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New species of *Sphaerosyllis* Claparède, 1863 (Annelida: Syllidae: Exogoninae) from Rio de Janeiro (Brazil)

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Abstract

A new syllid species belonging to the genus *Sphaerosyllis* (Claparède, 1863) was found in Southeast Brazil during the development of the project "Environmental, social and economic susceptibility of Ilha Grande Bay to spillage and the presence of oil at sea." Hence, this paper contains its morphological description, obtained after careful examination of several specimens under light and scanning electron microscopy. The new species can be diagnosed by the presence of intersegmental brown stripes along all body segments, fused palps for most of its length, a prostomium semicircular with three antennae, one simple dorsal chaeta, one simple ventral chaeta and 3–4 falcigers bearing unidentate blades. Finally, an identification key and a comparative table are provided for all the species formally recorded in Brazil to date.

Keywords: Biomonitoring, Benthic Macrofauna, Angra dos reis, Shallow waters, Syllidae

INTRODUCTION

The family Syllidae was established by Grube (1850) and is known as one of the most taxonomically rich polychaete groups (San Martín, 2003). Interestingly, the name Syllidae comes from the Latin word "Syllis," meaning "a nymph," with reference to an entity from Greek mythology, the lover of Apollo and mother of Zeuxippos of Sikyon (Rouse et al., 2022). Nowadays, the syllids are represented by around 700 to 1,000 valid species grouped into 70 genera, whereas new taxa are still being described (Aguado et al., 2007; Rouse et al., 2022; Read and Fauchald, 2023a). General reports on the family have been made by Glasby (2000), Rouse and Pleijel (2001), and San Martín (2003). Syllids are common on all shallow substrates, but less common at greater depths, with some species symbiotic or parasitic on other marine invertebrates (Martín and Britayev, 1998). The family Syllidae is currently divided into five subfamilies: Syllinae Grube, 1850; Autolytinae Langerhans, 1879; Exogoninae Langerhans, 1879; Eusyllinae Malaquin, 1893; Anoplosyllinae Aguado and San Martín, 2009, and a group of *Incertae sedis*

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genera, previously placed in "Eusyllinae" *sensu* Aguado and San Martín (2009), for which the molecular information is still lacking (Aguado and San Martín, 2009; Aguado et al., 2012).

The subfamily Exogoninae was established by Langerhans, 1879 and comprises nine genera, including *Sphaerosyllis* Claparède, 1863. The members of this subfamily are small to minute worms, usually found living in sand, among algae, in mud sediments, and in crevices of corals and rocks (San Martín, 1984a, 1984b, 2003). In general, the species assigned to this group are found in shallow substrates, but some can occur at great depths (Barroso et al., 2017).

Exogonines are usually short worms with few segments, approximately 30 in number (San Martín, 2005). The prostomium frequently has four lensed eyes (and sometimes one pair of anterior eyespots), three antennae, one pair of dorsally fused palps along most of its extension, and a peristomium with 1–2 pairs of tentacular cirri (Nogueira et al., 2004). Three reproductive methods have been described: dorsal incubation of eggs by means of capillary notochaetae on the females (Kuper and Westheide, 1998), ventral incubation of eggs with the development of attached juveniles (San Martín, 2005), and viviparity (Pocklington and Hutchenson, 1983; San Martín, 1991).

Sphaerosyllis Claparède, 1863 is a relatively large group of small, slender syllids, currently grouped in the subfamily Exogoninae Langerhans, 1875. In total, 74 species are accepted according to the World Register of Marine Species (WoRMS) (Read and Fauchald 2023b). The main characteristics used to distinguish this genus from others in its subfamily are a prostomium with four lensed eyes, three antennae, and one pair of palps fused for most of its length, a short pharynx armed with a single conical tooth, a short proventriculus with few muscular bands, and the usual absence of a dorsal cirri on chaetiger 2 (San Martín, 2005). This paper describes a new species of *Sphaerosyllis* found in Ilha Grande Bay (Rio de Janeiro, Brazil).

METHODS

Two monitoring campaigns aimed at understanding the benthic community diversity were carried out by the research project "Environmental, social and economic susceptibility of Ilha Grande Bay to spillage and the presence of oil at sea" (MONITOMAR) from July to October/2022. The marine benthic macrofauna was sampled in triplicate at four collecting stations.

The fieldwork was divided into two campaigns, of two days each, with sampling carried out close to the rocky shore, using a van Veen dredge at depths of 12 to 16 meters. The first campaign took place at Ilha de Imboassíca (23°4'59.73"S, 44°19'52.33"W) and Ilha de Búzios (23°3'26.81"S, 44°25'0.09"W), in Angra dos Reis (Rio de Janeiro State), both on the first day of sampling activities (July/5/2022). On the second day, the collecting points were selected at Ilha de Araraquara (23°3'59.40"S, 44°33'53.48"W), in Paraty and at Ilha do Brandão (23°1'49.79"S, 44°24'13.97"W), also in Angra dos Reis (July/6/2022). The second campaign took place on October/18/2022 at Jorge Grego (23°13'2.03"S, 44° 9'14.01"W) and Lopes Mendes (23°11'6.77"S, 44° 7'49.89"W), both in Ilha Grande (Rio de Janeiro). On the second day, the collecting points were situated at Ilha da Longa (23°8'23.34"S, 44°19'35.19"W) and Sítios Fortes (23°6'54.19"S, 44°17'48.55"W), also in Ilha Grande (October/19/2022).

