*Zootaxa* 4878 (1): 145–158
https://www.mapress.com/j/zt/


**Article**

ISSN 1175-5326 (print edition)
**ZOOTAXA**
ISSN 1175-5334 (online edition)

https://doi.org/10.11646/zootaxa.4878.1.6
http://zoobank.org/urn:lsid:zoobank.org:pub:ED7F02DC-27B8-4BB8-A4C7-EC1995D5C473

# Three new species of *Syllis* Savigny in Lamarck, 1818 (Annelida, Syllidae) from Chilean Patagonia

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## Abstract

Three new species of the genus *Syllis* Savigny *in* Lamarck, 1818, from the Chilean Patagonia are described, figured and discussed. The specimens were collected in boulders, sediment bottoms, *Macrocystis pyrifera* holdfasts, and inside tubes of *Chaetopterus* cf. *variopedatus*. *Syllis patagonica* n. sp., is characterized by its color pattern, short, fusiform dorsal cirri, plenty of hyaline inclusions, acuminate posterior acicula, and compound chaetae with slightly bidentate falcigers. *Syllis terraeignium* n. sp., has similar compound chaetae, but dorsal cirri are longer than those of the above mentioned species, a long proventricle, and the posterior acicula are straight, pointed. Finally, *Syllis patersoni* n. sp., has a slender, elongated body, with moderately long dorsal cirri, plenty of hyaline inclusions, acuminate posterior acicula, and compound chaetae composed by falcigers and short spiniger-like.

**Key words:** Syllidae, Patagonia, Chile, Taxonomy, *Chaetopterus* tubes

## Introduction

Syllidae is one of the most diverse families of polychaetes in Chilean waters. Considering the last works published by Cañete (2017) and San Martin *et al*. (2017a) the number of syllid species for Chile, including oceanic Juan Fernández and Rapa Nui islands, reaches 64. The overall knowledge of this family in Chile is scarce, with few recent works including new species and records: Soto & San Martín (2017a, b), Álvarez-Campos & Verdes (2017), and Cañete (2017). There are some older records and descriptions (*e.g.* Ehlers 1897; Wesenberg-Lund 1962; Hartmann-Schröder 1965 and others). San Martín *et al.* (2017a) summarized the knowledge of Syllidae in Chile providing an updated review with a key for subfamilies, genera and species. With exception of works made by Soto & San Martín (2017), the knowledge of this family in the Patagonian region of Chile is mainly related to ecological works for several species in the Aysén 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, 42 species of syllids have been reported for the Chilean Patagonia (between 40°–56°S).

*Syllis* is the most diverse known genus of the family in Chilean waters, with 22 species. Just eight species have been previously reported for the Chilean Patagonia with very old records of several species as *Syllis anops* Ehlers, 1897, *Syllis luteoides* (Hartmann-Schröder 1962) *Syllis magdalena* Wesenberg-Lund, 1962, *Syllis magellanica* Augener, 1918, *Syllis palifica* Ehlers, 1901, *Syllis prolixa* Ehlers, 1901, *Syllis sclerolaema* Ehlers, 1900 and *Syllis variegata* Grube, 1860, between Puerto Montt (40° S) and Cape Horn (56° S) (San Martin *et al.* 2017a). The current work provides a new account for this genus in the Chilean Patagonia, reaching to a total of eleven species, including the description of three new species.

*Accepted by W. Magalhães: 1 Oct. 2020; published: 12 Nov. 2020*

## 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 "Cruceros de Investigación Científica Marina en Áreas Remotas (CIMAR)" Program organized by the Chilean Navy from 1995 (Silva & Palma 2006).

The specimens were collected during CIMAR 15 and 16 oceanographic cruises in the fjords, channels and ice-fields zone, located in the Chilean Patagonian region (41°–55° S, Southeast Pacific, Fig. 1), from three sampling stations (stations 36, 41 and 50) by hand and Scuba diving from the intertidal rocky-shore to the subtidal zone (to 30 m depth). Biological substrates such as *M. pyrifera* kelp holdfasts and tubes of *Chaetopterus* cf. v*ariopedatus* (few empty tubes) found on the sampling stations were important habitats for syllid diversity. The specimens were manually sorted from these biological substrates and sieved (500 µm) where sediment samples were collected, then were fixed on board 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 Electron Microscope (SEM) procedures and images digitalization in *Syllis* species were made in the SIDI (Servicio Interdepartamental de Investigación) of the Universidad Autónoma de Madrid, Spain. Body width was measured across the proventricle segments and does not include parapodial lobes. The specimens were studied in Chile and Spain and deposited at Museo Nacional de Ciencias Naturales, Madrid (MNCN), Spain, and Laboratorio de Bentos, Universidad de Valparaíso (LBUV), Chile. Posteriorly, non-type specimens will be deposited at the Museo Nacional de Historia Natural de Santiago de Chile (MNHN) according to Chilean law. For general morphology and biology of the family Syllidae see San Martín (2003), San Martín & Aguado (2014), San Martín & Worsfold (2015) and San Martín *et al.* (2017a). 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. For each species, the station numbers are given along with the numbers of specimens in brackets in the Material Examined section.

