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Revision of the deep-water cone snail fauna from New Caledonia (Gastropoda, Conoidea)

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Abstract. The present work reviews the deep-water cone fauna of New Caledonia and its Economic Exclusive Zone. It is based on the material collected for more than 40 years by oceanographic expeditions in the deep waters surrounding New Caledonia, organized by the Muséum national d'histoire naturelle-Paris/ORSTOM, then Institut de Recherche pour le Développement, in the framework of the Tropical Deep-Sea Benthos programme. A total of 2377 lots containing 5113 specimens collected at depths between 100 and 1260 m have been examined. About 770 specimens were collected live, and allowed for radular and DNA studies. A phylogenetic analysis, based on the cox1 gene, of the deep-water cone snail fauna of New Caledonia is presented, along with a detailed, fully illustrated taxonomic account with data on geographic and bathymetric distribution and radular morphology. A total of 76 different species of cone snails were identified among the collected material. Of these, 22 corresponded to typical shallow water species, which were most likely translocated into deeper water, whereas 54 could be considered true components of the deep water (below 100 m) cone snail fauna. Species of the genus *Profundiconus* represent 22%, whereas those of the genera *Conasprella* and *Conus* represent 28% and 50%, respectively. Eleven deep water cone species can be considered as endemic to the New Caledonia EEZ, representing 20.3% of the total. The most abundant species found (more than 400 specimens each) were *Conus* (*Afonsoconus*) *bruuni*, *Conasprella* (*Boucheticonus*) *alisi*, *Conasprella* (*Conasprella*) *boucheti*, and *Profundiconus vaubani*. The new species *Conus* (*Taranteconus*) *samadiae* sp. nov. is hereby described.

Keywords. Phylogeny, Conidae, deep water, endemic species, New Caledonia.

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Introduction

Located in the South-West Pacific, at the northern extremity of the mostly submerged Zealandia continent, New Caledonia is home to an incredible array of marine life, including more than 1700 species of fish and 473 species of coral. The New Caledonian Exclusive Economic Zone (EEZ, Fig. 1) covers 1 470 000 km² and includes basins, ridges and seamounts (Staszak *et al.* 2022). The area also boasts one of the world's largest lagoons, and it is home of the world's second largest marine park.

The Institut de Recherche pour le Développement (IRD, formerly ORSTOM) and Muséum national d'histoire naturelle (MNHN) launched in the late 1970s a suite of oceanographic expeditions to sample the deep-water benthos of the tropical South and West Pacific, with emphasis on the 100–1500 m bathymetric zone (Bouchet *et al.* 2008). These scientific activities gave rise to the Tropical Deep-Sea Benthos (TDSB) programme. Thanks to this programme, the molluscs of the New Caledonia EEZ have been thoroughly and periodically sampled during the last 40 years. More than 1000 species of molluscs have been recorded from depths below 100 m. The region shows several discrete areas of micro-endemism, and it is speculated that its deep-sea mollusc fauna amounts to 15 000 to 20 000 species. The molluscan diversity and endemism on New Caledonian seamounts have been particularly well studied (Castelin *et al.* 2010, 2011). The results suggest a higher number of endemic species than previously anticipated, with a smaller geographical scale for most of the analysed species. On the other hand, it has been pointed out that the knowledge of endemism among deep-water species is biased not only by sampling issues, but also by incorrect species delimitation (Castelin *et al.* 2011). More than 40 new species of cone snails have been described based upon material gathered by the TDSB expeditions, most of them deep water species and with restricted geographical ranges. More than a half of these were from

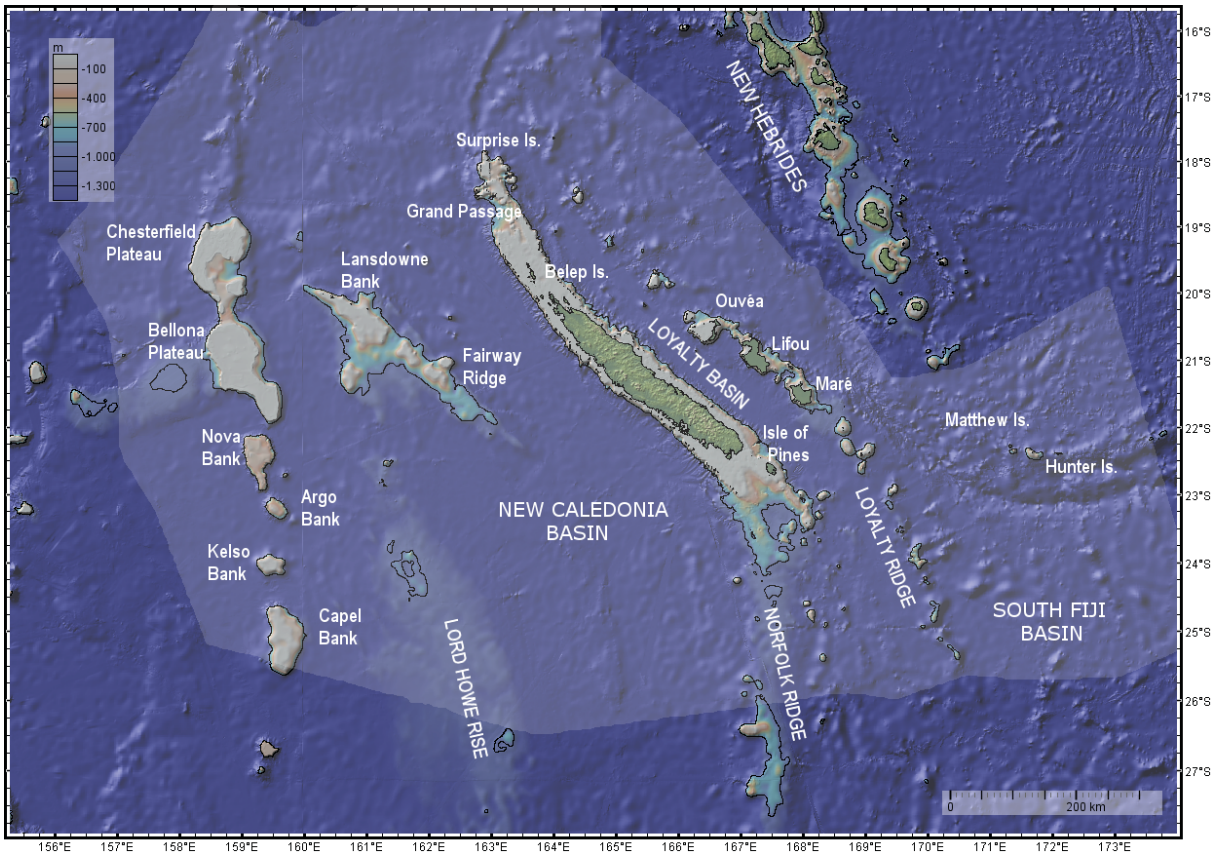

Fig. 1. Map of New Caledonia and its surroundings. The delimitation of the EEZ is represented by the area in a lighter color.

the New Caledonia EEZ, particularly from the seamounts of the Norfolk Ridge, but also from other areas such as the Plateau des Chesterfield in the Coral Sea, and the Grand Passage in the north. The cone snails from New Caledonia were first reviewed in a comprehensive manner by Estival (1981). In this work, the author listed 104 taxon names present in New Caledonia and Vanuatu, plus 8 additional specimens not identified at that time. The great majority of the species included were typical shallow water Indo-Pacific taxa, with reference to only very few specimens obtained from deep water dredgings. Interestingly, most of the figured specimens illustrating deep-water species were actually from the Philippines and not from New Caledonia. With the advent of the TDSB campaigns, the research cruises produced large lots of deep-water cone snails, with exact depth and locality data. The study of these lots revealed an entirely new cone fauna below the 100 m mark. Thus, the decade of the 1980s and the early 1990s was very productive in terms of the discovery of new species of deep-water cone snails from New Caledonia. The deep-water cone fauna from New Caledonia was reviewed in Röckel *et al.* (1995a). In that work, the authors reported 39 species, of which 5 were new to science, and 18 represented significant range extensions. We have now revised all the lots deposited at the MNHN containing cone snails taken by the TDSB expeditions, since their beginnings to the present moment. This represents the study of material collected during more than 40 years of exploration in waters around New Caledonia. Most of the specimens were empty shells, often worn and broken, but showing conchological features allowing for their identification in most cases. There were also some live-collected specimens among the lots, containing the dried animal inside. It was possible to rehydrate many of these specimens, allowing for radular studies which are hereby reported for the first time for many species. In addition to this, the more recent research cruises after the year 2000 were targeting the sampling of live specimens which were preserved for further DNA analyses. As a result, a large number of cone snail specimens has now been sequenced, and we can now provide the first comprehensive phylogenetic study of the New Caledonia deep water cone fauna. The study of this material has led to the discovery of several new species in the genus *Profundiconus* Kuroda, 1956 from this area, which have recently been reported (Tenorio 2015a, 2015b; Tenorio & Castelin 2016). Now we hereby add another new species to the inventory of the New Caledonia deep water cone fauna, namely *Conus* (*Taranteconus*) *samadiae* sp. nov.

In the present work, we provide the results of the phylogenetic analysis on deep water New Caledonian cones, and a taxonomic account of all the deep-water species identified in the lots examined. We were able to identify a total of 76 species, 22 of which were considered well-known shallow water dwellers. The other 54 species are therefore considered the true components of the New Caledonia deep water cone fauna. The taxonomic account is organized by genera and subgenera, and then alphabetically by species. Each record includes information on type material, material examined, geographical distribution and bathymetry, and a series of remarks summarizing the most relevant shell and radula morphological features as well as comments on their phylogenetic relationship to other species. Most species are illustrated showing their phenotypical variability, protoconch and radular teeth. Maps and bathymetric ranges are presented, showing the distribution of the different species in the New Caledonia EEZ. Finally, a detailed list containing the collection data for all of the specimens examined in the present work can be found in Supp. file 1.

Material and methods

Most of the material studied here was previously deposited in institutional repositories (MNHN and others; see abbreviations below). Descriptions and measurements are based on shells oriented in the traditional way: spire up with the aperture facing the viewer. The taxonomy used in the present work follows Tucker & Tenorio (2013), with the updates and modifications included in Puillandre *et al.* (2015). Most specimens studied were collected by dredging in deep water during many campaigns carried out by the MNHN around New Caledonia and in the Coral Sea for more than 40 years within the framework of the Tropical Deep-Sea Benthos (TDSB) program (expeditions.mnhn.fr). Distribution maps were generated with GeoMapApp (http://www.geomapapp.org), using the general bathymetric map of the oceans as a default basemap.

We describe shell morphology using the terminology established in Röckel *et al.* (1995b). We also used the procedure described in Röckel *et al.* (1995b) for counting the number of protoconch whorls.

We used the terminology for radular morphology of Tucker & Tenorio (2009), with the abbreviations in Kohn *et al.* (1999) and Rolán & Raybaudi-Massilia (2002). Specimens of shells containing the dried animal inside were digested in concentrated aqueous KOH for 24 h. The contents were flushed out of the shell by injecting distilled water through the aperture of the shell by means of a syringe with an incurved needle. The resulting mixture was then placed in a Petri dish and examined with the binocular microscope. The entire radula was removed with fine tweezers and rinsed with distilled water, then mounted on a slide using Aquatex (Merck) Mounting Medium and examined under the compound microscope. Photos were obtained with a CCD camera attached to the microscope.

DNA and phylogenetic analyses

Live specimens for DNA studies were either anaesthetised with an isotonic solution of $MgCl_2$ (prior to 2012) or processed with a microwave oven (Galindo *et al.* 2014). Tissue clips were then fixed in 96% ethanol. Specimen data and sequences are deposited in BOLD (Barcode of Life Datasystem) and GenBank (Supp. file 2). DNA was extracted using the Epmotion 5075 robot (Eppendorf), following the manufacturers' recommendations. A fragment of the cytochrome oxidase subunit I (cox1) was amplified using universal primers LCO1490/HCO2198 (Folmer *et al.* 1994). PCR reactions were performed in 25 µl, containing 3 ng of DNA, 1 × reaction buffer, 2.5 mM $MgCl_2$, 0.26 mM dNTP, 0.3 mM of each primer, 5% BSA, and 1.5 units of Qbiogene Q-Bio Taq. Amplification consisted of an initial denaturation step at 94°C for 4 min, followed by 35 cycles of denaturation at 94°C for 30 s, annealing at 50°C, followed by extension at 72°C for 1 min. The final extension was at 72°C for 5 min. PCR products were purified and sequenced by the Eurofins sequencing facility.

Additional sequences from GenBank were included in the dataset (Supp. file 2). As no indels were detected, cox1 sequences were aligned manually. A Bayesian phylogenetic tree (BA) was reconstructed using MrBayes ver. 3.2 (Huelsenbeck *et al*. 2001), with two runs, each consisting of three Markov chains of 10 000 000 generations each, with a sampling frequency of one tree each 1000 generations. Each codon positon of the cox1 gene was treated as an unlinked partition, each following a GTR model, with a gamma-distributed rate variation across sites approximated in four discrete categories and a proportion of invariable sites. Convergence of each analysis was evaluated using Tracer 1.7 (Rambaut *et al.* 2018) to check that ESS values were all greater than 200. A consensus tree was then calculated after omitting the first 25% of trees as burn-in. A phylogenetic Maximum Likelihood (ML) tree was constructed using IQ-TREE ver. 1.6.3 (Nguyen *et al.* 2015), with 1000 ultrafast bootstraps (Minh *et al.* 2013), performed on the IQ-tree server (http://iqtree.cibiv.univie.ac.at/). Each codon position followed its own substitution model, evaluated during the ML analysis.

Abbreviations of museums and institutions

AMS = Australian Museum, Sydney, Australia
ANSP = Academy of Natural Sciences of Philadelphia, USA
CMC = Canterbury Museum, Christchurch, New Zealand
DMNH = Delaware Museum of Natural History, Wilmington, USA
ER = Emilio Rolán reference collection (now at Museo de Historia Natural de la USC, Santiago de Compostela, Spain)
IMT = Institute of Malacology, Tokyo, Japan
KPMY = Kanagawa Prefectural Museum, Yokohama, Japan
LSL = Linnean Society of London, London, UK
MHNG = Muséum d'Histoire Naturelle, Geneva, Switzerland
MJT = Manuel J. Tenorio reference collection, Jerez, Spain
MNHN = Muséum national d'histoire naturelle, Paris, France
NHMD = Natural History Museum of Denmark, Copenhagen, Denmark
NHMUK = Natural History Museum, London, UK
NMSF = Natur-Museum Senckenberg, Frankfurt, Germany

NSMN = Nishinomiya Shell Museum, Nishinomiya, Japan
NSMT = National Science Museum, Tokyo, Japan
THTA = Teramachi Hall, Toba Aquarium, Toba, Japan
TMGS = Taiwan Museum of Geological Science, Taipei, Taiwan
WPMNH = Wakayama Prefectural Museum of Natural History, Kainan, Japan
ZMUC = Zoological Museum, University of Copenhagen (collection now in NHMD), Denmark

Other abbreviations

AP_L = anterior portion length
B_L = blade length
dd = dead
lv = live
PMD = relative position of maximum diameter
RD = relative diameter
RSH = relative spire height
S_L = shell length
T_L = radular tooth length

Results

Phylogeny of deep-water New Caledonian cones

Both the BA and ML trees are highly congruent, especially at the species level, and only the BA tree is presented (Fig. 2, Supp. file 3).

Unsurprisingly, the among-species relationships, and in particular the deeper nodes, are mostly unresolved. However, the three main lineages of cone snails encountered in the deep seas of New Caledonia (*Profundiconus*, *Conus* Linnaeus, 1758 and *Conasprella* Thiele, 1929; Uribe *et al.* 2017; Phuong *et al.* 2019) are recovered, as well as the subgenera within *Conus* and *Conasprella*. All the morphologically recognized species correspond to supported clades (posterior probabilities > 0.95 and bootstraps > 90) or singleton lineages (Fig. 2, Supp. file 3). The only exceptions are within *Profundiconus*, a genus previously recognized as including clearly distinguishable morphospecies, nonetheless separated by very short genetic distances, and even sometimes unrecognizable with the cox1 gene only (Tenorio & Castelin 2016). Indeed, *P. kanakinus* (Richard, 1983), *P. vaubani* (Röckel & Moolenbeek, 1995), and the morphospecies *P.* "white" *vaubani* are mixed within a single clade; conversely, the species *P. neocaledonicus* Tenorio & Castelin, 2016 is split into two non-sister clades (they are paraphyletic, one of them being more closely related to the *P. smirnoides* + *P. teramachii* clade), while other species (*P. smirnoides* Tenorio, 2015, *P. teramachii* (Kuroda, 1956), *P. zardoyai* Tenorio, 2015) are not statistically supported. The new species *C. samadiae* sp. nov., represented by a single sequenced specimen, is sister to the clade *C. chiangi* + *C. polongimarumai*, within the *Taranteconus* clade.

Systematic account

Subclass Caenogastropoda Cox, 1960
Order Neogastropoda Thiele, 1929
Superfamily Conoidea Fleming, 1822
Family Conidae Fleming, 1822
Genus *Profundiconus* Kuroda, 1956

Profundiconus barazeri Tenorio & Castelin, 2016
Figs 2, 3–4

Profundiconus barazeri Tenorio & Castelin, 2016: 25, figs 10, 11a–g, k.

Fig. 2. Cox1-based Bayesian phylogeny. Posterior probabilities (> 0.95) and bootstrap values (>90) from the ML analysis are provided for each node. Intraspecific relationships are collapsed. Subgenus names are indicated on the right.

Profundiconus n. sp. b – Puillandre *et al.* 2014: supplementary material 1 (unfigured).
Profundiconus barazeri – Monnier *et al.* 2018a: 144.

Material examined

25 lots (47 specimens). See Supp. file 1.

Type material

Holotype

NEW CALEDONIA • 11.6 mm; NW Bellona Reef, off New Caledonia, stn DW2564; 20º25′ S, 158º41′ E; 333–386 m depth; 13 Oct. 2005; EBISCO expedition; MNHN-IM-2007-30760. (Fig. 3A, M)

Figured material

NEW CALEDONIA • Paratype 1, 14.5 mm; same collection data as for holotype; MNHN-IM-2007-30924 (Fig. 3B) • 15.6 mm; same collection data as for holotype; MNHN (Fig. 3C) • 18.1 mm; N Bellona, off New Caledonia, stn CP2579; 20º21′ S, 158º40′ E; 440–455 m depth; 14 Oct. 2005; EBISCO expedition; MNHN (Fig. 3D) • 15.4 mm; same collection data as for holotype; MNHN (Fig. 3E) • 22.9 mm; same collection data as for holotype; MNHN (Fig. 3F) • 18.8 mm; N Bellona, off New Caledonia, stn CP2579; 20º21′ S, 158º40′ E; 440–455 m depth; 14 Oct. 2005; EBISCO expedition; MNHN (Fig. 3G) • 22.2 mm; Grand Passage, off New Caledonia, stn DW2980; 18°16′ S, 162°57′E; 574–660 m depth; 4 May 2008; CONCALIS expedition; MNHN (Fig. 3H) • 22.1 mm; Grand Passage, off New Caledonia, stn DW2993; 18º00′ S, 163º02′ E; 700–730 m depth; 6 May 2008; CONCALIS expedition; MNHN (Fig. 3I) • Paratype 4, 10.6 mm; Grand Passage, off New Caledonia, stn DW2985; 18°59′ S, 163°06′ E; 277–289 m depth; 5 May 2008; CONCALIS expedition; MNHN-IM-2000-30792 (Fig. 3J) • 13.4 mm; Grand Passage, off New Caledonia, stn DW3001; 18º32′ S, 163º09′ E; 390–400 m depth; 7 May 2008; CONCALIS expedition; MNHN (Fig. 3K) • Grand Passage, off New Caledonia, stn DW2986; 17º59′ S, 163º05′ E; 270–300 m depth; 5 May 2008; CONCALIS expedition; MNHN (Fig. 3L).

Geographical distribution and bathymetry

Coral Sea (Bellona Plateau and Plateau des Chesterfield) and N New Caledonia, Grand Passage area, typically at depths between 200 and 500 m, but specimens have been sampled from 700 m and beyond (Fig. 4). This species can be considered endemic.

Remarks

Shell very small (maximum length 16.5 mm). Protoconch white, porcellaneous, with 1.5 whorls (Fig. 3L). *Profundiconus barazeri* resembles in general aspect a small specimen of *Boucheticonus alisi* (Moolenbeek, Röckel & Richard, 1995) (Fig. 22, see below), but they are easily separable because the latter has a multispiral protoconch with a characteristic brown blotch. Radular tooth (Fig. 3M) rather large. Anterior portion of tooth much shorter than posterior section. Barb and pointed, well-defined blade, which covers 48–61% of apical portion of tooth. External cusp present, laterally widened and serrated, with 7–9 small denticles. Characteristic fringe of closely spaced projections pointing towards the apex located immediately below waist. Shaft fold present. Large and prominent basal spur on top of slanted base of tooth. In the phylogenetic tree (Fig. 2), *P. barazeri* appears sister to *Profundiconus estivali*. Specimens from two separate populations are known: from NW Bellona Reef, Plateau des Chesterfield (type locality), and from the Grand Passage area. Individuals from each of the populations exhibit distinctive shell patterns, but only those from the Coral Sea have been studied using DNA (Fig. 2). For the moment, we consider both populations conspecific.

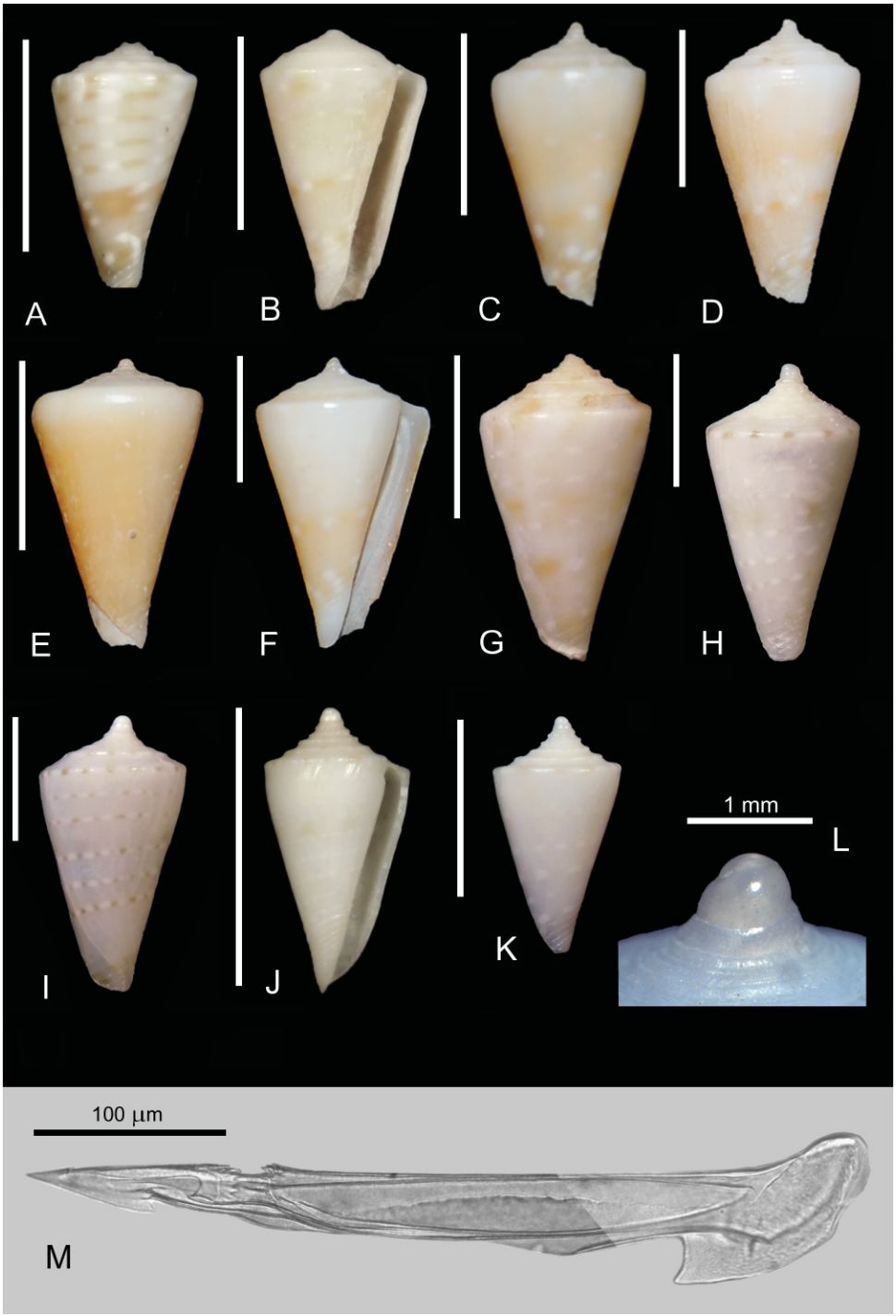

Fig. 3. *Profundiconus barazeri* Tenorio & Castelin, 2016. **A**. Holotype, NW Bellona Reef, Plateau des Chesterfield, 333–386 m depth, 11.6 mm (MNHN-IM-2007-30760). **B**. Paratype, same locality as specimen A, 14.5 mm (MNHN-IM-2007-30924). **C**. Same locality as specimen A, 15.6 mm. **D**. N Bellona, Plateau des Chesterfield, 440–455 m depth, 18.1 mm. **E**. Same locality as specimen A, 15.4 mm. **F**. Same locality as specimen A, 22.9 mm. **G**. Same locality as specimen D, 18.8 mm. **H**. Grand Passage, 574–660 m depth, 22.2 mm. **I**. Grand Passage, 700–730 m depth, 22.1 mm. **J**. Paratype, Grand Passage, 277–289 m depth, 10.6 mm (MNHN-IM-2000-30792). **K**. Grand Passage, 390–400 m depth, 13.4 mm. **L**. Protoconch of specimen from Grand Passage, 270–300 m depth. **M**. Radular tooth of the holotype, specimen A. Scale bars = 10 mm, unless otherwise stated.

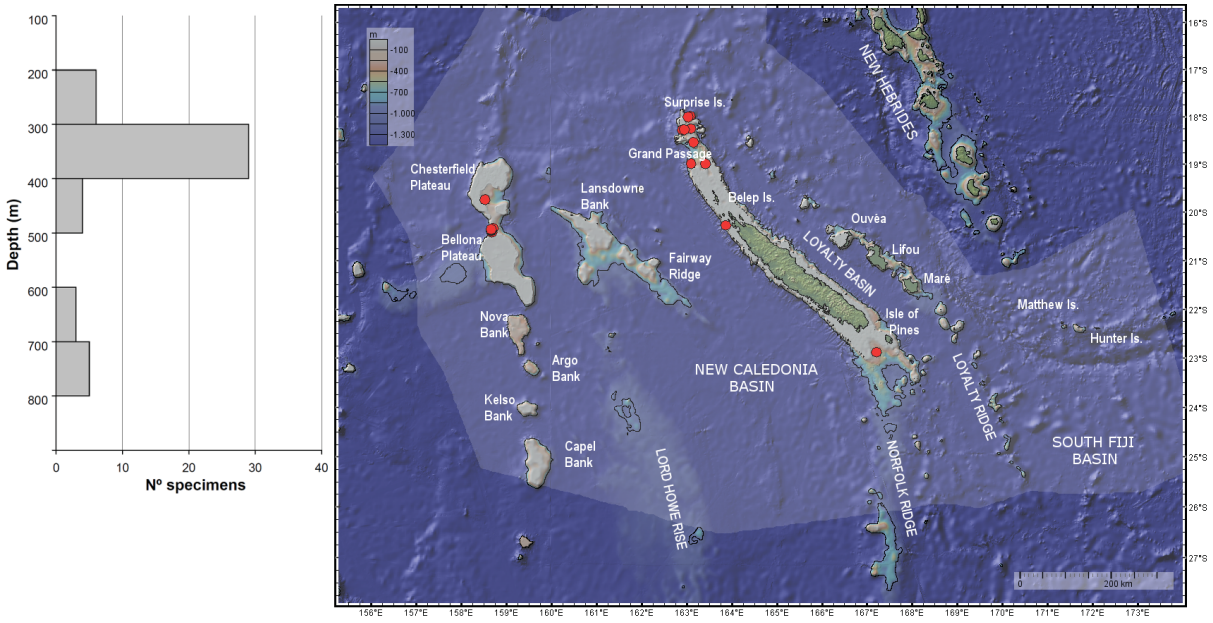

Fig. 4. Bathymetric range and distribution map for *Profundiconus barazeri* Tenorio & Castelin, 2016. Red circles indicate the points where the species was collected.

Profundiconus estivali (Röckel, Richard & Moolenbeek, 1995) comb. nov.
Figs 2, 5A–E, N, 6

Conus estivali Röckel *et al*., 1995a: 571, figs 6–7.

Conus species no. 22 – Röckel *et al.* 1995b: pl. 72 figs 26–27.
Continuconus estivali – Tucker & Tenorio 2013: 181. — Monnier *et al.* 2018a: 327.

Material examined

5 lots (5 specimens). See Supp. file 1.

Type material

Holotype

NEW CALEDONIA • 10.5 mm; Coral Sea, Plateau des Chesterfield, off New Caledonia, stn DC361; 19º52′ S, 158º38′ E; 400 m depth; 19 Oct. 1986; MUSORSTOM 5 expedition; MNHN-IM2000-2566 (Fig. 5A).

Figured material

NEW CALEDONIA • 11 mm; Plateau des Chesterfield, off New Caledonia, stn DW5040; 19°57′ S, 158°43′ E; 350–350 m depth; 22 Sep. 2017; KANADEEP expedition; MNHN-IM-2013-48166 (Fig. 5B) • Paratype, 12 mm; Coral Sea, Plateau des Chesterfield, off New Caledonia, stn DC378; 19º53′ S, 158º38′ E; 355 m depth; 20 Oct. 1986; MUSORSTOM 5 expedition; MNHN-IM-2000-2565 (Fig. 5C) • Paratype, 12.2 mm; same collection data as for the preceding specimen; MNHN-IM-2000-2565 (Fig. 5D) • Paratype, 12 mm; Coral Sea, Plateau des Chesterfield, off New Caledonia, stn DC379; 19º53′ S, 158º39′ E; 370–400 m depth; 20 Oct. 1986; MUSORSTOM 5 expedition; MNHN-IM-2000-2564 (Fig. 5E).

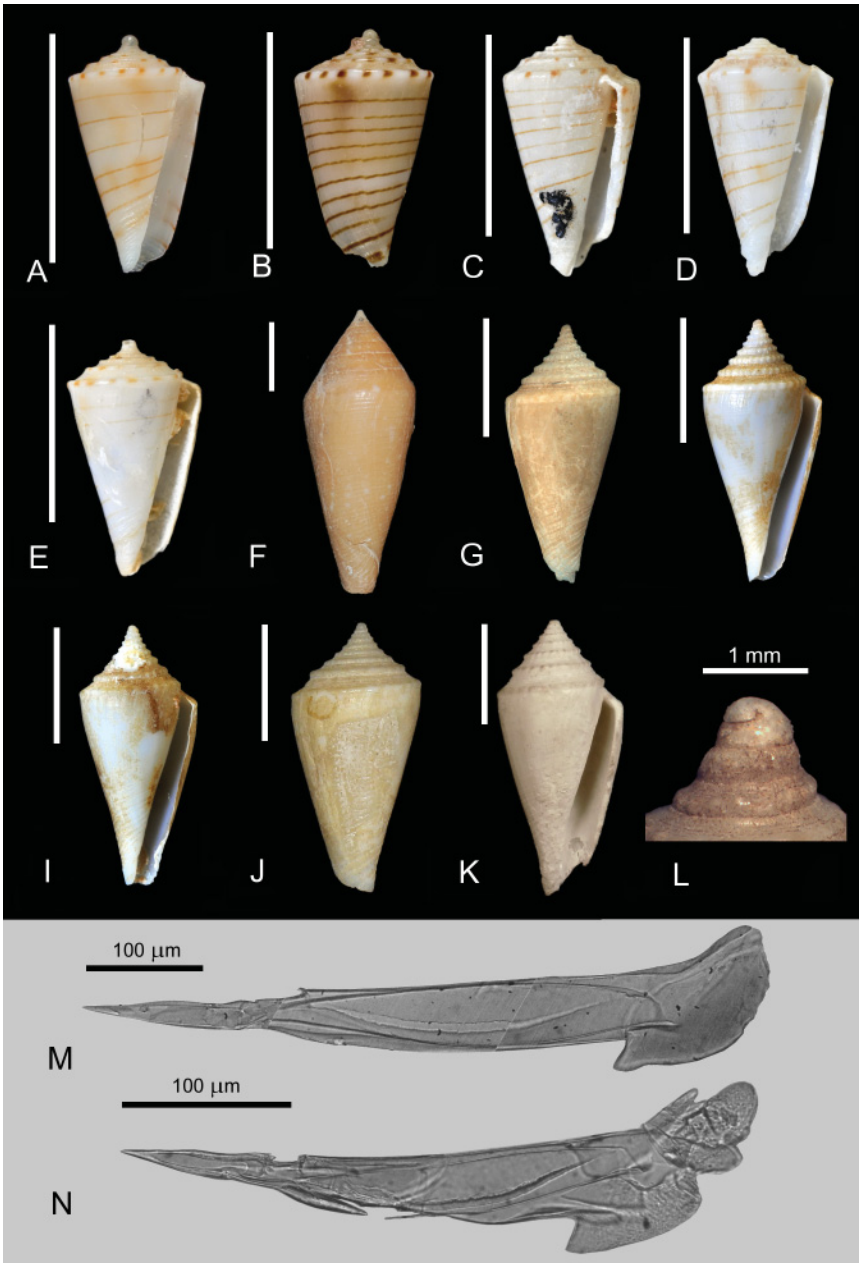

Fig. 5. A–E. *Profundiconus estivali* (Röckel, Richard & Moolenbeek, 1995). **A**. Holotype, Coral Sea, Plateau des Chesterfield, 400 m depth, 10.5 mm (MNHN-IM-2000-2566). **B**. Coral Sea, Plateau des Chesterfield, 350–350 m depth, 11 mm (MNHN-IM-2013-48166). **C**. Paratype, Coral Sea, Plateau des Chesterfield, 355 m depth, 12 mm (MNHN-IM-2000-2565). **D**. Paratype, Coral Sea, Plateau des Chesterfield, 355 m depth, 12.2 mm (MNHN-IM-2000-2565). **E**. Paratype, Coral Sea, Plateau des Chesterfield, 370–400 m depth, 12 mm (MNHN-M-2000-2564). – **F**. *Profundiconus lani* (Crandall, 1979), Loyalty Basin, off New Caledonia, 310–315 m depth, 41.2 mm. – **G–M**. *Profundiconus loyaltiensis* (Röckel & Moolenbeek, 1995). **G**. Holotype, Loyalty Ridge, Lifou, E of Cap de Pins, 480–495 m depth, 21.8 mm (MNHN-IM-2000-2545). **H**. Paratype, Loyalty Ridge, Lifou, E Cap de Pins, 530–575 m depth, 21 mm (MNHN-IM-2000-2544). **I**. Paratype, Loyalty Ridge, Lifou, E Cap de Pins, 530–575 m depth, 22.4 mm (MNHN-IM-2000-2544). **J**. Paratype, same collection data as for holotype, 23.1 mm (ZMUA). **K**. Plateau des Chesterfield, 630 m depth, 27.4 mm. **L**. Protoconch, specimen from New Caledonia, 18°35′ S, 163°10′ E, 525 m depth. **M**. Radular tooth of specimen I. – **N**. *Profundiconus estivali*. Radular tooth of specimen B. Scale bars = 10 mm, unless otherwise stated.

Geographical distribution and bathymetry

Coral Sea, Plateau des Chesterfield, at depths between 300 and 600 m. This species can be considered endemic to this area.

Remarks

Shell very small (maximum length 15 mm). Protoconch globose, white, translucent, with about 2 whorls. The characteristic protoconch and the quite constant pattern of 6 to 8 fine brown spiral lines on a white background allow immediate separation of *P. estivali* from its sister species *P. barazeri*. Radular tooth (Fig. 5N) with anterior portion much shorter than posterior section. External cusp present, laterally widened and serrated, with 5–6 denticles. Characteristic fringe of closely spaced projections pointing towards apex located immediately below waist. Shaft fold present. Large and prominent basal spur on top of slanted base of tooth. This is a rare species of which very few specimens are known. Its taxonomic position within Conidae has only been tentative so far. One live specimen was obtained during the KANADEEP expedition in 2017. Its DNA and radular morphology have now been examined, and both confirm its placement in the genus *Profundiconus* (Fig. 2).

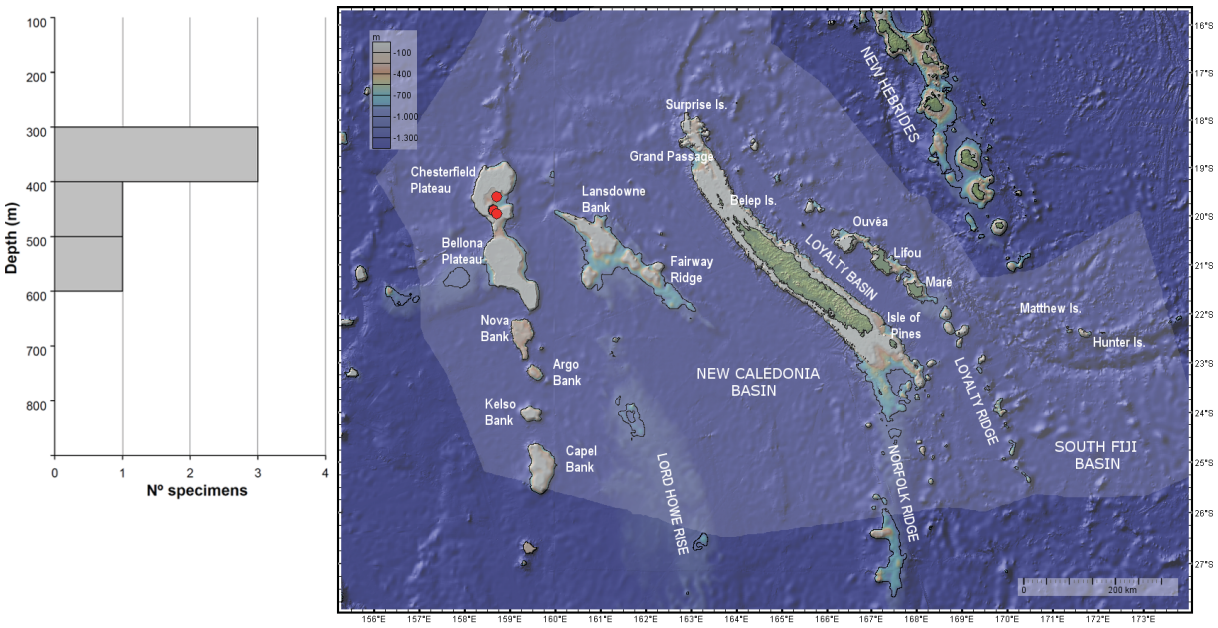

Fig. 6. Bathymetric range and distribution map for *Profundiconus estivali* (Röckel, Richard & Moolenbeek, 1995). Red circles indicate the points where the species was collected.

Profundiconus kanakinus (Richard, 1983)
Figs 7–8

Conus (*Endemoconus*) *kanakinus* Richard, 1983: 55.

Conus kanakinus – Röckel *et al.* 1995b: 248, pl. 51 figs 17–20.
Profundiconus kanakinus – Tucker & Tenorio 2013: 238. — Monnier *et al.* 2018a: 139.

Material examined

62 lots (252 specimens). See Supp. file 1.

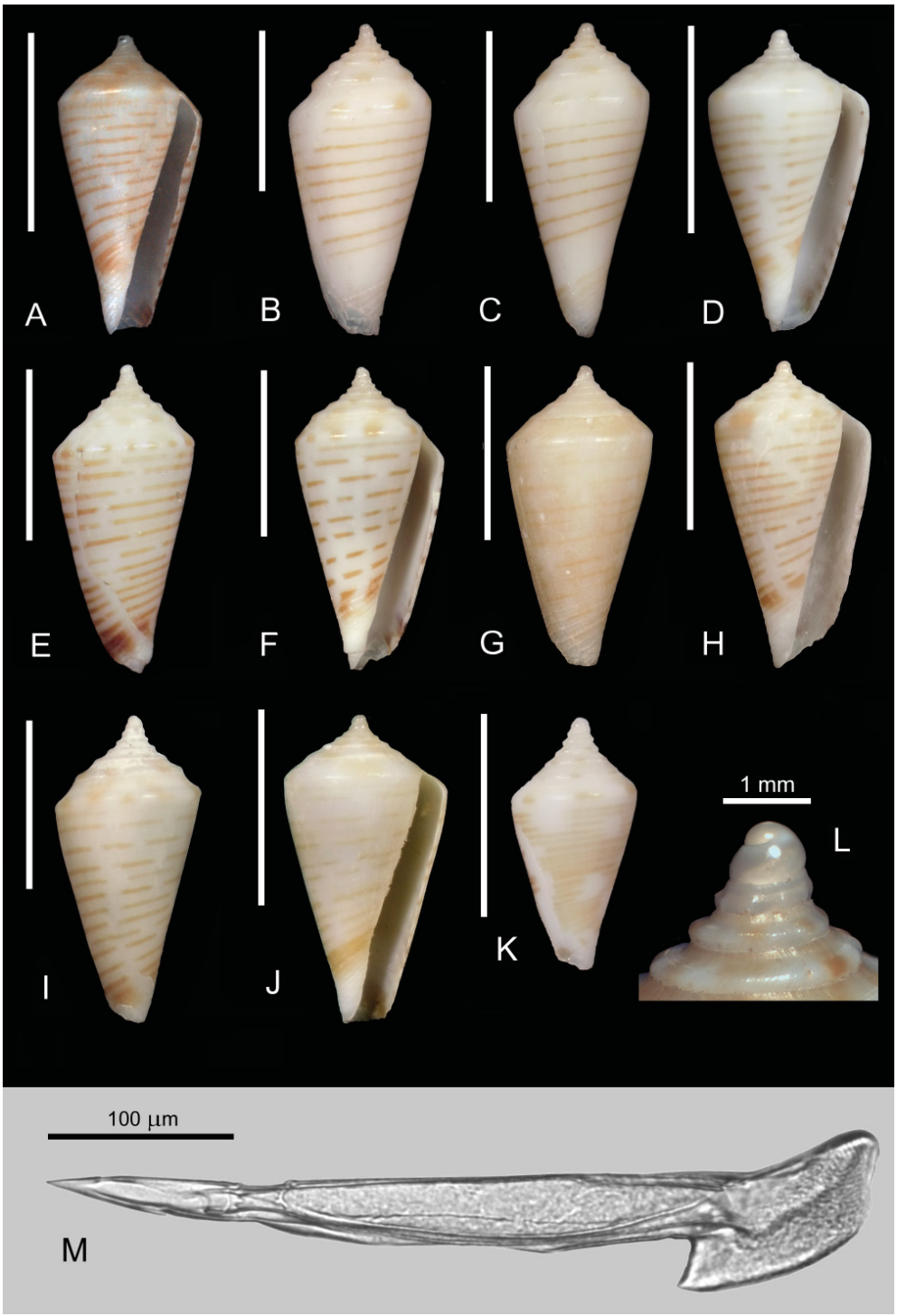

Fig. 7. *Profundiconus kanakinus* (Richard, 1983). **A**. Holotype, SW of Île des Pins, 390–395 m depth, 15.2 mm (MNHN-IM-2000-2548). **B**. S New Caledonia, 410–440 m depth, 19.5 mm. **C**. S New Caledonia, 410–440 m depth, 18.5 mm. **D**. Norfolk Ridge, Île des Pins, 468–500 m depth, 14.6 mm. **E**. S New Caledonia, S Île des Pins, 398–410 m depth, 18 mm. **F**. S New Caledonia, 400–430 m depth, 18.3 mm. **G**. Atoll Pelotas, north Lagoon, 415–460 m depth, 17.4 mm. **H**. S New Caledonia, 383–407 m depth, 18.5 mm. **I**. S New Caledonia, 400 m depth, 18.4 mm. **J**. Same collection data as for preceding, 15.8 mm. **K**. Atoll de Surprise, 300–350 m depth, 12.5 mm. **L**. Protoconch of specimen from S New Caledonia, 404–448 m depth. **M**. Radular tooth of specimen D. Scale bars = 10 mm, unless otherwise stated.

Type material

Holotype

NEW CALEDONIA • 15 mm; SW of Île des Pins, off New Caledonia; 22°49′ S, 167°12′ E; 390–395 m depth; 10 Apr. 1978; MNHN-IM-2000-2548 (Fig. 7A).

Figured material

NEW CALEDONIA • 19.5 mm; off S New Caledonia, stn DW222; 22º58′ S, 167º33′ E; 410–440 m depth; 30 Sep. 1985; MUSORSTOM 4 expedition; MNHN (Fig. 7B–C) • 14.6 mm; Norfolk Ridge, Île des Pins, off New Caledonia, stn DW2156; 22º54′ S, 167º15′ E; 468–500 m depth; 5 Nov. 2003; NORFOLK 2 expedition; MNHN (Fig. 7D, M) • 18 mm; S New Caledonia, S Île des Pins, off New Caledonia, stn DW05; 22º56′ S, 167º14′ E; 398–410 m depth; 17 Sep. 1986; SMIB 2 expedition; MNHN (Fig. 7E) • 18.3 mm; off S New Caledonia, stn DW66; 22º56′ S, 167º15′ E; 400–430 m depth; 10 Mar. 1989; SMIB 4 expedition; MNHN (Fig. 7F) • 17.4 mm; Atoll Pelotas, north Lagoon, off New Caledonia, stn DW475; 18º36′ S, 163º11′ E; 415–460 m depth; 2 Mar. 1985; LAGON expedition; MNHN (Fig. 7G) • 18.5 mm; off S New Caledonia, stn DW1736; 22º51′ S, 167º12′ E; 383–407 m depth; 28 Jun. 2001; NORFOLK 1 expedition; MNHN (Fig. 7H) • 18.4 mm; off S New Caledonia, stn DW729; 22°52′ S, 167°12′ E; 400 m depth; 12 May 1993; BATHUS 2 expedition; MNHN (Fig. 7I) • 15.8 mm; same collection data as for preceding; MNHN (Fig. 7J) • 12.5 mm; Atoll de Surprise, off New Caledonia, stn DW444; 18º15′ S, 162º59′ E; 300–350 m depth; 28 Feb. 1985; LAGON expedition; MNHN (Fig. 7K) • size unknown; off S New Caledonia, stn DW1739; 22º51′ S, 167º12′ E; 404–448 m depth; 28 Jun. 2001; NORFOLK 1 expedition; MNHN (Fig. 7L).

Geographical distribution and bathymetry

South New Caledonia (south of Île des Pins) and North New Caledonia (Grand Passage area, Surprise Island), at depths between 300 and 700 m . This species can be considered endemic to New Caledonia.

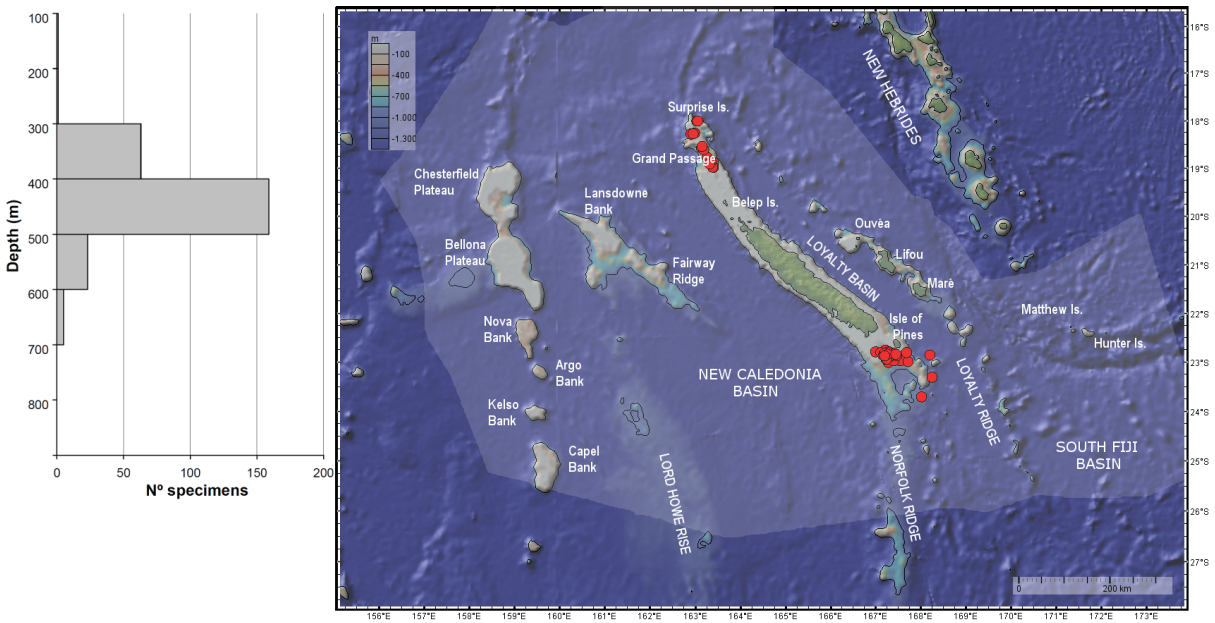

Fig. 8. Bathymetric range and distribution map for *Profundiconus kanakinus* (Richard, 1983). Red circles indicate the points where the species was collected.

Remarks

Shell small to very small (maximum length 20 mm). Protoconch globose, white, translucent, with about 2 whorls (Fig. 7L). Pattern composed of 10–15 irregularly interrupted brown spiral lines on a white ground color. Radular tooth (Fig. 7M) with anterior portion much shorter than posterior section. External cusp present, laterally widened and serrated, with 5–6 denticles. The two central denticles are longer and wider than the lateral ones, which appear less developed. Characteristic fringe of closely spaced projections pointing towards the apex located immediately below waist. Shaft fold present. Large and prominent basal spur on top of slanted base of tooth. In the phylogeny (Fig. 2), *P. kanakinus* appears in a clade along with specimens assigned to *P. vaubani*. It is not clear whether this indicates one single polymorphic species or simply the failure of cox1 to separate these closely related species. Specimens provisionally identified as *P.* cf. *kanakinus* have been collected off Wallis and Futuna Islands (Waterwitch Bank) during the MUSORSTOM 7 campaign (Moolenbeek & Röckel 1996). However, these specimens differ from the New Caledonian ones in having a less elongate last whorl and a color pattern of dashes and lines instead of only spiral lines, resulting in a pattern remarkably similar to that of *P. zardoyai*. These specimens require further study and are hereby considered not conspecific with *P. kanakinus*.

Profundiconus lani (Crandall, 1979)
Fig. 5F

Conus (*Profundiconus*) *lani* Crandall, 1979: 113, figs 1–2.
Conus (*Profundiconus*) *nigrostriatus* Kosuge, 1979: 21, pl. 4 fig. 10.

Conus lani – Röckel *et al.* 1995b: 151, pl. 27 figs 10–12.
Profundiconus lani – Tucker & Tenorio 2013: 248. — Monnier *et al.* 2018a: 141.

Material examined

3 lots (3 specimens). See Supp. file 1.

Type material

Holotype
TAIWAN • 53 mm; near Tiao-yu-tai, NE Taiwan; 75 m depth; TMGS.

Figured material

NEW CALEDONIA • 41.2 mm; Loyalty Basin, off New Caledonia, stn DW253; 21º32′ S, 166º20′ E; 310–315 m depth; 16 Apr. 1987; BIOGEOCAL expedition; MNHN (Fig. 5F).

Geographical distribution and bathymetry

Taiwan, Philippines and Solomon Islands. In New Caledonia, Coral Sea (W Bellona) and Loyalty Basin, dead collected at depths between 300 and 600 m. Several specimens collected at depths of 300–900 m during the TARASOC expedition to the central island groups of French Polynesia (Tuamotu Atolls) were identified as *P. lani* by Rabiller & Richard (2014). These were considered juvenile individuals, but might actually correspond to another, yet undescribed species which requires further studies.

Remarks

This is a medium-sized species, only represented from New Caledonia by one dead collected specimen and one fragment of another one. It has not been studied using DNA and its radular morphology is unknown, so its assignment to the genus *Profundiconus* is only provisional.

Profundiconus loyaltiensis (Röckel & Moolenbeek, 1995)
Figs 2, 5G–M, 9

Conus loyaltiensis Röckel & Moolenbeek in Röckel *et al.*, 1995a: 577, figs 1, 10–11, 55.

Profundiconus loyaltiensis – Tucker & Tenorio 2013: 261. — Monnier *et al.* 2018a: 132.

Material examined

10 lots (16 specimens). See Supp. file 1.

Type material

Holotype

NEW CALEDONIA • 21.7 mm; Loyalty Ridge, Lifou, E of Cap de Pins, off New Caledonia, stn CP465; 21°04′ S, 167°32′ E; 480–495 m depth; 21 Feb. 1989; MUSORSTOM 6 expedition; MNHN-IM-2000-2545 (Fig. 5G).

Figured material

NEW CALEDONIA • Paratype, 21 mm; Lifou, E of Cap de Pins, off New Caledonia, stn CP467; 21º06′ S, 167º32′ E; 530–575 m depth; 21 Feb. 1989; MUSORSTOM 6 expedition; MNHN-IM-2000-2544 (Fig. 5H) • Paratype, 22.4 mm; same collection data as for preceding; MNHN-IM-2000-2544 (Fig. 5I, M) • Paratype, 23.1 mm; same collection data as for holotype; ZMUA (Fig. 5J) • 27.4 mm; Plateau des Chesterfield, off New Caledonia, stn DC357; 19º37′ S, 158º46′ E; 630 m depth; 18 Oct. 1986; MUSORSTOM 5 expedition; MNHN (Fig. 5K) • 18.3 mm; off New Caledonia, stn DW162; 18º35′ S, 163º10′ E; 525 m depth; 16 Sep. 1985; MUSORSTOM 4 expedition; MNHN (Fig. 5L).

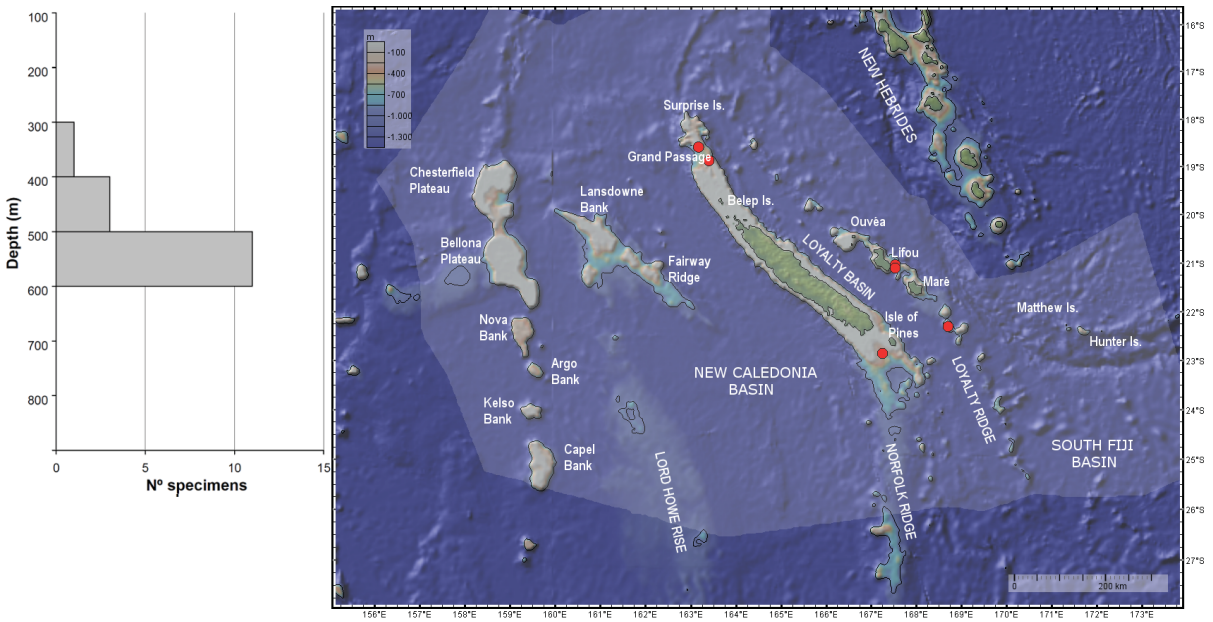

Fig. 9. Bathymetric range and distribution map for *Profundiconus loyaltiensis* (Röckel & Moolenbeek, 1995). Red circles indicate the points where the species was collected.

Geographical distribution and bathymetry

New Caledonia: Loyalty Islands, Grand Passage and Île des Pins, 300 to 600 m deep. Three dead (possibly subfossil; see Fig. 5K) specimens from the Chesterfield Islands, at depths of 570–630 m, have only been tentatively identified as *P.* cf. *loyaltiensis*, but conspecificity is unclear. This species can be considered endemic.

Remarks

Shell small (maximum length 24.5 mm), biconic with a moderate spire of deeply concave outline. Protoconch white, porcellaneous, with 1.5 whorls (Fig. 5L). Radular tooth (Fig. 5M) rather large. Anterior portion of tooth much shorter than posterior section. Barb and pointed, well-defined blade approximately one half of apical portion of tooth. External cusp present, laterally widened and serrated, with 5–6 denticles. Characteristic fringe of closely spaced projections pointing towards the apex located immediately below waist. Shaft fold present. Large and prominent basal spur on top of slanted base of tooth. The name *P. loyaltiensis* applies in the strict sense to shells coming from the Loyalty Islands having a moderate, concave spire with strong cords on the sutural ramp. It is not clear if these are conspecific with the specimens from Île des Pins and the Grand Passage area, which normally exhibit shells with less developed cords, and are often confused with the white form of *P. vaubani*. Specimens of *P. loyaltiensis* from the type locality have not been examined using DNA. The sequenced specimens actually correspond to the population from Île des Pins, and these appear in a clade mixed with specimens assigned to *P. vaubani* and *P. kanakinus* (Fig. 2). This observation is consistent with the fact that the alleged population of *P. loyaltiensis* from Île des Pins and the white form of *P. vaubani* might represent the same species. Therefore, the distribution range of the true *P. loyaltiensis* is possibly restricted to Loyalty Ridge, but this hypothesis requires confirmation.

Profundiconus neocaledonicus Tenorio & Castelin, 2016
Figs 2, 10–11

Profundiconus neocaledonicus Tenorio & Castelin, 2016: 33, figs 15a–j, 16a–c, 17.

Conus profundorum (non *Chelyconus* (*Profundiconus*) *profundorum* Kuroda, 1956) – Rolán & Raybaudi-Massilia 1994: 33, pl. 11 fig. 82. — Röckel *et al.* 1995a: 563, fig. 22; 1995b: 381, pl. 27 fig. 16.
Profundiconus cf. *profundorum* – Puillandre *et al.* 2014: supplementary material 1 (unfigured).
Profundiconus neocaledonicus – Monnier *et al.* 2018a: 128.

Material examined

100 lots (about 150 specimens). See Supp. file 1.

Type material

Holotype

NEW CALEDONIA • 45.9 mm; Norfolk Ridge, Banc Crypthélia, off New Caledonia, stn DW3076; 23°14′ S, 168°13′; 390–570 m depth; 23 Oct. 2008; TERRASSES expedition; MNHN-IM-2009-18227 (Fig. 10A).

Figured material

NEW CALEDONIA • 61.3 mm; SE part of Mont Vauban, off New Caledonia, stn DW3889; 22°25′ S, 171°41′ E; 354 m depth; 19 Sep. 2011; EXBODI expedition; MNHN (Fig. 10B, L–M) • 52.6 mm; Norfolk Ridge, off New Caledonia, stn DW167; 23º38′ S, 167º43′ E; 430–452 m depth; 29 Jan. 1993; SMIB 8 expedition; MNHN (Fig. 10C) • 54.5 mm; off S New Caledonia, stn CC1; 24º55′ S, 168º22′ E;

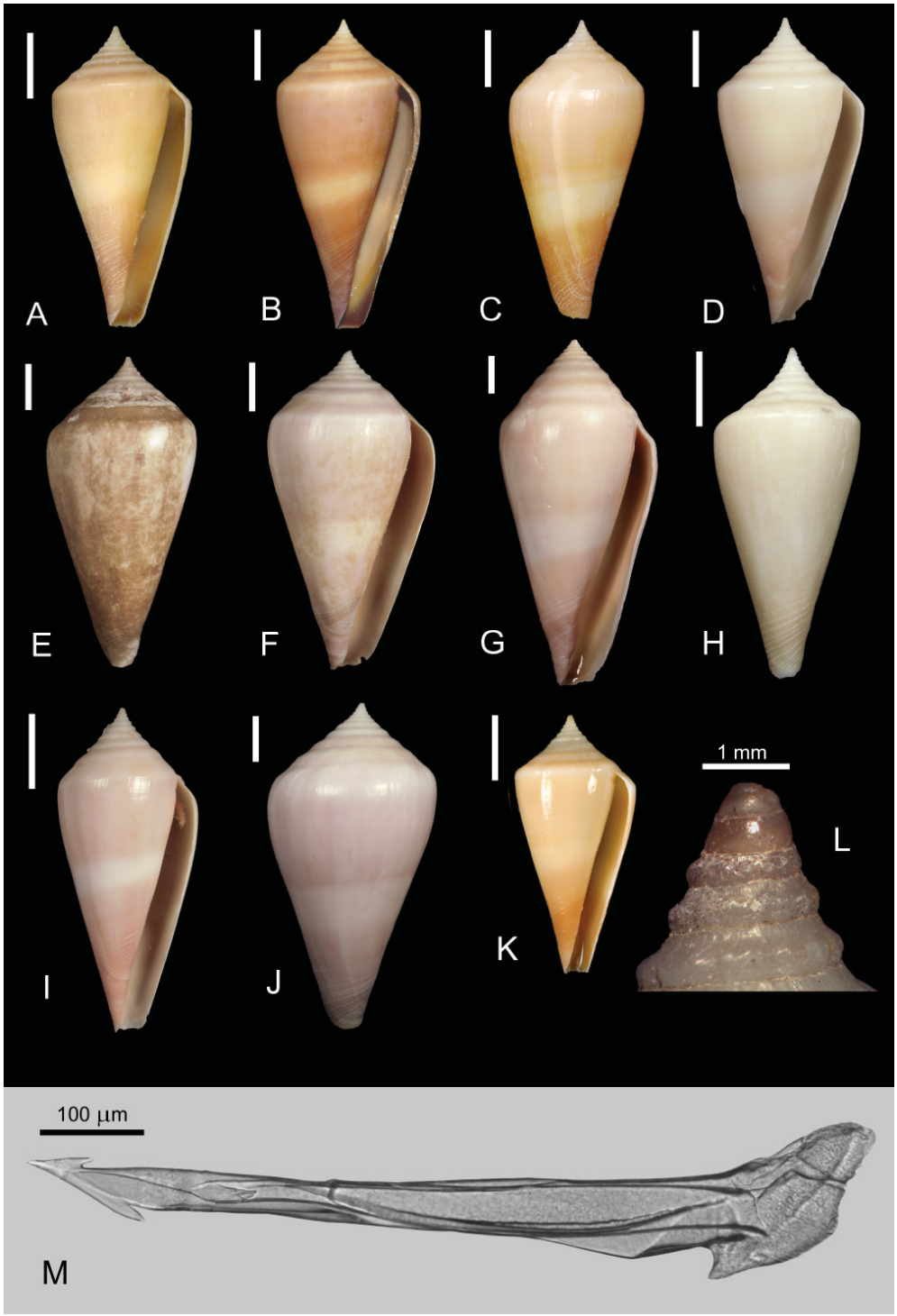

Fig. 10. *Profundiconus neocaledonicus* Tenorio & Castelin, 2016. **A**. Holotype, Norfolk Ridge, Banc Crypthélia, 390–570 m depth, 45.9 mm (MNHN-IM-2009-18227). **B**. SE part of Mont Vauban, off New Caledonia, 354 m depth, 61.3 mm. **C**. Norfolk Ridge, 430–452 m depth, 52.6 mm. **D**. S New Caledonia, 500 m depth, 54.5 mm. **E**. Norfolk Ridge, Banc N, 305–332 m depth, 67.3 mm. **F**. Loyalty Ridge, 373 m depth, 65.1 mm. **G**. Norfolk Ridge, Banc P, 347–1063 m depth, 92 mm. **H**. S New Caledonia, 503 m depth, 44.3 mm. **I**. Norfolk Ridge, 383–408 m depth, 53.4 mm. **J**. S New Caledonia, 304 m depth, 71.8 mm. **K**. Norfolk Ridge, Île des Pins, 468–500 m depth, 39.9 mm. **L**. Protoconch of specimen B. **M**. Radular tooth of specimen B. Scale bars = 10 mm, unless otherwise stated.

500 m depth; 28 Oct. 1986; CHALCAL 2 expedition; MNHN (Fig. 10D) • 67.3 mm; Norfolk Ridge, Banc N, off New Caledonia, stn DW1657; 23°28′ S, 167°52′ E; 305–332 m depth; 19 Jun. 2001; NORFOLK 1 expedition; MNHN (Fig. 10E) • 65.1 mm; Loyalty Ridge, off New Caledonia, stn DW406; 20°41′ S, 167°07′ E; 373 m depth; 15 Feb. 1989; MUSORSTOM 6 expedition; MNHN (Fig. 10F) • 92 mm; Norfolk Ridge, Banc P, off New Caledonia, stn DW1732; 23°29′ S, 168°16′ E; 347–1063 m depth; 27 Jun. 2001; NORFOLK 1 expedition; MNHN (Fig. 10G) • 44.3 mm; off S New Caledonia, stn DW22; 23°03′ S, 167°19′ E; 503 m depth; 24 May 1987; SMIB 3 expedition; MNHN (Fig. 10H) • 53.4 mm; Norfolk Ridge, off New Caledonia, stn CP811; 23°41′ S, 168°15′ E; 383–408 m depth; 28 Nov. 1993; BATHUS 3 expedition; MNHN (Fig. 10I) • 71.8 mm; off S New Caledonia, stn DW82; 23°14′ S, 168°04′ E; 304 m depth; 31 Oct. 1986; CHALCAL 2 expedition; MNHN (Fig. 10J) • 39.9 mm; Norfolk Ridge, Île des Pins, off New Caledonia, stn DW2156; 22°54′ S, 167°15′ E; 468–500 m depth; 5 Nov. 2003; NORFOLK 2 expedition; MNHN (Fig. 10K).

Geographical distribution and bathymetry

New Caledonia: Norfolk Ridge and Loyalty Islands, typically at depths between 300 and 600 m, although some individuals come from beyond 1000 m deep. Some specimens have been sampled in the Coral Sea (Argo Bank) and in the Grand Passage area. A couple of empty shells resembling *P. neocaledonicus* from Aliguay Island, Philippines have been examined, but their identity was not confirmed by radular or DNA studies. This observation might suggest an extension of the distribution range to the Philippines, but would require additional evidence (Tenorio & Castelin 2016).

Remarks

Medium-sized to moderately large (maximum length 92.0 mm). Protoconch multispiral of 3 or more whorls, white to pale violet-brown (Fig. 10L). Radular tooth (Fig. 10M) rather small. Anterior portion of tooth shorter than posterior section, with pointed blade covering about one half of apical portion of tooth. External cusp present, not much widened laterally and with indistinct serrations, with only 0–3 small blunt denticles. Characteristic fringe of closely spaced projections pointing towards apex located immediately below waist. Shaft fold present. Large and prominent basal spur on top of slanted base of

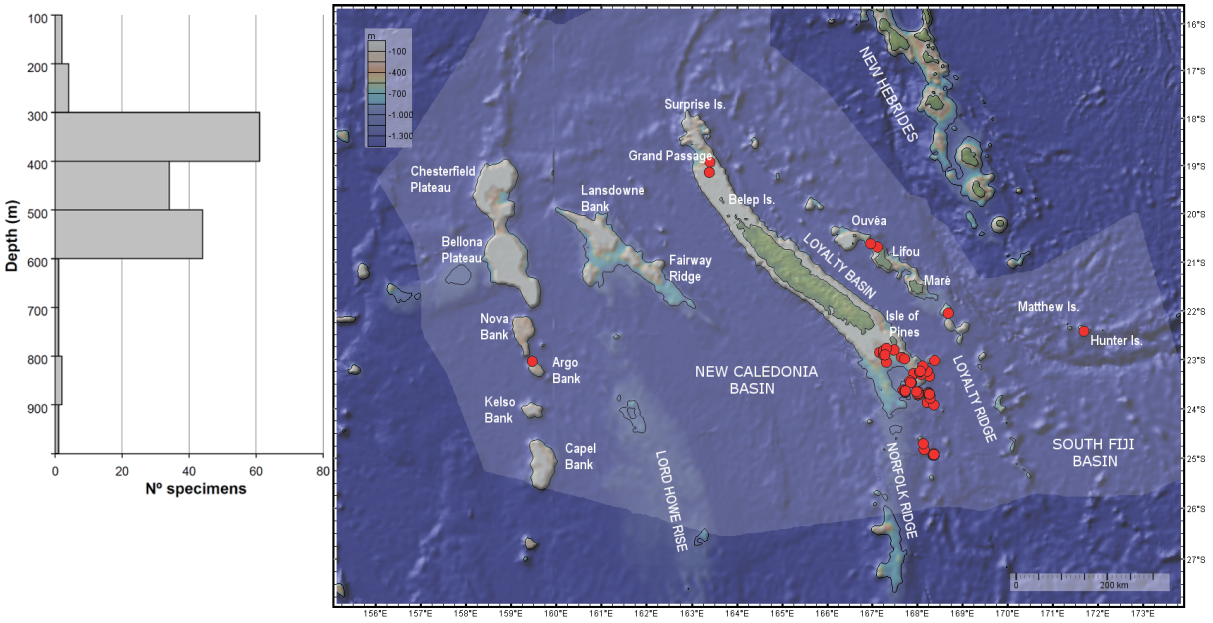

Fig. 11. Bathymetric range and distribution map for *Profundiconus neocaledonicus* Tenorio & Castelin, 2016. Red circles indicate the points where the species was collected.

tooth. In the phylogeny (Fig. 2), the specimens of *P. neocaledonicus* are grouped in a clade sister to another large one containing specimens of *P. teramachii* mixed with some individuals of *P. smirnoides*.

