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An overview of the occurrences of *Exogone* (Annelida, Syllidae) in Brazil, with the description of a new species

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Abstract

Syllidae is one of the largest families of polychaete annelids, with more than 1,100 described species, comprehending relatively small-bodied, errant animals. Among these, specimens of *Exogone* can be relatively common in certain areas and substrates, figuring as an important component of the fauna in many locations. In Brazil, 13 species of this genus have been reported, but in some cases with records difficult to confirm/reject. Herein we present an overview of the known diversity of the genus for the country, with additional four new occurrences for the Brazilian coast that were previously only registered in the 'grey literature', and an identification key to the species currently identified along the Brazilian coast; also, we bring the description of *Exogone paulolanai* sp. nov., raising to 18 the number of *Exogone* species for the country.

Keywords: 'Polychaeta', Species description, Brazilian fauna, New occurrence

INTRODUCTION

Syllidae Grube, 1850, is one of the largest polychaete families, encompassing relatively small-bodied errant animals, with more than 1,100 described species in 103 genera (Martin et al., 2019). Syllidae currently consists of five sub-families: Syllinae Grube, 1850, Autolytinae Langerhans, 1879, Exogoninae Langerhans, 1879, Eusyllinae Malaquin, 1893, and Anoplosyllinae Aguado and San Martín, 2009. Of these, Exogoninae comprises more than 290 accepted described species worldwide (Read and Fauchald, 2023), with more than 170 recorded for Brazilian waters (Amaral et al., 2006–2022); exogonines are small-bodied and frequently interstitial worms, found on soft bottoms, mud, rocks and associated with corals, sponges, and algae. The genus *Exogone* Ørsted, 1845 is a diverse genus of exogonines, commonly found on coastal waters around the globe and with more than 70 valid species (Read and Fauchald, 2023), 13 of which have been reported for Brazilian waters in formal publications (see below). In the present paper, we describe a new species, *E. paulolanai* sp. nov., from off South and Southeastern Brazilian coast; also, we provide descriptions of Brazilian specimens of *E. aquadulcensis* Pascual, Nuñez and San Martín, 1996, *E. lourei* Berkeley and Berkeley, 1938, *E. marisae* Pascual, Nuñez and San Martín, 1996, and *E. mompasensis* Mártínez, Adarraga and San Martín, 2002, species that so far have only been recorded in the so-called 'grey literature'

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(Nogueira, 2000; Fukuda, 2010). We present herein a brief overview and sources of information about the diversity of this genus in Brazilian waters, with a key to all the species reported for the country.

METHODS

The material analyzed in this paper was obtained from four independent studies. The first project, 'Polychaete annelids associated to the coral *Mussismilia hispida* (Verrill, 1868) in islands along the State of São Paulo' ("Coral polychaetes"), investigated the fauna of two islands, Laje de Santos (24°19'S, 46°11'W) and Ilha dos Alcatrazes (26°06'S, 45°42'W), from corals collected from depths of 2–13 m, in 1996, by scuba diving.

The project 'REVIZEE/South Score/Benthos' ("REVIZEE") started in 1995 and studied the fauna occurring in the Brazilian Economic Exclusive Zone, from Cabo de São Tomé (state of Rio de Janeiro; 22°S) to Chuí (state of Rio Grande do Sul; 34°30'S). Material was collected on the continental shelf and slope, from 60 to 808 m deep, using dredges, box corers, and Van Veen grabs (see Amaral et al., 2004 for collection details).

The project 'Biota/FAPESP/Benthic marine biodiversity in the State of São Paulo' ("BIOTA") was implemented in 1999 and investigated the fauna occurring off the state of São Paulo, including areas of rocky and sandy shores, along with soft bottoms from the infralittoral.

Finally, the project 'Biodiversity of Polychaeta (Annelida) on rocky shores off the state of São Paulo' ("BIOPOL") aimed to investigate the fauna of polychaetes from rocky shores off the coast of the state, from 2003 to 2007.

In all projects, the obtained material was fixed in 4–10% formaldehyde, preserved in 70% ethanol, and identified using morphological characters, under stereo- and compound light microscopes, with selected specimens studied in slides permanently mounted with glycerin jelly. Length was measured from the tip of the palps to the tip of the pygidium (or of the fragment), excluding anal cirri; width was taken at the proventricle level, excluding parapodia. For observations under scanning electron microscope (SEM), specimens were dehydrated via a series of ethanol solutions with progressively stronger concentrations (70–100%), critical point dried, sputter-coated with gold, and observed under the SEM equipment of the Instituto de Biociências, Universidade de São Paulo (IB/USP) (model Sigma VP Carl Zeiss) and the Museu de Zoologia, Universidade de São Paulo (MZUSP) (model LEO 440 Zeiss).

Museum abbreviations are as follows: AM - Australian Museum, Sydney, Australia; MNCN - Museo Nacional de Ciencias Naturales, Madrid, Spain; MZUSP - Museu de Zoologia, Universidade de São Paulo, São Paulo, Brazil; USNM - National Museum of Natural History, Smithsonian Institution, Washington, D.C., USA; ZMH - Zoological Museum Hamburg, Hamburg, Germany; and ZUEC (former MHN-BPO) - Museu da Diversidade Biológica, Universidade Estadual de Campinas, Campinas, Brazil.

RESULTS

Family Syllidae Grube, 1850
Subfamily Exogoninae Langerhans, 1879
Genus *Exogone* Ørsted, 1845

Type-species. *Exogone naidina* Ørsted, 1845.

Diagnosis. Mid-sized exogonines, usually with bodies slender, smooth, not covered by papillae. Palps well-developed, entirely fused or with terminal notch. Prostomium with two pairs of lenticulated eyes and, in some cases, one pair of anterior eyespots. Three smooth antennae, short and oval or elongated and digitiform. Peristomium with one pair of peristomial cirri. Peristomial, dorsal, and ventral cirri short, papilliform to ovate; ventral cirri shorter than dorsal cirri. Compound chaetae as falcigers and, usually, spiniger-like chaetae; shafts of compound chaetae subdistally inflated, spinulated, and, in some species, with conspicuous triangular enlargements; blades of spiniger-like chaetae long, filiform, with short spinulation; blades of falcigers usually bidentate, with distal tooth shorter than subdistal one; in some cases, blades of compound chaetae fused to shafts or secondarily lost. Dorsal simple chaetae present from anteriormost chaetigers, with slight subdistal spinulation and tapering tip; dorsal simple chaetae bayonet-shaped in some species. Ventral simple chaetae usually sinuous, bidentate, with distal tooth smaller than subdistal one, distal

end resembling those of falcigers blades. Aciculae usually distally inflated, with tips slightly curved. Pygidium with one pair of anal cirri, commonly longer than dorsal cirri. Many species build thin mucous tubes.

Remarks. San Martín (1991) split the genus *Exogone* into three subgenera: *Exogone* (*Exogone*) Ørsted, 1845, *Exogone* (*Parexogone*) Mesnil and Caullery, 1917, and *Exogone* (*Sylline*) Claparède, 1864. *Parexogone* was considered as the basalmost of the three subgenera since, according to San Martín (1991), the shape of the simple and compound chaetae would be typical of most syllids and very similar to those of other closely related genera, such as *Sphaerosyllis* Claparède, 1863 and *Brania* Quatrefages, 1866. Moreover, in many species of *Exogone* (*Parexogone*), the three antennae originate at separate points on the prostomium, similarly to what occurs in other genera of Exogoninae and opposite to the other subgenera of *Exogone. Exogone* (*Exogone*) was considered as an intermediate stage, with falciger blades showing a more characteristic organization, with subdistal tooth much more developed than the distal one, and *Exogone* (*Sylline*) was viewed as the most derived, with blades lost or partially or completely fused to the shafts (San Martín, 1991). *Parexogone* was elevated to generic level by Böggemann and Westheide (2004) and, following the results of phylogenetic analyses performed in the group (e.g., Aguado et al., 2007, 2012), the division of *Exogone* in subgenera was subsequently abandoned.

Some species found in Brazil were registered following the subgenera scheme; however, here they are presented as the group is currently understood.

