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Additional new species of marine annelids from Clipperton Island (Nereididae: Pilargidae: Sabellariidae)

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Abstract. We herein present three additional new species of marine annelids collected during the Expédition Clipperton (Dec. 2004–Apr. 2005). A new species of nereidid polychaete, *Perinereis hourdezi* sp. nov. differs from *P. websteri* Conde-Vela, 2022, described from Bermuda, by having most parapodia with neuropodial postchaetal lobes (missing in *P. websteri*), jaws with up to 5 teeth (up to 10 in *P. websteri*), and Areas VII–VIII with 24 paragnanths in 3 regular bands (16 paragnaths in 2 rows in *P. websteri*). A new species of pilargid polychaete, *Synelmis meziane* sp. nov. differs from *S. kirkegaardi* Salazar-Vallejo, 2003 described from the Eastern Atlantic, because it has median segments with parapodial cirri fusiform mucronate (tapered in *S. kirkegaardi*), and ventral cirri 2 × as long as wide (as long as wide in *S. kirkegaardi*). A new species of sabellariid polychaete, *Lygdamis mariae* sp. nov. differs from *L. nesiotes* (Chamberlin, 1919) described from the Tuamotu Islands because it has outer paleae solid (annulate in *L. nesiotes*), and 14 pairs of inner paleae (17 in *L. nesiotes*). Keys to identify all species of group 1A (Hutchings *et al.* 1991) of *Perinereis*, and to all species in *Synelmis* and *Lygdamis* are also included.

Keywords. *Perinereis*, *Lygdamis*, *Synelmis*, oceanic islands, morphology.

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Introduction

Oceanic islands have been attractive for marine scientists since Darwin's and Dana's early studies on coral reefs (Johnson *et al.* 2018). Because of their isolation, the study of their fauna stimulated research on endemism and extinctions; one of the first explanations included the effect of the extent of sea surface temperature decline during the Pleistocene, such Southern Hemisphere islands supposedly had less temperature variations and higher endemism (Briggs 1966). However, after a closer examination

of several faunistic groups, ocean currents, and dispersal capabilities, McDowall (1968) concluded that endemism should also depend on distance, dispersal and ocean currents. There are further complications and the study of these processes led to the MacArthur and Wilson theory of island biogeography in 1967. Once the geologic dynamics are taken into account, the contemporary complexities for the biota of islands require further efforts in conservation and management (Matthews & Triantis 2021).

Among the marine invertebrates, the molluscs are one of the best studied throughout the world. However, one of the most intriguing issues is in the proportion of gastropods to bivalves in different localities; for example, there are 69% gastropod species and 31% bivalve species in tropical continental islands, and these figures become 83% for gastropods and 17% for bivalves in tropical oceanic islands (Kohn 1971). This variation must depend on a reduction of available substrates in oceanic islands, because both groups have similar dispersal capabilities. For marine annelids, we do not have such fine analysis mostly because there are no similar collecting efforts for all groups of marine invertebrates, which usually concentrate on one or a few groups at a time.

Recent French expeditions differ by trying to collect everything from any selected locality they wish to study. Clipperton Island (10°17′ N, 109°13′ W) is in the Eastern tropical Pacific, 1280 km off Western Mexico, and is a low-relief atoll with a rock outcrop 29 m high, and an inner closed lagoon (Charpy *et al.* 2010). Not surprisingly, the "Expédition Clipperton" organized by Jean-Louis Etienne, and visiting the island from December 2004 to April 2005 has been regarded as "the most serious effort to assess the molluscan fauna of Clipperton" (Kaiser 2007: 8–9). The complete volume of the expedition (Charpy 2009) includes information for many different subjects and biological groups.

As indicated elsewhere (Salazar-Vallejo 2022), the marine annelids were collected by French and Mexican colleagues. The French collection was deposited in the Muséum national d'Histoire naturelle, Paris, and was made available for study, and in two articles, an iphionid, widely distributed species (Piotrowski *et al.* 2023), and new hesionid and phyllodocid species (Salazar-Vallejo 2022) were documented.

Nereidids are among the most common marine annelids in intertidal and subtidal substrates; most are free-living, and a few can build some tubes among algae (de León-González *et al.* 2021). Pilargids are rarely abundant and most species live in soft bottoms (Salazar-Vallejo & Rizzo 2021). Sabellariids live always attached to hard substrates, usually in mixed shores, although some have been seldom found living on other marine organisms (Chávez-López & Bastida-Zavala 2021).

Solís-Weiss & Hernández-Alcántara (2009) reported 23 species from Clipperton Island. Among the families covered in this contribution, they listed *Perinereis* sp. with small, damaged specimens, no pilargids, and three specimens of one sabellariid species, *Lygdamis nesiotes* (Chamberlin, 1919).

Dean *et al.* (2012) reported 106 species from Cocos Island, Costa Rica, including eight species of nereidids (no *Perinereis* Kinberg, 1865), one pilargid, *Synelmis gorgonensis* (Monro, 1933), and among sabellariids, they reported an undescribed species of *Gesaia* Kirtley, 1994.

In this contribution, we present some new species belonging to the Nereididae de Blainville, 1818, Pilargidae de Saint-Joseph, 1899, and Sabellariidae Johnston, 1865; three new species are described: *Perinereis hourdezi* sp. nov. (Nereididae), *Synelmis mezianei* sp. nov. (Pilargidae), and *Lygdamis mariae* sp. nov. (Sabellariidae). Keys are included to identify all species of group 1A of *Perinereis*, and all species of *Synelmis* Chamberlin, 1919 and *Lygdamis* Kinberg, 1867.

Material and methods

Specimens were collected by hand during the J.-L.-Étienne Expedition to Clipperton Island in 2005. Specimens were fixed in a formalin sea-water solution, and after removal of excess fixative, were stored in 80% ethanol. Temporal staining with Methyl green or Shirlastain-A was used to improve visibility of some features. Series of digital photographs were compressed with HeliconFocus. Type material is deposited in the Muséum national d'Histoire naturelle, Paris, France (MNHN), El Colegio de la Frontera Sur, Unidad Chetumal, México (ECOSUR), and the Laboratorio de Biosistemática, Facultad de Ciencias Biológicas, Universidad Autónoma de Nuevo León (UANL).

The descriptions of the species follow Teixeira *et al.* (2025) for nereidids, Salazar-Vallejo (2003) for pilargids, and Capa *et al.* (2015) for sabellariids. For the latter, opercular paleae were removed completely from the muscular peduncle for measuring their angle or inner features; complete parapodia were removed from the second parathoracic chaetiger and from a thoracic chaetiger for observing chaetae. Other sabellariid features are compiled in Table 1.

Results

Taxonomy

Class Polychaeta Grube, 1850
Subclass Errantia Audouin & Milne-Edwards, 1832
Order Phyllodocida Dales, 1962
Suborder Nereidiformia Fauchald, 1977
Family Nereididae de Blainville, 1818
Subfamily Nereidinae de Blainville, 1818

Genus ***Perinereis*** Kinberg, 1865

Perinereis Kinberg, 1865: 175.

Type species

Perinereis novaehollandiae Kinberg, 1865, by subsequent designation (Hartman 1948: 72), junior synonym of *Perinereis amblydonta* (Schmarda, 1861) after Ehlers (1904: 28).

Remarks

Nereidids with pharynx armed with conical paragnaths on maxillary and oral rings, some species with bar-shaped paragnaths on Area IV, with transverse bars on Area VI (in a variable number), short or long. Notopodia with homogomph spinigers, neuropodia with homogomph and heterogomph spinigers and heterogomph falcigers with short and long blades. *Perinereis* has been divided into informal groups and subgroups depending on the ornamentation in Area VI of the pharynx, as well as on the development of the dorsal ligule of the posterior notopodia (Hutchings *et al.* 1991). Recently, Villalobos-Guerrero (2019) included novel diagnostic characters of the marks in the pharynx between the right and left Area VI and Area V. In addition, he re-described and included in *Perinereis* two species previously included in *Nereis* and *Neanthes* Kinberg, 1865. Villalobos-Guerrero *et al.* (2021) reviewed the species of Group 2 of *Perinereis* (which present two bars in Area VI), and transferred three species to *Perinereis.* A recent contribution by Teixeira *et al.* (2025) included the descriptions of 13 new species, increasing their number to 89 species, being the second largest genus of Nereididae in number of species.

Distribution

The species of *Perinereis* are mainly distributed in the intertidal to the subtidal zone, in tropical to temperate localities in soft bottoms, inhabiting among sessile organisms, fissures between rocks, between patches of mytilid mollusks, or other sessile organisms. The deepest species recorded is from deep waters off Greece, *Perinereis tenuisetis* Fauvel, 1915, collected in a depth of 3848 m (Faulwetter *et al.* 2017).

Perinereis hourdezi sp. nov.
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Fig. 1

Diagnosis

Perinereis with posterior eyes completely exposed; tentacular belt 1.4× as long as first chaetiger; longest tentacular cirri reaching chaetigers 6–11; jaws with 3–5 teeth; pharyngeal area VI with shield-shaped bars, areas VII–VIII with 21–26 paragnaths in three transverse rows; posterior parapodia with enlarged glandular masses along dorsal ligules bases.

Etymology

The species is named after Dr Stéphen Hourdez in recognition of his contributions on polychaetes, especially of those of hydrothermal vents, and because he participated in the expedition to Clipperton Island and collected part of the specimens for describing this species.

Type material

Holotype

FRANCE • mature ♀ (complete spec.); Clipperton Island, stn 33; 10°18.27′ N, 109°14.00′ W; depth 1 m, platform; 25 Jan. 2005; L. Albenga and L. Dugrais leg.; MNHN IA-2000-2107.