Profundiconus puillandrei Tenorio & Castelin, 2016
Figs 2, 12–13

Profundiconus puillandrei Tenorio & Castelin, 2016: 28, figs 12a–j, 13a–d, 14.

Conus smirna (non *C. smirna* Bartsch & Rehder, 1943) – Marshall 1981: 499, fig. 3j.
Conus sp. C – Röckel *et al.* 1995a: 585, fig. 49.
Conus ikedai (non *C. ikedai* Ninomiya, 1987) – Poppe 2008: pl. 615 fig. 1a–b.
Profundiconus n. sp. g. – Puillandre *et al.* 2014: supplementary material 1 (unfigured).
Profundiconus puillandrei – Monnier *et al.* 2018a: 142.

Material examined

49 lots (93 specimens). See Supp. file 1.

Type material

Holotype

NEW CALEDONIA • 43.2 mm; Norfolk Ridge, Banc Jumeau Est, off New Caledonia, stn DW1707; 23°43′ S, 168°16′ E; 381–493 m depth; 25 June 2001; NORFOLK 1 expedition; MNHN-IM-2000-30771 (Fig. 12A, M).

Figured material

NEW CALEDONIA • 39.6 mm; Norfolk Ridge, Banc Aramis, off New Caledonia, stn DW2072; 25º21′ S, 168º57′ E; 1000–1005 m depth; 26 Oct. 2003; NORFOLK 2 expedition; MNHN (Fig. 12B) • 40.7 mm; Norfolk Ridge, Banc Zorro, off New Caledonia, stn DW2077; 25º21′ S, 168º19′ E; 666–1000 m depth; 27 Oct. 2003; NORFOLK 2 expedition; MNHN (Fig. 12C) • 35 mm; Norfolk Ridge, Banc Porthos, off New Caledonia, stn DW2068; 25º20′ S, 168º57′ E; 680–980 m depth; 26 Oct. 2003; NORFOLK 2 expedition; MNHN (Fig. 12D) • 31.7 mm; Norfolk Ridge, Banc Athos, off New Caledonia, stn DW2066; 25º17′ S, 168º55′ E; 834–870 m depth; 26 Oct. 2003; NORFOLK 2 expedition; MNHN (Fig. 12E, L) • 43.6 mm; Norfolk Ridge, Banc Zorro, off New Caledonia, stn DW2074; 25º24′ S, 168º20′ E; 623–691 m depth; 27 Oct. 2003; NORFOLK 2 expedition; MNHN (Fig. 12F) • 45.2 mm; Norfolk Ridge, Banc Jumeau Est, off New Caledonia, stn DW2054; 23º40′ S, 168º15′ E; 736–800 m depth; 24 Oct. 2003; NORFOLK 2 expedition; MNHN (Fig. 12G) • 57.3 mm; off New Caledonia, stn DW3907; 19°50′ S, 165°33′ E; 608–671 m depth; 23 Sep. 2011; EXBODI expedition; MNHN (Fig. 12H) • 19.7 mm; Norfolk Ridge, Banc Athos, off New Caledonia, stn DW2066; 25º17′ S, 168º55′ E; 834–870 m depth; 26 Oct. 2003; NORFOLK 2 expedition; MNHN (Fig. 12I) • 39.6 mm; Loyalty Ridge, off New Caledonia, stn DW776; 24º44′ S, 170º08′ E; 770–830 m depth; 24 Nov. 1993; BATHUS 3 expedition; MNHN (Fig. 12J) • 18.2 mm; Norfolk Ridge, Banc Athos, off New Caledonia, stn DW2065; 25º16′ S, 168º56′ E; 750–800 m depth; 26 Oct. 2003; NORFOLK 2 expedition; MNHN (Fig. 12K).

Geographical distribution and bathymetry

In New Caledonia, most specimens were sampled in locations across Norfolk Ridge, but also on the Loyalty Ridge and in the New Hebrides Arc (Hunter Island), at depths ranging from 300 to 1000 m and beyond, typically at between 500 and 900 m (Fig. 13). Also present in Kermadec Ridge, New Zealand, where several specimens were dredged alive from 1030–1180 m off Curtis Island, making this species one of the deepest-living ones among the known cone snails. Several empty shells matching *P. puillandrei* from Balut Island, Mindanao, Philippines, have been examined. The identity of these specimens from

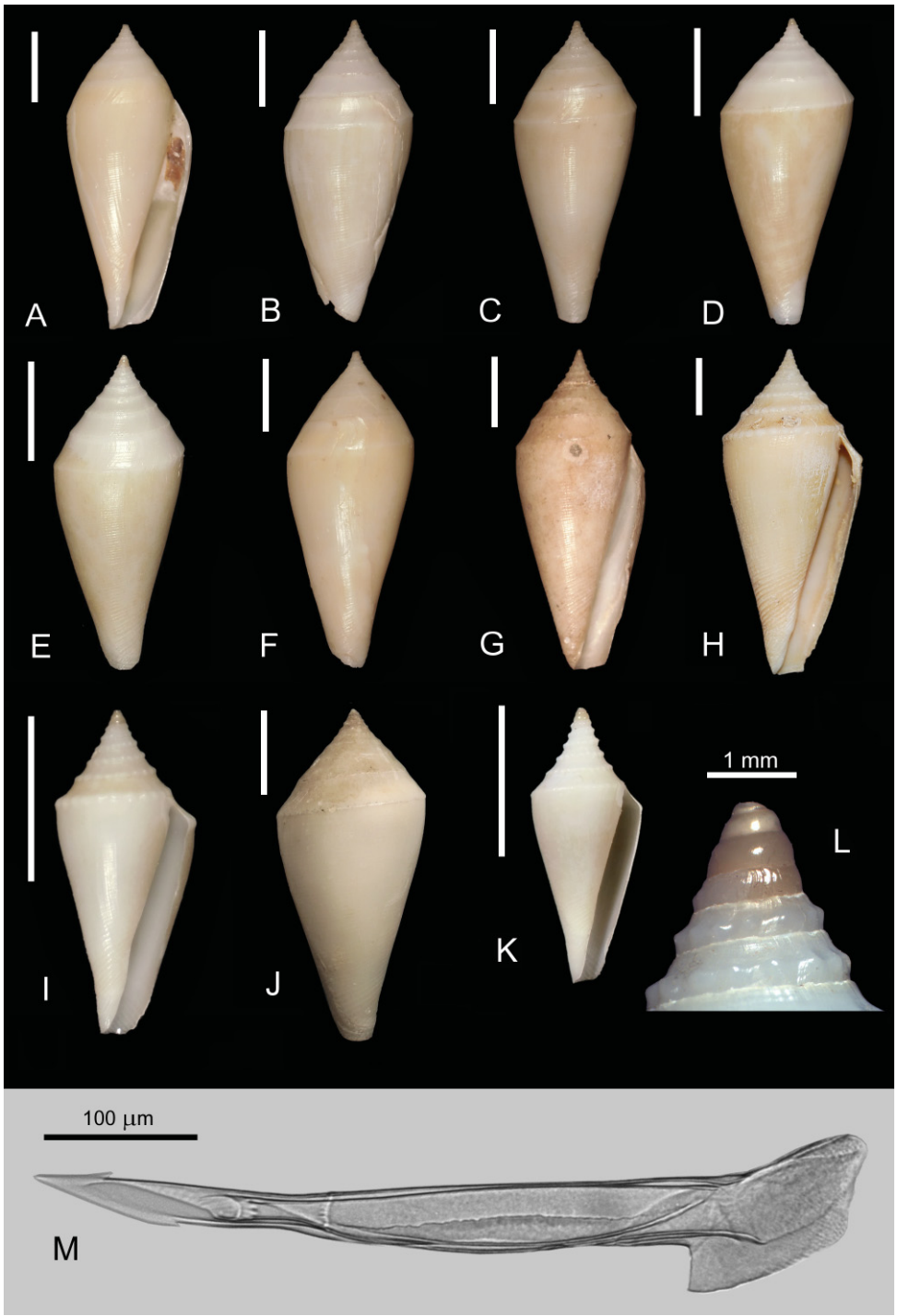

Fig. 12. *Profundiconus puillandrei* Tenorio & Castelin, 2016. **A**. Holotype, Norfolk Ridge, Banc Jumeau Est, 381–493 m depth, 43.2 mm (MNHN-IM-2000-30771). **B**. Norfolk Ridge, Banc Aramis, 1000–1005 m depth, 39.6 mm. **C**. Norfolk Ridge, Banc Zorro, 666–1000 m depth, 40.7 mm. **D**. Norfolk Ridge, Banc Porthos, 680–980 m depth, 35 mm. **E**. Norfolk Ridge, Banc Athos, 834–870 m depth, 31.7 mm. **F**. Norfolk Ridge, Banc Zorro, 623–691 m depth, 43.6 mm. **G**. Norfolk Ridge, Banc Jumeau Est, 736–800 m depth, 45.2 mm. **H**. Off New Caledonia, 608–671 m depth, 57.3 mm. **I**. Same collection data as for specimen E, 19.7 mm. **J**. Loyalty Ridge, 39.6 mm. **K**. Norfolk Ridge, Banc Athos, 750–800 m depth, 18.2 mm. **L**. Protoconch of specimen E. **M**. Radular tooth of the holotype A. Scale bars = 10 mm, unless otherwise stated.

the Philippines could not be confirmed by radular or DNA studies, but the conchological features seem consistent with the identification of these specimens as *P. puillandrei*. This might represent a significant range extension to the southern Philippines (Tenorio & Castelin 2016).

Remarks

Shell moderately small to medium-sized (maximum length 57.0 mm). Protoconch multispiral, with 3–3.5 whorls, white to yellow-brown (Fig. 12L). The shell of *P. puillandrei* has a distinct shoulder ridge, usually smooth but sometimes nodulose. Nodulose specimens may resemble a small *Profundiconus teramachii*. However, this species attains a larger size, has a lower spire and usually exhibits a broadly carinate shoulder. Radular tooth (Fig. 12M) small. Anterior portion of tooth shorter than posterior section, bearing one barb and a pointed blade which covers 50–62% of anterior portion of tooth. External cusp present, laterally widened and serrated, with 4–5 small denticles. Fringe of closely spaced projections pointing towards apex immediately below waist. Shaft fold present. Slanted base with a large and prominent basal spur. The sequenced specimens of *P. puillandrei*, both smooth and nodulose at the shoulder, form a clade sister to *Profundiconus neotorquatus* (da Motta, 1985), *P. neocaledonicus*, *P. teramachii* and *P. smirnoides* (Fig. 2).

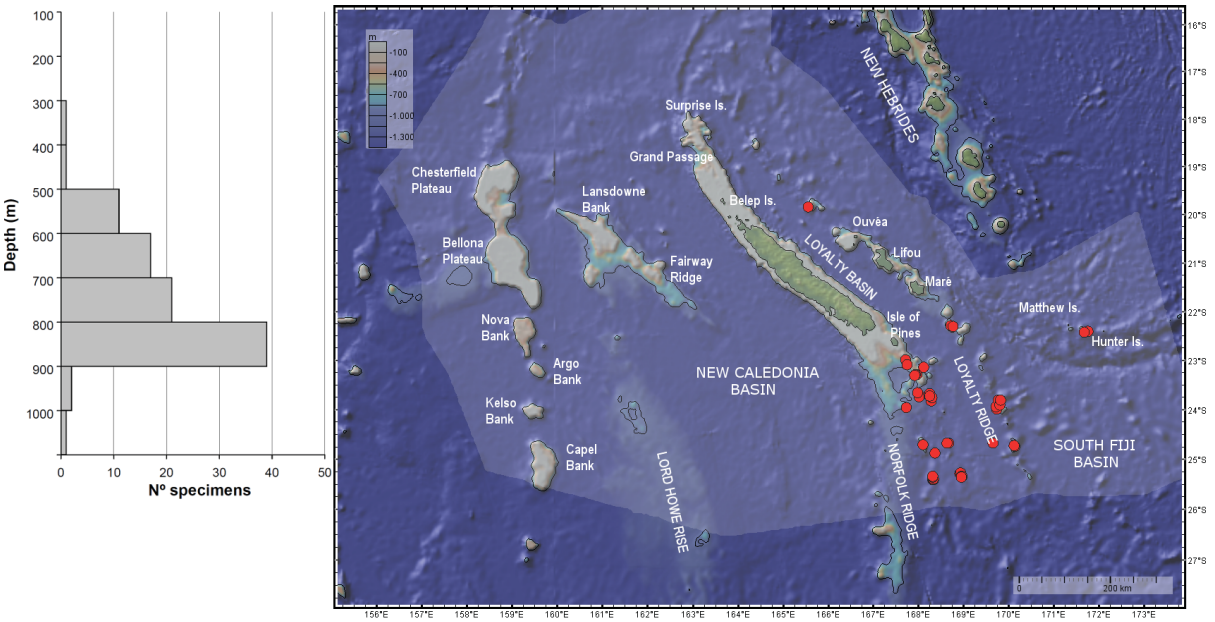

Fig. 13. Bathymetric range and distribution map for *Profundiconus puillandrei* Tenorio & Castelin, 2016. Red circles indicate the points where the species was collected.

Profundiconus smirnoides Tenorio, 2015
Figs 2, 14–15

Profundiconus smirnoides Tenorio, 2015b: 4, pls 1–3.

Conus smirna (non *C. smirna* Bartsch & Rehder, 1943) – Marshall 1981: 499, fig. 3h–i. — Richer de Forges & Estival 1986: 16, unnumbered fig. — Röckel *et al.* 1995a: 563, fig. 21; 1995b: pl. 27 figs 6–7. — Moolenbeek *et al.* 2008: pl. 3 fig. 26. — Puillandre *et al.* 2015: 4.
Profundiconus smirnoides – Monnier *et al.* 2018a: 136.

Material examined

42 lots (51 specimens). See Supp. file 1.

Type material

Holotype

NEW CALEDONIA • 71.8 mm; off Île des Pins, off New Caledonia, stn DW3125; 22°55.5′ S, 167°17.1′ E; 480–500 m depth; 30 Oct. 2008; TERRASSES expedition; MNHN-IM-2009-18220 (Fig. 14A).

Figured material

NEW CALEDONIA • 73.7 mm; Norfolk Ridge, Jumeau Est, off New Caledonia, stn DW3053; 23°45′ S, 168°16′ E; 410–440 m depth; 19 Oct. 2008; TERRASSES expedition; MNHN (Fig. 14B) • 81.5 mm; S Lansdowne, off New Caledonia, stn DW2635; 21°03′ S, 160°45′ E; 80–397 m depth; 21 Oct. 2005; EBISCO expedition; MNHN (Fig. 14C) • 79.7 mm; Norfolk Ridge, Banc Introuvable, off New Caledonia, stn DW1699; 24°40′ S, 168°40′ E; 581–600 m depth; 24 Jun. 2001; NORFOLK 1 expedition; MNHN (Fig. 14D) • 76.9 mm; Norfolk Ridge, Banc Introuvable, off New Caledonia, stn DW1699; 24°40′ S, 168°40′ E; 581–600 m depth; 24 Jun. 2001; NORFOLK 1 expedition; MNHN (Fig. 14E) • 52 mm; Norfolk Ridge, off New Caledonia, stn DW819; 23°45′ S, 168°16′ E; 478–486 m depth; 28 Nov. 1993; BATHUS 3 expedition; MNHN (Fig. 14F) • 63.4 mm; off New Caledonia, stn DW197; 18°51′ S, 163°21′ E; 550 m depth; 20 Sep. 1985; MUSORSTOM 4 expedition; MNHN (Fig. 14G) • 81.4 mm; Norfolk Ridge, off New Caledonia, stn DW169; 23°37′ S, 167°42′ E; 447–450 m depth; 29 Jan. 1993; SMIB 8 expedition; MNHN (Fig. 14H, M) • 39.9 mm; Norfolk Ridge, off New Caledonia, stn DW187; 23°17′ S, 168°06′ E; 390–540 m depth; 31 Jan. 1993; SMIB 8 expedition; MNHN (Fig. 14I) • 97.9 mm; Banc Kaimon Maru, off New Caledonia, stn DW65; 24°47′ S, 168°09′ E; 245–275 m depth; 3 Sep. 1985; BIOCAL expedition; MNHN (Fig. 14J) • 39.9 mm; Norfolk Ridge, Banc Eponge, off New Caledonia, stn CP08; 24°54′ S, 168°21′ E; 540 m depth; 11 Aug. 1999; LITHIST expedition; MNHN (Fig. 14K–L).

Geographical distribution and bathymetry

Coral Sea (Lansdowne Bank), New Caledonia including Grand Passage, Loyalty Islands, Norfolk Ridge, and northern New Zealand (Wanganella Bank, and possibly Kermadec Ridge), at depths between 80 and 1150 m, mostly between 450 and 600 m. There is a report of a dead specimen collected off Fiji (Moolenbeek *et al.* 2008), suggesting an extension of the range to this area.

Remarks

Shell moderately large to large (maximum length 98.0 mm), narrowly conoid-cylindrical with a high to very high spire. Protoconch multispiral, of 3.0–3.5 whorls, brown, smooth (Fig. 14L). Radular tooth (Fig. 14M) medium- to large-sized, very elongated, with anterior section longer than half of total tooth length in adult specimens. Waist indistinct, with barb and one pointed blade covering less than one quarter of anterior portion. Serrations absent. There is an external cusp starting at the base of the adapical opening, almost equal in size to the blade on the opposite side of the tooth. This external cusp is short, pointed and non-serrated. Immediately below the indistinct waist, there is a small oblique fringe with a serrated edge consisting of 4–5 blunt denticles pointing towards the anterior portion. A shaft fold is present, although difficult to detect in adults due to the elongation of the tooth. Slanted base, with a large basal spur present. Several specimens of *P. smirnoides* (cox1 gene fragment) have been sequenced (Fig. 2). The placement of this species in the *Profundiconus* clade is confirmed, although the relationships with other species of *Profundiconus*, most notably with *P. teramachii*, were not resolved satisfactorily (Tenorio & Castelin 2016).

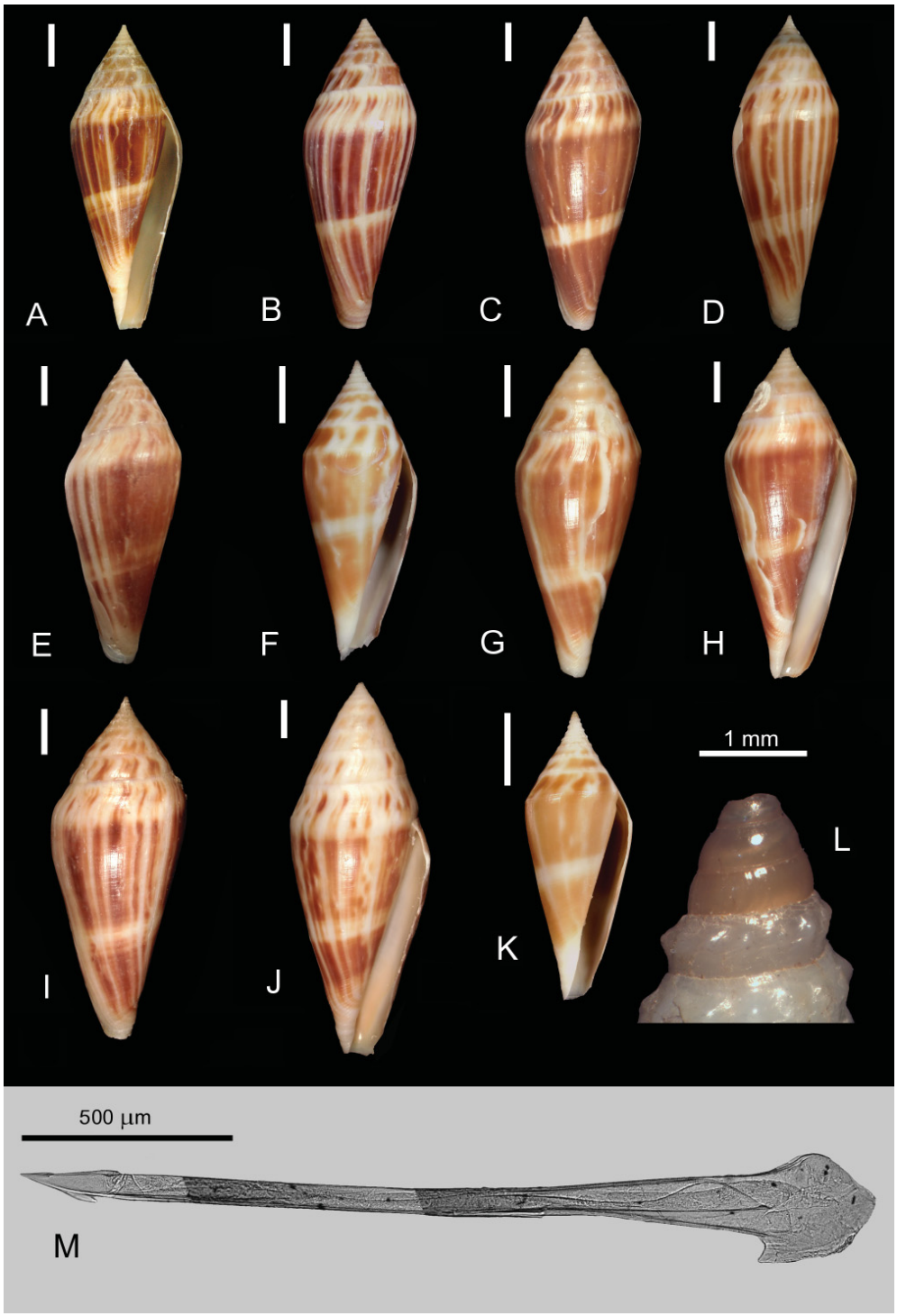

Fig. 14. *Profundiconus smirnoides* Tenorio, 2015. **A**. Holotype, off Île des Pins, 480–500 m depth, 71.8 mm (MNHN-IM-2009-18220). **B**. Norfolk Ridge, Jumeau Est, 410–440 m depth, 73.7 mm. **C**. Coral Sea, Lansdowne, 80–397 m depth, 81.5 mm. **D**. Norfolk Ridge, Banc Introuvable, 581–600 m depth, 79.7 mm. **E**. Same collection data as for specimen D, 76.9 mm. **F**. Norfolk Ridge, 478–486 m depth, 52 mm. **G**. Off New Caledonia, 550 m depth, 63.4 mm. **H**. Norfolk Ridge, 447–450 m depth, 81.4 mm. **I**. Norfolk Ridge, 390–540 m depth, 75.4 mm. **J**. Banc Kaimon Maru, 245–275 m depth, 97.9 mm. **K**. Norfolk Ridge, Banc Eponge, 540 m depth, 39.9 mm. **L**. Protoconch of specimen K. **M**. Radular tooth of specimen H. Scale bars = 10 mm, unless otherwise stated.

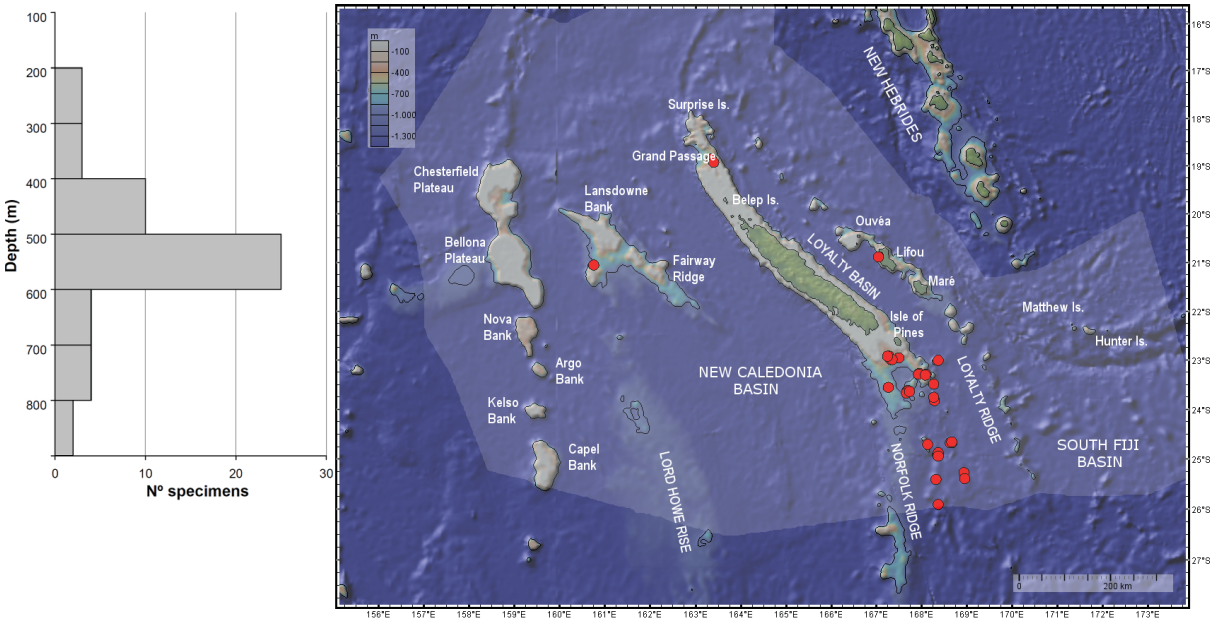

Fig. 15. Bathymetric range and distribution map for *Profundiconus smirnoides* Tenorio, 2015. Red circles indicate the points where the species was collected.

Profundiconus cf. ***teramachii*** (Kuroda, 1956)
Fig. 16C–H, M

Asprella (*Endemoconus*) *teramachii* Kuroda, 1956: 8, pl. 1 fig. 4.

Conus teramachii – Röckel *et al.* 1995b: 145, pl. 26 fig. 1.
Profundiconus teramachii – Tucker & Tenorio 2013: 391. — Monnier *et al.* 2018a: 137.

Material examined

2 lots (2 specimens). See Supp. file 1.

Type material

Holotype
JAPAN • 115 mm; Tosa; ca 914 m depth; THTA.

Figured material

NEW CALEDONIA • 89.3 mm; Plateau des Chesterfield, off New Caledonia, stn CP364; 19º45′ S, 158º47′ E; 675 m depth; 19 Oct. 1986; MUSORSTOM 5 expedition; MNHN (Fig. 16C–D) • 72.4 mm; Vanuatu, off New Caledonia, stn CP992; 18º52′ S, 168º55′ E; 748–775 m depth; 24 Sep. 1994; MUSORSTOM 8 expedition; MNHN (Fig. 16E–F) • 67.5 mm; Loyalty Islands (Fig. 16M).

Geographical distribution and bathymetry

Japan to Taiwan, Melanesia (Papua New Guinea and Solomon Islands), N of New Zealand (Wanganella Bank, Raoul Island, Kiwi Seamount), Queensland, Coral Sea (Lansdowne Bank), Vanuatu, Fiji, typically at depths between 250 and 800 m. Some specimens collected by the *Valdivia* during the Deutsche Tiefsee-Expedition came from depths as great as 1134 m (Röckel *et al.* 1995b). The conspecificity of

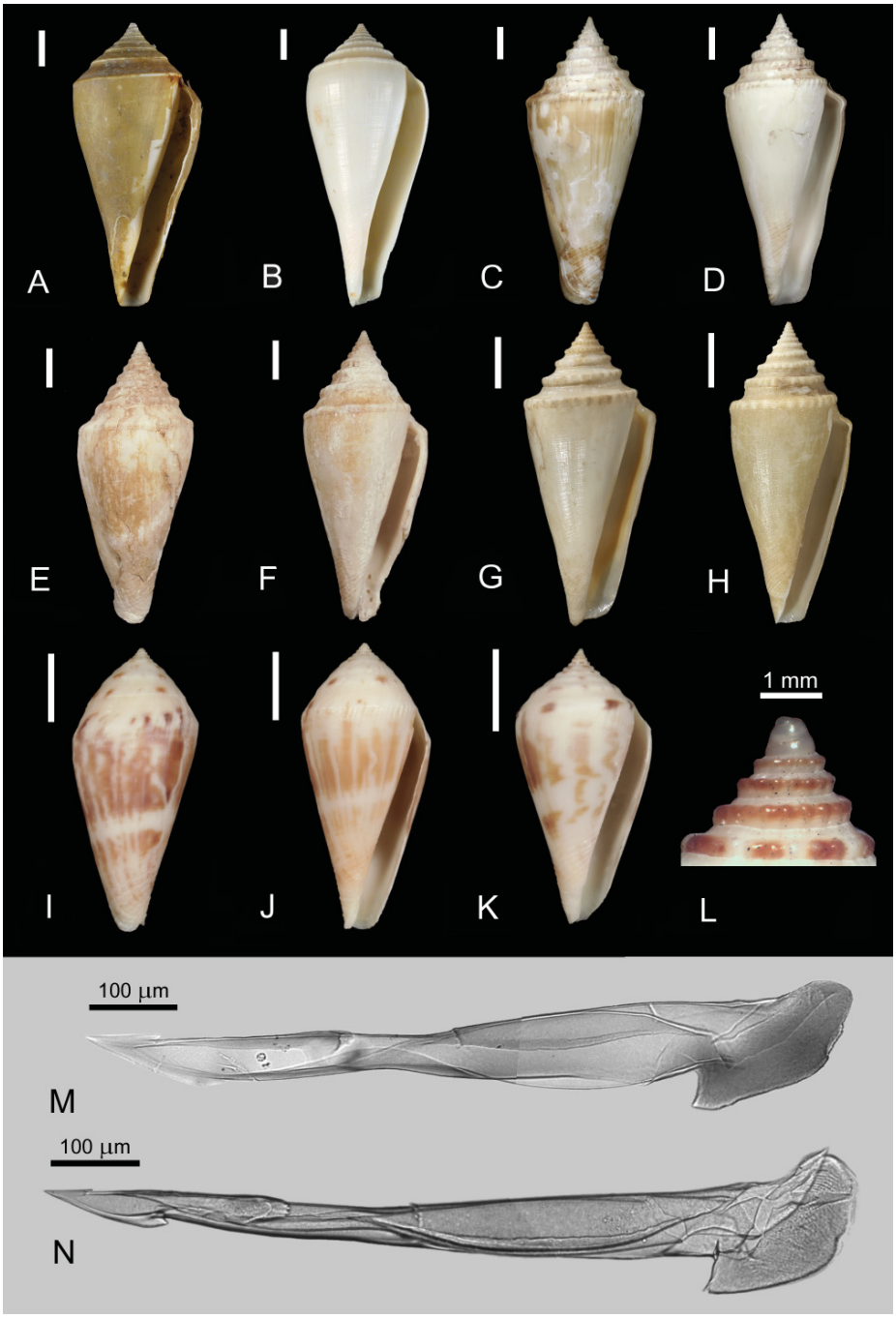

Fig. 16. A–B. *Profundiconus teramachii* (Kuroda, 1956). **A**. China Sea, 795–822 m depth, 79 mm (MNHN-IM-2013-50257). **B**. SE Isabel Island, Solomon Islands, 487–541 m depth, 93.2 mm (MNHN-IM-2007-30920). – **C–H**. *Profundiconus* cf. *teramachii*. **C–D**. Plateau des Chesterfield, 675 m depth, 89.3 mm. **E–F**. Vanuatu, 748–775 m depth, 72.4 mm. **G**. Kermadec Ridge, E of Chanter Islets, Raoul Island, New Zealand, 300–823 m depth, 59.2 mm (NMNZ M.225507). **H**. New Zealand, 300–823 m depth, 55.4 mm (NMNZ M.171916). – **I–L**. *Profundiconus virginiae* Tenorio & Castelin, 2016. **I–J**. Holotype, Coral Sea, Plateau des Chesterfield, 519–522 m depth, 42.5 mm (MNHN-IM-2007-30854). **K**. Paratype, Coral Sea, Plateau des Chesterfield, 431–436 m depth, 33.7 mm (MNHN-IM-2007-30858). **L**. Protoconch of paratype MNHN-IM-2000-30789. – **M**. *Profundiconus* cf. *teramachii*. Radular tooth of a specimen from the Loyalty Islands, 67.5 mm (ER coll.). – **N**. *Profundiconus virginiae*. Radular tooth of paratype MNHN-IM-2007-30858, specimen K. Scale bars = 10 mm, unless otherwise stated.

the populations from New Zealand (Marshall 1981) and New Caledonia, and possibly Fiji (Moolenbeek *et al.* 2008), with the nominal taxon is doubtful.

Remarks

Shell moderately large to large (it may attain lengths beyond 120 mm). Protoconch multispiral. The radular tooth of *P. teramachii* and *P.* cf. *teramachii* (Fig. 16M) is morphologically similar to that of *P. puillandrei* (Fig. 12M). Only two specimens of *P.* cf. *teramachii* were obtained, one from Plateau des Chesterfield (Fig. 16C–D), and another from off Vanuatu (Fig. 16E–F). These specimens exhibit a high, turriculated spire, with nodules crossed by several strong spiral cords, and are similar to specimens from Wanganella Bank in New Zealand (Fig. 16G–H). Many specimens of *P. teramachii* from Papua New Guinea, Solomon Islands (Fig. 16B) and Taiwan (Fig. 16A) have been sequenced but no individuals from New Caledonia or New Zealand were present in the sample. After many years of sampling in deep water around New Caledonia, very few specimens of these *teramachii*-like individuals have been collected, indicative of the scarcity of this species in the surveyed areas. The conspecificity of the populations from New Caledonia and New Zealand with the taxon *P. teramachii* needs to be confirmed using DNA studies. Nodulose specimens of *P. puillandrei* (i.e., Fig. 12H) might be misidentified as *P.* cf. *teramachii*.

Profundiconus vaubani (Röckel & Moolenbeek, 1995)
Figs 2, 17–19

Conus vaubani Röckel & Moolenbeek in Röckel *et al.*, 1995a: 587, figs 3, 14–15, 56.

Profundiconus vaubani – Tucker & Tenorio 2013: 409. — Monnier *et al.* 2018a: 131.

Material examined

91 lots (417 specimens). See Supp. file 1.

Type material

Holotype

NEW CALEDONIA • 25.7 mm; Norfolk Ridge, off New Caledonia, stn DW77; 23°38′ S, 167°43′ E; 435 m depth; 30 Oct. 1986; CHALCAL 2 expedition; MNHN -M-2000-3455 (Fig. 17A).

Figured material

NEW CALEDONIA • 21.8 mm; Norfolk Ridge, Banc Stylaster, off New Caledonia, stn DW2035; 23°40′ S, 167°40′ E; 515–540 m depth; 22 Oct. 2003; NORFOLK 2 expedition; MNHN (Fig. 17B) • 29.5 mm; Grand Passage, off New Caledonia, stn DW04; 18º55′ S, 163º24′ E; 350–365 m depth; 28 Nov. 1994; HALICAL 1 expedition; MNHN (Fig. 17C) • 29.1 mm; Norfolk Ridge, Banc Stylaster, off New Caledonia, stn DW1659; 23º37′ S, 167º41′ E; 449–467 m depth; 20 Jun. 2001; NORFOLK 1 expedition; MNHN (Fig. 17D) • 29.8 mm; same collection data as for preceding; MNHN (Fig. 17E) • 22.4 mm; Norfolk Ridge, Stylaster, off New Caledonia, stn DW3059; 23°40′ S, 167°44′ E; 440–450 m depth; 21 Oct. 2008; TERRASSES expedition; MNHN (Fig. 17F) • 26.7 mm; Norfolk Ridge, Banc Stylaster, off New Caledonia, stn DW05; 23º38′ S, 167º42′ E; 433–500 m depth; 10 Aug. 1999; LITHIST expedition; MNHN (Fig. 17G) • 23.7 mm; Norfolk Ridge, Stylaster, off New Caledonia, stn DW3060; 23°39′ S, 167°44′ E; 440–450 m depth; 21 Oct. 2008; TERRASSES expedition; MNHN (Fig. 17H) • 25.6 mm; Norfolk Ridge, Banc Stylaster, off New Caledonia, stn DW05; 23º38′ S, 167º42′ E; 433–500 m depth; 10 Aug. 1999; LITHIST expedition; MNHN (Fig. 17I) • 25.5 mm; off S New Caledonia, stn DW27; 23º37′ S, 167º41′ E; 460–470 m depth; 18 Oct. 1992; BERYX 11 expedition; MNHN (Fig. 17J) • 11.4 mm; off New Caledonia, stn DW46; 22º53′ S, 167º17′ E; 570–610 m depth; 30 Aug. 1985; BIOCAL expedition; MNHN (Fig. 17K) • size unknown; off New Caledonia, stn DW48; 23º00′ S, 167º29′ E; 775 m depth;

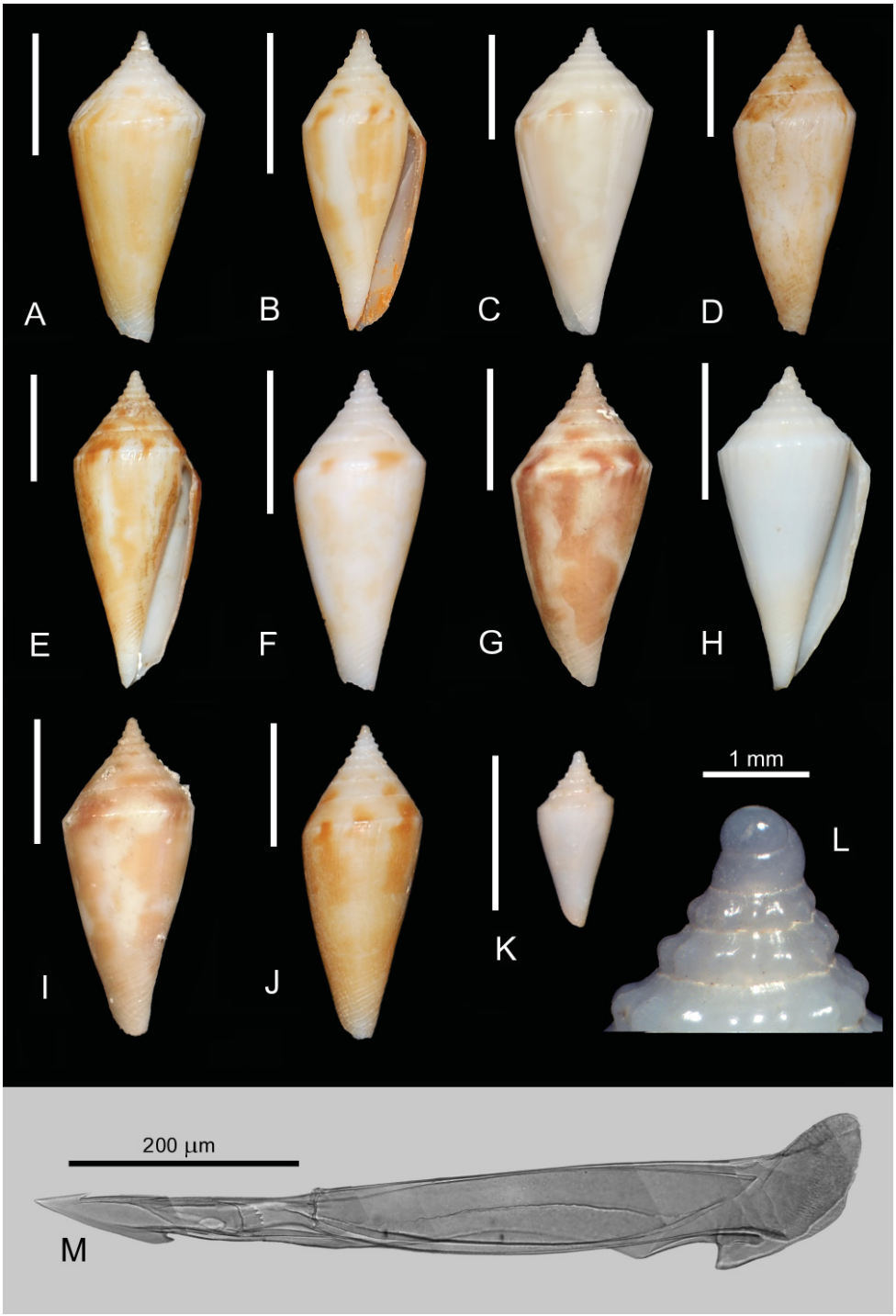

Fig. 17. *Profundiconus vaubani* (Röckel & Moolenbeek, 1995). **A**. Holotype, Norfolk Ridge, 435 m depth, 25.7 mm (MNHN-IM-2000-3455). **B**. Norfolk Ridge, Banc Stylaster, 515–540 m depth, 21.8 mm. **C**. Grand Passage, 350–365 m depth, 29.5 mm. **D**. Norfolk Ridge, Banc Stylaster, 449–467 m depth, 29.1 mm. **E**. Same collection data as for specimen D, 29.8 mm. **F**. Norfolk Ridge, Banc Stylaster, 440–450 m depth, 22.4 mm. **G**. Norfolk Ridge, Banc Stylaster, 433–500 m depth, 26.7 mm. **H**. Norfolk Ridge, Banc Stylaster, 440–450 m depth, 23.7 mm. **I**. Same collection data as for specimen G, 25.6 mm. **J**. S New Caledonia, 460–470 m depth, 25.5 mm. **K**. Off New Caledonia, 570–610 m depth, 11.4 mm. **L**. Protoconch of specimen from off New Caledonia, 775 m depth. **M**. Radular tooth of specimen from Norfolk Ridge, Banc Stylaster, 469–860 m depth, 20.6 mm. Scale bars = 10 mm, unless otherwise stated.

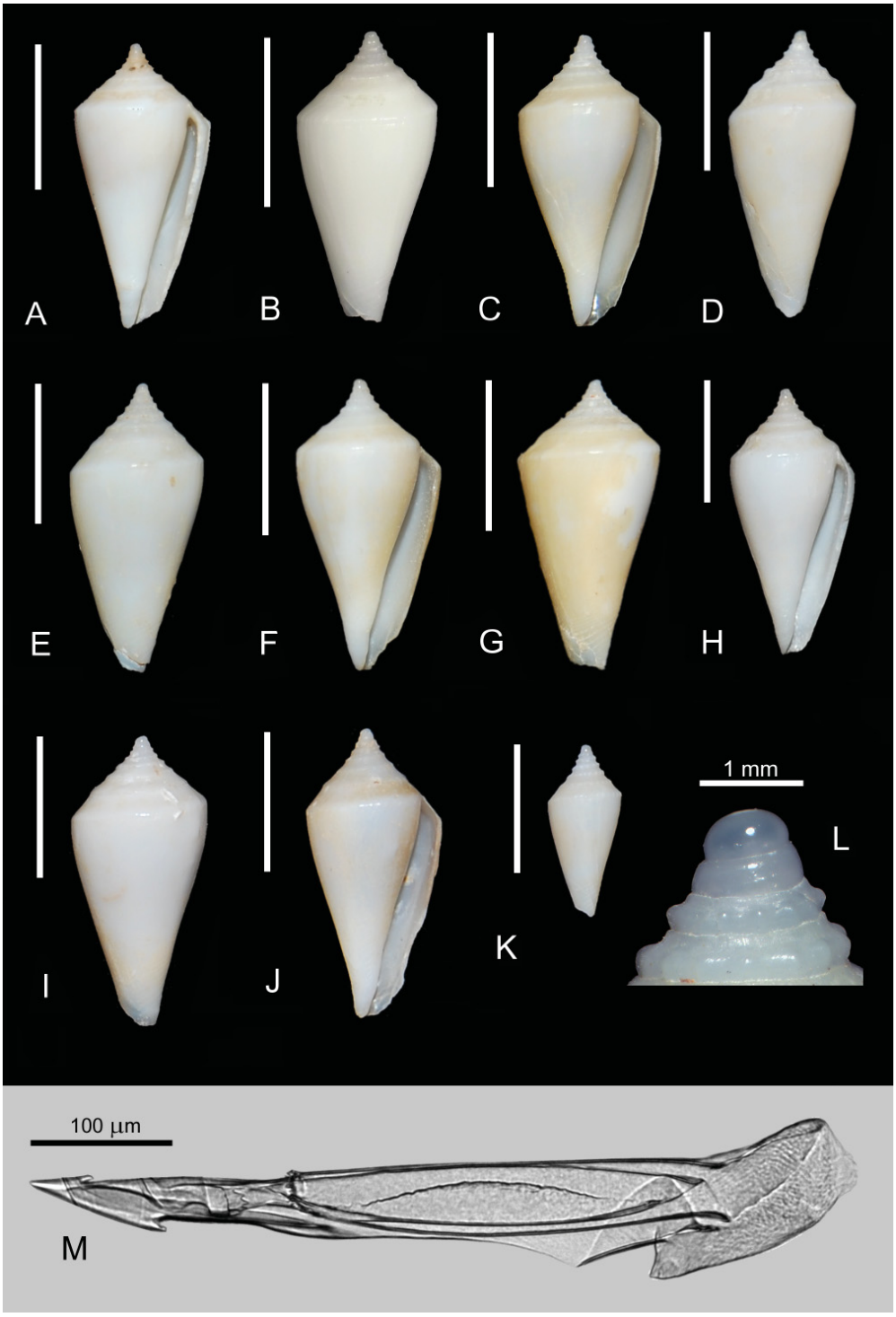

Fig. 18. *Profundiconus vaubani* (Röckel & Moolenbeek, 1995). **A**. Paratype, S New Caledonia, S Île des Pins, 490–495 m depth, 19.8 mm (MNHN-IM-2000-3456). **B**. Norfolk Ridge, Île des Pins, 553–575 m depth, 17.4 mm. **C**. S New Caledonia, 525–547 m depth, 19.2 mm. **D**. Same collection data as for specimen C, 20.9 mm. **E**. Same collection data as for specimen C, 20.7 mm. **F**. Same collection data as for specimen C, 19.2 mm. **G**. Same collection data as for specimen C, 19.3 mm. **H**. S New Caledonia, 530–541 m depth, 21.8 mm. **I**. Same collection data as for specimen H, 20.6 mm. **J**. Norfolk Ridge, Île des Pins, 496 m depth, 20.8 mm. **K**. Norfolk Ridge, Banc Stylaster, 440 m depth, 13.5 mm. **L**. Protoconch of specimen from S New Caledonia, 525 m depth. **M**. Radular tooth of specimen B. Scale bars = 10 mm, unless otherwise stated.

31 Aug. 1985; BIOCAL expedition; MNHN (Fig. 17L) • 20.6 mm; Norfolk Ridge, Banc Stylaster, stn DW1666; 23°42′ S, 167°43′ E; 469–860 m depth; 20 Jun. 2001; NORFOLK 1 expedition (Fig. 17M) • 19.8 mm; off S New Caledonia, S Île des Pins, stn DW10; 22°54′ S, 167°16′ E; 490–495 m depth; 18 Sep. 1986; SMIB 2 expedition; MNHN (Fig. 18A) • 17.4 mm; Norfolk Ridge, Île des Pins, off New Caledonia, stn DW2157; 22º56′ S, 167º19′ E; 553–575 m depth; 5 Nov. 2003; NORFOLK 2 expedition; MNHN (Fig. 18B, M) • 19.2 mm; off S New Caledonia, stn DW721; 22º54′ S, 167º17′ E; 525–547 m depth; 11 May 1993; BATHUS 2 expedition; MNHN (Fig. 18C) • 20.9 mm; same collection data as for preceding; MNHN (Fig. 18D) • 20.7 mm; same collection data as for preceding; MNHN (Fig. 18E) • 19.2 mm; same collection data as for preceding; MNHN (Fig. 18F) • 19.3 mm; same collection data as for preceding; MNHN (Fig. 18G) • 21.8 mm; off S New Caledonia, stn DW720; 22º52′ S, 167º16′ E; 530–541 m depth; 11 May 1993; BATHUS 2 expedition; MNHN (Fig. 18H) • 20.6 mm; same collection data as for preceding; MNHN (Fig. 18I) • 20.8 mm; Norfolk Ridge, Île des Pins, off New Caledonia, stn DW2147; 22º50′ S, 167º16′ E; 496 m depth; 4 Nov. 2003; NORFOLK 2 expedition; MNHN (Fig. 18J) • 13.5 mm; Norfolk Ridge, Banc Stylaster, off New Caledonia, stn DW2031; 23º39′ S, 167º44′ E; 440 m depth; 22 Oct. 2003; NORFOLK 2 expedition; MNHN (Fig. 18K) • 11.5 mm; off S New Caledonia, stn DW21; 22º59′ S, 167º19′ E; 525 m depth; 24 May 1987; SMIB 3 expedition; MNHN (Fig. 18L).

Geographical distribution and bathymetry

Most specimens come from Norfolk Ridge, but it has been also sampled in N New Caledonia (Grand Passage area), Loyalty Ridge, Hunter Island in the New Hebrides Arc, and the Coral Sea (Plateau des Chesterfield and Bellona Plateau), at depths between 400 and 800 m. This species can be considered endemic.

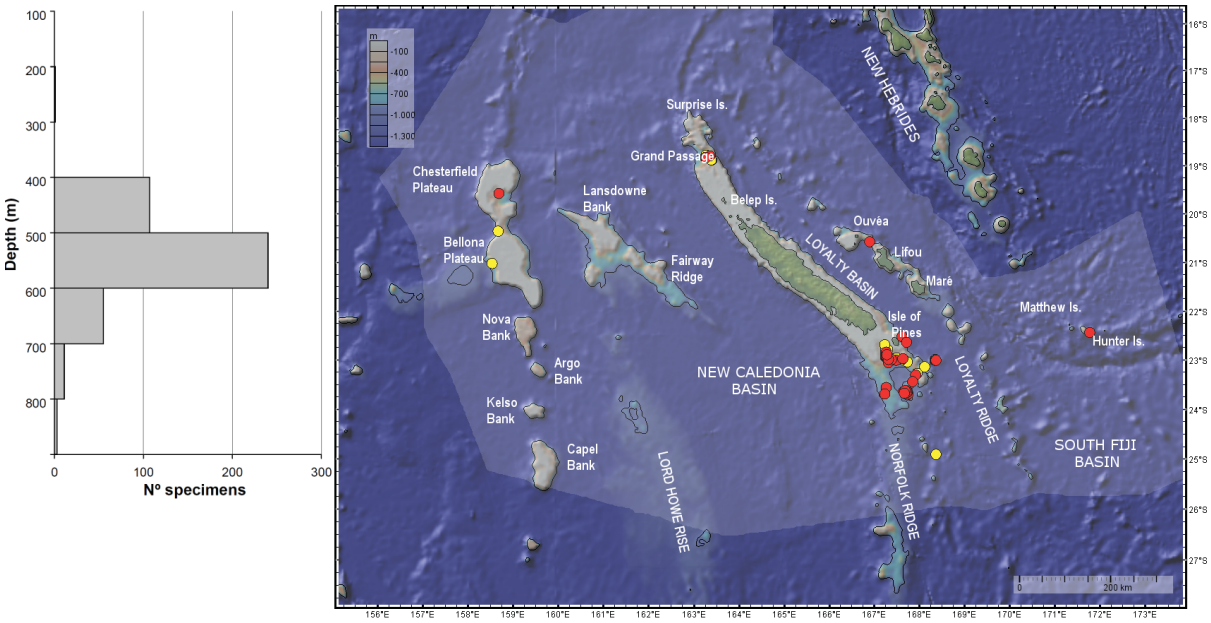

Fig. 19. Bathymetric range and distribution map for *Profundiconus vaubani* (Röckel & Moolenbeek, 1995). Red circles indicate the points where the standard form of the species has been collected. Yellow circles indicate the points where the white form has been collected.

Remarks

Shell small to moderately small (maximum length 29 mm), narrowly conical with a paucispiral protoconch of 1.75 whorls (Fig. 17L). Shoulder angulate with characteristic axial costae. Radular tooth (Fig. 17M) rather large. Anterior portion of tooth shorter than posterior section. Barb and pointed, well-defined blade approximately one half of apical portion of tooth. External cusp present, laterally widened and serrated, with 6–7 denticles. Characteristic fringe of closely spaced projections pointing towards the apex located immediately below the waist. Shaft fold present. Large and prominent basal spur on top of slanted base of tooth. The shell of typical *P. vaubani* (i.e., matching the holotype) exhibits a pattern of light brown axial streaks from the base to the last spire whorl on a white ground color. However, the type series and the original description also makes reference to pure white conical to slightly pyriform shells having a smooth, angulate or carinate shoulder instead of axially oriented ribs (Fig. 18A). These specimens, occasionally referred to as "white" *vaubani*, exhibit a radular tooth essentially identical to that of patterned forms. They have often been misidentified as *P. loyaltiensis* due to the plain white color, but the shell shape is different (more conical with a concave spire in *P. loyaltiensis*), and they lack the strong cords present on top of the spire whorls. Furthermore, the typical specimens of *P. vaubani* and the white ones (often mislabeled as *P. loyaltiensis*) share the same haplotype, and form a clade which also includes *P. kanakinus* (Fig. 2). Until further evidence is found, we hereby consider both typical and white specimens as representatives of the same species, namely *P. vaubani*.

Profundiconus virginiae Tenorio & Castelin, 2016
Figs 2, 16I–L, N, 20

Profundiconus virginiae Tenorio & Castelin, 2016: 22, figs 9a–d, g, 10.

Profundiconus n. sp. h – Puillandre *et al.* 2014: supplementary material 1 (unfigured).
Profundiconus cf. *cakobaui* (non *Conus cakobaui* Moolenbeek, Röckel & Bouchet, 2008) – Tenorio 2015a: 45 (unfigured).
Profundiconus virginiae – Monnier *et al.* 2018a: 143.

Material examined

3 lots (3 specimens). See Supp. file 1.

Type material

Holotype

NEW CALEDONIA • 42.5 mm; Coral Sea, Plateau des Chesterfield, off New Caledonia, stn DW2613; 19°37′ S, 158°42′ E; 519–522 m depth; 19 Oct. 2005; EBISCO expedition; MNHN-IM-2007-30854 (Fig. 16I–J).

Figured material

NEW CALEDONIA • Paratype, 33.7 mm; Plateau des Chesterfield, off New Caledonia, stn DW2609; 19°33′ S, 158°40′ E; 431–436 m depth; 19 Oct. 2005; EBISCO expedition; MNHN-IM-2007-30858 (Fig. 16K, N) • paratype, 16.3 mm (fragment); Plateau des Chesterfield, off New Caledonia, stn DW2610; 19°34′ S, 158°41′ E; 486–494 m depth; 19 Oct. 2005; EBISCO expedition; MNHN-IM-2000-30789 (Fig. 16L).

Geographical distribution and bathymetry

Coral Sea, Plateau des Chesterfield, at depths between 400–600 m. This species can be considered endemic.

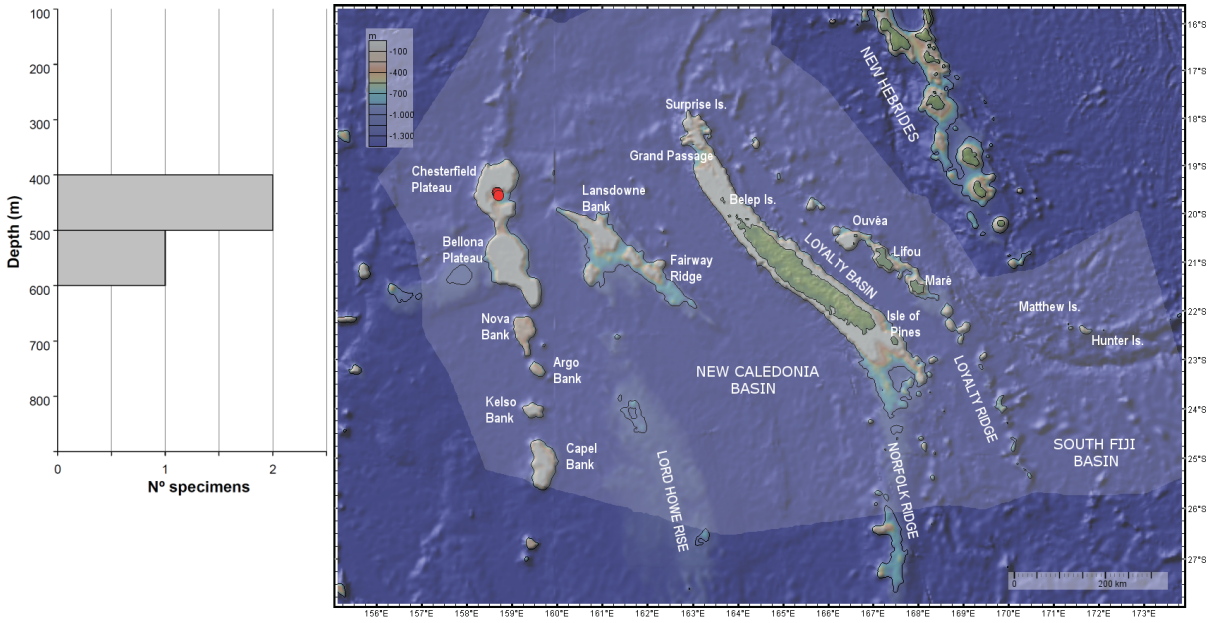

Fig. 20. Bathymetric range and distribution map for *Profundiconus virginiae* Tenorio & Castelin, 2016. Red circles indicate the points where the species was collected.

Remarks

Shell moderately small to medium sized (maximum length 42.5 mm). Multispiral protoconch with 3–3.5 whorls, white, glossy and translucent (Fig. 16L). Radular tooth (Fig. 16N) medium- to large-sized, rather elongated. Anterior portion of tooth shorter than posterior section, with one barb and a pointed, well-defined blade which covers 40–43% of anterior portion of tooth. External cusp present, laterally expanded and serrated, with 5–6 small denticles. Characteristic fringe of closely spaced projections pointing towards apex located immediately below waist. Shaft fold present. Large and prominent basal spur on top of slanted base of tooth. This is a very rare species known from very few specimens only. In the phylogeny (Fig. 2) the two sequenced individuals of *P. virginiae* form a monophyletic group that is the sister group of *P. zardoyai*, *P. vaubani*, and *P. kanakinus*.

Profundiconus zardoyai Tenorio, 2015

Figs 21–22

Profundiconus zardoyai Tenorio, 2015a: 39, pls 1–2.

Profundiconus zardoyai – Monnier *et al.* 2018a: 140.

Material examined

25 lots (about 85 specimens). See Supp. file 1.

Type material

Holotype

NEW CALEDONIA • 10.5 mm; Grand Passage, off New Caledonia, stn DW926; 18º57′ S, 163º25′ E; 325–330 m depth; 7 Aug. 1994; BATHUS 4 expedition; MNHN-IM-2000-28206 (Fig. 21A, L).

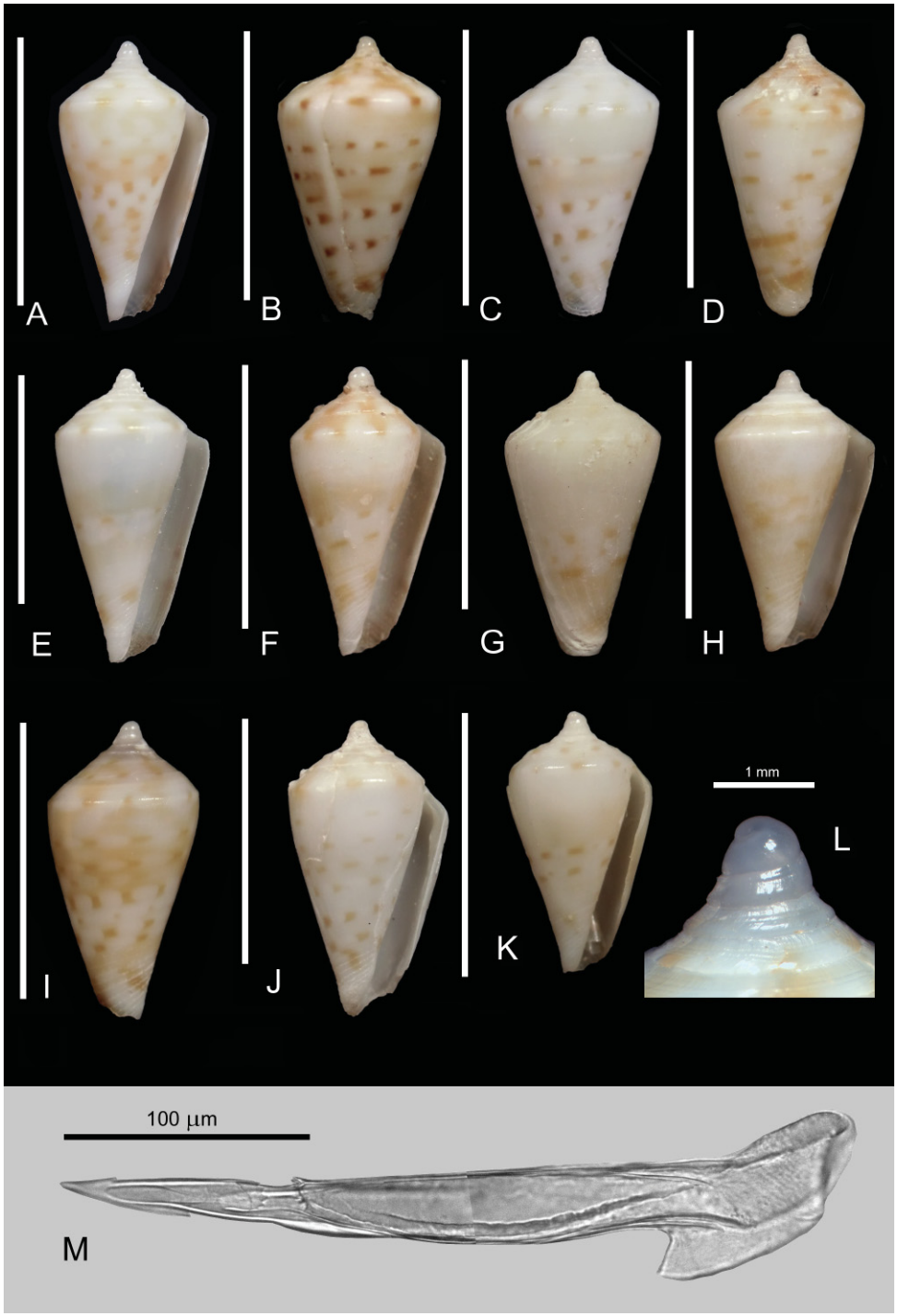

Fig. 21. *Profundiconus zardoyai* Tenorio, 2015. **A**. Holotype, Grand Passage, 325–330 m depth, 10.5 mm (MNHN-IM-2000-28206). **B**. N New Caledonia, 444–452 m depth, 10.6 mm. **C**. N New Caledonia, 325–330 m depth, 10.2 mm. **D**. Same collection data as for specimen C, 11 mm. **E**. N New Caledonia, 264–270 m depth, 12.9 mm. **F**. Grand Passage, 270 m depth, 11 mm. **G**. Off New Caledonia, 380–400 m depth, 11.5 mm. **H**. Grand Passage, 344–360 m depth, 11 mm. **I**. Same collection data as for specimen C, 10.8 mm. **J**. Secteur des Belep, off New Caledonia, 335 m depth, 12.1 mm **K**. Norfolk Ridge, 311–330 m depth, 10.4 mm. **L**. Protoconch of holotype (MNHN-IM-2000-28206). **M**. Radular tooth of specimen from N New Caledonia, 325–330 m depth, 10.7 mm. Scale bars = 10 mm, unless otherwise stated.

Figured material

NEW CALEDONIA • 10.6 mm; off N New Caledonia, stn DW927; 18º56′ S, 163º22′ E; 444–452 m depth; 7 Aug. 1994; BATHUS 4 expedition; MNHN (Fig. 21B) • 10.2 mm; off N New Caledonia, stn DW926; 18º57′ S, 163º25′ E; 325–330 m depth; 7 Aug. 1994; BATHUS 4 expedition; MNHN (Fig. 21C) • 11 mm; same collection data as for preceding; MNHN (Fig. 21D) • 12.9 mm; off N New Caledonia, stn DW942; 19º04′ S, 162º27′ E; 264–270 m depth; 8 Aug. 1994; BATHUS 4 expedition; MNHN (Fig. 21E) • 11 mm; Grand Passage, off New Caledonia, stn DW941; 19º02′ S, 163º27′ E; 270 m depth; 8 Aug. 1994; BATHUS 4 expedition; MNHN (Fig. 21F) • 11.5 mm; off New Caledonia, stn DW01; 18º56′ S, 163º24′ E; 380–400 m depth; 23 Nov. 1994; HALICAL 1 expedition; MNHN (Fig. 21G) • 11 mm; Grand Passage, off New Caledonia, stn DW924; 18°55′ S, 163°24′ E; 344–360 m depth; 7 Aug. 1994; BATHUS 4 expedition; MNHN (Fig. 21H) • 10.8 mm; off N New Caledonia, stn DW926; 18º57′ S, 163º25′ E; 325–330 m depth; 7 Aug. 1994; BATHUS 4 expedition; MNHN (Fig. 21I) • 12.1 mm; Secteur des Belep, off New Caledonia, stn DW1152; 18º58′ S, 163º24º E; 335 m depth; 29 Oct. 1989; LAGON expedition; MNHN (Fig. 21J) • 10.4 mm; Norfolk Ridge, off New Caledonia, stn DW181; 23º18′ S, 168º05′ E; 311–330 m depth; 31 Jan. 1993; SMIB 8 expedition; MNHN (Fig. 21K) • 10.7 mm; Grand Passage, off New Caledonia, stn DW926; 18º57′ S, 163º25′ E; 325–330 m depth; 7 Aug. 1994; BATHUS 4 expedition (Fig. 21M).

Geographical distribution and bathymetry

N New Caledonia: Grand Passage area, Secteur des Belep and Surprise Island. There is at least one record from the Coral Sea (Plateau des Chesterfield), although it might correspond to a misidentified *P. barazeri*. It has typically been found at depths between 200 and 600, although a few specimens come from depths of 700–800 m. This species can be considered endemic.

Remarks

Shell very small (maximum shell length 13.5 mm), conical to broadly conical with a moderate spire of sigmoid outline. Paucispiral protoconch of 1.5–1.75 whorls, white, porcellaneous and translucent (Fig. 21L). Radular tooth (Fig. 21M) rather large, with the anterior section much shorter than half of the

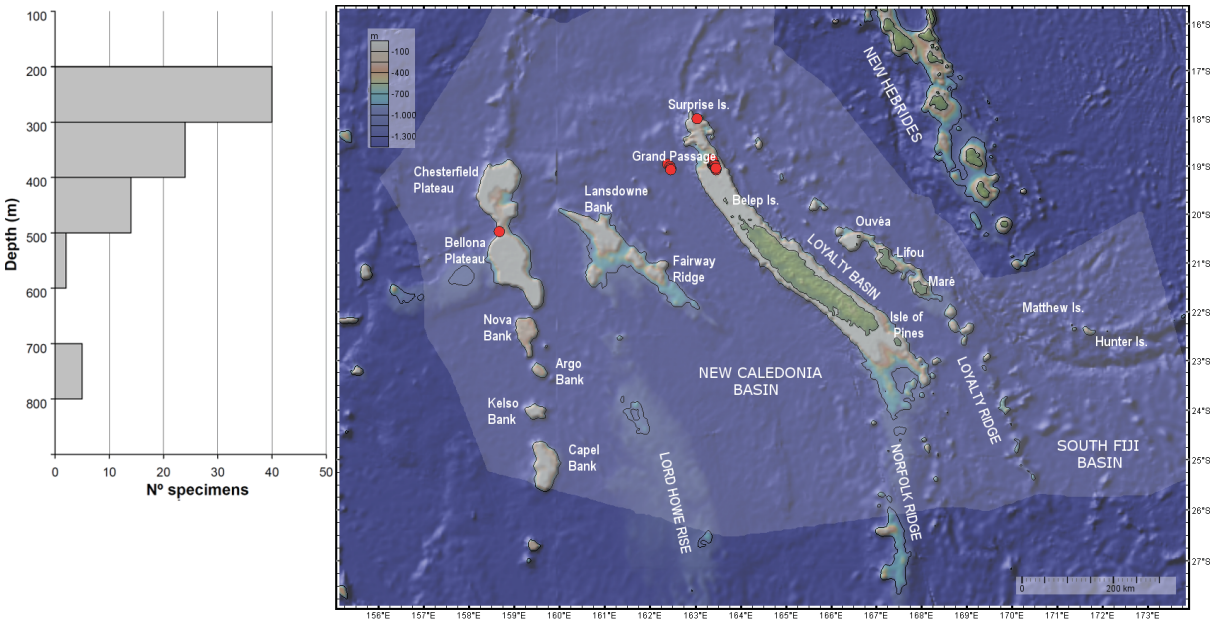

Fig. 22. Bathymetric range and distribution map for *Profundiconus zardoyai* Tenorio, 2015. Red circles indicate the points where the species was collected.

total tooth length. Barb present, opposing a pointed blade covering about one half of the anterior portion. External cusp laterally expanded and serrated with 5 to 6 small denticles. Characteristic fringe of closely spaced projections pointing towards the apex present immediately below the waist. Shaft fold present. Slanted base, with a large basal spur present. In the phylogeny, the two sequenced individuals form a monophyletic group that is the sister group of *P. vaubani* and *P. kanakinus*. Specimens of empty shells provisionally identified as *P.* cf. *kanakinus*, but remarkably similar to *P. zardoyai*, have been collected off Wallis and Futuna Islands (Moolenbeek & Röckel 1996). These specimens require further study and are hereby considered not conspecific with *P. zardoyai*.