Identification key to species of *Exogone* registered in the Brazilian coast (after Fukuda, 2010; Paresque et al., 2014)

1a – Compound chaetae bayonet-shaped by partial fusion of shafts and blades (Figure 1A, B), or blades absent.....2

1b – Compound chaetae on all chaetigers include both spiniger-like chaetae with fine, long, filiform blades (e.g., Figure 2A-D) and falcigers with bidentate blades, with subdistal tooth larger than distal one (e.g., Figure 2C, D).....4

2a – (1a) All chaetae simple, lacking blades.... *Exogone simplex*

2b – (1a) Compound chaetae bayonet-shaped by partial fusion of shafts and blades.....3

3a – (2b) Antennae inserted close to each other, almost aligned transversally, near anterior margin of prostomium, median antenna reaching half length of palps or slightly beyond, somewhat larger than lateral ones. Pharynx through ~3 segments; proventricle extending for ~1 chaetiger ....*E. aquadulcensis*

3b – (2b) Antennae inserted close to each other, almost aligned transversally, anterior to anterior pair of eyes, median antenna inserted slightly posteriorly and longer, reaching tip of palps. Pharynx slightly shorter than above, through 2–3 segments; proventricle extending for ~2 chaetigers..... ..... *Exogone naidinoides*

4a – (1b) All antennae short, showing similar shape and size, or median antenna slightly longer.....5

4b – (1b) At least median antenna elongate, usually more than twice the length of lateral ones, lateral antennae papilliform.....8

5a– (4a) Antennae ovate to pyriform, median antenna nearly twice as long as lateral ones. Dorsal simple chaetae with usually two long spines (aristae) reaching beyond tip of chaetae (Figure. 3C–D).....*Exogone marisae*

5b – (4a) Antennae ovate, papilliform, median antenna slightly larger than lateral ones. Dorsal simple chaetae without aristae.....6

6a – (5b) Antennae inserted on middle of prostomium, between the two pairs of eyes. Dorsal cirri on chaetiger 2 absent ....*Exogone verugera*

6b – (5b) Antennae inserted close to each other, between eyes of anterior pair. Dorsal cirri on chaetiger 2 present.....7

7a – (6b) Body relatively stout. Spinulation on blades of anterior body falcigers as thin, numerous spines. Proventricle through ~4 segments.....*Exogone africana*

7b – (6b) Body slender, filiform. Spinulation on blades of anterior body falcigers with only 3–4 relatively thick spines. Proventricle shorter than above, through ~2 segments ....*Exogone breviantennata*

8a – (4b) Compound chaetae as falcigers only..... ..... *Exogone anomalochaeta*

8b – (4b) Compound chaetae as both spiniger-like and falcigers...9

9a – (8b) Spiniger-like chaetae with modified shafts on chaetigers 2 or 1–2, with stout, subdistal triangular process (Figure. 2A, B).....10

9b – (8b) Shafts of spiniger-like chaetae not modified, similar to shafts of falcigers throughout.....14

10a –(9a) Spiniger-like chaetae with modified shafts on chaetigers 1–2.....11

10b –(9a) Spiniger-like chaetae with modified shafts only on chaetiger 2.....12

11a –(10a) Proventricle short, extending for ~2 chaetigers ....*Exogone cebimar*

11b –(10a) Proventricle long, extending for 4–5 chaetigers ....*Exogone lourei*

12a –(10b) Dorsal cirri on chaetiger 2 absent.....*Exogone gigas*
12b –(10b) Dorsal cirri on chaetiger 2 present.....13
13a –(12b) Midbody parapodia with 4–8 falcigers each. Blades of spiniger-like chaetae up to 60 µm long. Up to three aciculae per parapodium on anterior body.....*Exogone arenosa*
13b –(12b) Midbody parapodia with 3–4 falcigers each. Blades of spiniger-like chaetae up to 40 µm long. Up to two aciculae per parapodium on anterior body.....*Exogone rocas*
14a –(9b) Blades of falcigers on some anterior body chaetigers different from those of other parapodia.....15
14b –(9b) Blades of falcigers of similar morphology throughout body.....17
15a –(14a) Dorsal cirri on chaetiger 2 absent. Modified falcigers on chaetigers 1–2, with ~4 falcigers per parapodium, blades short, ~6 µm long, unidentate and with single, large, basal triangular spine (Figure. 6B)..*Exogone naidina*
15b –(14a) Dorsal cirri on chaetiger 2 present. Modified falcigers on chaetigers 1–5, blades bidentate, subdistal tooth distinctly larger than distal one, pointed, pronounced.....16
16a –(15b) Spiniger-like chaetae absent on chaetigers 1–5. Dorsal simple chaetae straight, subdistally swollen on one side, distally rounded.....*Exogone brasiliensis*
16b –(15b) Spiniger-like chaetae present on all chaetigers. Dorsal simple chaetae sigmoid, subdistally spinulated, with acute tip.....*Exogone rolani*
17a –(14b) Dorsal cirri on chaetiger 2 present. Spiniger-like chaetae on all chaetigers.....*Exogone dispar*
17b –(14b) Dorsal cirri on chaetiger 2 absent. Spiniger-like chaetae absent on some anterior body chaetigers.....18
18a –(17b) Spiniger-like chaetae present from chaetiger 4, modified, shafts distally enlarged, heavily spinulated, blades triangular, up to 18 µm long (Figs. 4B–D; 5F–G). Proventricle with ~40 muscle-cell row .....*Exogone mompasensis*
18b –(17b) Spiniger-like chaetae present from chaetiger 3, shafts spinulated, subdistally enlarged, distally acute, blades with short spinulation, distally bifid to bidentate, up to 36 µm long (Figs. 7B–D; 9D–E). Proventricle with ~22 muscle-cell rows.....*Exogone paulolanai* sp. nov.

Exogone africana Hartmann-Schröder, 1974

Exogone verugera africana Hartmann-Schröder, 1974: 137, figs. 164-168.
Exogone (Exogone) africana. San Martín, 2005: 143-145, figs. 90-91; Fukuda, 2010: 112-115, figure 30.
Exogone africana. Paresque et al., 2014: 512-514, figure 6; Nascimento et al., 2020: 3-4.

Remarks. Accounts on Brazilian records can be found in Paresque et al. (2014) and Nascimento et al. (2020).

Type locality. Atlantic Ocean, Namibia, Lüderitz.

Distribution. Atlantic Ocean: Namibia, Angola, Brazil (Paraíba, Pernambuco, Espírito Santo, São Paulo, Rocas Atoll, Fernando de Noronha), Mediterranean Sea (Egypt and Turkey). Pacific Ocean: USA (Hawaii), Japan, Australia (Queensland and New South Wales). Indian Ocean: Australia (Western Australia). From the intertidal zone to ~81 m deep.

Exogone anomalochaeta Benham, 1921

Exogone anomalochaeta Benham, 1921: 24-26, pl. 3, figs. 11-13; Barroso et al., 2017: 403-406, figs. 1-2.
Exogone (*Exogone*) *anomalochaeta*. San Martín and Parapar, 1997: 291; Fukuda, 2010: 115-118, figure 31.

Remarks. Accounts on Brazilian records can be found in Barroso et al. (2017).

Type locality. '*Commonwealth Bay and Macquarie Island*', as stated in the original description (Southern Ocean).

Distribution. Southern Ocean: Commonwealth Bay, Macquarie Island, South Shetland Islands. Southwestern Atlantic Ocean: Brazil. From the intertidal zone to 1,050 m deep.

Exogone aquadulcensis Pascual, Nuñez & San Martín, 1996

Exogone (*Sylline*) *aquadulcensis* Pascual, Nuñez & San Martín, 1996: p. 76-78, figure 3; Nogueira, 2000: 31, figure 6A-E.

Material examined. Project "Coral polychaetes." Laje de Santos (24°19'S 46°11'W): 1 spec., 17 Mar 1996; Ilha dos Alcatrazes (26°06'S 45°42'W): 14 specs. (MHN-BPO JN 5/1-15), 04 Dec 1996.

Description. Prostomium with two pairs of eyes and three ovate antennae inserted close to each other, almost aligned transversally, near anterior margin of prostomium, median antenna slightly larger than lateral ones. Dorsal cirri short, minute, absent on chaetiger 2. Anterior parapodia with bayonet chaetae with distally spinulated shafts and triangular blades, elongated and pointed (Figure 1A); blades of bayonet chaetae of mid- and posterior body chaetigers shorter, wider, more triangular (Figure 1B), except for the dorsalmost, which resembles those of anterior body but progressively thinner. Dorsal simple chaetae with subdistal spinulation and tapering tip (Figure 1C); ventral simple chaetae only present on posterior parapodia, inconspicuously bidentate, subdistal tooth much larger than distal one (Figure 1D). Single acicula per parapodium throughout, asymmetrical, distally roundish, blunt (Figure 1E). Pharynx through ~3 segments, proventricle short, extending for ~1 chaetiger, with ~14 muscle-cell rows (*fide* Pascual et al., 1996).

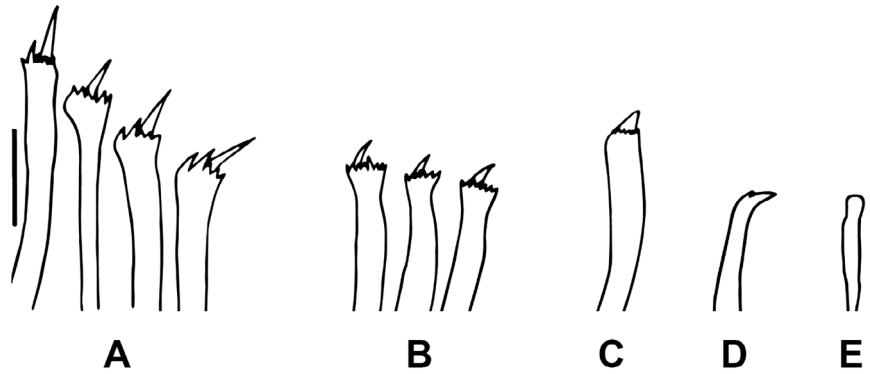

Figure. 1. *Exogone aquadulcensis*
A, compound chaetae, anterior body; B, compound chaetae, midbody; C, dorsal simple chaeta; D, ventral simple chaeta; E, acicula. Scale bar = 10 µm.

