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Exogoninae (Annelida: Syllidae) from Chilean Patagonia

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Abstract

The subfamily Exogoninae was studied from samples collected in shallow waters of the fjords and channels of the Patagonian region of Chile. Two new species are described: *Exogone yagan* **n. sp.** and *Erinaceusyllis carrascoi* **n. sp.** The species *Exogone heterosetoides*, *Erinaceusyllis bidentata* and *Erinaceusyllis perspicax* are newly reported to Chile, as well as the genus *Erinaceusyllis* San Martín, 2005. *Parapionosyllis brevicirra*, *Sphaerosyllis hirsuta* and *Salvatoria rhopalophora*, **n. comb.**, are also reported, with the latter redescribed. Finally, we redescribe *Exogone anomalochaeta* from Antarctica. Most of the species were found inside tubes of *Chaetopterus* cf. *variopedatus*; this habitat is new for Exogoninae. This research is a new taxonomic account of Syllidae in Chile and improves the knowledge of Exogoninae of the Patagonian region.

Key words: Exogoninae, Syllidae, Annelida, Patagonia, Chile, taxonomy

Introduction

The Syllidae is one of the most diverse family of polychaetes in Chilean waters with 63 species (San Martin *et al.* 2017). However, the general knowledge of this family in Chile is scarce, with only one recent work about new species and records (Soto & San Martín 2017), a second work on diversity and systematics of syllids associated with the macroalgae *Lessonia spicata* (Álvarez-Campos & Verdes, 2017) and some older records and descriptions (e. g.: Ehlers 1897; Wesenberg-Lund 1962; Hartmann-Schröder 1965 and others) and there is no comprehensive systematic compendium the Syllidae. San Martín *et al.* 2017 summarize the knowledge of Syllidae in Chile. With exception of work made by Soto & San Martin in 2017, the knowledge of this family in the Patagonian region of Chile is mainly related to ecological works for several species in the Aysen region (Cañete *et al*. 1999; Soto & Paterson 2010) and the Magellan Strait and Beagle Channel zone (Gambi & Mariani 1999; Thatje & Brown 2009; Montiel *et al*. 2011). Considering the current work 39 species of syllids have been reported for Chilean Patagonia (between 40°-56°S) the *Syllis* being the most diverse genus, with eighteen species (Soto & San Martin 2017; San Martin *et al.* 2017). The subfamily Exogoninae in Chilean Patagonia is represented up to now only by six species: *Salvatoria ropalophora* (Ehlers, 1897), *Sphaerosyllis kerguelensis* McIntosh, 1885, *S. hirsuta* Ehlers, 1897, *Parapionosyllis brevicirra* Day, 1954, *Exogone heterosetosa* McIntosh, 1885, and *Parexogone minuscula* (Hartman, 1953). Seven species of Exogoninae from Chilean Patagonia are reported or described herein: *Exogone heterosetoides* Hartmann-Schröder, 1979; *Exogone yagan* **n. sp**.; *Parapionosyllis brevicirra*, *Sphaerosyllis hirsuta*, *Erinaceusyllis bidentata* (Hartmann-Schröder, 1974); *E. carrascoi* **n. sp.**, *E. perspicax* (Ehlers, 1908), n. comb., and *Salvatoria rhopalophora* **n. comb.** The species *E. heterosetoides* and *E. bidentata* are reported for the first time, as well as the genus *Erinaceusyllis* San Martín, 2005, to Chile; as well as happens with the species *S. hirsuta*, the specimens agree with previous descriptions, and they are not described. Finally, we redescribe the species *Exogone anomalochaeta*, an Antarctic species, because of its similarity with *E. yagan* **n. sp.**

These Chilean species were collected in biological substrates such as *Macrocystis pyrifera* kelp holdfasts and *Chaetopterus* cf. *variopedatus* (Renier, 1804) tubes (Polychaeta, Chaetopteridae) as well as from pebbles and sandy bottoms. High abundance and diversity of syllids in association with biological substrates have been previously reported (Hernández *et al*. 2001; Álvarez-Campos & Verdes, 2017; Soto & San Martin 2017).

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Chaetopterus tubes are a new habitat for Exogoninae possibly in response to lack the other suitable habitats due to the environmental extreme conditions and ice-fields present in the fjords and channels of the Chilean Patagonia.

Material and methods

The specimens were obtained from samples collected by the Intertidal and Subtidal Marine Biotopes Project (Soto *et al*. 2012, 2015; Letelier *et al*. 2013) undertaken between 2009 and 2010 as part of the CIMAR 15 and 16 Oceanographic Cruises (Silva & Palma 2006) supported by Chilean Navy. For each species, the station numbers are given along with the numbers of specimens in brackets in the Material Examined section. Specimens were obtained from seven sampling stations (stations 8, 36, 41, 50, 51, 55 and 59). Information about sampling stations are provided in Table 1.

TABLE 1. Sampling stations, position, locality and environmental parameters related.

Station	Coordinates	Locality	Habitat	Depth (metres)	Salinity (psu)	Temperature (°C)
8	53º56'29''S 71º34'47''W	Holland Cape, Aracena Island. Magellan Strait	Tubes of *Chaetopterus and M.pyrifera* holdfasts	16	32	10.8
36	54º57´30.9"S 70º44´41.0" W	Ballenero channel: Magellan Strait	Tubes of *Chaetopterus*	14	35	8.7
41	50°16'37''S 74°53'21'' W.	Concepción channel, Drumond Hay Island	Boulders and sediment bottoms and *M. pyrifera* holdfasts	30	30.2	8.9
50	55º08´39.4"S 68º49´34.0" W	Seno Ponsonby, Beagle channel	Tubes of *Chaetopterus*	14	35	8.5
51	54º32´56"S 68º18´13" W	Parry Bay, Tierra del Fuego Island	*M.pyrifera* holdfasts	16	15	9.5
55	52º03'33''S 72º57'37''W	Kirke channel	*M.pyrifera* holdfasts	16	16	5.7
59	55º00'59''S 69º22'53''W	Beagle channel	*M.pyrifera* holdfasts	14	20	8.0

The specimens were collected in the fjords, channels and ice-fields zone, located in the Chilean Patagonian region (41°–55° S, Southeast Pacific). They were collected by hand and Scuba from the intertidal rocky-shore to the subtidal zone (to 30 m depth). Biological substrates such as *Macrocystis pyrifera* kelp holdfasts and *Chaetopterus* cf. *variopedatus* tubes were important habitats for syllid diversity. The specimens were fixed in a 10% formalin-seawater solution at the time of sampling and were later transferred to a 75% ethanol solution. The individuals were examined using both dissecting and compound light microscopes. The latter was equipped with interference contrast optics (Nomarski) and drawings were made using a camera-lucida drawing tube. Scanning Electronic Microscope (SEM) procedures and images digitalization in some key species were made in the SIDI (Servicio Interdepartamental de Investigación) of the Universidad Autónoma de Madrid, Spain. Body width was measured across the proventricle and does not include parapodial lobes. The specimens were studied in Chile and Spain and were deposited at Museo Nacional de Ciencias Naturales de Madrid (MNCNM), Spain and Laboratorio de Bentos, Universidad de Valparaiso (LBUV). Laterly specimens will be deposited at Museo Nacional de Historia Natural de Santiago de Chile (MNHN). For general morphology and biology of the family Syllidae see San Martín (2003), San Martín & Aguado (2014) and San Martín & Worsfold (2015). From each site (sampling station) environmental parameters from surficial water such as salinity as practical salinity units (PSU) and temperature (°C) were measured *in situ* using a HANNA Instruments multiparameter sensor.

Results

Family Syllidae Grube, 1850

Subfamily Exogoninae Langerhans, 1879

Genus *Exogone* Ørsted, 1845

***Exogone* Ørsted, 1845: 20.**

The diagnosis is that of San Martín (2005) to *Exogone* (*Exogone*) and those of Fukuda (2014) and Paresque *et al.* (2014).

Exogone heterosetoides Hartmann-Schröder, 1979

Exogone heterosetoides Hartmann-Schröder, 1979: 110, figs. 171–174.
Exogone (Exogone) heterosetoides: San Martín 2005: 126, figs. 75, 76.
Exogone heterosetosa non McIntosh: Ehlers 1897: 51, pl. 3, figs. 61–65.

Material examined. Station 36 (36) (LBUV).

Distribution. Australia. First report to Chile (Puerto Engaño in Ballenero channel. Magellan Strait to the south).

Habitat. Shallow bottoms: algae, sand. Seagrass, dead corals, mud, etc.; intertidal to 33 m (San Martín, 2005). Inside tubes of *Chaetopterus* cf. *variopedatus* in fjords and channels of Patagonia. Salinity: 35 PSU, temperature: 8.7°C.

Remarks. The examined specimens perfectly agree with the description of this species of San Martín (2005). The description of Ehlers (1897) of *E. heterosetosa* clearly is not the same species, but instead, *E. heterosetoides*. Both species, *E. heterosetosa* McIntosh, 1885 and *E. heterosetoides* are similar, characterized by having spiniger-like compound chaetae distally enlarged, spatulated, and blades short, filiform; however, the median antenna is longer, the antennae are originated on middle of prostomium, the shafts of spiniger-like chaetae are less enlarged, and the proventricle is longer in *E. heterosetosa* (see San Martín, 2005). This constitutes the first report of *E. heterosetoides* to Chile, although it was previously reported as *E. heterosetosa*. Probably both species are present in Chile.

Exogone yagan new species

Figures 1–3

Material examined. Station 36, holotype (MNCN 16.01/17768) and 11 paratypes (LBUV), plus 2 specimens for SEM (MNCN 16.01/17768). Station 59, 1 paratype (LBUV).