Genus *Conasprella* Thiele, 1929
Subgenus *Boucheticonus* Tucker & Tenorio, 2013

Conasprella* (*Boucheticonus*) *alisi (Röckel, Richard & Moolenbeek, 1995)
Figs 2, 23–24

Conus alisi Röckel *et al.*, 1995a: 579, figs 2, 4–5.

Conus species no. 19 – Röckel *et al.* 1995b: pl. 72 figs 21–22.
Boucheticonus alisi – Tucker & Tenorio 2013: 78. — Monnier *et al.* 2018a: 207.

Material examined

211 lots (about 495 specimens). See Supp. file 1.

Type material

Holotype

NEW CALEDONIA • 22.2 mm; Norfolk Ridge, Banc Aztèque, off New Caledonia, stn DW183; 23°18′ S, 168°05′ E; 330–367 m depth; 31 Jan. 1993; SMIB 8 expedition; MNHN-IM-2000-2588 (Fig. 23A).

Figured material

NEW CALEDONIA • 20.5 mm; Norfolk Ridge, Jumeau Ouest, off New Caledonia, stn CP3055; 23°42′ S, 168°01′ E; 250–320 m depth; 20 Oct. 2008; TERRASSES expedition; MNHN (Fig. 23B) • 27.7 mm; off N New Caledonia, stn DW926; 18º57′ S, 163º25′ E; 325–330 m depth; 7 Aug. 1994; BATHUS 4 expedition; MNHN (Fig. 23C) • 25 mm; off New Caledonia, stn DW230; 22º52′ S, 167º12′ E; 390–420 m depth; 30 Sep. 1985; MUSORSTOM 4 expedition; MNHN (Fig. 23D) • 20.3 mm; Norfolk Ridge, off New Caledonia, stn CP806; 23º42′ S, 168º01′ E; 308–312 m depth; 27 Nov. 1993; BATHUS 3 expedition; MNHN (Fig. 23E) • 18.7 mm; Norfolk Ridge, Banc P, off New Caledonia, stn DW1729; 23º20′ S, 168º16′ E; 340–619 m depth; 27 Jun. 2001; NORFOLK 1 expedition; MNHN (Fig. 23F) • 21.7 mm; same collection data as for preceding; MNHN (Fig. 23G) • 20.2 mm; same collection data as for preceding; MNHN (Fig. 23H) • 18 mm; Norfolk Ridge, Banc P, off New Caledonia, stn DW1728; 23º19′ S, 168º15′ E; 207–276 m depth; 27 Jun. 2001; NORFOLK 1 expedition; MNHN (Fig. 23I) • 19.1 mm; Norfolk Ridge, Banc P, off New Caledonia, stn DW1729; 23º20′ S, 168º16′ E; 340–619 m depth; 27 Jun. 2001; NORFOLK 1 expedition; MNHN (Fig. 23J) • 18 mm; Norfolk Ridge, Jumeau Ouest, off New Caledonia, stn DW3056; 23°42′ S, 168°01′ E; 250–330 m depth; 20 Oct. 2008; TERRASSES expedition; MNHN (Fig. 23K) • 20 mm; Norfolk Ridge, off New Caledonia, stn DW830; 23º20′ S, 168º01′ E; 361–365 m depth; 29 Nov. 1993; BATHUS 3 expedition; MNHN (Fig. 23L) • 19 mm; Grand Passage, off N New Caledonia, stn DW2964; 18º18′ S, 162º57′ E; 256–270 m depth; 02 May 2008; CONCALIS expedition; Atheris coll. (Fig. 23M).

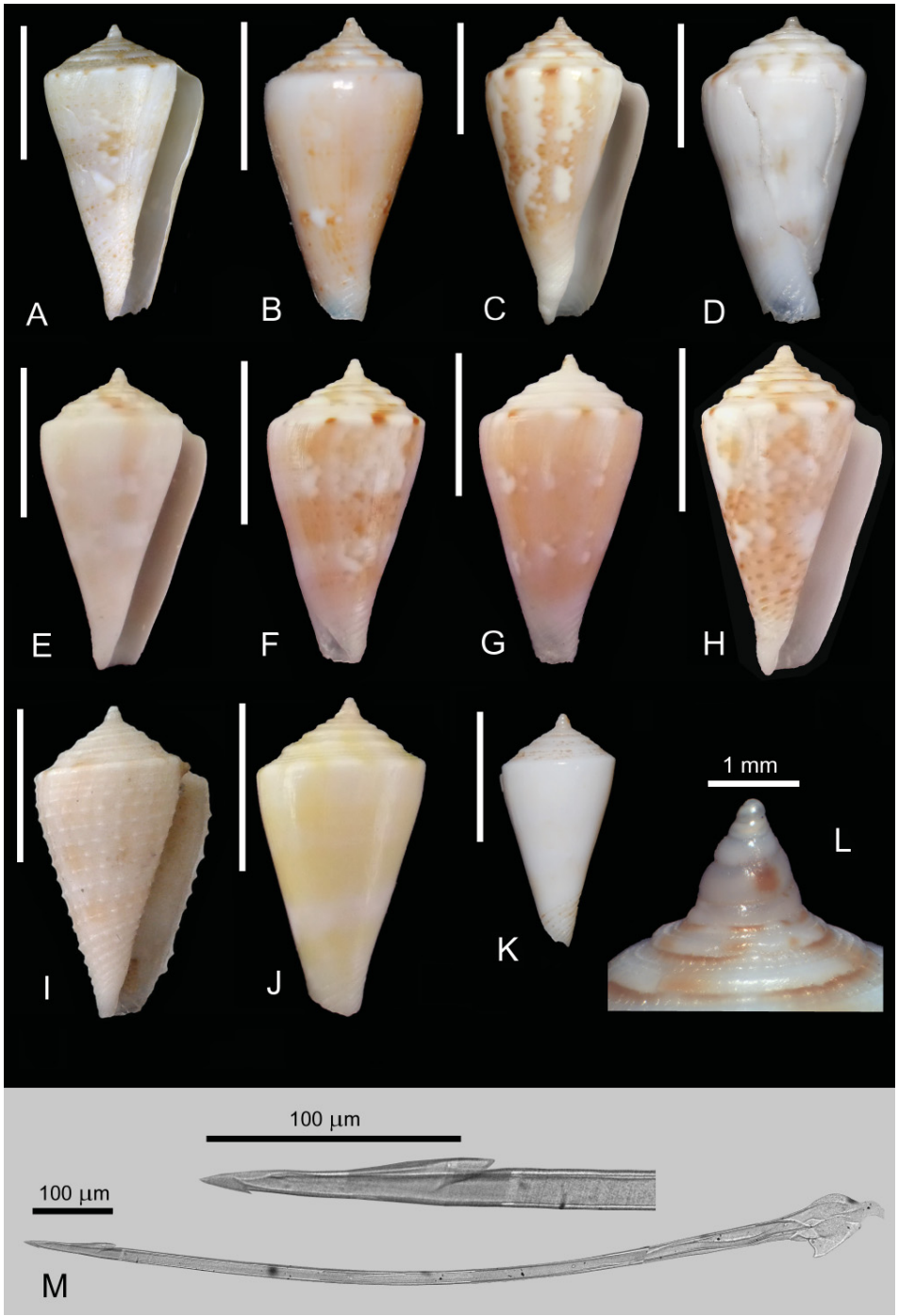

Fig. 23. *Conasprella* (*Boucheticonus*) *alisi* (Röckel, Richard & Moolenbeek, 1995). **A**. Holotype, Norfolk Ridge, Banc Aztèque, 330–367 m depth, 22.2 mm (MNHN-IM-2000-2588). **B**. Norfolk Ridge, Banc Jumeau Ouest, 250–320 m depth, 20.5 mm. **C**. N New Caledonia, 325–330 m depth, 27.7 mm. **D**. New Caledonia, 390–420 m depth, 25 mm. **E**. Norfolk Ridge, 308–312 m depth, 20.3 mm. **F**. Norfolk Ridge, Banc P, 340–619 m depth, 18.7 mm. **G**. Same collection data as for specimen F, 21.7 mm. **H**. Same collection data as for specimen F, 20.2 mm. **I**. Norfolk Ridge, Banc P, 207–276 m depth, 20.4 mm. **J**. Same collection data as for specimen F, 19.1 mm. **K**. Norfolk Ridge, Banc Jumeau Ouest, 18 mm. **L**. Protoconch of specimen from Norfolk Ridge, 361–365 m depth. **M**. Radular tooth of a specimen from Grand Passage, 256–270 m depth, 19 mm (Atheris coll.). Scale bars = 10 mm, unless otherwise stated.

Geographical distribution and bathymetry

New Caledonia: Norfolk Ridge and Grand Passage area, Loyalty Ridge and Coral Sea (Lansdowne Bank and Bellona Plateau), typically at depths between 200–500 m (Fig. 24). This species can be considered endemic.

Remarks

Conical shell small to moderately small (maximum length 30 mm), slightly pyriform. Protoconch (Fig. 23L) multispiral, pointed, of 4.5–5 whorls. Protoconch white with a peculiar brown blotch on fourth whorl. Spire slightly stepped, of moderate height, with a slightly convex outline. Radular tooth (Fig. 23M) large, very elongated with an extremely long anterior section that is more than four times as long as the posterior section of the tooth. Barb small and indistinct, with a blade that is enlarged and widened laterally. Serrations absent. Waist indistinct. Shaft fold not well developed but present. Slanted base with a large basal spur. This is one of the most abundant deep-water species of Conidae in New Caledonia. In spite of its large multispiral protoconch, the species can be considered endemic. It is highly variable in pattern and color. Pustulose specimens (Fig. 23I), with a somehow weird aspect, are not uncommon, but their identification is often confusing. In the phylogeny (Fig. 2), the specimens of *C. alisi* sequenced form a clade sister to *Conasprella* cf. *pseudokimioi*.

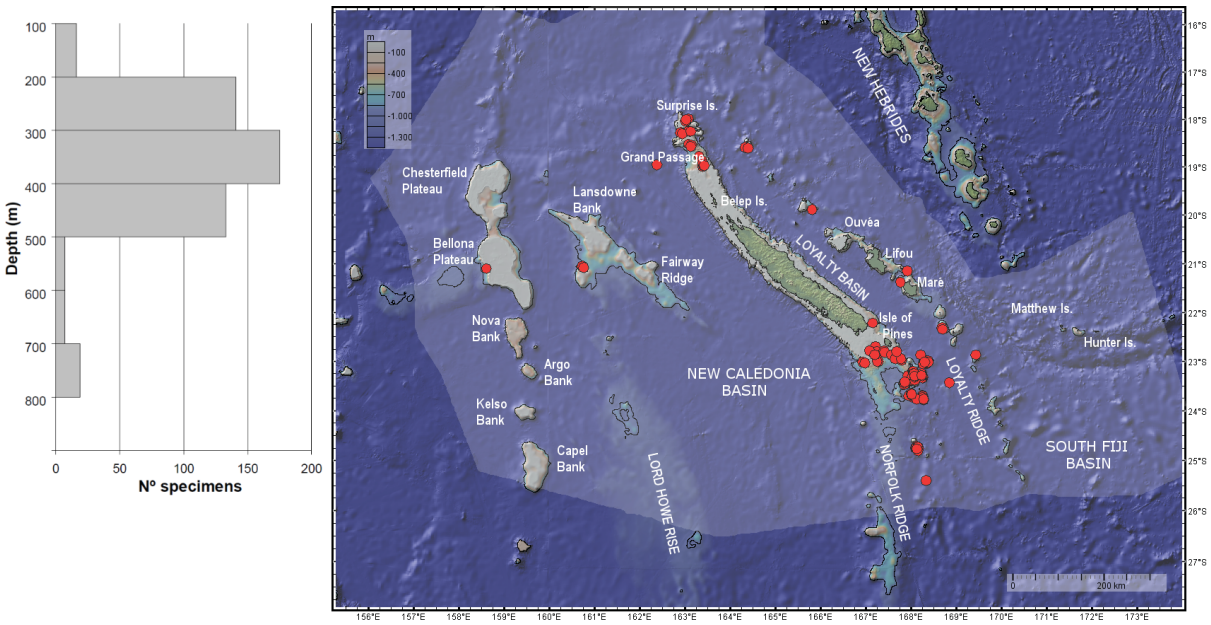

Fig. 24. Bathymetric range and distribution map for *Conasprella* (*Boucheticonus*) *alisi* (Röckel, Richard & Moolenbeek, 1995). Red circles indicate the points where the species was collected.

Conasprella* (*Boucheticonus*) *kimioi (Habe, 1965)
Figs 25A–D, M, 26

Rhizoconus kimioi Habe, 1965: 47, pl. 4 figs 1–2.

Conus kimioi – Röckel *et al.* 1995b: no. 244, pl. 52 figs 25–27.
Duodenticonus kimioi – Tucker & Tenorio 2013: 241.
Conasprella kimioi – Monnier *et al.* 2018a: 206.

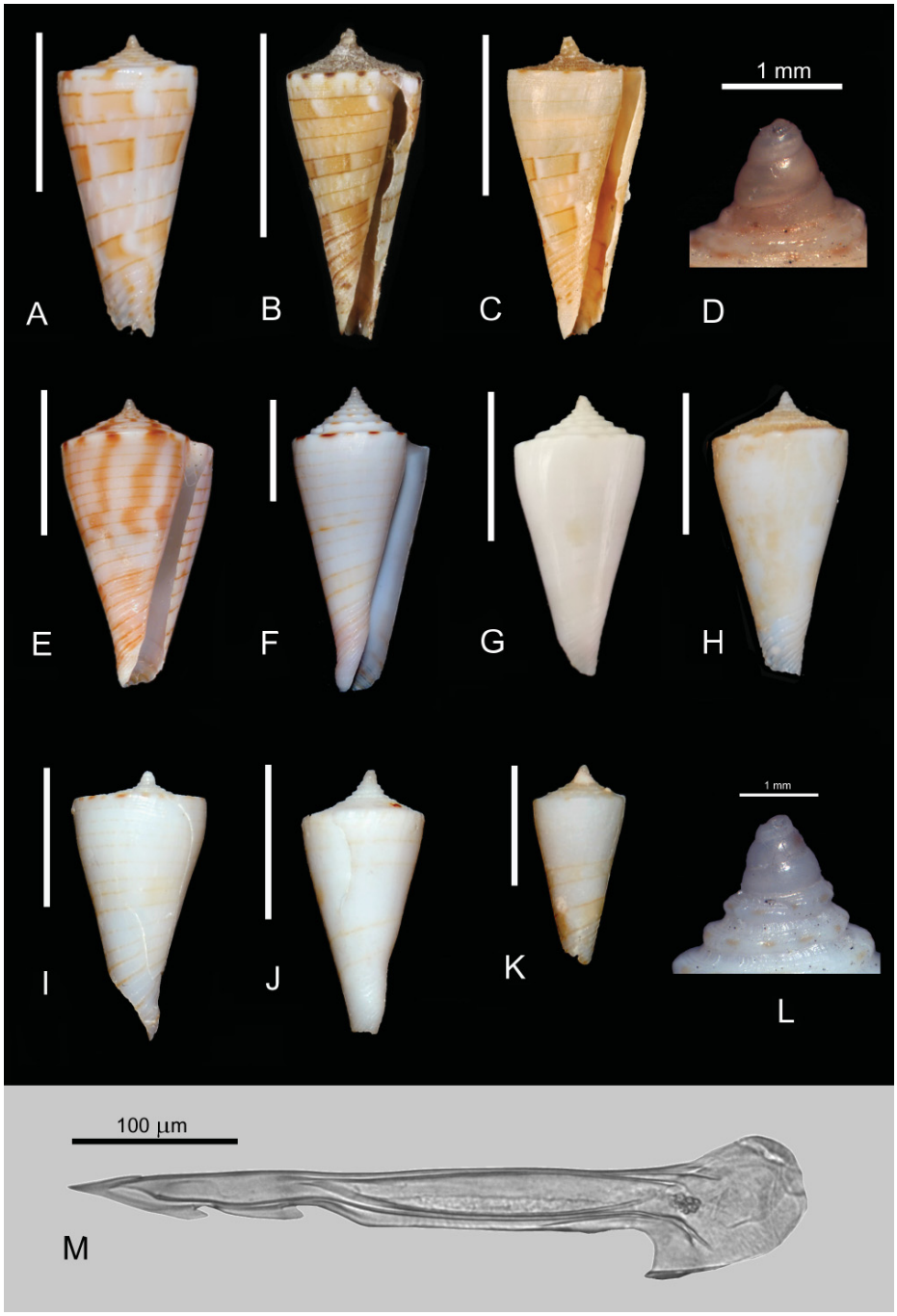

Fig. 25. A–D. *Conasprella* (*Boucheticonus*) *kimioi* (Habe, 1965). **A**. Norfolk Ridge, Banc Munida, 180–220 m depth, 19 mm. **B**. SE Île des Pins, 210 m depth, 15.3 mm (MNHN-IM-2013-66093). **C**. Banc Ellet, off New Caledonia, 100 m depth, 18.9 mm (MNHN IM-2009-31354). **D**. Protoconch of specimen A. – **E**. *Conasprella* (*Boucheticonus*) *pseudokimioi* (da Motta & Martin, 1982). Holotype, Mindanao Sea off Siquijor Island, Philippines, 20 mm (MHNG 982.727). – **F–L**. *Conasprella* (*Boucheticonus*) cf. *pseudokimioi*. **F**. Coral Sea, S Banc Nova, 320–345 m depth, 28 mm (MNHN-IM-2007-30835). **G**. Coral Sea, SW Bellona, 333–386 m depth, 18 mm (MNHN-IM-2007-30687). **H**. Same collection data as for specimen G, 20.2 mm. **I**. Coral Sea, W Bellona, 358–374 m depth, 19.5 mm. **J**. Coral Sea, W Bellona, 356–438 m depth, 16.8 mm. **K**. Grand Passage, 400 m depth, 16.7 mm. **L**. Protoconch of specimen F. – **M**. *Conasprella* (*Boucheticonus*) *kimioi*. Radular tooth of specimen from Île des Pins, 150 m depth, 19.0 mm. Scale bars = 10 mm, unless otherwise stated.

Material examined

10 lots (10 specimens). See Supp. file 1.

Type material

Holotype

JAPAN • 15 mm; off Okinoshima, Kochi Prefecture, Shikoku; ca 100 m depth; NSMT 38675.

Figured material

NEW CALEDONIA • 19 mm; Norfolk Ridge, Munida, off New Caledonia, stn DW3106; 23°02′ S, 168°21′ E; 180–220 m depth; 27 Oct. 2008; TERRASSES expedition; MNHN (Fig. 25A, D) • 15.3 mm; SE Île des Pins, off New Caledonia, stn DW4741; 22°52′ S, 167°41′ E; 210 m depth; 23 Aug. 2016; KANACONO expedition; MNHN-IM-2013-66093 (Fig. 25B) • 18.9 mm; Banc Ellet, off New Caledonia, stn DW3866; 22°52′ S, 169°26′ E; 100 m depth; 16 Sep. 2011; EXBODI expedition; MNHN IM-2009-31354 (Fig. 25C) • 19 mm; W Île des Pins, off New Caledonia, stn DW4728; 22°43'S, 167°02'E; 150 m; 20 Aug. 2016; KANACONO expedition; MNHN-IM-2013-69345 (Fig. 25M).

Geographical distribution and bathymetry

Japan to the Philippines, at depths between 120–250 m. In New Caledonia it has been sampled in several locations in Norfolk Ridge, Grand Passage, and also in Loyalty Ridge, at depths of 100–400 m. Also reported from Fiji in 416 m (Moolenbeek *et al.* 2008), and Wallis & Futuna Islands in 290–400 m (Moolenbeek & Röckel 1996).

Remarks

Small shell (maximum shell length 23 mm), narrowly conical to conical, with a low to moderate spire of concave outline. Protoconch multispiral of 3.5–3.75 whorls (Fig. 25D). Radular tooth (Fig. 25M) with a short barb, a pointed blade, and a very well developed, pointed posterior blade. The anterior section of the tooth is much shorter than the posterior section. Shaft fold present. A basal spur is present on top of the slanted base.

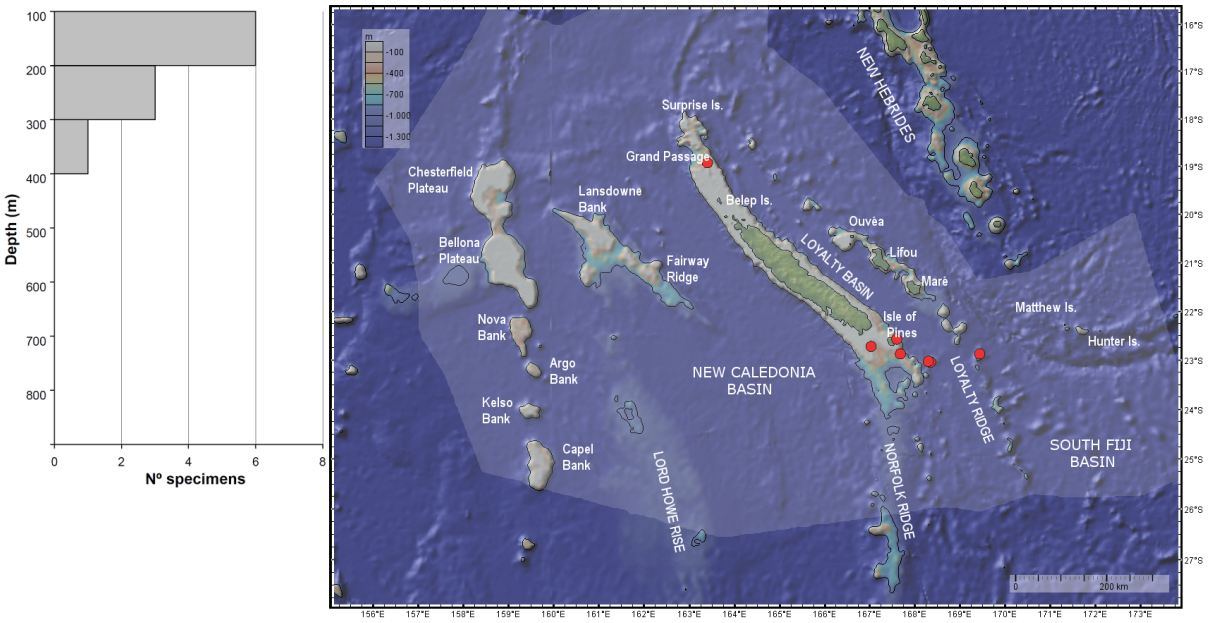

Fig. 26. Bathymetric range and distribution map for *Conasprella* (*Boucheticonus*) *kimioi* (Habe, 1965). Red circles indicate the points where the species was collected.

Conasprella* (*Boucheticonus*)** cf. ***pseudokimioi (da Motta & Martin, 1982)
Figs 2, 25F–L, 27

Conus pseudokimioi da Motta & Martin, 1982: 9, fig. 4.

Conus pseudokimioi – Röckel *et al.* 1995b: no. 245, pl. 52 figs 28–30.
Continuconus pseudokimioi – Tucker & Tenorio 2013: 332.
Kioconus (*Ongoconus*) *pseudokimioi* – Monnier *et al.* 2018a: 535.

Material examined

15 lots (17 specimens). See Supp. file 1.

Type material

Holotype

PHILIPPINES • 20 mm; Mindanao Sea, off Siguijor Island; 183 m depth; MHNG MOLL-138915 (Fig. 25E).

Figured material

NEW CALEDONIA • 28 mm; Nova Bank S, off New Caledonia, stn DW2528; 22º49′ S, 159º23′ E; 320–345 m depth; 9 Oct. 2005; EBISCO expedition; MNHN-IM-2007-30835 (Fig. 25F, L) • 18 mm; NW Bellona, off New Caledonia, stn DW2564; 20º25′ S, 158º41′ E; 333–386 m depth; 13 Oct. 2005; EBISCO expedition; MNHN-IM-2007-30687 (Fig. 25G) • 20.2 mm; same collection data as for preceding; MNHN (Fig. 25H) • 19.5 mm; W Bellona, off New Caledonia, stn DW2574; 20º20′ S, 158º45.6′ E; 358–374 m depth; 14 Oct. 2005; EBISCO expedition; MNHN (Fig. 25I) • 16.8 mm; W Bellona, off New Caledonia, stn DW2547; 21º06′ S, 158º36′ E; 356–438 m depth; 11 Oct. 2005; EBISCO expedition; MNHN (Fig. 25J) • 16.7 mm; Grand Passage, off New Caledonia, stn CP3006; 18º32.5′ S, 163º07.6′ E; 400 m depth; 7 May 2008; CONCALIS expedition; MNHN (Fig. 25K).

Geographical distribution and bathymetry

The nominal species occurs in the southern Philippines, at depths of 120–240 m. Specimens of *Conasprella* cf. *pseudokimioi* are distributed in the Coral Sea, N New Caledonia and Loyalty Ridge, typically at depths between 300 and 500 m. Two dead, worn specimens sampled in Vanua Levu, Fiji, in 416 m depth, have been tentatively identified as *C.* cf. *pseudokimioi* by Moolenbeek *et al.* (2008).

Remarks

Small to moderately small (maximum shell length 25 mm) conical shell, with a low spire of concave profile. Multispiral protoconch of more than 3 whorls, with a brown blotch on the mid whorl (Fig. 25L), a feature shared with *C. alisi*. The basal end appears slightly deflected to the left. Pure white ground color covered by fine brown spiral lines formed by small dots closely aligned. The pattern is usually faded in dead specimens and difficult to appreciate. Although live specimens were sampled, the morphology of the radular tooth of *C.* cf. *pseudokimioi* is unknown. In the phylogeny (Fig. 2), the two specimens sequenced appear sister to *C. alisi* with good support, confirming their placement in *Conasprella* rather than in *Conus*. Although very similar in shell morphology, the conspecificity of *C.* cf. *pseudokimioi* with typical *C. pseudokimioi* from the Philippines is very doubtful. Specimens of the latter have not been sequenced, but the radular morphology (Rolán & Raybaudi 1994) is known and consistent with its placement in *Conus* (radular tooth with one row of rather obsolete denticles in the serration, shaft fold absent; see Tucker & Tenorio 2009). Furthermore, it has been suggested (Rolán & Raybaudi 1994) that *C. pseudokimioi* from the Philippines represents the young stage of *Conus* (*Splinoconus*) *shikamai* Coomans & Moolenbeek, 1986. It is therefore likely that *C.* cf. *pseudokimioi* from New Caledonia

represents a distinct, yet undescribed species sister to *C. alisi*. However, prior to its formal introduction as a new species, the hypothesis requires further support, namely DNA sequencing of specimens of *C. pseudokimioi* from the type locality and examination of the radular tooth of *C.* cf. *pseudokimioi* from New Caledonia. The shell of *Conasprella kimioi*, also present in New Caledonia, is similar to that of *C.* cf. *pseudokimioi*, but this species appears separated in the phylogeny (Fig. 2).

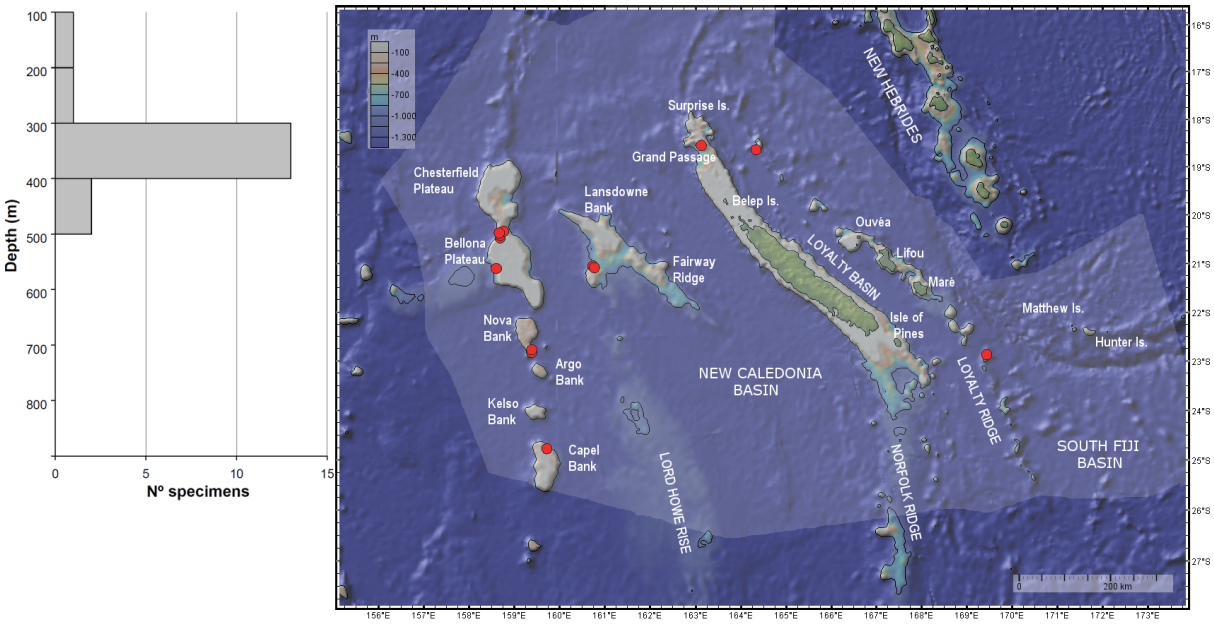

Fig. 27. Bathymetric range and distribution map for *Conasprella* (*Boucheticonus*) cf. *pseudokimioi* (da Motta & Martin, 1982). Red circles indicate the points where the species was collected.

Subgenus *Conasprella* Thiele, 1929

Conasprella* (*Conasprella*) *aphrodite (Petuch, 1979)
Figs 2, 28–29

Conus aphrodite Petuch, 1979: 11, fig. 34–35.

Conus aphrodite – Röckel *et al.* 1995b: no. 246, pl. 52 figs 31–34.
Conasprella aphrodite – Tucker & Tenorio 2013: 85. — Monnier *et al.* 2018a: 193.

Material examined

42 lots (about 60 specimens). See Supp. file 1.

Type material

Holotype

PHILIPPINES • 21 mm; Bohol Island, off Panglao; 250 m depth; DMNH 126398 (Fig. 28A).

Figured material

NEW CALEDONIA • 17.6 mm; east coast, off New Caledonia, stn DW654; 21°17′ S, 165°57′ E; 237–298 m depth; 12 Mar. 1993; BATHUS 1 expedition; MNHN (Fig. 28B) • 20.9 mm; Norfolk

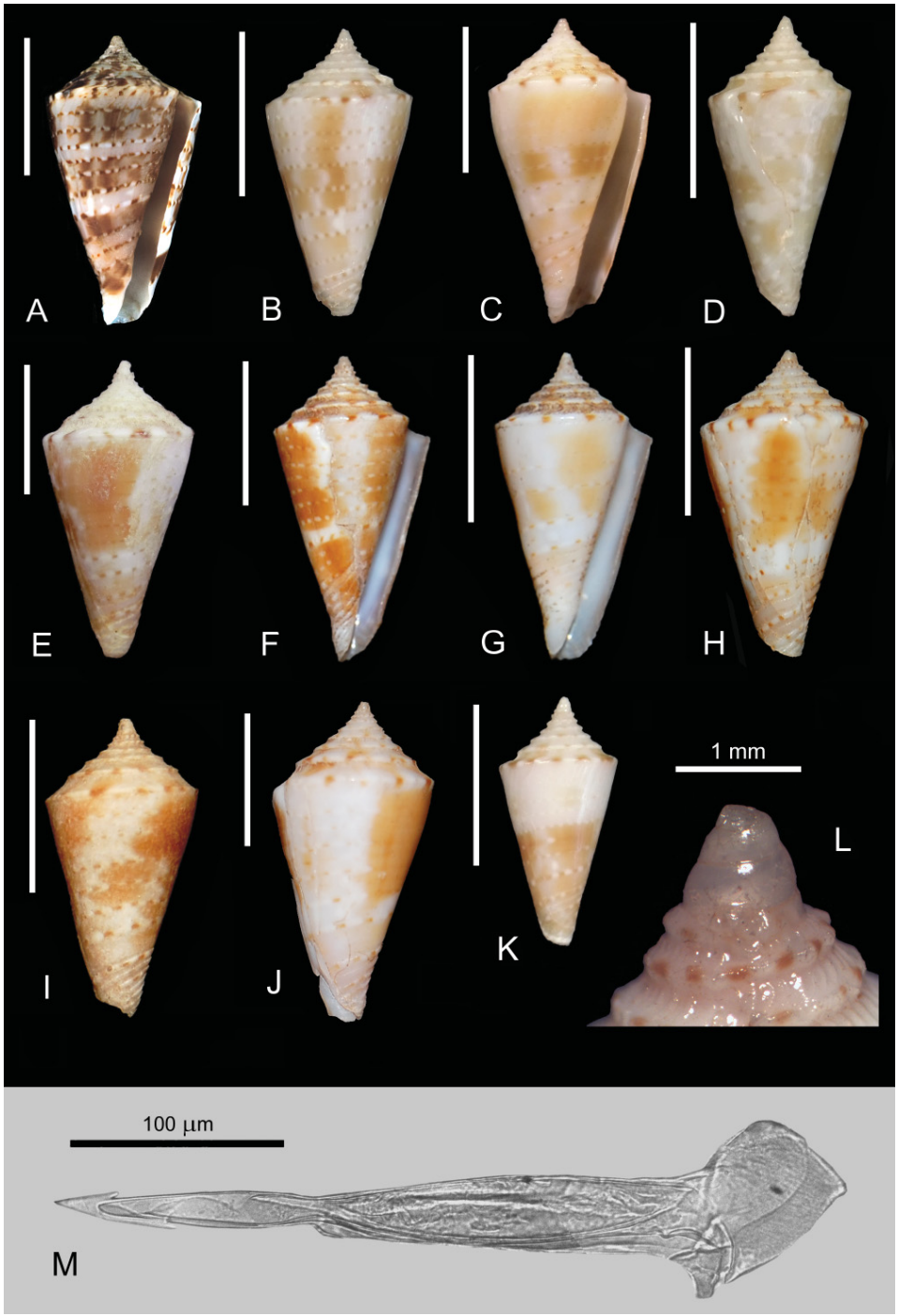

Fig. 28. *Conasprella* (*Conasprella*) *aphrodite* (Petuch, 1979). **A**. Holotype, Bohol Island, off Panglao, Philippines, 250 m depth, 21 mm (DMNH 126398). **B**. East coast, off New Caledonia, 237–298 m depth, 17.6 mm. **C**. Norfolk Ridge, 235–240 m depth, 20.9 mm. **D**. Same collection data as for specimen B, 17.2 mm. **E**. Norfolk Ridge, 278–310 m depth, 23 mm. **F**. Norfolk Ridge, Banc P, 266–267 m depth, 21.2 mm. **G**. Same collection data as for specimen F, 18.4 mm. **H**. Norfolk Ridge, Banc Crypthélia, 270 m depth, 18.3 mm. **I**. Same collection data as for specimen F, 17.4 mm. **J**. Norfolk Ridge, Banc Jumeau Ouest, 240–260 m depth, 24.2 mm. **K**. Same collection data as for specimen B, 15.5 mm. **L**. Protoconch of specimen from Norfolk Ridge, Banc Munida, 260–320 m depth. **M**. Radular tooth of specimen from Norfolk Ridge, Banc Kaimon Maru, 254–283, 18 mm. Scale bars = 10 mm, unless otherwise stated.

Ridge, off New Caledonia, stn DW175; 23º41′ S, 168º01′ E; 235–240 m depth; 29 Jan. 1993; SMIB 8 expedition; MNHN (Fig. 28C) • 17.2 mm; east coast, off New Caledonia, stn DW654; 21°17′ S, 165°57′ E; 237–298 m depth; 12 Mar. 1993; BATHUS 1 expedition; MNHN (Fig. 28D) • 23 mm; Norfolk Ridge, off New Caledonia, stn CP805; 23º41′ S, 168º01′ E; 278–310 m depth; 27 Nov. 1993; BATHUS 3 expedition; MNHN (Fig. 28E) • 21.2 mm; Norfolk Ridge, Banc P, off New Caledonia, stn DW1723; 23º18′ S, 168º15′ E; 266–267 m depth; 27 Jun. 2001; NORFOLK 1 expedition; MNHN (Fig. 28F) • 18.4 mm; same collection data as for preceding; MNHN (Fig. 28G) • 18.3 mm; Norfolk Ridge, Crypthélia, off New Caledonia, stn DW3075; 23°17′ S, 168°14′ E; 270 m depth; 23 Oct. 2008; TERRASSES expedition; MNHN (Fig. 28H) • 17.4 mm; Norfolk Ridge, Banc P, off New Caledonia, stn DW1723; 23º18′ S, 168º15′ E; 266–267 m depth; 27 Jun. 2001; NORFOLK 1 expedition; MNHN (Fig. 28I) • 24.2 mm; Norfolk Ridge, Jumeau Ouest, off New Caledonia, stn CP3054; 23°42′ S, 168°01′ E; 240–260 m depth; 20 Oct. 2008; TERRASSES expedition; MNHN (Fig. 28J) • 15.5 mm; east coast, off New Caledonia, stn DW654; 21°17′ S, 165°57′ E; 237–298 m depth; 12 Mar. 1993; BATHUS 1 expedition; MNHN (Fig. 28K) • 16.3 mm; Norfolk Ridge, Banc Munida, off New Caledonia, stn DW3100; 22°59′ S, 168°23′ E; 260–320 m depth; 27 Oct. 2008; TERRASSES expedition; MNHN (Fig. 28L) • 18 mm; Norfolk Ridge, Banc Kaimon Maru, off New Caledonia, stn DW11; 24º46.7′ S, 168º08.3′ E; 254–283 m; 11 Aug. 1999; LITHIST expedition (Fig. 28M).

Geographical distribution and bathymetry

Ryukyu Islands and the Philippines at depths between 120–380 m. In New Caledonia the species has been sampled mainly at Norfolk Ridge, but also at the Loyalty Islands, the Grand Passage area and the Coral Sea (Lansdowne Bank) at depths between 100 and 400 m. Some isolated specimens come from more than 700 m deep. The species has also been cited from Wallis & Futuna (Moolenbeek & Röckel 1996) and Polynesia (Rabiller & Richard 2014).

Remarks

Shell small to moderately small (maximum shell length 25 mm), conical, with a moderate, slightly stepped spire of concave outline. Protoconch multispiral of 3.25 to 3.5 whorls (Fig. 28L). Radular tooth

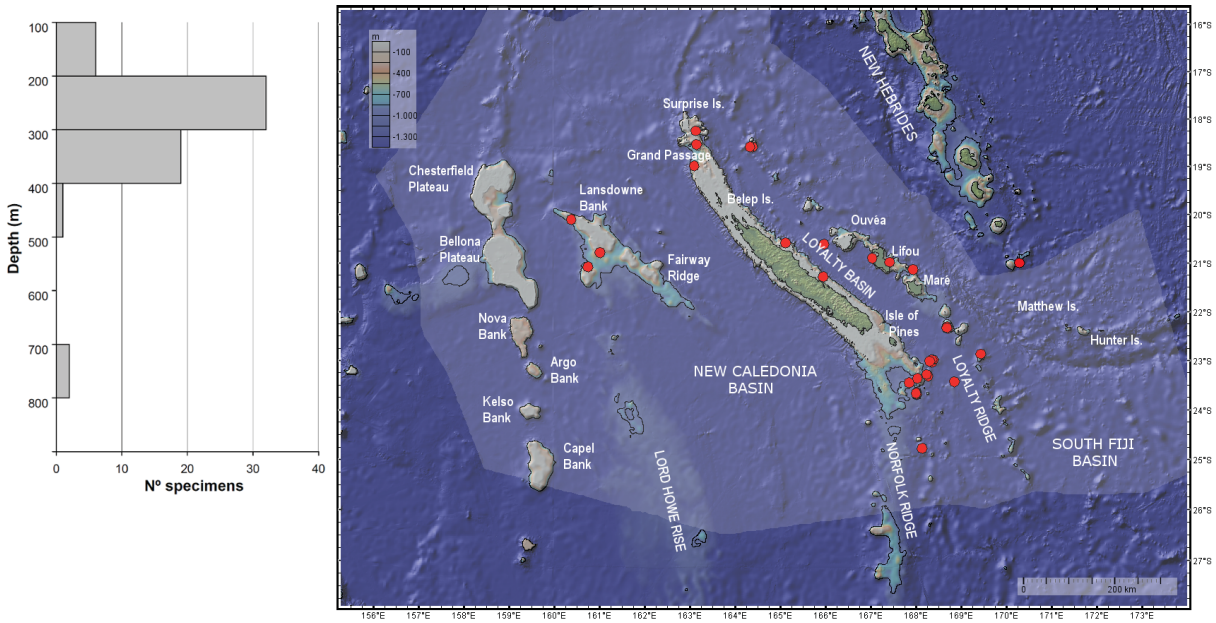

Fig. 29. Bathymetric range and distribution map for *Conasprella* (*Conasprella*) *aphrodite* (Petuch, 1979). Red circles indicate the points where the species was collected.

(Fig. 28M) small, with a barb and a pointed blade covering about one third of the anterior section, which is much shorter than the posterior section. Shaft fold present. Basal spur is present on top of the large, slanted base. Specimens from New Caledonia are morphologically similar to those from the Philippines. One specimen from this locality has been sequenced, and it appears sister to other species of *Conasprella* in the phylogeny (Fig. 2). No specimens of *C. aphrodite* from New Caledonia have been sequenced.

Conasprella* (*Conasprella*) *baileyi (Röckel & da Motta, 1979)
Figs 2, 30–31

Conus baileyi Röckel & da Motta, 1979: 9.

Conus baileyi – Röckel *et al.* 1995b: no. 248, pl. 53 figs 10–14.
Conasprella baileyi – Tucker & Tenorio 2013: 101. — Monnier *et al.* 2018a: 204.

Material examined

127 lots (246 specimens). See Supp. file 1.

Type material

Holotype

SOLOMON ISLANDS • 29 mm; off Russell Island, Solomon Sea; 110 m depth; MHNG 981/1071 (Fig. 30A).

Figured material

NEW CALEDONIA • 25 mm; Loyalty Ridge, off New Caledonia, stn DW451; 20º59′ S, 167º25′ E; 330 m depth; 20 Feb. 1989; MUSORSTOM 6 expedition; MNHN (Fig. 30B) • 25.7 mm; off S New Caledonia, stn DW130; 19º05′ S, 163º21′ E; 225–230 m depth; 4 Mar. 1990; SMIB 6 expedition; MNHN (Fig. 30C) • 26.6 mm; Grand Passage, off New Caledonia, stn DW2932; 19º05′ S, 163º30′ E; 215–225 m depth; 28 Apr. 2008; CONCALIS expedition; MNHN (Fig. 30D) • 23.5 mm; Grand Passage, off New Caledonia, stn DW126; 19°00′ S, 163°23′ E; 320–330 m depth; 3 Mar. 1990; SMIB 6 expedition; MNHN (Fig. 30E) • 23.3 mm; Norfolk Ridge, Banc Munida, off New Caledonia, stn DW2133; 23º01′ S, 168º18′ E; 215–270 m depth; 3 Nov. 2003; NORFOLK 2 expedition; MNHN (Fig. 30F) • 25.1 mm; Grand Passage, off New Caledonia, stn DW3017; 19°04′ S, 163°28′ E; 255–267 m depth; 9 May 2008; CONCALIS expedition; MNHN (Fig. 30G) • 19.8 mm; Baie du Santal, sinking towards the SW of Récif Shelter, off New Caledonia, stn DW1650; 20°54′ S, 167°02′ E; 120–250 m depth; Nov. 2000; LIFOU 2000 expedition; MNHN (Fig. 30H) • 18.7 mm; Grand Passage, off New Caledonia, stn DW2954; 19°02′ S, 163°17′ E; 250–280 m depth; 1 May 2008; CONCALIS expedition; MNHN (Fig. 30I, L) • 24.4 mm; Norfolk Ridge, Munida, off New Caledonia, stn DW3100; 22°59′ S, 168°23′ E; 260–320 m depth; 27 Oct. 2008; TERRASSES expedition; MNHN (Fig. 30J) • 15.5 mm; Norfolk Ridge, Banc Munida, off New Caledonia, stn DW2133; 23º01′ S, 168º18′ E; 215–270 m depth; 3 Nov. 2003; NORFOLK 2 expedition; MNHN (Fig. 30K) • 26.1 mm; S Île des Pins, off New Caledonia, stn CP4674; 22°48′ S, 167°29′ E; 302–311 m; 13 Aug. 2016; KANACONO expedition (Fig. 30M).

Geographical distribution and bathymetry

Solomon Islands, Australia (Queensland) and New Caledonia, typically between 100 and 400 m deep. Isolated specimens have been sampled at depths beyond 800 m. Also present in Fiji at depths between 292–311 m (Moolenbeek *et al.* 2008). It has been cited from Tuamotu Archipelago, French Polynesia, at depths between 490 and 835 m (Rabiller & Richard 2014).

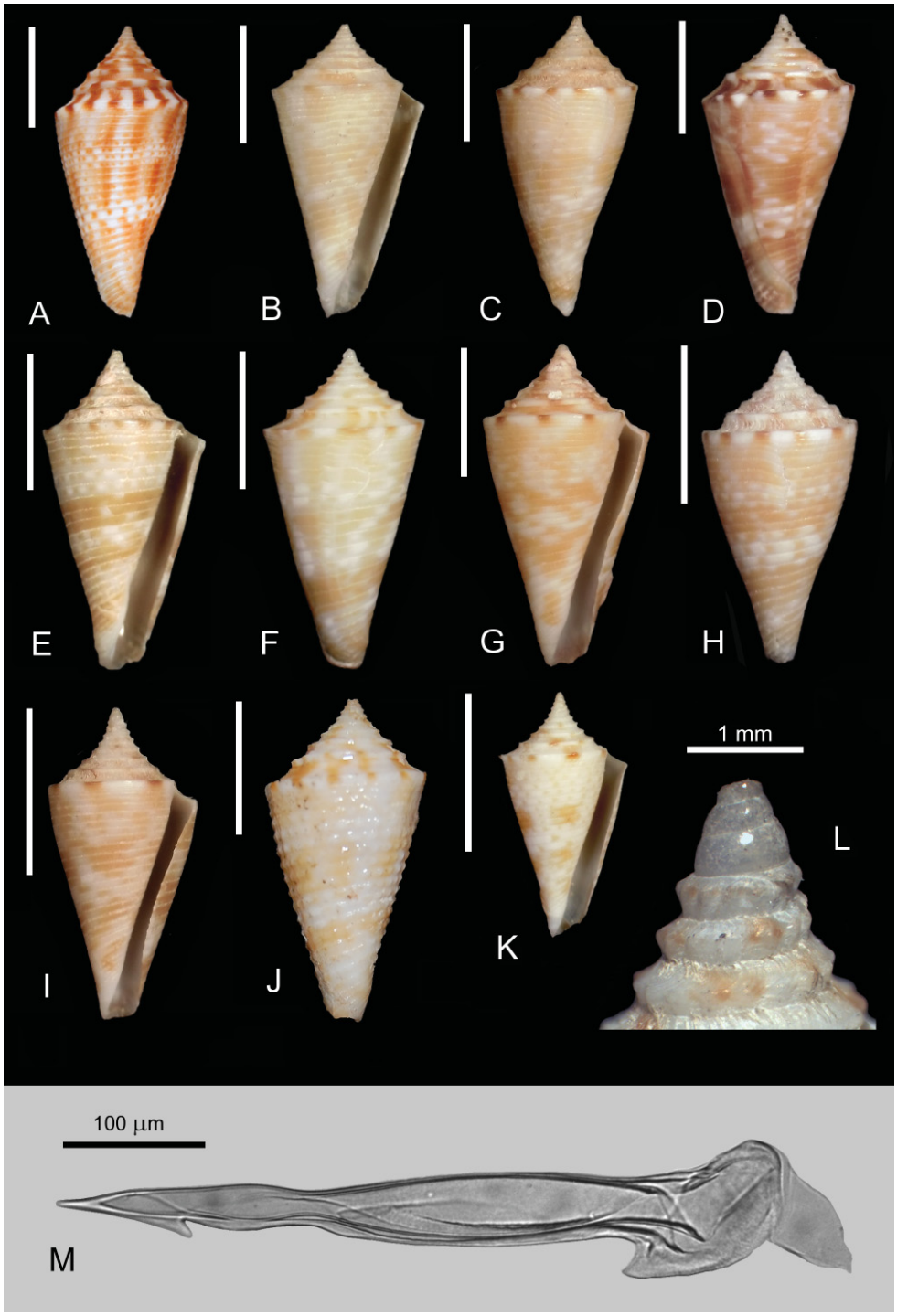

Fig. 30. *Conasprella* (*Conasprella*) *baileyi* (Röckel & da Motta, 1979). **A**. Holotype, off Russell Island, Solomon Islands, 110 m depth, 29 mm (MHNG 981/1071). **B**. Loyalty Ridge, 330 m depth, 25 mm. **C**. S New Caledonia, 225–230 m depth, 25.7 mm. **D**. Grand Passage, 215–225 m depth, 26.6 mm. **E**. Grand Passage, 320–330 m depth, 23.5 mm. **F**. Norfolk Ridge, Banc Munida, 215–270 m depth, 23.3 mm. **G**. Grand Passage, 255–267 m depth, 25.1 mm. **H**. Baie du Santal, sinking towards the SW of Récif Shelter, 120–250 m depth, 19.8 mm. **I**. Grand Passage, 250–280 m depth, 18.7 mm. **J**. Norfolk Ridge, Banc Munida, 260–320 m depth, 24.4 mm. **K**. Norfolk Ridge, Banc Munida, 215–270 m depth, 15.5 mm. **L**. Protoconch of specimen I. **M**. Radular tooth of specimen from S Île des Pins, 302–311 m depth, 26.1 mm. Scale bars = 10 mm, unless otherwise stated.

Remarks

Shell small to moderately small (maximum shell length 35 mm), conical with a moderate to high concave spire. Protoconch multispiral with 3 or more whorls (Fig. 30L). Radular tooth (Fig. 30M) with an indistinct barb and a pointed blade covering about one third of the anterior section, which is much shorter than the posterior section. Shaft fold present. Basal spur is present on top of the slanted base. This is an abundant species around New Caledonia, and it has been sampled in multiple locations. Although fairly constant in shell shape, it may be variably patterned, and pustulose specimens (Fig. 30J) ocassionally occur. The species has often been confused with *Conasprella wakayamaensis* (Kuroda, 1956) and *C. eugrammata* (Bartsch & Rehder, 1943), but these two species are not present in New Caledonia. In the phylogeny (Fig. 2), all specimens assigned to the taxon *C. baileyi* appear deeply nested within the *Conasprella* clade.

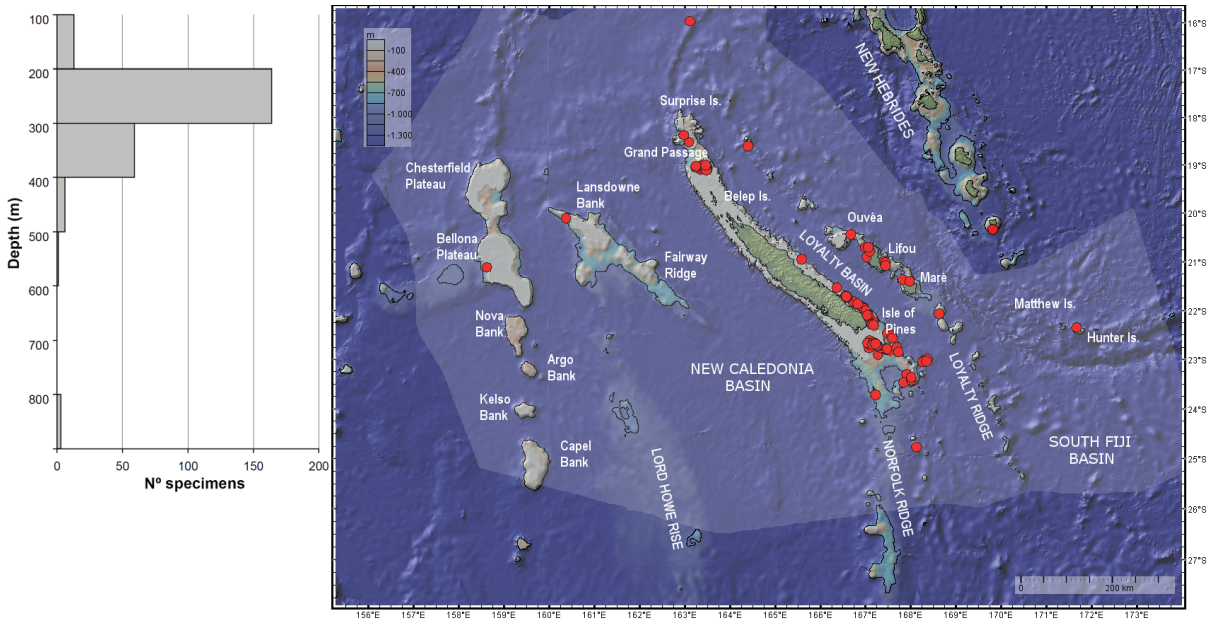

Fig. 31. Bathymetric range and distribution map for *Conasprella* (*Conasprella*) *baileyi* (Röckel & da Motta, 1979). Red circles indicate the points where the species was collected.

Conasprella* (*Conasprella*) *boholensis (Petuch, 1979)
Figs 2, 32–33

Conus boholensis Petuch, 1979: 12, figs 20–21.

Conus boholensis – Röckel *et al.* 1995b: no. 259, pl. 55 figs 22–27.
Endemoconus boholensis – Tucker & Tenorio 2013: 114.
Conasprella boholensis – Monnier *et al.* 2018a: 195.

Material examined

51 lots (135 specimens). See Supp. file 1.

Type material

Holotype

PHILIPPINES • 38.5 mm; Bohol Island, off Panglao; 250 m depth; DMNH 126400 (Fig. 32A).

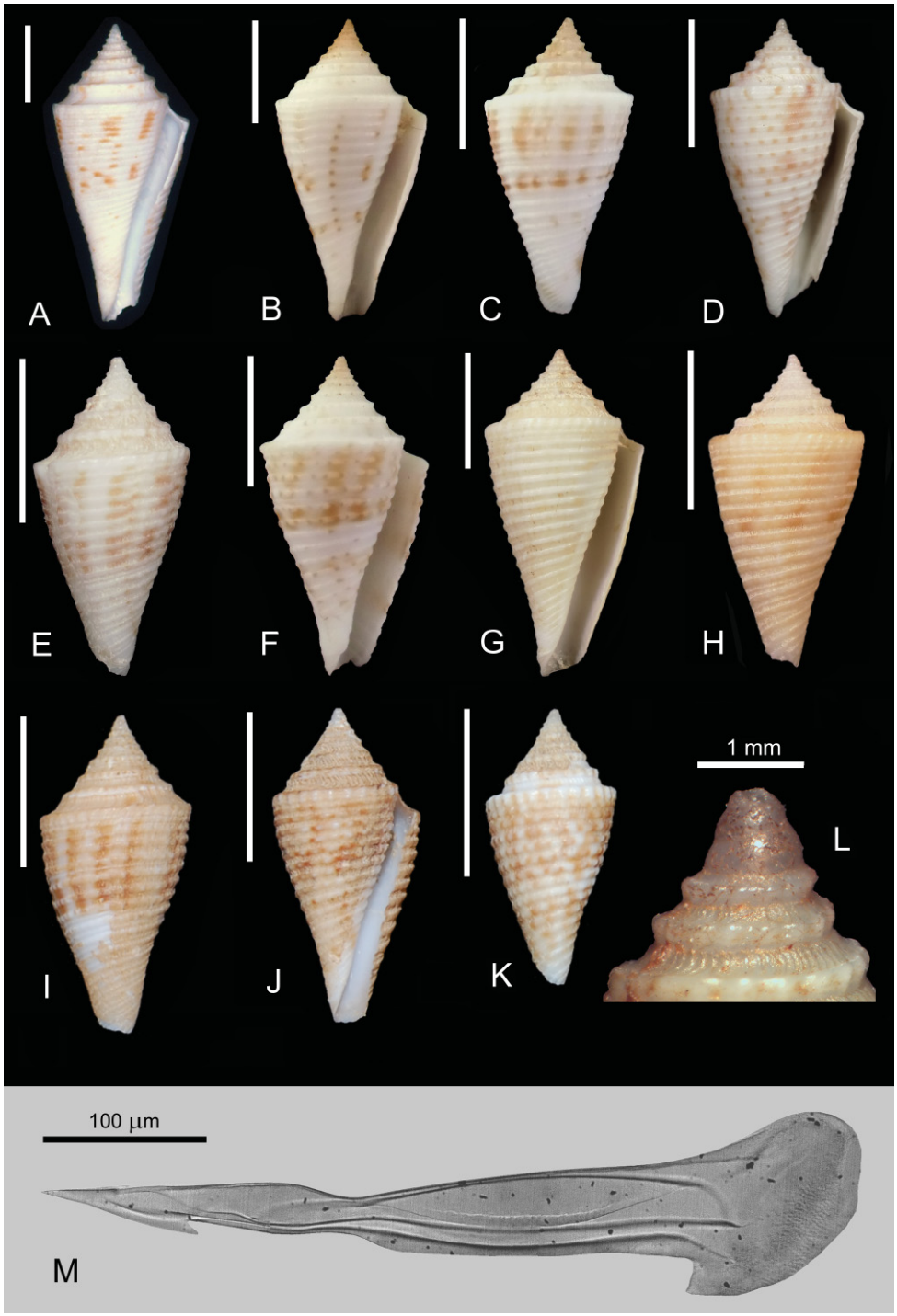

Fig. 32. *Conasprella* (*Conasprella*) *boholensis* (Petuch, 1979). **A**. Holotype, Bohol Island, off Panglao, Philippines, 250 m depth, 38.5 mm (DMNH 126400). **B**. East coast, off New Caledonia, 347–375 m depth, 29.4 mm. **C**. East coast, off New Caledonia, 591–660 m depth, 22.8 mm. **D**. Grand Passage, 341–351 m depth, 23.4 mm. **E**. Same collection data as for specimen D, 19.5 mm. **F**. Same collection data as for specimen D, 24.5 mm. **G**. Off New Caledonia, 410–420 m depth, 28.2 mm. **H**. Same collection data as for specimen G, 19.6 mm. **I**. East Coast, off New Caledonia, 410–430 m depth, 21.2 mm. **J**. Same collection data as for specimen I, 21.1 mm. **K**. Same collection data as for specimen I, 16.5 mm. **L**. Protoconch of specimen G. **M**. Radular tooth of a specimen from Grand Passage, 250–280 m depth, 26.7 mm (Atheris coll.). Scale bars = 10 mm, unless otherwise stated.

Figured material

NEW CALEDONIA • 29.4 mm; east coast, off New Caledonia, stn CP707; 21°43′ S, 166°36′ E; 347–375 m depth; 19 Mar. 1993; BATHUS 1 expedition; MNHN (Fig. 32B) • 22.8 mm; off E New Caledonia, east coast, stn CP702; 20°56′ S, 165°35′ E; 591–660 m depth; 18 Mar. 1993; BATHUS 1 expedition; MNHN (Fig. 32C) • 23.4 mm; Grand Passage, off New Caledonia, stn DW902; 19°01′ S, 163°15′ E; 341–351 m depth; 4 Aug. 1994; BATHUS 4 expedition; MNHN (Fig. 32D) • 19.5 mm; same collection data as for preceding; MNHN (Fig. 32E) • 24.5 mm; same collection data as for preceding; MNHN (Fig. 32F) • 28.2 mm; off New Caledonia, stn CC246; 22º08′ S, 167º11′ E; 410–420 m depth; 3 Oct. 1985; MUSORSTOM 4 expedition; MNHN (Fig. 32G, L) • 19.6 mm; same collection data as for preceding; MNHN (Fig. 32H) • 21.2 mm; east coast, off New Caledonia, stn CP695; 20°35′ S, 164°58′ E; 410–430 m depth; 17 Mar. 1993; BATHUS 1 expedition; MNHN (Fig. 32I) • 21.1 mm; same collection data as for preceding; MNHN (Fig. 32J) • 16.5 mm; same collection data as for preceding; MNHN (Fig. 32K) • 26.7 mm; Grand Passage, off N New Caledonia, stn DW2954; 19°02′ S, 163°18′ E; 250–280 m depth; 1 May 2008; CONCALIS expedition; Atheris coll. (Fig. 32M).

Geographical distribution and bathymetry

Philippines, S Vietnam, NW Australia at depths between 125–300 m. In New Caledonia, Coral Sea and Loyalty Islands at depths between 300 and 500 m. Also present in Fiji at 282–444 m (Moolenbeek *et al.* 2008).

Remarks

Conical to ventricosely conical shell, moderately small to medium-sized (maximum shell length 51 mm), with a carinate and often nodulose shoulder, and a moderate to high, stepped spire. Multispiral protoconch of about 3 whorls (Fig. 32L). Radular tooth (Fig. 32M) with an indistinct barb and a pointed blade covering about one third of the anterior section, which is much shorter than the posterior section. Shaft fold present. Basal spur is present on top of the slanted base. The morphology of the shell and radular tooth of *C. boholensis* is very similar to that of *Conasprella pagoda* (Kiener, 1847). In the phylogenetic analysis (Fig. 2), both species form clades which are very close to each other. These two species can be difficult to separate based upon shell morphology. The shell of *C. boholensis* is usually

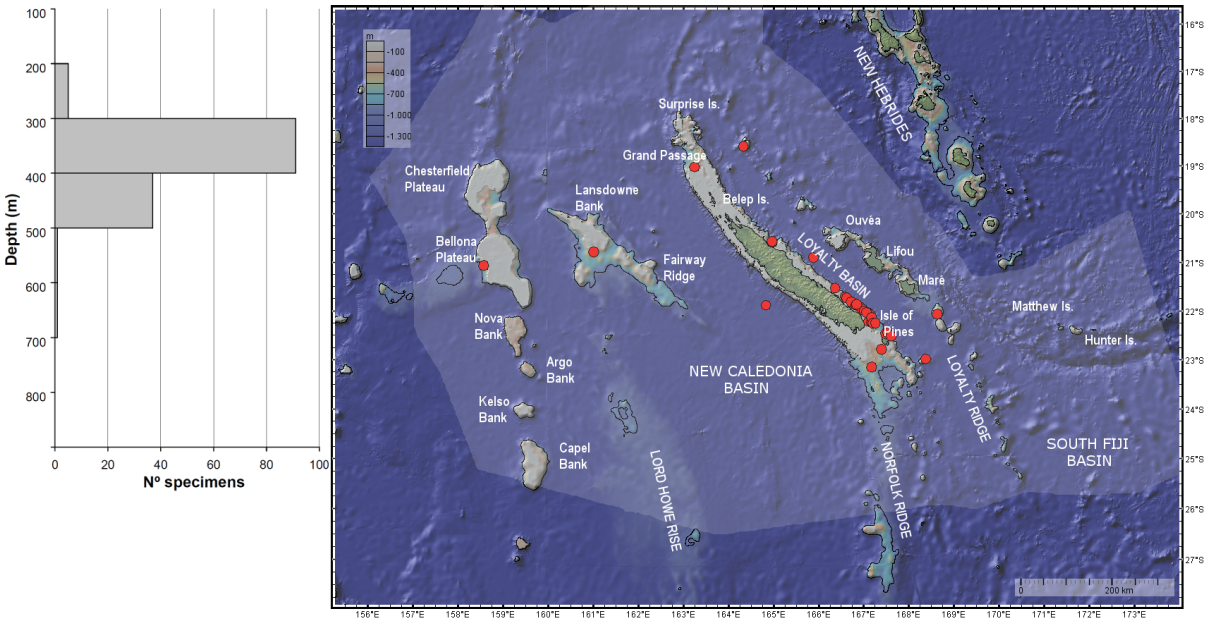

Fig. 33. Bathymetric range and distribution map for *Conasprella* (*Conasprella*) *boholensis* (Petuch, 1979). Red circles indicate the points where the species was collected.

more nodulose at the shoulder and exhibits radial threads on the teleoconch sutural ramp, whereas in *C. pagoda* the radial threads appear crossed by 4–6 major spiral cords.

Conasprella* (*Conasprella*) *boucheti (Richard, 1983)
Figs 2, 34–35

Conus (*Endemoconus*) *boucheti* Richard, 1983: 53.

Conus species no. 108, 108a – Estival 1981: 110–111.
Conus boucheti – Röckel *et al.* 1995b: no. 237, pl. 51 figs 21–24.
Endemoconus boucheti – Tucker & Tenorio 2013: 115.
Conasprella boucheti – Monnier *et al.* 2018a: 196.

Material examined

176 lots (438 specimens). See Supp. file 1.

Type material

Holotype
NEW CALEDONIA • 17.5 mm; SW of Île des Pins, off New Caledonia; 22°05′ S, 167°15′ E; 400 m depth; MNHN-IM-2000-2578 (Fig. 34A).

Figured material

NEW CALEDONIA • 23.8 mm; off New Caledonia, stn CC246; 22º08′ S, 167º11′ E; 410–420 m depth; 3 Oct. 1985; MUSORSTOM 4 expedition; MNHN (Fig. 34B) • 24.5 mm; Plateau des Chesterfield, off New Caledonia, stn DW2610; 19º34′ S, 158º41′ E; 486–494 m depth; 19 Oct. 2005; EBISCO expedition; MNHN (Fig. 34C) • 20.8 mm; Loyalty Ridge, off New Caledonia, stn DW460; 21º02′ S, 167º31′ E; 420 m depth; 20 Feb. 1989; MUSORSTOM 6 expedition; MNHN (Fig. 34D) • 27.3 mm; Lansdowne Fairway, off New Caledonia, stn DE16; 20º48′ S, 160º56′ E; 500 m depth; 21 Jul. 1988; CORAIL 2 expedition; MNHN (Fig. 34E) • 24.8 mm; off S New Caledonia, stn DW222; 22º58′ S, 167º33′ E; 410–440 m depth; 30 Sep. 1985; MUSORSTOM 4 expedition; MNHN (Fig. 34F) • 20.2 mm; Norfolk Ridge, Banc Jumeau Est, off New Caledonia, stn DW13; 23°45′ S, 168°17′ E; 400 m depth; 12 Aug. 1999; LITHIST expedition; MNHN (Fig. 34G) • 17.2 mm; Loyalty Ridge, off New Caledonia, stn DW459; 21º01′ S, 167º31′ E; 425 m depth; 20 Feb. 1989; MUSORSTOM 6 expedition; MNHN (Fig. 34H) • 18.5 mm; same collection data as for preceding; MNHN (Fig. 34I) • 18 mm; Nova Bank Nord, off New Caledonia, stn DW2534; 22º17′ S, 159º28′ E; 390–430 m depth; 10 Oct. 2005; EBISCO expedition; MNHN (Fig. 34J) • 12.6 mm; Loyalty Ridge, off New Caledonia, stn DW487; 21º23′ S, 167º46′ E; 500 m depth; 23 Feb. 1989; MUSORSTOM 6 expedition; MNHN (Fig. 34K) • 19.6 mm; Norfolk Ridge, Munida, off New Caledonia, stn DW3107; 23º01′ S, 169º23′ E; 380–440 m depth; 27 Oct. 2008; TERRASSES expedition; MNHN (Fig. 34L) • 19 mm; Grand Passage, off N New Caledonia, stn DW3003; 18º34′ S, 163º08′ E; 450-454 m depth; 7 May 2008; CONCALIS expedition; Atheris coll. (Fig. 34M).

Geographical distribution and bathymetry

New Caledonia, Coral Sea and New Hebrides Arc including Vanuatu, typically at depths between 300 and 600 m. Also reported from Fiji at depths of 390–405 m (Moolenbeek *et al.* 2008).

