtziella Dall, 1918 has a protoconch proportionally smaller but also with 3 rows of minute beads on the last whorl, teleoconch ribs that are narrower and terminate before the suture, with a subsutural band

of spirals that isolate ribs from the suture (ribs of *Kurtzina* end at the suture), and the last whorl is not sharply tapered.

Kurtzia Bartsch, 1944 has a protoconch with riblets cut into 3 beaded rows that have a more prominent median row, a shell usually with a higher spire, a varicose aperture with a denticle inside the outer lip at the base of the anal sinus, and narrower ribs.

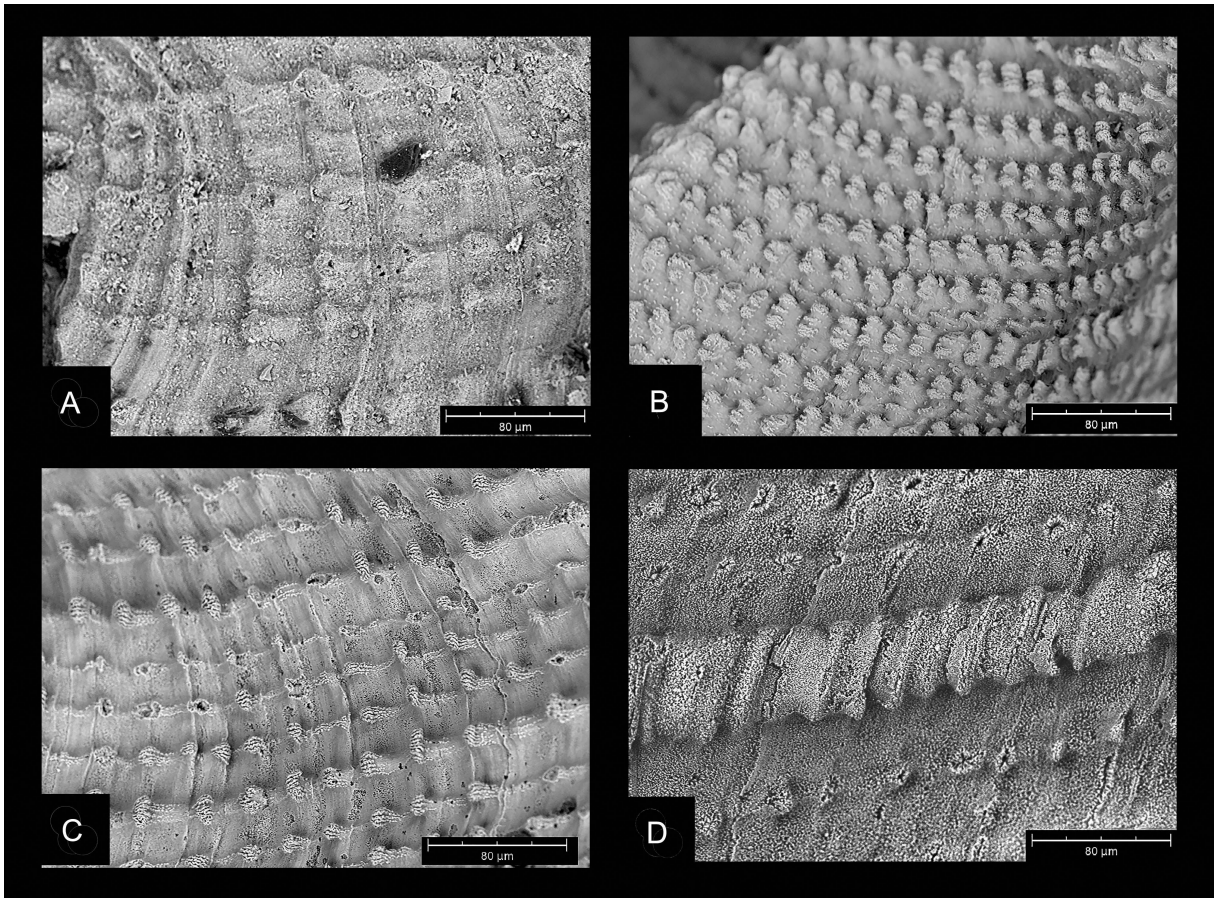


Fig. 93. Species of *Kurtzina* Bartsch, 1944, shell surface microsculpture. SEM images of shell surface. **A**. *Kurtzina texana* Fallon sp. nov., holotype 2.8 × 1.4 mm (ANSP 358401), S Texas coast, Gulf of Mexico. Structures composed of tight bundles that rise along spirals in a regular pattern, as worn in this image. These are like the better-preserved structures seen in the image of *Kurtzina venezuelana* (Weisbord, 1962) comb. nov. in C below. **B**. *Kurtzina garciai* Fallon sp. nov., paratype, 3.0 × 1.8 mm (E.F. García coll. 26631B), Campeche Bank, Mexico. Structures on these secondary spirals on the whorl shoulder are tight, trifurcated bundles of fibrils. **C**. *Kurtzina venezuelana* (Weisbord, 1962) comb. nov. Spec., 3.7 × 1.6 (MNHN-IM-2012-3741), offshore, French Guiana. Structures, oblong in shape and straddling secondary spirals, as shown in the image, comprise tight bundles of fibrils that expand at their crowns and are rounded over on their tops. **D**. "*Kurtziella" venezuelana* Weisbord, 1962, the fossil type to be compared with the Recent specimen in C, holotype, 5.2 × 2.5 mm (PRI 26336), Mare formation, Venezuela (a fossil). A single primary is seen in this image, with secondary spiral structures that are mostly eroded, lacking their tops. Nonetheless, the composition of structures (with hollow centers) and their oblong shapes straddling the secondary spirals is evident. Smaller structures align compactly in rows across the surface of the primary in an oblique direction, parallel to growth lines. Credits: SEM images courtesy of Chandler J. Olson. Scale bars: A–D = 80 µm.

Remarks

This is the first report of the occurrence of this genus in the western Atlantic. Two species from the eastern Pacific, described earlier by Dall (1919), were transferred to *Kurtzina* by Bartsch (1944), for *K. beta* and by McLean (1971), for *K. cyrene*. The two are listed in WoRMs (accessed on 2019-01-14). A third species listed in WoRMS on the date of access, *Mangilia crossata* Dall, 1927, does not meet the basic criteria of the genus. Two new western Atlantic species (from the Gulf of Mexico and Guadeloupe) and one previously named species in a comb. nov. (from French Guiana) are described next.

Phylogenetic relationships

There are only DNA sequence data for *Kurtzina venezuelana*. This lineage has been recovered sister to the clade *Psylocythara+Brachycythara*, albeit with no bootstrap support.

Kurtzina texana Fallon sp. nov.
urn:lsid:zoobank.org:act:B8D6AA17-FC42-4EB0-A9A1-D3D248D79CF4
Figs 93A, 94B–L

Differential diagnosis

Kurtzina garciai Fallon sp. nov. has 1 spiral cord on spire whorl sides (versus 3), whorls acutely angled, not convex, sides of last whorl that are flat, not convex, a larger shell (average length = 3.9 versus 2.8 mm for measured shells), and is colored differently.

Kurtzina venezuelana (Weisbord, 1962) comb. nov. has narrower ribs, a higher spire (shorter body whorl), more angular whorls, and is colored differently.

Etymology

Kurtzina texana Fallon sp. nov., the Texas *Kurtzina*, is named for the state from which most specimens have been collected.

Type material

Holotype

UNITED STATES OF AMERICA • 2.8 × 1.4 mm; Gulf of Mexico, S Texas coast; 26°45.77′ N, 97°13.43′ W; depth 72 ft [22 m]; 22 Apr. 1976; Bureau of Economic Geology, Texas; stn 610; ANSP 358401.

Paratypes (63 specs)

MEXICO • 1 spec., 3.0 × 1.6 mm; Campeche Bank; 20°00.35′ N, 92°26.10′ W; depth 73–77 m; 11 Jun. 2005; E.F. García leg.; dredged in muddy sediment from aboard R/V *Pelican*; EFG 26631C.

UNITED STATES OF AMERICA • 4 specs, 3.1 × 1.5, 3.1 × 1.6, 2.1 × 1.3, and 2.0 × 1.2 mm; same data as for holotype; ANSP 358401 • 31 specs, 4.1 × 1.9 (largest), 3.4 × 1.8 mm (best); Gulf of Mexico, S Texas coast; 27°09.8′ N, 97°17.32′ W; depth 64 ft [19.5 m]; 15 Mar. 1976; stn 942, Bureau of Economic Geology, Texas; ANSP 358402 • 2 specs, 2.9 × 1.5 and 2.9 × 1.4 mm; Gulf of Mexico, S Texas coast; 27°56.55′ N, 096°49.47′ W; depth 56 ft [17 m]; 4 May 1976; stn 1536, Bureau of Economic Geology, Texas; ANSP 358403 • 7 specs, 3.6 × 1.6 mm (largest), 2.0 × 1.2 mm (smallest); Gulf of Mexico, S Texas coast; 26°41.38′ N, 97°16.12′ W; depth 58 ft [18 m]; 22 Apr. 1976; stn 570, Bureau of Economic Geology, Texas; ANSP 358400 • 6 specs, 2.6 × 1.3, 2.7 × 1.3, 2.5 × 1.3, 2.5 × 1.3, 2.4 × 1.3 and 1.9 × 1.15 mm; Gulf of Mexico, S Texas coast; 28°01.05′ N, 096°44.32′ W; depth 55 ft [17 m]; 5 May 1976; stn 1624, Bureau of Economic Geology, Texas; ANSP 358404 • 1 spec., 2.6 × 1.3 mm; offshore of Louisiana; 28°40.87′ N, 90°45.01′ W; depth 19.1 m; 1 Jul. 2001; E.F. García leg.; dredged from mud from aboard

R/V *Pelican*; E.F. García coll. 24632A • 3 specs, 2.5 × 1.5, 2.7 × 1.5 and 3.3 × 1.7 mm; offshore of Louisiana; 28°37.92′ N, 90°36.55′ W; depth 22 m; 1 Jul. 2001; E.F. García leg.; box core grab on mud, taken aboard R/V *Pelican*; EFG 23552 • 2 specs, 3.5 × 1.8 and 2.5 × 1.3 mm; offshore of Alabama/Mississippi; 29°14′ N, 88°15′ W; depth 123 m; 15 Oct. 1994; E.F. García leg.; dredged from aboard R/V *Pelican*, EFG 23639; ANSP 498816 • 1 spec., 4.1 × 2.1 mm; offshore of Alabama/Mississippi; 29°21′ N, 87°42′ W; depth 140 m; 15 Oct. 1994; E.F. García leg.; dredged from aboard R/V *Pelican*; EFG 14532 • 4 specs, 3.9 × 1.9, 4.1 × 1.9, 4.4 × 1.9 and 3.7 × 1.7 mm; off Alabama; 29°24.43′ N, 87°58.63′ W; depth 74–72 m; 29 Jun. 2006; E.F. García leg.; dredged in mud, from aboard R/V *Pelican*; EFG 27793A • 1 spec., 3.4 × 1.7 mm; W Florida, Hillsborough Co., 95 mi. [153 km] W of Egmont Key; depth 73 m; Aug. 1968; J. Moore leg.; dredged; R/V *Cavalier*; UF 589697.

Description

Shell tiny (holotype length = 2.8 mm, examined specimen lengths to 4.4 mm), fragile, fusiform, biconic (W/L = 0.5000), with 5½ whorls total, 2½ convex teleoconch whorls, medially angulate with undulant sutures and sloping shoulders, the last whorl is 69% of shell length rapidly narrowing to the anterior canal. Aperture oval, with a short anterior canal and shallow notch on the shoulder. *Protoconch* multispiral, of 3 whorls, tip minute, protruding, first 1¾ smooth, the last 1¼ whorls with riblets, and the last whorl with 4 rows of beads formed by the intersection of spirals with riblets. *Axial sculpture* of broad, low ribs, narrower than their interspaces, run from suture to suture on spire whorls, are strongest at whorl periphery, and fade on shell base. There are 8 ribs on penultimate, 9 on last whorl. *Varix* absent. *Spiral sculpture* of primary and secondary spirals of various strengths. Primaries occur at whorl periphery, one above it on the shoulder, and one below it about midway on the side of the spire whorls. Weaker primaries progress down the last whorl to and on the anterior fasciole with 0–2 secondaries between them, a single strong secondary is at and is undulant with the suture. About 5 secondaries follow between the suture and single primary on the shoulder. Spirals are granulose and override ribs. *Sulcus* absent. *Outer lip* thin, no evidence of a stromboid notch. *Anal sinus* very shallow, almost as wide as the shoulder; not formed on holotype but assumed to be so as evidenced by some paratypes. *Inner lip* a thin glaze without a callus on the parietal wall. *Columella* short, straight. *Anterior canal* short, straight but angled to the left of the aperture when viewed ventrally; unnotched. *Anterior fasciole* is not swollen, with about 9 weak spiral cords, some with a single thread between. *Color* brownish pink with several faint light brown spiral bands at suture, on ramp, and on the shell base at the margin of the anterior fasciole.

Remarks

The original identification on the lot label of the type specimens of *Kurtzina texana* Fallon sp. nov. was *Cryoturris adamsii* (E.A. Smith, 1884) but this identification cannot be confirmed from Smith's original description. Smith's types (in NHMUK 1874.1.19.113) have been lost since 1986 (Andreia Salvador of the NHMUK in an email to P. Fallon dated 23 Oct. 2018) and no photograph or illustration of the type specimens has been found. Furthermore, the species illustrated in the identification guides by Rios (1985, 1994, 2009) as *C. adamsii* does not match Smith's description. So, while Smith's species has yet to be more clearly defined, either by topotypes (type locality Jamaica) or by other means, there is no evidence that *K. texana* Fallon sp. nov. is the same. *Cryoturris adamsii* (E.A. Smith, 1884) is considered a nomen dubium, see under genus *Rubellatoma* for additional information concerning the mis-application of E.A. Smith's name to *Rubellatoma brasiliensis* Fallon sp. nov. by some.

The average length of 29 specimens is 3.0 mm (range = 2.0–4.4 mm).

Range and habitat

Mexico (Campeche Bank), United States (South Texas coast, Alabama, Mississippi, W Florida); depth 17–140 m.

Kurtzina garciai Fallon sp. nov.
urn:lsid:zoobank.org:act:41002B55-0481-42B4-8FEA-B760554166E1
Figs 93B, 94M–S

Differential diagnosis

Kurtzina texana Fallon sp. nov. whorls are always convex, not acutely angled, it is smaller (average length = 3.0 versus 3.7 mm for measured shells) and colored differently.

Kurtzina venezuelana (Weisbord, 1962) comb. nov. has a narrower shell (W/L = 0.4390 versus 0.5238 for comparably sized shells, lengths = 4.1 and 4.2 mm, respectively), it has more strong primary spirals (three on the whorl sides versus only the strong peripheral spiral) and is colored differently.

Etymology

Kurtzina garciai Fallon sp. nov. is named in honor of Emilio García for the generous loan of his extensive and unique collection of Gulf of Mexico specimens, including this species and numerous others.

Type material

Holotype
UNITED STATES OF AMERICA • 4.2 × 2.2 mm; WNW of Dry Tortugas, Monroe Co., Florida Keys; 24°43.47′ N, 83°13.58′ W; depth 61.4–62.1 m; E.F. García leg.; dredged, ex E.F. García coll. 25413A; ANSP 498815.

Paratypes (4 specs)
MEXICO • 1 spec., 3.0 × 1.8 mm; Campeche Bank; 24°33.47′ N, 83°13.48′ W; depth 73–77 m; 11 Jun. 2005; E.F. García leg.; dredged; EFG 26631B.

UNITED STATES OF AMERICA • 1 spec., 4.1 × 2.0 and 3.6 × 1.9 mm; same data as for holotype; EFG 25413B; ANSP 498817 • 1 spec., 3.5 × 1.7 mm; Florida Keys, Monroe Co., WNW of Dry Tortugas; 24°33.47′ N, 83°13.48′ W; depth 61–61.2 m; E.F. García leg.; dredged; EFG 25470 • 1 spec., 3.8 × 2.1 mm; NW Florida, Bay Co., SW of Panama City; depth 180 ft [55 m]; E.F. García leg.; dredged; EFG 11817A.

Description

Shell small (holotype length = 4.2 mm), biconic (W/L = 0.5238), with 5½ whorls total, 2¾ acutely angular teleoconch whorls with impressed sutures and slightly convex shoulder, last whorl is 53% of shell length and rapidly narrows to the anterior canal (together shaped like a funnel). Aperture oval, with a short anterior canal, both about 46% of shell length, and a wide, shallow notch posteriorly on the shoulder. *Protoconch* of 3–3¼ whorls, tip minute, protruding, first 1¾–2 whorls smooth, the last 1¼ with riblets; 4 rows of nodules appear on the last full whorl (uppermost row reduced), formed by the intersection of nearly obsolete spirals with riblets. *Axial sculpture* of strong ribs with round crests, as wide to wider than their interspaces, are strongest at whorl periphery then fade before suture and evanesce on shell base. There are 10 ribs on penult, 10 on last whorl. *Varix* absent. *Spiral sculpture* of a single strong peripheral primary, 3 primaries on the penult below the peripheral one, three above, and 6 on the shell base. There are 1 or 2 secondaries between primaries except on the shoulder where there are more. All spirals override ribs. A primary is at the suture. Slightly swollen, elongate nodules are formed on rib crests by the peripheral primary. All spirals are granulose, the sutural one most heavily so. *Sulcus* absent. *Outer lip* thin, no evidence of a stromboid notch. *Anal sinus* very shallow; not formed on holotype but assumed to be so by the shallow arc of the ribs and growth striae on the shoulder that indicate a shallow notch almost as wide as the shoulder. *Inner lip* unemarginate, a thin glaze without a callus on the parietal wall.

Columella short, straight. *Anterior canal* short, straight but canal angled to the left of the aperture when viewed ventrally, unnotched. *Anterior fasciole* not swollen, with about 7 primaries, some with a single secondary between. *Color* pale golden brown shell, a narrow reddish-brown band at suture, reddish-brown inner and outer lip, and white primary spiral cords and first protoconch whorl.

Remarks

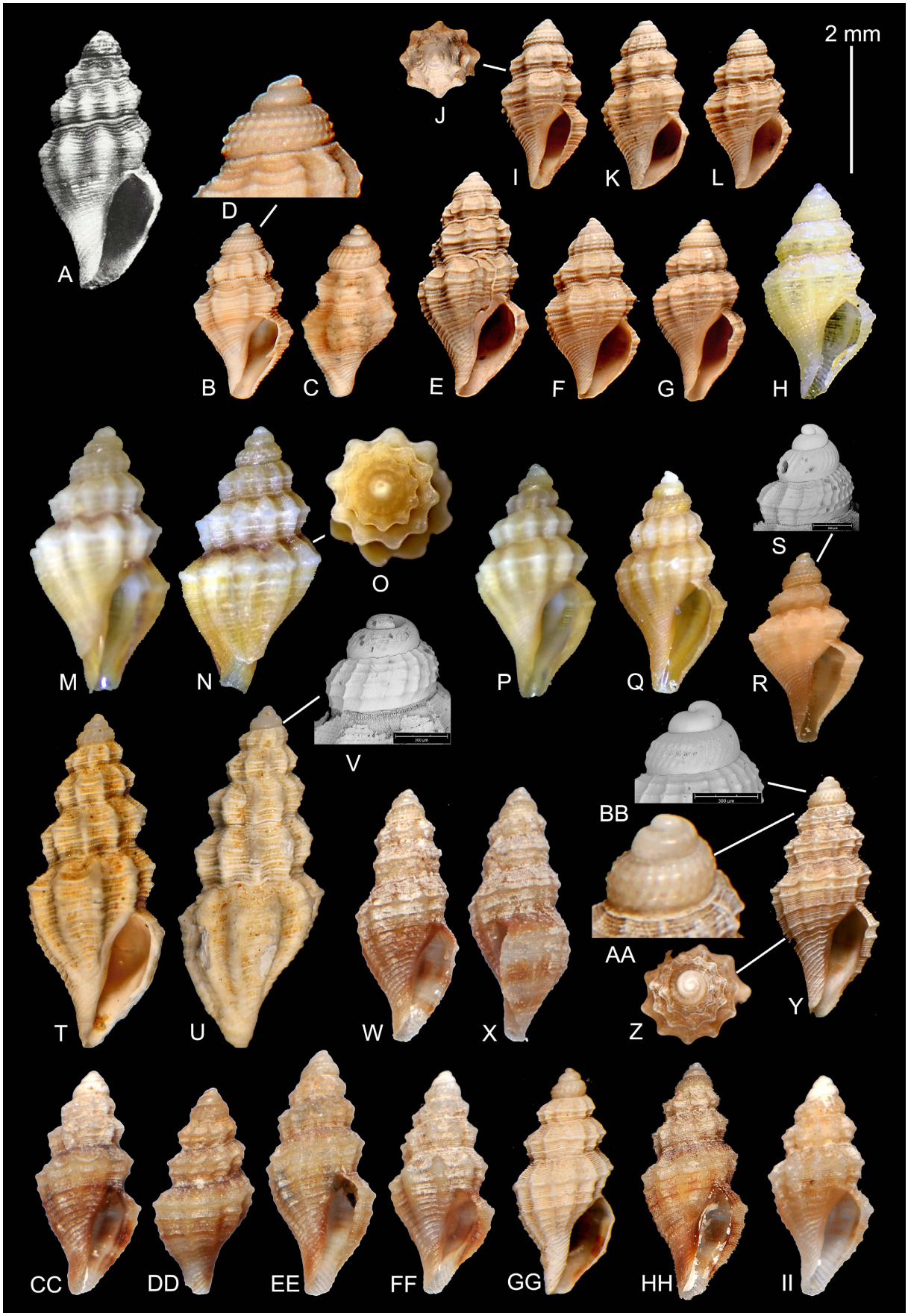
The holotype of *Kurtzina garciai* Fallon sp. nov. does not have a distinct anal sinus; however, the sinus of some paratypes is a weak notch on the shoulder. Bartsch's description of the anal notch in his diagnosis of the genus *Kurtzina* is somewhat ambiguous, describing only its location. So, the weak anal sinus of *K. garciai* Fallon sp. nov. is likely a characteristic of the genus.

The average length of 5 measured specimens is 3.7 mm (range = 3.0–4.2 mm).

Range and habitat

Gulf of Mexico: United States (Florida Keys) and Mexico (off Campeche); depth 61–77 m.

Fig. 94 (next page). Species of *Kurtzina* Bartsch, 1944. – **A**. *Kurtzina beta* (Dall, 1919). Spec., 4.1 × 2.0 mm, repository unknown, off Caelata La Cruz, Perú, trawled at depths of 18–36 m; 13–17 Apr. 1972, D. Shasky leg. – **B–L**. *Kurtzina texana* Fallon sp. nov. **B–D**. Holotype, 2.8 × 1.4 mm, ventral and dorsal views, and expanded view of protoconch (not to scale) (ANSP 358401), middle Texas coast, Gulf of Mexico. **E–F**. Paratypes, 3.6 × 1.6 and 2.8 × 1.5 mm (ANSP 358400), S Texas coast, Gulf of Mexico. **G**. Paratype, 2.9 × 1.5 mm (ANSP 358403), S Texas coast, Gulf of Mexico. **H**. Paratype, 3.4 × 1.7 mm (UF 589697), 95 mi. [153 km] W of Egmont Key, Hillsborough Co., W Florida. **I–L**. Paratypes, 2.6 × 1.3 mm, ventral and apical views, 2.7 × 1.3 and 2.5 × 1.3 mm (ANSP 358404), S Texas coast, Gulf of Mexico. – **M–S**. *Kurtzina garciai* Fallon sp. nov. **M–O** Holotype, 4.2 × 2.2 mm (ex E.F. García coll. 25413A), ventral, dorsal and apical views (ANSP 498815), WNW of Dry Tortugas, Monroe Co., Florida Keys. **P**. Paratype, 4.1 × 2.0 mm (E.F. García coll. 25413B), type locality, WNW of Dry Tortugas, Monroe Co., Florida Keys. **Q**. Paratype, 3.5 × 1.7 mm (E.F. García coll. 25470), WNW of Dry Tortugas, Monroe Co., Florida Keys. **R–S**. Paratype, 3.0 × 1.8 mm, ventral view, and SEM image of protoconch, 250 × (E.F. García coll. 26631B), Campeche Bank, Mexico. – **T–V**. *Kurtziella venezuelana* Weisbord, 1962, holotype, 5.2 × 2.4 mm, ventral and dorsal views, and SEM image of protoconch (PRI 26336), Mare Formation, Venezuela. – **W–II**. *Kurtzina venezuelana* (Weisbord, 1962) comb. nov. **W–X**. Sequence voucher, 4.1 × 1.8 mm, ventral and lateral views (MNHN-IM-2013-56872), off French Guiana. **Y–BB**. Spec., 3.7 × 1.6 mm, ventral and apical views, expanded view of protoconch (not to scale), and SEM image of protoconch (MNHN-IM-2012-3741), off French Guiana. **CC–EE**. Specs, 3.6 × 1.7, 3.3 × 1.6 dorsal view only, and 3.9 × 1.8 mm (MNHN-IM-2012-3739), off French Guiana. **FF**. Sequence voucher, 3.6 × 1.7 mm (MNHN-IM-2013-57407), off French Guiana. **GG**. Spec., 3.6 × 1.7 mm (MNHN-IM-2012-3741), off French Guiana. **HH**. Live-taken spec., 3.8 × 1.7 mm (MNHN-IM-2013-56036), off French Guiana. **II**. Sequence voucher, 3.5 × 1.7 mm (MNHN-IM-2013-56790), off French Guiana. Credits: A: photograph from Shasky (1996: 43, fig. 10); S, V, BB: SEM images courtesy of Paul Callomon and Chandler J. Olson. Scale bars: A–R, T–U, W–AA, CC–II = 2 mm; S, V, BB = 300 µm.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Kurtzina venezuelana (Weisbord, 1962) comb. nov.
Figs 93C–D, 94T–II

Kurtziella venezuelana Weisbord, 1962: 442–444, pl. 42 figs 3–5

Kurtziella venezuelana – Powell 1966: 103. — Williams 2005: #5665.

Differential diagnosis

Kurtzia sudamericana Fallon & Bouchet sp. nov. is found in the same samples as *Kurtzina venezuelana* comb. nov. and may be confused with it, young specimens being most difficult to distinguish. That species has a taller spire, a varicose lip, and fewer spiral primaries.

Kurtzina texana Fallon sp. nov. and *Kurtzina garciai* Fallon sp. nov. differences from *Kurtzina venezuelana* comb. nov. are discussed under the descriptions of those species.

Type material

Holotype
VENEZUELA • 5.2 × 2.5 mm; Mare formation near W-14, on hillside above west bank of Quebrada Mare Abajo in the Maiquetia district on the north coast [Late Pliocene to Recent (Weisbord 1962: 38)]; PRI 26336. (Fig. 94T–V)

Paratypes
None.

Material examined (120 specs)

In addition to the holotype, 119 specimens were examined, all from French Guiana. The following are data on 52 of the specimens:

FRENCH GUIANA • 1 spec., 3.8 × 1.8 mm; offshore; 5°13.8′ N, 52°08.9′ W; depth 36–41 m; 10 Aug. 2014; GUYANE 2014; stn CP4409; MNHN-IM-2012-3746 • 1 spec., 2.5 × 1.4 mm; offshore; 5°49′ N, 51°28′ W; depth 102–103 m; 6 Aug. 2014; GUYANE 2014; stn DW4390; MNHN-IM-2012-3736 • 6 specs, 3.9 × 1.8, 3.5 × 1.6, 3.4 × 1.6, 3.8 × 1.7, 3.6 × 1.7 and 3.8 × 1.7 mm; offshore; 5°49′ N, 51°28′ W; depth 102–103 m; 6 Aug. 2014; GUYANE 2014; stn DW4390; MNHN-IM-2012-3730 • 1 spec., 3.6 × 1.7 mm; offshore; 6°33.8′ N,0 53°07.8′ W; depth 60–61 m; 30 Jul. 2014; GUYANE 2014; stn CP4357; MNHN-IM-2012-3745 • 1 spec., 3.8 × 1.7 mm; offshore; 6°33.8′ N,0 53°07.8′ W; depth 60–61 m; Jul. 2014; GUYANE 2014; stn CP4357; MNHN-IM-2013-56036 • 7 specs, (2 measured) 3.7 × 1.6 and 3.6 × 1.6 mm; offshore; 5°36.3′ N, 52°09.2′ W; depth 57 m; 10 Aug. 2014; GUYANE 2014; stn CP4408; MNHN-IM-2012-3741 • 1 spec., 3.3 × 1.6 mm; offshore; 6°56′ N, 53°03′ W; depth 145 m; 31 Jul. 2014; GUYANE 2014; stn DW4360; MNHN-IM-2012-3732 • 1 spec., 2.5 × 1.5 mm; offshore; 5°49′ N, 51°28′ W; depth 102–103 m; 6 Aug. 2014; GUYANE 2014; stn DW4390; MNHN-IM-2012-3731 • 7 specs, 3.4 × 1.7, 3.2 × 1.4, 3.0 × 1.4, 3.1 × 1.5, 2.7 × 1.5, 3.2 × 1.6 and 3.2 × 1.5 mm; offshore; 6°33′ N, 52°28′ W; depth 130–131m; 4 Aug. 2014; GUYANE 2014; stn CP4379; MNHN-IM-2012-3740 • 11 specs, (1 measured) 4.1 × 1.9 mm; offshore; 5°13.8′ N, 52°08.9′ W; depth 36–41 m; 10 Aug. 2014; GUYANE 2014; stn CP4409; MNHN-IM-2012-3737 • 3 specs, (1 measured) 3.9 × 1.7 mm; offshore; 5°08.7′ N, 51°08.7′ W; depth 47 m; 26 Jul. 2014; GUYANE 2014; stn CP4344; MNHN-IM-2012-3729 • 3 specs, 4 × 1.7, 3.5 × 1.6 and 3.0 × 1.4 mm; offshore; 6°52.2′ N, 53°02.6′ W; depth 94 m; 30 Jul. 2014; GUYANE 2014; stn DW4359; MNHN-IM-2012-3738 • 2 specs, 3.2 × 1.7 and 3.0 × 1.4 mm; offshore; 6°18′ N, 52°13.3′ W; depth 95–97 m; 8 Aug. 2014; GUYANE 2014; stn CP4402; MNHN-IM-2012-3743 • 4 specs, 3.9 × 1.8, 3.6 × 1.7, 3.3 × 1.6 and 3.9 × 1.8 mm; offshore; 6°00.9′ N, 52°15′ W; depth 66–67 m; 8 Aug. 2014; GUYANE 2014; stn CP4400; MNHN-IM-2012-3739 • 1 spec., 3.6 × 1.7 mm; offshore; 5°13.8′ N, 52°08.9′ W; depth 36–41 m; 10 Aug. 2014; GUYANE 2014;

stn CP4409; sequenced; MNHN-IM-2013-57407 • 1 spec., 3.5 × 1.7 mm; offshore; 6°18′ N, 52°13.3′ W; depth 95–97 m; 8 Aug. 2014; GUYANE 2014; stn CP4403; sequenced; MNHN-IM-2013-56790 • 1 spec., 4.1 × 1.8 mm; offshore; 5°36.3′ N, 52°09.2′ W; depth 57 m; 10 Aug. 2014; GUYANE 2014; stn CP4408; sequenced; MNHN-IM-2013-56872.

Description

The original description is in Weisbord (1962: 442–443). *Shell* small (holotype length = 5.2 mm), stoutly biconic (W/L = 0.4808), with 8 whorls total, teleoconch with strong ribs acutely angled mid-whorl, sutures impressed, shoulders slightly convex to flat, the last whorl about 59% of shell length and rapidly narrowing to a short anterior canal. Aperture oval, with a short anterior canal, both about 40% of shell length, and with a shallow notch posteriorly. *Protoconch* of 3 whorls, tip minute, first 1½ whorls smooth, the last 1½ whorls with riblets; 3 or 4 rows of beads appear on the last full whorl, formed by the intersection of spirals and riblets. *Axial sculpture* of 10 strong ribs that run from suture to suture on spire whorls and to anterior fasciole on last; ribs low and very slightly recurved on shoulder, strongest and nodulose at angle of whorl periphery, and evanesce on shell base; they are as wide or slightly wider than their interspaces, their crests bluntly rounded (triangular in cross section). *Varix* absent. *Spiral sculpture* of primary and secondary frosted spirals; the strongest primaries are at whorl periphery where they are slightly swollen, mid-way on whorl side, and at whorl suture. Weaker primaries occur midway between these, and secondaries between the primaries. About 7 additional but weaker primaries occur on the shell base above the anterior fasciole, with decreasing separation and number of secondaries between them. About 11 secondaries or weak primaries lie between the suture and edge of shoulder. All spirals override ribs. *Sulcus* absent. Weakly recurved ribs are evidence of the past presence of the anal sinus. *Outer lip* thin, no evidence of a stromboid notch. *Anal sinus* is very shallow and nearly as wide as shoulder, not formed on holotype but on paratypes with its apex just above whorl periphery. *Inner lip* unemarginate, a thin, narrow glaze on the columella and parietal wall; without a callus on the parietal wall. *Columella* slightly curved. *Anterior canal* short, angled to the left of the aperture when viewed ventrally, unnotched. *Anterior fasciole* not swollen, with oblique spirals. *Color* creamy with a reddish-brown band mid-whorl, which is darkest on outer lip; primary spirals on whorl sides, anterior fasciole, and columella also a dark reddish-brown; protoconch hyaline.

Remarks

The largest measured specimen is smaller than Weisbord's (1962) type (4.1 versus 5.2 mm), differing primarily in the number of whorls. The holotype has 6½ adult whorls, those examined here are about 5, accounting for the difference in length.

Weisbord (1962: 38) provides the age range for this species as Late Pliocene to Recent. specimens examined here fit Weisbord's description well.

The average length of 36 specimens is 3.5 mm (range = 2.5–4.1 mm).

Range and habitat

Offshore, French Guiana; depth 31–149 m.

Genus ***Mandiana*** Fallon gen. nov.
urn:lsid:zoobank.org:act:2D167775-5D66-448C-A938-FA5DE9503214

Type species

Mandiana canaliculata Fallon & Bouchet gen. et sp. nov.

Diagnosis

Shell small, stoutly fusiform with a short anterior canal undifferentiated from the aperture, a deep anal sinus and a strong apertural varix and a low anal tooth on outer lip. Whorls are convex, impressed, with

little or no demarcated shoulder. Protoconch of 2 whorls or less, the last with fine riblets crossed by spiral grooves creating a cancellate appearance. Sculpture of round-crested ribs that extend from suture to suture on spire whorls, narrow and become slightly recurved in sulcal area on shoulder and evanesce on shell base. Spiral sculpture of alternating flattened primaries and secondaries with only secondaries on the shoulder; also a few widely separated spirals that are not flattened: 3 on the penultimate and 10 on the shell base. Spirals override ribs and are made microscopically wavy by incremental growth lines.

Etymology

Mandiana Fallon gen. nov. (fem.), is the name for the island of Martinique by the early inhabitants (the Taïno), the type locality of the two named species herein.

Summary diagnostic characteristics

Shell thick, stoutly fusiform, whorls convex, anterior canal short, undifferentiated.

Protoconch of 2 whorls or less, a portion of the last dimpled.

Anal sinus a deep notch, its apex round, sides slightly convergent.

Outer lip varicose and callused around the inside edge of the anal sinus, a low tooth present.

Axial sculpture of moderately strong ribs.

Spiral sculpture of flattened primaries and secondaries and widely separated primaries not flattened, made microscopically wavy by incremental growth striae, not frosted.

Shell surface microsculpture

In SEM images (Fig. 95), primary and secondary spirals are seen to be comprised of varying number of microscopic strings aligned in rows, the fewest rows in secondaries. Intercalary space is populated with

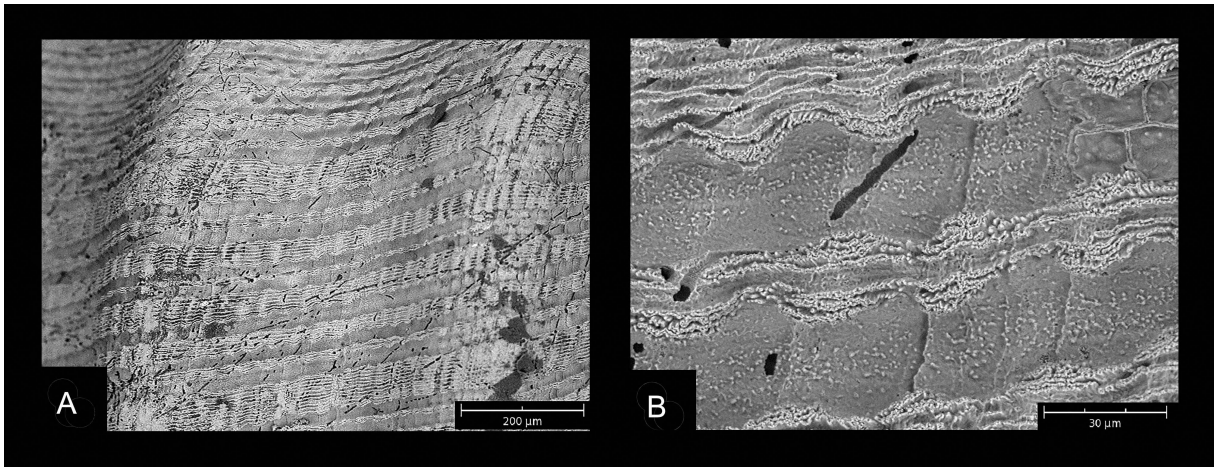


Fig. 95. *Mandiana canaliculata* Fallon & Bouchet gen. et sp. nov., shell surface microsculpture, holotype, 7.0 × 2.8 mm, live collected (MNHN-IM-2013-70598), Belgrade Cove, La Trinité, Martinique. **A**. Magnification 300×. Alternating wide (primary spirals) and narrow (secondary spirals) are flat, wide and narrow clusters of similar microscopic strings that appear wavy on account of growth increments. Only secondary spirals appear on shoulder, which are in turn variable in width (number of rows of microscopic strings in the spiral). **B**. Magnification 2000×. Growth increments are seen more clearly, and in synchrony with the crests of the microscopic string rows. Miniscule granules randomly populate intercalary space. Credits: SEM images courtesy of Paul Callomon. Scale bars: A = 200 µm; B = 30 µm.

random microscopic strings. Regularly spaced growth increments cause spirals to be wavy, all cresting on the ridge of the growth increment, so together, producing the wavy texture seen under high magnification.

Cryptomangelia Fallon gen. nov. has similar-appearing microscopic spirals that are regularly spaced, not clustered into primary and secondary spirals.

Differences from other genera

Pyrgocythara Woodring, 1928 lacks a cancellate protoconch and possesses a denticle below the anal sinus on outer lip, which is lacking in *Mandiana* Fallon gen. nov. Frosting is unlike the primary and secondary spirals made microscopically wavy by growth striae as in *Mandiana*.

Tenaturris Woodring, 1928 lacks a cancellate protoconch, has a short spire, a long and narrow aperture, and an anal sinus with a shallower notch that is closer to the suture.

Cryptomangelia Fallon gen. nov. has a different protoconch: the last whorl has riblets with 1 or 2 spirals about mid-whorl.

Stellatoma Bartsch & Rehder, 1939 differs in the form of its varix (narrow, heavily glazed versus heavy, not glazed), in its aperture (auriculate versus narrowly oval), and in its protoconch (straight versus cancellate riblets on last whorl).

Remarks

The two species assigned to this new genus have a combination of morphological traits unique in the genus group as outlined in the diagnostic characteristic above. Its uniqueness is supported at the genus level by the analysis of DNA sequence data of *Mandiana canaliculata* Fallon & Bouchet gen. et sp. nov. and although not sequenced, *M. vitrea* Fallon & Bouchet gen. et sp. nov. has all the characteristics of the genus. *Mandiana* Fallon gen. nov. is closest to *Cryptomangelia* Fallon gen. nov. in the phylogenetic tree.

Phylogenetic relationships

Only a single species has been sequenced, *Mandiana canaliculata* Fallon & Bouchet gen. et sp. nov. This lineage has been recovered sister to the genus *Cryptomangelia* Fallon gen. nov., with 84% bootstrap support.

Mandiana canaliculata Fallon & Bouchet gen. et sp. nov.
urn:lsid:zoobank.org:act:4410581C-8028-4E11-9C94-2335BC4F11EB
Figs 95A–B, 96, 97A–F

Differential diagnosis

Mandiana vitrea Fallon & Bouchet gen. et sp. nov. is translucent white, not amber, with a chestnut band in intercostal spaces on the shoulders.

Etymology

Mandiana canaliculata Fallon & Bouchet gen. et sp. nov. from the feminine form of the Latin adjective '*canaliculata*', which means 'channeled', in reference to the surface sculpture of the protoconch's second whorl.

Type material

Holotype

MARTINIQUE • 7.0 × 2.8 mm; Ste-Luce, Pointe les Fous; 14°27.9′ N, 60°56.4′ W; depth 0–1 m; 11 Sep. 2016; MADIBENTHOS; stn AM009; sequenced; MNHN-IM-2013-70598.

Paratypes (13 specs)
MARTINIQUE • 1 spec., 6.3 × 2.6 mm; Ile Petite Grenade, Cul-de-Sac Petite Grenadine; 14°34′ N, 60°50.2′ W; depth 0 m; 7 Oct. 2017; MADIBENTHOS; stn AM046; sequenced; MNHN-IM-2013-73069 • 6 specs, 4.1 × 1.9, 4.9 × 2.2, 4.9 × 2.0, 5.3 × 2.2, 3.1 × 1.6 and 5.8 × 2.5 mm; Baie du Galion, Anse Belgrade; 14°44.3′ N, 60°56.4′ W; depth 3 m; 18 Sep. 2016; MADIBENTHOS; stn AD246; MNHN-IM-2000-39681 • 1 spec., 5.9 × 2.6 mm; Baie du Galion, Anse Belgrade; 14°44.3′ N, 60°56.4′ W; depth 3 m; 18 Sep. 2016; MADIBENTHOS; stn AD246; ANSP 498842 • 1 spec., 5.7 × 2.3 mm; N of Caravelle Peninsula; 14°51.9′ N, 60°50.7′ W; depth 57 m; 19 Sep. 2016; MADIBENTHOS; stn AD247; USNM 1715388 • 2 specs, 6.9 × 2.8 and 6.5 × 2.7 mm; Ste-Luce, Pointe les Fous; 14°27.9′ N, 60°56.4′ W; depth 0–1 m; 11 Sep. 2016; MADIBENTHOS; stn AM009; MNHN-IM-2000-39679 • 2 specs, 3.5 × 1.9 and 3.4 × 1.7 mm; Ste-Luce, Pointe les Fous; 14°27.9′ N, 60°56.4′ W; depth 0–1 m; 11 Sep. 2016; MADIBENTHOS; stn AM009; MNHN-IM-2000-39680.

Other examined material

VENEZUELA • 1 spec., 7.9 × 3.1 mm; Nueva Esparta, Margarita Island, NW of Macanao Peninsula, Robledal; depth 3 ft [1 m]; EFG 19279.

Description

Shell small (holotype length = 7.0 mm), fusiform (W/L = 0.4000), thick, of 7⅝ convex whorls, the last whorl is 63% of shell length, shoulders steep, convex, only a slight obtuse angle marks the edge of the shoulder: aperture narrowly oval, about 44% of shell length, with a short, open anterior canal and deep anal sinus posteriorly. *Protoconch* of 2 whorls, the first whorl is smooth, the last portion with fine, dense riblets cut by spiral grooves creating dimpled surface like that of a golf ball. *Axial sculpture* of strong round-crested ribs that extend from suture to suture, 11 on the penultimate and 9 on the last whorl to the varix, intercostal space slightly narrower than rib widths, becoming wider toward the varix, ribs narrower on shoulder. Axials evanesce on shell base before anterior fasciole. *Varix* apertural, thick, broad, extending from the suture to the anterior canal. *Spiral sculpture* of flattened tightly packed primaries and secondaries of different widths that override ribs, 3 primaries on penultimate whorl anterior to shoulder with 3–5 secondaries between, shoulder spirals, of numerous secondaries only, shell base of alternating primaries and secondaries, and about 7 primaries on anterior fasciole. Primaries decrease in strength anteriorly. All spirals are made granulose by intersecting growth striae. *Sulcus* absent. Narrower, recurved ribs on shoulder mark past positions of anal sinus. *Outer lip* varicose, with a thin, narrow strip of shell along base of varix with a low callus below sinus inside lip. *Anal sinus* deep, mostly imbedded in varix near the suture, apex round, sides slightly convergent due to parietal callus and outer lip edge. *Inner lip* a narrow glaze along the columella and parietal wall, margined, with callus at the anal notch. *Columella* straight. *Anterior fasciole* not swollen, sculpted as the shell base. *Anterior canal* short, undifferentiated from aperture, open, unnotched. *Color* amber, primaries lighter; light chestnut brown band on whorl shoulders and intercostal spaces.

Animal

Live animal photograph (Fig. 96). Foot, proboscis, and cephalic tentacles translucent but nearly filled with opaque white inclusions. Eyespots at the end of the thin fleshy part of the tentacles, invisible against the black background.

Remarks

The average length of 15 specimens is 5.4 mm (range = 3.1–7.9 mm).

Range and habitat

Martinique and Venezuela (Margarita Island); depth 0–57 m, all but one taken at depth 0–3 m.

Fig. 96. *Mandiana canaliculata* Fallon & Bouchet gen. et sp. nov. (MNHN-IM-2013-73069), live animal. Photo by P. Maestrati.

Mandiana vitrea Fallon & Bouchet gen. et sp. nov.
urn:lsid:zoobank.org:act:DFB503F5-E025-4807-A8FB-DA192C8AB888
Fig. 97G–M

Differential diagnosis

This species differs from *Mandiana canaliculata* Fallon & Bouchet gen. et sp. nov. most notably in color (glassy white, rather than amber) and in spiral sculpture. *Mandiana vitrea* Fallon & Bouchet gen. et sp. nov. has evenly sized, flattened spiral cords that are well spaced, while the other has alternating primaries and secondaries.

Etymology

Mandiana vitrea Fallon & Bouchet gen. et sp. nov., the glassy *Mandiana*, from the Latin adjective '*vitrea*', meaning 'of glass' and resembling glass.

Type material

Holotype

MARTINIQUE • 5.9 × 2.5 mm; S of Grande Cove des Salines, St. Lucie Canal; 14°24′ N, 60°52.6′ W; depth 0 m; 12 Sep. 2016; MADIBENTHOS; stn AM011; MNHN-IM-2000-39682.

Paratypes (2 specs)

MARTINIQUE • 2 specs, 5.4 × 2.3 and 5.5 × 2.3 mm; S of Grande Cove des Salines, St. Lucie Canal; 14°24′ N, 60°52.6′ W; depth 0 m; 12 Sep. 2016; MADIBENTHOS; stn AM011; MNHN-IM-2000-39683.

Other material (2 specs)

The photos of these two specimens were added because of the specimens' excellent condition, but were not examined.

MARTINIQUE • 1 spec., 6.3 × 2.5 mm; La Trinité, Belgrade Cove; depth shallow water; photo #1075 courtesy D. Lamy • 1 spec., length = 7.0 mm; depth 3 m; photo #163 courtesy D. Lamy.

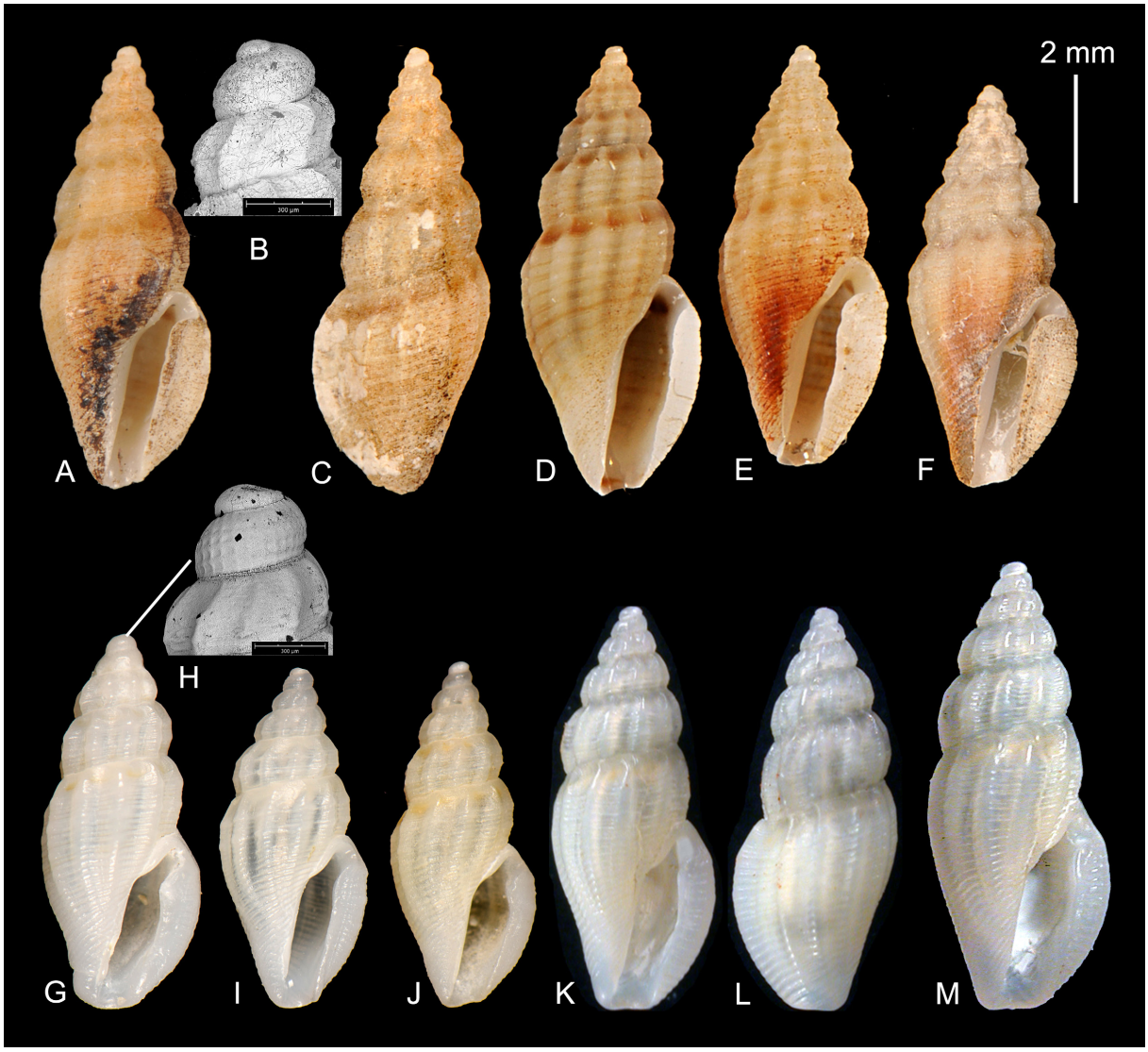


Fig. 97. Species of *Mandiana* Fallon gen. nov. – **A–F**. *Mandiana canaliculata* Fallon & Bouchet gen. et sp. nov. **A–C**. Holotype, sequence voucher 7.0 × 2.8 mm, ventral and dorsal views, and SEM image of protoconch (MNHN-IM-2013-70598), Belgrade Cove, Trinite Bay, Martinique. Protoconch worn but shows faint dimpled areas. **D–E**. Paratypes, 6.9 × 2.8 and 6.5 × 2.7 mm (MNHN-IM-2000-39679), Ste-Luce, Pointe les Fous, Martinique. **F**. Paratype, sequence voucher, 6.3 × 2.6 mm (MNHN-IM-2013-73069), Little Grenade Island, Martinique. – **G–M**. *Mandiana vitrea* Fallon & Bouchet gen. et sp. nov. **G–H**. Holotype, 5.9 × 2.5 mm, ventral view, and SEM image of protoconch (MNHN-IM-2000-39682), St Lucie Canal, S of Grande Cove des Salines, Martinique. **I–J**. Paratypes, 5.4 × 2.3 and 5.5 × 2.3 mm (MNHN-IM-2000-39683), St Lucie Canal, S of Grande Cove des Salines, Martinique. **K–L**. Spec, 6.3 × 2.5 mm, ventral and dorsal views (D. Lamy coll. photo #1075), Belgrade Cove, Trinite Bay, Martinique. **M**. Spec., 7.0 mm, ventral view (D. Lamy coll. photo #163), Martinique. Credits: B, H: SEM images courtesy of Paul Callomon; G–I: courtesy of D. Lamy. Scale bars: A, C–G, I–M = 2 mm; B, H = 300 µm.

Description

Shell small (holotype length = 6.3 mm), thick, stoutly fusiform, of 6½ appressed convex whorls, the last whorl about 66% of shell length, shoulders not distinctly margined, steep; sculpture of strong ribs and spiral cords; aperture narrowly oval, about 46% of shell length, with a very short, open anterior canal and deep anal sinus posteriorly. *Protoconch* of about 1⅞ round whorls, the first whorl smooth, the last portion with fine, dense riblets cut by spiral grooves creating dimpled surface like that of a golf ball. *Axial sculpture* of opisthocline, round-crested ribs that extend from suture to suture on the spire whorls and evanesce on shell base before anterior fasciole, 9 are on the penultimate and 8 on the last whorl to the varix; ribs about as wide as the interspaces but more widely spaced on dorsum of last whorl, narrower on shoulder. *Varix* thick, broad, immediately behind the narrow lip edge and extending the full length of the aperture. *Spiral sculpture* of flattened granulose primaries and secondaries, shoulder with closely packed secondaries only, whorl sides with evenly spaced flattened primaries, 2 larger one, one on the edge of the shoulder and another mid-way on whorl side, and about 14 primaries are on the shell base. All spirals override ribs. *Sulcus* absent. Narrower, recurved ribs and the presence of only tightly packed spirals mark past positions of anal sinus. *Outer lip* thin, narrow strip along base of varix; no stromboid notch; a low callus below sinus inside lip. *Anal sinus* deep, mostly imbedded in varix, parietal callus present, apex round, sides slightly convergent from parietal callus and outer lip edge. *Inner lip* narrow, margined, with callus at the anal sinus. *Columella* straight. *Anterior fasciole* not swollen, sculpted as the shell base, only spirals narrower, number about 6. *Anterior canal* short, undifferentiated from aperture, open, unnotched. *Color* glassy, spirals white, a faint brown band on whorl shoulders of some specimens.

Range and habitat

Martinique; depth 0–3 m.

Genus ***Psilocythara*** Fallon gen. nov.
urn:lsid:zoobank.org:act:2DF821DD-7BAF-45DB-AA5D-8D1E5301C295

Type species

Psilocythara sucina Fallon & Bouchet gen. et sp. nov.

Diagnosis

Like *Brachycythara* but with smooth shells and beaded, partially submerged protoconch whorls. Shell is exceptionally small (length < 4 mm), stout, biconic, glossy, translucent, except axials, which are opaque. Protoconch relatively large, of about 2½–3 small-tipped, rapidly expanding whorls, partially submerged (appearing like stacked inverted bowls), the last whorl sculptured whole or in part with crowded axial riblets crossed by 2–3 shallow spiral furrows, with a few unbroken strong riblets before lip. Aperture long and narrow, and the anterior canal differentiated by a narrowing of the aperture and unnotched at its end. Outer lip is strengthened by an enlarged last rib in mature specimens. Anal notch wide, shallow, about the full width of the shoulder, a parietal callus may be present. Sculpture consists of axial ribs and fine spiral grooves and raised ridges or spirals on the anterior of the shell base.

Etymology

Psilocythara Fallon gen. nov., from ancient Greek '*Psilos*' = 'barren', here 'bare-shelled' + '*cythara*', a recognizable stem of the family-group. These are smooth-shelled species that resemble *Brachycythara*.

Summary of diagnostic characteristics

Shell small, glossy, stoutly biconic with a short anterior canal.

Whorls convex, wider than high, shoulders round.

Protoconch large, of 2½–3 partially submerged whorls, tip minute, riblets present on last whorl, whole or in part cut by 2 or 3 shallow furrows.

Outer lip is strengthened by the last rib.

Sculpture of numerous moderately strong ribs crossed by fine spiral grooves overall and raised spirals, raised ridges or spirals on the anterior of the shell base, and the fasciole.

Outer lip is swollen.

Shell surface microsculpture

At high magnifications, 3003×, 700×, SEM images of the shell surface of all imaged specimens are smooth and featureless, except for incremental growth striae, and at the higher magnifications the appearance of randomly distributed punctae. The function of these shallow pores (they do not penetrate the shell) is unknown. All species appear to have well-spaced microscopic spiral grooves, which are not shown in the SEM images except for one species, *Psilocythara multicincta* (Rolán & Espinosa, 1999) gen. et comb. nov., which has more closely spaced and deeper grooves visible at low magnifications and as seen in the SEM image.

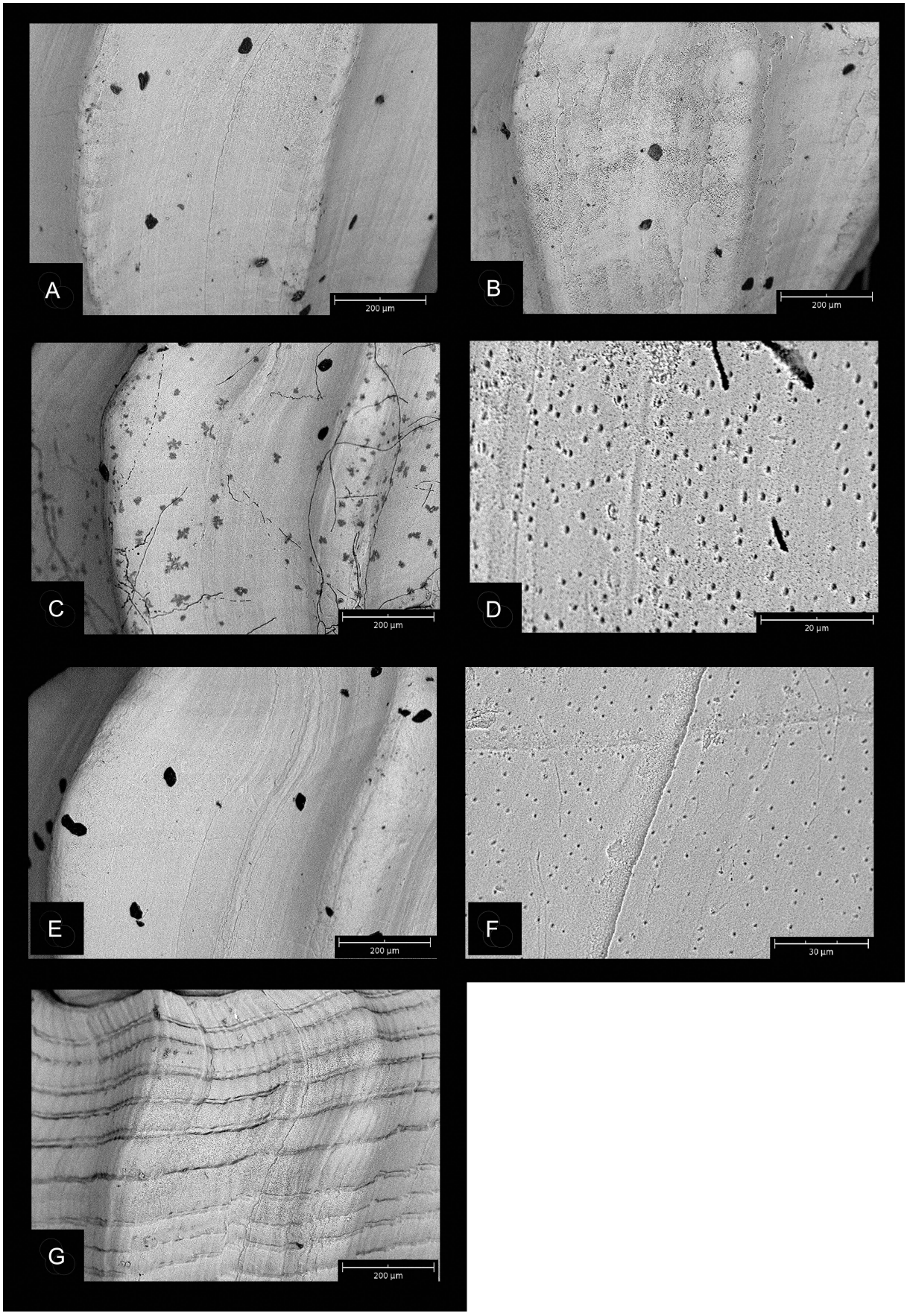
Differences from other genera

Brachycythara Woodring, 1928 possesses granulose spirals, has a different protoconch: of 1½–2½ round whorls, a tip large with a few or no riblets on the last whorl, and whorls not partially submerged. The protoconch of *Psilocythara* Fallon gen. nov. is about 2½–3 whorls, the first minute, the last ¼–½ whorl with 2 or 3 furrows across riblets.

Phylogenetic relationships

A single species has been sequenced, *Psilocythara multicincta* (Rolán & Espinosa, 1999) gen. et comb. nov. This lineage has been recovered sister to the genus *Brachycithara*, with 100% bootstrap support.

Fig. 98 (next page). Species of *Psilocythara* Fallon gen. nov., shell surface microsculpture. **A**. *Psilocythara roatanensis* Fallon gen. et sp. nov., holotype, 3.0 × 1.3 mm (ANSP 498953), Roatán Island, Honduras. Shell surface without spirals, faint growth lines visible. **B**. *Psilocythara versicolor* Fallon & Bouchet gen. et sp. nov., paratype, 3.1 × 1.7 and 3.0 × 1.7 mm (MNHN-IM-2000-40041), off French Guiana. Spirals absent in this view, jagged incremental growth lines visible. **C–D**. *Psilocythara sucina* Fallon & Bouchet gen. et sp. nov. **C**. Paratype, 3.1 × 1.8 mm (MNHN-IM-2000-39795), N of Grande-Terre, Guadeloupe. Growth increments barely visible, and 2 ribs visible. **D**. Same specimen as preceding, 3700×. Random arrangement of punctae visible. **E**. *Psilocythara barbarae* (W.G. Lyons, 1972) gen. et comb. nov. Spec., 3.7 × 1.9 mm (UF 589859), E of St Augustine, St Johns Co., E Florida. Surface smooth except for incremental growth lines. **F**. Same specimen as preceding, 2050×. Punctae and an incremental growth line visible. **G**. *Psilocythara multicincta* (Rolán & Espinosa, 1999) gen. et comb. nov. Spec., 2.9 × 1.6 mm (MNHN-IM-2012-5830), Pointe d'Antigues (Port-Louis), Guadeloupe. Spiral channels and incremental growth lines are visible. Scale bars: A–C, E, G = 200 µm; D = 20 µm; F = 30 µm.


A
200 µm
B
200 µm
C
200 µm
D
20 µm
E
200 µm
F
30 µm
G
200 µm

Psilocythara barbarae (W.G. Lyons, 1972) gen. et comb. nov.
Figs 98E–F, 99A–C

Brachycythara barbarae W.G. Lyons, 1972: 4, figs 3–4.

Brachycythara barbarae – Porter 1974: 245. — Rios 1975: 139; 1985: 147, pl. 50 fig. 689; 1994: 172, pl. 57 fig. 787. — Turgeon *et al*. 1988: 96; 1998: 105. — Odé 1992b: 75. — Shelton 1997: 14. — Rolán & Espinosa 1999: 37, figs 3–4, 16–18. — Boyko & Cordeiro 2001: 23. — Tucker 2004: 109. — Williams 2005: #5551.

Differential diagnosis

Psilocythara roatanensis Fallon gen. et sp. nov. from Honduras is very similar but smaller (holotypes' lengths = 3.0 versus 3.4 mm), has more ribs (14 versus 10 on the penultimate), and is narrower in shape (W/L = 0.4333 versus 0.5294).

Psilocythara sucina Fallon & Bouchet gen. et sp. nov. has more angular shoulders, ribs with peripheral nodules, and a straighter, more tapered body whorl. It is generally found in deeper water (60–74 m versus 27–55 m) and is geographically separated from the more northerly distributed *P. barbarae* (W.G. Lyons, 1972) gen. et comb. nov.

Type material

Holotype
UNITED STATES OF AMERICA • 3.4 × 1.8 mm; Florida, Hillsborough Co., off Egmont Key, Hourglass Station D; 27°37′ N, 83°58′ W; depth 55 m; USNM 707003.

Paratypes (8 specs)
UNITED STATES OF AMERICA • 1 spec.; same data as for holotype; USNM 707004 • 1 spec.; same data as for holotype; AMNH 167029 • 1 spec.; same data as for holotype; MCZ 278869 • 1 spec.; same data as for holotype; ANSP 324020 • 1 spec.; same data as for holotype; DMNH • 1 spec.; same data as for holotype; FSBC 1 • 1 spec.; same data as for holotype; LACM • 1 spec.; same data as for holotype; D. Steger coll. (Lyons 1972b: 4).

Material examined (189 specs)

The holotype, the paratype ANSP 324020, and the following lots were examined:

BAHAMAS • 92 specs, (2 measured) 3.9 × 1.9 and 2.8 × 1.5 mm; South Bimini; depth 0 m; in beach drift; R.L. Wagner leg.; UF 589865.

UNITED STATES OF AMERICA • 4 specs, 4.1 × 2.1, 3.7 × 1.9, 3.4 × 1.9 and 3.1 × 1.8 mm; 25 mi. E Florida, St. Johns Co., E of St. Augustine; depth 30 m; 1975; Ted Yocius leg.; dredged; UF 589859 • 1 spec., 2.8 × 1.5 mm; E Florida, Duval Co., Jacksonville Beach, 16th Ave. S; depth 0 m; Nov. 1981; in beach drift; Norma Bulock leg.; UF 589860 • 4 specs, 2.9 × 1.5, 2.4 × 1.3, 2.7 × 1.5 and 2.6 × 1.5 mm; E Florida, Duval Co., 27 ¾ mi. ESE of Mayport, base of sunken ship hull; depth 23 m; 14 Jul. 1987; C. Casin leg.; UF 589861 • 1 spec., 3.6 × 1.9 mm; E Florida, St. Johns Co., 65 mi. [105 km] E of St. Augustine; depth 53 m; Jun. 1972; Ted Yocius leg.; UF 589862 • 84 specs, (2 measured) 2.5 × 1.3 and 3.9 × 2.1 mm; E Florida, St. Johns Co., 50–60 mi. [80–97 km] E of Ponte Vedra; depth 40–46 m; Mar.–Apr., 1988; H.G. Lee leg.; ex batfish stomachs trawled from aboard scallop boat; UF 589863 • 1 spec., 3.2 × 1.6 mm; Alabama, Baldwin Co., Romar Beach; 30°1.52′ N, 87°37.39′ W; depth 27 m; Jun. 1993; Doug Shelton leg.; grab; UF 589864.

Description

The original description is in Lyons (1972: 4, figs 3–4). Examined shells closely match the original description. *Shell* translucent, glossy when fresh, rarely exceeding 4.0 mm, biconic with a short spire

and short anterior canal, of about 6 whorls, the last whorl about 74% of shell length. *Protoconch* of 2¾ to 2⅞ whorls, appearing like a stack of inverted bowls, the first whorl minute and distinct, the last with weak riblets, strongest toward the protoconch lip, the very last ¼ whorl with 2 spiral grooves that separate riblets into 3 rows of beads. *Axial sculpture* of round to sharply angle whorls sculpted with 8–9 ribs on the body whorl, about a wide as their interspaces, which run from the suture and evanesce on the base of the last whorl, strongest on periphery. *Spiral sculpture* of very fine well-spaced grooves on some specimens. *Color* a translucent golden brown with a wide brown band on the shoulder and sometimes with up to 6 narrow bands or lines below the periphery and another, wider band bordering the anterior fasciole.

Remarks

The average length of 19 measured specimens is 3.2 mm (range = 2.5–4.1 mm). Examined specimens differed in the amount of brown spiral lines and bands. Most examined specimens lacked brown spirals and bands, except for traces of a broad shoulder band. Fine spiral grooves were absent on the examined South Bimini population, and the last whorl is less rounded and the periphery more angular than the type.

Range and habitat

Confirmed specimens from United States (E Florida, W Florida, Alabama), and Bahamas. specimens not examined are reported from United States [North Carolina (Porter 1974) and Texas (Odé 1992b)], and Cuba (Rolán & Espinosa 1999); depth 27–55 m.

Psilocythara roatanensis Fallon gen. et sp. nov.
urn:lsid:zoobank.org:act:FDD484D9-E8AB-4EFC-B34A-FAC31E5822B6
Figs 98A, 99D–H

Differential diagnosis

Psilocythara barbarae (W.G. Lyons, 1972) gen. et comb. nov. is larger (holotypes' lengths = 3.4 versus 3.0 mm), has fewer ribs (10 versus 14 on the penultimate), and is stockier (W/L = 0.5294 versus 0.4333).

Etymology

Psilocythara roatanensis Fallon gen. et sp. nov., the Roatán Island *Psilocythara*, after the type locality.

Type material

Holotype

HONDURAS • 3.0 × 1.5 mm; Bay Islands, Roatán Island; depth 40–60 m; Apr. 2006; M. Coltro leg.; dredged; ANSP 498953.

Paratypes (2 specs)

HONDURAS • 3.0 × 1.5 mm; same data as for holotype; Apr. 2006; M. Coltro leg.; dredged; ANSP 498954 • 1 spec., 2.8 × 1.4 mm; same data as for holotype; Apr. 2006; M. Coltro leg.; dredged; ANSP 498955.

Description

Shell very small (holotype length = 3.0 mm), biconic (W/L = 0.50), translucent, of 5½ convex whorls, the last quite large, 73% of shell length; aperture narrow, barely wider at its middle than the anal sinus and anterior canal. *Protoconch* of 2½ round, translucent whorls, tip minute, then expanding rapidly, the last ½ with fine arcuate riblets crossed by 2 spiral grooves, forming 3 rows of beads. *Axial sculpture* of narrow, slightly opisthocline ribs that extend from suture to suture on spire whorls and to anterior fasciole

on the last, recurved on shoulder, slightly swollen nodules present on whorl periphery, and intercostal space a little wider than ribs, which number 14 on the penult and 10 on the last to the varix. *Varix* absent, the last rib is larger than the penultimate and serves to reinforce the lip, which extends from the suture to the beginning of the anterior canal. *Spiral sculpture* of obscure regularly spaced very faint lines most evident on crest of varix, otherwise shell surface appears glossy smooth. *Sulcus* absent; past positions of the anal sinus indicated by the presence of recurved ribs. *Outer lip* a narrow band of shell forward of the last, expanded, rib that extends from the anal sinus to the anterior canal, its edge forming a low arc; without a stromboid notch. *Anal sinus* is a wide shallow notch set off from the suture by a weak parietal callus, its outer edge continuous with the outer lip edge. *Inner lip* a narrow, thin glaze, emarginated, with a slight callus on the parietal wall at the anal sinus. *Columella* straight. *Anterior canal* open, distinct but short, unnotched. *Anterior fasciole* not swollen, with about 5 fine oblique spirals. *Color* translucent with opaque white ribs and a light brown band on the shoulder, and 5 thin brown lines on the last whorl and a brown band at the anterior canal.

Range and habitat

Known only from the type locality.

Psilocythara versicolor Fallon & Bouchet gen. et sp. nov.
urn:lsid:zoobank.org:act:3A70E600-68E6-408D-B198-17F86E065C75
Figs 98B, 99I–W

Differential diagnosis

Psilocythara sucina Fallon & Bouchet gen. et sp. nov. has more angular whorls and stronger ribs.

Psilocythara multicincta (Rolán & Espinosa, 1999) gen. et comb. nov. has a translucent shell with more pronounced spiral sculpture.

Psilocythara barbarae (W.G. Lyons, 1972) gen. et comb. nov. has ribs that fade before the anterior fasciole (not at the fasciole), has more angular spire whorls, and shoulders that are more convex.

Etymology

Psilocythara versicolor Fallon & Bouchet gen. et sp. nov. from the Latin adjective '*verisicolor*', which means 'having colors that change' after its variably colored specimens.

Type material

Holotype
FRENCH GUIANA • 3.0 × 1.7 mm; offshore; 5°36.3′ N, 52°09.2′ W; depth 57 m; 10 Aug. 2014; GUYANE 2014; stn CP4408; MNHN-IM-2012-43479.

Paratypes (32 specs)
FRENCH GUIANA • 1 spec., 2.8 × 1.9 mm; same data as for holotype; MNHN-IM-2000-40006 • 2 specs, 2.7 × 1.4 and 2.9 × 1.6 mm; offshore; 5°49′ N, 51°28′ W; depth 102–103 m; 6 Aug. 2014; GUYANE 2014, stn DW4390; MNHN-IM-2000-40010 • 1 spec., 3.1 × 1.7 mm; offshore; 6°18′ N, 52°13.3′ W; depth 95–97 m; 8 Aug. 2014; GUYANE 2014, stn CP4402; MNHN-IM-2000-40005 • 1 spec., 2.7 × 1.5 mm; offshore; 6°56′ N, 53°03′ W; depth 145 m; 31 Jul. 2014; GUYANE 2014; stn DW4360; MNHN-IM-2000-40008 • 2 specs, 2.7 × 1.4 and 2.4 × 1.3 mm; offshore; 6°33′ N, 52°28′ W; depth 130–131 m; 4 Aug. 2014; GUYANE 2014; stn CP4379; MNHN-IM-2000-40009 • 1 spec., 2.7 × 1.5 mm; offshore; 6°52.2′ N, 53°02.6′ W; depth 94 m; 30 Jul. 2014; GUYANE 2014; stn DW4359; MNHN-IM-2000-40007 • 1 spec., 2.1 × 1.3 mm; offshore; 6°00.9′ N, 52°15′ W; depth 66–67 m; 8 Aug. 2014; GUYANE 2014; stn CP4400; MNHN-IM-2000-40004 • 4 specs, 3.1 × 1.6, 2.9 × 1.4, 2.6 × 1.5 and

2.6 × 1.4 mm; offshore; 6°15.4′ N, 52°13.5′ W; depth 81–82 m; 4 Dec. 2017; PROTEUS-GUYANE; stn DW5099; MNHN-IM-2000-40042 • 7 specs, 3.1 × 1.7, 3.0 × 1.7, 3.0 × 1.6, 2.6 × 1.5, 2.5 × 1.4, 2.4 × 1.4 and 2.3 × 1.2 mm; offshore; 6°15.3′ N, 52°13.6′ W; depth 82 m; 4 Dec. 2017; PROTEUS-GUYANE; stn DW5098; MNHN-IM-2000-40041 • 6 specs, 3.6 × 1.9, 3.4 × 1.8, 3.3 × 1.8, 3.0 × 1.7, 2.7 × 1.5 and 3.3 × 1.8 mm; offshore; 6°06.8′ N, 52°06.7′ W; depth 77–80 m; 3 Dec. 201; PROTEUS-GUYANE; stn DW5095; MNHN-IM-2000-40029 • 1 spec., 2.8 × 1.5 mm; offshore; 6°11.2′ N, 52°02′ W; depth 103–105 m; 2 Dec. 2017; PROTEUS-GUYANE; stn DW5087; MNHN-IM-2000-40032 • 4 specs, lengths = 3.2, 3.2, 3.0 and 2.8 mm; offshore; 6°10.7′ N, 52°03.0′ W; depth 96–101 m; 4 Dec. 2017; PROTEUS-GUYANE; stn DW5097; MNHN-IM-2000-40030 • 1 spec., length = 4.0 mm; offshore; 6°09.9′ N, 52°00.1′ W; depth 100–101 m; 2 Dec. 2017; PROTEUS-GUYANE; stn DW5080; MNHN-IM-2000-40031.

Other examined material (6 specs)

The data on 6 specs follows.

FRENCH GUIANA • 2 specs, 2.8 × 1.4 and 3.0 × 1.7 mm; offshore; 5°49′ N, 51°28′ W; depth 102–103 m; 6 Aug. 2014; GUYANE 2014, stn DW4390; MNHN-IM-2000-40003 • 2 specs, 3.0 × 1.6 and 2.6 × 1.4 mm; offshore; 6°18′ N, 52°13.3′ W; depth 95–97 m; 8 Aug. 2014; GUYANE 2014, stn CP4402; MNHN-IM-2000-40001 • 1 spec., 2.2 × 1.4 mm; offshore; 6°56′ N, 53°03′ W; depth 145 m; 31 Jul. 2014; GUYANE 2014; stn DW4360; MNHN-IM-2000-40002 • 1 spec., length = 2.7 mm; offshore; 5°10.8′ N, 51°03.8′ W; depth 80 m; 19 Apr. 1999; Cosel and LeBeuff leg.; GREEN 0; stn D16; MNHN-IM-2000-40016.

Description

Shell small (holotype length = 3.0 mm, largest length = 4.0 mm), solid, biconic (W/L = 0.5667), glossy, of 5½ whorls, teleoconch whorls convex, broadly angular on the last with shoulder periphery extending to about ⅓ whorl height, straight sides, and slightly appressed sutures undulant from previous whorl's ribs, the last whorl about 66% of shell length; sculpture of strong ribs and spiral grooves; aperture a narrow oval, with a round notch posteriorly and short anterior canal, both about 50% of shell length. *Protoconch* of 3 rapidly expanding partially submerged whorls, the first minute, last whorl with riblets, the last ½ of which crossed with 2 spiral grooves producing weak nodules. *Axial sculpture* of moderately strong ribs that run from suture to suture on spire whorls, are arched on whorl sides and end at anterior fasciole on last whorl; nodules formed at whorl periphery, ribs recurved on shoulder. *Varix* is an enlarged rib near edge of lip. *Spiral sculpture* of a single nearly obscure, low primary spiral on whorl periphery, interconnecting nodules at rib intersections, defines edge of shoulder. Fine, nearly imperceptible grooves, widely spaced, present on shell surface. *Sulcus* absent, recurved ribs on shoulder mark past presence of ribs. *Outer lip* is a thin narrow strip of shell forward of varix that extends from and is contiguous with the outer edge of the anal sinus to end of the anterior canal. Stromboid notch absent. *Anal sinus* a wide shallow curved notch on whorl shoulder, sides divergent. *Inner lip* a thin glaze along columella, unemarginate and without a callus on parietal side of anal sinus. *Columella* straight. *Anterior canal* short, open, barely differentiated from the anterior end of the aperture, unnotched. *Anterior fasciole* not swollen, smooth except for growth striae. *Color* buff, with some slightly darker banding on shoulder and last whorl.

Remarks

The average length of 15 specimens is 2.8 mm (range = 2.1–3.1 mm). On fresh specimens, color patterning includes yellow, orange, and reddish orange with narrow, darker bands and lines.

Range and habitat

Off French Guiana; depth 57–145 m.

Psilocythara sucina Fallon & Bouchet gen. et sp. nov.
urn:lsid:zoobank.org:act:3C441209-F117-4C10-93D9-140ACE94D277
Figs 98C–D, 99X–GG

Differential diagnosis

Psilocythara barbarae (W.G. Lyons, 1972) gen. et comb. nov. has lower shoulders, ribs without peripheral nodules, and generally a more globose body whorl.

Psilocythara roatanensis Fallon gen. et sp. nov. has convex whorls with less distinct shoulders, and weaker ribs. Although dark color patterning is variable in *P. sucina* Fallon & Bouchet gen. et sp. nov., the striped form has fewer spiral stripes (4 versus 5).

Psilocythara versicolor Fallon & Bouchet gen. et sp. nov. has convex, less angular whorls.

Etymology

Psilocythara sucina Fallon & Bouchet gen. et sp. nov. derives its name from the feminine form of the Latin adjective '*sucinus*' which means 'amber', referring to its translucent, amber-colored shell.

Type material

Holotype
GUADELOUPE • 3.1 × 1.8 mm; Grand Cul-de-Sac, Port-Louis; 16°25.0′ N, 61°32.8′ W; depth 85 m; 16 May 2012; KARUBENTHOS 2012; stn GD31; MNHN-IM-2012-5815.