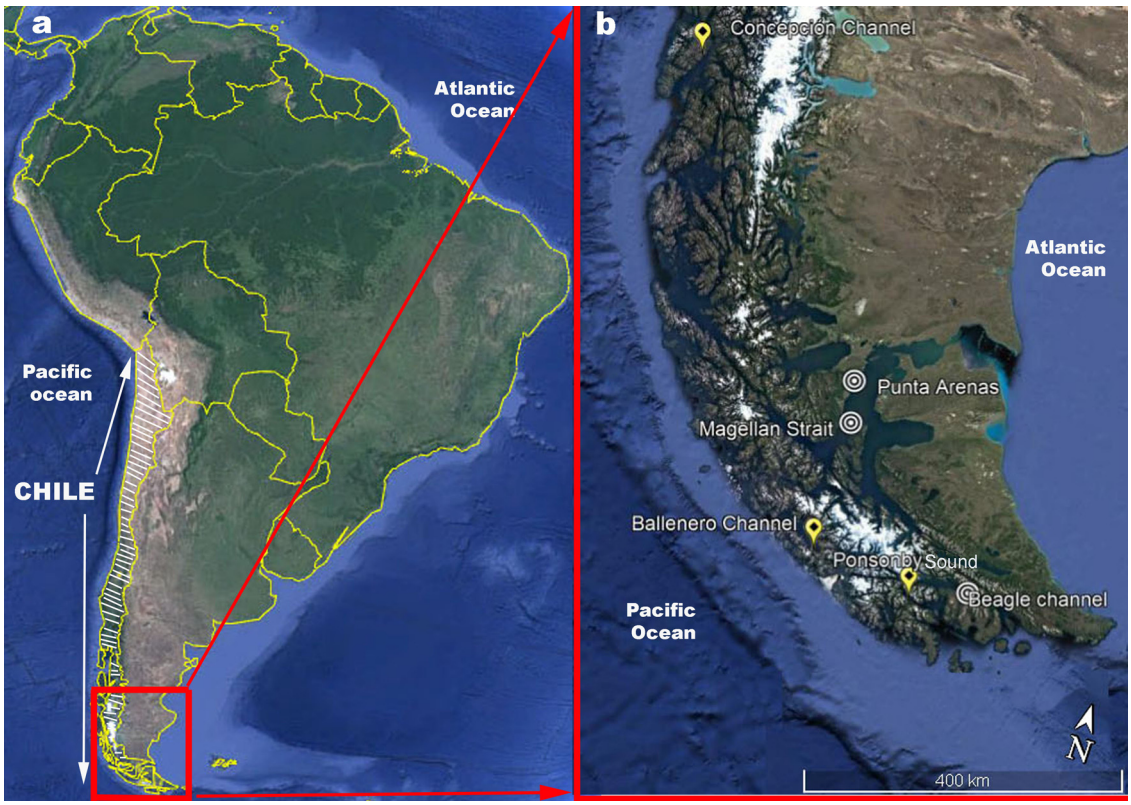


**FIGURE 1.** Study area showing the sampling stations. Map modified from Google Earth©

## Results

### Family Syllidae Grube, 1850

### Subfamily Syllinae Grube, 1850

### Genus *Syllis* Savigny *in* Lamarck, 1818

#### *Syllis patagonica* new species

Figures 2, 3, 4

**Material examined**. Holotype. St. 50 (MNCN 16.01/18723), 1 Paratype (MNCN 16.01/18724). St. 41, 1 Paratype (MNCN 16.01/18725) and 2 specimens used for SEM. St. 41, 5 Paratypes (LBUV 001/2020). St. 50, 5 Paratypes (LBUV 002/2020). Dates of collections: 19 October 2009 (St. 41) and 8 November 2010 (St. 50). Coordinates: St. 41 50°16'37" S 74°53'21"W, St. 50 55º08´39.4" S 68º49´34.0" W.

**Description**. Body robust, with wide, well marked segments (Figs 2A; 3A; 4A, B) yellowish pale on alive specimens; anterior segments with one transversal dark brown slender stripe on middle and two lateral ones, slender and shorter, located posteriorly on each segment (Fig. 3A–D); color pattern easily disappears after fixation. Holotype complete, 8 mm long, 0.42 mm wide, 67 chaetigers. Prostomium subcircular, with two pairs of small eyes in open trapezoidal arrangement; median antenna similar in length to prostomium and palps together, inserted between posterior eyes, on posterior margin of prostomium, with about 11–13 articles; lateral antennae inserted in front of anterior eyes, near anterior margin of prostomium (Figs 2A; 4A, B), slightly shorter than median antenna, with 10–11 articles. Peristomium slightly shorter than subsequent segments; dorsal tentacular cirri similar in length to median antenna, with 14-15 articles; ventral tentacular cirri shorter than dorsal ones, with 10 articles. Dorsal cirri shorter than body width, fusiform, thick (Figs 2A, 3A–D, 4A, B), dark by numerous glands inside articles; anterior dorsal cirri somewhat longer than remaining, with about 15-13-11-14-16 articles on first five chaetigers; dorsal cirri of proventricular segments with 8–11 articles, thicker than those of anterior segments; midbody dorsal cirri markedly fusiform and thick, alternating long ones with 10–11 and slightly shorter ones, with 8–9 articles (Fig. 4C). Parapodia conical, distally bilobed; ventral cirri short, thick, oval. Compound chaetae heterogomph falcigers with elongated, slender bidentate blades, proximal teeth small, distinctly smaller than distal ones, and short spines on margin, similar throughout, and marked dorsoventral gradation in length, more marked on anterior segments (Fig. 2B–D). Anterior parapodia each with 10–12 compound chaetae, blades 40 µm above, 18 µm below (Figs 2B; 4D); midbody parapodia each with 8–10 compound chaetae, 38 µm above, 18 µm below (Fig. 2C); posterior parapodia each with 8–9 compound chaetae, 38 µm above, 13 µm below (Fig. 2D). Solitary dorsal capillary chaetae on posterior parapodia, slender, slightly bidentate (Fig. 2E); ventral simple capillary chaetae on far posterior segments, similar to dorsal one, slightly thicker (Fig. 2F). Anterior parapodia with four slender, pointed aciculae (Fig. 2G), three or four on midbody parapodia (Fig. 2H), and single in posterior parapodia, thicker than anterior and midbody ones, acuminate (Fig. 2I). Pharynx wide, through nine segments; pharyngeal tooth conical, on anterior margin. Proventricle similar in length to proventricle, through 10 segments, with 35 muscle cell rows and midline (Fig. 2A). Intestine clearly visible, with marked segmental caeca. Pygidium small, with two short anal cirri, with 11 articles.

**Distribution**. Only known from Chilean Patagonia. Concepción channel, Drumond Hay island and Ponsonby sound, Beagle channel (Fig. 1).

**Habitat**. Inside tubes (non-empty and empty) of *Chaetopterus* cf. *variopedatus*, from boulders and sediment bottoms and associated to *M. pyrifera* holdfasts in fjords, islands and channels from Chilean Patagonia. Salinity: from 30.2 to 35 PSU, temperature: from 8.5 to 8.9°C. Shallow subtidal, between 14 and 30 metres depth.