Remarks

Small to medium-sized (maximum shell length 30 mm) conical shell with a carinate shoulder and moderately high spire of concave outline. Protoconch multispiral of about 3 whorls (Fig. 34L). Teleoconch sutural ramp with strong radial threads. There are 3 or 4 closely-set punctate spiral grooves just below

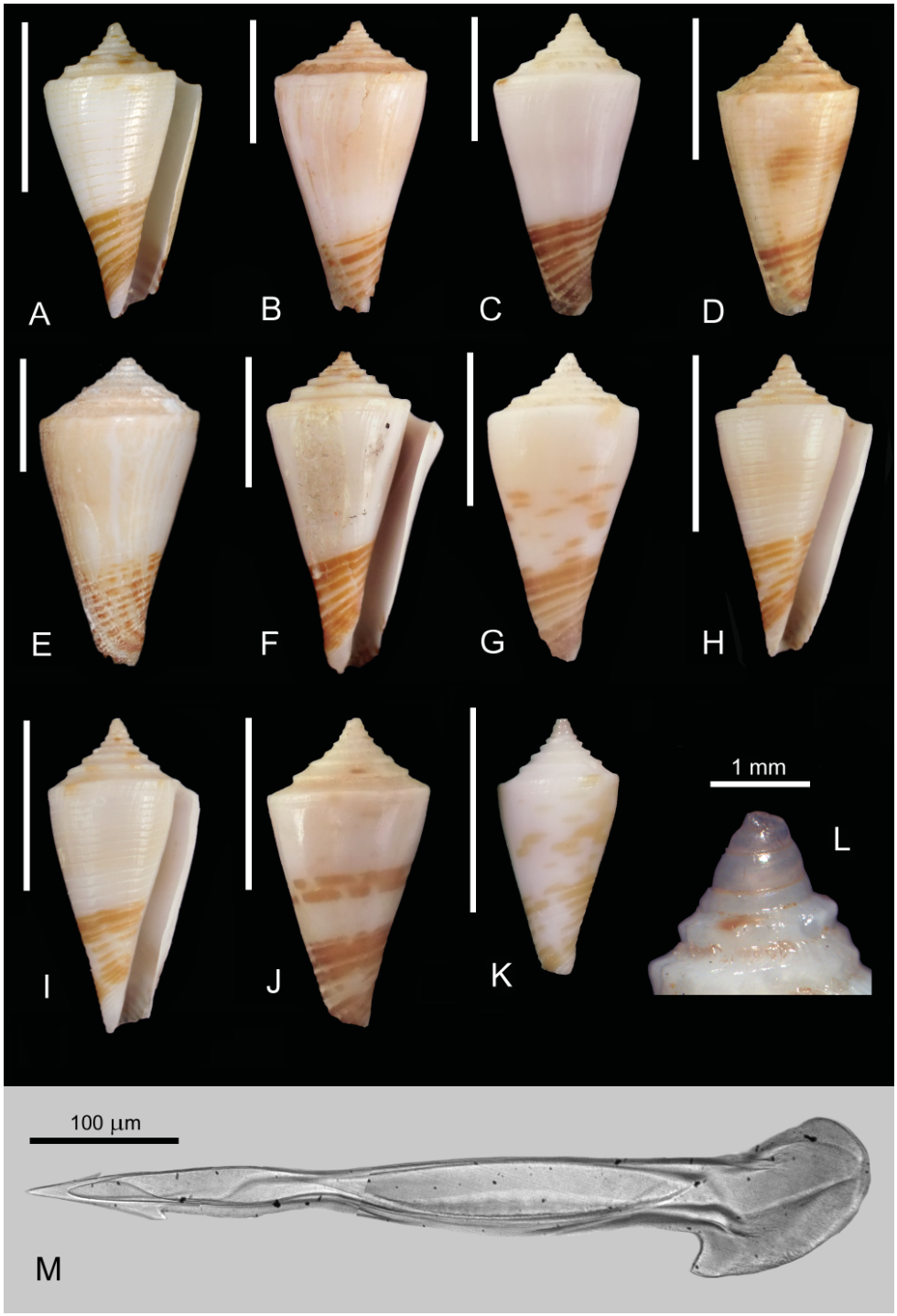

Fig. 34. *Conasprella* (*Conasprella*) *boucheti* (Richard, 1983). **A**. Holotype, SW of Île des Pins, 400 m depth, 17.5 mm (MNHN-IM-2000-2578). **B**. Off New Caledonia, 410–420 m depth, 23.8 mm. **C**. Plateau des Chesterfield, 486–494 m depth, 24.5 mm. **D**. Loyalty Ridge, 420 m depth, 20.8 mm. **E**. Coral Sea, Lansdowne Fairway, 500 m depth, 27.3 mm. **F**. S New Caledonia, 410–440 m depth, 24.8 mm. **G**. Norfolk Ridge, Banc Jumeau Est, 400 m depth, 20.2 mm. **H**. Loyalty Ridge, 425 m depth, 17.2 mm. **I**. Same collection data as for specimen H, 18.5 mm. **J**. Coral Sea, Banc Nova Nord, 390–430 m depth, 18 mm. **K**. Loyalty Ridge, 500 m depth, 12.6 mm. **L**. Protoconch of specimen from Norfolk Ridge, Banc Munida, 380–440 m depth. **M**. Radular tooth of specimen from Grand Passage, 450–454 m depth, 19 mm (Atheris coll.). Scale bars = 10 mm, unless otherwise stated.

the shoulder. Other than this, the last whorl can be essentially smooth, or variably covered with wide, axially striate spiral grooves. The typical shell pattern consists of about 6–8 broad brown spiral lines on the ribbons between the basal spiral grooves, but certain specimens also display interrupted brown bars and dashes or irregular brown blotches on the lavender-white area above the basal third. Radular tooth (Fig. 34M) with an indistinct barb and a pointed blade covering about one third of the anterior section, which is much shorter than the posterior section. Shaft fold present. Basal spur is present on top of the slanted base. This is a relatively abundant species in deep water around New Caledonia. In the phylogeny (Fig. 2), all the sequenced specimens of *C. boucheti* form a well-supported clade which is sister to the other species of *Conasprella*.

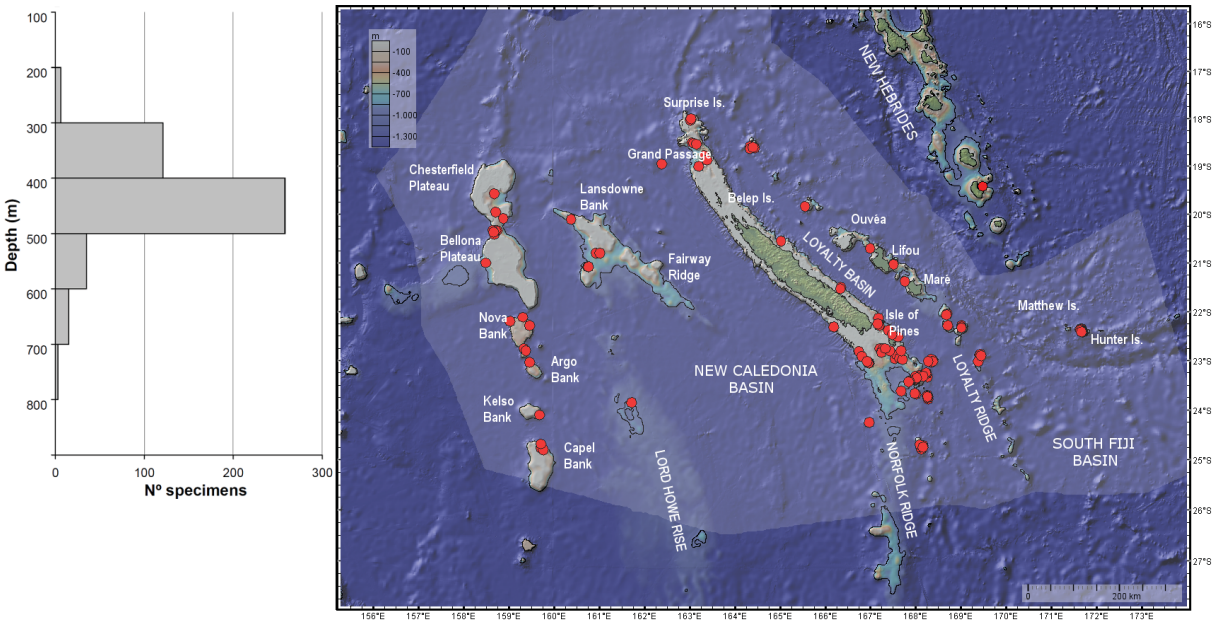

Fig. 35. Bathymetric range and distribution map for *Conasprella* (*Conasprella*) *boucheti* (Richard, 1983). Red circles indicate the points where the species was collected.

Conasprella* (*Conasprella*) *pagoda (Kiener, 1847)
Figs 2, 36–37

Conus pagodus Kiener, 1847: 310, pl. 70 fig. 4.

Conus pagodus – Röckel *et al.* 1995b: no. 258, pl. 55 figs 17–21.
Conasprella pagoda – Tucker & Tenorio 2013: 308. — Monnier *et al.* 2018a: 186.

Material examined

79 lots (about 230 specimens). See Supp. file 1.

Type material

Holotype
NEW CALEDONIA • 42 mm; Tahiti; MHNG 1107/29 (Fig. 36A).

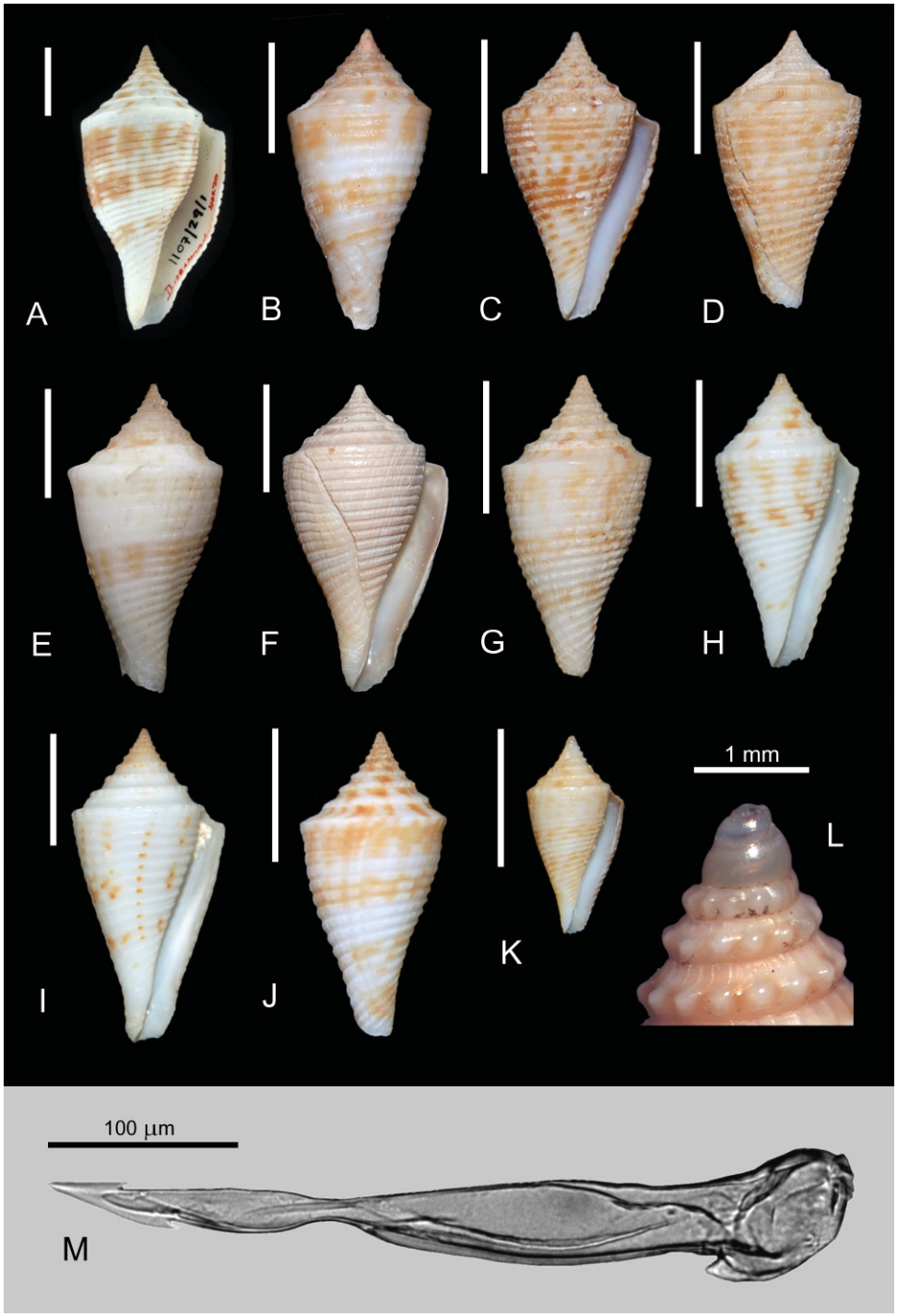

Fig. 36. *Conasprella* (*Conasprella*) *pagoda* (Kiener, 1847). **A**. Holotype, "Tahiti", 42 mm (MHNG 1107/29). **B**. East coast, off New Caledonia, 205–219 m depth, 27.4 mm. **C**. Same collection data as for specimen B, 21.6 mm. **D**. Same collection data as for specimen B, 24.8 mm. **E**. Off New Caledonia, 335 m depth, 28.4 mm. **F**. East coast, off New Caledonia, 255–280 m depth, 28.6 mm. **G**. East coast, off New Caledonia, 347–375 m depth, 22.8 mm. **H**. Same collection data as for specimen G, 23.2 mm. **I**. Same collection data as for specimen G, 28.1 mm. **J**. East coast, off New Caledonia, 320–386 m depth, 22.9 mm. **K**. Same collection data as for specimen F, 14.4 mm. **L**. Protoconch of specimen from Loyalty Islands (MJT coll.). **M**. Radular tooth of specimen from the Philippines, 48.5 mm (ER coll.). Scale bars = 10 mm, unless otherwise stated.

Figured material

NEW CALEDONIA • 27.4 mm; east coast, off New Caledonia, stn CP668; 20°57′ S, 165°35′ E; 205–219 m depth; 14 Mar. 1993; BATHUS 1 expedition; MNHN (Fig. 36B) • 21.6 mm; same collection data as for preceding; MNHN (Fig. 36C) • 24.8 mm; same collection data as for preceding; MNHN (Fig. 36D) • 28.4 mm; off New Caledonia, stn CP108; 22º03′ S, 167º06′ E; 335 m depth; 9 Sep. 1985; BIOCAL expedition; MNHN (Fig. 36E) • 28.6 mm; east coast, off New Caledonia, stn CP669; 20°57′ S, 165°35′ E; 255–280 m depth; 14 Mar. 1993; BATHUS 1 expedition; MNHN (Fig. 36F) • 22.8 mm; east coast, off New Caledonia, stn CP707; 21°43′ S, 166°36′ E; 347–375 m depth; 19 Mar. 1993; BATHUS 1 expedition; MNHN (Fig. 36G) • 23.2 mm; same collection data as for preceding; MNHN (Fig. 36H) • 28.1 mm; same collection data as for preceding; MNHN (Fig. 36I) • 22.9 mm; east coast, off New Caledonia, stn CP710; 21°43′ S, 166°36′ E; 320–386 m depth; 19 Mar. 1993; BATHUS 1 expedition; MNHN (Fig. 36J) • 14.4 mm; east coast, off New Caledonia, stn CP669; 20°57′ S, 165°35′ E; 255–280 m depth; 14 Mar. 1993; BATHUS 1 expedition; MNHN (Fig. 36K) • 26.9 mm; Loyalty Islands, off New Caledonia; 200–390 m depth; MJT coll. (Fig. 36L).

PHILIPPINES • 48.5 mm; ER coll. (Fig. 36M).

Geographical distribution and bathymetry

Japan to Philippines, Papua New Guinea and Solomon Islands at depths between 50–420 m. In New Caledonia most specimens have been sampled off the E coast and Loyalty Islands, at depths between 200 and 500 m. Also present in Vanuatu, in 72–547 m depth. The type locality "Tahiti" is most likely erroneous.

Remarks

Shell moderately small to medium-sized (maximum shell length 50 mm), conical to pyriform, with a characteristic constriction at basal third and a moderate to high, stepped spire of concave outline. Multispiral protoconch of 3–3.5 whorls (Fig. 36L). Teleoconch sutural ramp with radial threads crossing major spiral cords. Radular tooth (Fig. 36M) with a short barb and a pointed blade covering about one third of the anterior section, which is much shorter than the posterior section. Shaft fold is present but difficult to detect. Basal spur present. The morphology of the shell and radular tooth of *C. pagoda* is very

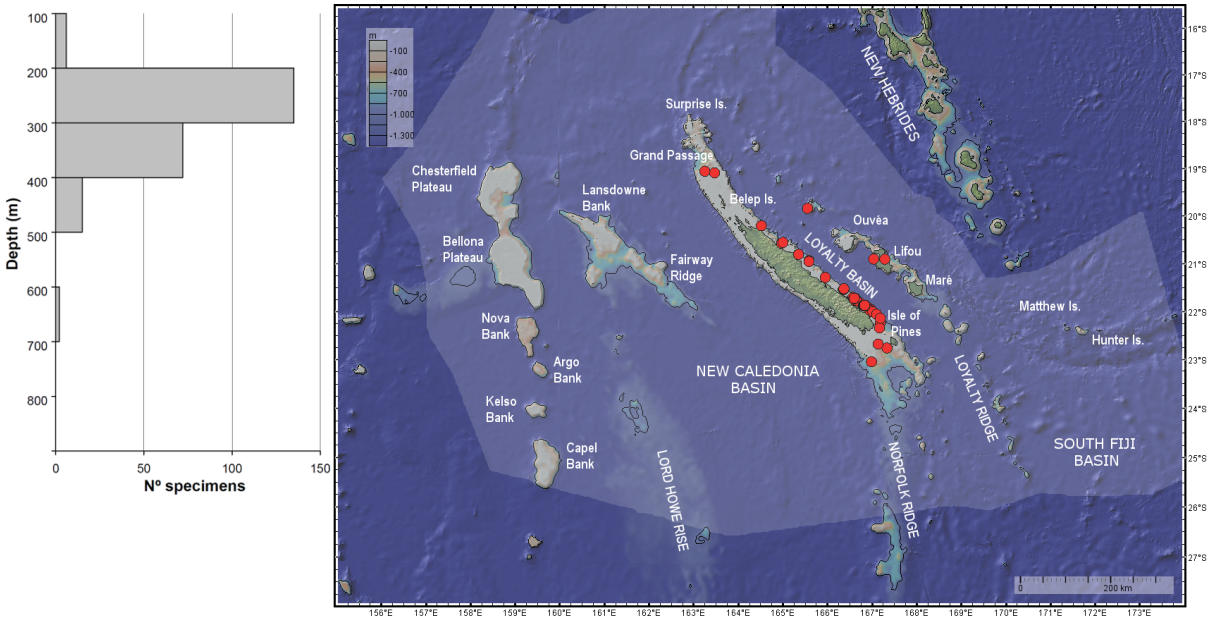

Fig. 37. Bathymetric range and distribution map for *Conasprella* (*Conasprella*) *pagoda* (Kiener, 1847). Red circles indicate the points where the species was collected.

similar to that of *C. boholensis*. In the phylogenetic analysis (Fig. 2), both species form clades which are very closely related. The shell of *C. boholensis* is usually more nodulose at the shoulder and exhibits radial threads on the teleoconch sutural ramp, whereas in *C. pagoda* the radial threads appear crossed by 4–6 major spiral cords. A typical constriction at the basal third present in large specimens of *C. pagoda* facilitates identification, but this feature may be not evident in smaller or juvenile specimens.

Conasprella* (*Endemoconus*) *howelli (Iredale, 1929)
Figs 38A–H, L–M, 39

Conus howelli Iredale, 1929: 182, pl. 40 figs 1, 8.

Conus howelli – Röckel *et al.* 1995b: no. 277, pl. 58 figs 25–28.
Endemoconus howelli – Tucker & Tenorio 2013: 223.
Conasprella howelli – Monnier *et al.* 2018a: 212.

Material examined

13 lots (15 specimens). See Supp. file 1.

Type material

Holotype
AUSTRALIA • 26.5 mm; Montague Island, New South Wales; AMS C.57711 (Fig. 38A).

Other material

NEW CALEDONIA • 21.5 mm; off S New Caledonia, Banc Kaimon Maru, stn DW8; 24°45′ S, 168°08′ E; 233 m depth; 21 May 1987; SMIB 3 expedition; MNHN (Fig. 38B) • 13.7 mm; Norfolk Ridge, off New Caledonia, stn DW159; 24º46′ S, 168º08′ E; 241–245 m depth; 28 Jan. 1993; SMIB 8 expedition; MNHN (Fig. 38C, L) • 15.1 mm; same collection data as for preceding; MNHN (Fig. 38D) • 17.1 mm; Loyalty Ridge, off New Caledonia, stn DW85; 22º20′ S, 168º43′ E; 260 m depth; 13 Sep. 1989; SMIB 5 expedition; MNHN (Fig. 38E) • 19.3 mm; Norfolk Ridge, east coast, off New Caledonia, stn DW170–172; 21°43′ S, 166°36′ E; 315–327 m depth; 29 Jan. 1993; SMIB 8 expedition; MNHN (Fig. 38F) • 24.2 mm; Norfolk Ridge, off New Caledonia, stn DW159; 24º46′ S, 168º08′ E; 241–245 m depth; 28 Jan. 1993; SMIB 8 expedition; MNHN (Fig. 38G) • 16.3; SE Île des Pins, off New Caledonia, stn DW4741; 22°52′ S, 167°41′ E; 210 m depth; 23 Aug. 2016; KANACONO expedition; MNHN-IM-2018-12306 (Fig. 38H) • 12.7 mm; Norfolk Ridge, off New Caledonia, stn DW159; 24º46′ S, 168º08′ E; 241–245 m; 28 Jan. 1993; SMIB 8 expedition (Fig. 38M).

Geographical distribution and bathymetry

Eastern Australia (New South Wales and Queensland) to N New Zealand (Lord Howe Island, Wanganella Bank) at depths between 50 to 295 m. In New Caledonia, specimens have been sampled in locations in Norfolk Ridge, Loyalty Ridge and Coral Sea (Kelso Bank), at depths between 100 and 400 m, but ocassionally beyond 500 m deep.

Remarks

Shell small to medium-sized (maximum shell length 49 mm), conical with a moderate to high, stepped spire. Multispiral protoconch of about 4 whorls (Fig. 38L). Teleoconch sutural ramp concave, with closely spaced radial threads. Radular tooth (Fig. 38M) typical of *Conasprella*, with a short barb and a pointed blade covering about one third of the anterior section, which is much shorter than the posterior section. Shaft fold present. Basal spur is present. Specimens from New Caledonia are similar to those from Australia and New Zealand. This species has not been examined using DNA.

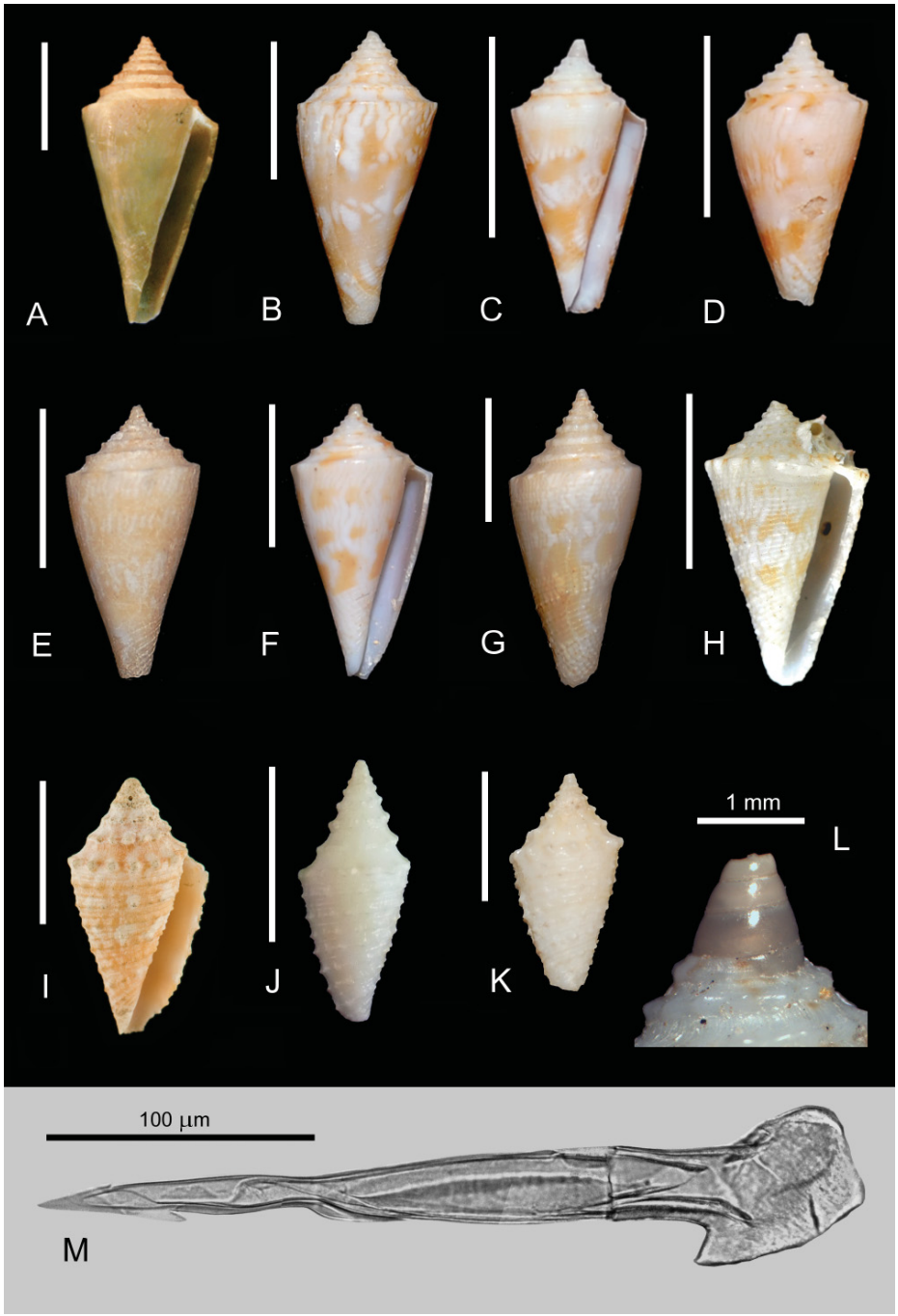

Fig. 38. A–H. *Conasprella* (*Endemoconus*) *howelli* (Iredale, 1929). **A**. Holotype, Montague Island, New South Wales, Australia, 26.5 mm (AMS C.57711). **B**. Banc Kaimon Maru, S New Caledonia, 233 m depth, 21.5 mm. **C**. Norfolk Ridge, 241–245 m depth, 13.7 mm. **D**. Same collection data as for specimen C, 15.1 mm. **E**. Loyalty Ridge, 260 m depth, 17.1 mm. **F**. Norfolk Ridge, 315–327 m depth, 19.3 mm. **G**. Same collection data as for specimen C, 24.2 mm. **H**. SE Île des Pins, 210 m depth, 16.3 mm (MNHN-IM-2018-12306). – **I–K**. *Conasprella* (*Endemoconus*) *raoulensis* (Powell, 1958). **I**. Holotype, off Raoul Island, Kermadec Islands, New Zealand, 75–85 m depth, 18 mm (ZMUC GAS-000805). **J**. Coral Sea, Banc Capel, 280–295 m depth, 15.1 mm. **K**. Norfolk Ridge, Banc Kaimon Maru, 230 m depth, 16.9 mm. – **L–M**. *Conasprella* (*Endemoconus*) *howelli*. **L**. Protoconch of specimen C from Norfolk Ridge, 241–245 m depth. **M**. Radular tooth of specimen from Norfolk Ridge, 241–245 m depth, 12.7 mm. Scale bars = 10 mm, unless otherwise stated.

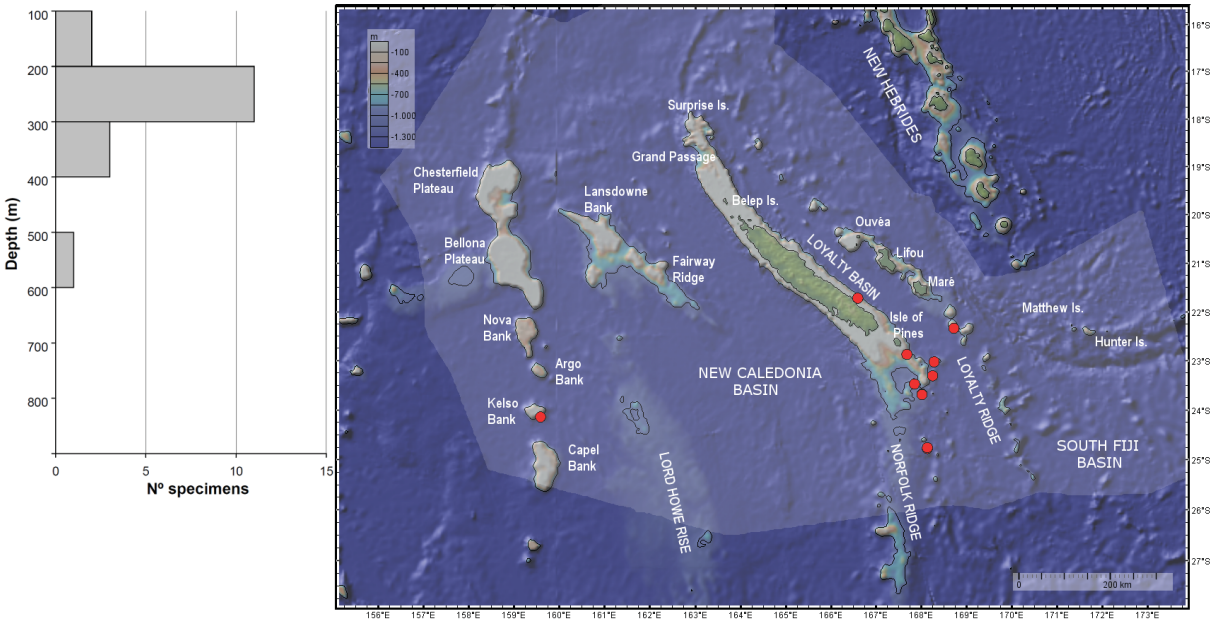

Fig. 39. Bathymetric range and distribution map for *Conasprella* (*Endemoconus*) *howelli* (Iredale, 1929). Red circles indicate the points where the species was collected.

Conasprella* (*Endemoconus*) *ione (Fulton, 1938)
Figs 2, 40–41

Conus ione Fulton, 1938: 55, pl. III fig. 2.

Conus ione – Röckel *et al.* 1995b: no. 105, pl. 25 figs 25–28.
Endemoconus ione – Tucker & Tenorio 2013: 231.
Conasprella ione – Monnier *et al.* 2018a: 214.

Material examined

87 lots (126 specimens). See Supp. file 1.

Type material

Holotype

JAPAN • 58 mm; Kii; NHMUK 1938.7.13.10 (Fig. 40).

Figured material

NEW CALEDONIA • 46.5 mm; off New Caledonia, stn DW230; 22º52′ S, 167º12′ E; 390–420 m depth; 30 Sep. 1985; MUSORSTOM 4 expedition; MNHN (Fig. 40B) • 45.2 mm; same collection data as for preceding; MNHN (Fig. 40C) • 47.5 mm; south of Grande Terre, off New Caledonia, stn DW210; 22º43′ S, 167º09′ E; 340–345 m depth; 28 Sep. 1985; MUSORSTOM 4 expedition; MNHN (Fig. 40D) • 33.2 mm; Norfolk Ridge, off New Caledonia, stn DW187; 23º17′ S, 168º06′ E; 390–540 m depth; 31 Jan. 1993; SMIB 8 expedition; MNHN (Fig. 40E) • 39.7 mm; Norfolk Ridge, off New Caledonia, stn DW189; 23º18′ S, 168º06′ E; 400–402 m depth; 31 Jan. 1993; SMIB 8 expedition; MNHN (Fig. 40F) • 48.3 mm; Norfolk Ridge, Île des Pins, off New Caledonia, stn DW2148; 22º44′ S, 167º16′ E; 366–391 m depth; 4 Nov. 2003; NORFOLK 2 expedition; MNHN (Fig. 40G) • 47 mm; off New Caledonia, stn CP3848; 22°03′ S, 168°42′ E; 430–440 m depth; 13 Sep. 2011; EXBODI expedition; MNHN (Fig. 40H) • 53.8 mm;

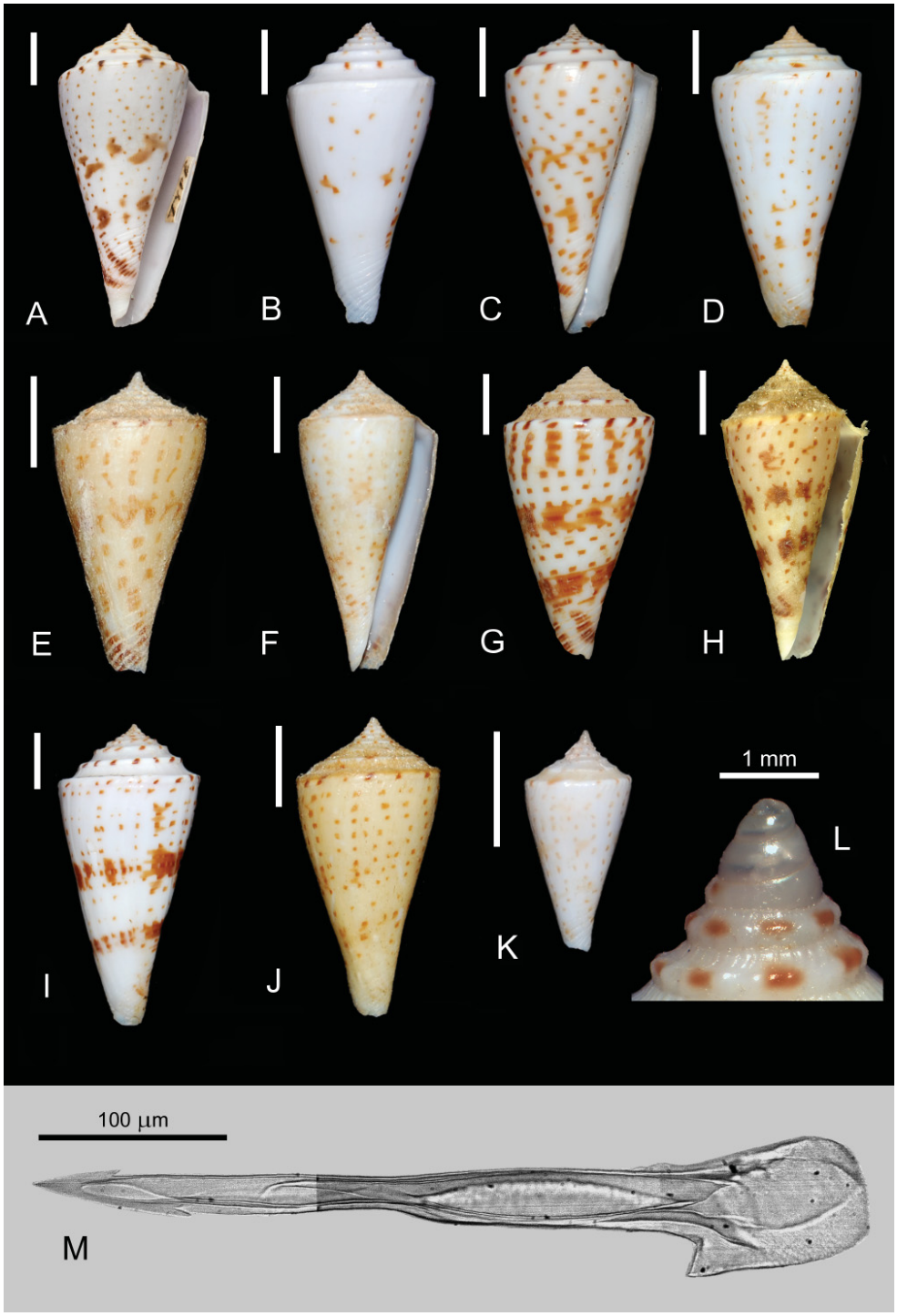

Fig. 40. *Conasprella* (*Endemoconus*) *ione* (Fulton, 1938). **A**. Holotype, Kii, Japan, 58 mm (NHMUK 1938.7.13.10). **B**. Off New Caledonia, 390–420 m depth, 46.5 mm. **C**. Same collection data as for specimen B, 45.2 mm. **D**. South of Grande-Terre, 340–345 m depth, 47.5 mm. **E**. Norfolk Ridge, 390–540 m depth, 33.2 mm. **F**. Norfolk Ridge, 400–402 m depth, 39.7 mm. **G**. Norfolk Ridge, Île des Pins, 366–391 m depth, 48.3 mm. **H**. Off New Caledonia, 430–440 m depth, 47 mm. **I**. S Île des Pins, 450 m depth, 53.8 mm (MJT coll.). **J**. Norfolk Ridge, 305–320 m depth, 36.9 mm. **K**. Loyalty Ridge, 373 m depth, 19.3 mm. **L**. Protoconch of specimen from Norfolk Ridge, 381–469 m depth. **M**. Radular tooth of specimen from Grand Passage, 252–280 m depth, 38.0 mm. Scale bars = 10 mm, unless otherwise stated.

S Île des Pins, off New Caledonia; 450 m depth; MJT (Fig. 40I) • 36.9 mm; Norfolk Ridge, off New Caledonia, stn DW184; 23º18′ S, 168º05′ E; 305–320 m depth; 31 Jan. 1993; SMIB 8 expedition; MNHN (Fig. 40J) • 19.3 mm; Loyalty Ridge, off New Caledonia, stn DW406; 20º41′ S, 167º07′ E; 373 m depth; 15 Feb. 1989; MUSORSTOM 6 expedition; MNHN (Fig. 40K) • 20 mm; Norfolk Ridge, off New Caledonia, stn DW827; 23º22′ S, 168º01′ E; 381–469 m depth; 29 Nov. 1993; BATHUS 3 expedition; MNHN (Fig. 40L) • 38 mm; Grand Passage, off N New Caledonia, stn DW2954; 19°02′ S, 163°18′ E; 250–280 m depth; 1 May 2008; CONCALIS expedition; Atheris coll. (Fig. 40M).

Geographical distribution and bathymetry

Widely distributed in the Indo-Pacific: Mozambique and Reunion Island, Japan to the Philippines and NW Australia, typically at depths between 240 and 400 m. In New Caledonia it is particularly abundant in Norfolk Ridge, but also present in the Grand Passage area, Loyalty Ridge, and Coral Sea (Plateau des Chesterfield), at depths between 200–500 m.

Remarks

Moderately large (maximum shell length 76 mm) conical shell, slightly pyriform with a moderately high spire. Multispiral protoconch of about 3.75 whorls (Fig. 40L). Teleoconch sutural ramps concave with regularly set axial threads. Radular tooth (Fig. 40M) with a short barb and a pointed blade covering about one third of the anterior section, which is much shorter than the posterior section. Shaft fold is present but difficult to detect. Basal spur present. This is a relatively abundant species in deep water around New Caledonia. Specimens from this area are similar to those from other localities, and can be either densely or sparsely patterned. In the phylogeny (Fig. 2), all sequenced specimens of *C. ione* appear in a clade which is sister to *Conasprella sieboldii* (Reeve, 1849), a species which is not present among the lots of deep-water New Caledonian material studied in the present work.

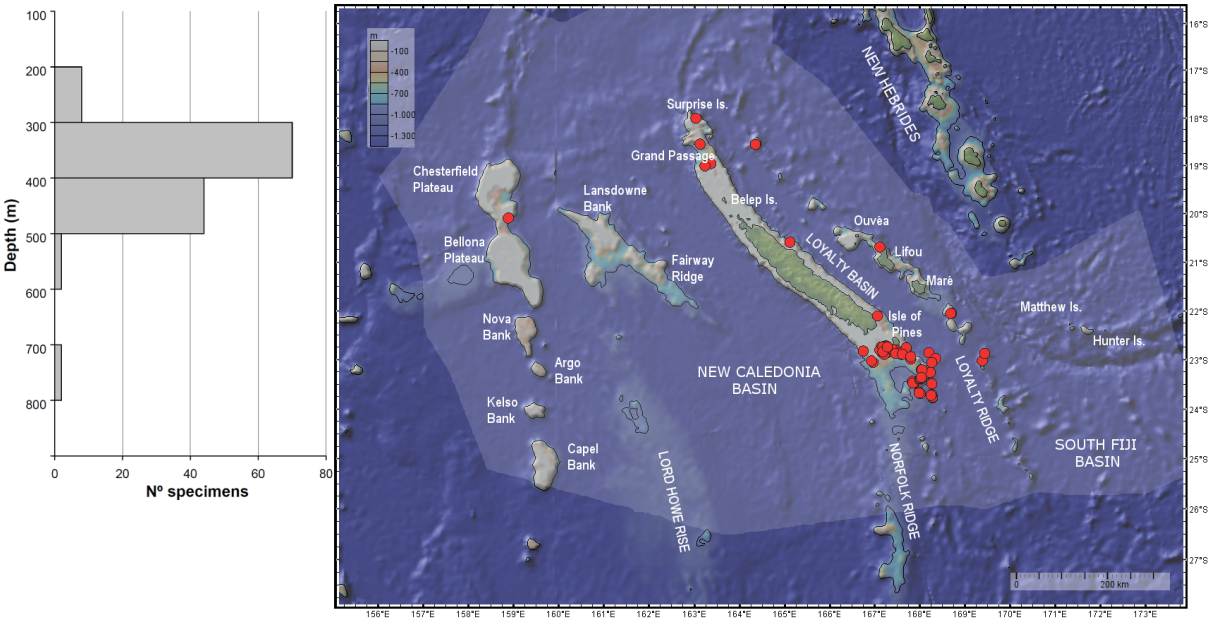

Fig. 41. Bathymetric range and distribution map for *Conasprella* (*Endemoconus*) *ione* (Fulton, 1938). Red circles indicate the points where the species was collected.

Conasprella* (*Endemoconus*) *raoulensis (Powell, 1958)
Figs 38I–K, 42

Conus (*Kermasprella*) *raoulensis* Powell, 1958: 83, pl. 9 fig. 1.

Conus raoulensis – Röckel *et al.* 1995b: no. 256, pl. 55 figs 9–12.
Endemoconus raoulensis – Tucker & Tenorio 2013: 341.
Conasprella raoulensis – Monnier *et al.* 2018a: 213.

Material examined

2 lots (2 specimens). See Supp. file 1.

Type material

Holotype

NEW ZEALAND • 18 mm; off Raoul Island, Kermadec Islands; 75–85 m depth; 3 Mar. 1952; NHMD-91129, previously ZMUC GAS-000805 (Fig. 38I).

Figured material

NEW CALEDONIA • 15.1 mm; Coral Sea, Capel Bank, off New Caledonia, stn DW255; 25º15′ S, 159º55′ E; 280–295 m depth; 7 Oct. 1986; MUSORSTOM 5 expedition; MNHN (Fig. 38J) • 16.9 mm; Norfolk Ridge, Banc Kaimon Maru, off New Caledonia, stn DW2093; 24º44′ S, 168º09′ E; 230 m depth; 29 Oct. 2003; NORFOLK 2 expedition; MNHN (Fig. 38K).

Geographical distribution and bathymetry

Known from N New Zealand (Wanganella Bank and Kermadec Islands) and Australia (Norfolk Island). Two dead specimens were collected in New Caledonia (Norfolk Ridge) and Coral Sea (Capel Bank) at depths between 200–400 m.

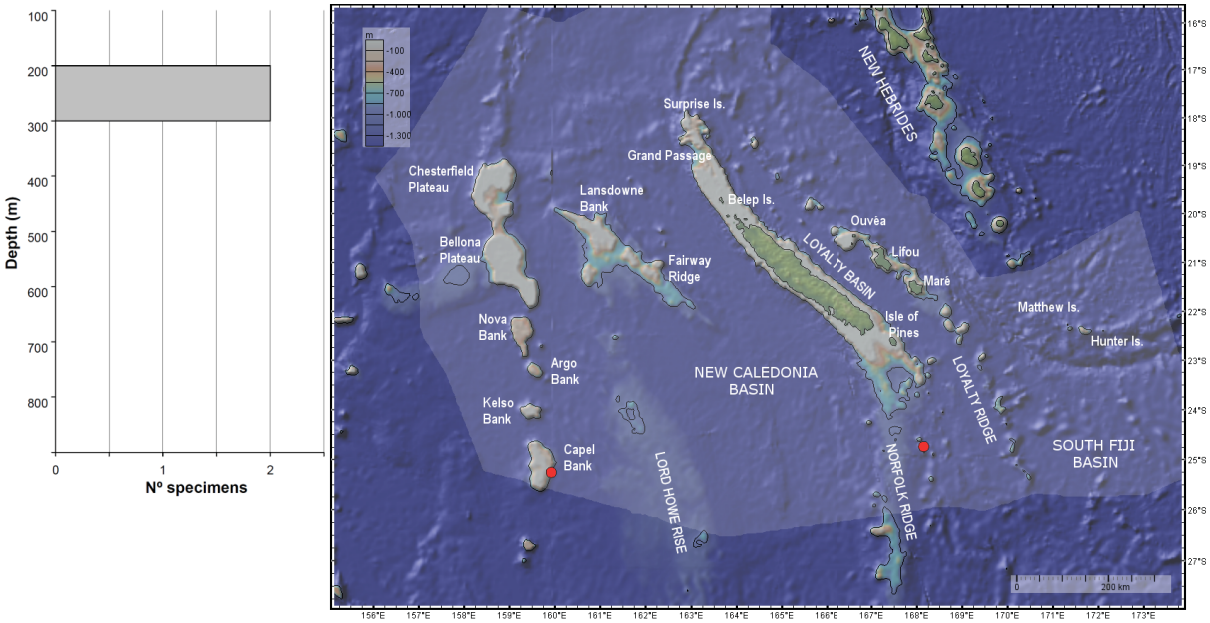

Fig. 42. Bathymetric range and distribution map for *Conasprella* (*Endemoconus*) *raoulensis* (Powell, 1958). Red circles indicate the points where the species was collected.

Remarks

Shell small (maximum shell length 22 mm), conical to broadly conical with a moderate to high stepped spire. Teleoconch sutural ramps concave with arcuate radial threads. Last whorl with strongly granulose spiral ribs. Protoconch multispiral of about 4 whorls. Radular morphology unknown. No specimens have been sequenced. The two dead specimens collected off New Caledonia exhibit shell features consistent with those of the holotype for the species.

Subgenus *Fusiconus* da Motta, 1991

Conasprella* (*Fusiconus*) *comatosa (Pilsbry, 1904)
Figs 2, 43A–H, L, 44

Conus comatosa Pilsbry, 1904: 550 (nomen novum for *Conus dormitor* Pilsbry, 1904 – non *Conus dormitor* Solander in Brander, 1766).
Conus dormitor Pilsbry, 1904: 6, pl. I figs 9, 9a.

Conus comatosa – Röckel *et al.* 1995b: 266, pl. 56 figs 16–20.
Bathyconus comatosa – Tucker & Tenorio 2013: 146.
Fusiconus (*Bathyconus*) *comatosus* – Monnier *et al.* 2018a: 165.

Material examined

30 lots (48 specimens). See Supp. file 1.

Type material

Lectotype (of *C. dormitor*)
JAPAN • 43.5 mm; Kikai Island, Ryukyu Islands; ANSP 85950 (Fig. 43A).

Figured material

NEW CALEDONIA • 46.8 mm; S Lansdowne, off New Caledonia, stn DW2632; 21º05′ S, 160º45′ E; 297–378 m depth; 21 Oct. 2005; EBISCO expedition; MNHN (Fig. 43B) • 40 mm; Norfolk Ridge, Banc Antigonia, off New Caledonia, stn CP1716; 23º22′ S, 168º03′ E; 266–276 m depth; 26 Jun. 2001; NORFOLK 1 expedition; MNHN (Fig. 43C) • 37.6 mm; SE Terrasses, off New Caledonia, stn DW3093; 22°06′ S, 167°03′ E; 190–200 m depth; 26 Oct. 2008; TERRASSES expedition; MNHN (Fig. 43D) • 39.5 mm; SE Terrasses, off New Caledonia, stn DW3093; 22°06′ S, 167°03′ E; 190–200 m depth; 26 Oct. 2008; TERRASSES expedition; MNHN (Fig. 43E) • 37.7 mm; Baie du Santal, sinking towards the SW of Récif Shelter, off New Caledonia, stn DW1650; 20°54′ S, 167°02′ E; 120–250 m depth; Nov. 2000; LIFOU 2000 expedition; MNHN (Fig. 43F) • 41.8 mm; Norfolk Ridge, Banc Munida, off New Caledonia, stn DW2135; 23º02′ S, 168º21′ E; 295–330 m depth; 3 Nov. 2003; NORFOLK 2 expedition; MNHN (Fig. 43G) • 41.8 mm; Baie du Santal, sinking towards the SW of Récif Shelter, off New Caledonia, stn DW1650; 20°54′ S, 167°02′ E; 120–250 m depth; Nov. 2000; LIFOU 2000 expedition; MNHN (Fig. 43H)

PHILIPPINES • 34 mm; ER coll. (Fig. 43L).

Geographical distribution and bathymetry

Japan, Philippines, NW Australia, Solomon Islands and Vietnam, at depths between 80–400 m. Widely distributed around New Caledonia, Loyalty Ridge and in the Coral Sea, typically at depths between 200 and 400 m.

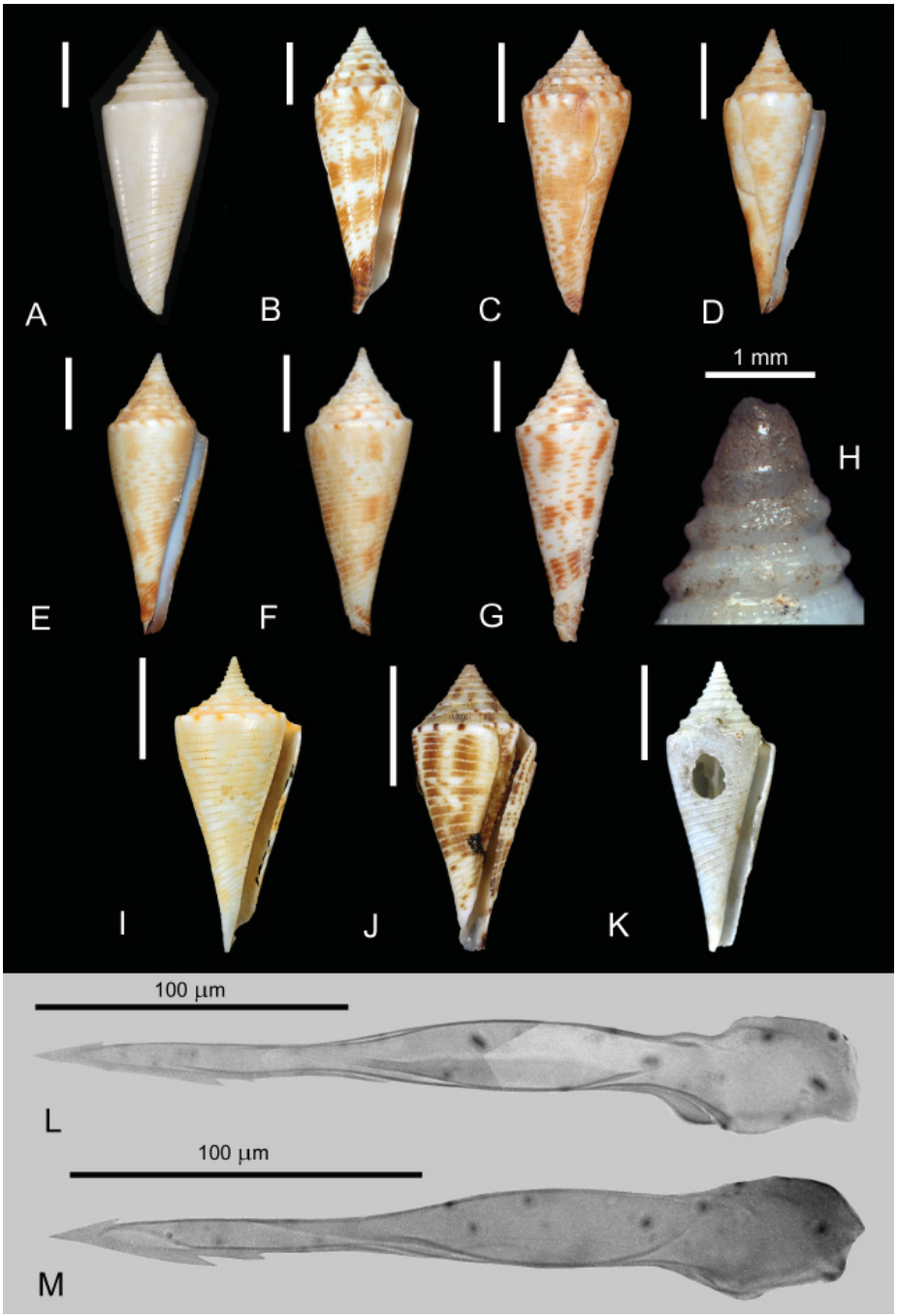

Fig. 43. A–H. *Conasprella* (*Fusiconus*) *comatosa* (Pilsbry, 1904). **A**. Holotype, Kikai Island, Ryukyu Islands, 43.5 mm (ANSP 85950). **B**. Coral Sea, S Lansdowne, 297–378 m depth, 46.8 mm. **C**. Norfolk Ridge, Banc Antigonia, 266–276 m depth, 40 mm. **D**. SE Terrasses, 190–200 m depth, 37.6 mm. **E**. Same collection data as for specimen D, 39.5 mm. **F**. Baie du Santal, 120–250 m depth, 37.7 mm. **G**. Norfolk Ridge, Banc Munida, 295–330 m depth, 41.8 mm. **H**. Protoconch of a specimen from stn DW1650, LIFOU 2000 exp. – **I–K**. *Conasprella* (*Fusiconus*) *saecularis* (Melvill, 1898). **I**. Syntype, Oman, Malcolm Inlet (Ghubbat al Ghazira), Persian Gulf, 44 m depth, 29 mm (NHMUK). **J**. W Île des Pins, off New Caledonia, 79 m depth, 24 mm (MNHN-IM-2013-68093). **K**. S Lansdowne Bank, 360–400 m depth, 32.3 mm (MNHN-IM-2016-4388). – **L**. *C.* (*F.*) *comatosa*. Radular tooth of a specimen from the Philippines, 34 mm (ER coll.). – **M**. *C.* (*F.*) *saecularis*. Radular tooth of a specimen from the Philippines, 34 mm (ER coll.) Scale bars = 10 mm, unless otherwise stated.

Remarks

Shell narrowly conical, moderately small to medium-sized (maximum length 50 mm), with a moderate to high spire. The dark brown color of the anterior end of the body whorl is a distinctive character for this species. Protoconch (Fig. 43H) multispiral of about 3.5 whorls. Radular tooth (Fig. 43L) small, with a barb, a pointed blade, and a very small pointed posterior blade, difficult to detect. The anterior section of the tooth is much shorter than the posterior section. Shaft fold present, blunt at its anterior end. Basal spur is present on top of the slanted base. Specimens from New Caledonia are similar in morphology to those from Japan and the Philippines. In the phylogeny (Fig. 2), the only specimen sequenced appears sister to *Bathyconus coriolisi*.

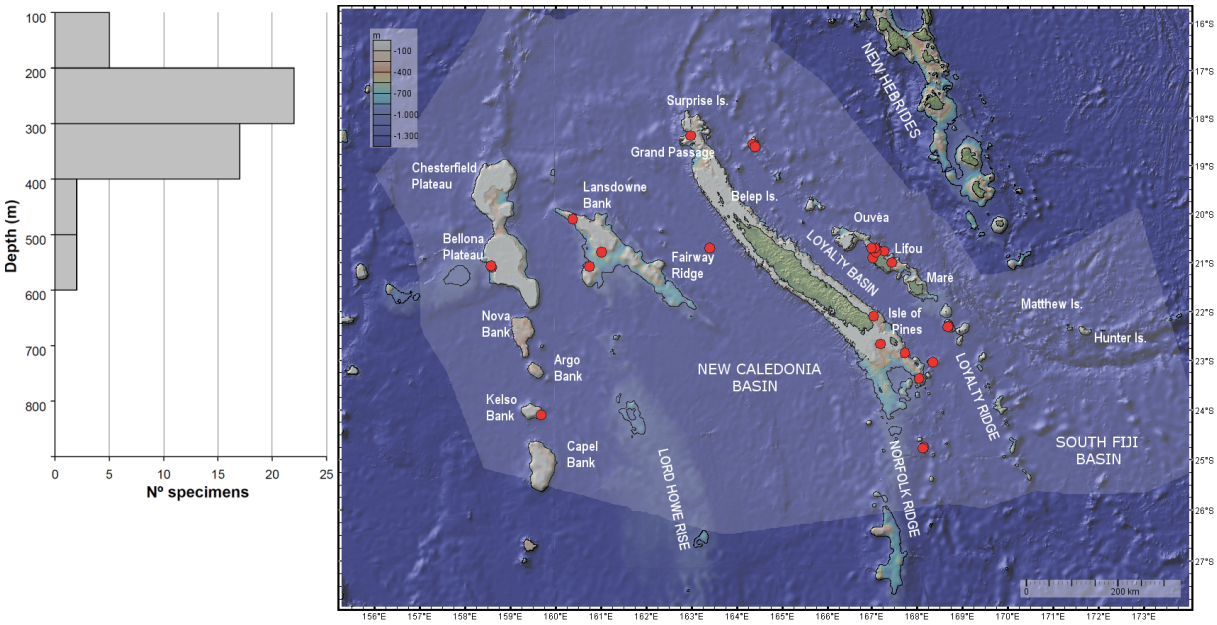

Fig. 44. Bathymetric range and distribution map for *Conasprella* (*Fusiconus*) *comatosa* (Pilsbry, 1904). Red circles indicate the points where the species was collected.

Conasprella* (*Fusiconus*) *coriolisi (Röckel, Richard & Moolenbeek, 1995)
Figs 2, 45–46

Conus orbignyi coriolisi Röckel *et al.*, 1995a: 578, figs 12–13.

Conus orbignyi coriolisi – Röckel *et al.*, 1995b: pl. 56 fig. 7.
Bathyconus coriolisi – Tucker & Tenorio 2013: 151.
Fusiconus (*Bathyconus*) *coriolisi* – Monnier *et al.* 2018a: 166.

Material examined

92 lots (129 specimens). See Supp. file 1.

Type material

Holotype

NEW CALEDONIA • 44.5 mm; Coral Sea, Capel Bank, Lord Howe Rise, off New Caledonia, stn DW266; 25°20′ S, 159° 46′ E; 240 m depth; 8 Oct. 1986; MUSORSTOM 5 expedition; MNHN-IM-2000-2570 (Fig. 45A).

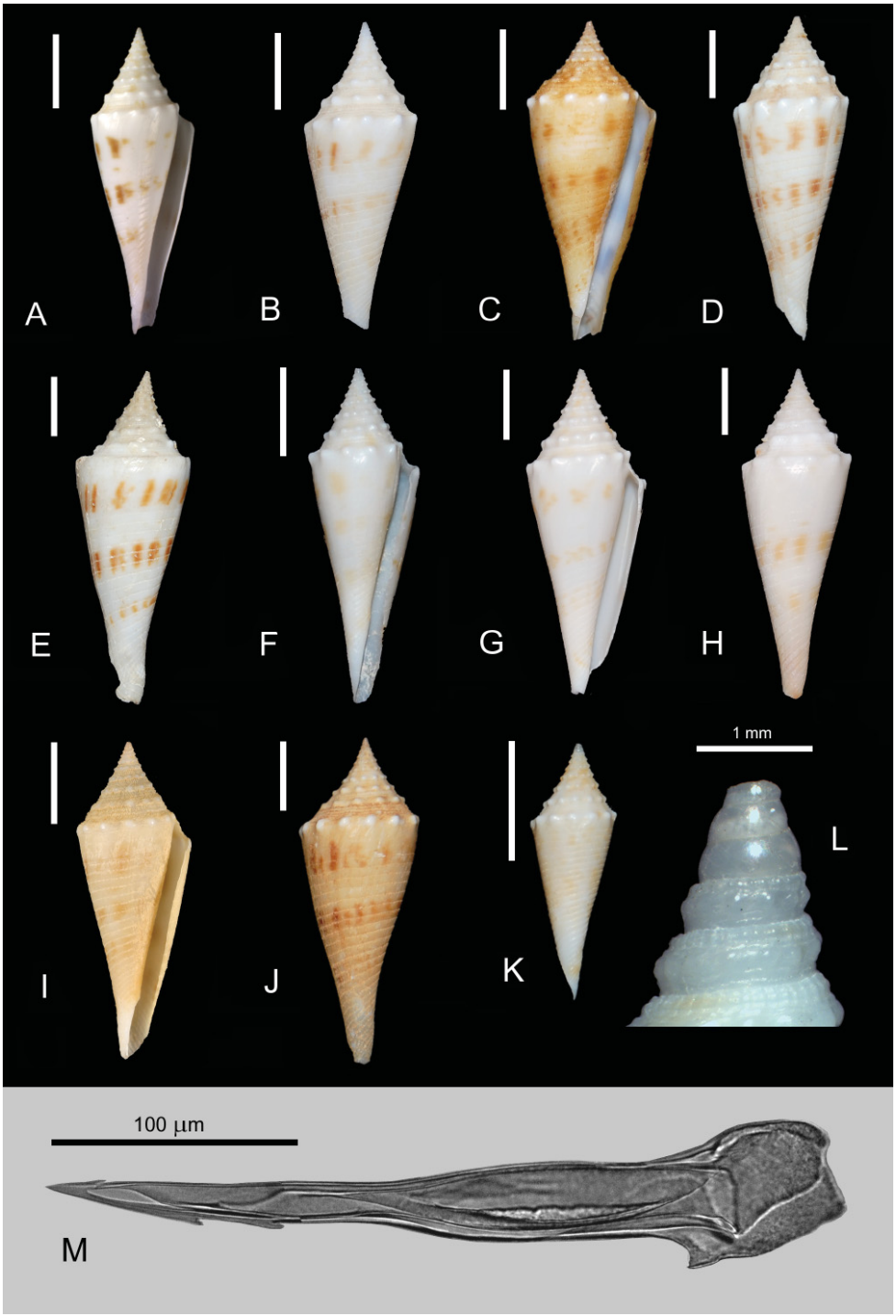

Fig. 45. *Conasprella* (*Fusiconus*) *coriolisi* (Röckel, Richard & Moolenbeek, 1995). **A**. Holotype, Coral Sea, Capel Bank, Lord Howe Rise, 240 m depth, 41.5 mm (MNHN-IM-2000-2570). **B**. Coral Sea, Kelso Bank, 225–230 m depth, 40.0 mm. **C**. Off New Caledonia, 378–414 m depth, 39.8 mm. **D**. S New Caledonia, 225–230 m depth, 47.8 mm. **E**. Coral Sea, Nova Bank, 330 m depth, 56.0 mm. **F**. Coral Sea, Capel Bank, 150–225 m depth, 37.8 mm. **G**. Coral Sea, W Bellona, 356–438 m depth, 46.5 mm. **H**. Coral Sea, Nova Bank, 305 m depth, 49.2 mm. **I**. Off New Caledonia, 300–302 m depth, 39.0 mm. **J**. E New Caledonia, 250 m depth, 47.0 mm. **K**. Same collection data as for specimen J, 21.5 mm. **L**. Protoconch of specimen from the Coral Sea, Argo Bank, 272 m depth. **M**. Radular tooth of specimen C from off New Caledonia, 378–414 m depth, 39.8 mm. Scale bars = 10 mm, unless otherwise stated.

Figured material

NEW CALEDONIA • 40 mm; Coral Sea, Kelso Bank, off New Caledonia, stn DW284; 24º10′ S, 159º33′ E; 225–230 m depth; 10 Oct. 1986; MUSORSTOM 5 expedition; MNHN (Fig. 45B) • 39.8 mm; off New Caledonia, stn CP3795; 22°14′ S, 167°11′ E; 378–414 m depth; 4 Sep. 2011; EXBODI expedition; MNHN (Fig. 45C, M) • 47.8 mm; off S New Caledonia, stn DW130; 19º05′ S, 163º21′ E; 225–230 m depth; 4 Mar. 1990; SMIB 6 expedition; MNHN (Fig. 45D) • 56 mm; Coral Sea, Nova Bank, off New Caledonia, stn CP318; 22º27′ S, 159º21′ E; 330 m depth; 13 Oct. 1986; MUSORSTOM 5 expedition; MNHN (Fig. 45E) • 37.8 mm; Coral Sea, Capel Bank, off New Caledonia, stn DW263; 25º21′ S, 159º46′ E; 150–225 m depth; 8 Oct. 1986; MUSORSTOM 5 expedition; MNHN (Fig. 45F) • 46.5 mm; W Bellona, off New Caledonia, stn DW2547; 21º06′ S, 158º36′ E; 356–438 m depth; 11 Oct. 2005; EBISCO expedition; MNHN (Fig. 45G) • 49.2 mm; Coral Sea, Nova Bank, off New Caledonia, stn DC64; 22º11′ S, 159º15′ E; 305 m depth; 27 Jul. 1984; CHALCAL 1 expedition; MNHN (Fig. 45H) • 39 mm; off New Caledonia, stn CP3828; 22°00′ S, 167°01′ E; 300–302 m depth; 8 Sep. 2011; EXBODI expedition; MNHN (Fig. 45I) • 47 mm; off E New Caledonia, stn CP713; 21º45′ S, 166º37′ E; 250 m depth; 19 Mar. 1993; BATHUS 1 expedition; MNHN (Fig. 45J) • 21.5 mm; same collection data as for preceding; MNHN (Fig. 45K) • Coral Sea, Argo Bank, off New Caledonia, stn DW294; 23°11′ S, 159º30′ E; 272 m depth; 11 Oct. 1986; MUSORSTOM 5 expedition; MNHN (Fig. 45L).

Geographical distribution and bathymetry

Distributed around New Caledonia, Loyalty Ridge and in the Coral Sea, typically at depths between 200 and 400 m. It also seems to be present in the Philippines and Vanuatu (Puillandre *et al.* 2011).

Remarks

Medium-sized (maximum length 57 mm) narrowly conical shell, with a high spire. Protoconch (Fig. 45L) of 3 or more whorls, smooth, glossy and translucent. Last whorl white or sparsely patterned with 3 spiral bands of irregular brown blotches. Radular tooth (Fig. 45M) small, with a barb, a pointed blade, and a pointed posterior blade. The anterior section of the tooth is much shorter than the posterior section. Shaft fold present, blunt at its anterior end. Basal spur is present on top of the slanted base. Although

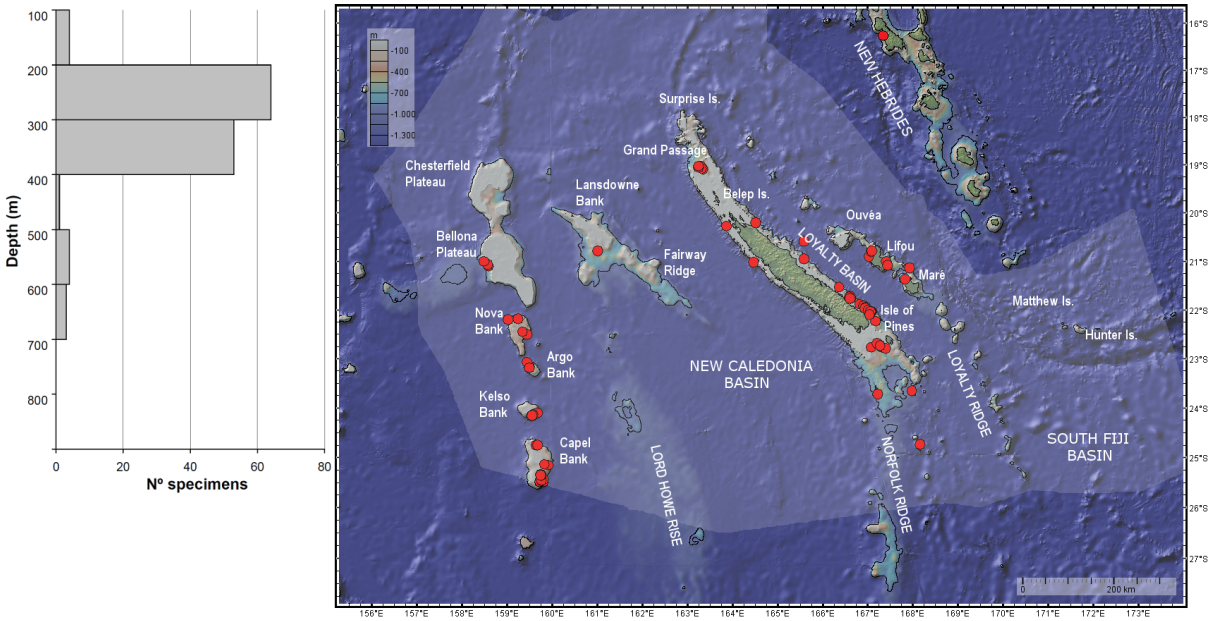

Fig. 46. Bathymetric range and distribution map for *Conasprella* (*Fusiconus*) *coriolisi* (Röckel, Richard & Moolenbeek, 1995). Red circles indicate the points where the species was collected.

originally introduced as a subspecies of *Conasprella* (*Fusiconus*) *orbignyi* (Audouin, 1831), *C. coriolisi* is a distinct species. In the phylogeny (Fig. 2) all specimens of *C. coriolisi* form a clade which is sister to *C. comatosa*, with a genetic distance to typical *C. orbignyi* of approximately 9% (Puillandre *et al.* 2011).

Conasprella* (*Fusiconus*) *ichinoseana (Kuroda, 1956)
Figs 2, 47–48

Asprella (*Conasprella?*) *ichinoseana* Kuroda, 1956: 10, pl. 1. fig. 5.

Conus ichinoseana – Röckel *et al.* 1995b: no. 263, pl. 56 figs 13–15.
Endemoconus ichinoseana – Tucker & Tenorio 2013: 225.
Fusiconus (*Fusiconus*) *ichinoseana* – Monnier *et al.* 2018a: 160.

Material examined

24 lots (33 specimens). See Supp. file 1.

Type material

Holotype
JAPAN • 58 mm; off Tosa; NSMN NC-H330 (Fig. 47A).