Paratypes (17 specs)
GUADELOUPE • 2 specs, 2.8 × 1.5 and 2.4 × 1.4 mm; Grand Cul-de-Sac, Port-Louis; 16°25.0′ N, 61°32.8′ W; depth 85 m; 16 May 2012; KARUBENTHOS 2012; stn GD31; MNHN-IM-2000-39795 • 1 spec., 2.6 × 1.3 mm; N of Grande-Terre; 16°29.7′ N, 61°31.4′ W; depth 60–82 m; 14 Jun. 2015; KARUBENTHOS 2; stn DW4545; MNHN-IM-2000-39697 • 1 spec., 2.5 × 1.3 mm; 16°22.57′ N, 61°34.12′ W; depth 80 m; 4 May 2012; KARUBENTHOS 2012; stn GD01; MNHN-IM-2012-5811 • 2 specs, 2.8 × 1.55 and 2.55 × 1.5 mm; Basse-Terre, Anse à la Barque; 16°05.5′ N, 61°46.6′ W; depth 45 m; 9 May 2012; KARUBENTHOS 2012; stn GD12; MNHN-IM-2012-5813 • 6 specs, (2 measured) 2.8 × 1.5 and 2.2 × 1.6 mm; Port-Louis; 16°23′ N, 61°33′ W; depth 120 m; 18 May 2012; KARUBENTHOS 2012; stn GN27; MNHN-IM-2012-5824 • 1 spec., 2.75 × 1.45 mm; behind Fajou Island; 16°22.2′ N, 61°35.01′ W; depth 60 m; 24 May 2012; KARUBENTHOS 2012; stn GD54; MNHN-IM-2012-5819.

MARTINIQUE • 1 spec., 2.9 × 1.5 mm; Bellefontaine, SW of centrale EDF; 14°39.9′ N, 61°09.9′ W; depth 60 m; 2 Oct. 2016; MADIBENTHOS; stn AD287; MNHN-IM-2000-39696 • 1 spec., 3.0 × 1.5 mm; SW of Vétiver; 14°37.5′ N, 61°08.3′ W; depth 74 m; 2 Oct. 2016; MADIBENTHOS; stn AD290; USNM 1715389 • 1 spec., 2.9 × 1.5 mm; Bellefontaine, SW of centrale EDF; 14°39.9′ N, 61°09.9′ W; depth 60 m; 2 Oct. 2016; MADIBENTHOS; stn AD287; MNHN-IM-2000-39696 • 1 spec., length = 2.8 mm; Les Anses-d'Arlet, Trou Jacqueline; 14°28.5′ N, 61°05.1′ W; depth 0–29 m; 26 Sep. 2016; MADIBENTHOS; stn AD271; MNHN-IM-2000-39695.

Other material examined

An additional 8 specimens from Guadeloupe were examined but not included in the type series.

Description

Shell small (holotype length = 3.1 mm), biconic (W/L = 0.5806), glossy, translucent, of 5¼ whorls teleoconch turreted with sharply angled shoulders, straight sides angled into the succeeding whorls' suture; slightly appressed sutures undulant from previous whorls' ribs, the last whorl large, about 74% of

shell length; sculpture of strong ribs and well-spaced microscopic spiral grooves; aperture narrow with a round notch posteriorly, anterior canal short, hardly differentiated from aperture, both about 58% of shell length. *Protoconch* of 3 translucent whorls, tip minute, then expands rapidly, the last whorl partially submerged, the first ¾ of which has fine arcuate riblets crossed by 2 grooves producing 3 rows of beads, and the last ¼ of the last whorl has 4 strong riblets without grooves. *Axial sculpture* of strong ribs that extend from suture to suture on spire whorls and to anterior fasciole on the last, intercostal space about as wide as ribs; ribs recurved and lower on shoulder, have swollen nodes on whorl periphery, number 10 on the penultimate and 7 on the last whorl up to the varix. *Varix* an enlarged and swollen rib near the edge of the outer lip, extends from the suture to the beginning of the anterior canal. *Spiral sculpture* of obscure microscopic lines, otherwise shell surface is glossy smooth. *Sulcus* absent; past presence of the anal sinus is indicated by the presence on whorl shoulders of recurved ribs, slightly excavated on their ventral side. *Outer lip* with a rib-like varix and a narrow band of shell forward of the varix that extends from the anal sinus to the anterior canal, its edge forming a low arc; without a stromboid notch. *Anal sinus* a wide shallow notch adjacent to the suture; its outer edge extends to the outer lip edge. *Inner lip* a narrow glaze, emarginated, without a callus on the parietal wall at the anal sinus. *Columella* straight. *Anterior canal* is open, distinct but short, unnotched. *Anterior fasciole* not swollen, with about 5 or 6 very fine oblique spirals. *Color* translucent amber with lighter color accents on rib peripheries, varix, protoconch, and anterior fasciole, and a dark amber band on the shoulder. In addition, there are 4 narrow, dark amber bands on the last whorl.

Remarks

The color pattern is variable in this species, some with a single diffuse band mid-whorl, as shown in Fig. 99JJ. The average length of 19 measured specimens is 2.7 mm (range = 2.2–3.2 mm).

Range and habitat

Guadeloupe and Martinique; depth 0–150 m. Most (96%) at depth 40–150 m.

Psilocythara multicincta (Rolán & Espinosa, 1999) gen. et comb. nov.
Figs 98G, 99HH–SS

Brachycythara multicincta Rolán & Espinosa, 1999: 47, figs 6–7, 19–21.

Brachycythara multicincta – Redfern 2001: 129; pl. 58 fig. 535; 2013: 207, fig. 578. — García & Lee 2002: 12. — Tucker 2004: 652. — Williams 2005: #5553.

Differential diagnosis

Psilocythara multicincta (Rolán & Espinosa, 1999) gen. et comb. nov. teleoconch surface has spiral grooves under microscopic examination, as stated for the genus in the diagnosis, but they are more deeply grooved than its congeners, appearing as if the surface is covered with flattened cords. In color, this species tends to have a dark spire, like the brown shoulder band, with a contrasting cream colored body whorl, although this bi-colored scheme is not seen in all specimens.

Type material

Holotype

CUBA • 3.0 × 1.7 mm; Cienfuegos; depth 15–50 m; MNCN 15.05/31935.

Paratypes (8 specs)

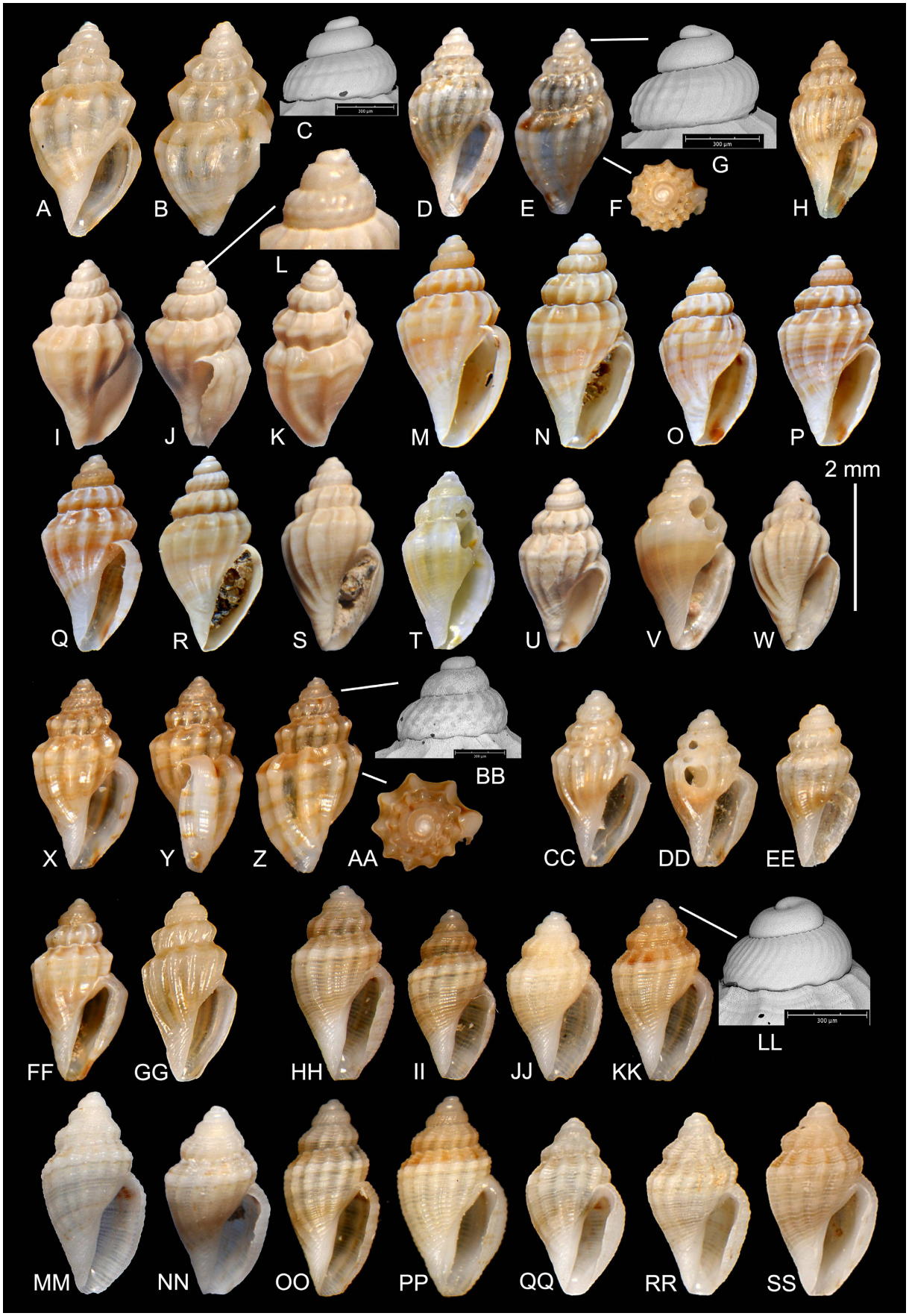
CUBA • 2 specs; same data as for holotype; IDO • 2 specs; same data as for holotype; MCZ • 2 specs; same data as for holotype; Rolán coll. • 2 specs; same data as for holotype; Fernandes Garces coll.

Other material examined (42 specs)

42 specimens were examined. Among these, 2 specimens from Guadeloupe were sequenced:

GUADELOUPE • 1 spec., 3.0 × 1.6 mm; Grand Cul-de-Sac Marin, the outside slope facing Fajou Island; 16°21.72′ N, 61°36.35′ W; depth 22 m; 5 May 2012; KARUBENTHOS 2012, stn GS05; sequenced; MNHN-IM-2013-20597 • 1 spec., 3.2 × 1.7 mm; bouée PCA, S Port-Louis, W Petit Canal; 16°22.57′ N, 61°31.74′ W; depth 8 m; 15 May 2012; KARUBENTHOS 2012, stn GS19; sequenced; MNHN-IM-2013-20621 • 1 spec., 3.3 × 1.6 mm; leaving Port-Louis; 16°23.74′ N, 61°32.07′ W; depth 49 m; 15 May 2012; KARUBENTHOS 2012; stn GS18; MNHN-IM-2012-5828 • 2 specs, 3.3 × 1.7 and 3.0 × 1.5 mm; Grand Cul-de-Sac Marin, Passe à Caret; 16°22.3′ N, 61°38.1′ W; depth 29 m; 23 May 2012; KARUBENTHOS 2012; stn GS29; MNHN-IM-2012-5831 • 2 specs, 2.5 × 1.5 and 2.2 × 1.4 mm; Grand Cul-de-Sac Marin, Port-Louis (W Petit Canal); 16°22.6′ N, 61°31.7′ W; depth 8 m; 15 May 2012; KARUBENTHOS 2012; stn GS19; MNHN-IM-2012-5829 • 3 specs, (2 measured) 3.6 × 1.8 and 1.7 × 1.4 mm; Grand Cul-de-Sac Marin, Port-Louis (aircraft wreck); 16°25.6′ N, 61°32.6′ W; depth 14 m; 12 May 2012; KARUBENTHOS 2012; stn GB12; MNHN-IM-2012-5805 • 1 spec., 3.05 × 1.5 mm; Rocroy sud; 16°02.38′ N, 61°45.71W; depth 17 m; 10 May 2012; KARUBENTHOS 2012; stn GB08; MNHN-IM-2012-5771 • 2 specs, 3.2 × 1.6 and 3.2 × 1.8 mm; Grand Cul-de-Sac Marin, Port-Louis (Oeil); 16°26.8′ N, 61°32.4′ W; depth 16 m; 18 May 2012; KARUBENTHOS 2012; stn GB20; MNHN-

Fig. 99 (next page). Species of *Psilocythara* Fallon gen. nov. **A–B**. *Brachycythara barbarae* W.G. Lyons, 1972, holotype, 3.4 × 1.8 mm, ventral and dorsal views (USNM 707003), Hillsborough Co., W Florida. – **C**. *Psilocythara barbarae* (W.G. Lyons, 1972) gen. et comb. nov. Spec., 3.7 × 1.9 mm, SEM of protoconch only (UF 589859), E of St Augustine, St Johns Co., E Florida. – **D–H**. *Psilocythara roatanensis* Fallon gen. et sp. nov. **D–G**. Holotype, 3.0 × 1.3 mm, ventral, dorsal and apical views, and SEM image of protoconch (ANSP 498953), Roatán Island, Honduras. **H**. Paratype, 2.8 × 1.4 mm (ANSP 498954), Roatán Island, Honduras. – **I–W**. *Psilocythara versicolor* Fallon & Bouchet gen. et sp. nov. **I–L**. Holotype, 3.0 × 1.7 mm, ventral, lateral and dorsal views, and expanded view of protoconch (not to scale) (MNHN-IM-2012-43479), off French Guiana. **M–P**. Paratypes, 3.4 × 1.8, 3.3 × 1.8, 2.7 × 1.5 and 3.0 × 1.7 mm (MNHN-IM-2000-40029), off French Guiana. **Q–R**. Paratypes, 3.1 × 1.7 and 3.0 × 1.7 mm (MNHN-IM-2000-40041), off French Guiana. **S**. Paratype, 3.1 × 1.7 mm (MNHN-IM-2000-40005), off French Guiana. **T**. Paratype, 2.8 × 1.5 mm (MNHN-IM-2000-40032), off French Guiana. **U**. Paratype, 2.8 × 1.9 mm (MNHN-IM-2012-43479), off French Guiana. **V**. Paratype, 2.9 × 1.6 mm (MNHN-IM-2000-40010), off French Guiana. **W**. Paratype, 2.7 × 1.4 mm (MNHN-IM-2000-40009), off French Guiana. – **X–GG**. *Psilocythara sucina* Fallon & Bouchet gen. et sp. nov. **X–BB**. Holotype, 3.1 × 1.8 mm, ventral, lateral, dorsal and apical views, and SEM image of protoconch (MNHN-IM-2012-5815), Grand Cul-de-Sac, Guadeloupe. **CC–DD**. Paratypes, 2.8 × 1.5 and 2.4 × 1.4 mm (MNHN-IM-2000-39795), the type locality. **EE**. Paratype, 2.6 × 1.3 mm (MNHN-IM-2000-39697), N of Grande-Terre, Guadeloupe. **FF**. Paratype, 2.9 × 1.5 mm (MNHN-IM-2000-39696), off Bellefontaine, Martinique. **GG**. Paratype, 3.0 × 1.5 mm (USNM 1715389), SW of Vétiver, Martinique. – **HH–SS**. *Psilocythara multicincta* (Rolán & Espinosa, 1999) gen. et comb. nov. **HH–LL**. Specs, 3.1 × 1.6, 2.7 × 1.4, 2.5 × 1.4 and 2.9 × 1.6 mm, with SEM image of protoconch (MNHN-IM-2012-5830), Antigues Point (Port-Louis), Guadeloupe. **mm**. Sequenced voucher, 3.2 × 1.7 mm (MNHN-IM-2013-20621), bouée PCA (S of Port-Louis, W of Petit Canal), Guadeloupe. **NN**. Sequenced voucher, 3.0 × 1.6 mm (MNHN-IM-2013-20597), Grand Cul-de-Sac Marin outside slope facing Fajou Island, Guadeloupe. **OO–PP**. Specs, 3.2 × 1.6 and 3.2 × 1.8 mm (MNHN-IM-2012-5810), Grand Cul-de-Sac Marin, Port-Louis (Oeil), Guadeloupe. **QQ–RR**. Specs, 2.8 × 1.5 and 2.9 × 1.7 mm (MNHN-IM-2000-39690), Le Robert, E Loup Bordelais, Martinique. **SS**. Spec., 3.1 × 1.8 mm (MNHN-IM-2000-39688), Anse Belleville, Martinique. Credits: C, G, BB, LL: SEM images courtesy of Paul Callomon. Scale bars: A–B, D–F, H–AA, CC–KK, MM–SS = 2 mm; C, G, BB, LL = 300 μm.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IM-2012-5810 • 1 spec., 2.3 × 1.3 mm; leaving Port-Louis; 16°23.74′ N, 61°32,07′ W; depth 49 m; 15 May 2012; KARUBENTHOS 2012; stn GB14; MNHN-IM-2012-5806 • 1 spec., 2.1 × 1.3 mm; 16°23,88′ N, 61°32.47′ W; depth 80 m; 16 May 2012; KARUBENTHOS 2012; stn GD32; MNHN-IM-2012-5816 • 5 specs, (2 measured) 2.95 × 1.6 and 2.6 × 1.4 mm; Pointe d'Antigues (Port-Louis); 16°25.99′ N, 61°32.92′ W; depth 45 m; 17 May 2012; KARUBENTHOS 2012; stn GS22; MNHN-IM-2012-5830 • 1 spec., 2.9 × 1.5 mm; Grand Cul-de-Sac Marin, in front of Fajou Island; 16°21.7′ N, 61°36.4′ W; depth 22 m; 5 May 2012; KARUBENTHOS 2012; stn GS05; MNHN-IM-2012-5826 • 1 spec., 2.3 × 1.3 mm; Grand Cul-de-Sac Marin; 16°21.97′ N, 61°37.98′ W; depth 11 m; 4 May 2012; KARUBENTHOS 2012; stn GS04; MNHN-IM-2012-5825 • 1 spec., 2.8 × 1.6 mm; Grand Cul-de-Sac Marin, Pointe Gris-Gris; 16°23.3′ N, 61°31.8′ W; depth 13 m; 16 May 2012; KARUBENTHOS 2012; stn GB17; MNHN-IM-2012-5809 • 1 spec., 3.1 × 1.65 mm; Grand Cul-de-Sac Marin; 16°21.72′ N, 61°36.35′ W; depth 22 m; 5 May 2012; KARUBENTHOS 2012; stn GB03; MNHN-IM-2012-5804 • 1 spec., 2.85 × 1.4 mm; Grand Cul-de-Sac Marin, external slope facing Fajou Island; 16°21.75′ N, 61°36.07′ W; depth 23 m; 6 May 2012; KARUBENTHOS 2012; stn GS06; MNHN-IM-2012-5827 • 1 spec., 3.6 × 1.9 mm; Grand Cul-de-Sac Marin; 16°21.97′ N, 61°37.98′ W; depth 11 m; 8 May 2012; KARUBENTHOS 2012; stn GB02; MNHN-IM-2012-5803 • 2 specs, 2.9 × 1.5 and 2.6 × 1.45 mm; entrance to the Barracuda Cave, Port-Louis; 16°27.34′ N, 61°32.07′ W; depth 19 m; 16 May 2012; KARUBENTHOS 2012; stn GB16; MNHN-IM-2012-5808 • 1 spec., 3.5 × 1.75 mm; bouée PCA, S Port-Louis (W Petit Canal); 16°22.57′ N, 61°31.74′ W; depth 8 m; 15 May 2012; KARUBENTHOS 2012; stn GB15; MNHN-IM-2012-5807 • 1 spec., ethanol-preserved, 3.1 × 1.5 mm; Lizzard Point; 16°08.43′ N, 61°46.92′ W; depth 12 m; 7 May 2012; KARUBENTHOS 2012; stn GS07; MNHN-IM-2019-35025.

MARTINIQUE • 1 spec., 3.6 × 1.9 mm; off Macouba; 14°53.6′ N, 61°08.8′ W; depth 36 m; 22 Sep. 2016; MADIBENTHOS; stn AD259; MNHN-IM-2000-39693 • 1 spec., length = 3.0 mm; off Macouba; 14°55′ N, 61°08.9′ W; depth 80 m; 27 Sep. 2016; MADIBENTHOS; stn AD275; MNHN-IM-2000-39686 • 1 spec., 3.0 × 1.6 mm; off Macouba; 14°55′ N, 61°08.8′ W; depth 77 m; 25 Sep. 2016; MADIBENTHOS; stn AD264; MNHN-IM-2000-39691 • 1 spec., length = 3.2 mm; north of the peninsula of Caravelle; 14°52.1′ N, 60°53.7′ W; depth 59 m; 18 Sep. 2016; MADIBENTHOS; stn AD244; MNHN-IM-2000-39687 • 2 specs, 3.1 × 1.8 and 2.9 × 1.6 mm; Le Prêcheur, Anse Belleville; 14°49.1′ N, 61°13.8′ W; depth 20-25 m; 8 Oct. 2016; MADIBENTHOS; stn AS576; MNHN-IM-2000-39688 • 1 spec., 2.7 × 1.5 mm; NE Le Lorrain; 14°51.3′ N, 61°01.7′ W; depth 49 m; 21 Sep. 2016; MADIBENTHOS; stn AD256; MNHN-IM-2000-39689 • 2 specs, 2.9 × 1.7 and 2.8 × 1.5 mm; Le Robert, E Loup Bordelais; 14°42.9′ N, 60°50.8′ W; depth 43 m; 17 Sep. 2016; MADIBENTHOS; stn AD239; MNHN-IM-2000-39690 • 1 spec., 2.85 × 1.5 mm; Bellefontaine; 14°40.2′ N, 61°10′ W; depth 40 m; 2 Oct. 2016; MADIBENTHOS; stn AD286; MNHN-IM-2000-39692.

ST. VINCENT AND THE GRENADINES • 1 spec., 4.0 × 2.2 mm; St. Vincent Island; depth 45 m; J. Colomb leg.; dredged; MNHN-IM-2000-39684 • 1 spec., 3.7 × 1.8 mm; St. Vincent Island; depth 8–10 m; J. Colomb leg.; dredged; MNHN-IM-2000-39685.

Description

The original description appears in Rolán & Espinosa (1999: 47, figs 6–7, 19–21). *Shell* biconic, solid with a glossy surface, of about 5 mostly convex whorls, the last whorl with an obtusely angle shoulder and about 78% of the shell's length. Aperture is an elongated oval. The *protoconch* has 2½ whorls, the first minute, then rapidly expanding, the last with riblets and the last with 3 spiral grooves that segment the riblets into beads. The teleoconch has *axial ribs* that run from suture to suture on spire whorls evanesce about mid-whorl on the last. Deep, well-spaced *spiral grooves* cover the shell, shoulders, and sides, lending the appearance of the surface covered with flattened cords. *Outer lip* is thin, strengthened by the last rib. *Anal sinus* shallow, separated from the parietal wall by a callus. *Anterior canal* is very short and open, end unnotched.

Remarks

The average length of 38 measured specimens is 4.5 mm (range = 1.7–4.0 mm).

Range and habitat

Cuba (type locality), Guadeloupe, Martinique, and St. Vincent and the Grenadines; depth 8–80 m.

Genus ***Pyrgocythara*** Woodring, 1928

Type species

Pyrgocythara eminula Woodring, 1928, by original designation.

Summary diagnostic characteristics

Shell is slender, translucent when fresh, with turreted or subangulate whorls and a spire shorter than last whorl.

Aperture is a narrow oval with a short anterior canal.

Protoconch of 3–3½ whorls, with a minute tip, and ending with about 1¾–2⅛ whorls of well-spaced, fine curved riblets.

Outer lip varicose, anal sinus wide, with a parietal callus and denticle inside outer lip.

Sculpture of narrow to moderately wide axials and of spirals of alternating strengths, appearing like a basket weave.

Spirals lightly segmented by dense growth lines; not "frosted", usually without swelling or spikes on rib crests.

Shell surface microsculpture

Spirals are segmented by growth striae but without structures at their intersection, unlike 'frosted' genera. At 850× magnification microscopic granules are distributed evenly over the shell surface in a non-random pattern (Fig. 100). These microscopic granules differ from the microscopic angular structures that are arranged in rows on the shell surface of *Cryptomangelia* Fallon gen. nov. In *Vitricythara* Fargo, 1953, granules are much smaller, absent (at magnifications employed), or differ in form between intercalary space and spiral surfaces.

Differences from other genera

Vitricythara Fargo, 1953 differs in that it has weaker secondary spirals, spirals with swellings or spikes on rib crests, and a longer, narrower aperture, including anterior canal. It also has primary spirals and axial ribs that are subequal in strength, creating a reticulate surface.

Tenaturris Woodring, 1928 has a narrower aperture, shorter spire with respect to the body whorl, anal sinus lacking a callus on parietal wall, and spirals of uniform strength.

Acmaturris Woodring, 1928 and *Adelocythara* Woodring, 1928 both have a broad-tipped protoconch, not a minute one characteristic of *Pyrgocythara*, and have a 'frosted' surface. These microsculptural elements are absent in *Pyrgocythara*.

Agathotoma Cossmann, 1889 lacks primary spiral sculpture, possessing only secondaries, and has a denticle inside the outer lip below the anal sinus. It has from none to about ½-whorl of riblets at the end of the protoconch. Secondary spirals are 'frosted'.

Platycythara Woodring, 1928 was erected for a fossil species. *Mangilia elata* Dall, 1889, was reclassified in *Platycythara* by Lyons (1989) but this species has a minute protoconch and lightly segmented spirals, which along with other important characteristics, is consistent with *Pyrgocythara*.

Cryptomangelia Fallon gen. nov. has a distinctly different protoconch (2–2½ whorls, the last fully or partially marked with fine riblets crossed by up to 2 spirals on the last portion of the protoconch, has stronger and fewer ribs, and is usually colored with brown bands.

Bathyturris Fallon gen. nov. lacks an anal sinus tooth and has a 'frosted' surface microsculpture.

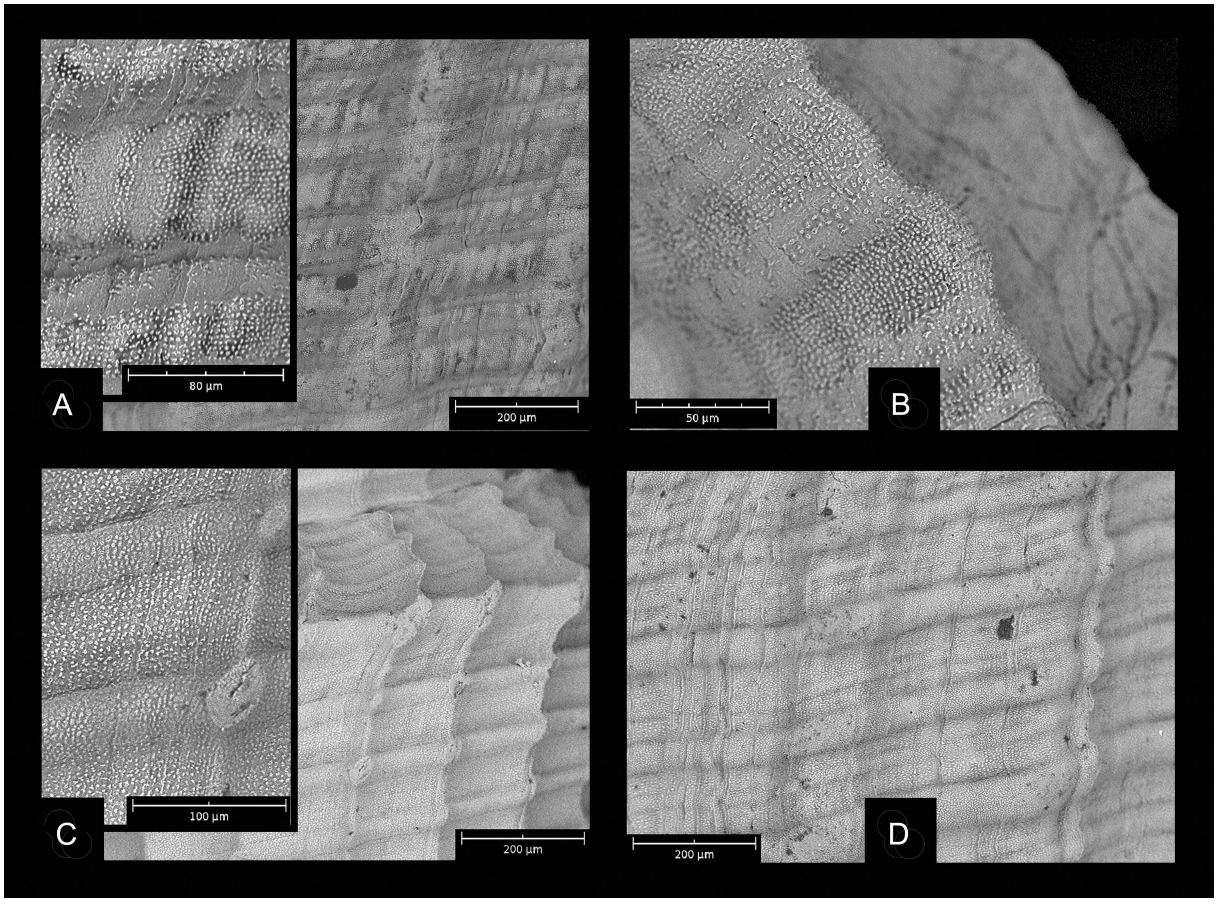

Fig. 100. Species of *Pyrgocythara* Woodring, 1928, shell surface microsculpture. **A–B**. *Pyrgocythara trilineata* (C.B. Adams, 1845) comb. nov. **A**. Spec., 4.5 × 3.0 mm (MNHN-IM-2013-71485), N of Cape Enragé, Martinique. Segmentation of spirals by growth increments is visible at lower magnification. Minute, microscopic granules arranged in compact rows over the shell surface are shown in the inset. **B**. Surface relief of granules at higher magnification is seen on the crest of a rib (lower magnification). **C–D**. *Pyrgocythara elata* (Dall, 1889) comb. nov. Spec., 2.9 × 1.4 mm (UF 589866), W of Dry Tortugas, Florida Keys. **C**. Spirals are segmented by growth lines, much farther apart in this juvenile specimen than in the image of the fully developed *P. trilineata*. The shell surface is covered with microscopic granules, although they are not as well organized into rows as in *P. trilineata*, as shown in the inset. **D**. *Pyrgocythara elata* (Dall, 1889) comb. nov. Spec., 6.7 × 2.6 mm (UF 589867), 26 mi. [42 km] E of St Augustine, St Johns Co., E Florida. More mature specimen than in C, showing a single spiral secondary between primaries. Credits: SEM images courtesy of Paul Callomon. Scale bars: A, C–D = 200 µm; B = 50 µm; inset scale bars: A = 80 µm; C = 100 µm.

Remarks

The concept of the genus *Pyrgocythara* has been obscured by the inclusion of species that are stouter, more coarsely ribbed, have weaker spirals, protoconchs of fewer whorls, and are colored with wide brown bands, i.e., *Pyrgocythara vicina*, *P. crassicostata*, *P. albovittata*, *P. cinctella*, *P. brevis*, *P. hemphilli*, *P. filosa*, and *P. plicosa*, none of which meet the diagnostic criteria of *Pyrgocythara*. The first authors to use Pyrgocythara for these shallow-water species were Bartsch & Rehder (1939) for *P. hemphilli*, followed by Fargo (1953) for *P. emeryi*, a fossil species. This latter author reasoned that although its protoconch is only 1½ whorls (the type of *Pyrgocythara* has 3) and is blunt-tipped, he settled on *Pyrgocythara* because the similar Recent species living in the same area, *P. hemphilli* Bartsch & Rehder, 1939, lacked frosting (but not the 3-whorled, small-tipped protoconch). *Pyrgocythara hemphilli* is now proposed to be combined in *Cryptomangelia* Fallon gen. nov. in this work.

Phylogenetic relationships

The DNA sequence data support the monophyly of the genus *Pyrgocythara*, with the two sequenced species forming a well-supported clade. The lineage is recovered as a sister to the genus *Vitricythara*, with 100% bootstrap support. All sequenced species show a modest intraspecific variability (average intraspecific p-distance range: 0.5–0.8%).

Pyrgocythara subtilis (R.B. Watson, 1881) comb. nov.
Fig. 102C–E

Pleurotoma (*Mangelia*) *subtilis* R.B. Watson, 1881: 430–432.

Pleurotoma (*Mangelia*) *subtilis* – R.B. Watson 1886: pl. 23 fig. 4a–b.
"*Agathotoma*" *subtilis* – Rios 1985: 143, pl. 48 fig. 663.

The variable width, wide, closely packed, flat spirals of P. subtilis are different from Pyrgocythara trilineata (C.B. Adams, 1845) comb. nov., where spirals are more rounded and not tightly packed. The sculpture of P. subtilis may be a variant of that of P. trilineata, in which case the taxon would be a junior synonym.

Type material

Holotype by monotypy (ICZN Art. 73.1.2.)
BRAZIL • 3.9 × 1.7 mm; off Pernambuco; 9°05.0′ S, 34°50.0′ W; depth 640 m; Oct. 9, 1873; HMS Challenger exped., stn 122; NHMUK 1887.2.9.1055. A single specimen is listed as a syntype in the NHMUK data portal, and Watson (1881: 430–432) makes no mention of other specimens, so this specimen is taken to be the holotype.

Paratypes
None known.

Material examined

A fine photograph of the type was downloaded from the NHMUK data portal. No specimens have been found in the material examined for this work.

Description

The original description appears in Watson (1881: 430–432).

Remarks

Watson's description of the protoconch is not complete, but the presence of a "pointed embryonic whorl" probably indicates that the tip is minute, an important characteristic of *Pyrgocythara*. However, he states that the embryonic shell has only 1½ whorls without mentioning whether riblets are present on a succeeding whorl, which is considered part of the teleoconch by some. Also, the microscopic hair-like lines of growth are revealing, and together with the morphological features visible in the photographs, affirm the assignment of this species to *Pyrgocythara*.

Range and habitat

This bathyal species is known only from the type specimen.

Pyrgocythara trilineata (C.B. Adams, 1845) comb. nov.
Figs 100A–B, 101, 102F–U

Pleurotoma trilineata C.B. Adams, 1845 [Jan.]: 3.

Pleurotoma trifasciata Reeve, 1845 [Dec.]: pl. 33 fig. 297 is a synonym according to Tryon 1884: 248 and Tomlin (1934: 39), which is accepted here. One syntype is in NHMUK 1874.10.31.10, with an unknown locality.

Pleurotoma costata Reeve, 1845: pl. 33 fig. 298, non *costata* Link, 1808, nec Pennant, nec Eichwald, 1830, and is a synonym according to Krebs (1864). Two syntypes, 6.4 × 2.5 and 7.2 × 2.6 mm, are in NHMUK 1874.10.31.9, type locality St. Vincent, West Indies [St. Vincent and the Grenadines] (see Fig. 79Z–BB). Its synonymy here is based on the comparison of *Pleurotoma costata* Reeve, 1845 types with variants of *Pleurotoma trilineata* C.B. Adams, 1845.

Kurtziella trilineata var. *macula* Nowell-Usticke, 1969: 28, pl. 6 fig. 1199 is a varietal name given to the form with a brown patch behind the inside of the aperture and lacking the 3 spiral lines.

Pleurotoma (*Mangilia*) *decora* E.A. Smith, 1882: 215, is the replacement name for *Pleurotoma costata* Reeve, 1845.

Mangilia trilineata – Tryon 1884: 247, pl. 18 fig. 36 as junior synonym of *Mangilia costata* (Reeve, 1845).

Defrancia costata – H. & A. Adams 1853: 95.

Tenaturris trilineata – Powell 1966: 101. — de Jong & Coomans 1988: 114; pl. 18 fig. 609. — Diaz & Puyana 1994: 227. — Redfern 2013: 216–217, fig. 603a–d.

Cryoturris trilineata – Abbott 1974: species 3238. — Vokes & Vokes 1983: 58, pl. 29 fig. 9. — García & Lugue 1986: 48. — Espinosa *et al*. 1995: 44.

Tenaturris decora – It has been treated as a separate species by Sander & Lalli 1982: 317. — Rios 1983: 114; 1985: 143, pl. 49 fig. 667; 1994: 176; pl. 58 fig. 810. — Williams 2005: #5761. Or as a white variant of *T. trilineata* (Reeve, 1845) by de Jong & Coomans (1988: 114). Note that one syntype of *T. decora* is not all-white but has a brown band on its dorsum (Fig. 102S–U), reinforcing de Jong & Cooman's (1988) claim of synonymy.

Agathotoma trilineata – Redfern 2001: 130, pl. 59 fig. 538a–c, pl. 112 fig. 538d.

Differential diagnosis

Typical specimens of *Pyrgocythara trilineata* (C.B. Adams, 1845) comb. nov. have three brown spiral lines on the last whorl and/or a yellowish-brown band inside the upper two-thirds of the outer lip. This contrasts with the apertural banding of the genus *Vitricythara*, in which the brown band is generally located in the lower one-third of the aperture.

Pyrgocythara elata (Dall, 1889) comb. nov. differs in having more ribs and straight whorl sides. The last whorl tapers more acutely, and a strong sutural spiral absent in *P. trilineata*.

Pyrgocythara fenestrata Fallon & Bouchet sp. nov., see under this species for differences from *P. trilineata*.

Vitricythara lavalleana (d'Orbigny, 1853) has a longer anterior canal, fewer spirals, and is colored differently. Its surface is distinctly reticulate, and with fewer spirals, it appears more translucent.

Vitricythara fassioae Fallon & Bouchet sp. nov. has a longer anterior canal, fewer spirals, and is colored differently.

Vitricythara magnini Fallon & Bouchet sp. nov. has a more distinct reticulate sculpture, and reddish, brown-stained anterior (canal and fasciole).

Type material

Lectotype

The lectotype was designated by Clench & Turner (1950: pl. 29 fig. 15, pl. 49 fig. 5).

JAMAICA • 4.6 × 12.8 mm; MCZ 177361.

Paralectotypes

None known.

Material examined (306 specs)

A total of 306 specimens were examined. 187 from MNHN Guadeloupe samples, 81 from MNHN Martinique samples, and a single specimen from MNHN French Guiana samples. Additionally, 37 specimens were examined from the Bahamas, St. Vincent and the Grenadines, and Grenada. Information about Guadeloupe and Martinique live caught specimens, and some of the variants that are illustrated in the figure, are given below.

BAHAMAS • 3 specs, 5.3 × 2.0, 5.3 × 2.1 and 4.4 × 1.8 mm; Exumas, Long Cay; depth 0 m; Nov. 1963; Dieter Cosman leg.; in beach drift; UF 589868.

GUADELOUPE • 1 spec., 3.7 × 1.6 mm; outside slope facing Fajou Island, Grand Cul-de-Sac Marin; 16°21.72′ N, 61°36.35′ W; depth 22 m; 5 May 2012; KARUBENTHOS 2012; stn GS05; sequenced; MNHN-IM-2013-20592 • 1 spec., 5.6 × 2.2 mm; the 3 arches (Port-Louis); 16°23.26′ N, 61°31.79′ W; depth 10 m; 14 May 2012; KARUBENTHOS 2012; stn GB13; sequenced; MNHN-IM-2013-20837 • 1 spec., 5.7 × 2.2 mm; Bouillante Bay; 16°08.07′ N, 61°46.71′ W; depth 6 m; 10 May 2012; KARUBENTHOS 2012; stn GB09; sequenced; MNHN-IM-2013-20661 • 1 spec., 3.8 × 1.7 mm; Lizard Point; 16°08.43′ N, 61°46.92′ W; depth 12 m; 7 May 2012; KARUBENTHOS 2012; stn GS07; sequenced; MNHN-IM-2013-20660 • 1 spec., 4.2 × 1.7 mm; Amedier Cave (Pointe de la Vigie); 16°30.04′ N, 61°28.79′ W; depth 16 m; 19 May 2012; KARUBENTHOS 2012; stn GB23; sequenced; MNHN-IM-2013-20659 • 1 spec., 3.9 × 1.7 mm; Lizzard Point; 16°08.43′ N, 61°46.92′ W; depth 12 m; 7 May 2012; KARUBENTHOS 2012; stn GS07; sequenced; MNHN-IM-2013-20560 • 1 spec., 4.7 × 1.9 mm, ethanol-preserved; Grand Cul-de-Sac Marin; 16°21.97′ N, 61°37.98′ W; depth 11 m; 4 May 2012; KARUBENTHOS 2012; stn GS04; MNHN-IM-2019-34677 • 1 spec., 5.5 × 2.1 mm, ethanol-preserved; sandy bottoms in seagrass *Halophila stipulacea*; 16°12.42′ N, 61°47.12′ W; depth 35 m; 8 May 2012; KARUBENTHOS 2012; stn GD08; MNHN-IM-2019-34692 • 1 spec., 5.0 × 2.1 mm, ethanol-preserved; sandy bottoms in seagrass *Halophila stipulacea*; 16°12.42′ N, 61°47.12′ W; depth 35 m; 8 May 2012; KARUBENTHOS 2012; stn GD08; MNHN-IM-2019-34693 • 1 spec., 3.7 × 1.6 mm,

ethanol-preserved; bouée PCA; 16°22.57′ N, 61°31.74′ W; depth 8 m; 15 May 2012; KARUBENTHOS 2012; stn GS19; MNHN-IM-2019-34706 • 1 spec., 3.5 × 1.4 mm, ethanol-preserved; Caye Plate (PCSM); 16°10.97′ N, 61°32.41′ W; depth 14 m; 25 May 2012; KARUBENTHOS 2012; stn GS33; MNHN-IM-2019-34733 • 1 spec., 4.3 × 1.7 mm, ethanol-preserved; Lizard Point; 16°08.43′ N, 61°46.92′ W; depth 12 m; 7 May 2012; KARUBENTHOS 2012; stn GS07; MNHN-IM-2019-34690 • 1 spec., 4.7 × 1.9 mm, ethanol-preserved; Ilet Gosier, Petit Cul-de-Sac Marin; 16°11.8′ N, 61°29.66′ W; depth 6 m; 3 May 2012; KARUBENTHOS 2012; stn GS03; MNHN-IM-2019-34676 • 1 spec., 2.8 × 1.3 mm, ethanol-preserved; Oil (Port-Louis); 16°26.78′ N, 61°32.41′ W; depth 16 m; 18 May 2012; KARUBENTHOS 2012; stn GS24; MNHN-IM-2019-34722 • 2 specs, 5.9 × 2.3 and 5.6 × 2.2 mm; Bouillante Bay; 16°08.07′ N, 61°46.71′ W; depth 6 m; 10 May 2012; KARUBENTHOS 2012; stn GB09; MNHN-IM-2012-8979.

MARTINIQUE • 1 spec., 4.4 × 1.8 mm; Cheval Blanc, Bellefontaine; 14°39.7′ N, 61°09.6′ W; depth 9 m; 30 Sep. 2016; MADIBENTHOS,stn AS373; MNHN-IM-2000-39698 • 1 spec., 5.5 × 2.0 mm; Rocher du Diamant; 14°26.7′ N, 61°02.3′ W; depth 19–21 m; 9 Sep. 2016; MADIBENTHOS; stn AS057; sequenced; MNHN-IM-2013-70265 • 1 spec., 4.6 × 1.9 mm; NE of Cayes Pariadis, E of Le Vauclin; 14°34.7′ N, 60°45.9′ W; depth 18 m; 16 Sep. 2016; MADIBENTHOS; stn AS081; sequenced; MNHN-IM-2013-70812 • 1 spec., 4.5 × 2.0 mm; N of Cape Enragé; 14°39.2′ N, 61°09.2′ W; depth 8 m; 27 Sep. 2016; MADIBENTHOS; stn AR462, rock bottom; sequenced; MNHN-IM-2013-71485 • 1 spec., 4.8 × 1.9 mm; Rocher du Diamant; 14°26.7′ N, 61°02.3′ W; depth 19–21 m; 9 Sep. 2016; MADIBENTHOS; stn AS057; sequenced; MNHN-IM-2013-70266 • 1 spec., 7.0 × 2.6 mm; S of Pimantée Point, Trois Rivières; 14°27.5’ N, 60°58.2’ W; depth 17–19 m; 9 Oct. 2016; MADIBENTHOS; stn AS579; MNHN-IM-2000-39868.

ST. VINCENT AND THE GRENADINES • 1 spec., 4.7 × 1.8 mm; Ronde Island; depth 24 ft [7 m]; 3 May 2005; G. Mackintosh leg.; night SCUBA; UF 589869 • 2 specs, lengths = 5.3 and 4.3 mm; Bequia, before Moonhole; 25 ft [7.6 m]; 5 Jul. 2004; G. Mackintosh leg.; night SCUBA sieved; ANSP 498957 • 1 spec., length = 5.2 mm; Canouan Island, S of Corbec Bay; depth 25 ft [7.6 m]; 16 Jun. 1997; G. Mackintosh leg.; night SCUBA; ANSP 498957.

Description

A re-description is warranted here due to Adams’s (1845) unsatisfactory brief one. Shell small, fusiform (length = 4.5 mm, W/L = 0.4444), translucent; in total, 6¾ whorls, with the last whorl about 70% of shell length; whorl sutures impressed, with slightly convex, sloped shoulders marked at the whorl periphery by a primary spiral, followed by slightly convex whorl sides; sculpture consists of low narrow ribs overridden by spirals of alternating strengths; the aperture is a narrow oval, varicose, with a wide anal sinus and a short anterior canal delineated by a tapered anterior, with the aperture and canal measuring about 50% of shell length. Protoconch consists of 3–3½ glossy whorls, with the first whorl minute and protruding, and the last 1¾–2 whorls containing oblique arched riblets that grow stronger and wider apart toward the lip. Axial sculpture of 16 narrow ribs on the penultimate whorl and 14 on the last to the varix, extending from suture to suture on spire whorls and fading before the anterior fasciole. Ribs are recurved, narrower, and lower on whorl shoulders, then angled at the shoulder edge, spaced about their width on whorl sides, more so on the dorsum of the last whorl. A varix at the aperture, crenated by spirals, is much larger than preceding ribs, running from slightly above the suture, angled at the shoulder, and curved around the anal sinus, then leading to the anterior canal. It is thickened inside the aperture. The spiral sculpture consists of primary and secondary spirals; a single subsutural primary is followed by an alternating sequence of flattened primaries and minute secondaries on the whorl shoulder. A strong primary defines the edge of the shoulder and is followed by 5 primaries on whorl sides with 1 or 2 secondaries in between. The shell base, including the sutural primary spiral, has 6 additional primaries with a secondary in between. Primaries are slightly flattened and slightly swollen on rib crests. A sulcus is absent. Recurved ribs on the shoulder indicate past positions of the anal sinus. The outer lip is varicose

and narrow, extending from the inner edge of the varix and then from the anal sinus to the stromboid notch in a low arc. The anal sinus is as wide as the shoulder, deep with a round apex, with a denticle inside the outer lip and a callus on the parietal wall. The inner lip is a narrow glaze, unemarginate. The anterior fasciole is not swollen and has about 8 oblique spirals. The anterior canal is short and open, roughly differentiated by the tapering of the last whorl, very slightly notched and turned slightly to the left at its end when viewed ventrally. Color light yellowish-brown to white, with (on the 3-spiraled color form) 3 reddish-brown primary spirals: on the suture, a 2nd spiral on the whorl side, and a spiral at the suture line.

Animal

Photographs of live specimens from Martinique that were later sequenced show a translucent milky-white animal, with opaque areas and white spots in its foot, and a proboscis with small yellowish spots. Eyes (seen as black spots) are midway along the fleshy cephalic tentacles. The foot appears to be horned anteriorly with a pointed posterior (Fig. 101).

Fig. 101. *Pyrgocythara trilineata* (C.B. Adams, 1845) comb. nov. (MNHN-IM-2013-70265 and 71485), ventral and dorsal views of different live specimens. Photos by C. Redfern.

Remarks

Placement of *Pleurotoma trilineata* C.B. Adams, 1845 in the genus *Tenaturris* (Powell 1966) has been the most widely used combination by recent authors. Other combinations include *Cryoturris* (Abbott 1974) and *Agathotoma* (Redfern 2001). The genus *Pyrgocythara* seems to have been largely overlooked, perhaps because it was erected for a single fossil species by Woodring (1928).

Pyrgocythara trilineata (C.B. Adams, 1845) comb. nov. has the diagnostic characteristics of the genus listed at the beginning of this part. It has been stated as probably the same as the fossil species *Pyrgocythara eminula* Woodring, 1928, type species of the genus (Faber 2004: 57). No effort has been made at this time to confirm whether they are the same. *Pyrgocythara eminula* is depicted in Fig. 102A–B for comparison.

The average length of 105 measured specimens is 4.6 mm (range = 2.0–7.4 mm). *Pyrocythara trilineata* is a variable species in both color pattern and shape (shoulder angle and size); that the several forms shown in Fig. 102 are all the same species is supported on key morphological grounds and sequence data analysis. Some color forms have reddish-brown spirals, others have broad orange bands, and some have a single brown band on the shell dorsum.

Range and habitat

Pyrgocythara trilineata has a wide range in the western Atlantic and eastern Caribbean Sea, extending from the Bahamas to French Guiana. Most examined specimens are from Guadeloupe, and Martinique; depth 0–60 m, most taken in less than 20 m. Other specimens have been both examined and/or reported from Jamaica and St. Vincent and the Grenadines (stated type localities), and from the Bahamas (Redfern 2001; 2013) E Florida (Hirsh 2006), Cayman Islands (ANSP 336205), Cuba (UF lot), Grenada, and Netherlands Antilles (ANSP 351025).

Pyrgocythara fenestrata Fallon & Bouchet sp. nov.
urn:lsid:zoobank.org:act:350E23AA-6380-4F8C-B585-E5505446172D
Fig. 102V–CC

Differential diagnosis

The most apparent difference from the similar *Pyrgocythara trilineata* is that primary spirals are equal in strength to axials, with their intersection forming regular squares in intercalary spaces. In the latter species, spirals are weaker. The color is usually different, although all-white specimens of *P. trilineata* have been found in the Bahamas. Upon closer examination, the spirals of *P. fenestrata* are knotty and opaque, contrasting with the smooth and glassy spirals of (fresh) *P. trilineata*.

Etymology

Pyrgocythara fenestrata Fallon & Bouchet sp. nov. is derived from the feminine form of the Latin adjective '*fenestrata*', meaning 'windowed'. It is named for the window-like squares created by the intersection of subequal spirals and axials.

Type material

Holotype

GUADELOUPE • 4.4 × 1.8 mm; Bouée PCA; 16°22.57′ N, 61°31.74′ W; depth 8 m; 15 May 2012; KARUBENTHOS 2012; stn GS19; sequenced; MNHN-IM-2013-20633.

Paratypes (8 specs**)**
FRENCH GUIANA • 1 spec., length = 6.2 mm; offshore; 6°33' N, 52°28' W; depth 130–131 m; 4 Aug. 2014; GUYANE 2014; stn CP4379; dredged; MNHN-IM-2012-43492.

GUADELOUPE • 1 spec., 5.7 × 2.2 mm; Grand Cul-de-Sac Marin; 16°21.25′ N, 61°35.08′ W; depth 3 m; 2 May 2012; KARUBENTHOS 2012; stn GS01; sequenced; MNHN-IM-2013-20565 • 1 spec., 4.1 × 1.7 mm; Grand Cul-de-Sac Marin, outside slope facing Fajou Island; 16°21.72′ N, 61°36.35′ W; depth 22 m; 5 May 2012; KARUBENTHOS 2012; stn GS05; sequenced; MNHN-IM-2013-20591 • 1 spec., 4.3 × 1.7 mm, sequenced; the type locality; sequenced; MNHN-IM-2013-20648 • 1 spec., 4.5 × 1.8 mm; Grand Cul-de-Sac Marin; 16°21.87′ N, 61°31.78′ W; depth 5 m; 20 May 2012; KARUBENTHOS 2012; stn GS27; sequenced; MNHN-IM-2013-20649 • 1 spec., 3.3 × 1.5 mm; Pointe Grigri; 16°23.26′ N, 61°31.79′ W; depth 13 m; 16 May 2012; KARUBENTHOS 2012; stn GB17; sequenced; MNHN-IM-2013-20639 • 1 spec., 4.7 × 2.0 mm; Lizzard Point; 16°08.43′ N, 61°46.92′ W; depth 12 m; 7 May 2012; KARUBENTHOS 2012; stn GS07; sequenced; MNHN-IM-2013-20602 • 1 spec., 5.7 × 2.2 mm; Lizard Point; 16°08.43′ N, 61°46.92′ W; depth 12 m; 7 May 2012; KARUBENTHOS 2012; stn GB05; sequenced; MNHN-IM-2013-20568.

Description

Shell small, fusiform (length = 4.4 mm, W/L = 0.4091), opaque, about 6¼ whorls altogether, sutures impressed, with sloped shoulders slightly rounded to straight whorl sides, the last whorl about 70% of shell length; sculpture of low narrow ribs overridden by spirals of alternating strengths; aperture a narrow oval, varicose, with a wide anal sinus and short anterior canal delineated by a tapered anterior, aperture and canal about 52% of shell length. *Protoconch* of 3–3½ glossy whorls, the first whorl minute, protruding, the last 2–2½ whorls with oblique, with rather widely spaced arched riblets that grow stronger and wider apart toward the lip. *Axial sculpture* of low, flattened ribs that extend from suture to suture on spire whorls and evanesce prior to the anterior fasciole. Ribs slightly recurved on whorl shoulders, and spaced about their width on whorl sides, more so on the dorsum of the last whorl. *Varix* at aperture, distinctly crenated by primary spirals, much larger than preceding ribs, arched above suture, curved around anal sinus, then to anterior canal. It is thickened inside the aperture. *Spiral sculpture* of primary and secondary spirals; 4–5 secondaries present on shoulder. A strong primary defines the edge of the shoulder and is followed by 3 primaries on whorl sides with 1 secondary between. The shell base, including the sutural primary spiral, has about 4 more primaries with a secondary between. Primaries are flattened and subequal in strength to the axial ribs, their appearance knobby, likely an effect of incremental growth, and slightly swollen on rib crests. *Sulcus* absent. Recurved ribs on the shoulder are evidence of past positions of the anal sinus. *Outer lip* is heavily varicose. *Inner lip* a narrow glaze, unemarginate. *Anterior fasciole* is not swollen, with about 8 oblique spirals. *Anterior canal* is short, open, roughly differentiated by the tapered last whorl, unnotched, and turned slightly to the left at its end when viewed ventrally. *Color* white with yellowish brown streaks in alternating intercostal shoulder spaces.

Remarks

The average standard length of 7 specimens is 4.4 mm (range = 3.3–6.2 mm). All have fully formed varices. Coloration varied in the number and intensity of shoulder streaks, and some specimens possess dark reddish brown bands on the inside of the shell.

Range and habitat

French Guiana, Guadeloupe (Grande-Terre); depth 3–131 m.

Pyrgocythara unid. sp. U
Fig. 102DD

Differential diagnosis

A translucent, cylindrical shell unlike any others in the genus group.

Material examined (1 spec.)

BRAZIL • 1 spec., 4.2 × 1.6 mm; Bahia State, Itapua Beach; Mar. 1989; G. Pomponet leg.; in beach drift; ANSP 498958.

Partial description

Shell small, turreted, cylindrical, of 6½ whorls, spire shorter than body whorl, aperture narrow, varicose, with a deep anal sinus and short anterior canal. *Protoconch* of about 2½ smooth, regularly expanding whorls, tip small, the last whorl with riblets weak at first then growing strong at the end. *Axial sculpture* of narrow ribs that extend from suture to suture on spire whorls and evanesce on the shell base. Intercostal space about the same as rib width. *Spiral sculpture* of evenly space primary spirals.

Fig. 102. Species of *Pyrgocythara* Woodring, 1928. Part 1. – **A–B**. *Pyrgocythara eminula* Woodring, 1928, holotype, type of the genus, 4.4 × 1.3 mm (USNM 369386), Bowden formation, Jamaica (fossil). – **C–E**. *Pleurotoma* (*Mangelia*) *subtilis* R.B. Watson, 1881, syntype, 3.9 × 1.7 mm, ventral, lateral and dorsal views (NHMUK 1887.2.9.1055), off Pernambuco, Brazil. – **F–H**. *Pleurotoma trilineata* C.B. Adams, 1845, lectotype, 4.6 × 1.8 mm, ventral, lateral and dorsal views (MCZ 177361), Jamaica. – **I–J**. *Pleurotoma trifasciata* Reeve, 1845, syntype, length = 5.2 mm, ventral and lateral views (NHMUK 1874.10.31.10), locality unknown. – **K–R**. *Pyrgocythara trilineata* (C.B. Adams, 1845) comb. nov. Examples illustrate species variability. **K**. Sequence voucher, 5.6 × 2.2 mm (MNHN-IM-2013-20837), Les 3 arches (Port-Louis), Guadeloupe. **L**. Sequence voucher, 5.5 × 2.0 mm (MNHN-IM-2013-70265), Rocher du Diamant, Martinique. **M**. Spec., ethanol-preserved live caught, 4.7 × 1.9 mm (MNHN-IM-2019-34676), Petit Cul-de-Sac Marin, Guadeloupe. **N**. Spec., length = 4.7 mm (UF 589869), Ronde Island, Saint Vincent and the Grenadines. **O**. Spec., 5.3 × 2.0 mm (UF 589868), Long Cay, Exumas, Bahamas. **P–Q**. Sequence voucher, 4.5 × 2.0 mm, ventral view, and SEM image of protoconch (MNHN-IM-2013-71485), Fond Boucher, N of Cape Enragé, Martinique. **R**. Spec., 7.0 × 2.6 mm (MNHN-IM-2000-39868), Trois Rivières, S of Pimantée Point, Martinique. – **S–U**. *Pleurotoma* (*Mangilia*) *decora* (E.A. Smith, 1882), name replacing *Pleurotoma costata* (Reeve, 1845), syntypes, 7.2 × 2.6 and 6.4 × 2.5 mm, ventral and dorsal views (NHMUK 1874.10.31.9), Saint Vincent Island, Saint Vincent and the Grenadines. A synonym of *P. trilineata*. – **V–CC**. *Pyrgocythara fenestrata* Fallon & Bouchet sp. nov. **V**. Paratype, sequence voucher, 5.7 × 2.2 mm (MNHN-IM-2013-20565), Grand Cul-de-Sac Marin, Guadeloupe. **W–Y**. Holotype, sequence voucher, 4.4 × 1.8 mm, ventral, lateral and dorsal views (MNHN-IM-2013-20633), bouée PCA, Guadeloupe. **Z**. Paratype, sequence voucher, 4.1 × 1.7 mm (MNHN-IM-2013-20591), outside slope facing Fajou Island, Grand Cul-de-Sac Marin, Guadeloupe. **AA**. Paratype, sequence voucher, 4.3 × 1.7 mm (MNHN-IM-2013-20648), bouée PCA, Guadeloupe. **BB**. Paratype, sequence voucher, 4.5 × 1.8 mm (MNHN-IM-2013-20649), Grand Cul-de-Sac Marin, Guadeloupe. **CC**. Paratype, sequence voucher, 3.3 × 1.5 mm (MNHN-IM-2013-20639), Grigri Point, Guadeloupe. – **DD**. *Pyrgocythara* unid. sp. U. Spec., 4.2 × 1.6 mm (ANSP 498958), Bahia, Brazil. Distinctive undescribed species shown for comparison. Credits: C–E: Photograph from the NHMUK data portal; I–J, S–U: copyright NHMUK, courtesy of Harry Taylor and Kevin Webb of the Photographic Unit, and Andreia Salvador, Senior Curator of Marine Gastropods; Q: SEM image courtesy of Paul Callomon. Scale bar: A–P, R–DD = 2 mm; Q = 300 µm.

2mm
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Pyrgocythara elata (Dall, 1889) comb. nov.
Figs 100C–D, 103A–U

Mangilia (? *Daphnella*) *elata* Dall, 1889a: 105–106.

Mangilia (? *Daphnella*) *elata* – Dall 1889b: 100.
Daphnella elata – Dall 1892: 224; pl. 21 fig. 1. — Schuchert *et al*. 1905: 180. — Fargo 1953: 396, pl. 21 figs 3, 3a. — DuBar 1962: 96. — Treece 1980: 562.
Mangilia (*Daphnella*) *elata* – Dall & Simpson 1901: 389, pl. 54 fig. 17.
Cryoturris elata – Powell 1966: 101. — Abbott 1974: 281 (sp. 3236).
Vitricythara elata – Turgeon *et al*. 1988: 100.
Platycythara elata – Lyons 1989: 28, pl. 11 fig. 13 – Turgeon *et al*. 1998: 108. — Williams 2005: #5680. — García 2007: 8. — Rosenberg *et al*. 2009: 667.
Vitricythara (*Platycythara*) *elata* – Grace 2007: 28.

Differential diagnosis

Pyrgocythara elata (Dall, 1889) comb. nov. is the only species of the genus *Pyrgocythara* with a strong sutural spiral (best visible on the shell base) that stands out from the other primary spirals except the peripheral one. Other characteristics that differentiate this species from others are noted below.

Vitricythara lavalleana (d'Orbigny, 1853) has more convex whorl sides, fewer ribs and spirals, has a more reticulate appearance, and a longer anterior canal.

Vitricythara fassioae Fallon & Bouchet sp. nov. has a narrower shell, fewer spirals, and a longer anterior canal.

Vitricythara magnini Fallon & Bouchet sp. nov. last whorl narrows more gradually to the anterior canal, not as abruptly, and lacks a strong sutural spiral.

Type material

Syntypes (9 specs)

UNITED STATES OF AMERICA • 5 specs; North Carolina, E of Cape Lookout; depth 40 m; 19 Oct. 1885; USFC; stn 2608; large beam trawl; USNM 93027 • 1 spec.; North Carolina, Cape Lookout; depth 40 m; 19 Oct. 1885; USFC; large beam trawl; stn 2610; USNM 93028 • 1 spec.; North Carolina, S of Cape Fear; depth 31 m; 20 Oct. 1885; USFC; stn 2616; dredge; USNM 93029 • 2 specs; South Carolina, 12 mi. [19 km] E of Frying Pan Shoals; depth 12 fms [22 m]; W. Rush leg.; USNM 83001.

Material examined (41 specs)

Syntypes in USNM 93027, 93028, and 93029 were examined. In addition, 34 specimens in the following lots were examined:

UNITED STATES OF AMERICA • 2 specs, 7.1 × 2.5 and 6.9 × 2.5 mm; E Florida, Duval Co., off Xalvis Island; depth 100–150 ft [30–46 m]; Sep. 1985; B. Holiman leg.; dump of scallops trawled 20–40 mi. [32–64 km] ESE of Mayport; UF 589870 • 6 specs, 6.0 × 2.3, 5.2 × 2.0, 4.5 × 1.8, 4.3 × 1.95, 4.5 × 1.9 and 2.6 × 1.2 mm; E Florida, Duval Co., 27.75 mi. [45 km] ESE of Mayport; 1997; C. Carlin leg.; bottom sample in shell hash and sand in base of sunken ship; UF 589871 • 1 spec., 5.3 × 1.3 mm; E Florida, St. Johns Co., off St. Augustine; Apr. 1989; B. Holiman leg.; scallop dump; UF 589872 • 11 specs, 6.7 × 2.6, 4.3 × 2.0, 3.7 × 1.7, 3.9 × 1.8, 3.4 × 1.5, 3.4 × 1.5, 3.4 × 1.6, 3.5 × 1.4, 3.0 × 1.3, 2.9 × 1.4 and 5.2 × 2.0 mm; E Florida, St. Johns Co., 26 mi. [42 km] E of St. Augustine;

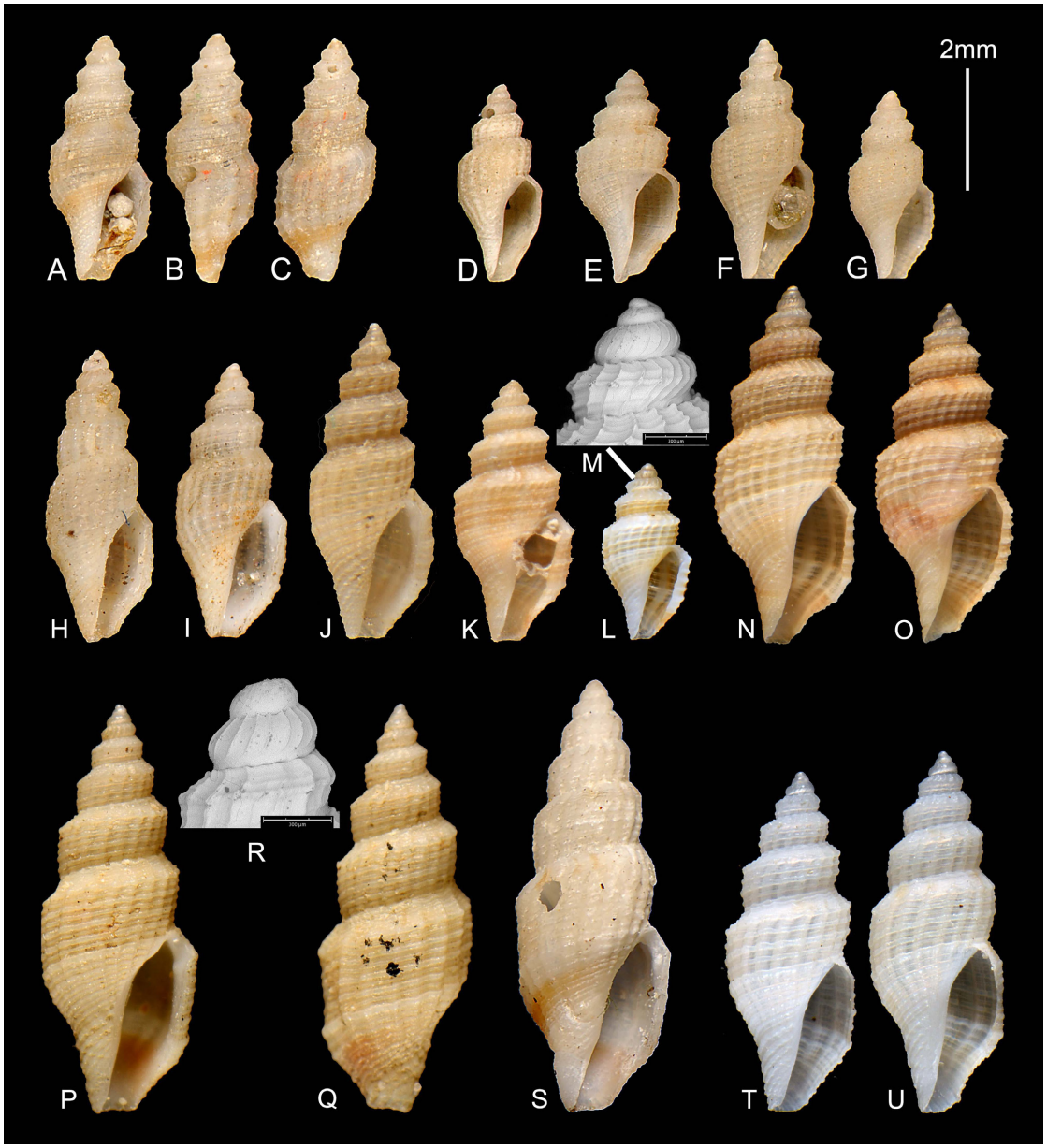

Fig. 103. Species of *Pyrgocythara* Woodring, 1928. Part 2. – **A–I**. *Mangilia elata* Dall, 1889. **A–G**. Syntypes, 4.1 × 1.7 mm, ventral, lateral and dorsal views, lengths = 3.3, 3.5, 4.0 and 3.2 mm (USNM 93027), off Cape Fear, North Carolina. **H**. Syntype, 4.8 × 1.8 mm (USNM 93029), S of Cape Fear, North Carolina. **I**. Syntype, 4.5 × 1.8 mm (USNM 93028), off Cape Lookout, North Carolina. This specimen is the same size as the one figured in Dall (1892), but not the size (4.75 × 2.0 mm) given in his description. – **J–U**. *Pyrgocythara elata* (Dall, 1889) comb. nov. **J–K**. Specs, 5.2 × 2.0 and 4.3 × 2.0 mm (UF 589867), 26 mi. [42 km] E of St Augustine, St Johns Co., E Florida. **L–M**. Spec., 2.9 × 1.4 mm, ventral view, and SEM image of protoconch (UF 589866), W of Dry Tortugas, Florida Keys. **N–O**. Specs, 6.0 × 2.4 and 5.8 × 2.3 mm (UF 589873), 50–60 mi. [80–97 km] E of Ponte Vedra, St Johns Co., E Florida. **P–R**. Spec., 6.7 × 2.6 mm, ventral and dorsal views, and SEM image of protoconch (UF 589867), 26 mi. [42 km] E of St Augustine, St Johns Co., E Florida. Large, mature specimen; SEM image of the protoconch, with part of the first whorl missing. **S**. Spec., 7.1 × 2.5 and 6.9 × 2.5 mm (UF 589870), off Xalvis Island, Duval Co., E Florida. Largest specimen. **T–U**. Specs, 5.4 × 2.1 and 5.8 × 2.2 mm (UF 589874), off Cape St George's, Franklin Co., W Florida. Different color from E Florida specimens. Credits: M, R: SEM images courtesy of Paul Callomon. Scale bars: A–L, N–Q, S–U = 2 mm; M, R = 300 µm.

depth 38 m; 1981; Ted Yocius leg,; dredged; UF 589867 • 9 specs, 6.0 × 2.4, 5.8 × 2.8, 5.1 × 2.1, 4.7 × 2.0, 4.0 × 1.9, 4.3 × 1.7, 4.2 × 1.7, 3.8 × 1.7 and 3.8 × 1.6 mm; E Florida, St. Johns Co., 50–60 mi. [80–97 km] E of Ponte Vedra; 12 Mar. 1988; H.G. Lee leg.; ex batfish stomachs; UF 589873 • 4 specs, 6.7 × 2.5, 5.4 × 2.1, 5.8 × 2.2 and 3.4 × 1.4 mm; W Florida, Franklin Co., off Cape St. George; May 1985; J.H. Kesler leg.; ex batfish stomachs; UF 589874 • 1 spec., 2.9 × 1.4 mm; Florida Keys, W of Dry Tortugas; depth 200 ft [61 m]; 1974; Riley Black leg.; dredged; UF 589866.

Description

This re-description is based on the original description by Dall (1889a: 105–106) and on larger more mature specimens from NE Florida (Fig. 103P–R). *Shell* small, fusiform, translucent; in all 8 whorls; teleoconch whorl sutures impressed, with flat, sloped shoulders sharply demarcated by a primary spiral, followed by flat whorl sides; last whorl 63% of shell length; sculpture of cord-like ribs overridden by strong spirals of alternating strengths; aperture a narrow oval, varicose, with a wide anal sinus and short anterior canal delineated by a rapidly tapering anterior, aperture and canal about 44% of shell length. *Protoconch* of 3¼ glossy whorls, the first whorl minute, protruding, the remaining whorls with arched riblets that grow stronger and wider apart advancing to the lip. Riblets on last whorl do not reach the suture with the first teleoconch whorl. *Axial sculpture* of 21 narrow cord-like ribs on the penultimate whorl and 15 on the last that extend from suture to suture on spire whorls and evanesce before the anterior fasciole. Ribs recurved, narrower, and lower on whorl shoulders, then sharply angled at shoulder edge, and spaced about their width on whorl sides, more so on the dorsum of the last whorl. *Varix* at aperture, crenated by strong spirals, edge rolled slightly inward when not fully formed, much larger than preceding ribs, runs from slightly above suture to anterior canal, curved around anal sinus. *Spiral sculpture* of primary and secondary spirals; about 5 fine secondary spirals on whorl shoulders, then a strong primary on shoulder edge, followed by 5 or 6 primaries on whorl sides ending in a strong sutural primary. A single secondary lies between these primaries. The shell base, below the sutural primary spiral, has weaker alternating primary and secondary spirals. Microscopic spirals lie between some, all override weaker ribs in this region. *Sulcus* absent. Recurved ribs on the shoulder are evidence of past positions of the anal sinus. *Outer lip* angulated at the shoulder, weakly varicose; with a small denticle at anterior margin of anal sinus, inside outer lip. *Anal sinus* as wide as the shoulder, deep with a round apex, and denticle inside outer lip and a moderate-sized callus on parietal wall. *Inner lip* a narrow glaze, unemarginate except along anterior canal. A moderate callus at the anal sinus. *Anterior fasciole* not swollen, with about 9–10 oblique spirals. *Anterior canal* short, straight, open, differentiated by the rapid tapering of the last whorl, unnotched. *Color* light yellowish-brown to white with a reddish-brown band on the shell base, usually just above the anterior fasciole, and narrow white band above this.

Remarks

Placement of this species in *Platycythara* is not supported here (explained at the beginning of Part 1, in the section on differences from other genera).

The average length of 34 specimens is 4.5 mm (range = 2.9–7.1 mm).

Range and habitat

United States (North Carolina, South Carolina, NE Florida, Florida Keys, and NW Florida); depth 22–46 m.

Genus ***Rhomboturris*** Fallon gen. nov.
urn:lsid:zoobank.org:act:4580C141-E967-4A68-BB39-A5E8965C9F12

Type species

Rhomboturris corbariae Fallon & Bouchet gen. et sp. nov.

Diagnosis

Shell small (< 8.0 mm), stoutly fusiform with turreted whorls (W/L = 0.38–0.44), an anterior canal of moderate length, shoulder with a shallow anal notch and last whorl without a varix. Whorls with flat, sloping shoulders, acutely angled about mid-whorl, and with flat sides angled in toward succeeding suture; last whorl about 61–63% of shell length. Protoconch of about 3–3¼ round whorls, the last 1–2¼ whorls with riblets, and the last may or may not be subcarinate. Aperture narrowly oval, sides almost parallel and narrow gradually to anterior canal, and are together less than 50% of shell length. Axial sculpture of narrow but moderately strong ribs with round crests that extend from suture to suture on spire whorls, narrow and recurved on shoulder and evanescent on shell base. Spiral sculpture of flattened alternating primary and 0–3 secondary spirals with primaries swollen or nodulose on rib crests, pattern about the same over the entire shell surface.

Summary diagnostic characteristics

Shell with turreted whorls, aperture narrow with nearly straight sides, anterior canal moderately long.

Protoconch trochoid, of 3–3¼ round whorls, the first whorl minute, the last whorl bulging or not with riblets that usually run shy of the abapical suture.

Outer lip is simple, without varix or dentition.

Anal sinus is wide and shallow.

Sculpture of narrow but strong ribs crossed by strong, flattened primary spirals that are smooth, not frosted by growth increments.

Etymology

Rhomboturris Fallon gen. nov., from the Latin '*rhombus*' = 'equilateral parallelogram' + '*turris*' = 'tower'. A reference to the dominant shape of species' rough outlines, equilateral sides with two different angles such to appear diamond shaped.

Shell surface microsculpture

Granules, or irregularly shaped, short, microscopic strings that sparsely populate intercostal space (SEM magnification 870–1150×) (Fig. 105), are denser on secondary and tertiary spirals (and more string-like) than in intercalary space and absent on top surface of flattened spirals. At higher magnification (2250–3000×) short strings appear more irregular or as tufts of strings that rise above the shell surface.

Radula

The radula of a representative of a single species of the genus *Rhomboturris*, *Rhomboturris kantori* Fallon & Bouchet gen. et sp. nov., was imaged. Its description is as follows: hypodermic marginal teeth simple, semi-enrolled, and trough-shaped, moderately long, with a length of about 110 m (3.5% of AL). Tooth edges slightly overlap in the median section. The base is narrow, solid, and attenuated, constituting about ¼ of total tooth length. Tip pointed with slightly thickened edges and a weak, short blade on the convex side. The base has a distinct spur (Fig. 104).

Difference from other genera

Benthomangelia Thiele, 1925 has similar deep water adaptations (see under Remarks) but differs in its spiral sculpture (subequal flattened spirals versus spirals of alternating strengths), in protoconch morphology (3–4 whorls, the last with strong riblets versus up to 3¼ whorls, up to the last 2¼ with fine riblets).

Cryoturris Woodring, 1928, has a frosted shell surface.

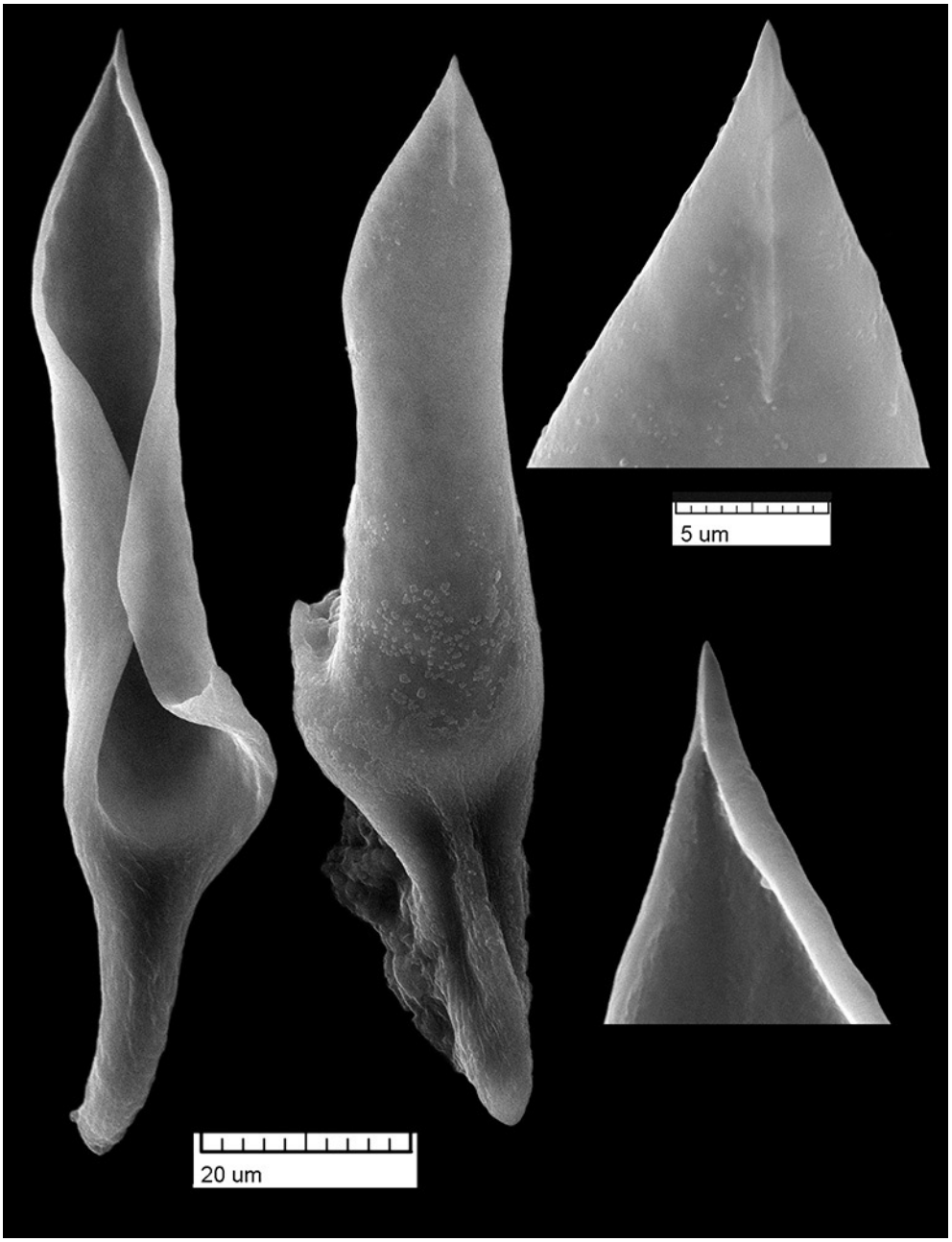

Fig. 104. Marginal radular teeth of *Rhomboturris kantori* Fallon & Bouchet gen. et sp. nov., holotype (MNHN-IM-2013-56250). Photograph by Yuri Kantor.

Bathyturris Fallon gen. nov. differs in possessing cord-like, not flattened, primary spirals that are not frosted, a trochoid protoconch with 3–3½ regularly expanding whorls, with a small tip, all but the first ½–1 whorl with crowded riblets, the last whorl bulging with riblets that stop short of the suture, and usually with microscopic spikes along riblet crests that are absent in *Rhomboturris* Fallon gen. nov.

Remarks

Deepwater species tend to converge on a similar shell form: fusiform, thin-shelled, subdued sculpture, anterior canal of moderate to long length, absence of apertural dentition and varix, and monochromatic white or off-white color.