**Type locality**. Concepción channel, Drumond Hay island, southern Chile (Patagonia).

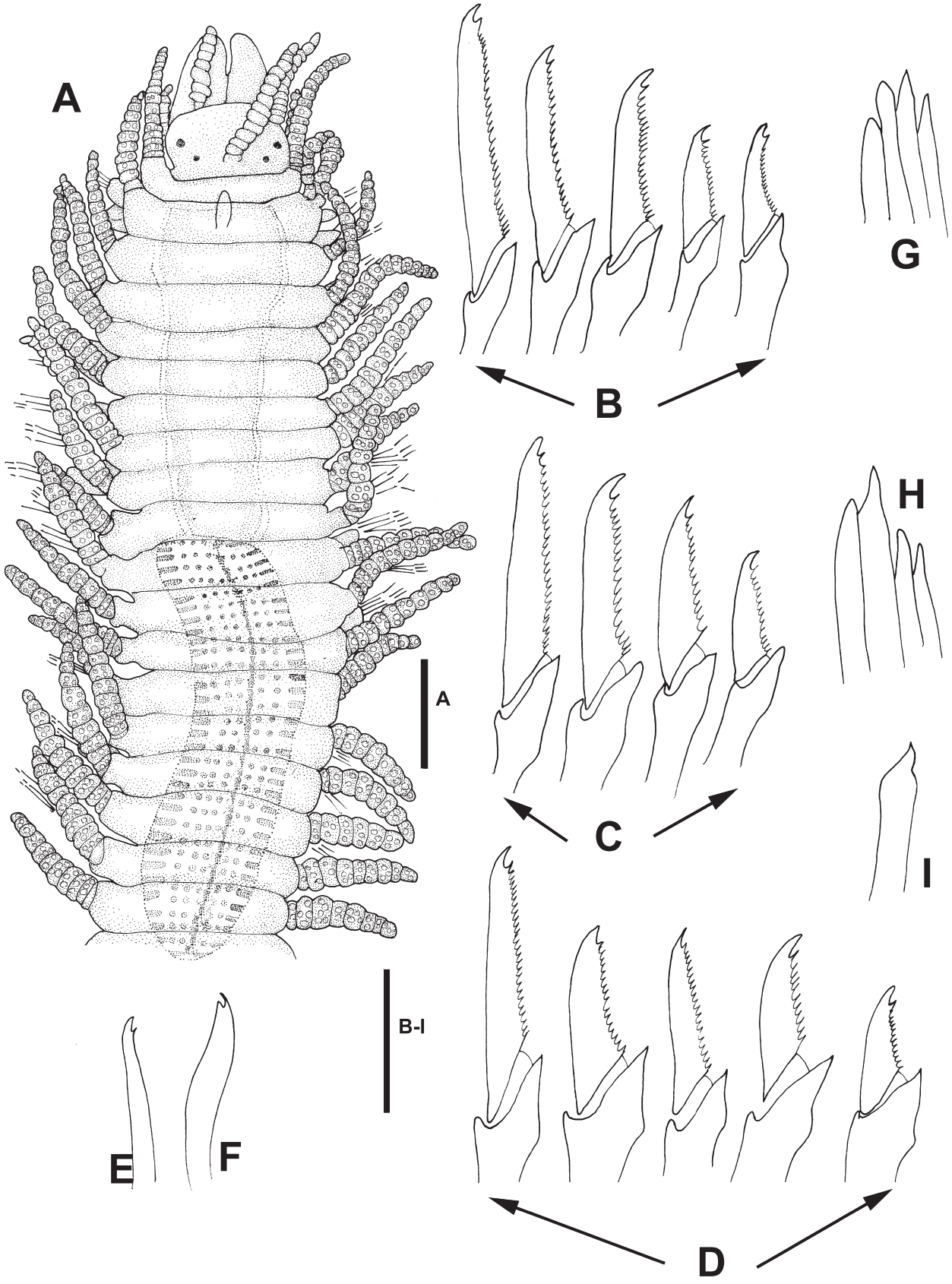


**FIGURE 2.** *Syllis patagonica* n. sp. (Holotype, MNCN 16.01/18723). A, anterior end, dorsal view. B, compound chaetae, anterior parapodium. C, compound chaetae, midbody parapodium. D, compound chaetae, posterior parapodium. E, dorsal simple chaeta. F, ventral simple chaeta. G, aciculae, anterior parapodium. H, aciculae, midbody parapodium. I, aciculum, posterior parapodium. Scale: A, 0.2 mm; B–I, 20 µm.