Paratypes

FRANCE • 3 ♀♀ (1 complete and 2 incomplete specs); Clipperton Island, stn 33; 10°18.27′ N, 109°14.00′ W; depth 1 m, platform; 25 Jan. 2005; L. Albenga and L. Dugrais leg.; UANL 8292 • 3 ♀♀ (1 complete and 2 incomplete specs); Clipperton Island, stn 33; 10°18.27′ N, 109°14.00′ W; depth 1 m, platform; 25 Jan. 2005; L. Albenga and L. Dugrais leg.; ECOSUR 317 • 8 ♂♂ (5 complete and 3 incomplete specs); Clipperton Island, stn 27; 10°18.01′ N, 109°13.87′ W; depth 1 m, platform; 23 Jan. 2005; S. Hourdez and K.-L. Kaiser leg.; in front of Camp Bougainville; ECOSUR 318.

Description (holotype)

Body. Mature female, complete, subcylindrical; 43 mm long, 2 mm wide (without parapodia), 111 chaetigers. Dorsum yellowish, with two light brown lateral lines along body, and a pale middorsal line along 51 chaetigers, thereafter brownish to body end. Venter homogeneously yellowish.

Prostomium. Slightly longer than wide; two pairs of eyes in trapezoidal arrangement, gap between both pairs 1.3 × as wide as diameter of posterior pair. Anterior pair in lateral position, oval, with eye diameter as wide as antennae basal diameter, with gap between eyes 6 × as wide as eye diameter; lenses visible, reddish, rounded, placed anterolaterally covering about 80% of eye. Posterior pairs rounded, blackish, minute, about $^{1}/_{20}$ as wide as prostomial width, with diameter 3 × as wide as that of antennae basis, not covered by tentacular belt; with gap between eyes 9 × as wide as eye diameter. Palpophores longer than wide, palpostyle rounded. Median notch extended to middle of prostomium, to level of anterior pairs of eyes.

Tentacular belt. 1.4 × as long as first chaetiger; anterior margin not covering posterior eyes. Tentacular cirri corrugate to articulate, tips of two right lateral cirri broken, posterior dorsal cirri reaching chaetiger 6 (Fig. 1A).

Antennae. Conical, tapering, wider basally, tips not reaching palpophore ends, 3.3 × as long as wide at basal region; antennae separated by space as wide as half basal diameter of antennae.

Pharynx. Not exposed, ventrodistal incision needed. Jaws amber with 5 accessory denticles. Paragnaths light brown in color, consisting of uniform-base cones, except shield-shaped bars on Area VI, those of maxillary ring smallest. Formula as follow: maxillary ring: paragnaths conical. AI = 2 in a line; AII = 4 left, 6 right; AIII = 7 paragnaths in central group, and a pair of paragnaths in a line at each side; AIV = 8 left, 10 right. Oral ring: paragnaths conical and smooth bars. AVI-V-VI pattern, υ-shaped (after Villalobos-Guerrero, 2019); AV = 3 conical paragnaths in inverted triangle; AVI= one long shield-shaped bar to each side; VII–VIII = 24 paragnaths with wide basis in three regular bands, anterior band consisting of seven paragnaths only in ridge position, middle band with 11 cones in furrow and ridge, posterior band with six on each ridge position.

Chaetigers 1–2. With neuraciculae only; with both noto- and neuraciculae thereafter.

Notopodia. Consisting of dorsal cirrus (comprising proximal cirrophore and distal cirrostyle), dorsal ligule, and median ligule in biramous parapodia.

Anterior parapodia (Fig. 1C). Dorsal cirrophore with two light brown glandular areas, proximal one smaller. Dorsal cirrostyle longer than dorsal ligule, 1.5 × as long as ventral cirri. Dorsal ligule triangular, with blunt tip, 1.4 × as long as wide. Median ligule subconical, blunt, 1.4 × as long as wide, similar size to dorsal ligule. Neuroacicular ligule with superior lobe shorter than inferior lobe, both blunt. Neuropodial prechaetal lobe missing, postchaetal one present. Ventral ligule subconical, 3 × as long as wide, slightly longer than ventral cirri. Notochaetae 5 homogomph spinigers. Supracicular neurochaetae 5 homogomph spinigers, and 3 heterogomph falcigers with blunt tips and spinulose inner edge, blade 6 × as long as wide (Fig. 1F). Infracicular neurochaetae 1 heterogomph spiniger and 11 heterogomph falcigers, similar than supracicular ones, decreasing slightly in size towards ventral part.

Median parapodia (Fig. 1D). Dorsal cirrophore with four glandular patch, proximal one smaller, rounded, distal one larger. Dorsal cirrostyle 1.7 × as long as dorsal ligule. Dorsal ligule triangular, tapered, 1.6 × as long as wide, with elongated glandular area. Median ligule subconical, blunt, 2 × as long as wide, slightly longer than dorsal ligule. Neuroacicular ligule rounded anteriorly, with superior lobe slightly visible. Neuropodial prechaetal lobe missing, postchaetal one present. Ventral ligule subulated, 2.5 × as long as wide, slightly longer than ventral cirri. Notochaetae 7 homogomph spinigers. Supracicular neurochaetae 5 homogomph spinigers and 1 heterogomph falcigers, blade 5 × as long as wide; infracicular neurochaetae 1 homogomph spiniger and 7 heterogomph falcigers, blade 5.2 × as long as wide (Fig. 1G).

Posterior parapodia (Fig. 1E). Dorsal cirrophore with two dark fused glandular areas. Dorsal cirrostyle 1.5 × as long as dorsal ligule, inserted medially. Dorsal ligule triangular, tapered, 1.8 × as long as wide, enlarged glandular masses covering base of ligule. Median ligule subconical, blunt, 2.5 × as long as wide, larger than dorsal one. Neuroacicular ligule triangular, longer than wide. Neuropodial prechaetal lobe missing, postchaetal one present. Superior and inferior lobes not seen; ventral ligule subtriangular, tapered, 2.9 × as long as wide. Ventral cirri similar in size to ventral ligule. Notochaetae 4 homogomph spinigers. Supracicular neurochaetae 6 homogomph spinigers and 2 heterogomph falcigers one of them broken, blade 5.6 × as long as wide (Fig. 1H). Infracicular neurochaetae 1 heterogomph spiniger, and 4 heterogomph falcigers, blades 6 × as long as wide (Fig. 1I).

Posterior region. Pygidium with terminal anus and pair of long anal cirri, as long as last 4–5 chaetigers (Fig. 1B).

Oocytes. Brownish, only present in posterior parapodia, each about 90 µm in diameter, distorted inside right margin of Fig. 1E.

Variation

Complete paratypes are 35–60 mm long, 1.2–2.2 mm wide, with 100–114 chaetigers. A specimen with one paragnath on Area I, another specimen with 3 paragnaths in a line, all other specimens with 2 paragnaths in a line; Area II with 6 paragnaths in two lines in all specimens in each side; Area III with a central group of 8 to 12 small paragnaths and one or two paragnaths on each side. Area IV with 10–11 paragnaths at right side and 10–12 at left side; Area V invariably with three large paragnaths in inverted triangle; Area VI with one large bar on each side, except in two specimens in one of them, the left bar was fragmented into two pieces. Longer tentacular pair of cirri reaching chaetigers 7–11.

Distribution

This species is known only from Clipperton Island.

Remarks

The original proposal of the species group of *Perinereis* by Hutchings *et al.* (1991) was modified by Prajapat *et al.* (2024), by transferring 10 species from group 1B to group 1A without giving arguments; the species transferred were *P. barbara* (Monro, 1926) from Port Jackson, Australia; *P. capensis* (Kinberg, 1865) from Good Hope Cape, South Africa; *P. iranica* Bonyadi-Naeini, Rastegar-Pouyani, Glasby & Rahimian, 2018 from Iran, Persian Gulf; *P. kaustiana* Teixeira, Fourreau, Sempere-Valverde & Carvalho, 2024 from Saudi Arabia, Gulf of Aqaba; *P. nigropunctata* (Horst, 1924) from Malaysia; *P. obfuscata* (Grube, 1878) from Philippines; *P. perspicillata* (Grube, 1878) from Philippines; *P. pictilis* Glasby, Nu-Wei & Gibb, 2013 from Queensland, Australia; *P. striolata* (Grube, 1878) from Philippines; *P. suluana* (Horst, 1924) from Pulu Tongkil, Sulu Archipielago and *P. villabosi* Rioja, 1947 from Western Mexico. Except for *P. iranica, P. obfuscata, P. perspicillata, P. pictilis,* and *P. striolata*, we prefer to leave the rest of the species in subgroup 1B due to the notable development of the posterior parapodia explained in the descriptions or redescriptions of these species.

Perinereis hourdezi sp. nov. belongs to the informal species group proposed by Hutchings *et al.* (1991) characterized by having a transverse bar in Area VI, and dorsal cirrophore not greatly expanded (Group 1A); currently there are 27 species considered in this group. The group includes *P. arabica* Mohammad, 1971 described from Kuwait*; P. atlantica* (McIntosh, 1885) from Cape Verde Islands; *P. calmani* Monro, 1926 from Eastern Australia and China Sea; *P. cultrifera* Grube, 1840 from Naples, Mediterranean Sea; *P. falsovariegata* Monro, 1933b from Still Bay, South Africa; *P. faulwetterae* Teixeira, Langeneck, Grosse, Bakken & Ravara, 2025 from the Mediterranean Sea; *P. floridana* Ehlers, 1868 from Florida, North America; *P. helleri* Grube, 1878 from the Philippines; *P. houbihuensis* Hsueh, 2024 from Taiwan; *P. iranica* Bonyadi-Naeini *et al.*, 2018 from Abu Musa Island, Persian Gulf; *P. louizomarum* Rezzag Mahcene, Villalobos-Guerrero, Kurt, Denis & Dass, 2023 from Algeria; *P. longdongwanensis* Hsueh, 2024 from Taiwan; *P. minerva* Teixeira, Langeneck, Grosse, Bakken & Ravara, 2025 from the Mediterranean Sea; *P. misrai* Prajapat, Villalobos & Vachhrajani, 2024, from India; *P. muscoi* Teixeira, Langeneck, Grosse, Bakken & Ravara, 2025 from the Mediterranean Sea; *P. obfuscata* (Grube, 1878) from the Philippines; *P. pangcahae* Hsueh, 2024 from Taiwan; *P. perspicillata* (Grube, 1878) from the Philippines; *P. rullieri* Pilato, 1974 from Sicily, Catania, Mediterranean Sea; *P. pseudocultrifera* Hsueh, 2024 from Taiwan; *P. seurati* Gravier 1905 from Gambier Islands in freshwater; *P. striolata* (Grube, 1878) from the Philippines; *P. taitungensis* Hsueh, 2024 from Taiwan; *P. taorica* Langerhans, 1881

from the Canary Islands; *P. tenuisetis* Fauvel, 1915 from the Mediterranean Sea; *P. twobae* Teixeira, Langeneck, Grosse, Bakken & Ravara, 2025 from the Mediterranean Sea; and *P. websteri* Conde-Vela 2022 from Bermuda.