Description. Holotype longest complete specimen, a female with developing embryos attached to nephridial pores. Embryos from chaetigers 15 to 40, with developed antennae and anal cirri (Fig. 2D), attached by anus to nephridial pores. Body long, slender, 5.2 mm long, 0.21 mm wide, 44 chaetigers. Prostomium semicircular to subpentagonal, about 2.5 times wider than long; with four large eyes in trapezoidal arrangement, anterior pair slightly larger than posterior pair; antennae located close to each other, between anterior eyes (Fig. 1A); antennae all similar, short, ovoid, with median one slightly longer than lateral ones (Figs 1A, 2B, C). Palps broad, fused along their length with distal notch, slightly longer than prostomium (Figs 1A, 2A, C). Peristomium distinct; tentacular cirri small, papilliform (Figs 1A, 2A, C). Dorsal cirri longer than tentacular cirri, similar in shape and length to antennae, somewhat smaller on most anterior segments (Figs 1A, 2A–C), absent on chaetiger 2. Compound chaetae all short falcigers, with proximal tooth distinctly long and distal tooth small (Figs 1C, G, H, 2E, 3A-D) and short, with straight spines on margin. On median and posterior parapodia, most dorsal compound chaetae with slightly elongated blade and longer spines along margin (Figs 1F, 3D). Anterior parapodia each with

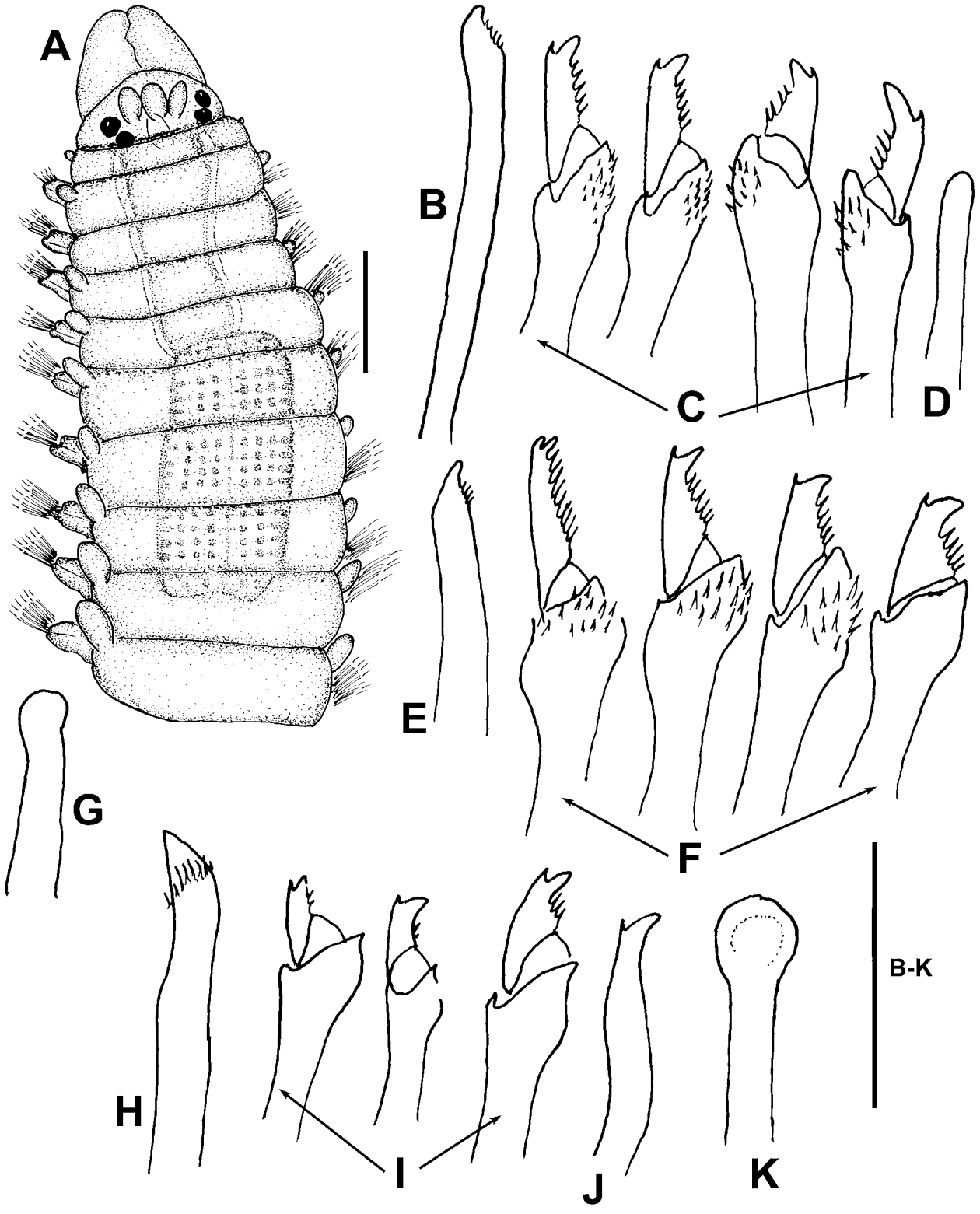

FIGURE 1. ***Exogone yagan*** **n. sp.** MNCN 16.01/17768. Holotype. A, anterior end, dorsal view. B, dorsal simple chaeta, anterior parapodium. C, compound chaetae, anterior parapodium. D, acicula, anterior parapodium. E, dorsal simple chaeta, midbody parapodium. F, compound chaetae, midbody parapodium. G, acicula, anterior parapodium. H, dorsal simple chaeta, posterior parapodium. I, compound chaetae, posterior parapodium. J, ventral simple chaeta, K, acicula, posterior parapodium. **Scale bars**. A: 0.1 mm. B–K: 20 µm.

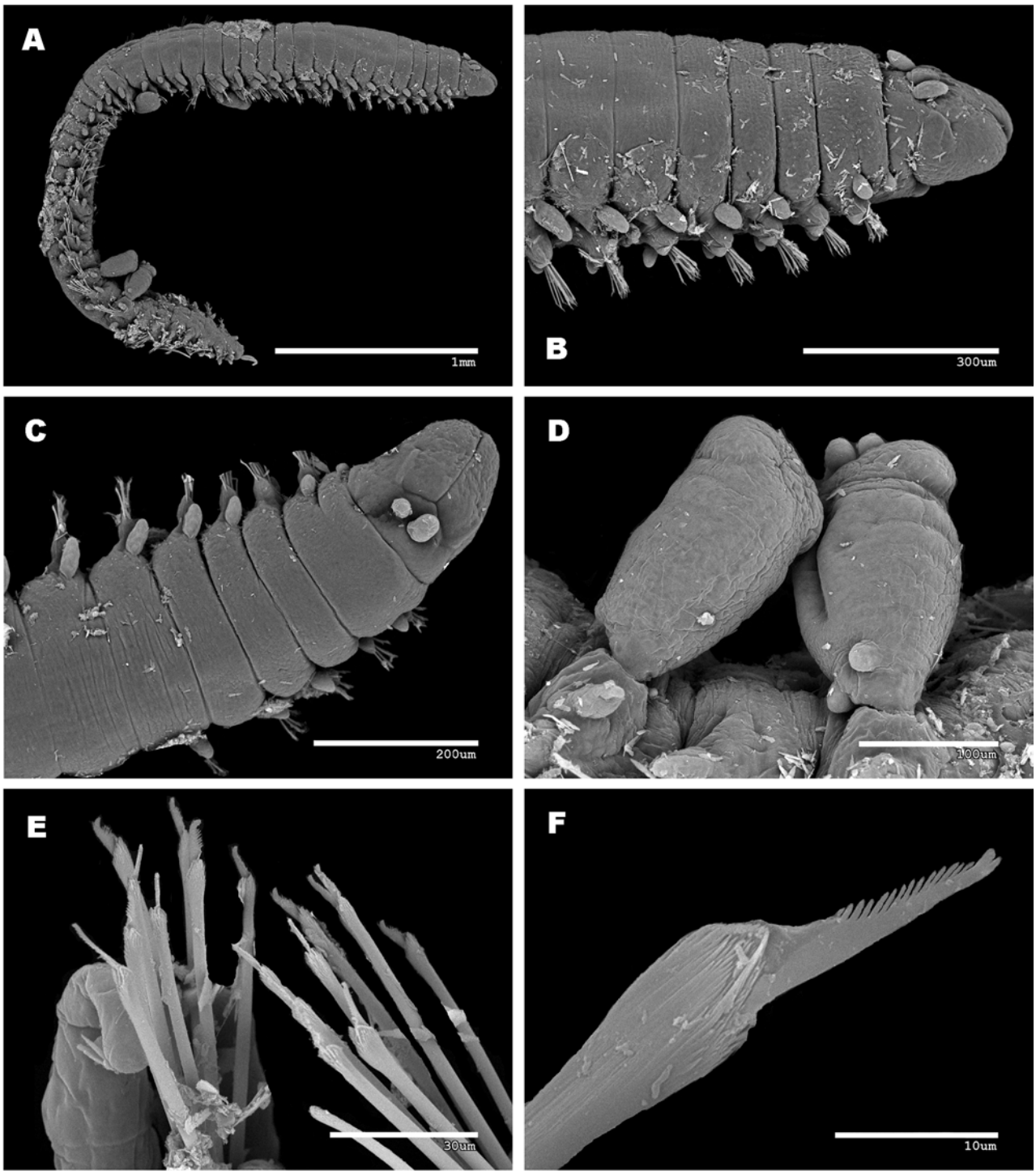

FIGURE 2. ***Exogone yagan*** **n. sp.** SEM. A, complete female with embryos, latero-dorsal view. B, same, anterior end, dorsal view. C, another specimen, dorsal view. D, embryos. E, compound chaetae, anterior parapodium. F, Most dorsal compound chaeta, anterior parapodium.

ca. 8–9 compound chaetae; number of compound chaetae diminishing posteriorly to 4–5 on mid-body and 2–3 on posterior parapodia. Blades of compound chaetae 10 mm long, shorter on posterior parapodia. Dorsalmost compound chaetae of mid-body and posterior parapodia slightly longer, about 12–13 mm long. Dorsal simple chaetae from chaetiger 1, with rounded tips and finely spinulose subterminally (Figs 1B, 3D), thicker posteriorly (Figs 1E, I, 3E). Ventral simple chaetae on posterior parapodia, sigmoid, smooth or with minute subdistal spines, with small distal tooth and longer subdistal tooth (Figs 1K, 3F). Acicula solitary, distally blunt, becoming larger

more posteriorly (Figs 1D, H, L). Pharynx long, through about 5–6 segments; pharyngeal tooth large, located on anterior rim (Fig. 1A), surrounded by ten soft papillae. Proventricle similar in length to pharynx, through about 3–4 segments, with about 20 muscle cell rows. Pygidium with two anal cirri, relatively short in comparison with other related species (Fig. 2A).

Distribution. Only known from Chilean Patagonia. Puerto Engaño in Ballenero channel; Magellan Strait to the south. Also Beagle channel southwest arm.

Habitat. Inside tubes of *Chaetopterus* cf. *variopedatus* in fjords and channels from Patagonia. Salinity: from 20 to 35 PSU, temperature: from 8.01 to 8.7°C. Shallow subtidal, 30 m.

Type locality. Ballenero channel. Magellan Strait south.