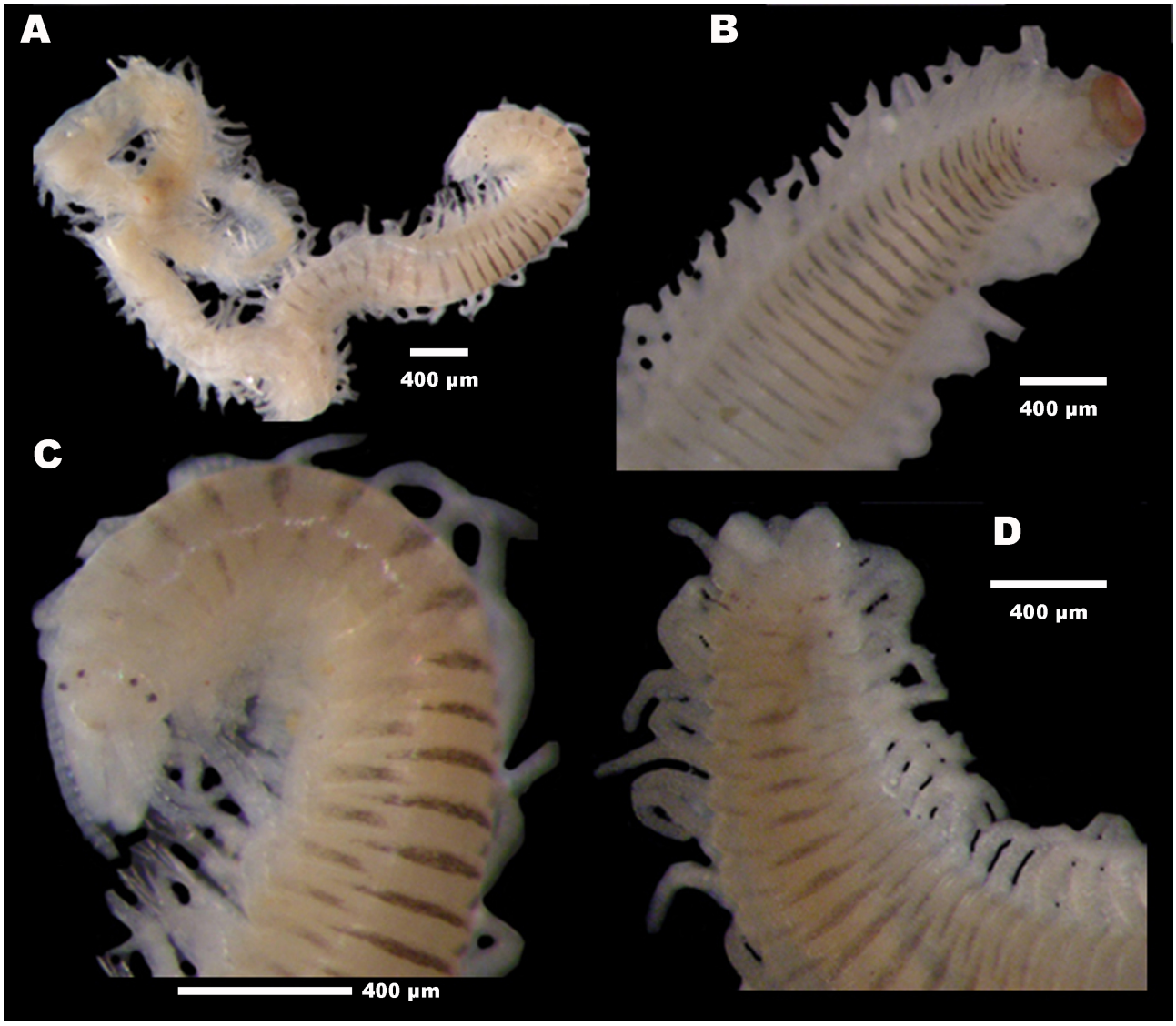


**FIGURE 3.** Live specimens of *Syllis patagonica* n. sp. A–D, anterior end, dorsal view. Scale: A–D: 400 µm.

**Remarks**. *Syllis patagonica*, n. sp. is characterized by its color pattern (alive specimens), robust body with short, fusiform dorsal cirri whose articles are plenty of dark glandular inclusions, short, ovoid ventral cirri, and compound chaetae with elongated blades, similar throughout body, with short, small proximal tooth and short spines on margin. The arrangement of dorsal cirri is similar to those of *Syllis armillaris* (O. F. Müller, 1771), a widely reported species but probably only inhabiting Atlantic European and Mediterranean coasts; however, *S. armillaris* has an elongated and slender body, the anterior chaetae are similar to those of *S. patagonica* n. sp. but those of midbody are different, with much shorter, almost unidentate blades (Licher 1999; San Martín 2003). *Syllis hyalina* Grube, 1863 is also similar but the body is elongated and slender, the midbody dorsal cirri are more elongated, and the blades of compound chaetae are not so elongated as in *S. patagonica* n. sp., with blades more markedly bidentate (Licher 1999; San Martín 2003). *Syllis monilaris* Savigny in Lamarck, 1818, the type species of the genus, also has short dorsal cirri, but the body is also elongated, the dorsal cirri are slender than those of *S. patagonica* n. sp. and the compound chaeta are short and unidentate or almost unidentate (Álvarez-Campos *et al*. 2015a; San Martín *et al*. 2017b). *Syllis qamhiyn* Lucas, San Martín & Fiege, 2020, from Socotra (Indian Ocean), also has thickened, short dorsal cirri on midbody and short, ovoid ventral cirri, but the body is elongated and slender, the dorsal cirri ends more pointed, and the midbody and posterior chaetae have short blades (Lucas *et al.* 2020). Finally, *Syllis hampirmenyatu* Martínez & San Martín, 2020, from Timor, also has short dorsal cirri on midbody, but the body is slender and elongated, the dorsal cirri are not thick, and the compound chaetae have shorter blades (Martínez & San Martín 2020).

There are additional species of *Syllis* having short, thickened dorsal cirri on the midbody, but they have partially or totally fused shafts with short blades.

**Etymology**. This species is named in honor of the Patagonian region currently considered a "Hotspot" of biodiversity, being type locality for many marine species.

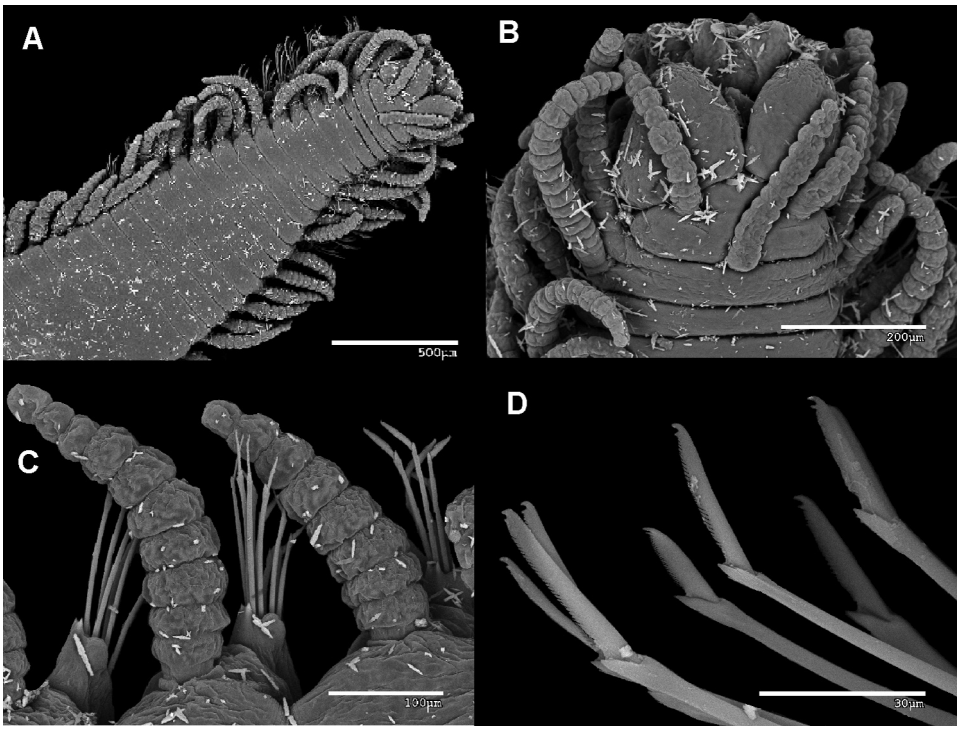


**FIGURE 4.** SEM of *Syllis patagonica* n. sp. A, anterior end, dorsal view. B, detail of prostomium and anterior segments, dorsal view. C, dorsal cirri and parapodia, midbody. D, anterior compound chaetae. Scale: A, 500 µm; B, 200 µm; C, 100 µm; D, 30 µm.

### *Syllis terraeignium* new species

Figures 5, 6

**Material examined**. Holotype (MNCN 16.01/18726). Station 36, 1 Paratype (MNCN 16.01/18727) and 2 specimens (SEM). St. 36, 2 specimens (LBUV 003/2020). St. 50, 3 specimens (LBUV 004/2020). Dates of collections: 5 November 2010 (St. 36) and 8 November 2010 (St. 50). Coordinates: St. 36 54º57´30.9" S 70º44´41.0" W, St. 50 55º08´39.4" S 68º49´34.0" W.