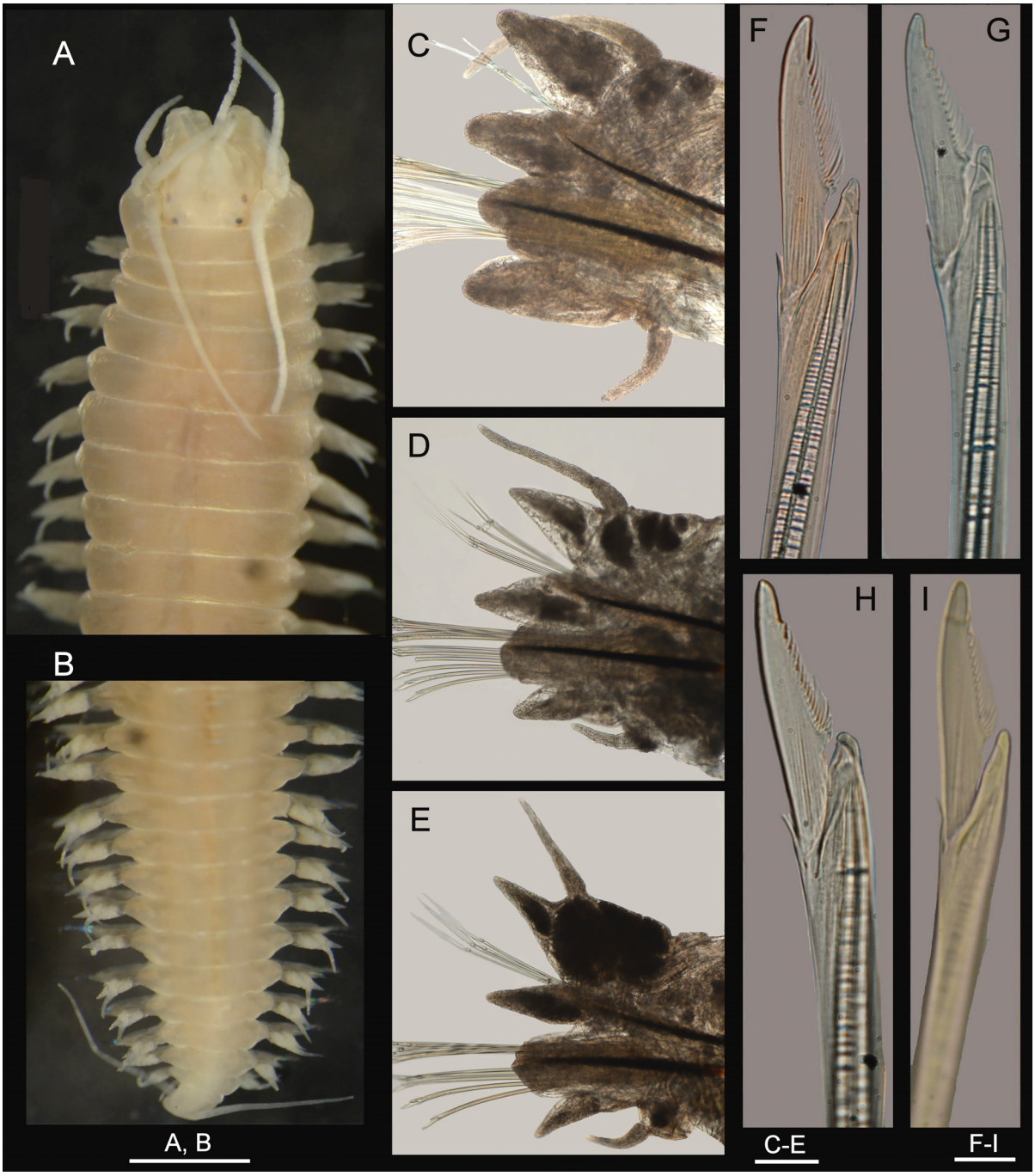

Fig. 1. *Perinereis hourdezi* sp. nov., holotype, ♀ (MNHN IA-2000-2107). **A**. Anterior end, dorsal view. **B**. Posterior end, dorsal view. **C–E**. Parapodia of chaetigers 11, 42 and 80, anterior view, repeectively. **F**. Supracicular neuropodial heterogomph falciger, chaetigers 11. **G**. Infracicular neuropodial heterogomph falciger, chaetiger 42. **H**. Supracicular neuropodial heterogomph falciger, chaetiger 80. **I**. Infracicular neuropodial heterogomph falciger, chaetiger 80. Scale bars: A = 1 mm; B = 1 mm; C–E = 250 µm; F–I = 15 µm.

Perinereis hourdezi sp. nov. resembles *P. cultrifera*, *P. helleri*, *P. misrai, P. rullieri, P. taitungensis*, *P. rullieri, P. taorica* and *P. websteri* by having Area III with 2–3 paragnaths in line on both side of the central area, as well as 3 paragnaths in a triangular arrangement over Area V. However, *P. hourdezi* as well as *P. misrai, P. rullieri* and *P. websteri* do not present notopodial prechaetal lobe; *P. hourdezi* can be separated from these species because it has a short neuropodial postchaetal lobe on all parapodia.

Solís-Weiss & Hernández-Alcántara (2009: 251, 255) recorded *Perinereis* sp. for Clipperton Island, after 7 anterior fragments of juvenile specimens collected in their station 2, in the west side of the island. Their specimens could belong to this newly described species, but because it was not illustrated and the specimens were not available, we cannot clarify their status.

Key to the species of group 1A of Perinereis Kinberg, 1865

(after Hutchings *et al.* 1991, modified by Prajapat *et al.* 2024)

1. Dorsal cirri short, barely or not protruding beyond distal region of dorsal ligule in mid-body parapodia 2
– Dorsal cirri long, protruding distinctly beyond distal region of dorsal ligule in mid-body parapodia 23

2. Notopodial prechaetal lobe present 3
– Notopodial prechaetal lobe absent 18

3. Neuropodial postchaetal lobe present throughout body 4
– Neuropodial prechaetal lobe absent 6

4. Acicula light yellow; Area V without paragnaths; neurochaetae with homogomph falcigers ..... ***P. tenuisetis*** (Fauvel, 1915) (Italy)
– Aciculae dark brown or black; Area V with paragnaths; neurochaetae with heterogomph falcigers 5

5. Areas VII–VIII with four irregular bands of paragnaths; Area III without laterally isolated paragnaths; Area I with 0–2 paragnaths; subacicular neurochaetae with homogomph spinigers ..... ***P. arabica*** Mohammad, 1971 (Kuwait)
– Areas VII–VIII with a line of 3–6 paragnaths; Area III without laterally isolated paragnaths; Area I with 16 paragnaths in group; subacicular neurochaetae with heterogomph spinigers ..... ***P. taorica*** Langerhans, 1881 (Madeira)

6. Area III with laterally isolated paragnaths 7
– Area III without laterally isolated paragnaths 13

7. Area V with paragnaths 8
– Area V without paragnaths .....***P. pseudocultrifera*** Hsueh, 2024 (Taiwan)

8. Area V with only one paragnaths 9
– Area V with 2 or more paragnaths 11

9. Area I with one paragnath; Area III with 6–7 paragnaths; Area VI with a shield-shaped bar ....***P. minerva*** Teixeira, Langeneck, Grosse, Bakken & Rava, 2025 (Italy)
– Area I with numerous paragnaths; Area III with more than 10 paragnaths; Area VI with a crescent-shaped bar 10

10. Posterodorsal tentacular cirri reaching chaetiger 8.2 × as long as palps; Area I with 4 or more paragnaths ..... ***P. striolata*** (Grube, 1878) (Philippines)
– Posterodorsal tentacular cirri reaching chaetiger 5, about as long as palps; Area I with 1 paragnath ..... ***P. obfuscata*** (Grube, 1878) (Philippines)

11. Dorsal cirrus subequal or slightly shorter than dorsal ligule in middle parapodia 12
– Dorsal cirrus slightly longer than dorsal ligule in middle parapodia; notopodial prechaetal lobe present throughout body; posterodorsal tentacular cirri reaching chaetiger 5–8; Area I with one paragnath; Area V with 3 paragnaths in triangle; ridge of areas VI–V–VI with U-shaped pattern .... ***P. rullieri*** Pilato, 1974 (Sicily, Italy)

12. Posterodorsal tentacular cirri reaching chaetiger 4–5; jaws with 4–5 teeth; Area VI with conical shield-shaped bar; ridge of areas VI–V–VI with π-shaped pattern .... ***P. cultrifera*** (Grube, 1840) (Italy)
– Posterodorsal tentacular cirri reaching chaetiger 2; jaws with 3 teeth; Area VI with rectangular-shaped type bar; ridge of areas VI–V–VI with ɔc-shaped pattern ..... ***P. taitungensis*** Hsueh, 2024 (Taiwan)

13. Postero-dorsal tentacular cirri reaching chaetiger 2–3 14
– Postero-dorsal tentacular cirri reaching chaetiger 4 16

14. Area I with 2 paragnaths in a line; Area V with 0–1 paragnaths; jaws with up to 5 teeth 15
– Area I with 5 paragnaths in group; Area V with 4 (4–16) paragnaths; jaws with up to 3 teeth .... ***P. longdongwanensis*** Hsueh, 2024 (Taiwan)