Figured material

NEW CALEDONIA • 34 mm; Plateau des Chesterfield, off New Caledonia, stn DW2612; 19º35′ S, 158º41′ E; 392 m depth; 19 Oct. 2005; EBISCO expedition; MNHN (Fig. 47B) • 50 mm; Grand Passage, off New Caledonia, stn CP2957; 18º57′ S, 163º16′ E; 450–460 m depth; 1 May 2008; CONCALIS expedition; MNHN (Fig. 47C) • 46.2 mm; Grand Passage, off New Caledonia, stn DW908; 18º58′ S, 163°11′ E; 502–527 m depth; 4 Aug. 1994; BATHUS 4 expedition; MNHN (Fig. 47D) • 35.9 mm; Grand Passage, off New Caledonia, stn CP2958; 18º58′ S, 163º15′ E; 432–448 m depth; 1 May 2008; CONCALIS expedition; MNHN (Fig. 47E) • 47.8 mm; same collection data as for preceding; MNHN (Fig. 47F) • 32.5 mm; Grand Passage, off New Caledonia, stn CP2957; 18º57′ S, 163º16′ E; 450–460 m depth; 1 May 2008; CONCALIS expedition; MNHN (Fig. 47G, L) • 51.6 mm; off New Caledonia, stn CC201; 18º56′ S, 163º14′ E; 490 m depth; 3 Oct. 1985; MUSORSTOM 4 expedition; MNHN (Fig. 47H) • 49.6 mm; off New Caledonia, stn CC246; 22º08′ S, 167º11′ E; 410–420 m depth; 3 Oct. 1985; MUSORSTOM 4 expedition; MNHN-IM-2009-29244 (Fig. 47I) • 40 mm; along passe Yaté, off New Caledonia, stn CP3836; 22°08′ S, 167°11′ E; 415–420 m depth; 9 Sep. 2011; EXBODI expedition; MNHN (Fig. 47J) • 26.8 mm; N Bellona, off New Caledonia, stn DW2578; 20º21′ S, 158º40′ E; 440–505 m depth; 14 Oct. 2005; EBISCO expedition; MNHN (Fig. 47K) • 34 mm; Grand Passage, off New Caledonia, stn CP2957; 18º57′ S, 163º16′ E; 450–460 m; 1 May 2008; CONCALIS expedition; Atheris coll. (Fig. 47M).

Geographical distribution and bathymetry

From Japan to the Philippines and Vietnam at depths of 80–575 m. In New Caledonia, Loyalty Ridge and the Coral Sea, specimens have been sampled at depths between 200 and 600 m. Also reported from NW Australia.

Remarks

Shell medium-sized to large (maximum shell length mm 105 mm), narrowly conical with a high, stepped spire of outline almost straight. Protoconch multispiral of about 3 whorls (Fig. 47L). Last whorl with punctate spiral grooves and ribbons in between. Radular tooth (Fig. 47M) with a short barb and a pointed blade covering about one third of the anterior section, which is much shorter than the posterior

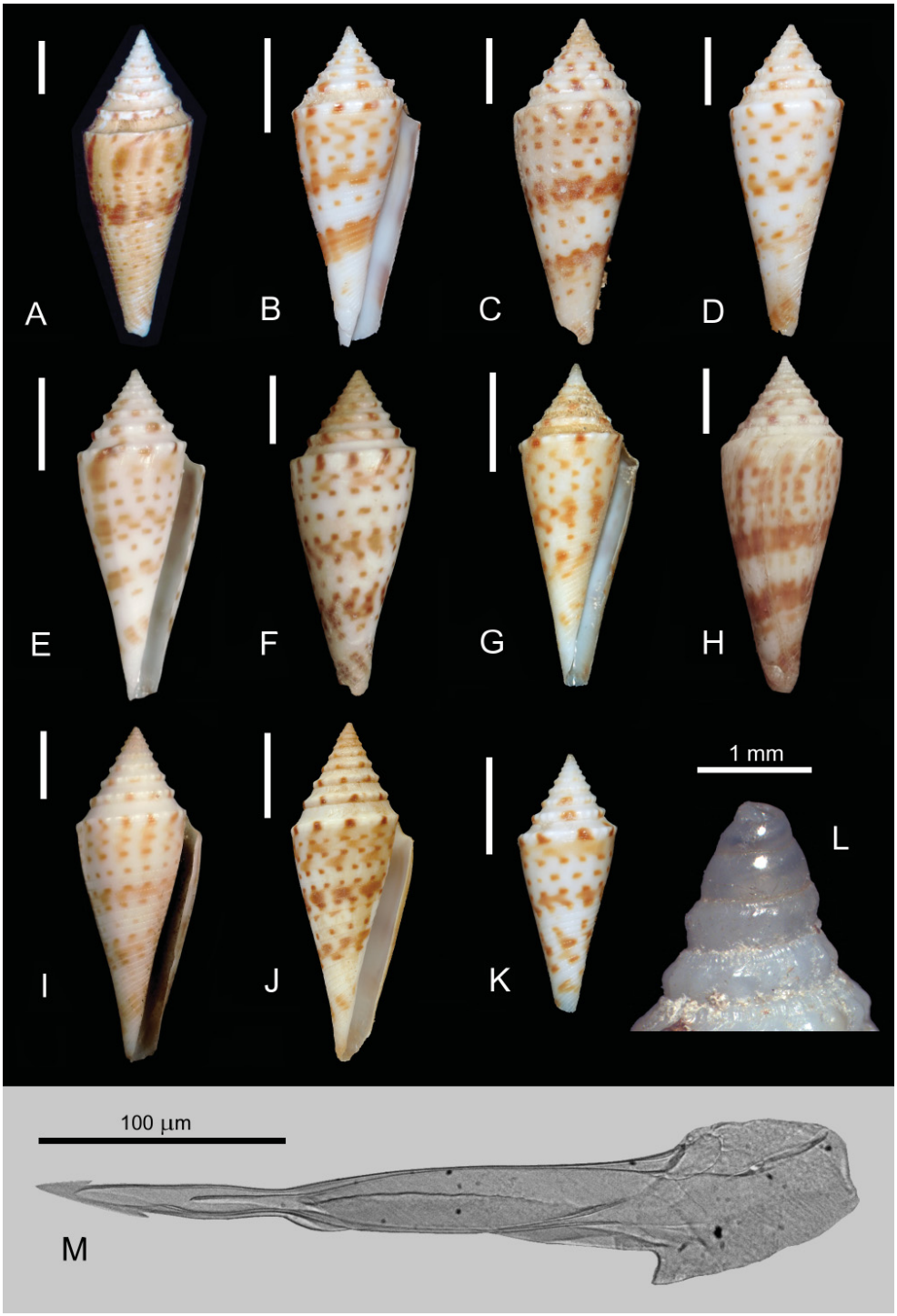

Fig. 47. *Conasprella* (*Fusiconus*) *ichinoseana* (Kuroda, 1956). **A**. Holotype, off Tosa, Japan, 58 mm (NSMN NC-H330). **B**. Coral Sea, Plateau des Chesterfield, 392 m depth, 34 mm. **C**. Grand Passage, 450–460 m depth, 50 mm. **D**. Grand Passage, 502–527 m depth, 46.2 mm. **E**. Grand Passage, 432–448 m depth, 35.9 mm. **F**. Same collection data as for specimen E, 47.8 mm. **G**. Same collection data as for specimen C, 32. 5 mm. **H**. Off New Caledonia, 490 m depth, 51.6 mm. **I**. Off New Caledonia, 410–420 m depth, 49.6 mm. **J**. Along passe Yaté, 415–420 m depth, 40 mm (MNHN-IM-2009-29244). **K**. Coral Sea, N Bellona, 440–505 m depth, 26.8 mm. **L**. Protoconch of specimen G. **M**. Radular tooth of specimen from Grand Passage, 450–460 m depth, 34 mm. Scale bars = 10 mm, unless otherwise stated.

section. Shaft fold present. Basal spur is present on top of the slanted base. Specimens of *C. ichinoseana* from different localities (New Caledonia, Coral Sea, Philippines, Taiwan) are clustered together in the phylogeny (Fig. 2).

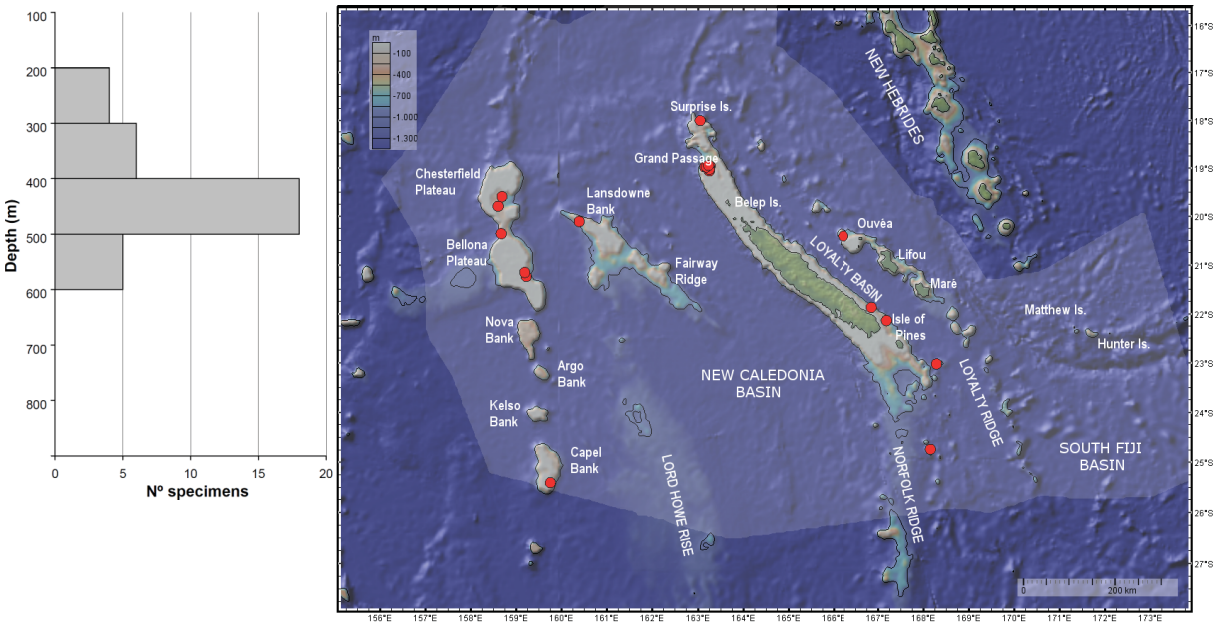

Fig. 48. Bathymetric range and distribution map for *Conasprella* (*Fusiconus*) *ichinoseana* (Kuroda, 1956). Red circles indicate the points where the species was collected.

Conasprella* (*Fusiconus*) *saecularis (Melvill, 1898)
Fig. 43I–K, M, 49

Conus (*Leptoconus*) *saecularis* Melvill, 1898: 10, pl. I fig. 23.
Conus schepmani Fulton 1936: 7.

Conus elegans (non *Conus elegans* G.B. Sowerby III, 1895) – Schepman 1913: 393, pl. 25 fig. 4.
Conus saecularis – Röckel *et al.* 1995b: no. 265, pl. 56 figs 21–27.
Bathyconus saecularis – Tucker & Tenorio 2013: 356.
Fusiconus (*Bathyconus*) *saecularis* – Monnier *et al.* 2018a: 169.

Material examined

6 lots (6 specimens). See Supp. file 1.

Type material

Syntype

OMAN • 29 mm; Malcolm Inlet (Ghubbat al Ghazira), Persian Gulf; 44 m depth; NHMUK (Fig. 43I).

Figured material

NEW CALEDONIA • 24 mm; W Île des Pins, off New Caledonia, stn CP4655; 22°31′ S, 167°04.2′ E; 79 m depth; 10 Aug. 2016; KANACONO expedition; MNHN-IM-2013-68093 (Fig. 43J) • 32.3 mm;

S Lansdowne Bank, off New Caledonia, stn DW4982; 20°46′ S, 160°57′ E; 360–400 m depth; 10 Sep. 2017; KANADEEP expedition; MNHN-IM-2016-4388 (Fig. 43K).

PHILIPPINES • 34 mm; ER coll. (Fig. 43M).

Geographical distribution and bathymetry

Gulf of Oman, W Thailand and NE Malaysia, Japan (Ryukyu Islands), Philippines, Solomon Islands and Papua New Guinea, at depths between 85–400 m. It has also been cited from Fiji at depths of 35–51 m (Moolenbeek *et al.* 2008), and from Bayonnaise Bank, Wallis & Futuna, dead at depths between 425–430 m (Moolenbeek & Röckel 1996). The few specimens from New Caledonia have been sampled around Île des Pins and sites in Norfolk Ridge, but also in N New Caledonia and in the Coral Sea (Lansdowne Bank) at depths between 200 and 400 m.

Remarks

Small to medium-sized (maximum length 40 mm) narrowly conical shell, with a moderate to high stepped spire of concave outline. Protoconch multispiral of 3–3.5 whorls. Radular tooth (Fig. 43M) small, with a barb, a pointed blade, and a very small pointed posterior blade, difficult to detect. The anterior section of the tooth is much shorter than the posterior section. Shaft fold present, blunt at its anterior end. Basal spur is present on top of the slanted base. In the phylogeny, the single specimen from New Caledonia sequenced appears together with other specimens of *C. saecularis* from Papua New Guinea. Specimens of *C. saecularis* from the type locality have not been sequenced. Hence, the conspecificity with individuals from other localities within the distribution range remains to be confirmed.

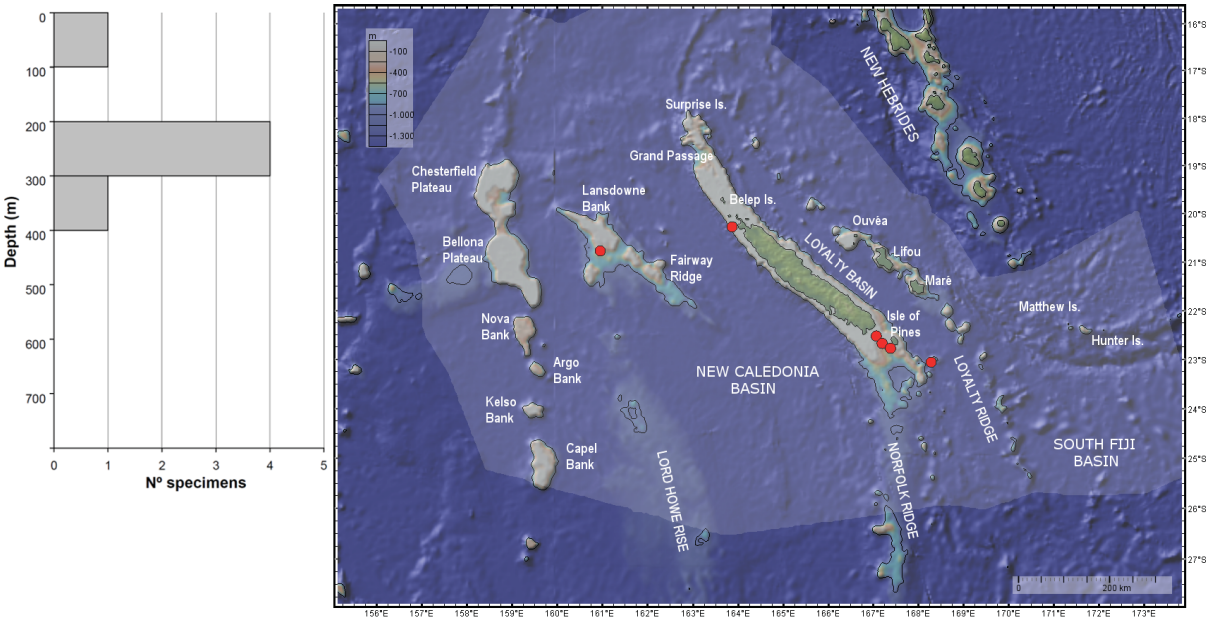

Fig. 49. Bathymetric range and distribution map for *Conasprella* (*Fusiconus*) *saecularis* (Melvill, 1898). Red circles indicate the points where the species was collected.

Genus *Conus* Linnaeus, 1758
Subgenus *Afonsoconus* Tucker & Tenorio, 2013

Conus* (*Afonsoconus*) *bruuni Powell, 1958
Figs 2, 50–51

Conus bruuni Powell, 1958: 84, pl. 10 fig. 3.

Conus bruuni – Röckel *et al.* 1995b: no. 66, pl. 16 figs 16–21.
Afonsoconus bruuni – Tucker & Tenorio 2013: 119. — Monnier *et al.* 2018a: 640.

Material examined

201 lots (558 specimens). See Supp. file 1.

Type material

Holotype
NEW ZEALAND • 43.5 mm; off Raoul Island, Kermadec Islands; 75–85 m depth; 3 Mar. 1952; NHMD-91131, previously ZMUC-GAS-808 (Fig. 50A).

Figured material

NEW CALEDONIA • 43.5 mm; off S New Caledonia, stn CH5; 24º44′ S, 168º09′ E; 223 m depth; 27 Oct. 1986; CHALCAL 2 expedition; MNHN (Fig. 50B) • 42.3 mm; Norfolk Ridge, Banc Jumeau Ouest, off New Caledonia, stn DW2042; 23º41′ S, 168º01′ E; 235–245 m depth; 23 Oct. 2003; NORFOLK 2 expedition; MNHN (Fig. 50C) • 41.1 mm; same collection data as for preceding; MNHN (Fig. 50D) • 51.3 mm; Grand Passage, off New Caledonia, stn DW2986; 17º59′ S, 163º05′ E; 270–300 m depth; 5 May 2008; CONCALIS expedition; MNHN (Fig. 50E, L) • 48.3 mm; Norfolk Ridge, Crypthélia, off New Caledonia, stn DW3072; 23°19′ S, 168°16′ E; 180–220 m depth; 23 Oct. 2008; TERRASSES expedition; MNHN (Fig. 50F) • 52.8 mm; Loyalty Ridge, off New Caledonia, stn DW417; 20º42′ S, 167º04′ E; 283 m depth; 16 Feb. 1989; MUSORSTOM 6 expedition; MNHN (Fig. 50G) • 56.8 mm; off S New Caledonia, stn DW113; 19º03′ S, 163º30′ E; 250 m depth; 2 Mar. 1990; SMIB 6 expedition; MNHN (Fig. 50H) • 42 mm; Norfolk Ridge, Jumeau Ouest, off New Caledonia, stn DW3056; 23°42′ S, 168°01′ E; 250–330 m depth; 20 Oct. 2008; TERRASSES expedition; MNHN (Fig. 50I) • 70.6 mm; New Caledonia, SW Île des Pins, off New Caledonia, stn PL21; 22º45′ S, 167º09′ E; 340–340 m depth; 12 Mar. 1989; CALSUB expedition; MNHN (Fig. 50J) • 13.4 mm; Norfolk Ridge, off New Caledonia, stn DW156; 24º46′ S, 168º08′ E; 275–300 m depth; 28 Jan. 1993; SMIB 8 expedition; MNHN (Fig. 50K) • 68 mm; Grand Passage, off N New Caledonia, stn CP3008; 18º30′ S, 163º04′ E; 275–305 m depth; 7 May 2008; CONCALIS expedition; Atheris coll. (Fig. 50M).

Geographical distribution and bathymetry

N New Zealand (Kermadec Islands) in less than 100 m deep. In New Caledonia, Loyalty Islands and the Coral Sea typically at depths between 200 and 400 m. Specimens from the Philippines identified as *A. bruuni* correspond most likely to a different species (Tenorio *et al.* 2018).

Remarks

Medium-sized to moderately large (maximum shell length 75 mm) conical shell with a low to moderate spire straight or slightly concave and an angulate shoulder. Protoconch multispiral of about 3 whorls (Fig. 50L). Radular tooth (Fig. 50M) rather large, narrow and elongated with the anterior section slightly shorter than the posterior section. The tooth is serrated with a fairly long row of small denticles ending in a small terminating cusp. Barb and blade very short, almost equal in size. Basal spur is present on top of

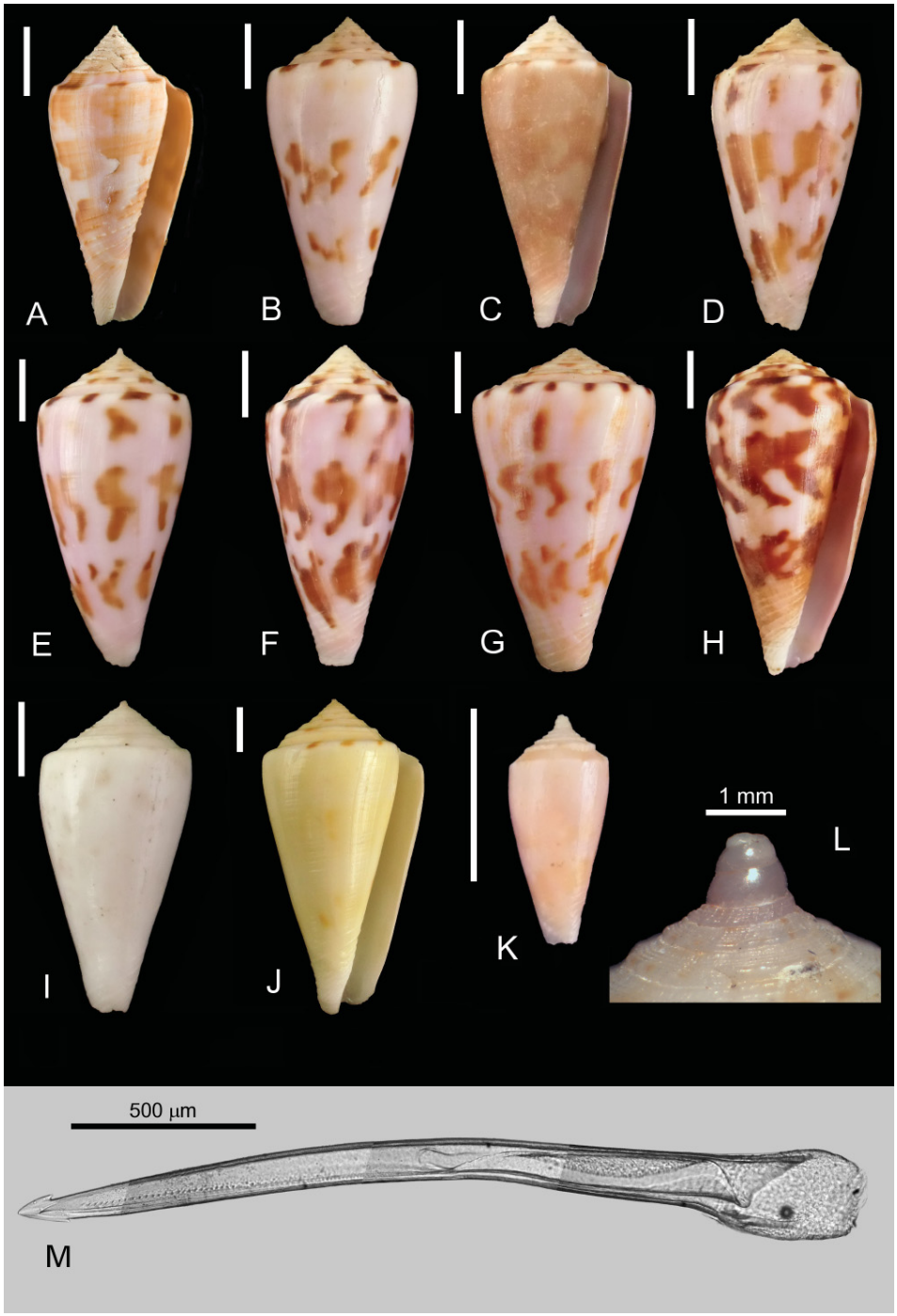

Fig. 50. *Conus* (*Afonsoconus*) *bruuni* Powell, 1958. **A**. Holotype, off Raoul Island, Kermadec Islands, New Zealand, 75–85 m depth, 43.5 mm (NHMD-91131). **B**. S New Caledonia, 223 m depth, 47.4 mm. **C**. Norfolk Ridge, Banc Jumeau Ouest, 235–245 m depth, 42.3 mm. **D**. Same collection data as for specimen C, 41.1 mm. **E**. Grand Passage, 270–300 m depth, 51.3 mm. **F**. Norfolk Ridge, Banc Crypthélia, 180–220 m depth, 48.3 mm. **G**. Loyalty Ridge, off New Caledonia, 283 m depth, 52.8 mm. **H**. S New Caledonia, 250 m depth, 56.8 mm. **I**. Norfolk Ridge, Banc Jumeau Ouest, 250–330 m depth, 42 mm. **J**. SW of Île des Pins, off New Caledonia, 340–340 m depth, 70.6 mm. **K**. Norfolk Ridge, 275–300 m depth, 13.4 mm. **L**. Protoconch of specimen from Grand Passage, off New Caledonia, 270–300 m depth. **M**. Radular tooth of specimen from Grand Passage, 275–305 m depth, 68.0 mm. Scale bars = 10 mm, unless otherwise stated.

the large base. This is possibly the most abundant species among the lots from New Caledonia examined in the present work, with more than 550 specimens. In the phylogeny of New Caledonian cone snails presented in Fig. 2, *C.* (*A.*) *bruuni* appears sister to species in the (sub)genus *Phasmoconus*. However, in a more general phylogeny, the *Afonsoconus* clade is sister to the *Textilia* clade (Tenorio *et al.* 2018; Puillandre *et al.* 2014), which contains fish-eating species with harpoon-shaped radular teeth such as *Conus* (*Textilia*) *dusaveli* (H. Adams, 1872) or *Conus* (*Textilia*) *cervus* Lamarck, 1822. Although these two species occur in New Caledonia, no live specimens were available, so they were not included in our phylogenetic analysis.

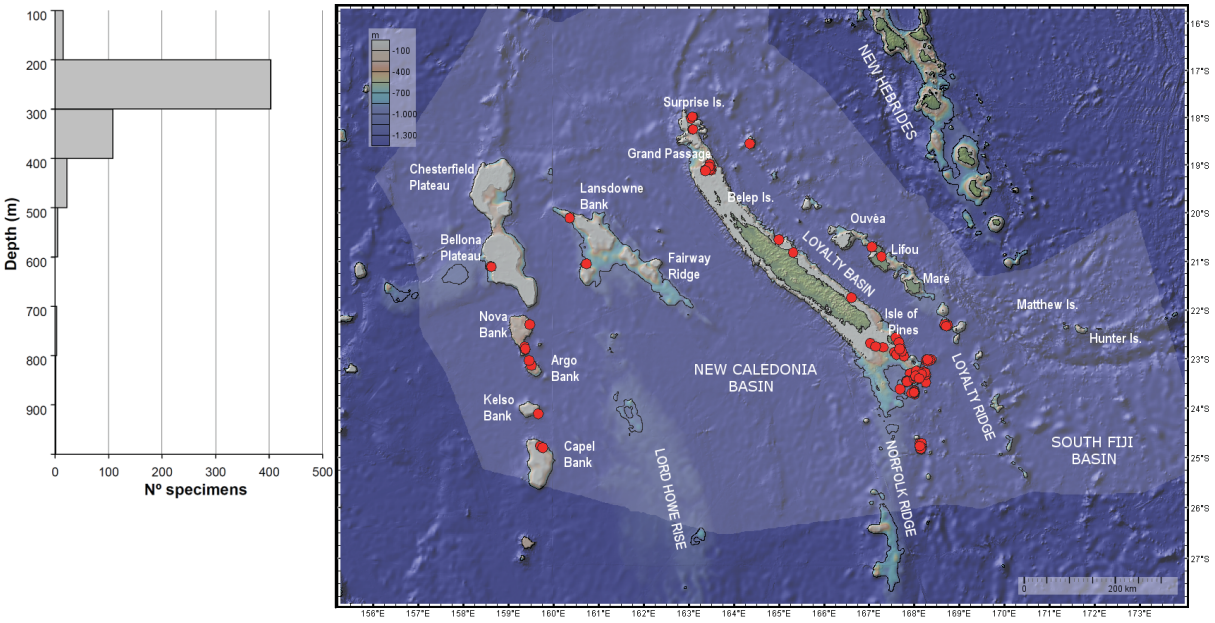

Fig. 51. Bathymetric range and distribution map for *Conus* (*Afonsoconus*) *bruuni* Powell, 1958. Red circles indicate the points where the species was collected.

Subgenus *Asprella* Schaufuss, 1869

Conus* (*Asprella*) *fijisulcatus Moolenbeek, Röckel & Bouchet, 2008
Figs 52A–H, M, 53

Conus fijisulcatus Moolenbeek *et al.*, 2008: 43.

Asprella fijisulcata – Tucker & Tenorio 2013: 190. — Monnier *et al.* 2018a: 613.

Material examined

14 lots (32 specimens). See Supp. file 1.

Type material

Holotype

FIJI • 54.9 mm; Natewa Bay, Vanua Levu; 16°40′ S, 179°36′ E; 220–224 m depth; MNHN-IM-2000-21038 (Fig. 52A).

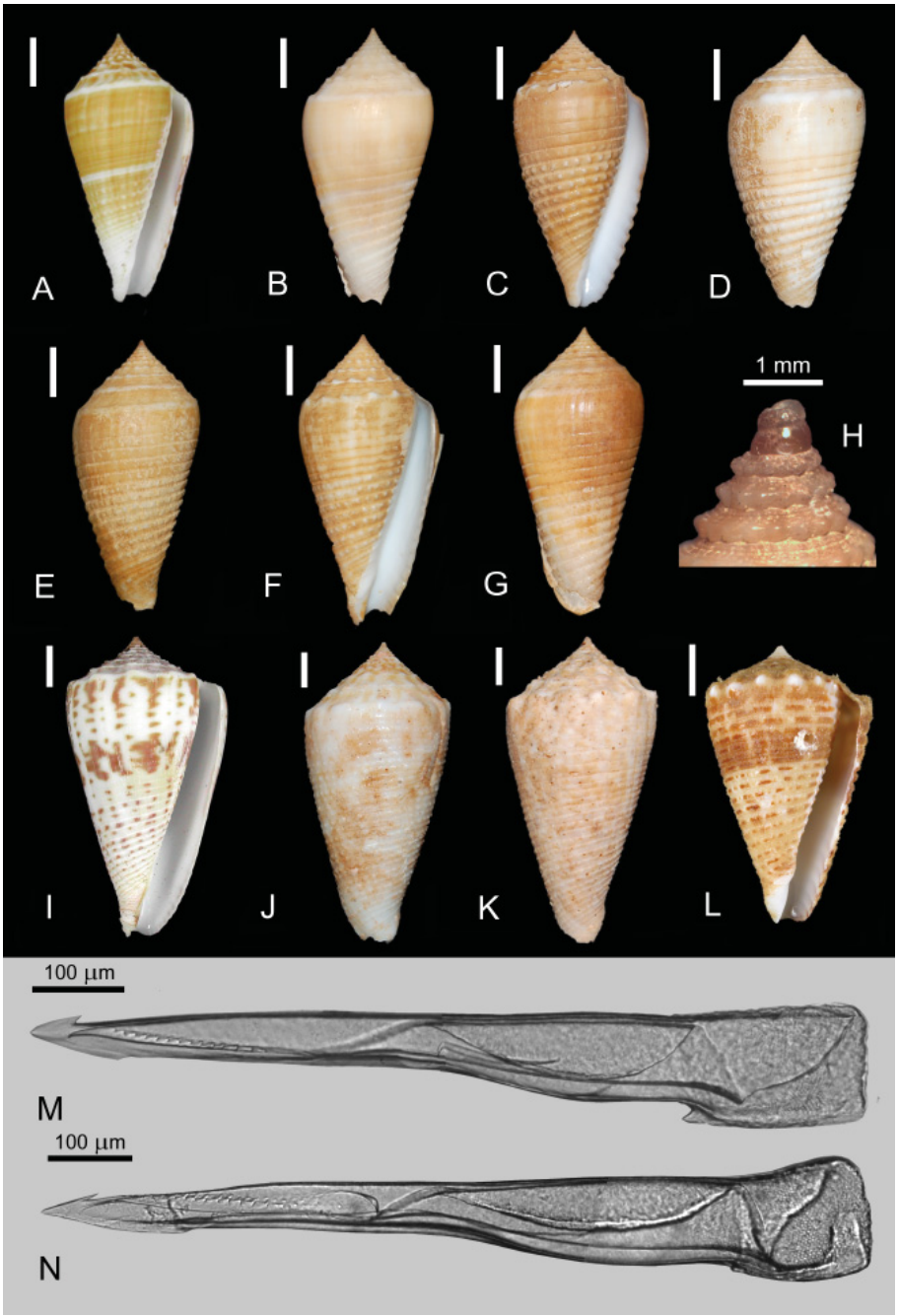

Fig. 52. A–H. *Conus* (*Asprella*) *fijisulcatus* Moolenbeek, Röckel & Bouchet, 2008. **A**. Holotype, Natewa Bay, Vanua Levu, Fiji, 220–224 m depth, 54.9 mm (MNHN-IM-2000-21038). **B**. New Caledonia, east coast, 237–298 m depth, 55.9 mm. **C**. Same collection data as for specimen B, 52.7 mm. **D**. SE New Caledonia, 253–266 m depth, 53.7 mm. **E**. Passe du Solitaire, off New Caledonia, 251–281 m depth, 54.4 mm. **F**. SE New Caledonia, 204–220 m depth, 58.8 mm. **G**. SE New Caledonia, 314–364 m depth, 61.4 mm. **H**. Protoconch of specimen B. – **I–K**. *Conus* (*Asprella*) *gigasulcatus* Moolenbeek, Röckel & Bouchet, 2008. **I**. Holotype, south of Viti Levu, Fiji, 144–150 m depth, 73.1 mm (MNHN-IM-2000-21041). **J**. SE Terrasses, off New Caledonia, 260–270 m depth, 85.2 mm. **K**. SE New Caledonia, 253–266 m depth, 80.9 mm. – **L**. *Conus* (*Asprella*) *samiae* da Motta, 1982. Munida Bank, Norfolk Ridge, 180–220 m depth, 53.9 mm (MNHN-IM-2007-34858). – **M**. *C.* (*A.*) *fijisulcatus*. Radular tooth of specimen E. – **N**. *C.* (*A.*) *samiae*. Radular tooth of specimen L. Scale bars = 10 mm, unless otherwise stated.

Figured material

NEW CALEDONIA • 55.9 mm; off New Caledonia, east coast, stn DW654; 21º17′ S, 165º57′ E; 237–298 m depth; 12 Mar. 1993; BATHUS 1 expedition; MNHN (Fig. 52B, H) • 52.7 mm; same collection data as for preceding; MNHN (Fig. 52C) • 53.7 mm; off SE New Caledonia, stn CP852; 21º44′ S, 166º36′ E; 253–266 m depth; 19 Mar. 1994; HALIPRO 1 expedition; MNHN (Fig. 52D) • 54.4 mm; Passe du Solitaire, off New Caledonia, stn CP3813; 21°46′ S, 166°38′ E; 251–281 m depth; 6 Sep. 2011; EXBODI expedition; MNHN (Fig. 52E, M) • 58.8 mm; off SE New Caledonia, stn CC855; 21º45′ S, 166º37′ E; 204–220 m depth; 20 Mar. 1994; HALIPRO 1 expedition; MNHN (Fig. 52F) • 61.4 mm; off SE New Caledonia, stn CP851; 21º43′ S, 166º37′ E; 314–364 m depth; 19 Mar. 1994; HALIPRO 1 expedition; MNHN (Fig. 52G).

Geographical distribution and bathymetry

Fiji, at depths between 150–497 m, and New Caledonia (E coast and Loyalty Islands) between 200–500 m.

Remarks

Shell medium to large (maximum shell length 62 mm), broadly conical, with a rather high spire of straight profile. Multispiral protoconch of 2.3 whorls (Fig. 52H). Radular tooth (Fig. 52M) narrow and elongated with the anterior section slightly shorter than the posterior section. The tooth is serrated with 14–15 small denticles arranged in one single row. There is a small terminating cusp. Barb well marked. Blade rounded and short, about 2.5 times the size of the barb, covering about 20–25% of the anterior section of the tooth. Small basal spur pointing upwards on top of the large cylindrical base. In the phylogeny, all specimens examined belong to New Caledonian populations, as specimens from the type locality have not been sequenced. These form a clade sister to *Conus* (*Asprella*) *samiae* da Motta, 1982.

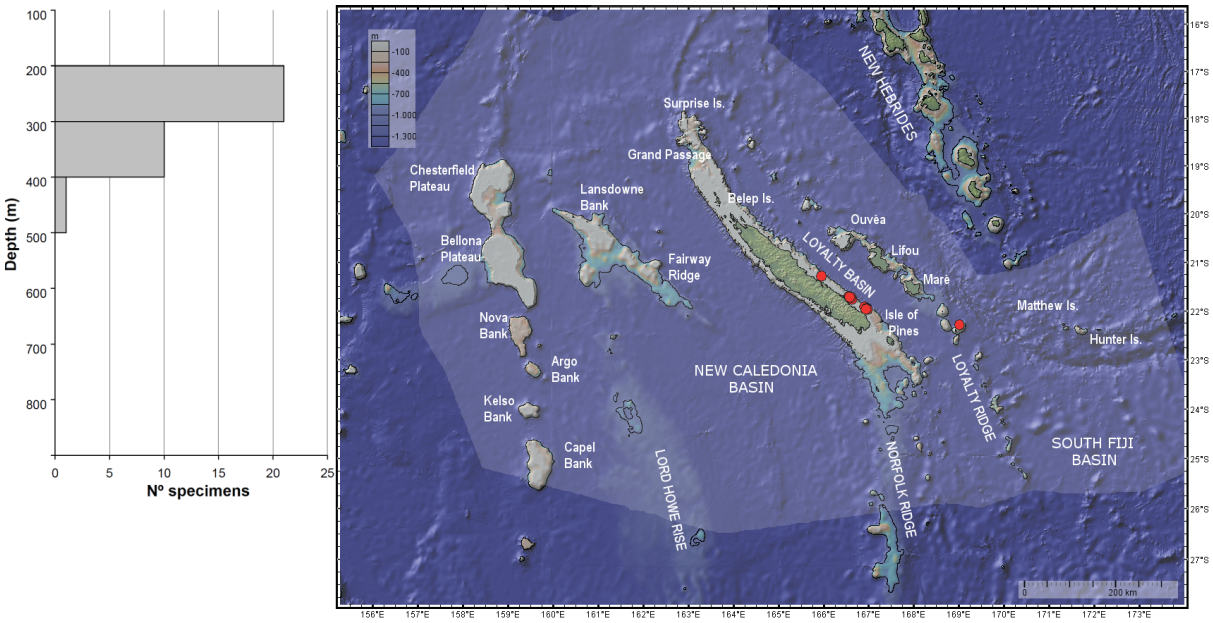

Fig. 53. Bathymetric range and distribution map for *Conus* (*Asprella*) *fijisulcatus* Moolenbeek, Röckel & Bouchet, 2008. Red circles indicate the points where the species was collected.

Conus* (*Asprella*) *gigasulcatus Moolenbeek, Röckel & Bouchet, 2008
Figs 52I–K, 54

Conus gigasulcatus Moolenbeek *et al.*, 2008: 43.

Asprella gigasulcata – Tucker & Tenorio 2013: 206. — Monnier *et al.* 2018a: 614.

Material examined

5 lots (6 specimens). See Supp. file 1.

Type material

Holotype

FIJI • 73.1 mm; south of Viti Levu; 18°12.4′ S, 178°33.0′ E; 144–150 m depth; MNHN-IM-2000-21041 (Fig. 52I).

Figured material

NEW CALEDONIA • 85.2 mm; SE Terrasses, off New Caledonia, stn CP3091; 22°17′ S, 167°09′ E; 260–270 m depth; 25 Oct. 2008; TERRASSES expedition; MNHN (Fig. 52J) • 80.9 mm; off SE New Caledonia, stn CP852; 21º44′ S, 166º36′ E; 253–266 m depth; 19 Mar. 1994; HALIPRO 1 expedition; MNHN (Fig. 52K).

Geographical distribution and bathymetry

Fiji, at depths between 150–260 m, Indonesia (Kei Islands, off Irian Jaya) in 82 m, Solomon Islands between 97 and 381 m, Vanuatu between 45 and 175 m, and New Caledonia (E coast) between 100–300 m.

Remarks

Shell moderately large to large (maximum length 88 mm), broadly conical with a rather low, concave spire. Protoconch missing in all specimens examined. Radular morphology not known. Initially described

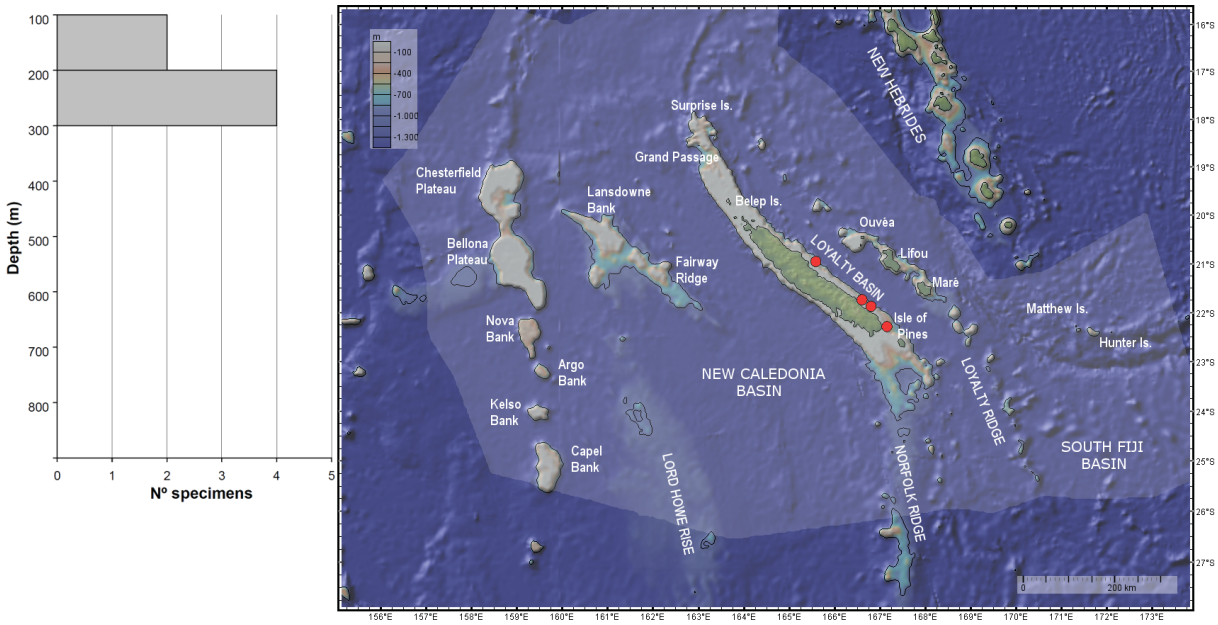

Fig. 54. Bathymetric range and distribution map for *Conus* (*Asprella*) *gigasulcatus* Moolenbeek, Röckel & Bouchet, 2008. Red circles indicate the points where the species was collected.

from Fiji, this species has been subsequently reported from many other localities. One specimen from Vanuatu has been sequenced. In the phylogeny, it appears sister to the clade containing *C. fijisulcatus* and *C. samiae*.

Conus* (*Asprella*) *samiae da Motta, 1982
Figs 2, 52L, N

Conus samiae da Motta, 1982: 12, fig. 11.

Conus sulcatus f. *samiae* – Röckel *et al.* 1995b: pl. 47 figs 14–16.
Asprella sulcata f. *samiae* – Tucker & Tenorio 2013: 357.
Asprella samiae – Monnier *et al.* 2018a: 615.

Material examined

1 lot (1 specimen).

Type material

Holotype
PHILIPPINES • 57.4 mm; off Balut Island, Mindanao; ca 200 m depth; MHNG MOLL-138917.

Figured material

NEW CALEDONIA • 53.9 mm; Norfolk Ridge, Munida, off New Caledonia, stn DW3106; 23°02′ S, 168°21′ E; 180–220 m depth; 27 Oct. 2008; TERRASSES expedition; MNHN-IM-2007-34858 (Fig. 52L, N).

Geographical distribution and bathymetry

Philippines, Papua New Guinea and Solomon Islands, at depths between 20 to 240 m. In New Caledonia there is one single live record from Norfolk Ridge at depths between 180–220 m.

Remarks

Shell medium to moderately large (maximum shell length 70 mm), broadly conical, with a low to moderate spire of concave profile. Shoulder with coarse nodules. Radular tooth (Fig. 52N) narrow and elongated with the anterior section slightly shorter than the posterior section. The tooth is serrated with 12–15 small denticles arranged in one single row, becoming two rows below. There is a small, rounded terminating cusp. Barb well marked. Blade rounded and short, covering about 35–40% of the anterior section of the tooth. Small basal spur pointing upwards on top of the base. Only one single live specimen has been sampled. In the phylogeny (Fig. 2), this species appears sister to *C. fijisulcatus*. However, in a phylogeny with a more extended sampling, it appears sister to a clade which includes several other species within *Asprella* such as *Conus* (*Asprella*) *sulcatus* Hwass in Bruguière, 1792, *C.* (*A.*) *rolani* Röckel, 1986, and the recently described *C.* (*A.*) *neocostatus* Olivera, Watkins, Puillandre & Tenorio, 2021.

Subgenus *Embrikena* Iredale, 1937

Conus* (*Embrikena*) *pergrandis Iredale, 1937
Figs 2, 55A–D, M, 56

Embrikena pergrandis Iredale, 1937: 407, pl. xviii.
Conus fletcheri Petuch & Mendenhall, 1972: 96, figs 1–2.
Conus (*Embrikena*) *potusmarumai* Kosuge, 1980b: 81, pl. 28 figs 1–4.

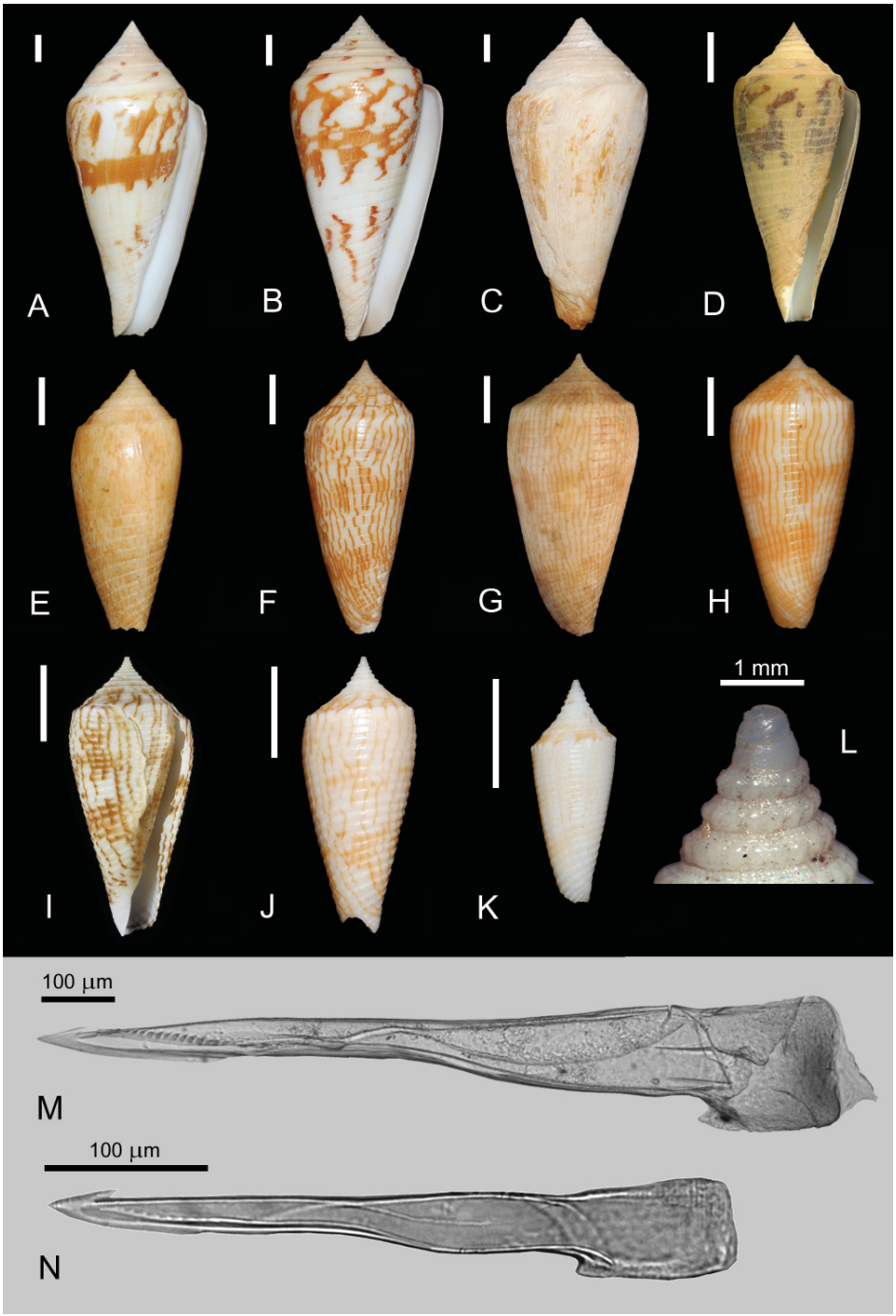

Fig. 55. A–D. *Conus* (*Embrikena*) *pergrandis* Iredale, 1937. **A**. Loyalty Ridge, 390 m depth, 116.4 mm. **B**. Loyalty Ridge, 283 m depth, 106 mm. **C**. Loyalty Ridge, 509 m depth, 114.7 mm. **D**. Along Toupeti, off New Caledonia, 307–309 m depth, 60.2 mm. – **E**. *Conus* (*Phasmoconus*) *armadillo* Shikama, 1971. Loyalty Ridge, 420 m depth, 54.9 mm. – **F–L**. *C.* (*Ph.*) *kuroharai* (Habe, 1965). **F**. Banc Kaimon Maru, Norfolk Ridge, 233–259 m depth, 55.4 mm. **G**. Loyalty Ridge, 275–295 m depth, 60.1 mm. **H**. Loyalty Ridge, 257 m depth, 47 mm. **I**. E Île des Pins, off New Caledonia, 138–146 m depth, 36.7 mm (MNHN-IM-2013-66069). **J**. Banc Munida, Norfolk Ridge, 180–220 m depth, 30.5 mm. **K**. Same collection data as for specimen J, 20.6 mm. **L**. Protoconch of specimen K. – **M**. *C.* (*E.*) *pergrandis*. Radular tooth of specimen A. – **N**. *C.* (*P.*) *kuroharai*. Radular tooth of specimen I. Scale bars = 10 mm, unless otherwise stated.

Conus pergrandis – Röckel *et al.* 1995b: no. 110, pl. 26 figs 16–19.
Embrikena pergrandis – Tucker & Tenorio 2013: 318. — Monnier *et al.* 2018a: 706.

Material examined

12 lots (12 specimens). See Supp. file 1.

Type material

Holotype

SOLOMON ISLANDS • 137 mm; Tahli Bay, New Britain; 55–73 m depth; AMS C.3152.

Figured material

NEW CALEDONIA • 116.4 mm; Loyalty Ridge, off New Caledonia, stn DW391; 20º47′ S, 167º06′ E; 390 m depth; 13 Feb. 1989; MUSORSTOM 6 expedition; MNHN (Fig. 55A, M) • 106 mm; Loyalty Ridge, off New Caledonia, stn DW418; 20º42′ S, 167º03′ E; 283 m depth; 16 Feb. 1989; MUSORSTOM 6 expedition; MNHN (Fig. 55B) • 114.7 mm; Loyalty Ridge, off New Caledonia, stn dive16; 20º38′ S, 167º02′ E; 509 m depth; CALSUB expedition; MNHN (Fig. 55C) • 60.2 mm; along Toupeti, off New Caledonia, stn CP3806; 21°42′ S, 166°34′ E; 307–309 m depth; 5 Sep. 2011; EXBODI expedition; MNHN (Fig. 55D).

Geographical distribution and bathymetry

Taiwan, Philippines, Papua New Guinea, Solomon Islands and Vanuatu. Also reported from Australia, off Queensland. In New Caledonia it has been found along the east coast, Loyalty Islands and Hunter Island, at depths between 200 and 700 m.

Remarks

Shell large to very large (maximum shell length 160 mm), ventricosely conical, with a moderate spire, slightly sigmoid to concave. Radular tooth (Fig. 55M) with the anterior section slightly shorter than the

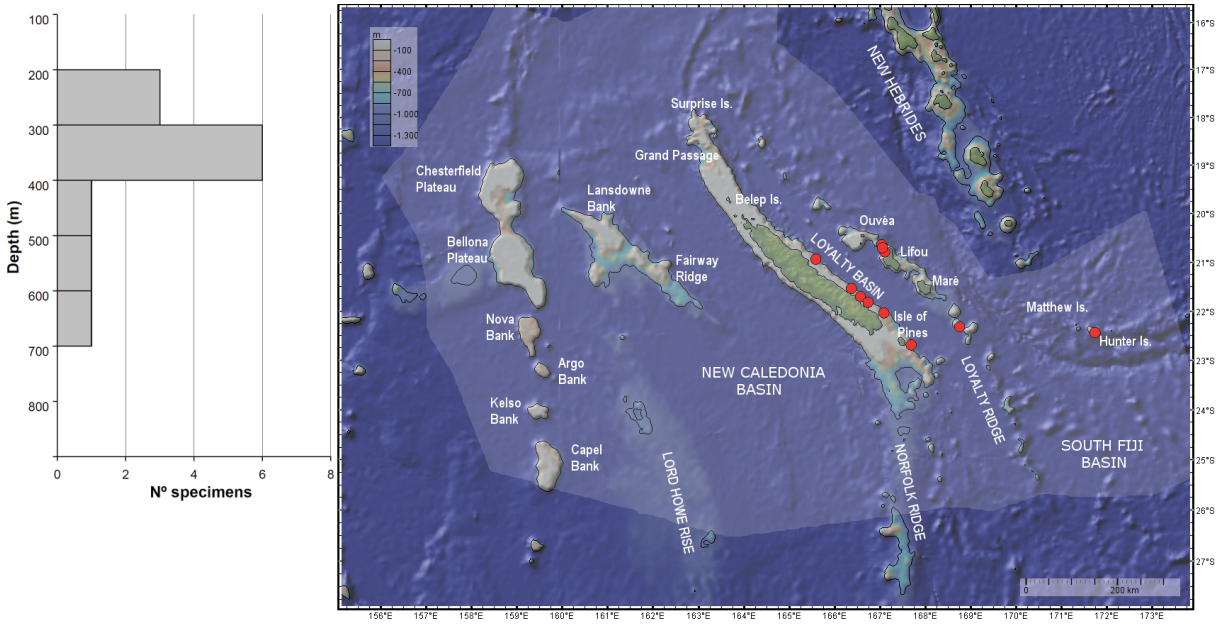

Fig. 56. Bathymetric range and distribution map for *Conus* (*Embrikena*) *pergrandis* Iredale, 1937. Red circles indicate the points where the species was collected.

posterior section. The tooth is serrated with 14–15 denticles arranged in one single row. There is a small rounded terminating cusp. Barb well marked. Blade rounded, covering about 50% of the anterior section of the tooth. Basal spur pointing upwards on top of the rather large base. In the phylogeny (Fig. 2), all specimens examined using DNA form a clade representing the subgenus *Embrikena*.

Subgenus *Klemaeconus* Tucker & Tenorio, 2013

Conus* (*Klemaeconus*) *plinthis Richard & Moolenbeek, 1988
Figs 2, 57–58

Conus plinthis Richard & Moolenbeek, 1988: 235, pl. 1 figs 6–9, 11.

Conus plinthis – Röckel *et al.* 1995b: no. 216, pl. 48 figs 19–22.
Continuconus plinthis – Tucker & Tenorio 2013: 323. — Monnier *et al.* 2018a: 325.

Material examined

150 lots (368 specimens). See Supp. file 1.

Type material

Holotype
NEW CALEDONIA • 43.9 mm; S of Grande-Terre, off New Caledonia, stn DW210; 22º43′ S, 167º09′ E; 340–345 m depth; 28 Sep. 1985; MUSORSTOM 4 expedition; MNHN-IM-2000-2526 (Fig. 57A).

Figured material

NEW CALEDONIA • 31.2 mm; off S New Caledonia, stn DW9; 24º42′ S, 168º08′ E; 265 m depth; 21 May 1987; SMIB 3 expedition; MNHN (Fig. 57B) • 38.3 mm; Norfolk Ridge, off New Caledonia, stn DW163; 24º50′ S, 168º09′ E; 310–460 m depth; 28 Jan. 1993; SMIB 8 expedition; MNHN (Fig. 57C) • 30.4 mm; Norfolk Ridge, off New Caledonia, stn DW187; 23º17′ S, 168º06′ E; 390–540 m depth; 31 Jan. 1993; SMIB 8 expedition; MNHN (Fig. 57D) • 36.7 mm; Norfolk Ridge, off New Caledonia, stn CP162; 24º48′ S, 168º09′ E; 254–264 m depth; 28 Jan. 1993; SMIB 8 expedition; MNHN (Fig. 57E) • 41 mm; off S New Caledonia, Banc Kaimon Maru, stn DW43; 24º46′ S, 168º09′ E; 235–245 m depth; 8 Mar. 1989; SMIB 4 expedition; MNHN (Fig. 57F) • 26.3 mm; off New Caledonia, stn DW184; 19º04′ S, 163º27º E; 260 m depth; 18 Sep. 1985; MUSORSTOM 4 expedition; MNHN (Fig. 57G) • 32 mm; Norfolk Ridge, off New Caledonia, stn DW159; 23º46′ S, 168º08′ E; 241–245 m depth; 28 Jan. 1993; SMIB 8 expedition; MNHN (Fig. 57H) • 29.1 mm; same collection data as for preceding; MNHN (Fig. 57I) • 26 mm; Banc Antigonia, off New Caledonia, stn DW183; 23º17′ S, 168º05′ E; 330–367 m depth; 31 Jan. 1993; SMIB 8 expedition; MNHN (Fig. 57J) • 20 mm; Norfolk Ridge, Jumeau Ouest, off New Caledonia, stn DW3056; 23°42′ S, 168°01′ E; 250–330 m depth; 20 Oct. 2008; TERRASSES expedition; MNHN (Fig. 57K) • size unknown; Norfolk Ridge, Banc Kaimon Maru, off New Caledonia, stn DW1679; 24º43′ S, 168º10′ E; 298–324 m depth; 22 Jun. 2001; NORFOLK 1 expedition; MNHN (Fig. 57L) • 29.7 mm; Norfolk Ridge, off New Caledonia, stn DW187; 23°17′ S, 168°06′ E; 390– 540 m depth; 31 Jan. 1993; SMIB 8 expedition (Fig. 57M).

Geographical distribution and bathymetry

New Zealand (Kermadec Islands, N Three Kings Rise) at depths between 135 and 844 m, Australia (Norfolk Island) and New Caledonia, mainly in Norfolk Ridge, but also in Grand Passage, Loyalty Islands, New Hebrides Arc (Vanuatu, Hunter Island) and Coral Sea (Nova, Capel and Landsdowne Banks), at depths between 200–500 m. Also present in Fiji at depths between 262–266 m (Moolenbeek *et al.* 2008). Specimens of this species have also been collected in 227–367 m on a seamount off the Tonga Islands during MNHN expedition BORDAU 2.

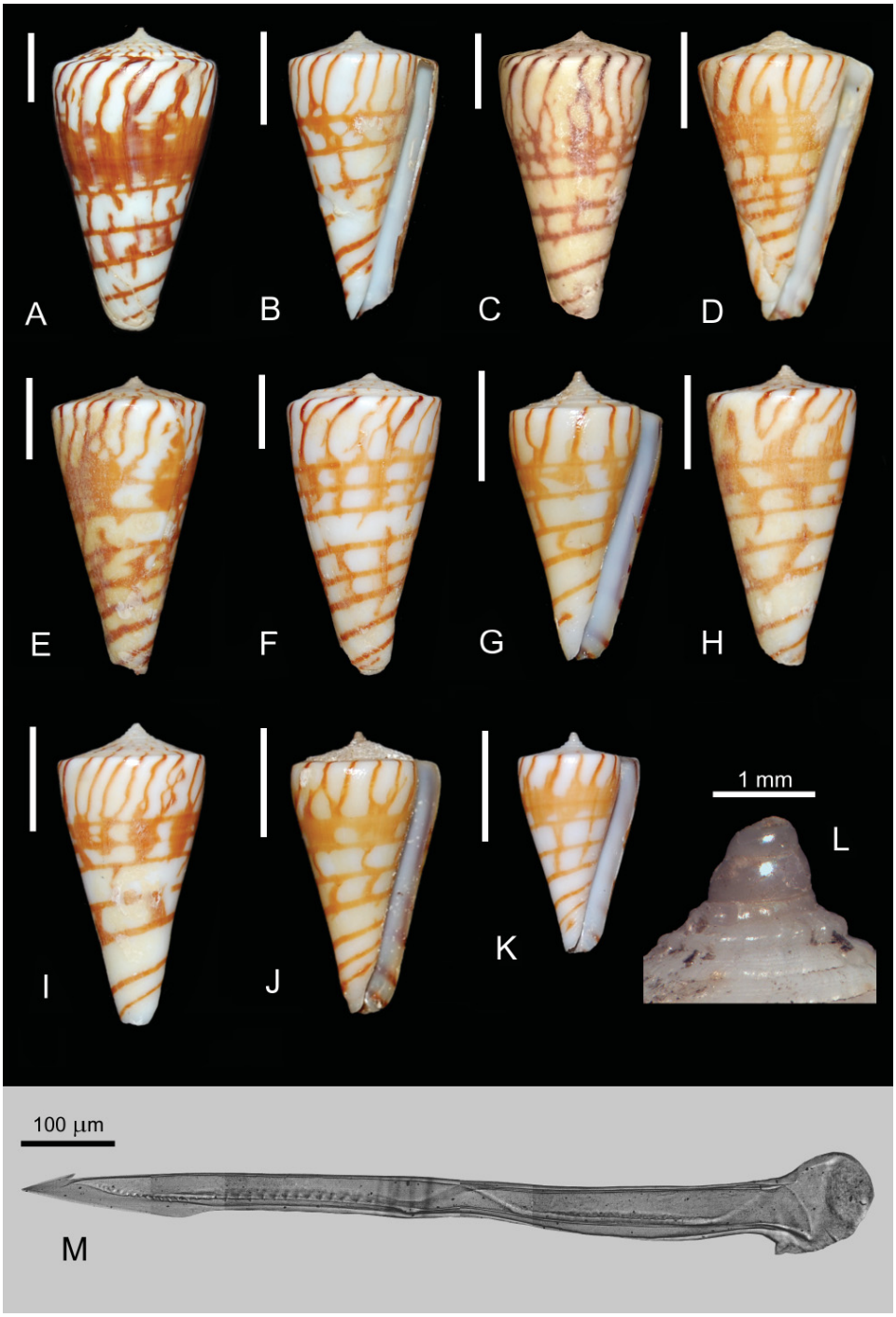

Fig. 57. *Conus* (*Klemaeconus*) *plinthis* Richard & Moolenbeek, 1988. **A**. Holotype, S New Caledonia, 340–345 m depth, 43.9 mm (MNHN-IM-2000-2526). **B**. Banc Kaimon Maru, Norfolk Ridge, 265 m depth, 31.2 mm. **C**. Norfolk Ridge, 310–460 m depth, 38.3 mm. **D**. Norfolk Ridge, 390–540 m depth, 30.4 mm. **E**. Norfolk Ridge, 254–264 m depth, 36.7 mm. **F**. Banc Kaimon Maru, Norfolk Ridge, 235–245 m depth, 41 mm. **G**. Off New Caledonia, 260 m depth, 26.3 mm. **H**. Norfolk Ridge, 241–245 m depth, 32 mm. **I**. Same collection data as for specimen H, 29.1 mm. **J**. Banc Antigonia, Norfolk Ridge, 330–367 m depth, 26 mm. **K**. Banc Jumeau Ouest, Norfolk Ridge, 250–330 m depth, 20 mm. **L**. Protoconch of specimen from Banc Kaimon Maru, Norfolk Ridge, 298–324 m depth. **M**. Radular tooth of specimen from Norfolk Ridge, 390–540 m depth, 29.7 mm. Scale bars = 10 mm, unless otherwise stated.

Remarks

Conical shell, moderately small to medium-sized (maximum shell length 65 mm) with a low to moderate spire of concave outline. Protoconch multispiral of about 3.25 whorls (Fig. 57L). Radular tooth (Fig. 57M) elongated with the anterior section slightly narrower and longer than the posterior section. Barb short. Blade rounded, covering about one-third of the anterior section. There is a pronounced row of serrations that runs the entire length of the anterior section of the tooth, ending at the terminating cusp. Basal spur present. This is one of the most representative species of the New Caledonia deep water cone fauna, and relatively common among the samples studied. However, it can not be considered endemic, as it is also present at other locations outside of the New Caledonia EEZ. In the phylogeny (Fig. 2) it is sister to *Conus* (*Klemaeconus*) *whiteheadae* da Motta, 1985.

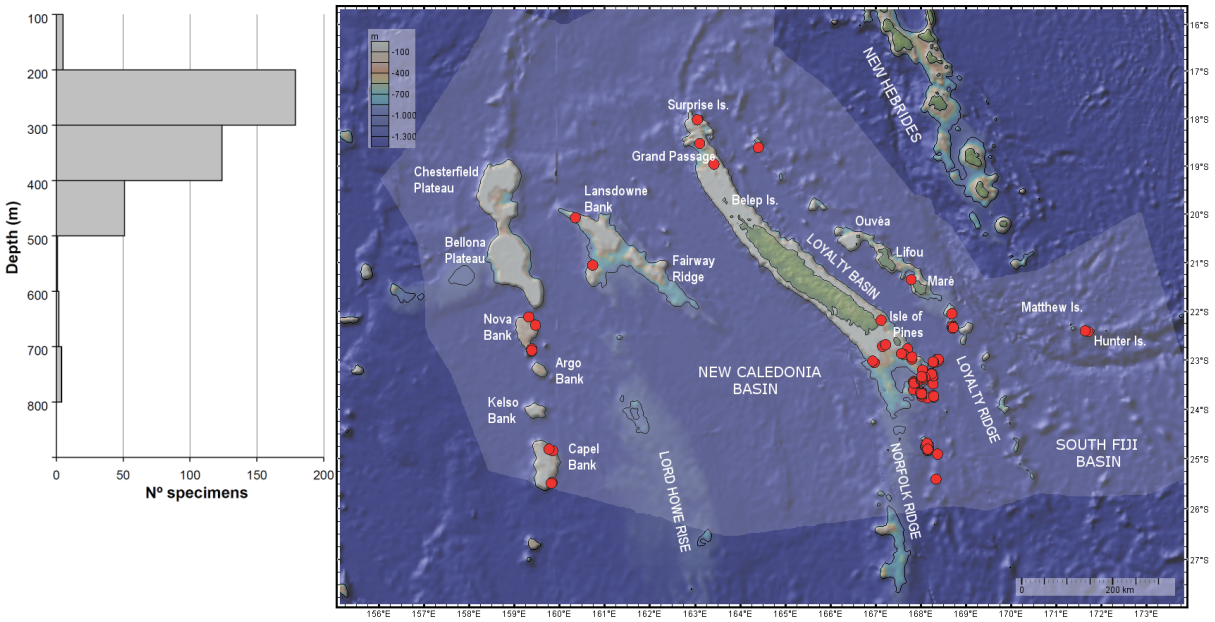

Fig. 58. Bathymetric range and distribution map for *Conus* (*Klemaeconus*) *plinthis* Richard & Moolenbeek, 1988. Red circles indicate the points where the species was collected.

Conus* (*Klemaeconus*) *whiteheadae da Motta, 1985
Figs 2, 59–60

Conus whiteheadae da Motta, 1985: 26, fig. 3a–b.

Conus sugimotonis – Röckel *et al.* 1995b: pl. 25 fig. 22.
Kioconus sugimotonis f. *whiteheadae* – Tucker & Tenorio 2013: 421.
Continuconus sugimotonis f. *whiteheadae* – Monnier *et al.* 2018a: 331, figs 1, 3–4.

Material examined

11 lots (13 specimens). See Supp. file 1.

Type material

Holotype

AUSTRALIA • 96.5 mm; Vicinity of Lord Howe and Lady Musgrave Islands; MHNG MOLL-138918 (Fig. 59A).