**Description**. Body elongated, robust, with wide, well-marked segments anteriorly (Figs 5A; 6A, B), abruptly tapered from midbody backwards, white to yellowish, without color pattern (Fig. 6A, B). Holotype complete, 10 mm long, 0.9 mm wide, 77 chaetigers. Prostomium almost circular, with two pairs of small eyes in open trapezoidal arrangement; median antenna longer than prostomium and palps together, inserted between posterior eyes, near posterior margin of prostomium, with about 24 articles; lateral antennae inserted in front of anterior eyes, near anterior margin of prostomium (Figs 5A; 6A–D), shorter than median antenna, with 15 articles. Peristomium distinctly shorter than subsequent segments (Figs 5A; 6D); dorsal tentacular cirri similar in length to median antenna, with 24 articles; ventral tentacular cirri shorter than dorsal ones, with 11 articles. Dorsal cirri shorter than body width, more or less fusiform on anterior segments, elongated from midbody (Figs 5A, B; 6C, D); anterior dorsal cirri somewhat longer than remaining, with about 27-13-22-18-17 articles, on first five chaetigers; dorsal cirri of proventricular segments with 23–16 articles; midbody dorsal cirri elongated, alternating long ones with 25 and shorter ones, with 15 articles (Fig. 5B). Parapodia conical, distally slightly bilobed; ventral cirri digitiform. Compound chaetae heterogomph falcigers with elongated, slender bidentate blades, proximal teeth small, distinctly smaller than distal ones, and short spines on margin, similar throughout, with slight antero-posterior gradation and marked dorsoventral gradation in length, more marked on anterior segments. Anterior parapodia each with 10–12 compound chaetae, blades 57–58 µm above,

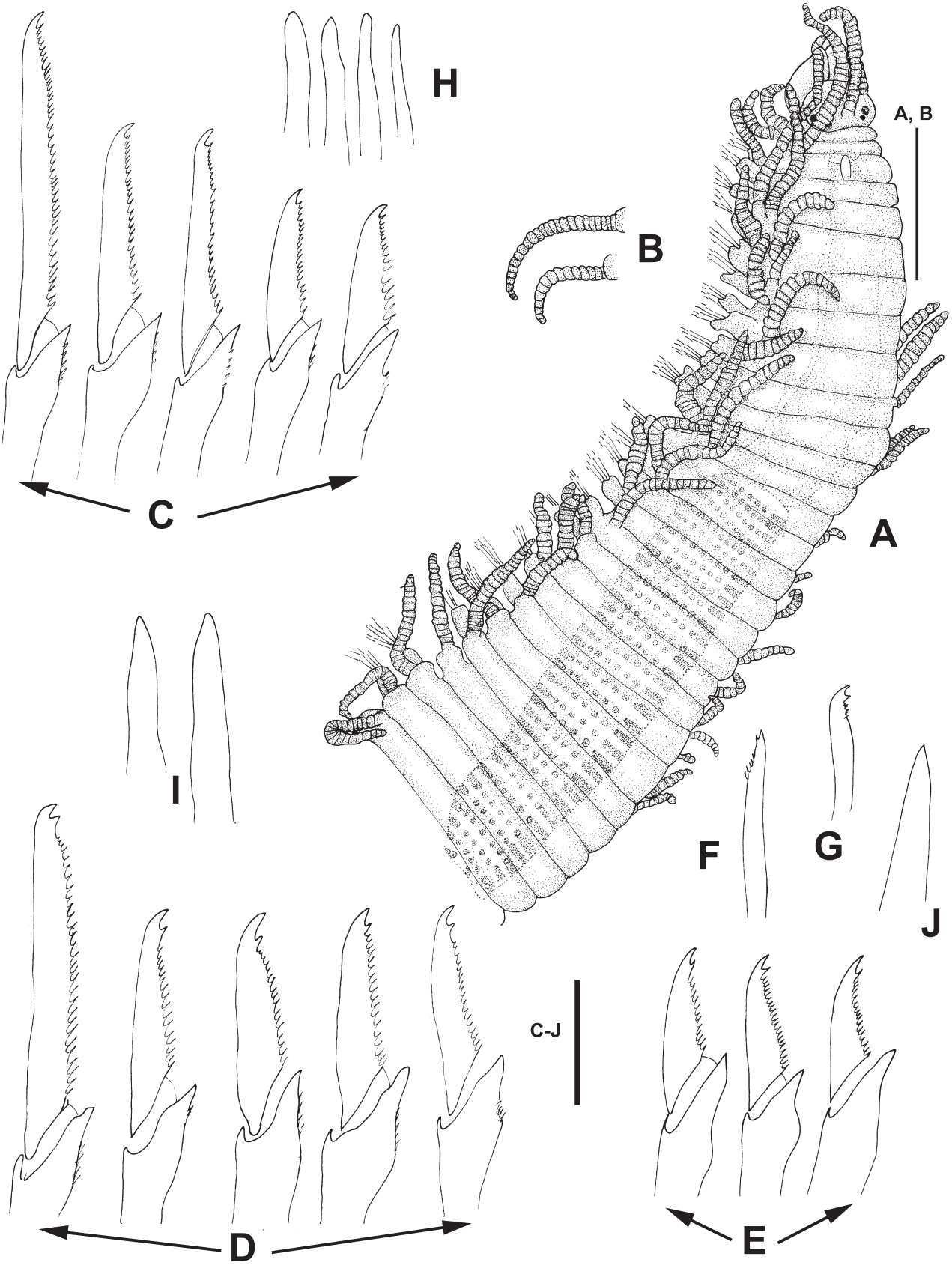


**FIGURE 5**. *Syllis terraeignium* n. sp. (Holotype, MNCN 16.01/18726). A, anterior end, dorsal view. B, dorsal cirri, midbody. C, compound chaetae, anterior parapodium. D, compound chaetae, midbody parapodium. E, compound chaetae, posterior parapodium. F, dorsal simple chaeta. G, ventral simple chaeta. H, aciculae, anterior parapodium. I, aciculae, midbody parapodium. J, aciculum, posterior parapodium. Scale: A–B, 0.2 mm; C–J, 20 μm.

26–27 µm below (Fig. 5C); midbody parapodia each with 8–10 compound chaetae, blades similar to those of anterior segments but more distinctly bidentate (Figs 5D; 6E); posterior parapodia each with six compound chaetae, blades 26 µm above, 24 µm below (Fig. 5E), finely bidentate. Solitary dorsal capillary chaetae on posterior parapodia, slender, minutely bidentate, with minute subdistal serrations (Figs 5F; 6F); ventral simple capillary chaetae on far posterior segments, more distinctly bidentate than dorsal one (Fig. 5G). Anterior parapodia with four slender, pointed aciculae (Fig. 5H), two on midbody parapodia, distinctly thicker (Fig. 5I), and single in posterior parapodia, thicker than anterior and midbody ones, distally pointed (Fig. 5J). Pharynx through 11 segments; pharyngeal tooth conical, on anterior margin (Fig. 5A). Proventricle longer than pharynx, through 15 segments, with 43–45 muscle cell rows, without midline (Fig. 5A). Pygidium small, with two short anal cirri, with 11–17 articles.

**Distribution**. Only known from Chilean Patagonia. Concepción channel, Drumond Hay island, Ballenero channel: Magellan Strait and Ponsonby sound, Beagle channel (Fig. 1).