15. Area V with 1 paragnath; Area VI with a smooth-shaped bar; with neuropodial postchaetal lobe ..... ***P. houbihuensis*** Hsueh, 2024 (Taiwan)
– Area V without paragnaths; Area VI with crescent-shaped bar; without neuropodial postchaetal lobe ..... ***P. calmani*** (Monro, 1926) (Australia and MacClesfield Bank)

16. Posterodorsal tentacular cirri reaching chaetiger 5–6; jaws with up to 6 teeth; Area III with no more than 7 paragnaths 17
– Posterodorsal tentacular cirri reaching chaetiger 11; jaws with 11 teeth; Area III with 10–15 paragnaths ..... ***P. seurati*** Gravier, 1905 (Gambier Islands, in freshwater)

17. Jaws with 0–3 teeth; Area V without paragnaths, rarely with 1–2; Area VI with crescent-shaped bar ..... ***P. louisomarum*** Rezzag Mahcene, Villalobos-Guerrero Kurt, Denis & Dass, 2023 (Algeria)
– Jaws with 5–6 teeth; Area V with 3 paragnaths in triangle; Area VI with chevron-shaped bar; ridge of areas VI–V–VI with U-shaped pattern .... ***P. muscoi*** Teixeira, Langeneck, Grosse, Bakken & Rava, 2025 (Italy, Salento, Ionian Sea)

18. Area V with 1 paragnath 19
– Area V with 3 or more paragnaths 21

19. Area I with 1 paragnath; Area III without laterally isolated paragnaths .... ***P. atlantica*** (M'Intosh, 1885) (São Vicente, Cape Verde)
– Area I with 2 or more paragnaths; Area III with laterally isolated paragnaths 20

20. Area I with 2 paragnaths; ridge of areas VI–V–VI with λ-shaped pattern; Area VI with smooth shaped bar ..... ***P. floridana*** Ehlers, (1868) (Florida, USA)
– Area I with 4 (rarely 2–5) paragnaths; Area VI–V–VI with ɔc-shaped ridge pattern; Area VI with bar type chevron-shaped ..... ***P. pangcahae*** Hsueh, 2024 (Taiwan)

21. Postero-dorsal tentacular cirri reaching chaetiger 2; mandibles with 11–12 teeth; Area VI with smooth shaped bar ..... ***P. iranica*** Bonyadi-Nacini, Rastegar-Pouyani, Rastegar-Pouyani, Glasby & Rahimian, 2018 (Abu Musan Island, Persian Gulf)
– Postero-dorsal tentacular cirri reaching chaetiger 6; mandibles with 7 teeth; Area VI with shield-shaped bar ..... ***P. perspicillata*** (Grube, 1878) (Philippines)

22. Notopodial prechaetal lobe present 23
– Notopodial prechaetal lobe absent 25

23. Area III with group of 11–20 paragnaths and two lateral groups with 2–3 paragnaths in line; Area VI with one smooth straight bar in each side ..... ***P. helleri*** (Grube, 1878) (Philippines)
– Area III with up to 7 paragnaths, without lateral groups; Area VI with shield-shaped bar on each side 24

24. Dorsum with transverse rows of unpigmented papillae; antennae ½ × as long as palpophores; ridge areas VI–V–VI with ɔc-shaped pattern ..... ***P. faulwetterae*** Teixeira, Langeneck, Grosse, Bakken & Rava, 2025 (Italy, Trieste, Adriatic Sea)
– Dorsum without transverse rows of papillae; antennae as long as palpophores; antennae reach anterior end of palpophore; ridge areas VI–V–VI with U-shaped pattern ..... ***P. twobae*** Teixeira, Langeneck, Grosse, Bakken & Rava, 2025 (Italy, Calafuria)

25. Ridge of areas VI–V–VI with π-shaped pattern 26
– Ridge of areas VI–V–VI in another pattern 27

26. Area III with group of 10–11 paragnaths and sometimes with 1–2 isolated lateral paragnaths; Area V with 3 paragnaths in triangle; Area VI with crescent-shaped bar in each side; area VII–VIII with 21–26 paragnaths inserted in forrow zone ..... ***P. misrai*** Prajapat, Villalobos-Guerrero & Vachhrajani, 2024 (India)
– Area III with 20–24 paragnaths in oval group; Area V with one paragnath, without lateral groups; Area V with only one paragnath; Area VI with broad petite shield-shaped bar in each side; Area VII–VIII with 30 paragnaths inserted in forrow and ridge zones ..... ***P. falsovariegata*** Monro, 1933 (South Africa)

27. Neuropodial postchaetal lobe present; jaws with up to 5 teeth; Area I with 2 paragnaths in line; Area IV with up to 8–10 paragnaths; Area V with 3 paragnaths in triangle; Area VI with shield-shaped bar in each side; Area VII–VIII with 24 paragnaths in 3 regular bands; ridge of areas VI–V–VI with U-shaped pattern ..... ***P. hourdezi*** sp. nov. (Clipperton Island)
– Neuropodial postchaetal lobe absent; jaws with up to 10 teeth; Area I with 3 paragnaths in triangle; Area IV with up to 18–19 paragnaths; Area V with 1 paragnath; Area VI with smooth shaped bar in each side; Area VII–VIII with 16 paragnaths in 2 regular bands; ridge of areas VI–V–VI with λ-shaped pattern ..... ***P. websteri*** Conde-Vela, 2022 (Bermuda)

Class Polychaeta Grube, 1850
Order Phyllodocida Dales, 1962
Family Pilargidae de Saint-Joseph, 1899
Subfamily Kinephorinae Ehlers, 1920

Genus ***Synelmis*** Chamberlin, 1919

Synelmis Chamberlin, 1919: 177.

Synelmis – Salazar-Vallejo 2003: 21.

Type species

Synelmis simplex Chamberlin, 1919, by original designation (junior synonym of *Ancistrosyllis rigida* Fauvel, 1919 fide Salazar-Vallejo 2003: 34).

Remarks

Synelmis includes pilargids with a thin, muscular body, with a thick cuticle, and many segments. Their shiny integument and consistency resemble those found in nematodes, but the presence of parapodia easily separates them from each other. As indicated in the key below, the species can be sorted out after some morphological features, especially regarding the insertion of lateral antenna, the size of median antenna, the presence and number of eyes, the start of notospines, and the shape and size of parapodial cirri. The presence of pigmented glands along the body can be useful to separate similar species.

Distribution

The species of *Synelmis* thrive in shallow to continental shelf substrates, in mixed or sandy bottoms, in tropical to temperate localities throughout the world.

Synelmis mezianei sp. nov.
urn:lsid:zoobank.org:act:4A49E035-E775-4522-B200-98248865AA6F
Fig. 2

Diagnosis

Synelmis with lateral antennae inserted basally to palps; notospines from chaetiger 5; median chaetigers with dorsal cirri basally swollen, tapered, ventral cirri twice as long as wide.

Etymology

The species is named after Dr Tarik Meziane, curator of the Annelida collection of the Muséum national d'Histoire naturelle, Paris, in recognition of his long-term support of our research activities. The specific epithet is a noun in the genitive case (ICZN 1999, Art. 31.1.2).

Type material

Holotype

FRANCE • complete spec.; Clipperton Island, stn 10; 10°17.31′ N, 109°12.19′ W; depth 13 m; 17 Jan. 2005; J.-M. Bouchard, L. Albenga and L. Dugrais leg.; coral rubble, suction pump; MNHN IA-2000-2108.

Paratype

FRANCE • 1 complete spec.; same data as for holotype, colorless anterior fragment, 10 mm long, 0.5 mm wide, 42 chaetigers; ECOSUR 319.

Other material examined

FRANCE • 2 median fragm.; same data as for holotype, fragments 9.5–12.5 mm long, 0.5–0.6 mm wide, 31–45 chaetigers, pale, almost breaking off in some portions; MNHN IA-2001-157.

Description

Body. Holotype (MNHN IA-2000-2108), anterior fragment, colorless, subcylindrical, tapered anteriorly; in cross section, dorsum elevated, parapodia on lateral depressions, venter with longitudinal groove; 19 mm long, 0.5 mm wide, 74 chaetigers.

Prostomium. Trapezoidal, slightly wider posteriorly (Fig. 2A). Palps biarticulate, separated from each other, separation visible dorsally and ventrally, palpostyles hemispherical, ventral papillae tapered, surpassing palpostyles tips. Antennae all cirriform, lateral antennae inserted anteriorly, close to palp bases, surpassing palpostyle tips; median antenna inserted on posterior prostomial margin, ½ × as long as prostomial length. Eyes blackish, semilunar, positioned slightly ahead of lateral antenna.

Tentacular belt. Tentacular cirri cirriform, directed anteriorly, ventral cirri slightly longer than dorsal ones.

Parapodia. Sesquiramous throughout fragment. First dorsal cirri longer than following ones. Parapodial cirri thinner, not basally swollen along chaetigers 1–9. Dorsal and ventral cirri basally swollen, with long tapered tips, glandular in median (Fig. 2B–C), and posterior segments (Fig. 2D–E). Neurochaetal lobe truncate, sometimes not visible by obstruction of body wall. Notopodia of chaetigers 1–4 without notospines, following one with notospines, progressively longer and more exposed posteriorly, tips usually broken.

Chaetae. Furcate chaetae not seen, probably broken. Neurochaetae simple, smooth or finely spinulose capillaries, about 14 per bundle by chaetiger 40, with 1–2 larger than others, decreasing to about 10 per bundle by chaetiger 70.

Posterior end. Unknown.

Variation

The paratype (ECOSUR 319) shows a similar morphology. The lateral antennae surpass palpostyles tips; ventral palp papillae tapered, surpassing palpostyles tips; eyes are semilunar; median antenna half as long as prostomium; tentacular cirri wider basally, tapered, ventral ones slightly longer than dorsal ones; parapodial cirri similar, progressively wider basally from chaetiger 8–9; notospines from chaetiger 5; furcates not seen, probably broken.

Distribution

Only known from subtidal rocky bottoms in Clipperton Island, Eastern Pacific.