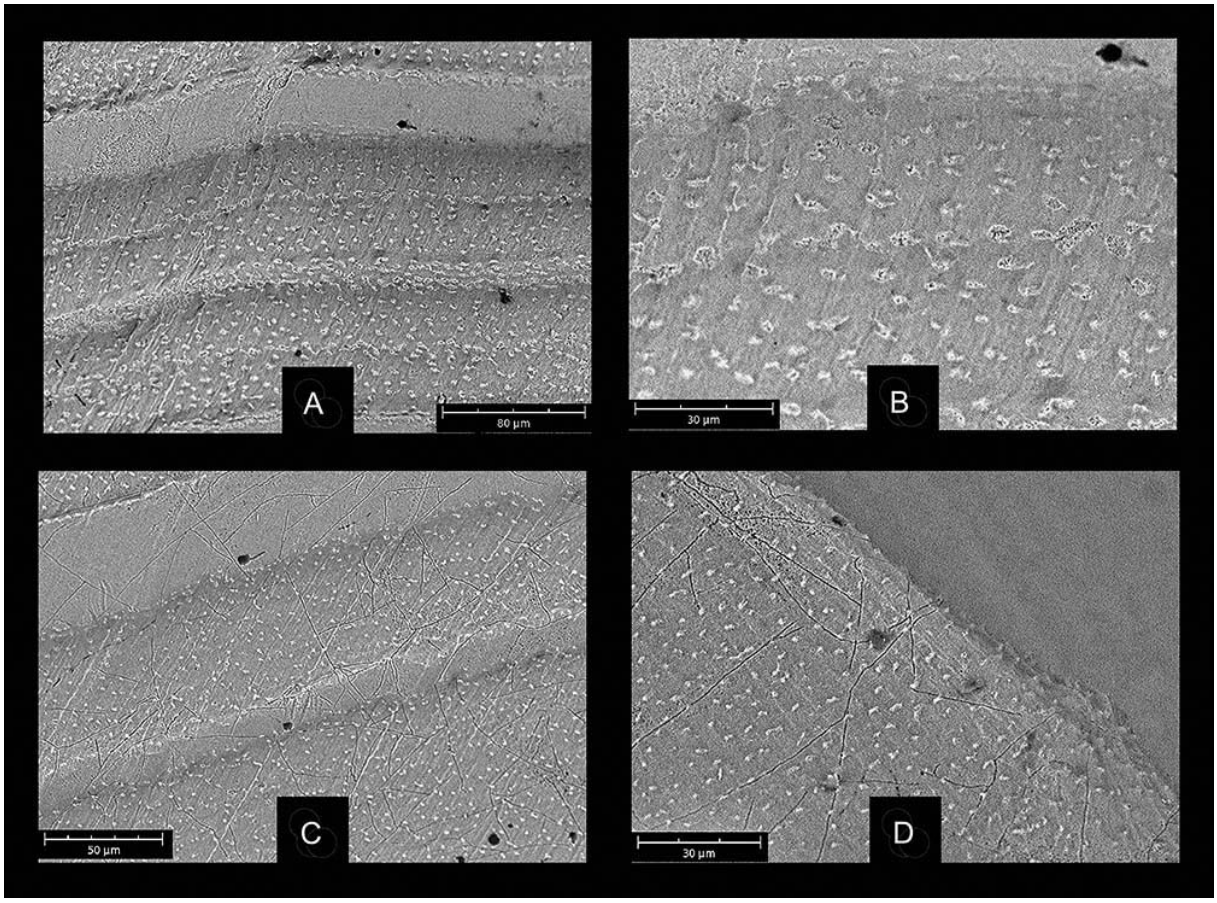

Fig. 105. Species of *Rhomboturris* Fallon gen. nov., shell surface microsculpture. – **A–B**. *Rhomboturris corbariae* Fallon & Bouchet gen. et sp. nov. **A**. Holotype, 6.3 × 2.6 mm (MNHN-IM-2000-39702), N of Marie-Galante, Guadeloupe. Magnification 870 ×. Irregularly shaped microscopic strings present in intercalary space and on secondary and tertiary spirals, but not on the surface of primary spirals (upper margin of Fig. 1). **B**. Magnification 2250 ×. Irregularly shaped granules, or microscopic strings, are aligned in direction of tertiary spirals (also secondary spirals not visible in image) but more randomly in intercalary space. – **C–D**. *Rhomboturris brychia* Fallon & Bouchet gen. et sp. nov. **C**. Holotype 7.1 × 3.7 mm (MNHN-IM-2000-39699), W of Basse-Terre, Guadeloupe. Magnification 1150 ×. Microscopic strings are present in intercalary space, absent on surface of primary and secondary spirals. Despite the greater magnification of the surface of *R. corbariae* Fallon & Bouchet gen. et sp. nov. in A, it appears that those of *R. brychia* Fallon & Bouchet gen. et sp. nov. are smaller. **D**. Magnification 3000 ×. Microscopic strings appear more as tufts of strings that rise above the shell surface. Credits: SEM images courtesy of Paul. Scale bars: A = 80 µm ; B, D = 30 µm; C = 50 µm.

Phylogenetic relationships

Only one species, *Rhomboturris kantori* Fallon & Bouchet gen. et sp. nov., has been sequenced. This lineage has been recovered as sister to the clade *Cryptomangelia* Fallon gen. nov. + *Mandiana* Fallon gen. nov., although it lacks bootstrap support.

Rhomboturris kantori Fallon & Bouchet gen. et sp. nov.
urn:lsid:zoobank.org:act:9E2387DE-982C-4169-8DC6-44C07F0CF03F
Figs 104, 106A–F

Differential diagnosis

Rhomboturris corbariae Fallon & Bouchet gen. et sp. nov. has a different spiral pattern, usually 1 secondary between primaries (versus 1–3), and has about the same number but narrower ribs.

Benthomangelia puillandrei Fallon & Bouchet sp. nov. is slimmer (W/L = 0.3302 versus 0.4127), has uniformly flattened spirals, weaker, more numerous ribs (about 16 versus 12), and a different protoconch (3¾ whorls with a single whorl with strong riblets versus 3 whorls and the last 2 with riblets.

Etymology

Rhomboturris kantori Fallon & Bouchet gen. et sp. nov., named in honor of Yuri Kantor, a long-time participant in the field work and research of the MNHN malacology team, specifically for contributing radula images and their description to the present work.

Type material

Holotype
FRENCH GUIANA • 6.2 × 2.7 mm; offshore; 6°58′ N, 53°00′ W; depth 197–200 m; 31 Jul. 2014; GUYANE 2014; stn CP4363; sequenced; MNHN-IM-2013-56250.

Paratypes (16 specs)
FRENCH GUIANA • 3 specs, 6.9 × 3.0, 6.4 × 2.8 and 3.5 × 2.0 mm; offshore; 6°40′ N, 52°29′ W; depth 240 m; 3 Aug. 2014; GUYANE 2014; stn CP4374; MNHN-IM-2012-43484 • 2 specs, 6.4 × 2.7 and 5.8 × 2.5 mm; offshore; 6°58′ N, 53°00′ W; depth 197–200 m; 31 Jul. 2014; GUYANE 2014; stn CP4363; MNHN-IM-2012-43476 • 1 spec., 4.9 × 2.1 mm; offshore; 6°58′ N, 53°00′ W; depth 197–200 m; 31 Jul. 2014; GUYANE 2014; stn CP4363; sequenced; MNHN-IM-2013-57400 • 1 spec., 6.2 × 2.8 mm; offshore; 6°58′ N, 53°00′ W; depth 197–200 m; 31 Jul. 2014; GUYANE 2014; stn CP4363; MNHN-IM-2013-57401 • 1 spec., 6.1 × 2.8 mm; offshore; 6°58′ N, 53°00′ W; depth 197–200 m; 31 Jul. 2014; GUYANE 2014; stn CP4363; sequenced; MNHN-IM-2013-57402 • 5 specs, 5.1 × 2.3, 3.4 × 1.6, 3.9 × 1.9, 4.1 × 1.9 and 4.5 × 2.1 mm; offshore; 6°56′ N, 53°03′ W; depth 145 m; 31 Jul. 2014; GUYANE 2014; stn DW4360; MNHN-IM-2000-40011 • 1 spec., length = 4.9 mm; offshore; 6°11.7′ N, 52°00.5′ W; depth 147–148 m; 2 Dec. 2017; PROTEUS-GUYANE; stn DW5081; MNHN-IM-2000-40033 • 1 spec., 3.0 × 1.3 mm; offshore; 6°09.8′ N, 53°01.7′ W; depth 93–96 m; 3 Dec. 2017; PROTEUS-GUYANE; stn DW5088; MNHN-IM-2000-40035 • 1 spec., length = 4.5 mm; offshore; 6°12.4′ N, 52°01.7′ W; depth 148–149 m; 2 Dec. 2017; PROTEUS-GUYANE; stn DW5084; MNHN-IM-2000-40034.

Description

Shell small (holotype length = 6.2 mm), thin-shelled, semi-translucent white, fusiform (W/L = 0.4355), teleoconch of about 6¾ acutely angled whorls with sloping, flat shoulders, the last whorl about 63% of shell length; aperture narrow, with almost parallel sides that gradually narrow to an anterior canal of moderate length, which together are about 45% of shell length; shell sculpture of weak ribs and spirals. *Protoconch* of 3 whorls, first whorl minute, last 2 with recurved riblets fine at first then strong at end, the

last whorl subcarinate. *Axial sculpture* of about 12 rather straight moderately strong ribs that run from suture to suture on spire whorls and evanesce before anterior fasciole, intercostal space wider than ribs. Ribs are strongest at whorl periphery and are reduced and slightly recurved on shoulders. *Varix* absent. *Spiral sculpture* of flattened primaries and secondaries that override ribs, made granulose by closely spaced growth striae; a single primary, followed by about 10 secondaries of variable strength on whorl shoulder. Four primaries alternate with 1–3 secondaries on whorl sides, the peripheral one is strongest, primaries slightly swollen on rib crests. *Sulcus* absent, but width of the shoulder corresponds to the width of the anal sinus, which is marked by curved growth striae and reduced ribs. *Outer lip* thin, without dentition. *Anal sinus* is a shallow notch the width of the shoulder, with a thin edge and without a parietal callus. *Inner lip* a thin narrow glaze along the columella and parietal wall; without a callus. *Columella* straight. *Anterior canal* of moderate length, straight, end unnotched. *Anterior fasciole* is not swollen, sculpted the same as the shell base, spirals of alternating strength and oblique to shell long axis. *Color* of spirals, and ribs white, intercalary space translucent, and aperture porcelaneous.

Remarks

The average length of 14 specimens is 5.2 mm (range = 3.4–6.9 mm).

Range and habitat

Off French Guiana; depth 197–240 m, live caught between 197–200 m.

Rhomboturris brychia Fallon & Bouchet gen. et sp. nov.
urn:lsid:zoobank.org:act:74E54376-BDDF-44F0-A8E1-B9DBACBCAA78
Figs 105C–D, 106G–I

Differential diagnosis

Rhomboturris kantori Fallon & Bouchet gen. et sp. nov. has a different pattern of spirals, usually 1–3 secondaries between primaries (versus 0–1), and has about the same number but broader ribs.

Rhomboturris corbariae Fallon & Bouchet gen. et sp. nov. has tertiary spirals between the primary and secondary ones. The 2nd and 3rd whorls of the protoconch are proportionally smaller.

Benthomangelia puillandrei Fallon & Bouchet sp. nov. is slimmer (W/L = 0.3302 versus 0.3801), has narrower, more uniform spirals, weaker, more numerous ribs (about 16 versus 11), and a different protoconch (3¾ whorls with a single whorl with strong riblets versus 3¼ whorls and the last 2¼ with riblets.

Etymology

Rhomboturris brychia Fallon & Bouchet gen. et sp. nov. is derived from the Greek adjective '*brychios*', meaning 'from the deep', after the bathyal depth from which the specimen was collected.

Type material

Holotype
GUADELOUPE • 7.1 × 2.7 mm; W of Basse-Terre; 16°13′ N, 61°52′ W; depth 409–532 m; 8 Jun. 2015; KARUBENTHOS 2; stn CP4512, MNHN-IM-2000-39699.

Paratypes (2 specs)
GUADELOUPE • 1 spec., 8.5 × 3.2 mm; W of Basse-Terre; 16°13′ N, 61°54′ W; depth 700–750 m; 7 Jun. 2015; KARUBENTHOS 2; stn DW4507; MNHN-IM-2000-39701 • 1 spec., 7.5 × 3.0 mm; W of Basse-Terre; 16°13′ N, 61°51′ W; depth 749–768 m; 8 Jun. 2015; KARUBENTHOS 2; stn CP4516; MNHN-IM-2000-396700.

Description

Shell small (holotype length = 7.1 mm), thin-shelled, fusiform (W/L = 0.3803), of about 7¼ whorls, teleoconch whorls turreted with sloping, flat shoulders, sutures with a subsutural fold, or heavy spiral cord developed by rib terminations, the last whorl about 61% of shell length; aperture narrow, with almost parallel sides that gradually narrow to an anterior canal of moderate length, which together are about 43% of shell length; shell sculpture consists of narrow ribs and strong spirals of about the same strength. *Protoconch* of 3¼ whorls, large, beehive-shaped, relatively large for species, first whorl minute, smooth, remaining whorls with arched riblets fine at first then strong at end. *Axial sculpture* of about 11 narrow ribs that run from suture to suture on spire whorls and evanesce on base of last whorl, strongest at whorl periphery and are much reduced and slightly recurved on shoulders, intercostal space 2–3x wider than rib width. *Varix* absent. *Spiral sculpture* of flattened primaries and secondaries, 4 primaries on whorl sides, occasionally with a single secondary paired on the abapical side on the last whorl, all override ribs and are nodulous on rib crests, the peripheral one more so. About an additional 8–9 spirals run from the suture line to the anterior canal on the shell base. *Sulcus* absent, but width of the shoulder corresponds to the width of the anal sinus, which is marked by curved ribs and growth striae. *Outer lip* thin, without dentition. *Anal sinus* a shallow notch the width of the shoulder, with a thin edge and without a parietal callus. *Inner lip* a thin glaze along a moderately wide area along the columella and parietal wall; without a callus. *Columella* straight. *Anterior canal* of moderate length, curved slightly to the right viewed ventrally, end unnotched. *Anterior fasciole* not swollen, sculpted about the same as the shell base with about 7 weaker primaries without intervening secondaries, running oblique to shell axis. *Color* opaque off-white, aperture yellowish, protoconch yellowish brown.

Remarks

The average length of 3 specimens is 7.7 mm (range = 7.1–8.5 mm).

Range and habitat

Known only from the type locality; depth bathyal, 409–768 m.

Rhomboturris corbariae Fallon & Bouchet gen. et sp. nov.
urn:lsid:zoobank.org:act:415304F1-8AF5-4A03-AD24-0D96FBCB2CB2
Figs 105A–B, 106J–R

Differential diagnosis

Rhomboturris kantori Fallon & Bouchet gen. et sp. nov. has a different spiral pattern, usually 1–3 secondaries between primaries (versus 1), and has about the same number but broader ribs.

Rhomboturris brychia Fallon & Bouchet gen. et sp. nov. lacks the tertiary spirals between the secondary and primary ones. The 2nd and 3rd whorls of the protoconch are proportionally taller.

Benthomangelia puillandrei Fallon & Bouchet sp. nov. is slimmer (W/L = 0.3302 versus 0.4127), has flattened spirals of uniform width, weaker, more numerous ribs (about 16 versus 12), and a different protoconch (3¾ whorls with a single whorl with strong riblets versus 3 whorls and the last 2 with riblets).

Etymology

Rhomboturris corbariae Fallon & Bouchet gen. et sp. nov., is named in honor of Laure Corbari, Curator of Crustaceans at MNHN, as well as a participant in the KARUBENTHOS, MADIBENTHOS, and French Guiana expeditions.

Type material

Holotype

GUADELOUPE • 6.3 × 2.6 mm; N of Marie-Galante; 16°02′ N, 61°14′ W; depth 266–388 m; 23 Jun. 2015; KARUBENTHOS 2; stn DW4603; MNHN-IM-2000-39702.

Paratypes (38 specs)

GUADELOUPE • 2 specs, 6.7 × 2.6 and 5.9 × 2.6 mm; N of Grande-Terre; 16°34′ N, 61°37′ W; depth 426–441 m; 9 Jun. 2015; KARUBENTHOS 2; stn DW4518; USNM 1715425 • 1 spec., 5.6 × 2.5 mm; N of Grande-Terre; 16°27′ N, 61°35′ W; depth 275–292 m; 11 Jun. 2015; KARUBENTHOS 2; stn DW4530; MNHN-IM-2000-39706 • 1 spec., 6.0 × 2.7 mm; N of Grande-Terre; 16°09′ N, 61°19′ W; depth 233–396 m; 19 Jun. 2015; KARUBENTHOS 2; stn DW4583; USNM 1715412 • 1 spec., 7.0 × 2.7 mm; E of La Désirade; 16°17′ N, 61°01′ W; depth 208–362 m; 17 Jun. 2015; KARUBENTHOS 2; stn DW4568; MNHN-IM-2000-39703 • 1 spec., 7.7 × 3.1 mm; W of La Désirade; 16°08′ N, 61°19′ W; depth 400–420 m; 19 Jun. 2015; KARUBENTHOS 2; stn DW4582; USNM 1715411 • 2 specs, 5.7 × 2.5 and 5.6 × 2.5 mm; N of Grande-Terre; 16°38′ N, 61°35′ W; depth 343–402 m; 14 Jun. 2015; KARUBENTHOS 2; stn DW4549; MNHN-IM-2000-39707 • 4 specs, (2 measured) 5.0 × 2.2 and 3.4 × 1.7 mm; N of Grande-Terre; 16°31′ N, 61°32′ W; depth 268–306 m; 14 Jun. 2015; KARUBENTHOS 2; stn DW4546; MNHN-IM-2000-39708 • 4 specs, (2 measured) 5.4 × 2.3 and 3.8 × 1.9 mm; N of Grande-Terre; 16°38′ N, 61°37′ W; depth 413–423 m; 13 Jun. 2015; KARUBENTHOS 2; stn DW4544; ANSP 498831 • 1 spec., 4.9 × 2.1 mm; E of La Désirade; 16°17′ N, 61°01′ W; depth 208–362 m; 17 Jun. 2015; KARUBENTHOS 2; stn DW4568; MNHN-IM-2000-39704 • 2 specs, 6.2 × 2.6 and 3.4 × 1.8 mm; N of Grande-Terre; 16°34′ N, 61°37′ W; depth 426–441 m; 9 Jun. 2015; KARUBENTHOS 2; stn DW4518; MNHN-IM-2000-39709 • 4 specs, (2 measured) 5.4 × 2.4 and 2.3 × 1.4 mm; W of Marie-Galante; 16°01′ N, 61°24′ W; depth 281–406 m; 21 Jun. 2015; KARUBENTHOS 2; stn DW4587; MNHN-IM-2000-39710 • 3 specs, (2 measured) 3.1 × 1.7 and 2.5 × 1.4 mm; W of Marie-Galante; 15°49′ N, 61°28′ W; depth 376–393 m; 27 Jun. 2015; KARUBENTHOS 2; stn DW4632; MNHN-IM-2000-39705 • 2 specs, 5.5 × 2.4 and 4.9 × 2.2 mm; E of La Désirade; 16°19′ N, 61°00′ W; depth 286–343 m; 17 Jun. 2015; KARUBENTHOS 2; stn DW4570; MNHN-IM-2000-39711 • 6 specs, 7.0 × 3.0, 5.7 × 2.5, 5.3 × 2.2, 4.8 × 2.2, 3.3 × 1.8 and 3.3 × 1.7 mm; N of Grande-Terre; 16°34′ N, 61°37′ W; depth 426–441 m; 9 Jun. 2015; KARUBENTHOS 2; stn DW4518; ANSP 498830 • 2 specs, 6.8 × 2.8 and 6.3 × 2.5 mm; N of Grande-Terre; 16°34′ N, 61°37′ W; depth 426–441 m; 9 Jun. 2015; KARUBENTHOS 2; stn DW4518; MNHN-IM-2000-39712.

Fig. 106 (next page). Species of *Rhomboturris* Fallon gen. nov. – **A–F**. *Rhomboturris kantori* Fallon & Bouchet gen. et sp. nov. **A–B**. Holotype, 6.2 × 2.7 mm, ventral and dorsal views, sequenced (MNHN-IM-2013-56250), off French Guiana. **C**. Paratype, 6.2 × 2.8 mm (MNHN-IM-2013-57401), off French Guiana. **D**. Paratype, 6.1 × 2.8 mm (MNHN-IM-2013-57402), off French Guiana. **E**. Paratypes, 6.4 × 2.7 mm (MNHN-IM-2012-43476), off French Guiana. **F**. Paratype, 6.9 × 3.0 mm (MNHN-IM-2012-43484), off French Guiana. – **G–I**. *Rhomboturris brychia* Fallon & Bouchet gen. et sp. nov., holotype, 7.1 × 3.7 mm, ventral and dorsal views, and SEM image of protoconch (MNHN-IM-2000-39699), W of Basse-Terre, Guadeloupe. – **J–R**. *Rhomboturris corbariae* Fallon & Bouchet gen. et sp. nov. **J–L**. Holotype, 6.3 × 2.6 mm, ventral and dorsal views, and SEM image of protoconch (MNHN-IM-2000-39702), N of Marie-Galante, Guadeloupe. **M**. Paratype, 7.7 × 3.1 mm (USNM 1715411), W of La Désirade, Guadeloupe. **N**. Paratype, 7.0 × 2.7 mm (MNHN-IM-2000-39703), E of La Désirade. **O**. Paratype, length = 6.0 mm (USNM 1715412), N of Grande-Terre. **P–Q**. Paratype, 6.9 × 2.8 mm, ventral and apical view (USNM 1199842), off Sea Aquarium, Curaçao. **R**. Paratype, 7.0 × 3.0 mm (USNM 1199841), off Sea Aquarium, Curaçao. Credits: I, L: SEM images courtesy of Paul Callomon. Scale bars: A–H, J–K, M–R = 2 mm; I, L = 300 µm.

2mm
A
B
C
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NETHERLANDS ANTILLES • 1 spec., 7.0 × 3.0 mm; Curaçao, off Sea Aquarium; 12°04.87′ N, 68°53.75′ W; depth 288 m; 23 or 24 May 2012; Smithsonian field trip; submersible *Curasub* stn 4, in old gin bottle; USNM 1199841 • 1 spec., 6.9 × 2.8 mm; off Curaçao, off Sea Aquarium, 12°04.87′ N, 68°53.75′ W; depth 280 m; 23 or 24 May 2012; Smithsonian field trip; submersible *Curasub* stn 3, in old beer bottle; USNM 1199842.

Description

Shell small (holotype length = 6.3 mm), thin-shelled, semi-translucent white, fusiform (W/L = 0.4127), teleoconch of about 7, acutely angled whorls with sloping, flat shoulders, the last whorl about 63% of shell length; aperture narrow, with almost parallel sides that gradually narrow to an anterior canal of moderate length, which together are about 46% of shell length; shell sculpture consists of weak ribs and spirals. *Protoconch* of 3 whorls, first whorl minute, last 2 with recurved riblets fine at first then strong at end, second with supersutural spiral thread; the last whorl subcarinate. *Axial sculpture* of about 12 rather straight moderately strong ribs that run from suture to suture on spire whorls and evanesce on base of last whorl, intercostal space about as wide or wider than rib width. Ribs are strongest at whorl periphery and are much reduced and slightly recurved on shoulders. *Varix* absent. *Spiral sculpture* of primaries, secondaries, and tertiaries, 1–4 secondaries between flattened primaries, and a single faint tertiary between these, all override ribs, the pattern continuous over entire surface of teleoconch with about 4 primaries on penultimate whorl side and one on shoulder at suture, and no primaries on shoulders, only secondaries. The peripheral spiral is slightly swollen on ribs. About an additional 18 pairs (not counting tertiaries) run from the suture line to end of anterior canal on shell base. *Sulcus* absent, but width of the shoulder corresponds to the width of the anal sinus, which is marked by curved growth striae and reduced ribs. *Outer lip* thin, without dentition. *Anal sinus* is a shallow notch the width of the shoulder, with a thin edge and without a parietal callus. *Inner lip* a thin glaze along a moderately wide area along the columella and parietal wall; without a callus. *Columella* is slightly sigmoid. *Anterior canal* of moderate length, curved slightly to the right viewed ventrally, end unnotched. *Anterior fasciole* not swollen, sculpted the same as the shell base, spirals of alternating strength, here oblique to shell long axis. *Color* simi-translucent white (spirals white, intercalary space translucent).

Remarks

The average length of 32 specimens is 5.3 mm (range = 2.3–7.7 mm).

Range and habitat

Bathyal. Netherlands Antilles (Curaçao) and off Guadeloupe; depth 208–441 m.

Genus ***Rubellatoma*** Bartsch & Rehder, 1939

Type species

Mangelia rubella J.D. Kurtz & W. Stimpson, 1851, by original designation.

Summary diagnostic characteristics

Shell fusiform, robust, the last whorl longer than spire and tapers gradually to a short or moderately long canal.

Whorls with steep shoulders, obtusely angled at or below mid-whorl.

Protoconch of about 2¼ to 3 whorls, tip minute and angled then rapidly and symmetrically expanding, the last whorl slightly bulging and partially bearing riblets.

Aperture narrowly oval, varicose, which may be a strong varix or thickened rib-like varix, with a wide, shallow anal sinus; usually without an anal tooth or parietal callus but lyrae may be present inside the outer lip of mature specimens of some.

Axial ribs are moderately strong, usually narrow with a wide intercostal space, and 10 or more on the penultimate whorl.

Spiral sculpture of flattened spirals, or bands, of alternate widths separated by shallow grooves; bands may be slightly convex in cross section and some nodulose on rib crests.

Color white to ivory base with none (all white) to one or more colored bands, narrow to wide, columella and anterior fasciole colored red, orange, or violet in some.

Shell surface microsculpture

Of wide and narrow bands overall, mostly flat but may be convex in some species. Narrow bands mostly lack definite sub-structure at higher magnification (750–2450 ×) but may have 'elongate cells' or jagged strings, depending on species, both aligned parallel with the band. Wide bands are densely populated with 'pustules', microscopic, round structures with open centers, or in some species, plant-like cells (their boundaries cell wall-like), elongate (Fig. 107).

Difference from other genera

Ithycythara Woodring, 1928, has a narrower, more streamlined shell, a body whorl that usually narrows abruptly at the anterior canal, and only 5–7, usually 6, ribs per whorl aligned whorl-to-whorl. Both genera possess nodulose peripheral cords, mostly obsolete in intercostal space of both genera.

Stellatoma Bartsch & Rehder, 1939 possess a broadly oval (auriculate) aperture with a short anterior canal (versus a narrow aperture and a moderately long anterior canal); a protoconch of 1¼–1½ whorls with a large tip (versus 2¼–3-whorl protoconch with a minute tip); a surface sculpture of slightly flattened to flattened spirals (versus spiral grooves); and a color that is largely monochromatic with darker colored apertures (versus a shell with colored bands or all white).

Remarks

The genus *Rubellatoma* is common in the shallow, temperate tropical waters of Florida, the region where the type species of *Rubellatoma* is found. The presence of members of this genus in deep sub-tropical waters of the French Antilles is additional evidence that some members prefer cooler water. The two named Florida species are similar and may have descended from a common ancestor that was once widely distributed along the east and west coasts of Florida, before the separation of the Gulf of Mexico and the Atlantic by the Florida peninsula. *Rubellatoma diomedea* is limited to the west coast and *R. rubella* to the east coast, with the latter's range extending northward to North Carolina, and former's range along the eastern and northeastern Gulf to Alabama.

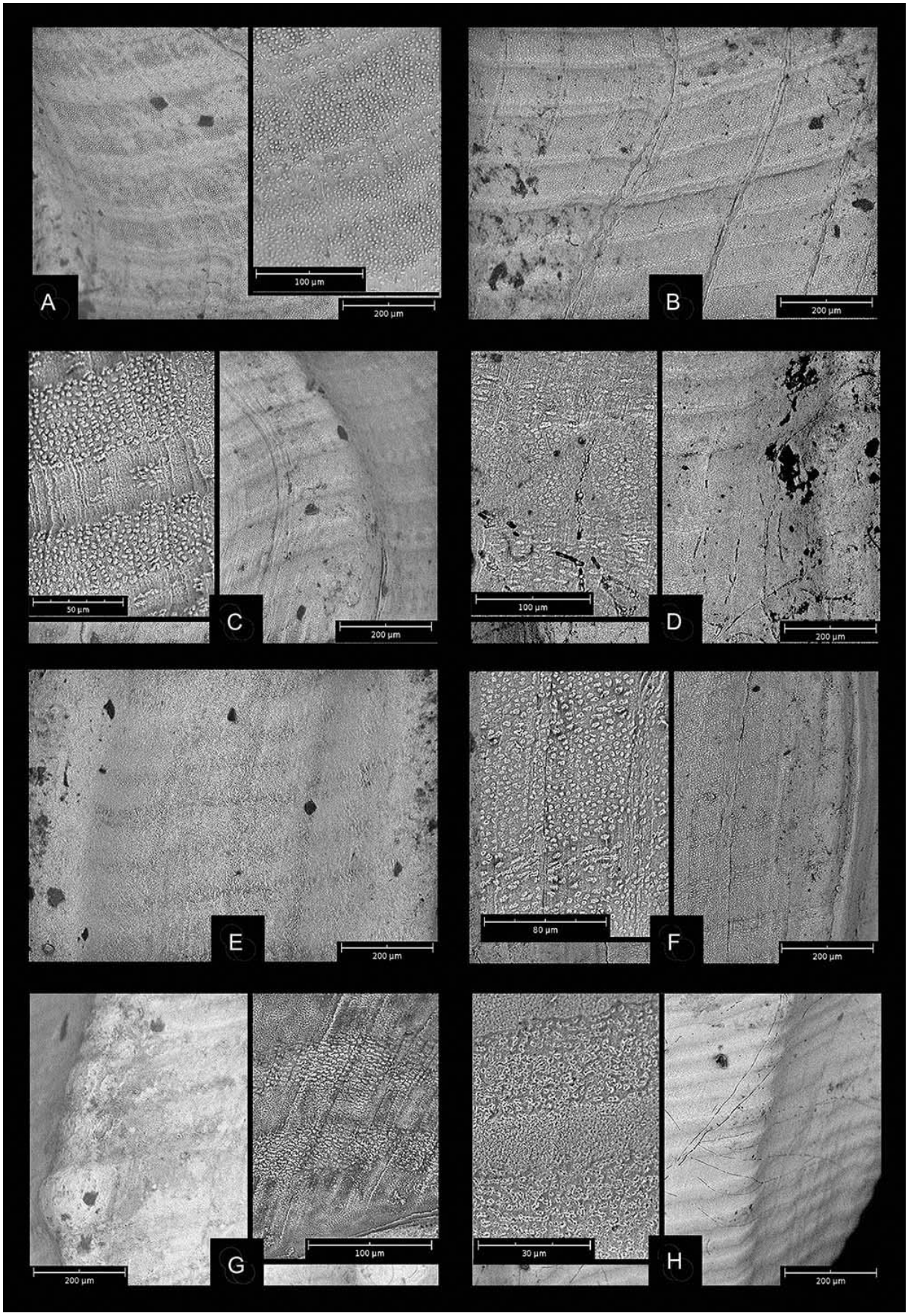
Another temperate tropical water species of *Rubellatoma* is found in southern Brazil, *Rubellatoma brasiliensis* Fallon sp. nov.

Evidence that *Rubellatoma* is more widely distributed in the western Atlantic is indicated by specimens described for the first time in this study, from the eastern and western Caribbean, the Bay Islands of Honduras and Colombia. Deep water species are also described in *Rubellatoma* for the first time that exhibit adaptations of deep water, nearly colorless and possessing longer anterior canals.

Nomen dubium

The taxon *Pleurotoma* (*Clathurella*) *adamsii* E.A. Smith, 1884 has been combined in *Cryoturris* by Rios (1985: 144; 1994: 173; 2009: 339), and Williams (2005: #5561). The accompanying photographs in the publications by these authors are illustrations of the species described here as *Rubellatoma brasiliensis* Fallon sp. nov. The type of *P. adamsii* has been lost, and no photograph of Smith's (1884) type has been located. The original description is of a 3.5 mm specimen with a short fusiform shape and angular whorls, covered by granulose spiral striae, a reference to the frosted microsculpture like *Cryoturris* or similarly frosted genera. Smith's (1884) description might fit one of several species of frosted mangeliids but not *Rubellatoma.* Inasmuch as the type has been lost, no photograph of it is available, and no credible subsequent identification of Smith's (1884) species, it is here considered a nomen dubium.

Fig. 107 (next page). Species of *Rubellatoma* Bartsch & Rehder, 1939, shell surface SEM images. All base images at 300×, insets vary in magnification. **A**. *Rubellatoma rubella* (J.D. Kurtz & W. Stimpson, 1851). Spec. 9.4×4.0 mm (UF 589875), off Big Talbot Island, Duval Co., E Florida. Surface with wide and narrow bands, the wide bands are slightly convex, narrow ones flat. Wide bands are densely covered with microscopic granules with open centers, not organized but not touching. Narrower bands appear split into two bands, their surfaces less densely covered with short, jagged granules aligned parallel to the direction of the narrow bands. Inset 700×. **B**. *Rubellatoma diomedea* Bartsch & Rehder, 1939. Spec., 9.9×4.2 mm (UF 589876), 10 mi. [16 km] SW of Seahorse Key, Cedar Keys, Levy Co., W Florida. Like *R. rubella*, wide and narrow bands, the wide bands densely covered with granules, the narrow ones paired and sparsely populated by irregularly shaped structures aligned parallel to the direction of the narrow bands. **C**. *Rubellatoma brasiliensis* Fallon sp. nov., holotype 7.8×3.2 mm (UF 589877), off Guarapari, Espirito Santo State, Brazil. Like the preceding 2 species, except the wide bands are populated by more irregularly shaped microscopic granules (open centers) than the 2 preceding species. The narrow bands appear split down the center into 2 bands, as in the preceding 2 species, but their surfaces are more sparsely covered with short, jagged strings that are roughly aligned parallel to the direction of the bands. Inset 1300×. **D**. *Rubellatoma hondurasensis* Fallon sp. nov., holotype, 7.8×2.8 mm (ANSP 498961), S of Barbareta Island, Bay Islands, Honduras. Surface of wide and narrow bands, wide bands have packed cells like plant tissue, irregular in shape but packed together tightly. Narrow bands have elongated cells, also packed together like plant tissue, arranged parallel to the direction of the band. Inset. **E**. *Rubellatoma castanea* Fallon sp. nov., holotype, 7.1×2.7 mm (ANSP 498960), Tayrona Park, Colombia. Wide and narrow bands are visible at 300×, but no structure is resolved at 920×. **F**. *Rubellatoma vitrea* Fallon sp. nov., holotype, 7.2×2.9 mm (MNHN-IM-2000-39723), Salines, Pointe des Châteaux, Grande-Terre, Guadeloupe. Shell surface like *Rubellatoma brasiliensis* Fallon sp. nov. but narrow band not split in two and is populated with more jagged, elongate strings. Inset 1000×. **G**. *Rubellatoma nodosa* Fallon & Bouchet sp. nov., holotype, 7.9×3.1 mm (MNHN-IM-2000-39717), N of Grande Terre, Guadeloupe. Surface covered with wide and narrow bands, wide bands microscopically granular, lacking definitive structure at 810×. Narrow band of elongate, cells arranged plant-like, compact, and parallel to band. Inset 810×. **H**. *Rubellatoma brevis* Fallon & Bouchet sp. nov., holotype, 4.5×2.1 mm (MNHN-IM-2012-8754), off Fajou Island, Grand Cul-de-Sac Marin, Guadeloupe. Surface of wide and narrow bands, narrow bands have convex, amorphous surfaces viewed at 2450×. Wide bands are flat, covered with crowded, irregularly shaped string granules. Inset 2450×. Credits: SEM images courtesy of Paul Callomon. Scale bars (excluding insets): A–H = 200 μm.


A
100 µm
200 µm
B
200 µm
50 µm
C
200 µm
100 µm
D
200 µm
E
200 µm
80 µm
F
200 µm
200 µm
G
100 µm
30 µm
H
200 µm

***Rubellatoma* spp. Part 1**

Rubellatoma rubella (J.D. Kurtz & W. Stimpson, 1851)
Figs 107A, 108A–L

Mangelia rubella J.D. Kurtz & W. Stimpson, 1851: 115.

Mangelia rubella – Kurtz 1860: 9. — Abbott 1954b: 272. — Tucker 2004: 857.
Mangilia rubella – Bush 1885b: 580. — Dall 1889b: 100; 1890b: 41; 1892: 214; 1903: 1606. — Gardner & Aldrich 1919: 17. (as aff. *rubella*). — Maury 1922: 40.
Rubellatoma rubella – Bartsch & Rehder 1939: 131. — DuBar 1962: 38. — Porter & Wolfe 1971: 97. — Andrews 1977: 138, text fig. (as cf. *rubella*). —Kaicher 1984: card 3953. — Lyons 1989: 28, pl. 11 fig. 7. — Odé 1992a: 57. – Turgeon *et al*. 1998: 109. — García & Lee 2002: 12. — Williams 2005: #5651. — García 2007: 8. — Frank 2008: http://www.jaxshells.org. — Lee 2009: 134, fig. 654.
Cryoturris rubella – Gardner 1948: 272.
Kurtziella (*Rubellatoma*) *rubella* – Abbott 1974: 281, fig. 3244. — Rios 1983: 115.; 1985: 145, pl. 49 fig. 680; 1994: 175, pl. 58 fig. 803.
Kurtziella rubella – Campbell *et al*. 1975: 118. — Porter 1975: 34. — Turgeon *et al*. 1988: 98.

Differential diagnosis

Rubellatoma diomedea Bartsch & Rehder, 1939 differs in possessing a chestnut brown, not horn-colored protoconch, and lower whorl peripheries. See other differences under *R. diomedea*.

Type material

The type according to Kurtz & Stimpson (1851):

UNITED STATES OF AMERICA • 0.4 × 0.14 pollex [ca 9.8 × 3.4 mm]; Coast of Carolina [Oak Island, North Carolina (Kurtz 1860: 9)]; repository unknown. Not at the MCZ (email communication with Adam Baldinger, curator, dated 11 February 2020).

Material examined (47 specs)

UNITED STATES OF AMERICA • 4 specs, 12.0 × 4.8, 11.8 × 4.7, 8.2 × 3.6, and 7.0 × 3.2 mm; E Florida, Duval Co., 60 mi. [97 km] E of Mayport; depth 18 m; Jun. 1978; C.M. Lloyd leg.; in beach renourishment spoil; UF 589878 • 1 spec., 9.1 × 3.5 mm; E Florida, Duval Co., 7 mi. [11 km] E of border of Neptune/Jacksonville Beaches; depth 20 m; Aug. 1986; Bill Hanson leg.; in beach renourishment spoil; UF 589879 • 11 specs, 10.0 × 4.0, 8.1 × 3.8, 8.4 × 3.7, 7.7 × 3.7, 8.0 × 3.7, 7.8 × 3.6, 7.5 × 3.6 7.4 × 3.9, 7.2 × 3.2, 5.4 × 2.9, 2.9 × 1.6 mm; E Florida, St. Johns Co., 55 mi. [89 km] E of Ponte Vedra; depth 43 m; 12 Mar. 1988; H.G. Lee leg.; ex batfish trawled by scallop boat; UF 589880 • 29 specs, (12 measured) 12.5 × 4.7, 10.7 × 4.5, 9.5 × 4.0, 9.6 × 4.0, 9.4 × 4.0, 9.8 × 4.1, 9.1 × 3.7, 9.0 × 3.6, 8.5 × 3.5, 8.5 × 3.4, 7.5 × 3.4 and 7.3 × 3.1 mm; E Florida, Duval Co., off Big Talbot Island; depth 9–18 m; 1965–1975; Bill Skipper leg.; trawled, ex flat blue starfish; UF 589875 • 2 specs, 8.0 × 3.5 and 6.8 × 3.0 mm; E Florida, Duval Co., 7 mi. [11 km] E of border of Neptune/Jacksonville Beaches; depth 20 m; Aug. 1986; Bill Hanson leg.; in beach renourishment spoil; UF 589881.

Description

The type, *Mangelia rubella* J.D. Kurtz & W. Stimpson, 1851, could not be located. This description is based on that of Kurtz & Stimpson (1851: 115) and on Donn Tippett's research notes ("Mang 1", undated) regarding specimens off North Carolina at the Smithsonian. *Shell* small (type length = 9.8 mm), glossy, ovate-fusiform (W/L = 0.3469), of 7 obtuse-angled whorls appressed to sutures, the last whorl about 66% of shell length; sculpture of moderately strong axial ribs and flattened spirals, varix is a

strong last rib in mature specimens; aperture narrowly oval, about 50% of shell length, including canal; anal sinus shallow, anterior canal moderately long. *Protoconch* of 2½–3 smooth whorls, the first minute, the last with opisthocline riblets that get gradually stronger toward the end of the protoconch but fade before the suture with the first teleoconch whorl. *Axial sculpture* of moderately strong ribs, 11 on the penultimate 9 on the last, that run from suture to suture, and fade on the anterior fasciole on the last whorl; are strongest at whorl periphery, reduced and recurved on the upper half of the shoulder. *Varix* is a strong last rib serves to strengthen the outer lip. *Spiral sculpture* of incised grooves separating wide, flattened spirals; growth increments cause spirals to be jagged. *Sulcus* absent; recurved ribs on shoulder mark former positions of the anal sinus. *Outer lip* thickened, usually the last and strongest rib, mature specimens have a series of 6–8 elongate lyrae inside the upper half of the outer lip that run back into the aperture. *Anal sinus* is a shallow arch the width of the shoulder, without a parietal callus or tooth. *Inner lip* a narrow strip of glazed shell along the columella and parietal wall, margined. *Columella* straight. *Anterior canal* moderately long, straight, or curved slightly to the left when viewed ventrally, unnotched. *Anterior fasciole* is not swollen, covered with fine oblique thread-like spirals and strong growth lines. *Color* white to reddish with a broad white band at whorl periphery. Ribs may be white with reddish color confined to intercostal spaces.

Remarks

The average length of 30 specimens is 8.5 mm (range = 2.9–12.5 mm). Color patterning can also differ, including the absence or intensity of the colored and white bands; however, the peripheral white or ivory band appears to be common to all.

Range and habitat

Western Atlantic coast of the United States (North Carolina to NE Florida); depth 9–43 m.

Rubellatoma diomedea Bartsch & Rehder, 1939
Figs 107B, 108M–O

Rubellatoma diomedea Bartsch & Rehder, 1939: 131–132, pl. 17 fig. 3.

Rubellatoma diomedea – Perry 1940: 171, pl. 39 fig. 274. — Abbott 1954: 272. — Perry & Schwengel 1955: 189–190, pl. 39 fig. 274. — Powell 1966: 102, pl. 16 fig. 1. — Andrews 1971: 124, text fig. — Kaicher 1984: card 3903. — Odé 1992a: 57. — Gundersen 1998: 13 (captioned photo). — Turgeon *et al*. 1998: 109, 266. — Tucker 2004: 308. — Williams 2005: #5650.
Rubellatoma diomeda [sic] – Tunnell & Chaney 1970: 198.
Kurtziella (*Rubellatoma*) *diomedea* – Abbott 1974: 281, sp. 3245.
Kurtziella diomedea – Turgeon *et al*. 1988: 98. — Shelton 1997: no. 285.

non *Rubellatoma diomedea* – Frank 2008: http://www.jaxshells.org. — Lee 2009: 134, fig. 653.
non *Kurtziella* (*Rubellatoma*) *diomedea* – Vokes & Vokes 1983: 31, pl. 21 fig. 20.

Differential diagnosis

Bartsch & Rehder (1939: 131–132) state that *Rubellatoma rubella* (J.D. Kurtz & W. Stimpson, 1851) has horn-colored nuclear whorls, not chestnut-brown, and teleoconch whorl peripheries higher, near the whorl middle, not below as in *R. diomedea*. *R. diomedea* is stockier (W/L = 0.4084 versus 0.3469 of holotypes). in addition to this distinction, *R. rubella* is a larger species, with a longer more evenly tapered body whorl, usually with swollen nodules on whorl peripheries. Their distribution differs, *R. rubella* is found on the east coast of Florida, *R. diomedea* on the west coast.

Type material

Holotype

UNITED STATES OF AMERICA • 9.8 × 4.0 mm; W Florida, Lee Co., Sanibel Island; 1935; Perry leg.; USNM 508645.

Paratypes (4 specs)

UNITED STATES OF AMERICA • 3 specs; Alabama, off Mobile Bay; 27 fms [49 m]; USFC R/V *Albatross* stn 2389; USNM 323723.

Bartsch & Rehder (1939: 131) state that a 4th specimen is in Perry's collection. The location of this specimen is unknown.

Material examined (3 specs)

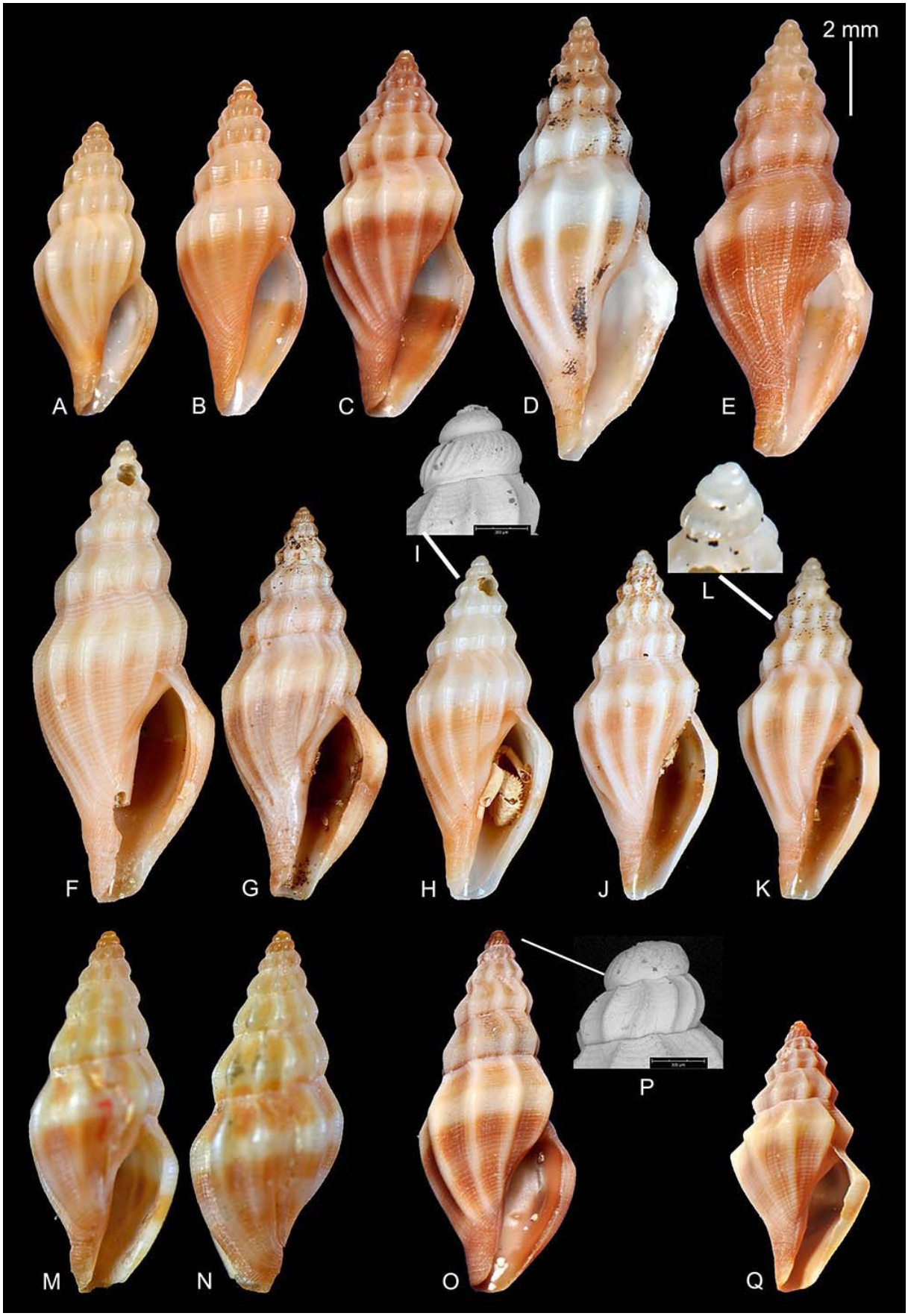
The holotype and the following 2 specimens were examined.

UNITED STATES OF AMERICA • 1 spec., 9.9 × 4.2 mm; W Florida, Levy Co., Cedar Keys, 10 mi. [16 km] SW of Seahorse Key; May 1985; David Hill leg.; ex batfish stomachs; UF 589882 • 1 spec., 7.4 × 3.7 mm; W Florida, Levy Co.; J. Keeler leg.; ex batfish stomachs; UF 589876.

Description

Adapted from Bartsch & Rehder (1939b: 131–132), research notes of Donn Tippett (undated, Mangeliidae Vol 2: 244–248), and examination of the holotype. *Shell* small (holotype length = 9.8 mm), fusiform (W/L = 0.4084), glossy, with about 7½ whorls, teleoconch whorls appressed, steeply sloping, and angled below mid-whorl, the last whorl 66% of shell length. Sculpture of moderately strong axial ribs and fine spiral grooves. Aperture elongate-oval, about 49% of shell length, including a short anterior canal, with a shallow anal sinus near suture. *Protoconch* of 3 smooth whorls, the first minute, the last with opisthocline riblets that gradually grow stronger toward the end of the protoconch and fade before the suture with the first teleoconch suture. *Axial sculpture* of strong axial ribs that run from suture to suture on spire whorls and to the anterior fasciole on the last; are strongest and highest at the periphery and then gradually taper to the sutures and to the anterior fasciole where they evanesce. Ribs number 10 on the penultimate and 7 on the last ¾-whorl. Ribs are not quite as wide as intercostal spaces. The entire shell surface is marked by numerous incremental growth lines. *Varix* absent, last rib serves to strength

Fig. 108 (next page). Species of *Rubellatoma* Bartsch & Rehder, 1939. Part 1. – **A–L**. *Rubellatoma rubella* (J.D. Kurtz & W. Stimpson, 1851). **A**. Spec., 8.0 × 3.5 mm (UF 589879), in beach renourishment spoil, taken from 7 mi. [11 km] E of the border of Neptune/Jacksonville Beaches, Duval Co., E Florida. **B**. Spec., 9.1 × 3.5 mm (UF 589879), in beach renourishment spoil, taken from beaches 7 mi. [11 km] E of the border of Neptune/Jacksonville, Duval Co., E Florida. **C**. Spec., 10.0 × 4.0 mm (UF 589880), 55 mi. [89 km] E of Ponte Vedra, St Johns Co., E Florida. **D–E**. Specs, 11.8 × 4.7 and 12.0 × 4.8 mm (UF 589878), in beach renourishment spoil, taken from 60 mi. [97 km] E of Mayport, Duval Co., E Florida. **F–L**. Specs, 9.5 × 4.0, 9.6 × 4.0, 9.4 × 4.0, ventral view and SEM image of protoconch, 9.8 × 4.1, 9.1 × 3.7 mm, ventral and enlarged view of protoconch, not to scale (UF 589875), off Big Talbot Island, Duval Co., E Florida, in 9–18 m, ex flat blue starfish. – **M–Q**. *Rubellatoma diomedea* Bartsch & Rehder, 1939. **M–N**. Holotype, 9.8 × 4.0 mm, ventral and dorsal views (USNM 508645), Sanibel Island, W Florida. **O–P**. Spec., 9.9 × 4.2 mm, ventral view and SEM image of protoconch (UF 589876), 10 mi. [16 km] SW of Seahorse Key, Cedar Keys, Levy Co., W Florida. The minute tip of the protoconch has eroded away on this specimen, and only the last two protoconch riblets are in view at the right of the image. **Q**. Spec., 7.4 × 3.7 mm (UF 589882), Levy Co., W Florida. Credits: I, P: SEM images courtesy of Paul Callomon. Scale bars: A–H, J–K, M–O, Q = 2 mm; I, P = 300 μm.


2 mm
A
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outer lip. *Spiral sculpture* of wide flattened spirals over the entire surface separated by shallow grooves, intersected by incremental growth lines. Growth lines are most visible in grooves. *Sulcus* absent; past positions of the sinus marked by slightly recurved ribs on the shoulder. *Outer lip* is thin, usually a narrow strip of shell along the base of the last and strongest rib. *Anal sinus* a wide shallow 'U' that occupies most of the width of the shoulder, apex centrally located. *Inner lip* a narrow glaze along the columella and parietal wall to the outer lip suture; without a significant parietal callus. *Columella* straight. *Anterior canal* short, straight, unnotched. *Anterior fasciole* sculpted as shell base with a denser concentration of growth striae. *Color* shell base beige ivory with broad color bands of dark yellowish beige on most of the shoulder and on base beginning just above suture line to anterior canal, with a slightly lighter band centered in the base band; periphery with light ivory band; protoconch chestnut brown. Color pattern shows though inside aperture.

Range and habitat

Eastern Gulf of Mexico. United States (Alabama and W Florida); depth 1–49 m.

Rubellatoma spp. Part 2

Rubellatoma brasiliensis Fallon sp. nov.
urn:lsid:zoobank.org:act:FCE0B619-B9E3-42D6-905E-8CB88492403E
Figs 107C, 109A–H

non *Cryoturris adamsi* [sic] (E.A. Smith, 1884) – Rios 1985: 144; pl. 49 fig. 672; 1994: 173; pl. 57 fig. 793; 2009: 339, fig. 871. — Williams 2005: #5561.

Differential diagnosis

Rubellatoma rubella (J.D. Kurtz & W. Stimpson, 1851) has stronger and fewer ribs (11 versus 14 on the penultimate whorl), has a shorter body whorl (66% versus 71% of shell length), and has a different color pattern – a white spiral band around the shoulder, which is lacking in *R. brasiliensis* Fallon sp. nov.

Etymology

Rubellatoma brasiliensis Fallon sp. nov., the Brazilian *Rubellatoma*, is named for the country from which the type series was collected.

Type material

Holotype

BRAZIL • 7.8 × 3.2 mm; Espirito Santo State, off Guarapari; depth 60–80 m; Dec. 2004; local fishermen leg.; trawled; UF 589877.

Paratypes (7 specs)

BRAZIL • 2 specs, 7.4 × 3.0 and 7.2 × 3.0 mm; Espirito Santo State, off Guarapari; depth 60–80 m; Dec. 2004; local fishermen leg.; trawled; USNM 1715459 • 1 spec., 8.6 × 3.5 mm; off Santa Catarina State; depth 210 m; 1991; local fishermen leg.; trawled on mud; ANSP 498959 • 1 spec., 7.6 × 3.0 mm; Bahia State, Salvador, Itapua Beach; depth 0 m; Oct. 1993; G. Pomponet leg.; in beach drift; USNM 1715460 • 1 spec., 8.4 × 3.5 mm; Rio de Janeiro State, off Niteroi; depth 60–80 m; Mar. 2001; local fishermen leg.; trawled; UF 589883 • 2 specs, 8.6 × 3.6 and 7.5 × 3.1 mm; Espirito Santo State, Piuma; depth 20 m; dredged; UF 589884.

Description

Shell small (length = 7.8 mm), fusiform (W/L = 0.4103), glossy, with about 7½ whorls; teleoconch whorls appressed and slightly undulant over previous whorl's ribs, steeply sloping, and roundly (spire) to sharply

angled (last whorl) about mid-whorl, the last whorl large, about 71% of shell length and tapers gradually to a moderately long anterior canal. Sculpture of moderately strong axial ribs and fine spiral grooves. Aperture elongate-oval, about 61% of shell length including canal, with a shallow anal sinus near suture. *Protoconch* of about 2½ evenly expanding, glossy whorls, the first minute, the last with riblets that begin weak and closely spaced and end strong and widely spaced. *Axial sculpture* of moderately strong, narrow axial ribs, intercostal distance about 2x their width, that ribs run from suture to suture on spire whorls and to the anterior fasciole on the last; ribs number 14 on the penultimate, 12 on the last and gradually taper to sutures and to the anterior fasciole where they evanesce. *Varix* absent; the last rib, close to the apertural lip, serves to strengthen the shell's lip. *Spiral sculpture* of flat spirals separated by grooves, closer and weaker on shoulder, the peripheral one cord-like and nodulose on rib crests; spirals override ribs. *Sulcus* absent but recurved ribs on whorl shoulders are marks of the past locations of the anal sinus. *Outer lip* includes the last rib and a thin margin of shell that runs along its bottom edge. Anal tooth absent. *Anal sinus* a wide shallow notch almost the width of the shoulder with a round apex deepest near peripheral edge of shoulder. The sinus rests in front of the last rib, which is curved behind it. *Inner lip* a thin glaze along the columella and parietal wall, unemarginate and without a callus. *Columella* is slightly sinusoidal. *Anterior canal* moderately long, open, unnotched. *Anterior fasciole* is not swollen, with about 13 closely spaced weak oblique spiral secondaries. *Color* a creamy yellow base with a chestnut brown to dark violet mid-whorl spiral band, lip edge, and anterior fasciole; intercostal spaces on shoulder tinted with chestnut brown. The spiral band that shows inside the aperture of the shell.

Remarks

The taxon *Cryoturris adamsii* (E.A. Smith, 1884) is applied to this species by some, but see rationale as a nomen dubium at the beginning of Part 1.

The average length of 8 specimens is 7.9 mm (range = 7.2–8.6 mm). The anterior canal of some specimens curves to the left when viewed ventrally. Color markings vary from chestnut brown (or orange in aged shells) to deep violet.

Range and habitat

Southern Brazil (Bahia, Espirito Santo, Santa Catarina States); depth 200–210 m.

Rubellatoma hondurasensis Fallon sp. nov.
urn:lsid:zoobank.org:act:3697B23C-0D32-4CED-9551-D19C8F0CB381
Figs 107D, 109I–L

Differential diagnosis

Rubellatoma brasiliensis Fallon sp. nov. has a proportionally larger body whorl (71% versus 69% of shell length), stronger and more ribs on the penultimate whorl (14 versus 11) with less intercostal space, peripheral nodules stronger, and different color banding.

Etymology

Rubellatoma hondurasensis Fallon sp. nov., the Honduras *Rubellatoma*, is named after the country from which the type series originated.

Type material

Holotype

HONDURAS • 7.5 × 2.8 mm; Bay Islands, S of Barbareta Island; 16°25.1′ N, 86°09′ W; depth 24 m; 16 Jun. 2009; P. Fallon leg.; dredged on coralline sand; ANSP 498961.

Paratype (1 spec.)
HONDURAS • 1 spec., length = 7.5 mm; off Belfate; 15°50.33′ N, 86°27.49′ W; depth 11–12 m, 14 Jun. 2009; P. Fallon leg.; dredged on silty fine sand; P. Fallon coll.

Description

Shell small (length to 7.5 mm), fusiform, with 7½ whorls, sutures appressed and undulant over previous whorl's ribs, last whorl, longer than spire and tapered, 69% of shell length, whorl shoulders low, straight and extend to about mid-whorl on spire whorls, sides below periphery straight and angled slightly in to the suture; aperture narrowly oval, gradually constricts to a short anterior canal, and together with anterior canal, comprises 51% of shell length; sculptural elements of axials and spiral grooves. *Protoconch* trochoid, of 2⅞ evenly expanding whorls, the first 2 smooth, the last with numerous riblets on the last ¾ whorl that begin weak and closely spaced and end strong and widely spaced. *Axial sculpture* of narrow ribs with round crests that run from suture to suture, are narrower and recurved on whorl shoulders, and end at the anterior fasciole, 11 ribs are on the penultimate whorl and 11 on the last. *Varix* absent; the last rib, close to the edge of the aperture, serves to strength the shell's lip. *Spiral sculpture* of mildly convex spirals separated by grooves, spirals on shoulder closer and weaker. Spirals override ribs, the peripheral one is cord-like with weak nodules present on rib crests. *Sulcus* absent but recurved ribs on whorl shoulders mark past locations of the anal sinus. *Outer lip* a thin margin of shell that runs along the bottom edge of the last rib, anal sinus tooth absent. *Anal sinus* a wide shallow notch almost the width of the shoulder with a round apex, sides divergent. The sinus rests in front of the last rib, which is curved behind. *Inner lip* a thin glaze along the columella, unemarginate and without a callus. *Columella* is slightly sinusoidal. *Anterior canal* short, open, not delineated from aperture, unnotched. *Anterior fasciole* not swollen, with about 12 closely spaced oblique spirals. *Color* a creamy yellow base with a chestnut brown mid-whorl spiral band and anterior fasciole; a lighter, more diffuse band present at the whorl sutures. The mid-whorl band is visible above spire whorl sutures and inside the aperture.

Range and habitat

Honduras; depth 11–24 m.

Rubellatoma vitrea Fallon sp. nov.
urn:lsid:zoobank.org:act:65C01734-98A2-4259-A167-04A09FCDD9FC
Figs 107F, 109M–O

Differential diagnosis

This species differs from *Rubellatoma rubella* (J.D. Kurtz & W. Stimpson, 1851) in the following manner: it is smaller, whorls less angular, and is colored differently: translucent white with a dark orange band mid-whorl.

Rubellatoma castanea Fallon sp. nov. has fewer ribs (11 versus 12 on the penultimate), and a protoconch with fewer riblets (last ¼-whorl versus last full whorl). It is also a different color.

Etymology

Rubellatoma vitrea Fallon sp. nov. is derived from the feminine form of the Latin adjective '*vitreus*', meaning 'resembling glass', referencing its semitransparent shell.

Type material

Holotype
GUADELOUPE • 7.2 × 2.9 mm; Grande-Terre, Pointe des Châteaux, Salines; depth 1 m; MNHN-IM-2000-39723.

Paratypes

None.

Description

Shell small (length = 7.2 mm) fusiform, translucent, of 8 whorls total, teleoconch whorls convex, slightly angled mid-whorl; last whorl, long and gently tapering, about 65% of shell length; aperture narrowly oval, about 46% of shell length, including a short anterior canal; sculptural elements of axial ribs, a spiral cord, and spiral grooves. *Protoconch* of 2½ smooth, evenly expanding round whorls with riblets on the last whorl that get gradually stronger toward the end of the protoconch. *Axial sculpture* of strong ribs with round crests that run from suture to suture, are narrower and recurved on whorl shoulders, angled at shoulder edge, and end at the anterior fasciole. Intercostal spaces are narrower than ribs, number 12 on the penultimate and 12 on the last whorl. *Varix* absent; the last rib, close to the apertural lip, serves to strength the shell's lip. *Spiral sculpture* of well-spaced incised grooves and a strong spiral at whorl periphery that overrides ribs, giving the appearance of slightly nodulous ribs at whorl peripheries. *Sulcus* absent but recurved ribs on whorl shoulders are marks of the past locations of the anal sinus. *Outer lip* is thin, a narrow band of shell that runs along the bottom edge of the last full rib, with a narrow axial fold along its edge. Lip edge forms a low arc from the edge of the shoulder to the anterior canal, stromboid notch absent. *Anal sinus* a wide round notch, centered along the width of the shoulder, sides divergent, dentition lacking. *Inner lip* a shallow glazed excavation along the columella, unemarginate and without a callus. *Columella* straight. *Anterior canal* short, open, unnotched. Note that tip of the anterior canal of the type specimen may have been broken, hence naturally slightly longer. *Anterior fasciole* is not swollen, without spiral sculpture but with heavy growth marks along the fasciole at rib terminations. *Color* translucent white with mid-whorl orange spiral band, which is visible at spire whorl sutures.

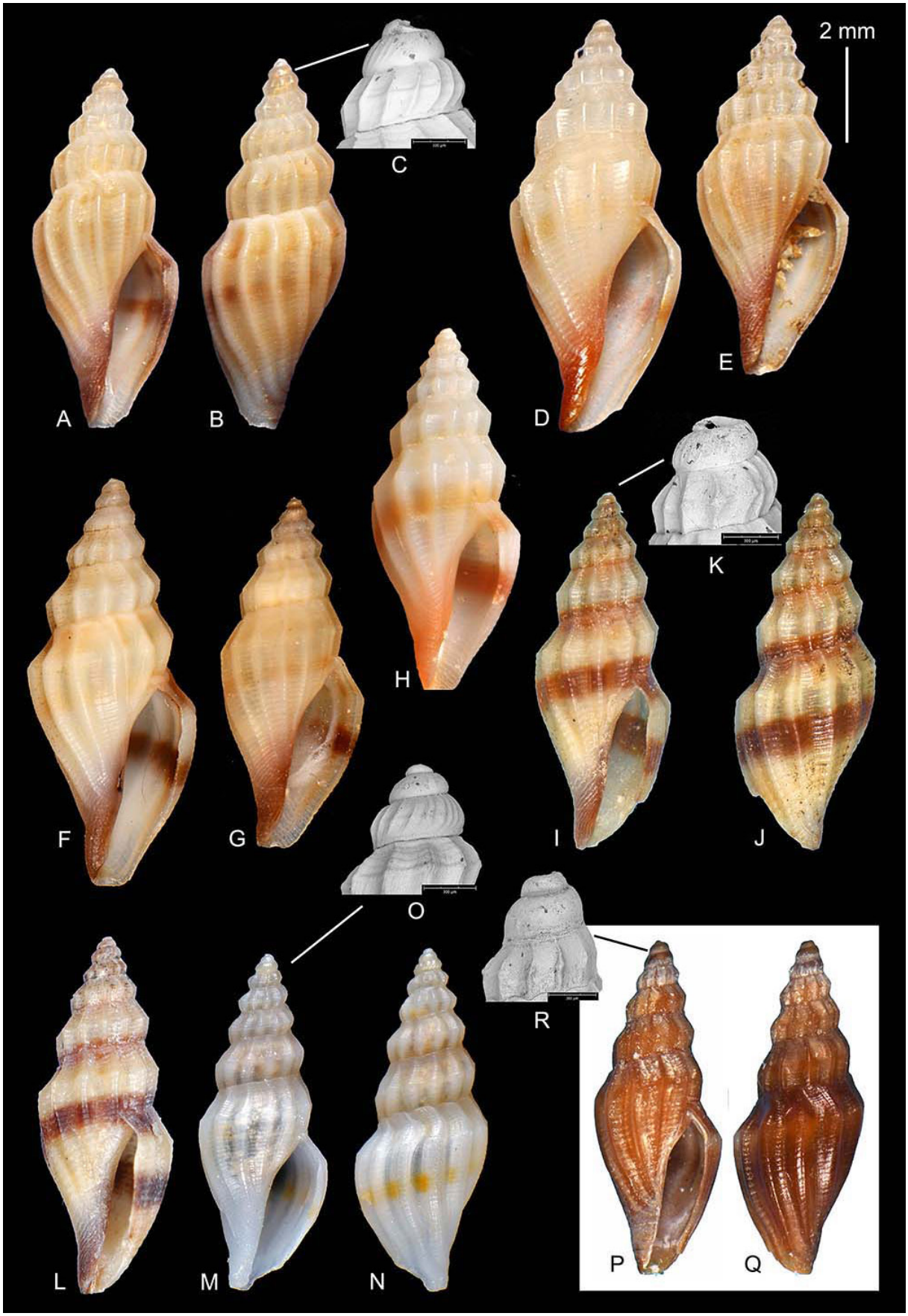
Remarks

This single specimen merits description due to the lack of other representatives of this genus in shallow water samples from around Guadeloupe and Martinique, as well as its morphological uniqueness. Unlike most of its congeners, its spire whorls are convex and not significantly angled (but like *Rubellatoma castanea* Fallon sp. nov. in this regard).

Range and habitat

Known only from the type locality.

Fig. 109 (next page). Species of *Rubellatoma* Bartsch & Rehder, 1939. Part 2. – **A–H**. *Rubellatoma brasiliensis* Fallon sp. nov. **A–C**. Holotype, 7.8 × 3.2 mm, ventral and dorsal views, and SEM image of protoconch (UF 589877), off Guarapari, Espirito Santo State, Brazil. **D–E**. Paratypes, 8.6 × 3.6 and 7.5 × 3.1 mm (UF 589884), Piuma, Espirito Santo State, Brazil. **F**. Paratype, 8.6 × 3.5 mm (ANSP 498959), off Santa Catarina State, Brazil. **G**. Paratype, 7.4 × 3.0 mm (USNM 1715459), off Guarapari, Espirito Santo State, Brazil. **H**. Paratype, 7.6 × 3.0 mm (USNM 1715460), Itapua Beach, Salvador, Bahia State, Brazil. – **I–L**. *Rubellatoma hondurasensis* Fallon sp. nov. **I–K**. Holotype, 7.8 × 2.8 mm, ventral and dorsal views, and SEM image of protoconch (ANSP 498961), S of Barbareta Island, Bay Islands, Honduras. **L**. Paratype, length = 7.5 mm (P. Fallon coll.), off Belfate, Honduras. – **M–O**. *Rubellatoma vitrea* Fallon sp. nov., holotype, 7.2 × 2.9 mm, ventral and dorsal views, and SEM image of protoconch (MNHN-IM-2000-39723), Salines, Pointe des Châteaux, Grande-Terre, Guadeloupe. – **P–R**. *Rubellatoma castanea* Fallon sp. nov., holotype, 7.1 × 2.7 mm, ventral and dorsal views, and SEM image of protoconch (ANSP 498960), Tayrona Park, Colombia. Credits: C, K, O, R: SEM images courtesy of Paul Callomon. Scale bars: A–B, D–J, L–N, P–Q = 2 mm; C, K, O, R = 300 µm.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Rubellatoma castanea Fallon sp. nov.
urn:lsid:zoobank.org:act:964C01A1-56A8-46F7-A7D6-D3EB3A343C55
Figs 107E, 109P–R

Differential diagnosis

Rubellatoma hondurasensis Fallon sp. nov. has more angular shoulders, more riblets on the last whorl of the protoconch, and is colored differently.

Rubellatoma brasiliensis Fallon sp. nov. is larger, has more angular shoulders, more riblets on the last whorl of the protoconch, and is colored differently.

Rubellatoma vitrea Fallon sp. nov. differs in the manner described in the identification section of that species.

Etymology

Rubellatoma castanea Fallon sp. nov. is derived from the feminine form of the Latin adjective, '*castaneus*', meaning 'chestnut-colored', which references the color of the shell.

Type material

Holotype

COLOMBIA • 7.1 × 2.7 mm; Tayrona Park; depth 18 m; on soft sand; ANSP 498960.

Paratypes

None.

Description

Shell small (to 7.1 mm), fusiform, with 7⅛ whorls, obtusely angled with peripheries mid-whorl and rounded, sutures appressed and slightly undulant over previous whorl's ribs; last whorl, long and gently tapering, about 68% of length; aperture narrowly oval, about 49% of shell length; sculptural elements of axials, a spiral cord, and spiral grooves. *Protoconch* of about 2½ evenly expanding smooth whorls, tip minute (mostly missing) with 2 riblets on the last ¼-whorl. *Axial sculpture* of strong ribs with round crests that run from suture to suture, are narrower and recurved on whorl shoulders, and end at the anterior fasciole. Ribs are about as wide as intercostal space, number 11 on the penultimate and 11 on the last whorl. *Varix* absent; the last rib, close to the apertural lip, serves to strength the shell's lip. *Spiral sculpture* of flat spirals separated by coarse grooves that override ribs; spirals weakest and closer on shoulder; a single spiral cord present on whorl periphery, slightly nodulous on rib crests. *Sulcus* absent but recurved ribs on whorl shoulders are marks of the past locations of the anal sinus. *Outer lip* is a thin margin of shell that runs along the bottom edge of the last rib, which is the margin of the outer lip. Tooth below anal sinus absent; stromboid notch broad and shallow. *Anal sinus* is a wide shallow notch with a round apex that is closer to the whorl periphery than the suture. The sinus rests in front of the last rib, which is curved behind it. *Inner lip* a shallow glazed excavation along the columella, unemarginate and without a callus. *Columella* straight. *Anterior canal* short, open, unnotched. *Anterior fasciole* is not swollen, without spiral sculpture but with heavy growth marks along the fasciole at rib terminations. *Color* chestnut brown with a lighter spiral band beginning on shoulder and shifting to whorl periphery on last whorl, and a darker chestnut brown band just below the peripheral lighter one; shoulders of protoconch translucent brown, sides opaque dirty white; aperture grayish (originally dark violet?), dark chestnut brown band shows through.

Remarks

Only a single specimen was available but because of its singular protoconch sculpture (only two riblets) and color (almost entirely chestnut brown) it is sufficiently different to merit description at this time. Unlike most of its congeners, spire whorls are convex, not appreciably angled (but like *R. vitrea* Fallon sp. nov. in this regard).

Range and habitat

Known only from the type locality.

***Rubellatoma* spp. Part 3**

Rubellatoma nodosa Fallon & Bouchet sp. nov.
urn:lsid:zoobank.org:act:6F8F62E5-8174-4312-8415-D7BE869F0EDF
Figs 107G, 110A–F

Differential diagnosis

Rubellatoma nodosa Fallon & Bouchet sp. nov. looks like the fossil species *Ithycythara scissa* Woodring, 1928 but differs in having more angular whorls, a tapered body whorl (that of *I. scissa* is somewhat more rounded), more axial ribs (10 versus 7 on the penultimate whorl), and a protoconch with fewer whorls (2¼ versus 3).

Unlike most other members of this genus group known to date, *R. nodosa* Fallon & Bouchet sp. nov. is found in deep water (> 260 m). When fresh, it is translucent white with very faint brown spiral bands on the shoulder, faint brown primaries on the dorsal surface, and a brown protoconch.

Rubellatoma nivea Fallon & Bouchet sp. nov., also a deep water species, has nodules restricted to the peripheral spiral. See under this species' section for further differences.

Rubellatoma edithae (Nowell-Usticke, 1971) comb. nov. is a light yellowish brown with a broad slightly darker band below the whorl periphery, and a brown protoconch. It is smaller than *R. nodosa* Fallon & Bouchet sp. nov. and has only been reported from shallow water.

Etymology

Rubellatoma nodosa Fallon & Bouchet sp. nov. is derived from the Latin adjective '*nodosus*', meaning 'knotty', a reference to the nodulose primary spirals on the crests of axial ribs, unique to this species.

Type material

Holotype

GUADELOUPE • 7.9 × 3.1 mm; N of Grande-Terre; 16°38′ N, 61°37′ W; depth 413–423 m; 13 Jun. 2015; KARUBENTHOS 2; stn DW4544; MNHN-IM-2000-39717.

Paratypes (13 specs)

GUADELOUPE • 7 specs, 6.9 × 2.8, 6.3 × 2.6, 6.2 × 2.8, 6.3 × 2.7, 6.5 × 2.5, 6.4 × 2.6 and 5.6 × 2.6 mm; S of La Désirade; depth 350 m; dredged; D. Lamy coll. • 1 spec., 6.2 × 2.8 mm; Banc des Vaisseaux; depth 300 m; dredged; D. Lamy coll. • 1 spec., 7.3 × 2.8 mm; E La Désirade; 16°24′ N, 60°49′ W; depth 367–428 m; 15 Jun. 2015; KARUBENTHOS 2; stn DW4556; USNM 1715413 • 4 specs, 6.3 × 2.3, 6.1 × 2.4, 5.7 × 2.2 and 6.1 × 2.5 mm; N Grande-Terre; 16°31′ N, 61°32′ W; depth 268–306 m; 14 Jun. 2015; KARUBENTHOS 2; stn DW4546; MNHN-IM-2000-39722.

Other material examined (8 specs)

GUADELOUPE • 2 specs, 6.8 × 2.7 and 6.6 × 2.6 mm; N Grande-Terre; 16°37′ N, 61°31′ W; depth 432–482 m; 14 Jun. 2015; KARUBENTHOS 2; stn DW4550; MNHN-IM-2000-39720 • 4 specs,

lengths = 6.6, 6.1, 6.0 and 4.0 mm; E La Désirade; 16°19′ N, 60°55′ W; depth 396–399 m; 17 Jun. 2015; KARUBENTHOS 2; stn DW4572; MNHN-IM-2000-39721 • 1 spec., 5.9 × 2.3 mm; E La Désirade; 16°19′ N, 60°55′ W; depth 396–399 m; 17 Jun. 2015; KARUBENTHOS 2; stn DW4572; MNHN-IM-2000-39719 • 1 spec., 6.2 × 2.5 mm; N Grande-Terre; 16°29′ N, 61°38′ W; depth 353–360 m; 11 Jun. 2015; KARUBENTHOS 2; stn DW4531; MNHN-IM-2000-39718.

Description

Shell small (holotype length = 7.9 mm), fusiform (W/L = 0.3924), with 7 whorls, sutures appressed and slightly undulant over previous whorl's ribs, shoulders steeply sloped and flat, extending mid-whorl, sides angle in toward sutures on spire whorls, the last whorl long and tapering and about 71% of shell length; sculptural elements of axials and spiral cords; aperture narrowly oval, last whorl narrows to a moderately long canal, aperture and canal together comprise about 53% of shell length. *Protoconch* of about 2¼ smooth whorls, tip minute, protruding down into center, then rapidly expands, the last's periphery progressively bulging ¾- to ½-whorl distant from the adapical suture, with arched riblets above and absent below the bulge. *Axial sculpture* of ribs that run from suture-to-suture and evanesce before the anterior fasciole, are low and narrow, intercostal spaces about twice their width, 10 on the penultimate, 9 on the last to the varix. *Varix* apertural, stronger on shoulder and near the end of the anterior canal than the previous rib, crenulated by overriding nodulose primary spirals. *Spiral sculpture* of wide and narrow flattened spirals that override ribs, separated by grooves, spirals form strong nodules on rib crests and alternate with 1 or 2 narrow, weaker spirals that do not form nodules. The penultimate whorl has 3 nodulose spirals, the last whorl 9 to the anal fasciole; whorl shoulders have only narrow spirals. The spiral on the whorl periphery is strongest and marks the boundary of the shoulder and whorl side. *Anal sinus* nearly as wide as shoulder, shallow, apex round and closer to whorl edge than to suture, its sides divergent. *Outer lip* varicose, a thin narrow strip of shell extends along the outer edge of the varix and is contiguous with the rim of the anal sinus. *Columella.* Straight. *Anterior canal* of moderate length, open, straight, unnotched. *Anterior fasciole* not swollen, 5 oblique spirals present. *Color* white with a faint wide rusty brown band on shoulder between ribs of last ½-whorl, and other indistinct rusty brown markings; first whorl of protoconch rusty brown.

Remarks

There is only a hint of color bands on this bathyal species when compared to their shallow water congeners. Other differences include greater swelling of spirals on rib crests, and a strong varix.

The average length of 21 measured specimens is 6.3 mm (range = 4.0–7.9 mm). specimens vary somewhat in the pattern of faint brown coloring.

Range and habitat

Guadeloupe; depth 268–482 m.

Rubellatoma nivea Fallon & Bouchet sp. nov.
urn:lsid:zoobank.org:act:12BF3AC1-A99A-4C71-9B4E-C2D0DBDD1A7E
Fig. 110G–M

Differential diagnosis

Rubellatoma nodosa Fallon & Bouchet sp. nov. is slightly broader, (W/L = 0.3924 versus 0.3684) has more prominent nodules on rib crests and lacks an anal and parietal tooth. It is quite similar and appears to be separated by habitat preference bathymetrically, occurring in samples taken between 268–482 m versus 160–262 m for *R. nivea* Fallon & Bouchet sp. nov. thus preferring deeper water.

Etymology

Rubellatoma nivea Fallon & Bouchet sp. nov. derives its name from the feminine form of the Latin adjective '*niveus*', meaning 'covered with snow', and refers to its predominantly white color.

Type material

Holotype

GUADELOUPE • 7.6 × 2.8 mm; W of Marie-Galante; 16°00′ N, 61°23′ W; depth 204–251 m; 21 Jun. 2015; KARUBENTHOS 2; stn DW4586; MNHN-IM-2000-39714.

Paratypes (9 specs)

GUADELOUPE • 1 spec., 7.3 × 2.6 mm; S of La Désirade; depth 250 m; 2016; dredged; D. Lamy coll. • 1 spec., 5.7 × 2.4 mm; same data as for holotype; MNHN-IM-2000-39716 • 1 spec., 6.1 × 2.3 mm; W of Marie-Galante; 16°00′ N, 61°23′ W; depth 204–251 m; 21 Jun. 2015; KARUBENTHOS 2; stn DW4586; MNHN-IM-2000-39715 • 2 specs, 7.2 × 2.7 and 5.3 × 2.0 mm; S of La Désirade; depth 250 m; 2016; dredged; D. Lamy coll. • 1 spec., 5.7 × 2.1 mm; W of Marie-Galante; 15°53′ N, 61°25′ W; depth 262–266 m; 22 Jun. 2015; KARUBENTHOS 2; stn DW4599; ANSP 498832 • 1 spec., length = 4.0 mm; Grand Cul-de-Sac Marin: Port-Louis; 16°25′ N, 61°33′ W; depth 160 m; 14 May 2012; KARUBENTHOS 2012; stn GD25; MNHN-IM-2012-8940 • 2 specs, 6.3 × 2.5 and 6.2 × 2.4 mm; W of Marie-Galante; 15°56′ N, 61°23′ W; depth 208–210 m; 22 Jun. 2015; KARUBENTHOS 2; stn DW4597; USNM 1715426.