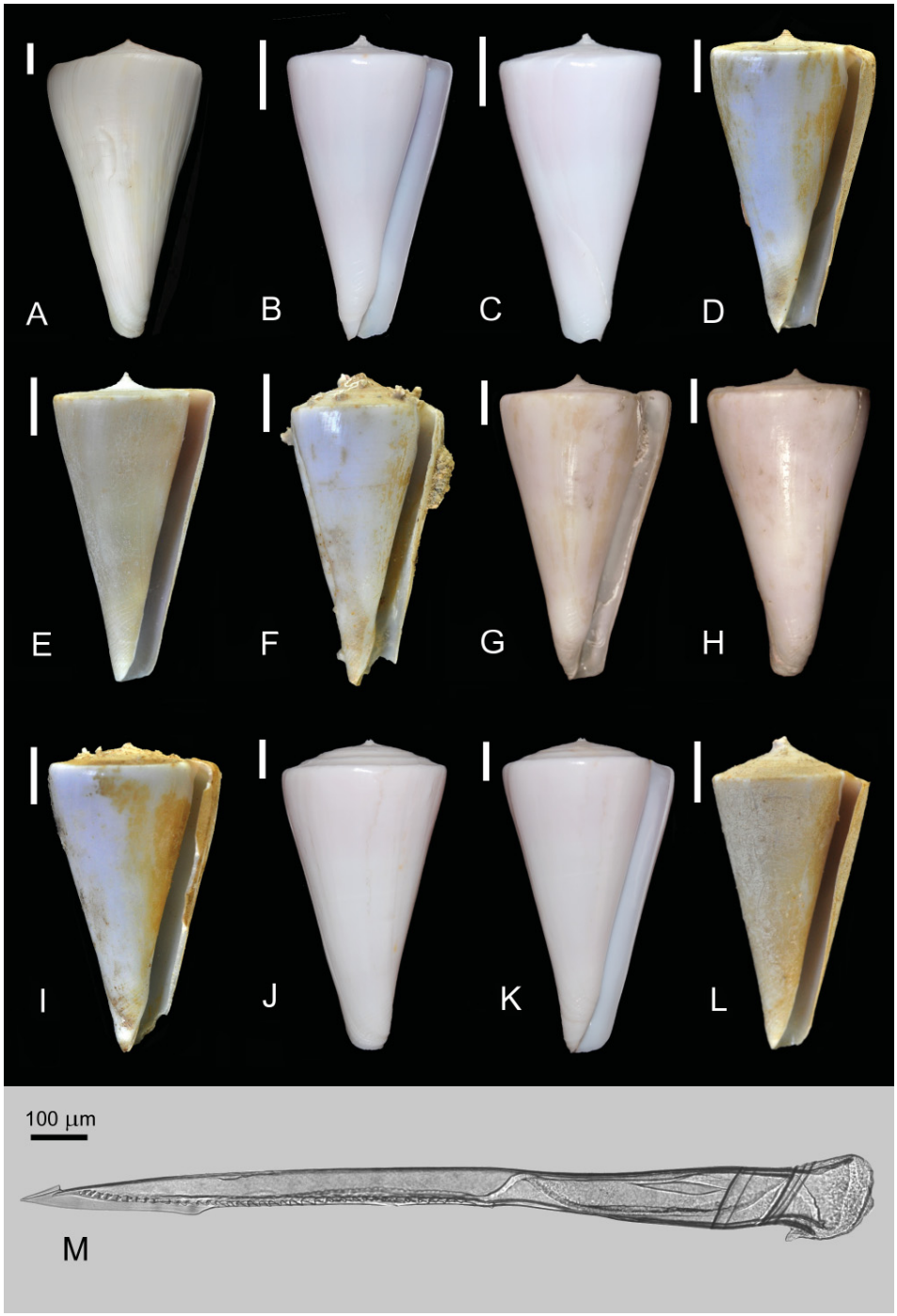

Fig. 59. *Conus* (*Klemaeconus*) *whiteheadae* da Motta, 1985. **A**. Holotype, Australia, Vicinity of Lord Howe and Lady Musgrave Islands, 96.5 mm (MHNG MOLL. 984.594). **B**. N Bellona, Coral Sea, off New Caledonia, 298–309 m depth, 44 mm. **C**. Dorsal view of specimen B. **D**. Bellona Plateau, Coral Sea, 300 m depth, 57.7 mm (MNHN-IM-2013-48182). **E**. Banc Nova, Coral Sea, 320–330 m depth, 53.6 mm (MNHN-IM-2013-48183). **F**. Plateau des Chesterfield, Coral Sea, 460–490 m depth, 54.3 mm (MNHN-IM-2013-48185). **G**. Capel Bank, Coral Sea, 285 m depth, 68.8 mm. **H**. Dorsal view of specimen G. **I**. S Lansdowne Bank, Coral Sea, 410–430 m depth, 54.6 mm (MNHN-IM-2013-48190). **J**. Off Lady Elliot Island, Queensland, Australia, 80.1 mm (MJT coll.). **K**. Dorsal view of specimen J. **L**. Banc Nova, Coral Sea, 330–335 m depth, 51.6 mm (MNHN-IM-2013-48188). **M**. Radular tooth of specimen B. Scale bars = 10 mm, unless otherwise stated.

Figured material

NEW CALEDONIA • 44 mm; N Bellona, off New Caledonia, stn CP2571; 20º25′ S, 158º45′ E; 298–309 m depth; 14 Oct. 2005; EBISCO expedition; MNHN (Fig. 59B–C, M) • 57.7 mm; Bellona Plateau, off New Caledonia, stn DW5017; 21°09′ S, 159°11′ E; 300 m depth; 20 Sep. 2017; KANADEEP expedition; MNHN-IM-2013-48182 (Fig. 59D) • 53.6 mm; Nova Bank, off New Caledonia, stn DW5001; 22°30′ S, 159°24′ E; 320–330 m depth; 18 Sep. 2017; KANADEEP expedition; MNHN-IM-2013-48183 (Fig. 59E) • 54.3 mm; Plateau des Chesterfield, off New Caledonia, stn DW4974; 19°47′ S, 158°36′ E; 460–490 m depth; 9 Sep. 2017; KANADEEP expedition; MNHN-IM-2013-48185 (Fig. 59F) • 68.8 mm; Coral Sea, Banc Capel, off New Caledonia, stn DW274; 24º45′ S, 159º41′ E; 285 m depth; 9 Oct. 1986; MUSORSTOM 5 expedition; MNHN (Fig. 59G–H) • 54.6 mm; S Lansdowne Bank, off New Caledonia, stn CP4984; 20°47′ S, 160°57′ E; 410–430 m depth; 10 Sep. 2017; KANADEEP expedition; MNHN-IM-2013-48190 (Fig. 59I) • 51.6 mm; Nova Bank, off New Caledonia, stn CP5003; 22°30′ S, 159°27′ E; 330–335 m depth; 18 Sep. 2017; KANADEEP expedition; MNHN-IM-2013-48188 (Fig. 59L)

AUSTRALIA • 80.1 mm; off Lady Elliot Island, Queensland; MJT (Fig. 59J–K).

Geographical distribution and bathymetry

Australia (Queensland) and Coral Sea, at depths between 200 and 500 m.

Remarks

Shell moderately large to large (maximum shell length 103 mm), conical, with a low spire of concave profile. Early whorls project from an essentially flat spire, occasionally slightly domed. Last whorl with a characteristic very pale violet uniform color, especially in fresh specimens. Radular tooth (Fig. 59M) elongated, with the anterior section longer than the posterior section. The tooth is serrated with 40–42 denticles arranged in one single row, splitting into two rows in the basal area towards the small terminating cusp. Barb well marked. Blade rounded, covering about one third of the anterior section of the tooth. Basal spur pointing upwards on top of the rounded base. Although initially introduced as a full species by da Motta (1985), it has usually been considered a subspecies or form of *Conus* (*Klemaeconus*)

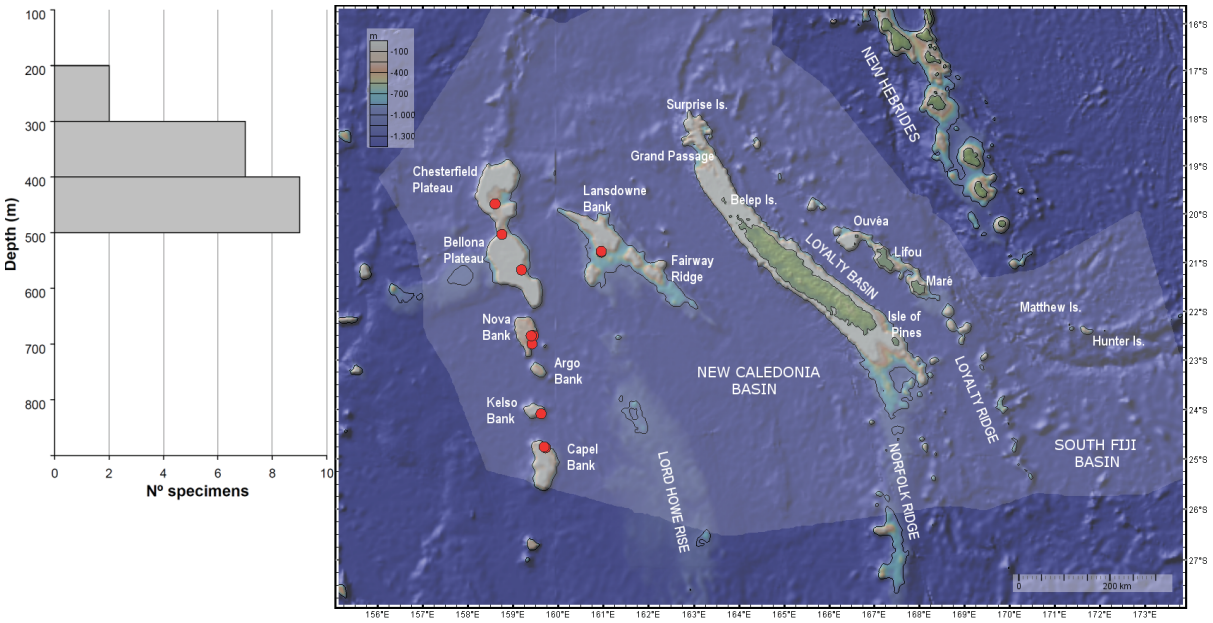

Fig. 60. Bathymetric range and distribution map for *Conus* (*Klemaeconus*) *whiteheadae* da Motta, 1985. Red circles indicate the points where the species was collected.

sugimotonis Kuroda, 1929. In our phylogeny (Fig. 2) the specimens of *C.* (*K.*) *whiteheadae* examined form a clade sister to *C.* (*K.*) *plinthis*. The specimens of *C.* (*K.*) *sugimotonis* from China are distinct by DNA, and belong to a clade which is sister to the one that includes *C.* (*K.*) *plinthis* and *C.* (*K.*) *whiteheadae*. Hence, our DNA data support *C.* (*K.*) *whiteheadae* as a full species rather than a form of *C.* (*K.*) *sugimotonis*, with a distribution area most likely restricted to the Coral Sea and its surroundings.

Subgenus ***Kurodaconus*** Shikama & Habe, 1968

The species assigned to the (sub)genus *Kurodaconus* (type species: *Kurodaconus stupa* (Kuroda, 1956)) form a well-supported clade sister to *Conus* (*Mitraconus*) *cylindraceus* Broderip & Sowerby, 1830, and these two are sister to another clade which contains the type species for the (sub)genus *Turriconus* Shikama & Habe, 1968, namely *Conus* (*Turriconus*) *excelsus* G.B. Sowerby III, 1908 (see below). In addition to this, species in *Kurodaconus* exhibit distinct shell and radular morphologies which allow a clear separation from species in *Turriconus* (see Tucker & Tenorio 2013). For this reason, we hereby consider *Kurodaconus* a valid supraspecific taxon, rather than a synonym of *Turriconus*.

Conus* (*Kurodaconus*) *darkini Röckel, Korn & Richard, 1993
Figs 2, 61A–C, I, 62

Conus darkini Röckel *et al.*, 1993: 48, figs 1–4.

Conus darkini – Röckel *et al.* 1995b: no. 119, pl. 27 figs 22–25.
Embrikena darkini – Tucker & Tenorio 2013: 161.
Turriconus (*Kurodaconus*) *darkini* – Monnier *et al.* 2018a: 347.

Material examined

4 lots (4 specimens). See Supp. file 1.

Type material

Holotype

NEW CALEDONIA • 55.7 mm; Loyalty Ridge, LIFOU, E Cap de Pins, off New Caledonia, stn CP467; 21º06′ S, 167º32′ E; 530–575 m depth; 21 Feb. 1989; MUSORSTOM 6 expedition; MNHN-IM-2000-2568 (Fig. 61A).

Figured material

NEW CALEDONIA • 57.3 mm; Récif Pétrie, off New Caledonia, stn DW3930; 18°37′ S, 164°26′ E; 448–464 m depth; 26 Sep. 2011; EXBODI expedition; MNHN (Fig. 61B, I) • 78 mm; Norfolk Ridge, Banc Munida, off New Caledonia, stn CP2143; 23º01′ S, 168º17′ E; 564–590 m depth; 3 Nov. 2003; NORFOLK 2 expedition; MNHN (Fig. 61C).

Geographical distribution and bathymetry

New Caledonia: Loyalty Ridge and Norfolk Ridge, at depths between 400 and 600 m. Also reported from the Philippines (Balut Island) and the Kita-Koho area (Philippine Sea), at depths between 285–325 m. One specimen known from French Polynesia, dredged between 300 and 600 m off Moorea.

Remarks

Shell moderately large to large (maximum shell length 87 mm), ventricosely conical to conical, with a high or moderate stepped spire of straight or slightly concave profile. Larval shell multispiral of about 3.5 whorls. Radular tooth (Fig. 61I) with the anterior section much shorter than the posterior section. The

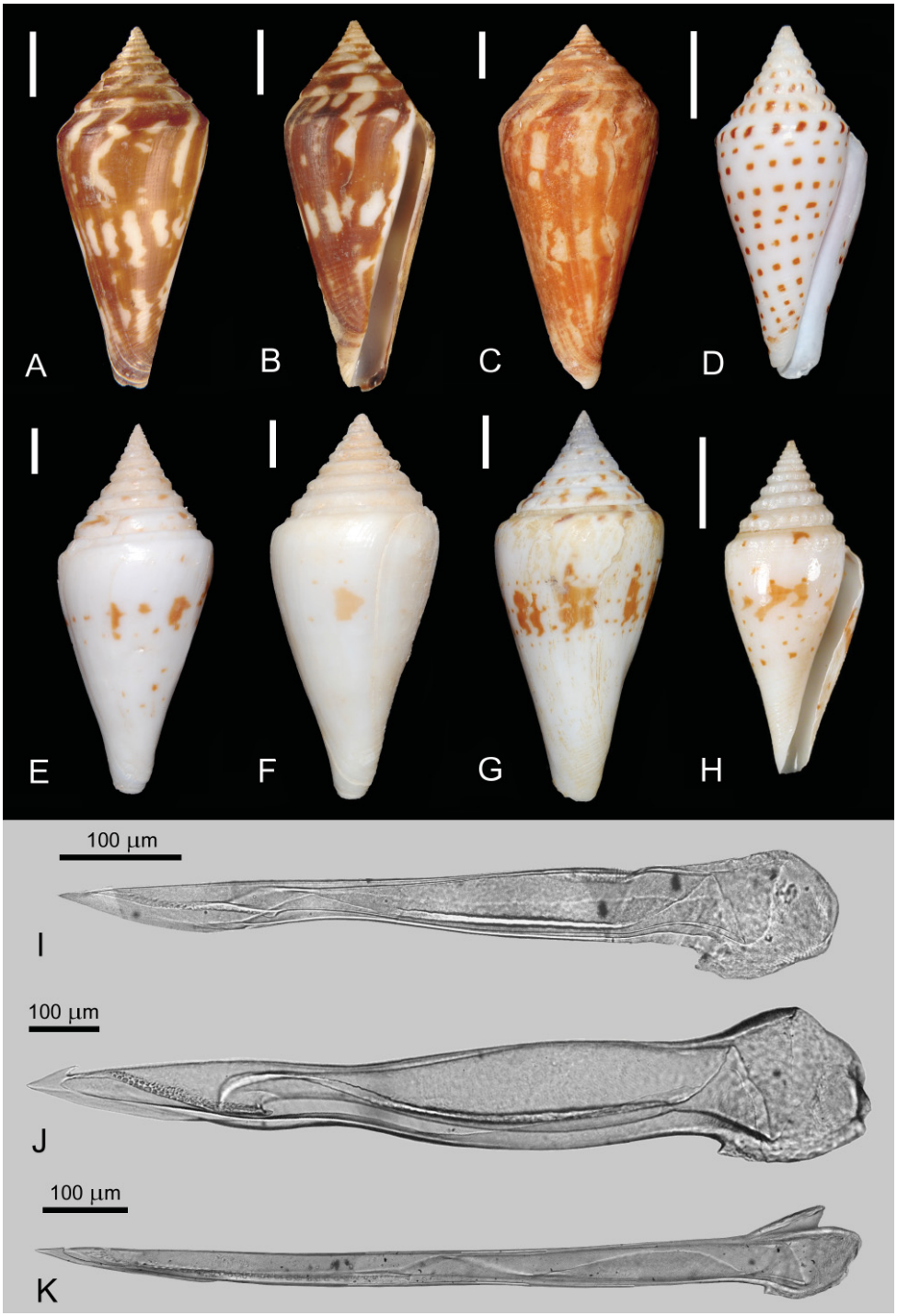

Fig. 61. A–C. *Conus* (*Kurodaconus*) *darkini* Röckel, Korn & Richard, 1993. **A**. Holotype, Loyalty Ridge, 530–575 m depth, 55.6 mm (MNHN-IM-2000-2568). **B**. Récif Pétrie, off New Caledonia, 448–464 m depth, 57.3 mm. **C**. Banc Munida, Norfolk Ridge, 564–590 m depth, 78 mm. – **D**. *Conus* (*Kurodaconus*) *stupella* Kuroda, 1956. Grand Passage, 277–289 m depth, 40.5 mm. – **E–H**. *Conus* (*Kurodaconus*) *stupa* (Kuroda, 1956). **E**. Banc Munida, Norfolk Ridge, 372–393 m depth, 81.1 mm. **F**. Banc Munida, Norfolk Ridge, 547–560 m depth, 81.3 mm. **G**. Loyalty Ridge, 430 m depth, 73.3 mm. **H**. Banc Munida, Norfolk Ridge, 402–410 m depth, 36.5 mm. – **I**. *C.* (*K.*) *darkini*. Radular tooth of specimen B. – **J**. *C.* (*K.*) *stupa*. Radular tooth of specimen G. – **K**. *C.* (*K.*) *stupella*. Radular tooth of a specimen from Taiwan, 68.7 mm (MJT coll.). Scale bars = 10 mm, unless otherwise stated.

tooth is serrated with 15–18 minute denticles arranged in two or three rows. Small rounded terminating cusp present. Barb well marked. Blade rounded, indistinct, covering most of the anterior section of the tooth. Strong basal spur on top of the rounded base. Prior to radular examination, this species was considered a member of *Profundiconus* (Tenorio & Castelin 2016). Upon radular examination, it was tentatively placed in the genus *Embrikena* (Tucker & Tenorio 2013). DNA studies clearly indicate that *C. darkini* belongs to the same clade as *Conus* (*Kurodaconus*) *stupa* Kuroda, 1956, which is its sister species in the phylogeny (Fig. 2), and the type species for the genus *Kurodaconus*. *Conus* (*K.*) *darkini* is an elusive species, and very few specimens have been sampled.

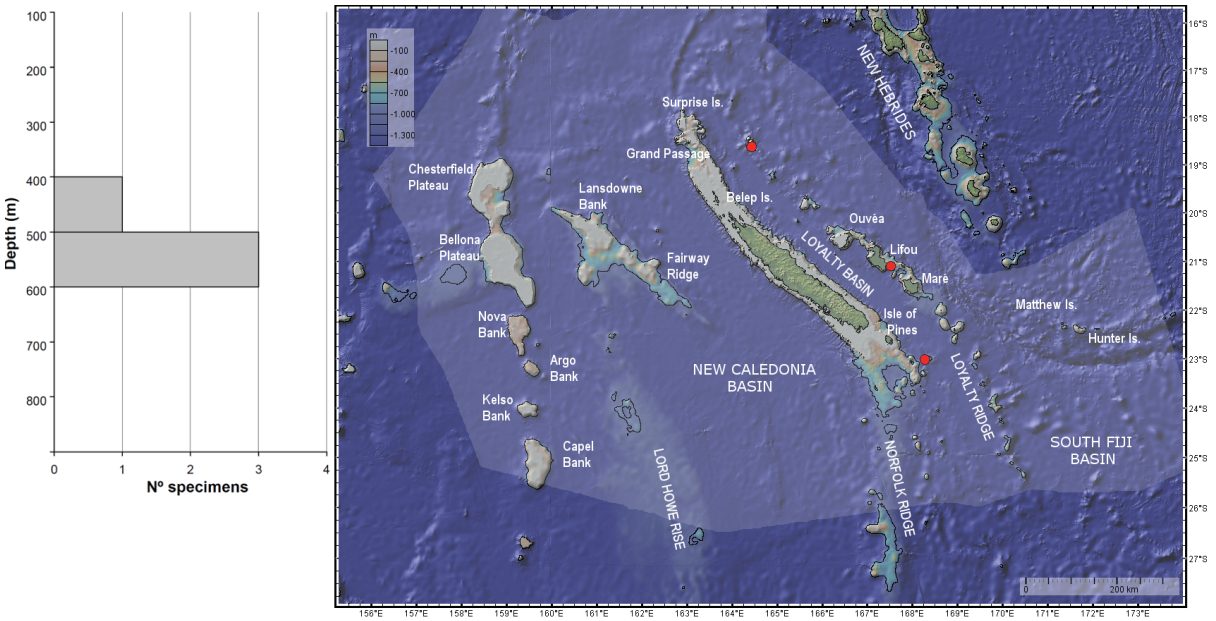

Fig. 62. Bathymetric range and distribution map for *Conus* (*Kurodaconus*) *darkini* Röckel, Korn & Richard, 1993. Red circles indicate the points where the species was collected.

Conus* (*Kurodaconus*) *gondwanensis Röckel & Moolenbeek, 1995
Figs 2, 63–64

Conus gondwanensis Röckel & Moolenbeek in Röckel *et al.*, 1995a: 572, figs 8–9, 54.

Conus species no. 15 – Röckel *et al.* 1995b: pl. 72 figs 12–13.
Kioconus gondwanensis – Tucker & Tenorio 2013: 210.
Turriconus (*Kurodaconus*) *gondwanensis* – Monnier *et al.* 2018a: 345.

Material examined

36 lots (54 specimens). See Supp. file 1.

Type material

Holotype

NEW CALEDONIA • 21.5 mm; off S New Caledonia, Banc Jumeau Ouest, stn DW73; 23º40′ S, 168º00′ E; 230–240 m depth; 7 Sep. 1989; SMIB 5 expedition; MNHN-IM-2000-2556 (Fig. 63A).

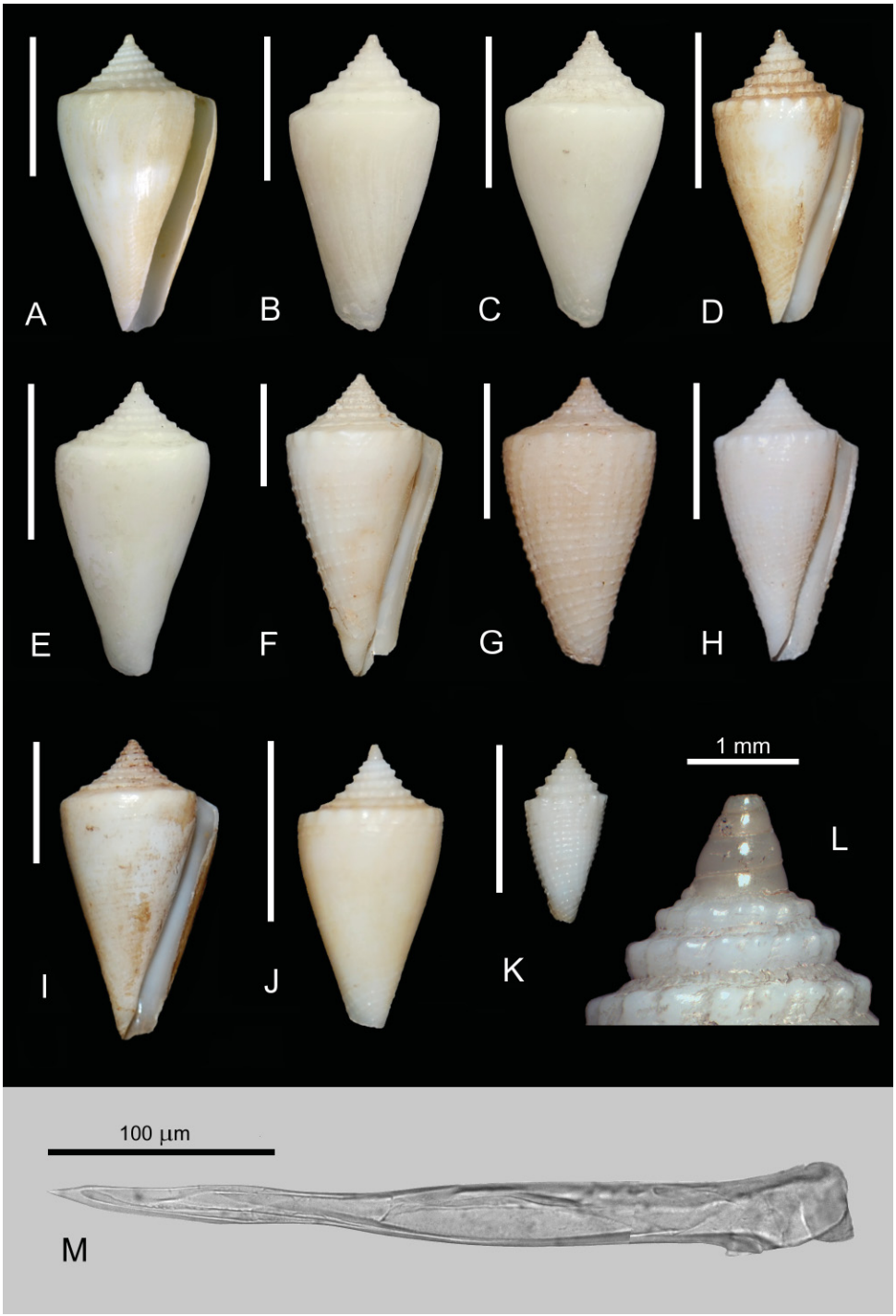

Fig. 63. *Conus* (*Kurodaconus*) *gondwanensis* Röckel & Moolenbeek, 1995. **A**. Holotype, Banc Aztèque, 240 m depth, 21.5 mm (MNHNIM-2000-2556). **B**. Banc Kaimon Maru, Norfolk Ridge, 262–290 m depth, 20.7 mm. **C**. Same collection data as for specimen B, 19.8 mm. **D**. Banc P, Norfolk Ridge, 200–291 m depth, 19 mm. **E**. Banc Kaimon Maru, Norfolk Ridge, 257–262 m depth, 19.1 mm. **F**. Banc Crypthélia, Norfolk Ridge, 187–197 m depth, 29.7 mm. **G**. Banc Kaimon Maru, Norfolk Ridge, 230 m depth, 21.4 mm. **H**. Same collection data as for specimen G, 20.8 mm. **I**. Banc Kaimon Maru, Norfolk Ridge, 228–240 m depth, 24.9 mm. **J**. Banc Kaimon Maru, Norfolk Ridge, 231–233 m depth, 15.7 mm. **K**. Norfolk Ridge, 241–245 m depth, 12 mm. **L**. Protoconch of specimen J. **M**. Radular tooth of a specimen from Lifou, New Caledonia, 18.8 mm (ER coll.). Scale bars = 10 mm, unless otherwise stated.

Figured material

NEW CALEDONIA • 20.7 mm; off S New Caledonia, Banc Kaimon Maru, stn DW158; 24º46′ S, 168º08′ E; 262–290 m depth; 28 Jan. 1993; SMIB 8 expedition; MNHN (Fig. 63B) • 19.8 mm; same collection data as for preceding; MNHN (Fig. 63C) • 19 mm; Norfolk Ridge, Banc P, off New Caledonia, stn DW1724; 23º17′ S, 168º14′ E; 200–291 m depth; 27 Jun. 2001; NORFOLK 1 expedition; MNHN (Fig. 63D) • 19.1 mm; off S New Caledonia, Banc Kaimon Maru, stn DW155; 24º46′ S, 168º08′ E; 257–262 m depth; 28 Jan. 1993; SMIB 8 expedition; MNHN (Fig. 63E) • 29.7 mm; Norfolk Ridge, Banc Crypthélia, off New Caledonia, stn DW2123; 23º18′ S, 168º15′ E; 187–197 m depth; 2 Nov. 2003; NORFOLK 2 expedition; MNHN (Fig. 63F) • 21.4 mm; Norfolk Ridge, Banc Kaimon Maru, off New Caledonia, stn DW2093; 24º44′ S, 168º09′ E; 230 m depth; 29 Oct. 2003; NORFOLK 2 expedition; MNHN (Fig. 63G) • 20.8 mm; same collection data as for preceding; MNHN (Fig. 63H) • 24.9 mm; Norfolk Ridge, Banc Kaimon Maru, off New Caledonia, stn CP1681; 24º44′ S, 168º10′ E; 228–240 m depth; 22 Jun. 2001; NORFOLK 1 expedition; MNHN (Fig. 63I) • 15.7 mm; Norfolk Ridge, Banc Kaimon Maru, off New Caledonia, stn DW1675; 24º45′ S, 168º09′ E; 231–233 m depth; 22 Jun. 2001; NORFOLK 1 expedition; MNHN (Fig. 63J, L) • 12 mm; Norfolk Ridge, off New Caledonia, stn DW159; 24º46′ S, 168º08′ E; 241–245 m depth; 28 Jan. 1993; SMIB 8 expedition; MNHN (Fig. 63K) • 18.8 mm; Lifou, Loyalty Islands, off New Caledonia; ER coll. (Fig. 63M).

Geographical distribution and bathymetry

New Caledonia: Norfolk Ridge and Loyalty Islands, typically at depths between 100 and 300 m. Some specimens have been sampled in the Coral Sea (Bellona Plateau) and the New Hebrides Arc (Hunter Island). The species has not yet been found outside of the New Caledonia EEZ, and therefore it can be considered endemic.

Remarks

Shell small to moderately small (maximum shell length 30 mm), broadly conical, with a moderately stepped, nodulose spire of deeply concave profile. Larval shell (Fig. 63L) multispiral of more than 4 whorls. Shoulder slightly tuberculate to carinate. Last whorl pure white-colored, smooth or with

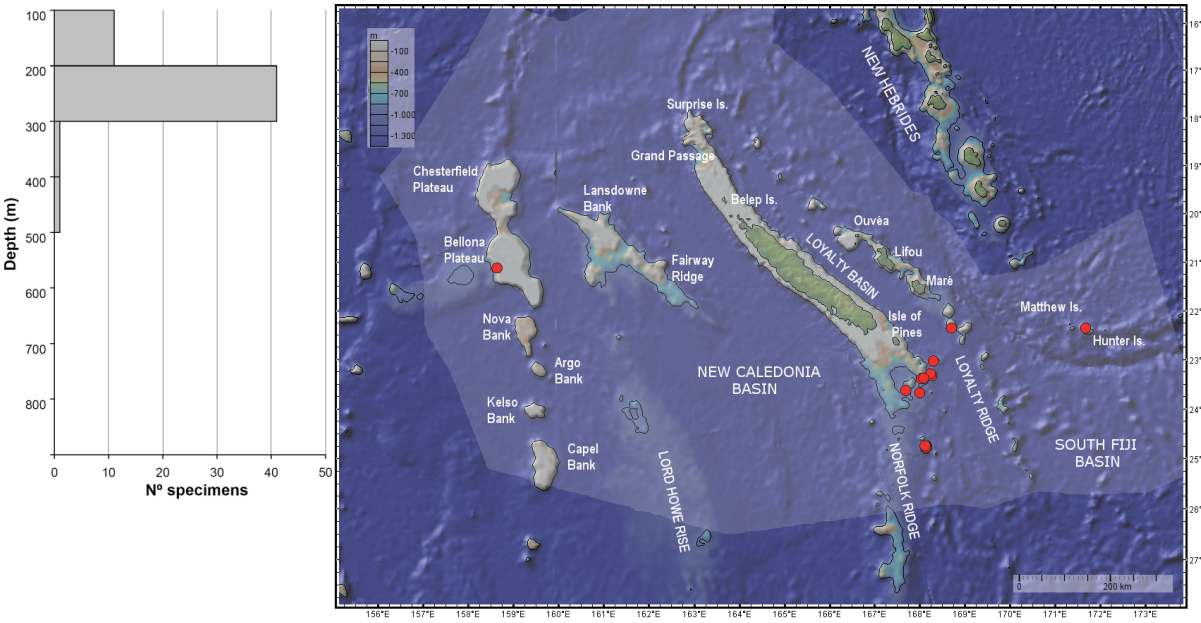

Fig. 64. Bathymetric range and distribution map for *Conus* (*Kurodaconus*) *gondwanensis* Röckel & Moolenbeek, 1995. Red circles indicate the points where the species was collected.

granulated spiral ribs (Fig. 63F–H, K). Radular tooth (Fig. 63M) with the anterior section much shorter than the posterior section. The tooth is serrated with 12–15 minute denticles arranged in two rows. The denticles are obsolete or absent in the apical portion. Small, almost indistinct rounded terminating cusp present. Barb small, rather indistinct. Blade rounded, covering most of the anterior section of the tooth. Basal spur on top of a narrow base. In the phylogeny (Fig. 2), the specimens of *C.* (*K.*) *gondwanensis* form a clade sister to the other species of *Kurodaconus*.

Conus* (*Kurodaconus*) *luciae Moolenbeek, 1986
Figs 65–66

Conus luciae Moolenbeek, 1986: 211, figs 1–3.

Conus luciae – Röckel *et al.* 1995b: no. 109, pl. 26 figs 13–15.
Kurodaconus luciae – Tucker & Tenorio 2013: 262.
Turriconus (*Kurodaconus*) *luciae* – Monnier *et al.* 2018a: 346.

Material examined

110 lots (about 160 specimens). See Supp. file 1.

Type material

Holotype
NEW CALEDONIA • 55.3 mm; Coral Sea, Nova Bank, off New Caledonia, stn DC68; 22º35′ S, 159º15′ E; 296 m depth; 28 Jul. 1984; CHALCAL 1 expedition; MNHN-IM-2000-2542 (Fig. 65A).

Figured material

NEW CALEDONIA • 30.4 mm; Coral Sea, Capel Bank, off New Caledonia, stn DW2495; 24º45′ S, 159º42′ E; 350–357 m depth; 6 Oct. 2005; EBISCO expedition; MNHN (Fig. 65B) • 55.9 mm; Coral Sea, Nova Bank, off New Caledonia, stn CP315; 22º25′ S, 159º27′ E; 330–335 m depth; 13 Oct. 1986; MUSORSTOM 5 expedition; MNHN (Fig. 65C) • 40 mm; off New Caledonia, stn DW3887; 22°22′ S, 171°42′ E; 257–298 m depth; 18 Sep. 2011; EXBODI expedition; MNHN (Fig. 65D) • 34.5 mm; off S New Caledonia, stn DW56; 23º21′ S, 168º05′ E; 230–260 m depth; 9 Mar. 1989; SMIB 4 expedition; MNHN (Fig. 65E) • 44 mm; Nova Bank Nord, off New Caledonia, stn DW2534; 22º17′ S, 159º28′ E; 390–430 m depth; 10 Oct. 2005; EBISCO expedition; MNHN (Fig. 65F) • 40.3 mm; Norfolk Ridge, Banc Stylaster, off New Caledonia, stn DW2033; 23°39′ S, 167°43′ E; 430–450 m depth; 22 Oct. 2003; NORFOLK 2 expedition; MNHN (Fig. 65G) • 42.1 mm; Coral Sea, Nova Bank, off New Caledonia, stn DW301; 22º07′ S, 159º25′ E; 487–610 m depth; 12 Oct. 1986; MUSORSTOM 5 expedition; MNHN (Fig. 65H) • 32.3 mm; Coral Sea, Argo Bank, off New Caledonia, stn DW299; 22º48′ S, 159º24′ E; 360–390 m depth; 11 Oct. 1986; MUSORSTOM 5 expedition; MNHN (Fig. 65I) • 31.8 mm; Kelso Bank, off New Caledonia, stn DW2520; 24º06′ S, 159º41′ E; 350–400 m depth; 8 Oct. 2005; EBISCO expedition; MNHN (Fig. 65J) • 17.5 mm; Coral Sea, Capel Bank, off New Caledonia, stn DW256; 25º18′ S, 159º53′ E; 290–300 m depth; 7 Oct. 1986; MUSORSTOM 5 expedition; MNHN (Fig. 65K) • 19 mm; Norfolk Ridge, Mont Jumeau Ouest, off New Caledonia, stn DW809; 23°39′ S, 167°59′ E; 650–730 m depth; 27 Nov. 1993; BATHUS 3 expedition; MNHN (Fig. 65L) • 55.9 mm; Coral Sea, Nova Bank, off New Caledonia, stn 315; 22º25′ S, 159º27′ E; 330–335 m depth; 13 Oct. 1986; MUSORSTOM 5 expedition (Fig. 65M).

Geographical distribution and bathymetry

New Caledonia: Norfolk Ridge, Loyalty Islands, and especially in the Coral Sea (Banks Nova, Argo, Kelso, Capel and Lansdowne), typically at depths between 200 and 500 m.

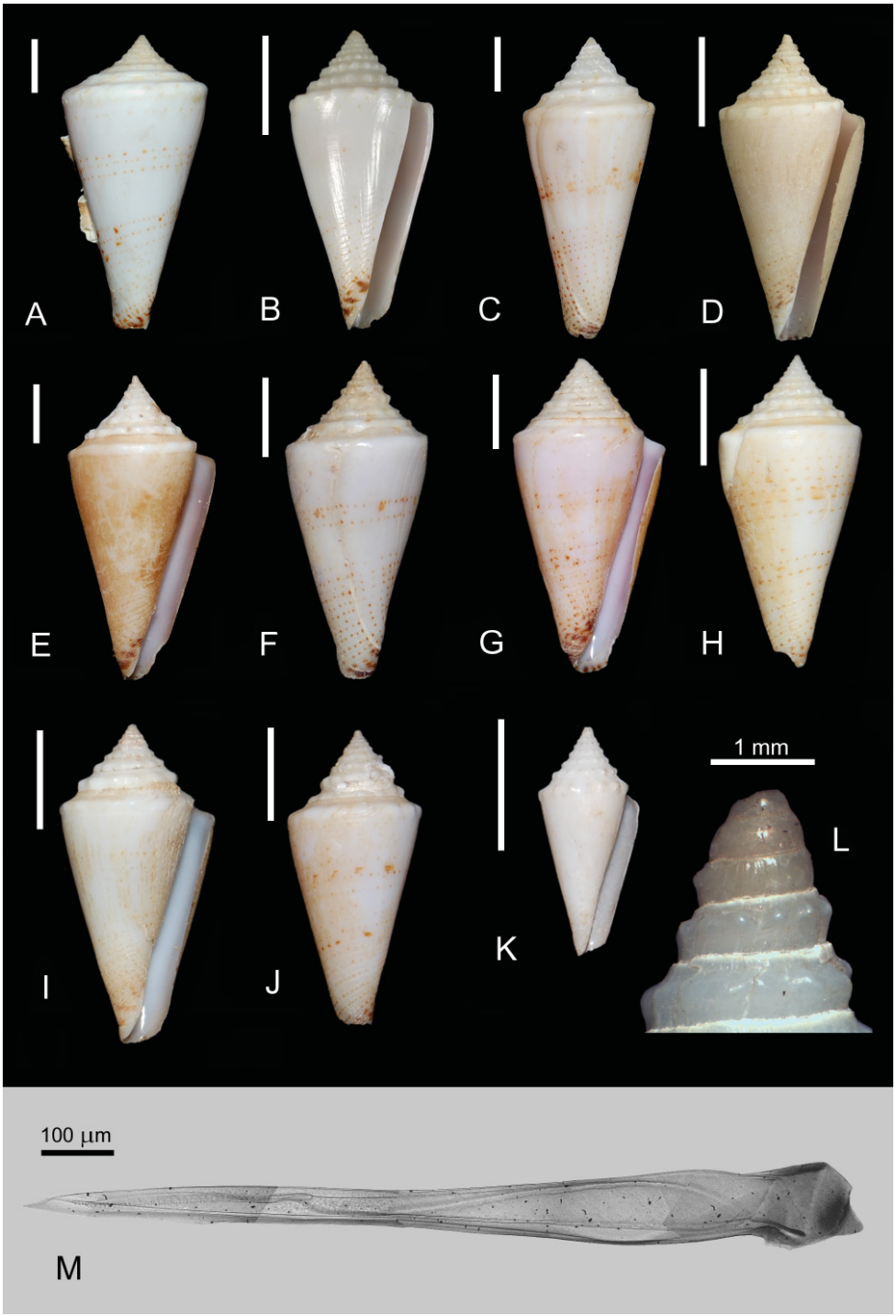

Fig. 65. *Conus* (*Kurodaconus*) *luciae* Moolenbeek, 1986. **A**. Holotype, Banc Nova, Coral Sea, 296 m depth, 55.3 mm (MNHN-IM-2000-2542). **B**. Capel Bank, Coral Sea, 350–357 m depth, 30.4 mm. **C**. Nova Bank, Coral Sea, 330–335 m depth, 55.9 mm. **D**. Off New Caledonia, 257–298 m depth, 40 mm. **E**. S New Caledonia, 230–260 m depth, 34.5 mm. **F**. Nova Bank Nord, Coral Sea, 390–430 m depth, 44 mm. **G**. Banc Stylaster, Norfolk Ridge, 430–450 m depth, 40.3 mm. **H**. Nova Bank, Coral Sea, 487–610 m depth, 42.1 mm. **I**. Argo Bank, Coral Sea, 360–390 m depth, 32.3 mm. **J**. Kelso Bank, Coral Sea, 350–400 m depth, 31.8 mm. **K**. Capel Bank, Coral Sea, 290–300 m depth, 17.5 mm. **L**. Protoconch of a specimen from Mont Jumeau Ouest, Norfolk Ridge, 650–730 m depth. **M**. Radular tooth of a specimen from Nova Bank, Coral Sea, 330–335 m depth, 55.9 mm. Scale bars = 10 mm, unless otherwise stated.

Remarks

Shell medium-sized to moderately large (maximum shell length 62 mm), conical, with a moderate, variably stepped spire of straight to concave profile. Early spire whorls tuberculated. Larval shell (Fig. 65L) multispiral of more than 3 whorls. Shoulder with a characteristic rounded ridge, often tuberculated in younger specimens. Base with a distinctive columellar plait, more evident in larger specimens. Color of the last whorl very pale violet to white, with sparse reddish brown dotted spiral lines. Radular tooth (Fig. 65M) elongated, with the anterior portion shorter than the posterior section. The tooth is serrated with more than 40 minute denticles arranged in multiple rows. Small, elongated terminating cusp present. Barb present. Blade rounded, covering about 66–75% of the anterior section of the tooth. Small basal spur on top of the base. In the phylogeny, all specimens of *C. luciae* form a clade deeply nested within the *Kurodaconus* clade. This species is particularly abundant on the southern banks of the Coral Sea, and it has not been found outside of the New Caledonia EEZ. Therefore, it is considered an endemism from this area.

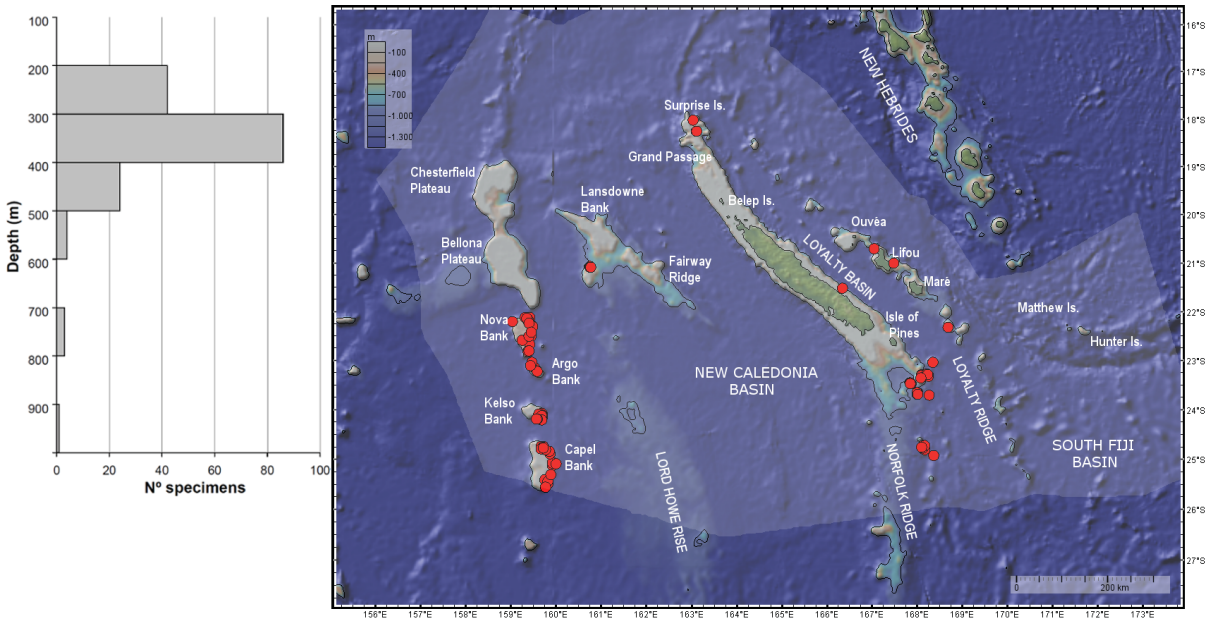

Fig. 66. Bathymetric range and distribution map for *Conus* (*Kurodaconus*) *luciae* Moolenbeek, 1986. Red circles indicate the points where the species was collected.

Conus* (*Kurodaconus*) *stupa Kuroda, 1956
Figs 2, 61E–H, J, 67

Embrikena stupa Kuroda, 1956: 1, pl. 1 fig. 1.

Conus stupa – Röckel *et al.* 1995b: no. 121, pl. 28 figs 1–3.
Kurodaconus stupa – Tucker & Tenorio 2013: 379.
Turriconus (*Kurodaconus*) *stupa* – Monnier *et al.* 2018a: 343.

Material examined

9 lots (9 specimens). See Supp. file 1.

Type material

Holotype

JAPAN • 100 mm; off Tosa; ca 183 m depth; THTA.

Figured material

NEW CALEDONIA • 81.1 mm; Norfolk Ridge, Banc Munida, off New Caledonia, stn CP2139; 23º01′ S, 168º23′ E; 372–393 m depth; 3 Nov. 2003; NORFOLK 2 expedition; MNHN (Fig. 61E) • 73.3 mm; Norfolk Ridge, Banc Munida, off New Caledonia, stn DW2137; 23º01′ S, 168º23′ E; 547–560 m depth; 3 Nov. 2003; NORFOLK 2 expedition; MNHN (Fig. 61F) • 73.3 mm; Loyalty Ridge, off New Caledonia, stn CP464; 21º02′ S, 167º32′ E; 430 m depth; 21 Feb. 1989; MUSORSTOM 6 expedition; MNHN (Fig. 61G, J) • 36.5 mm; Norfolk Ridge, Banc Munida, off New Caledonia, stn DW2136; 23º01′ S, 168º23′ E; 402–410 m depth; 3 Nov. 2003; NORFOLK 2 expedition; MNHN (Fig. 61H).

Geographical distribution and bathymetry

From Japan to Taiwan, Philippines and Solomon Islands. In New Caledonia present in the Norfolk Ridge and Grand Passage area, Loyalty Islands and New Hebrides Arc (Hunter Island), at depths between 200 and 600 m. Also found in the Coral Sea (Lansdowne Bank)

Remarks

Shell moderately large to large (maximum shell length 100 mm), ventricosely conical to broadly and ventricosely conical, with a high stepped spire of slightly concave profile. Early spire whorls tuberculated. Protoconch multispiral. Shoulder subangulate to rounded. Color of the last whorl white, with sparse reddish brown dotted spiral lines. Radular tooth (Fig. 61J) stout, with the anterior portion much shorter than the posterior section. The tooth is serrated with 20 to 30 minute denticles arranged in multiple rows, ending on a small, pointed terminating cusp. Barb well marked. Blade rounded, covering about 70% of the anterior section of the tooth. Small basal spur on top of the rounded base. In the phylogeny (Fig. 2), the specimens of *C. stupa* form a clade sister to *C.* (*K.*) *darkini*. This species is widely distributed in the Western Pacific, but it is rather uncommonly sampled due to its deep-water habitat.

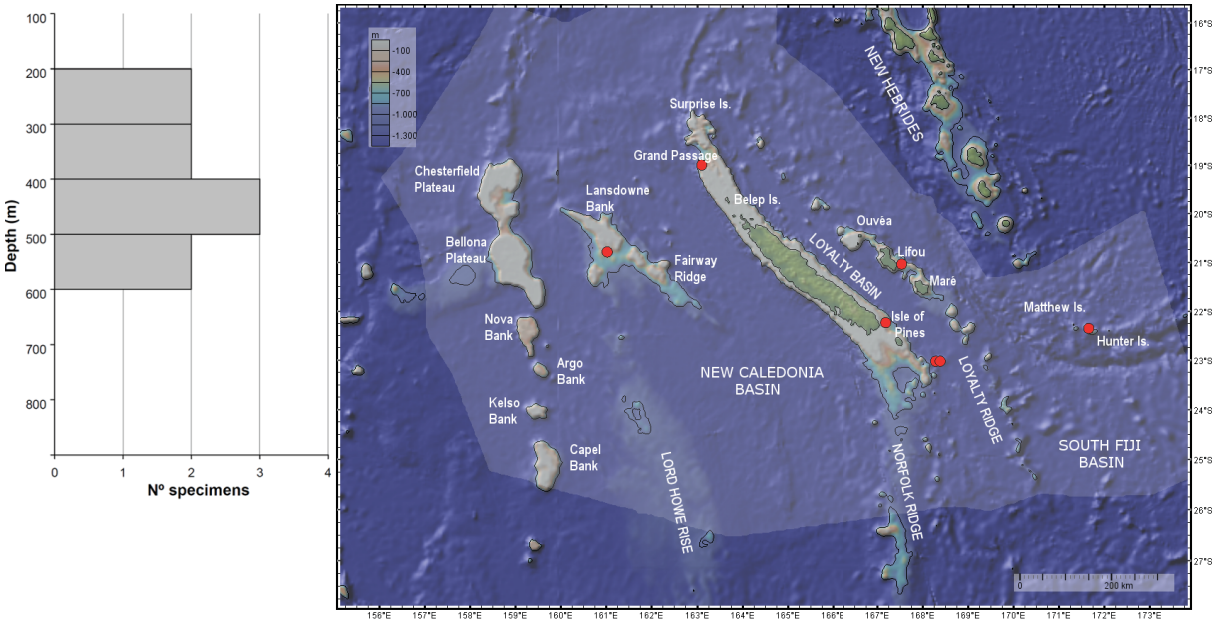

Fig. 67. Bathymetric range and distribution map for *Conus* (*Kurodaconus*) *stupa* (Kuroda, 1956). Red circles indicate the points where the species was collected.

Conus* (*Kurodaconus*) *stupella (Kuroda, 1956)
Fig. 61D, K

Embrikena stupella Kuroda, 1956: 1, pl. 1 fig. 3.

Conus stupella – Röckel *et al.* 1995b: no. 122, pl. 28 figs 4–6.
Kurodaconus stupella – Tucker & Tenorio 2013: 379.
Turriconus (*Kurodaconus*) *stupella* – Monnier *et al.* 2018a: 344.

Material examined

1 lot (1 specimen). See Supp. file 1.

Type material

Holotype
JAPAN • 72.5 mm; off Tosa; 110–128 m depth; THTA.

Figured material

NEW CALEDONIA • 40.5 mm; Grand Passage, off New Caledonia, stn DW2985; 18°59′ S, 163°06′ E; 277–289 m depth; 5 May 2008; CONCALIS expedition; MNHN (Fig. 61D).

TAIWAN • 68.7 mm; MJT coll. (Fig. 61K).

Geographical distribution and bathymetry

Japan to Taiwan and the Philippines. This is the first record from New Caledonia, where one single specimen was sampled in the Grand Passage area, at depths between 277–289 m.

Remarks

Shell moderately large to large (maximum shell length 100 mm), ventricosely conical to broadly and ventricosely conical, with a high, stepped spire of straight profile. Early spire whorls tuberculated. Shoulder subangulate to rounded. Color of the last whorl white or pale violet, with spiral rows of brown spots. Radular tooth (Fig. 61K) very elongated, with the anterior portion of about equal length as the posterior section. The tooth is serrated with about 40 minute denticles arranged in two rows, ending on a small, pointed terminating cusp. Barb small. Blade rounded, covering about 40% of the anterior section of the tooth. Small basal spur on top of the base. The radular analysis is based on a specimen from Taiwan, as no live specimens were sampled from New Caledonia. For this reason, it was not included in the phylogeny. This is a species very similar to *C.* (*K.*) *stupa*. However, apart from the differences in shell pattern, the very different radular morphologies suggests that *C.* (*K.*) *stupella* and *C.* (*K.*) *stupa* are not synonyms of each other, as it has often been considered.

Subgenus *Lividoconus* Wils, 1970

Conus* (*Lividoconus*) *lischkeanus Weinkauff, 1875
Figs 2, 68–69

Conus lischkeanus Weinkauff, 1875: 311, pl. 56 figs 2–3.
Conus kermadecensis Iredale, 1913: 227, pl. 9 fig. 15.

Calamiconus lischkeanus – Tucker & Tenorio 2013: 256.
Calamiconus kermadecensis – Tucker & Tenorio 2013: 240.
Lividoconus lischkeanus – Monnier *et al.* 2018a: 1046.
Lividoconus kermadecensis – Monnier *et al.* 2018a: 1047.

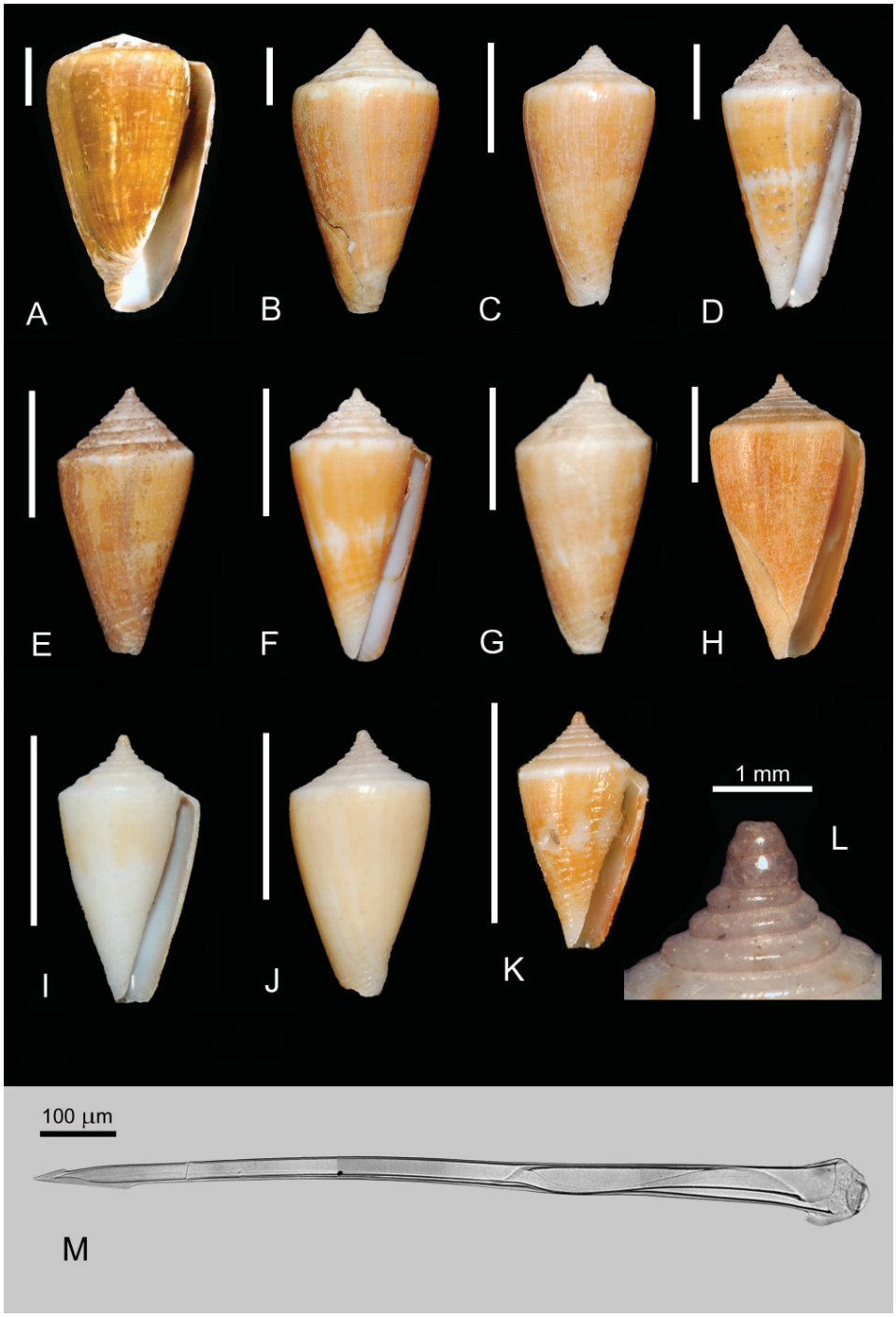

Fig. 68. *Conus* (*Lividoconus*) *lischkeanus* Weinkauff, 1875. **A**. Lectotype of *Conus kermadecensis* Iredale, 1913, Sunday Island, Kermadec Islands, New Zealand, 47 mm (CMC). **B**. Banc P, Norfolk Ridge, 190–212 m depth, 49.9 mm. **C**. Banc Antigonia, Norfolk Ridge, 204–215 m depth, 23.8 mm. **D**. Banc Antigonia, Norfolk Ridge, 257–269 m depth, 38.1 mm. **E**. Same collection data as for specimen D, 21.2 mm. **F**. Banc Munida, Norfolk Ridge, 150–180 m depth, 21.4 mm. **G**. Same collection data as for specimen F, 23 mm. **H**. Along passe Yaté, off New Caledonia, 100 m depth, 30 mm. **I**. Banc Antigonia, Norfolk Ridge, 180–250 m depth, 14.2 mm. **J**. Same collection data as for specimen I, 16.1 mm. **K**. Same collection data as for specimen F, 13.3 mm. **L**. Protoconch of specimen I. **M**. Radular tooth of a specimen from Pouembout, New Caledonia, 80–90 m depth,19 mm (Franck Leterrier coll.). Scale bars = 10 mm, unless otherwise stated.

Material examined

24 lots (43 specimens). See Supp. file 1.

Type material

Lectotype (of *C. kermadecensis*)
NEW ZEALAND • 47 mm; Sunday Island, Kermadec Islands; CMC (Fig. 68A).

Figured material

NEW CALEDONIA • 49.9 mm; Norfolk Ridge, Banc P, off New Caledonia, stn DW1727; 23º17′ S, 168º14′ E; 190–212 m depth; 27 Jun. 2001; NORFOLK 1 expedition; MNHN (Fig. 68B) • 23.8 mm; Norfolk Ridge, Banc Antigonia, off New Caledonia, stn CP1713; 23º22′ S, 168º02′ E; 204–215 m depth; 26 Jun. 2001; NORFOLK 1 expedition; MNHN (Fig. 68C) • 38.1 mm; Norfolk Ridge, Banc Antigonia, off New Caledonia, stn CP1714; 23º22′ S, 168º03′ E; 257–269 m depth; 26 Jun. 2001; NORFOLK 1 expedition; MNHN (Fig. 68D) • 21.2 mm; same collection data as for preceding; MNHN (Fig. 68E) • 21.4 mm; Norfolk Ridge, Munida, off New Caledonia, stn DW3109; 23°01′ S, 168°18′ E; 150–180 m depth; 28 Oct. 2008; TERRASSES expedition; MNHN (Fig. 68F) • 23 mm; same collection data as for preceding; MNHN (Fig. 68G) • 30 mm; along passe Yaté, off New Caledonia, stn DW3866; 22°52′ S, 169°26′ E; 100 m depth; 16 Sep. 2011; EXBODI expedition; MNHN (Fig. 68H) • 14.2 mm; Norfolk Ridge, Banc Antigonia, off New Caledonia, stn DW1712; 23º23′ S, 168º02′ E; 180–250 m depth; 26 Jun. 2001; NORFOLK 1 expedition; MNHN (Fig. 68I, L) • 16.1 mm; Norfolk Ridge, Banc Antigonia, off New Caledonia, stn DW1712; 23º23′ S, 168º02′ E; 180–250 m depth; 26 Jun. 2001; NORFOLK 1 expedition; MNHN (Fig. 68J) • 13.3 mm; Norfolk Ridge, Munida, off New Caledonia, stn DW3109; 23°01′ S, 168°18′ E; 150–180 m depth; 28 Oct. 2008; TERRASSES expedition; MNHN (Fig. 68K) • 19 mm; Pouembout, New Caledonia; 80-90 m depth; Franck Leterrier coll. (Fig. 68M).

Geographical distribution and bathymetry

Very widely distributed in the Indo-Pacific: in the Indian Ocean, Natal and S Madagascar to Gulf of Aden and Oman, and W Australia; in the Pacific Ocean, Japan to Taiwan and Queensland, Solomon

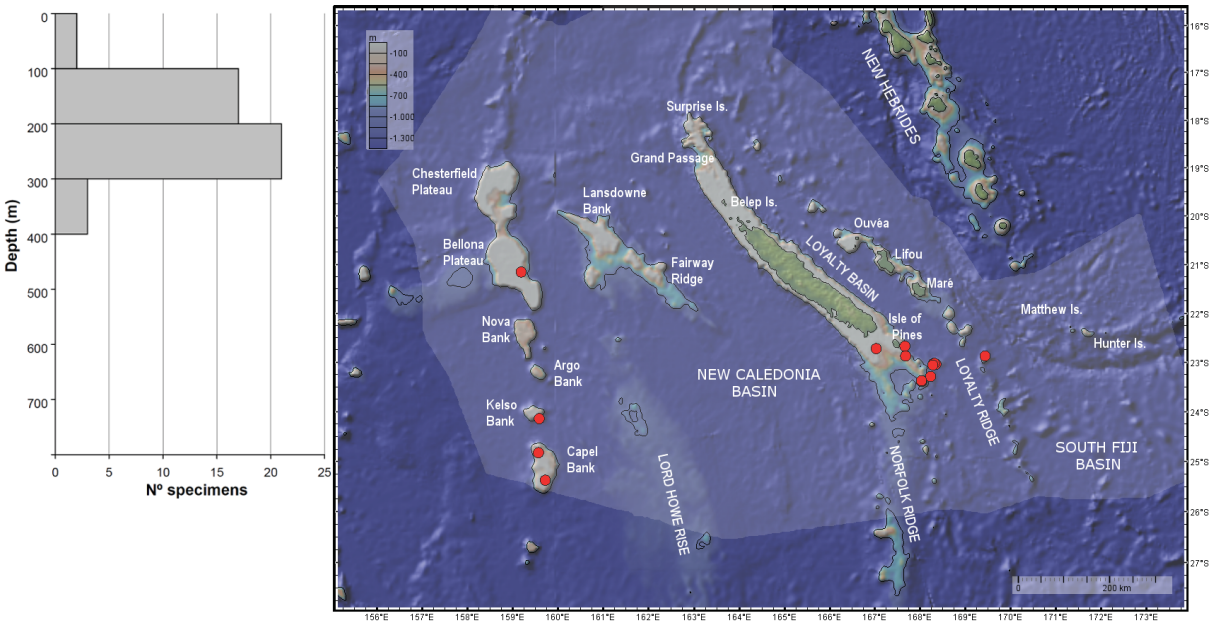

Fig. 69. Bathymetric range and distribution map for *Conus* (*Lividoconus*) *lischkeanus* Weinkauff, 1875. Red circles indicate the points where the species was collected.

Islands, N New Zealand and Kermadec Islands, intertidal to a depths of 200 m. In New Caledonia, Coral Sea and Loyalty Ridge typically at depths between 200 and 400 m.

Remarks

Moderately small to moderately large (maximum shell length 75 mm) conical to broadly conical shell with a low to moderate spire. Protoconch multispiral of about 3.75 whorls (Fig. 68L). Serrations are absent; terminating cusp is present. Radular tooth (Fig. 68M) with a short barb and blade. The anterior section much longer than the posterior section of the tooth. Waist indistinct. Serrations absent. Terminating cusp and basal spur are present. The specimens from New Caledonia are consistent with the morphological concept of *C. kermadecensis* Iredale, 1913. However, in the phylogeny (Fig. 2; Supp. file 3) the specimens from New Caledonia appear mixed with specimens from the Solomon Islands (MNHN-IM-2007-30886 and MNHN-IM-2007-30888), S Madagascar (MNHN-IM-2009-15671) and Oman (KJ549938 = UF292826), all forming a compact clade. Hence, we hereby consider all individuals as representative of one single widespread species, *C. lischkeanus*, and not ascribed to any particular subspecies.

Subgenus *Phasmoconus* Mörch, 1852

Conus* (*Phasmoconus*) *armadillo Shikama, 1971
Fig. 55E

Conus (*Asprella*) *armadillo* Shikama, 1971: 34, text-fig. 2.

Conus armadillo – Röckel *et al.* 1995b: no. 203, pl. 46 figs 12–15.
Graphiconus armadillo – Tucker & Tenorio 2013: 90.
Phasmoconus (*Phasmoconus*) *armadillo* – Monnier *et al.* 2018a: 775.

Material examined

1 lot (1 specimen). See Supp. file 1.

Type material

Holotype
"TAIWAN" • 73 mm; type locality "Taiwan"; KPMY 6027-1852.

Figured material

NEW CALEDONIA • 54.9 mm; Loyalty Ridge, off New Caledonia, stn DW428; 20º24′ S, 166º13′ E; 420 m depth; 17 Feb. 1989; MUSORSTOM 6 expedition; MNHN (Fig. 55E).

Geographical distribution and bathymetry

Taiwan to the Philippines, Queensland and New Caledonia (Loyalty Islands), at depths between 100 to 500 m.

Remarks

Shell moderately large, ventricosely conical with a spire of moderate height and concave profile. Larval shell multispiral of more than 3 whorls. Radular tooth (Rolán & Raybaudi 1994) with the anterior section shorter than the posterior section. The tooth is serrated, with 11–13 sharp denticles arranged in one single row. Small pointed terminating cusp. Barb present. Blade rounded, covering about 40% of the anterior section of the tooth. Basal spur pointing upwards on top of the rather large base. This species is very similar to *Conus* (*Phasmoconus*) *kuroharai* (Habe, 1965). In spite of being a typical component of the deep-water cone fauna, its presence in New Caledonia is only based on one single, dead specimen sampled in Loyalty Ridge at 420 m deep.

Conus* (*Phasmoconus*) *kuroharai (Habe, 1965)
Figs 2, 55F–L, N, 70

Asprella kuroharai Habe, 1965: 46, pl. 4 figs 3–4.

Conus kuroharai – Röckel *et al.* 1995b: no. 204, pl. 46 figs 16–19.
Graphiconus kuroharai – Tucker & Tenorio 2013: 245.
Phasmoconus (*Phasmoconus*) *kuroharai* – Monnier *et al.* 2018a: 773.

Material examined

19 lots (23 specimens). See Supp. file 1.

Type material

Holotype

JAPAN • 59 mm; off Okinoshima, Kochi Prefecture, Shikoku; ca 100 m depth; NSMT 38679.

Figured material

NEW CALEDONIA • 55.4 mm; Norfolk Ridge, Banc Kaimon Maru, off New Caledonia, stn CP1677; 24º44′ S, 168º09′ E; 233–259 m depth; 22 Jun. 2001; NORFOLK 1 expedition; MNHN (Fig. 55F) • 60.1 mm; Loyalty Ridge, off New Caledonia, stn DW40; 22º20′ S, 168º41′ E; 275–295 m depth; 8 Jun. 1989; VOLSMAR expedition; MNHN (Fig. 55G) • 47 mm; Loyalty Ridge, off New Caledonia, stn DW422; 20º26′ S, 166º40′ E; 257 m depth; 16 Feb. 1989; MUSORSTOM 6 expedition; MNHN (Fig. 55H) • 36.7 mm; E Île des Pins, off New Caledonia, stn DW4733; 22°35′ S, 167°36′ E; 138–146 m depth; 22 Aug. 2016; KANACONO expedition; MNHN-IM-2013-66069 (Fig. 55I, N) • 30.5 mm; Norfolk Ridge, Munida, off New Caledonia, stn DW3106; 23°02′ S, 168°21′ E; 180–220 m depth; 27 Oct. 2008; TERRASSES expedition; MNHN (Fig. 55J) • 20.6 mm; same collection data as for preceding; MNHN (Fig. 55K–L).

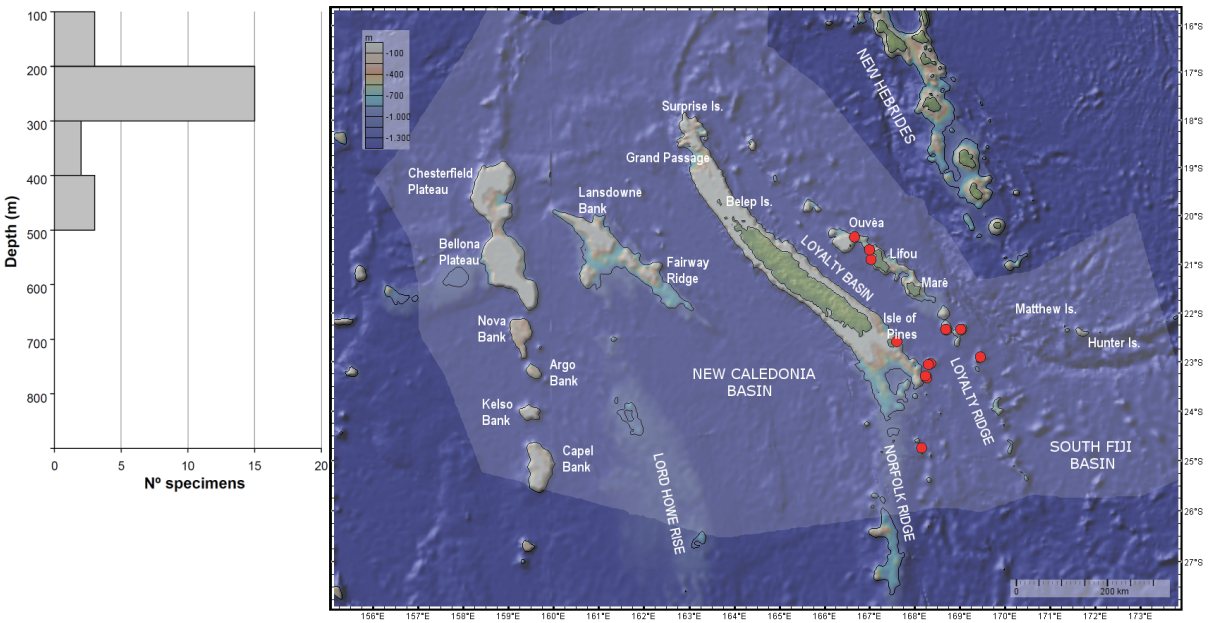

Fig. 70. Bathymetric range and distribution map for *Conus* (*Phasmoconus*) *kuroharai* (Habe, 1965). Red circles indicate the points where the species was collected.

Geographical distribution and bathymetry

Japan to the Philippines. In New Caledonia: Norfolk Ridge and Loyalty Ridge, 100 to 500 m, but most often at depths between 200 and 300 m.