Remarks. This species was described from the Canary Islands, reported as endobiont in the sponges *Aaptos aaptos* (Schmidt, 1864) and *Erylus discopherus* (Schmidt, 1862). The material analyzed herein present spicules adhered to body, suggesting some sort of association with sponges. Considering morphological characters, our material matches the original description by Pascual et al. (1996).

Type locality. Atlantic Ocean: Tenerife, Canary Islands, Spain.

Distribution. Atlantic Ocean: Canary Islands, Brazil (São Paulo). From 2–13 m deep. First record for the Southern Atlantic.

Exogone arenosa Perkins,1980

Exogone arenosa Perkins, 1981: 1094-1097, figs. 5g-j, 6; Lana, 1984: 66-67, figs. 55-56; Sovierzoski, 2000: 61-62, figure 11; Paresque et al., 2014: 522-525, figs. 12-13.
Exogone (Exogone) arenosa. Fukuda, 2010: 118-121, fig. 32.

Remarks. Accounts on Brazilian records can be found in Paresque et al. (2014).

Type locality. Atlantic Ocean: Hutchingson Island, Florida, USA.

Distribution. Atlantic Ocean: USA (Florida), Brazil (Paraíba, São Paulo, Paraná), Caribbean Sea (Cuba, Panamá, and Venezuela). From the intertidal zone to ~150 m deep.

Exogone brasiliensis Fukuda, Menezes-Moura, Guimarães and Ruta, 2019

Exogone brasiliensis Fukuda, Menezes-Moura, Guimarães and Ruta, 2019: 3-7, figs. 1-3.
Exogone (Exogone) sp. 3 *sensu* Fukuda (2010): 144-146, Figure 42.
Exogone (Exogone) sp. nov. C *sensu* Menezes (2012): 70-73, Figure 23.

Remarks. Accounts on Brazilian records can be found in Fukuda et al. (2019).

Type locality. Southwestern Atlantic: Campos basin, state of Rio de Janeiro, Brazil.

Distribution. Atlantic Ocean: Brazil (Alagoas, Sergipe, Espírito Santo, Rio de Janeiro and Santa Catarina). From 13–160 m deep.

Exogone breviantennata Hartmann-Schröder, 1959

Exogone breviantennata Hartmann-Schröder, 1959: 125, figs.75-78; Nuñez, 1990: 283-285, figure 80; Zottoli and Long, 2000: 502-511, figs. 1-5; Aguado and San Martín, 2007: 209-210; Paresque et al., 2014: 510-512; Ribeiro et al., 2018: 15-17, figure 9; Nascimento et al., 2020: 4.
Exogone (Exogone) breviantennata. San Martín, 1991: 730, figure 8; 2005: 141-142, figure 81E, 89; Nuñez et al., 1992: 47, figure 3; Nogueira, 2000: 32, figure 6F-I; Nogueira et al., 2004: 63-66, figs. 6-7.
Exogone ovalis Hartmann-Schröder, 1960: 106, figs. 131-133.
Exogone occidentalis Westheide, 1974: 305-309, pl.52a-l; Morgado and Amaral, 1985: 220, figure 1.
Exogone verugera not Claparède, 1868. Imajima, 1966: 399, figure 3; Day, 1967: 272, figure 12 g-l; Gardiner, 1975: 132, figure 11 a-e.

Remarks. Accounts on Brazilian records can be found in Nogueira et al. (2004), Paresque et al. (2014), and Nascimento et al. (2020).

Type locality. Pacific Ocean: Estero Jaltepeque, El Salvador.

Distribution. Atlantic Ocean: USA (Florida), Madeira Island, Canary Islands, Mediterranean Sea (Lebanon), Caribbean Sea (Bahamas, Belize, Cuba,

and Venezuela), Brazil (Espírito Santo, Paraíba, Pernambuco, Rio de Janeiro, and São Paulo). Pacific Ocean: China, Australia (Queensland), Galápagos Islands, El Salvador. Indian Ocean: Tanzania, Mozambique, Australia (Western Australia). From the intertidal zone to ~40 m deep.

Exogone cebimar Fukuda and Nogueira, 2014

Exogone cebimar Fukuda and Nogueira, 2014: 80-81, figs. 1-2.
Exogone (Exogone) sp. 2 *sensu* Fukuda, 2010: 140-141, figs. 40-41.

Remarks. Accounts on Brazilian records can be found in Fukuda and Nogueira (2014).

Type locality. Atlantic Ocean: São Sebastião, state of São Paulo, Brazil.

Distribution. Atlantic Ocean: Brazil (São Paulo). Intertidal.

Exogone dispar (Webster,1879)

Paedophyllax dispar Webster, 1879: 23, pl. 4, figure 49, pl. 5, figs. 50-55
Exogone dispar. Westheide, 1974: 298-301, figs. 48-49; Perkins, 1981: 1090-1091; Campoy, 1982: 290, pl. 21; Uebelacker, 1984: 30-43, figure 30-35–30-36; San Martín, 1984: 221, pl. 52; Fan et al., 1993: 25, figure 5; Paresque et al., 2014: 517-521, figs. 9-11.
Exogone (E.) dispar. San Martín, 1991: 729; 2003: 274-276, figs. 149-150; 2005: 137-138, figs. 81F, 85; Ruíz-Ramírez and Salazar Vallejo, 2001: 127, figure 3 (45-54); Fukuda, 2010: 126–129, figure 35

Remarks. Accounts on Brazilian records can be found in Paresque et al. (2014).

Type locality. Atlantic Ocean: Northampton County, Virginia, USA.

Distribution. Atlantic Ocean: North Sea (Skagerrak), Mediterranean Sea (Iberian Peninsula and Italy), USA, Mexico, Panamá, Caribbean Sea (Cuba and Trinidad and Tobago), Brazil (Paraíba, Pernambuco, Bahia, Espírito Santo, and São Paulo), South Africa. Pacific Ocean: China, Japan, Mexico (Baja California), and Galápagos. Indian Ocean: Australia (Western Australia). From the intertidal zone to ~157 m deep.

Exogone gigas Paresque, Fukuda and Nogueira, 2014

Exogone gigas Paresque et al., 2014: 525-530, figs. 14-15.
Exogone (Exogone) sp. 1 *sensu* Fukuda, 2010: 137-138, figure 39.

Remarks. Accounts on Brazilian records can be found in Paresque et al. (2014).

Type locality. Atlantic Ocean: Campos basin, state of Rio de Janeiro, Brazil

Distribution. Atlantic Ocean: Brazil (Rio de Janeiro and São Paulo). From the intertidal zone to ~143 m.

Exogone lourei Berkeley & Berkeley, 1938

Exogone lourei Berkeley & Berkeley, 1938: 44, figs. 6-12; Perkins, 1981: 1092-1094.
Exogone (E.) lourei. San Martín, 1991: 735; 2005: 129-130, fig. 78; Kudenov & Harris, 1995: 15-17, fig. 1.3; Fukuda, 2010: 129-131, fig. 36.

Material examined. Project "REVIZEE/Score Sul/ Bentos." State of Rio de Janeiro – st. 6762 (23°26'S 41°15 'W, 146 m): 1 spec., 28 Feb 1998; st. 6763 (23°08'S 41°00'W, 105 m): 2 specs., 1 Mar 1998.

Additional examined material. *Exogone lourei*. Cuba – Canarreos Archipelago, Isla de Pinos, Punta del Francés: 3 specs. (MNCN 16.01/630), coll. G. San Martín. Cabo Verde – Ilha do Sal, Joaquim Petinha: 3 specs. (MNCN 16.01/6909), 8 Aug 1985, coll. G. San Martín. Australia – Western Australia, Beacon Is., Goss Passage, 8 m: 1 spec. (AM W26992), coll. P. Hutchings, 22 May 1994, det. G. San Martín, 2001. *Exogone pseudolourei* San Martín, 1991. Puerto Rico - off San Juan, 512 m: 2 specs. (USNM 101329, holotype; USNM 101330, paratype), det. G. San Martín, 1986.