Other material examined (1 spec.)

GUADELOUPE • 1 spec., 6.0 × 2.1 mm; E La Désirade; 16°17′ N, 61°01′ W; depth 250–359 m; 17 Jun. 2015; KARUBENTHOS 2; stn CP4569; MNHN-IM-2000-39869.

Description

Shell small (holotype length = 7.6 mm), fusiform (W/L = 0.3684), with about 7 whorls, sutures slightly appressed and undulant over previous whorl's ribs, the last whorl long and tapering and about 65% of shell length, shoulders sloping, and slightly convex, extending mid-whorl, sides straight below periphery; aperture narrowly oval and together with a moderately long anterior canal comprising about 49% of shell length; sculptural elements of narrow ribs and flattened spirals. *Protoconch* of about 2¼–2⅜ glossy whorls, the first minute, protruding down into center, then rapidly expands, the last's periphery progressively bulging ⅔–½-whorl distant from the adapical suture, with arched riblets above and nearly obsolete or obsolete below the bulge. *Axial sculpture* of ribs that run from suture-to-suture and evanesce at the anterior fasciole; ribs are low and narrow, intercostal spaces wider, recurved on whorl shoulders; 10 occur on the penultimate, 8 on the last to the varix. *Varix* apertural, is like but larger and stronger than previous ribs, is near the edge of the lip and extending farther to the end of the anterior canal than preceding rib, is crenulated by spiral cords. *Spiral sculpture* of variable width flat spirals separated by grooves, strongest spirals weakly nodulose on rib crests, 3 nodulose spirals on penultimate, and 9 on the last, weaker spirals present on the shoulder slope are not nodulose. The peripheral spiral strongest and marks the boundary of the shoulder and whorl sides. *Anal sinus* nearly as wide of shoulder, shallow, apex round and about mid shoulder, sides divergent; tooth present inside outer lip and on parietal wall. *Outer lip* thin, narrow strip of shell along the base of the varix, which is contiguous with the rim of the anal sinus. *Columella* straight. *Anterior canal* moderately long, open, straight, unnotched. *Anterior fasciole* not swollen, with about 14 oblique spirals. *Color* translucent milky-white with faint yellowish-brown bands on shoulder, about mid-whorl, and just above anterior fasciole on base; protoconch glossy yellowish-brown.

Remarks

The average length of 11 specimens is 6.1 mm (range = 4.0–7.6 mm). The anal and parietal tooth is present in fully developed specimens, which appears to be at variance with most species of *Rubellatoma*. So too is the relatively strong varix exhibited by the holotype and paratype visible in Fig. 110J. Color patterning ranges from banding similar or fainter than holotype to pure white, except the protoconch, which is usually yellowish brown.

Range and habitat

Guadeloupe; depth 160–262 m.

Rubellatoma edithae (Nowell-Usticke, 1971) comb. nov.
Fig. 110N–Q

Ithycythara edithae Nowell-Usticke, 1971: 24, pl. 4 fig. 1155.

Ithycythara edithae – Faber 1988: 79. — Boyko & Cordeiro 2001: 74. — Tucker 2004: 327.
Cryoturris edithae – Williams 2005: #5565.

Differential diagnosis

Rubellatoma brevis Fallon & Bouchet sp. nov. is smaller (holotype lengths = 4.5 versus 5.7 mm); has more angular whorls, with peripheries mid-whorl not below; and a protoconch of 2½, not 3 whorls.

Type material

Holotype

ANTIGUA AND BARBUDA • 5.7 × 2.3 mm; Antigua Island, St Johns, Secret Harbor; depth not stated; Nowell-Usticke leg.; AMNH 195465.

Paratypes

Unknown, but "their existence is indicated by Usticke's (1971: 24) given size range for the taxon of 4.75–5.6 mm length" (Boyko & Cordeiro 2001).

Fig. 110 (next page). Species of *Rubellatoma* Bartsch & Rehder, 1939. Part 3. – **A–F**. *Rubellatoma nodosa* Fallon & Bouchet sp. nov. **A–C**. Holotype, 7.9 × 3.1 mm, ventral and dorsal views, and SEM image of protoconch (MNHN-IM-2000-39717), N of Grande Terre, Guadeloupe. **D–E**. Paratypes, 6.9 × 2.8 and 6.5 × 2.5 mm (D. Lamy coll.), S of La Désirade, Guadeloupe. **F**. Paratype, 6.3 × 2.3 mm (MNHN-IM-2000-39722), N Grande-Terre, Guadeloupe. – **G–M**. *Rubellatoma nivea* Fallon & Bouchet sp. nov. **G–I**. Holotype, 7.6 × 2.8 mm, ventral and dorsal views, and SEM image of protoconch (MNHN-IM-2000-39714), W of Marie-Galante, Guadeloupe. **J**. Paratype, 7.3 × 2.6 mm (D. Lamy coll.), S of La Désirade, Guadeloupe. **K**. Paratype, 7.2 × 2.7 mm (D. Lamy coll.), S of La Désirade, Guadeloupe. **L–M**. Paratypes, 6.3 × 2.5 and 6.2 × 2.4 mm (USNM 1715426), W Marie-Galante, Guadeloupe. – **N–P**. *Ithycythara edithae* Nowell-Usticke, 1971, holotype, 5.7 × 2.3 mm, ventral, dorsal and apical (not to scale) views (AMNH 195465), Secret Harbor, St Johns, Antigua Island, Antigua and Barbuda. – **Q**. *Rubellatoma edithae* (Nowell-Usticke, 1971) comb. nov., spec., 5.3 × 2.2 mm (MNHN-IM-2000-39570), l'Ane Cove, Martinique. – **R–U**. *Rubellatoma brevis* Fallon & Bouchet sp. nov. **R–T**. Holotype, 4.5 × 2.1 mm, ventral and dorsal views, and SEM image of protoconch (MNHN-IM-2012-8754), off Fajou Island, Grand Cul-de-Sac Marin, Guadeloupe. **U**. Paratype, 4.8 mm × 2.4 mm (MNHN-IM-2000-39713), Schoelcher, Anse Madame, Martinique. Credits: C, I, T: SEM images courtesy of Paul Callomon. Scale bars: A–B, D–H, J–S, U = 2 mm; C, I, T = 300 µm.

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Material examined (1 spec.)

In addition to the holotype, a single specimen that might be this species was examined.

MARTINIQUE • 1 spec., 5.3 × 2.2 mm; l'Anse à l'Âne; depth 2–3 m; R. Delannoye leg.; on moss and sand; MNHN-IM-2000-39570.

Description

Shell small (holotype length = 5.7 mm), fusiform (W/L = 04035) with 7 whorls sharply angulated below mid-whorl, steeply sloping shoulders, sutures appressed and weakly undulant, last whorl 69% of shell length; aperture narrowly oval, 51% of shell length including a moderately long anterior canal; sculpture of strong but narrow ribs and wide, flat spirals. *Protoconch* of 3 about whorls, tip minute then rapidly expands to the last whorl which bears fine, curved, diagonal axial riblets. *Axial sculpture* of 11 to 12 strong ribs that run from suture to suture and evanesce before the anterior fasciole on the last whorl, about as wide as intercostal space, bear nodules on whorl periphery. *Varix* apertural, narrow and rib-like. *Spiral sculpture* of flattened spiral cords separated by grooves; spirals override ribs; a single peripheral cord nodulous on rib crests. *Sulcus* absent. *Outer lip* varicose with a narrow strip of shell along the leading edge of the varix. *Anal sinus* nearly as wide as shoulder, shallow, poorly developed on holotype. *Inner lip* a thin glaze along the columella and parietal wall; parietal callus absent. *Columella* slightly curved. *Anterior canal* open, moderately long and straight, unnotched. *Anterior fasciole* is not swollen, sculpted with oblique spirals and growth lines. *Color* semi-translucent waxy white with a faint yellowish-brown mid whorl spiral band that extends above sutures of spire whorls; yellowish brown along outer lip below anal sinus; protoconch golden brown.

Range and habitat

Antigua Island and Martinique; depth 2–3 m.

Rubellatoma brevis Fallon & Bouchet sp. nov.
urn:lsid:zoobank.org:act:D58AF7A1-6475-4EF9-BB24-79E81299676B
Figs 107H, 110R–U

Differential diagnosis

Rubellatoma edithae (Nowell-Usticke, 1971) comb. nov. is larger (holotype lengths = 5.7 versus 4.5 mm); has fewer angular whorls, with peripheries below not at mid-whorl; and has a protoconch of 3 not 2½ whorls.

Etymology

Rubellatoma brevis Fallon & Bouchet sp. nov. derives its name from the feminine form of the Latin adjective '*brevis*', meaning 'short', a reference to its short, stocky size.

Type material

Holotype

GUADELOUPE • 4.5 × 2.1 mm; Grand Cul-de-Sac Marin, off Fajou Island; 16°23.16′ N, 61°32.02′ W; depth 50 m; 5 May 2012; KARUBENTHOS 2012; stn GD03; MNHN-IM-2012-8754.

Paratype (1 spec.)

MARTINIQUE • 1 spec., 4.8 mm × 2.4 mm; Schoelcher, Anse Madame; 14°37.1′ N, 61°06.8′ W; depth 90 m; 7 Oct. 2016; MADIBENTHOS; stn AD610; MNHN-IM-2000-39713.

Description

Shell small (holotype length = 4.5 mm), fusiform (W/L = 04667) with 6 whorls; teleoconch whorls appressed sutures and acutely angulated about mid-whorl with steeply sloping shoulders; last whorl large, 72% of shell length; aperture narrowly oval, about 54% of shell length including a moderately long anterior canal; sculpture of widely separate narrow ribs and spirals. *Protoconch* of about 2½ round whorls, tip minute, then rapidly expands to the last 1¼ whorls that bear fine, curved, diagonal, axial riblets that end short of the first teleoconch whorl. *Axial sculpture* of narrow, low ribs that run from suture to suture on spire whorls and evanesce before the anterior fasciole on last whorl, ribs slightly curved on whorl sides and recurved on shoulders, 11 on penultimate and 8 on last whorl to varix. *Varix* large, on last ¼-turn of the body whorl, behind anal sinus and extends from above the suture to beginning of anterior canal. *Spiral sculpture* of coarse, somewhat flattened spirals separated by grooves; spirals override ribs; a single stronger peripheral cord is nodulous on rib crests. Spirals coarsened by microscopic structures, not by growth increments. *Sulcus* absent. *Outer lip* varicose with a strip of shell that extends out from the leading edge of the varix, about the width of a single intercostal space, narrowing toward the anterior canal. *Anal sinus* shallow, nearly as wide as shoulder. *Inner lip* a thin glaze along the columella and parietal wall, margined, without calluses. *Columella* straight. *Anterior canal* moderately long, open, end unnotched. *Anterior fasciole* is not swollen, sculpted with oblique spirals and growth lines. *Color* translucent dirty white with a faint yellowish-brown spiral band on the shoulder at the suture and 2 faint yellowish-brown bands mid-whorl and on the anterior fasciole. The mid-whorl band is darkest at the edge of the outer lip.

Range and habitat

Guadeloupe and Martinique; depth 50–90 m.

Genus ***Saccharoturris*** Woodring, 1928

Type species

Mangilia consentanea Guppy, 1896 in Guppy & Dall, 1896, by original designation.

Summary diagnostic characteristics

A tall-spired shell with strongly constricted whorls that are acutely angled mid-whorl or obtusely (nearly convex), and with shoulders from nearly flat to slightly convex.

Protoconch of 1½–3⅛ whorls with riblets, nearly or completely obsolete but with a mid-whorl keel bearing paddle-like projections on the last ¼ to 2 whorls.

Sculpture of strong but narrow ribs and usually heavily frosted primary and secondary spirals.

Aperture a relatively short moderately wide oval, not varicose, with a broad, shallow anal sinus on the shoulder, and strongly constricted anterior canal.

Outer and inner lips without dentition or calluses.

Anterior canal short to moderately long.

Shell surface microsculpture

SEM images of the shell surface show the presence of tall, hollow, finger-like projections, ‘pipes’, some with flared tips, others manifolded, or paired in a V-shape configuration that account for the exceptionally rough frosting of the genus *Saccharoturris* (Fig. 111). Pipes form on crests of spirals at their intersection with growth lines. Broken pipes are observed to be hollow, probably due to retreating

papillae on the shell-forming mantle edge. Intact structures can be seen near the suture, likely protected by the overhanging whorl. Although they possess similar papilliform projections, some differences are noted in the descriptions that follow.

Difference from other genera

Cryoturris Woodring, 1928 is a genus group that may have some species with protoconchs possessing mid-whorl keels developed with paddle-like nodules but have more distinct riblets on whorl shoulders above the keel, teleoconch spires are shorter, and frosting on the shell surface not as coarse. Other differences include a more distinct anal sinus.

Saccharoturris monocingulata (Dall, 1889)
Figs 111A–B, 112B–H

Mangilia quadrata var. *mono* Dall, 1889a: 114, pl. 11 figs 15–16

Mangilia quadrata var. *monocingulata* – Dall 1889b: 102–103, pl. 11 figs 15–16. — A.E. Verrill & Bush 1900: 511.
Mangelia millestriata var. *monocingulata* – Peile 1926: 84.
Saccharoturris monocingulata – Powell 1966: 102. — Turgeon *et al*. 1988: 100; 1998: 109. — Williams 2005: #5574. — García 2007: 8. — Lamy & Pointier 2017: 486, pl. 169 fig. 2a–b.
Mangelia (*Saccharoturris*) *monocingulata* – Abbott 1974: 278, fig. 3186.
Mangelia monocingulata – Sander & Lalli 1982: 317.

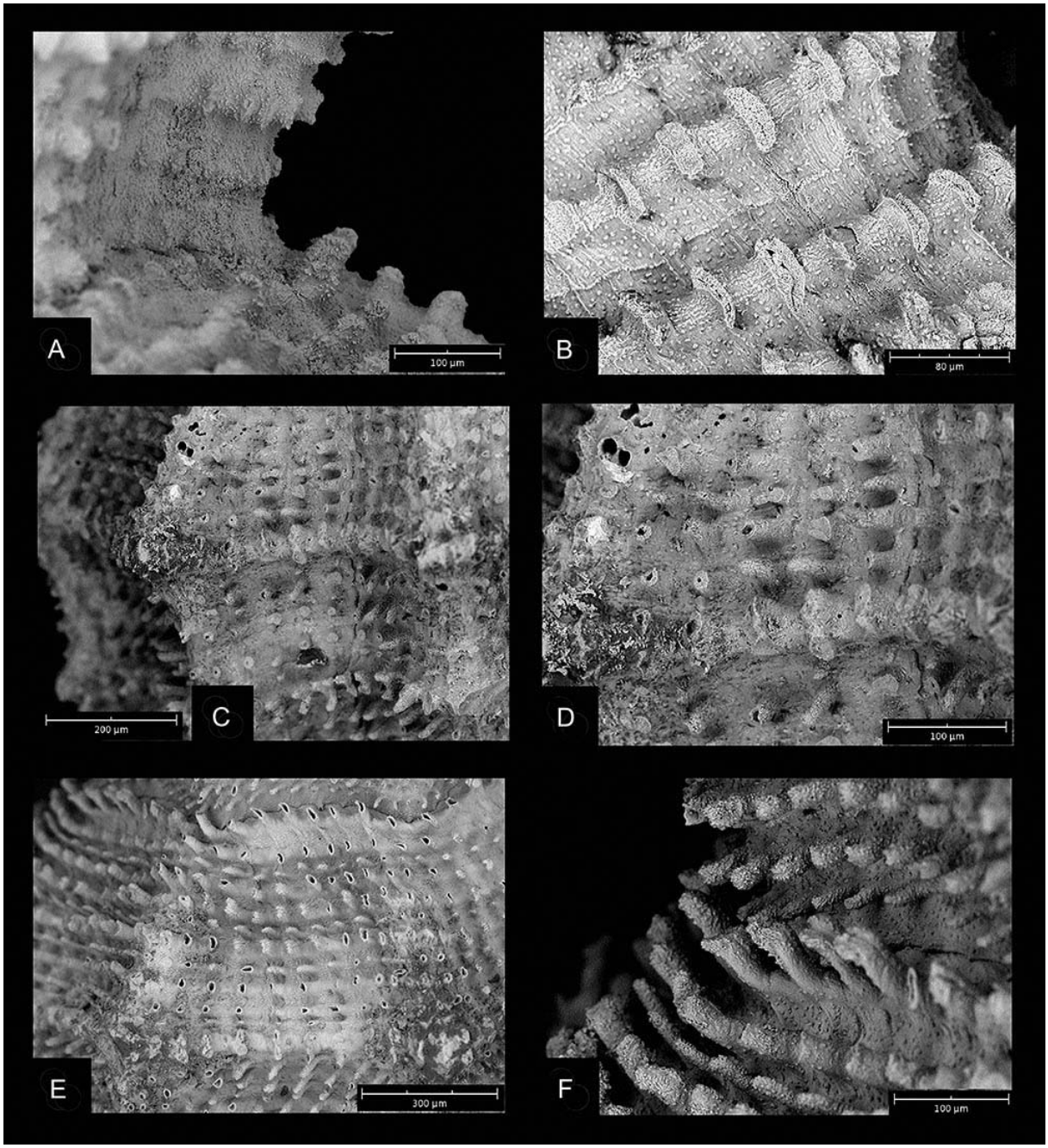
Differential diagnosis

This species is easily distinguished from its congeners by its larger protoconch (about 3 whorls versus 2½ and 1½ of the two other species) and by its more acutely angled whorls.

Fig. 111 (next page). Species of *Saccharoturris* Woodring, 1928, shell surface microsculpture. – **A–B**. *Saccharoturris monocingulata* (Dall, 1889). **A**. Spec., 9.3 × 3.6 mm (MNHN-IM-2000-39727), S of Marie-Galante, Guadeloupe. Shoulder of penultimate whorl at suture, 600 ×. Crests of most pipes have been sheared off. **B**. Spec., 7.8 × 3.0 mm (MNHN-IM-2000-39728), E of La Désirade, Guadeloupe. Shoulder of penultimate whorl at suture, 850 ×. A closer look at the position of pipes relative to spirals and growth lines. Pipes, all sheered down in this image, are oblong in cross section, hollow, and straddle the spirals. – **C–D**. *Saccharoturris bicingulata* Fallon & Bouchet sp. nov. **C**. Holotype, 8.9 × 3.3 mm (MNHN-IM-2000-39724), W of Marie-Galante, Guadeloupe. Side of penultimate whorl between first and second primaries, about 360 ×. Primaries have paired pipes joined at their base and spread 'V'-like along the spiral cord (most have been damaged); secondaries have pipes along spirals (most with bases flush with shell surface) at intervals corresponding to their intersection with incremental lines, and occasionally manifolded along incremental lines. Manifolded pipes seen only on shoulder. **D**. Same specimen and general area as in Fig. C including peripheral primary, about 670 ×. A closer view of pipes and manifolded pipes on shoulder. Paired pipes along peripheral primary are damaged and not clear in this image. – **E–F**. *Saccharoturris major* Fallon & Bouchet sp. nov. **E**. Paratype, 13.9 × 4.5 mm (D. Lamy coll.), S of La Désirade, Guadeloupe. Wide view of a portion of the penultimate shoulder showing spiral alignment of pipes, about 250 ×. The taller pipes are aligned along the suture and better protected from abrasion hence fewer are broken. The hollow nature of the structures is seen in broken pipes, and the variation in the diameter of pipes from row to row can also be seen. **F**. Same specimen as in Fig. E: a closer view near the suture, about 650 ×. Flaring of some of the tips of unbroken pipes is seen in this species. Credits: SEM images courtesy of Chandler J. Olson and Krasimira "Kasey" Seizova. Scale bars: A, D, F = 100 µm; B = 80 µm; C = 200 µm; E = 300 µm.

Dall's statement that both of his figured specimens are sub-adults is likely correct; however, the aperture does not change in larger, presumably adult specimens (length = 9.3 mm versus 6.7 mm for 1 of 3 syntypes in MCZ 7127 and 7.0 mm SL for the syntype in USNM 87425).

Regarding Dall's assignment of *S. monocingulata* as a variety of *Glyphoturris quadrata*, the protoconch of *Glyphoturris* is small-tipped, rapidly enlarging to the last half whorl or more, which has arced axial riblets. The protoconch of *Saccharoturris* is different: of up to 3 rapidly enlarging whorls, the last two of which are strongly keeled and bear beads on the keel. Although the teleoconchs of the two genera possess angular whorls noticeably constricted at spire sutures, other morphological traits are different.



Type material

Syntypes (5 specs)

BARBADOS • 3 specs; off St. James; depth 100 fms [183 m]; 1878; R/V *Blake* exped.; USNM 87425 • 1 spec., 6.7 × 3.0 mm; offshore; depth 100 fms [183 m]; 1878; R/V *Blake* exped.; MCZ 2127 • 1 spec.; depth 100 fms [183 m]; 1878; R/V *Blake* exped.; MCZ 7126.

Material examined (> 100 specs)

Over 100 specimens were examined from samples collected during the KARUBENTHOS 2 and from the collections of Dominique Lamy and Emilio García. Data on some of the examined lots are:

GUADELOUPE • 7 specs, largest 9.3 × 3.6 mm; S of Marie-Galante; 15°51′ N, 61°18′ W; depth 250–254 m; 29 Jun. 2015; KARUBENTHOS 2; stn DW4646; MNHN-IM-2000-39727 • 5 specs, largest 8.5 × 3.4 mm; E of La Désirade; 16°25′ N, 60°52′ W; depth 185–250 m; 16 Jun. 2015; KARUBENTHOS 2; stn DW4560; MNHN-IM-2000-39728 • 1 spec., 2.3 × 1.4 mm, juvenile; Grand Cul-de-Sac Marin, off Fajou Island; 16°23′ N, 61°33′ W; depth 125 m; 5 May 2012; KARUBENTHOS 2012; stn GN10; MNHN-IM-2012-8982.

Description

Redescription based on Dall (1889a: 114) and examined types. *Shell* small (9.3 × 3.6 mm, largest examined), narrowly fusiform (W/L = 0.3871), of about 9 whorls with a tall spire, acutely angled whorls with strongly constricted sutures, and slightly convex shoulders that extend mid-whorl, the last whorl about 52% of shell length. Shell sculptured with ribs and coarsely frosted primary and secondary spirals. Aperture oval, narrowed anteriorly at the canal, which is of moderate length; length of aperture and canal is about 35% of shell length. *Protoconch* of about 3 round whorls, the first smooth, last 1½ whorls with ribs reduced mid-whorl to axially elongate swellings (appearing like tiny paddles) that form an acutely angled median carina. Riblets above and below the carina are nearly obsolete. *Axial sculpture* of moderately strong, round-crested ribs that run from suture to suture on spire whorls and evanesce on shell base, 10 ribs on penultimate whorl, 9 on the last. Ribs not aligned from whorl to whorl. Intercostal space is about the same as rib width on early whorls, greater than rib width on last whorl. *Varix* absent; the last rib strengthens the lip edge. *Spiral sculpture* consists of primaries and secondaries of varying strengths. Whorl peripheries have paired primaries that define the edge of the whorl shoulder, 2 more primaries are on whorl sides, and about 5 on the shell base that grow weaker anteriorly. The shoulder has about 11 secondaries; the whorl sides about 3–5 between primaries. Spirals override ribs; the strongest primaries (a pair) are at the whorl periphery and form sharp nodules on rib crests. *Sulcus* absent. *Outer lip* is a thin strip of shell at the base of the last rib, without a stromboid notch. *Anal sinus* edge of outer lip at shoulder without indentation. *Inner lip* a thin glaze along the columella and parietal wall, without calluses. *Columella* straight. *Anterior canal* of moderate length, straight, unnotched. *Anterior fasciole* is not swollen, surface covered with alternating rows of fine and very fine papillae. *Color* uniformly cream.

Range and habitat

Widespread. Examined specimens include localities Antigua, Guadeloupe, Barbados, and Mexico (Campeche Bank). Other reports in the literature include Bermuda (Verrill & Bush 1900; Peile 1926) and on museum data labels, United States (off eastern Florida, UF 228433, 228440). Depth 125–420 m for Guadeloupe specimens.

Saccharoturris bicingulata Fallon & Bouchet sp. nov.
urn:lsid:zoobank.org:act:6FA7DBCF-259E-4303-B83F-5FD2BDEADFF5
Figs 111C–D, 112I–M

non *Mangilia quadrata* var. *monocingulata* Dall, 1889 – Dall 1889a: 114: pl. 11 fig. 16 only (misidentification, in part, that is likely this species). Locality Barbados, R/V *Blake* exped.

Differential diagnosis

The most obvious difference of *Saccharoturris bicingulata* Fallon & Bouchet sp. nov. from its congeners is the presence of two strong primaries, one on the whorl periphery and the other below, a little more than half-way the distance to the following suture. Both primaries cross over ribs and produce sharp, elongate nodules on crests, and lend whorls an almost square outline.

Saccharoturris monocingulata (Dall, 1889) has a pair of strong primaries at the whorl periphery, and two or more weaker ones below and as such its whorl profile appears more angular. Its protoconch has about 3 whorls (versus 2½) and possesses angular projecting paddles, the accompanying riblets obsolete.

Saccharoturris major Fallon & Bouchet sp. nov. has one strong primary spiral at the whorl periphery, and a single weaker one a little more than half-way the distance to the following suture, not two strong primaries. Spire whorls are more convex (less angular mid-whorl) than either of its congeners. Its protoconch has a bulbous first whorl and distinct ribs above the carina.

Etymology

Saccharoturris bicingulata Fallon & Bouchet sp. nov., from the Latin adjective with prefixes '*bi*+*cingula*', meaning 'having two belts', after its characteristic two strong primaries on spire whorl sides.

Type material

Holotype
GUADELOUPE • 8.9×3.3 mm; W of Marie-Galante; 15°58′ N, 61°23′ W; depth 200–206 m; 22 Jun. 2015; KARUBENTHOS 2; stn DW4594; MNHN-IM-2000-39724.

Paratypes (5 specs)
GUADELOUPE • 1 spec., 6.7×2.7 mm, ethanol-preserved; W of Marie-Galante; 15°45′ N, 61°09′ W; depth 150–221 m; 27 Jun. 2015; KARUBENTHOS 2; stn DW4589; MNHN-IM-2013-60929 • 1 spec., 6.9×2.8 mm, ethanol-preserved; W of Marie-Galante; 15°45′ N, 61°09′ W; depth 150–221 m; 27 Jun. 2015; KARUBENTHOS 2; stn DW4589; MNHN-IM-2013-60930 • 1 spec., 9.8×3.5 mm; W of Marie-Galante; 15°53′ N, 61°25′ W; depth 262–266 m; 22 Jun. 2015; KARUBENTHOS 2; stn DW4599; USNM 1715414 • 1 spec., 10.2×3.8 mm; W of Marie-Galante; 15°50′ N, 61°26′ W; depth 265–268 m; 27 Jun. 2015; KARUBENTHOS 2; stn DW4635; ANSP 498833 • 1 spec., 6.0×2.5 mm; W of Marie-Galante; 16°00′ N, 61°23′ W; depth 204-251 m; 21 Jun. 2015; KARUBENTHOS 2; stn DW4586; MNHN-IM-2000-39725.

Description

Shell small (holotype length=8.9 mm, largest examined=10.2 mm), narrowly fusiform (W/L=0.3708), of 8¼ whorls with a tall spire, convex whorls with strongly constricted sutures and convex shoulders, the last whorl about 56% of shell length. Shell sculptured with ribs, a coarsely frosted primary and secondary spirals. Aperture widely oval, abruptly narrowed anteriorly at the canal, which is moderately long, length of aperture and canal is about 34% of shell length. *Protoconch* of 2½ round whorls, the first bulbous and smooth, the 2nd with ribs nearly obsolete except for mid-whorl, axially elongate, swellings (appearing like tiny paddles) that form an acutely angled median carina. The tips of the paddles appear

minutely fimbriated by structures unresolved in the 245× SEM magnification. *Axial sculpture* of low, round-crested ribs that run from suture to suture on spire whorls, are slightly recurved on whorl shoulders and evanesce on shell base, 8 ribs on penult whorl, 8 on the last. A few ribs much reduced, all just slightly offset from a whorl-to-whorl alignment. Intercostal space greater than rib width. Growth striae, running axially, produce heavy 'frosting' that under high magnification are finger-like projections, or papillae, which are in turn aligned spirally over the shell surface forming rows of projections. *Varix* absent; the last rib serves to strengthen the lip. *Spiral sculpture* of primaries and secondaries, 2 primaries on spire whorls, the perimeter and mid-whorl, 5 on the base, the latter grow weaker anteriorly. The shoulder has only secondaries, about 21, and spire whorl sides and base 5–11 rows in intercalary space, and in twin rows on cords, these latter being finger-like and leaf-like. *Sulcus* absent. Recurved ribs on shoulder mark past presence of anal sinus. *Outer lip* is a thin strip of shell at the base of the last rib, without a stromboid notch. *Anal sinus* is a very shallow, an almost imperceptible curved indentation along the edge of the outer lip about the width of the shoulder. *Inner lip* a thin glaze along the columella, without a callus. *Columella* weakly sinusoidal. *Anterior canal* of moderate length, twisted to the right in a counterclockwise fashion viewed ventrally; unnotched. *Anterior fasciole* not swollen, surface covered with minute papillae. *Color* a dark golden yellow, spiral primaries lighter, and tip of protoconch and inner lip dark golden brown.

Range and habitat

Guadeloupe (W of Marie-Galante) and Barbados (Dall 1889a: pl. 11 fig. 16); depth 150–268 m, live depth 150–221 m.

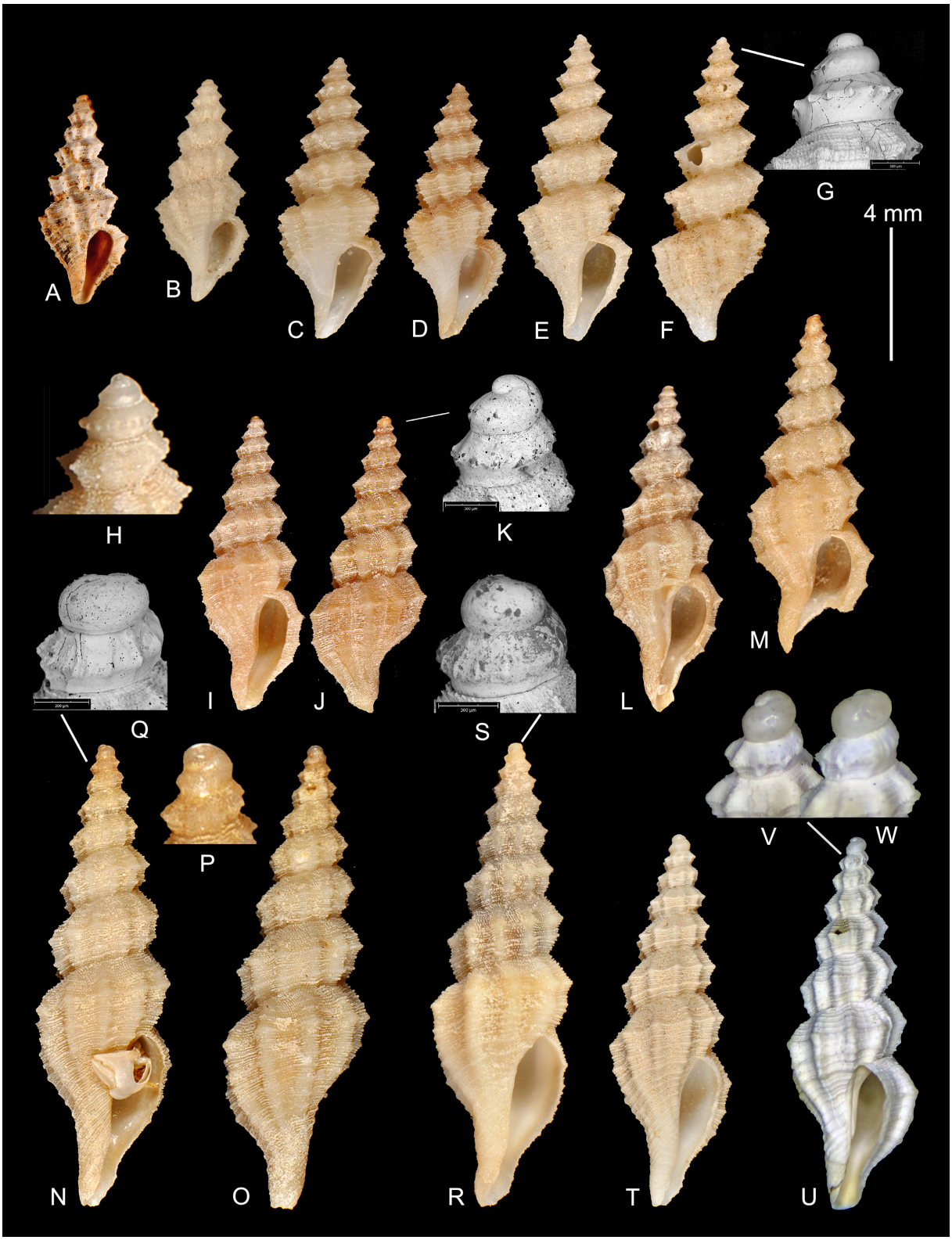
Saccharoturris major Fallon & Bouchet sp. nov.
urn:lsid:zoobank.org:act:3D2DF22B-839D-4854-B6D8-815EB9401BE7
Figs 111E–F, 112N–W

Differential diagnosis

This species is the largest among the three *Saccharoturris* species (length of *Saccharoturris major* = 14.0 versus 10.2 and 9.3 mm for *S. bicingulata* and *S. monocingulata*, respectively). It is most easily

Fig. 112 (next page). Species of *Saccharoturris* Woodring, 1928. – **A**. *Fusus consentaneus* Guppy, 1896, type species of genus, "figured type", 6.3 × 2.7 mm (USNM 107091), fossil, Jamaica. – **B**. *Mangilia quadrata* var. *monocingulata* Dall, 1889, syntype, 6.7 × 3.0 mm (MCZ 7127), Barbados. – **C–H**. *Saccharoturris monocingulata* (Dall, 1889). **C–D**. Specs, 8.5 × 3.4 and 7.8 × 3.1 mm (MNHN-IM-2000-39728), E of La Désirade, Guadeloupe. **E–G**. Spec., 9.3 × 3.6 mm, ventral and dorsal views, and SEM of protoconch (MNHN-IM-2000-39727), S of Marie-Galante, Guadeloupe. **H**. Spec., 2.3 × 1.4 mm, juvenile (not shown), photograph of protoconch only (not to scale) (MNHN-IM-2012-8982), off Fajou Island, Grand Cul-de-Sac Marin, Guadeloupe. – **I–M**. *Saccharoturris bicingulata* Fallon & Bouchet sp. nov. **I–K**. Holotype, 8.9 × 3.3 mm, ventral and dorsal views, and SEM image of protoconch (MNHN-IM-2000-39724), W of Marie-Galante, Guadeloupe. **L**. Paratype, 9.8 × 3.5 mm (USNM 1715414), W of Marie-Galante, Guadeloupe. **M**. Paratype, 10.2 × 3.8 mm (ANSP 498833), W of Marie-Galante, Guadeloupe. – **N–W**. *Saccharoturris major* Fallon & Bouchet sp. nov. **N–Q**. Holotype, 14.0 × 4.2 mm, crabbed specimen, ventral and dorsal views, expanded view of protoconch (not to scale), and SEM image of protoconch (MNHN-IM-2000-39726), N of Marie-Galante, Guadeloupe. **R–S**. Paratype, 13.9 × 4.5 mm, ventral view and SEM image of protoconch (ANSP 498795), S of La Désirade, Guadeloupe. **T**. Paratype, 11.2 × 3.7 mm (USNM 1715415), S of La Désirade, Guadeloupe. **U–W**. Paratype, 9.5 × 3.5 mm, ventral and two expanded views of its protoconch, not to scale (E.F. García coll.), off Louisiana. Credits: G, K, Q, S: SEM images courtesy of Krasimira "Kasey" Seizova and Paul Callomon. Scale bars: A–F, H–J, L–P–P, R, T–W = 4 mm; G, K, Q, S = 300 µm.

distinguished by its more convex whorl profile, and bulbous protoconch with the more subdued mid-whorl riblet swellings on the last ¼-whorl and possess the longest and straightest anterior canal. Sculptural differences are discussed in the differential diagnosis of *S. bicingulata* Fallon & Bouchet sp. nov.



Etymology

Saccharoturris major Fallon & Bouchet sp. nov., from the feminine form of the comparative Latin adjective '*major*', meaning 'the larger', after its larger size relative to its congeners.

Type material

Holotype

GUADELOUPE • 14.0 × 4.2 mm; N of Marie-Galante; 16°00′ N, 61°13′ W; depth 272–305 m; 23 Jun. 2015; KARUBENTHOS 2; stn DW4605; MNHN-IM-2000-39726.

Paratypes (6 specs)

GUADELOUPE • 1 spec., 11.2 × 3.7 mm; N of Grande-Terre; 16°38.4′ N, 61°31.3′ W; depth 64–69 m; 12 Jun. 2015; KARUBENTHOS 2; stn DW4533; USNM 1715415 • 3 specs, 13.9 × 4.5, 13.0 × 4.1 and 11.2 × 3.7 mm; S of La Désirade; depth 250 m; 2016; dredged; D. Lamy coll. • 1 spec. length = 13.8 mm; S of La Désirade; depth 250 m; 2018; dredged, ex D. Lamy coll.; ANSP 498795.

UNITED STATES OF AMERICA • 1 spec., 9.5 × 3.5 mm; off Louisiana; 27°55.14′ N, 92°22.71′ W to 27°55.09′ N, 92°22.08′ W; depth 160–168 m; 19 May 2019; E.F. García leg.; dredged from on board R/V *Pelican*; E.F. García coll. 32371.

Description

Shell small (holotype length = 14.0 mm), narrowly fusiform (W/L = 0.3000), of 9 whorls with a tall spire, convex whorls with strongly constricted sutures, convex shoulders, the last whorl about 54% of shell length. Shell sculptured with ribs and coarsely frosted primary and secondary spirals. Aperture oval, abruptly narrowed anteriorly at the canal, which is the longest of the genus, length of aperture and canal is about 39% of shell length. *Protoconch* of about 1½ round whorls, the first smooth, with embedded tip, expanding rapidly to become quite bulbous, the last ¼ with weak riblets with axially elongate swellings (appearing like tiny paddles) that form a weak median carina. *Axial sculpture* of moderately strong, round-crested ribs that run from suture to suture on spire whorls and evanesce on shell base, 10 ribs on penult whorl, 8 on the last. Ribs not aligned from whorl to whorl. Intercostal space about the same as rib width on early whorls, greater than rib width on last whorl. *Varix* absent; the last rib serves to strengthen the lip. *Spiral sculpture* of primary and secondaries of varying strengths, 4 primaries on the penultimate whorl, about 5 on base that grow weaker anteriorly. Spirals override ribs, the strongest at the whorl periphery defines the edge of the shoulder and forms sharp nodules on rib crests. 3–5 secondaries are present in intercalary space and in twin rows on primaries. *Sulcus* absent. *Outer lip* is a thin strip of shell at the base of the last rib, without a stromboid notch. *Anal sinus* nonexistent in examined specimens with intact lips. *Inner lip* a thin glaze along the columella, without calluses. *Columella* straight. *Anterior canal* longest of genus, straight, unnotched. *Anterior fasciole* not swollen, surface covered with frosting. *Color* off white, aperture white or yellowish.

Remarks

The 7 measured specimens have an average length = 12.4 mm (range = 9.5–14.0 mm). The coarseness of frosting on spirals varies considerably, from the coarsest exhibited by the holotype and other specimens from Guadeloupe to the relatively smooth frosting of the Louisiana specimen.

Range and habitat

Guadeloupe and United States (Louisiana); depth 64–305 m.

Genus ***Stellatoma*** Bartsch & Rehder, 1939

Type species

Mangelia stellata Stearns, 1872 by original designation.

Summary diagnostic characteristics

Shell small, fusiform, sturdy, with a body whorl larger and broader than its spire, with convex, subangulate, or high-shouldered whorls, with a broadly oval aperture (auriculate), and with a short anterior canal.

Anal sinus wide, directed laterally, with a tooth at its base and a callus on the parietal wall.

Outer lip varicose, usually glazed and channeled inside the outer lip.

Protoconch of 1¼–1½ smooth whorls, the tip relatively large, the end with straight riblets, usually within ¼-turn of the protoconch lip.

Axial sculpture of strong ribs that are narrower and slightly recurved on the shoulder.

Spiral sculpture of mostly flattened to obsolete primary spirals of variable strengths, the strongest primary at whorl periphery, sometime slightly nodulous on rib crests, with finer, thread-like secondary spirals sometime present between primaries, without frosting.

Shell surface microsculpture

Under SEM high magnification (850×), the shell surface has a uniformly dense concentration of short, miniscule strings of similar length, some joined at their ends, others open but are configured in a multitude of shapes. Non-linear strings shapes are separated from their neighbors by a small space (none touching). The strings do not exhibit a larger organization and appear on the surface of the spiral sculptural elements that are visible under the stereo dissecting microscope but are somewhat less dense or absent in the grooves between spirals. The strings appear to differ somewhat by species in the size, density, and the preponderance of one shape over the other (Fig. 113).

The surface microsculpture of *Pyrgocythara elata* (Dall, 1889) comb. nov. (SEM at 850x) is also comprised of miniscule strings, smaller than seen in *Rubellatoma* and most configured as closed shapes.

Difference from other genera

Cryptomangelia Fallon gen. nov. protoconch has 2–2½ whorls that terminate with ½–1 whorl of riblets, a portion of which is usually crossed by 1 or 2 median spirals, the teleoconch has ribs that are strong on whorl shoulders, terminating a little above the suture, lack an auriculate aperture, and usually possess brown and white cryptic banding coloration.

Remarks

Pyrgocythara emeryi Fargo, 1953, described from a fossil, may belong in the genus *Rubellatoma*, but only a single Recent specimen has been reported from Ham Bay, St. Croix (Nowell-Usticke 1959: 83, not figured), its identity unconfirmed.

Stellatoma stellata (Stearns, 1872)
Figs 113A, 114A–L

Mangelia stellata Stearns, 1872: 22.

Mangelia stellata – Dall 1884: 328; 1889b: 100, 101. — Tryon 1884: 246, pl. 34 fig. 84. — Gardner 1948: 272, pl. 37 fig. 1. — M. Smith 1951: 137, pl. 44 fig. 11, pl. 52 fig. 14. — Richards 1962: 86, pl. 21 figs 4–5. — Rehder 1981: 621, fig. 184. — Rios 1985: 142, pl. 48 fig. 662; 1994: 172, pl. 57 fig. 785. — Tucker 2004: 931 refs. — Williams 2005: #5630.
Mangilia stellata – Simpson 1887: 55. — Maury 1922: 40.
Daphnella stellata – Paetel 1888.
Stellatoma stellata – Bartsch & Rehder 1939, 132. — Perry 1940: 168, pl. 38 fig. 268a. — Perry & Schwengel 1955: 186, pl. 38 fig. 268a. — Powell 1966: pl. 16 fig. 2. — Abbott 1968: 168, fig. 9. — Lyons *et al*. 1971: 14. — Campbell *et al*. 1975: 51–124. — Kaicher 1984: card 3958. — Turgeon *et al*. 1988: 100; 1998: 109. — Redfern 2001: 135, pl. 60 fig. 556; 2013: 215, fig. 598. — Sykes & Hall 1970; 304.
Mangelia (*Stellatoma*) *stellata* – Abbott 1974: sp. 3160.
Mangelia (*Mangelia*) *stellata* – Vokes & Vokes 1983: pl. 29 fig. 2.

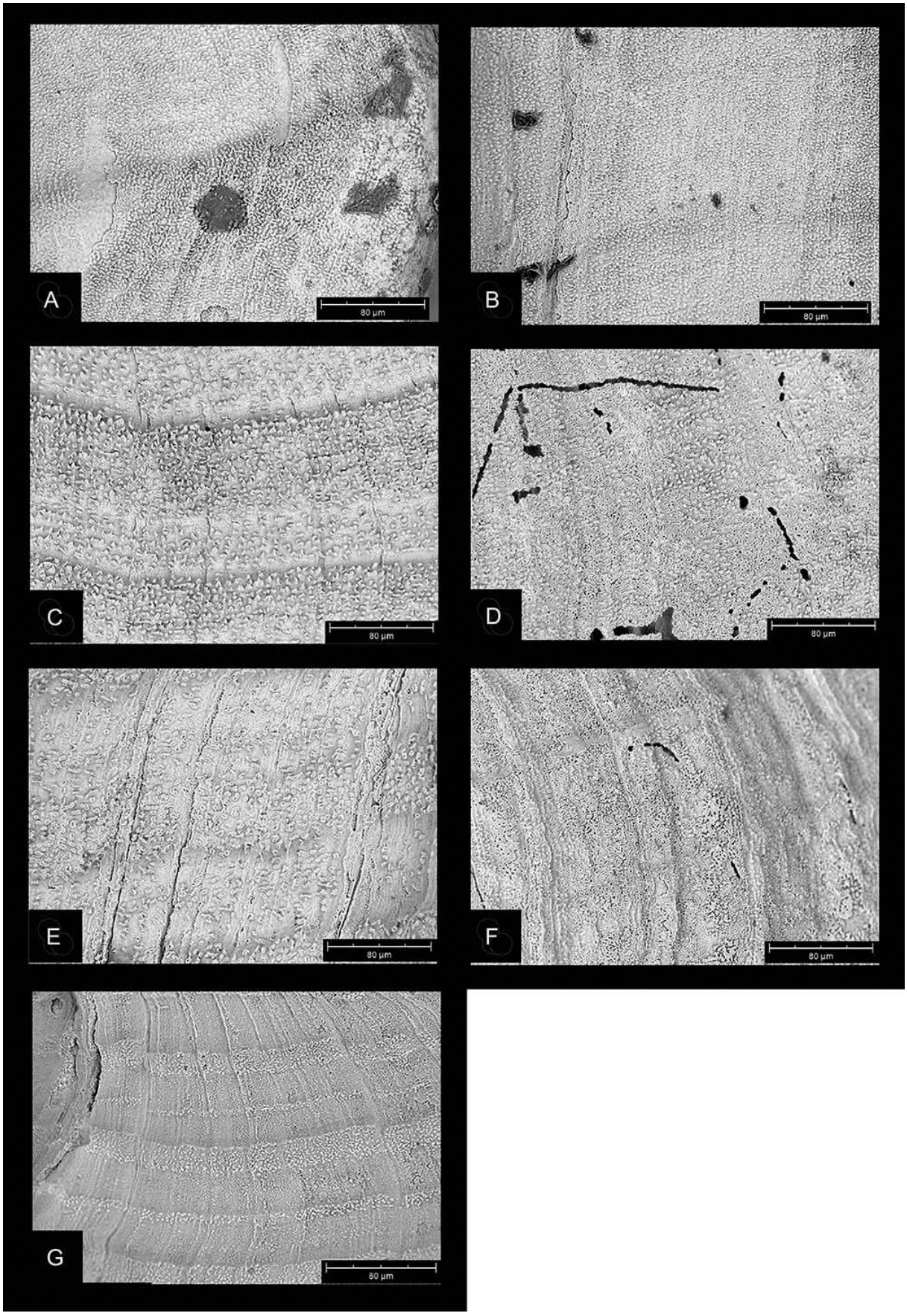
Differential diagnosis

Stellatoma luciae Fallon sp. nov. is smaller, usually with white shoulders and stronger ribs.

Type material

Holotype
UNITED STATES OF AMERICA • 8.7 × 3.8 mm; W Florida, Tampa Bay; depth low water; Stearns leg.; USNM 86896.

Fig. 113 (next page). Species of *Stellatoma* Bartsch & Rehder, 1939, shell surface microsculpture. **A**. *Stellatoma stellata* (Stearns, 1872). Spec., 6.1 × 2.7 mm (UF 589885), Tarpon Springs, Pinellas Co., W Florida. Short microscopic string-like structures are densely packed on the surface without a distinct pattern. **B**. *Stellatoma luciae* Fallon sp. nov., paratype, 5.0 × 2.3 mm (UF 589896), off Mississippi River delta, Louisiana. Short, microscopic, string-like structures are densely packed on the surface, shorter than those seen in A. No distinct greater pattern. **C**. *Stellatoma hemphilli* (Bartsch & Rehder, 1939) comb. nov. Spec., 7.8 × 3.2 mm (UF 589907), Lower Matecumbe Key, Monroe Co., Florida Keys. Short microscopic strings are less densely packed and larger than seen in A and B and form short bends. No distinct greater pattern. **D**. *Stellatoma flavobrunnea* Fallon sp. nov. Spec., 7.1 × 3.2 mm (UF 589910), West End, Great Bahama Island, Bahamas. String structures of similar density and form as seen in C but microscopic, short strings form loops and bends. No distinct greater pattern. **E**. *Stellatoma* unid. sp. K. Spec., 7.0 × 2.7 mm (UF 589921), Cedar Key, Levy Co., W Florida. Microscopic strings are the largest and least dense on this species, and some thinning seen in grooves between architectural spirals, as also seen in C. Microscopic, short strings form loops and bends. No distinct greater pattern. **F**. *Stellatoma* unid. sp. L. Spec., 6.0 × 2.3 mm (UF 589922), off Crystal River, Citrus Co., W Florida. Short microscopic strings are mostly obliterated, probably by surface abrasion, though some intact ones are visible on the left side of the image. The horizontal grooves mark separation of flattened primary architectural spirals; the vertical ones are growth lines. **G**. *Stellatoma discors* Fallon sp. nov., holotype, 6.0 × 2.9 mm (UF 589913), Tarpon Springs, Pinellas Co., W Florida. Microscopic strings are shorter (almost nodulose) and smaller than in preceding specimens, are densely aggregated within spaces between secondary architectural spirals. Credits: SEM images courtesy of Chandler J. Olson. Scale bars = 80 μm.


A
80 µm
B
80 µm
C
80 µm
D
80 µm
E
80 µm
F
80 µm
G
80 µm

Paratypes (3 specs)
UNITED STATES OF AMERICA • 3 specs; W Florida, Tampa Bay; depth low water; Stearns leg.; USNM 86896a.

Material examined (30 specs)

In addition to the holotype, the following 29 specimens were examined:

UNITED STATES OF AMERICA • 7 specs, 6.1 × 2.7, 6.3 × 3.0, 6.4 × 2.9, 6.0 × 2.6, 6.5 × 2.9, 6.2 × 2.7 and 5.9 × 3.0 mm; W Florida, Pinellas Co., Tarpon Springs, just N of edge of causeway, Howard Park Beach; depth low water; 9 Apr. 1994; P.L. Poland leg.; in sand; UF 589885 • 4 specs, 7.7 × 3.5, 6.0 × 2.9, 6.0 × 2.4, and 4.8 × 2.3 mm; W Florida, Gulf Co. , St. Joe Bay, 4 mi. [6.4 km] N of Cape San Blas; 7 Jul. 1985; H.G. Lee and J.H. Koslan leg.; in *Zostera* bed; UF 589886 • 1 spec., 7.3 × 3.0 mm; W Florida, Pinellas Co., Tarpon Springs, just N of edge of causeway, Howard Park Beach; depth low water; 25 Feb. 1994; P.L. Poland leg.; in sand; UF 589887 • 3 specs, 6.8 × 3.1, 5.3 × 2.4 and 5.2 × 2.6 mm; W Florida, Hernando Co., NW Bayport, SW end of Pine Island; depth just subtidal; 7 May 1995; P.L. Poland leg.; in sand; UF 589888 • 2 specs, 5.0 × 2.4 and 5.0 × 2.5 mm; W Florida, Pasco Co., W end of Green Island Key; depth just subtidal; 19 Jun. 1993; P.L. Poland leg.; in sand; UF 589889 • 1 spec., 4.6 × 2.4 mm; W Florida, Pinellas Co., Howard Park Beach; 28°09.327′ N, 82°48.302′ W; depth 0 m; 2 Sep. 2000; G.W. Calvin leg.; in drift; UF 589890 • 7 specs, 7.0 × 2.7, 6.2 × 2.4, 5.0 × 2.2, 6.9 × 2.5, 5.2 × 2.3, 5.2 × 2.1 and 5.0 × 2.0 mm; W Florida, Pasco Co., Anclote Key, just S of the Key; depth 0 m; 28 Feb. 1976; H.G. Lee leg.; in drift on sand bar; UF 589891 • 1 spec., 4.6 × 2.3 mm; W Florida, Pasco Co., Anclote Key, just S of the Key; depth 0 m; 28 Feb. 1976; H.G. Lee leg.; in drift on sand bar at mid-tide line; UF 589892 • 1 spec., 7.9 × 3.1 mm; W Florida, Pinellas Co., Mullet Key, E side before drawbridge; depth [0.3–0.6 m]; 23 Jan. 2000; M. Krisberg leg.; hand dredge; UF 589893 • 2 specs, 7.8 × 3.5 and 7.5 × 3.2 mm, both live taken; E Florida Brevard Co., Banana R., N side of Rt 520; depth shallow water; 19 Apr. 1998; M. Krisberg leg.; hand dredge in grass flats; UF 589894.

Description

The following description is more detailed than Sterns' original and is based on his description and on examination of the holotype. *Shell* small (holotype length = 8.7 mm), fusiform (W/L = 0.4368), of 7 angled whorls with impressed sutures, last whorl 63% of shell length; whorl sides angled in toward the suture of succeeding whorl; sculpture of strong ribs and weak spirals; aperture narrowly auriculate, varicose, about 46% of shell length; anal sinus wide, anterior canal short. *Protoconch* of 1¼ swollen whorls, the first lop-sided with a recumbent tip, the last nearly straight-sided with a few faint riblets at the end. *Axial sculpture* of strong ribs that extend from suture to suture on spire whorls and to anterior fasciole on shell base, slightly recurved on shoulder, angled at periphery (edge of shoulder), and curved toward fasciole on shell base; 12 to 13 ribs; intercostal spaces marked by fine incremental striae. *Varix* apertural, rib-like, extending from around the rear of the anal sinus and then tapers off at the end of the anterior canal. *Spiral sculpture* of flattened spirals, the peripheral one strongest, slightly nodulous on rib crests, 1 weaker spiral is anterior to the periphery and 5 more on the base. *Sulcus* absent; recurved ribs on shoulder mark past positions of anal sinus. *Outer lip* varicose, with a shallow channel in front of a callus along the underside of the varix, and an anal tooth and a swelling at the aperture. *Anal sinus* a wide, deep notch ***in*** front of the varix with a round apex and straight sides, close to but offset from suture by a parietal callus. *Inner lip* is a narrow glaze along the columella and parietal wall; callused at the parietal wall of the anal sinus. *Columella* straight. *Anterior canal* short, barely differentiated from the aperture, straight, and unnotched. *Anterior fasciole* not swollen, with about 5 oblique spirals. *Color* yellowish tinged with a reddish brown base and darker glazed outer lip and aperture.

Remarks

The holotype is a large, gerontic specimen, atypical of the species-group. More specifically, it is larger, its whorls are more angular, has a narrower aperture, and is colored differently. Nonetheless, the listed and figured specimens from W Florida are considered the same species. Important characteristics of the holotype are shared by all members of the species group.

Two specimens taken at Banana R. on the N side of Rt. 520, Brevard Co., E Florida (Fig. 114D–E) appear to be this species and may represent extralimital occurrences. The shoulders on the specimens are slightly higher than on the W Florida specimens which suggests they may be geographic variants.

The average length of 27 specimens is 6.1 mm (range = 4.6–8.7 mm).

Range and habitat

United States (W Florida, E Florida); depth shallow water in sand and grass flats.

Stellatoma luciae Fallon sp. nov.
urn:lsid:zoobank.org:act:C0B9E551-04FA-41E6-B6EF-B2A1B35CF84E
Figs 113B, 114M–AA

Differential diagnosis

Stellatoma krisbergi Fallon sp. nov. has narrower ribs, acutely angled whorls, not high shouldered ones, and lacks spirals except a peripheral one.

Stellatoma pulex Fallon sp. nov. is slightly smaller (average length = 3.9 versus 4.4 mm), and possesses rounder shoulders, not as angled as in *S. luciae* Fallon sp. nov. and has weaker but more ribs (10 versus 12 on the penultimate whorl of the holotypes).

Stellatoma hemphilli (Bartsch & Rehder, 1939) is larger (average length = 7.6 versus 4.4 mm), has stronger ribs, and is colored differently.

Stellatoma flavobrunnea Fallon sp. nov., see the Identification section of that species for differences.

Etymology

Stellatoma luciae Fallon sp. nov. is named in honor of Lucy L. Fallon, granddaughter of the first author (PF), a sweet and smart teen as of this writing, whose given name comes from her 4th great-grandmother, an immigrant from Ireland.

Type material

Holotype

UNITED STATES OF AMERICA • 5.0 × 2.3 mm; off Louisiana, off Mississippi River Delta; depth 100–200 ft [30–61 m]; Aug. 1974; Thomas McGinn leg.; trawled, ex batfish stomachs; UF 589895.

Paratypes (11 specs)

UNITED STATES OF AMERICA • 11 specs, 5.3 × 2.5, 5.6 × 2.6, 4.6 × 2.4, 4.5 × 2.1, 4.3 × 2.0, 4.2 × 2.1, 3.9 × 2.0, 3.6 × 1.9, 3.7 × 1.9, 3.8 × 2.1 and 3.8 × 1.8 mm; same data as for holotype; UF 589896.

Description

Shell small (holotype length = 5.0 mm), stoutly fusiform (W/L = 0.4600), of 5¾ high round-shouldered whorls with sutures undulant over prior whorl's ribs; last whorl 64% of shell length; whorl sides convex; sculpture of strong ribs and weak spirals; aperture narrowly auriculate, about 46% of shell length; anal

sinus wide, anterior canal short. *Protoconch* of 1⅜ smooth whorls, the tip large, recumbent, then whorl rapidly expands; about 7 fine riblets appear on the last portion, the adult shell beginning at the onset of a mid-whorl spiral. *Axial sculpture* of strong, round-crested ribs that extend from suture to suture on spire whorls and to the anterior fasciole on shell base; ribs narrow on the shoulder are angled at periphery (edge of shoulder) and are straight until shell base where they are gently curved toward the fasciole. Ribs are wider than intercostal space, number 10 on the penultimate and 7 to the varix on the last whorl. *Varix* apertural, rib-like, swollen, close to the edge of the aperture, extending from the suture, narrowing near the end of the anterior canal. *Spiral sculpture* of flattened primary spirals that override ribs, the peripheral one strongest, slightly nodulous on rib crests, 3 spirals on penultimate whorl side not counting the peripheral one, 6 on the shell base. Intercalary space narrow, without spiral secondaries. Shoulder with 3 or 4 secondaries. *Sulcus* absent. *Outer lip* varicose, with a thin strip of shell along the base of the varix, aperture glazed and slightly thickened, with a channel that runs parallel to the lip edge, immediately underneath the lip, between the callused underside of the varix and lip edge, and from an anal tooth below the anal sinus to the base of the aperture, before the anterior canal. *Anal sinus* a wide notch carved into the face of varix, directed laterally, its apex lies near shoulder edge, its rim and adjoining parietal callus glazed. *Inner lip* is a narrow, margined, glaze along the columella and parietal wall, callused on the parietal wall side of the anal sinus and with an oblique plica midway along the inner side of the columella. *Columella* straight. *Anterior canal* noticeably short, ending in a narrow channel, straight, unnotched. *Anterior fasciole* is not swollen, with about 6 oblique, broken spirals. *Color* yellowish brown below the suture line, yellowish white above except brown along the suture; outer and inner lip glazed dark reddish brown.

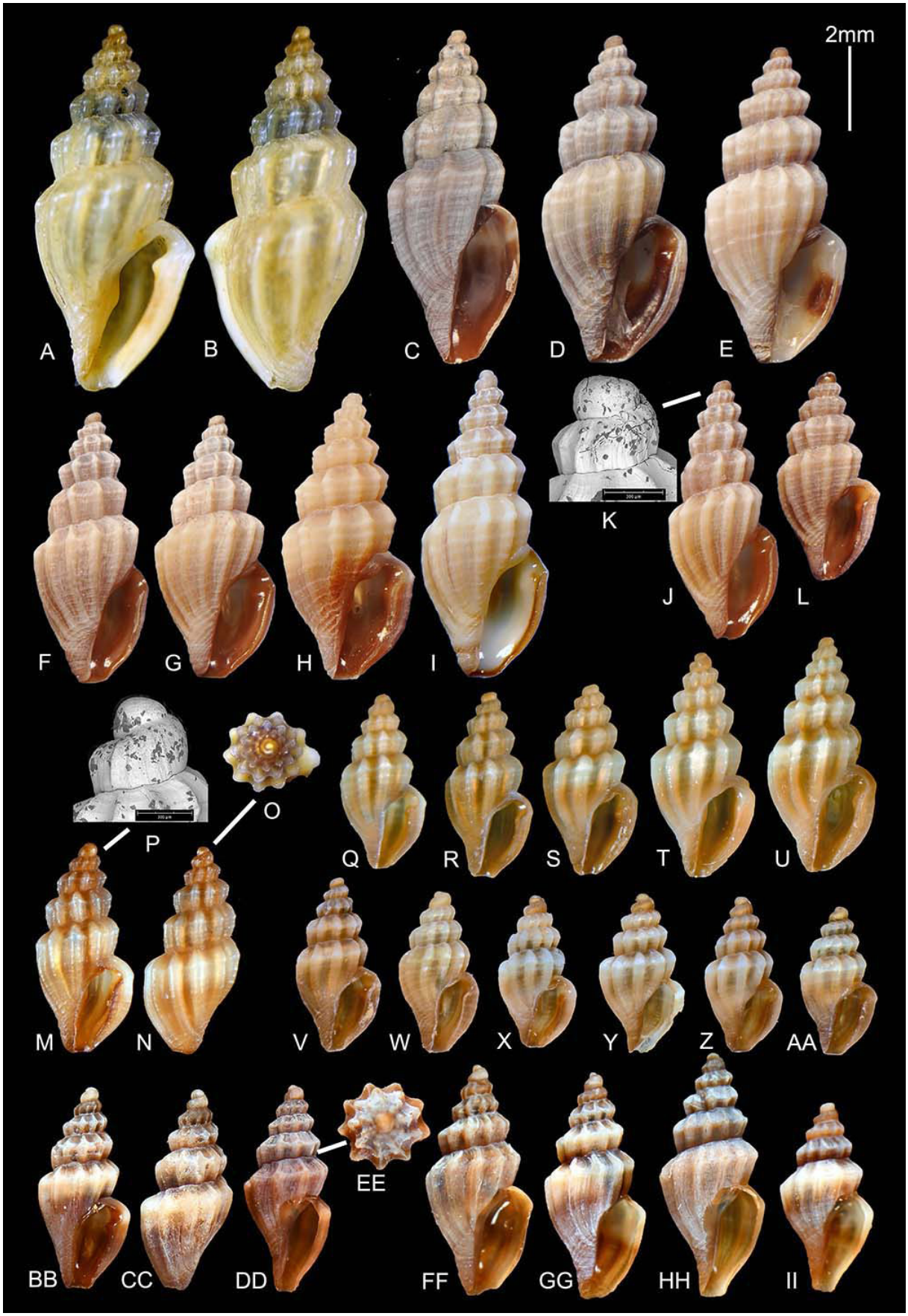
Remarks

The 12 specimens have an average length = 4.4 mm (range = 3.6–5.6 mm).

Range and habitat

Known only from the type locality.

Fig. 114. Species of *Stellatoma* Bartsch & Rehder, 1939. Part 1. – **A–B**. *Mangelia stellata* Stearns, 1872, holotype, 8.7 × 3.8 mm, ventral and dorsal views (USNM 86896), Tampa Bay, Hillsborough Co., W Florida. – **C–L**. *Stellatoma stellata* (Stearns, 1872). **C**. Spec., 7.9 × 3.1 mm (UF 589893), Mullet Key, Pinellas Co., W Florida. **D–E**. Specs, 7.8 × 3.5 and 7.5 × 3.2 mm (UF 589894), N side of Rt 520, Banana R., Brevard Co., W Florida. **F–G**. Specs, 6.5 × 2.9, 6.4 × 2.9 mm (UF 589885), Tarpon Springs, Pinellas Co., W Florida. **H**. Spec., 6.8 × 3.1 mm (UF 589888), SW end of Pine Island, NW Bayport, Hernando Co., W Florida. **I**. Spec., 7.3 × 3.0 mm (UF 589887), Howard Park Beach, Tarpon Springs, Pinellas Co., W Florida. **J–K**. Specs, 6.5 × 2.9 mm and SEM of protoconch (UF 589885), Tarpon Springs, Pinellas Co., W Florida. **L**. Spec., 5.0 × 2.5 mm (UF 589889), W end, Green Island Key, Pasco Co., W Florida. – **M–AA**. *Stellatoma luciae* Fallon sp. nov. **M–P**. Holotype, 5.0 × 2.3 mm, ventral, dorsal and apical views, and SEM of protoconch (UF 589895), off Mississippi River Delta, Gulf of Mexico. **Q–AA**. Paratypes, 5.3 × 2.5, 5.6 × 2.6, 4.6 × 2.4, 4.5 × 2.1, 4.3 × 2.0, 4.2 × 2.1, 3.9 × 2.0, 3.6 × 1.9, 3.7 × 1.9, 3.8 × 2.1 and 3.8 × 1.8 mm (UF 589896), all from the type locality. – **BB–II**. *Stellatoma krisbergi* Fallon sp. nov. **BB–CC**. Holotype, 4.8 × 2.2 mm, ventral and dorsal views (UF 589897), 2 blocks along A1A, S of Sebastian Inlet, Brevard Co., E Florida. **DD–EE**. Paratype, 4.9 × 2.2 mm, ventral and apical views (UF 589898), from the type locality. **FF–II**. Paratypes, 5.6 × 2.6, 5.5 × 2.5, 5.8 × 2.6 and 4.6 × 2.3 mm (UF 589899), E shore of Intercostal waterway, S of Sebastian Inlet, Brevard Co., E Florida. Credits: K, P: SEM images courtesy of Chandler J. Olson. Protoconch scale bars: A–J, L–O, Q–II = 2 mm; K, P = 300 μm.


2mm
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Stellatoma krisbergi Fallon sp. nov.
urn:lsid:zoobank.org:act:8538C6CC-0EBA-4DD2-A920-485CE274B63A
Fig. 114BB–II

Differential diagnosis

Stellatoma krisbergi Fallon sp. nov. is like *S. stellata* but has stronger ribs and is smaller (average length = 5.2 versus 6.1 mm of 6 and 27 specimens, respectively). These E Florida specimens (*S. Stellata* is predominantly from W Florida) have whorls angled mid-whorl (not shouldered), ribs nodulose at their periphery, a white mid-whorl spiral band, and lack primary spirals except for the nodulose peripheral one.

Stellatoma luciae Fallon sp. nov. has stronger ribs, shouldered whorls (not angled mid-whorl), and stronger primary spirals.

Stellatoma pulex Fallon sp. nov. has weaker ribs, shouldered whorls (not angled mid-whorl), and is colored differently.

Etymology

Stellatoma krisbergi Fallon sp. nov. is named in honor of Mr Marlo Krisberg for his avid interest in malacology, for sharing his detailed studies of Florida mollusks with others, and for collecting the type specimens of this species.

Type material

Holotype
UNITED STATES OF AMERICA • 4.8 × 2.2 mm; E Florida, Brevard Co., S of Sebastian Inlet, 300 ft from the A1A shoreline, 2 blocks along A1A; depth 0.9–1.5 m; 29 Sep. 1995; M. Krisberg leg.; in seagrass; UF 589897.

Paratypes (5 specs)
UNITED STATES OF AMERICA • 1 spec., 4.9 × 2.2 mm; same data as for holotype; UF 589898 • 4 specs, 5.8 × 2.6, 5.6 × 2.6, 5.5 × 2.5 and 4.6 × 2.3 mm; E Florida, Brevard Co., S of Sebastian Inlet, E shore of Intercostal; depth 0.2–1.2 m; 4 Nov. 1995; M. Krisberg leg.; in seagrass; UF 589899.

Description

Shell small (holotype length = 4.8 mm), fusiform (W/L = 0.4583), of 6 acutely angled whorls with impressed sutures, last whorl 64% of shell length; spire whorl sides angled in toward the suture of succeeding whorl; sculpture of strong ribs and a weak spiral; aperture narrowly auriculate, about 45% of shell length; anal sinus wide, anterior canal short. *Protoconch* of 1⅜–1½ round whorls, tip rather large then whorl rapidly expanding and smoothly transitioning into the adult sculpture without a distinct protoconch margin. 2 or three partial ribs likely belong to the adult form and begin after 1⅜ protoconch whorls. The surface of the protoconch appears microscopically wrinkled, not glassy smooth. *Axial sculpture* of strong ribs that extend from suture to suture on spire whorls and evanesce up to the anterior fasciole on shell base. Ribs are narrower, slightly recurved, and fade up to the suture, acutely angled and widest at mid-whorl, and curved toward fasciole on shell base; 10 ribs on the penultimate, 7 on the last to the varix. *Varix* rib-like, swollen, close to the edge of the aperture, behind a narrow lip, extending from the suture, not above it, narrowing to the end of the anterior canal. *Spiral sculpture* of a single primary spiral at whorl periphery, nodulous on rib crests, and a few faint spirals on the lower base before the anterior fasciole. Ribs obsolete on shoulders and whorl sides. *Sulcus* absent; recurved ribs on shoulder mark past positions of anal sinus. *Outer lip* a thin strip of shell along the outer edge of the aperture, glazed and slightly thickened, with a channel that runs parallel to the lip edge, immediately underneath

the lip, between the callused underside of the varix and lip edge, and from an anal tooth below the anal sinus to the base of the aperture, before the anterior canal. *Anal sinus* a wide notch carved into the face of varix, directed laterally, its apex near shoulder edge; its rim and adjoining parietal callus glazed, smooth. *Inner lip* is a narrow glaze along the columella and parietal wall; callused on the parietal wall side of the anal sinus and with an oblique plica midway along the inner side of the columella. *Columella* straight. *Anterior canal* short, differentiated from the aperture by a constriction of the shell base, straight, unnotched. *Anterior fasciole* not swollen; with about 7 fine oblique spirals. *Color* dark brown with a diffuse peripheral white band; ribs and protoconch lighter; and a glazed reddish brown inner and outer lips.

Remarks

The average length of 6 specimens is 5.2 mm (range = 4.6–5.8 mm). Only the 4.8 mm specimen (the holotype) has a fully formed outer lip. The remaining 5 have partially formed outer lips.

Range and habitat

United States (E Florida); depth shallow water on sand and seagrass flats.

Stellatoma pulex Fallon sp. nov.
urn:lsid:zoobank.org:act:9140C6BD-C0E7-41C4-9F52-AAFFD8B33C39
Fig. 115A–Q

Differential diagnosis

Stellatoma luciae Fallon sp. nov. is slightly larger (4.4 versus 3.9 mm average length) and has stronger and fewer ribs (12 versus 10 on the penultimate whorl of the holotypes).

Etymology

Stellatoma pulex Fallon sp. nov. derives its name from the Latin noun '*pulex*', meaning 'flea', as it is the smallest in the genus group – name in apposition.

Type material

Holotype

UNITED STATES OF AMERICA • 4.3 × 2.2 mm; Florida Keys, Florida Bay, 500 m W of Little Madeira Bay mouth; depth 0 m; Jun. 1985; H.G. Lee leg.; in drift; UF 589900.

Paratypes (29 specs)

UNITED STATES OF AMERICA • 25 specs, (17 measured) 4.3 × 2.2, 3.6 × 1.8, 4.8 × 2.2, 3.5 × 1.8, 4.2 × 2.1, 4.7 × 2.4, 4.1 × 2.0, 3.8 × 2.0, 3.9 × 2.0 mm, lengths only = 3.6, 3.8, 3.7, 3.8, 3.3, 3.1, 3.2 and 4.4 mm; same data as for holotype; UF 589901 • 4 specs, 4.5 × 2.1, 4.3 × 2.1, 4.7 × 2.1 and 3.4 × 1.7 mm; Florida Keys, Lower Matecumbe Key; depth 0 m; 3 Mar. 1998; P. Fallon leg.; in drift, ocean side following a storm; ANSP 498962.

Other material examined (6 specs)

UNITED STATES OF AMERICA • 2 specs, 3.1 × 1.5 and 3.1 × 1.5 mm; Florida Keys, Key Largo, S tip of El Radabob Key; depth shallow water; 2 Mar. 1999; M. Krisberg leg.; hand dredge on eel grass flats; UF 589902 • 2 specs, 3.9 × 2.0 (live taken) and 3.6 × 1.7 mm; Florida Keys, Key Largo, S tip of El Radabob Key; 2 Mar. 2000; M. Krisberg leg.; hand dredge on eel grass flats; UF 589903 • 2 specs, 3.0 × 1.6 and 2.7 × 1.6 mm; E Florida, Brevard Co., off Cape Canaveral; Dec. 1977; C.M. Lloyd leg.; from scallop dump at Port Canaveral; UF 589904.

Description

Shell small (holotype length = 4.3 mm), stoutly fusiform (W/L = 0.5116), of 5½ high round-shouldered whorls with lightly appressed sutures undulant over prior whorl's ribs; last whorl 67% of shell length; whorl sides mostly straight; sculpture of moderately strong ribs and weak, almost obsolete spirals; aperture narrowly auriculate, about 47% of shell length; anal sinus deep, anterior canal short. *Protoconch* of 1¼ smooth whorls, the tip minute, recumbent, the first whorl bulbous, then about 6 fine riblets appear on the last ¼-whorl, the adult shell beginning with a few close-set ribs. *Axial sculpture* of narrow cord-like ribs (half-round in cross-section) that extend from suture to suture on spire whorls and to the anterior fasciole on shell base; ribs narrow, and distinctly recurved on shoulders, and straight on whorl sides until shell base, where they are gently curved toward the fasciole. Ribs are narrower than the intercostal space, number 12 on the penultimate and 10 to the varix on the last whorl. Incremental growth lines are visible in intercostal spaces. *Varix* rib-like, swollen, close to the edge of the aperture, behind a narrow lip, extending from the suture, narrowing to the end of the anterior canal. *Spiral sculpture* of weak primary and weaker secondary spirals, except for the peripheral one, which is the strongest and is nodulous on rib crests; all spiral override ribs, of which there are 3 spirals on penultimate whorl side, 6 on the shell base, and a single weaker spiral between each. *Sulcus* absent; recurved ribs (and growth increments) on shoulder mark past positions of the anal sinus. *Outer lip* varicose, with a thin strip of shell along the base of the varix, glazed and slightly thickened, with a channel that runs parallel to the lip edge, immediately underneath the lip, between the callused underside of the varix and lip edge, and from an anal tooth below the anal sinus to the base of the aperture, before the anterior canal. *Anal sinus* is a wide notch carved into the face of varix, directed laterally, its apex lies about mid-shoulder. *Inner lip* is a narrow, margined, glaze along the columella and parietal wall, callused on the parietal wall side of the anal sinus and with an oblique plica midway along the inner side of the columella. *Columella* straight. *Anterior canal* short, open, straight, unnotched. *Anterior fasciole* not swollen, with about 7 oblique, well-spaced spirals. *Color* yellowish brown with yellowish white shoulder band and glazed inner and outer lip.

Remarks

26 measured specimens have an average length = 3.9 mm (range = 3.1–4.8 mm). Most specimens are monochromatic; a few are bicolored with whitish shoulder bands of varying widths.

Range and habitat

United States (SE Florida, Florida Keys, Florida Bay); depth shallow water.

Stellatoma hemphilli (Bartsch & Rehder, 1939) comb. nov.
Figs 113C, 115R–X

Pyrgocythara hemphilli Bartsch & Rehder, 1939b: 132–133, pl. 17 fig. 2

Pyrgocythara hemphilli – Perry 1940: 168, pl. 38 fig. 269. — Perry & Schwengel 1955: 186, pl. 38 fig. 269. — Brann & Kent 1960: 761. — Powell 1966: 102. — Sykes & Hall 1970: 304. — Abbott 1974: 284, text fig. 3305. — Carnes 1975: 11. — Kaicher 1984: card 3962. — Turgeon *et al*. 1988: 100; 1998: 109. — Odé 1992a: 54. — Shelton 1997: 15. — Redfern 2001: 134, pl. 60 fig. 554a–b. — Leal 2005: 17, photo; 2011: 1, text photo. — Tucker 2004: 460. — Williams 2005: #5709. — Grace 2007: 28.

Differential diagnosis

Often mistaken for *Stellatoma stellata* (Stearns, 1872), the whorls of *S. hemphilli* are less angular and more ribs are present on the penultimate whorl (12–13 versus 10). Stellatoma *hemphilli* usually has an orange or dark purplish orange outer lip and columella, while *S. stellata* has a more highly glazed

aperture that is a dark yellowish brown. Both species are reported from shallow water on the west coast of Florida, although from different habitats, *S. stellata* sandy substrates, and *S. hemphilli* muddy sand. These reports may be a clue to habitat preferences.

Cryptomangelia filosa (Rehder, 1943) gen. et comb. nov. is smaller (holotypes 6.5 versus 8.9 mm), has a narrower aperture, a broader white shoulder band, and more angled shoulders.

Type material

Holotype

UNITED STATES OF AMERICA • 8.9 × 3.5 mm; W Florida, Sarasota Bay; depth low water; H. Hemphill leg.; USNM 86898a.

Possible paratypes (5 specs)

UNITED STATES OF AMERICA • 3 specs; W Florida, Sarasota Bay; depth low water; USNM 86898 • 2 specs, Boca Ciega, Pinellas Co., W Florida; depth low water; Hemphill leg.; on mud flats; USNM 86897.

The first lot is likely the original lot from which the holotype was selected. Although not explicitly named as paratypes, Bartsch & Rehder state that Hemphill also collected this species at Boga Ciega. The following lot does not have locality detail but may be the referenced specimens, requiring further research.

Material examined (11 specs)

The holotype and the following 10 specimens from W Florida most closely match the description.

UNITED STATES OF AMERICA • 1 spec., 8.6 × 3.5 mm; W Florida, Gulf Co., Port St. Joe; depth 0.3–0.6 m; hand dredge; in muddy sand and eel grass; UF 589905 • 4 specs, 7.7 × 3.2, 7.5 × 30, 7.5 × 3.1 and 4.7 × 2.2 mm; W Florida, Gulf Co., St Joe Bay, 4 mi. [6.4 km] N of Cape San Blas near W shore; depth 1 m; 7 Jul. 1985; J.H. Keetas and H.G. Lee leg.; in *Thalassia* bed; UF 589906 • 5 specs, 9.5 × 3.7, 7.7 × 3.0, 7.8 × 2.8, 7.4 × 3.0 and 7.0 × 3.0 mm; W Florida, Gulf Co., St Joe Bay; depth 0.3 m; 1985; Jim and Linda Brenner leg.; from on muddy sand; UF 589907.

Description

The following redescription is based on examination of the holotype and the original description by Bartsch & Rehder (1939b: 132–133). *Shell* small (holotype length = 8.9 mm), fusiform (W/L = 0.3933) with convex whorls with impressed sutures, the last whorl 60% of shell length; sculpture primarily of strong ribs and weak spirals; aperture is narrowly auriculate, varicose, about 42% of shell length with a wide anal sinus, and short anterior canal. *Protoconch* of 1½ swollen whorls, the first whorl is lop-sided with a recumbent tip that rapidly expands to a nearly straight-sided whorl with faint riblets on about the last ½ whorl. *Axial sculpture* of strong axial ribs that narrow and are recurved on the shoulder and evanesce on the shell base before the anterior fasciole, with about 10 ribs per whorl. Ribs are about as wide as the interspaces, which are slightly concave. Microscopic incremental growth lines mark the entire surface of the shell. *Varix* apertural, rib-like, swollen, extends from the suture to the end of the anterior canal. *Spiral sculpture* consists of mostly flattened primary and secondary spirals. The peripheral one is the strongest and is slightly nodulous on rib crests, 3 or 4 primaries are on whorl sides with a secondary between each. Weaker primaries, about 4, are on the shoulder. *Sulcus* absent; recurved ribs on shoulder mark past positions of anal sinus. *Outer lip* varicose, with a thin strip of shell along the outer edge of the varix, slightly thickened; a channel runs underneath the outer lip between its edge and base of the varix. *Anal sinus* a deep notch carved into face of varix with a round apex and straight sides, close to but offset from suture by a parietal callus. *Inner lip* is a narrow glaze along the columella and parietal wall with a callus on the parietal wall. *Columella* straight. *Anterior canal* short, undifferentiated from

the aperture, straight, unnotched. *Anterior fasciole* is not swollen, marked by obliquely slanting, closely approximated spirals, which vary in size and spacing. *Color* varying in ground color from chestnut brown to wax yellow, usually with a pale zone at the angle of the shoulder. The outer lip and base of the columella may be a glazed orange or dark purplish orange.