At each point, three samples of sandy sediment (replicates) were collected, transferred to 50x70 cm plastic bags, fixed in 10% formaldehyde. The material collected underwent the elutriation process five times and were sieved through a 0.3 mm mesh. The macrofauna was transferred to small vials containing 93% alcohol. After the elutriation process, the remaining sediment was deposited again in plastic bags and 93% alcohol was added. In the laboratory, the sandy sediment was sorted with a magnifying glass to extract and separate the macrofauna at the level of large taxonomic groups, which were later identified to the lowest taxonomic level, especially polychaetes. From these, a type series of 6 specimens was separated to this study.

The type material is in the Polychaeta Collection of Rio de Janeiro State University under the acronym "UERJ-Pol."

A single specimen was prepared for scanning electron microscopy (SEM) using 99% Hexamethyldisilazane (HMDS) solution, according to the following process: i) removal of water using ethanol (EtOH) in a series of 70%, 80%, 90%, and then absolute EtOH concentration, during 15–20 minutes at each step; ii) replacement of ethanol using HMDS in a series of 1:2, 1:1, 2:1 ratios of absolute EtOH and HMDS at each step for 15–20 minutes and, finally, iii) total evaporation of the HMDS, for about 4–5 hours.

RESULTS

Systematic account

Syllidae Grube, 1850

Exogoninae Langerhans, 1875

Sphaerosyllis Claparède, 1863

Type species: *Sphaerosyllis hystrix* Claparède, 1863

Genus diagnosis

Small and slender worms, with a papillated body. Palps fused for most of their length. Prostomium semicircular, with two pairs of lensed eyes and three antennae. Absence of eyespots. Antennae with broader bases, ending in short, slender, cylindrical to filiform tips. Peristomium with a single pair of tentacular cirri, similar in shape to the antennae and dorsal cirri throughout. Dorsal cirri are usually absent on chaetiger 2. Pharynx slender, with small, conical pharyngeal teeth, located on the anterior border of pharynx. Proventriculus is short, spherical, distinctly wider than the pharynx, with few muscular bands. Usual and distinct presence of parapodial glands, with fibrillar, hyaline, or granular material. Falcigers with short, unidentate blades. Ventral brooding of eggs and embryos (San Martín, 2003; San Martín, 2005; Barroso et al., 2017; Surugiu and San Martín, 2017).

Remarks

Initially, San Martín (1984b) divided *Sphaerosyllis* into two subgenera: *Sphaerosyllis* (*Sphaerosyllis*) Claparède, 1863 and *Sphaerosyllis* (*Prosphaerosyllis*) San Martín, 1984b (Nogueira et al., 2004). In his re-evaluation, San Martín (2005) divided *Sphaerosyllis* (*Sphaerosyllis*) into two genera: *Erinaceusyllis* San Martín, 2005 and *Sphaerosyllis*. On the other hand, Böggemann and Westheid (2004), after a re-examination of the *Prosphaerosyllis xarifae* (Hartmann-Schröder, 1960) type material, proposed that *Sphaerosyllis* (*Prosphaerosyllis*) should be treated as a separate genus: *Prosphaerosyllis,* also pointing out that the type specimens of *P. xarifae* had 18 muscle rings in the proventricle, and not 16, as mentioned in the first description. Morphologically, the arguments used by San Martín (2005) to separate *Sphaerosyllis* from *Prosphaerosyllis* and *Erinaceusyllis* were the presence of papillae on the pharynx opening, a conical pharyngeal tooth, always located on the anterior margin of the pharynx or very close to it, usually with a short proventricle with 12–23 rows of muscle cells, a large posterior acicula bent distally at a right angle, usually accompanied by a second straight aciculum, blades of compound chaetae that are always short and unidentate, and ventral brooding of embryos and juveniles. San Martín (2005) transferred three species of *Sphaerosyllis* to the new genus *Erinaceusyllis.* In addition, he emphasized that *Erinaceusyllis* differs from *Prosphaerosyllis* by the presence of a rhomboidal to oval dorsal tooth, usually located near the middle of the pharynx, antennae that are always short, tentacular and dorsal cirri with a bulbous cirrophore with a retractile cirrostyle, and more numerous papillae along the body, usually present in different sizes. Finally, Aguado et al. (2012) presented a general review of the family Syllidae, recognizing the taxonomic validity of the genera *Sphaerosyllis, Prosphaerosyllis*, and *Erinaceusyllis*, reinforcing their position in the subfamily Exogoninae.

Sphaerosyllis lanai sp. nov.

LSID

urn:lsid:zoobank.org:pub:54B04E61-92E3-4727-AD18-35ECA595A84E

Etimology

The specific epithet "*lanai*" was chosen to honor the esteemed polychaete researcher Paulo da Cunha Lana, for his immeasurable contributions to the scientific knowledge on Brazilian marine science and as an inspiration for future generations of taxonomists, ecologists, and oceanographers.