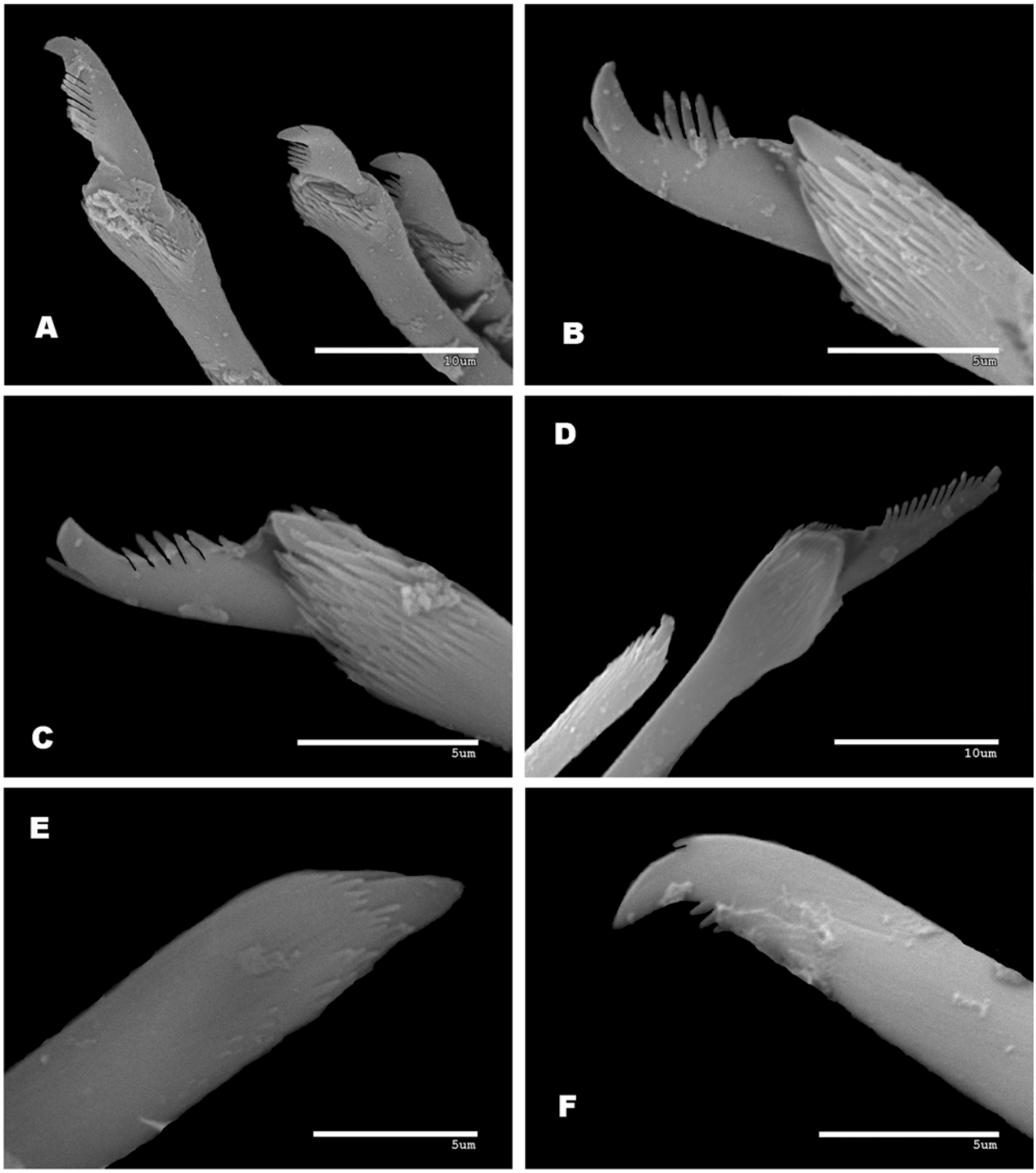

FIGURE 3. ***Exogone yagan*** **n. sp.** SEM. A–C, compound chaetae, midbody. D, Most dorsal compound chaeta and dorsal simple chaeta, midbody parapodium. E, dorsal simple chaeta. F, ventral simple chaeta.

Remarks. *Exogone yagan* **n. sp.** is characterized by having all the antennae short, ovoid, the lack of dorsal cirri on chaetiger 2, and especially the lack of spiniger-like compound chaetae, a typical character of the genus *Exogone*, although some other species also lack them, totally or partially.

The general aspect of body is quite similar to *Exogone verugera* (Claparède, 1868) from the NE Atlantic and Mediterranean, also reported from other areas, but this species has distinct spiniger-like compound chaetae on each parapodium (see San Martín, 2003). Other similar species are *E. breviantennata* Hartmann-Schröder, 1959 and *E. africana* Hartmann-Schröder, 1974, which however have dorsal cirri on chaetiger 2 and spiniger-like chaetae (San Martín, 2005; Paresque et al., 2014). The Australian species *E. goorapuranga* San Martín, 2005 also lacks spiniger-like compound chaetae on anterior segments and develops a short spiniger-like chaeta in the mid-body (San Martín, 2005); however, this species has the median antenna distinctly longer than the lateral ones, dorsal cirri on chaetiger 2, a much shorter proventricle, and the shafts of compound chaetae have long, filiform distal spines. The most similar species is *E. anomalochaeta* Benham, 1921, because it also lacks spiniger-like compound chaetae, but the median antenna is slightly longer than the lateral ones, the antennae are more slender than those of *E. yagan* **n. sp.** and are inserted in front of the anterior eyes, the dorsal cirri are papilliform, and the compound chaetae are more strongly spinose, with even shorter blades than those of *E. yagan*, **n. sp.** (see re-description of this species, below).

Etymology. This species is named in honor of the "Yaganes" aboriginals that inhabited the southern Chilean Patagonia.

Exogone anomalochaeta Benham, 1921

Figures 4–5

Exogone anomalochaeta Benham, 1921: 24, pl. 5, figs 11–13; 1927: 62, pl. 1, figs. 9– 10; Blankestein & Lana 1986: 62, figs 30–31 San Martín & Parapar 1997: 291; Barroso *et al.* 2017: 403, figs. 1–2.
Exogone (Parexogone) tridentata Hartmann-Schröder, 1993: 143, figs. 20–21.

Material examined. Livingston Island, South Shetlands (Antarctica), id. G. San Martín, 17 February 1994, 1 specimen (MNCN 16.01/1518); same location, 19 February 1994, 24 specimens (MNCN 16.01/1518), (4 SEM); same location, 7 February 1994, 4 specimens (MNCN 16.01/1517); same location, 30 January 1995, 1 specimen (MNCN 16.01/3540); same location, 18 January 1995, 3 specimens (MNCN 16.01/3541).

Remarks and additions to description. The new species herein described, *Exogone yagan*, share the lack of spiniger-like chaetae with *E. anomalochaeta*, an Antarctic species. For this reason, we examined specimens deposited in the MNCNM, collected and reported by San Martín & Parapar (1997). These specimens agree with the previous descriptions, except for the absence of dorsal cirri on chaetiger 2 (Figs 4A, 5A); this character is described in the previous descriptions but in Benham 1921, fig. 11, the drawing shows dorsal cirri on chaetiger 2; at that time, the importance of the presence or absence of dorsal cirri on chaetiger 2 was not known to separate species of *Exogone*, and usually they were figured although not present. The compound chaetae are all thick, with distally enlarged shafts and numerous distal and subdistal spines (Figs 4C, E, G), and very short, almost included inside the distal, spinose part of the shafts, named as "gomphotric chaetae" by Benham 1921, 1927. The dorsal simple chaetae are the typical of the genus (Figs 4B, F, 5B, C, E), but some in the mid-body are distally enlarged, and having a spatulate appearance (Fig. 4D). Apparently, this species lacks ventral simple chaetae, since they have not been described by any author and we have not found these in the material examined.

Barroso *et al.* (2017) recently redescribed this species in bases of material collected in Brazil between 749 and 1050 m depth. These specimens agree well with the Antarctic specimens, except by having ventral simple chaetae and longer proventricle (3.5–5 segments instead of 2–3 segments); it is possible that they could belong to two different species, but would be necessary more detailed studies to separate them.

Habitat. In mud. Intertidal to 1000 m.

Distribution. Antarctic and sub-Antarctic seas. Brazil.

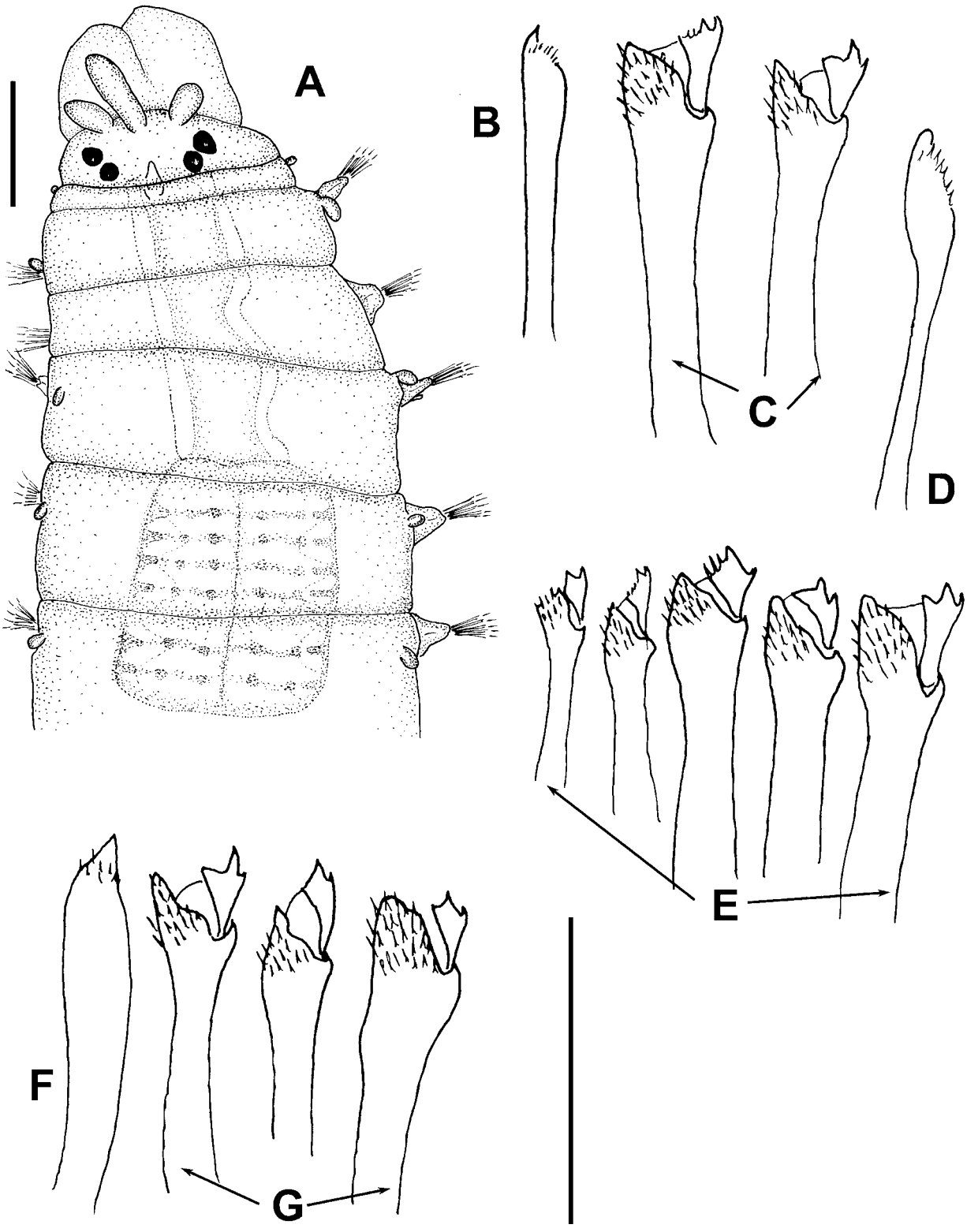

FIGURE 4. ***Exogone anomalochaeta*** Benham, 1921. MNCN 16.01/1519. A, anterior end, dorsal view. B, dorsal simple chaeta. C, compound chaetae, anterior parpaodium. D, dorsal simple chaeta, midbody parapodium. E, compound chaetae, midbody parapodium. F, dorsal simple chaeta, posterior parapodium. G, compound chaetae, posterior parapodium.
Scale bars. A: 0.1 mm. B–G: 20 µm.