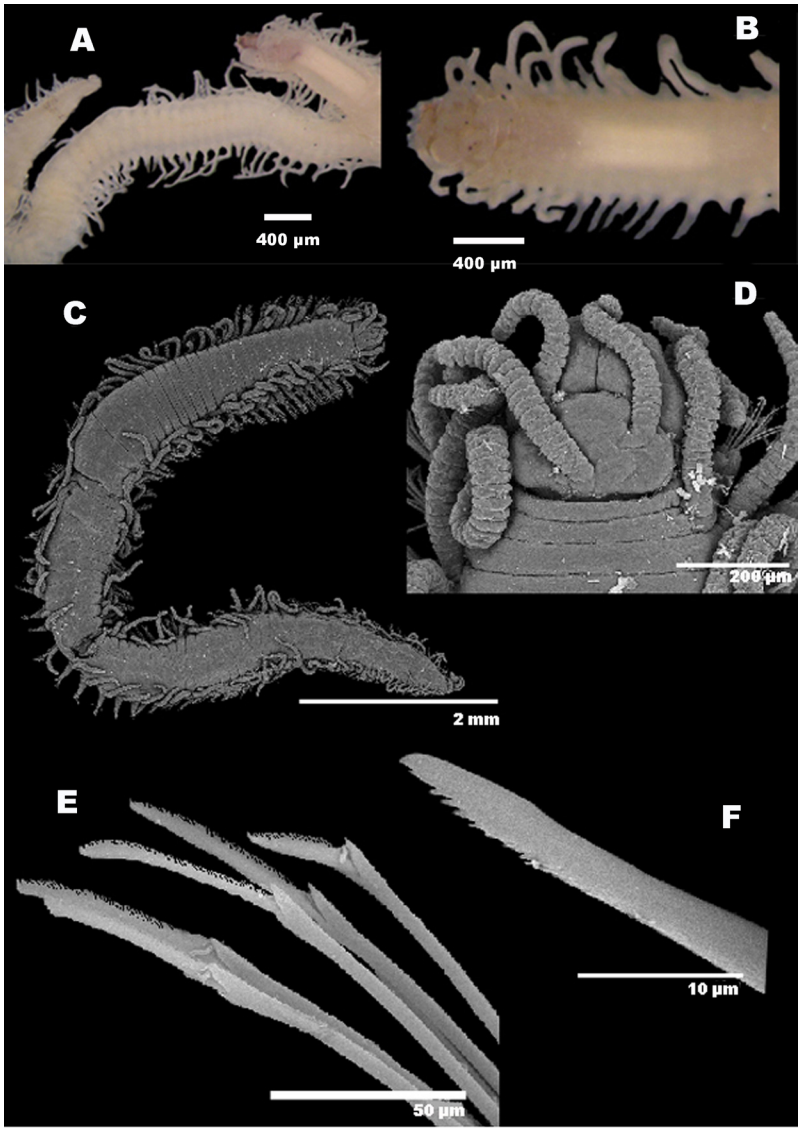


**FIGURE 6.** *Syllis terraeignium* n. sp. A–B, live specimens; C–F, SEM photographs. C, complete specimen, dorsal view. D, detail of prostomium and anterior segments, dorsal view. E, compound chaetae, midbody. F, dorsal simple chaeta. Scale: A–B, 400 µm; C, 2 mm; D, 200 µm; E, 50 µm; F, 10 µm.

**Habitat**. Inside tubes (non-empty and empty) of *Chaetopterus* cf. *variopedatus*, from boulders and sediment bottoms and associated to *M. pyrifera* holdfasts in fjords, islands and channels from Chilean Patagonia. Salinity: from 30.2 to 35 PSU, temperature: from 8.5 to 8.9°C. Shallow subtidal, between 14 and 30 meters depth.

**Type locality**. Concepción channel, Drumond Hay island, southern Chile (Patagonia).

**Remarks**. *Syllis terraeignium* n.sp. is characterized by its robust body, with short dorsal cirri, compound chaetae with elongated, slightly bidentate blades, and pointed, straight acicula on posterior parapodia. *Syllis albanyensis* (Hartmann-Schröder 1984) from Australia, has similar body and elongated blades, but the posterior acicula are bent at right angle and the dorsal simple chaetae are truncated (Hartmann-Schröder 1984; San Martín *et al*. 2017b). *Syllis lunaris* (Imajima 1966), from the Pacific Ocean, occurying from Japan to Australia, has similar chaetae and acicula, but the dorsal cirri are much longer and the proventricle is much shorter (Imajima 1966; San Martín *et al.* 2017b). *Syllis crassicirrata* (Treadwell 1925) also has a robust body with long proventricle, but the dorsal cirri are much thicker and longer, the chaetae are more distinctly bidentate and the acicula protrudes out from the parapodial lobes; furthermore, it is a brightly colored species (Álvarez-Campos *et al*. 2015b; Ba-Akdah *et al.* 2018). The compound chaetae of *Syllis terraignium* n. sp. are very similar to those of *Syllis pallida* Verrill, 1875, but the proventricle is shorter and the posterior aciculae are acuminate (San Martín 1992). *Syllis antarctica* (Averincev 1972), from Antarctica and deep areas in the Pacific Ocean, has very similar compound chaetae, but the dorsal cirri are shorter, the body is pigmented with a brown-chocolate color, and the aciculae protrudes out from parapodial lobes (San Martín 2004). *Syllis nigricirris* Grube, 1863 from Mediterranean and Madeira also has similar compound chaetae, but the dorsal cirri are longer and pigmented, and the aciculae protrude out from parapodial lobes (Licher 1999). Finally, *Syllis alternata* Moore, 1908, an apparently worldwide distributed species, has also similar compound chaetae, and straight, pointed aciculae, but it is a much longer species, with dorsal cirri very long and the aciculae protrude out from parapodial lobes (Licher 1999; San Martín 2003).

**Etymology**. This species is named after "Tierra del Fuego'' island, from Latin *Terra* (land) and *Ignis* (fire). *Syllis terraeignium* was mainly found in shallow waters of Magellan Strait and Beagle Channel that surround this island, which is located in the South America southern point.

### ***Syllis patersoni*** **new species**

Figure 7

**Material examined**. St. 41. Holotype (MNCN 16.01/18728) and two Paratypes (MNCN 16.01/18764). Date of collection: 19 October 2009 (St. 41). Coordinates: St. 41 50°16'37" S 74°53'21''W.