Type material

UERJ 8586 (Holotype), 1 specimen; 23°5'7"S, 44°19'50"W; 12 meters deep. UERJ 8587 (Paratype), 1 specimen; 23°5'7"S 44°19'50"W; 12 meters deep.

Additional material

UERJ 8588, 1 specimen; 23°5'7"S 44°19'50"W; 12 meters deep. UERJ 8590, 3 specimens; 23° 5' 7"S 44° 19' 50"W; 12 meters deep.

Species diagnosis

Median antenna the same size as the lateral pair, situated at the middle of the anterior margin of the prostomium. Antennae, tentacular cirri, dorsal cirri, ventral cirri, and pygidial cirri with the same shape, with globular bases transitioning to cylindrical tips. Intersegmental brownish stripes between each chaetiger from anterior to posterior end of body. Absence of parapodial glands. Parapodial chaetae present as four falcigers in anterior and mid-body chaetigers, three falcigers in posterior chaetigers, one simple dorsal chaetae and one simple ventral chaetae from anterior chaetigers, and one aciculum distally bent at a right angle from mid-body to posterior chaetigers.

Species description

Body slender, holotype complete, 30 chaetigers, 2mm long by 0.25 mm wide (Table S1, Supplementary material). Palps long, fused up to the end (Figure 1A, 2A). Antennae short, not exceeding the length of palpi (Figures 1A, 2A, 3A); lateral pair at the anterior margin of the prostomium (Figures 3A, 3C). Median antenna situated at the posterior margin of prostomium, the same size as the lateral pair (Figures 1A, 3A). Two pairs of eyes arranged trapezoidally (Figure 2A). Nuchal organs not observed. Peristomium dorsally reduced, projecting laterally below the prostomium. Pair of tentacular cirri present, the same size as the dorsal and ventral cirri. Antennae, tentacular cirri, dorsal cirri, ventral cirri, and pygidial cirri similar in shape, with globular bases transitioning to cylindrical tips (Figure 2B); shorter tips on the anterior body, transitioning to larger tips on mid to posterior body. Dorsal cirri absent on chaetiger 2. Pharynx extending over 3 chaetigers, with a small tooth at the anterior end (Figure 1A); proventriculus occupying 2–2.5 segments, rectangular to square (Figure 1A), distinctly wider than the pharynx, with around 13–15 thick rows of muscle cells (Figure 1A). Secondary annulations may be inconspicuous under optical microscopy, but were observed under scanning electron microscopy, numbering 5 secondary annuli per chaetiger (Figure 3B). First chaetigers with few finger-like papillae, transitioning abruptly to a more papillated region beginning from chaetiger 7–8 (Figure 3B).

Parapodial lobes distally rounded, with two anterior papillae in the dorsal and ventral region on the distal end. Falcigers always unidentated, showing a strong dorso-ventral gradation in blades length on the anterior chaetigers, but less evident on the mid-body and posterior chaetigers (Figures 1E-G, 3D-H). Anterior chaetigers have four falcigers (Figures 1E; 3F), with blades 15–7.5 µm long; mid-body chaetigers have four falcigers (Figures 1F, 3E), with blades 12–7.5 µm long; the posterior chaetigers have three falcigers (Figures 1G, 3H), with blades 10–7.5 µm long. Falciger blades denticulated on anterior chaetigers; with the two longer entirely denticulated and the two shorter subdistally denticulated. Mid-body and posterior body falciger blades all subdistally denticulated.

Presence of dorsal simple chaetae from chaetiger 1, almost straight, slightly curved distally, becoming markedly straight on posterior chaetigers (Figures 1H, 2D). Presence of ventral simple chaetae from chaetiger 1, with the same shape as the dorsal simple chaetae, but shorter than the falcigers (Figures 1I, 2C, 3E). Both simple chaetae have a smooth surface, without any kind of ornamentation. Anterior parapodia without acicula; a single aciculum per parapodium, from the mid- to posterior body chaetigers, always distally bent at a right angle (Figures 1J, 3G). Pygidial cirri with the same shape as the dorsal and peristomial cirri, but much larger and longer (Figure 2F).