Description. Largest specimen analyzed incomplete with 47 chaetigers, 4.43 mm long, 0.17 mm wide. Palps triangular, almost completely fused, with terminal notch and conspicuous line of fusion. Prostomium oval, shorter than palps, with two pairs of eyes in trapezoidal arrangement, eyespots absent. Antennae inserted close to each other, near prostomium midline; antennae aligned or slightly anterior to anterior pair of eyes; median antenna tapering, with subdistal enlargement, inserted slightly posterior to lateral ones, reaching slightly beyond palps mid-length; lateral antennae ovate, ⅓½ as long as median antenna. Peristomium slightly shorter than anteriormost chaetigers; anterior border of peristomium covering posterior prostomium, including part of posterior eyes in some specimens; peristomial cirri small, papilliform. Dorsal cirri ovate,

longer than peristomial cirri and slightly shorter than lateral antennae, present on all chaetigers. Ventral cirri digitiform, shorter than parapodial lobes. Parapodial lobes short, conical. Compound chaetae as falcigers and spiniger-like chaetae, with spinulated blades and shafts, spinulation more conspicuous on anterior body chaetae, shafts and blades progressively smoother towards posterior body; anterior parapodia with 1–2 spiniger-like chaetae and 5–6 falcigers each, midbody parapodia with 1 spiniger-like and 3 falcigers, posterior body parapodia with 1 spiniger-like and 1–2 falcigers each; shafts of spiniger-like chaetae from chaetigers 1 (Figure 2A) and 2 (Figure 2B) with subdistal triangular enlargement, larger than distal part of shafts and more developed on chaetiger 2; blades of spiniger-like chaetae 45–32 µm long on anterior body, 55–42 µm on midbody (Figure 2C), and ~25 µm on posterior body (Figure 2D). Falcigers with bidentate blades, teeth progressively smaller towards posterior body; blades 10 µm long on anterior body and midbody, 10–6 µm long on posterior body (Figure 2C–D). Dorsal simple chaetae present from anterior body onwards, slightly sigmoid, subdistally spinulated and inflated, with acute tip, progressively wider and smoother towards posterior body (Figure 2E–F). Ventral simple chaetae only on posteriormost chaetigers, sigmoid, bidentate with proximal tooth larger than distal one, as wide as posterior body dorsal simple chaetae (Figure 2G). Anteriormost parapodia with two aciculae each, one straight, with acute tip and slightly subdistally inflated, another slightly curved and distally inflated, with apparently hollow tip (Figure 2H); from proventricle onwards, single acicula per parapodium, of latter type (Figure 2I); aciculae progressively stouter towards posterior region. Pygidium with pair of elongated anal cirri, as long as median antenna. Pharynx extending through ~4 segments, opening surrounded by papillae; conical tooth on anterior portion of pharynx; proventricle extending for 4–5 segments, with ~40 muscle-cells rows.

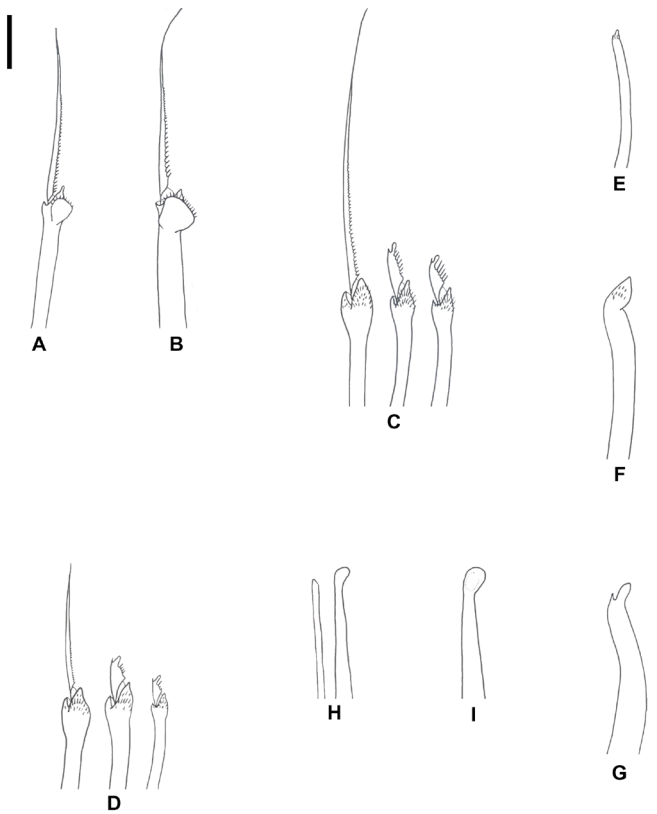

Figure 2. *Exogone lourei*
A, spiniger-like chaeta, chaetiger 1; B, spiniger-like chaeta, chaetiger 2; C, compound chaetae, midbody; D, compound chaetae, posterior body; E, dorsal simple chaeta, anterior body; F, dorsal simple chaeta, posterior body; G, ventral simple chaeta; H, aciculae, anterior body; I, acicula, posterior body. Scale bar = 10 µm.

Remarks. The specimens examined herein are similar to those from Australia (San Martín, 2005), Cuba, and Cape Verde. The fact that Australian specimens present only one acicula per parapodium (San Martín, 2005) could be size related, as the specimens studied by San Martín (2005) are smaller than those herein analyzed, and some size-related variations are not rare in the family (San Martín, 2003).

Type locality. Pacific Ocean: Nanaimo, British Columbia, Canada.

Distribution. Pacific Ocean: from Canada (British Columbia) to Panama. Indian Ocean: Australia (Western Australia). Atlantic Ocean: Canary Islands, Caribbean Sea, Brazil (Rio de Janeiro). First record for the Southern Atlantic.

Exogone marisae Pascual, Núñez & San Martín, 1996

Exogone marisae Pascual et al., 1996: 72-74, figure 2; Nogueira, 2000: 34, figure 6J-M; Fukuda, 2010: 132-134, figure 37.

Material examined. Project "BIOTA/ FAPESP/ Marine Benthos." Caraguatatuba – Praia de Martim de Sá, on *Dyctiota* sp.: 1 spec., 16 Mar 2001; on *Sargassum* sp.: 7 specs., 16 Mar 2001.

Additional examined material. *Exogone aristata* Hartmann-Schröder, 1982. Australia – Western Australia, Beacon Is., Goss Passage, 24 m: 1 spec. (AM W26989), coll. P. Hutchings, 22 May 1994, det. G. San Martín, 2000.

Description. Largest analyzed specimen complete, 2.45 mm long, 0.16 mm wide, with 21 chaetigers. Palps triangular, entirely fused, with faint line of fusion. Prostomium narrow, rectangular, shorter than palps, with two pairs of almost coalescent eyes, eyespots absent. Antennae small, ovate to pyriform, slightly tapering at tips, inserted on middle of prostomium, slightly anterior to anterior pair of eyes; median antenna nearly twice as long as lateral ones. Peristomium shorter than anteriormost chaetigers, with anterior border covering posterior prostomium; peristomial cirri minute, smaller than lateral antennae, almost spherical. Dorsal cirri present on all chaetigers, ovate, about same size as lateral antennae; ventral cirri roundish, about ½ size of dorsal cirri. Compound chaetae as spiniger-like and falcigers, both with narrow shafts, coarsely spinulated and distally inflated, shafts progressively less inflated ventralwards; some compound chaetae with almost homogomph articulation (Figure 3A–B). Parapodia each with one spiniger-like chaeta throughout and 3-4 falcigers on anterior and midbody regions, 2 falcigers per parapodium on posterior body. Spiniger-like chaetae with short, narrow blades, ~9 µm long (Figure 3A–B). Falcigers with short blades, ~5–3 µm long, some blades shorter than spines on shaft; most blades bidentate, distal tooth smaller than subdistal one, some falcigers without distal tooth due to reduction of blade size. Dorsal simple chaetae present from anterior body onwards, slightly sigmoid, subdistally spinulated, with usually two long spines (aristae) reaching beyond tip of chaeta; aristae more conspicuous on chaetae from posterior chaetigers (Figure 3C–D); ventral simple chaetae only present on posteriormost chaetigers, subdistally spinulated, bidentate, distal tooth smaller than subdistal one, aristae absent. Parapodia each with single acicula throughout, distally inflated, hollow, and slightly curved (Figure 3F). Pygidium with pair of elongated anal cirri, ~75 µm long, digitiform, with enlarged bases and tapering tips. Pharynx extending through ~3 segments, with large conical tooth at anterior opening; proventricle extending through 2.5 segments, with ~20 muscle-cells rows.

Biology. One of the specimens analyzed was epigamous, with gametes filling the coelom of chaetigers 12–16.

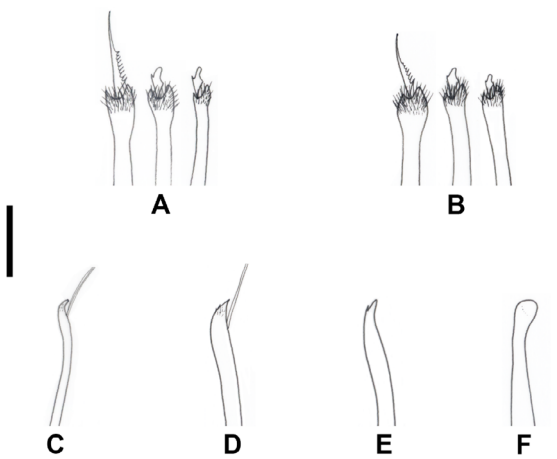

Figure 3. *Exogone marisae*
A, compound chaetae, anterior body; B, compound chaetae, posterior body; C, dorsal simple chaeta, anterior body; D, dorsal simple chaeta, posterior body; E, ventral simple chaeta; F, acicula, posterior body. Scale bar = 10 µm.

