

The genus *Syllis* Savigny in Lamarck, 1881 (Annelida: Syllidae: Syllinae) from Australia (Part 3): new species and redescription of previously described species

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Abstract

Syllis Savigny in Lamarck, 1818, the type genus of Syllidae, is the largest and most diverse within the family. This genus presents many taxonomic, biogeographic, and phylogenetic problems due mainly to the lack of molecular data and morphological synapomorphies for many of the species, but also due to poor or inadequate descriptions. In order to improve the knowledge of the genus, we have undertaken a morphological revision of Australian species, based on type material and material collected over years by the Australian Museum. This is the third paper dealing with this family. Eighteen species are herein described, of which five are new and twelve are redescrptions of already known species, with four new combinations: *Syllis imajimai*, n. sp.; *S. narranuk*, n. sp.; *S. noolinga*, n. sp.; *S. similisunzima*, n. sp.; *S. thylacine*, n. sp.; *S. busseltonensis* (Hartmann-Schröder, 1982) n. comb.; *S. patriciae* (Hartmann-Schröder, 1981) n. comb.; *S. pharobroomensis* (Hartmann-Schröder, 1979) n. comb., *S. pharynxcircunfusata* (Hartmann-Schröder, 1979) n. comb, *S. armillaris* (O. F. Müller, 1771); *S. augeneri* Haswell, 1920; *S. benelihauae* (Campoy & Alquézar, 1982); *S. hyalina* Grube, 1863; *S. cf. nigrescens* Grube, 1878; *S. profunda* Cognetti, 1955; *S. truncata* Haswell, 1920; and *S. variegata* Grube, 1860.

Key words: *Syllidae*, *Syllis*, Australia, Taxonomy, new species

Introduction

The Australian Syllidae Grube, 1850, have been studied from the beginning of the 20th century (e.g. Haswell 1886, 1920; Augener 1913, 1927; Fauvel 1917; Monro 1931; Hartmann-Schröder 1979, 1980, 1981, 1982, 1983, 1984, 1985, 1986, 1987, 1989, 1990, 1991; Hutchings & Rainer 1979, 1980; Hutchings & Murray 1984; San Martín & López 1998, 2003; Glasby 2000; Glasby & Watson 2001; Watson 2009; Aguado *et al.* 2015). Detailed studies, including descriptions, keys, drawings and SEM photos of all the Australian Syllidae subfamilies began with San Martín (2005) with the Exogoninae Langerhans, 1879, and San Martín & Hutchings (2006) with the Eusyllinae Malaquin, 1893 (including Anoplosyllinae Aguado & San Martín, 2009). Syllinae Grube, 1850, the largest and the most taxonomically difficult subfamily of syllids, has been studied in several different papers, as it presents a large number of genera and species, some of which have an uncertain systematic position. All the known Australian genera of the subfamily Syllinae were studied by San Martín *et al.* (2008a, 2008b, 2010), except for the type genus, *Syllis*, which is the only remaining genus to be revised. *Syllis* Savigny in Lamarck, 1818, is the largest and most diverse genus within the subfamily, with more than 120 species (Licher 1999; San Martín 2003; San Martín & Aguado 2014, 2022), and many systematic problems remain unsolved, due to the lack of molecular data for many of its species, the absence of clear morphological synapomorphies, and to the existence of many poor or inadequate descriptions of some taxa. Recently, Álvarez-Campos *et al.* (2015a) redescrbed some Australian species, including some preliminary results of the phylogenetic relationships within *Syllis*. They concluded that *Typosyllis* Langerhans,