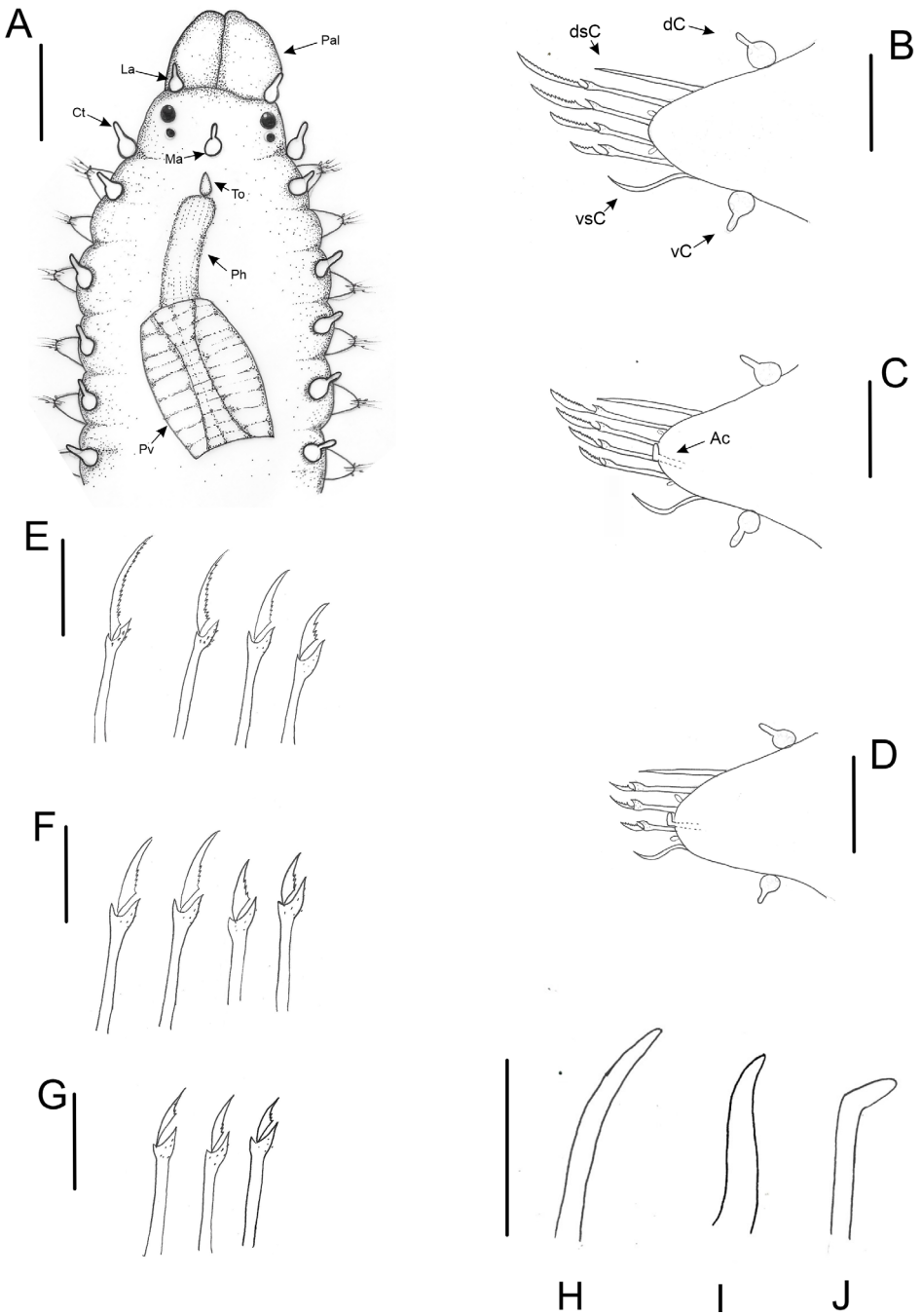

Figure 1. *Sphaerosyllis lanai* sp. nov. (Holotype, UERJ 8586): Anterior end, dorsal view (A). Parapodium and chaetae on anterior body (B). Parapodium and chaetae on mid-body (C). Parapodium and chaetae on posterior body (D). Falciger dorso-ventral gradation in anterior chaetigers (E). Falciger dorso-ventral gradation in mid-body chaetigers (F). Falciger dorso-ventral gradation in posterior chaetigers (G). Dorsal simple chaetae (H). Ventral simple chaetae (I). Aciculum distally bent at a right angle (J). Abbreviations: Ac = Aciculum; Ct = Tentacular cirri; dSC = Dorsal simple chaeta; La = Lateral antenna; Ma = Median antenna; Pal = Palps; Ph = Pharynx; Pv = Proventriculus; To = Tooth; vSC = Ventral simple chaeta. Scale bar: A = 100 µm; B, C, D = 18 µm; E = 16 µm; F = 12 µm; G = 10 µm; H, I, J = 14 µm.