Remarks

The average length of 11 specimens is 7.6 mm (range = 4.7–9.5 mm).

Range and habitat

United States (W Florida); depth in shallow water in seagrass beds.

Stellatoma flavobrunnea Fallon sp. nov.
urn:lsid:zoobank.org:act:1413E3D4-D39B-4109-BD43-DF49D94BBBFC
Figs 113D, 115Y–GG

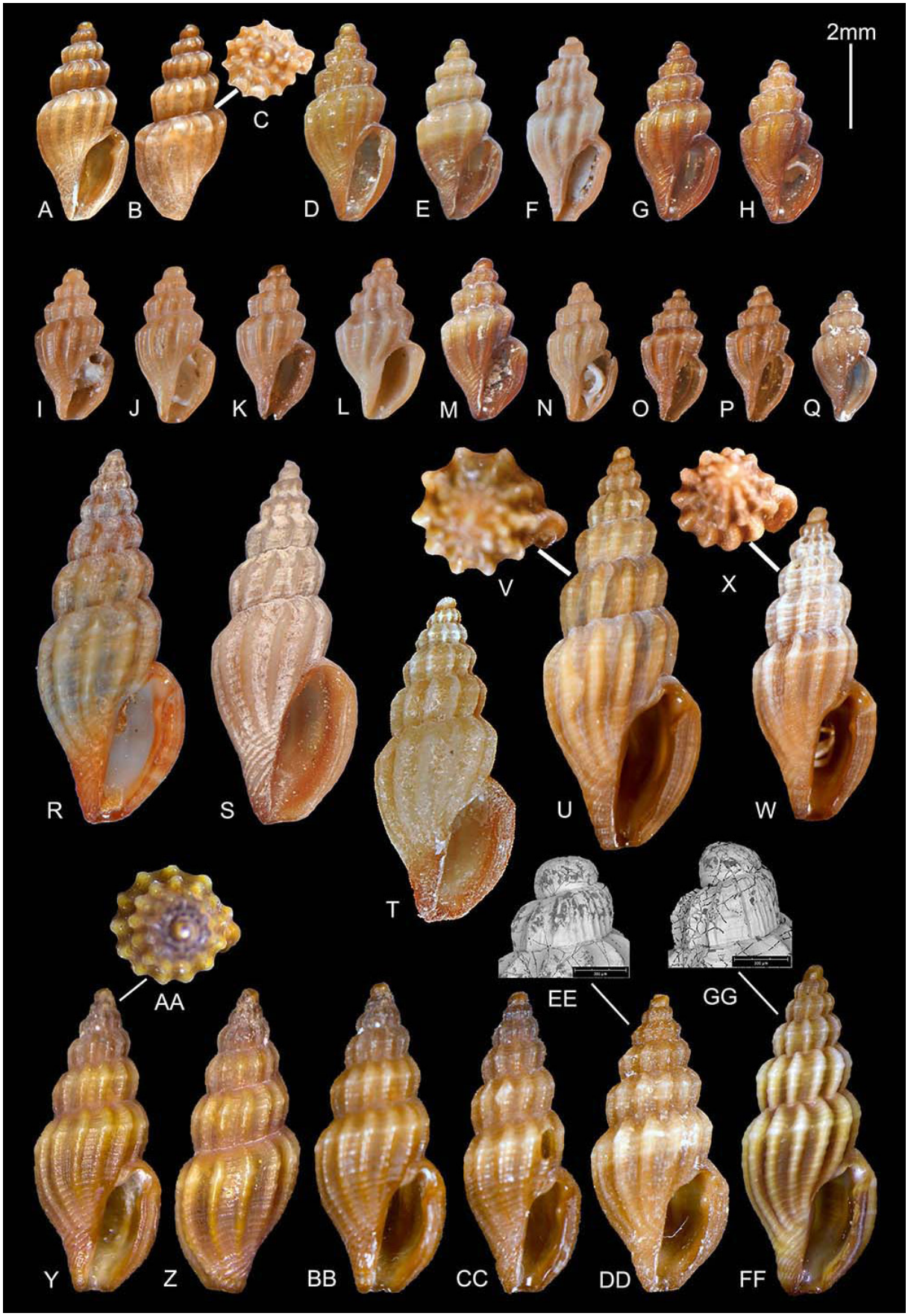
Differential diagnosis

Stellatoma pulex Fallon sp. nov. from SE Florida, Florida Keys, Florida Bay resembles *S. flavobrunnea* Fallon sp. nov., from the Bahamas (including a single record from the Florida Keys), but is smaller, 3.1–4.8 mm versus 4.3–7.8 mm, and has a different spiral sculpture: 3 weak primaries on penultimate whorl, with a weak secondary between each. *Stellatoma flavobrunnea* has 3–4 strong primaries on the penultimate whorl, with a secondary between each.

Stellatoma hemphilli (Bartsch & Rehder, 1939) from the west coast of Florida resembles *S. flavobrunnea* Fallon sp. nov., from the Bahamas (including a single record from the Florida Keys). *Stellatoma hemphilli* has stronger ribs (higher and narrower in cross section, compare apical views in Fig. 115) and stronger primary spirals, and usually a single secondary between primaries, versus none or one or more microscopic thread-like secondaries.

Stellatoma luciae Fallon sp. nov. from off the Mississippi River delta is smaller (average length = 4.4 versus 6.5 mm) has more angular shoulders and is proportionally stockier (W/L = 0.4600 versus 0.4492). The ribs are proportionally stronger with less intercostal space.

Fig. 115 (next page). Species of *Stellatoma* Bartsch & Rehder, 1939. Part 2. – **A–Q**. *Stellatoma pulex* Fallon sp. nov. **A–C**. Holotype**,** 4.3 × 2.2 mm, ventral, dorsal and apical views (UF 589900), 500 m W of Little Madeira Bay mouth, Florida Bay, Florida Keys. **D–P**. Paratypes, not in order illustrated, 4.2 × 2.1, 4.7 × 2.4, 4.1 × 2.0, 3.8 × 2.0, and 3.9 × 2.0 mm, and lengths 3.6, 3.8, 3.7, 3.8, 3.3, 3.1, 3.2 and 4.4 mm (UF 589901), from the type locality. **Q**. Spec., 3.1 × 1.5 mm (UF 589902), S tip of El Radabob Key, Key Largo, Florida Keys. – **R**. *Pyrgocythara hemphilli* Bartsch & Rehder, 1939, holotype, 8.9 × 3.5 mm (USNM 8689A), Sarasota Bay, W Florida. – **S–X**. *Stellatoma hemphilli* (Bartsch & Rehder, 1939) comb. nov. **S**. Spec. 8.6 × 3.5 mm (UF 589905), Port St Joe, Gulf Co., W Florida. **T**. Spec., 7.5 × 3.0 mm (UF 589907), Port St Joe, Gulf Co., W Florida. **U–X**. Specs, 9.5 × 3.7 and 7.0 × 3.0 mm, apical views of each (UF 589907), St Joe Bay, Gulf Co., W Florida. – **Y–GG**. *Stellatoma flavobrunnea* Fallon sp. nov. **Y–AA**. Holotype, 7.0 × 3.1 mm, ventral, dorsal and apical views (UF 589908), 300 m N of Current Cut, Current, Eleuthera Island, Bahamas. (the type locality). **BB–CC**. Paratypes, 7.4 × 3.3 and 7.2 × 2.8 (UF 589909), from the type locality. **DD–EE**. Paratype, 7.1 × 3.2 mm, ventral view, and SEM image of protoconch (UF 589910), West End, Grand Bahama Island, Bahamas. **FF–GG**. Spec., 7.8 × 3.2 mm, ventral view, and SEM image of protoconch (UF 589912), Lower Matecumbe Key, Monroe Co., Florida Keys. Credits: EE, GG: SEM images courtesy of Chandler J. Olson. Scale bars: A–DD, FF = 2 mm; EE, GG = 300 μm.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Etymology

Stellatoma flavobrunnea Fallon sp. nov. is derived from the combination of two Latin adjectives, '*flavo*' meaning 'yellow', and '*brunnea*' meaning 'brown' (hence jointly 'yellowish-brown'), which describes its color.

Type material

Holotype

BAHAMAS • 7.0 × 3.1 mm; Eleuthera Island, Current, 300 m N of Current Cut; depth 0 m; May 1978; H.G. Lee leg.; from drift on sandy beach; UF 589908.

Paratypes (13 specs)

BAHAMAS • 3 specs, 7.4 × 3.3, 7.2 × 2.8 and 5.2 × 2.2 mm; same data as for holotype; UF 589909 • 1 spec., 7.1 × 3.2 mm; W end of Grand Bahama Island; depth 0 m; 1985; Bob Quigley; in beach drift; UF 589910 • 2 specs, 5.8 × 2.5 and 4.7 × 2.2 mm; Eleuthera Island, Airport Beach; depth 0 m; 1999; C.M. Lloyd leg.; in beach drift; UF 589911 • 7 specs, 5.9 × 2.6, 5.5 × 2.5, 5.7 × 2.7, 5.3 × 2.3, 5.5 × 2.4, 5.2 × 2.5 and 4.3 × 1.9 mm; Grand Bahama Island, Gold Rock Creek; 26°36.15′ N, 78°22.15′ W; depth 0 m; J. Worsfold leg.; ANSP 369335.

Other material examined (1 spec.)

UNITED STATES OF AMERICA • 1 spec., 7.8 × 3.2 mm; Florida Keys, Monroe Co., just SE of US1 SW and Lower Matecumbe Key; depth shallow water; 5 Jul. 1997; P.L. Poland leg.; in *Halimeda* and *Thalassia* on silty sand; UF 589912.

Description

Shell small (holotype length = 7.0 mm), stoutly fusiform (W/L = 0.4429) whorls convex with impressed sutures, undulant over prior whorl's ribs, the last whorl 63% of shell length; sculpture primarily of strong ribs and weak spirals; aperture narrowly auriculate, varicose, about 43% of shell length with a wide anal sinus and short anterior canal. *Protoconch* of 1½ swollen whorls, the first lop-sided with a tip that rapidly expands to a nearly straight-sided whorl with riblets on about the last ¼ whorl. *Axial sculpture* of strong axial ribs that narrow and are recurved on the shoulder and evanesce on the shell base before the anterior fasciole, with about 11 ribs per whorl; microscopic incremental growth lines mark the surface of the shell. *Varix* apertural, rib-like, swollen, extends from the suture to the end of the anterior canal. *Spiral sculpture* of nearly flattened primary and secondary spirals. The peripheral one is the strongest and slightly nodulous on rib crests; 3 or 4 primaries are on the whorl sides, not counting the peripheral one, with a secondary between each, and about 4 secondaries are on the shoulder. *Sulcus* absent; recurved ribs on shoulder mark past positions of anal sinus. *Outer lip* varicose with a narrow strip of shell along the outer edge of the varix. Inside the outer lip a low tooth lies at the anal sinus and is followed by a low thickening that runs the length of the varix. *Anal sinus* a deep notch carved into face of varix with a round apex and straight sides, close to but offset from suture by a parietal callus. *Inner lip* is a narrow glaze along the columella and parietal wall with a callus on the parietal wall. *Columella* straight. *Anterior canal* short, undifferentiated from the aperture, straight, unnotched. *Anterior fasciole* is not swollen, marked by oblique, closely approximated thread-like spirals. *Color* is golden brown with a wide wax-yellow zone at the angle of the shoulder that extends over the sides of the whorl on rib crests. Aperture and outer lip are glazed reddish-brown. The protoconch and the first few teleoconch whorls are brown in color.

Remarks

The average length of 15 specimens is 6.0 mm (range = 4.3–7.8 mm).

Range and habitat

Bahamas (Eleuthera Island, Grand Bahama Island) and United States (Florida Keys). Reported from beach drift and in seagrass beds in shallow water.

Stellatoma discors Fallon sp. nov.
urn:lsid:zoobank.org:act:B9A53A0E-1D94-42E8-82F4-B0F3C496E78A
Figs 113G, 116A–I

Differential diagnosis

Stellatoma flavobrunnea Fallon sp. nov. of the Bahamas has weaker spirals, a shorter anterior canal, and is colored differently. All other described species have even weaker spirals.

Etymology

Stellatoma discors Fallon sp. nov. is derived from the Latin adjective '*discors*', meaning 'different', named for its atypical color, which is straw rather than a darker brown or reddish brown, and for the absence of a glazed aperture and outer lip.

Type material

Holotype

UNITED STATES OF AMERICA • 6.0 × 2.9 mm; W Florida, Pinellas Co., Tarpon Springs, Howard Park; depth shallow water; 11 Jan. 2001; M. Krisberg leg.; hand dredge; UF 589913.

Paratypes (23 specs)

UNITED STATES OF AMERICA • 10 specs, 5.3 × 2.5, 6.4 × 2.7, 3.5 × 2.0, 5.8 × 2.6, 5.1 × 2.4, 5.5 × 2.3, 5.2 × 2.5, 5.2 × 2.3, 4.5 × 2.1 and 4.0 × 2.3 mm; same data as for holotype; UF 589914 • 2 specs, 5.7 × 2.5 and 6.0 × 2.6 mm; W Florida, Pinellas Co., Tarpon Springs, S edge of Howard Park Beach; depth 1 m; 19 Dec. 1994; Phil Poland leg.; in *Thalassia* bed; UF 589915 • 11 specs, (6 measured) 5.0 × 2.5, 6.2 × 3.0, 5.7 × 2.5, 4.9 × 2.4, 6.2 × 2.7 and 5.4 × 2.5 mm; W Florida, Pinellas Co., Tarpon Springs, S edge of Howard Park Beach; depth 1 m; Phil Poland leg.; 19 Jan. 1995; in seagrass; UF 589916.

Other material examined (13 specs)

UNITED STATES OF AMERICA • 1 spec., 5.2 × 2.7 mm; W Florida, Levy Co., near Cedar Key; depth 6–10 ft [1.8–3 m]; Bill Hanson leg.; 13 Nov. 1986; dredged on mud and seagrass bed; UF 589917 • 1 spec., 4.3 × 2.2 mm; W Florida, Sarasota Co., Sarasota, New Pass, Quick Point Park, E side of roadway; depth shallow water; 21 Dec. 2002; M. Krisberg leg.; hand dredge; UF 589918 • 6 specs, 5.7 × 2.7, 6.0 × 2.9, 5.0 × 2.5, 5.3 × 2.5, 4.8 × 2.3 and 5.1 × 2.6 mm; W Florida, Citrus Co., off Crystal River; depth 1–1.5 m; 1 Sep. 1989; George Hapsis leg.; hand dredged; UF 589919 • 5 specs, largest length = 5.7 mm; W Florida, Pasco Co., just S of Anclote Key; depth 0 m; 28 Feb. 1976; H.G. Lee leg.; from on sand bar at mid tide line; UF 589920.

Description

Shell small (holotype length = 6.0 mm, largest examined specimen length = 6.4 mm), strong, biconic (W/L = 0.4833, with turreted spire and 6¼ whorls total, the last about 67% of shell length; whorls with strong shoulders with about a 45° slope on spire whorls, greater on last. Shell translucent between spirals and axials. Aperture a narrow oval with a short, barely differentiated anterior canal and broad posterior notch. *Protoconch* of 1½ round, somewhat globose, and smooth except for a few weak wrinkles near its lip. *Axial sculpture* of strong, round-crested ribs, extend from suture to suture on spire whorls, evanesce on shell base, ending at anterior fasciole; ribs wider than intercostal space, are slightly opisthocline, recurved, and weaker on shoulder, and curve toward columella on shell base. *Varix* ***apertural***, like an enlarged last rib. *Spiral sculpture* of strong primary and microscopic secondary spirals, beaded by growth striae, and all override axials. A beaded-like surface is produced by the primaries on rib crossing over crests. *Sulcus* indistinct, lies on the upper portion of the shoulder; recurved ribs mark the past presence of the anal sinus. Secondary spirals occupy the sulcal area, primaries are absent and first appear on the

shoulder, past the sulcus, just before the whorl periphery. *Outer lip* varicose with a narrow strip of shell just forward of the varix, that extends from the anal sinus to the anterior canal, with a wide shallow indentation that marks the stromboid notch. specimens with a well-developed outer lip have a low denticle below the anal sinus. *Anal sinus* a broad shallow notch adjacent to the suture, and almost but less than the width of the shoulder. *Inner lip* a narrow thin glaze, smooth, margined, without a significant callus on the parietal wall at the anal sinus. *Anterior fasciole* not swollen, with 6 oblique spirals. *Color* of straw, primary spirals, protoconch, and crest of varix white; shoulder with a broad brown band, grading from very light at suture to dark near shoulder edge.

Remarks

22 specimens were measured yielding an average length = 5.35 mm (range = 3.50–6.40 mm). Another 11, all within the same size range, were weathered and omitted from this statistic. specimens are uniform in sculptural detail; color varies among individuals in the intensity of the brown shoulder band, reduced to a dark line near the edge of the shoulder on some, with a lighter band between the dark line and suture.

Range and habitat

United States (W Florida); depth 0–3 m on sand and seagrass beds (live taken at 0–3 m).

***Stellatoma* unid. spp.**

Six specimens that belong in *Stellatoma* have not been fully described in this project. An insufficient number of specimens were available to eliminate doubt of their uniqueness to complete full descriptions. These are briefly described and illustrated in the event more specimens are found in the future.

Stellatoma unid. sp. K
Figs 113E, 116J–M

Differential diagnosis

This species differs from *Stellatoma hemphilli* (Bartsch & Rehder, 1939) comb. nov. in subtle ways: ribs are more cord like in cross section (compare apical views) and whorls subangular. Also, primaries are stronger and slightly flattened in intercostal space.

Stellatoma discors Fallon sp. nov. differs in possessing a more bulbous first protoconch whorl and darker color. May possibly be a variant of that species.

Material examined (1 spec.)

UNITED STATES OF AMERICA • 1 spec., 7.0 × 2.7 mm; W Florida, Levy Co., N end of Cedar Key; 2 Dec. 1978; John Fatis and H.G. Lee leg.; ex batfish stomachs; UF 589921.

Partial description

Shell is small, of 6¾ whorls, teleoconch whorls with convex shoulders and straight sides slanted in toward the suture. Sculpture of strong cord-like ribs and alternating primary and secondary spirals. Aperture not fully developed. *Protoconch* of 1½ swollen whorls, the first lop-sided with a recumbent tip, the last nearly straight sided with faint riblets at the end. *Axial sculpture* of strong ribs, curved on base toward columella, reduced and recurved on shoulder, extend to the anterior fasciole on the last on the shell base. *Spiral sculpture* of primaries that override ribs, swollen on rib crests and slightly flattened in intercostal space; 5 on penultimate and about the same on the shell base, all reducing in strength anteriorly.

Stellatoma unid. sp. L
Figs 113F, 116N–Q

Differential diagnosis

Unusual color (predominantly white) and unusually weak ribs for *Stellatoma*, but with a protoconch typical for the genus group. Its exaggerated turreted spire (broad, flattened shoulder is more than other members of the genus group) is unique. The specimen's lack of a mature lip suggests that a full description is not merited currently. Also, more specimens should confirm whether the turreted spire is typical.

Material examined (1 spec.)

UNITED STATES OF AMERICA • 1 spec., 6.1 × 2.5 mm; W Florida, Citrus Co., off Crystal River; depth 3–5 ft [0.9–1.5 m]; 1 Jul. 1989; G. Hapsis leg.; hand dredge; UF 589922).

Partial description

Shell small, turreted, with 6½ whorls, teleoconch whorls are greater at their periphery than at their suture. *Protoconch* of 1½ swollen whorls, lop-sided with a recumbent tip, the last nearly straight sided with faint riblets at the end. *Axial sculpture* of narrow, weak ribs that extend from suture to suture on spire whorls and evanesce on the shell base. Intercostal space 2 × or more than rib widths. *Spiral sculpture* of primary and secondary spirals. Two groups of 3 primaries on the penultimate whorl side (none on shoulder) and 5 primaries on shell base.

Stellatoma unid. sp. M
Fig. 116R–T

Differential diagnosis

Like a small *Stellatoma hemphilli* (Bartsch & Rehder, 1939) comb. nov. but even smaller.

Material examined (1 spec.)

UNITED STATES OF AMERICA • 1 spec., 6.8 × 2.7 mm; Florida Keys, Key West, W side of Flemming Island; depth 6 m; Dec. 1995; G. Mackintosh leg.; sieved from among turtle grass and fine sand; ANSP 498963.

Partial description

Shell is small, of 6½ whorls total, teleoconch whorls with well-rounded shoulders and only slightly convex whorl sides. *Protoconch* of 1½ swollen whorls, the first lop-sided with a recumbent tip, the last nearly straight sided with faint riblets at the end and a faint spiral on the last ¼ whorl. *Axial sculpture* of strong slightly sigmoid ribs that are recurved on the shoulder, extend to the following suture on spire whorls, and to the anterior fasciole on the last. *Spiral sculpture* of wide, flattened primaries that override ribs, 6 on penultimate and 7 of last whorl. 1–3 microscopic intercalary spirals were observed.

Stellatoma unid. sp. N
Fig. 116U–W

Differential diagnosis

Like *Stellatoma pulex* Fallon sp. nov. of the Florida Keys, only substantially larger. It may be an exceptionally large specimen of that species.

Material examined (1 spec.)

UNITED STATES OF AMERICA • 1 spec., 6.4 × 2.8 mm; Florida Keys, Monroe Co., off Sombrero Light Key; depth 55 m; Jul. 1971; D. Cosman leg.; dredged; UF 589923.

Description

Shell small, of about 6½ whorls, characteristic of the genus in morphology. *Protoconch* of about 1½ smooth whorls ending with about 6 fine riblets before a well-marked protoconch lip. *Axial sculpture* of strong ribs that extend from suture to suture, 10 on the penultimate and 9 on the last whorl to the varix. *Spiral sculpture* of mostly weak, indistinct spirals (strongest on whorl periphery), 5 on the penultimate whorl side and as many to the shell base, all overriding ribs; about 12 finer but more distinct spirals are tightly spaced on the anterior fasciole.

Stellatoma unid. sp. O
Fig. 116X–AA

Differential diagnosis

The mostly all-white color of this specimen is unique. Its whorl and rib profiles are unlike other members of the genus group.

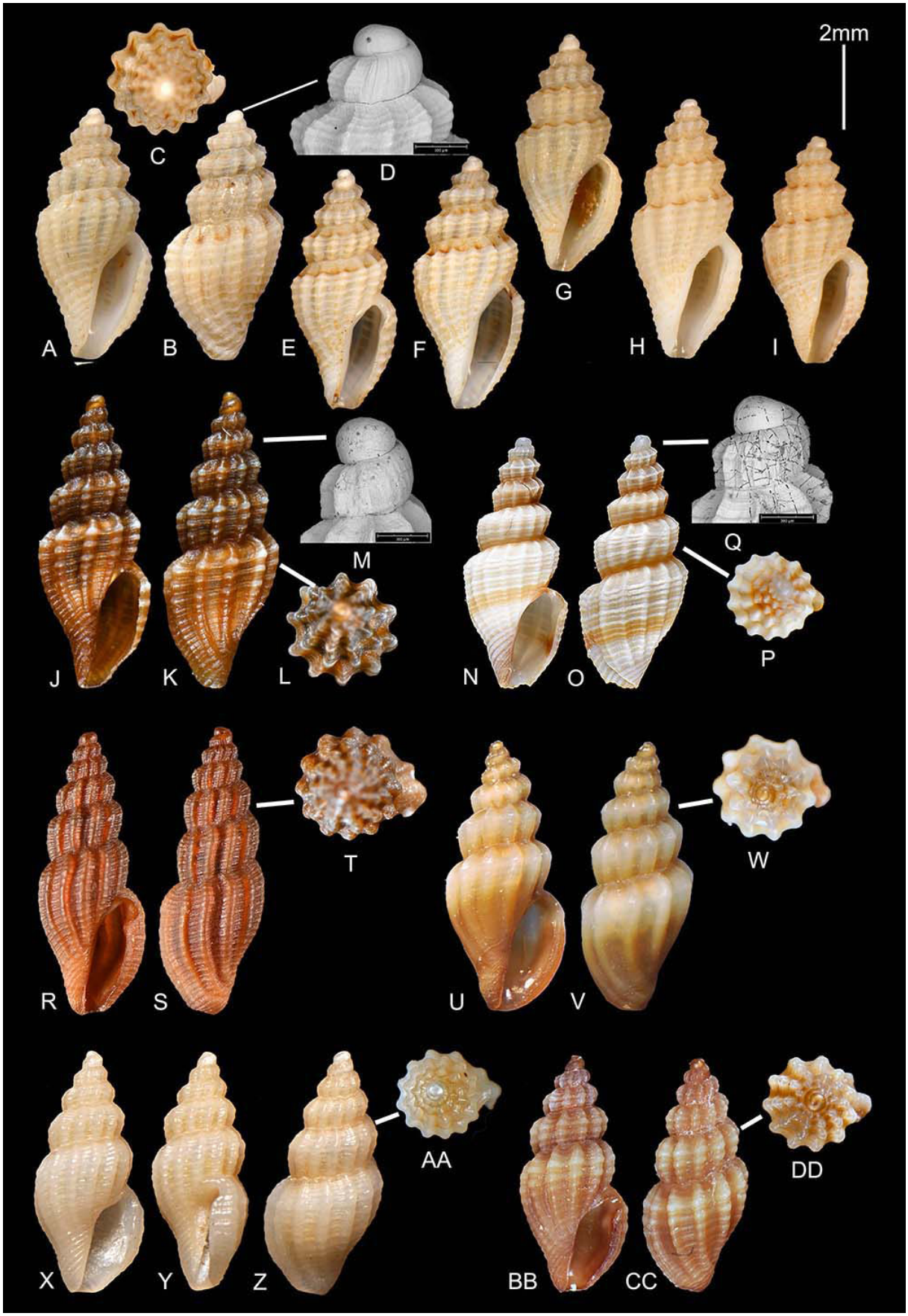
Material examined (1 spec.)

BAHAMAS • 1 spec., 6.1 × 2.5 mm; Exuma, Warderich Wells Cay; depth 0 m; Mar. 1976; D. Cosman leg.; in drift; UF 589924.

Partial description

Shell small, of about 6 whorls and having the overall morphology of the genus: convex whorls (no angulation at shoulder), auriculate aperture with a narrow outer lip channeled underneath, and a short anterior canal. *Protoconch* of about 1½ smooth whorls, tip large then whorl rapidly expanding and ending with a few fine riblets. *Axial sculpture* of strong ribs that extend from suture to suture, 14 on the penultimate and 10 on the last whorl to the varix. *Spiral sculpture* of strong primaries that override rib crests, somewhat flattened in intercostal spaces, about 4 on the shoulder, 4 on the penultimate whorl side 7 on shell base, and 8 oblique spirals (not flattened) on the anterior fasciole.

Fig. 116. Species of *Stellatoma* Bartsch & Rehder, 1939. Part 3. – **A–I**. *Stellatoma discors* Fallon sp. nov. **A–D**. Holotype, 6.0 × 2.9 mm, ventral, lateral, dorsal and apical views, and SEM image of protoconch (UF 589913), Tarpon Springs, Pinellas Co., W Florida. **E–F**. Paratypes, 5.7 × 2.5 and 6.0 × 2.6 mm (UF 589915), Tarpon Springs, Pinellas Co., W Florida. **G–I**. Paratypes, 5.7 × 2.5, 6.2 × 2.7 and 5.4 × 2.5 mm (UF 589916), Tarpon Springs, Pinellas Co., W Florida. – **J–M**. *Stellatoma* unid. sp. K. Spec., 7.0 × 2.7 mm, ventral, dorsal and apical views, and SEM of protoconch (UF 589923), N end of Cedar Key, Levy Co., W Florida. – **N–Q**. *Stellatoma* unid. sp. L. Spec., 6.1 × 2.5 mm, ventral, dorsal and apical views, and SEM of protoconch (UF 589922), off Crystal River, Citrus Co., W Florida. – **R–T**. *Stellatoma* unid. sp. M. Spec., 6.8 × 2.7 mm, ventral, dorsal and apical views (ANSP 498963), W side, Fleming Key, Key West, Florida Keys. – **U–W**. *Stellatoma* unid. sp. N. Spec., 6.4 × 2.8 mm, ventral, dorsal and apical views (UF 589923), off Sombrero Light Key, Monroe Co., Florida Keys. – **X–AA**. *Stellatoma* unid. sp. O. Spec., 6.1 × 2.5 mm, ventral, lateral, dorsal and apical views (UF 589924), Warderich Wells Cay, Exuma, Bahamas. – **BB–DD**. *Stellatoma* unid. sp. P. Spec., 5.5 × 2.6 mm, ventral, dorsal and apical views (ANSP 498964), W side, Allan Cay, Bahamas. Credits: D, M, Q: SEM images courtesy Chandler J. Olson and Krasimira "Kasey" Seizova. Scale bars: A–C, E–L, N–P, R–DD = 2 mm; D, M, Q = 300 µm.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Stellatoma unid. sp. P
Fig. 116BB–DD

Differential diagnosis

Like *Stellatoma* unid. sp. O but with fewer ribs and colored differently.

Material examined (2 specs)

BAHAMAS • 2 specs, 5.6 × 2.5 and 5.5 × 2.6 mm; Allan Cay, W side; depth 6 m; 15 Mar. 1996; G. Mackintosh leg.; night SCUBA; ANSP 498964 • 1 spec., 5.5 × 2.3 mm; Eleuthera Island, Tarpum Bay, "Xenos Beach"; depth 0 m; D. Kirsh leg.; from beach drift; D. Kirsh coll.

Partial description

Shell is small, of about 5¾ whorls and possessing the overall morphology of the genus: convex whorls, auriculate aperture with a narrow outer lip channeled underneath, and a short anterior canal. *Protoconch* of 1½ smooth round whorls, with fine riblets on last ¼-whorl; protoconch tip recumbent, not small relative to the rest of the protoconch. *Axial sculpture* of strong rib that extend from suture to suture, 11 on the penultimate and 9 on the last whorl to the varix. *Spiral sculpture* of strong primary spirals slightly flattened in intercostal spaces, swollen on rib crests, and with secondary spirals in some intercalary spaces. About 5 primaries of varying strengths on shoulder, 5 on penultimate whorl side, and 4 or 5 more on shell base. The two peripheral spirals are strongest.

Genus ***Suturocythara*** E.F. García, 2008

Type species

Suturocythara redferni E.F. García, 2008 by original designation.

Summary diagnostic characteristics

Shell small (length < 5.0 mm), elongate-cylindrical with narrow shoulders that rise above the suture, whorl sides slightly convex to flat, anterior canal open, short.

Protoconch of 1–2¼ whorls, tip large, first whorl protruding, last whorl may have riblets.

Axial sculpture of moderately strong ribs that rise above the suture, wide to narrow, hooked on shoulder.

Spiral sculpture of regularly spaced primaries and secondaries, with spacing varying by species; all override ribs, not frosted.

Aperture narrowly oval with a varicose lip crenulated by spirals.

Anal sinus spout-like, constricted at opening, with a heavy bridging callus on parietal side, denticle lacking.

Anterior canal short.

Shell surface microsculpture

SEM images show primary spirals to be tight bundles of thread-like spirals and secondaries to be smaller bundles that run between primaries. There are more secondaries than primaries, but the ratio varies on a shell. Between secondaries are parallel single microscopic spirals. Spirals can be flat, as in *Suturocythara minima* Fallon & Bouchet sp. nov. The number (and relative size) of primary spirals differ by species for those specimens imaged.

Radula

A representative of species of this genus, *Suturocythara guadalupensis* (Espinosa & Ortea, 2017) comb. nov., MNHN-IM-2013-20637, was imaged (Fig. 117). Its description is as follows: hypodermic marginal teeth simple, small, length about 50 mm (2.1% of AL), with distinct thin ligaments connecting teeth base. Tooth coniform, gradually narrowing toward simple tip without barbs and blades and large oval terminal opening. Base with broad basal opening and without a distinct spur.

Difference from other genera

Agathotoma Cossmann, 1889, has a microscopically papillose protoconch terminating with riblets; teleoconch ribs do not rise above the suture line (for most species), ribs gather into folds at the anterior fasciole, and have a more open anal sinus.

Bactrocythara Woodring, 1928 has a large symmetrical protoconch of 3 whorls, the first minute, the last 1–2 whorls with riblets. Ribs originate at the suture and do not rise above it, and are not hooked on the shoulder.

Remarks

With its tubular form, spout-like anal sinus, shoulders that rise above sutures, and minute size, less than 5 mm, this genus is quite distinctive. Variation among species is principally in their sculptural elements and size.

Rolán *et al*. (1994) named an eastern Atlantic (African) species, *Bactrocythara agachada* Rolan *et al*., 1994, which likely belongs in *Suturocythara* instead of *Bactrocythara*, based on their description and photograph. The protoconch is described as having 2½ fairly convex whorls, but there is no illustration, and no mention of the typical *Suturocythara* protoconch, the diagnosis of which is a "tip large, first whorl protruding." A second species, also assigned to *Bactrocythara* by these authors, *Bactrocythara haullevillei* (Dautzenberg, 1912), may belong in *Suturocythara* – here based only on the photograph; no description or illustration of its protoconch was provided. Therefore, the occurrence of *Suturocythara* along the eastern Atlantic coast of Africa needs to be confirmed through further examination of these species.

Phylogenetic relationships

The DNA sequence data show that the only *Suturocythara* sequenced, *S. guadalupensis* (Espinosa & Ortea, 2017) comb. nov., does not belong to the large TWA Mangeliid radiation. Instead, it is sister to the *Toxicochlespira*/*Benthomangelia* clade, and all of them are sister to the rest of the Mangeliidae. An expanded dataset extended to other biogeographic areas will provide a better understanding of the relationships of this genus.

Suturocythara guadalupensis (Espinosa & Ortea, 2017) comb. nov.
Figs 117, 118A–B, 119A–K

Agathotoma guadalupensis Espinosa & Ortea in Espinosa *et al*., 2017: 7–8, pl. 2c.

Differential diagnosis

Suturocythara redferni E.F. García, 2008 protoconch has more whorls, 2¼ versus 1¼, has ribs that are almost obsolete on the last whorl of the teleoconch, and is slimmer (W/L of holotypes = 0.3750 versus 0.3832).

Suturocythara apocrypha E.F. García, 2008 has a different surface sculpture (narrow ribs and widely spaced spirals versus broader ribs and closely spaced spirals) and a different coloration (all white versus dark and yellowish brown whorls).

Type material

Holotype

GUADELOUPE • 4.41 × 1.69 mm; N of Fajou Island; depth 16–23 m; 12 May 2012; KARUBENTHOS 2012; stn GR60; MNHN-IM-2000-29722.

Paratypes

None.

Material examined (16 specs)

GUADELOUPE • 1 spec., 4.4 × 1.7 mm; Baie de Bouillante; 16°08.07′ N, 61°46.71′ W; depth 6 m; 10 May 2012; KARUBENTHOS 2012; stn GS12; sequenced; MNHN-IM-2013-20637 • 1 spec., 3.6 × 1.5 mm, ethanol-preserved; Lizzard Point; 16°08.43′ N, 61°46.92′ W; 12 m, KARUBENTHOS 2012; stn GS07; 7 May 2012; MNHN-IM-2019-34698 • 1 spec., 4.4 × 1.8 mm; Lizzard Point; 16°08.43′ N, 61°46.92′ W; depth 12 m; 7 May 2012; KARUBENTHOS 2012; stn GB05; MNHN-IM-2012-7356 • 1 spec., 3.7 × 1.6 mm; Lizzard Point; 16°08.43′ N, 61°46.92′ W; depth 29 m; 7 May 2012; KARUBENTHOS 2012; stn GR10; MNHN-IM-2012-7355 • 5 specs, largest is 4.3 × 1.7 mm; Ilet Pigeon; 16°02.4′ N, 61°45.6′ W; depth 50 m; 11 May 2012; KARUBENTHOS 2012; stn GS13; MNHN-IM-2012-7357 • 5 specs, largest is 4.2 × 1.7 mm; Pointe de l'Ermitage, 16°07.61′ N, 61°46.53′ W; depth 11 m; 8 May 2012; KARUBENTHOS 2012; stn GS09; MNHN-IM-2012-14915 • 2 specs, 3.85 × 1.6 and 2.7 × 1.2 mm; Lizzard Point; 16°08.43′ N, 61°46.92′ W; depth 12 m; 7 May 2012; KARUBENTHOS 2012; stn GS07; MNHN-IM-2012-14914.

Description

Based partially on Espinosa *et al*. (2017: 7–8). *Shell* small (holotype length = 4.41 mm), solid, cylindrically fusiform (W/L = 0.3832) with about 5 slightly convex whorls, the last whorl quite large, at 69% of shell length; teleoconch whorls rise a little above suture forming a gutter between their apices and sutures; aperture narrowly oval, about 47% of shell length including a short anterior canal; anal sinus spout-like. Sculpture of low, broad ribs and thread-like spirals. *Protoconch* of about 1¼ whorls, tip large, protruding, the last whorl squarish, sculpted with about 10 rows of irregular zigzag spirals, and with 1 or 2 riblets at end. *Axial sculpture* of low, broad ribs about as wide as intercostal space that run from suture to suture on spire whorls curved in toward anterior fasciole, hooked on shoulder, and evanesce at anterior fasciole on last; ribs slightly opisthocline, about 10 per whorl. *Varix* apertural, thick, rises above suture and almost completely wraps around anal sinus then extends to end of canal; crenulated by spirals; creased along its dorsal side. *Spiral sculpture* of thread-like primary and secondaries; primaries well-spaced, overring ribs where elongated irregular nodules form over crests; secondaries are between primaries; last whorl with about 12 or 13 primary spirals. *Sulcus* strongly recurved ribs on shoulder mark past positions of the anal sinus. *Outer lip* varicose, with a thin strip of shell along the base of the varix that extends from the anal sinus to anterior canal, with shallow stromboid sinus near anterior end. *Anal sinus* deep in varix, spout-like with canal nearly a closed tube directed laterally from shell axis, entrance partially constricted by parietal callus and outer lip. *Inner lip* a thin narrow glaze, margined along the columella and parietal wall, detached at the anterior canal, and with a thick bridging callus posteriorly. *Anterior fasciole* not swollen; sculptured with about 5 oblique spirals. *Columella* straight. *Anterior canal* delineated by an abrupt narrowing of aperture just below stromboid notch; short, tubular groove, slightly notched at end. *Color* of spire whorls is dark brown, last whorl yellowish-brown except aperture, varix, anterior fasciole, and outer lip, white.

Fig. 117. Radular marginal teeth of *Suturocythara guadalupensis* (Espinosa & Ortea, 2017) comb. nov. (MNHN-IM-2013-20637). Image by Y. Kantor.

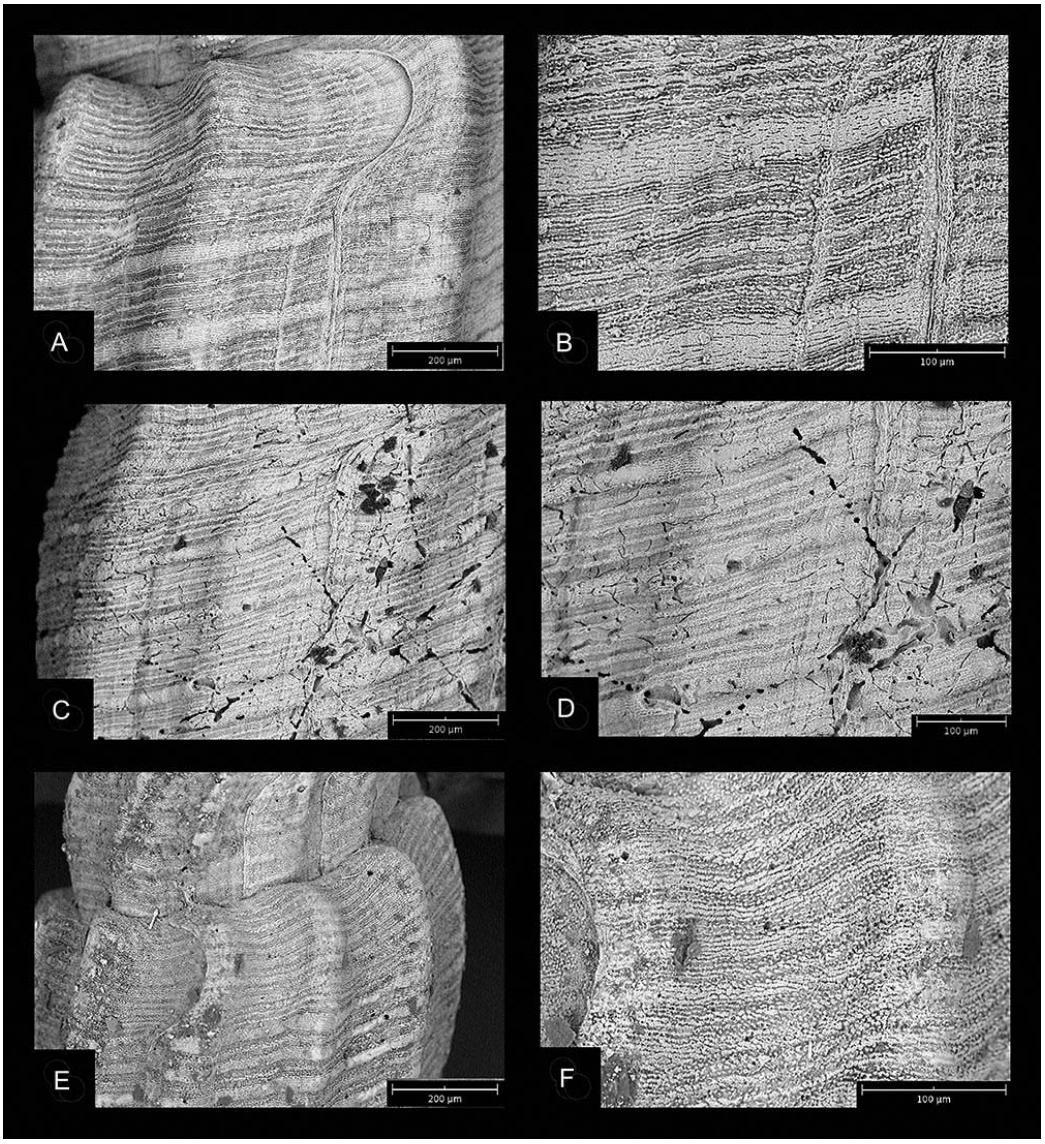


Fig. 118 (next page). Species of *Suturocythara* E.F. García, 2008, shell surface microsculpture. **A**. *Suturocythara guadalupensis* (Espinosa & Ortea, 2017) comb. nov. Spec., 4.2 × 1.7 mm (MNHN-IM-2012-14915), Pointe de l'Ermitage, Guadeloupe. Magnification 300 ×. About 5 primary spirals are shown, with about 5 secondaries between them. **B**. Same specimen as in A. Two visible primaries are seen to be tight clusters of thread-like spirals; intercalary space is filled with smaller clusters of only a few spirals (secondaries) with about 5–8 single spirals (light colored lines) between. **C**. *Suturocythara redferni* E.F. García, 2008. Spec., 3.6 × 1.4 mm (MNHN-IM-2000-39729), off Macouba, Martinique. About 8 primary spirals are shown with 3-6 secondaries between. **D**. Same specimen as in C. Magnification 510 ×. Four visible primaries are seen to be tight clusters of thread-like spirals, and that secondary spirals (3–6 between primaries) are smaller clusters of thread-like spirals. There may be, though not clearly shown, single thread-like spirals between these. **E**. *Suturocythara minima* Fallon & Bouchet sp. nov., holotype, 2.75 × 1.15 mm (MNHN-IM-2012-28596), Pointe d'Antigues (Port-Louis), Guadeloupe. The shoulder area has only band-like secondary spirals. Primaries (also band-like) begin below the shoulder. **F**. Same specimen as in E. Primary spirals are flat, tightly packed thread-like spirals, with only a few secondaries between them. Secondaries (as seen in the shoulder area) have 2–4 thread-like spirals packed close together, with about as many single spirals between them. Credits: SEM images courtesy Paul Callomon. Scale bars: A, C, E = 200 µm; B, D, F = 100 µm.

Remarks

The average length of 13 specimens is 3.9 mm (range = 2.7–4.4 mm).

Range and habitat

Guadeloupe; depth 6–50 m.

Suturocythara redferni E.F. García, 2008
Figs 118C–D, 119L–Q

Suturocythara redferni E.F. García, 2008: 6, 8, figs 27–32.

Agathotoma sp. C – Redfern 2001: 131, pl. 59 fig. 541 is this species according to García (2008: 8).

Differential diagnosis

Suturocythara guadalupensis (Espinosa & Ortea, 2017) comb. nov. protoconch has fewer whorls, 1¼ versus 2¼, a squarish protoconch versus a protoconch with round shoulders, its teleoconch has distinct ribs on the last whorl versus almost obsolete ones of *S. redferni* and is slightly broader (W/L of holotypes = 0.3832 versus 0.3750).

Suturocythara apocrypha E.F. García, 2008 is broader, larger, and mostly translucent white, without yellowish brown streaks.

Type material

Holotype

BAHAMAS • 4.0 × 1.5 mm; Abaco, Green Turtle Cay District, off Guana Cay; 26°44.33′ N, 77°09.92′ W; depth 53 m; 15 Jul. 1983; C. Redfern leg.; ANSP 416412.

Paratypes

None.

Material examined (2 specs)

MARTINIQUE • 1 spec., 3.6 × 1.4 mm; off Macouba; 14°54.9′ N, 61°08.9′ W; depth 77 m; 25 Sep. 2016; MADIBENTHOS; stn AD267; MNHN-IM-2000-39729 • 1 spec., 3.7 × 1.8 mm; Fond Boucher; 14°55′ N, 61°08.9′ W; depth 78–80 m; 24 Sep. 2016; MADIBENTHOS; stn AD263; MNHN-IM-2000-39730.

Description

Based on the original description García (2008: 6, 8) and examination of the holotype. *Shell* small (holotype length = 40 mm), solid, cylindrically fusiform (W/L = 0.3750) with about 5 slightly convex whorls, the last whorl quite large, at 70% of shell length; teleoconch whorls rise a little above suture forming a gutter between their apices and sutures; aperture narrowly oval, about 50% of shell length including a short anterior canal; anal sinus spout-like; sculpture of low, broad ribs and thread-like spirals. *Protoconch* of about 2¼ whorls, tip large, then rapidly expands such that the first whorl is angled; the last whorl has thin, arcuate axial riblets and a few faint, irregular, zigzag spirals near the suture with the first teleoconch whorl. Riblets extend slightly above adapical suture. *Axial sculpture* Axial sculpture on early whorls composed of numerous ribs, diminishing in number and strength on later whorls, nearly obsolete on last two whorls, evident mainly at shoulder, number about 11 on penultimate whorl. Ribs as wide as interspaces. *Varix* thick, rises above suture and almost completely wraps around sinus then extends to end of canal; crenulated by spirals; creased along its dorsal side. *Spiral sculpture* of primaries and microscopic secondaries; primaries closely spaced, slightly nodulose on rib crests, and intercalary

spaces with 3–6 microscopic secondaries. *Sulcus* absent. *Outer lip* narrow, incurved, along base of varix, with shallow stromboid sinus near anterior end. *Anal sinus* deep in varix, spout-like with canal nearly a closed tube, directed laterally from shell axis, entrance partially constricted by parietal callus and outer lip. *Inner lip* a thin narrow glaze, margined, along the columella and parietal wall, detached at the anterior canal, and with a thick bridging callus posteriorly. *Anterior fasciole* not swollen; sculptured with about 5 oblique spirals. *Columella* straight. *Anterior canal* delineated by an abrupt narrowing of aperture just below stromboid notch; short, tubular groove, slightly notched at end. *Color* creamy white base including ribs, varices, aperture and anterior fasciole, intercostal space yellowish brown, protoconch dark yellowish brown.

Range and habitat

Bahamas (Abaco), Martinique; depth 53–80 m. The occurrence of *Suturocythara redferni* in Martinique represents a southward range extension, previously reported only from the Bahamas.

Suturocythara apocrypha E.F. García, 2008
Fig. 119R–S

Suturocythara apocrypha E.F. García, 2008: 8, 10, figs 33–36.

Agathotoma apocrypha – Rolán *et al*. 2012: 48, figs 3a–e, 11d, table 1. Note that their fig. 3f illustrates the typical shell surface microsculpture of *Suturocythara*. — Lamy & Pointier 2017: 478, pl. 165 fig. 7a–b.

Differential diagnosis

Suturocythara redferni E.F. García, 2008 is smaller, has a different protoconch (2¼ versus 1¼ whorls) has broader ribs and more closely spaced spirals, and has a different coloration (creamy white base with yellowish brown intercostal streaks versus all white with only a faint yellowish band on the suture line).

Suturocythara guadalupensis (Espinosa & Ortea, 2017) comb. nov. has a different surface sculpture (broader ribs and closely spaced spirals versus narrow ribs and widely spaced spirals) and a different coloration (dark and yellowish brown whorls versus all white).

Type material

Holotype
MEXICO • 4.6 × 1.7 mm; Gulf of Mexico, Campeche, Campeche Bay; 20°00.35′ N, 92°26.10′ W; depth 73–74 m; 10 Jun. 2005; E.F. García leg.; dredged, NSF-II-35 grant; ANSP 416415.

Paratypes (5 specs, list from García 2008)
MEXICO • 1 spec., W of Campeche; 28 Jan. 1966; D. Steger leg.; ANSP 306436 • 1 spec.; W of Campeche; 20°51.16′ N, 92°26.28′ W; depth 93–94 m; 10 Jun. 2005; E.F. García leg.; NSF-II-34 grant; ANSP 416417 • 1 spec.; Gulf of Mexico, off Yucatan Peninsula; 20°52.2′ N, 92°24.82′ W; depth 77–81 m; BMSM 15498 • 1 spec.; Campeche Bay; 20°52.40′ N, 92°24.83′ W; 10 Jun. 2005; SBMNH 83342 • 1 spec.; E. García coll.

Other material examined (1 spec.)

BELIZE • 1 spec., 4.3 × 1.6 mm; Ambergris Cay; depth 3–5 ft [1–1.5 m]; 20 Mar. 1987; P. Williams leg.; from sand on coral reef; P. Fallon coll.

Description

This description is based on an examination of the holotype in ANSP 416415 and on the original description in García (2008: 8, 10). *Shell* small (holotype length = 4.6 mm), solid, cylindrically fusiform (W/L = 0.3696) with about 5 slightly convex whorls, the last whorl quite large, at 67% of shell length; teleoconch whorls rise a little above suture forming a narrow gutter between their apices and sutures. Aperture narrowly oval, about 49% of shell lengh, including a short anterior canal; anal sinus spout-like. Sculpture of low, narrow ribs and thread-like spirals. *Protoconch* of 1¼ whorls, with a large tip, first ¼-whorl protruding, the last portion somewhat squarish in profile. Surface of last portion sculpted with about 9 fine, irregular, zigzag spirals. *Axial sculpture* of strong, widely spaced opisthocline ribs; that extend higher than suture posteriorly creating an undulated shoulder line, are recurved on the shoulder, and curve toward anterior fasciole on shell base; about 12 ribs on penultimate whorl. *Varix* thick, rises slightly above suture and almost completely wraps around sinus then extends to end of canal; crenulated by spirals; creased along its dorsal side. *Spiral sculpture* Spiral sculpture of strong, widely spaced primary spirals that are slightly weaker than axials, creating a reticulate pattern, intercalary spaces with 3 or 4 microscopic secondaries. *Sulcus* absent; recurved ribs on shoulder mark past presence of the anal sinus. *Outer lip* is narrow, extends from anal sinus to anterior canal along base of varix, incurved, with shallow stromboid sinus near anterior end. *Anal sinus* deep in varix, spout-like with canal nearly a closed tube, directed laterally from shell axis, entrance partially constricted by parietal callus and outer lip. *Inner lip* a thin narrow glaze, margined, along the columella and parietal wall, detached at the anterior canal, and with a thick bridging callus posteriorly. *Anterior fasciole* not swollen, sculptured with about 5 oblique primary spirals. *Columella* straight. *Anterior canal* delineated by an abrupt narrowing of aperture just below stromboid notch; short, tubular groove, slightly notched at end. *Color* translucent white with a faint narrow yellowish band along the suture line.

Range and habitat

Mexico (Campeche Bay), Belize (Ambergris Cay); depth 1–94 m.

Suturocythara minima Fallon & Bouchet sp. nov.
urn:lsid:zoobank.org:act:6B0EC936-5647-4747-BBAA-29B778DFF09E
Figs 118E–F, 119T–AA

Differential diagnosis

The small size and white color distinguish this species from its congeners. It is similar in most respects to *Suturocythara apocrypha* E.F. García, 2008, type locality Campeche Bay, Mexico. That species is larger; its holotype is about 84% longer than the largest *S. minima* Fallon & Bouchet sp. nov. (3.85 versus 4.6 mm). *Suturocythara minima* Fallon & Bouchet sp. nov. possesses more and finer spirals that are weaker than the ribs.

Etymology

Suturocythara minima Fallon & Bouchet sp. nov. derives its name from the feminine form of the Latin superlative '*minimus*', which means 'the smallest'. The examined specimens measure less than 3 mm in length.

Type material

Holotype

GUADELOUPE • 2.75 × 1.15 mm; Pointe d'Antigues (Port-Louis); 16°25.99′ N, 61°32.92′ W; depth 45 m; 17 May 2012; KARUBENTHOS 2012; stn GB18; MNHN-IM-2012-28596.

Paratypes (4 specs)
GUADELOUPE • 1 spec., 2.85 × 1.0 mm; Basse-Terre, Sec Ferry; 16°17.5′ N, 61°49.0′ W; depth 27 m; 12 May 2012; KARUBENTHOS 2012; stn GS15; MNHN-IM-2012-28598 • 1 spec., 2.2 × 1.0 mm; Bouillante Bay; 16°08.07′ N, 61°46.71′ W; depth 6 m; 10 May 2012; KARUBENTHOS 2012; stn GB09; MNHN-IM-2012-28595 • 1 spec., 2.6 × 1.1 mm; Grand Cul-de-Sac Marin, facing Fajou Island; 16°21.7′ N, 61°36.4′ W; depth 22 m; 5 May 2012; KARUBENTHOS 2012; stn GS05; MNHN-IM-2012-28597 • 1 spec., 2.65 × 1.1 mm; Grand Cul-de-Sac Marin, Caret Pass; 16°22.3′ N, 61°38.1′ W; depth 29 m; 23 May 2012; KARUBENTHOS 2012; stn GS29; MNHN-IM-2012-28599.

Description

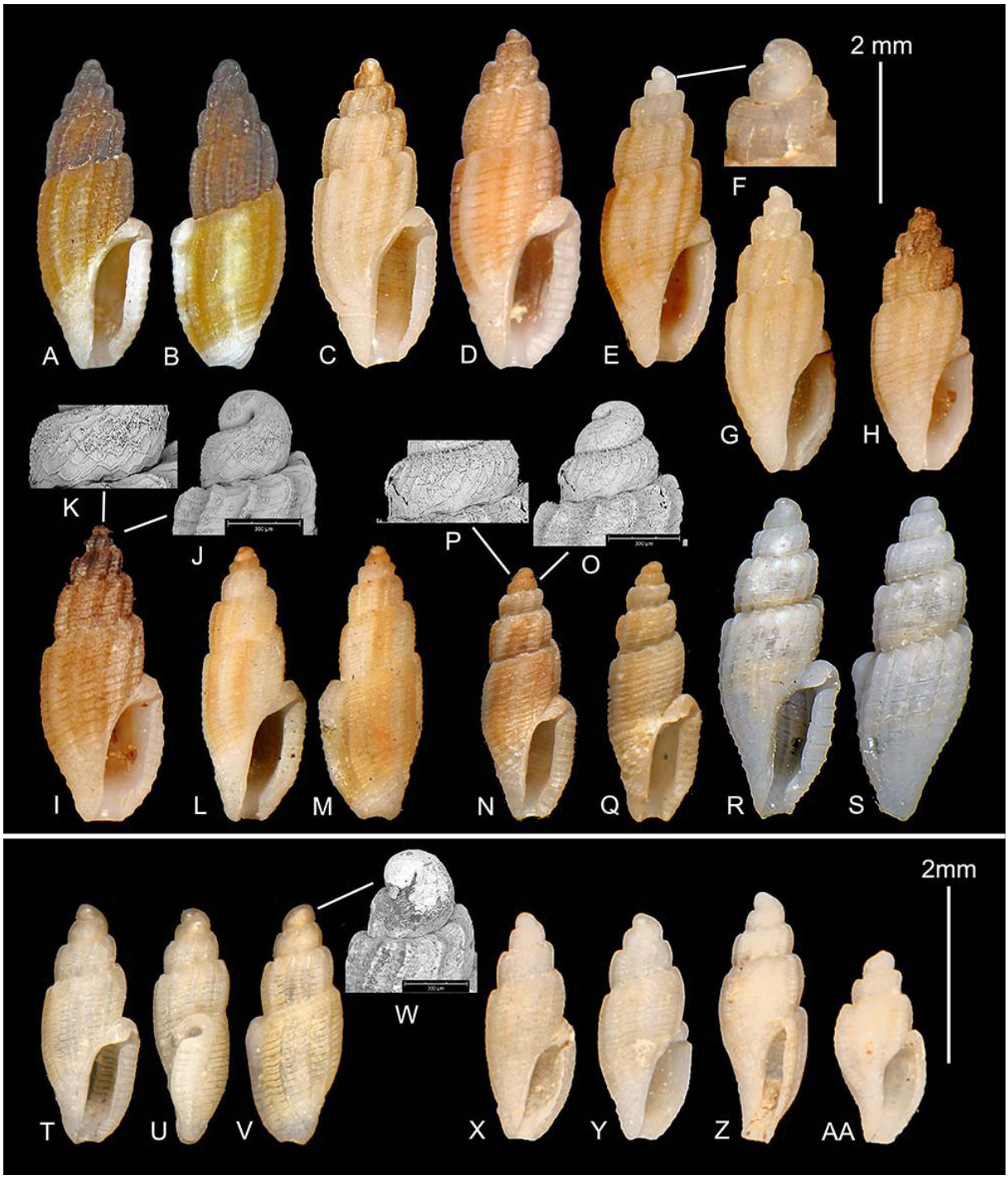
Shell very small (holotype length = 2.75 mm), solid, cylindrically fusiform (W/L = 0.4182) with about 5 slightly convex whorls, the last whorl quite large, about 73% of shell length; teleoconch shoulders rise a little above suture forming a narrow gutter between their apices and sutures. Aperture narrowly oval, about 51% of shell length, including a short anterior canal; anal sinus spout-like; sculpture of low, narrow ribs, and fine spirals. *Protoconch* of about 1¼ whorls, tip large, then rapidly expands such that the first ½-whorl is angled, the last portion high and squarish. *Axial sculpture* of narrow ribs that run from suture to suture, recurved on whorl shoulders and turned into the inner lip and anterior fasciole. Ribs spaced 3 or more times their width. *Varix* apical, thick, rises above suture and almost completely wraps around sinus then extends to end of canal; crenulated by spirals; creased along its dorsal side. *Spiral sculpture* of fine, primaries, 7 or 8 on penultimate beginning just below shoulder, 6 secondary spirals on shoulder, all override ribs. *Sulcus* absent, ribs are recurved and slightly excavated in sulcal area, and spirals finer than on whorl face. *Outer lip* varicose, with a narrow strip of shell that extends from anal sinus to anterior canal along base of varix, incurved, with shallow stromboid sinus near anterior end. *Anal sinus* deep in varix, spout-like with canal nearly a closed tube, directed laterally from shell axis, entrance partially constricted by bridging parietal callus and varicose outer lip. *Inner lip* a thin narrow glaze along the columella and parietal wall, margined, detached at the anterior canal, and with a thick bridging callus

Fig. 119 (next page). Species of *Suturocythara* E.F. García, 2008. – **A–B**. *Agathotoma guadalupensis* Espinosa & Ortea, 2017, holotype, 4.4 × 1.7 mm (MNHN), N of Fajou Island, Guadeloupe. – **C–K**. *Suturocythara guadalupensis* (Espinosa & Ortea, 2017) comb. nov. **C**. Spec., 4.4 × 1.8 mm (MNHN-IM-2012-7356), Lizzard Point, Bouillante, Guadeloupe. **D**. Spec., 4.4 × 1.7 mm, sequenced, radula extracted (MNHN-IM-2013-20637), Bouillante Bay, Guadeloupe. **E–G**. Specs, 4.3 × 1.7, ventral view, and expanded view of protoconch, not to scale, and length = 4.1 mm (MNHN-IM-2012-7357), Pigeon Island, Guadeloupe. **H–K**. Specs, lengths = 3.8 mm and 4.2 × 1.7 mm, with SEM images of protoconch, and expanded view of last protoconch whorl (MNHN-IM-2012-14915), Pointe de l'Ermitage, Guadeloupe. – **L–Q**. *Suturocythara redferni* E.F. García, 2008. **L–M**. Holotype, 3.9 × 1.5 mm (ANSP 416412), off Guana Cay, Abaco, Bahamas. **N–P**. Spec., 3.6 × 1.4 mm, ventral view, SEM image of protoconch, and expanded view of last protoconch whorl, not to scale (MNHN-IM-2000-39729), off Macouba, Martinique. **Q**. Spec., 3.7 × 1.6 mm (MNHN-IM-2000-39730), Fond Boucher, Martinique. – **R–S**. *Suturocythara apocrypha* E.F. García, 2008, holotype, 4.6 × 1.7 mm (ANSP 416415), Campeche Bay, Campeche, Gulf of Mexico. – **T–AA**. *Suturocythara minima* Fallon & Bouchet sp. nov. **T–W**. Holotype, 2.75 × 1.15 mm, ventral, lateral and dorsal views, and SEM image of protoconch (MNHN-IM-2012-28596), Pointe d'Antigues (Port-Louis), Guadeloupe. **X**. Paratype, 2.7 × 1.1 mm (MNHN-IM-2012-28599), Grand Cul-de-Sac Marin: Passe a Caret, Guadeloupe. **Y**. Paratype, 2.6 × 1.1 mm (MNHN-IM-2012-28597), Grand Cul-de-Sac Marin, face à Fajou Island, Guadeloupe. **Z**. Paratype, 2.9 × 1.0 mm (MNHN-IM-2012-28598), Basse-Terre, Sec Ferry, Guadeloupe. **AA**. Paratype, 2.2 × 1.0 mm (MNHN-IM-2012-28595), Bouillante Bay, Guadeloupe. Credits: A–B: from Espinosa *et al*. (2017: pl. 2c). SEM images courtesy Paul Callomon. Scale bars: A–I, L–N, Q–V, X–AA = 2 mm; J–K, O–P, W = 300 μm; K, P = unscaled.

posteriorly. *Columella* straight. *Anterior canal* delineated by an abrupt narrowing of aperture just below stromboid notch; short, tubular groove, slightly notched at end. *Anterior fasciole* not swollen, sculptured with fine spirals. *Color* white, with translucent spirals.

Range and habitat

Guadeloupe; depth 6–45 m.



Genus ***Tenaturris*** Woodring, 1928

Type species

Cythara guppyi Dall in Guppy & Dall, 1896, by original designation.

Summary diagnostic characteristics

Shell stout, biconic, spire much shorter than last whorl, which tapers with no or only a slight constriction at the anterior canal.

Protoconch of 1½–2½ whorls, the tip large, then whorl rapidly expands, usually with riblets at the end and with microscopic papillae beginning on the first or second whorl.

Aperture long and narrow with an anal sinus that adjoins the parietal wall posteriorly and a short, undifferentiated anterior canal.

Outer lip varicose with a callus (not a tooth) just below the anal sinus.

Axial ribs are wide or narrow and typically low and sometimes obsolete on the last whorl.

Spirals are microscopic, usually slightly flattened.

Shell surface microsculpture

Under SEM magnification of 850×, the jagged nature of spirals (as seen under a stereo microscope at 70×) appears rippled by incremental growth, with distinct valleys and troughs. species-specific patterns of primary and secondary spirals include ones with widely separate pairs of secondary spirals, closely spaced spirals that alternate multiple secondaries between primaries, and more widely spaced spirals with multiple secondaries between primaries. All imaged species have the same general appearance of rippled, slightly flattened spirals. In addition, and barely visible in the 850× SEM images, some shell surfaces in intercalary space appear like fine lacework. The lacework pattern differs among species (Figs 120–121).

Differences from other genera

Pyrgocythara Woodring, 1928, differs principally in having a shorter and more open aperture. Its spire is longer in proportion to the overall length of the shell.

Remarks

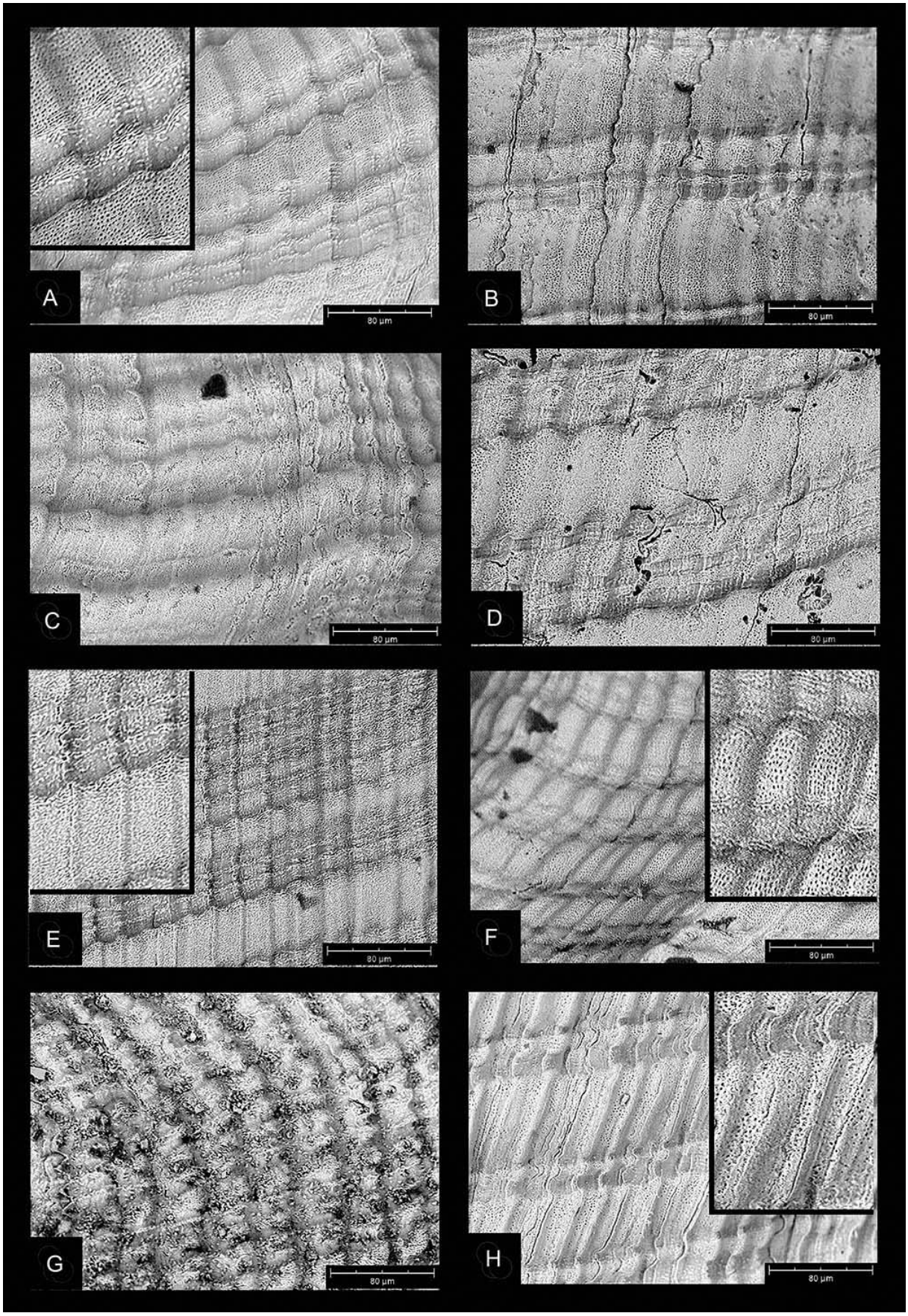
The genus *Tenaturris* comprises species with long apertures and short spires, as well as those with short apertures and taller spires. The group with long, narrow apertures and short spires consists of species similar to *Tenaturris bartlettii*-like (or *T. inepta*-like) species, the true *Tenaturris*. The group with shorter apertures and longer spires includes "*Tenaturris*" *trilineata*-like species that belong in *Pyrgocythara*. The *T. bartlettii*-like species conform closely to Woodring's (1928) diagnosis of *Tenaturris*, while the "*Tenaturris*" *trilineata*-like species conform to Woodring's (1928) diagnosis of *Pyrgocythara*. In addition to their morphological differences, analysis of genetic sequencing data supports their separation at the genus level.

There has been debate about whether *Tenaturris bartlettii* (Dall, 1889) and *Tenaturris inepta* (E.A. Smith, 1882) represent the same or different species (Redfern 2001: 135). Examination of numerous specimens indicates that they are different and readily distinguishable by their sculptural patterns, explained in the descriptions that follow.

Phylogenetic relationships

The DNA sequence data support the monophyly of the genus *Tenaturris*, with all sequenced species forming a well-supported clade. The lineage is recovered as a sister to the clade *Kurtziella* + *Cryoturris*, albeit with no bootstrap support. All sequenced species show a modest intraspecific variability (average intraspecific p-distance range: 0.2–1.3%).

Fig. 120 (next page). Species of *Tenaturris* Woodring, 1928, shell surface microsculpture. Part 1. **A**. *Tenaturris inepta* (E.A. Smith, 1882). Spec., 10.6 × 4.6 mm (UF 589926), Tavernier Key, Monroe Co., Florida Keys. Wide primaries of varying widths are separated by paired narrower secondary spirals (except near the suture, seen at the bottom of the image, where they appear to pile up), both spirals are rippled by incremental growth. The surfaces of secondary spirals are largely bare, but at higher magnification (inset, not to scale), they have elongated granules along the sides of spirals. Additionally, at higher magnification, the primaries appear perforated by punctae and appear lacy. **B**. *Tenaturris portoricana* Fallon sp. nov., holotype, 6.3 × 3.0 mm (UF 589931), Isla Verde, San Juan, Puerto Rico. The paired secondary spirals are darker and more distinct, while the primaries are wider and lighter in color. Dense incremental growth lines ripple both. Primaries are laced, but barely discernible in this image. **C**. *Tenaturris profunda* Fallon & Bouchet sp. nov., holotype, 7.8 × 3.6 mm (MNHN 2012-35917), W of Marie-Galante, Guadeloupe. Two primaries follow two sets of paired secondaries (uppermost). In this view, there is minimal space between them. The secondaries are narrower and somewhat weaker than the primaries. **D**. *Tenaturris finlayae* Fallon sp. nov., holotype, 10.3 × 4.3 mm (UF 589929), Eleuthera Island, Bahamas. The well-spaced, paired secondary spirals are less distinct than in Fig. 120A but are rippled by growth increments in this view. Primary spirals, the broad band in the center of the image, is also lace-like, although eroded on the crests of the ripples. **E**. *Tenaturris bartlettii* (Dall, 1889). Sequence voucher, 10.9 × 4.1 mm (MNHN-IM-2013-72478), E of Le Vauclin, NE Cayes Pariadis, Martinique. Single and paired primary spirals of different widths (lighter bands) are separated by 3 and 5 narrower secondaries (darker bands). Spirals are segmented rather than rippled, as in *T. inepta*. No distinct lace-like surface is seen on the surface of the primaries. Surfaces of all spirals are covered, to some degree, with densely packed irregular strings (inset). **F**. *Tenaturris arubensis* Fallon sp. nov., holotype 9.8 × 4.5 mm (ANSP 498965), Boca Catalina, Aruba, Netherlands Antilles. The surface appears spirally grooved, with narrow secondaries that are not distinctly separated from the primaries. The primaries constitute the more expansive spaces between grooves, segmented by incremental growth lines and appearing laced, as shown in the inset. **G**. *Tenaturris callomoni* Fallon sp. nov., holotype, 13.1 × 5.2 mm (UF 589934), W of Egmont Key, Hillsborough Co., W Florida. Although a poor image, the presence of crowded secondary spirals is like the pattern seen in *T. bartlettii*, Fig. 120E. **H**. *Tenaturris coniculus* Fallon & Bouchet sp. nov., paratype, 5.0 × 2.4 mm (MNHN-IM-2012-8985), Pointe Montagnier (Pointe de la Vigie), Guadeloupe. The primaries are compactly arranged, wide and flattened with a single narrow secondary in the space between, all coarsely rippled by incremental growth. This pattern is unique within the *Tenaturris* genus group. Troughs in the surface ripples of the primaries have a lacy surface (inset). Credits: SEM images courtesy of Chandler J. Olson and Krasimira "Kasey" Seizova. Scale bars = 80 µm; insets not to scale.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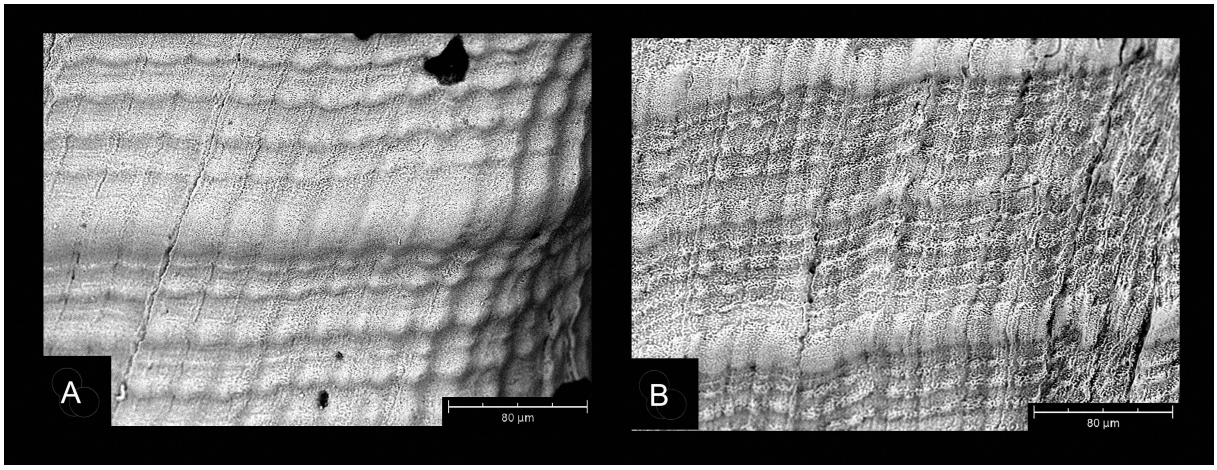


Fig. 121. Species of *Tenaturris* Woodring, 1928, shell surface microsculpture. Part 2. SEM images 850×. **A**. *Tenaturris dysoni* (Reeve, 1846). Sequence voucher, 6.0×2.8 mm (MNHN-IM-2013-72284), Passe du Marin, Pointe Borgnesse, Martinique. Strong primaries with spaced secondaries of varying strength characterize the pattern of spirals in this species. At higher magnification (not shown), the surface appears granular. **B**. *Tenaturris militaris* Fallon & Bouchet sp. nov., paratype, 5.2×2.4 mm (MNHN-IM-2000-39740), N of Grande-Terre, Guadeloupe. The image shows 3 strong primaries with spaced thread-like microscopic secondaries in between. Both primaries and secondaries exhibit variability in strength. At higher magnification (not shown), the surface appears granular. Credits: SEM images courtesy of Chandler J. Olson and Krasimira "Kasey" Seizova. Scale bars = 80 µm.

Tenaturris inepta (E.A. Smith, 1882)
Figs 120A, 122B–G

Pleurotoma (*Mangilia*) *inepta* E.A. Smith, 1882: 217.

Mangilia inepta – Tryon 1884: 248.
Daphnella inepta – Paetel 1888.
Tenaturris inepta – Rios 1985: 144, pl. 49 fig. 670; 1994: 176, pl. 58 fig. 813. — Odé 1992b: 77 (as cf. *inepta*). — Redfern 2001: 135, pl. 61 fig. 559a; 2013: 216, fig. 602a–c. — García & Lee 2002: 12: 12. — Rodriguez-Sevilla *et al*. 2003: 371. — Williams 2005: #5767. — García 2007: 8.

non *Mangilia* (*Cithara*) *inepta* – Melvill & Standen 1895: 97–98. — Bouge & Dautzenberg 1914: 162.

Differential diagnosis

Tenaturris finlayae Fallon sp. nov. of the Bahamas has a protoconch of the same number of whorls but of a different shape: asymmetrical, small, globular, tip slightly immersed.

Tenaturris portoricana Fallon sp. nov. has spire whorls that are nearly flat, not convex, and a smaller shell (average length = 7.3 versus 10.8 mm).

Tenaturris bartlettii (Dall, 1889), see discussion under that species for differences.

Type material

Holotype
HONDURAS • 11.1×5.0 mm; NHMUK 1996044.

Paratypes

None.

Material examined (16 specs)

A photograph of the holotype provided by the NHMUK was examined and the following 16 specimens:

MEXICO • 1 spec., 12.3 × 5.4 mm; Quintana Roo, Cozumel Island; depth 1.5–4.6 m; Nov. 1993; J. Cordy leg.; ANSP 498972.

UNITED STATES OF AMERICA • 1 spec., 7.2 × 3.3 mm; W Florida, W of Sarasota; depth 229 m; P. Williams leg.; dredged; ANSP 498971 • 2 specs, lengths = 11.3 and 11.2 mm; Florida Keys, Big Pine Key; depth shallow water; S. Rosenthal leg.; screened in sea grass; S. Rosenthal coll. • 4 specs, 14.0 × 5.9, 9.8 × 4.5, 13.4 × 5.7 and 8.4 × 4.5 mm; Florida Keys, Key Vaca, off Marathon Key; depth 61 m; 1978; Ted Kalafut leg.; dredged in mud; UF 589925 • 2 specs, 13.7 × 5.7 and 10.6 4.6 mm; Florida Keys, SE Tavenier Key, S end Tavenier Creek; depth 3–4.6 m; 28 Dec. 1978; H.G. Lee leg.; dredged from on sea grass flats; UF 589926 • 2 specs, 10.6 × 4.7 and 9.7 × 4.3 mm; Florida Keys, Cudjoe Key, Cudjoe Bay; depth 0.6–0.9 m; Apr. 2002 and Mar. 1997; M. Krisberg leg.; hand dredged in soft sand and turtle grass; UF 589927 • 4 specs, (1 measured) 7.6 × 3.4 mm; offshore Lousiana; 27°59.141′ N, 91°38.832′ W; depth 91–95 m; Jul. 2001; E.F. García leg.; dredged from coralline sand; UF 589928.

Description

Shell small (holotype length = 11.1 mm), biconic, of about 7 whorls, shoulders rounded, without a distinct angle at edge of shoulder, last whorl 71% of shell length; teleoconch sculpture of; of broad, low ribs and numerous fine spirals overall; aperture varicose, narrow and elongate, of about 57% of shell length including the short anterior canal, with an anal notch adjoining the parietal wall where it joins the outer lip. *Protoconch* of 1½ smooth whorls, tip relatively large, then whorls rapidly expand to the last, which is somewhat globular, faint riblets appear on the last ¼ turn. Sub-microscopic papillae cover the surface. *Axial sculpture* of low, broad ribs that extend suture to suture on spire whorls and evanesce on the last whorl, before the anterior fasciole; ribs about 9 on the ventral side of the body whorl and none on the dorsal side to the varix. 1 or 2 earlier varices are present on most specimens. *Varix* thick and broad, at or near edge of lip, extends from above the suture to the anterior canal. *Spiral sculpture* of pairs of secondary spirals, with relatively wide, flat, primaries between pairs. All spirals override ribs, and incremental growth lines impart a rippled effect to the spirals. *Sulcus* absent. Ribs and growth lines are slightly recurved on whorl shoulders. *Outer lip* the varix and a narrow strip of shell (often chipped off) that extends from varix base, its edge forming a flat arc from the anal sinus to the anterior canal. *Anal sinus* a round moderately deep notch adjoining the parietal wall that cuts slightly into the varix, surrounded by a callus on the parietal wall and around the sinus and onto the outer lip. *Inner lip* a thin, narrow glaze unemarginate except on the canal. *Columella* straight. *Anterior canal* short, poorly differentiated; unnotched. *Anterior fasciole* not swollen; sculpture like that of the shell base. *Color* off-white, without faint brown bands (perhaps bleached after 140 years?).