Remarks

Shell medium-sized to moderately large (maximum shell length 66 mm). Conical to ventricosely conical, with a low to moderate spire of deeply concave to sigmoid profile. Protoconch multispiral (Fig. 55L), of more than 3 whorls. Last whorl with a characteristic pattern of narrow wavy brown axial lines. Radular tooth (Fig. 55N) with the anterior section shorter than the posterior section. The tooth is serrated with 18–11 denticles arranged in one single row. Barely perceptible elongated terminating cusp. Barb well marked. Blade rounded, covering about 40–50% of the anterior section of the tooth. Basal spur pointing upwards on top of an axially elongated base. The specimens sequenced form a clade sister to *Conus* (*Phasmoconus*) *richeri* Richard & Moolenbeek, 1988 (Fig. 2).

Conus* (*Phasmoconus*) *richeri Richard & Moolenbeek, 1988
Figs 71–72

Conus richeri Richard & Moolenbeek, 1988: 233, pl. 1 figs 1–5, 10.

Conus richeri – Röckel *et al.* 1995b: no. 194, pl. 43 figs 21–23.
Graphiconus richeri – Tucker & Tenorio 2013: 347.
Phasmoconus (*Phasmoconus*) *richeri* – Monnier *et al.* 2018a: 726.

Material examined

66 lots (101 specimens). See Supp. file 1.

Type material

Holotype
NEW CALEDONIA • 40 mm; north Lagoon, off New Caledonia, stn DW500; 19°04.30′ S, 163°30.50′ E; 225 m depth; 4 Mar. 1985; LAGON expedition; MNHN-IM-2000-2520 (Fig. 71A).

Figured material

NEW CALEDONIA • 52.9 mm; south of Grande–Terre, off New Caledonia, stn DW378; 22º39′ S, 167º10′ E; 70–72 m depth; 21 Jan. 1985; LAGON expedition; MNHN (Fig. 71B) • 55.9 mm; off New Caledonia, Secteur des Belep, stn DW1148; 19º07′ S, 163º30′ E; 220 m depth; 28 Oct. 1989; LAGON expedition; MNHN (Fig. 71C) • 61.8 mm; Grand Passage, off New Caledonia, stn DW933; 19°07′ S, 163°29′ E; 212–220 m depth; 8 Aug. 1994; BATHUS 4 expedition; MNHN (Fig. 71D) • 57.9 mm; same collection data as for preceding; MNHN (Fig. 71E) • 57.6 mm; same collection data as for preceding; MNHN (Fig. 71F) • 53.9 mm; SW slope of the Dumbéa Pass, off New Caledonia, stn DW725; 22°47′ S, 167°27′ E; 217 m depth; 12 May 1993; BATHUS 2 expedition; MNHN (Fig. 71G) • 57.9 mm; Grand Passage, off New Caledonia, stn DW3018; 19°07′ S, 163°28′ E; 199–215 m depth; 9 May 2008; CONCALIS expedition; MNHN (Fig. 71H) • 52.3 mm; SW slope of the Dumbéa pass, off New Caledonia, stn DW726; 22°47′ S, 167°29′ E; 241–260 m depth; 12 May 1993; BATHUS 2 expedition; MNHN (Fig. 71I) • 53.8 mm; Grand Passage, off New Caledonia, stn DW3019; 19°05′ S, 163°28′ E; 242–253 m depth; 9 May 2008; CONCALIS expedition; MNHN (Fig. 71J) • 36.9 mm; off New Caledonia, stn DW186; 19º07′ S, 163º30′ E; 190 m depth; 19 Sep. 1985; MUSORSTOM 4 expedition; MNHN (Fig. 71K) • size unknown; Norfolk Ridge, Banc Antigonia, off New Caledonia, stn DW1712; 23º23′ S, 168º02′ E; 180–250 m depth; 26 Jun. 2001; NORFOLK 1 expedition; MNHN (Fig. 71L) • 59.3 mm; Grand Passage, off New Caledonia, stn DW3016; 19°05′ S, 163°28′ E; 244–252 m depth; 9 May 2008; CONCALIS expedition; Atheris coll. (Fig. 71M).

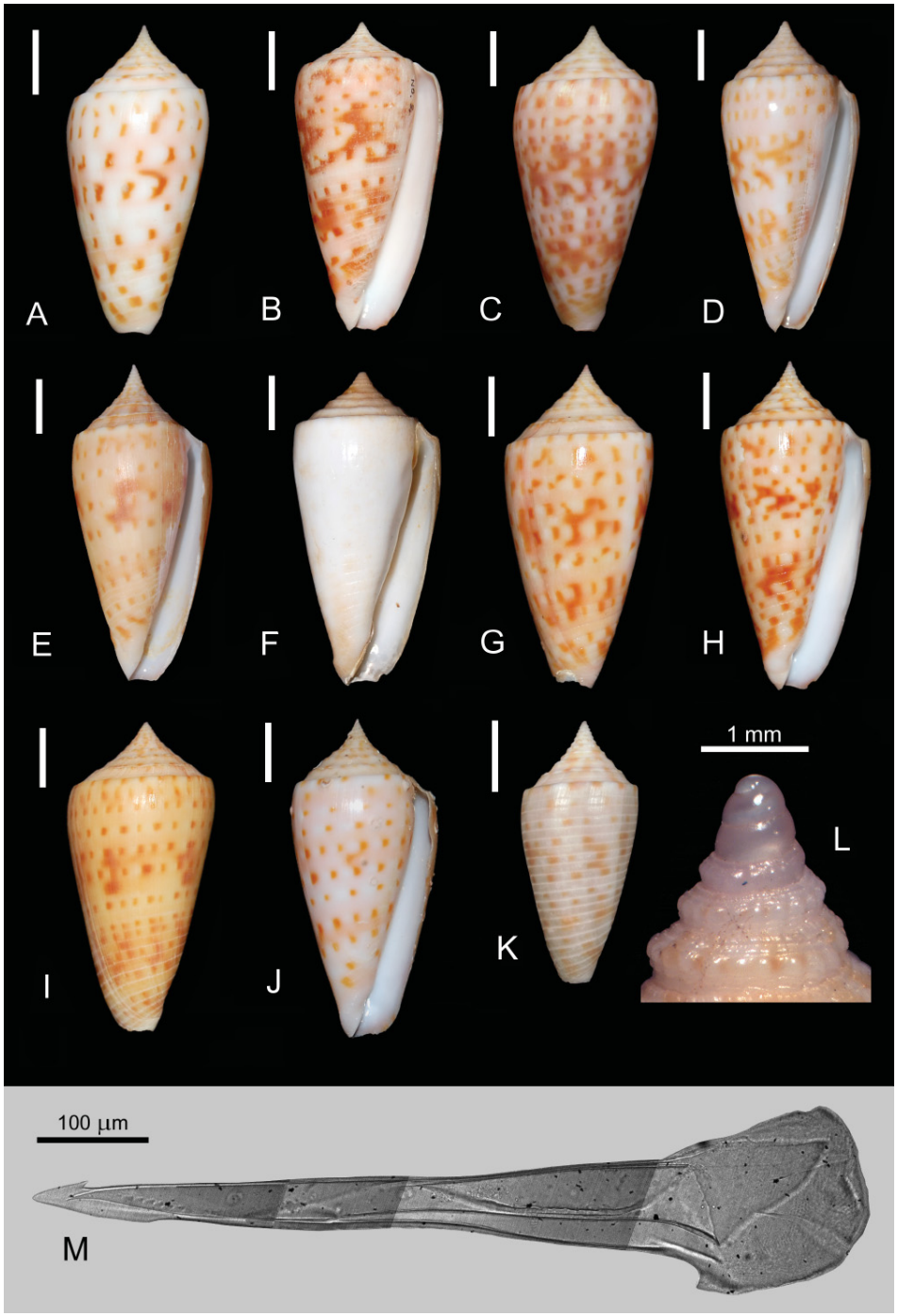

Fig. 71. *Conus* (*Phasmoconus*) *richeri* Richard & Moolenbeek, 1988. **A**. Holotype, Lagon Nord, New Caledonia, 225 m depth, 47.9 mm (MNHN-IM-2000-2520). **B**. South of Grande–Terre, off New Caledonia, 70–72 m depth, 52.9 mm. **C**. Secteur des Belep, off New Caledonia, 220 m depth, 55.9 mm. **D**. Grand Passage, 212–220 m depth, 61.8 mm. **E**. Same collection data as for specimen D, 57.9 mm. **F**. Same collection data as for specimen D, 57.6 mm. **G**. SW slope of the Dumbéa Pass, off New Caledonia, 217 m depth, 53.9 mm. **H**. Grand Passage, 199–215 m depth, 57.9 mm. **I**. SW slope of the Dumbéa Pass, off New Caledonia, 241–260 m depth, 52.3 mm. **J**. Grand Passage, 242–253 m depth, 53.8 mm. **K**. Off New Caledonia, 190 m depth, 36.9 mm. **L**. Protoconch of a specimen from Banc Antigonia, Norfolk Ridge. **M**. Radular tooth of specimen from Grand Passage, 244–252 m depth, 59.3 mm. Scale bars = 10 mm, unless otherwise stated.

Geographical distribution and bathymetry

New Caledonia: Norfolk Ridge, Grand Passage area, Loyalty Ridge and Coral Sea (Lansdowne and Capel Banks), at depths between 100 to 300 m. This species can be considered endemic.

Remarks

Shell medium-sized to moderately large (maximum shell length 62 mm). Conical to ventricosely conical, with a low to moderate spire of deeply concave outline. Protoconch multispiral (Fig. 71L) of more than 3 whorls. Last whorl patterned with spiral rows of orange to reddish brown blotches alternating with white. Patternless white shells do exist (Fig. 71F). Radular tooth (Fig. 71M) with the anterior section slightly shorter than the posterior section. The tooth is serrated with 8–10 denticles arranged in one single row. Elongated terminating cusp present. Barb well marked. Blade rounded, covering about 30% of the anterior section of the tooth. Basal spur on top of a rather large base. The specimens sequenced form a clade sister to *C.* (*P.*) *kuroharai*. This species, endemic to the EEZ, is one of the most characteristic representatives of the New Caledonian deep-water cone fauna, and it is fairly common in the localities where it has been sampled.

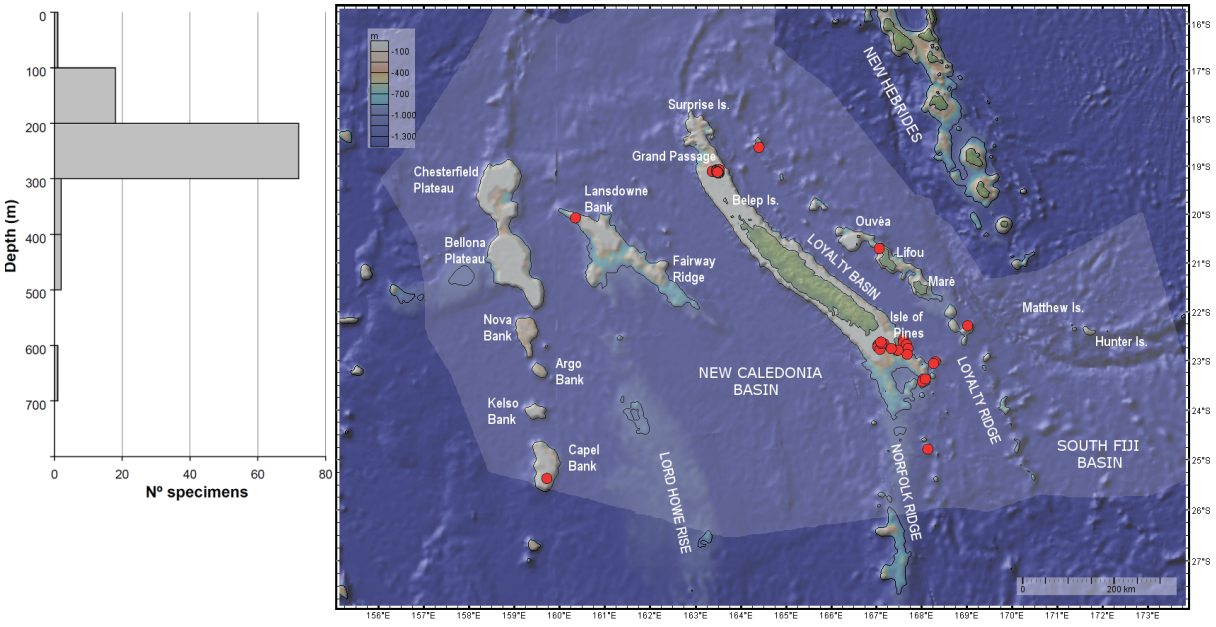

Fig. 72. Bathymetric range and distribution map for *Conus* (*Phasmoconus*) *richeri* Richard & Moolenbeek, 1988. Red circles indicate the points where the species was collected.

Subgenus *Splinoconus* da Motta, 1991

Conus* (*Splinoconus*) *capitanellus Fulton, 1938
Figs 2, 73–74

Conus capitanellus Fulton, 1938: 55, pl. 3 fig. 1–1a.

Conus capitanellus – Röckel *et al.* 1995b: no. 99, pl. 24 figs 24–26.
Stellaconus capitanellus – Tucker & Tenorio 2013: 125.
Kioconus (*Isoconus*) *capitanellus* – Monnier *et al.* 2018a: 546.

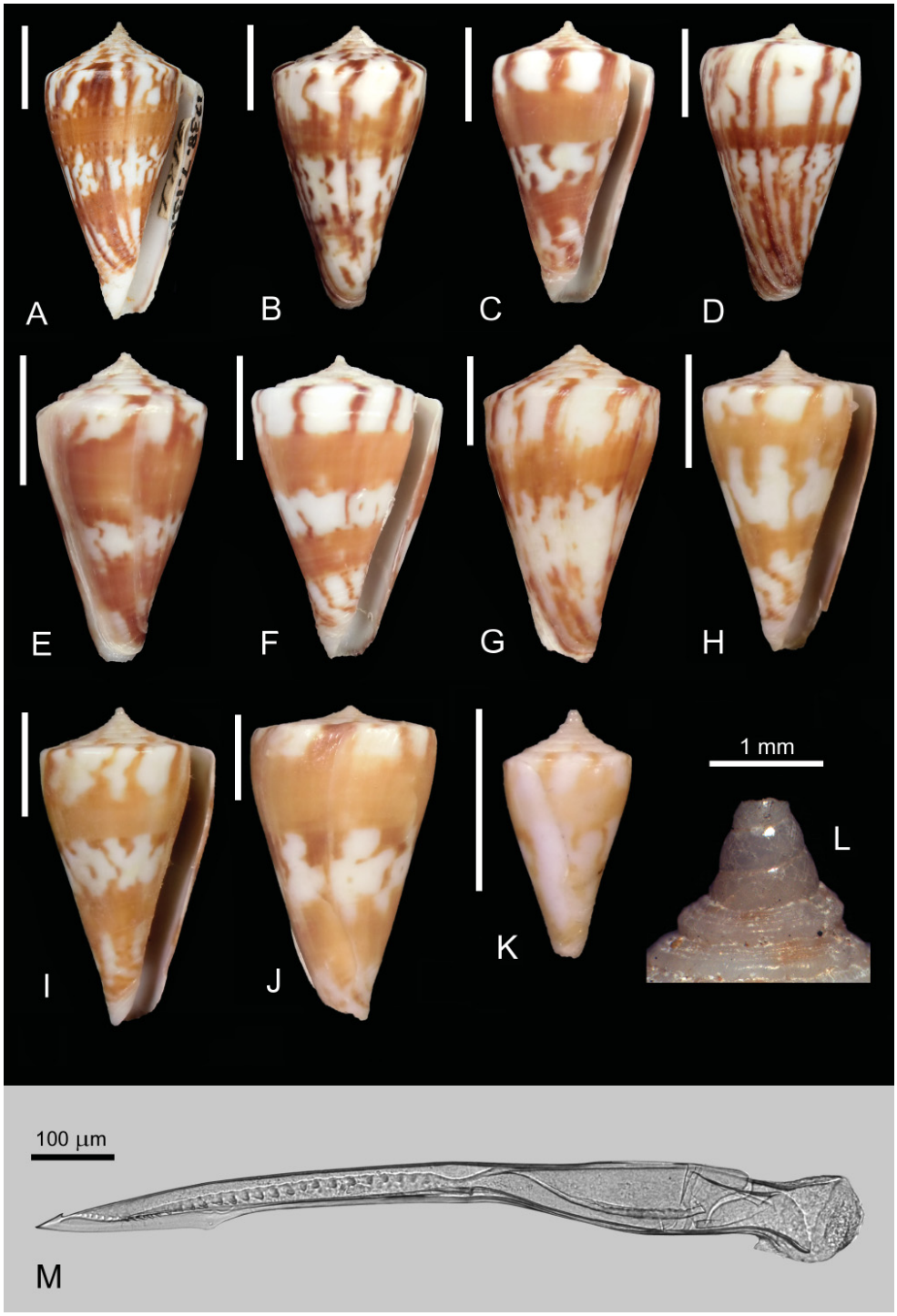

Fig. 73. *Conus* (*Splinoconus*) *capitanellus* Fulton, 1938. **A**. Holotype, Kii, Japan, 36 mm (NHMUK 1938.7.13.10). **B**. Norfolk Ridge, 235–252 m depth, 33.3 mm. **C**. Same collection data as for specimen B, 30.2 mm. **D**. Same collection data as for specimen B, 31.6 mm. **E**. Same collection data as for specimen B, 23.9 mm. **F**. Same collection data as for specimen B, 29.1 mm. **G**. S New Caledonia, 230 m depth, 35.6 mm. **H**. Norfolk Ridge, 241–245 m depth, 26.8 mm. **I**. Same collection data as for specimen H, 30.8 mm. **J**. Same collection data as for specimen H, 36.9 mm. **K**. Norfolk Ridge, 372–660 m depth, 13.7 mm. **L**. Protoconch of a specimen from S Lansdowne, Coral Sea, 373–404 m depth. **M**. Radular tooth of a specimen from Norfolk Ridge, 235–252 m depth, 29.4 mm. Scale bars = 10 mm, unless otherwise stated.

Material examined

137 lots (371 specimens). See Supp. file 1.

Type material

Holotype

JAPAN • 58 mm; Kii; NHMUK 1938.7.13.10 (Fig. 73A).

Figured material

NEW CALEDONIA • 33.3 mm; Norfolk Ridge, off New Caledonia, stn DW154; 24º46′ S, 168º08′ E; 235–252 m depth; 28 Jan. 1993; SMIB 8 expedition; MNHN (Fig. 73B) • 30.2 mm; same collection data as for preceding; MNHN (Fig. 73C) • 31.6 mm; same collection data as for preceding; MNHN (Fig. 73D) • 23.9 mm; same collection data as for preceding; MNHN (Fig. 73E) • 29.1 mm; same collection data as for preceding; MNHN (Fig. 73F) • 35.6 mm; off S New Caledonia, stn DW71; 24º42′ S, 168º10′ E; 230 m depth; 27 Oct. 1986; CHALCAL 2 expedition; MNHN (Fig. 73G) • 26.8 mm; Norfolk Ridge, off New Caledonia, stn DW159; 24º46′ S, 168º08′ E; 241–245 m depth; 28 Jan. 1993; SMIB 8 expedition; MNHN (Fig. 73H) • 30.8 mm; same collection data as for preceding; MNHN (Fig. 73I) • 36.9 mm; same collection data as for preceding; MNHN (Fig. 73J) • 13.7 mm; Norfolk Ridge, off New Caledonia, stn DW165; 24º47′ S, 168º10′ E; 372–660 m depth; 28 Jan. 1993; SMIB 8 expedition; MNHN (Fig. 73K) • S Lansdowne, off New Caledonia, stn DW2631; 21º03′ S, 160º44′ E; 373–404 m depth; 21 Oct. 2005; EBISCO expedition; MNHN (Fig. 73L) • 29.4 mm; Norfolk Ridge, off New Caledonia, stn DW154; 24º46′ S, 168º08′ E; 235– 252 m depth; 28 Jan. 1993; SMIB 8 expedition (Fig. 73M).

Geographical distribution and bathymetry

Japan to the Philippines. Widespread in New Caledonia, including Grand Passage area, Norfolk Ridge, Loyalty Ridge, New Hebrides Arc and the Coral Sea, at depths between 200 and 400 m.

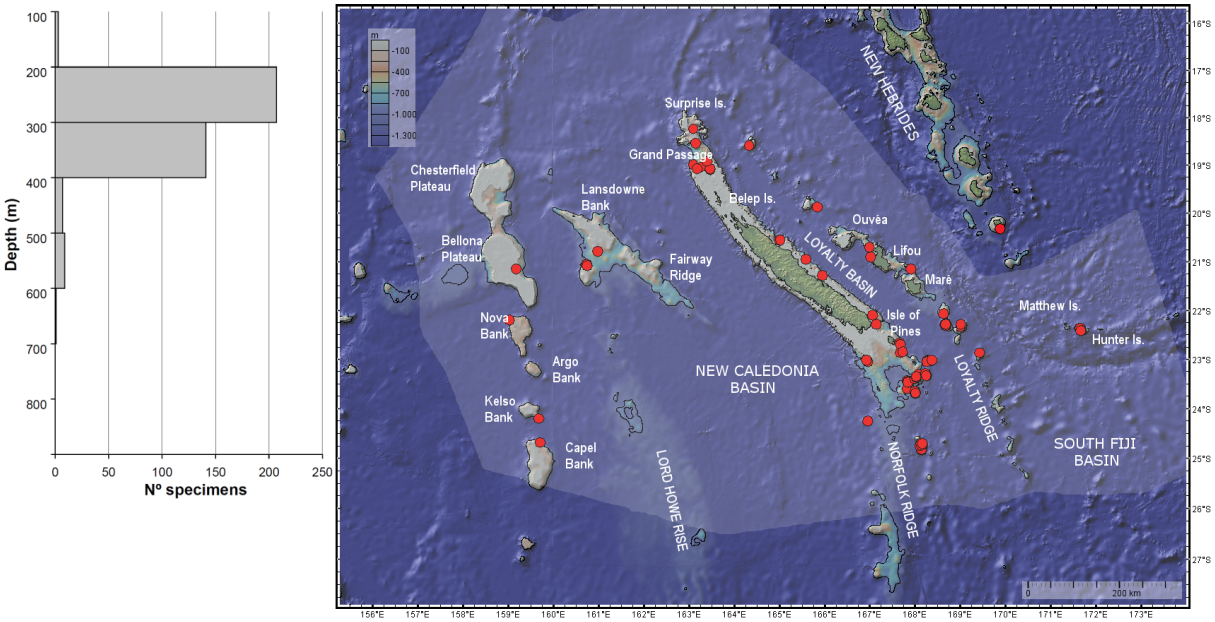

Fig. 74. Bathymetric range and distribution map for *Conus* (*Splinoconus*) *capitanellus* Fulton, 1938. Red circles indicate the points where the species was collected.

Remarks

Shell moderately small to medium-sized (maximum shell length 40 mm). Conical with a low spire of straight or concave profile. Protoconch multispiral (Fig. 73L) of 3 to 3.5 whorls. Last whorl white, usually patterned with two broad brown spiral bands on each side of the centre, and brown axial streaks. Radular tooth (Fig. 73M) narrow and elongated, with the anterior section longer than the posterior section. Tooth serrated with 30–32 denticles in one row, becoming 2–3 rows below. The denticles are minute on the apical portion, but become coarser towards the small, pointed terminating cusp. Barb small. Blade prominent but not sharply pointed, covering about 50% of the anterior section of the tooth. Basal spur present on top of the rather small, rounded base. This is one of the most abundant species in the deep-water New Caledonian cone fauna. Many specimens from New Caledonia and the Coral Sea have been sequenced (Fig. 2) and all form a clade, sister to *Conus* (*Splinoconus*) *hamamotoi* Yoshiba & Koyama, 1984.

Conus* (*Splinoconus*) *dayriti Röckel & da Motta, 1983
Figs 75A–G, M, 76

Conus dayriti Röckel & da Motta, 1983: 118, pl. 40 figs 5–6.

Conus dayriti – Röckel *et al.* 1995b: no. 241, pl. 52 figs 11–15.
Boucheticonus dayriti – Tucker & Tenorio 2013: 161. — Monnier *et al.* 2018a: 208.

Material examined

10 lots (14 specimens). See Supp. file 1.

Type material

Holotype
PHILIPPINES • 20.5 mm; Punta Engaño, Cebu; 73–146 m depth; NMSF (Fig. 75A).

Figured material

NEW CALEDONIA • 23.5 mm; Norfolk Ridge, Crypthélia, off New Caledonia, stn DW3072; 23°19′ S, 168°16′ E; 180–220 m depth; 23 Oct. 2008; TERRASSES expedition; MNHN (Fig. 75B) • 23.9 mm; same collection data as for preceding; MNHN (Fig. 75C, H) • 23.8 mm; same collection data as for preceding; MNHN (Fig. 75D) • 20.6 mm; Norfolk Ridge, Banc P, off New Caledonia, stn DW1726; 23º18′ S, 168º15′ E; 185–207 m depth; 27 Jun. 2001; NORFOLK 1 expedition; MNHN (Fig. 75E) • 29.5 mm; same collection data as for preceding; MNHN (Fig. 75F) • 19.2 mm; Grand Passage, off New Caledonia, stn DW2963; 18º22′ S, 162º59′ E; 220–240 m depth; 2 May 2008; CONCALIS expedition; MNHN (Fig. 75G) • 11.9 mm; off Aliguay Island, Philippines, stn DW2374 8º43′ N, 123º14′ E; 105–109 m depth; 28 May 2005; PANGLAO 2005 expedition; MNHN-IM-2007-34848 (Fig. 75M).

Geographical distribution and bathymetry

Philippines and New Caledonia, where it has been sampled in the Grand Passage area, Norfolk Ridge, Loyalty Ridge and New Hebrides Arc (outside New Caledonia EEZ), at depths between 70 to 500 m.

Remarks

Shell small to medium-sized (maximum shell length 36 mm). Conical to ventricosely conical, with an angulate shoulder and a low to moderate spire of straight profile. The multispiral protoconch (Fig. 75H) of more than 3 whorls projects above the teleoconch whorls. Last whorl colored with pastel shades of pink and orange, occasionally completely white (Fig. 75G). Sparse pattern of irregular cloudy blotches and interrupted spiral bands of white and brown-orange dots. Radular tooth (Fig. 75M) narrow and

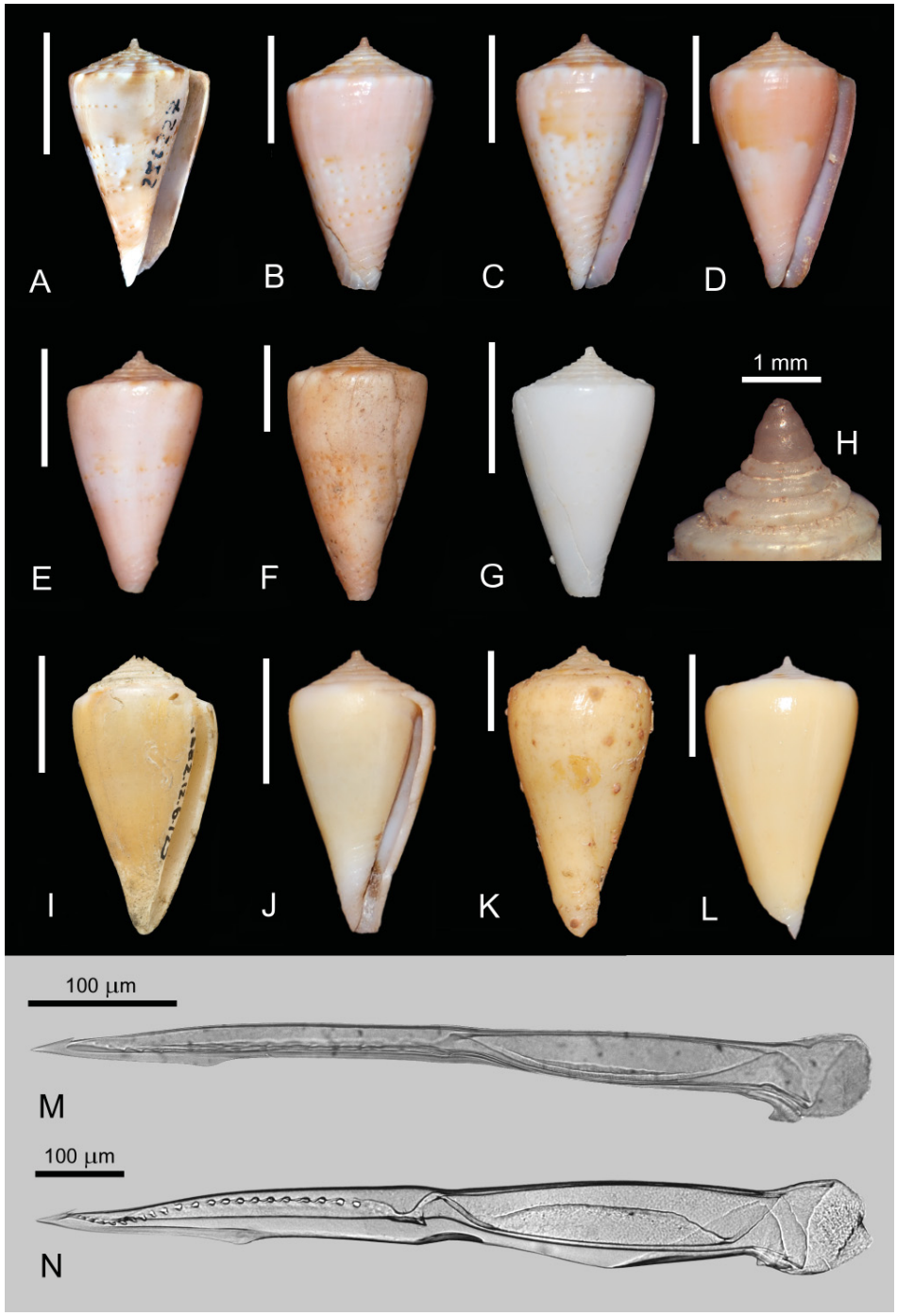

Fig. 75. A–H. *Conus* (*Splinoconus*) *dayriti* Röckel & da Motta, 1983. **A**. Holotype, Punta Engaño, Cebu, Philippines, 73–146 m depth, 20.5 mm (NMSF). **B**. Banc Crypthélia, Norfolk Ridge, 180–220 m depth, 23.5 mm. **C**. Same collection data as for specimen B, 23.9 mm. **D**. Same collection data as for specimen B, 23.8 mm. **E**. Banc P, Norfolk Ridge, 185–207 m depth, 20.6 mm. **F**. Same collection data as for specimen E, 29.5 mm. **G**. Grand Passage, 220–240 m depth, 19.2 mm. **H**. Protoconch of specimen C. – **I–L**. *Conus* (*Splinoconus*) *martensi* E.A. Smith, 1884. **I**. Holotype, 24 mm (NHMUK). **J**. Norfolk Ridge, 386–390 m depth, 22.4 mm. **K**. East coast, off New Caledonia, 94–100, 36.5 mm. **L**. Same collection data as for specimen K, 27.8 mm. – **M**. *C.* (*S.*) *dayriti*. Radular tooth, off Aliguay Island, Philippines, 105–109 m depth, 11.9 mm (MNHN-IM-2007-34848). – **N**. *C.* (*S.*) *martensi*. Radular tooth, Pouembout, 22 mm (Franck Leterrier coll.). Scale bars = 10 mm, unless otherwise stated.

elongated, with the anterior section longer than the posterior section. Tooth serrated with 12–13 denticles in one row. The denticles are well-spaced to each other within the anterior section, ending on an almost indistinct rounded cusp. Barb small but well-marked. Blade prominent but not sharply pointed, covering about 50% of the anterior section of the tooth. Basal spur present on top of the rather small, rounded base. No live specimens from New Caledonia were sampled. The analogies in shell morphology with *Conasprella* (*Boucheticonus*) *alisi* had placed this species in the (sub)genus *Boucheticonus* (Tucker & Tenorio 2013; Monnier *et al.* 2018a). However, DNA study of one specimen of this species from the Philippines showed that it was not a conasprellid (Puillandre *et al.* 2014). *Conus dayriti* is sister to the clade formed by *C.* (*S.*) *capitanellus* and hence it is placed in the subgenus *Splinoconus*. The radular morphology (Fig. 75M) is consistent with this taxonomic placement.

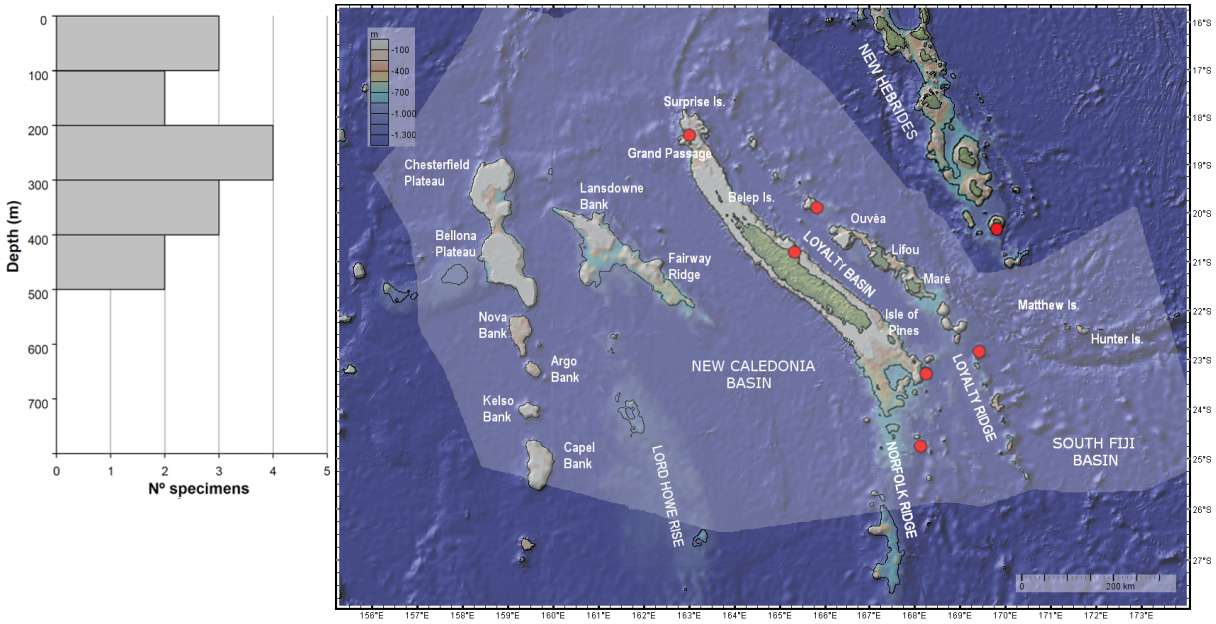

Fig. 76. Bathymetric range and distribution map for *Conus* (*Splinoconus*) *dayriti* Röckel & da Motta, 1983. Red circles indicate the points where the species was collected.

Conus* (*Splinoconus*) *hamamotoi Yoshiba & Koyama, 1984
Figs 2, 77–78

Conus hamamotoi Yoshiba & Koyama, 1984: 115, pl. 1 figs 1–5.

Conus hamamotoi – Röckel *et al.* 1995b: no. 35, pl. 9 figs 23–27.
Nitidoconus hamamotoi – Tucker & Tenorio 2013: 218.
Kioconus (*Isoconus*) *hamamotoi* – Monnier *et al.* 2018a: 544.

Material examined

15 lots (19 specimens). See Supp. file 1.

Type material

Holotype
JAPAN • 23 mm; 1 to 1.5 km W of Ogokuda Beach, Wakayama Prefecture; 60–70 m depth; WPMNH (Fig. 77A).

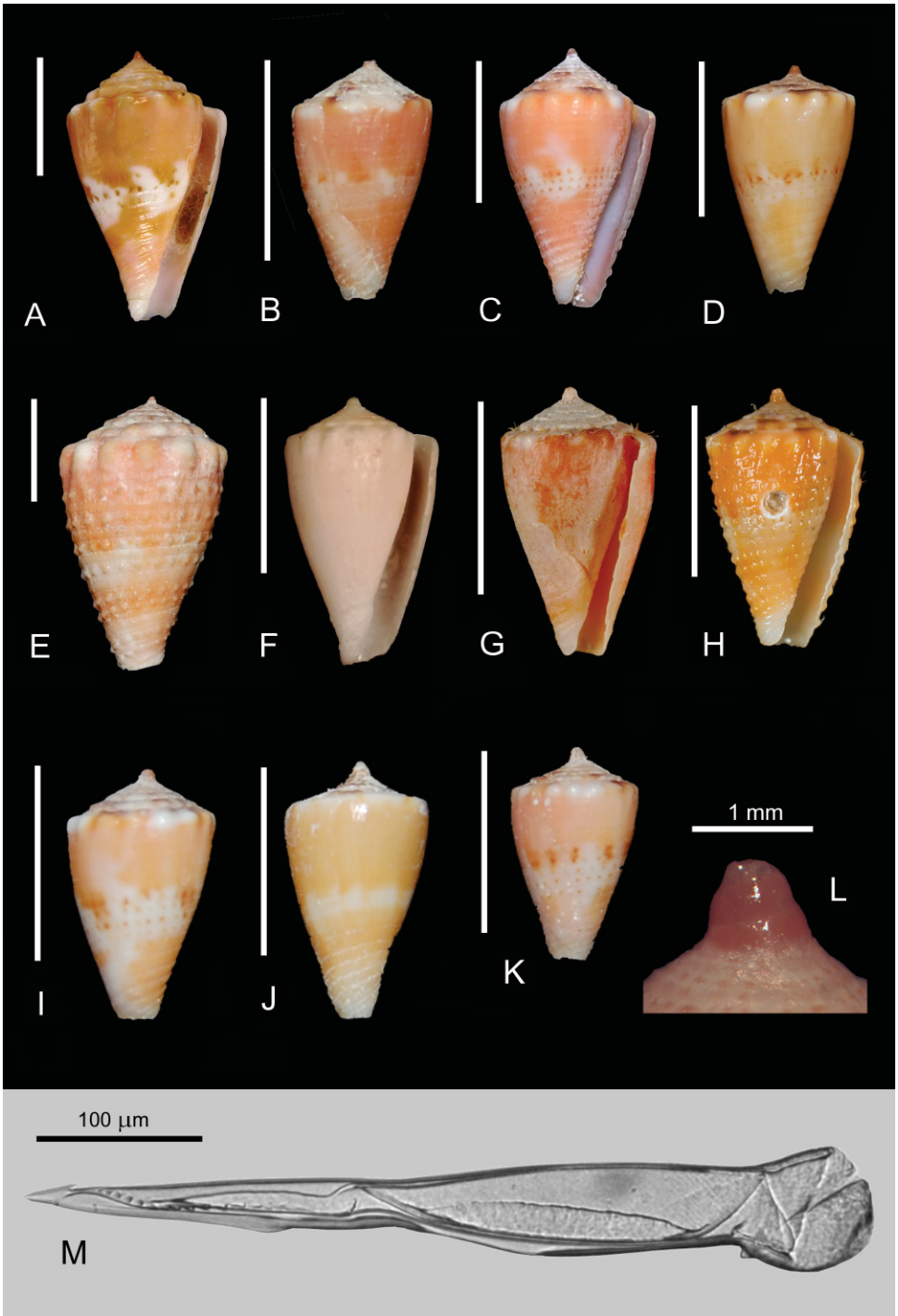

Fig. 77. *Conus* (*Splinoconus*) *hamamotoi* Yoshiba & Koyama, 1984. **A**. Holotype, 1-1.5 km west of Ogokuda beach, Wakayama prefecture, Japan, 60–70 m depth, 23 mm (WPMNH). **B**. Lansdowne–Fairway, Coral Sea, 62 m depth, 12.1 mm. **C**. Plateau des Chesterfield, Coral Sea, 68 m depth, 18.1 mm. **D**. Plateau des Chesterfield, Coral Sea, 95 m depth, 14.8 mm. **E**. Same collection data as for specimen C, 26.8 mm. **F**. W Bellona, Coral Sea, 356–438 m depth, 15.3 mm. **G**. Banc Ellet, off New Caledonia, 100–280 m depth, 14 mm. **H**. Banc Munida, Norfolk Ridge, 150–180 m depth, 15.1 mm. **I**. Norfolk Ridge, 57–59 m depth, 12.8 mm. **J**. Same collection data as for specimen I, 13.7 mm. **K**. Same collection data as for specimen I, 11.8 mm. **L**. Protoconch of specimen C. **M**. Radular tooth of specimen C. Scale bars = 10 mm, unless otherwise stated.

Figured material

NEW CALEDONIA • 12.1 mm; Lansdowne–Fairway, off New Caledonia, stn DW02; 20º50′ S, 161º37′ E; 62 m depth; 20 Jul. 1988; CORAIL 2 expedition; MNHN (Fig. 77B) • 18.1 mm; Plateau des Chesterfield, off New Caledonia, stn DW108; 19º09′ S, 158º49′ E; 68 m depth; 27 Jul. 1988; CORAIL 2 expedition; MNHN (Fig. 77C, L–M) • 14.8; Plateau des Chesterfield, off New Caledonia, stn DW141; 19º34′ S, 158º27′ E; 95 m depth; 30 Jul. 1988; CORAIL 2 expedition; MNHN (Fig. 77D) • 26.8 mm; Plateau des Chesterfield, off New Caledonia, stn DW108; 19º09′ S, 158º49′ E; 68 m depth; 27 Jul. 1988; CORAIL 2 expedition; MNHN (Fig. 77E) • 15.3 mm; W Bellona, off New Caledonia, stn DW2547; 21º06′ S, 158º36′ E; 356–438 m depth; 11 Oct. 2005; EBISCO expedition; MNHN (Fig. 77F) • 14 mm; Banc Ellet, off New Caledonia, stn DW3865; 22°53′ S, 169°26′ E; 100–280 m depth; 16 Sep. 2011; EXBODI expedition; MNHN (Fig. 77G) • 15.1 mm; Norfolk Ridge, Munida, off New Caledonia, stn DW3109; 23°01′ S, 168°18′ E; 150–180 m depth; 28 Oct. 2008; TERRASSES expedition; MNHN (Fig. 77H) • 12.8 mm; Norfolk Ridge, off New Caledonia, stn DW186; 23º25′ S, 168º06′ E; 57–59 m depth; 31 Jan. 1993; SMIB 8 expedition; MNHN (Fig. 77I) • 13.7 mm; same collection data as for preceding; MNHN (Fig. 77J) • 11.8 mm; same collection data as for preceding; MNHN (Fig. 77K).

Geographical distribution and bathymetry

Southern Japan and New Caledonia, where it has been sampled in Norfolk Ridge, Loyalty Ridge and the Coral Sea, at depths between 0 to 400 m, typically subtidal to 200 m deep.

Remarks

Shell small (maximum shell length 27 mm). Broadly conical, with a tuberculate shoulder and a spire of moderate height and straight outline. Multispiral protoconch (Fig. 77L) of about 3 whorls. Last whorl with spiral ribs and ribbons, which may be granulose (Fig. 77E, H), colored with pink to orange leaving a mid-body irregular spiral band with reddish brown dots arranged in spiral rows. Radular tooth (Fig. 77M) with the anterior section slightly longer than the posterior section. Tooth serrated with 15–16 denticles in one row, ending on an almost indistinct rounded cusp. Barb small. Blade rounded, covering about 70% of the anterior section of the tooth. Small basal spur present on top of the rounded base.

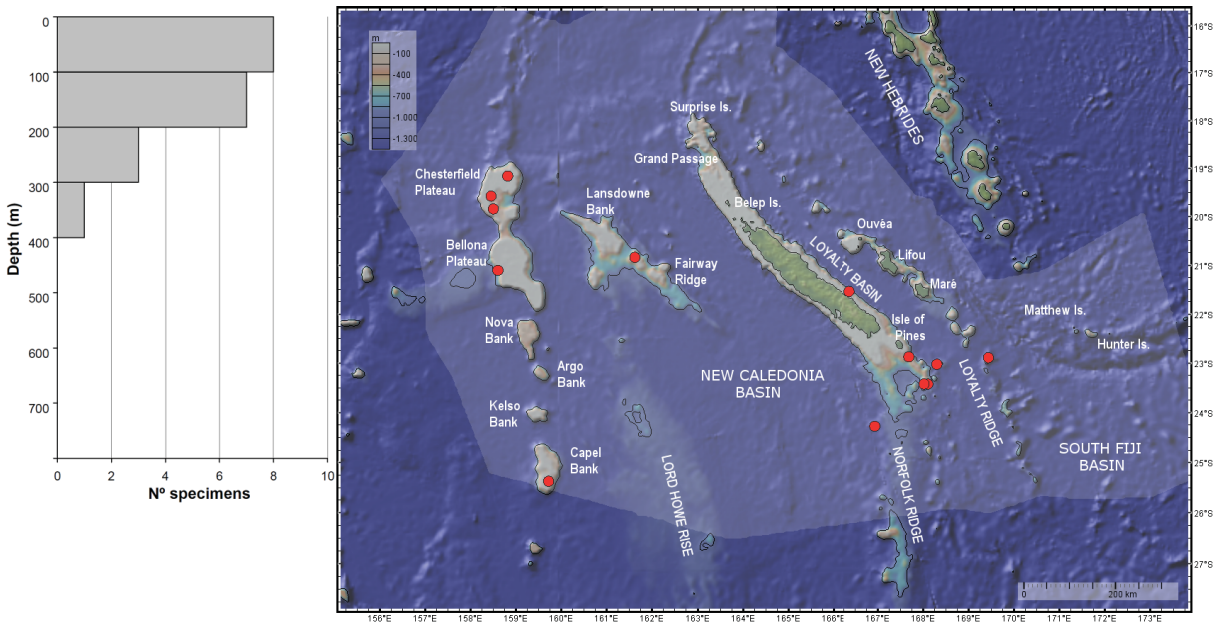

Fig. 78. Bathymetric range and distribution map for *Conus* (*Splinoconus*) *hamamotoi* Yoshiba & Koyama, 1984. Red circles indicate the points where the species was collected.

Conus (*S.*) *hamamotoi* is not a typical deep-water cone snail, as it is commonly found above a depth of 100 m. However, live specimens have been found in New Caledonia at depths between 150 and 180 m (Fig. 77H). Dead specimens have been found down to 400 m deep. This is a rare species, which has been now examined using DNA, and its radula studied. In the phylogeny (Fig. 2) this species appears sister to *C.* (*S.*) *capitanellus*, also in the *Splinoconus* clade.

Conus* (*Splinoconus*) *martensi E.A. Smith, 1884
Figs 75I–L, N, 79

Conus martensi E.A. Smith, 1884: 488.
Conus sazanka Shikama, 1970: 25, pl. 1 figs 24–25.
Conus yoshioi Azuma, 1973: 10, pl. 1. fig. 2, text-fig. 9–9a.
Conus kurzi Petuch, 1974: 41, fig. 1–2.

Conus martensi – Röckel *et al.* 1995b: pl. 32 fig. 1.
Kioconus martensi – Tucker & Tenorio 2013: 273.
Kioconus (*Isoconus*) *martensi* – Monnier *et al.* 2018a: 542.

Material examined

11 lots (13 specimens). See Supp. file 1.

Type material

Holotype
INDIAN OCEAN • 24 mm; Providence Reef, Mascarenes; NHMUK (Fig. 77I).

Figured material

NEW CALEDONIA • 22.4 mm; Norfolk Ridge, off New Caledonia, stn DW829; 23º21′ S, 168º02′ E; 386–390 m depth; 29 Nov. 1993; BATHUS 3 expedition; MNHN (Fig. 77J) • 36.5 mm; east coast, off New Caledonia, stn DW678; 20º49′ S, 165º19′ E; 94–100 m depth; 15 Mar. 1993; BATHUS 1 expedition; MNHN (Fig. 77K) • 27.8 mm; same collection data as for preceding; MNHN (Fig. 77L) • 22 mm; Pouembout, New Caledonia; 80–90 m depth; Franck Leterrier coll. (Fig. 75N).

Geographical distribution and bathymetry

Widely distributed across the Pacific (Japan, Philippines, Indonesia, Hawaii) and Indian Ocean (East and South Africa, including Madagascar and the Mascarenes). In New Caledonia it has been sampled in Norfolk Ridge, Loyalty Ridge and the Coral Sea, at depths between 0 to 500 m.

Remarks

Shell moderately small to medium-sized (maximum shell length 42 mm). Conical shell with a subangulate to angulate shoulder, and a low to moderate spire of concave profile. Multispiral protoconch. Last whorl colored pale yellow to red-orange. Radular tooth (Fig. 77N) with the anterior and posterior sections subequal in length. Tooth serrated with 22 rounded denticles arranged in one row, ending on a pointed cusp. Barb small. Blade rounded, covering about 70% of the anterior section of the tooth. Small basal spur present on top of the rounded base. The holotype of *C. martensi* in NHMUK is a dead and worn shell (Fig. 77I). Its conchological features are consistent with those of the widespread Indo-Pacific species *Conus sazanka* Shikama, 1970, which is considered a junior synonym. A DNA analysis shows that specimens from the SW Indian Ocean (Mozambique Channel) and the Western Pacific (New Caledonia) correspond to the same species (Supp. file 3).

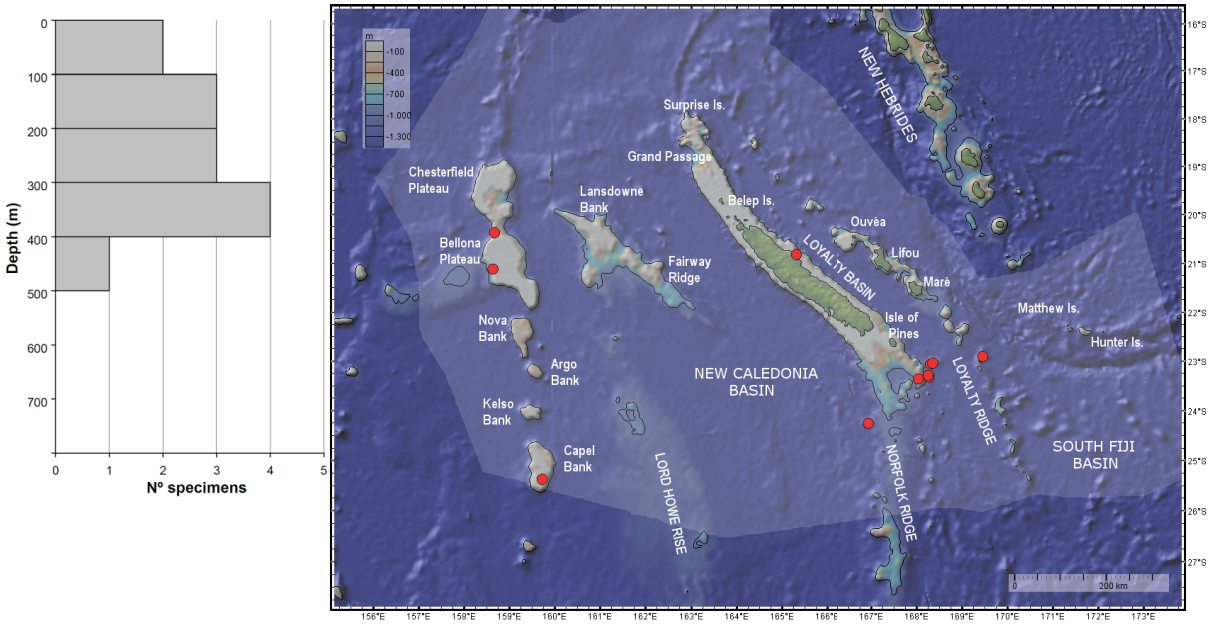

Fig. 79. Bathymetric range and distribution map for *Conus* (*Splinoconus*) *martensi* E.A. Smith, 1884. Red circles indicate the points where the species was collected.

Conus* (*Splinoconus*) *queenslandis da Motta, 1984
Figs 2, 80–81

Conus queenslandis da Motta, 1984: 25, fig. 3a–b.

Conus tribblei queenslandis – Röckel *et al.* 1995b: pl. 25 figs 13–15.
Kioconus tribblei queenslandis – Tucker & Tenorio 2013: 338.
Kioconus (*Kioconus*) *queenslandis* – Monnier *et al.* 2018a: 507.

Material examined

27 lots (37 specimens). See Supp. file 1.

Type material

Holotype

AUSTRALIA • 121.6 mm; trawled between Lord Howe and Lady Musgrave Island, Queensland; ca 274 m depth; MHNG MOLL-138916 (Fig. 80A).

Figured material

NEW CALEDONIA • 62 mm; off N New Caledonia, Grand Passage, stn DW2940; 19°04′ S, 165°27′ E; 283–270 m depth; 28 Apr. 2008; CONCALIS expedition; MNHN (Fig. 80B) • 48.4 mm; off New Caledonia, stn DW149; 19º08′ S, 163º23′ E; 155 m depth; 14 Sep. 1985; MUSORSTOM 4 expedition; MNHN (Fig. 80C) • 49.2 mm; Mont Munida, off New Caledonia, stn CP4779; 23°02′ S, 168°17′ E; 270–293 m depth; 28 Aug. 2016; KANACONO expedition; MNHN (Fig. 80D, M) • 83.6 mm; off E New Caledonia, east coast, stn CP702; 20°56′ S, 165°35′ E; 591–660 m depth; 18 Mar. 1993; BATHUS 1 expedition; MNHN (Fig. 80E) • 45 mm; Canal de l'Havannah, off New Caledonia, stn CP3788; 22°13′ S, 167°07′ E; 264–273 m depth; 3 Sep. 2011; EXBODI expedition; MNHN (Fig. 80F) • 86.6 mm; W Île des Pins, off New Caledonia, stn DW4651; 22°42′ S, 167°14′ E; 295–300 m depth; 9 Aug. 2016;

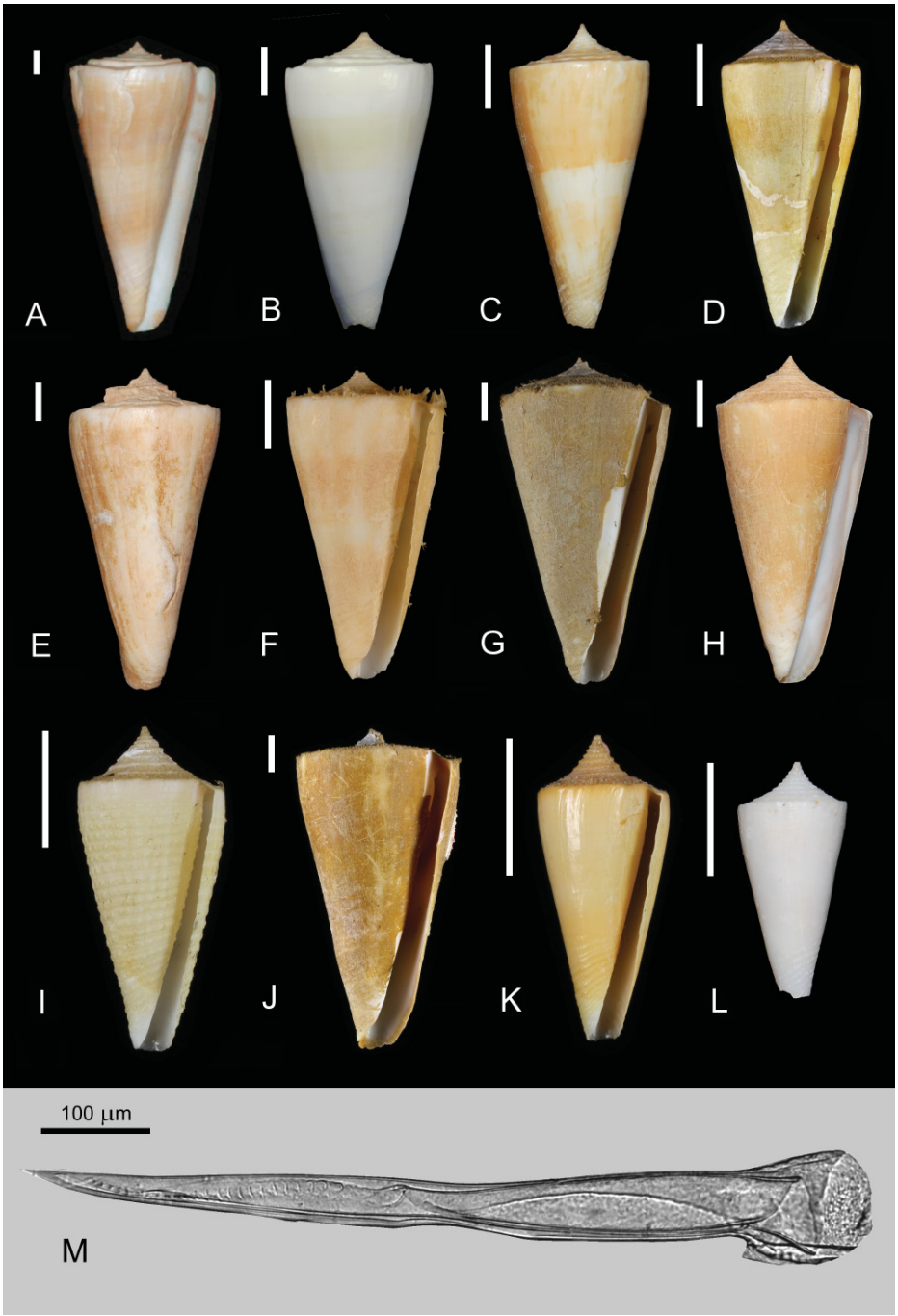

Fig. 80. *Conus* (*Splinoconus*) *queenslandis* da Motta, 1984. **A**. Holotype, between Lord Howe and Lady Musgrave Island, Queensland, Australia, 150 fathoms, 121.6 mm (MHNG 983.576). **B**. Grand Passage, 283–270 m depth, 62 mm. **C**. Off New Caledonia, 155 m depth, 48.4 mm. **D**. Mont Munida, Norfolk Ridge, 270–293 m depth, 49.2 mm (MNHN-IM-2013-66066). **E**. East coast, off New Caledonia, 591–660 m depth, 83.6 mm. **F**. Canal de l'Havannah, off New Caledonia, 264–273 m depth, 45 mm (MNHN-IM-2009-31352). **G**. W Île des Pins, 295–300 m depth, 86.6 mm (MNHN-IM-2013-66051). **H**. E New Caledonia, 250 m depth, 69.6 mm. **I**. Mont Antigonia, Norfolk Ridge, 180–210 m depth, 27.8 mm (MNHN-IM-2013-66071). **J**. W Île des Pins, 250–225 m depth, 87 mm (MNHN-IM-2013-68770). **K**. Mont Munida, Norfolk Ridge, 140–277 m depth, 22.3 mm (MNHN-IM-2013-66126). **L**. Baie du Santal, Loyalty Islands, 120–250 m depth, 21 mm. **M**. Radular tooth of specimen D. Scale bars = 10 mm, unless otherwise stated.

KANACONO expedition; MNHN (Fig. 80G) • 69.6 mm; off E New Caledonia, stn CP713; 21º45′ S, 166º37′ E; 250 m depth; 19 Mar. 1993; BATHUS 1 expedition; MNHN (Fig. 80H) • 27.8 mm; Mont Antigonia, off New Caledonia, stn DW4768; 23°25′ S, 168°01′ E; 180–210 m depth; 27 Aug. 2016; KANACONO expedition; MNHN (Fig. 80I) • 87 mm; W Île des Pins, off New Caledonia, stn DW4701; 22°41′ S, 167°13′ E; 250–225 m depth; 16 Aug. 2016; KANACONO expedition; MNHN (Fig. 80J) • 22.3 mm; Mont Munida, off New Caledonia, stn DW4775; 23°03′ S, 168°17′ E; 140–277 m depth; 28 Aug. 2016; KANACONO expedition; MNHN (Fig. 80K) • 21 mm; Loyalty Islands, Lifou, Baie du Santal, off New Caledonia, stn DW1650; 20º54′ S, 167º01.7′ E; 120–250 m depth; Nov. 2000; LIFOU 2000 expedition; MNHN (Fig. 80L).

Geographical distribution and bathymetry

Queensland, Coral Sea and New Caledonia (Grand Passage area, Norfolk Ridge and Loyalty Islands), from 100 to 700 m deep, typically at depths between 100 and 300 m.

Remarks

Shell moderately large to large (maximum shell length 121.6 mm), narrowly conical to conical, with a low spire of concave outline and an angulate shoulder. Multispiral protoconch. Last whorl white to pale orange-brown, with occasional presence of rather diffuse broad spiral bands above and below midbody. Specimens with a nodulose last whorl (Fig. 80I) are known. Radular tooth (Fig. 80M) rather elongated, with the anterior and posterior sections subequal in length. Tooth serrated with 25 to 27 denticles arranged in one row, ending on a rounded cusp. Barb small. Blade rounded, almost indistinct, covering about 70% of the anterior section of the tooth. Strong basal spur present on top of the base. *Conus* (*S.*) *queenslandis* was considered a subspecies of *Conus tribblei* Walls, 1977 by Röckel *et al.* (1995b) based on similarities in conchological features. In the phylogeny (Fig. 2), *C. tribblei* and *C. queenslandis* form two well-supported sister clades, at a distance consistent with a separation at the species level.

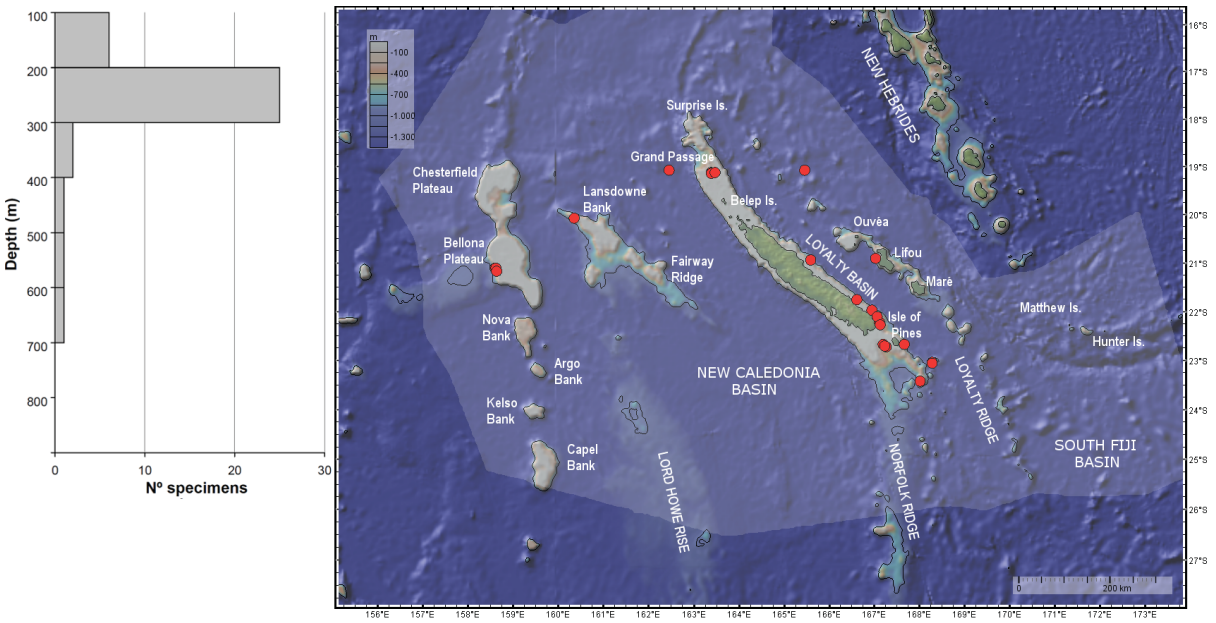

Fig. 81. Bathymetric range and distribution map for *Conus* (*Splinoconus*) *queenslandis* da Motta, 1984. Red circles indicate the points where the species was collected.

Subgenus ***Taranteconus*** Azuma, 1972

According to Phuong *et al.* (2019), *Conus* (*Taranteconus*) *chiangi* (Azuma, 1972), which is the type species of the (sub)genus *Taranteconus*, is sister to a clade containing the Indo-Pacific species assigned to the (sub)genus *Rhombiconus* Tucker & Tenorio, 2009. These two groups are sister to another clade composed of western Atlantic and eastern Pacific species of cones, including *Conus* (*Stephanoconus*) *regius* Gmelin, 1791, the type species of the (sub)genus *Stephanoconus* Mörch, 1852. All these species from very distant geographic areas had so far been lumped in the supraspecific taxon *Stephanoconus*. In addition to the geographic separation, the species in *Taranteconus* exhibit very distinct shell and radular morphologies which allow a clear separation from species in *Stephanoconus* and also from *Rhombiconus* (Tucker & Tenorio 2013). Hence, the phylogenetic relationship between the (sub) genera *Taranteconus*, *Rhombiconus* and *Stephanoconus* is formally analogous to that existing between *Kurodaconus*, *Mitraconus* and *Turriconus* (see above). For this reason, we hereby consider *Taranteconus* a valid supraspecific taxon, rather than a synonym of *Stephanoconus*.

Conus* (*Taranteconus*) *chiangi (Azuma, 1972)
Figs 2, 82A–H, M, 83

Taranteconus chiangi Azuma, 1972: 56, text-figs 5–6.
Cornutoconus lamellatus Suzuki, 1972: 2, text-fig. 1.

Conus chiangi – Röckel *et al.* 1995b: no. 238, pl. 51 figs 25–27.
Taranteconus chiangi – Tucker & Tenorio 2013: 136. — Monnier *et al.* 2018a: 287.

Material examined

28 lots (34 specimens). See Supp. file 1.

Type material

Holotype
SOUTH CHINA SEA • 18 mm; ca 366 m depth; coll. Azuma no. 15777.

Figured material

NEW CALEDONIA • 16.7 mm; Norfolk Ridge, Banc Kaimon Maru, off New Caledonia, stn DW1675; 24º45′ S, 168º09′ E; 231–233 m depth; 22 Jun. 2001; NORFOLK 1 expedition; MNHN (Fig. 82A, H) • 14.9 mm; Norfolk Ridge, Banc P, off New Caledonia, stn DW1726; 23º18′ S, 168º15′ E; 185–207 m depth; 27 Jun. 2001; NORFOLK 1 expedition; MNHN (Fig. 82B) • 16.1 mm; Norfolk Ridge, Munida, off New Caledonia, stn DW3106; 23°02′ S, 168°21′ E; 180–220 m depth; 27 Oct. 2008; TERRASSES expedition; MNHN (Fig. 82C) • 17.1 mm; Norfolk Ridge, Banc Crypthélia, off New Caledonia, stn DW2123; 23º18′ S, 168º15′ E; 187–197 m depth; 2 Nov. 2003; NORFOLK 2 expedition; MNHN (Fig. 82D) • 15 mm; Norfolk Ridge, off New Caledonia, stn DW158; 24º47′ S, 168º08′ E; 262–290 m depth; 28 Jan. 1993; SMIB 8 expedition; MNHN (Fig. 82E) • 18 mm; same collection data as for preceding; MNHN (Fig. 82F) • 14 mm; off S New Caledonia, stn DW95; 23º00′ S, 168º20′ E; 200 m depth; 14 Sep. 1989; SMIB 5 expedition; MNHN (Fig. 82G) • 19.8 mm; Bohol Island, Philippines; J. Conde coll.; MNCN (Fig. 82M).

Geographical distribution and bathymetry

Japan to the Philippines, at depths between 200–400 m. In New Caledonia it has been sampled at multiple localities (Coral Sea, Norfolk Ridge, Grand Passage area, Loyalty Islands), typically at depths between 200 and 400 m.