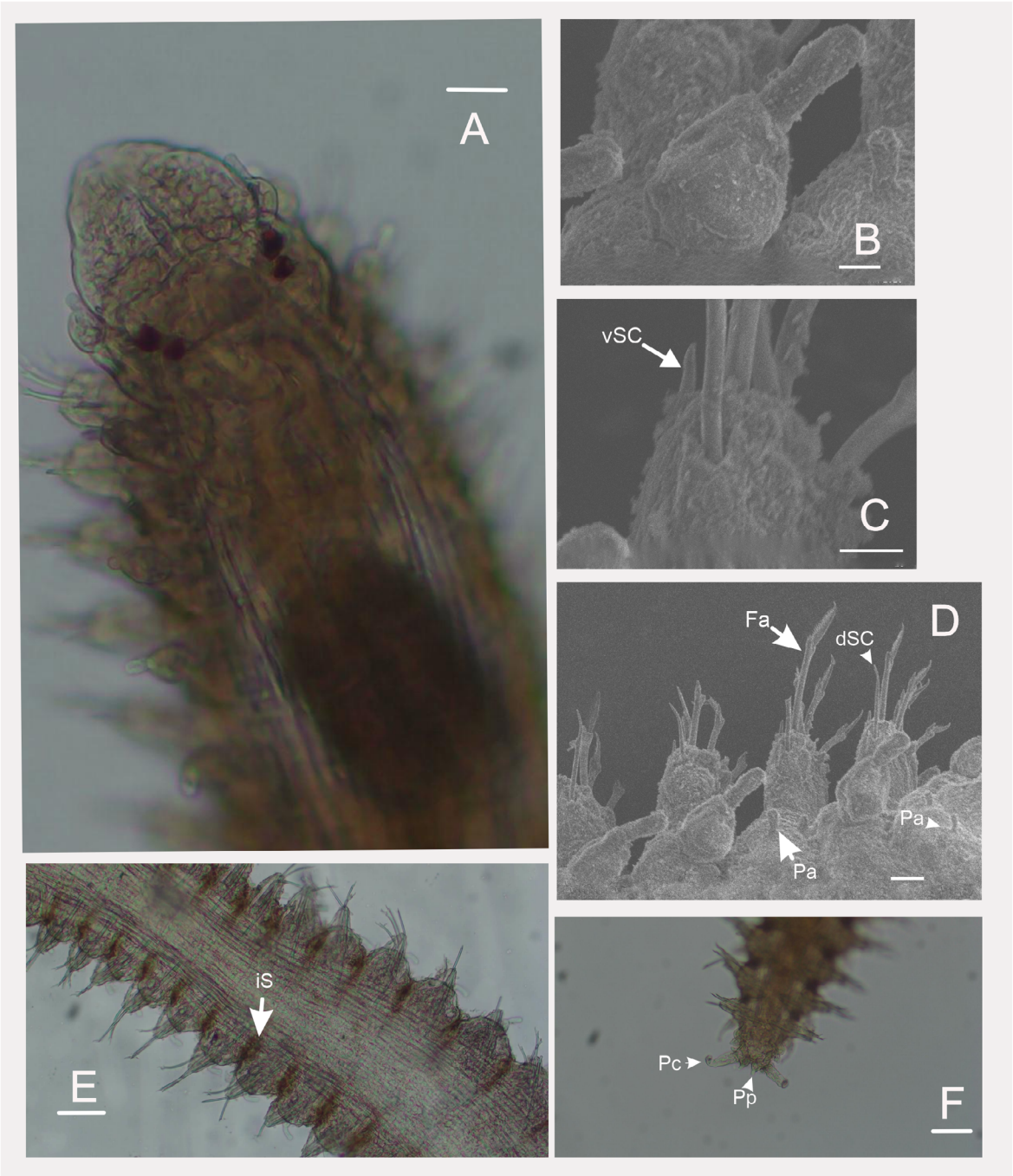

Figure 2. *Sphaerosyllis lanai* sp. nov. under Scanning Electron Microscopy. Anterior end, dorsal view (A). Dorsal cirri (B). Ventral simple chaetae from anterior chaetiger (C). Dorsal view of chaetigers 1-4 in detail (D). Mid-body, dorsal view (E). Posterior end (F). Abbreviations: dSC = Dorsal simple chaeta; Fa = Falciger; iS = Instersegmental stripes; Pa = papillae; Pc = Pygidial cirri; Pp = Pygidial papila; vSC = Ventral simple chaetae. Scale bar: A = 30µm; B = 5 µm; C = 6 µm; D = 10 µm; E = 85 µm; F = 60 µm.