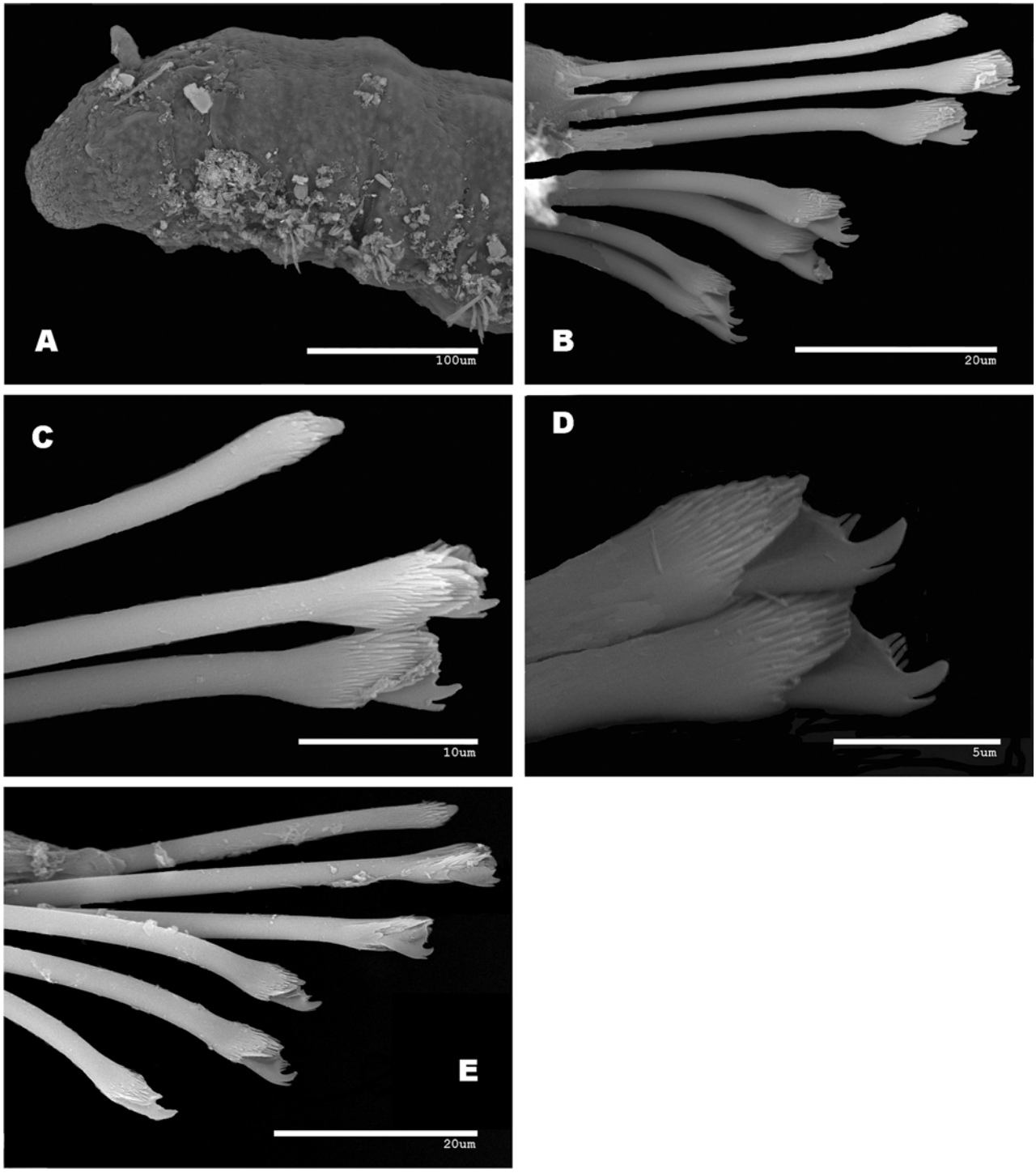

FIGURE 5. ***Exogone anomalochaeta*** Benham, 1921. MNCN 16.01/1519. SEM. A, anterior end, latero-dorsal view. B, chaetae, anterior parapodium. Dorsal simple chaeta and most dorsal compound chaetae, anterior parpaodium. D, most ventral compound chaetae, anterior parpaodium. E, chaetae, posterior parpaodium.

Genus *Parapionosyllis* Fauvel, 1923

Parapionosyllis Fauvel, 1923: 289.
The diagnosis is that of San Martín (2005).

Parapionosyllis brevicirra Day, 1954

Parapionosyllis brevicirra Day, 1954: 16, fig. 2; Hartmann-Schröder 1962: 98, figs. 81–83; 1965: 292; San Martín 2003: 281, figs. 153–155.

Material examined. Station 51 (2), station 50 (2), station 36 (26), station 41 (2) and station 8 (1). All specimens archived at LBUV.

Remarks. The specimens examined are identical to those from the western Mediterranean although they have fewer parapodial glands and these are less pigmented and marked.

Distribution. Tristan da Cunha, S Chile, Mediterranean. Chilean Patagonia: from Concepción channel to Beagle channel (50°16 ′ S - 55º08 ′ S).

Habitat. Shallow sandy bottoms and *Posidonia oceanica* meadows in W Mediterranean (San Martín 2003). Sand among algae and rhizoids of brown algae, up to 40 m depth (Hartmann-Schröder 1965). Inside tubes of *Chaetopterus* cf. *variopedatus* in fjords and channels from Patagonia. Salinity: from 15 to 35 PSU, temperature: from 8.01 to 10.8° C. Intertidal and shallow subtidal (30m depth).

Genus *Sphaerosyllis* Claparède, 1863

Sphaerosyllis Claparède, 1863: 45.
The diagnosis is that of San Martín 2005.

Sphaerosyllis hirsuta Ehlers, 1897

Sphaerosyllis hirsuta Ehlers, 1897: 48, pl. 3, figs. 58–60; San Martín 2005: 99, figs. 55, 56.

Material examined. Station 8 (1) and station 36 (5) (LBUV).

Distribution. Widely distributed through all Pacific Ocean, from Japan and Kurile Islands, to New Zealand and Patagonia (Chile) in South.

Habitat. Widely distributed on all kind of substrates: dead corals, algae, encrusting organisms, seagrasses. Sand; intertidal to 45 m (San Martín 2005). Inside tubes of *Chaetopterus* cf. *variopedatus* in fjords and channels of Patagonia. Salinity: from 20 to 35 PSU, temperature: from 8.01 to 10°C.

Genus *Erinaceusyllis* San Martín, 2005

Erinaceusyllis San Martín, 2005: 73.

Erinaceusyllis bidentata (Hartmann-Schröder, 1974)

Sphaerosyllis erinaceus bidentata Hartmann-Schröder, 1974: 134, pl. 13, figs. 116–119; 1992: 227, figs. 16–18.
Erinaceusyllis bidentata San Martín 2005: 77, fig. 31.

Material examined. Station 36 (2) (LBUV).

Distribution. Eastern Africa (Mozambique), Australia (Western Australia) and Chilean Patagonia (New to Chile).

Habitat. Coarse sand, shells and gravel, amongst algae, incrustations, sponges, ascidians and bryozoans, coral rubble. Intertidal to 27 m depth (San Martín 2005). Inside tubes of *Chaetopterus* cf. *variopedatus* in fjords and channels. Salinity: 35 PSU, temperature: 8.7°C.

Remarks. Our specimens agree with those from Australia, except that the median antenna is inserted more posteriorly, between the eyes.

***Erinaceusyllis carrascoi* new species**
Figure 6

Material examined. Station 41, holotype (MNCN 16.01/17769) and paratype. Station 36 (2) (LBUV).

Description. Holotype complete female carrying eggs dorsally. Body small to minute, 2.2 mm long, 0.18 mm wide, with 24 chaetigers; body covered with small, scattered papillae (Fig. 6A). Prostomium oval, wider than long; four large eyes in trapezoidal arrangement, nearly in line, and two anterior eyespots; antennae spindle-shaped, basally bulbous; medial tentacle detached in both specimens; lateral antennae inserted slightly anteriorly to anterior pair of eyes, each bulbous basally, with short tips (Fig. 6A). Palps shorter than prostomium, fused along their length, with a median scar. Peristomium shorter than subsequent segments, forming a bilobate fold over posterior part of prostomium; tentacular cirri similar to lateral antennae. Dorsal cirri lacking on chaetiger 2; anterior dorsal cirri similar to lateral antennae, basally inflated, spherical, but with longer tips and some minute, rounded papillae, and some with internal, granular glands (Fig. 6A); papillae becoming progressively longer on mid-body, with less bulbous bases and much longer tips, then becoming shorter again on posterior parapodia (Fig. 6B). Parapodial lobes conical, with few short papillae and one long distal papilla posterior to acicula and two ventrolateral papillae on anterior surface (Fig. 6C). Ventral cirri short, digitiform. Compound chaetae heterogomph, with smooth shafts; blades elongate, slender, unidentate, slightly hooked distally, with short marginal spines (Figs 6E, G); anterior parapodia each with seven compound chaetae, each with slight dorso-ventral gradation in length, 25 mm above, 20 mm below; number of compound chaetae and length of blades decreasing posteriorly; posterior parapodia each with four compound chaetae, similar to those of anterior parapodia, blades similar but shorter, about 20 mm above 15 mm below. Dorsal simple chaetae from chaetiger 1, each distally entire, smooth, slender, and curved (Fig. 6D, F). Ventral simple chaetae on posterior parapodia, similar to dorsal simple chaetae but shorter and slender (Fig. 6H). Acicula solitary, acuminate (Figs. 6C). Pharynx proportionally slender, through four segments; pharyngeal tooth small, oval, located near opening (Fig. 6A). Proventricle barrel-shaped, through three segments, with about 15 muscle cell rows. Pygidium small, with two long anal cirri, similar to dorsal cirri of midbody.