Remarks

The average length of 14 specimens i*s* 10.8 mm (range = 7.2–14.0 mm). Brown bands vary from absent (as in the holotype) to distinct shoulder and mid-whorl bands. specimens with the darkest banding of those examined are from the Florida Keys. Some specimens are weakly angulated at the edge of the shoulder. The holotype is entirely white, but most specimens examined for this study had three faint brown bands, with the shoulder and mid-whorl bands being darker.

Range and habitat

Confirmed specimens are from the United States (W Florida, Florida Keys), Mexico (Quintana Roo), Honduras; depth 0.6–229 m. Other localities that have not been examined include Brazil (Rios 1985, 1994; Absalão *et al*. 2005) and Barbados (Sander & Lalli 1982).

Tenaturris finlayae Fallon sp. nov.
urn:lsid:zoobank.org:act:20F3F718-6054-4AE2-A84C-27A2B75E2886
Figs 120D, 122H–O

Differential diagnosis

Tenaturris inepta (A.E. Smith, 1882) has a similar shell surface microsculpture and number of protoconch whorls (1½), but has a differently shaped protoconch: squarish, symmetrically coiled around the shell axis, tip not immersed, not globular, and larger. The shoulders of *T. inepta* are generally rounded, lacking a distinct angulation as seen in *T. finlayae.*

Etymology

Tenaturris finlayae Fallon sp. nov. is named after a grandniece (given name Finlay) of the noted shell collector, C. John Finlay.

Type material

Holotype
BAHAMAS • 10.3 × 4.3 mm; Eleuthera, 300 m N of Current Cut; depth 0 m; May 1978; H.G. Lee leg.; in beach drift; UF 589929.

Paratypes (20 specs)
BAHAMAS • 17 specs, 9.5 × 4.3, 10.4 × 4.5, 9.2 × 4.4, 8.0 × 3.8, 7.7 × 3.8, 8.3 × 3.8, 7.7 × 3.5, 4.3 × 4.4, 4.7 × 2.3, 7.3 × 3.4, 7.7 × 3.5, 7.0 × 3.2, 7.1 × 3.0, 6.9 × 3.2, 6.5 × 3.0, 6.5 × 3.0 and 6.2 × 2.7 mm; same data as for holotype; UF 589930 • 2 specs, 7.6 × 3.4 and 6.2 × 2.8 mm; the Exumas, off Great Guana Cay; depth 320 m; Apr. 2005; T. McCleery; dredged; ANSP 498969 • 1 spec., 11.3 × 4.9 mm; Andros Island, off Fresh Creek; 1983; Gladys Fehling leg.; dredged off cays; ANSP 498970.

Description

Shell small (holotype length = 10.3 mm), biconic, of about 6½ whorls, shoulders angled, last whorl 71% of shell length; teleoconch sculpture of broad, low ribs and numerous fine spirals overall; aperture varicose, narrow and elongate, of about 55% of shell length including the short anterior canal, with an anal sinus adjoining the parietal wall where it joins the outer lip. *Protoconch* of 1½ glossy whorls, tip relatively large, then rapidly expands to the end (somewhat globular), with a few riblets on last ¼ turn. Although worn, some microscopic papillae are visible near the suture, in the SEM image, and so its entire surface was likely covered. *Axial sculpture* of low, slightly opisthocline, irregular ribs (in strength) that extend suture to suture on spire whorls and evanesce on the last whorl, before the anterior fasciole; ribs 16 on the penultimate and 15 on the last to the varix. *Varix* apertural, thick and broad, extends from above the suture, curved around anal sinus on shoulder, and then to the anterior canal. *Spiral sculpture* of pairs of microscopic spirals separated by single wide primaries. All spirals override ribs, and incremental growth lines produce rippled spirals. *Sulcus* absent. Ribs and growth lines are slightly recurved on whorl shoulders. *Outer lip* varicose, the edge of a narrow strip of shell (mostly chipped off) that extends from varix base, forms a flat arc from the anal sinus to the anterior canal. *Anal sinus* is a round moderately deep notch adjoining the parietal wall that cuts slightly into the varix, about as wide as shoulder, is surrounded by a weak callus on the parietal wall, around the inside edged of the sinus and inside the outer

lip. *Inner lip* a narrow glaze, unemarginate except on the canal. *Columella* straight. *Anterior canal* short, poorly differentiated; unnotched. *Anterior fasciole* not swollen, sculpture like that of shell base, except spirals (about 10) are more closely set and partially obscured by wear. *Color* off-white.

Remarks

The average length of 21 specimens is 7.6 mm (range = 4.3–11.3 mm).

Range and habitat

Bahamas (Eleuthera Island, Andros Island, and the Exumas); depth from beach drift and dredged at 320 m.

Tenaturris portoricana Fallon sp. nov.
urn:lsid:zoobank.org:act:08F4D9F7-7DF4-4F24-9F62-29E560D92C96
Figs 120B, 122P–X

Differential diagnosis

Tenaturris inepta (E.A. Smith, 1882) has a similar microsculpture but spire whorls that are more convex and a taller spire. Its shell is larger, on average (average length = 10.8 versus 7.3 mm).

Tenaturris finlayae Fallon sp. nov. has angled spire whorls, versus slightly convex, nearly flat whorls, a taller spire, and lacks a brown shoulder band.

Etymology

Tenaturris portoricana Fallon sp. nov., the Puerto Rican *Tenaturris*, is named after the country where all specimens have been collected.

Type material

Holotype

PUERTO RICO • 6.3 × 3.0 mm; San Juan, Isla Verde beach; depth 0 m; 17 Jul. 1964; H.G. Lee leg.; in beach drift; UF 589931.

Paratypes (6 specs)

PUERTO RICO • 3 specs, 5.5 × 2.7, 5.9 × 2.8 and 6.5 × 2.8 mm; N coast, Durado Beach; 29 Apr. 1964; Swift leg.; UF 589932 • 1 spec. 5.3 × 2.5 mm; Aguadilla, Playa La Ruina; depth 0 m; Apr. 2021; D. Kirsh leg.; in beach drift; D. Kirsh coll. • 1 spec. length = 7.2 mm; Playa Isabela; depth 0 m; Apr. 2021; D. Kirsh leg.; in beach drift; D. Kirsh coll. • 1 spec. length = 5.6 mm; Isabela, Pozo Theodore; depth 0 m; Apr. 2021; D. Kirsh leg.; in beach drift; D. Kirsh coll.

Other material examined (2 specs)

The following lot has been excluded from the type series because of excessive wear.

PUERTO RICO • 2 specs, 11.5 × 5.4 and 12.1 × 5.9 mm; same data as for holotype; UF 589933.

Description

Shell small (holotype length = 6.3 mm), biconic, of about 5½ slightly convex whorls, shoulders steeply sloped on last 2 whorls, absent on earlier ones, last whorl 79% of shell length; teleoconch sculpture of broad, low ribs crossed by microscopic spirals overall; aperture varicose, narrow and elongate, of about 63% of shell length including the short anterior canal, with an anal sinus adjoining the parietal wall.

Protoconch of 1½ glossy whorls, tip partially immersed, without riblets at its end. Sub-microscopic papillae cover protoconch as seen in the SEM image. *Axial sculpture* of low, slightly opisthocline ribs that extend suture to suture on spire whorls and evanesce on the last whorl, before the anterior fasciole; ribs 16 on the penultimate and 13 on the last to the varix, very slightly nodulose on edge of shoulder, lower and slightly recurved in sulcal area. *Varix* thick and broad, at or near edge of lip, extends from above the suture, is curved around anal sinus and then extends to the anterior canal. *Spiral sculpture* of primary and secondary spirals. Pairs of secondaries are separated by wide primaries, all override ribs, and are rippled by incremental growth lines. *Sulcus* absent. Ribs and growth lines are slightly recurved on whorl shoulders. *Outer lip* is a narrow strip of shell (mostly chipped off) that extends from base of varix, lip edge forming a flat arc from the anal sinus to the anterior canal. *Anal sinus* a round moderately deep notch adjoining the parietal wall acutely angled to the axis of the shell (adapically directed) and that cuts slightly into the varix, which is surrounded by a weak callus on the parietal wall, around the inside edged of the sinus and inside the outer lip. *Inner lip* a narrow margined glaze along the columella with a low callus on the parietal wall at the anal sinus. *Columella* straight. *Anterior canal* short, poorly differentiated; unnotched. *Anterior fasciole* is not swollen, sculpture like that of shell base except spirals (about 10) are more closely set and partially obscured by wear. *Color* white with a sub-sutural brown band and two brown spots on the outer lip.

Remarks

The average length of 9 specimens is 7.3 mm (range = 5.3–12.1 mm). The protoconch may have a few weak riblets at its end.

Range and habitat

Puerto Rico (N coast); depth shallow water (assumed because all specimens were beach-collected).

Tenaturris arubensis Fallon sp. nov.
urn:lsid:zoobank.org:act:AE18EAAB-2434-4F6B-A460-F8AC4891399A
Figs 120F, 122Y–FF

Differential diagnosis

Tenaturris inepta (E.A. Smith, 1882) has spire whorls with rounder shoulders and a taller spire (29% versus 23% of holotype shell length). Additionally, its shell is slightly larger (10.8 versus 8.45 mm average length). It differs in coloration, lacking the spiral lines of brown and white dashes present in *T. arubensis* Fallon sp. nov., and features a white, rather than brown protoconch.

Tenaturris portoricana Fallon sp. nov. also has a shorter spire, spire whorls only slightly convex, a thinner, translucent shell, and a different coloration.

Etymology

Tenaturris arubensis Fallon sp. nov. is named after Aruba, Netherlands Antilles, where all specimens have been collected.

Type material

Holotype

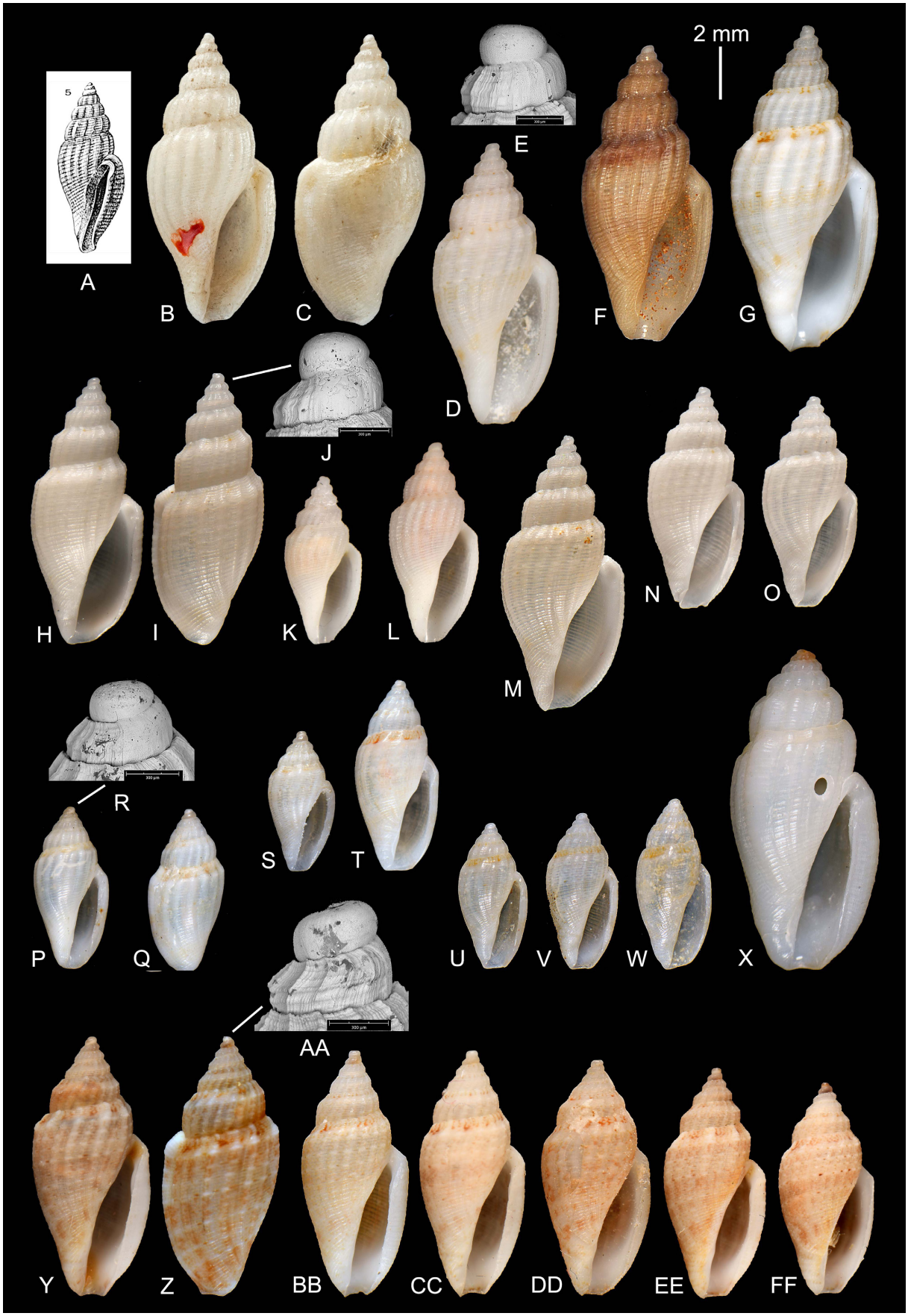
NETHERLANDS ANTILLES • live taken, 9.8 × 4.5 mm; Aruba, Boca Catalina; depth 3–5 m; 20–28 May 2016; C. Afonso leg.; night SCUBA from on sand and algae carpet on rock platform; ANSP 498965.

Paratypes (6 specs)
NETHERLANDS ANTILLES • 4 specs, 8.7 × 4.0, 8.1 × 3.7, 6.9 × 3.0 and 6.6 × 3.1 mm; same data as for holotype; USNM 1715461 • 2 specs, 9.3 × 4.0 and 9.3 × 3.9 mm; Aruba, North Malmok, Arashi Beach; depth 10–15 m; Aug. 2020; Leo Ros leg.; hand dredged by diver; ANSP 498966.

Description

Shell small (holotype length = 9.8 mm), biconic, of about 6¾ total, teleoconch whorls steep shouldered, side short, straight, last whorl 77% of shell length; teleoconch sculpture of low ribs crossed by microscopic spirals overall; aperture varicose, narrow and elongate, of about 62% of shell length including a short anterior canal, with an anal sinus adjoining the parietal wall. *Protoconch* of 1½ glossy whorls, tip large, partially immersed, with fine riblets at its end. Microscopic granules, or papillae, cover the surface of the protoconch and are barely discernible in the 250× SEM image. *Axial sculpture* of low, slightly opisthocline ribs that extend suture to suture on spire whorls and evanesce on the last whorl, before the anterior fasciole; ribs 19 on the penultimate and 15 on the last to the varix, every other rib slightly nodulose on edge of shoulder on last 2 whorls, lower and recurved somewhat in sulcal area. *Varix* apertural, thick and broad, extends from slightly above the suture, is curved around anal sinus and then extends to the anterior canal. *Spiral sculpture* of flattened primary spirals, with indistinct, narrow secondaries in between primaries; spirals override ribs, and crowded incremental growth produces rippled spirals. *Sulcus* absent. Ribs and growth lines are slightly recurved on whorl shoulders. *Outer lip* varicose, with a narrow strip of shell along its base, lip edge forming a low arc from the anal sinus to the anterior canal. *Anal sinus* is a round deep notch adjoining the parietal wall, directed adapically, surrounded by a weak callus around the inside edge of the sinus and inside the outer lip. *Inner lip* has a narrow, marginated glaze along the columella, joins the outer lip at the suture with a low callus on the parietal wall. *Columella* is slightly sigmoid. *Anterior canal* short, poorly differentiated; end notched.

Fig. 122 (next page). Species of *Tenaturris* Woodring, 1928. Part 1. – **A**. *Cythara guppyi* Dall in Guppy & Dall, 1896, holotype, 6.5 mm (USNM 107145), type species of the genus. – **B–C**. *Pleurotoma inepta* E.A. Smith, 1882, holotype, 11.1 × 5.0 mm (NHMUK 1996044), Honduras. – **D–G**. *Tenaturris inepta* (E.A. Smith, 1882). **D–E**. Spec., 10.6 × 4.6 mm, ventral view, and SEM image of protoconch (UF 589926), Tavernier Key, Monroe Co., Florida Keys. **F**. Spec., length = 11.2 mm (S. Rosenthal coll.), Big Pine Key, Monroe Co., Florida Keys. **G**. Spec., 12.3 × 5.4 mm (ANSP 498972), Cozumel Island, Quintana Roo, Mexico. – **H–O**. *Tenaturris finlayae* Fallon sp. nov. **H–J**. Holotype, 10.3 × 4.3 mm, ventral and dorsal views, and SEM image of protoconch (UF 589929), Eleuthera Island, Bahamas. Protoconch worn, but a few papillae are visible near the suture. **K–L**. Paratypes, 7.6 × 3.4 and 6.2 × 2.8 mm (ANSP 498969), off Great Guana Cay, the Exumas, Bahamas. **M–O**. Paratypes, 10.4 × 4.5, 8.3 × 3.8 and 8.0 × 3.8 mm (UF 589930), Eleuthera Island, Bahamas. – **P–X**. *Tenaturris portoricana* Fallon sp. nov. **P–R**. Holotype, 6.3 × 3.0 mm, ventral and dorsal views, and SEM image of protoconch (UF 589931), Isla Verde, San Juan, Puerto Rico. Protoconch worn, but a few papillae visible near the suture. **S**. Paratype, 5.3 × 2.5 mm (D. Kirsh coll.), Playa Ruina, Aguadilla, Puerto Rico. **T**. Paratype, length = 7.2 mm (D. Kirsh coll.), Playa Isabela, Puerto Rico. **U–W**. Paratypes, 5.5 × 2.7, 5.9 × 2.8 and 6.5 × 2.8 mm (UF 589932), Durado Beach, N coast, Puerto Rico. **X**. Spec., 12.1 × 5.9 mm (UF 589933), Isla Verde beach, San Juan, Puerto Rico, the type locality. A gerontic, beach-rolled specimen of 6½ whorls. – **Y–FF**. *Tenaturris arubensis* Fallon sp. nov. **Y–AA**. Holotype, 9.8 × 4.5 mm, ventral and dorsal views, and SEM image of protoconch (ANSP 498965), Boca Catalina, Aruba, Netherlands Antilles. **BB–DD**. Paratypes, 9.3 × 4.0, 9.3 × 3.9 and 8.9 × 4.2 mm (ANSP 498966), Arashi Beach, North Malmok, Aruba, Netherlands Antilles. **EE–FF**. Paratypes, 8.7 × 4.0 and 8.1 × 3.7 mm (USNM 1715461), Boca Catalina, Aruba, Netherlands Antilles. Credits: A: from Dall (1896: pl. 27 fig. 5); B–C: courtesy of Harry Taylor, Photographic Unit, copyright NHMUK; E, J, R, AA: SEM images courtesy of Chandler J. Olson. Scale bars: A–D, F–I, K–Q, S–Z, BB–FF = 2 mm; E, J, R, AA = 300 μm.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Anterior fasciole not swollen, sculpture like that of the shell base, except spirals are oblique. *Color* is pale grayish or straw with light brown bands of variable widths, the widest ones at the suture, just below the whorl periphery, and above the anterior fasciole, and an even darker shoulder band. Protoconch brown, varix, and shoulder nodules white. On a smaller scale, 3 spiral lines of dashes, independent of the microscopic spirals, are brown in intercalary spaces and white on ribs that occur on the penultimate whorl, and a few more lines on the shell base.

Remarks

The average length of 8 specimens is 8.5 mm (range = 6.6–9.8 mm).

Range and habitat

Netherlands Antilles (Aruba); depth 3–15 m.

Tenaturris bartlettii (Dall, 1889)
Figs 120E, 123, 124A–H

Mangilia (*Cythara*) *bartlettii* Dall, 1889a: 101, pl. 12 fig. 6, pl. 14 figs 5, 8.

Cythara bartletti [sic] – Peile 1926: 84.
Mangelia bartlettii – Abbott 1958: 97, pl. 3 fig. s; 1968: 168, fig. 7. — Warmke & Abbott 1961: 137, pl. 25 fig. f. — Arnow *et al*. 1963: 169. — Rios 1970: 126. — Hoerle 1970: 65. — Carnes 1975: 18.
Mangelia bartletti [sic] – Abbott 1974: 278, fig. 3159. — Rice & Kornicker 1965: 127, pl. 7 fig. 9. — Ekdale 1974: 650. — Sander & Lalli 1982: 317. — Vokes & Vokes 1983: 58, pl. 29 fig. 1. — García & Luque 1986: 48.
Tenaturris bartlettii – Powell 1966: 101. — Rios 1975: 137, pl. 41 fig. 626; 1985: 137, pl. 41 fig. 666; 1994: 176; pl. 58 fig. 809. — Turgeon *et al*. 1988: 100; 1998: 109. — Odé 1992b: 76. — Absalão *et al*. 2005: 33, fig. 85.
Tenaturris bartletti [sic] – Kaicher 1984: card 3885. — de Jong & Coomans 1988: 114. — Leal 1991b: 190. — Díaz & Puyana 1994: 227, pl. 68 fig. 900. — Gundersen 1998: 13. — Redfern 2001: 135, pl. 61 fig. 557. — Williams 2005: #5767.

Differential diagnosis

Tenaturris maryae Fallon sp. nov. has coarser spirals and a different protoconch. It is larger in diameter (0.85 versus 5.90 mm), has slightly more whorls (2¼ versus 2), and has more and finer riblets on the last ¼-whorl.

Tenaturris stellae Fallon sp. nov. has a similar surface microsculpture but a smaller protoconch (1½ versus 2 whorls).

Tenaturris inepta (E.A. Smith, 1882) and its group (*T. portoricana* Fallon sp. nov., and *T. finlayae* Fallon sp. nov.) all have a distinctly different shell surface microsculpture than *T. bartlettii* and its group. Compare Fig. 120A and Fig. 120E for *T. inepta* and *T. bartletti*.

Type material

Lectotype (here designated)
The single syntype in USNM 87417 (Dall 1889a: 101, pl. 14 fig. 5) most closely matches Dall's description and is here designated the lectotype. This specimen has a red dot and an old slip with the word "type".

CUBA • 10.1 × 4.5 mm; off Havana; depth 450 fms [823 m]; 1877; Sigsbee leg.; USFC R/V *Blake* exped.; stn 51; USNM 87417.

Paralectotypes (2 specs)

Dall's type series, including the designated lectotype, consists of 7 syntypes in 6 lots, which were divided between the MCZ and NMNH. In addition to the selected lectotype, the following 3 lots are this species:

CUBA • 1 spec., 6.6 × 3.4 mm, juvenile; off Havana; depth 450 fms [823 m]; MCZ 7102.

UNITED STATES OF AMERICA • 1 spec., 10.0 × 4.5 mm; Florida Keys, Key West; 24°33′ N, 81°46′ W; H. Hemphill leg.; on algae between tides; USNM 86915.

U.S. VIRGIN ISLANDS • 1 spec., 10.0 × 4.5 mm; St. Croix, off Frederickstadt; 17° 37.92′ N, 64°54.33′ W; depth 110 fms [201 m]; 5 Jan. 1879; USFC R/V *Blake* exped.; stn 132; MCZ 7100.

The remaining two lots (USNM 87418 and MCZ 7101) are from off Barbados and have been redescribed as *Tenaturris maryae* Fallon sp. nov. (see description of that species.)

Material examined (35 specs)

In addition to the types noted above, 34 other specimens were examined, 8 of which were live caught and subsequently sequenced. Data on 12, including the live caught and other figured specimens, follow.

GUADELOUPE • 1 spec., 8.4 × 4.0 mm; Bouillante Islet; 16°07.41′ N, 61°46.64′ W; depth 40 m; 8 May 2012; KARUBENTHOS 2012; stn GD09; sequenced; MNHN-IM-2013-20237 • 1 spec., 5.7 × 2.4 mm; Port-Louis; 16°22.77′ N, 61°34.19′ W; depth 66 m; 17 May 2012; KARUBENTHOS 2012; stn GD35; sequenced; MNHN-IM-2013-20640 • 1 spec., 7.4 × 3.1 mm; Port-Louis; 16°22.77′ N, 61°34.19′ W; depth 66 m; 17 May 2012; KARUBENTHOS 2012; stn GD35; sequenced; MNHN-IM-2013-7803 • 1 spec., 10.0 × 4.3 mm; W of Marie-Galante; 15°56′ N, 61°26′ W; depth 133–152 m; 22 Jun. 2015; KARUBANTHOS 2015; stn DW4593; sequenced; MNHN-IM-2013-61028 • 1 spec., 12.2 × 4.9 mm; W of Marie-Galante; 15°45′ N, 61°09′ W; depth 150–221 m; 27 Jun. 2015; KARUBENTHOS 2; stn DW4589; MNHN-IM-2000-39731 • 1 spec., 10.2 × 4.2 mm; Grand Cul-de-Sac Marin, Port-Louis; 16°25′ N, 61°33′ W; depth 160 m; 14 May 2012; KARUBENTHOS 2012; stn GD25; MNHN-IM-2012-8730 • 1 spec., 10.8 × 4.6 mm; Grand Cul-de-Sac Marin, off Fajou Island; 16°23′ N, 61°36′ W; depth 150 m; 4 May 2012; KARUBENTHOS 2012; stn GN04; MNHN-IM-2012-8733 • 1 spec., 10.6 × 4.7 mm, ethanol-preserved; S of Marie-Galante; 15°52′ N, 61°20′ W; depth 217–225 m; 28 Jun. 2015; KARUBENTHOS 2; stn DW4637; MNHN-IM-2013-61421.

MARTINIQUE • 1 spec., 4.0 × 1.9 mm; off Macouba; 14°55′ N, 61°08.9′ W; depth 78–80 m; 24 Sep. 2016; MADIBENTHOS; stn AD263; sequenced; MNHN-IM-2013-71303 • 1 spec., 10.9 × 4.1 mm; NE Cayes Pariadis, E Le Vauclin; 14°34.2′ N, 60°44.8′ W; depth 90 m; 14 Sep. 2016; MADIBENTHOS; stn AD231; sequenced; MNHN-IM-2013-72478 • 1 spec., 8.1 × 3.3 mm; N of Caravelle Peninsula; 14°52.1′ N, 60°53.7′ W; depth 59 m; 18 Sep. 2016; MADIBENTHOS; stn AD244; sequenced; MNHN-IM-2013-72615 • 1 spec., 4.7 × 2.2 mm; SW Pointe Borgnesse, Passe du Marin; 14°26.1′ N, 60°54.5′ W; depth 60 m; 10 Sep. 2016; MADIBENTHOS; stn AD218; sequenced; MNHN-IM-2013-70357.

Description

Redescription of USNM 87417, the lectotype. *Shell* small (length = 10 mm), biconic, of 6½ whorls, shoulders progressing from very slightly tabulate to round, last whorl 75% of shell length; teleoconch sculpture of numerous weak, narrow ribs to none on shell dorsum, of numerous fine spirals overall; aperture varicose, narrow elongate, about 60% of shell length including anterior canal, with an anal

notch and short anterior canal. *Protoconch* of 2¼ glossy dark amber whorls, about 0.59 mm in diameter at its base, the minute, recumbent tip of the first whorl rapidly expands such that the first whorl is asymmetrical. Riblets on last ½ whorl begin fine and closely set, then become stronger and more widely spaced. *Axial sculpture* of weak, narrow ribs that extend suture to suture on spire whorls and down to anterior fasciole on the last. There are 20 ribs on the last whorl up to about ¼-whorl before the varix, which is smooth, and a couple of irregularly placed earlier varices on the last whorl. *Varix* large. Rises over the suture and extends to the anterior canal. Older varices present, up to about 4, on previous whorls. *Spiral sculpture* of well-spaced pairs of fine primary spirals overall, with pairs closer and more prominent on the anterior fasciole, all finely beaded by intersecting growth increments. Spirals override ribs. Microscopic secondaries (finer than the primary spirals) occupy the intercalary space between paired spirals, numbering variably from 2 to 7. *Sulcus* absent. *Outer lip* varicose, extends from base of varix, slightly angled into the aperture, its outer edge forming an arc from the anal sinus to the stromboid notch; stromboid notch shallow. *Anal sinus* is a round moderately deep notch that cuts slightly into the varix, with a flat columellar callus below the sinus and a callus on the outer lip. *Inner lip* a thin, narrow glaze. *Columella* straight. *Anterior canal* short, poorly differentiated; unnotched. *Anterior fasciole* is not

Fig. 123. *Tenaturris bartlettii* (Dall, 1889) (MNHN-IM-2013-72615), dorsal and lateral views of live animal. Photos by C. Redfern.

swollen, with somewhat stronger primary spirals that run obliquely but in the same pattern as the shell base. *Color* irregular pale diffuse brown bands subsuturally and on outer lip at mid-point and at junction with anterior canal; diffuse brown spots randomly spaced around whorl shoulders.

Animal

The animal is translucent white with small opaque-white spots on the foot, and opaque yellowish spots on a translucent white siphon (Fig. 123). Eyes (seen as black spots) are midway along the fleshy cephalic tentacles.

Remarks

Tenaturris bartlettii (Dall, 1889) has been synonymized with *T. inepta* (E.A. Smith, 1882) by V.O. Maes (unpublished MS, Rosenberg 2009). However, Redfern (2001: 135) distinguishes the two species based on protoconch color and other shell characteristics. As demonstrated here, *T. bartlettii* possesses a different microsculpture: widely spaced pairs of primary spirals of varying strengths, with 2–7 secondary spirals in between. *T. inepta* has single primaries, also of varying strengths, separated by paired secondaries. The protoconch of *T. bartlettii* consists of 2¼ whorls compared to 1½ whorls in *T. inepta.* This distinct microsculpture is also characteristic of *T. maryae* Fallon sp. nov. and *T. stellae* Fallon sp. nov.

The average length of 28 measured specimens is 8.3 mm (range = 4.0–12.2 mm).

Range and habitat

Cuba (type locality), U.S Virgin Islands (St. Croix), Guadeloupe, Martinique, and French Guiana; depth 4–312 m, live caught depth 40–152 m.

Tenaturris callomoni Fallon sp. nov.

urn:lsid:zoobank.org:act:CA272494-8897-4963-825F-60A1EDADCD3F

Figs 120G, 124I–O

Differential diagnosis

Tenaturris bartlettii (Dall, 1889) has a similar surface microsculpture but a different protoconch, with 2¼ versus 1½ whorls; the last half-whorl has fine, closely spaced riblets that become stronger up to the lip edge, whereas the last ¼ whorl possesses only a few indistinct riblets. The protoconch tip of *T. bartlettii* is not partially immersed as in *T. callomoni* Fallon sp. nov.

Tenaturris maryae Fallon sp. nov. has coarser spirals, and a protoconch with 2¼ versus 1½ whorls that is white, not dark golden brown. (See difference between *T. bartlettii* and *T. maryae* under the diagnosis of *T. maryae*.)

Tenaturris stellae Fallon sp. nov. is somewhat smaller (average length = 7.1 versus 8.4 mm), its whorls have distinct shoulders, possess more distinct ribs on last whorl, and has a longer anterior canal.

Etymology

Tenaturris callomoni Fallon sp. nov. is named in honor of Paul Callomon, for his creation of SEM images, other helpful suggestions for this manuscript, andhis dedication to the dissemination of molluscan lore.

Type material

Holotype

UNITED STATES OF AMERICA • 13.1 × 5.2 mm; W Florida, Hillsborough Co., W of Egmont Key; depth 240 ft [73 m]; 1968; Jim Moore leg.; dredged; R/V *Cavalier*; UF 589934.

Paratypes (7 specs)
UNITED STATES OF AMERICA • 5 specs, 10.2 × 4.5, 7.5 × 3.8, 6.7 × 2.8, 7.5 × 3.1 and 9.6 × 4.3 mm; same data as for holotype; UF 590829 • 1 spec., 8.3 × 3.7 mm; W Florida, Manatee Co., off Anna Maria; depth 91 m; J. Moore leg.; trawled; NHMUK • 1 spec., 8.7 × 3.6 mm; W Florida, Hillsborough Co., 95 mi. [153 km] W of Egmont Key; depth 73 m; dredged; ANSP 498974.

Other material examined (2 specs)

UNITED STATES OF AMERICA • 1 spec., 9.4 × 4.2 mm; E Florida, Dania, Broward Co.; depth 0 m; Jan. 2003; John Chester leg.; from beach renourishment; UF 590827 • 1 spec., 3.2 × 1.8 mm; offshore of Louisiana; 28°03.439′ N, 92°26.978′ W; depth 71–74 m; E.F. García leg.; dredged; UF 590828.

Description

Shell small (holotype length = 13.1 mm), biconic, of 7¾ convex whorls without distinct shoulders, last whorl 72% of shell length; teleoconch sculpture of numerous weak, opisthocline ribs on early whorls graduating to none except varices on the last; of numerous fine spirals overall; aperture elongate narrow, varicose, with a short anterior canal about 57% of shell length including anterior canal. *Protoconch* of 1½ whorls, the tip of the first whorl is partially immersed such that the first whorl appears nearly flat, a few weak riblets present at its end. Color a light to dark golden brown. *Axial sculpture* of obscure and obsolete ribs on the penultimate and last whorls, low, opisthocline ribs on earlier whorls. 2–3 varices on the penultimate and last whorls. *Varix* apertural, broad and thick, extending from a little above the suture, very slightly curved around the anal sinus then to the stromboid notch, reduced in height anteriorly. *Spiral sculpture* of pairs of flat spirals separated by strong grooves and segmented by growth lines. Flat spirals are in-turn halved by weak grooves. *Sulcus* absent; slightly recurved growth striae and ribs or varices mark the past presence of the anal sinus. *Outer lip* varicose, with a strip of shell that extends along the base of varix, its outer edge forming a flat arc from the anal sinus to the anterior canal. *Anal sinus* a round notch adjacent to the parietal, wall its apex lies on the ventral edge of the varix. *Inner lip* a thin, narrow glaze. *Columella* straight. *Anterior canal* short, poorly differentiated from aperture; unnotched. *Anterior fasciole* not swollen, with primary spirals in the same pattern as the shell base only closer and with fewer secondaries between. *Color* off-white with diffuse yellowishbrown spots on whorl shoulders and a light amber protoconch.

Remarks

The average length of 10 specimens is 8.4 mm (range = 3.2–13.1 mm).

Range and habitat

United States (W Florida, off Louisiana); depth 73–91 m.

Tenaturris maryae Fallon sp. nov.
urn:lsid:zoobank.org:act:AD798CB6-F176-46CE-800C-6C1963042763
Fig. 124P–S

Differential diagnosis

Tenaturris bartlettii (Dall, 1889) usually has an amber colored protoconch, not white, and finer spirals.

Tenaturris stellae Fallon sp. nov. has more distinct shoulders and a protoconch with fewer whorls (1½ versus 2¼).

Etymology

Tenaturris maryae Fallon sp. nov. honors the author's wife, Mary Fallon, for her support and patience throughout the years of research and preparation of this monograph.

Type material

Holotype

BARBADOS • 8.1 × 3.8 mm; 13°10′ N, 59°32′ W; depth 100 fms [183 m]; 1877–1878; USCSS R/V *Blake* exped.; USNM 87418. This specimen is also a paralectotype of *Tenaturris bartlettii* (Dall, 1889).

Paratypes (2 specs)

BARBADOS • 1 spec., length = 5.5 mm; same data as for holotype; USNM 87418 • 1 spec., 8.2 × 4.1 mm; off Barbados; 13°10′ N, 59°32′ W; depth 100 fms [183 m]; 1878; USCSS R/V *Blake* exped.; MCZ 7101. These two specimens are also paralectotypes of *Tenaturris bartlettii* (Dall, 1889).

Description

Based on the examination of lot USNM 87418 and D. Tippet's notes, dated 9 May 1996, of lot MCZ7101. *Shell* small (holotype length = 8.1 mm), biconic, of 6 convex whorls with steeply sloping -rounded shoulders slightly angled only on early spire whorls, last whorl largest, 77% of shell length; teleoconch sculpture of numerous opisthocline ribs and numerous strong spirals overall; aperture elongate narrow, varicose, with an anal sinus and short anterior canal about 64% of shell length, including anterior canal. *Protoconch* of 2¼ evenly expanding, symmetrical whorls with 8–10 arched riblets on last ¼ whorl, tip immersed, overall color white. *Axial sculpture* of numerous narrow, slightly opisthocline ribs that are low and slightly recurved on the shoulder that extend suture to suture on spire whorls and evanesce before the anterior fasciole on the last. Ribs closer than intercostal space. Several earlier varices appear on both whorls. *Varix* at outer lip, broad and thick, extending from a little above the suture, very slightly curved around the anal sinus then to the stromboid notch, reduced in width anteriorly. Spirals extend to around the face of the varix. *Spiral sculpture* of evenly spaced strong spirals, weaker than ribs. Primaries become more closely spaced advancing anteriorly; all are intersected by dense growth lines resulting in their rippled appearance. *Sulcus* absent; recurved ribs and varices mark the past presence of the anal sinus. *Outer lip* varicose, with a thin strip of shell along the base of varix. A low callus lies inside the lip, at the base the anal sinus. *Anal sinus* is a round moderately deep notch that cuts slightly into the varix, with a flat columellar callus below the sinus, around the inside edge of the sinus, to the inside of the outer lip. *Inner lip* a thin, narrow glaze along the parietal wall and columella, margined along the anterior canal, unemarginate elsewhere. *Columella* straight. *Anterior canal* short, unnotched. *Anterior fasciole* is not swollen, with the same pattern as the shell base. *Color* golden yellow with a faint brownish shoulder and mid-whorl band, anterior canal, and shoulder of varix white.

Range and habitat

Off Barbados; depth 183 m.

Tenaturris stellae Fallon sp. nov.
urn:lsid:zoobank.org:act:376AC4CB-305E-4D62-8F2A-2EF6F60436D9
Fig. 124T–Z

Differential diagnosis

Tenaturris bartlettii (Dall, 1889) has a similar surface microsculpture but a different protoconch, with 2¼ versus 1½ whorls of *T. stellae* Fallon sp. nov.; the last half whorl of *T. bartlettii* has fine, closely spaced riblets that become stronger up to the lip edge, whereas the last ¼ whorl of the protoconch of *T. stellae* has indistinct, weak riblets.

Tenaturris callomoni Fallon sp. nov. is somewhat larger (average length = 8.4 versus 7.1 mm), its whorls are without distinct shoulders, possesses less distinct ribs on the last whorl, and its shell has a slightly shorter anterior canal.

Tenaturris maryae Fallon sp. nov. also has a similar surface microsculpture but an even larger protoconch (2¼ versus the 1½ whorls of *T. stellae* Fallon sp. nov.).

Etymology

Tenaturris stellae Fallon sp. nov., Stella's *Tenaturris*, is named after my fabulous teenage granddaughter, and an award-winning lacrosse player, Stella E. Fallon.

Type material

Holotype

HONDURAS • 7.6 × 3.2 mm; 2 mi. [3.2 km] SSE of Morat Island; 16°25.058′ N, 86°10.896′ W; depth 6–27 m; 23 Sep. 2008; P. Fallon leg.; dredged on silty to coarse carbonate sand patches of algae; ANSP 498976.

Paratypes (2 specs)

HONDURAS • 1 spec., 7.3 × 3.1 mm; 2 mi. [3.2 km] SSE of Morat Island; 16°25.058′ N, 86°10.896′ W; depth 6–27 m; 23 Sep. 2008; P. Fallon leg.; dredged from silty to coarse carbonate sand with algae patches; ANSP 498975 • 1 spec., 6.4 × 3.1 mm; 0.5 mi. [0.8 km] SSE of Morat Island; 16°25.207′ N, 86°10.601′ W; depth 27–35 m; 25 Sep. 2008; P. Fallon leg.; dredged from silty to coarse carbonate sand with algae patches; USNM 1715464.

Description

Shell small (holotype length = 7.6 mm), biconic (W/L = 0.4211), of 6½ convex whorls with rounded shoulders, last whorl 73% of shell length; teleoconch sculpture of numerous weak, opisthocline ribs on early whorls graduating to none except varices on the last; of numerous fine spirals overall; aperture elongate narrow, varicose, with a short anterior canal about 55% of shell length including anterior canal. *Protoconch* of 1½ whorls, the tip minute, then rapidly expands, with a few weak riblets at its end. *Axial sculpture* of broad, low ribs, intercostal space narrower than ribs. Ribs are narrower on shoulder and are recurved, extend from suture to suture, and evanesce on base to anterior fasciole. Ribs number 16 on penultimate and 16 on last whorl, earlier varices present. *Varix* apertural, broad and thick, extending from a little above the suture, very slightly curved around the anal sinus then to the stromboid notch, reduced in height anteriorly. *Spiral sculpture* of well-spaced fine spirals separated by microscopic spirals in between. Only microscopic spirals are on the shoulder. Microscopic incremental growth lines cause spirals to be beaded, appearing granulose. *Sulcus* absent; recurved growth striae and ribs or varices mark the past presence of the anal sinus. *Outer lip* varicose, with a strip of shell that extends along the base of varix, its outer edge forming a flat arc from the anal sinus to the anterior canal. *Anal sinus* a round notch in front of the varix and centered on shoulder, a callus present on the inside the outer lip, at the anterior boundary of the anal sinus. *Inner lip* a thick but narrow glaze along the parietal wall and anterior canal. *Columella* straight. *Anterior canal* short, but well differentiated from the aperture, unnotched. *Anterior fasciole* slightly swollen by stronger spirals than those on the shell base, and by closely spaced oblique spirals. *Color* off-white with diffuse brown spots on whorl shoulders and a light amber protoconch.

Remarks

The average length of 3 specimens is 7.1 mm (range = 6.4–7.6 mm).

Range and habitat

Honduras (Bay Islands, off Morat Island); depth 6–35 m.

Tenaturris profunda Fallon & Bouchet sp. nov.
urn:lsid:zoobank.org:act:64C9A87B-39DE-4AB5-B736-24E6ECBB8B5A
Figs 120C, 124AA–HH

Differential diagnosis

This species is unique for the vase-like shape of the last whorl; there is a slight narrowing of the anterior characteristic of its congeners.

Tenaturris bartlettii (Dall, 1889) also has 2¼ protoconch whorls, but a smaller protoconch that measures about 0.59 mm at its base, compared to 0.89 mm. *T. bartlettii* is found in shallower waters (40–152 m compared to 200–312 m) and seems to have a broader range, extending from Cuba to French Guiana.

Tenaturris stellae Fallon sp. nov. 1½ protoconch whorls.

Etymology

Tenaturris profunda Fallon & Bouchet sp. nov., from the Latin adjective '*profundus*' meaning 'deep', feminine form '*profunda*'. The deep-sea *Tenaturris* is named for its bathyal habitat, which is deeper than that of its congeners.

Type material

Holotype

GUADELOUPE • 7.8 × 3.6 mm; W of Marie-Galante; 15°53′ N, 61°25′ W; depth 262–266 m; 22 Jun. 2015; KARUBENTHOS 2; stn DW4599; MNHN-IM-2012-35917.

Paratypes (33 specs)

GUADELOUPE • 8 specs, 7.2 × 3.6, 7.8 × 3.7, 6.9 × 3.4, 7.4 × 3.9, 7.0 × 3.1, 7.5 × 3.6, 7.1 × 3.0 and 5.8 × 2.7 mm; W of Marie-Galante; 15°53′ N, 61°25′ W; depth 262–266 m; 22 Jun. 2015; KARUBENTHOS 2; stn DW4599; MNHN-IM-2000-39743 • 1 spec., 7.1 × 3.4 mm; W of Marie-Galante; 15°53′ N, 61°25′ W; depth 262–266 m; 22 Jun. 2015; KARUBENTHOS 2; stn DW4599; USNM 1715416 • 1 spec., 7.9 × 3.8 mm; N of Île des Saintes; 15°56′ N, 61°38′ W; depth 277–304 m; 26 Jun. 2015; KARUBENTHOS 2; stn DW4627; MNHN-IM-2012-35914 • 1 spec., 9.1 × 4.5 mm; S of Marie-Galante; 15°52′ N, 61°20′ W; depth 217–225 m; 28 Jun. 2015; KARUBENTHOS 2; stn DW4637; MNHN-IM-2012-35913 • 1 spec., 11.1 × 4.8 mm; S of Marie-Galante; 15°50′ N, 61°19′ W; depth 305–312 m; 28 Jun. 2015; KARUBENTHOS 2; stn DW4638; USNM 1715417 • 3 specs, 10.7 × 4.7, 9.9 × 4.1 and 9.9 × 4.3 mm; S of Marie-Galante; 15°51′ N, 61°18′ W; depth 250–254 m; 29 Jun. 2015; KARUBENTHOS 2; stn DW4646; USNM 1715418 • 1 spec., 9.3 × 4.2 mm; S of La Désirade; depth 250 m; 2016; dredged; D. Lamy coll. • 4 specs, 9.0 × 4.0, 9.6 × 4.3, 9.8 × 4.5 and 9.5 × 4.7 mm; S of La Désirade; depth 250 m; 2017; dredged; UF 589804 • 9 specs, 9.0 × 4.0, 9.5 × 4.5, 8.1 × 3.7, 9.1 × 4.1, 9.3 × 4.6, 8.0 × 3.8, 8.8 × 4.0, 8.6 × 4.0 and 7.8 × 3.6 mm; S of La Désirade; depth 250 m; dredged; D. Lamy coll. • 4 specs, 9.8 × 4.5, 9.0 × 4.1, 10.3 × 4.5 and 9.1 × 4.3 mm; S of La Désirade; depth 250 m; 2016; dredged; ANSP 498796.

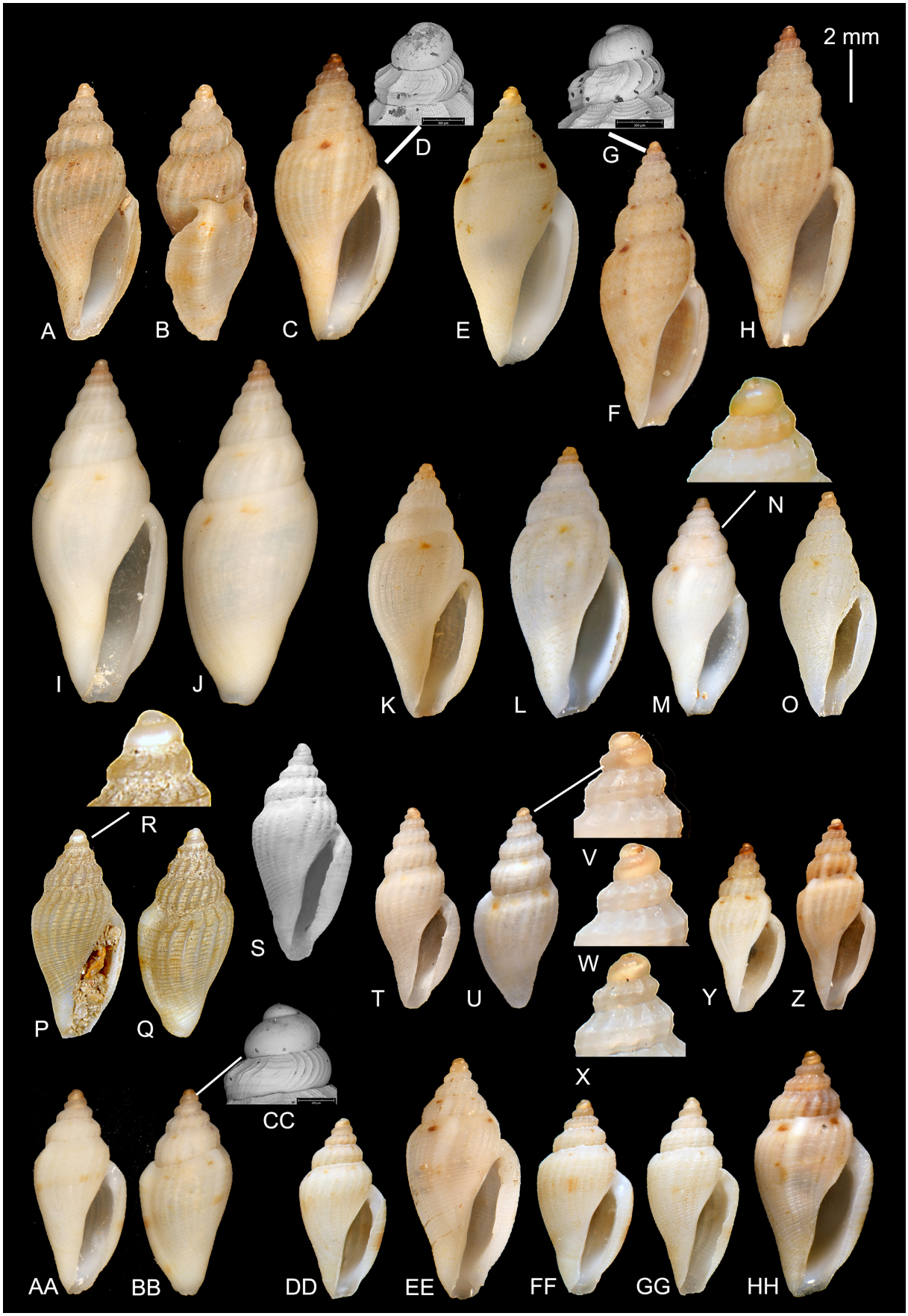
Other material examined (5 specs)

GUADELOUPE • 3 specs, 8.4 × 3.7, 8.0 × 3.5 and 6.4 × 3.1 mm; W of Marie-Galante, Guadeloupe; 15°58′ N, 61°22′ W; depth 201–214 m; 22 Jun. 2015; KARUBENTHOS 2; stn DW4592; MNHN-IM-2000-39741 • 2 specs, 9.3 × 4.0 and 7.9 × 3.7 mm; W of Marie-Galante; 15°58′ N, 61°23′ W; depth 200–206 m; 22 Jun. 2015; KARUBENTHOS 2; stn DW4594; MNHN-IM-2000-39742.

Description

Shell small (holotype length = 7.8 mm), biconic (W/L = 0.4615) of 6 convex whorls with sloping, rounded shoulders and straight sides, last whorl 76% of shell length; teleoconch sculpture of 16 opisthocline ribs on penultimate whorl, including 1 earlier varix; of numerous fine spirals overall; aperture elongate narrow, varicose, with an anal sinus and short anterior canal of about 65% of shell length including anterior canal. *Protoconch* of 2¼ evenly expanding, symmetrical whorls with 8–10 fine arched riblets on last ¼ whorl; diameter ca 0.85 mm; light amber in color. *Axial sculpture* of low, slightly opisthocline ribs that are slightly recurved on the shoulder but expire before the suture, then extend to the following suture on the spire whorls and evanesce before the anterior fasciole on the last whorl. There are 16 ribs on the penultimate and 16 on the last up to the varix. Several earlier varices appear on both whorls. *Varix* at outer lip, broad and thick, extending from a little above the suture, very slightly curved around the anal sinus and ending at the beginning of the anterior canal. *Spiral sculpture* of primary and secondary spirals. About 5 closely packed secondaries are present between the suture and ribs and then another 5 to the outer edge of the shoulder. Evenly spaced primaries with a wide intercalary space are present on spire whorl sides and shell base. Closely packed incrementals are visible between spirals. Primaries become more closely spaced, advancing anteriorly; all are intersected by dense growth lines, resulting in their rippled appearance. *Sulcus* absent; recurved ribs and varices mark the past presence of the anal sinus.

Fig. 124 (next page). Species of *Tenaturris* Woodring, 1928. Part 2. – **A–B**. *Mangilia* (*Cythara*) *bartlettii* Dall, 1889, lectotype, 10.1 × 4.5 mm, ventral and lateral views (USNM 87417), off Havana, Cuba. – **C–H**. *Tenaturris bartlettii* (Dall, 1889). – **C–D**. Spec., 10.8 × 4.6 mm, ventral view, and SEM of protoconch (MNHN-IM-2012-8733), Grand Cul-de-Sac Marin, off Fajou Island, Guadeloupe. Sub-microscopic papillae cover the protoconch as shown in the SEM image. **E**. Spec., ethanol-preserved, 10.6 × 4.7 mm (MNHN-IM-2013-61421), S Marie-Galante, Guadeloupe. **F–G**. Spec., 10.9 × 4.1 mm, sequenced voucher, ventral view, and SEM of protoconch (MNHN-IM-2013-72478), E of Le Vauclin, NE of Pariadis, Martinique. Sub-microscopic papillae cover the protoconch in the SEM image. **H**. Spec., 12.2 × 4.9 mm (MNHN-IM-2000-39731), W of Marie-Galante, Guadeloupe. – **I–O**. *Tenaturris callomoni* Fallon sp. nov. **I–J**. Holotype, 13.1 × 5.2 mm, ventral and dorsal views (UF 589934), W of Egmont Key, Hillsborough Co., W Florida. **K–L**. Paratypes, 9.6 × 4.3 and 10.2 × 4.5 mm (UF 590829), W of Egmont Key, Hillsborough Co., W Florida. **M–N**. Paratype, 8.3 × 3.7 mm, ventral and protoconch (not to scale) views (ANSP 498973), off Anna Maria, Manatee Co., W Florida. **O**. Paratype, 8.7 × 3.6 mm (ANSP 498974), 95 mi. [153 km] W of Egmont Key, Hillsborough Co. W Florida. – **P–S**. *Tenaturris maryae* Fallon sp. nov., also paralectotypes of *Mangilia* (*Cythara*) *bartlettii* Dall, 1889. **P–R**. Holotype, 8.1 × 3.8, ventral and dorsal views, and expanded view of protoconch (not to scale) (USNM 87418), off Barbados. **S**. Paratype, 8.2 × 4.1 mm (MCZ 7101, black and white photo), off Barbados. Both are misidentified specimens from Dall's type series of *T. bartlettii*. – **T–Z**. *Tenaturris stellae* Fallon sp. nov. **T–X**. Holotype, 7.6 × 3.2 mm, ventral, dorsal and 3 views of protoconch (not to scale) (ANSP 498975), 2 mi. [3.2 km] SSE of Morat Island, Honduras. **Y**. Paratype, 6.4 × 3.1 mm (USNM 1715464) 0.5 mi. [0.8 km] SSE of Morat Island, Honduras. **Z**. Paratype, 7.3 × 3.1 mm (ANSP 498976), 2 mi. [3.2 km] SSE of Morat Island, Honduras. – **AA–HH**. *Tenaturris profunda* Fallon & Bouchet sp. nov. **AA–CC**. Holotype, 7.8 × 3.6 mm (MNHN-IM-2012-35917), W of Marie-Galante, Guadeloupe. **DD**. Paratype, 6.9 × 3.4 mm (MNHN-IM-2012-39743), W of Marie-Galante, Guadeloupe. **EE**. Paratype, 9.1 × 4.5 mm (MNHN-IM-2012-35913), S of Marie-Galante, Guadeloupe. **FF**. Paratype, 7.4 × 3.9 mm (MNHN-IM-2000-39743), W of Marie-Galante, Guadeloupe. **GG**. Paratype, 7.5 × 3.6 mm (MNHN-IM-2012-39743), W of Marie-Galante, Guadeloupe. **HH**. Paratype, 9.3 × 4.2 mm (D. Lamy coll.), S of La Désirade, Guadeloupe. Credits: D, G, CC: SEM images courtesy of Chandler J. Olson; S: image by D.L. Tippett taken on a visit to the MCZ on 9 May 1996 and copied from D.L. Tippett's "undated. Mangeliidae, volumes 2–4, research notes" #3, supplemental folder (undated). Scale bars: A–C, E–F, H–BB, DD–HH = 2 mm; D, G, CC = 300 μm.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Outer lip varicose, with a thin strip of shell along the base of varix, its outer edge forming a low arc from the anal sinus to the anterior canal. A callus lies inside the lip, at the base of the anal sinus. *Anal sinus* a round moderately deep notch that cuts into the varix, with the inside rim of the sinus thickened. *Inner lip* has a narrow glaze along the parietal wall and columella, unemarginate. *Columella* straight. *Anterior canal* short, poorly differentiated from the aperture; unnotched. *Anterior fasciole* is not swollen, with the same pattern as the shell base. *Color* off-white with faint brown bands on shoulder, mid-whorl, and at the border of the anterior fasciole; diffuse dark brown blotches around whorl shoulders.

Remarks

The average length of 39 specimens is 8.5 mm (range = 5.8–11.1 mm).

Range and habitat

Guadeloupe; depth 200–312 m, the median depth 250 m.

Tenaturris dysoni (Reeve, 1846)
Figs 121A, 125, 126A–N

Pleurotoma dysoni Reeve, 1846c: pl. 5 fig. 29.
Kurtziella trilineata var. *maculata* Nowell-Usticke, 1969: 28, pl. 6 fig. 1199.
Kurtziella maculata Nowell-Usticke, 1971: 25, pl. 4 fig, 1199a is a junior synonym (Rosenberg 2009). The type locality is Ham Bay, St. Croix; the lectotype is in AMNH 195468 (Boyko & Cordeiro 2001: 75).

Cythara dysoni – H. & A. Adams 1853: vol. 1, 100.
Mangilia dysoni – Tryon 1884: 247, pl. 21 fig. 27.
Daphnella dysoni – Paetel 1888: 89.
Tenaturris dysoni – Redfern 2001: 135, pl. 61 fig. 558a–b. — Williams 2005: #5763. — Zhang 2011: 153, fig. 585. — Lamy & Pointier 2017: 488, pl. 169 fig. 7a–b.

Differential diagnosis

Tenaturris militaris Fallon & Bouchet sp. nov. has less convex shoulders that are more acutely angled, and whorl sides that are straight, not convex. Its protoconch has slightly more whorls (2¼ versus 2).

Type material

Lectotype (here designated)
HONDURAS • 7.0 × 2.9; NHMUK 20180546.

Paralectotype
HONDURAS • 7.2 × 3.1 mm; NHMUK 20180546.

No additional data is available other than that it is possible the specimens were collected in beach drift ("found on the sands" according to Reeve) by David Dyson sometime before 1846. Although not directly observed, a photo of the syntypes provided by the NHMUK represented the types. (Fig. 126A–C).

Other material examined (28 specs)

BAHAMAS • 1 spec., length = 7.2 mm; Crooked Island; depth 0 m; 13 Mar. 1958; H. Hough leg.; in beach drift; UF 590826.

GRENADA • 3 specs, 7.1 × 3.1, 7.0 × 3.0 and 6.6 2.9 mm; S side of Molinier Pt.; depth 24 ft [7 m]; 5 Jan. 2007; G. Mackintosh leg.; night SCUBA diving; P. Fallon coll. • 1 spec., 8.0 × 3.4 mm; S side of Molinere Point; depth 22 ft [6.7 m]; 8 Apr. 2004; G. Mackintosh leg.; night SCUBA diving; ANSP 498968 • 1 spec., 8.0 × 3.7 mm; Dragon's Bay; depth 25 ft [7.6 m]; 1 Apr. 2006; G. Mackintosh leg.; night SCUBA diving; P. Fallon coll. • 1 spec., 7.3 × 3.4 mm; Carriacou Island, Hillsborough Bay; depth 60 ft [18 m]; 5 May 2005; G. Mackintosh leg.; night SCUBA diving; P. Fallon coll.

GUADELOUPE • 1 spec., 5.0 × 2.4 mm; Oil (Port-Louis); 16°26.78′ N, 61°32.41′ W; depth 16 m; 18 May 2012; KARUBENTHOS 2012; stn GS24; sequenced; MNHN-IM-2013-20625 • 1 spec., 3.8 × 2.1 mm; Grand Cul-de-Sac Marin, Port-Louis (plane wreckage); 16°25.6′ N, 61°32.6′ W; depth 14 m; 14 May 2012; KARUBENTHOS 2012; stn GB12; MNHN-IM-2012-5772 • 1 spec., 4.5 × 2.3 mm; Rocroy sud; 16°02.38′ N, 61°45.71′ W; depth 17 m; 10 May 2012; KARUBENTHOS 2012; stn GS11; MNHN-IM-2012-9023 • 2 specs, 4.3 × 2.3 and 6.5 × 2.9 mm; Grand Cul-de-Sac Marin, external slope facing Fajou Island; 16°21.75′ N, 61°36.07′ W; depth 23 m; 6 May 2012; KARUBENTHOS 2012; stn GS06; MNHN-IM-2012-9026 • 1 spec., 5.6 × 2.6 mm; Côte Ferry; 16°17.69′ N, 61°48.23′ W; depth 10 m; 12 May 2012; KARUBENTHOS 2012; stn GB11; MNHN-IM-2012-8738 • 1 spec., 5.7 × 2.6 mm; leaving Port-Louis; 16°23.74′ N, 61°32.07′ W; depth 49 m; 15 May 2012; KARUBENTHOS 2012; stn GS18; MNHN-IM-2012-8739 • 1 spec., 4.1 × 1.9 mm; Petite-Terre; 16°07.9′ N, 61°12.5′ W; depth 50 m; 27 May 2012; KARUBENTHOS 2012; stn GS36; MNHN-IM-2012-8948.

MARTINIQUE • 1 spec., 6.0 × 2.8 mm; off Macouba; 14°55.1′ N, 61°09′ W; depth 80 m; 24 Sep. 2016; MADIBENTHOS; stn AD261; MNHN-IM-2000-39733 • 1 spec., 6.1 × 2.7 mm; N of Caravelle Peninsula; 14°52.5′ N, 60°51.1′ W; depth 58 m; 19 Sep. 2016; MADIBENTHOS; stn AD248; MNHN-IM-2000-39735 • 1 spec., 6.0 × 2.8 mm; Passe du Marin, Pointe Borgnesse; 14°27′ N, 60°53.8′ W; depth 4–8 m; 9 Sep. 2016; MADIBENTHOS; stn AS112; sequenced; MNHN-IM-2013-72284 • 1 spec., length = 6.6 mm; Passe de Caye Pinsonnelle; 14° 36.13′ N, 60° 48.97′ W; depth 23 m; 17 Sep. 2016; MADIBENTHOS; stn AB185; sequenced; MNHN-IM-2013-70811 • 1 spec., 5.3 × 2.4 mm; Grande Anse du Diamant, S Caye d'Obian; 14°27.9′ N, 61°01.2′ W; depth 26 m; 15 Sep. 2016; MADIBENTHOS; stn AS075; sequenced; MNHN-IM-2013-72544 • 1 spec., 5.6 × 2.6 mm; Fort-de-France Bay, Banc Mitan; 14°35′ N, 61°04.6′ W; depth 13 m; 7 Oct. 2016; MADIBENTHOS; stn AB392; MNHN-IM-2000-39734.

ST. VINCENT AND THE GRENADINES • 1 spec., 3.3 × 1.8 mm; Isle de Quatre; depth 10 ft. [3 m]; 9 Jul. 2004; G. Mackintosh leg.; night SCUBA diving; P. Fallon coll. • 1 spec., 7.0 × 3.3 mm; Union Island, Chatham Bay; depth 65 ft [20 m]; 6 Apr. 2007; G. Mackintosh leg.; night SCUBA diving; P. Fallon coll. • 4 specs, 7.2 × 3.2, 6.4 × 3.1, 6.7 × 3.1 and 7.2 × 3.4 mm; Union Island, Chatham Bay; depth 65 ft [20 m]; 6 Apr. 2007; G. Mackintosh leg.; night SCUBA diving; P. Fallon coll. • 1 spec., 7.7 × 3.4 mm; St. Vincent Island; J. Colomb leg.; MNHN-IM-2000-39732.

Description

Shell very small (largest syntype length = 7.2 mm, largest measured length = 8.0 mm), heavy, biconic, of 7 whorls total, 5 turreted teleoconch whorls, the last 70% of shell length, shoulders round, sides convex, last whorl straightening at anterior canal, sutures impressed; sculpture of strong ribs and primary and secondary spirals; aperture long and narrow (about 51% of shell length), varicose, with an anal sinus posteriorly, and a short, open anterior canal. *Protoconch* of about 2¼ smooth round whorls, the tip small, then rapidly expands, the last ½-whorl or so with fine arched riblets that are well apart. Sub-microscopic papillae cover the protoconch in an SEM image. *Axial sculpture* of strong, narrow ribs that extend from suture to suture on spire whorls and evanesce before anterior fasciole on last, 14 ribs present on the penultimate and 11 on the last whorl to the varicose lip. Some of the ribs appear to be former varices, though weaker than the last. Ribs slightly curved, recurved in sulcus. Intercostal space is narrower than the ribs, although it widens near the dorsum. *Varix* thick, broad, frilled by primary spirals,

extending the full length of the aperture, beginning above the suture, slightly recurved anal sinus, then narrowing down to the end of the anterior canal. *Spiral sculpture* of evenly spaced primary spirals overall overriding axials, four on penultimate whorl (one on shoulder edge, 3 on side) and about 8 on shell base. A much weaker primary runs between on the penultimate. The primary spirals and narrow ribs produce a reticulate surface although the ribs are stronger than the spirals. Numerous microscopic secondaries lie in the intercalary space between primaries. *Sulcus* absent. Recurved ribs on shoulder mark past positions of anal sinus. *Outer lip* thin, a narrow strip from anal sinus to anterior canal at base of varix, its edge forming an arc from the sinus to the canal, a wide but weak stromboid notch present. *Anal sinus* is a moderately deep round notch adjoining suture and directed adapically, partially cut into the varix. A thickening of the shell around the inside of the anal sinus and onto the inner side of the outer lip present. *Inner lip* a narrow excavation, unemarginate, without callus at the anal sinus. *Anterior fasciole* is not swollen, sculpted like the shell base, with about 6 primary spirals. *Anterior canal* is short and poorly differentiated from the aperture, open, end unnotched. *Color* light yellowish brown with 3 wide reddish-brown bands below the shoulder and another on the shoulder, and 2 or 3 narrow bands between these. Color in the intercostal space is lighter.

Fig. 125. *Tenaturris dysoni* (MNHN-IM-2013-70811), live animal. Photos by C. Redfern.

Animal

The animal is translucent white with small opaque white spots on the foot, and siphon. Eyes (seen as barely visible black spots) are midway along the fleshy cephalic tentacles (Fig. 125).

Remarks

The average length of 27 specimens is 6.1 mm (range = 3.3–8.0 mm). Whorl profiles vary from convex to only lightly convex. Although spiral banding may vary among individuals, the three wide bands on the shell base and one on the shoulder are almost always present. An exception is the all-white specimen from Crooked Island, Bahamas (Fig. 126G).

Range and habitat

Bahamas, Honduras, Guadeloupe, Martinique, St. Vincent and the Grenadines, Grenada; depth 3–80 m. Other published localities include Bahamas (Redfern 2001), U.S. Virgin Islands, Antigua, St. Barts (Nowell-Usticke 1971), and other eastern Caribbean localities.

Tenaturris coniculus Fallon & Bouchet sp. nov.

urn:lsid:zoobank.org:act:6740524A-FDEE-4401-9FA4-52C3F6642AE7

Figs 120H, 126O–U

Tenaturris sp. 1 – Lamy & Pointier 2017: 488, pl. 169 fig. 9a–b.

Differential diagnosis

Tenaturris coniculus Fallon & Bouchet sp. nov. is easily recognized by its resemblance to a cone and thinner shell than other members of *Tenaturris*.

Tenaturris bartlettii (Dall, 1889) has a stronger shell, a higher spire, and is larger in size.

Etymology

Tenaturris coniculus Fallon & Bouchet sp. nov. from the Latin diminutive '*coniculus*', meaning 'little cone', on account of its resemblance to members of the family Conidae, and its small size. This is a noun in apposition.

Type material

Holotype

GUADELOUPE • length = 5 mm; Pointe Montagnier (Pointe de la Vigie); 16°30.57′ N, 61°28.45′ W; depth 12 m; 19 May 2012; KARUBENTHOS 2012; stn GS25; sequenced; MNHN-IM-2009-31333.

Paratypes (6 specs)

GUADELOUPE • 2 specs, 2.5 × 1.4 and 2.4 × 1.3 mm; Grotte Amédier (Pointe de la Vigie); 16°30.04′ N, 61°28.79′ W; depth 16 m; 19 May 2012; KARUBENTHOS 2012; stn GS26; MNHN-IM-2012-5795 • 1 spec., 5.0 × 2.4 mm; Pointe Montagnier (Pointe de la Vigie); 16°30.57′ N, 61°28.45′ W; depth 12 m; 19 May 2012; KARUBENTHOS 2012; stn GS25; MNHN-IM-2012-8985 • 1 spec., 6.4 × 3.3 mm; NW Grande-Terre, Port Louis; depth 2–10 m; dredged; D. Lamy coll. #2026 • 1 spec., 6.5 × 3.2 mm; NW Grande-Terre, Port Louis; dredged; L. Charles coll. #2027 • 1 spec., 6.3 × 3.1 mm; NW Grande-Terre, Port Louis; dredged; L. Charles coll. #2029.

Description

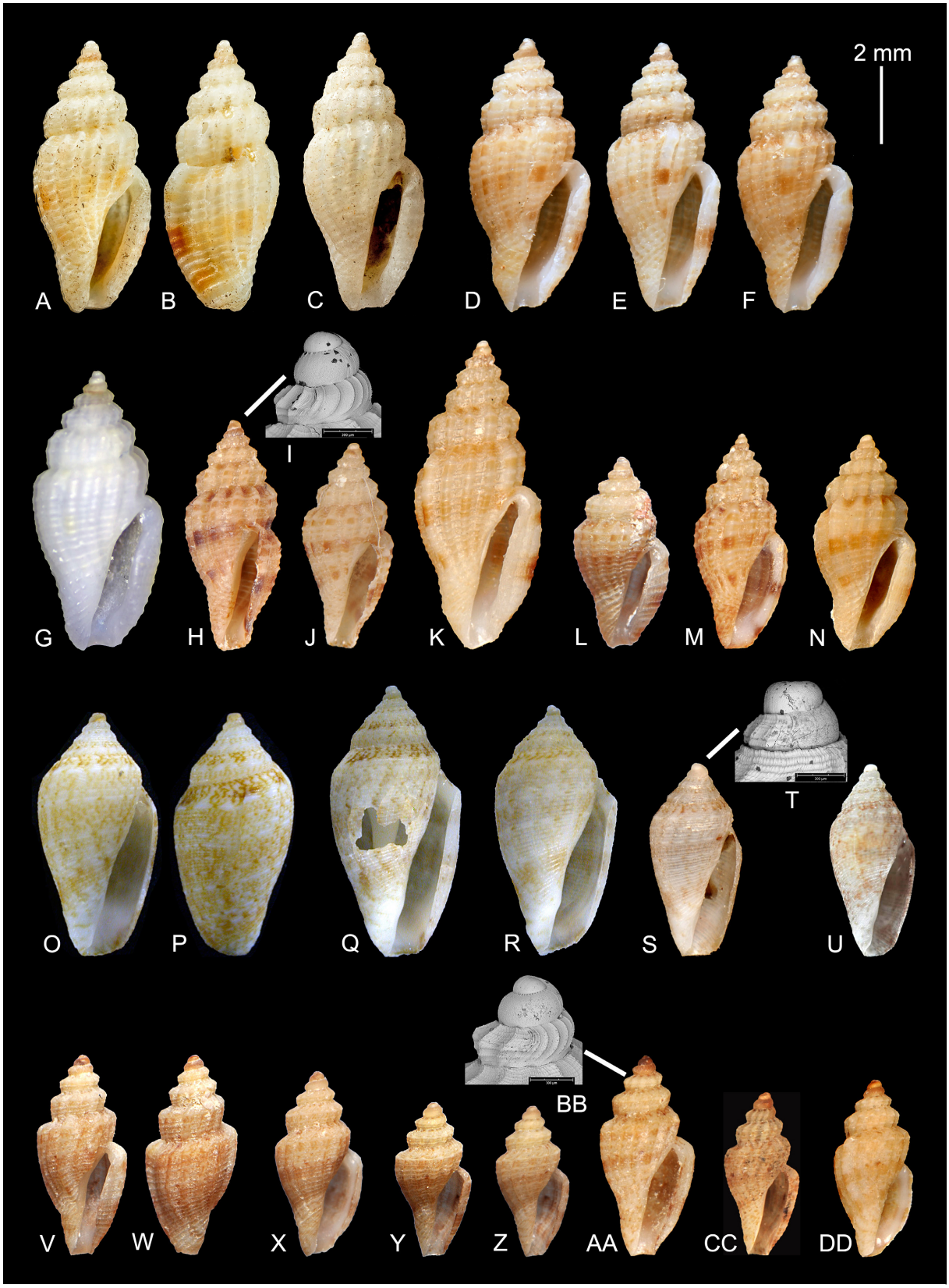
Shell small (length = 5 mm), cone-shaped (W/L = 0.4921) light but strong, of 6 whorls total, spire very low, only about 18% of shell length, teleoconch with rounded, sloping shoulders that reach ¾-the

distance to subsequent sutures, and to about mid-whorl on the penultimate, sutures impressed; sculpture of low, nearly obsolete ribs, and densely covered with spiral cords; aperture long and narrow, about 70% of shell length, lip slightly thickened, anal sinus is shallow, and anterior canal short. *Protoconch* stout, cylindrical, of 1½ smooth whorls. *Axial sculpture* of low, broad ribs, mostly obsolete except on whorl peripheries and on shoulders. *Varix* absent on type, a weakly rolled edge of the outer lip in others. *Spiral sculpture* of densely packed flattened primaries with a single secondary between that are rippled by microscopic growth striae. *Sulcus* absent. *Outer lip* is thin, its edge forming an arc from and contiguous with the outer edge of the anal sinus to the end of the anterior canal; no stromboid notch. *Anal sinus* is a shallow, round notch adjoining suture, as wide as shoulder, with a low callus around the inside edge of the sinus and on the parietal wall and outer lip. *Inner lip* a narrow glaze, unemarginate, with a low callus at the beginning of the canal. *Anterior fasciole* not swollen, sculpted as the shell base. *Anterior canal* short, wide open, and undifferentiated from the aperture, end unnotched. *Color* white base with broad, light yellowish-brown bands with intermittent white spiral cords regularly brown spotted, shoulder with darker brown transverse zigzag lines.

Remarks

Tenaturris coniculus Fallon & Bouchet sp. nov. is distinctly different from its congeners, possessing a low spire and nearly obsolete ribs on all but the first teleoconch whorl. Otherwise, it has most of the diagnostic characteristics listed at the beginning of Part 1. This species, as odd as it is, clearly falls into the *Tenaturris* clade (Fig. 1).

Fig. 126 (next page). Species of *Tenaturris* Woodring, 1928. Part 3. – **A–C**. *Mangelia dysoni* Reeve, 1846. **A–B**. Lectotype, 7.0 × 2.9 mm (NHMUK 20180546), Honduras. **C**. Paralectotype, 7.2 × 3.1 mm (NHMUK 20180546), Honduras. – **D–N**. *Tenaturris dysoni* (Reeve, 1846). **D–F**. 3 specs, 7.1 × 3.2, 6.9 × 2.9 and 6.5 × 3.0 mm (PJF coll), S side of Molinier Pt., Grenada. **G**. Spec., length = 7.2 mm (UF 590826), Crooked Island, Bahamas. **H–I**. Sequenced voucher, 6.0 × 2.8 mm, ventral view, and SEM image of protoconch (MNHN-IM-2013-72284), Passe du Marin, Pointe Borgnesse, Martinique. **J**. Sequenced voucher, 5.3 × 2.4 mm (MNHN-IM-2013-72544), Grande Anse du Diamant, S Caye d'Obian, Martinique. **K**. Spec., 8.0 × 3.4 mm (ANSP 498968), S side of Molinier Pt., Grenada. **L**. Sequenced voucher, 5.0 × 2.4 mm (MNHN-IM-2013-20625), Oil (Port-Louis), Guadeloupe. **M**. Spec., 5.6 × 2.6 mm (MNHN-IM-2012-8738), Côte Ferry, Guadeloupe. **N**. Spec., 5.6 mm (MNHN-IM-2000-39734), Banc Mitan, Fort-de-France Bay, Martinique. – **O–U**. *Tenaturris coniculus* Fallon & Bouchet sp. nov. **O–P**. Paratype, length = 6.3 mm, ventral and dorsal views (L. Charles coll.), Guadeloupe. **Q**. Paratype, 6.4 × 3.3 mm (D. Lamy coll. #2026), Port-Louis, Guadeloupe. **R**. Paratype, 6.5 mm (D. Lamy coll. #2027), Port-Louis, Guadeloupe. **S–T**. Paratype, 5.0 × 2.4 mm, ventral view, and SEM image of protoconch (MNHN-IM-2012-8985), Pointe Montagnier (Pointe de la Vigie), Guadeloupe. **U**. Holotype, sequenced voucher, length = 5.0 mm (MNHN-IM-2009-31333), Pointe Montagnier (Pointe de la Vigie), Guadeloupe. – **V–DD**. *Tenaturris militaris* Fallon & Bouchet sp. nov. **V–W**. Holotype, sequenced voucher (MNHN-IM-2013-20629), tombant de Port-Louis, Guadeloupe. **X**. Paratype, sequenced voucher, 4.8 × 2.4 mm (MNHN-IM-2013-20679), tombant de Port-Louis, Guadeloupe. **Y**. Paratype, sequenced voucher, 4.0 × 2.0 mm (MNHN-IM-2013-20628), tombant de Port-Louis, Guadeloupe. **Z**. Paratype, 3.9 × 1.9 mm (MNHN-IM-2013-20677), tombant de Port-Louis, Guadeloupe. **AA–BB**. Paratype, 5.2 × 2.4 mm, ventral view, and SEM image of protoconch (MNHN-IM-2000-39738), N of Grande-Terre, Guadeloupe. **CC**. Paratype, length = 4.2 mm (MNHN-IM-2000-39739), Épave du Rouraima, St-Pierre Bay, Martinique. **DD**. Paratype, 4.6 × 2.3 mm (MNHN-IM-2000-39740), Pigeon Island, Guadeloupe. Credits: A–C: courtesy of Harry Taylor, Photographic Unit, copyright NHMUK; I, T, BB: SEM images courtesy of Chandler J. Olson; O–R: courtesy of D. Lamy; U: photo from MNHN data portal Collection: Molluscs (IM), specimen MNHN-IM-2009-31333. Scale bars: A–H, J–S, U–AA, CC–DD = 2 mm; I, T, BB = 80 µm.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The average length of 7 measured specimens is 4.9 mm (range = 2.4–6.5 mm). The two smallest (lengths = 2.4 and 2.5 mm) are juveniles.

Range and habitat

Guadeloupe; depth 2–16 m.

Tenaturris militaris Fallon & Bouchet sp. nov.
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Figs 121B, 126V–DD

Differential diagnosis

Tenaturris dysoni (Reeve, 1846) has more convex shoulders with a greater slope, and whorl sides that are convex, not straight.

Etymology

Tenaturris militaris Fallon & Bouchet sp. nov. from the feminine form of the Latin adjective '*militaris*', meaning 'soldierly', due to its soldier-like appearance.

Type material

Holotype
GUADELOUPE • 5.2 × 2.4 mm; leaving Port-Louis; 16°23.74′ N, 61°32.07′ W; depth 49 m; 15 May 2012; KARUBENTHOS 2012; stn GS18; sequenced; MNHN-IM-2013-20629.