Remarks. *Exogone marisae* is part of a group of species of *Exogone* with aristae on the dorsal simple chaetae. This group also includes the Australian species *E. aristata* Hartmann-Schröder, 1982 and *E. ingridae* San Martín, 2005. However, *E. marisae* differs from both species above by presenting falcigers with conspicuously reduced blades and aristae only present on the dorsal simple chaetae. Furthermore, specimens of *E. aristata* have elongated median antenna, while *E. ingridae* has larger proventricle, extending through ~7 segments, and falcigers modified, with lateral spines joined together by a membrane (San Martín, 2005).

Another Australian species, *E. brevifalcigera* Hartmann-Schröeder, 1990, also resembles *E. marisae* in the shape and size of antennae and in the reduced size of the falciger blades. However, *E. brevifalcigera* differs from *E. marisae* by not presenting aristae on dorsal simple chaetae and by having a larger proventricle, occupying 4–5 segments, despite having a similar number of muscle-cells rows (San Martín, 2005).

Type locality. Atlantic Ocean: Canary Islands, Spain.

Distribution. Atlantic Ocean: Spain (Canary Islands), Brazil (São Paulo). First record for the Southern Atlantic.

Exogone mompasensis Martínez, Adarraga & San Martín, 2002

Exogone (E.) mompasensis Martínez et al., 2002: 676-680, figs. 1-2; San Martín, 2003: 255-256, figure 137; Fukuda, 2010: 134-137, figure 38.

Material examined. Project "REVIZEE/Score South/Benthos." State of São Paulo - st. 6661 (24°07'S 45°51'W, 147 m): 54 sp., 9 Jan 1998; st. 6669 (24º07`S 44º42'W, 101 m): 13 specs., 11 Jan 1998. State of Rio Grande do Sul - st. 6829 (33°41'S 51°32'W, 100 m): 1 spec., 3 Apr 1998.

Additional material examined. *Exogone mompasensis.* Spain - Basque Country, Guipúzcoa, San Sebastián, Punta de Mompás: holotype (MNCN 16.01/8710) and 11 paratypes (MNCN 16.01/10118), 8 Apr 1997, coll. G. San Martín, id. Martinez *et al.*

Description. Mid-sized body, largest specimen analyzed incomplete, 4.11 mm long, 0.18 mm wide, with 43 chaetigers. Palps triangular, almost totally fused, with conspicuous line of fusion and short distal notch (Figures 4A; 5A–C). Prostomium shorter than palps, with two pairs of eyes in open trapezoidal arrangement on posterior half; eyespots absent; median antenna between eyes, long, abruptly tapering distally, extending until close to tip of palps; lateral antennae inserted in front of anterior pair of eyes, digitiform, with ½ length of median antenna (Figures 4A; 5A, C–D). Peristomium slightly shorter than anterior chaetigers, covering posterior prostomium, including part of posterior pair of eyes in some specimens; peristomial cirri small, papilliform (Figures 4A, 5A–D); nuchal organs as pair of ciliated pitches dorso-laterally on peristomium, right dorsally to peristomial cirri (Figure 5C–D). Dorsal cirri ovate, slightly larger than peristomial cirri, absent on chaetiger 2; ventral cirri similar to dorsal cirri but slightly smaller; dorsal and ventral cirri progressively larger posteriorwards (Figure 4A). Parapodial lobes conical, short. From chaetiger 4 onwards, each parapodium with one modified spininger-like chaeta, with shaft distally thickened and strongly spinulated, and triangular blade, with wide base and acute tip, distally bidentate, ~18 µm long throughout (Figures 4B–D, 5F–G). Anterior body parapodia with 8–10 falcigers each, midbody parapodia with 3–4, posterior body parapodia with two falcigers each; falcigers with spinulated shafts and blades; blades short, ~7 µm long on anterior and midbody chaetae (Figures 4B–C, 5H–I), 5 µm long on posterior body, spinulation sometimes restricted to single spine on shortest blades of posteriormost parapodia (Figures 4D, 5J). Dorsal simple chaetae present from the chaetiger 1, sigmoid, subdistally spinulated, with acute tip, progressively stouter towards posterior body (Figures 4E–F, 5K); ventral simple chaetae present from mid- to posterior body region, about as thick as dorsal simple chaetae, sigmoid, bidentate, distally similar to falciger tips, with small distal tooth, and short spinulation (Figures 4G, 5L). Anterior parapodia with two distally inflated aciculae each, one straight, another slightly curved, apparently hollow (Figure 4H); after proventricle, parapodia with single acicula each, of latter type, progressively stouter posteriorwards (Figure 4I). Pygidium with pair of elongate anal cirri, longer and thinner than median antenna (Figure 5E). Pharynx extending through ~3–4 segments, with smooth margin and conical, pointed tooth close to opening; proventricle occupying ~2.5 segments, with ~40 muscle-cells rows (Figure 4A).

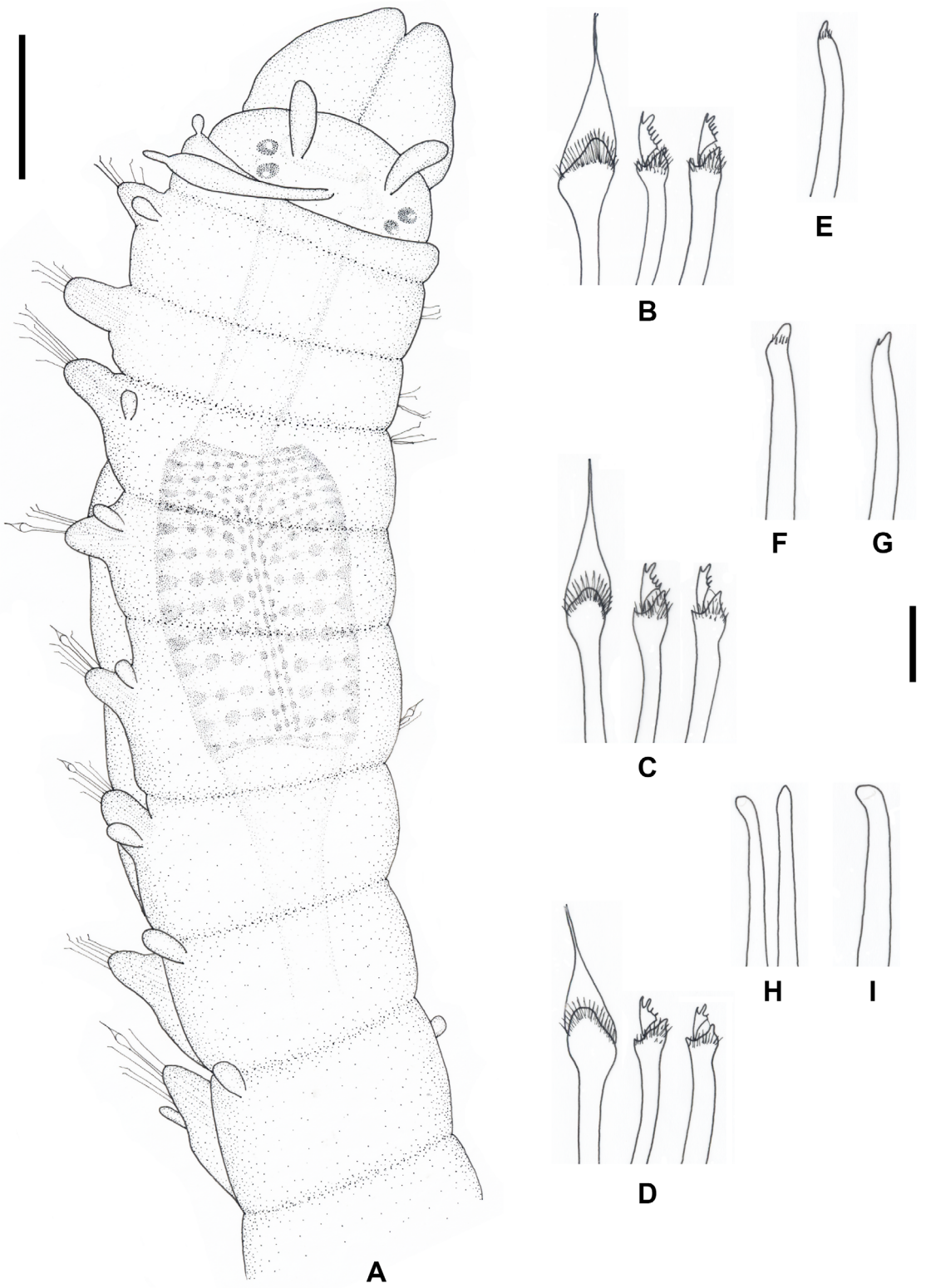

Figure 4. *Exogone mompasensis*. A, anterior body, dorsal view; B, compound chaetae, anterior body; C, compound chaetae, midbody; D, compound chaetae, posterior body; E, dorsal simple chaeta, anterior body; F, dorsal simple chaeta, posterior body; G, ventral simple chaeta, posterior body; H, aciculae, anterior body; I, acicula, posterior body. Scale bars A = 100 µm; B–I = 10 µm.