Remarks. *Erinaceusyllis carrascoi* **n. sp.** is characterized by having compound chaetae with slender, unidentate blades with short, straight spines on margin, lack of dorsal cirri on chaetiger 2, and presence of papillae on parapodia and dorsal cirri.

About 12 species of *Erinaceusyllis* have unidentate compound chaetae, but none has long papillae on the parapodial lobes and papillae on the dorsal cirri, except *E. cirripapillata* San Martín, 2005 from Australia. However, that species has longer, mushroom-shaped papillae on the dorsal cirri (San Martín, 2005); these are short and rounded in *E. carrascoi* **n. sp**.

Erinaceusyllis horrockensis (Hartmann-Schröder, 1981), also from Australia, has similar compound chaetae, but has dorsal cirri on chaetiger 2 (San Martín, 2005). *Erinaceusyllis centroamericana* (Hartmann-Schröder, 1959) a circuntropical species, *E. serratosetosa* (Hartmann-Schröder, 1982) from Australia, also reported to the Western Mediterranean, and *E. ettienei* San Martín, 2005 from Australia, have compound chaetae with longer blades and longer spines on the margin (San Martín, 2005). *Erinaceusyllis opisthodentata* (Hartmann-Schröder, 1987), *E. kathrynae* San Martín, 2005, and *E. hartmannschroederae* San Martín, 2005, all from Australia have, in contrast with the previous species, compound chaetae with short blades, *E. opisthodentata* also with the pharyngeal tooth located more posteriorly than in *E. carrascoi* **n. sp.** (San Martín, 2005).

Erinaceusyllis nana Ding & Westheide, 2008, an even smaller species from China, has very similar compound chaetae, but lacks long papillae on the parapodial lobes and has smoth dorsal cirri (Ding & Westheide, 2008).

Erinaceusyllis bidentata (Hartmann-Schröder, 1974) from East Africa, Australia and Chile, also has papillae on the dorsal cirri, but the compound chaetae are bidentate (San Martín, 2005).

Finally, *E. erinaceus* (Claparède, 1863), from N Atlantic and N Pacific, has longer compound chaetae with longer marginal spines, and lacks papillae on the dorsal cirri and long papillae on the parapodia (Verdes et al., 2013).

Distribution. Chilean Patagonia: from Concepción channel to Magellan Strait (50°16 ′S - 54°57 ′ S).

Habitat. Shallow subtidal (30 m). Inside tubes of *Chaetopterus* cf. *variopedatus* in fjords and channels from Patagonia. Salinity: from 30.2 to 35 PSU, temperature: from 8.7 to 8.9°C.

Type locality. Concepción channel, Drumond Hay Island (Chilean Patagonia).

Etymology. This species is named to honor the late Dr. Franklin Carrasco, Chilean polychaetologist.

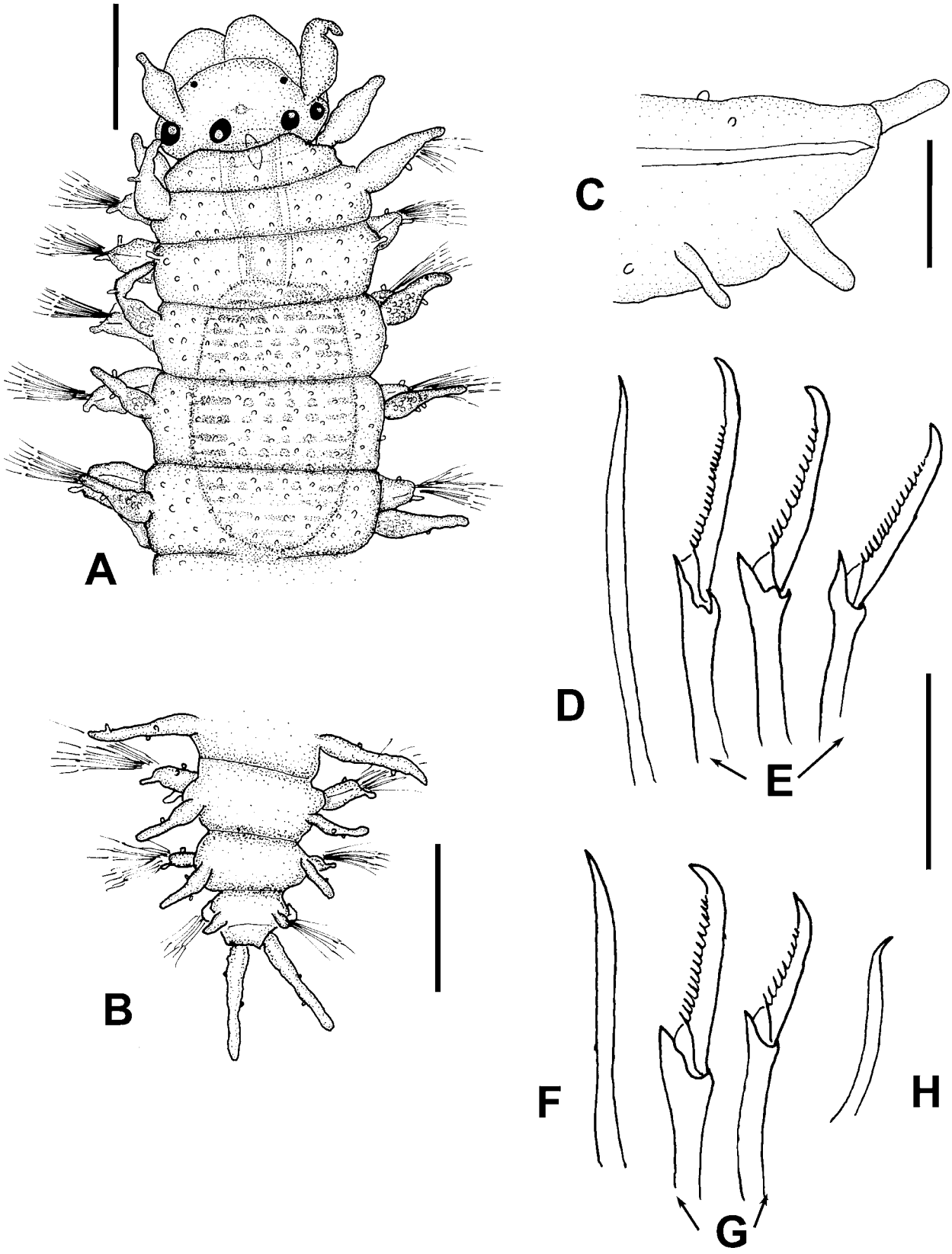

FIGURE 6. ***Erinaceusyllis carrascoi*** **n. sp.** MNCN 16.01/17769. Holotype. A, anterior end, dorsal view. B, posterior end, dorsal view. C, parapodial lobe, midbody, antero-lateral view. D, dorsal simple chaeta, anterior parapodium. E, compound chaetae, anterior parapodium. F, dorsal simple chaeta, posterior parapodium. G, compound chaetae, posterior parapodium. H, ventral simple chaeta. **Scale bars**. A: 0.1 mm. B–H: 20 μm.

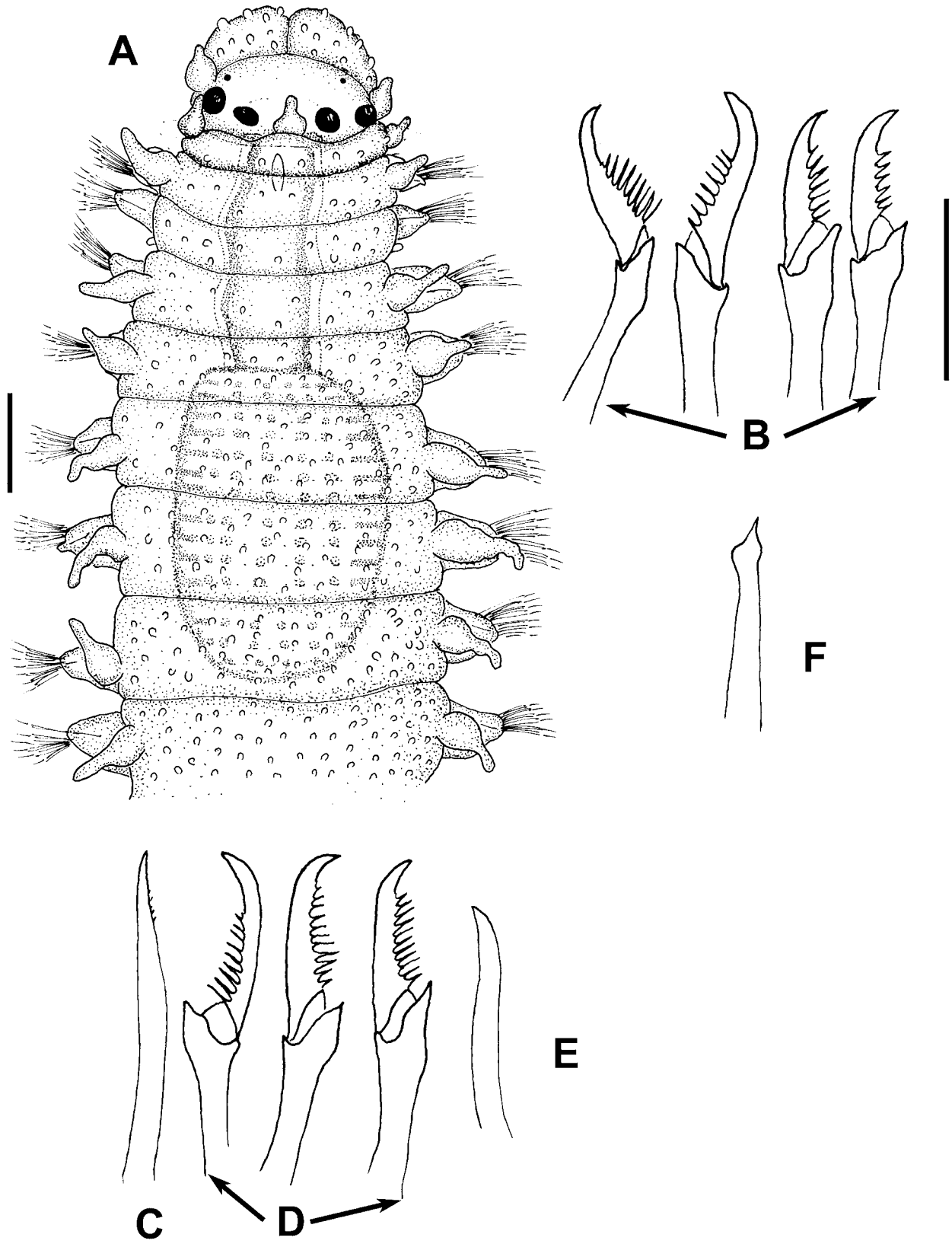

FIGURE 7. ***Erinaceusyllis perspicax*** (Ehlers, 1908) n. comb. A, anterior end, dorsal view. B, compound chaetae, anterior parapodium. C, dorsal simple chaeta, posterior parapodium. D, compound chaetae, posterior parapodium. E, ventral simple chaeta, F, acicula, posterior parapodium. **Scale bars**. A: 0.1 mm. B–F: 20 μm.