**Description**. Body elongated, slender (Fig. 7A), without color markings; holotype complete, 19 mm long, 0.5 mm wide, 132 chaetigers. Prostomium almost circular, with two pairs of small eyes in open trapezoidal arrangement; median antenna slightly longer than prostomium and palps together, inserted in front of posterior eyes, with about 19 articles; lateral antennae inserted in front of anterior eyes, shorter than median antenna, with 18 articles. Peristomium distinctly shorter than subsequent segments (Fig. 7A); dorsal tentacular cirri longer than median antenna, with 25 articles; ventral tentacular cirri shorter than dorsal ones, with 13 articles. Dorsal cirri similar in length to body width, longer on anterior segments, slender, elongated, with numerous spiralized glands inside articles (Fig. 7A, B); anterior dorsal cirri somewhat longer than remaining, with about 27-14-20-27-17 articles on first five chaetigers; dorsal cirri from proventricular segments alternating long cirri, with 29 articles, and short ones, with 19 articles (Fig. 7B); articles plenty of distinct refringent glands (Fig. 7A, B). Parapodia conical; ventral cirri digitiform. Compound chaetae composed by few short, spiniger-like chaetae (Fig. 7C, E, G) and several heterogomph falcigers with elongated, slender, bidentate blades, proximal teeth slightly smaller than distal ones, and short to moderate spines on margin, with dorso-ventral gradation in length (Fig. 7D, F, H), similar throughout. Anterior parapodia each with 2–3 short spiniger-like chaetae, blades 69 µm (Fig. 7C) and 11–12 falcigers with dorso-ventral gradation, blades 36 µm above, 22 µm below (Fig. 7D); midbody parapodia each with two spiniger-like chaetae, blades 75–71 µm long (Fig. 7E) and 6–7 falcigers, blades 35 µm above, 20 µm below (Fig. 7F); posterior parapodia each with one spiniger-like, shorter than those of midbody and anterior segments, blades 57 µm long (Fig. 7G), and 5–6 falcigers, blades 29 µm above, 16 µm below (Fig. 7H). Solitary dorsal capillary chaetae on posterior parapodia, slender bidentate, with minute subdistal serrations (Fig. 7I); ventral simple capillary chaetae on far posterior segments, more distinctly bidentate than dorsal one (Fig. 7J). Anterior parapodia with four slender, pointed aciculae (Fig. 7K), three on midbody parapodia, distinctly thicker (Fig. 7L), and single in posterior parapodia, acuminate (Fig. 7M). Pharynx long and slender, through more than 12 segments (everted); pharyngeal tooth conical, on anterior margin (Fig. 7A). Proventricle slender and long, shorter than pharynx, through eight segments, with 42 muscle cell rows, without midline (Fig. 7A). Pygidium small, with two long anal cirri, with 25 articles.

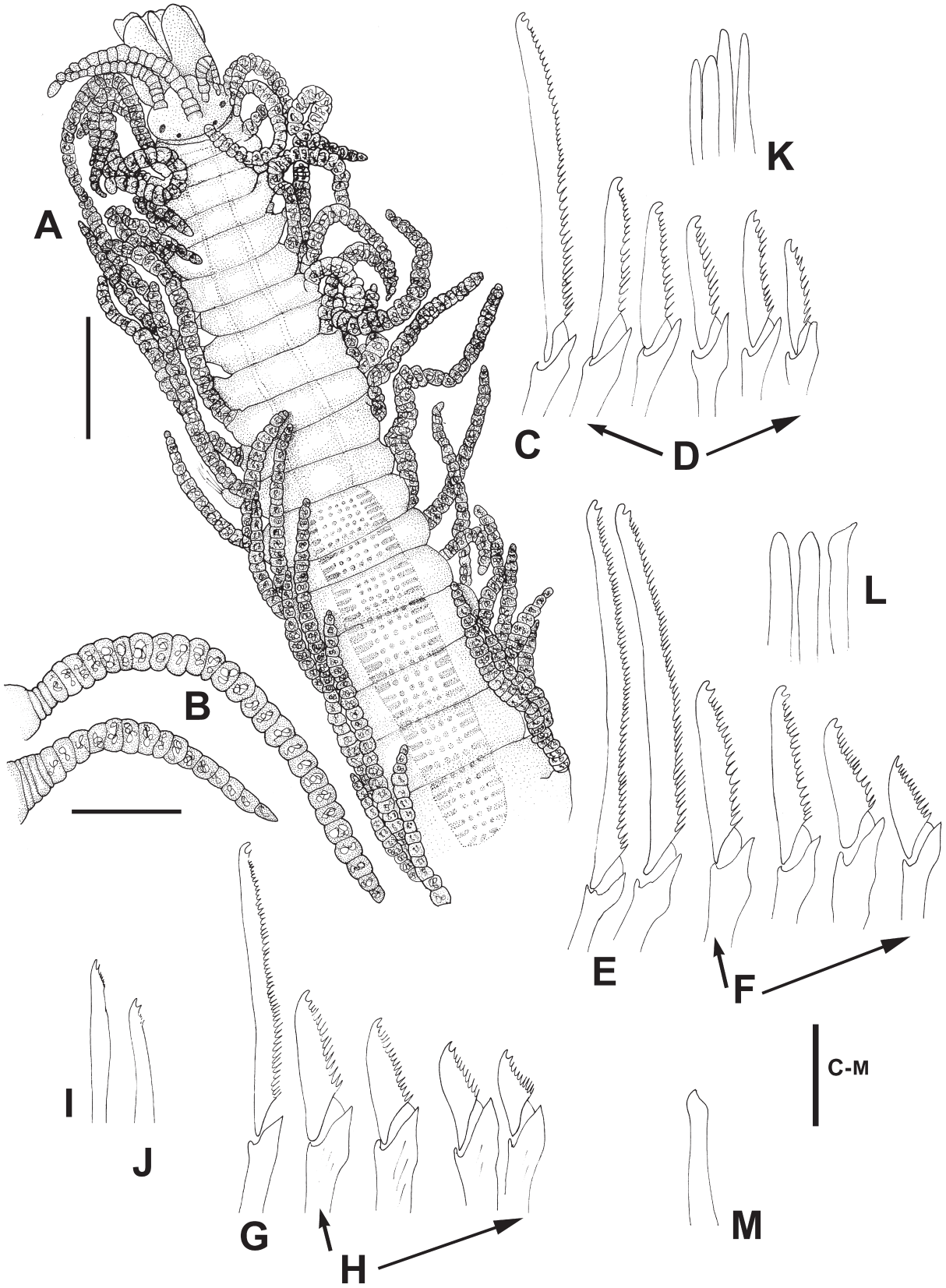


**FIGURE 7.** *Syllis patersoni* n. sp. (Holotype, MNCN 16.01/18728). A, anterior end, dorsal view. B, dorsal cirri, midbody. C, spiniger-like chaeta, anterior parapodium. D, compound chaetae, anterior parapodium. E, spiniger-like chaetae, midbody parapodium. F, compound chaetae, midbody parapodium. G, spiniger-like chaeta, posterior parapodium. H, compound chaetae, posterior parapodium. I, dorsal simple chaeta. J, ventral simple chaeta. K, aciculae, anterior parapodium. L, aciculae, midbody parapodium. M, aciculum, posterior parapodium. Scale: A, 0.4 mm; B, 0,2 mm; C–M, 20 μm.