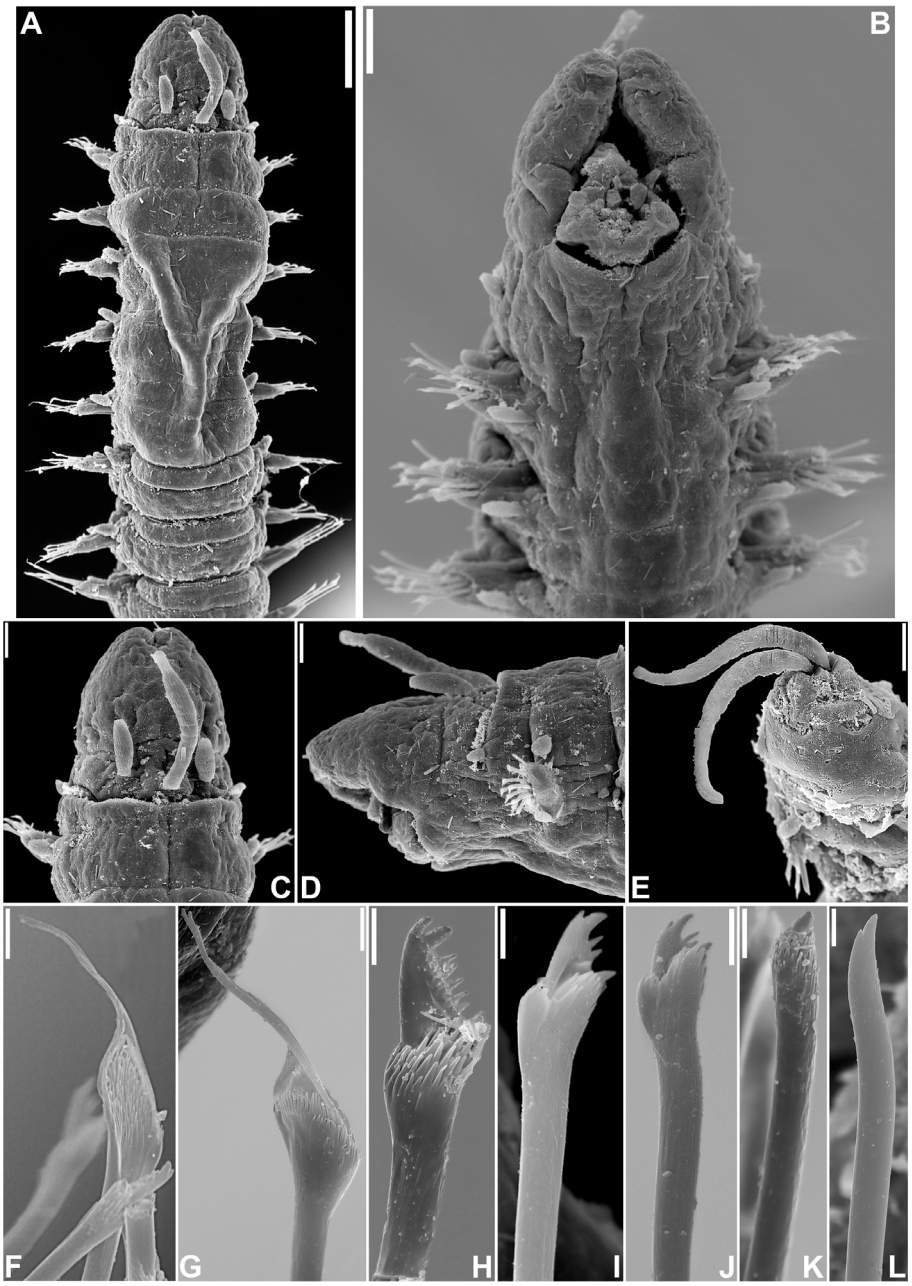

Figure 5. *Exogone mompasensis*, SEM. A, anterior body, dorsal view; B, anterior body, ventral view; C, prostomium, peristomium, and chaetiger 1, dorsal view; D, prostomium, peristomium, and chaetiger 1, lateral view; E, pygidium, dorso-lateral view; F–G, spiniger-like chaetae, anterior to midbody; H–J, dorsalmost falcigers, anterior, mid- and posterior body, respectively; K, dorsal simple chaeta, midbody; L, ventral simple chaeta, posterior body. Scale bars: A = 50 µm; B = 25 µm; C–E = 20 µm; F–G, J–L = 2.5 µm; H–I = 2 µm.

Remarks. Brazilian animals herein analyzed are very similar to Iberian specimens, except for the median antenna in some cases, which is slightly longer and more distally tapered on Brazilian material (Martínez et al., 2002; San Martín, 2003).

Type-locality. Atlantic Ocean: Guipúzcoa, San Sebastián, Spain.

Distribution. Atlantic Ocean: Spain (San Sebastián). First occurrence for the Southern Atlantic.

Exogone naidina Ørsted, 1845

Exogone naidina Ørsted, 1845: 20-23, pl. 2; Gardiner, 1975: p. 132, fig. 11j-n; San Martín, 1984: p. 208-210; Nogueira, 2000: 34-35, figure 6N-Q.
Exogone (*Exogone*) *naidina*. San Martín, 2003: p. 262-265, figs. 142-143.
Exogone gemmifera Pagenstecher, 1862. Fauvel, 1923: p. 305, figure 117a-d; Day, 1967: p. 274, figure 12.10p-u; Ben-Eliahu, 1977: p. 78, figure 7; Rullier & Amoureux, 1979: p. 162.

Material examined. Project 'Coral polychaetes.' State of São Paulo, Santos, Laje de Santos, 2 specs. (MHN-BPO JN 8/1-2).

Description. Small-sized species. Palps distally rounded almost completely fused. Prostomium ovate, with four eyes in trapezoidal arrangement; antennae almost transversely aligned, inserted slightly anteriorly to anterior pair of eyes; median antenna about twice as long as lateral ones. Dorsal cirri small, roundish, absent on chaetiger 2, progressively slightly larger towards posterior body. Compound chaetae with distally spinulated shafts; each parapodium with one spiniger-like chaeta with thin blade (Figure 6A), and three falcigers with short, bidentate blades, with subdistal tooth larger than distal one (Figure 6B). Falcigers of chaetigers 1–2 with modified blades, bidentate, with large teeth, distal tooth larger than subdistal one. Dorsal simple chaetae unidentate, subdistally spinulated, with tapered tip, present on all parapodia (Figure 6C); ventral simple chaetae only present on posteriormost chaetigers, bidentated, proximal tooth larger than distal one (Figure 6D). Single acicula per parapodium throughout, distally inflated (Figure 6E). Pharynx extending through ~2.5 segments, with tooth close to opening; proventricle occupying ~2 segments, with ~15 muscle-cells rows.

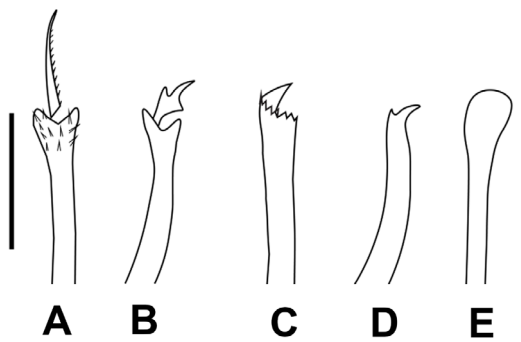

Figure 6. *Exogone naidina*. A, spiniger-like chaeta; B, falciger; C, dorsal simple chaeta; D, ventral simple chaeta; E, acícula. Scale bar = 10 µm.

Remarks. Brazilian specimens match the description of those from the Iberian Peninsula (San Martín, 1984, 2003).

Type location. Northern Atlantic Ocean: Denmark.

Distribution. Cosmopolitan (San Martín, 2003).

Exogone naidinoides Westheide, 1974

Exogone naidinoides Westheide, 1974: 301–305, figs. 50–51e–f; Russell, 1991: 57–59, figure 3; Paresque et al., 2014: 504-508, figs. 2-4; Nascimento et al., 2020: 4.
Exogone (Sylline) naidinoides. San Martín, 1991: 737, figure 7a–f; San Martín & Bone, 2001: p. 612-613; Capa et al., 2001: 623; Ruíz-Ramírez and Salazar-Vallejo, 2001: 128, figure 4 (66–76); San Martín, 2005: 146–147, figure 93; Fukuda, 2010: 149–151, figure 44.

Remarks. Accounts on Brazilian records can be found in Paresque et al. (2014) and Nascimento et al. (2020).

Type locality. Pacific Ocean: Ecuador, Galápagos.

Distribution. Pacific Ocean: Galápagos. Indian Ocean: Australia (Western Australia). Atlantic Ocean: Canary Islands, Belize, Mexico, Panama, Cuba, Venezuela, and Brazil (Paraíba, Pernambuco, Espírito Santo, São Paulo and Trindade Island).