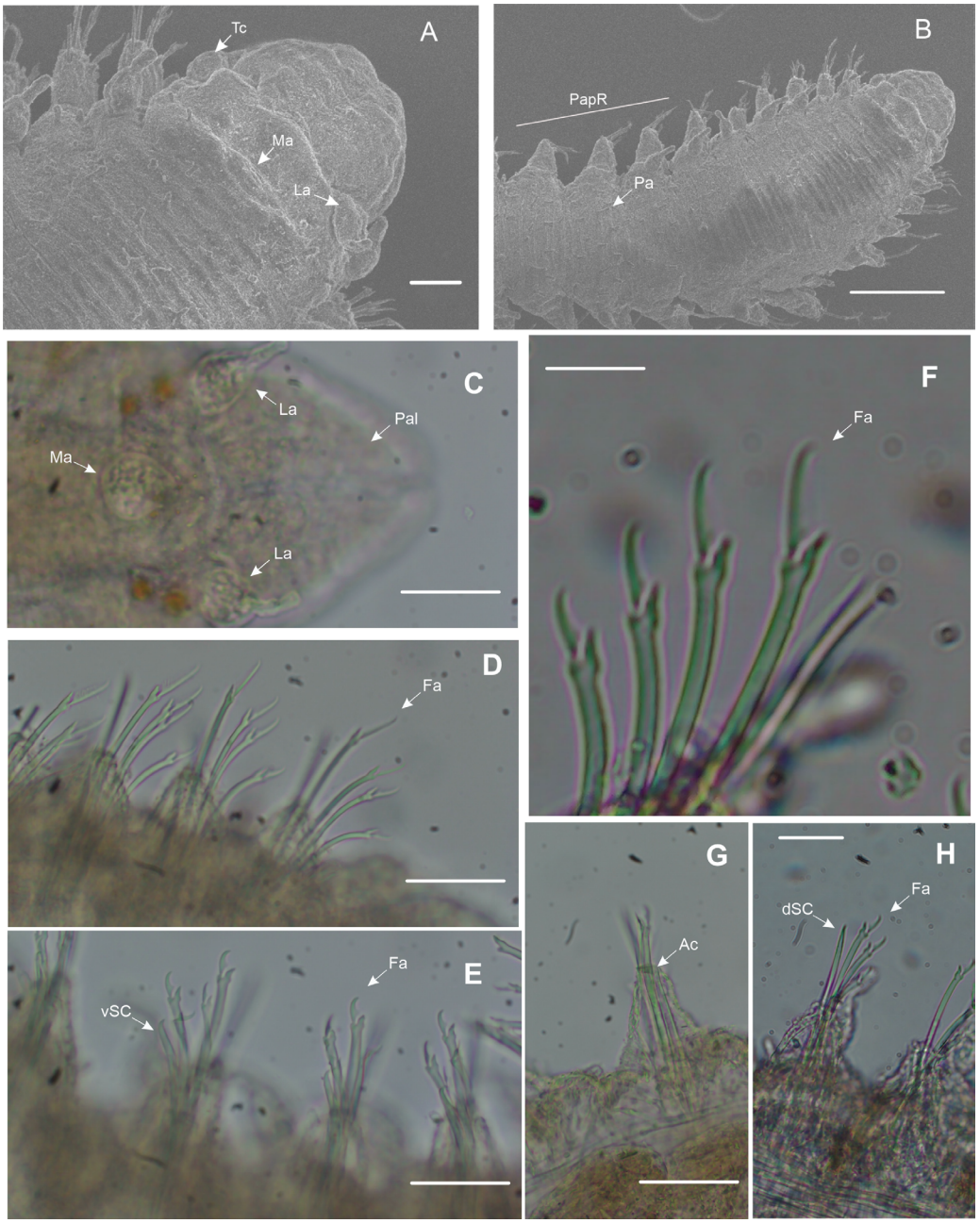

Figure 3. SEM and Optical microscopy plate of *Sphaerosyllis lanai* sp. nov. focusing on the anterior region in dorsal view and falciger gradation from the anterior to the posterior chaetigers. Position, size, and shape of prostomium antennae and tentacular cirri; the median antenna is easily missed, but its insertion is conspicuously represented on the posterior margin of the prostomium with the aid of the SEM (A). Transition in the quantity of papillae in the anterior region of the body and the presence of secondary annuli in each chaetiger (B). Prostomium, focusing on the position of the lateral and median antennae under optical microscopy (C). Anterior chaetigers in dorsal view (D). Midbody chaetigers in ventral view (E). Dorso-ventral gradation of falcigers blades length in the anterior chaetiger (F). Posterior body chaetiger in ventral view (G). Posterior body chaetiger in dorsal view (H). Abbreviations: Ac= aciculum; dSC = Dorsal simple chaetae; Fa = Falciger; La = Lateral antenna; Ma = Median antenna insertion; Pal= Palp; Pap = Papillae; PapR = Papillated region; Tc = Tentacular cirri; vC = Ventral cirri; vSC = Ventral simple chaetae. Scale bar: A = 20 µm; B = 100 µm; C = 17µm; D = 24µm; E = 20µm; F = 16µm; G = 17µm; H = 10µm.

Remarks

Morphologically, *S. lanai* sp. nov. is close to the following species of *Sphaerosyllis*: *S. dubiosa* Hartmann-Schröder, 1962, *S. hystrix* Claparède, 1863, *S. bulbosa* Southern, 1914, *S. piriferopsis* Perkins, 1981, *S. thomasi* San Martín, 1984b, *S. annulata* Nogueira et al., 2001, *S. parabulbosa* San Martín and López, 2002, *S. climenti* del Pilar Ruso and San Martín, 2012, and *S. pontica* Surugiu and San Martín, 2017. However, only *S. hystrix* Claparède, 1863, *S. piriferopsis* Perkins, 1981 and *S. annulata* Nogueira et al., 2004 have been confirmed for Brazil. On the other hand, *S. bulbosa*, *S. thomasi*, *S. parabulbosa*, *S. climenti* have been described for the Mediterranean and Iberian waters. Finally, *S. pontica* Surugiu and San Martín, 2017 have been described for the Black Sea and *S. dubiosa* for the Chilean pacific coast. To date, a total of eight species have been formally recognized as occurring in Brazilian waters: *S. hystrix*, *S. capensis* Day, 1953, *S. densopapillata* Hartmann-Schröder, 1979, *S. piriferopsis* Perkins, 1981, *S. brasiliensis* Nogueira et al., 2001, *S. annulata*, *S. ceciliae* Barroso et al., 2017 and *S. monicae* Barroso et al., 2017.