Remarks

Synelmis mezianei sp. nov. resembles *S. kirkegaardi* Salazar-Vallejo, 2003 from Cape Verde Islands, Eastern Atlantic, because both species have lateral antennae inserted anteriorly, notospines from chaetiger 5, and parapodial cirri basally swollen. However, they differ because in *S. mezianei* median segments have parapodial cirri tapered and ventral cirri are 2 × as long as wide, whereas in *S. kirkegaardi* parapodial cirri are fusiform mucronate, about as long as wide.

Key to the species of *Synelmis* Chamberlin, 1919

(modified after Salazar-Vallejo 2003; most references therein)

1. Prostomium with lateral antennae positioned anteriorly, close to base of palpostyles 2
– Prostomium with lateral antennae positioned medially 7

2. Notospines from chaetigers 5–6 3
– Notospines from chaetiger 9; with four eyes; median chaetigers with cirri basally swollen ....***S. gracilis*** (Hessle, 1924) (Japan)

3. Median chaetigers with thin cirri, sometimes basally expanded 4
– Median chaetigers with thicker cirri, expanded basally 6

4. Prostomium with two eyes 5
– Prostomium with two rows of lateral eyes, each with 4–5 ocelli; chaetiger 1 with dorsal cirrus as long as following ones .....***S. knoxi*** Glasby, 2003 (New Zealand)

5. Anterior segments without pigmented lateral glands; median antenna short, about ½× as long as prostomial length; chaetiger 1 with dorsal cirri longer than following ones .... ***S. amoureuxi*** Salazar-Vallejo, 2003 (Brazil)
– Anterior segments with abundant, dark lateral glands; median antenna long, ¾× as long as prostomial; chaetiger 1 with dorsal cirri longer than following ones ....***S. gibbsi*** Salazar-Vallejo, 2003 (Red Sea to Marshall Islands)

6. Median segments with parapodial cirri fusiform mucronate, ventral cirri as long as wide .... ***S. kirkegaardi*** Salazar-Vallejo, 2003 (Eastern Atlantic)
– Median segments with parapodial cirri tapered, ventral cirri 2 × as long as wide ....***S. mezianei*** sp. nov. (Clipperton Island)

7. Prostomium with eyes 8
– Prostomium without eyes 15

8. Only one pair of lateral eyes 9
– Eyes multiple, 2–4 in each lateral row (sometimes laterally fused) 13

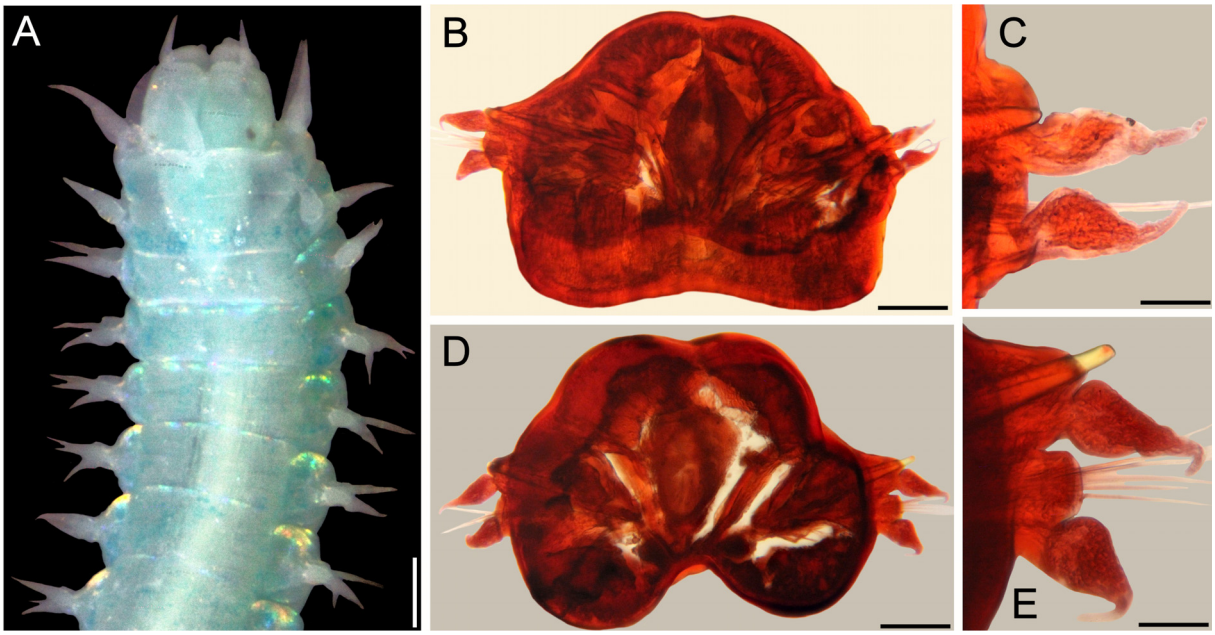

Fig. 2. *Synelmis mezianei* sp. nov. **A, D–E**. Holotype (MNHN IA-2000-2108). **A**. Anterior region, dorsal view, after Methyl green staining. **B–C**. Paratype (ECOSUR 319), chaetiger 41, anterior view, after Shirlastain-A staining. **C**. Close-up of left parapodium. **D**. Chaetiger 75, anterior view, after Shirlastain-A staining. **E**. Close-up of left parapodium. Scale bars: A = 0.14 mm; B = 110 µm; C = 30 µm; D = 120 µm; E = 45 µm.

9. Median segments with parapodial cirri fusiform; median antenna short, not reaching chaetiger 1 ... 10
– Median segments with parapodial cirri digitate to basally swollen, not fusiform 12

10. All antennae fusiform 11
– All antennae cirriform; notospines from chaetigers 10–11; without lateral glands behind chaetal lobes .....***S. albini*** (Langerhans, 1881) (Eastern Atlantic)

11. Notospines from chaetiger 8; dorsal cirri as long as wide .....
.....***S.*** cf ***albini*** Wolf, 1984 (Gulf of Mexico)
– Notospines from chaetigers 10–16; dorsal cirri 2 × as long as wide .....
.....***S. harrisae*** Salazar-Vallejo, 2003 (California to northwestern Mexico)

12. Median antenna short, not reaching chaetiger 1; eyes dorsal; notospines from chaetiger 13–18 .....
.....***S. britayevi*** Salazar-Vallejo, 2003 (Mozambique Channel)
– Median antennae long, reaching chaetiger 1; eyes lateral; notospines from chaetigers 7–14; eyes lateral or absent .....***S. emiliae*** Salazar-Vallejo, 2003 (partim) (Eastern Pacific)

13. With two eyes per side, fused to each other 14
– With four eyes per side; median and posterior chaetigers with dorsal and ventral cirri basally swollen to digitate; notospines from chaetigers 17–22 .....
.....***S. sotoi*** Salazar-Vallejo, 2003 (Grand Caribbean)

14. Median and posterior chaetigers with dorsal and ventral cirri digitate, similar in length and width; notospines from chaetigers 15–23 .....***S. rigida*** (Fauvel, 1919) (India to Western Pacific)
– Median chaetigers with dorsal and ventral cirri fusiform; notospines from chaetigers 9–11 .....
.....***S. gorgonensis*** (Monro, 1933a) Eastern Pacific

15. Notospines from chaetiger 5; median segments with parapodial cirri of similar length; median antenna short, not reaching chaetiger 1 .....
.....***S. levinae*** Salazar-Vallejo, 2003 (Eastern Pacific seamounts)
– Notospines from chaetigers 8–20; median segments with ventral cirri longer than dorsal ones 16

16. Median antenna long, reaching chaetiger 1 17
– Median antenna short, not reaching chaetiger 1 18

17. Median segments with ventral cirri 2 × as long as wide; notospines from chaetigers 13–15 .....
.....***S. emiliae*** Salazar-Vallejo, 2003 (partim) (Eastern Pacific)
– Median segments with ventral cirri 4 × as long as wide; notospines from chaetigers 9–20 .....
.....***S. sergi*** Glasby & Marks, 2013 (Australia)

18. Median segments with parapodial cirri tapered 19
– Median segments with parapodial cirri swollen medially, mucronate; notospines from chaetiger 12
.....***S. glasbyi*** Salazar-Vallejo, 2003 (Mozambique Channel)

19. Notospines from chaetiger 8–10; all antennae of similar size .....
.....***S. urogorri*** Moreira & Parapar, 2007 (NW Spain)
– Notospines from chaetigers 12–15; median antenna slightly longer than laterals .....
.....***S. sinica*** Sun & Chen, 1990 (South China Sea)

Class Pleistoannelida Struck, 2011
Subclass Sedentaria Lamarck, 1818
Order Spionida Fauchald, 1977
Family Sabellariidae Johnston, 1865

Genus ***Lygdamis*** Kinberg, 1867

Lygdamis Kinberg, 1867: 350.
Tetreres Caullery, 1913: 200 (partim).

Lygdamis – Johansson 1927: 81 (diagn.). — Hartman 1944: 331 (syn.). — Kirtley 1994: 116 (diagn., syn., key). — Capa *et al.* 2012: 261 (diagn.).

Type species

Lygdamis indicus Kinberg, 1867, by monotypy.

Diagnosis (modified from Capa *et al.* 2012)

Sabellariids with opercular lobes completely separated; outer and inner paleae arranged in semicircles. Nuchal hooks falcate, without limbation. Median organ cylindrical truncate or tapered blunt. Tentacles in parallel series (compound). Four parathoracic segments, each with lanceolate paleae and capillaries in each parapodial branch. Branchiae from segment 2 to mid-abdominal segments.

Remarks

Caullery (1913) noted there were two groups of species, separated by the number of parathoracic chaetigers, in what he regarded as *Pallasia* de Quatrefages, 1848, and he also indicated that de Quatrefages had not clarified the number of parathoracic chaetigers. He restricted *Pallasia* to include species with three parathoracic chaetigers, whereas for those provided with four, he proposed *Tetreres*. *Pallasia* had been used before in dipterans (Robineau-Desvoidy 1830), and in fishes (Nardo 1840), rendering invalid its usage for polychaetes. Annenkova (1925) proposed *Pallasina* as a new name for *Pallasia*. Johansson (1926: 6; 1927: 81) concluded that *Tetreres* was a junior synonym of *Lygdamis,* and he might not have seen the paper by Annenkova, but it would make no difference for nomenclatural purposes. *Tetreres* Caullery, 1913 was listed above in the list of synonyms, but in part, because three species Caullery listed actually belong in *Lygdamis*, as indicated by Kirtley (1994: 3).