Paratypes (36 specs)
GUADELOUPE • 1 spec., 4.0 × 2.0 mm; leaving Port-Louis; 16°23.74′ N, 61°32.07′ W; depth 49 m; 15 May 2012; KARUBENTHOS 2012; stn GS18; sequenced; MNHN-IM-2013-20628 • 1 spec., 3.9 × 1.9 mm; leaving Port-Louis; 16°23.74′ N, 61°32.07′ W; depth 49 m; 15 May 2012; KARUBENTHOS 2012; stn GS18; sequenced; MNHN-IM-2013-20677 • 1 spec., 4.8 × 2.4 mm; leaving Port-Louis; 16°23.74′ N, 61°32.07′ W; depth 49 m; 15 May 2012; KARUBENTHOS 2012; stn GS18; sequenced; MNHN-IM-2013-20679 • 1 spec., 4.0 × 1.8 mm, ethanol-preserved; leaving Port-Louis; 16°23.74′ N, 61°32.07′ W; depth 49 m; 15 May 2012; KARUBENTHOS 2012; stn GS18; MNHN-IM-2019-34713 • 1 spec., 4.3 × 2.2 mm, ethanol-preserved; leaving Port-Louis; 16°23.74′ N, 61°32.07′ W; depth 49 m; 15 May 2012; KARUBENTHOS 2012; stn GS18; MNHN-IM-2019-34712 • 1 spec., 3.4 × 1.5 mm, ethanol-preserved; Lizzard Point; 16°08.43′ N, 61°46.92′ W; depth 12 m; 7 May 2012; KARUBENTHOS 2012; stn GS07; MNHN-IM-2019-34691 • 4 specs, (2 measured) 3.4 × 1.6 and 2.0 × 1.1 mm; Pointe d'Antigues (Port-Louis); 16°25.99′ N, 61°32.92′ W; depth 45 m; 17 May 2012; KARUBENTHOS 2012; stn GS22; MNHN-IM-2012-9041 • 3 specs; leaving Port-Louis; 16°23,74′ N, 61°32.07′ W; depth 49 m; 15 May 2012; KARUBENTHOS 2012; stn GB14; MNHN-IM-2012-9035 • 10 specs, 5.2 × 2.3, 4.9 × 2.2, 4.9 × 2.2, 4.6 × 2.2, 3.9 × 1.9, 3.5 × 1.7, 2.8 × 1.6, 2.4 × 1.4, 2.9 × 1.6 and 2.8 × 1.6 mm; Grand Cul-de-Sac Marin; 16°21.72′ N, 61°36.35′ W; depth 22 m; 5 May 2012; KARUBENTHOS 2012; stn GB03; MNHN-IM-2012-9042 • 2 specs, 4.6 × 2.3 and 3.3 × 1.8 mm; Pigeon Island; 16°02,4′ N, 61°45.6′ W; depth 50 m; 11 May 2012; KARUBENTHOS 2012; stn GS13; MNHN-IM-2012-9022 • 1 spec., 5.2 × 2.4 mm; N Grande-Terre; 16°31.3′ N, 61°24.5′ W; depth 59–74 m; 14 Jun. 2015; KARUBENTHOS 2; stn DW4551; MNHN-IM-2000-39738 • 6 specs, (2 measured) 4.7 × 2.2 and 3.4 × 1.8 mm; N Grande-Terre; 16°29,7′ N, 61°31.4′ W; depth 60–82 m; 14 Jun. 2015; KARUBENTHOS 2; stn DW4545; MNHN-IM-2000-39740.

MARTINIQUE • 1 spec., length = 6.2 mm; SW Pointe Borgnesse, Passe du Marin; 14°26.1′ N, 60°54.5′ W; depth 60 m; 10 Sep. 2016; MADIBENTHOS; stn AD218; MNHN-IM-2000-39736 • 1 spec., 3.9 × 1.9 mm; off Macouba; 14°55′ N, 61°08.9′ W; depth 80 m; 27 Sep. 2016; MADIBENTHOS;

stn AD275; MNHN-IM-2000-39737 • 2 specs, lengths = 4.2 and 3.0 mm; Épave du Rouraima, Baie de St-Pierre; 4°44.5′ N, 61°10.8′ W; depth 44–47 m; 8 Oct. 2016; MADIBENTHOS; stn AS572; MNHN-IM-2000-39739.

Description

Shell heavy, stout (W/L = 0.4615), of 4 turreted whorls, the last whorl 71% of shell length, spire sides nearly flat, straightening at anterior canal, sutures impressed; sculpture of low ribs and frosted spirals; aperture long and narrow, about 55% of shell length, varicose, with a shallow anal sinus posteriorly, and a short, open anterior canal. *Protoconch* broadly conical, of 2¼ whorls, the last ½ with riblets. *Axial sculpture* of broad, low ribs of varying strength that extend from suture to suture on spire whorls but evanesce before anterior fasciole on last, and on the holotype, at a previous varix that lies 180° from the lip edge; 15 ribs present on the penultimate and 12 on the last whorl to the varicose lip. Ribs slightly curved, recurved in sulcus. Intercostal space narrower than ribs, although widening nearing on the dorsum. *Varix* apertural, thick, broad, extending the full length of the aperture and narrowing down to the end of the anterior canal. *Spiral sculpture* of evenly spaced primary spirals overall, overriding axials, with about 5 well-spaced secondaries between. *Sulcus* absent. Recurved ribs on shoulder mark past positions of anal sinus. *Outer lip* varicose, a narrow strip at base of varix runs from anal sinus to anterior canal at base of varix, no stromboid notch. *Anal sinus* is a shallow round notch adjoining suture, shoulder width, and partially cut into the varix. *Inner lip* a narrow glaze, unemarginate, without callus at the anal sinus. *Anterior fasciole* not swollen, sculpted as the shell base. *Anterior canal* short and undifferentiated from the aperture, open, end unnotched. *Color* light yellowish brown with a light brown band below the suture visible on the last whorl, and a narrow band between ribs in the sulcus next to the suture. Light brown mottling present over much of shell surface.

Remarks

The average length of 25 measured specimens is 3.9 mm (range = 2.0–5.2 mm).

Range and habitat

Guadeloupe and Martinique; depth 12–60 m.

***Tenaturris* spp. Part 4**

Five lots of *Tenaturris* that are different than those described herein are depicted in Fig. 127A–F. Insufficient specimens are in hand to fully describe and name them. They are included here for possible future reference.

Tenaturris unid. sp. Q
Fig. 127A

Material examined (1 spec.)

VENEZUELA • 1 spec., length = 10.5 mm; 8 mi. [12.9 km] N of Los Testigos; depth 71 m; 10 Jan. 2008; G. Mackintosh leg.; dredged from on mud; UF 590830.

Tenaturris unid. sp. R
Fig. 127B

Material examined (1 spec.)

BRAZIL • 1 spec., length = 5.0 mm; Bahia State, Salvador, Itapua Beach; depth 0 m; Mar. 1990; G. Pomponet leg.; in beach drift; ANSP 498977.

Tenaturris unid. sp. U
Fig. 127C

Material examined (1 spec.)

PANAMA • 1 spec., length = 9.7 mm; E coast; depth 40–120 m; ca 2000; dredged in mud; ANSP 498979.

Tenaturris unid. sp. S
Fig. 127D–E

Material examined (2 specs)

PANAMA • 2 specs, lengths = 6.9 and 8.6 mm; Escudo de Veraguas Island; depth 2–3 m; Nov. 2003; A. Bodart and T. McCleery leg.; hand dredged in coral sand; ANSP 498978.

Tenaturris unid. sp. T
Fig. 127F

Material examined (1 spec.)

ST. VINCENT AND THE GRENADINES • 1 spec., length = 8.5 mm; Bequia, Friendship Bay; depth 8 m; 15 May 1993; G. Mackintosh leg.; night SCUBA; ANSP 498980.

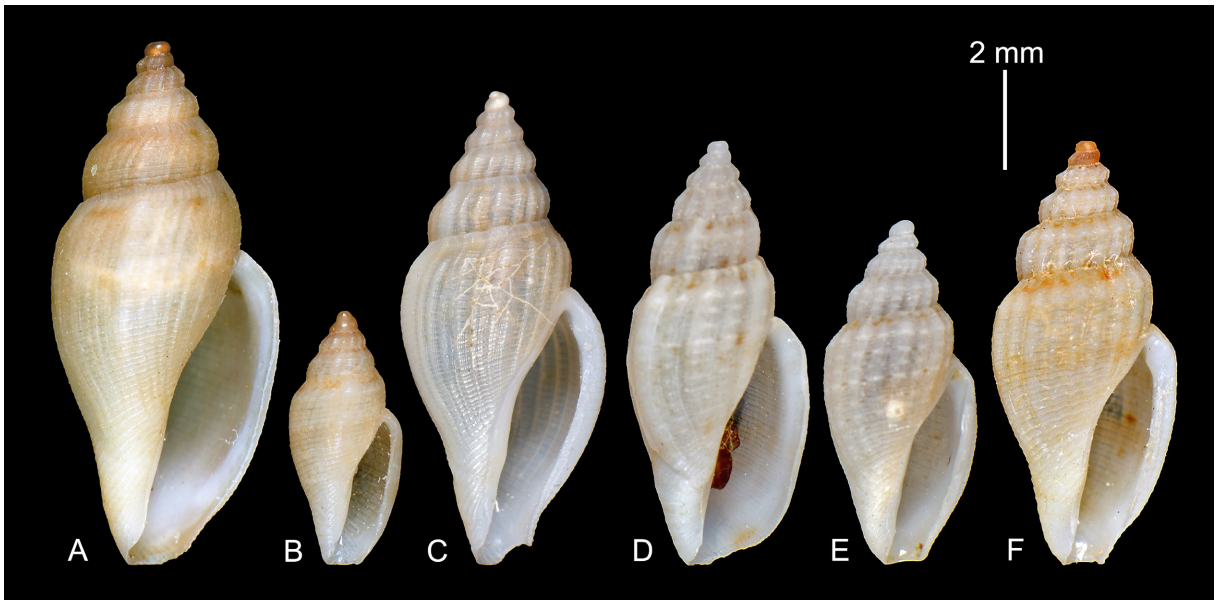


Fig. 127. *Tenaturris* Woodring, 1928. Part 4. – **A**. *Tenaturris* unid. sp. Q. Spec., length = 10.5 mm; 8 mi. [12.9 km] N of Los Testigos, Venezuela (UF 590830). – **B**. *Tenaturris* unid. sp. R. Spec., length = 5.0 mm; Itapua Beach, Salvador, Bahia State, Brazil; ANSP 498977. – **C**. *Tenaturris* unid. sp. U. spec., length = 9.7 mm; E coast. – **D–E**. *Tenaturris* unid. sp. S. 2 Specs, lengths = 6.9 and 8.6 mm; Escudo de Veraguas Island, Panama (ANSP 498978). – **F**. *Tenaturris* unid. sp. T. Spec., length = 8.5 mm; Friendship Bay, Bequia, Saint Vincent and the Grenadines (ANSP 498980). Scale bar: A–F = 2 mm.

Genus ***Vitricythara*** Fargo, 1953

Type species

Cythara metria Dall, 1903 by original designation (Fig. 129A–B).

Summary diagnostic characteristics

Shell slender, translucent, spire turreted, shorter than body whorl, with angular or rounded shoulders.

Aperture long and narrow with a short to moderately long anterior canal.

Protoconch of 2½–3¼ whorls, the first with a minute tip, with riblets that do not reach the suture.

Outer lip varicose, anal sinus wide, shallow, with a thickening around its perimeter and a weak callus on the outer lip at the margin of the sinus.

Axials are narrow, wide apart, and curve to the inner lip on the lower base.

Spiral primaries have nearly the same strength as axials, forming a reticulate surface; secondary spirals usually obsolete or nearly so.

Spirals of some species with swelling or spikes on rib crests and microscopically segmented by incremental growth lines, spirals not frosted.

Shell surface microsculpture

Surface microsculpture consists of two types among the species examined (Fig. 128). Intercalary space (between spirals and visible with the naked eye) is either smooth, featureless at magnifications examined (700–900×), or populated with microscopic granules of a size and shape that vary by species. Visible

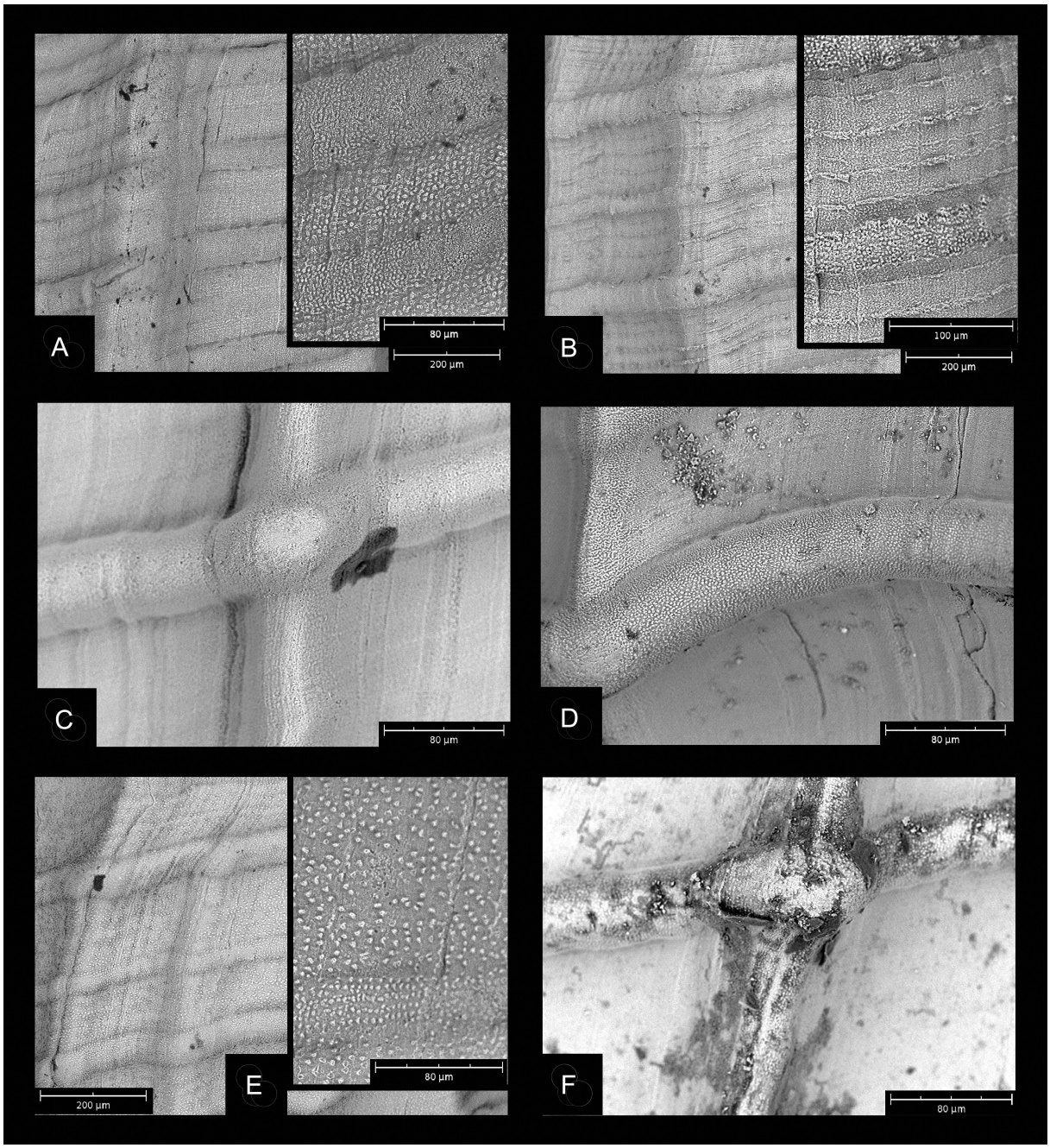
Fig. 128 (next page). Species of *Vitricythara* Fargo, 1953, shell surface microsculpture. SEM images at 300×, 850×, or 860×, as noted. **A**. *Vitricythara marissae* Fallon sp. nov., holotype, 5.2×2.1 mm (UF 590832), off St George's Island, Franklin Co., W Florida. The portion of shell imaged is anterior of shell base, where spirals are somewhat flattened (300×). At higher magnification (850×) short, irregularly shaped microscopic granules cover both primary spirals and intercalary spaces but are smaller and denser on spirals. **B**. *Vitricythara formosa* Fallon & Bouchet sp. nov., holotype, 5.8×2.1 mm (MNHN-IM-2000-39750), Le Prêcheur, Anse Belleville, Martinique. Intercalary spaces are wide and show weak tertiary spirals as paired, irregular shaped strings aligned in about 5 rows (the tertiary spirals) within the space between primary spirals (300× and 700× inset). Much smaller, dense concentrations of granules populate intercalary space, and larger, more irregularly shaped ones cover primary and secondary spirals. **C**. *Vitricythara lavalleana* (d'Orbigny, 1847). Spec., 6.0×2.2 mm (MNHN-IM-2000-39794), Grand Cul-de-Sac Marin, Guadeloupe. The intersection of the ribs and spiral (spiral overriding rib) is shown with a featureless intercalary space. **D**. *Vitricythara lavalleana* (d'Orbigny, 1847). Spec., 5.6×2.0 mm (UF 590831), beach at Porto Bela, Santa Catarina State, Brazil. Like preceding, except extremely small, granules are just visible at 850×. **E**. *Vitricythara magnini* Fallon & Bouchet sp. nov., paratype and sequence voucher, 5.3×2.0 mm (MNHN-IM-2013-72655), N of Loup Ministre, Martinique. Like *V. formosa* (Fig. 128B above) but without tertiary spirals in the wide intercalary spaces, surface less densely covered with granules. **F**. *Vitricythara fassioae* Fallon & Bouchet sp. nov., holotype, 6.2×2.1 mm (MNHN-IM-2013-72929), Le Lamentin, Fort-de-France Bay, Martinique. Rib and spiral intersection as in Fig. 128C, partially eroded and obscured by dirt. No granules observed in the intercalary space. Credits: SEM images courtesy of Chandler J. Olson and Paul Callomon. Scale bars (base images): A–B, E=200 µm; C–D, F=80 µm. Insets: A, E=80 µm; B=100 µm.

spirals are also either smooth or covered with granules, which are usually a different size and density than those in intercalary space if present.

In members of the genus *Pyrgocythara*, there is less of a difference between spirals and intercalary space in granule size and shape.

Differences from other genera

Pyrgocythara Woodring, 1928 has more pronounced secondary spirals, unlike those that are absent or very weak. Its spirals lack swellings or spikes on rib crests and usually a narrow oval aperture, compared to the long and narrow form, including an anterior canal. Since ribs are more prominent than primaries, the sculpture of the genus group *Pyrgocythara* resembles a basket weave rather than being distinctly reticulate.



Remarks

The type species of the genus, *Vitricythara metria* (Dall, 1903) has not been encountered in this study. This is also true of *V. micromeris* (Dall, 1903), considered a synonym of *V. metria* by some but not accepted here. Illustrations of both species are figured for comparison to *V. marissae* Fallon sp. nov. and to *V. magnini* Fallon & Bouchet sp. nov., both of which may easily be mistaken for *V. metria.* Differences are explained in their respective differential diagnoses.

Phylogenetic relationships

The DNA sequence data support the monophyly of the genus *Vitricythara*, with the two sequenced species forming a well-supported clade. The lineage is recovered sister to the genus *Pyrgocythara*, with 100% bootstrap support.

Vitricythara metria (Dall, 1903)
Fig. 129A–B

Cythara metria Dall, 1903: 1633, pl. 60 fig. 13.

Cythara metria – Schuchert *et al*. 1905: 410, pl. 18. — Merrill 1905: 209.
Acmaturris metria – Mansfield 1930: 44; pl. 3 fig. 5. — McGinty 1970: 65. — Campbell *et al*. 1975: 99. — Turgeon *et al*. 1988: 101; 1998: 109.
Vitricythara metria – Fargo 1953: 395, pl. 21 figs 1, 1a. — Olsson & McGinty 1958: 18. — Warmke & Abbott 1961: 138, pl. 25 fig. u. — Rice & Kornicker 1965: 127, fig. 10. — Ekdale 1974: 651. — Williams 2005: #5790.
Pyrgocythara (*Vitricythara*) *metria* – Powell 1966: 118, pl. 18 fig. 12. — Abbott 1974: 284. — Campbell 1993: 99, fig. 490a.
Pyrgocythara metria – García & Lugue 1986: 48. — de Jong & Coomans 1988: 118, pl. 18 fig. 627.
Agathotoma (*Vitricythara*) *metria* – Odé 1992a: 50.

Differential diagnosis

There are numerous reports of Recent occurrences of *Vitricythara metria* in the published literature, and numerous lots so identified in museum collections. However, none of the ones examined matches the holotype, and so it is not helpful to list them here. Most are likely to be the species proposed here as *V. formosa* Fallon & Bouchet sp. nov. described below.

Cythara micromeris Dall, 1903 is considered a subspecies of *V. metria* by Fargo 1953. Later it was considered a synonym by Odé 1992a: 50 but a separate taxon by Campbell 1993: 99, who explained that it is half as large and narrower, with possibly a different range. Differences also include fewer primary spirals. Thus, a close comparison of the two species does not support their synonymy. Although Recent specimens have not been found for either species, they are included in this work for comparison to their other congeners.

Vitricythara marissae Fallon sp. nov. is morphologically the closest extant species, having in common with *V. metria* the sloping shoulders, pinched anterior, and strong knobby spiral at the boundary of the anterior fasciole. It differs in possessing a 3¼-whorl protoconch with a full whorl of riblets, a subsutural fold, and primaries swollen on rib crests.

Type material

Holotype
UNITED STATES OF AMERICA • 7.5 × 2.7 mm; Florida, Pliocene marl of Shell Creek; USNM 163985.

Paratypes

None.

Material examined (1 spec.)

The holotype was examined; no Recent specimens have been found for this study.

Description

Since Dall did not describe this species, the description in Fargo (1953: 395, pl. 21 figs 1, 1a. 2) and examination of the holotype, USNM 163985 shown in Fig. 128A–B are the basis for this description. *Shell* small, turreted, of about 8 whorls total; teleoconch whorl sutures impressed, early whorls with a wide shoulder slope of 45–60°, last 2 whorls with rounded shoulders; shoulders demarcated by a primary spiral, followed by flat to slightly concave whorl sides; last whorl 64% of shell length; sculpture of cord-like ribs overridden by strong spirals of nearly the same strength in a reticulate pattern; aperture a narrow oval, with a wide anal sinus and short anterior canal barely delineated by the anterior taper, aperture and canal about 45% of shell length. *Protoconch* conical, of 2–3 whorls, the first whorl minute, the last ½ with riblets. *Axial sculpture* of narrow cord-like ribs that run from suture to suture on spire whorls and dwindle down to weak lines on the anterior fasciole. Ribs slightly recurved on whorl shoulders and spaced greater than their width on shoulders and whorl sides. *Varix* apertural, weak on holotype, extending from anal sinus and diminishing along anterior canal. *Spiral sculpture* of 4 primary spirals on spire whorls, and another 4 on body whorl, with a single weaker secondary spiral between the primaries. Spirals override ribs and are not swollen on rib crests, however. A strong spiral at the Junction of the shell base and anterior fasciole is 'bumpy' because the ribs become closer and diminish in strength as the shell narrows toward the canal, as does space between overriding spiral bumps. Wide interspaces produce a cancellate surface. *Sulcus* absent. Recurved ribs on the shoulder are evidence of past positions of the anal sinus. *Outer lip* part of the developing varix in the holotype. *Anal sinus* as wide as the shoulder with a round apex. *Inner lip* a thin narrow glaze along the parietal wall and columella. *Anterior fasciole* not swollen, with about 6 oblique spirals. *Columella* straight. *Anterior canal* short, straight, open, differentiated by the narrowing of the last whorl, end unnotched. *Color* does not appear in this fossil shell.

Remarks

This species was described from a fossil specimen and has not been found in samples examined for this work. Although reported from Recent fauna by some authors, their identifications need to be confirmed.

Range and habitat

Pliocene marl of Shell Creek, Florida.

Vitricythara marissae Fallon sp. nov.
urn:lsid:zoobank.org:act:4F64A968-0E96-45FA-BCBA-61DD27AC03C2
Figs 128A, 129C–F

Differential diagnosis

Vitricythara metria (Dall, 1903) has, according to Fargo (1953: 395), a protoconch of 2–3 whorls with riblets on the last ½ whorl (the holotype had a worn protoconch when examined for this project). *Vitricythara marissae* Fallon sp. nov. has a 3¼-whorl protoconch with a full whorl of riblets. in addition to differences in their protoconchs, *V. marissae* has a subsutural fold (albeit weak) and primaries swollen on rib crests, neither characteristic present in *V. metria*.

Vitricythara micromeris (Dall, 1903) differs in much the same way as *V. metria* but lacks the knobby spirals at the anterior fasciole, the pinched anterior, and has fewer primary spirals. It also lacks a subsutural fold.

Pyrgocythara trilineata (C.B. Adams, 1845) comb. nov. has a protoconch with 1¾ whorls with riblets, a teleoconch with stronger secondary spirals, a deeper anal sinus with a denticle, and a stronger varix.

Vitricythara magnini Fallon & Bouchet sp. nov. has finer, more numerous ribs and 2 protoconch whorls with riblets, not 1.

Vitricythara lavalleana (d'Orbigny, 1853) has weaker (mostly obsolete) secondary spirals, and primary spirals spiked on rib crests.

Etymology

Vitricythara marissae Fallon sp. nov. is named in honor of Marissa, daughter-in-law and the mother of two wonderful granddaughters of the first author.

Type material

Holotype

UNITED STATES OF AMERICA • 5.2 × 2.1 mm; W Florida, Franklin Co., off St. Georges Island; depth less than 37 m; 1 Feb. 1986; Jack Rudloe leg.; dredged, ex batfish stomach; UF 590832.

Paratypes

None.

Description

Shell small, turreted, translucent, of 7 whorls total; teleoconch whorl sutures impressed, whorls with shoulder slope of 45-60° and flat sides; shoulders demarcated by a primary spiral; last whorl 63% of shell length; sculpture of cord-like ribs overridden by weaker spirals only slightly resembling a reticulate pattern; aperture oval, varicose, with a wide anal sinus and short anterior canal barely delineated, aperture and canal about 45% of shell length. *Protoconch* conical, of 3¼ whorls, the first whorl minute, the last with well-spaced curved riblets that end before the suture with the first teleoconch whorl. Riblets extend a little above the adapical sutures. *Axial sculpture* of strong cord-like ribs that run from suture to suture on spire whorls and to the anterior fasciole where they angle in, much reduced, over the fasciole. Ribs weaker and slightly recurved on whorl shoulders and spaced greater than their width on whorl sides. 15 are present on the penultimate whorl and 11 on the last to the varix. Microscopic growth striae overlay spirals. *Varix* apertural, stronger than preceding ribs, extending from suture, straight along shoulder, then arched along outer lip to end of anterior canal. Crenated by primary spirals. *Spiral sculpture* of primaries and secondaries, beginning with a weak subsutural fold at the suture followed by 3 secondaries on the shoulder, then 6 primaries with a single secondary between, the peripheral primary the strongest. The shell base has 8 primaries with 8 secondaries between that weaken in strength and flatten anteriorly, ending with a strong bumpy primary (closely set ribs with overriding primary spiral) marking the beginning of the anterior fasciole. The bumpy spiral is followed by primaries, the first and second also bumpy but somewhat less so, then 6 more oblique secondaries. *Sulcus* absent; recurved ribs on the shoulder are evidence of past positions of the anal sinus. *Outer lip* varicose with a thin, narrow strip of shell at its base extending from the anal sinus to a wide shallow stromboid notch. *Anal sinus* as wide as the shoulder, deep with a round apex, and set forward of the varix, with a weak callus inside outer lip and on parietal wall. *Inner lip* a narrow glaze, thinly margined. *Anterior fasciole* not swollen, with oblique spirals. *Anterior canal* short, straight, open, weakly differentiated by the taper of the last whorl and pinched anterior, unnotched. *Color* yellowish-brown, varix white.

Remarks

Although based on only a single specimen, it is most like *Vitricythara metria* (Dall, 1903) of any extant species encountered so far, yet has a few differences that are not attributable to species variation, as explained in the differential diagnosis paragraph above. For this reason, it was felt useful to describe it at this time.

Range and habitat

Known only from the type locality.

Vitricythara micromeris (Dall, 1903)
Fig. 129G–I

Cythara micromeris Dall, 1903: 1633, pl. 60 fig. 16.

Cythara metria micromeris – Schuchert *et al*. 1905: 410, pl. 18 fig. 6.
Vitricythara metria subsp. *micromeris* – Fargo 1953: 395, pl. 21 fig. 2. — Campbell *et al*. 1975: 51–124. — Ward & Blackwelder 1987: 181, pl. 46 fig. 4.
Pyrgocythara (*Vitricythara*) *micromeris* – Campbell 1993: 99, fig. 490.
Pyrgocythara (*Vitricythara*) *metria* subsp. *micromeris* – Powell 1966: 118.

Differential diagnosis

According to Campbell (1993), *Vitricythara micromeris* is half the size and narrower, with possibly a different range than the similar *V. metria* (Dall, 1903). Differences also include fewer primary spirals.

Vitricythara formosa Fallon & Bouchet sp. nov. differences are discussed in the differential diagnosis of that species.

Type material

Holotype
UNITED STATES OF AMERICA • 5.2 × 1.6 mm; Florida, Pliocene marl of Shell Creek; USNM 163993.

Paratypes
None.

Material examined

High quality SEM images of the shell and protoconch of the holotype were provided by the Smithsonian. No Recent specimens have been found in examined samples.

Description

This redescription is based on Campbell (1993: 99) and examination of SEM images of the holotype. *Shell* small (length = 5.1 mm), turreted, translucent; teleoconch whorl sutures impressed, early whorls with a wide shoulder slope of 45–60° and wider than at their anterior sutures, last 2 whorls with rounded shoulders; shoulders demarcated by a primary spiral, followed by flat to slightly convex whorl sides; last whorl 68% of shell length; sculpture of cord-like ribs overridden by strong primary spirals in a reticulate pattern; aperture narrow, with a wide anal sinus and short anterior canal barely delineated by the anterior taper, aperture and canal about 50% of shell length. *Protoconch* conical, of about 2–2¼ whorls, the first whorl minute, the last possibly (only worn remnants remain) with a few riblets on the last ¼-whorl. *Axial sculpture* of narrow cord-like ribs that run from suture to suture on spire whorls and evanesce before the anterior fasciole. Ribs slightly recurved on whorl shoulders and spaced greater than their width on

whorl sides. *Varix* apertural, thick, arching above the suture line and extending to the end of anterior canal. *Spiral sculpture* of 3 primaries and 3 secondaries between on spire whorl sides, 6–7 on the body whorl below suture line with secondaries between some. Tertiary spirals are present on whorl shoulders and between primary and secondary spirals on whorl sides. Wide interspaces between primaries produce a cancellate surface. *Sulcus* absent. Recurved ribs on the shoulder are evidence of past positions of the anal sinus. *Outer lip* varicose. *Anal sinus* nearly as wide as the shoulder, in front of the varix, and deep with a round apex directed somewhat laterally; denticle inside outer lip and a moderate-sized callus on parietal. *Inner lip* a narrow glaze, emarginate with moderate callus at the anal sinus. *Anterior fasciole* not swollen, with about 6 oblique spirals. *Anterior canal* short, straight, open, differentiated by the narrowing of the last whorl, unnotched. *Color* is absent in this fossil shell.

Remarks

Vitricythara micromeris (Dall, 1908) has been synonymized with or made a subspecies of *V. metria* (Fargo 1953; Powell 1966; Ward & Blackwelder 1987; Odé 1992a) but is recognized as a separate species here, which agrees with the position of Campbell (1993).

Range and habitat

Known only from the type locality.

Vitricythara formosa Fallon & Bouchet sp. nov.
urn:lsid:zoobank.org:act:3056A9F9-0E75-4390-BF74-A6249210ECD4
Figs 128B, 129J–V

Differential diagnosis

The profile of *Vitricythara metria* (Dall, 1903) has a teleoconch with sloped shoulders with a clear angle at their edge, versus more elevated shoulders with a rounded edge, lacking a clear angle at their edge. *Vitricythara metria* has a proportionally shorter body whorl at 64% of shell length versus 70% for *V. formosa* (as measured on holotypes). The aperture of *V. metria* is correspondingly shorter, 45% versus 49% of shell length on the same specimens.

Vitricythara micromeris (Dall, 1903) also has a different profile, with sloped shoulders rather than high, rounded ones, and a narrower shell.

Etymology

Vitricythara formosa Fallon & Bouchet sp. nov. derives its name from the feminine form of the Latin adjective '*formosus*', meaning 'handsome', due to its appealing shape and sculpture.

Type material

Holotype

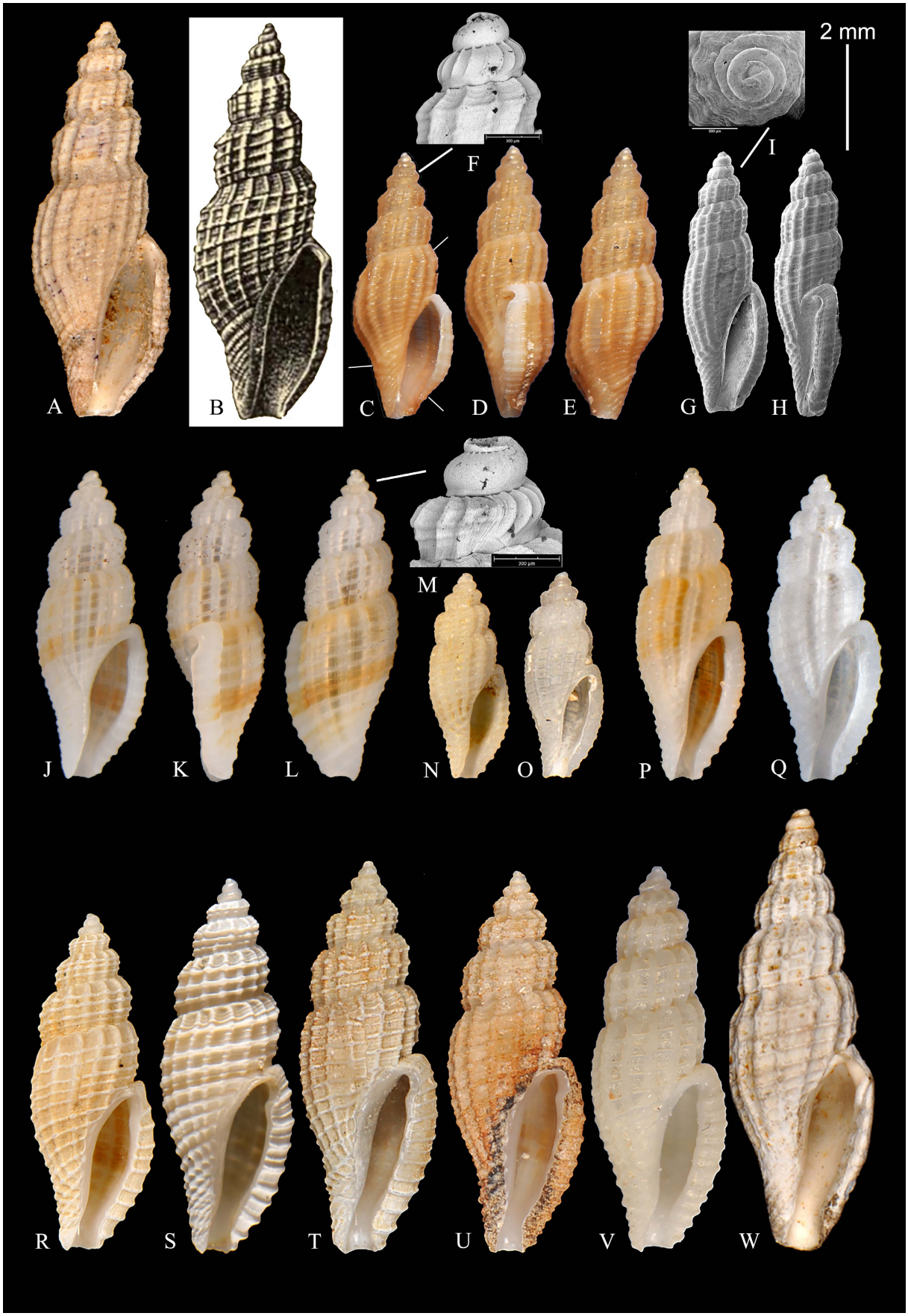
MARTINIQUE • 5.8 × 2.1 mm; Anse Belleville, Le Prêcheur; 14°49.1′ N, 61°13.8′ W; depth 20–25 m; 8 Oct. 2016; MADIBENTHOS; stn AS576; MNHN-IM-2000-39750.

Paratypes (22 specs)

MARTINIQUE • 4 specs, 5.9 × 2.2, 4.2 × 1.7, 4.4 × 1.7 and 5.0 × 1.7 (broken) mm; same data as for holotype; MNHN-IM-2000-39763 • 1 spec., 4.3 × 1.7 mm; Fort-de-France Bay, Banc Mitan; 14°35′ N, 61°04.6′ W; depth 13 m; 7 Oct. 2016; MADIBENTHOS; stn AB392; MNHN-IM-2000-39755 • 1 spec., 6.4 × 2.3 mm; Fort-de-France Bay, Le Lamentin, bout de la piste; 14°35.2′ N, 61°01.4′ W; depth 10 m; 6 Oct. 2016; MADIBENTHOS; stn AD606; USNM 1715391 • 1 spec., 5.5 × 2.0 mm; Fort-de-France Bay, Pointe des Nègres; 14°35.9′ N, 61°05.5′ W in 8 m; 9 Oct. 2016; MADIBENTHOS; stn AR418; MNHN-

IM-2000-39757 • 2 specs, 5.5 × 2.1 and 3.5 × 1.4 mm; Fort-de-France Bay, E of Grande Sèche; 14°34.6′ N, 61°03.3′ W; depth 6 m; 9 Oct. 2016; MADIBENTHOS; stn AB398; MNHN-IM-2000-39760 • 1 spec., 5.1 × mm; S Pointe Pimantée, Trois Rivières; 14°27.5′ N, 60°58.2′ W; depth 17–19 m; 9 Oct. 2016; MADIBENTHOS; stn AS579; MNHN-IM-2000-39751 • 2 specs, 5.8 × 2.3 and 5.3 × 2.0 mm; Fort-de-France Bay, Monsigny; 14°34.3′ N, 61°02.7′ W; depth 7 m; 7 Oct. 2016; MADIBENTHOS; stn AB394; MNHN-IM-2000-39759 • 1 spec., length = 5.0 mm; Marin Pass, Borgnesse Point; 14°26.9′ N, 60°54′ W; depth 15 m; 11 Sep. 2016; MADIBENTHOS; stn AS066; MNHN-IM-2000-39752 • 2 specs, 5.1 × 2.0 and 4.7 × 1.8 mm; Fort-de-France Bay, Caye de Gros Îlet; 14°33.2′ N, 61°01.6′ W; depth 6 m; 6 Oct. 2016; MADIBENTHOS; stn AB390; MNHN-IM-2000-39761 • 1 spec., 4.6 × 1.8 mm; Sortie Rivière, Anse Noire; 14°31.7′ N, 61°05.3′ W; depth 5–10 m; 7 Sep. 2016; MADIBENTHOS; stn AD208; MNHN-IM-2000-39753 • 2 specs, 6.6 × 2.5 and 4.8 × 2.0 mm; Fond Boucher; 14°39.3′ N, 61°09.4′ W; depth 14 m; 27 Sep. 2016; MADIBENTHOS; stn AS363; MNHN-IM-2000-39762 • 1 spec., 3.7 × 1.5 mm; Pointe de la Baleine; 14°31.1′ N, 61°05.9′ W; depth 17-19 m; 30 Sep. 2016; MADIBENTHOS; stn AB369; MNHN-IM-2000-39754 • 1 spec., 4.8 × 1.8 mm; Baie de Fort-de-France, bout de la piste; 14°35.2′ N, 61°01.4′ W; depth 2 m; 6 Oct. 2016; MADIBENTHOS; stn AD607; ANSP 498844 • 1 spec., 4.8 × 1.8 mm; Schoelcher, Fond Bellemare; 14°37.7′ N, 61°07.2′ W; depth 4 m; 27 Sep. 2016; MADIBENTHOS; stn AB460; MNHN-IM-2000-39756 • 1 spec., 5.0 × 1.8 mm; Anse Noire, Grotte aux chauves-souris; 14°32′ N, 61°05.3′ W; depth 13 m; 6 Sep. 2016; MADIBENTHOS; stn AB150. MNHN-IM-2000-39758.

Fig. 129 (next page). Species of *Vitricythara* Fargo, 1953. Part 1. – **A–B**. *Cythara metria* Dall, 1903. **A**. Holotype, 7.5 × 2.7 mm and type of genus *Vitricythara* Fargo, 1953 (USNM 163985), Shell Creek, Florida, Pliocene. **B**. Drawing of Dall (1903: fig. 13), the same specimen in Fig. 129A. Note that the whorl angle (from the shell axis) was somewhat exaggerated compared to the actual specimen. The drawing more clearly illustrates the secondary spirals between primaries than are visible in the photograph. – **C–F**. *Vitricythara marissae* Fallon sp. nov., holotype, 5.2 × 2.8 mm, ventral, lateral and dorsal views, and SEM image of protoconch (UF 590832), off St George's Island, Franklin County, NW Florida. The 3 fine lines in the photograph point to some of the same characteristics possessed by *V. metria*: slope of whorl shoulders, pinched outer lip at the anterior canal, and strong, bumpy spiral at the anterior fasciole boundary. The text explains the distinguishing characteristics of *V. metria* and other similar species. – **G–I**. *Cythara micromeris* Dall, 1903, holotype, 5.1 × 1.6 mm, ventral, lateral and apical SEM images, apical scale bar = 300 µm (USNM 163993), Pliocene marl of Shell Creek, Florida. – **J–V**. *Vitricythara formosa* Fallon & Bouchet sp. nov. **J–M**. Holotype, 5.8 × 2.1 mm, ventral, lateral, dorsal views and SEM image of protoconch (MNHN-IM-2000-39750), Le Prêcheur, Anse Belleville, Martinique. **N**. Paratype, 4.3 × 1.7 mm (MNHN-IM-2000-39755), Banc Mitan, Fort-de-France Bay, Martinique. **O**. Spec., 3.9 × 1.5 mm (MNHN-IM-2012-8752), Oil (Port-Louis), Guadeloupe. **P**. Paratype, 5.9 × 2.2 mm (MNHN-IM-2000-39763), Le Prêcheur, Anse Belleville, Martinique. **Q**. Spec., 5.8 × 2.1 mm (ANSP 498983), Dania Beach, Broward Co., E Florida. **R**. Paratype, 6.5 × 2.4 mm (USNM 1715391), bout de la piste, Fort-de-France Bay, Martinique. **S**. Spec., 7.1 × 2.6 mm (MNHN-IM-2012-8753), Grand Cul-de-Sac Marin, Guadeloupe. **T**. Spec., 7.4 × 2.8 mm (MNHN-IM-2012-8746), Grand Cul-de-Sac Marin, Guadeloupe. **U**. Spec., 7.2 × 2.6 mm (MNHN-IM-2012-8740), Banc Provençal, Guadeloupe. **V**. Spec., 7.3 × 2.6 mm (ANSP 498982), Union Island, Saint Vincent and the Grenadines. – **W**. *Acmaturris brisis* Woodring, 1928, holotype, 8.4 × 2.8 mm (USNM 369400), Bowden beds, Jamaica (fossil). This figure is included for comparison to *Vitricythara metria* (Dall, 1903). Its whorls are evenly convex, not distinctly shouldered, and have fewer spirals and axials. There are unconfirmed reports of Recent specimens of this species published as *A.* aff. *brisis* (Amapá, Brazil: Rios 1983, 1985, 1994, 2009) that are probably *Vitricythra formosa* Fallon & Bouchet sp. nov. Credits: B: from Dall (1903: 1633, pl. 60 figs 13, 16); F, I, M: SEM images courtesy of Paul Callomon; G–I: courtesy of Yolanda Villacampa, USNM. Scale bars: A–E, G–H, J–L, N–W = 2 mm; F, I, M = 300 µm.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Other material examined (28 specs)

GUADELOUPE • 1 spec., 5.5 × 2.1 mm; Trou à l'orage; 16°22.88′ N, 61°31.43′ W; depth 8 m; 18 May 2012; KARUBENTHOS 2012; stn GB21; MNHN-IM-2012-8751 • 1 spec., 7.2 × 2.8 mm; Grand Cul-de-Sac Marin; 16°19,92′ N, 61°33,45′ W; depth 4 m; 19 May 2012; KARUBENTHOS 2012; stn GD43; MNHN-IM-2012-8745 • 1 spec., 4.2 × 1.7 mm; Rocroy sud; 16°02.38′ N, 61°45.71′ W; depth 17 m; 10 May 2012; KARUBENTHOS 2012; stn GS11; MNHN-IM-2012-8744 • 1 spec., 7.9 × 2.9 mm; Grand Cul-de-Sac Marin; 16°18.02′ N, 61°33.03′ W; depth 5 m; 20 May 2012; KARUBENTHOS 2012; stn GS28; MNHN-IM-2012-8750 • 1 spec., 6.6 × 2.6 mm; Petit Cul-de-Sac Marin; 16°13.62′ N, 61°32.38′ W; depth 3 m; 21 May 2012; KARUBENTHOS 2012; stn GD49; MNHN-IM-2013-8039 • 3 specs, 4.5 × 1.8, 3.1 × 1.3 and 4.5 × 1.8 mm; Grand Cul-de-Sac Marin, Pointe Gris-Gris; 16°23.3′ N, 61°31.8′ W; depth 14 m; 16 May 2012; KARUBENTHOS 2012; stn GS21; MNHN-IM-2012-8930 • 1 spec., 3.9 × 1.5 mm; Oil (Port-Louis); 16°26.78′ N, 61°32,41′ W; depth 16 m; 18 May 2012; KARUBENTHOS 2012; stn GS24; MNHN-IM-2012-8752 • 1 spec., 7.15 × 2.6 mm; Banc Provençal; 16°13.61′ N, 61°32.39′ W; depth 4 m; 23 May 2012; KARUBENTHOS 2012; stn GD53; MNHN-IM-2012-8740 • 2 specs, 5.7 × 3.0 and 3.3 × 1.3 mm; leaving Port-Louis; 16°23.74′ N, 61°32.07′ W; depth 49 m; 15 May 2012; KARUBENTHOS 2012; stn GB14; MNHN-IM-2012-8748 • 2 specs, 4.5 × 1.8 and 4.5 × 1.8 mm; Tête à l'Anglais; 16°22.9′ N, 61°45.94′ W; depth 23 m; 8 May 2012; KARUBENTHOS 2012; stn GB06; MNHN-IM-2012-8743 • 3 specs, 5.0 × 1.9, 4.0 × 1.6, and 5.1 × 2.0 mm; Pigeon Island; 16°02.4′ N, 61°45.6′ W; depth 50 m; 11 May 2012; KARUBENTHOS 2012; stn GS13; MNHN-IM-2012-8742 • 1 spec., 7.4 × 2.7 mm; Grand Cul-de-Sac Marin; 16°18.02′ N, 61°33.03′ W; depth 5 m; 20 May 2012; KARUBENTHOS 2012; stn GS28; MNHN-IM-2012-8746 • 2 specs, 6.1 × 2.1 and 4.55 × 1.8 mm; Pointe nord Baie de Bouillante; 16°08.48′ N, 61°47.03′ W; depth 54 m; 8 May 2012; KARUBENTHOS 2012; stn GD10; MNHN-IM-2012-8741 • 1 spec., 6.3 × 2.4 mm; Petit Cul-de-Sac Marin; 16°13.62′ N, 61°32.38′ W; depth 3 m; 21 May 2012; KARUBENTHOS 2012; stn GD49; MNHN-IM-2012-8749 • 4 specs, 4.7 × 1.9, 6.3 × 2.4, 7.0 × 3.5 and 7.1 × 2.6 mm; Grand Cul-de-Sac Marin; 16°18′ N, 61°33.44′ W; depth 11 m; 19 May 2012; KARUBENTHOS 2012; stn GD40; MNHN-IM-2012-8753.

ST. VINCENT AND THE GRENADINES • 1 spec., length = 5.2 mm; Union Island, Chatham Bay; depth 21 ft [6 m]; 16 Jun. 2007; P. Fallon leg.; in diver-collected sediment from between coral outcroppings; P. Fallon coll. • 1 spec., 7.3 × 2.6 mm; Union Island, Chatham Bay; depth 65 ft [20 m]; 6 Apr. 2007; G. Mackintosh leg.; night SCUBA from on sand and rubble; ANSP 498982.

UNITED STATES OF AMERICA • 1 spec., 5.8 × 2.1 mm; E Florida, Broward Co., Dania Beach; depth 80–100 ft [24–30 m]; 1989; beach re-nourishment; ANSP 498983.

Description

Shell small (holotype length = 5.8 mm, largest = 7.4 mm), fusiform (W/L = 0.3621), translucent; whorls convex, shoulders round, high, sutures impressed, last whorl 70% of shell length; sculpture of cord-like ribs overridden by spirals about half as strong as the ribs in a reticulate pattern; aperture long and narrow, varicose, with a wide anal sinus and short anterior canal, aperture, and canal about 49% of shell length. *Protoconch* is symmetrical, evenly expanding 2½–2⅞ round whorls, the first whorl minute and about the last ½ whorl with riblets that do not extend to the suture with the teleoconch whorl. *Axial sculpture* of 16 strong cord-like ribs on the penultimate whorl and 11 on the last to the varix that extend from suture to suture on spire whorls and to the inner lip, curve around to and, much weakened, cross the anterior fasciole. Ribs recurved, narrower, and lower on whorl shoulders, and spaced about the same as their width on whorl sides, more so on the dorsum of the last whorl. *Varix* is apertural, crenated by primary spirals, and extends slightly above the suture to the anterior canal. *Spiral sculpture* of primary, secondary, and microscopic tertiary spirals; one secondary and one weak primary on whorl shoulders, then a strong primary at whorl periphery, followed by two primaries alternating with two secondaries,

all four equally spaced, then five primaries on shell base to the beginning of the anterior fasciole. A weak secondary spiral lies between some primaries; microscopic tertiaries fill the intercalary space between all primaries and secondaries. A strong primary, knobby because of overriding closely spaced ribs, marks the beginning of the anterior fasciole, followed by five oblique, weak spirals. *Sulcus* absent. Recurved and narrower ribs on the shoulder are evidence of past positions of the anal sinus. *Outer lip* varicose, with a thin, narrow strip of shell at the base of the varix extending from the anal sinus to a wide shallow stromboid notch. *Anal sinus* as wide as the shoulder, deep with a round apex, and set forward of the varix, with a weak callus inside outer lip and on parietal wall. *Inner lip* has a narrow glaze along the parietal wall and columella, thinly margined. The ***anterior fasciole*** is not swollen, but it has oblique spirals. *Columella* is slightly sigmoidal. *Anterior canal* moderately long, narrow, skewed to the left, viewed ventrally, tip slightly notched. *Color* translucent to opaque white with a brownish-orange mid-whorl band and faint brownish-orange hue over the upper ⅔ of the body whorl.

Remarks

The average length of 51 specimens is 5.3 mm (range = 3.1–7.9 mm). The spiral band seen on the holotype is rare among the approximately 50 specimens examined that range from white to pale straw, most of which were collected empty. So, either the color rapidly fades, or monochromatic color is prevalent, as seen in the specimens in Fig. 129.

Range and habitat

Examined specimens are from the United States (E Florida), Guadeloupe, Martinique, and St. Vincent and the Grenadines; depth 2–54 m, with most occurring in less than 20 m depth. This is a widespread species reported from numerous localities throughout the Caribbean and western North Atlantic from North Carolina to the Bahamas. specimens identified as *Vitricythara metria* (Dall, 1903) may be this species because of their similarity.

***Vitricythara* spp. Part 2**

Vitricythara lavalleana (d'Orbigny, 1847)
Figs 128C–D, 131A–H

Pleurotoma lavalleana d'Orbigny, 1853 in R. de la Sagra, 1841–1853: 174–175, pl. 24 figs 7–9. Note: it appears that the Latin descriptions and French commentaries of *P. auberiana* and *P. lavalleana* were switched because of a publishing error. The species name header and plate and figure numbers remain. So, the reference of pages 174–175, pl. 24 figs 7–9 is correct, bearing in mind that the text for *P. lavalleana* lies under *P. auberiana* on the same page.

Pleurotoma lavalleana – Tucker 2004: 550.
Mangilia lavalleana – Dall 1889a: 111.
Mangelia lavalleana – Peile 1926: 84. — Warmke & Abbott 1961: 140.
Cryoturris lavalleana – Sander & Lalli 1982: 317. — Williams 2005: #5567.
Vitricythara lavalleana – Kaicher 1984: card 3986. — Turgeon *et al*. 1998: 262. — García & Lee 2002: 12.
Pyrgocythara (*Vitricythara*) *lavalleana* – Diaz & Puyana 1994: 228, fig. 905.

Differential diagnosis

Vitricythara fassioae Fallon & Bouchet sp. nov. is most similar but differs principally in possessing a longer anterior canal and more primary spirals.

Vitricythara magnini Fallon & Bouchet sp. nov. differences are given in the differential diagnosis of that species.

Type material

Syntypes (2 specs)

CUBA and MARTINIQUE • 2 specs, 6.6 × 2.5 and 5.6 × 2.1 mm, and a severely weathered fragment is in NHMUK 1854.10.4.429.

d'Orbigny (1847) stated that these specimens were collected in Cuba and Martinique without stating which locality the 8 mm specimen referenced in his description came from. The difference (8.0 versus 6.6 mm) between the size of his type and the largest syntype in the lot today leaves open the possibility that the larger specimen has been lost in the intervening 177+ years.

Material examined (7 specs)

In addition to the photo of the syntypes provided by the NHMUK, the following 7 specimens were examined:

BRAZIL • 3 specs, 5.6 × 2.0, 6.3 × 2.3 and 6.7 × 2.5 mm; Santa Catarina State, beach at Porto Bela; depth 0 m; 30 Oct. 1999; Elaine leg.; in beach drift; UF 590831.

GUADELOUPE • 2 specs, 5.7 × 2.2 and 6.0 × 2.2 mm; Grand Cul-de-Sac Marin; 16°18′ N, 61°33.44′ W; depth 11 m; 19 May 2012; KARUBENTHOS 2012; stn GD40; MNHN-IM-2000-39794 • 1 spec., 4.4 × 1.7 mm; Grand Cul-de-Sac Marin; 16°17.24′ N, 61°33.46′ W; depth 3 m; 15 May 2012; KARUBENTHOS 2012; stn GD30; MNHN-IM-2012-8747.

MARTINIQUE • 1 spec., 4.4 × 1.7 mm; Fort-de-France Bay, Le Lamentin, bout de la piste; 14°35.3′ N, 61°01.5′ W; depth 9 m; 6 Oct. 2016; MADIBENTHOS; stn AD603; MNHN-IM-2000-39764.

Description

This redescription is based on d'Orbigny's (1847) description and the photograph provided by the NHMUK. *Shell* small (largest syntype length = 6.6 mm), translucent, fusiform (W/L = 0.3788), in all 8 whorls, the last whorl 66% of shell length; teleoconch whorl sutures impressed, with flat, sloped shoulders sharply demarcated by a primary spiral, followed by flat whorl sides; sculpture of cord-like ribs overridden by spirals of alternating but nearly the same strength; aperture a narrow oval, varicose, with a wide anal sinus and short anterior canal delineated by a tapering anterior, aperture and canal about 48% of shell length. *Protoconch* of about 3–3¼ round whorls, the first whorl minute, the last 2 whorls with arched riblets that grow stronger and wider apart to the lip. Riblets fade before the suture, leaving a smooth supra-sutural band. *Axial sculpture* of 14 narrow cord-like ribs on the penultimate whorl and 13 on the last that extend from suture to suture on spire whorls and curve to the inner lip, running much weakened over the anterior fasciole. Ribs recurved on the shoulders and spaced greater than their width, even more so on the dorsum of the last whorl. *Varix* apertural, crenated by strong spirals, rope-like and larger than preceding ribs, runs from suture, around anal sinus, to stromboid notch and thence to the anterior canal, diminished in size. *Spiral sculpture* of primaries and secondary spirals; secondaries on whorl shoulders, then a strong primary on the edge of shoulders, followed by 3 more primaries on penultimate whorl side and 5 primaries on shell base. A weak single primary lies between primaries and fine secondaries in intercalary space. The shell base, below the sutural primary spiral, has weaker primary spirals with secondaries between, all override ribs. *Sulcus* absent. Recurved ribs on the shoulder are evidence of past positions of the anal sinus. *Outer lip* varicose and with a narrow strip of shell along the base of the varix from the anal sinus to the stromboid notch; with a small denticle at the anterior margin of anal sinus, inside the outer lip on the underside of the varix. *Anal sinus* as wide as

the shoulder, shallow with a round apex, surrounded by a weak callus on the parietal wall and outer lip. *Inner lip* has a narrow glaze along the parietal wall and the columella, unemarginate. *Anterior fasciole* is not swollen, with about 6 oblique spirals. *Anterior canal* is short, straight, open, differentiated by the tapering of the last whorl, slightly notched. *Color* golden yellow with white shoulder and mid-whorl bands and light reddish brown blotches on shoulder ribs and band on anterior fasciole. Color bands vary among individuals.

Range and habitat

Guadeloupe, Martinique, and Brazil (Santa Catarina State); depth shallow water up to 11 m. Other localities may include Louisiana (offshore, García & Lee 2002), Bermuda (Peile 1926), Puerto Rico (Warmke & Abbott 1961), Barbados (Dall 1889a), and Colombia (Diaz & Puyana 1994).

Vitricythara fassioae Fallon & Bouchet sp. nov.
urn:lsid:zoobank.org:act:FE956E0F-170F-492A-87C4-668165914055
Figs 128F, 131I–P

Differential diagnosis

Vitricythara lavalleana (d'Orbigny, 1853) is similar but has a shorter anterior canal and fewer primary spirals.

Vitricythara magnini Fallon & Bouchet sp. nov. protoconch has 3¼ whorls, not 3, and 2 whorls with riblets, not just one as in *V. fassioae* Fallon & Bouchet sp. nov.

Vitricythara metria (Dall, 1903) has ribs stronger than its spiral cords, a narrower, longer aperture, and more angular shoulders.

Etymology

Vitricythara fassioae Fallon & Bouchet sp. nov. is named in honor of Giulia Fassio from the University of Rome for her work at the barcode bench during the MADIBENTHOS and other MNHN expeditions.

Type material

Holotype
MARTINIQUE • 6.2 × 2.1 mm, live caught; Fort-de-France Bay, off the end of the track at Le Lamentin; 14°35.2′ N, 61°01.4′ W; depth 10 m; 6 Oct. 2016; MADIBENTHOS; stn AD606; sequenced; MNHN-IM-2013-72929.

Paratypes (9 specs)
MARTINIQUE • 3 specs, largest = 6.1 × 2.15 mm; Fort-de-France Bay, Le Lamentin, bout de la piste; 14°35.3′ N, 61°01.5′ W; depth 9 m; 6 Oct. 2016; MADIBENTHOS; stn AD603; MNHN-IM-2000-39749 • 3 specs, largest = 5.4 × 2.1 mm; Fort-de-France Bay, Le Lamentin, end of the track; 14°35.2′ N, 61°01.4′ W; depth 10 m; 6 Oct. 2016; MADIBENTHOS; stn AD606; MNHN-IM-2000-39748 • 1 spec., 4.5 × 1.6 mm; Anse Noire, Sortie Rivière; 14°31.7′ N, 61°05.3′ W; depth 5–10 m; Sep. 2016; MADIBENTHOS; stn AD208; USNM 1715390 • 1 spec., 5.1 × 2.0 mm; Bellefontaine; 14°40.1′ N, 61°10.5′ W; depth 77 m; 4 Oct. 2016; MADIBENTHOS; stn AD299; MNHN-IM-2000-39747 • 1 spec., 5.1 × 1.8 mm; N of Loup Ministre; 14°49.4′ N, 60°56′ W; depth 60 m; 20 Sep. 2016; MADIBENTHOS; stn AD251; ANSP 498843.

Other material examined (4 specs)

MARTINIQUE • 1 spec.; Pointe Gribouldin, Le Prêcheur; 14°48.5′ N, 61°13.8′ W; depth 56 m; 8 Oct. 2016; MADIBENTHOS; stn AS574; MNHN-IM-2000-39744 • 2 specs; Fort-de-France Bay, Le Lamentin, bout de la piste; 14°35′ N, 61°01.4′ W; depth 10 m; 6 Oct. 2016; MADIBENTHOS; stn AD605; MNHN-IM-2000-39745 • 1 spec.; Baie de Fort-de-France, Le Lamentin, bout de la piste; 14°35.4′ N, 61°01.5′ W; depth 8 m; 6 Oct. 2016; MADIBENTHOS; stn AD602; MNHN-IM-2000-39746.

Description

Shell fusiform (W/L=0.3387), fragile, translucent, of 7¼ turreted whorls with shoulders about 45° off shell axis and with slightly convex sides, last whorl about 66% of shell length. Aperture long with a moderately long anterior canal, both about 48% of shell length. *Protoconch* of 3 round whorls, the first minute then whorls expand rapidly, the last with widely spaced, strong arched riblets that do not reach the suture. *Axial sculpture* of narrow cord-like ribs only slightly stronger than spiral cords that run from suture to suture on spire whorls and across the fasciole to the inner lip, reduced in strength across the fasciole, 18 on the penult, 17 on body whorl. Growth striae visible on shell surface between axials and spirals, heaviest between axials on shoulder. *Spiral sculpture* of round spirals sub-equal in strength and overriding axials, forming small spikes at their intersection. No frosting visible on any of the sculptural elements and no spirals between the spirals. *Sulcus* absent. Recurved ribs on shoulder are evidence of past positions of the anal sinus. *Outer lip* thin, broken in holotype but varicose in intact mature specimens. *Anal sinus* is a shallow notch the full width of the shoulder. *Inner lip* a narrow glaze, unemarginate except along anterior canal. Without a callus on the parietal wall. *Anterior fasciole* not swollen, with about 5 oblique spirals. *Anterior canal* moderately long, end slightly skewed to the right when viewed ventrally, unnotched. *Color* light yellowish-brown with a pale reddish-brown band on shoulder, darkest on ribs, and on the anterior fasciole and lower shell base.

Remarks

Vitricythara fassioae Fallon & Bouchet sp. nov. differs from Fargo's (1953) original diagnosis of the genus in possessing a moderately long, not short, anterior canal.

Range and habitat

Martinique; depth 5–90 m.

Vitricythara magnini Fallon & Bouchet sp. nov.
urn:lsid:zoobank.org:act:4D1245D8-C527-4D34-A7A9-CE13EC64F470
Figs 128E, 130, 131Q–Y

Differential diagnosis

Pyrgocythara trilineata (C.B. Adams, 1845) comb. nov. has a shorter anterior canal and lacks the reddish-brown band on the anterior fasciole and lower shell base.

Vitricythara fassioae Fallon & Bouchet sp. nov. has a translucent shell, lacks frosted spirals, and has a longer anterior canal.

Vitricythara lavalleana (d'Orbigny, 1853) is quite similar; it has a longer anterior canal and a more translucent shell. Shell microstructure is finely granulose with granules absent in intercalary spaces, whereas *V. magnini* Fallon & Bouchet sp. nov. is densely granulose in intercalary spaces.

Vitricythara metria (Dall, 1903) has higher shoulders, a straighter anterior canal, and a strong beaded spiral at the anterior fasciole-shell base boundary.

Pyrgocythara elata (Dall, 1889) comb. nov. has straighter whorl sides, a more abrupt narrowing of the last whorl, and a stronger sutural spiral. It is otherwise similar in protoconch whorls and number of whorls with riblets, and in length of anterior canal.

Bathyturris bicarinata Fallon & Bouchet gen. et sp. nov. is larger and lacks an anal denticle.

Etymology

Vitricythara magnini Fallon & Bouchet sp. nov. is named in honor of Hervé Magnin, the former Head of Biodiversity at the National Park of Guadeloupe (currently director of Parc Naturel Marin du Golfe du Lion), in recognition of his invitation to MNHN to conduct the KARUBENTHOS 2012 expedition.

Type material

Holotype

GUADELOUPE • 6.0 × 2.3 mm; 16°23.16′ N, 61°32.02′ W; depth 50 m; 5 May 2012; KARUBENTHOS 2012; stn GD03; sequenced; MNHN-IM-2013-20491.

Paratypes (16 specs)

GUADELOUPE • 1 spec., 3.4 × 1.5 mm; Grand Cul-de-Sac Marin, off Fajou Island; 16°23.16′ N, 61°32.02′ W; depth 50 m; 5 May 2012; KARUBENTHOS 2012; stn GD03; sequenced; MNHN-IM-2013-20493 • 1 spec., 5.2 × 2.1 mm, sequenced; Grand Cul-de-Sac Marin, off Fajou Island; 16°23.16′ N, 61°32.02′ W; depth 50 m; 5 May 2012; KARUBENTHOS 2012; stn GD03; MNHN-IM-2013-20492 • 1 spec., 5.1 × 2.0 mm, ethanol-preserved; Grand Cul-de-Sac Marin, off Fajou Island; 16°23.16′ N, 61°32.02′ W; depth 50 m; 5 May 2012; KARUBENTHOS 2012; stn GD03; MNHN-IM-2019-34678 • 1 spec., 3.9 × 1.5 mm, ethanol-preserved; behind Fajou Island; 16°22.2′ N, 61°35.01′ W; depth 60 m; 24 May 2012; KARUBENTHOS 2012; stn GD54; MNHN-IM-2019-34731 • 1 spec., 4.65×1.9 mm; Ilet Gosier; 16°11.31’ N, 61°29.59’ W; depth 22 m; 23 May 2012; KARUBENTHOS 2012; stn GD50; MNHN-IM-2012-8958 • 3 specs, 6.1 × 2.2, 6.0 × 2.1, and 5.6 × 2.1 mm; Sud Anse Caraïbe; 16°11.98′ N, 61°47.57′ W; depth 40 m; 12 May 2012; KARUBENTHOS 2012; stn GN18; MNHN-IM-2012-9063.

MARTINIQUE • 1 spec., 5.3 × 2.0 mm; N of Loup Ministre; 14°49.4′ N, 60°56′ W; depth 60 m; 20 Sep. 2016; MADIBENTHOS; stn AD251; sequenced; MNHN-IM-2013-72655 • 2 specs, 4.3 × 1.8 and 3.4 × 1.4 mm; Schoelcher, Anse Madame; 14°37.3′ N, 61°07′ W; depth 57 m; 7 Oct. 2016; MADIBENTHOS; stn AD611; IM-2000-39766 • 3 specs, 4.6 × 1.8, 4.3 × 1.5, and 3.7 × 1.6 mm; Fort-de-France Bay, SW of Pointe des Nègres; 14°35.7′ N, 61°06′ W; depth 60 m; 30 Sep. 2016; MADIBENTHOS; stn AD276; USNM 1715400 • 2 specs, 6.1 × 2.2 and 5.1 × 1.7 mm; La Caravelle peninsula, N of Rocher de la Caravelle; 14°50.6′ N, 60°54.2′ W; depth 60 m; 18 Sep. 2016; MADIBENTHOS; stn AD243; MNHN-IM-2000-39765.

Other material examined (167 specs)

An additional 167 specimens were examined, all from Guadeloupe and Martinique.

Description

Shell small (holotype length = 6.0 mm, examined specimens to 7.3 mm), fusiform, of 8 whorls, teleoconch whorls turreted, shoulders flat, sloping, delimited by the first primary spiral on whorl side, the last whorl 65% of shell length, sculpture of subequal ribs and primaries forming a reticulate pattern, aperture narrowly oval, varicose, with a deep anal sinus and short anterior canal, aperture and canal together about 50% of shell length. *Protoconch* of 3¼–3½ round whorls, the first minute, the last 2 with well-spaced, fine arched riblets that grow stronger toward the end, the bottom ¼ of which are finer, sweep forward,

and do not reach the suture. *Axial sculpture* of narrow cord-like ribs that run from suture to suture on spire whorls, are recurved on shoulder, and then to inner lip on body whorl, much reduced in strength across the fasciole. There are 14 ribs on the penultimate and 12 on the last to the varix. *Varix* apertural, crenated by primary spirals, larger than preceding ribs, runs from suture to anterior canal, curved around anal sinus. *Spiral sculpture* of primaries about the same strength as ribs and about the same spacing to create a cancellate pattern on the shell surface. Primary spirals tend to alternate in strength, with a 4 on penultimate, and 5 on the shell base. *Sulcus* absent. Recurved ribs on the shoulder are evidence of past positions of the anal sinus. *Outer lip* varicose, the edge frilled, with a denticle at anterior margin of anal sinus inside outer lip. *Anal sinus* is deep with a round apex and slightly convergent sides made so by denticle inside outer lip and a moderate-sized callus on parietal wall. *Inner lip* a narrow glaze, unemarginate except along anterior canal. A moderate callus on the parietal wall at the anal sinus. *Anterior fasciole* not swollen, with about 7 oblique spirals. *Anterior canal* end slightly skewed to the right when viewed ventrally, unnotched. *Color* light yellowish-brown with reddish-brown interrupted bands on the shoulder and lower shell base, darkest in intercostal space, and visible inside of the anterior canal and aperture. Varix whitish.

Animal

A photograph of *Vitricythara magnini* Fallon & Bouchet sp. nov. (Fig. 130) shows a translucent milky-white animal. Its foot with opaque white spots and a proboscis with small opaque white and orange spots.

Fig. 130. *Vitricythara magnini* Fallon & Bouchet sp. nov. (MNHN-IM-2013-72665), live animal. Photos by C. Redfern.

The end of the proboscis has a bilobed flare with a ring of smaller white spots around its edge. The eyes are half-way up the cephalic tentacles and tail of the foot is pointed.

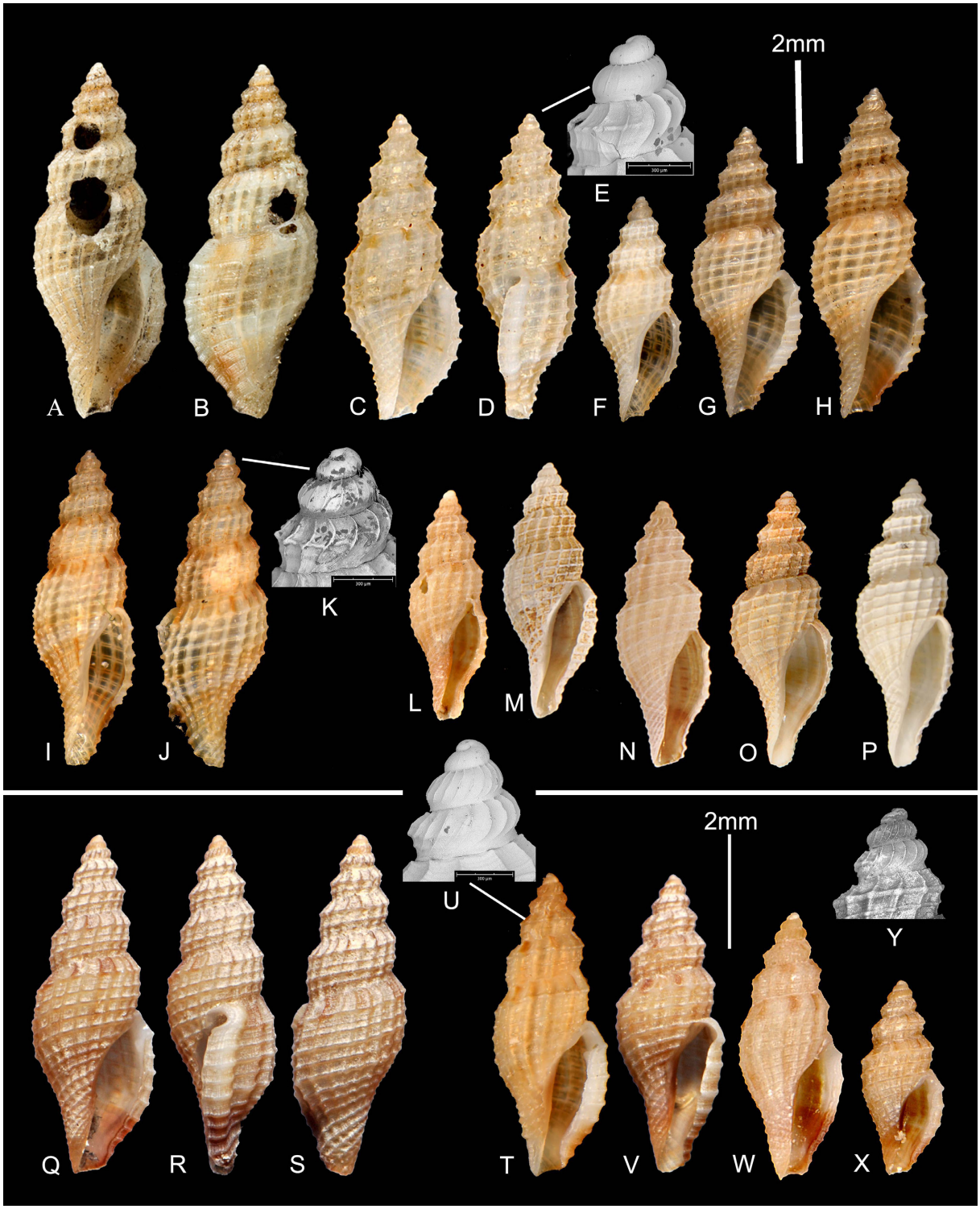
Remarks

The average length of 40 specimens is 5.0 mm (2.5–8.9 mm). Axial ribs vary in strength among specimens.

Range and habitat

Guadeloupe and Martinique; depth 2–120 m, 95% in depths ≥45 m.

Fig. 131 (next page). Species of *Vitricythara* Fargo, 1953. Part 2. – **A–B**. *Pleurotoma lavalleana* d'Orbigny, 1853, syntype, ventral and dorsal views, 6.6 × 2.5 mm (NHMUK 1854.10.4.429), Martinique. – **C–H**. *Vitricythara lavalleana* (d'Orbigny, 1853). **C–E**. Spec., 6.0 × 2.2 mm, ventral and dorsal views, and SEM of protoconch (MNHN-IM2000-39794), Grand Cul-de-Sac Marin, Guadeloupe. **F**. Spec., 4.4 × 1.7 mm (MNHN-IM-2012-8747), Grand Cul-de-Sac Marin, Guadeloupe. **G–H**. Specs, 5.6 × 2.0 and 6.3 × 2.3 mm (UF 590831), Santa Catarina State, Brazil. – **I–P**. *Vitricythara fassioae* Fallon & Bouchet sp. nov. **I–K**. Holotype, 6.2 × 2.1 mm, ventral and dorsal views, and SEM of protoconch (MNHN-IM-2013-72929), Le Lamentin, Fort-de-France Bay, Martinique. **L**. Paratype, 4.5 × 1.6 mm (USNM 1715390), Anse Noire, Sortie Rivière, Martinique. **M**. Paratype, 5.1 × 2.0 mm (MNHN-IM-2000-39747), Bellefontaine, Martinique. **N**. Paratype, 5.1 × 1.8 mm (ANSP 498843), N of Loup Ministre, Martinique. **O**. Paratype, 5.4 × 2.1 mm (MNHN-IM-2000-39748), Le Lamentin, Fort-de-France Bay, Martinique. **P**. Paratype, 6.1 × 2.15 mm (MNHN-IM-2000-39748), Le Lamentin, Fort-de-France Bay, Martinique. – **Q–Y**. *Vitricythara magnini* Fallon & Bouchet sp. nov. **Q–S**. Holotype and sequence voucher, 6.0 × 2.3 mm (MNHN-IM-2013-20491), off Fajou Island, Grand Cul-de-Sac Marin, Guadeloupe. **T–U**. Paratype and sequence voucher, 5.3 × 2.0 mm, ventral view, and SEM of protoconch (MNHN-IM-2013-72655), N of Loup Ministre, Martinique. **V**. Paratype and sequence voucher, 5.2 × 2.1 mm (MNHN-IM-2013-20492), off Fajou Island, Grand Cul-de-Sac Marin, Guadeloupe. **W**. Paratype, 4.65 × 1.9 mm (MNHN-IM-2012-8958), Ilet Gosier, Guadeloupe. **X**. Paratype, 2.4 × 1.5 mm (MNHN-IM-2013-20493), off Fajou Island, Grand Cul-de-Sac Marin, Guadeloupe. **Y**. Paratype, 4.6 × 1.8 mm, SEM of protoconch only, 245 × (USNM 1715400), SW Pointe des Nègres, Fort-de-France Bay, Martinique. Credits: A–B: courtesy of Harry Taylor, Photographic Unit. Copyright NHMUK; E, K, U, Y: SEM images courtesy of Chandler J. Olson and Paul Callomon. Scale bars: A–D, F–J, L–T, V–X = 2 mm; E, K, U, Y = 300 µm.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Discussion

Classifying many mangeliid species has been achieved through an interdisciplinary approach. The classical method of describing a species based on morphology has allowed for the identification of individual species and traits retained at the level of genus. Gene sequencing and analysis have proven invaluable in confirming the identification of individual species and genera. They have also been crucial in uncovering species that are otherwise difficult to separate. However, this interdisciplinary approach was limited by tissue availability for gene sequencing, which allowed sequencing only 19 of the 25 genera. Nonetheless, the strong correlation between phylogeny and identified morphological traits, as well as shell surface micro-sculpture (SSM), has enabled the confident acceptance of the six genus groups based solely on shell morphology.

Despite the lack of uniform sample collection, available information on the localities of 175 species (not counting the undescribed ones and deep-water species), distribute across 11 regions, provided insight into mangeliid ranges simply by measuring their presence or absence in the regions. Future investigations of under-sampled regions, either through sampling or review of collections, may yield new species and a more precise estimate of the range of individual species.

Another possible use of species inventories is to compare species richness across geographic areas. However, because sampling of TWA regions has not been consistent in the number of samples or in the collection method, this measure is subject to bias; nevertheless, it may still provide some indication of trends. Biogeographical ranges and regional diversity are the subjects of the following two sections.

Biogeographical considerations: species' ranges

Examining collections of mangeliids from various geographic areas is useful for gauging the approximate geographical range of species. Due to the widely different collecting methods, sampled habitats (depth, substrate, temperature regimes, associated communities, etc.), and other unknown collection biases, it is ineffective to attempt to assess the range of specific species. However, understanding how mangeliid assemblages within different regions compare is of interest. In this context, a region refers to a contiguous geographic area made up of one or more states or countries, not a biogeographic zone in the sense of faunistic regions determined by physical parameters and overall faunal composition. Examples of regions used here include North Carolina to E Florida, the Bahamas, the eastern Gulf of Mexico, and the western Gulf of Mexico, among others (see Table 8). Guadeloupe serves as a convenient focal point for comparison to other regions due to the large number of samples (see Table 1) and species (56) collected from numerous shallow water habitats (100 m or less). The variety of habitats sampled around Guadeloupe increases the likelihood of encountering the same species in other regions, even when sample sizes are lower, provided that species ranges extend to the region in question. Additionally, Guadeloupe is roughly centrally located in the eastern Caribbean, approximately 10° north of French Guiana and 10° south of E Florida, the core area of this study. The species count for a region excludes species found predominantly at depths greater than 100 m and does not account for unnamed species whose uniqueness has not yet been established. The number of species shared with Guadeloupe is shown in Table 8.

Regions that increase in distance northward exhibit a significant decline in Guadeloupean species between Guadeloupe and the Florida Keys over a span of about 4° latitude. As shown in Table 8, 41% of the Florida Keys assemblage of 22 species consists of the same species found in Guadeloupe samples. Few specimens were collected from the geographical area between Guadeloupe and the Florida Keys, so the number of shared species in the Greater Antilles does not appear in the table.

In the other direction, southward, the increasing distance of regions from Guadeloupe is more gradual, which is reflected in the gradual decrease in the percentage of shared species. At 4° of latitude distance south of Guadeloupe, the northern South American region, 41% of its assemblage (34 species) are the

Table 8. The number of shallow water species shared with Guadeloupe in regions beyond Guadeloupe.

	Species in 100 m depth or less			
Region **Constituent countries or states**	**No. species in region**	**No. of shared species**	**% Guadaloupe species**	**Approx. latitude range**
W Carib.: Honduras, Belize, Panama, Providencia Is.	23	9	39	18° to 9° N
W GOM: Texas, Mexico	12	2	10	29.5° to 18.8° N
E GOM: W FL, AL, MS, LA	43	6	14	29.5° to 26.1° N
SW US Atlantic: NC, SC, GA, E FL	30	7	23	35° to 25.6° N
Bahamas	22	8	36	26.8° to 22.2° N
Florida Keys	22	9	41	25.6° to 24.3° N
Guadeloupe	56	56	100	16.3° N
Martinique	53	38	72	14.7° N
SVG, Grenada	35	24	69	13.3° to 12° N
N South America: Colombia, Venezuela, Neth. Antilles, Trinidad and Tobago, French Guiana	34	14	41	12.3° to 4.7° N
Southern Brazil	15	1	7	0° to 33° S

same as found in Guadeloupe samples, which is coincidentally the same percentage of shared species in the Florida Keys Region.

Martinique, located approximately 150 km south of Guadeloupe and separated from it by the island of Dominica, shares 72% of its species with those in Guadeloupe. This is a surprising drop given Martinique's proximity and the fact that it was also heavily sampled (164 samples from multiple habitats around the island). In samples from the next southern region, SVG and Grenada (which are about 288–440 km south of Guadeloupe, roughly 3° of latitude away), 69% of 35 species are shared with those found in Guadeloupe samples. In the most distant region, southern Brazil, only 7% of its examined species are shared with Guadeloupean ones, although the number of species available from Brazil for comparison is low (15).