Among the Brazilian records of the genus mentioned above, S. *hystrix*, *S. capensis*, *S. densopapillata*, and *S. monicae* differ from *S. lanai* sp. nov. by having the median antenna inserted in the anterior region of the prostomium (Table S1). Moreover, *S. hystrix*, *S. capensis, S. densopapillata*, and *S. annulata* differ from *S. lanai* sp. nov. by the presence of parapodial glands (Table S1). Some species differ from *S. lanai* sp. nov. by having part of the prostomium covered by the peristomium, as *S. capensis*, *S. piriferopsis*, *S. brasiliensis*, *S. annulata*, *S. monicae*, and *S. ceciliae*. *Sphaerosyllis hystrix*, *S. annulata*, and *S. ceciliae* can be distinguished from *S. lanai* sp. nov. by the presence of two types of acicula along the body. In *S. hystrix*, the anterior parapodia has 8 falcigerous chaetae. On the other hand, *S. capensis* has sub-bidentate dorsal falcigerous chaetae, numbering 6–8 on the anterior parapodia; whereas *S. densopapillata* has 6–7 falcigerous chaetae on the anterior parapodia, 5–6 falcigerous chaetae on the median parapodia, and a densely papillated body throughout. The body of *S. piriferopsis* is covered only by dorsal papillae arranged in two longitudinal rows; whereas *S. brasiliensis,* in addition to the dorsal region, also has the ventral region covered with numerous papillae. On the other hand, *S. monicae* is apparently unique among the congeners in the absence of both papillae and parapodial glands. With regard to the secondary annulations, the chaetigers of *S. annulata* have four conspicuous secondary annuli, besides having posterior parapodia with 2 falcigerous chaetae (Table S1). It is also relevant considering the ecological differences among them. *Sphaerosyllis monicae* and *S. ceciliae* have been reported on soft bottoms from a bathymetric range of more than 700 m depth in the Campos oceanographic basin (Barroso et al., 2017). On the other hand, *S. hystrix*, *S. capensis*, *S. densopapillata*, *S. piriferopsis*, *S. brasiliensis*, and *S. annulata* can be found in shallower waters, ranging 11–30 meters deep and associated with soft and/or hard bottoms, such as macroalgae, sponges, or coral assemblages.

Sphaerosyllis lanai sp. nov. also shows some morphological similarities when compared to some species that are not formally recorded in Brazil, namely: *S. dubiosa*., *S. bulbosa*, *S. thomasi*, *S. parabulbosa*, *S. climenti*, and *S. pontica.* Among them, only *S. dubiosa* and *S. lanai* sp. nov. have secondary annuli on the body surface. However, *S. dubiosa* differs from *S. lanai* sp. nov. by the presence of a straight acicula and only four yellowish transverse bands per chaetiger. *Sphaerosyllis bulbosa* is also unique among these species due to the presence of a single type of aciculum, which is sub-distally oval followed by a rounded tip, a characteristic that clearly differentiates this species' aciculum from *S. lanai* sp. nov., which is bent distally at a right angle. On the other hand, *S. thomasi* has two types of acicula along the body, with a variation of 3–5 falcigers in number, and a ventral simple chaetae emerging from the posterior chaetigers. However, in *S. lanai* sp. nov. only one type of acicula is found, with 3–4 falcigers per chaetiger and a ventral simple chaetae emerging from the anterior chaetigers. Finally, both *S. parabulbosa, S. climenti*, and *S. pontica* have parapodial glands and 3–6 falcigers along the body chaetigers. These glands are absent in *S. lanai* sp. nov. and the falciger number is also different. *Sphaerosyllis bulbosa*, *S. parabulbosa*, and *S. pontica* were collected in a bathymetric range

varying from 30 to 200 meters deep in general. Additionally, *S. dubiosa, S. thomasi*, *S. climenti*, and *S. lanai* sp. nov. were reported in shallower waters, with a bathymetric distribution of 2–16 meters deep.

Ecology

Specimens were sampled from a sandy substrate, near the rocky shore. The bathymetric range varies from 12 to 16 meters deep.

Key to *Sphaerosyllis* species reported for the Brazilian coast

1. Two types of acicula along the body...2
   - Only one type of aciculum along the body...4

2(1). Parapodial glands absent, ventral simple chaetae present from mid body chaetigers...*S. ceciliae* Barroso et al. 2017 (Campos Basin, Southern Brazil continental slope, SW Atlantic Ocean)
   - Parapodial glands present, ventral simple chaetae present on posterior chaetigers...3

3(2). Pharynx length occupying 4 chaetigers, 3–5 falcigers along body chaetigers, body with 4 dark bands per chaetiger on secondary annuli...*S. annulata* Nogueira et al., 2004 (Brazil, State of São Paulo, Ubatuba)
   - Pharynx length occupying 2–3 chaetigers, 3–4 falcigers along body chaetigers, body pigmentation and secondary annuli absent...*S. hystrix* Claparède, 1863 (Adriatic Sea)

4(1). Ventral simple chaetae present from anterior chaetigers, body pigmentation present as intersegmental brownish stripes...*S. lanai* sp. nov. (Brazil, Rio de Janeiro State, Angra dos Reis)
   - Ventral simple chaetae present from mid body or posterior chaetigers, body pigmentation absent...5

5(4). Parapodial glands present...6
   - Parapodial glands absent...7

6(5). 5–8 falcigers on body chaetigers, small papillae scattered along the body, pharynx length occupying 3 chaetigers ...*S. capensis* Day, 1953 (South Africa, Cape Agulhas)
   - 3–6 falcigers on the body chaetigers, numerous papillae densely grouped along the body, pharynx length occupying 3–4 chaetigers...*S. densopapillata* Hartmann-Schröder, 1979 (Australia, Broome)