**Distribution**. Only known from Chilean Patagonia in Concepción channel, Drumond Hay island (Fig. 1).

**Habitat**. From boulders, sediment bottoms and associated to *M. pyrifera* holdfasts in fjords, islands and channels from Chilean Patagonia. Salinity: from 30.2 PSU, temperature: 8.9°C. Shallow subtidal at 30 m depth. This species was not found inside tubes of *Chaetopterus* cf. *variopedatus*.

**Type locality**. Concepción channel, Drumond Hay island, southern Chile (Patagonia).

**Remarks**. *Syllis patersoni*, n. sp. is characterized by its elongated, slender body, long pharynx and proventricle, acuminate posterior acicula, and two types of compound chaetae on each parapodium, relatively short spiniger-like chaetae and falcigers, both bidentate, with proximal teeth well-marked, and distal teeth slightly rounded, and short to moderate straight spines on margin.

*Syllis alosae* San Martín, 1992, from Cuba, also has similar falcigers, but the spiniger-like are distally broad, shows a marked color pattern, the dorsal cirri are shorter, and the posterior acicula are straight, protruding out from the parapodial lobes (San Martín 1992). *Syllis maryae* San Martín, 1992, from Cuba and Brazil, has similar body, dorsal cirri, pharynx and proventricle, but the spiniger-like chaetae are proportionally longer, in relation to the falcigers, than those of *Syllis patersoni*, n. sp. The posterior acicula are distally bent at a right angle, and the dorsal simple chaetae are truncate; furthermore, some specimens show some dorsal glands on some post-proventricular segments (San Martín 1992; Nogueira & San Martín 2002). Similar differences are shared with *Syllis edensis* (Hartmann-Schröder, 1989) from Australia (Hartmann-Schröder 1989; Álvarez-Campos *et al*. 2015b). *Syllis bouvieri* Gravier, 1900, from the Red Sea, also has similar type of compound chaetae but the longer ones are not so long in proportion with the falcigers, the proximal and distal teeth are more separated, with a curved arc in between, the spines on margin of blades are longer, the dorsal cirri are longer, and the proventricle is shorter and wider (Gravier 1900; Lucas *et al*. 2020). *Syllis hyllebergi* (Licher 1999), from the Eastern Mediterranean, Red Sea and Brazil, has shorter dorsal cirri, shorter proventricle, and the falcigers are more markedly bidentate, with longer spines on margin (Licher 1999; Nogueira & San Martín 2002). Several other species also have spiniger-like and falciger chaetae, but the spiniger-like chaetae are much more longer and slender, with filiform blades, in proportion with the falcigers.

*Syllis beneliahuae* (Campoy & Alquézar 1982), widely distributed in tropical and temperate seas, is also a similar species, with slender body, and relatively short spiniger-like chaetae, acuminate posterior acicula and relatively long dorsal cirri, with articles with plenty of refringent glands; however that species has longer spiniger-like chaetae (blades more than twice as long as the longer falciger) and shorter proventricle (Campoy & Alquézar 1982; Campoy 1982; San Martín 2003).

*Syllis augeneri* Haswell, 1920, from Australia and Indonesia, also has acuminate posterior acicula and short spiniger-like chaetae, but the dorsal cirri are much shorter and proportionally thicker, and the spiniger-like chaetae are much shorter than those of *S. patersoni* n. sp. (Haswell 1920; Aguado *et al*. 2008).

**Etymology**. This species is named in honor of Dr. Gordon LJ Paterson, British polychaetologist currently retired.

**Discussion and conclusion**s

It is well-known that some invertebrates and biological substrates are important habitats for polychaetes (Alvarez-Campos & Verdes 2017; Martin & Britayev 1998). *Syllis* species presented on this work were collected from biological substrates such as *Macrocystis pyrifera* (Linnaeus) C. Agardh, 1820 kelp holdfasts and *Chaetopterus* cf. *variopedatus* (Renier, 1804) tubes (Chaetopteridae) as well as from pebbles and sandy bottoms. In this research three new *Syllis* species were described; two of them were found associated to *C.* cf. *variopedatus* and all three species were found living on *Macrocystis pyrifera* holdfasts. *Chaetopterus* tubes are a new habitat for *Syllis* possibly as an adaptation to the lack of other suitable habitats due to the presence of extreme environmental conditions and the influence of ice-fields present in the fjords and channels of the Chilean Patagonia. *Chaetopterus* tubes have demonstrated to be a suitable habitat for several syllid species previously recorded at Chilean Patagonia by Soto & San Martin (2017 a,b). These authors have already found twelve species of syllids hence with the current work the total number of syllid species increases to 15. 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 2017a, b). Chaetopterid tubes clearly favour symbiotic associations offering a good habitat for diverse species, due to well-protected shelter and continuous water flow, likely bringing easily accessible food particles (Britayev and Martin 2019). The great majority of tubes were occupied by one *Chaetopterus* species although *Syllis* species were also recorded inside empty tubes and even between the layers that form these tubes. Similarly, *M. pyrifera* holdfasts also allow that several syllid species may inhabit them. Nine species have been recorded by Soto and San

Martin (2017a, b) for Chilean Patagonia and with this work the total number of syllids increase to 12. *Syllis* seems to be a common inhabitant on this type of habitat because Alvarez-Campos and Verdes (2017) recorded nine species of this genus and total number of twelve species of Syllidae inhabiting holdfasts of the brown algae *Lessonia spicata* in Central Chile. These authors highlighted the importance of kelp holdfasts as hotspots for syllid diversity, understanding that kelp-like species play an important ecological role providing food, mechanical shelter against wave impact, refuge from predators, secure spawning areas and nursery grounds (Pabis and Sicinski 2010).


## Acknowledgments

We thank the crew of B/O *AGOR Vidal Gormaz* of the Chilean Navy for their support in the CIMAR 15 Oceanographic Cruise; the crews of Abbate Molina belong to IFOP for their assistance on the CIMAR 16 Oceanographic Cruise and to the National Oceanographic Committee for funding of the Marine Biotopes Project. Many thanks also to Enrique Rodríguez and Esperanza Salvador for their help with SEM observations at SIDI, UAM, Spain. To the University of Valparaiso (UV) for funding provided to E. S. for the stays in UAM, Madrid and for funding provided to G. SM. for his stay at Marine Science Faculty from UV in Chile. Both supports were internal funding from UV. Finally, we thank Javier Naretto, Sergio Letelier and two anonymous divers from Chilean Navy for sample collecting. Miguel Ángel Alonso Zarazaga gave us useful advices about the latin names of the species *Syllis terraeignium*. Javier Sánchez Almazán gave numbers to the specimens deposited in the Museum of Madrid and gave us advices and information.


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