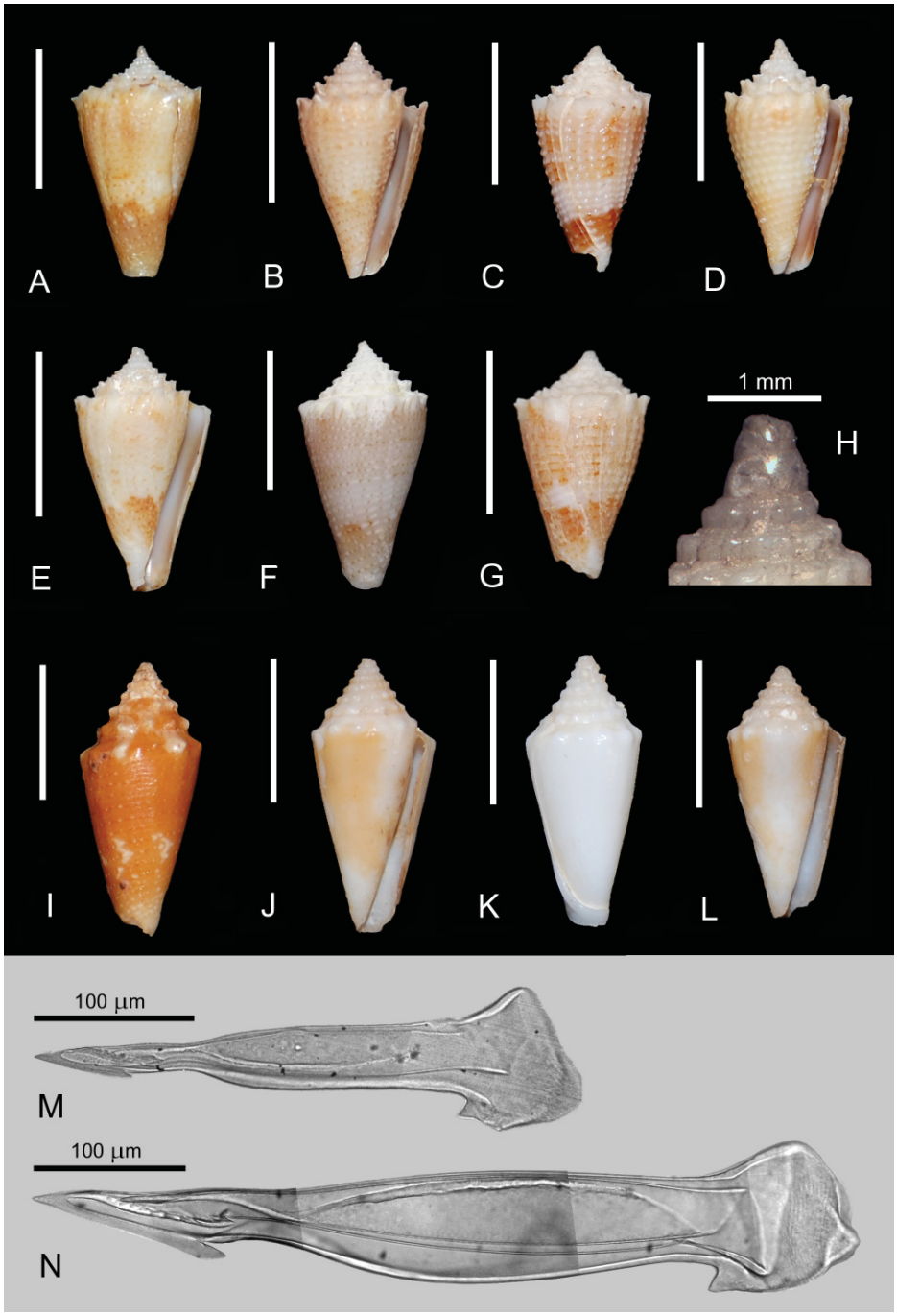

Fig. 82. A–H. *Conus* (*Taranteconus*) *chiangi* (Azuma, 1972). **A**. Banc Kaimon Maru, Norfolk Ridge, 231–233 m depth, 16.7 mm. **B**. Banc P, Norfolk Ridge, 185–207 m depth, 14.9 mm. **C**. Banc Munida, Norfolk Ridge, 180–220 m depth, 16.1 mm. **D**. Banc Crypthélia, Norfolk Ridge, 187–197 m depth, 17.1 mm. **E**. Norfolk Ridge, 262–290 m depth, 15 mm. **F**. Same collection data as for specimen E, 18 mm. **G**. S New Caledonia, 200 m depth, 14 mm. **H**. Protoconch of specimen A. – **I–L**. *Conus* (*Taranteconus*) *polongimarumai* (Kosuge, 1980). **I**. Banc Munida, Norfolk Ridge, 180–220 m depth, 20.5 mm. **J**. Grand Passage, 277–289 m depth, 19.4 mm. **K**. Same collection data as for specimen J, 18.9 mm. **L**. Same collection data as for specimen J, 17.3 mm. – **M**. *C.* (*T.*) *chiangi*. Radular tooth, specimen from Bohol Island, Philippines, 19.8 mm (MNCN). – **N**. *C.* (*T.*) *polongimarumai*. Radular tooth, specimen from Pouembout, New Caledonia, 21 mm (Frank Leterrier coll.). Scale bars = 10 mm, unless otherwise stated.

Remarks

Small conical shell (maximum shell length 25 mm) with a moderate to high spire of straight to slightly concave profile. Characteristic hollow spinose processes present at shoulder angle. Multispiral protoconch of about 3 whorls (Fig. 82H). Last whorl with spiral ribs, often granulated. Radular tooth (Fig. 82M) with the anterior section much shorter than the posterior section. Tooth serrated with 7–8 denticles arranged in one row, ending on a large, pointed cusp. Barb small. Blade pointed, covering about 60–70% of the anterior section of the tooth. Strong basal spur present on top of the very large base. In the phylogeny (Fig. 2), *C.* (*T.*) *chiangi* is sister to *C.* (*T.*) *polongimarumai*. In the phylogeny of Phuong *et al.* (2019), *C.* (*T.*) *chiangi* appears sister to a clade which contains Indo-Pacific species included in the (sub)genus *Rhombiconus* Tucker & Tenorio, 2009. The latter species are known to prey selectively on amphinomid polychaete worms.

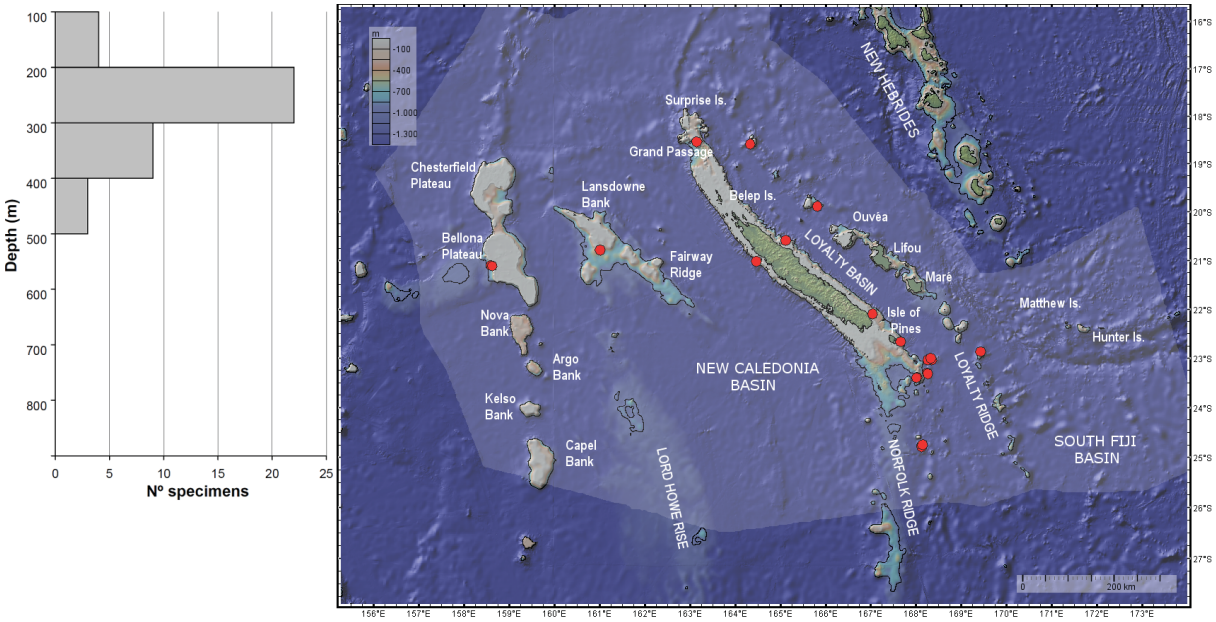

Fig. 83. Bathymetric range and distribution map for *Conus* (*Taranteconus*) *chiangi* (Azuma, 1972). Red circles indicate the points where the species was collected.

Conus* (*Taranteconus*) *polongimarumai (Kosuge, 1980)
Figs 2, 82I–L, N, 84

Conus polongimarumai Kosuge, 1980a: 63, pl. 18 figs 6–8.

Conus polongimarumai – Röckel *et al.* 1995b: no. 243, pl. 52 figs 21–24.
Taranteconus polongimarumai – Tucker & Tenorio 2013: 324. — Monnier *et al.* 2018a: 288.

Material examined

14 lots (about 20 specimens). See Supp. file 1.

Type material

Holotype

PHILIPPINES • 22.5 mm; Punta Engaño, Mactan Island; IMT 80-63.

Figured material

NEW CALEDONIA • 20.5 mm; Norfolk Ridge, Munida, off New Caledonia, stn DW3106; 23°02′ S, 168°21′ E; 180–220 m depth; 27 Oct. 2008; TERRASSES expedition (Fig. 82I) • 19.4 mm; Grand Passage, off New Caledonia, stn DW2985; 18°59′ S, 163°06′ E; 277–289 m depth; 5 May 2008; CONCALIS expedition; MNHN (Fig. 82J) • 18.9 mm; same collection data as for preceding; MNHN (Fig. 82K) • 17.3 mm; same collection data as for preceding; MNHN (Fig. 82L) • 21 mm; Pouembout, New Caledonia; 80–90 m depth; Franck Leterrier coll. (Fig. 82N).

Geographical distribution and bathymetry

Philippines, Marshall Islands, W Thailand, in shallow water to 350 m deep. In New Caledonia it has been sampled at depths between 100 to 500 m in the Coral Sea, Grand Passage area, Norfolk Ridge and Loyalty Islands.

Remarks

Shell small (maximum shell length 30 mm), conical with a moderate to high, stepped spire of straight to slightly concave profile. Spire whorls and shoulder with strong nodules continuing as axial costae below. Multispiral protoconch of about 3 whorls. Radular tooth (Fig. 82N) with the anterior section much shorter than the posterior section. Tooth serrated with 7–8 denticles arranged in one row, ending on a large, pointed cusp. Barb moderate. Blade prominent and pointed, covering about 80–90% of the anterior section of the tooth. Strong basal spur present on top of the very large base. In the phylogeny (Fig. 2), *C.* (*T.*) *polongimarumai* is sister to *C.* (*T.*) *chiangi*.

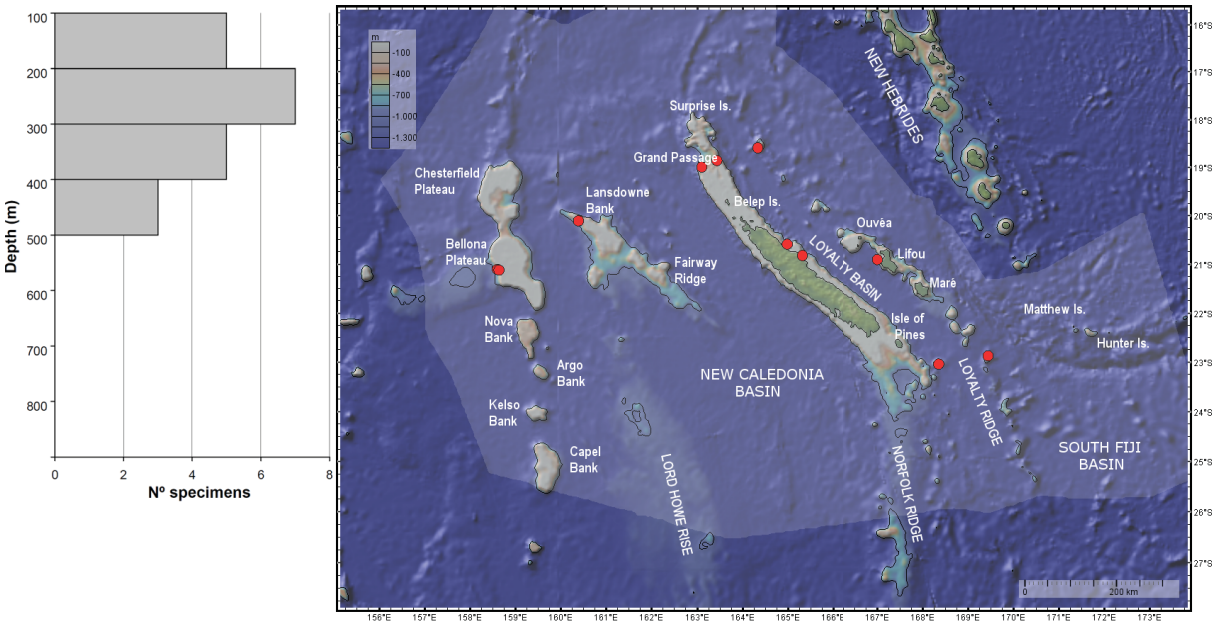

Fig. 84. Bathymetric range and distribution map for *Conus* (*Taranteconus*) *polongimarumai* (Kosuge, 1980). Red circles indicate the points where the species was collected.

Conus* (*Taranteconus*) *samadiae sp. nov.
urn:lsid:zoobank.org:act:A81F054F-DB47-47CB-9E2C-53197AB6C74F
Figs 2, 85A–G, L, 86

Etymology

The species is dedicated to Sarah Samadi, professor at the MNHN. Sarah Samadi has been the cruise leader of many expeditions of the TDSB program, including in New Caledonia. She also initiated the DNA barcoding programme of the marine benthic fauna at the MNHN, that led to the discovery of many new taxa.

Material examined

3 lots (3 specimens). See Supp. file 1.

Type material

Holotype

NEW CALEDONIA • lv, 16.5 mm; Plateau des Chesterfield, off New Caledonia, stn DW5035; 19°50′ S, 158°30′ E; 230–260 m depth; 22 Sep. 2017; KANADEEP expedition; MNHN-IM-2013-48261 (Fig. 85A–B, L).

Paratypes

NEW CALEDONIA • 1 dd, 16.7 mm; between Plateau des Chesterfield and Bellona Plateau, off New Caledonia, stn DW5026; 20°22′ S, 158°40′ E; 360–410 m depth; 21 Sep. 2017; KANADEEP expedition; MNHN-IM-2018-12309 (Fig. 85C–D) • 1 dd, 12.8 mm; off New Caledonia, stn DW3903; 19°52′ S, 165°50′ E; 580 m depth; 22 Sep. 2011; EXBODI expedition; MNHN-IM-2014-7986 (Fig. 85E–G).

Description

Morphometric parameters. S_L = 12–17 mm (mean S_L = 15.3 mm); RD = 0.52–0.57; RSH = 0.28–0.29; PMD = 0.79–0.85.

Shell. Small to very small. Maximum length: 16.7 mm. Shell profile elongated conical to conoid-cylindrical, with straight sides adapically, very slightly concave below. Spire high, of straight to slightly sigmoid outline, giving a biconic appearance to the overall shell profile. Protoconch white, paucispiral of 1.5 whorls (Fig. 85G). 2–3 early teleoconch whorls nodulose, flat or slightly concave. Early teleoconch whorls with 4 strong cords crossing the nodules. Teleoconch whorls with 4–5 flat cords forming 4–5 spiral grooves becaming rather obsolete on the last whorl. Shoulder angulate or subangulate, with ocasional presence of a ridge. Basal third with rather indistinct spiral grooves. Early teleoconch whorls white. Late teleoconch whorls brown with axial white streaks. Last whorl brown with large axial white areas overlaid in variable amount with spiral rows of alternating brown and white dots and dashes from base to shoulder. The white dots and dashes eventually fuse together, forming chevron markings. Aperture narrow, purplish white.

Animal. The animal or operculum has not been observed.

Radular tooth. Radula from the holotype studied (Fig. 85L). Radular tooth of medium relative size (S_L/T_L = 52), with a short apical barb. Anterior section shorter than the posterior section of the tooth (T_L/AP_L = 2.78). Waist well marked. Blade pointed, covering slightly more than one half of the anterior section (100 B_L/AP_L = 59 %). Short serration with 4–5 denticles, arranged in one row ending in a prominent, pointed terminating cusp. A basal spur is present.

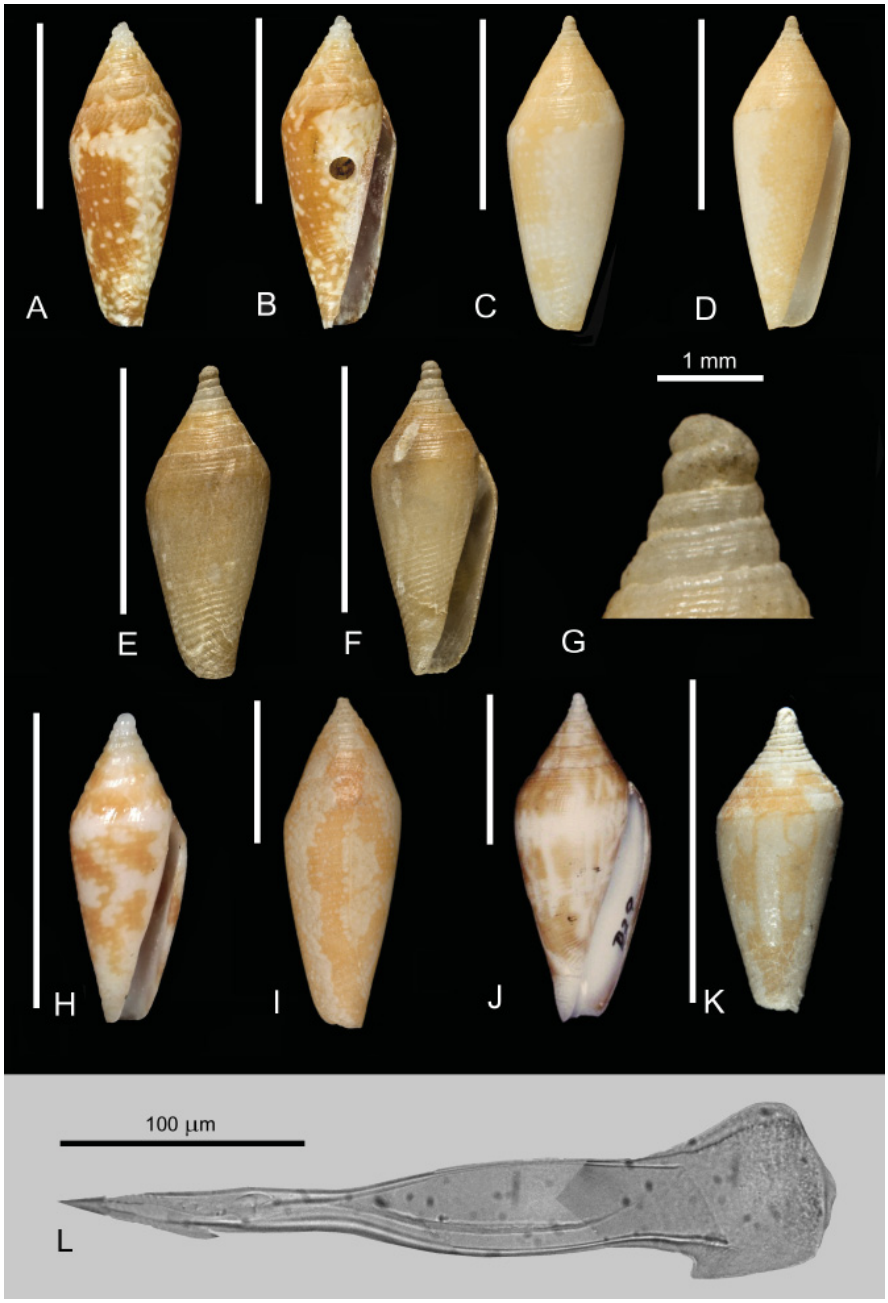

Fig. 85. A–G. *Conus* (*Taranteconus*) *samadiae* sp. nov. **A**. Holotype, Plateau des Chesterfield, Coral Sea, 230–260 m depth, 16.5 mm (MNHN-IM-2013-48261). **B**. Ventral view of specimen in specimen A. **C**. Paratype, between Plateau des Chesterfield and Bellona Plateau, Coral Sea, 360–410 m depth, 16.7 mm (MNHN-IM-2018-12309). **D**. Ventral view of specimen in C. **E**. Paratype, Loyalty Ridge, off New Caledonia, 580 m depth, 12.8 mm (MNHN-IM-2014-7986). **F**. Ventral view of specimen in E. **G**. Protoconch of paratype MNHN-IM-2014-7986. – **H**. *Profundiconus stahlschmidti* Tucker & Tenorio, 2014. Holotype, Pasir Tengah Atoll, Togian Islands, Sulawesi, Indonesia,10–12 m depth, 10.5 mm (SMF 336434). – **I**. *Conus pacificus* Moolenbeek & Röckel, 1996. Holotype, Banc Bayonnaise, off Wallis & Futuna Islands, 597–600 m depth, 20.2 mm (MNHN-IM-2000-2531). – **J**. *Profundiconus scopulicola* Okutani, 1972. Holotype, Hyotanse Bank, Izu-Shichito Island, off Honshu, Japan, 200 m depth, 22 mm (NSMT Mo 64688). – **K**. *Conus* (*Mitraconus*) *cylindraceus* Broderip & Sowerby, 1830. Récif Pétrie, off New Caledonia, 360–410 m depth, 9.5 mm (MNHN-IM-2018-12484). – **L**. *Conus* (*Taranteconus*) *samadiae* sp. nov. Radular tooth of the holotype. Scale bars = 10 mm, unless otherwise stated.

Distribution and habitat

Specimens have been found in two separate areas: Coral Sea (Plateau des Chesterfield and N Bellona Plateau) at depths of 200–400 m, and Loyalty Ridge (Récifs de l'Astrolabe-Sud) in a depth of 580 m. Most likely endemic to New Caledonia.

Remarks

In the phylogeny (Fig. 2) the analysed specimen of *C.* (*T.*) *samadiae* sp. nov is sister to *C.* (*T.*) *chiangi* and *C.* (*T.*) *polongimarumai*, hence its placement in the subgenus *Taranteconus* at this stage. The radular tooth of *C.* (*T.*) *samadiae* (Fig. 85L) exhibits features which are also present in the radular teeth of *C.* (*T.*) *chiangi* (Fig. 82M) and *C.* (*T.*) *polongimarumai* (Fig. 82N). The shell of C. (*T.*) *samadiae* is morphologically most similar to that of *Profundiconus stahlschmidti* Tucker & Tenorio, 2014 (Fig. 85H) and of *Profundiconus pacificus* (Moolenbeek & Röckel, 1996) (Fig. 85I) in shape and pattern. None of these two species has been examined using DNA, and the morphology of their radular teeth is unknown. These taxa had only been tentatively placed in the genus *Profundiconus*. However, given the similarities in shell shape and pattern of these species to those of *C.* (*T.*) *samadiae*, as shown in Fig. 85, it seems reasonable to assume that both *pacificus* and *stahlschmidti* are not members of the genus *Profundiconus* but instead are typical *Conus*, and likely of the same subgenus as *C.* (*T.*) *samadiae*. We therefore assign *pacificus* and *stahlschmidti* to *Conus* (*Taranteconus*). It is possible that other alleged species of *Profundiconus* such as *P. lani* or *P. dondani* might change their taxonomic placement if their radular teeth and/or DNA are examined. The shell of *C.* (*T.*) *samadiae* is smaller than that of *C.* (*T.*) *pacificus*. It has an elongate conical rather than cylindrical-fusiform profile (RD 0.52–0.57 for *samadiae* versus 0.48–0.52 for *pacificus*), with a spire similar in height but straight or slightly sigmoid in profile, rather than slightly convex as in *C.* (*T.*) *pacificus*. The spire whorls of *C.* (*T.*) *samadiae* bear 4–5 spiral grooves, whereas *C.* (*T.*) *pacificus* has two on the early whorls, and only one on the last whorl. The species *C.* (*T.*) *stahlschmidti*, known from the Togian Islands in Sulawesi, Indonesia, is on average smaller. Its shell profile is similar to that of *C.* (*T.*) *samadiae*, but differs mainly by the sculpture of the early teleoconch whorls: in *C.* (*T.*) *samadiae* the 2–3 early teleoconch whorls are nodulose, whereas nodules are present only in the first early teleoconch whorl of *C.* (*T.*) *stahlschmidti*. The nodules in

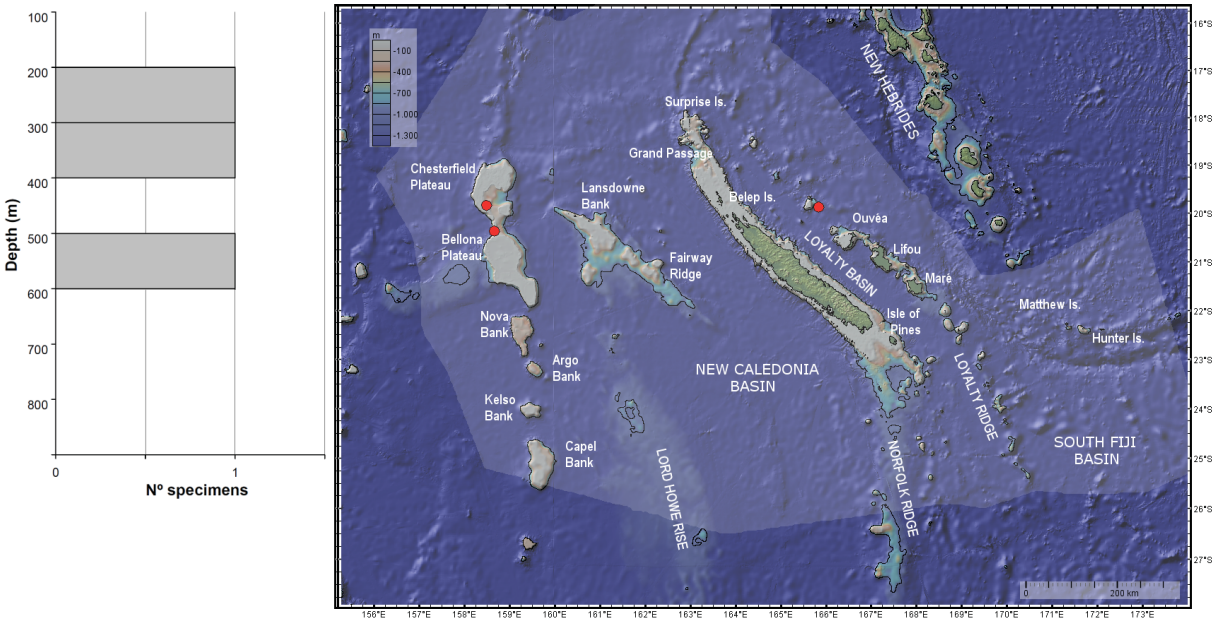

Fig. 86. Bathymetric range and distribution map for *Conus* (*Taranteconus*) *samadiae* sp. nov. Red circles indicate the points where the species was collected.

stahlschmidti have longitudinal bars on the whorl tops reaching the suture with the protoconch whorls, but these structures seem to be absent in both *C.* (*T.*) *samadiae* and *C.* (*T.*) *pacificus*. The elusive species *Profundiconus scopulicola* Okutani, 1972 (Fig. 85J) from Japan bears some resemblance to *C.* (*T.*) *samadiae*, but its shell is more rounded at the shoulder, has a more pyriform last whorl profile, and a different shell pattern. The shell of the species *Conus* (*Mitraconus*) *cylindraceus* Broderip & G.B. Sowerby I, 1830 (Fig. 85K) may exhibit a similar shape, but it attains a larger adult size, and it has a multispiral protoconch, apart from evident differences in shell pattern. This species is also distinct using DNA (cox1) from *C.* (*T.*) *samadiae* (Fig. 2).

Subgenus *Turriconus* Shikama & Habe, 1968

Conus* (*Turriconus*) *andremenezi (Olivera & Biggs, 2010)
Figs 2, 87A–H, L–M, 88

Conus andremenezi Olivera & Biggs in Biggs *et al.*, 2010: 4, figs 1–2, 6.

Turriconus andremenezi – Tucker & Tenorio 2013: 83.
Turriconus (*Turriconus*) *andremenezi* – Monnier *et al.* 2018a: 339.

Material examined

20 lots (24 specimens). See Supp. file 1.

Type material

Holotype

PHILIPPINES • 36.7 mm; Aliguay Island; 150 m depth; Marine Science Institute of the University of the Philippines (Fig. 87A).

Figured material

NEW CALEDONIA • 47.1 mm; along Passe d'Ounia, off New Caledonia, stn CP3823; 21°55′ S, 166°55′ E; 246–255 m depth; 7 Sep. 2011; EXBODI expedition; MNHN (Fig. 87B) • 40.4 mm; along Passe d'Ounia, off New Caledonia, stn CP3827; 21°58′ S, 166°57′ E; 220–232 m depth; 8 Sep. 2011; EXBODI expedition; MNHN (Fig. 87C) • 43.3 mm; Passe du Solitaire, off New Caledonia, stn CP3813; 21°46′ S, 166°38′ E; 251–281 m depth; 6 Sep. 2011; EXBODI expedition; MNHN (Fig.89D) • 44.2 mm; along Toupeti, off New Caledonia, stn CP3806; 21°42′ S, 166°34′ E; 307–309 m depth; 5 Sep. 2011; EXBODI expedition; MNHN (Fig. 87E) • 45.5 mm; along Passe d'Ounia, off New Caledonia, stn CP3827; 21°58′ S, 166°57′ E; 220–232 m depth; 8 Sep. 2011; EXBODI expedition; MNHN (Fig. 87F) • 44.7 mm; off SE New Caledonia, stn CP853; 21º45′ S, 166º37′ E; 241–250 m depth; 19 Mar. 1994; HALIPRO 1 expedition; MNHN (Fig. 87G, L) • 32.6 mm; off east coast New Caledonia, stn CP712; 21º44′ S, 166º35′ E; 210 m depth; 19 Mar. 1993; BATHUS 1 expedition; MNHN (Fig. 87H, M).

Geographical distribution and bathymetry

Philippines, eastern Malaysia, Vietnam, Papua New Guinea and Solomon Islands. In New Caledonia it is present along the south-eastern coast, Coral Sea, Norfolk Ridge and Loyalty Islands, at depths between 220–232 m.

Remarks

Medium-sized biconical shell (maximum shell length 53 mm) with a high spire of concave outline. Last whorl with raised, often nodulose spiral ribs. Protoconch multispiral of about 3.5 whorls (Fig. 87L). Last whorl off-white ground color with purplish-brown spots, which may cover several spiral ribs

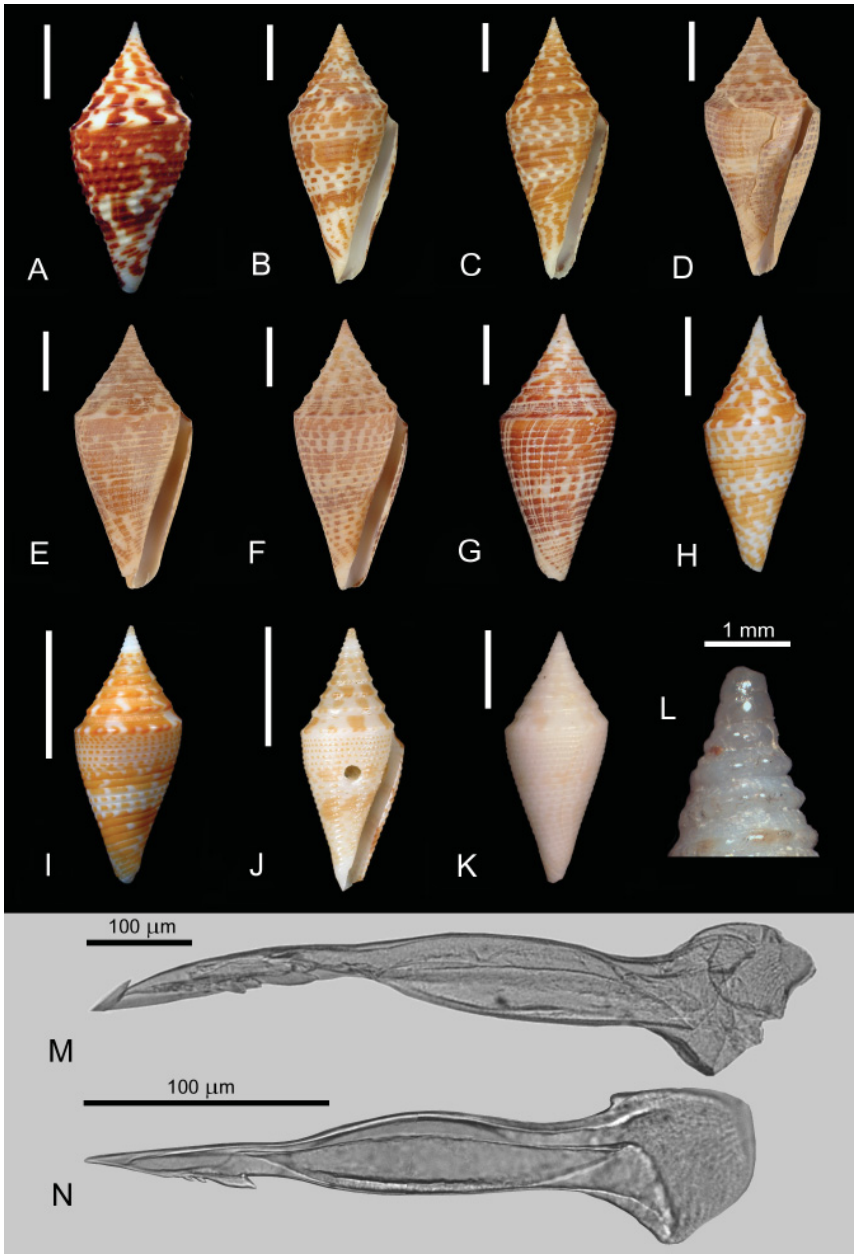

Fig. 87. A–H. *Conus* (*Turriconus*) *andremenezi* (Olivera & Biggs, 2010). **A**. Holotype, Aliguay Island, Philippines, 150 m depth, 36.7 mm (Marine Science Institute of the University of the Philippines). **B**. Along Passe d'Ounia, off New Caledonia, 246–255 m depth, 47.1 mm (MNHN-IM-2009-29237). **C**. Along Passe d'Ounia, off New Caledonia, 220–232 m depth, 40.4 mm (MNHN-IM-2009-29232). **D**. Passe du Solitaire, off New Caledonia, 251–281 m depth, 43.3 mm (MNHN-IM-2009-31346). **E**. Along Toupeti, off New Caledonia, 307–309 m depth, 44.2 mm (MNHN-IM-2009-31347). **F**. Same collection data as for specimen C, 45.5 mm (MNHN-IM-2009-31349). **G**. SE New Caledonia, 241–250 m depth, 44.7 mm. **H**. East coast, off New Caledonia, 210 m depth, 32.6 mm. – **I–K**. *Conus* (*Turriconus*) *miniexcelsus* (Olivera & Biggs, 2010). **I**. Holotype, Aliguay Island, Philippines, 30–150 m depth, 20.3 mm (Marine Science Institute of the University of the Philippines). **J**. Banc Munida, Norfolk Ridge, 180–220 m depth, 22 mm (MNHN-IM-2007-34852). **K**. S Lansdowne, Coral Sea, 289–294 m depth, 32.3 mm. – **L–M**. *Conus* (*Turriconus*) *andremenezi*. **L**. Protoconch of specimen G. **M**. Radular tooth of specimen H. – **N**. *Conus* (*Turriconus*) *miniexcelsus*. Radular tooth of specimen J. Scale bars = 10 mm, unless otherwise stated.

and extend into the interspaces. There is a great variability in shell shape and pattern. Radular tooth (Fig. 87M) with the anterior section shorter than the posterior section. Tooth serrated with 8–9 denticles arranged in one row, ending on a very large and pointed cusp. Barb very large, sharp and pointed. Blade reduced, indistinct, restricted to the apical portion. Basal spur absent or vestigial. Base rounded. *Conus* (*Turriconus*) *andremenezi* is most similar to *Conus* (*T.*) *praecellens* A. Adams, 1854, and is difficult to separate from it based on conchological features only. Furthermore, *C.* (*T.*) *praecellens* constitutes a species complex, and at least some of the species have been disentangled using morphological and DNA approaches (Biggs *et al.* 2010). We have examined 20 lots containing 24 *praecellens*-like specimens from New Caledonia. Seven of these specimens were sequenced, and they all grouped together in a clade which also contained the holotype of *C.* (*T.*) *andremenezi* (Fig. 2). Hence, all these specimens were identified as *C.* (*T.*) *andremenezi*. The non-sequenced or dead collected specimens have been tentatively identified as *C.* (*T.*) *andremenezi* as well, based on shell morphology. However, some of these specimens might actually correspond to another species within the *C.* (*T.*) *praecellens* complex. At this stage we can only confirm the occurrence of *C.* (*T.*) *andremenezi* in New Caledonia.

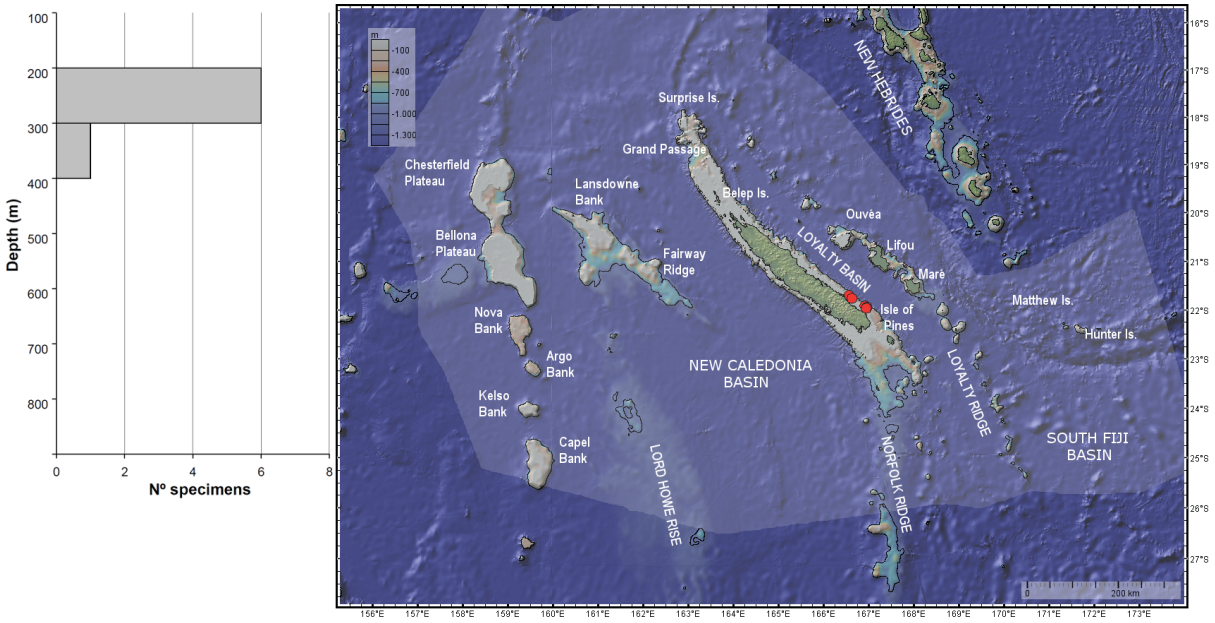

Fig. 88. Bathymetric range and distribution map for *Conus* (*Turriconus*) *andremenezi* (Olivera & Biggs, 2010). Red circles indicate the points where the species was collected.

Conus* (*Turriconus*) *excelsus G.B. Sowerby III, 1908
Figs 2, 89–90

Conus excelsus G.B. Sowerby III, 1908: 465.
Conus nakayasui Shikama & Habe, 1968: 57, pl. 6 figs 1–4.
Asprella tannaensis Cotton, 1945: 270, pl. 4 fig. 3.

Conus pulcherrimus (non *C. pulcherrimus* Heilprin, 1879) – Brazier 1894: 187.
Conus excelsus – Röckel *et al.* 1995b: no. 112, pl. 26 figs 24–28.
Turriconus excelsus – Tucker & Tenorio 2013: 183.
Turriconus (*Turriconus*) *excelsus* – Monnier *et al.* 2018a: 332.

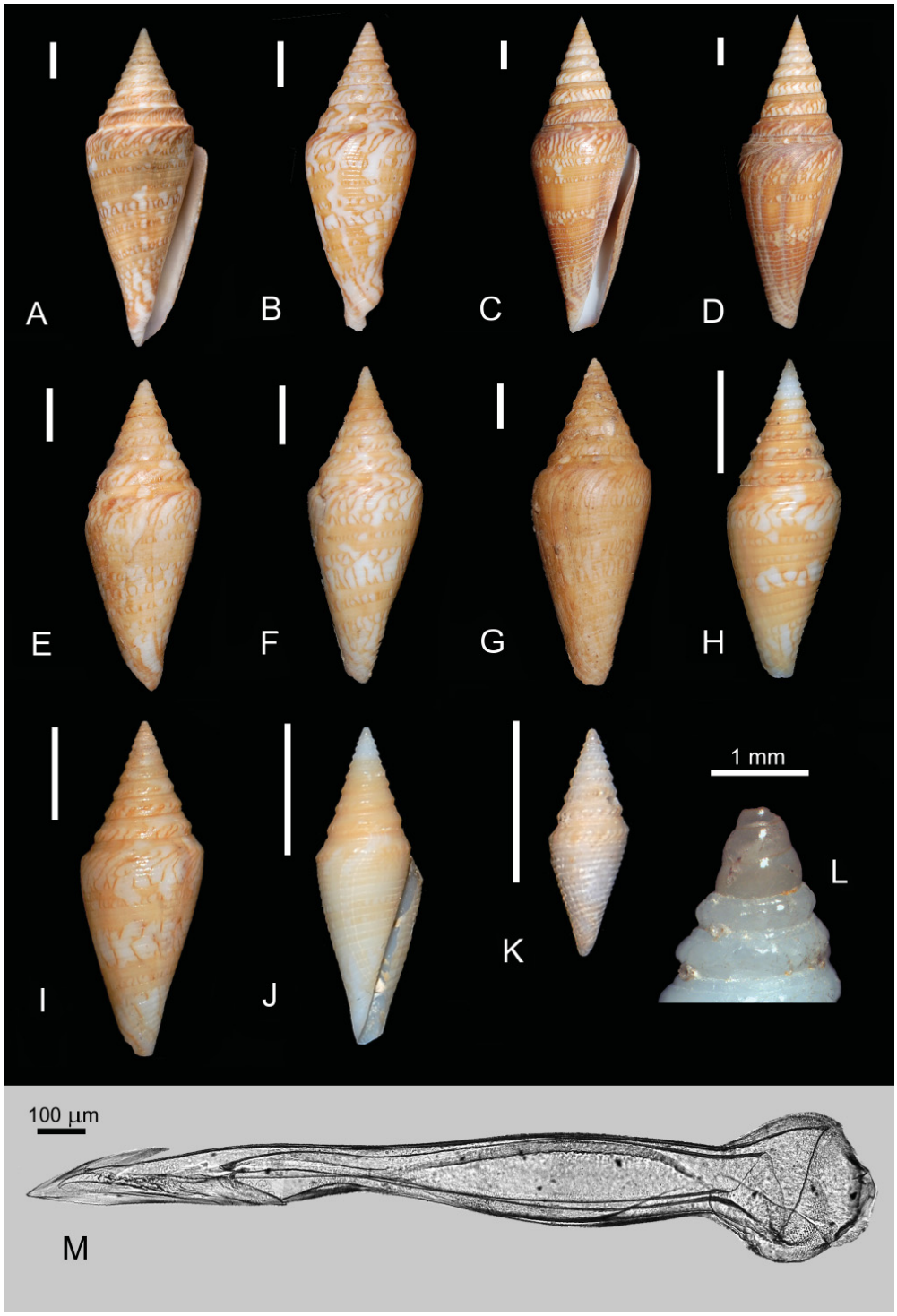

Fig. 89. *Conus* (*Turriconus*) *excelsus* G.B. Sowerby III, 1908. **A**. Holotype, New Caledonia, 88.5 mm (NHMUK 1908.5.30.1). **B**. SE Terrasses, off New Caledonia, 260 m depth, 68.1 mm. **C**. Banc Kaimon Maru, Norfolk Ridge, 231–233 m depth, 112.5 mm. **D**. Dorsal view of specimen C. **E**. Loyalty Ridge, 283 m depth, 59 mm. **F**. Same collection data as for specimen E, 53.8 mm. **G**. Banc Munida, Norfolk Ridge, 550 m depth, 71.6 mm. **H**. Loyalty Ridge, 280 m depth, 31 mm. **I**. Loyalty Ridge, 390 m depth, 36.4 mm. **J**. Loyalty Ridge, 240 m depth, 24.2 mm. **K**. Same collection data as for specimen J, 14.2 mm. **L**. Protoconch of specimen H. **M**. Radula of a specimen from the Philippines, 91 mm (Atheris coll.). Scale bars = 10 mm, unless otherwise stated.

Material examined

14 lots (16 specimens). See Supp. file 1.

Type material

Holotype

NEW CALEDONIA? • 88.5 mm; NHMUK 1908.5.30.1 (Fig. 89A).

Figured material

NEW CALEDONIA • 68.1 mm; SE Terrasses, off New Caledonia, stn DW3090; 22°16′ S, 167°08′ E; 260 m depth; 25 Oct. 2008; TERRASSES expedition; MNHN (Fig. 89B) • 112.5 mm; Norfolk Ridge, Banc Kaimon Maru, off New Caledonia, stn DW1675; 24º45′ S, 168º09′ E; 231–233 m depth; 22 Jun. 2001; NORFOLK 1 expedition; MNHN (Fig. 89C–D) • 59 mm; Loyalty Ridge, off New Caledonia, stn DW418; 20º42′ S, 167º03′ E; 283 m depth; 16 Feb. 1989; MUSORSTOM 6 expedition; MNHN (Fig. 89E) • 53.8 mm; same collection data as for preceding; MNHN (Fig. 89F) • 71.6 mm; Norfolk Ridge, Banc Munida, off New Caledonia, stn DW2142; 23º01′ S, 168º17′ E; 550 m depth; 3 Nov. 2003; NORFOLK 2 expedition; MNHN (Fig. 89G) • 31 mm; Loyalty Ridge, off New Caledonia, stn DW423; 20º26′ S, 166º41′ E; 280 m depth; 16 Feb. 1989; MUSORSTOM 6 expedition; MNHN (Fig. 89H, L) • 36.4 mm; Loyalty Ridge, off New Caledonia, stn DW391; 20º47′ S, 167º06′ E; 390 m depth; 13 Feb. 1989; MUSORSTOM 6 expedition; MNHN (Fig. 89I) • 24.2 mm; Loyalty Ridge, off New Caledonia, stn DW456; 21º01′ S, 167º26′ E; 240 m depth; 20 Feb. 1989; MUSORSTOM 6 expedition; MNHN (Fig. 89J) • 14.2 mm; same collection data as for preceding; MNHN (Fig. 89K).

PHILIPPINES • 91 mm; Atheris coll. (Fig. 89M).

Geographical distribution and bathymetry

Japan to Philippines, Solomon Islands and Australia (Queensland). Also present in the Andaman Sea, off Myanmar. In New Caledonia present in Loyalty Islands, Norfolk Ridge, Grand Passage area and Coral Sea, typically at depths between 200–400 m, but also found below 500 m.

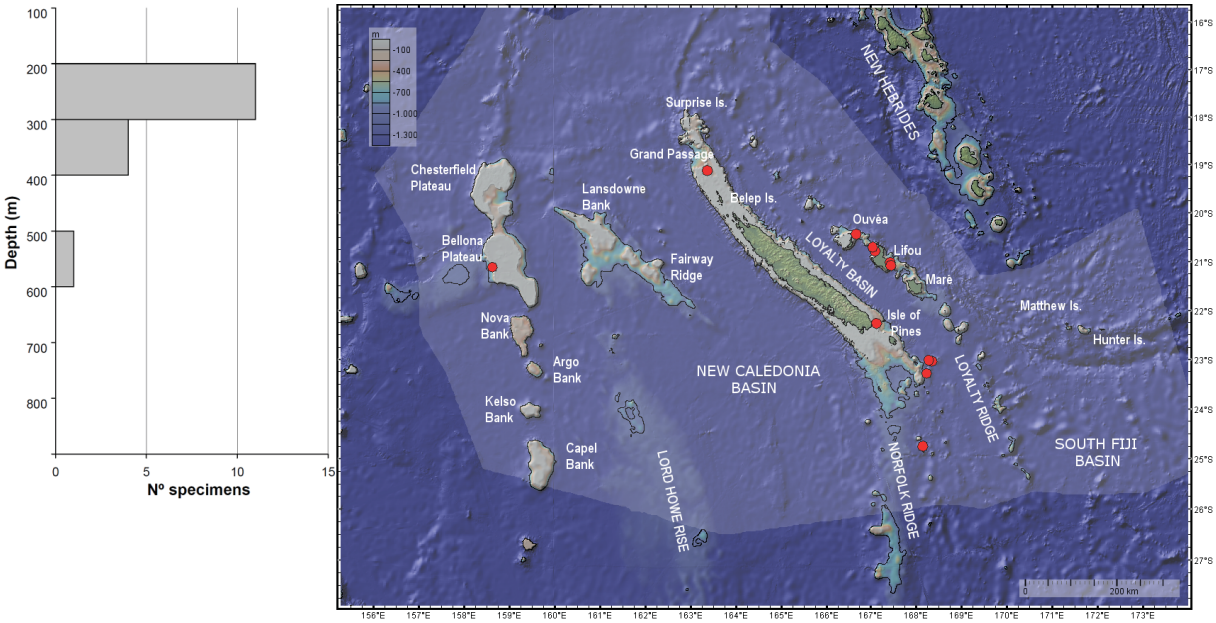

Fig. 90. Bathymetric range and distribution map for *Conus* (*Turriconus*) *excelsus* G.B. Sowerby III, 1908. Red circles indicate the points where the species was collected.

Remarks

Biconical shell, moderately large to large (maximum shell length 113 mm), with a very high and stepped spire. Protoconch multispiral of about 3 whorls (Fig. 89L). Last whorl white with irregular brown axial lines and brown spiral bands on each side of center, overlaid with spiral rows of alternating white spots and brown axial dashes. Radular tooth (Fig. 89M) with the anterior section shorter than the posterior section. Tooth serrated with 5–6 denticles arranged in one row becoming 2–3 rows below, ending on a very large pointed, tusk-shaped cusp. Barb very large, with the shape of a sickle. Blade reduced, indistinct, restricted to the apical portion (25–30% of the anterior section of the tooth). Basal spur absent or vestigial. Base rounded. The sequenced specimens of *C*. (*T*.) *excelsus* form a well supported clade within *Turriconus* (Fig. 2).

Conus* (*Turriconus*) *miniexcelsus (Olivera & Biggs, 2010)
Figs 2, 87I–K, N

Conus miniexcelsus Olivera & Biggs in Biggs *et al*., 2010: 5, figs 1–2, 4, 6, 8.

Turriconus miniexcelsus – Tucker & Tenorio 2013: 281.
Turriconus (*Turriconus*) *miniexcelsus* – Monnier *et al.* 2018a: 340.

Material examined

2 lots (2 specimens). See Supp. file 1.

Type material

Holotype
PHILIPPINES • 22 mm; Aliguay Island; 30–150 m depth; Marine Science Institute of the University of the Philippines (Fig. 87I).

Figured material

NEW CALEDONIA • 22 mm; Norfolk Ridge, Munida, off New Caledonia, stn DW3106; 23°02′ S, 168°21′ E; 180–220 m depth; 27 Oct. 2008; TERRASSES expedition; MNHN (Fig. 87J, N) • 32.3 mm; S Lansdowne, off New Caledonia, stn DW2639; 20º47′ S, 161º01′ E; 289–294 m depth; 22 Oct. 2005; EBISCO expedition; MNHN (Fig. 87K).

Geographical distribution and bathymetry

Japan (Ryu Kyu Islands) to the Philippines and Vietnam (Monnier *et al.* 2018a). Also present in Papua New Guinea, Solomon Islands and New Caledonia, where this species has been sampled in Coral Sea and Norfolk Ridge at depths between 180–294 m.

Remarks

Shell moderately small (maximum shell length 37 mm), biconical with a high spire of straight profile. Protoconch multispiral of about 3 whorls. Last whorl with flat spiral ribbons, white with two brown spiral bands, and a pattern of little brown square or rectangular spots. Radular tooth (Fig. 87N) with the anterior section much shorter than the posterior section. Tooth serrated with 4–5 small denticles arranged in one row, ending on a large, pointed cusp. Barb indistinct. Blade reduced or absent. Very small basal spur present on the rounded base. This species, resembling in shape a small specimen of *C*. (*T*.) *excelsus* (and hence its name), was initially reported from the Philippines, and its range has now been extended to many other localities including New Caledonia. It is distinct from *C*. (*T*.) *excelsus* as shown in the DNA phylogeny (Fig. 2), where one specimen from New Caledonia appears sister to another one from Papua New Guinea.

Table 1. Typical shallow-water (less than 100 m depth) species of cones identified among the deep-water lots sampled by TDSB expeditions.

Species	Nº of lots	Nº of specimens
Conasprella (*Conasprella*) *articulata* (G. B. Sowerby II, 1873)	2	3
Conasprella (*Conasprella*) *memiae* (Habe & Kosuge, 1970)	2	6
Conasprella (*Conasprella*) *tirardi* (Röckel & Moolenbeek, 1996)	4	4
Conus (*Darioconus*) *lamberti* Souverbie, 1877	2	2
Conus (*Harmoniconus*) *musicus* Hwass in Bruguière, 1792	1	1
Conus (*Harmoniconus*) *nanus* G. B. Sowerby I, 1833	1	2
Conus (*Leporiconus*) *granum* Röckel & Fischöder, 1985	1	1
Conus (*Lividoconus*) *floridulus* A. Adams & Reeve, 1848	1	1
Conus (*Mitraconus*) *cylindraceus* Broderip & G. B. Sowerby I, 1830	2	2
Conus (*Phasmoconus*) *exiguus* (Lamarck, 1810)	3	3
Conus (*Puncticulis*) *arenatus* Hwass in Bruguière, 1792	1	1
Conus (*Rhizoconus*) *mustelinus* Hwass in Bruguière, 1792	1	1
Conus (*Rhizoconus*) *pertusus* Hwass in Bruguière, 1792	4	4
Conus (*Splinoconus*) *corallinus* Kiener, 1847	2	2
Conus (*Splinoconus*) *viola* (Cernohorsky, 1977)	2	3
Conus (*Strategoconus*) *swainsoni* Estival & von Cosel, 1986	2	2
Conus (*Strategoconus*) *varius* Linnaeus, 1758	1	1
Conus (*Tesselliconus*) *eburneus* (Hwass in Bruguière, 1792)	1	1
Conus (*Tesselliconus*) *suturatus* (Reeve, 1844)	4	6
Conus (*Textilia*) *cervus* (Lamarck, 1822)	2	2 (fragments)
Conus (*Textilia*) *dusaveli* (H. Adams, 1872)	8	9
Conus (*Turriconus*) *acutangulus* (Lamarck, 1810)	3	3

Shallow water species of cones present in the TDSB lots

As mentioned earlier, New Caledonia hosts more than 100 species of cone snail species. Most of these species are widely distributed in the Indo-Pacific region and usually inhabit shallow waters (i.e., less than 100 m deep). Empty shells of these species having a typical shallow water habitat are occasionally found in deeper water, most likely due to translocation. These are not considered true components of the New Caledonia EEZ deep-water cone fauna. Certain species have an intermediate bathymetric range, and have been found alive both above and below the 100 m mark. These have been treated as components of the New Caledonia deep-water cone fauna and are discussed in detail above. We hereby include for reference a checklist of species present in the examined lots from the TDSB campaigns, which are not considered true components of the New Caledonian deep-water cone fauna (Table 1).

Discussion

In the present work, we have reviewed in detail the deep-water dwelling species of cone snails from New Caledonia and surrounding areas within the EEZ. This is the result of the examination of the material collected during MNHN research cruises over the last 40 years, within the framework of the Tropical Deep-Sea Benthos campaigns. We have examined about 2400 lots comprising more than 5000 specimens of cone snails. Only a small number of these lots contained material considered unidentifiable due to its poor conservation condition. On the other hand, a few lots contained specimens of cone snails which were collected in shallow water (i.e., less than 100 m depth), and were not treated in the present work. We have therefore covered a total of 2377 lots, which include 5113 specimens. Of these, 770 were collected in live condition, allowing for radular and DNA studies for the first time in several instances. Many of the empty shells corresponding to dead collected specimens were in good condition, with often well-preserved protoconchs and shell patterns. Even broken shells still showed sufficient characteristic features which allowed their identifications. We have been able to identify a total of 76 different species of cone snails among the lots examined. Twenty-two of these are well-known typical shallow water dwellers (Table 1). The empty shells of these species found in deep water are therefore presumed translocated specimens, which do not correspond to the deep-water cone fauna. Taking all this into consideration, we ended up with 2337 lots and 5064 specimens (767 collected live) corresponding to 54 species which are true components of the New Caledonian deep water cone fauna, and constitute the main subject of the present study. We must point out that this number of species is based solely on the material recovered by the MNHN expeditions. We are aware of the possible occurrence of at least some other species, such as *Conus* (*Klemaeconus*) *hirasei* Kuroda, 1956, which has been very scarcely reported from New Caledonia in deep water by some shell dealers and collectors. This species was not present among the material examined by us, and apart from very scattered references in commercial lists of shell dealers, there is no unequivocal confirmation for the occurrence of this species in the New Caledonia EEZ. Furthermore, we have been unable to find any records for specimens of *C.* (*K.*) *hirasei* from New Caledonia in public repositories. Hence, at this time we have excluded this species from our deep-water cone inventory. In any case, there is at least evidence for the presence of *C.* (*K.*) *hirasei* in Melanesia in deep water (Solomon Islands and Papua New Guinea, specimens collected by MNHN expeditions SALOMON 1, SALOMONBOA 3, and BIOPAPUA).

Figure 91 shows the taxonomic partition of the deep-water cones from New Caledonia.

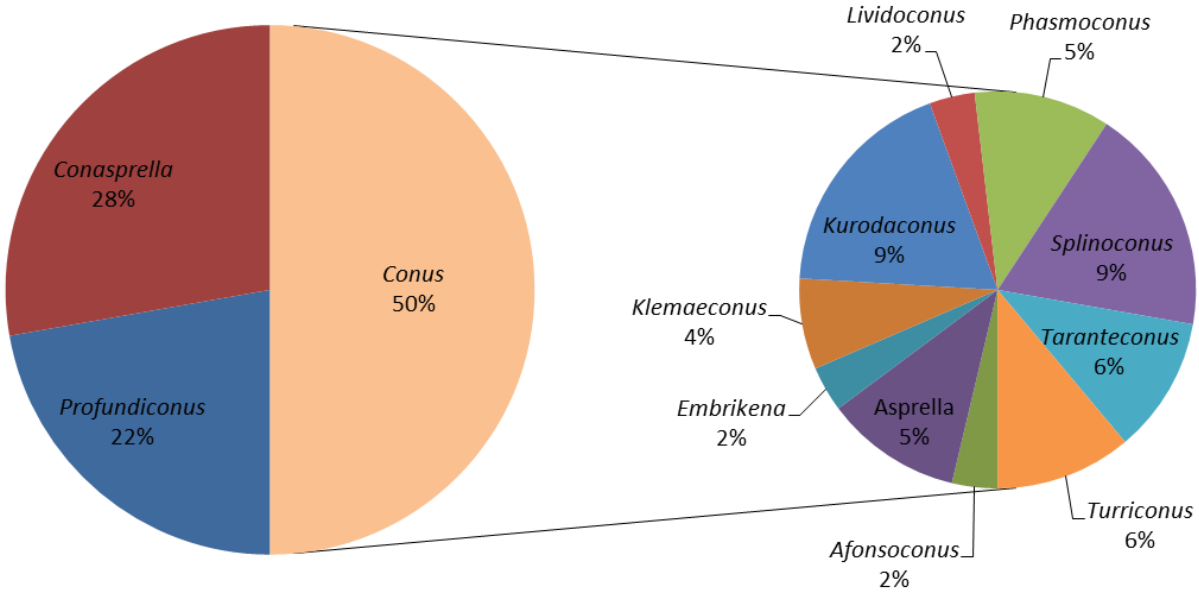

Fig. 91. Taxonomic partition of the deep-water cones from New Caledonia.

Species in the genus *Profundiconus* represent 22%, whereas those in *Conasprella* 28%, and in *Conus* 50%. There are representative species of three subgenera within *Conasprella*, and of 10 subgenera in *Conus*. With respect to the relative abundance, Fig. 92 represents the number of specimens present for each of the deep-water species found in the lots examined.

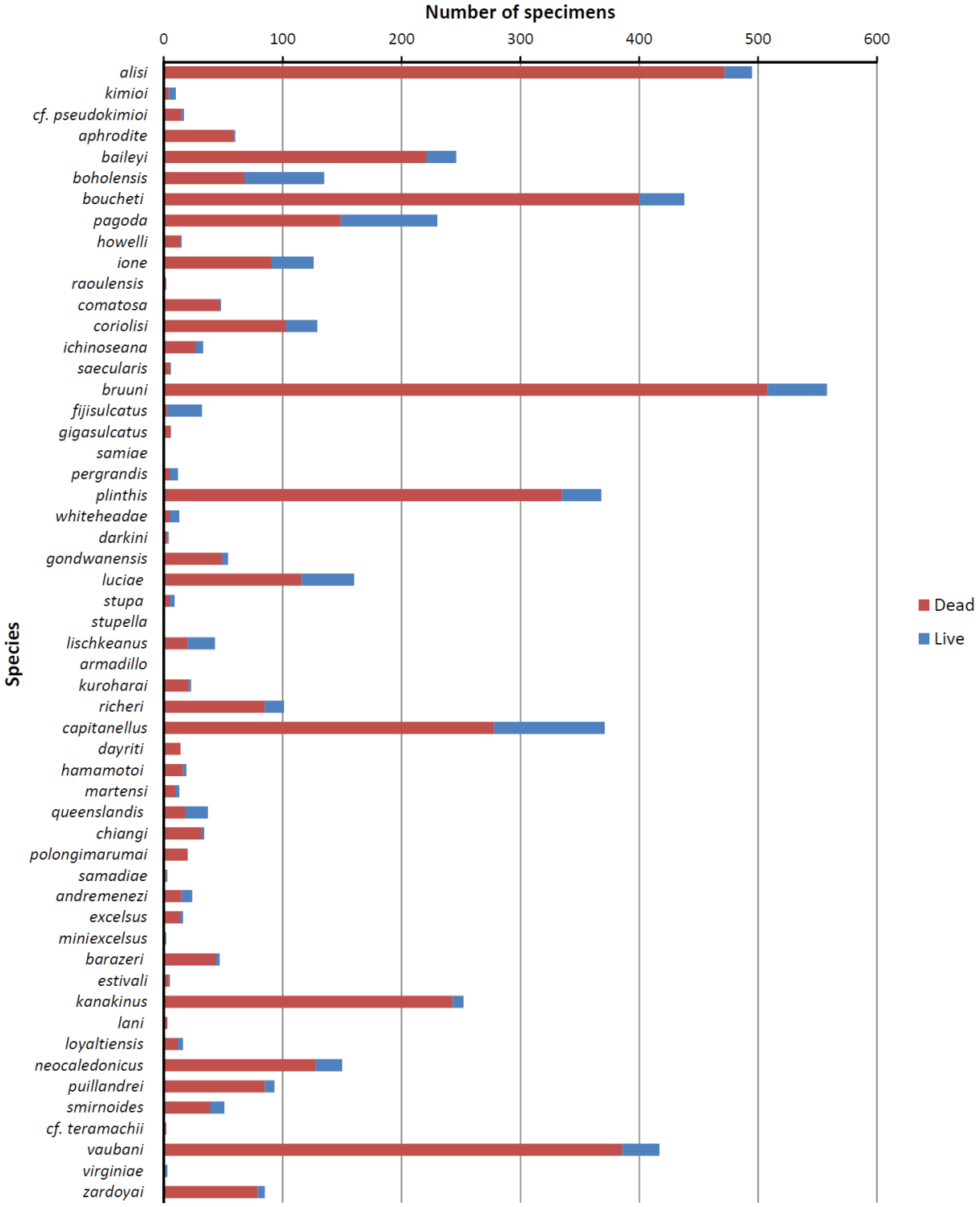

Fig. 92. Number of specimens of New Caledonia deep-water cone species found in the lots examined in the present work.

Thus, the most abundant species in terms of specimens sampled (more than 400 specimens) were *C.* (*A.*) *bruuni*, *C.* (*B.*) *alisi*, *C* (*C.*) *boucheti* and *P. vaubani*. Other abundant species present (more than 300 specimens) were *C.* (*K.*) *plinthis* and *C.* (*S.*) *capitanellus*. If we translate the taxonomic composition into number of specimens sampled per genus, we now find that individuals of species of *Profundiconus*

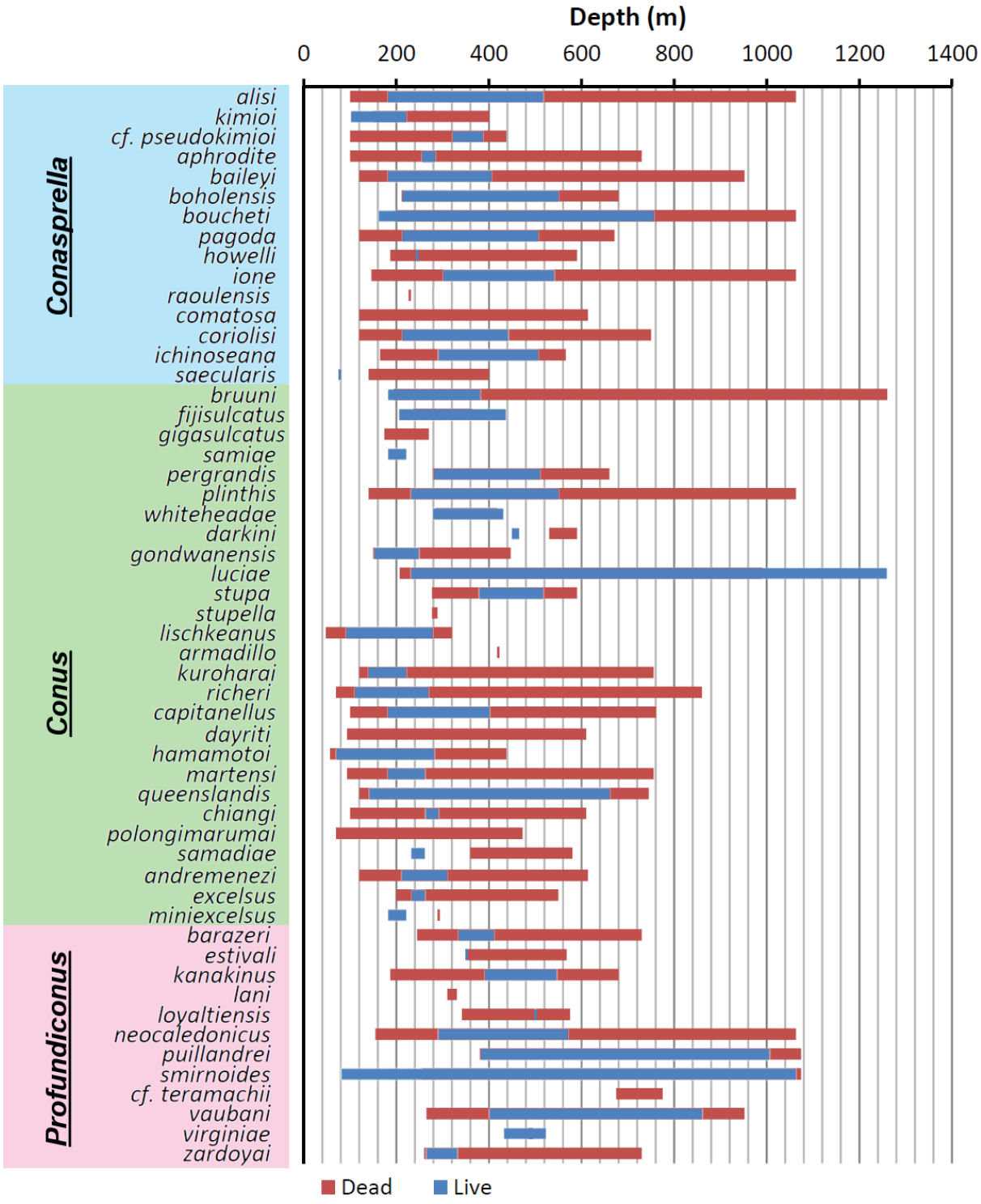

Fig. 93. Bathymetric distribution of New Caledonia deep-water cone species, showing live and dead collected depth ranges.

represent 22% of the total number of specimens, whereas specimens of species of *Conus* and *Conasprella* are equally represented (38 % and 39%, respectively). Figure 93 represents the bathymetric distribution of the different species of cone snails, both in live and dead collected condition.

At least one species has been found in live condition at depths beyond 1000 m, namely *P. puillandrei* (1000–1005 m). Other species such as *P. smirnoides* and *C.* (*K.*) *luciae* have been sampled alive from depths in the range from 347–1063 m and 315–1260 m, whereas *P. vaubani* reaches 860 m depth. These results significantly expand the depth ranges of species in both dead and live condition compared to the data presented in Röckel *et al.* (1995a), due to the much larger pool of samples included in the study.

Finally, we have identified 11 deep-water species in this study as endemic to the New Caledonia EEZ out of 54, representing 20.3%. We might add some shallow water endemic species, such as *C. swainsoni* and *C. lamberti*, elevating the number of endemics to 13 out of 76 species examined in the present work, leading to an overall 17%. That represents a high level of endemic cone species, equal to or even higher than that observed in other areas of high endemicity of cone snails such as the Atimo Vatae region in southern Madagascar (Monnier *et al.* 2018b). The continuous sampling efforts within the framework of the TDSB campaigns to uncover deep-water biodiversity have paid off and allowed for the discovery of many new taxa. Furthermore, these campaigns have recently provided the first insights into the venom composition of deep-water cone snails. The deep-water habitat complicates sampling, and the recovery of live specimens suitable for venom profiling is generally exceptional. Even so, the conopeptide repertories of the species *Profundiconus neocaledonicus*, *Profundiconus* cf. *vaubani* and *Conasprella* (*Fusiconus*) *coriolisi* from New Caledonia have recently been determined by means of transcriptomic analysis of their venom glands (Fassio *et al*. 2019; Fedosov *et al*. 2021). The venom of these species, which belong to divergent lineages within Conidae, is highly distinct from that of other cone snails, and therefore important for examining the venom evolution in the Conidae. The proteomic analysis of the venom of these species is currently being carried out in order to validate the results from the transcriptomic analysis, and will be reported in due course.

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Supp. file 1. Detailed list containing the collection data for all of the specimens examined in the present work. https://doi.org/10.5852/ejt.2023.896.2291.9901

Supp. file 2. Specimen data and sequences deposited in BOLD (Barcode of Life Datasystem) and GenBank. https://doi.org/10.5852/ejt.2023.896.2291.9903

Supp. file 3. cox1-based Bayesian molecular phylogeny. Posterior probabilities (>0.95) and bootstraps values (>90) from the ML analysis are provided for each node.
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