7(5). Ventral simple chaetae from mid-body chaetigers, pharynx length occupying 2 chaetigers, proventriculus length occupying 3 chaetigers, median antenna on prostomium anterior margin...*S. monicae* Barroso et al., 2017 (Campos Basin, Southern Brazil continental slope, SW Atlantic Ocean)
   - Ventral simple chaetae from posterior chaetigers, pharynx length occupying 3 chaetigers, proventriculus length occupying 2 to 2.5 chaetigers, median antenna on prostomium posterior margin or in the middle...8

8(7). Median antenna on prostomium posterior margin, dorso-ventral gradation in falcigers blades' length only on anterior chaetigers, falciger shafts longer only on anterior chaetigers, falcigers numbering 3–5 along body chaetigers ...*S. piriferopsis* Perkins, 1981 (Atlantic coast of the USA, Florida, Hutchinson Island)
   - Median antenna on the middle of the prostomium, dorso-ventral gradation in falcigers blades' length on all chaetigers, falciger shafts longer on anterior and mid-body chaetigers, falcigers numbering 5–6 along body chaetigers...*S. brasiliensis* Nogueira et al., 2001 (São Paulo, Ilha dos Alcatrazes)

DISCUSSION

Regarding the occurrences of *Sphaerosyllis* in Brazil, there is much to discuss in terms of the records of species that were described for the first time based on material sampled in distant locations, such as the South Pacific, Australia, and North Atlantic. Of the species formally reported for Brazil, only *S. brasiliensis, S. annulata, S. ceciliae*, and *S. monicae* were described based on the analysis of specimens collected from the Brazilian coast (Nogueira et al., 2001, 2004; Barroso et al., 2017). Nevertheless, the other species *S. bulbosa, S. piriferopsis*, *S. densopapillata*, and *S. hystrix* have Ireland, Florida, Australia, and the Adriatic Sea as their type localities, respectively (San Martín, 2003, 2005). All of them have been recorded in the Mediterranean and North Atlantic in general, and *S. hystrix* is considered a cosmopolitan species (San Martín, 2003, 2005).

The new species described here comes from the shallow waters of Ilha Grande Bay (IGB), a very popular place for tourism, important for harboring the Port of Angra dos Reis ('Terminal Portuário de Angra dos Reis' – TPAR), from where cargo ships with steel products and granite depart, and others arrive with wheat. According to Creed et al. (2007a, 2007b), the sediment near the rocky shore, where the samples were taken, has thicker grains compared to locations further from the shore. It also has a higher percentage of calcium carbonate due to the shell fragments found in the area. The water temperature ranges from 24 °C to 28 °C, salinity varies from 27 to 38, dissolved oxygen levels range from 28% to 133%, and visibility ranges from 1.7 m to 19.5 m throughout the year. Dias et al. (1990) proposed the first bathymetric map of the IGB and demonstrated that the region features submerged river channels and a coastal depression between the mainland

and the island, and showed that the depth varies from 10 to 30 meters.

Brasil et al. (2007) provided a taxonomic account on marine annelids with a sum of 113 species for 69 genera for the IGB and mentioned that the richer sampling points were located near rocky shores. They reported three Syllidae genera, but did not detail them to a specific level. The genera are *Syllis* (Lamarck, 1818), *Pionosyllis* (Malmgren, 1867), and *Odontosyllis* (Claparède, 1863). We report the genus *Sphaerosyllis* for the first time for this locality.

Polychaetes, the most diverse class of benthic invertebrates on sandy beaches (Aguiar et al., 2020), play an extremely important role in bioturbation processes, in which nutrients stored in the sediment are transported into the water column (Josefson and Rasmussen 2000). The richness of invertebrates in unconsolidated sediments decreases as the sediment grains become finer, and on the semi-protected beaches of the IGB, the family Syllidae was found to be more predominant (Aguiar et al., 2020). This region is also home to the Angra dos Reis nuclear power plants, which are responsible for 3% of the country's energy generation. In other words, an important region in terms of biodiversity and economy. Even so, new species can be found with a more accurate taxonomic bias, as is the case with *Sphaerosyllis lanai* sp. Nov., a fact that highlights the importance of biomonitoring studies and taxonomic reviews of previous records. As an example, Surugiu and San Martín (2017) revisited the material collected from the Black Sea, previously identified as *S. bulbosa*, and concluded, after careful re-examination, that the report was about a new species. In Brazil, this has been occurring in both shallow and deep waters, as a result of the recent training of taxonomists and sampling campaigns.

This taxonomic account does not discuss the molecular identity of any of the aforementioned taxa, which include the reports of species described in distant type localities that should be investigated in more detail in future researches, along with careful examination of the material deposited in public research collections.

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AUTHOR CONTRIBUTIONS

A.R.: Funding Acquisition; Project Administration; Resources;

G.S.: Methodology;

N.O., S.L.S.D.M.: Conceptualization; Formal Analysis; Investigation; Writing – Original Draft;

N.O., S.L.S.D.M., A.R.: Writing – Review & Editing.

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