After de Quatrefages (1848), Johansson (1927) made the most extended study on sabellariids including histological details. Johansson included keys to genera, but the most complete revision was by Kirtley (1994), because he modified the generic composition of the family, proposed some genera, and described many species. In *Lygdamis*, Kirtley described 7 species and included a key to the then known 16 species. Lechapt & Kirtley (1998) slightly modified the previous key, but because of some problems running it, a new key is presented below to the known species.

On the other hand, a nomenclatural note must be included regarding *Tetreres*. Caullery (1913) listed five species in the genus and newly combined as *T. laevispinis* (Grube, 1870), *T. giardi* (M'Intosh, 1885), *T. murata* (Allen, 1904), *T. asteriformis* (Augener, 1906), and *T. porrecta* (Ehlers, 1908). The first three belong in *Lygdamis*, as indicated by Kirtley (1994; see key below), whereas the latter two belong elsewhere.

Kirtley (1994: 188) retained *Tetreres* for species like the last two ones, and for seven species newly described by him. His proposal and separation were confirmed in recent studies (Capa *et al.* 2012;

Hutchings *et al.* 2012). However, Kirtley (1994: 188) proposed *Hermella varians* Treadwell, 1902 as its type species, but this is incorrect.

Because Caullery did not indicate the type species for *Tetreres*, a subsequent designation is in order. However, the species to be designated must be one of those included in the original proposal (ICZN 1999, Arts 67.2, 69.1). Caullery (1913: 200) newly combined *H. varians* in *Pallasia*, not in *Tetreres*, and this listing might made Kirtley think his proposal was code compliant, but it is not. Consequently, the type species by subsequent designation must be *Sabellaria* (*Pallasia*) *asteriformis* Augener, 1906, which is a junior synonym of *Hermella varians* Treadwell, 1902, as confirmed by Kirtley (1994: 197) after the study of their type specimens.

Lygdamis mariae sp. nov.
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Figs 3–4, Table 1

Idanthyrsus pennatus Hartman, 1939: 19 (non Peters, 1854).
Lygdamis nesiotes Hartman, 1944: 332–333 (non Chamberlin, 1919).

Diagnosis

Lygdamis with outer paleae smooth, of a single type, straight, solid, not annulate, aristate, tips bent 140–150°, 34 per side; inner paleae 14 per side; median organ tapered, blunt; nuchal hooks tapered, tips long, wide, sharp.

Etymology

The species is named after Dr María Capa, in recognition of her many publications on taxonomy of marine annelids, and especially after her studies on sabellariid polychaetes which were very useful during this contribution. The specific epithet is a noun in the genitive case (ICZN 1999, Art. 31.1.2).

Type material

Holotype

FRANCE • complete spec.; Clipperton Island, stn 36; 10°17.49′ N, 109°13.56′ W; depth 54 m; 27 Jan. 2005; S. Hourdez, K.-L. Kaiser and J.-M. Bompar leg.; anchoring of *Rara Avis*; MNHN IA-2000-2109.

Paratypes

FRANCE • 1 complete spec.; same data as for holotype; paratype breaking in two; MNHN IA-2000-2110 • 5 complete specs; Clipperton Island, stn 10; 10°17.31′ N, 109°12.19′ W; depth 13 m; 17 Jan. 2005; J.-M. Bouchard, L. Albenga and L. Dugrais leg.; coral rubble, suction pump, one still in tube, another one too twisted, colorless; ECOSUR 320 • 2 complete specs; Clipperton Island, stn 17; 10°19.22′ N, 109°13.39′ W; depth 23 m; 20 Jan. 2005; J.-M. Bouchard, L. Albenga and L. Dugrais leg.; epifaunal organisms, hand collecting, opercula barely pigmented; MNHN IA-2000-2111 • 1 complete spec.; Clipperton Island, stn 20; 10°17.50′ N, 109°13.55′ W; depth 20 m; 22 Jan. 2005; J.-M. Bouchard, L. Albenga and L. Dugrais leg.; anchoring point of *Rara Avis*, coral rubble, colorless, with tube fragments, first branchiae duplicate; MNHN IA-2000-2112 • 5 complete specs; Clipperton Island, stn 25; 10°19.34′ N, 109°13.40′ W; depth 18 m; 23 Jan. 2005; S. Hourdez and K.-L. Kaiser leg.; coral rubble, platform margin, one in tube, colorless, anal peduncle contracted, blackish, smallest specimen medially brownish; ECOSUR 321 • 2 complete specs; Clipperton Island, stn 27; 10°18.01′ N, 109°13.87′ W; depth 1 m; 23 Jan. 2005; S. Hourdez and K.-L. Kaiser leg.; in front of Camp Bougainville, colorless; MNHN IA-2000-2113 • 1 complete spec.; Clipperton Island, stn 30; 10°18.72′ N, 109°12.01′ W; depth 15 m; 24 Jan. 2005; S. Hourdez, K.-L. Kaiser and J.-M. Bompar leg.; coral rubble and red algae, colorless, precaudal region

with a band of tiny black spots, wider mid-ventrally; ECOSUR 322 • 1 anterior fragm.; Clipperton Island, stn 31, East of Port Jaouen; 10°17.45′ N, 109°13.26′ W; depth 1 m; 24 Jan. 2005; S. Hourdez and K.-L. Kaiser leg.; colorless; MNHN IA-2000-2114.

Description (holotype)

Body. Complete, mature specimen, preserved in tube, posterior region breaking off. Body 52 mm long, 4 mm wide, 54 chaetigers. Body pale; operculum dark brown, especially laterally with pale spots below marginal cirri (Fig. 3A–C); prepygidial parapodia with interramal glandular ridge, brownish (Fig. 3E).

Operculum. Oblique, bent ventrally, dorsally depressed into darker concavity (Fig. 3A). Opercular paleae golden; outer paleae aristate, tips bent 140°–150°, 56 per side, core solid, non-annulate (Fig. 4A); inner paleae straight to slightly bent, darker, core brownish (Fig. 4B), 22 per side. Marginal papillae cirriform, basally wider, tapered, blunt, larger posteriorly, decreasing in size anteriorly (Fig. 3C), papillae with anterior surface darker, lateral paler areas extended into opercular margin (Fig. 3A), 18 papillae per side. Opercular ventral surface with 11 oblique series of tentacles per side, tentacular series longer basally, shorter distally (Fig. 3B).

Palps. Tapered, contracted, one visible ventrally (Fig. 3B), other hidden between tentacles. Mouth U-shaped, lateral lips foliose, partially covering mouth opening.

Nuchal hooks. Large, tapered, falcate, sharp, completely covered by pale, hook foliose projection (Fig. 3D); hooks noted because of their darker pigmentation. In one paratype (Fig. 4C) sharp, long, wide, with handles annulate. Median organ shorter than palps, tapered, tip blunt, blackish, with series of lateral eyespots, visible close to nuchal hooks.

Thorax. With 2 chaetigers without notochaetae. Chaetiger 1 with capillary neurochaetae and long, conical ventral cirrus directed ventrally, reaching mouth opening. Chaetiger 2 with capillary neurochaetae and long, conical ventral cirrus directed anteriorly, shorter than one present in chaetiger 1, and 2 slightly shorter cirri directed dorsally. Branchiae cirriform, tapered, from chaetiger 2, continued through 25 more segments.

Parathorax. With 4 biramous chaetigers with paleae and capillaries in both rami. Notopodia 4 × as long as neuropodia, dorsal cirri digitate on a swollen, wide conical base (Fig. 4D); neuropodial cirri conical, blunt, as long as wide (Fig. 4E). Notochaetae directed posteriorly, 10–12 per ramus, increasing in number posteriorly; neurochaetae directed anteriorly, 7–9 per ramus, increasing in number posteriorly; tips finely denticulate (Fig. 4E, inset).

Abdomen. With parapodia biramous, first two chaetigers with longer notopodia; successive notopodia half as long. Notopodia uncinigerous, foliaceous, short, curved lobes with abundant uncini (Fig. 4F), each with 8–9 transverse rows of denticles, mostly paired (Fig. 4F, upper inset). Neuropodia reduced to short chaetal lobe; neurochaetae capillaries, thicker ones verticillate denticulate, thinner ones denticulate (Fig. 4F). Prepygidial abdominal segments with notopodia reduced to short fan-shaped lobes, with glandular pigmented ridge between parapodial rami (Fig. 3E).

Cauda. Short, tubular, bent ventrally, damaged, without cirri.

Variation

The variation of some morphological features in 16 specimens is shown in Table 1. All features are size-dependent. Specimens were 12–52 mm long (mean 30.7 mm); smaller specimens were pale, especially if preserved outside their tubes, larger specimens and those preserved in tubes are darker. Their opercula

had 15–56 outer (mean 34), and 6–22 inner (mean 14) paleae, and 8–18 marginal papillae (mean 14). The latter are usually blunt, shorter in smaller specimens and progressively smaller towards the dorsalmost position. The second parathoracic chaetiger had 7–17 notochaetal (mean 11), and 4–8 neurochaetal lanceolate paleae (mean 6). The median organ was never truncate, it was mostly blunt, but in three cases it had a more defined tip. Most specimens had two hooks, golden in smaller, brownish in larger specimens; only two specimens had one of them duplicate. The depressed lobe covering the falcate dorsal hook tip was covering the hooks completely in 4 specimens, medially in 11 specimens, and basally in 2; the latter might be due to partial damages due to abrasion during sampling. There were 19–35 pairs of branchiae (mean 25); anterior branchiae longer, progressively smaller posteriorly, often detached. The cauda, or anal peduncle, was always very short, 0.3–1.7 mm long. Specimens larger than 25 mm had hypertrophied gonads along posterior body half; smaller ones are juveniles.