Erinaceusyllis perspicax (Ehlers, 1908) new combination

Figure 7

Sphaerosyllis perspicax Ehlers, 1908: 66, pl. 6, figs. 1–3; 1913: 480; Hartman 1964: 89, pl. 28, figs. 4–5.

Material examined. Station 36 (1) and station 41 (1) (LBUV).

Description. Body small, 2.8 mm long, 0.3 mm wide, 24 chaetigers, with numerous, scattered, short papillae on dorsum (Fig. 7A), slightly longer laterally, especially prominent on palps. Prostomium oval, slightly wider than long; with four large eyes in trapezoidal arrangement, nearly in line, and two anterior eyespots; antennae with bulbous bases and short tips; median antenna short, inserted on posterior margin of prostomium; lateral antennae similar to median antenna, inserted in front of anterior eyes. Palps shorter than prostomium, fused along their length, with numerous, distinct papillae (Fig. 7A). Peristomium covering dorsal posterior margin of prostomium; tentacular cirri similar to antennae. Dorsal cirri with bulbous bases and short tips, more elongated than antennae and tentacular cirri, absent on chaetiger 2 (Fig. 7A), more elongate in mid-body. Parapodia rectangular to conical, with few, small, papillae. Compound chaetae heterogomph, with smooth shafts (Figs 7 B, D); blades short, falcate, unidentate, all similar in length, about 18–20mm; margin of blades provided with long, slender spines (Figs 7B, D); anterior parapodia with 7–9 compound chaetae, decreasing in number posteriorly to 5–6 on posterior parapodia. Dorsal simple chaetae on posterior parapodia, unidentate, provided with minute marginal subdistal spines (Fig. 7C) or smooth. Ventral simple chaetae slender, smooth, unidentate (Fig. 7E), on far posterior parapodia. Acicula solitary, acuminate (Fig. 7F), with another slender, straight acicula on far anterior parapodia. Pharynx through five segments; pharyngeal tooth, slightly behind opening (Fig. 7A). Proventricle long, wide, barrel-shaped, through 3–4 segments, with about 20–22 muscle cell rows. Pygidium semi-circular, with two anal cirri similar to dorsal cirri.

Remarks. *Erinaceusyllis perspicax* is characterized by having large eyes distinctly in a line and separated. The antennae, tentacular and anterior dorsal cirri are inflated, with slender tips, becoming more elongated, and slightly inflated on bases, from mid-body. The compound chaetae are more or less elongated, with unidentate blades, and with moderate to long, straight spines on margin.

The most similar species is *E. hartmannschroederae,* San Martín, 2005 from Australia, but in that species the eyes are not so separated, the anterior appendages are not so inflated on bases, and the blades of compound chaetae are shorter, and similar in size, without spines on the ventral ones (San Martín 2005).

Distribution. Kerguelen Islands, Antarctica (Wilhelm II coast). Chilean Patagonia, first report to Chile.

Habitat. Shallow subtidal (30 m depth). Inside tubes of *Chaetopterus* cf. *variopedatus* in fjords and channels from Patagonia. Salinity: from 30.2 to 35 PSU, temperature: from 8.7 to 8.9°C.

Genus *Salvatoria* McIntosh, 1885

Salvatoria McIntosh, 1885: 188, emended by San Martín 2005.
The diagnosis is that of San Martín 2005.

Salvatoria rhopalophora (Ehlers, 1897) n. comb.

Figures 8, 9, 10

Grubea rhopalophora Ehlers, 1897: 53, pl. 3, figs. 66–70. Wesenberg-Lund 1962: 65.
Brania rhopalophora Hartman 1964: 79, pl. 25, fig. 1.

Material examined. Station 41 (60), station 55 (3) (LBUV) and station 36 (13 specimens plus 2 specimens for SEM) (MNCN 16.01/17770).

Description. Body small, largest specimen a mature male with natatory chaetae, 2.8 mm long, 0.1 mm wide, for about 31 chaetigers. Prostomium ovate, wider than long, with four thick eyes in trapezoidal arrangement and two anterior eyespots. Antennae spindle-shaped (Fig. 8A, 9A–C), subdistally inflated, ending in short tip; shorter than combined lengths of prostomium and palps; median antenna longer than lateral antennae, inserted on line between posterior eyes (Fig. 8A); lateral antennae inserted in front of eyes (Fig. 8A). Palps similar in length to

prostomium or shorter, fused dorsally by a membrane, with small distal notch (Figs. 8A, 9A–C). Peristomium shorter than subsequent segments; tentacular cirri similar to antennae but more elongate, dorsal pair similar in length to lateral antennae, ventral pair shorter. Dorsal cirri spindle-shaped, present on all chaetigers, all similar in length or with slight variations in length, except those of chaetiger 1, slightly longer than subsequent ones (Figs. 8A, 9A–C). Compound chaetae with bidentate blades, both teeth similar, provided with moderately long, distally directed, thin spines basally, shorter and straight as more distal on margin (Figs. 8C, 9D–F); spines longer in dorsalmost chaetae. Anterior parapodia each with about 9–11 compound chaetae; posteriorly number of compound chaetae declines progressively to 5–6 on posterior parapodia, provided with shorter blades, less marked dorso-ventral gradation in length of blades. In mid-body, blades of most dorsal compound chaetae 36 mm above, 17 mm below. Dorsal simple chaetae from mid-body, unidentate or minutely bidentate (Figs. 8B, 9A, B), with minute subdistal marginal spines. Ventral simple chaetae on most posterior parapodia of some specimens, sigmoid, bidentate, similar to dorsal ones (Figs. 8E, 10C). Anterior parapodia each with two aciculae, one straight and another one acuminte; solitary acicula in mid-body and posterior parapodia, acuminate (Fig. 8D). Pharynx through about 3–4 segments; pharyngeal tooth small, rhomboidal to ovate, located near anterior margin, but distinct posteriorly, without papillae on opening (Fig. 8A). Proventricle similar in length to pharynx, through about three segments, with 18–20 muscle cell rows. Pygidium small, with two anal cirri, similar to dorsal cirri but slightly longer.

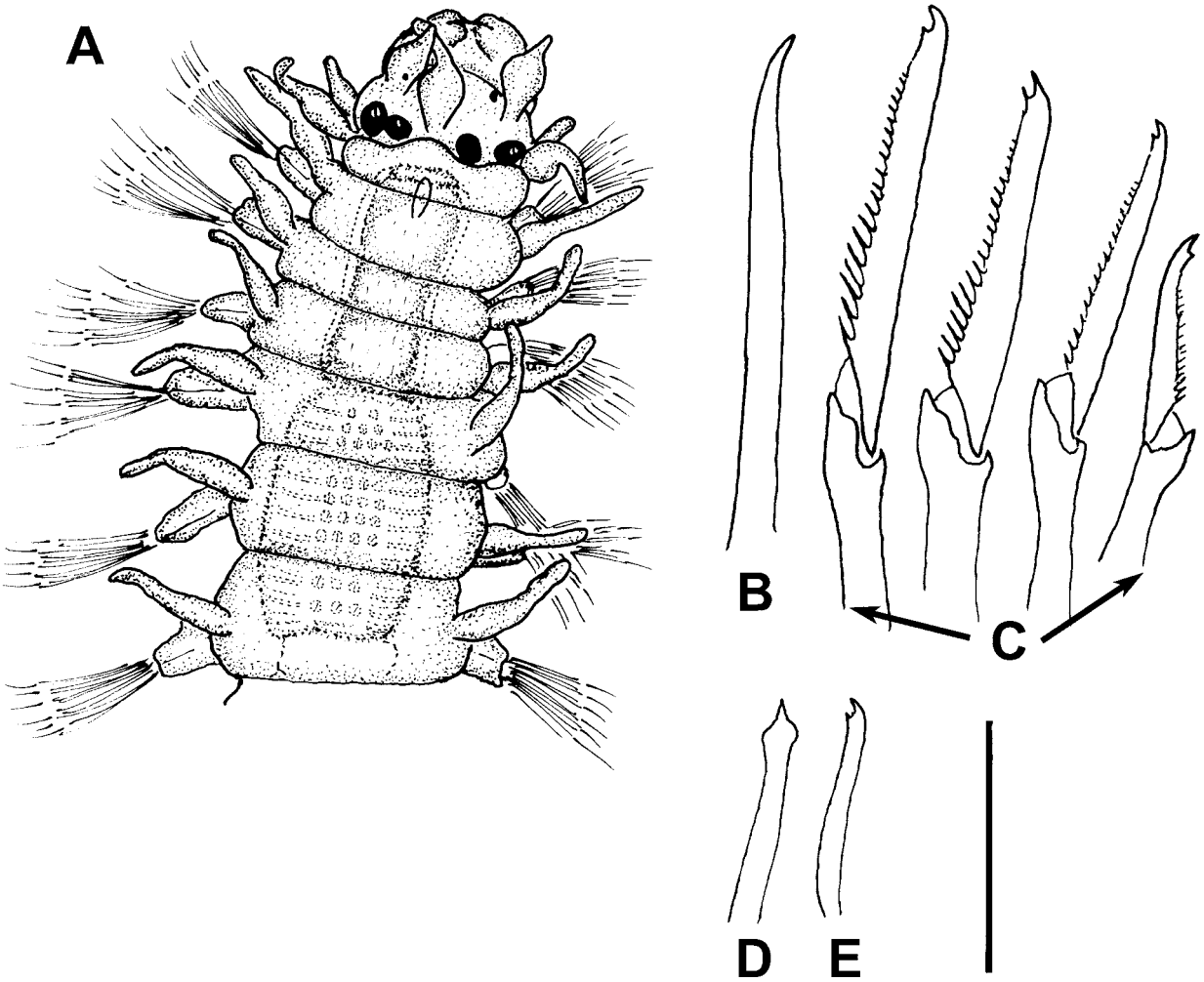

FIGURE 8. ***Salvatoria rhopalophora*** (Ehlers, 1897) n. comb. MNCN 16.01/17770. A, anterior end, dorsal view. B, dorsal simple chaeta, midbody parapodium. C, compound chaetae, midbody parapodium. D, acicula, midbody parpaodium. E, ventral simple chaeta, posterior parapodium. **Scale bars**. A: 0.1 mm. B–F: 20 µm.