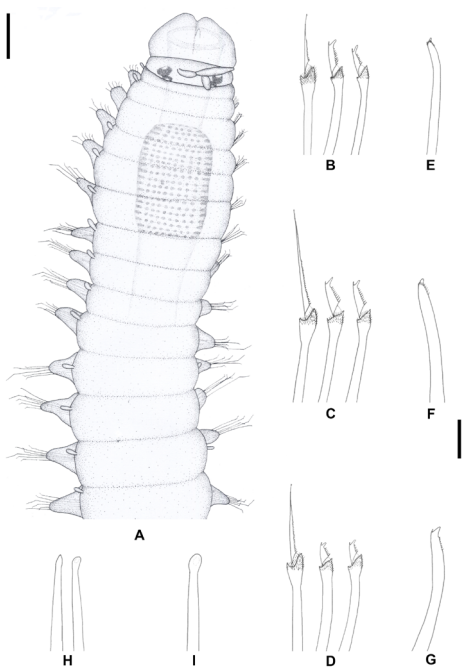

Figure 7. *Exogone paulolanai* sp. nov. A, anterior body, dorsal view; B, compound chaetae, anterior body; C, compound chaetae, midbody; D, compound chaetae, posterior body; E, dorsal simple chaeta, anterior body; F, dorsal simple chaeta, posterior body; G, ventral simple chaeta, posterior body; H, aciculae, anterior body; I, acicula, posterior body. Scale bars A = 100 µm; B–I = 10 µm.

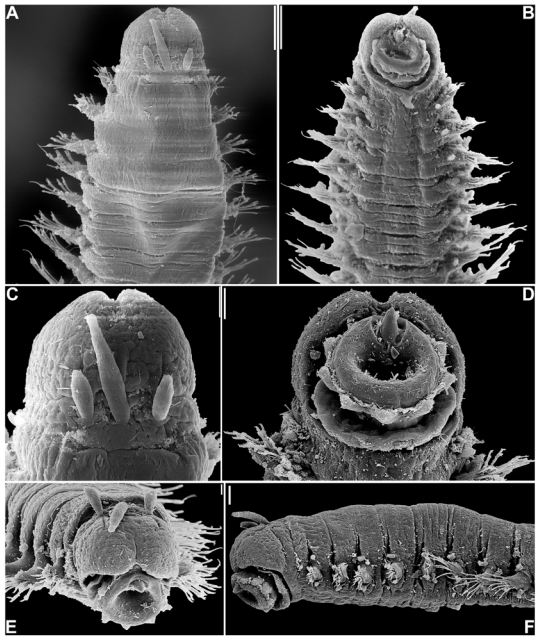

Figure 8. *Exogone paulolanai sp*. nov., SEM. A, anterior body, dorsal view; B, anterior body, ventral view; C, prostomium and peristomium, dorsal view; D, prostomium and peristomium, ventral view (pharynx everted); E, prostomium, frontal view (pharynx everted); F, anterior body, left lateral view. Scale bars: A, B = 50 µm; C, D = 20 µm; E, 10 µm; F, 30 µm.

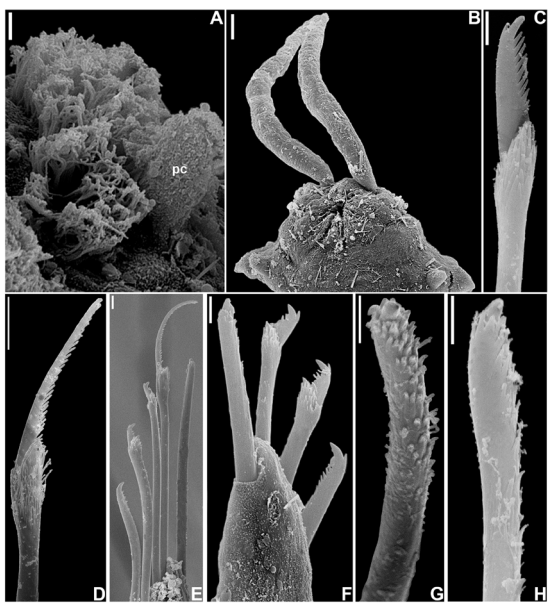

Figure 9. *Exogone paulolanai sp*. nov., SEM. A, tuft of cilia and peristomial cirrus (pc); B, pygidium, dorsal view; C, falciger, mid- to posterior body; D, spiniger-like chaeta, anterior body; E–F, chaetae, posterior body; G, dorsal simple chaeta, anterior to midbody; H, dorsal simple chaeta, posterior body. Scale bars: A, C, G, H = 2 µm; B = 10 µm; D = 5 µm; E, F = 3 µm.

Exogone paulolanai sp. nov.

(http://zoobank.org:act:03432197-BAD8-4FF2-BBB6-269E95BE5F58)
Exogone (E.) sp. 4 *sensu* Fukuda, 2010: 147-149, figure 43.

Type-material. Brazil, State of São Paulo, offshore (24º07´S 45º51´W, 147 m). Holotype (MZUSP 6100) and 50 paratypes (MZUSP 6101–6102; ZUEC-POL 27534), coll. Project REVIZEE, 9 Jan 1998, det. Fukuda, M.V., 2006.

Material examined. Project REVIZEE. State of Rio de Janeiro – st. 6739 (24º02´S 43º30´W, 147 m): 1 spec., 14 Feb 1998; st. 6759 (23º20'S 41º22'W, 110 m): 8 specs., 28 Feb 1998; st. 6762 (23º26´S 41º15´W, 145 m): 4 specs., 27 Feb 1998; st. 6763 (23º08´S 41º00´W, 100 m): 1 spec., 1 Mar 1998; st. 6769 (22º02'S 40º05'W, 93 m): 1 spec., 2 Mar 1998. State of Santa Catarina – st. 6817 (29º28'S 48º09'W, 210 m): 1 spec., 22 Mar 1998.

Additional material examined. *Exogone heterosetoides* Hartmann-Schröder, 1979. Australia - Western Australia, Broome: 1 spec. (holotype, ZMH-P15516), coll. 8 Sep 1975, det. G. Hartmann-Schröder. Antarctica - South Shetland Islands, S Livingston Island: 1 spec. (MNCN 16.01/3536), 25 Jan 1995, coll and id. G. San Martín. *Exogone heterosetoides australis* Hartmann-Schröder and Rosenfeld, 1988. Antarctica - King George Island, 265 m deep: 1 spec. (holotype, ZMH P-19143), coll. 'Polarstern' Reise, 03 Dec 1984; South Shetland Islands, Livingston Island: 2 specs. (MNCM 16.01/1492), 6 Feb 1994, col. and det. G. San Martín; South Shetland Islands, Livingston Island 49 m: 1 spec. (MNCN 16.01/3539), 18 Jan 1995, coll. and id. G. San Martín. *Exogone heterosetosa* McIntosh, 1885. Antarctica - Antarctic Peninsula, 184 m: 2 specs. (ZMH P-21652), coll. 24 May 1986, det. G. Hartmann-Schröder and P. Rosenfeldt, 1991; Australia - Western Australia, Goss Passage, Long Island, 8 m: 10 specs. (AM W27057), coll. C. Bryce, 22 May 1994, det. G. San Martín, 2000.

Description. Largest specimen analyzed 2.72 mm long and 0.29 mm wide, with 32 chaetigers. Palps triangular to ovate, almost entirely fused, with a faint line of fusion and terminal notch. Prostomium shorter than palps, with two pairs of eyes in trapezoidal arrangement, eyespots absent. Median antenna slightly enlarged subdistally, with

tapering tip, inserted centrally on prostomium, reaching mid-length of palps or slightly beyond; lateral antennae ovate to digitiform, ~½ length of median antenna and inserted slightly anterior to it, aligned with anterior pair of eyes and near them (Figures 7A; 8A, C). Peristomium shorter than anteriormost chaetigers; peristomial cirri papilliform, smaller than lateral antennae (Figures 7A; 8A, C); nuchal organs as patches of cilia between prostomium and peristomium, close to peristomial cirri (Figures 8A, C; 9A). Dorsal cirri absent from chaetiger 2, slightly larger than peristomial cirri and similar in shape (Figure 7A; 8A, E–F); ventral cirri about same size as peristomial cirri, but slightly more tapered. Parapodial lobes conical (Figures 7A; 8A–B; E–F; 9F); anterior parapodia each with 7–11 falcigers and, from chaetiger 3, also 1–2 spiniger-like chaetae; midbody parapodia with 5 falcigers and 1 spiniger-like chaeta each; posterior parapodia each with three falcigers and one spiniger-like chaeta. Spiniger-like chaetae with strongly spinulated shafts, especially on anterior body; blades with short spinulation, indistinctly bidentate, relatively short, measuring 31–16 µm long on anterior body (Figures 7B; 9D), 36-28 µm on midbody (Figure 7C), and 25-22 µm long on posterior body (Figures 7D; 9E). Falcigers with bidentate, spinulated blades, with short, straight spines; blades with dorso-ventral gradation in length, 10-8 µm long on anterior body (Figure 7B), 12–6 µm on midbody (Figure 7C), and 8-5 µm long on posterior body (Figures 7D; 9E–F). Dorsal simple chaetae present from chaetiger 1, sigmoid, with acute tip, subdistally spinulated, with about same width as falciger shafts on anterior body (Figures 7E; 9G), progressively stouter posteriorwards (Figures 7F; 9F, H); ventral simple chaetae only present on posteriormost chaetigers, approximately as stout as dorsal simple chaetae, sigmoid, subdistally spinulated, bidentate, subdistal tooth larger (Figures 7G; 9F). Anterior parapodia with 2 aciculae each, distally inflated, hollow, one straight, another slightly curved (Figure 7H); after proventricle, parapodia with single acicula each, of latter type but stouter (Figure 7I). Pygidium with pair of relatively narrow and elongated anal cirri, ~3–4 times longer than median antenna; anus dorsal to anal cirri (Figure 9B). Pharynx extending through ~3 segments, with margin surrounded by 10 soft papillae, and conical, large tooth located anteriorly (Figure 9B, D–F); proventricle extending for ~3 segments, with ~22 muscle-cell rows (Figure 7A).