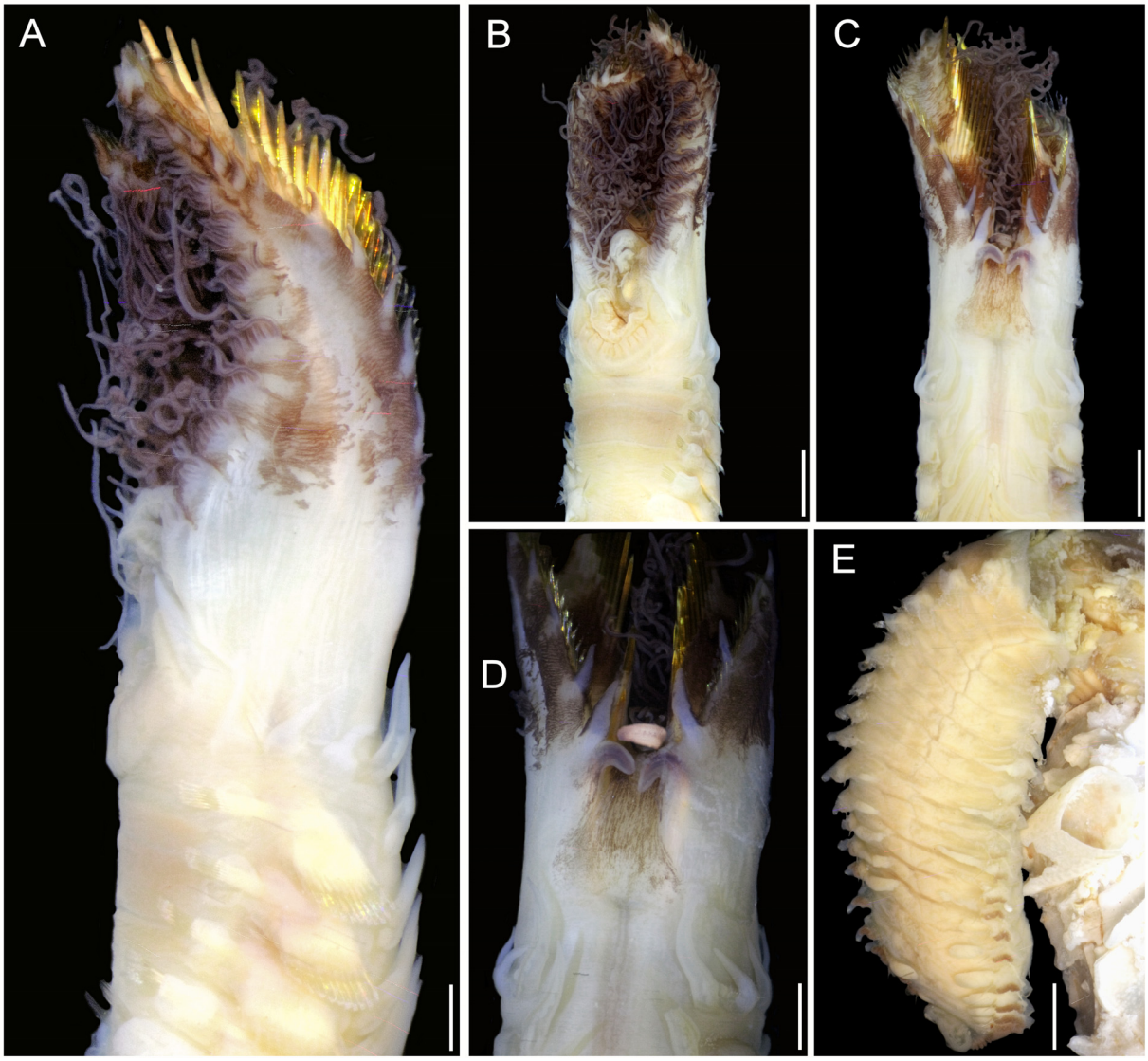

Fig. 3. *Lygdamis mariae* sp. nov., holotype (MNHN IA-2000-2109). **A–D**. Anterior region. **A**. Left lateral view (left tentacles removed). **B**. Ventral view. **C**. Dorsal view. **D**. Close-up, showing complete cover of nuchal hooks. **E**. Posterior region, ventral view, specimen in tube. Scale bars: A = 0.8 mm; B–C = 1.7 mm; D = 0.9 mm, E = 1.5 mm.

Distribution

Only known from Clipperton Island, on rocky bottoms, 1–54 m depth; some Eastern Pacific records of *L. nesiotes* (Chamberlin, 1919) might represent this species but there are not enough details in earlier records to clarify this.

Remarks

Lygdamis mariae sp. nov. resembles *L. nesiotes* (Chamberlin, 1919) described from the Tuamotu Islands (18°47′ S, 141°35′ W), and they are so similar that some Eastern Pacific records might represent this new species. After the key above, their main differences rely on the inner structure of the outer paleae, the angle formed by their tips, and the number of inner paleae. In *L. mariae*, outer paleae are solid, non-annulate, their tips bend at about 140–150°, and there are 14 pairs of inner paleae, whereas in *L. nesiotes* they are annulate internally, their tips are bent at about 120°, and there are 17 pairs of inner paleae.

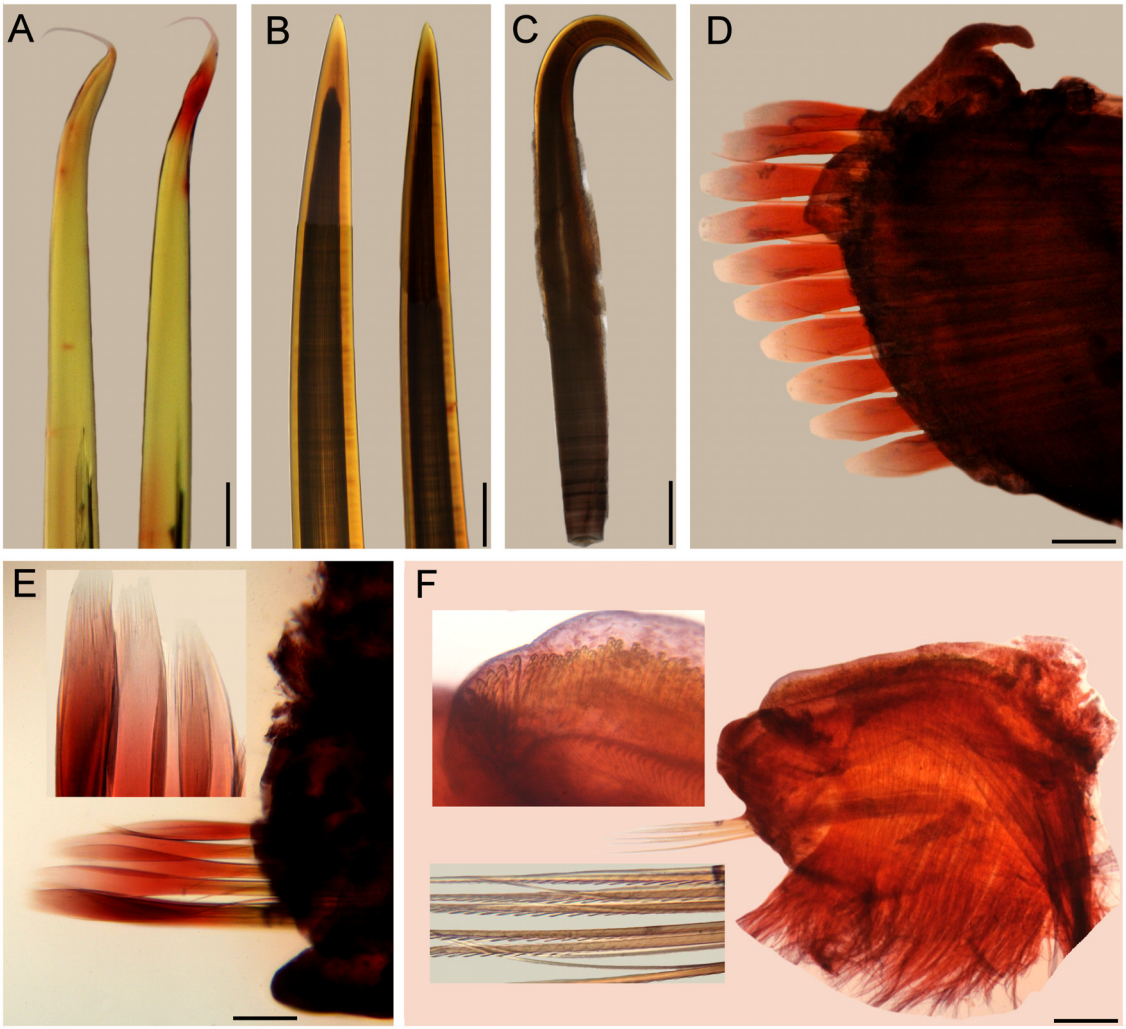

Fig. 4. *Lygdamis mariae* sp. nov. **A–B, D–F**. Holotype (MNHN IA-2000-2109). **A**. Upper and lower outer opercular paleae. **B**. Upper and lower inner paleae. **C**. Paratype (ECOSUR 320, stn 10), nuchal hook. **D**. Second parathoracic chaetiger, right notopodium, anterior view. **E**. Right neuropodium, anterior view (inset: tip of neurochaetal lanceolate paleae). **F**. Second abdominal chaetiger, right parapodium, anterior view (upper inset: notopodial uncini in frontal view; lower inset: basal portions of neurochaetae). Scale bars: A, E = 80 µm; B, D = 0.2 mm; C = 0.27 mm; F = 0.15 mm.