Putting this in perspective, of the 56 shallow water species found in Guadeloupe samples, 34 species (computed by listing all the species shared in the 9 regions, computation not shown) are shared with one or more other regions (except Martinique, which is geographically close and shares 38 species so is not included in this assessment). Fifteen of the 34 are shared in just one other region, 6 in two regions, and the remaining 13 in 3 or more regions. The following 9 of the 13 species appear in 4 or more regions:

- *Agathotoma candidissima* (C.B. Adams, 1845)
- *Agathotoma castellata* (E.A. Smith, 1888)
- *Brachycythara alba* (C.B. Adams, 1845)
- *Cryoturris dorvilliae* (Reeve, 1845)
- *Cryoturris olsoni* Fallon & Bouchet sp. nov.
- *Glyphoturris quadrata* (Reeve, 1845)
- *Glyphoturris rugirima* (Dall, 1889)
- *Ithycythara variabilis* Fallon & Bouchet sp. nov.
- *Pyrgocythara trilineata* (C.B. Adams, 1845) comb. nov.

So, while 34% of Guadeloupean species were found in 2 or more regions, the majority (66%) are limited to a range of one additional region, principally the region encompassing SVC and Grenada.

Table 9. Number of shallow water species (< 100 m) in each genus by region.

Region	*Agathotoma*	*Adelocythara*	*Brachycythara*	*Cryoturris*	*Cryptomangelia*	*Mandiana*	*Glyphoturris*	*Ithycythara*	*Kurtzia*	*Kurtziella*	*Kurtzina*	*Psilocythara*	*Pyrgocythara*	*Rubellatoma*	*Stellatoma*	*Suturocythara*	*Tenaturris*	*Vitricythara*	Species sum	Genera sum
W GOM: TX, Mexico	–	–	–	2	–	–	–	4	2	1	2	–	1	–	–	–	–	–	12	6
E GOM: W FL, AL, MS, LA	1	–	2	7	2	–	2	9	4	4	2	1	1	1	4	–	2	1	43	15
SW US Atlan.: NC, SC, GA, E FL	1	–	1	6	2	–	2	4	1	3	–	1	2	1	3	–	2	1	30	14
S Brazil	–	–	–	1	3	–	1	6	1	1	–	–	–	1	–	–	–	1	15	8
Bahama Is.	1	–	2	–	5	–	1	6	–	–	–	1	1	–	2	–	3	–	22	9
Florida Keys	3	–	2	3	2	–	2	3	2	1	–	–	1	–	2	–	1	–	22	11
W Carib.: Honduras, Belize, Panama, Providencia	2	–	2	2	–	–	2	5	–	1	–	1	1	1	–	1	3	2	23	12
Guadeloupe	6	4	2	7	6	–	2	10	1	2	1	2	2	2	–	2	4	3	56	16
Martinique	11	–	2	7	3	2	2	11	1	2	–	2	1	1	–	1	3	4	53	15
SVG, Grenada	7	2	2	7	1	–	1	8	–	3	–	1	1	–	–	–	1	1	35	12
N South America: Colomb., Ven., Neth. Antilles, Trin. & Tobago, Fr. Guiana	5	–	2	5	2	1	3	6	2	3	1	1	–	1	–	–	1	1	34	14
Column sum	37	6	17	47	26	3	18	72	14	21	6	10	11	8	11	4	20	14		
Number of species	12	6	3	22	20	2	4	41	8	14	3	5	3	6	7	4	10	5	**175**	= Spp. sum
Range: Av. no. of regions	3.1	1.0	5.7	2.1	1.3	1.5	4.5	1.8	1.8	1.5	2.0	2.0	3.7	1.3	1.6	1.0	2.0	2.8		

Regional diversity of shallow water genera (<100 m)

The previous paragraphs examined the composition of shallow-water species assemblages in designated regions by comparing them with those in Guadeloupe. It was estimated that 66% of the species in Guadeloupe are limited to Guadeloupe and a single additional SVG–Guadeloupe region, or about 288–440 km to the south. The northward direction is less meaningful without data from the Greater Antilles. The Florida Keys have an estimated 16% of the species found in Guadeloupe, approximately 2600 km away (as the crow flies), but 7 of the 9 species are widespread and found in 3 other regions. This exercise aims to examine the constituent genera of the 11 regions. Furthermore, based on the number of species in each genus group, the objective was to calculate the average range of the genus group. Again, sampling among regions was too uneven to estimate individual species' ranges reliably. The 18 genera comprised of shallow water species are listed along with the number of species in each genus group from the assemblages of the 11 regions. As with the previous exercise regarding species assemblages, unnamed species are not counted, nor are species that have not been found in the samples examined for this monograph. specifically, species known only from types or reported in the literature but not found in samples are also excluded. An example is *Kurtziella vincula* Usticke, 1969, which is a valid shallow water species that has not been seen in any of the shallow water samples and, therefore, is not included. This results in a reduced count of the actual number of species, and possibly genera, in individual regions. Genus groups with few or no species in shallow water are *Acmaturris*, *Bactrocythara*, *Bathyturris*, *Benthomangelia*, *Habrocythara*, *Rhomboturris*, and *Saccharoturris*. For simplicity, none of the species in these groups is included in this analysis. All other genera are included except deep water species in otherwise shallow water genera *Cryoturris*, *Ithycythara*, *Rubellatoma*, and *Tenaturris*.

Table 9 presents two general observations regarding the specimens examined for this project. The first is the presence and total number of shallow water genera found in each region. The second is the average number of regions in which species within each genus occur, which is computed as the sum of species'

occurrences within all the regions divided by the number of species found within the genus. Genera with at least one species appearing in more than one region will have an average range greater than 1.0 for a maximum of 11.0 (all species of genus appearing in all 11 regions), those genera possessing species with no multiple region occurrences will have an average range of 1.0 (each species restricted to a single region).

Concerning the first general observation, the sum of genera by region varies from 6 to 16 in each region (last column of Table 9). The lower sum of genera (6–9) in regions W GOM, S Brazil, and Bahamas. is likely due to the lower number of examined lots (25, 48, and 57 respectively) and conversely, the highest number of genera (14–16) were found in the E Gulf of Mexico, Guadeloupe, Martinique, and N South America regions, which had the highest number of examined lots (144, 791, 570, 211, respectively). Regions with an intermediate number of genera were represented by an intermediate number of lots. The general observation then, is that the number of genera within a region is likely dependent on the number of lots available for examination from the region.

Latitude may also play a role in the occurrence of genera. Some may be absent or represented by only a few rare occurrences in more temperate regions, such as *Adelocythara*, *Mandiana*, and *Suturocythara* but appear to be more common in the tropical waters of the E Caribbean: Guadeloupe, Martinique, SVG, and Grenada, and northern South America. *Stellatoma* appears to favor temperate tropical waters (E GOM, Carolina to SE Florida, Bahamas, and the Florida Keys).

The average geographical range of species within each genus (the bottom row of Table 9) is independent of both the number of regions in which the genus occurs and the number of species in that genus. For instance, *Ithycythara* has 41 species included in its genus, with an average species range of 1.8 regions. Another genus, *Agathotoma*, has an average range of 3.1 regions for its 12 species. Also notable is *Glyphoturris*, which has only 4 species, with an average range of 4.5 regions. species of *Glyphoturris* are more widely distributed on average than those of *Ithycythara*.

The highest dispersal rates (> 2.0), on the other hand, indicate genera with one or more widespread species. species of the genus *Agathotoma* have a high average range because most species occur in more than one region. *Brachycythara* has one of the smallest numbers of species (3) that appear in most regions; thus, most can be described as widespread. As noted in the discussion of the range of species assemblages, *Agathotoma*, *Brachycythara*, *Cryoturris*, *Glyphoturris*, and *Pyrgocythara* have widespread species appearing in 4 or more regions. These species are a significant component of their respective genus groups' high average species ranges (3.1, 5.7, 2.1, 4.5, and 3.7, respectively). In summary, comparisons of species assemblages and genus groups demonstrate that most mangeliids have a limited range.

Deep-water genera (> 100 m)

Most mangeliid genera inhabit shallow waters. Deep waters are inhabited by species in five genera: *Acmaturris*, *Bathyturris*, *Benthomangelia*, *Habrocythara*, *Rhomboturris*, and *Saccharoturris*. Most deep-water species addressed in this monograph were found in samples collected during the KARUBENTHOS 2 expedition offshore of Guadeloupe (average depth 341 m, range of 48–898 m). Other genera, such as *Cryoturris*, *Ithycythara*, *Rubellatoma*, and *Tenaturris*, include a mix of shallow and deep-water species; the latter were also identified in samples from the same expedition off Guadeloupe. Deep-water species from off La Désirade Island, Guadeloupe (150–350 m) come from the collection of Dominique Lamy, from the Smithsonian's field trips to Curaçao (submersible dives between 130–288 m), and from the efforts of Emilio García, which coincided with sampling efforts sponsored by NSF grants for studying the effects of oil spills in the Gulf of Mexico. Since this work covers only a relatively small number of deep-sea species, comparing regional occurrences would be meaningless. The number of species in each of the deep-water genera is shown in Table 2.

Acknowledgements

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Also gratefully acknowledged was the invitation by Jerry Harasewych of the Smithsonian for the rare opportunity to study turriform conoideans acquired during the Smithsonian's *Curasub* field trips off Curaçao, part of the Deep Reef Observation Project (DROP), a long-term collaboration between the Smithsonian and the Curaçao Sea Aquarium, owned by Adrian "Dutch" Schrier. Almost all mangeliids collected in 2012 and 2013 from this little-explored area are included in this work. Also acknowledged is Yolanda Villacampa, Smithsonian Museum Department of Invertebrate Zoology, for her time and effort in creating SEM images of Dall's 1927 species and of other type specimens held by the Smithsonian that appear in this report.

Andreia Salvador and Harry Taylor, both at NHMUK, are acknowledged for the wonderful photographs of 19th century type specimens held at their institution.

The major portion of the mangeliids described in this paper has come from the samples collected during MNHN expeditions. The authors acknowledge the support and funding for the samples collected around Guadeloupe in May 2012 during the KARUBENTHOS 2012 expedition (PI: Philippe Bouchet), organized jointly by the National Park of Guadeloupe, MNHN, Université des Antilles et de la Guyane (UAG), and Université Pierre et Marie Curie (UPMC), with funding from Fonds Européen de Développement Régional (FEDER) and Port Autonome de la Guadeloupe.

Many new species were found in samples collected during the French Guiana expedition, under the "*Our Planet Reviewed*" programme. The MNHN and Pro-Natura International (PNI) conducted a biodiversity expedition in 2014–2015. It was supported by the European Regional Development Fund (ERDF/FEDER), Fonds Shell, Région Guyane, Conseil Général de la Guyane, Direction de l'Environnement, de l'Aménagement et du Logement (DEAL), and Direction Régionale de la Recherche et de la Technologie (DRRT). The expedition operated under permit APA-973-1 from Région Guyane to MNHN.

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Direct contributors to this monograph include Yuri Kantor of the IEE RAS for the magnificent images of mangeliid radular teeth, and Philippe Maestrati for the photographs of live specimens that illuminate the animal in a more natural form.

A museum collection loan of significant importance to this research came from John Slapsinsky of the FLMNH, for the loan of Harry Lee's Florida collection of 285 lots. These Florida mangeliids, sourced from various habitats, were initially identified by Harry Lee, with some of the more unusual specimens coming from scallop dumps and fish stomachs, leading to a wide representation of Florida mangeliids. Additionally, Harry Lee received 'mystery' specimens from farther afield, sent to challenge his well-regarded taxonomic expertise, resulting in a collection rich in undescribed and uncommon species.

Privately held collections provided another source of new species from widely separated areas. The large number of gastropods from deep water off La Désirade, Guadeloupe, loaned by Dominique Lamy, significantly contributed to the species count for that region. Emilio García's collection of mollusks from offshore surveys in the mid to western Gulf of Mexico, conducted over several years, contained a high percentage of new species, showcasing the uniqueness of this family group in the Gulf. His meticulous data recording and cataloging have resulted in one of the finest collections in the area. Emilio García's collecting efforts received support from various Gulf of Mexico research programs, with later initiatives funded by NSF Grants and the "Gulf of Mexico Research Initiative" (GoMRI), backed by British Petroleum.

Shell collectors whose years of SCUBA diving at localities around the Caribbean have brought to light a magnificent variety of mangeliids from reefal habitats. By good fortune, the extensive collections of Gary and Margaret Mackintosh (purchased through Randy Allamand) and of Robert Masino were acquired for this project. Their field notes have preserved the scientific value of their collections. Over the years and many dives, they amassed a rich assemblage that has yielded numerous new mangeliid species, helping expand our understanding of Mangeliidae diversity.

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Two invaluable aids used throughout this work deserve special mention: Malacolog 4.1.1 (Rosenberg 2009) and Catalog of Recent and fossil turrids (Mollusca: Gastropoda) (Tucker 2004). The ANSP database (now only available on the GBIF site) of western Atlantic mollusks was consulted for previously described species of mangeliids, synonymies, citations of original publications, and as the singular source for the inventory of available western Atlantic species names. John Tucker's Catalog was consulted for publications in which a particular taxon appeared, and because of the comprehensiveness of the listing of species names, an aid to avoiding the creation of synonyms when selecting new ones. Both references greatly facilitated this project's research.

Other databases that provided invaluable help in planning museum visits include the FLMNH online database at http://www.flmnh.ufl.edu, the MCZ online database at https://mczbase.mcz.harvard.edu/SpecimenSearch.cfm, and the Smithsonian's online database "The Natural History Web" at https://collections.nmnh.si.edu/search/iz/, which were often consulted during the course of research. Several photographs and species information were taken from the Smithsonian's online collections database.

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Supplementary file

Supp. file 1: Mangeliidae 5 genes alignments. https://doi.org/10.5852/ejt.2026.1089.3320.14580

Appendix 1

Index of specific names

Page number column is the species description or the first mention of other status/action.

Specific name	Genus	Author	Status/action	Page
accinctus	*Murex*	Montagu, 1808	Occupied, *Cryoturris dorvilliae* next available name	176
adamsii	*Pleurotoma* (*Clathurella*)	E.A. Smith, 1884	nomen dubium	503
alba	*Brachycythara*	(C.B. Adams, 1850)		148
albida	*Pleurotoma*	C.B. Adams, 1850	syn. of *Glyphoturris quadrata*	271
albocapitanea	*Kurtziella*	Fallon	sp. nov.	438
albovittata	*Cryptomangelia* Fallon gen. nov.	(C.B. Adams, 1845)	comb. nov.	245
aliceae	*Adelocythara*	Fallon & Bouchet	sp. nov.	61
alpha	*Ithycythara*	Fallon	sp. nov.	363
altaspira	*Ithycythara*	Paulmier, 2019		336
angularis	*Acmaturris*	Fallon & Bouchet	sp. nov.	37
angulata	*Ithycythara*	Fallon & Bouchet	sp. nov.	306
angusta	*Agathotoma*	(Bellardi, 1847)	type of genus, photo only	66
angusta	*Ithycythara*	Fallon	sp. nov.	330
annaclaireleeae	*Acmaturris*	E.F. García, 2008		40
antillensis	*Ithycythara*	Paulmier, 2019		317
antonia	*Benthomangelia*	(Dall, 1881)		139
apocrypha	*Suturocythara*	E.F. García, 2008		548
arawak	*Ithycythara*	Fallon & Bouchet	sp. nov.	309
arubensis	*Tenaturris*	Fallon	sp. nov.	559
asarca	*Bactrocythara*	Dall & Simpson, 1901	syn. of *Bactrocythara candeana*	100
asthenika	*Agathotoma*	Rolán, Fernández-Garcés & Redfern, 2012		78
astricta	*Mangelia*	Reeve, 1846	nomen dubium	225
atrostyla	*Kurtzia*	(Tryon, 1884)	comb. nov.; lectotype designated	395
auberiana	*Ithycythara*	(d'Orbigny, 1853)	lectotype designated	327
aurantiaca	*Ithycythara*	Fallon & Bouchet	sp. nov.	380
aurolineata	*Bathyturris* Fallon gen.nov.	Fallon & Bouchet	sp. nov.	116
badia	*Pleurotoma*	Reeve, 1846	E Pacific species	262
badia	*Cryoturris*	Fallon & Bouchet	sp. nov.	161
bahamense	*Ithycythara*	Fallon	sp. nov.	347
bahiensis	*Ithycythara*	Fallon	sp. nov.	382
balteata	*Mangelia*	Reeve, 1846	syn. of *Ithycythara lanceolata*	343
bandella	*Benthomangelia*	(Dall, 1881)		137

Specific name	Genus	Author	Status/action	Page
barbarae	*Psilocythara* Fallon gen. nov.	(W.G. Lyons, 1972)	comb. nov.	464
bartlettii	*Tenaturris*	(Dall, 1889)	lectotype designated	562
beta	*Ithycythara*	Fallon	sp. nov.	365
bicarinata	*Bathyturris* Fallon gen. nov.	Fallon & Bouchet	sp. nov.	127
bicincta	*Acmaturris*	Fallon & Bouchet	sp. nov.	31
bicingulata	*Saccharoturris*	Fallon & Bouchet	sp. nov.	519
biconica	*Brachycythara*	(C.B. Adams, 1850)		145
biconica	*Ithycythara*	Fallon & Bouchet	sp. nov.	301
bouillantensis	*Adelocythara*	Fallon & Bouchet	sp. nov.	47
brachytera	*Bactrocythara*	Fallon & Bouchet	sp. nov.	103
brasiliensis	*Rubellatoma*	Fallon	sp. nov.	503
brevis	*Rubellatoma*	Fallon & Bouchet	sp. nov.	514
brevis	*Cryptomangelia* Fallon gen. nov.	(C.B. Adams, 1845)	comb. nov.	251
brevissima	*Acmaturris*	Fallon & Bouchet	sp. nov.	29
brisis	*Acmaturris*	Woodring, 1928	fossil, photo only	28
brisseti	*Ithycythara*	Fallon & Bouchet	sp. nov.	376
brunnea	*Pleurotoma*	Perkins, 1869	syn. of *Cryptomangelia plicosa*	255
brychia	*Rhomboturris* Fallon gen. nov.	Fallon & Bouchet	sp. nov.	491
bugeae	*Ithycythara*	Fallon & Bouchet	sp. nov.	298
callomoni	*Tenaturris*	Fallon	sp. nov.	565
canaliculata	*Mandiana* Fallon gen. nov.	Fallon & Bouchet	sp. nov.	457
candeana	*Bactrocythara*	(d'Orbigny, 1853)		100
candidissima	*Agathotoma*	(C.B. Adams, 1845)		70
caquetio	*Adelocythara*	Fallon	sp. nov.	60
caretensis	*Adelocythara*	Fallon & Bouchet	sp. nov.	50
caribaea	*Cryptomangelia* Fallon gen. nov.	(d'Orbigny, 1853)	syn. of *Cryptomangelia cinctella*	226
caribbeana	*Kurtziella*	Weisbord, 1962	syn. of *Cryoturris dorvilliae*	176
castanea	*Cryptomangelia* Fallon gen. nov.	Fallon	sp. nov.	246
castanea	*Rubellatoma*	Fallon	sp. nov.	508
castellata	*Agathotoma*	(E.A. Smith, 1888)		92
cedarkeysarum	*Kurtzia*	Fallon	sp. nov.	405
cerina	*Kurtziella*	(J.D. Kurtz & W. Stimpson, 1851)	lectotype designated	417
cerinella	*Cryoturris*	(Dall, 1889)	lectotype designated	213
ceroplasta	*Kurtzia*	(K.J. Bush, 1885)	comb. nov.	398
chechoi	*Ithycythara*	Espinosa & Ortea, 2004		340

Specific name	Genus	Author	Status/action	Page
chordata	*Bactrocythara*	Fallon & Bouchet	sp. nov.	108
cinctella	*Cryptomangelia* Fallon gen. nov.	(L. Pfeiffer, 1840)	comb. nov.	226
cingulata	*Kurtziella*	Fallon	sp. nov.	426
citronella	*Pleurotoma*	(Dall, 1886)	original drawing only	128
clathrata	*Ithycythara*	Fallon	sp. nov.	356
clausa	*Bathyturris* Fallon gen. nov.	Fallon & Bouchet	sp. nov.	119
cledonida	*Columbella*	Duclos, 1846	nomen dubium in *Glyphoturris*	270
cocta	*Ithycythara*	Fallon	sp. nov.	341
colombiana	*Cryptomangelia* Fallon gen. nov.	Fallon	sp. nov.	244
comparata	*Acmaturris*	Woodring, 1928	fossil, photo only	27
condita	*Ithycythara*	Fallon & Bouchet	sp. nov.	320
coniculus	*Tenaturris*	Fallon & Bouchet	sp. nov.	575
corbariae	*Rhomboturris* Fallon gen. nov.	Fallon & Bouchet	sp. nov.	492
costata	*Pleurotoma*	Reeve, 1845	syn. of *Pyrgocythara. trilineata*	476
coxi	*Pyrgocythara*	Fargo, 1953	fossil	70
crassicostata	*Mangelia*	(C.B. Adams, 1850)	syn. of *Cryptomangelia fusca*	262
cruzana	*Cryoturris*	Nowell-Usticke, 1969	syn. of *Glyphoturris quadrata*	272
cuna	*Ithycythara*	Fallon	sp. nov.	371
curacaoensis	*Acmaturris*	Fallon	sp. nov.	33
curiosa	*Ithycythara*	Fallon	sp. nov.	321
cymella	*Habrocythara* Fallon gen. nov.	(Dall, 1889)	comb. nov.	284
decolora	*Ithycythara*	Fallon	sp. nov.	384
decora	*Pleurotoma*	E.A. Smith, 1882	syn. of *Pyrgocythara trilineata*	476
delannoyi	*Kurtziella*	Fallon & Bouchet	sp. nov.	419
delicata	*Kurtzia*	Fallon	sp. nov.	410
delicatior	*Cryoturris*	Fallon & Bouchet	sp. nov.	187
densestriata	*Mangelia*	C.B. Adams, 1850	syn. of *Agathotoma candidissima*	70
deseada	*Bathyturris* Fallon gen. nov.	Fallon & Bouchet	sp. nov.	117
diminuta	*Pleurotoma*	C.B. Adams, 1845	syn. of *Glyphoturris quadrata*	272
diomedea	*Rubellatoma*	Bartsch & Rehder, 1939		500
diomedeae	*Pleurotoma*	A.E.Verrill & Smith in A.E. Verrill, 1884	syn. of *Benthomangelia bandella*	137
discors	*Stellatoma*	Fallon	sp. nov.	537
dorvilliae	*Pleurotoma*	Reeve, 1845	next available name for *Murex accinctus*	176
dubia	*Agathotoma*	(C.B. Adams, 1845)		69

Specific name	Genus	Author	Status/action	Page
dysoni	*Tenaturris*	(Reeve, 1846a)	lectotype designated	572
eburnea	*Ithycythara*	Paulmier, 2019		318
eburnea	*Cryoturris*	Fallon & Bouchet	sp. nov.	165
ecthymata	*Agathotoma*	E.F. García, 2008		81
edithae	*Rubellatoma*	(Nowell-Usticke, 1971)	comb. nov.	512
edonida	*Columbella*	Duclos, 1848	nomen dubium in *Cryptomangelia*, photo	270
eduardoi	*Agathotoma*	Rolán, Fernández-Garcés & Redfern, 2012		86
elata	*Pyrgocythara*	(Dall, 1889)	comb. nov.	484
eleutherae	*Cryptomangelia* Fallon gen. nov.	Fallon	sp. nov.	231
ellenstrongae	*Ithycythara*	Fallon & Bouchet	sp. nov.	302
emeryi	*Pyrgocythara*	Fargo, 1953	fossil only	4
eminula	*Pyrgocythara*	Woodring, 1928	fossil, photo only	480
enceladus	*Benthomangelia*	Figueira & Absalão, 2010		138
ephamila	*Mangilia*	K.J. Bush, 1885	syn. of *Kurtzia atrostyla*	395
eritima	*Glyphoturris*	(K.J. Bush, 1885)		270
espresso	*Cryptomangelia* Fallon gen. nov.	Fallon	sp. nov.	233
fargoi	*Cryoturris*	McGinty, 1955		193
fasciata	*Ithycythara*	Paulmier, 2019	syn. of *Ithycythara lanceolata*	343
fassioae	*Vitricythara*	Fallon & Bouchet	sp. nov.	593
fenestrata	*Pyrgostrata*	Fallon & Bouchet	sp. nov.	480
filosa	*Cryptomangelia* Fallon gen. nov.	(Rehder, 1943)	comb. nov.	259
finlayae	*Tenaturris*	Fallon	sp. nov.	557
flammea	*Ithycythara*	Fallon & Bouchet	sp. nov.	314
flavobrunnea	*Stellatoma*	Fallon	sp. nov.	534
flavolineata	*Kurtziella*	Fallon	sp. nov.	443
flemingkeyensis	*Ithycythara*	Fallon	sp. nov.	354
floridensis	*Bactrocythara*	Fallon	sp. nov.	112
formosa	*Vitricythara*	Fallon & Bouchet	sp. nov.	587
forthiensis	*Pleurotoma*	Reeve, 1845	syn. of *Cryoturris dorvilliae*	176
fulgens	*Cryptomangelia* Fallon gen. nov.	(E.A. Smith, 1888)	comb. nov.	248
fulvofasciata	*Ithycythara*	Fallon & Bouchet	sp. nov.	312
furva	*Cryptomangelia* Fallon gen. nov.	Fallon & Bouchet	sp. nov.	228
fusca	*Cryptomangelia* Fallon gen. nov.	(C.B. Adams, 1845)	comb. nov.	262

Specific name	Genus	Author	Status/action	Page
fusiformis	*Pleurotoma*	C.B. Adams, 1850	syn. of *Glyphoturris quadrata*	272
fusiformis	*Ithycythara*	Fallon	sp. nov.	337
galindoae	*Ithycythara*	Fallon & Bouchet	sp. nov.	331
garciai	*Kurtzina*	Fallon	sp. nov.	451
guadalupensis	*Suturocythara*	(Espinosa & Ortea, 2017)	comb. nov.	543
guadeloupensis	*Brachycythara*	Fallon & Bouchet	sp. nov.	150
guarani	*Cryptomangelia* Fallon gen. nov.	(d'Orbigny, 1841)	comb. nov.	239
guarapari	*Kurtziella*	Fallon	sp. nov.	434
guianensis	*Ithycythara*	Fallon & Bouchet	sp. nov.	377
gypsata	*Ithycythara*	Fallon	sp. nov.	359
hastata	*Ithycythara*	Fallon & Bouchet	sp. nov.	316
hemphilli	*Stellatoma*	(Bartsch & Rehder, 1939)	comb. nov.	532
herosae	*Kurtzia*	Fallon & Bouchet	sp. nov.	400
hewittae	*Ithycythara*	Fallon	sp. nov.	319
hexagonum	*Pleurotoma*	L. Pfeiffer, 1840	nomen dubium	67
hieui	*Agathotoma*	Fallon & Bouchet	sp. nov.	80
hirschi	*Kurtziella*	Fallon	sp. nov.	647
holimanae	*Cryoturris*	Fallon	sp. nov.	203
hondurasensis	*Rubellatoma*	Fallon	sp. nov.	504
hornbeckii	*Mangelia*	Reeve, 1846	syn. of *Agathotoma candidissima*	70
hyacinthina	*Ithycythara*	Fallon	sp. nov.	357
hyperlepta	*Ithycythara*	F. Haas, 1953		383
ignota	*Glyphoturris*	Fallon	sp. nov.	279
incincta	*Pleurotoma*	R.B. Watson, 1881	syn. of *Benthomangelia antonia*	139
inepta	*Tenaturris*	(E.A. Smith, 1882)		555
innocens	*Mangelia*	Thiele, 1925	syn. of *Benthomangelia antonia*	139
inornata	*Agathotoma*	Fallon & Bouchet	sp. nov.	87
intercedens	*Kurtziella*	(Melvill, 1923)		422
isabelensis	*Adelocythara*	Fallon	sp. nov.	62
jewetti	*Clathurella*	Stearns, 1873	syn. of *Cryptomangelia plicosa*	255
juliocesari	*Acmaturris*	Fernández-Garcés & Rolán, 2010		40
kalina	*Kurtziella*	Fallon & Bouchet	sp. nov.	435
kellumi	*Ithycythara*	Fargo, 1953	fossil, syn. of *Ithycythara psila*	350
kantori	*Rhomboturris* Fallon gen. nov.	Fallon & Bouchet	sp. nov.	490
kirshi	*Agathotoma*	Rolán, Fernández-Garcés & Redfern, 2012	syn. of *Agathotoma millestriata*	95
krisbergi	*Stellatoma*	Fallon	sp. nov.	530

Specific name	Genus	Author	Status/action	Page
laciniata	*Ithycythara*	Fallon	sp. nov.	352
lactea	*Ithycythara*	Fallon	sp. nov.	362
laminata	*Glyphoturris*	Fallon	sp. nov.	280
lamyi	*Ithycythara*	Fallon & Bouchet	sp. nov.	307
lanceolata	*Ithycythara*	(C.B. Adams, 1850)		343
laqueata	*Pleurotoma*	Reeve, 1846a	nomen dubium	225
lavalleana	*Vitricythara*	(d'Orbigny, 1853)		591
legallae	*Agathotoma*	Fallon & Bouchet	sp. nov.	73
lilliputae	*Ithycythara*	Fallon	sp. nov.	369
limonitella	*Kurtziella*	(Dall, 1884)	lectotype designated	427
lineata	*Acmaturris*	Fallon & Bouchet	sp. nov.	36
lizae	*Cryoturris*	Fallon	sp. nov.	172
longa	*Kurtziella*	Nowell-Usticke, 1969	syn. of *Cryoturris dorvilliae*	176
luciae	*Stellatoma*	Fallon	sp. nov.	527
luteofasciata	*Pleurotoma*	Reeve, 1845	nomen dubium	245
maestratii	*Cryoturris*	Fallon & Bouchet	sp. nov.	163
magnini	*Vitricythara*	Fallon & Bouchet	sp. nov.	594
mairelae	*Acmaturris*	Fernández-Garcés & Rolán, 2010		41
major	*Saccharoturris*	Fallon & Bouchet	sp. nov.	520
margaritifera	*Kurtzia*	(Fargo, 1953)	comb. nov.	407
marissae	*Vitricythara*	Fallon	sp. nov.	584
maryae	*Tenaturris*	Fallon	sp. nov.	566
mellosa	*Cryptomangelia* Fallon gen. nov.	Fallon & Bouchet	sp. nov.	236
mericiacum	*Pleurotoma*	Locard, 1897	syn. of *Benthomangelia antonia*	139
metria	*Vitricythara*	(Dall, 1903)		583
micromeris	*Vitricythara*	(Dall, 1903)		586
militaris	*Tenaturris*	Fallon & Bouchet	sp. nov.	578
millestriata	*Agathotoma*	(E.A. Smith, 1882)	lectotype designated	95
minima	*Suturocythara*	Fallon & Bouchet	sp. nov.	549
minor	*Kurtziella*	Fallon & Bouchet	sp. nov.	432
monocingulata	*Saccharoturris*	(Dall, 1889)		516
moratensis	*Ithycythara*	Fallon	sp. nov.	373
multicincta	*Psilocythara* Fallon gen. nov.	(Rolán & Espinosa, 1999)	comb. nov.	469
multilineata	*Cryptomangelia* Fallon gen. nov.	(C.B. Adams, 1845)	comb. nov.	261
muricoides	*Mangelia*	C.B. Adams, 1850	syn. of *Icthycythara lanceolata*	343
nana	*Kurtziella*	Fallon	sp. nov.	446

Specific name	Genus	Author	Status/action	Page
nanodes	*Cryptomangelia* Fallon gen. nov.	(Melvill, 1923)	comb. nov.	253
nivea	*Rubellatoma*	Fallon & Bouchet	sp. nov.	510
nodosa	*Rubellatoma*	Fallon & Bouchet	sp. nov.	509
obesicostata	*Pleurotoma*	Reeve, 1846a	syn. of *Cryptomangelia guarani*	239
obtusa	*Bactrocythara*	(Guppy, 1896)		102
olsoni	*Cryoturris*	Fallon & Bouchet	sp. nov.	181
oriens	*Kurtziella*	Fallon	sp. nov.	429
padolina	*Granoturris*	Fargo, 1953	fossil	155
parkeri	*Ithycythara*	Abbott, 1958		324
parva	*Habrocythara* Fallon gen. nov.	Fallon & Bouchet	sp. nov.	289
peggywilliamsae	*Agathotoma*	Fallon	sp. nov.	75
pelicanus	*Acmaturris*	E.F. García, 2008		42
pelican	*Cryoturris*	Fallon	sp. nov.	198
perryae	*Kurtziella*	Bartsch & Rehder, 1939		437
plicata	*Pleurotoma*	C.B. Adams, 1840	name replaced by *C. plicosa*	255
plicosa	*Cryptomangelia* Fallon gen. nov.	(C.B. Adams, 1850)	comb. nov.	255
portlouisensis	*Adelocythara*	Fallon & Bouchet	sp. nov.	48
portoricana	*Tenaturris*	Fallon	sp. nov.	558
presleyi	*Cryoturris*	(W.G. Lyons, 1972)	comb. nov.	209
primolevis	*Adelocythara*	Woodring, 1928	fossil, type of genus, photo only	52
procera	*Cryoturris*	Fallon & Bouchet	sp. nov.	190
profunda	*Tenaturris*	Fallon & Bouchet	sp. nov.	569
prominens	*Agathotoma*	Rolán, Fernández-Garcés & Redfern, 2012		90
pruvosti	*Bactrocythara*	Fallon & Bouchet	sp. nov.	107
psila	*Ithycythara*	(K.J. Bush, 1885)		350
psylla	*Cryptomangelia* Fallon gen. nov.	Fallon & Bouchet	sp. nov.	230
puillandrei	*Benthomangelia*	Fallon & Bouchet	sp. nov.	135
pulchella	*Cryptomangelia*	Fallon & Bouchet	sp. nov.	243
pulchra	*Habrocythara* Fallon gen. nov.	Fallon & Bouchet	sp. nov.	288
pulex	*Stellatoma*	Fallon	sp. nov.	531
pumila	*Cryptomangelia* Fallon gen. nov.	Fallon & Bouchet	sp. nov.	237
quadrata	*Glyphoturris*	(Reeve, 1845)		271
quadrilineata	*Cryoturris*	(C.B. Adams, 1850)	syn. of *C. dorvilliae*	176
rapa	*Cryoturris*	Fallon & Bouchet	sp. nov.	173
rarior	*Kurtziella*	Fallon & Bouchet	sp. nov.	441

Specific name	Genus	Author	Status/action	Page
redferni	*Suturocythara*	E.F. García, 2008		547
redferni	*Cryoturris*	Fallon & Bouchet	sp. nov.	184
rhodostoma	*Bathyturris* Fallon gen. nov.	Fallon & Bouchet	sp. nov.	129
roatanensis	*Psilocythara* Fallon gen. nov.	Fallon	sp. nov.	465
robusta	*Cryoturris*	Fallon & Bouchet	sp. nov.	188
rotunda	*Ithycythara*	Fallon	sp. nov.	370
rubella	*Rubellatoma*	(J.D. Kurtz & W. Stimpson, 1851)		499
rubricata	*Pleurotoma*	Reeve, 1846a	nomen dubium	298
rugirima	*Glyphoturris*	(Dall, 1889)		276
sagena	*Daphnella*?	Dall, 1927	Raphitomidae?	28
santacatalina	*Ithycythara*	Fallon	sp. nov.	372
saopaulensis	*Ithycythara*	Fallon	sp. nov.	387
scissa	*Ithycythara*	Woodring, 1928	fossil, no photo	509
seizovae	*Cryoturris*	Fallon	sp. nov.	208
septentrionalis	*Cryoturris*	Fallon	sp. nov.	195
serga	*Bathyturris* Fallon gen. nov.	(Dall, 1881)	comb. nov.	124
serta	*Cryoturris*	Fargo, 1953	fossil, photo only	203
simplex	*Cryoturris*	Fallon & Bouchet	sp. nov.	171
simplicis	*Ithycythara*	Fallon	sp. nov.	389
singularis	*Bactrocythara*	Fallon	sp. nov.	106
slapcinskyi	*Cryoturris*	Fallon & Bouchet	sp. nov.	217
solata	*Bathyturris* Fallon gen. nov.	Fallon	sp. nov.	120
stellae	*Tenaturris*	Fallon	sp. nov.	567
stellata	*Stellatoma*	(Stearns, 1872)		524
subtilis	*Pyrgocythara*	(R.B. Watson, 1881)	comb. nov.	475
sucina	*Psilocythara* Fallon gen. nov.	Fallon & Bouchet	sp. nov.	468
sudamericana	*Kurtzia*	Fallon & Bouchet	sp. nov.	401
texana	*Kurtzina*	Fallon	sp. nov.	449
texana	*Cryoturris*	Fallon	sp. nov.	197
tortugana	*Cryoturris*	Fallon	sp. nov.	202
tricincta	*Acmaturris*	Fallon & Bouchet	sp. nov.	32
trifasciata	*Pleurotoma*	Reeve, 1845	syn. of *Pyrgocythara trilineata*	476
trilineata	*Pyrgocythara*	(C.B. Adams, 1845)	comb. nov.	476
troyolsoni	*Adelocythara*	Fallon	sp. nov.	63
unid. sp. 1d	*Adelocythara*		unid. sp.	51
unid. sp. 1e	*Adelocythara*		unid. sp.	54
unid. sp. 1f	*Adelocythara*		unid. sp.	55

Specific name	Genus	Author	Status/action	Page
unid. sp. 1g	*Adelocythara*		unid. sp.	55
unid. sp. 1h	*Adelocythara*		unid. sp.	58
unid. sp. 6	*Cryptomangelia* Fallon gen. nov.		unid. sp.	228
unid. sp. A	*Bathyturris* Fallon gen. nov.		unid. sp.	132
unid. sp. A	*Benthomangelia*		unid. sp.	142
unid. sp. A	*Cryoturris*		unid. sp.	212
unid. sp. A	*Cryptomangelia* Fallon gen. nov.		unid. sp.	264
unid. sp. A	*Ithycythara*		unid. sp.	356
unid. sp. A	*Kurtzia*		unid. sp.	413
unid. sp. A	*Kurtziella*		unid. sp.	442
unid. sp. B	*Cryoturris*		unid. sp.	212
unid. sp. B	*Kurtziella*		unid. sp.	442
unid. sp. C	*Cryoturris*		unid. sp.	220
unid. sp. C	*Ithycythara*		unid. sp.	368
unid. sp. D	*Cryoturris*		unid. sp.	221
unid. sp. D	*Cryptomangelia* Fallon gen. nov.		unid. sp.	265
unid. sp. E	*Cryoturris*		unid. sp.	205
unid. sp. E	*Cryptomangelia* Fallon gen. nov.		unid. sp.	264
unid. sp. F	*Cryoturris*		unid. sp.	220
unid. sp. G	*Cryptomangelia* Fallon gen. nov.		unid. sp.	266
unid. sp. G	*Cryoturris*		unid. sp.	211
unid. sp. H	*Cryptomangelia* Fallon gen. nov.		unid. sp.	265
unid. sp. I	*Cryptomangelia* Fallon gen. nov.		unid. sp.	264
unid. sp. J	*Cryptomangelia* Fallon gen. nov.		unid. sp.	252
unid. sp. K	*Cryptomangelia* Fallon gen. nov.		unid. sp.	254
unid. sp. K	*Stellatoma*		unid. sp.	538
unid. sp. L	*Cryptomangelia* Fallon gen. nov.		unid. sp.	250
unid. sp. L	*Ithycythara*		unid. sp.	310
unid. sp. L	*Stellatoma*		unid. sp.	539
unid. sp. M	*Cryptomangelia* Fallon gen. nov.		unid. sp.	266
unid. sp. M	*Ithycythara*		unid. sp.	350
unid. sp. M	*Stellatoma*		unid. sp.	539

Specific name	Genus	Author	Status/action	Page
unid. sp. N	*Cryptomangelia* Fallon gen. nov.		unid. sp.	252
unid. sp. N	*Ithycythara*		unid. sp.	388
unid. sp. N	*Stellatoma*		unid. sp.	539
unid. sp. O	*Cryptomangelia* Fallon gen. nov.		unid. sp.	268
unid. sp. O	*Ithycythara*		unid. sp.	368
unid. sp. O	*Stellatoma*		unid. sp.	540
unid. sp. P	*Ithycythara*		unid. sp.	342
unid. sp. P	*Stellatoma*		unid. sp.	542
unid. sp. Q	*Ithycythara*		unid. sp.	381
unid. sp. Q	*Tenaturris*		unid. sp.	579
unid. sp. R	*Ithycythara*		unid. sp.	382
unid. sp. R	*Tenaturris*		unid. sp.	579
unid. sp. S	*Ithycythara*		unid. sp.	348
unid. sp. S	*Tenaturris*		unid. sp.	580
unid. sp. T	*Ithycythara*		unid. sp.	349
unid. sp. T	*Tenaturris*		unid. sp.	580
unid. sp. U	*Ithycythara*		unid. sp.	349
unid. sp. U	*Pyrgocythara*		unid. sp.	482
unid, sp. U	*Tenaturris*		unid. sp.	580
unid. sp. V	*Ithycythara*		unid. sp.	342
usitata	*Cryoturris*	Fallon & Bouchet	sp. nov.	168
variabilis	*Ithycythara*	Fallon & Bouchet	sp. nov.	325
venezuelana	*Kurtzina*	(Weisbord, 1962)	comb. nov.	454
versicolor	*Psilocythara* Fallon gen. nov.	Fallon & Bouchet	sp. nov.	466
vicina	*Cryptomangelia* Fallon gen. nov.	(C.B. Adams, 1850)	comb. nov.	260
vincula	*Kurtziella*	Nowell-Usticke, 1969		421
violet	*Agathotoma*	Fallon & Bouchet	sp. nov.	84
vitrea	*Rubellatoma*	Fallon	sp. nov.	505
vitrea	*Mandiana* Fallon gen. nov.	Fallon & Bouchet	sp. nov.	459
voluta	*Cryoturris*	Fallon	sp. nov.	180
whitneyae	*Ithycythara*	Fallon	sp. nov.	335
xalvisae	*Kurtzia*	Fallon	sp. nov.	408
youloumani	*Adelocythara*	Fallon	sp. nov.	59

Appendix 2

Key to Genera

This key is designed to help identify a specimen's genus. It is not a traditional dichotomous key that typically ends in the identification of a single possibility, since too many subjective or detailed selection criteria would be necessary, any one of which could lead to the wrong choice or require a time-consuming examination. Instead, this key has five separate parts, each based on a different character or pair of characters, any of which will lead to a subset of genera. Choosing a second character will usually result in a smaller subset, a third a smaller yet. Whichever group or groups are chosen (protoconch, varix, axial and spiral sculpture, surface texture, or shell form) a quick microscopic examination will be an advantage.

1. **Protoconch**
    a. 2¼–3¾ whorls, first whorl minute
        i. *Bactrocythara* (2½–3)
        ii. *Bathyturris* (3–3½, microscopic spikes on riblets)
        iii. *Benthomangelia* (3–3¾)
        iv. *Cryoturris* (2¼–3)
        v. *Glyphoturris* (2¼–3¼)
        vi. *Ithycythara* (2¼–3½)
        vii. *Pyrgocythara* (3–3½)
        viii. *Rhomboturris* (3–3¼)
        ix. *Rubellatoma* (2¼–3; first angled)
        x. *Saccharoturris* (3, last whorl w/beaded carina)
        xi. *Vitricythara* (2½–3½)
    b. 2½–3½ last whorl with 3–4 rows of 'beads'
        i. *Kurtzia* (2½–3¼)
        ii. *Kurtziella* (2–3½)
        iii. *Kurtzina* (3)
        iv. *Psilocythara* (2½–3)
    c. 1–2½ whorls, tip large (not much smaller than last whorl)
        i. *Acmaturris* (1 ⅞–2½)
        ii. *Adelocytharis* (1¼–2)
        iii. *Agathotoma* (1–2½; papillose under SEM)
        iv. *Ithycythara* (1½; *I. curiosa* Fallon sp. nov., *I. chechoi* and *I. bahamense* Fallon sp. nov.)
        v. *Mandiana* (1 ⅞–2; last whorl dimpled)
        vi. *Stellatoma* (1¼–1½)
        vii. *Suturocythara* (1–2¼; first whorl protruding)
        viii. *Tenaturris* (1½–2½; papillose with SEM)

d. 1–2½ whorls, tip minute (much smaller than last whorl)
    i. *Brachycythara* (1½–2¼)
    ii. *Cryptomangelia* (1¼–2½, rarely 3; carina on last ½ whorl)
    iii. *Habrocythara* (1½–2½)
    iv. *Ithycythara*
    v. *Saccharoturris* (1½–2½, beaded carina)

2. **Varix and anal sinus**
    a. Varix absent, no dentition in aperture
        i. *Benthomangelia* (sinus shallow, width of shoulder)
        ii. *Cryoturris*
        iii. *Kurtziella*
        iv. *Kurtzina*
        v. *Rhomboturris*
        vi. *Saccharoturris* (shallow sinus)
    b. Varix apertural, strong to moderately strong, crenated by strong spirals
        i. *Vitricythara*
        ii. *Bathyturris*
    c. Varix apertural, sinus laterally directed
        i. *Acmaturris* (crenated, sinus wide)
        ii. *Adelocythara* (crenated, sinus wide)
        iii. *Agathotoma* (crenated, sinus shallow to deep)
        iv. *Mandiana* (sinus deep)
        v. *Suturocythara* (crenated, narrow notch in varix)
    d. Varix apertural, a strengthened rib, anal sinus shallow
        i. *Cryptomangelia* (sinus with an anal tooth)
        ii. *Glyphoturris*
        iii. *Rubellatoma*
        iv. *Stellatoma*
    e. Varix apertural, weak (only a little stronger than preceding rib)
        i. *Bactrocythara*
        ii. *Brachycythara*
        iii. *Habrocythara*
        iv. *Ithycythara*
        v. *Kurtzia*
        vi. *Psilocythara*
        vii. *Pyrgocythara*
        viii. *Tenaturris*

3. **Sculpture: axials (spirals)**
    a. Ribs narrow
        i. *Bactrocythara* (ribs hook-shaped on shoulder)
        ii. *Ithycythara* (ribs, usually 6, aligned whorl-to-whorl)
        iii. *Pyrgocythara* (like a basket weave with strong spirals)
        iv. *Habrocythara* (no spirals)
    b. Ribs and spirals subequal, appear lattice-like on shell surface
        i. *Bathyturris*
        ii. *Acmaturris*
        iii. *Vitricythara*
        iv. *Rhomboturris* (axials crossed by flattened spirals)
    c. Ribs moderate (fine or moderately strong spirals)
        i. *Adelocythara* (spirals strong, numerous)
        ii. *Mandiana* (ribs broad, spiral uniform)
        iii. *Psilocythara*
        iv. *Rubellatoma* (flattened spirals)
        v. *Suturocythara*
    d. Ribs strong
        i. *Agathotoma* (no primary spirals; ribs gathered on ant. fasciole)
        ii. *Brachycythara* (numerous)
        iii. *Cryptomangelia* (rise above suture)
        iv. *Glyphoturris*
        v. *Kurtzia*
        vi. *Kurtzina*
        vii. *Saccharoturris* (narrow, not broad)
        viii. *Stellatoma* (spirals usually flattened)
    e. Ribs weak, nodulose at periphery
        i. *Benthomangelia*
        ii. *Kurtziella* (end at subsutural band of spirals)
    f. Ribs various: narrow to broad
        i. *Cryoturris*
4. **Surface texture**
    a. Frosted
        i. *Acmaturris*
        ii. *Adelocythara*
        iii. *Agathotoma*
        iv. *Bathyturris*
        v. *Cryoturris*
        vi. *Glyphoturris* (heavy)
        vii. *Kurtzia*
        viii. *Kurtziella*
        ix. *Kurtzina*
        x. *Saccharoturris* (heavy)

b. Smooth: glossy or dull
    i. *Bactrocythara*
    ii. *Benthomangelia*
    iii. *Brachycythara*
    iv. *Cryptomangelia*
    v. *Ithycythara*
    vi. *Mandiana*
    vii. *Psilocythara*
    viii. *Rubellatoma*
    ix. *Stellatoma*
    x. *Suturocythara*
    xi. *Tenaturris*

c. Smooth: translucent
    i. *Mandiana* (translucent)
    ii. *Habrocythara* (translucent)
    iii. *Ithycythara* (translucent)
    iv. *Pyrgocythara*
    v. *Rhomboturris*
    vi. *Vitricythara*

5. **Shell form and anterior canal**

a. Fusiform, canal short
    i. *Acmaturris* (short)
    ii. *Agathotoma* (strongly shouldered)
    iii. *Bactrocythara* (gradual taper to canal)
    iv. *Bathyturris*
    v. *Kurtziella*
    vi. *Kurtzina* (large body whorl)
    vii. *Mandiana*
    viii. *Pyrgocythara* (whorls turreted or subangulate)
    ix. *Rubellatoma* (short)

b. Fusiform (whorls angled about mid-whorl), canal moderately long
    i. *Acmaturris* (some species)
    ii. *Ithycythara*
    iii. *Kurtzia*
    iv. *Rubellatoma*
    v. *Saccharoturris* (strongly constricted whorls)

c. Turreted (whorls angled above mid-whorl), canal moderately long
    i. *Acmaturris* (some species)
    ii. *Benthomangelia*
    iii. *Rhomboturris*
    iv. *Vitricythara*

d. Spindle-shaped, canal long
    i. *Habrocythara*
e. Stocky, canal short
    i. *Adelocythara*
    ii. *Cryptomangelia*
    iii. *Glyphoturris*
f. Biconic
    i. *Brachycythara*
    ii. *Psilocythara*
    iii. *Stellatoma*
    iv. *Tenaturris*
    v. *Cryoturris*; *Ithycythara*; *Kurtzina* (a few species)
g. Cylindrical, anterior canal short
    i. *Suturocythara* (shoulders rise above sutures)

Appendix 3

BOLD and GenBank accession numbers.

Taxon	Accession N°	BOLD	COI	16S	12S	28S	H3
TWA Mangeliidae							
Adelocythara bouillantensis Fallon & Bouchet sp. nov.	IM-2013-20569	CONO5325-24	PP941150	–	PP941567	PP941497	–
Adelocythara cartensis Fallon & Bouchet sp. nov.	IM-2013-20570	CONO5300-24	PP941160	PP941315	PP941572	PP941501	PP941417
Adelocythara cartensis Fallon & Bouchet sp. nov.	IM-2013-20571	CONO5245-24	PP941296	PP941396	PP941649	PP941546	PP941487
Adelocythara cartensis Fallon & Bouchet sp. nov.	IM-2013-20622	CONO5257-24	PP941133	–	PP941557	PP941491	PP941403
Adelocythara cartensis Fallon & Bouchet sp. nov.	IM-2013-20646	CONO5313-24	PP941291	–	–	–	–
Adelocythara portlouisensis Fallon & Bouchet sp. nov.	IM-2013-20558	CONO5324-24	PP941275	PP941389	PP941642	PP941541	PP941480
Adelocythara portlouisensis Fallon & Bouchet sp. nov.	IM-2013-20651	CONO5274-24	PP941168	PP941318	PP941575	PP941502	–
Adelocythara portlouisensis Fallon & Bouchet sp. nov.	IM-2013-20666	CONO5282-24	PP941237	–	–	–	–
Agathotoma asthenika Rolán, Fernández-Garcés & Redfern, 2012	IM-2013-20618	CONO5308-24	PP941172	PP941320	PP941577	PP941504	PP941421
Agathotoma asthenika Rolán, Fernández-Garcés & Redfern, 2012	IM-2013-20623	CONO5258-24	PP941186	PP941330	PP941587	PP941507	PP941429
Agathotoma asthenika Rolán, Fernández-Garcés & Redfern, 2012	IM-2013-20624	CONO5259-24	PP941226	PP941359	PP941615	PP941525	PP941453
Agathotoma asthenika Rolán, Fernández-Garcés & Redfern, 2012	IM-2013-20642	CONO5271-24	PP941147	–	–	–	–
Agathotoma asthenika Rolán, Fernández-Garcés & Redfern, 2012	IM-2013-20655	CONO5316-24	PP941216	–	–	–	–

Taxon	Accession N°	BOLD	COI	16S	12S	28S	H3
Agathotoma asthenika Rolán, Fernández-Garcés & Redfern, 2012	IM-2013-20656	CONO5332-24	PP941177	–	–	–	–
Agathotoma asthenika Rolán, Fernández-Garcés & Redfern, 2012	IM-2013-20668	CONO5284-24	PP941283	–	–	–	–
Agathotoma asthenika Rolán, Fernández-Garcés & Redfern, 2012	IM-2013-20670	CONO5285-24	PP941276	–	–	–	–
Agathotoma asthenika Rolán, Fernández-Garcés & Redfern, 2012	IM-2013-70344	CONO5353-24	PP941202	–	–	–	–
Agathotoma candidissima (C.B. Adams, 1845)	IM-2013-20599	CONO5248-24	PP941154	PP941313	PP941570	PP941499	PP941415
Agathotoma candidissima (C.B. Adams, 1845)	IM-2013-20620	CONO5309-24	PP941282	–	–	–	–
Agathotoma candidissima (C.B. Adams, 1845)	IM-2013-20673	CONO5320-24	PP941268	–	–	–	–
Agathotoma candidissima (C.B. Adams, 1845)	IM-2013-20678	CONO5290-24	PP941155	–	–	–	–
Agathotoma candidissima (C.B. Adams, 1845)	IM-2013-70919	CONO5385-24	PP941248	–	–	–	–
Agathotoma candidissima (C.B. Adams, 1845)	IM-2013-7815	CONO5235-24	PP941191	PP941334	PP941591	PP941511	PP941433
Agathotoma candidissima (C.B. Adams, 1845)	IM-2013-8031	CONO5295-24	PP941194	PP941337	PP941594	PP941514	PP941436
Agathotoma castellata (E.A. Smith, 1888)	IM-2013-20557	CONO5239-24	PP941176	PP941323	PP941580	PP941505	PP941424
Agathotoma castellata (E.A. Smith, 1888)	IM-2013-20601	CONO5249-24	PP941231	PP941362	PP941618	PP941529	PP941457
Agathotoma castellata (E.A. Smith, 1888)	IM-2013-20631	CONO5329-24	PP941220	PP941357	PP941612	PP941523	PP941452
Agathotoma castellata (E.A. Smith, 1888)	IM-2013-20641	CONO5270-24	PP941175	–	–	–	–
Agathotoma castellata (E.A. Smith, 1888)	IM-2013-20662	CONO5318-24	PP941169	–	–	–	–
Agathotoma castellata (E.A. Smith, 1888)	IM-2013-20663	CONO5281-24	PP941137	–	–	–	–

Taxon	Accession N°	BOLD	COI	16S	12S	28S	H3
Agathotoma castellata (E.A. Smith, 1888)	IM-2013-20667	CONO5283-24	PP941159	–	–	–	–
Agathotoma castellata (E.A. Smith, 1888)	IM-2013-70525	CONO5365-24	PP941277	–	–	–	–
Agathotoma ecthymata E.F. García, 2008	IM-2013-70515	CONO5382-24	PP941215	PP941352	PP941607	PP941520	PP941447
Agathotoma legallae Fallon & Bouchet sp. nov.	IM-2013-20604	CONO5250-24	PP941204	PP941342	PP941598	PP941516	PP941440
Agathotoma legallae Fallon & Bouchet sp. nov.	IM-2013-20611	CONO5252-24	PP941214	PP941350	PP941605	PP941519	PP941446
Agathotoma prominens Rolán, Fernández-Garcés & Redfern, 2012	IM-2013-20296	CONO5237-24	PP941294	PP941395	PP941648	PP941545	PP941486
Agathotoma prominens Rolán, Fernández-Garcés & Redfern, 2012	IM-2013-20561	CONO5241-24	PP941138	PP941303	PP941559	PP941493	PP941405
Agathotoma prominens Rolán, Fernández-Garcés & Redfern, 2012	IM-2013-20562	CONO5242-24	PP941258	PP941377	PP941631	PP941537	PP941470
Agathotoma prominens Rolán, Fernández-Garcés & Redfern, 2012	IM-2013-20606	CONO5305-24	PP941295	–	–	–	–
Agathotoma prominens Rolán, Fernández-Garcés & Redfern, 2012	IM-2013-20615	CONO5307-24	PP941206	–	–	–	–
Agathotoma prominens Rolán, Fernández-Garcés & Redfern, 2012	IM-2013-20616	CONO5254-24	PP941166	–	–	–	–
Agathotoma prominens Rolán, Fernández-Garcés & Redfern, 2012	IM-2013-20617	CONO5255-24	PP941249	–	–	–	–
Agathotoma prominens Rolán, Fernández-Garcés & Redfern, 2012	IM-2013-20652	CONO5315-24	PP941167	–	–	–	–
Agathotoma prominens Rolán, Fernández-Garcés & Redfern, 2012	IM-2013-20653	CONO5275-24	PP941158	–	–	–	–
Agathotoma prominens Rolán, Fernández-Garcés & Redfern, 2012	IM-2013-71053	CONO5386-24	PP941279	–	–	–	–

Taxon	Accession N°	BOLD	COI	16S	12S	28S	H3
Agathotoma prominens Rolán, Fernández-Garcés & Redfern, 2012	IM-2013-71054	CONO5387-24	PP941223	–	–	–	–
Agathotoma prominens Rolán, Fernández-Garcés & Redfern, 2012	IM-2013-71055	CONO5393-24	PP941200	–	–	–	–
Agathotoma prominens Rolán, Fernández-Garcés & Redfern, 2012	IM-2013-71407	CONO5366-24	PP941274	–	–	–	–
Agathotoma prominens Rolán, Fernández-Garcés & Redfern, 2012	IM-2013-72634	CONO5401-24	PP941261	–	–	–	–
Agathotoma violet Fallon & Bouchet sp. nov.	IM-2013-70250	CONO5364-24	PP941131	PP941300	PP941555	PP941489	PP941401
Agathotoma violet Fallon & Bouchet sp. nov.	IM-2013-70251	CONO5363-24	PP941245	–	–	–	–
Agathotoma violet Fallon & Bouchet sp. nov.	IM-2013-70268	CONO5397-24	PP941144	PP941307	PP941563	PP941495	PP941409
Agathotoma violet Fallon & Bouchet sp. nov.	IM-2013-71500	CONO5352-24	PP941234	–	–	–	–
Agathotoma violet Fallon & Bouchet sp. nov.	IM-2013-72240	CONO5400-24	PP941230	–	PP941617	PP941528	PP941456
Benthomangelia puillandrei Fallon & Bouchet sp. nov.	IM-2013-60808	CONO5347-24	PP941233	PP941363	PP941619	PP941530	PP941458
Brachycythara alba (C.B. Adams, 1850)	IM-2013-20647	CONO5273-24	PP941187	PP941331	PP941588	PP941508	PP941430
Brachycythara biconica (C.B. Adams, 1850)	IM-2013-20630	CONO5264-24	PP941256	PP941375	PP941630	PP941536	PP941468
Cryoturris badia Fallon & Bouchet sp. nov.	IM-2013-20627	CONO5261-24	PP941266	PP941384	PP941637	–	–
Cryoturris dorvilliae (Reeve, 1845)	IM-2013-20671	CONO5286-24	PP941287	PP941392	PP941645	PP941542	PP941483
Cryoturris dorvilliae (Reeve, 1845)	IM-2013-70600	CONO5391-24	PP941228	PP941360	–	PP941526	PP941454
Cryoturris maestratii Fallon & Bouchet sp. nov.	IM-2013-70918	CONO5396-24	PP941290	PP941394	PP941647	PP941544	PP941485
Cryoturris maestratii Fallon & Bouchet sp. nov.	IM-2013-71936	CONO5358-24	PP941289	PP941393	PP941646	PP941543	PP941484

Taxon	Accession N°	BOLD	COI	16S	12S	28S	H3
Cryoturris procera Fallon & Bouchet sp. nov.	IM-2013-8059	CONO5296-24	PP941219	PP941356	PP941611	–	PP941451
Cryoturris redferni Fallon & Bouchet sp. nov.	IM-2013-20590	CONO5246-24	PP941127	PP941297	PP941550	–	PP941398
Cryoturris redferni Fallon & Bouchet sp. nov.	IM-2013-20619	CONO5327-24	PP941197	PP941338	–	–	PP941437
Cryoturris redferni Fallon & Bouchet sp. nov.	IM-2013-20675	CONO5288-24	PP941174	PP941322	PP941579	–	PP941423
Cryoturris redferni Fallon & Bouchet sp. nov.	IM-2013-72675	CONO5356-24	PP941232	–	–	–	–
Cryoturris redferni Fallon & Bouchet sp. nov.	IM-2013-72793	CONO5357-24	PP941236	–	–	–	–
Cryoturris simplex Fallon & Bouchet sp. nov.	IM-2013-9122	CONO5321-24	PP941165	PP941317	PP941574	–	PP941419
Cryoturris usitata Fallon & Bouchet sp. nov.	IM-2013-20252	CONO5292-24	PP941161	–	–	–	–
Cryoturris usitata Fallon & Bouchet sp. nov.	IM-2013-20329	CONO5298-24	PP941193	PP941336	PP941593	PP941513	PP941435
Cryoturris usitata Fallon & Bouchet sp. nov.	IM-2013-20664	CONO5333-24	PP941178	–	–	–	–
Cryoturris usitata Fallon & Bouchet sp. nov.	IM-2013-20676	CONO5289-24	PP941281	–	–	–	–
Cryoturris usitata Fallon & Bouchet sp. nov.	IM-2013-9256	CONO5236-24	PP941132	PP941301	PP941556	PP941490	PP941402
Cryptomangelia furva Fallon & Bouchet gen. et sp. nov.	IM-2013-20632	CONO5265-24	PP941217	PP941353	PP941608	–	PP941448
Cryptomangelia furva Fallon & Bouchet gen. et sp. nov.	IM-2013-20638	CONO5269-24	PP941143	PP941306	PP941562	–	PP941408
Cryptomangelia guarani (d'Orbigny, 1841) gen. et comb. nov.	IM-2013-72855	CONO5378-24	PP941139	PP941304	PP941560	–	PP941406
Cryptomangelia guarani (d'Orbigny, 1841) gen. et comb. nov.	IM-2013-72866	CONO5379-24	PP941185	PP941329	PP941586	PP941506	PP941428
Cryptomangelia guarani (d'Orbigny, 1841) gen. et comb. nov.	IM-2013-72867	CONO5377-24	PP941129	PP941299	PP941554	PP941488	PP941400

Taxon	Accession N°	BOLD	COI	16S	12S	28S	H3
Cryptomangelia guarani (d'Orbigny, 1841) gen. et comb. nov.	IM-2013-72868	CONO5398-24	PP941286	–	–	–	–
Cryptomangelia guarani (d'Orbigny, 1841) gen. et comb. nov.	IM-2013-72869	CONO5399-24	PP941288	–	–	–	–
Cryptomangelia Fallon gen. nov. unid. sp. 6	IM-2013-20600	CONO5303-24	PP941146	PP941309	PP941565	–	PP941411
Glyphoturris quadrata (Reeve, 1845)	IM-2013-20605	CONO5251-24	PP941199	PP941341	PP941597	–	PP941439
Glyphoturris quadrata (Reeve, 1845)	IM-2013-20635	CONO5267-24	PP941163	PP941316	PP941573	–	PP941418
Glyphoturris quadrata (Reeve, 1845)	IM-2013-20636	CONO5268-24	PP941195	–	–	–	–
Glyphoturris quadrata (Reeve, 1845)	IM-2013-7715	CONO5293-24	PP941250	PP941371	PP941626	–	PP941464
Glyphoturris rugirima (Dall, 1889)	IM-2013-20612	CONO5306-24	PP941212	PP941348	PP941603	–	PP941445
Glyphoturris rugirima (Dall, 1889)	IM-2013-20644	CONO5272-24	PP941128	PP941298	PP941551	–	PP941399
Glyphoturris rugirima (Dall, 1889)	IM-2013-20657	CONO5277-24	PP941284	PP941391	PP941644	–	PP941482
Glyphoturris rugirima (Dall, 1889)	IM-2013-20669	CONO5319-24	PP941164	–	–	–	–
Glyphoturris rugirima (Dall, 1889)	IM-2013-70237	CONO5350-24	PP941170	–	–	–	–
Glyphoturris rugirima (Dall, 1889)	IM-2013-70238	CONO5368-24	PP941189	–	–	–	–
Glyphoturris rugirima (Dall, 1889)	IM-2013-70239	CONO5394-24	PP941135	–	–	–	–
Glyphoturris rugirima (Dall, 1889)	IM-2013-70289	CONO5349-24	PP941156	–	–	–	–
Glyphoturris rugirima (Dall, 1889)	IM-2013-71431	CONO5361-24	PP941252	–	–	–	–
Glyphoturris rugirima (Dall, 1889)	IM-2013-71807	CONO5371-24	PP941222	–	–	–	–
Glyphoturris rugirima (Dall, 1889)	IM-2013-71808	CONO5395-24	PP941292	–	–	–	–

Taxon	Accession N°	BOLD	COI	16S	12S	28S	H3
Glyphoturris rugirima (Dall, 1889)	IM-2013-71809	CONO5370-24	PP941141	–	–	–	–
Glyphoturris rugirima (Dall, 1889)	IM-2013-71810	CONO5369-24	PP941157	–	–	–	–
Glyphoturris rugirima (Dall, 1889)	IM-2013-73176	CONO5351-24	PP941183	–	–	–	–
Habrocythara parva Fallon & Bouchet gen. et sp. nov.	IM-2013-20603	CONO5304-24	PP941180	PP941325	PP941582	–	–
Habrocythara pulchra Fallon & Bouchet gen. et sp. nov.	IM-2013-60417	CONO5346-24	PP941271	PP941387	PP941640	–	PP941478
Ithycythara arawak Fallon & Bouchet sp. nov.	IM-2013-20634	CONO5310-24	PP941272	PP941388	PP941641	–	PP941479
Ithycythara unid. sp. L.	IM-2013-20658	CONO5317-24	PP941181	PP941326	PP941583	–	–
Ithycythara condita Fallon & Bouchet sp. nov.	IM-2013-20626	CONO5260-24	PP941145	PP941308	PP941564	–	PP941410
Ithycythara flammea Fallon & Bouchet sp. nov.	IM-2013-20289	CONO5297-24	PP941264	PP941382	PP941635	–	PP941474
Ithycythara flammea Fallon & Bouchet sp. nov.	IM-2013-74626	CONO5359-24	PP941182	PP941327	PP941584	–	PP941426
Ithycythara galindoae Fallon & Bouchet sp. nov.	IM-2013-20674	CONO5287-24	PP941265	PP941383	PP941636	–	PP941475
Kurtzia ceroplasta (K.J. Bush, 1885) comb. nov.	IM-2013-20614	CONO5253-24	PP941240	PP941366	PP941621	–	PP941460
Kurtzia ceroplasta (K.J. Bush, 1885) comb. nov.	IM-2013-20654	CONO5276-24	PP941208	PP941345	PP941601	–	PP941443
Kurtzia ceroplasta (K.J. Bush, 1885) comb. nov.	IM-2013-70921	CONO5390-24	PP941263	PP941381	PP941634	–	PP941473
Kurtzia ceroplasta (K.J. Bush, 1885) comb. nov.	IM-2013-72671	CONO5373-24	PP941225	–	–	–	–
Kurtzia sudamericana Fallon & Bouchet sp. nov.	IM-2013-56920	CONO5339-24	PP941173	PP941321	PP941578	–	PP941422
Kurtzia sudamericana Fallon & Bouchet sp. nov.	IM-2013-57403	CONO5342-24	PP941257	PP941376	–	–	PP941469

Taxon	Accession N°	BOLD	COI	16S	12S	28S	H3
Kurtzia sudamericana Fallon & Bouchet sp. nov.	IM-2013-57404	CONO5343-24	PP941280	PP941390	PP941643	–	PP941481
Kurtzia sudamericana Fallon & Bouchet sp. nov.	IM-2013-57408	CONO5345-24	PP941134	–	–	–	–
Kurtziella cerina (J.D. Kurtz & W. Stimpson, 1851)	USNM: IZ:1446138		MK308316	–	–	–	–
Kurtziella cerina (J.D. Kurtz & W. Stimpson, 1851)	USNM: IZ:1463473		MH235820	–	–	–	–
Kurtziella cerina (J.D. Kurtz & W. Stimpson, 1851)	USNM: IZ:1463474		MH235868	–	–	–	–
Kurtziella cerina (J.D. Kurtz & W. Stimpson, 1851)	USNM: IZ:1463475		MH235840	–	–	–	–
Kurtziella cerina (J.D. Kurtz & W. Stimpson, 1851)	USNM: IZ:1463503		MH235812	–	–	–	–
Kurtziella delannoyi Fallon & Bouchet sp. nov.	IM-2013-72798	CONO5367-24	PP941260	PP941379	PP941633	–	PP941472
Kurtziella delannoyi Fallon & Bouchet sp. nov.	IM-2013-74657	CONO5388-24	PP941179	PP941324	PP941581	–	PP941425
Kurtzina venezuelana (Weisbord, 1962) comb. nov.	IM-2013-56790	CONO5337-24	PP941151	PP941311	PP941568	–	PP941413
Kurtzina venezuelana (Weisbord, 1962) comb. nov.	IM-2013-56872	CONO5338-24	PP941243	PP941367	PP941622	–	PP941461
Kurtzina venezuelana (Weisbord, 1962) comb. nov.	IM-2013-57407	CONO5344-24	PP941207	PP941344	PP941600	–	PP941442
Mandiana canaliculata Fallon & Bouchet gen. et sp. nov.	IM-2013-70598	CONO5376-24	PP941205	PP941343	PP941599	–	PP941441
Mandiana canaliculata Fallon & Bouchet gen. et sp. nov.	IM-2013-73069	CONO5362-24	PP941267	PP941385	PP941638	–	PP941476
Psilocythara multicincta (Rolán & Espinosa, 1999) gen. et comb. nov.	IM-2013-20597	CONO5302-24	PP941244	PP941369	PP941624	–	PP941462

Taxon	Accession N°	BOLD	COI	16S	12S	28S	H3
Psilocythara multicincta (Rolán & Espinosa, 1999) gen. et comb. nov.	IM-2013-20621	CONO5256-24	PP941235	PP941364	PP941620	–	PP941459
Pyrgocythara fenestrata Fallon & Bouchet sp. nov	IM-2013-20565	CONO5243-24	PP941227	–	–	–	–
Pyrgocythara fenestrata Fallon & Bouchet sp. nov	IM-2013-20591	CONO5301-24	PP941278	–	–	–	–
Pyrgocythara fenestrata Fallon & Bouchet sp. nov	IM-2013-20633	CONO5266-24	PP941126	–	–	–	–
Pyrgocythara fenestrata Fallon & Bouchet sp. nov	IM-2013-20639	CONO5330-24	PP941162	–	–	–	–
Pyrgocythara fenestrata Fallon & Bouchet sp. nov	IM-2013-20648	CONO5331-24	PP941196	–	–	–	–
Pyrgocythara fenestrata Fallon & Bouchet sp. nov	IM-2013-20649	CONO5314-24	PP941209	–	–	–	–
Pyrgocythara plicosa (C.B. Adams, 1850)	USNM: IZ:1446052		MK308244	–	–	–	–
Pyrgocythara trilineata (C.B. Adams, 1845) comb. nov.	IM-2013-20560	CONO5240-24	PP941241	–	–	–	–
Pyrgocythara trilineata (C.B. Adams, 1845) comb. nov.	IM-2013-20568	CONO5244-24	PP941293	–	–	–	–
Pyrgocythara trilineata (C.B. Adams, 1845) comb. nov.	IM-2013-20592	CONO5247-24	PP941218	PP941355	PP941610	PP941522	PP941450
Pyrgocythara trilineata (C.B. Adams, 1845) comb. nov.	IM-2013-20602	CONO5326-24	PP941269	PP941386	PP941639	PP941540	PP941477
Pyrgocythara trilineata (C.B. Adams, 1845) comb. nov.	IM-2013-20659	CONO5278-24	PP941198	PP941340	PP941596	PP941515	PP941438
Pyrgocythara trilineata (C.B. Adams, 1845) comb. nov.	IM-2013-20660	CONO5279-24	PP941238	–	–	–	–
Pyrgocythara trilineata (C.B. Adams, 1845) comb. nov.	IM-2013-20661	CONO5280-24	PP941213	–	–	–	–

Taxon	Accession N°	BOLD	COI	16S	12S	28S	H3
Pyrgocythara trilineata (C.B. Adams, 1845) comb. nov.	IM-2013-20837	CONO5335-24	PP941273	–	–	–	–
Pyrgocythara trilineata (C.B. Adams, 1845) comb. nov.	IM-2013-70265	CONO5381-24	PP941153	–	–	–	–
Pyrgocythara trilineata (C.B. Adams, 1845) comb. nov.	IM-2013-70266	CONO5392-24	PP941221	–	–	–	–
Pyrgocythara trilineata (C.B. Adams, 1845) comb. nov.	IM-2013-70812	CONO5383-24	PP941140	–	–	–	–
Pyrgocythara trilineata (C.B. Adams, 1845) comb. nov.	IM-2013-71485	CONO5380-24	PP941270	–	–	–	–
Rhomboturris kantori Fallon & Bouchet gen. et sp. nov.	IM-2013-56250	CONO5336-24	PP941184	PP941328	PP941585	–	PP941427
Rhomboturris kantori Fallon & Bouchet gen. et sp. nov.	IM-2013-57400	CONO5340-24	PP941285	–	–	–	–
Rhomboturris kantori Fallon & Bouchet gen. et sp. nov.	IM-2013-57402	CONO5341-24	PP941130	–	–	–	–
Suturocythara guadalupensis (Espinosa & Ortea, 2017) comb. nov.	IM-2013-20637	CONO5311-24	PP941171	PP941319	PP941576	PP941503	PP941420
Tenaturris bartlettii (Dall, 1889)	IM-2013-20237	CONO5322-24	PP941239	PP941365	–	PP941531	–
Tenaturris bartlettii (Dall, 1889)	IM-2013-20640	CONO5312-24	PP941247	PP941370	PP941625	PP941532	PP941463
Tenaturris bartlettii (Dall, 1889)	IM-2013-61028	CONO5348-24	PP941262	PP941380	–	PP941539	–
Tenaturris bartlettii (Dall, 1889)	IM-2013-70357	CONO5354-24	PP941246	–	–	–	–
Tenaturris bartlettii (Dall, 1889)	IM-2013-71303	CONO5375-24	PP941148	–	–	–	–
Tenaturris bartlettii (Dall, 1889)	IM-2013-72478	CONO5372-24	PP941203	–	–	–	–
Tenaturris bartlettii (Dall, 1889)	IM-2013-72615	CONO5355-24	PP941201	–	–	–	–
Tenaturris bartlettii (Dall, 1889)	IM-2013-7803	CONO5234-24	PP941210	PP941346	–	PP941517	–
Tenaturris coniculus Fallon & Bouchet sp. nov.	IM-2009-31333	CONO5294-24	PP941224	PP941358	PP941614	PP941524	–

Taxon	Accession N°	BOLD	COI	16S	12S	28S	H3
Tenaturris dysoni (Reeve, 1846a)	IM-2013-20625	CONO5328-24	PP941136	PP941302	PP941558	PP941492	PP941404
Tenaturris dysoni (Reeve, 1846a)	IM-2013-70811	CONO5389-24	PP941255	–	–	–	–
Tenaturris dysoni (Reeve, 1846a)	IM-2013-72284	CONO5384-24	PP941149	PP941310	PP941566	PP941496	PP941412
Tenaturris dysoni (Reeve, 1846a)	IM-2013-72544	CONO5402-24	PP941152	PP941312	PP941569	PP941498	PP941414
Tenaturris militaris Fallon & Bouchet sp. nov.	IM-2013-20628	CONO5262-24	PP941192	PP941335	PP941592	PP941512	PP941434
Tenaturris militaris Fallon & Bouchet sp. nov.	IM-2013-20629	CONO5263-24	PP941142	PP941305	PP941561	PP941494	PP941407
Tenaturris militaris Fallon & Bouchet sp. nov.	IM-2013-20677	CONO5334-24	PP941242	–	–	–	–
Tenaturris militaris Fallon & Bouchet sp. nov.	IM-2013-20679	CONO5291-24	PP941190	PP941333	PP941590	PP941510	PP941432
Vitricythara fassioae Fallon & Bouchet sp. nov.	IM-2013-72929	CONO5360-24	PP941211	PP941347	PP941602	PP941518	PP941444
Vitricythara magnini Fallon & Bouchet sp. nov.	IM-2013-20491	CONO5238-24	PP941188	PP941332	PP941589	PP941509	PP941431
Vitricythara magnini Fallon & Bouchet sp. nov.	IM-2013-20492	CONO5323-24	PP941259	PP941378	PP941632	PP941538	PP941471
Vitricythara magnini Fallon & Bouchet sp. nov.	IM-2013-20493	CONO5299-24	PP941229	PP941361	PP941616	PP941527	PP941455
Vitricythara magnini Fallon & Bouchet sp. nov.	IM-2013-72655	CONO5374-24	PP941125	–	–	–	–
Other Mangeliidae							
Benthomangelia cf. *trophonoidea*	IM-2007-17835	CONO148-08	EU015644.1	HQ401663	HQ401594	EU015528	EU015753
Citharomangelia planilabroides	IM-2007-17896	CONO219-08	EU015670.1	MN320420	MN322387	EU015555	EU015779
Citharomangelia sp.	IM-2007-17866	CONO244-08	EU015688.1	PP941368	PP941623	EU015573	EU015797
Citharomangelia sp.	IM-2007-17874	CONO254-08	EU015696.1	HQ401694	HQ401630	EU015581	EU015805
Eucithara sp.	IM-2007-17899	CONO222-08	EU015673.1	PP941349	PP941604	EU015558	EU015782
Heterocithara sp.	IM-2007-17884	CONO271-08	EU015706.1	HQ401685	HQ401619	EU015591	EU015815
Macteola sp.	IM-2007-17863	CONO234-08	EU015685.1	–	PP941552	EU015570	EU015794
Macteola sp.	IM-2007-17864	CONO240-08	EU015686.1	–	PP941613	EU015571	EU015795
Mangeliidae sp.	IM-2007-17872	CONO252-08	EU015694.1	HQ401695	HQ401631	EU015579	EU015803
Toxicochlespira pagoda	IM-2007-17925	CONO354-08	EU015738.1	HQ401711	HQ401649	EU015623	EU015845
Outgroups							
Cryptodaphne cf. *rugosa*	IM-2007-42473	CONO744-08	PP941254	PP941374	PP941629	PP941535	PP941467
Daphnella sp.	IM-2007-17881	CONO268-08	EU015703.1	PP941351	PP941606	EU015588	EU015812
Daphnella sp.	IM-2007-17927	CONO360-08	EU015740.1	HQ401674	HQ401607	EU015625	EU015847

Taxon	Accession N°	BOLD	COI	16S	12S	28S	H3
Eucyclotoma cymatodes	IM-2007-17903	CONO227-08	EU015678.1	HQ401676	HQ401610	EU015563	EU015787
Hemilienardia calcicincta	IM-2007-17861	CONO232-08	EU015683.1	HQ401684	HQ401618	EU015568	EU015792
Kermia rufolirata	IM-2007-42414	CONO685-08	KC250728.1	PP941354	PP941609	PP941521	PP941449
Pagodibela pacifica	IM-2007-17844	CONO186-08	EU015652.1	MN942687	MN942693	EU015536	EU015760
Pleurotomella sp.	IM-2007-17848	CONO191-08	EU015657.1	HQ401701	HQ401640	EU015541	EU015765
Pseudodaphnella aureotincta	IM-2007-17878	CONO259-08	EU015700.1	HQ401688	HQ401624	EU015585	EU015809
Pseudodaphnella crypta	IM-2007-42597	CONO914-08	KC250675.1	PP941314	PP941571	PP941500	PP941416
Raphitoma sp.	IM-2007-17882	CONO269-08	EU015704.1	PP941339	PP941595	EU015589	EU015813
Raphitoma sp.	IM-2007-17890	CONO279-08	EU015713.1	HQ401703	HQ401642	EU015598	EU015822
Spergo sp.	IM-2007-17841	CONO184-08	EU015650.1	HQ401682	HQ401616	EU015534	EU015759
Teretiopsis cf. *hyalina*	IM-2007-17845	CONO188-08	EU015654.1	HQ401708	HQ401646	EU015538	EU015762
Thatcheria mirabilis	IM-2007-17924	CONO349-08	EU015736.1	FJ868138	FJ868124	EU015621	EU015843
Tritonoturris sp.	IM-2007-17891	CONO280-08	EU015714.1	HQ401712	PP941553	EU015599	EU015823
Tritonoturris sp.	IM-2007-42485	CONO756-08	PP941251	PP941372	PP941627	PP941533	PP941465
Typhlosyrinx supracostata	IM-2009-16822	CONO5233-24	PP941253	PP941373	PP941628	PP941534	PP941466
Veprecula cf. *spanionema*	IM-2007-17883	CONO270-08	EU015705.1	HQ401717	HQ401654	EU015590	EU015814