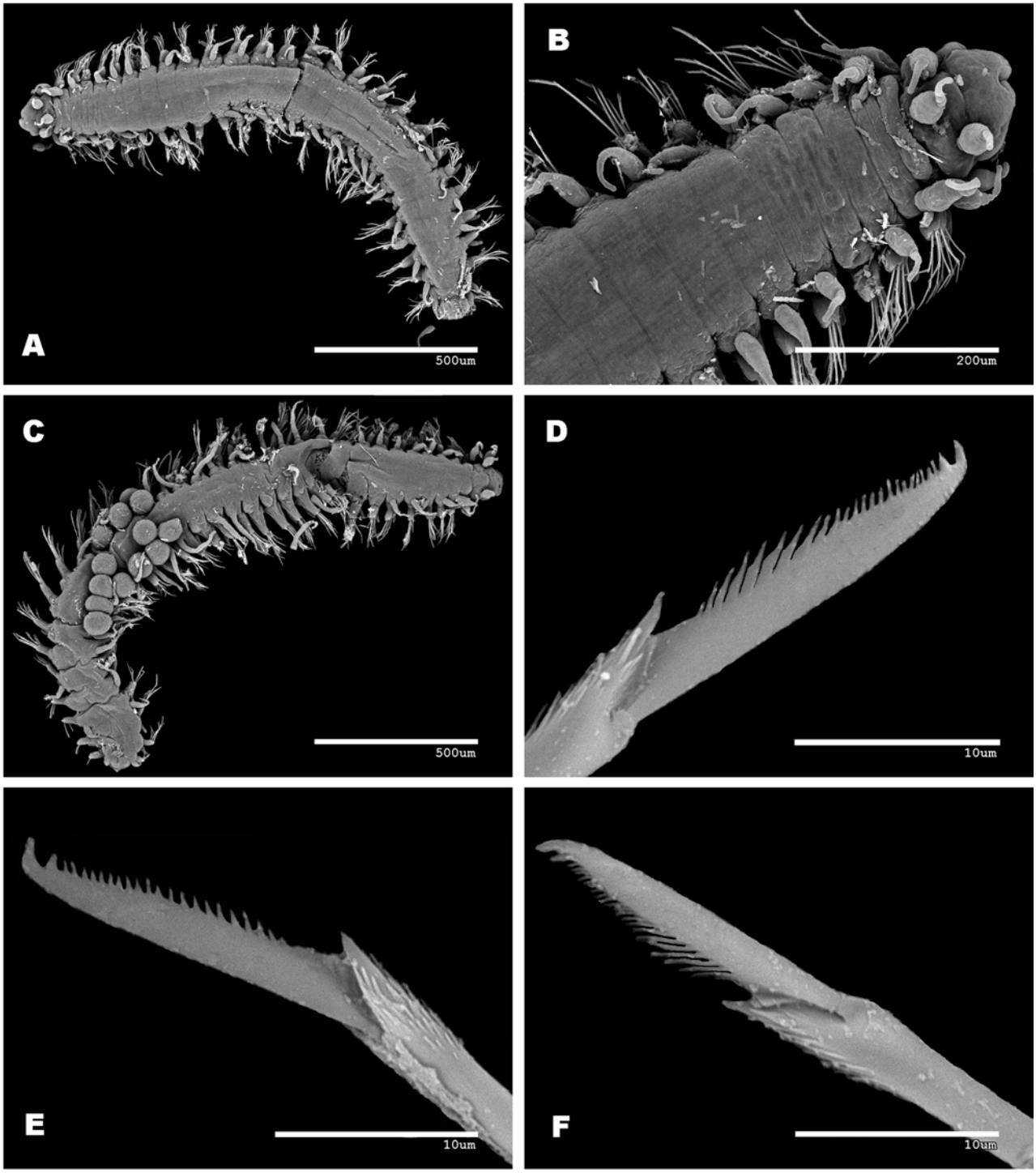

FIGURE 9. ***Salvatoria rhopalophora*** (Ehlers, 1897) n. comb. SEM. A, complete specimen, dorsal view. B, anterior end, dorsal view. C, female carrying eggs, dorsal view. D–F, compound chaetae.

Remarks. *Salvatoria rhopalophora* **n. comb**. Is similar to *S. clavata* (Claparède, 1863), a common species in NE Atlantic and Mediterranean, which is widely reported and shows great variability and *S. koorineclavata* San Martín, 2005 from Australia and China. These species have similar compound chaetae with bidentate blades and short spines on the margin. A revision of this group worldwide, using molecular methodology or a detailed comparative morphological study, would be necessary to segregate and delimitate species. However, *S. rhopalophora* **n. comb**. seems to have shorter and thicker antennae than the other two species, and with a shorter pharynx and proventricle. *Salvatoria clavata* also has the pharyngeal tooth farther back than *S. koorineclavata* and *S. rhopalophora*.

Distribution. Sub-Antarctic Islands. New to Chile. Chilean Patagonia: from Concepción channel to Magellan Strait (50°16 ′ S–54°57 ′ S).

Habitat. Sediments and algae. Intertidal to shallow subtidal (30 m depth). Inside tubes of *Chaetopterus* cf. *variopedatus* in fjords and channels from Patagonia. Salinity: from 30.2 to 35 PSU, temperature: from 8.7 to 8.9°C. From *Macrocystis pyrifera* kelp holdfast Salinity: 16 temperature: 5.7°C.

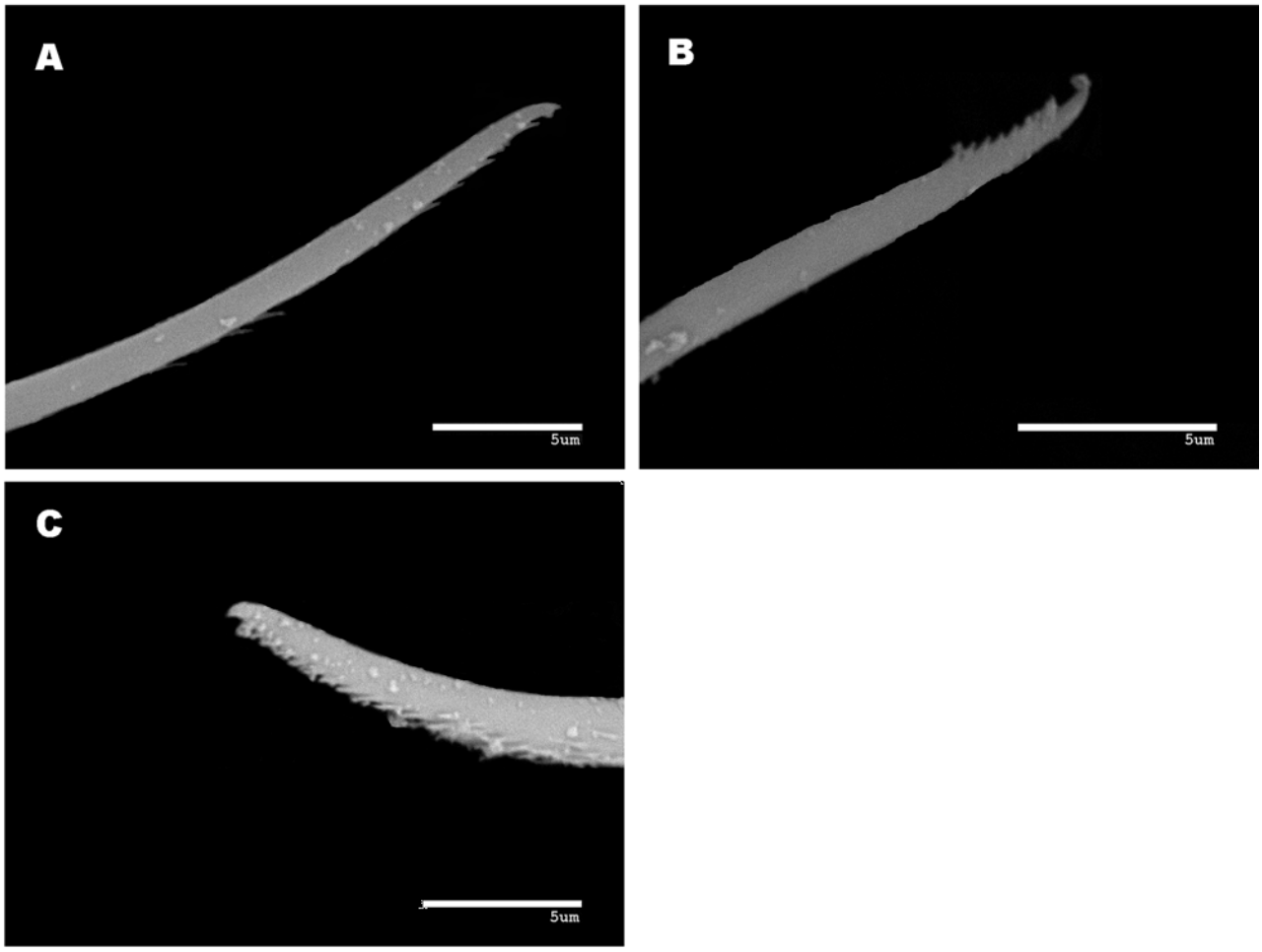

FIGURE 10. ***Salvatoria rhopalophora*** (Ehlers, 1897) n. comb. SEM. A, B, dorsal simple chaeta. C, ventral simple chaeta.