Remarks. *Exogone paulolanai* sp. nov. is similar to the Australian *E. heterosetosa* McIntosh, 1885 and *E. heterosetoides* Hartmann-Schröder, 1979, and to the Mediterranean *E. mompasensis*, in having a median antenna longer than the lateral ones and spiniger-like chaetae with heavily spinulated shafts and relatively short blades. However, differently from representatives of those species, specimens of *E. paulolanai* sp. nov. present spiniger-like chaetae beginning on chaetiger 3, lacking the characteristic strongly enlarged shafts and triangular blades of members of those species. Moreover, *E. paulolanai* sp. nov. differs from both Australian species by having falcigers with proportionally longer blades, up to 12 µm long, while falciger blades are at most 7 µm long in members of both *E. heteroseta* and *E. heterosetoides*.

Etymology. This species is dedicated to Paulo da Cunha Lana, a man of science responsible for great advances not only in polychaete research, but also for the Sciences in general.

Type-locality. Atlantic Ocean: offshore São Paulo, Brazil.

Distribution. Brazil (Rio de Janeiro, São Paulo, Santa Catarina). From 100-187 m deep.

Exogone rocas Nascimento, Fukuda and Paiva, 2020

Exogone rocas Nascimento et al., 2020: 7-9, figure 4.

Remarks. Accounts on Brazilian records can be found in Nascimento et al. (2020).

Type locality. Atlantic Ocean: Rocas Atoll, Brazil.

Distribution. Only known from the type locality.

Exogone rolani San Martín, 1991

Exogone rolani San Martín, 1991: 731–733, figure 9; Paresque et al., 2014: 514-517, figs. 7-8.

Remarks. Accounts on Brazilian records can be found in Paresque et al. (2014).

Type-locality. Atlantic Ocean: Archipelago de los Canarreos, Cuba.

Distribution. Atlantic Ocean: USA (East coast), Cuba, Brazil (Paraíba and Rio de Janeiro). From the intertidal zone to ~91 m deep.

Exogone simplex Hartmann-Schröder, 1960

Exogone simplex Hartmann-Schröder, 1960: 107–108, pl. 15, figs. 134–136; Paresque et al., 2014: 508–510, figure 5.
Exogone (*Sylline*) *simplex*. San Martín, 2005: 146, figure 92; Fukuda, 2010: 152–153, figure 45.
Exogone cf. *simplex*. Nascimento et al., 2020: 4-7, figure 3.

Remarks. Accounts on Brazilian records can be found in Paresque *et al.* (2014) and Nascimento *et al.* (2020).

Type-locality. Indian Ocean: Hurghada, Egypt, Red Sea.

Distribution. Indian Ocean: Red Sea (Egypt), Australia (Western Australia). Pacific Ocean: Australia (New South Wales). Atlantic Ocean: Angola, Brazil (Paraíba, Rio Grande do Norte and São Paulo).

Exogone verugera (Claparède,1868)

Paedophylax veruger Claparède, 1868: 67-68, pl. XII fig. 3.
Paedophylax brevicornis. Webster and Benedict, 1887: 721, pl. II fig. 40-41, pl. III fig. 42-45.
Exogone verugera. Attolini, 1997.

Remarks. Accounts on Brazilian records can be found in Attolini (1997).

Type-locality. Italy, Naples (Atlantic Ocean, Mediterranean Sea)

Distribution. Cosmopolitan (records on Atlantic, Pacific, and Indian oceans). From 12 - 197 m deep.

DISCUSSION

This contribution presents an inventory of what is known about this diverse genus of syllids on the Brazilian coast so far, summarizing results from formally published works (e.g., Paresque et al., 2014; Nascimento et al., 2020), together with the so-called 'grey literature' (e.g., Nogueira, 2000; Fukuda, 2010), i.e., information published in channels other than peer-reviewed, academic papers, such as is the case of considerable part of the literature on Brazilian polychaetes (Lana et al., 2017). Moreover, we present the description of a species new to science.

With this paper, we aimed to contribute to the knowledge about the polychaete fauna of Brazil, a megadiverse country that, despite having a coastline of around 7,500 km, extending from latitudes 4°N to 34°S, holds only around 1,350 species of annelid polychaetes recorded so far (cf. Amaral et al., 2022). In this way, we present a contribution towards mitigating some of the deficits in our knowledge about biodiversity (Hortal et al., 2015), namely, the 'Linneann Deficit'—by presenting the description of a species new to science and of specimens of Brazilian populations—, and the 'Wallacean Deficit,' by expanding the geographic records of species distributions.

In times when large datasets have been increasingly used for different analyses, we must be cautious with the curation of such data, with the source used being of utmost importance to the achievement of accurate results. In this sense, taxonomic identifications conducted in the most rigorous way possible gain a new level of importance, as they can be the difference between subsequent analytical works establishing their bases on ´consolidated´ or ´unconsolidated´ substrates, to borrow the terms from benthic studies.

The taxonomy of syllids, and of annelids in general, presents many cases in which morphology alone seems not to be enough to differentiate some species, at least at first sight, for the separation of certain populations as distinct clades, even when referring to localities sometimes as far away as the coast of São Paulo (SW Atlantic) and the Great Barrier Reef (SW Pacific). Using different classes of information, such as molecular, a series of cryptic species have been revealed (Struck et al., 2018), leading to reconsiderations on the previously supposed distribution patterns of many taxa (e.g., Silva et al., 2017; Cerca et al., 2019). However, the lack of data on sequences of many taxa in public databases makes confirmations/rebuttals, if not impossible, at least very doubtful in several cases. This is what happens in the species reported herein. This way, the identifications were based solely on the morphology, a criterion according to which many of the specimens studied are practically indistinguishable from those from other, sometimes distant, locations. In these cases, even

though future analyses involving broader classes of data may present different results, we chose to identify the material with the previously existent names, as at this point, morphologically, we do not have bases to state otherwise.

When presenting a synthesis such as this contribution, one of the challenges is the lack of testimonial material that can corroborate (or refute) the occurrence of a given taxon for the coast. This leads to the question of the basic need to deposit the material studied in reference collections, which often does not happen, especially when the studies are not specifically linked to the field of Taxonomy. Thus, certain records will remain forever on checklists without being confirmed; however, without vouchers, they cannot be rejected either, even if they are never found again. That is the case of *E*. *verugera*, reported only once for Brazilian waters (Attolini, 1997) but lacking available voucher specimens for examination, putting in question the certainty of the presence of this Mediterranean species in Brazil. In this study, we show another example of the paramount importance of museums and scientific collections, safeguarding reference material to aid not only in issues such as those treated herein but going far beyond (Johnson et al., 2023), keeping vouchers with different layers of information (evolutionary, historical, geographic) linked to each object kept in their collections (Borges et al., 2022).

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As part of this special issue, not only the new species herein described, but also this whole contribution, are in honor of Paulo da Cunha Lana. In his own words, "*an eternally curious person, I've always really liked marine worms and other animals, but I like people much more*." Besides being a scientist that would perhaps fit well in the Renaissance model, with vast interests and readings that allowed him to go in a conversation from the state-of-the-art of new analyses and technologies to some little known, obscure poet from a distant country, Paulo was also a kind, good humored, and generous human being, but with the energy, wit, and assertiveness when criticisms were needed. Paulo's demise was way too early, leaving a gap that is not larger because of all the students and mentees that he left along his most prolific career, which already had made him immortal, whether nature agrees with it or not... Thank you for everything, Paulo!

AUTHOR CONTRIBUTIONS

M.V.F.: Conceptualization; Investigation; Project Administration; Funding Acquisition; Writing – original draft; Writing – review and editing.

W.M.G.R.: Writing – original draft; Writing – review and editing.

R.H.C.R.: Writing – original draft; Writing – review and editing.

J.M.M.N.: Supervision; Resources; Project Administration; Funding Acquisition; Writing – review and editing.

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