Table 1. Morphological features of *Lygdamis mariae* sp. nov.; paired features were counted only on the right side; cover of dorsal hook is indicated on how much of the falcate tip is covered; the parathoracic segment was the second one and the number refers to the paleae only, and the anal peduncle is total length.

station number	length of specimen	outer number	inner paleae	marginal papillae	dorsal hooks cover	median organ	noto-chaetae	neuro-parath	pairs of branciae	anal ped.
10	12	32	11	8	medially	blunt	11	5	19	0.3
	28	36	16	15	medially	blunt	17	6	28	0.6
	27	28	11	14	medially	blunt	9	6	27	1.3
17	17	36	18	13	basally	blunt	11	6	22	0.5
	28	47	18	14	medially	blunt	12	6	24	1.0
20	18	15	6	11	medially	blunt	7	4	21	1.0
25	21	28	16	16	medially	pointed	10	6	25	0.7
	25	13	9	10	medially, left double	pointed	10	6	25	lost
	38	39	15	14	complete	pointed	11	7	28	1.0
	45	33	16	15	bsally eroded	blunt	12	6	35	1.5
27	27	25	11	15	complete	blunt	9	6	28	1.5
	38	30	12	13	medially	blunt	9	5	30	1.7
30	36	41	14	12	medially, right double	blunt	12	6	19	1.5
31	13 w/o post region	38	12	13	medially	blunt	10	4	19	
36	48	44	20	15	complete	blunt	10	6	27	1.0
	52	56	22	18	almost complete	blunt	9	8	26	2.0

Chamberlin (1919) included some other details that might be relevant. For example, in his specimens being up to 32 mm long, he noted that opercular paleae, inner and outer, had annulated cores (Chamberlin 1919: 492: "cross-striate"), 5–7 chaetae in parathoracic parapodia, 17–19 pairs of branchiae, and dorsal hooks are completely covered by a fleshy depressed lobe matching hook's shape (Chamberlin 1919: 491, pl. 75 fig. 7). As indicated above, these features are size-dependent and of limited use for diagnostic purposes. On the other hand, he noted the median organ: "just in front of the nuchal hooks in the depression between the two opercular lobes is a long unpaired cirrus with a dark tip" (Chamberlin 1919: 491). Capa *et al.* (2015: 197, table 1) noted it can be tapered, blunt (as in *L. giardi* (M'Intosh, 1885) or *L. wambiri* Hutchings *et al.* 2012), or cylindrical truncate (in their *L. nasutus*). The shape could be diagnostic as it seems truncate ones are cylindrical, whereas tapered ones are triangular in cross section; regretfully, there are no details about their shape, and their presence has been indicated for 8 out of 19 species compiled by Hutchings *et al.* (2012: 25, table 2).

Key to the species of *Lygdamis* Kinberg, 1867

(data from Hutchings *et al.* 2012; dos Santos *et al.* 2014; Capa *et al.* 2015)

1. Outer paleae smooth 2
– Outer paleae rugose, aristate 21

2. Outer paleae of a single type 3
– Outer paleae of two types, thick aristate and thinner, tapered, about 20 per side; inner paleae straight, tapered, blunt, about 20 per side ..... ***L. japonicus*** Nishi & Kirtley, 1999 (Amakusa, Japa)

3. Outer paleae with tips straight 4
– Outer paleae curved, or with curved tips 12

4. Outer paleae sharp, non-aristate 5
– Outer paleae aristate 8

5. Inner paleae smooth 6
– Inner paleae subdistally rugose, tips blunt, 10–14 per side; outer paleae 16–20 per side (body 12–43 mm long) ..... ***L. giardi*** (M'Intosh, 1885) (SE Australia)

6. Inner paleae tapered, blunt 7
– Inner paleae with wide tips, 30–36 per side; nuchal hooks tapered, tip sharp, wide; outer paleae 42–44 per side (body 15–20 mm long) ..... ***L. augeneri*** Kirtley, 1994

7. Operculum with 25–30 marginal papillae per side (outer paleae 37–55 per side; inner paleae 16–19 per side); nuchal hooks tapered, tip sharp, thin (body 22–60 mm long) ..... ***L. giardi*** sensu Okuda 1938 (Osaka, Japan)
– Operculum with 14–16 marginal papillae per side; nuchal hooks unknown (body 25 mm long) ..... ***L. gilchristi*** (McIntosh, 1924) (South Africa)

8. Inner paleae smooth, non-annulated 9
– Inner paleae annulated, tips blunt, 10 per side; outer paleae 20 per side (body 30 mm long)..... ***L. bhaudi*** Kirtley, 1994 (Madagascar)

9. Nuchal hooks with tips wide, blunt; outer paleae tapered, aristae long 10
– Nuchal hooks with tips narrow, sharp; outer paleae widened medially, aristae short, 34–45 per side; inner paleae 11 per side (body 130 mm long) ..... ***L. muratus*** Allen, 1904 (England)

10. Operculum with less than 30 paleae per side 11
– Operculum with 50–60 outer, and 18–20 inner paleae per side (body 13 mm long) ..... ***L. splendidus*** Lechapt & Kirtley, 1994 (New Caledonia)

11. Operculum with 25 outer, and 10 inner paleae per side (body 11 mm long) ..... ***L. indicus*** Kinberg, 1867 (Indonesia)
– Operculum with 18 outer, and 7 inner paleae per side (body 30–43 mm long) ..... ***L. nasutus*** Capa, Faroni-Perez & Hutchings, 2015 (Great Barrier Reef, Australia)

12. Outer paleae non-aristate 13
– Outer paleae aristate 17

13. Outer paleae slightly curved; nuchal hooks tapered 14
– Outer paleae markedly curved, 19–20 per side; nuchal hooks medially constricted, tip directed laterally at 90° from shaft (body 50 mm long) ..... ***L. gibbsi*** Kirtley, 1994 (Solomon Islands)

14. Nuchal hooks tips bent ventrally 15
– Nuchal hooks tips directed laterally, not bent ventrally; operculum with 14–21 outer, and 9–14 inner paleae per side (body 95 mm long) ..... ***L. wirtzi*** Nishi & Núñez, 1999 (Madeira, Canary Islands)

15. Outer paleae with tips wide, blunt, 25–32 per side; inner paleae 12–16 per side (body 28 mm long) ..... ***L. curvatus*** (Johansson, 1922) (Bonin Islands, Japan)
– Outer paleae with tips narrow, tapered; nuchal hooks tapered, tips sharp, narrow 16

16. Inner paleae medially annulated, 16 per side; outer paleae 34 per side .... ***L. malagasiensis*** Kirtley, 1994 (Madagascar)
– Inner paleae smooth, 12 per side; outer paleae 15 per side (body 16 mm long) .... ***L. ehlersi*** (Caullery, 1913) (Indonesia)

17. Nuchal hooks with tips sharp 18
– Nuchal hooks with tips blunt, wide; operculum with 28 outer, and 12 inner paleae per side (body 92–102 mm long) ..... ***L. rayrobersti*** Kirtley, 1994 (Florida) (dos Santos *et al.* 2014) (Brazil)

18. Nuchal hooks tapered 19
– Nuchal hooks subdistally widened; outer paleae with aristae directed upwards, 25 per side; inner paleae 16 per side (body 45 mm long) ..... ***L. dayi*** Kirtley, 1994 (South Africa)

19. Nuchal hooks tips short, narrow; outer paleae with tips bent about 90° .... ***L. laevispinis*** (Grube, 1870) (Samoa)
– Nuchal hooks tips long, wide 20

20. Outer paleae subdistally annulate, with tips bent about 120°, 25–32 per side; inner paleae 12–16 per side; operculum with 12–15 marginal papillae (32 mm long) .... ***L. nesiotes*** (Chamberlin, 1919) (Tuamotu Islands)
– Outer paleae solid, not annulate, with tips bent 140°–150°, 34 (15–56) per side; inner paleae 14 (6–22) per side; operculum with 14 (8–18) marginal papillae (12–52 mm long) .... ***L. mariae*** sp. nov. (Clipperton Island)

21. Outer paleae curved (34); inner paleae sharp (27) (ant. fragm. 23 mm long) .... ***L. robinsi*** Jeldes & Lefevre, 1959 (off Angola)
– Outer paleae straight 22

22. Inner paleae blunt 23
– Inner paleae sharp, 12 per side; outer paleae with about 30 paleae per side; outer paleae 27–29 per side (body 14 mm long) ..... ***L. wambiri*** Hutchings, Capa & Peart, 2012 (Queensland, Australia)

23. Outer paleae with very long tip; inner paleae with tip slightly falcate (body 5.5 mm long) .... ***L. pechi*** Chávez-López, 2022 (Gulf of Mexico)
– Outer paleae with short tip; inner paleae with tip straight (body 10–40 mm long) .... ***L. kirkegaardi*** Kirtley, 1994 (off Liberia)

Remarks

Hartman (1967: 150) recorded an undescribed species from sediments at depths of 3678–3803 m in the Drake Passage, Antarctica. She indicated the operculum had 16 smooth outer paleae, and 3–4 inner ones per side, and that the nuchal hooks were "flat, curved at right angles to the shaft, and distally expanded." The species was listed by Achari (1974: 50, table 1) as belonging to *Lygdamis*, but it was transferred to *Tetreres* and described as *T. maririceae* by Kirtley (1994: 194), although he did not cite Hartman's record. This explains why it was excluded from the key above. On the other hand, the first introduction of the name *Tetreres muratus* var. *gilchristi* by McIntosh has been cited with three different years. Kirtley (1994: 127) gives 1922, Hartman (1959: 476) gives 1924, which is the correct one and followed by WoRMS (Read & Fauchald 2021), and Day (1967: 677) gives 1925 which refers to the

second publication, with illustrations, of the preceding one made one year before. On the other hand, because morphological features are size-dependent in *L. mariae* sp. nov., the known size or size range for each species has been included in the key to help identify specimens, because size range might differ between similar species.

Discussion

The excellent quality of the specimens gathered during the Clipperton Expedition allowed us to discover and describe several new species. A previous publication based upon specimens of this expedition resulted in 5 new species (Salazar-Vallejo 2022), and in the current contribution three other species are described. The total number of these potential endemics is rather low, but Cortes (2012) has been shown that endemism in oceanic islands along the Eastern tropical Pacific tends to be rather low (less than 3% of total species). We can anticipate that additional field work and especially the study of some poorly known groups will reveal additional undescribed species. We expect our contribution can encourage further studies for fellow scientists in this exciting field of insular endemics.

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