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References

Álvarez-Campos, P. & Verdes, A. (2017) Syllids inhabiting holdfasts of *Lessonia spicata* in Central Chile: diversity, systematics, and description of three new species. *Systematics and Biodiversity.*

https://doi.org/10.1080/14772000.2017.1285364
Barroso, R., Paiva, P.C., Nogueira, J.M.M. & Fukuda, M.V. (2017) Deep sea Syllidae (Annelida, Phyllodocida) from Southestern Atlantic. *Zootaxa*, 4221 (4), 401–430.
https://doi.org/10.11646/zootaxa.4221.4.1
Benham, W.B. (1921) Polychaeta. Australasian Antarctic Expedition 1911–14 under the leadership of Sir Douglas Mawson, D. Sc. B. E. *Scientific Reports, series C, Zoology and Botany*, 6, 1–28.
Benham, W.B. (1927) Polychaeta. British Antarctic ("Terra Nova") Expedition, 1910. *Natural History Report, British Museum Natural History Zoology*, 7, 47–182.
Blankesteyn, A. & Lana, P.C. (1986) Anelideos Poliquetas das Expediçoes Antarcticas Brasileiras de 1982/1983, 1983/1984 e 1984/1985. *Nerítica*, 1, 49–77.
Cañete, J.I., Leighton, G.L. & Aguilera, F.F. (1999) Polychaetes from Aysén Fjord, Chile: distribution, abundance and biogeographical comparison with the shallow soft-bottom polychaete fauna from Antarctica and the Magellan Province. *Scientia Marina*, 63 (Supl. 1), 243–252.
https://doi.org/10.3989/scimar.1999.63s1243
Claparède, E. (1863) *Bebachtungen über Anatomie und Entwicklungsgeschichte wirbelloser Thiere and der Küste von Normandie angestellt*. Leipzig. VII+ 120 pp., 18 pls.
Day, J.H. (1954) The polychaeta of Tristan da Cunha. *Results of the Norwegian Scientific Expedition to Tristan da Cunha 1937–1938*, 29, 1–35.
Ding, Z. & Westheide, W. (2008) Interstitial Exogoninae from the Chinese coast (Polychaeta, Syllidae). *Senckenbergiana biologica*, 88, 125–159.
Ehlers, E. (1897) *Polychaeten*. Hamburger Magalhaenischen Sammelreise, Hamburg, Friedrischen & Co. 148 pp.
Ehlers, E. (1908) Die bodensässigen Anneliden aus den Sammlungen der deutschen Tiefsee-Expedition. *Wissenschaftliche Ergebnisse der deutschen Tiefsee-Expedition auf dem Dampfer 'Valdivia'* 1898–1899, 16 (1), 1–168.
Ehlers, E. (1912) Polychaeta. National Antarctic Expedition 1901-1904. *Natural History, Zoology, London, British Museum Trustees*, 6, 1–32. [3 pls.]
Ehlers, E. (1913) Die Polychaeten-Sammlungen der deutschen Südpolar-Expedition 1901–1903. *Deutsche Südpolar-Expedition*, 13 (4), 397–598. [pls. 26–46.]
Fauvel, P. (1923) *Faune de France 5. Polychètes Errantes*. Le Chevalier Eds. Paris, 486 pp.
Fukuda, M.V. & Nogueira, J.M.M. (2014) A new species of *Exogone* (Syllidae : Exogoninae) from off the state of São Paulo (south-east Brazil). *Memoirs of Museum Victoria*, 71, 79–84.
https://doi.org/10.24199/j.mmv.2014.71.08
Gambi, M.C. & Mariani, S. (1999) Polychaetes of the soft bottoms of the Straits of Magellan collected during the Italian oceanographic cruise in February-March 1991. *Scientia Marina*, 63 (Suppl. 1), 233–242.
https://doi.org/10.3989/scimar.1999.63s1233
Grube, A.E. (1850) Die Familien der Anneliden. *Archiv für Naturgeschichte,* 16, 249–364.
Hartman, O. (1953) Non-pelagic Polychaeta of the Swedish Antarctic Expedition 1901–1903. *Further Zoological Results of the Swedish Antarctic Expedition*, 4, 1–83.
Hartman, O. 1964. Polychaeta Errantia of Antarctica. *Antarctic Research Series*, 3, 1–131.
https://doi.org/10.1029/AR003
Hartmann-Schröder, G. (1956) Polychaeten studien I. *Zoologischer Anzeiger*, 157, 87–91.
Hartmann-Schröder, G. (1962) Zur Kenntnis des Eulitorals der chilenischen Pazifikküste und der argentinischen Küste Südpatagoniens unter besonderer Berücksichtigung der Polychaeten und Ostracoden. Tl. II. Die Polychaeten des Eulitorals. *Mitteilungen aus dem Hamburgischen Zoologischen Museum und Institut,* 60 (Suppl.), 57–167.
Hartmann-Schröder, G. (1965) Zur Kenntnis des Sublittorals der chilenischen Küste, unter besonder Berücksichtigung der Polychaeten und Ostracoden. Die Polychaeten des Sublitorals. *Mitteilungen aus dem Hamburgischen Zoologischen Museum und Institut*, 62 (Suppl. vol.), 59–305.
Hartmann-Schröder, G. (1974) Zur Polychaetenfauna von Natal (Siidafrika). *Mitteilungen aus dem Hamburgischen Zoologischen Museum und Institut*, 71, 35–73.
Hartmann-Schröder, G. (1979) Teil 2. Die Polychaeten der tropischen Nordwestküste Australiens (Zwischen Port Samson in Norden und Port Hedland in Süden). *Mitteilungen aus dem Hamburgischen Zoologischen Museum und Institut,* 76, 75–218.
Hartmann-Schröder, G. (1993) Die Polychaeten der Polarstern-Reise ANT III/2 in die Antarktischen Halbinsel und isla de los Estados (Feuerland, Argentinien) 1991. Teil 1: Polynoidae bis Iphitimidae. *Mitteilungen aus dem Hamburgischen Zoologischen Museum und Institut,* 90, 127–150.
Hernández, C.E., Muñoz, G. & Rozbaczylo, N. (2001) Poliquetos asociados con *Austromegabalanus psittacus* (Molina, 1782) (Crustacea: Cirripedia) en Península Gualpén, Chile central: Biodiversidad y efecto del tamaño del sustrato biológico. Revista de Biología Marina y Oceanografía, 36, 99–108.
https://doi.org/10.4067/S0718-19572001000100009
Imajima, M. & Hartman, O. (1964) The polychaetous annelids of Japan. *Allan Hancock Foundation Occasional Paper,* 26, 1–452.
Langerhans, P. (1879) Die Wurmfauna von Madeira. *Zeitschrift für Wissenschaftliche Zoologie*, 33, 513–592.

Letelier, S., Báez, P., Ramírez, M.E., Rebolledo, A., Soto, E.H. & Naretto, J. (2013) Biotopos marinos intermareales y submareales (Crucero CIMAR 16 Fiordos) desde el Estrecho de Magallanes al Canal Beagle. *Boletín del Museo Nacional de Historia Natural, Chile*, 62, 147–157.

McIntosh, W.C. (1885) Report on the Annelida Polychaeta collected by H.M.S. Challenger during the years 1873–76. *Challenger Reports*, 12, 1–554.

Montiel, A., Quiroga, E. & Gerdes, D. (2011) Diversity and spatial distribution patterns of Polychaete assemblages in the Paso Ancho, Strait of Magellan Chile. *Continental Shelf Research*, 31, 304–314. https://doi.org/10.1016/j.csr.2010.11.010

Örsted, A.E. (1845) Ueber die Entwicklung der Jungen bei einer Annelide und über änveren Untersuchiede zwischen beiden Geschlechtern. *Archiv für Naturgeschichte Berlin,* 11 (1), 20–23.

Paresque, K., Fukuda, M.V. & Nogueira, J.M.M. (2014) The genus *Exogone* (Polychaeta: Syllidae) from the Brazilian coast, with the description of a new species. *Zootaxa*, 3790 (4), 501–533. https://doi.org/10.11646/zootaxa.3790.4.1

San Martín, G. (2003) *Annelida Polychaeta II. Syllidae*. IN: Fauna Ibérica, vol. 21. Ramos, M. A. e*t al.* (EDS). Museo Nacional de Ciencias Naturales. CSIC. Madrid, 554 pp.

San Martín, G. (2005) Exogoninae (Polychaeta: Syllidae) from Australia, with the description of a new genus and twenty-two new species. *Records of the Australian Museum*, 57 (1), 39–152. https://doi.org/10.3853/j.0067-1975.57.2005.1438

San Martín, G. & Aguado, M.T. (2014) Family Syllidae. In *Phyllodocida: Nereidiformia. Handbook of Zoology, Annelida. A Natural History of the Phyla of the Animal Kingdom.* Verlag Walter der Gruyter GmbH & Co. Schmidt- Rhaesa, A. (Ed. In chief), 52 pp.

San Martín, G. & Parapar, J. (1997) "Errant" polychaetes of the Livingston Island shelf (South Shetlands, Antactica), with the description of a new species. *Polar Biology*, 17, 285–295. https://doi.org/10.1007/PL00013370

San Martín, G. & Worsfold, T. (2015) Guide and keys for identification of Syllidae (Annelida: Phyllodocida) from the British Isles (reported and expected species). *Zookeys*, 488, 1–29. https://doi.org/10.3897/zookeys.488.9061

San Martín, G., Rozbaczylo, N. & Díaz-Díaz, O. (2017) Guía y claves para el reconocimiento de las subfamilias, género y especies de Syllidae registradas a lo largo de la costa de Chile, archipiélago Juan Fernández e isla de Pascua (Annelida: Phyllodocida: Syllidae). *Anales del Instituto de la Patagonia*, 45 (2), 7–50.

Silva, N. & Palma, S. (eds.) (2006) Avances en el conocimiento oceanográfico de las aguas interiores chilenas, Puerto Montt a cabo de Hornos. *Comité Oceanográfico Nacional – Pontificia Universidad Católica de Valparaíso, Valparaíso*, 162 pp.

Soto, E.H. & Paterson, G.L.J. (2010) Poliquetos bentónicos intermareales y sublitorales de la región de Aysén, Chile. *Anales Instituto de la Patagonia,* 38 (2), 69–80. https://doi.org/10.4067/S0718-686X2010000200007

Soto, E.H., Báez, P., Ramírez, M.E., Letelier, S., Naretto, J. & Rebolledo, A. (2012) Biotopos marinos intermareales entre Canal Trinidad y Canal Smyth, sur de Chile. *Revista de Biología Marina y Oceanografía*, 47 (2), 177–191. https://doi.org/10.4067/S0718-19572012000200002

Soto, E.H., Báez, P., Ramírez, M.E., Letelier, S., Naretto, J. & Rebolledo, A. (2015) Biotopos marinos intermareales y sublitorales someros entre Canal Trinidad y Canal Smyth, XII región, Chile. *Ciencia y Tecnología del Mar,* 36, 91–103.

Soto, E.H. & San Martin, G. (2017) New reports and a new species of Syllidae (Annelida) from Chilean Patagonia. *Journal of the Marine Biological Association of the United Kingdom*. https://doi.org/10.1017/S0025315417001242

Thatje, S. & Brown, A. (2009) The Macrobenthic ecology of the Straits of Magellan and the Beagle Channel. *Anales Instituto de la Patagonia*, 37 (2), 17–27. https://doi.org/10.4067/S0718-686X2009000200002

Verdes, A., Aguado, M.T. & San Martín, G. (2013) Re-description of some poorly known species of the family Syllidae (Annelida). *Journal of the Marine Biological Association of the United Kingdom*, 93 (8), 2109–2122. https://doi.org/10.1017/S0025315413000660

Wesenberg-Lund, E. (1962) Polychaeta Errantia. Reports of the Lund University to Chile Expedition 43. *Acta University of Lund*, 57 (12), 1–139.