1879, considered as a valid genus, or subgenus, by many other authors (e.g. Fauvel 1923, Fauchald 1977, Licher 1999), lacks any systematic validity, since the species belonging to this group (sensu Licher 1999) do not form a monophyletic clade. They also found that the type genus of the family should also be reorganized, and consists of at least four different clades (Álvarez-Campos *et al.* 2015a). Therefore, the real status of *Syllis* remains unresolved and it should be reviewed in depth, including the recently re-described type species of the genus, *Syllis monilaris* Savigny in Lamarck, 1818 (Álvarez-Campos *et al.* 2015b). Based on material collected during decades by the Australian Museum (AM) staff, as well as type material deposited in other scientific institutions, whenever available, we describe or redescribe the species of this genus; in Álvarez-Campos *et al.* (2015a) we redescribed seven species; in San Martín *et al.* (2017) we redescribed 12 species and four new species. This is the third paper on this genus, in which we describe five new species: *Syllis imajimai* n. sp.; *S. narranuk* n. sp.; *S. noolinga* n. sp.; *S. similisunzima* n. sp.; and *S. thylacine* n. sp. Also, the species *S. armillaris* (O. F. Müller, 1771); *S. augeneri* Haswell, 1920; *S. benelihaue* (Campoy & Alquézar, 1982); *S. busseltonensis* (Hartmann-Schröder, 1982) n. comb.; *S. hyalina* Grube, 1863; *S. cf. nigrescens* Grube, 1878; *S. patriciae* (Hartmann-Schröder, 1981) n. comb.; *S. pharobroomensis* (Hartmann-Schröder, 1979) n. comb.; *S. pharynxcircunfusata* (Hartmann-Schröder, 1979) n. comb.; *S. profunda* Cognetti, 1955; *S. truncata* Haswell, 1920; and *S. variegata* Grube, 1860. Several of these species are reported as being worldwide in distribution or were described from areas far away from Australia (e.g. *S. armillaris*, *S. benelihaue*, *S. hyalina*, *S. profunda*, *S. variegata*); we have not found differences from the previous descriptions, so we attribute them to such species; however, their supposedly wide distributions should be confirmed by molecular studies, as they may represent introduced species or suites of cryptic species. This objective is out of the scope of this paper and would be an interesting future research project.

Material and Methods

The studied specimens were collected by the staff of the Marine Invertebrates of the AM during regular fieldwork trips and various biological surveys between 1970 and 2015. The specimens were fixed in formalin and then transferred to 70% alcohol. Comparative and type material of some species was loaned from the Zoologisches Museum of Hamburg, Germany (HZM). Material was examined under a Nikon Optiphot microscope with a differential interference contrast system (Nomarsky), an ocular micrometer, and a camera lucida drawing tube. Width of the specimens, excluding parapodia, was measured at the proventricle level. Abbreviations used: AM, Australian Museum, Sydney; HZM, Zoologische Museum, Hamburg.

Results

Genus *Syllis* Savigny in Lamarck, 1881

For diagnosis and synonymies see Álvarez-Campos *et al.* (2015a, b) and San Martín & Aguado (2022).

Syllis armillaris (O. F. Müller, 1771)

Figure 1

Nereis armillaris O. F. Müller, 1771: 150, pl. 9, Figs 1–5.

Syllis armillaris.—Johnston 1840: 145, pl. 9, Figs 1–2.—San Martín 2003: 423, Figs 232, 233.—Musco & Giangrande 2005: 472, fig. 4.

Typosyllis (*Syllis*) *armillaris*.—Langerhans 1879: 535.

Syllis (*Typosyllis*) *armillaris*.—Fauvel 1923: 264, Figs 99 a–f.—Day 1967: 249, Figs 12.4 a–d.

Typosyllis armillaris.—Marenzeller 1890: 3.—Campoy 1982: 436, pls. 55.57.—Hutchings & Murray 1984: 34.—Licher 1999: 189, fig. 84.

Typosyllis (*Typosyllis*) *armillaris*.—Hartmann-Schröder 1984: 13; 1985: 65; 1986: 37; 1987: 32; 1989: 19.

Material examined. AUSTRALIA, NEW SOUTH WALES: 50 m west of Split Solitary Island, 30° 14' S, 153° 10' 48" E, coll. 7 March 1992, hand collected on SCUBA, *Herdmania momus*, rocks, sponges and ascidians, 16 m,

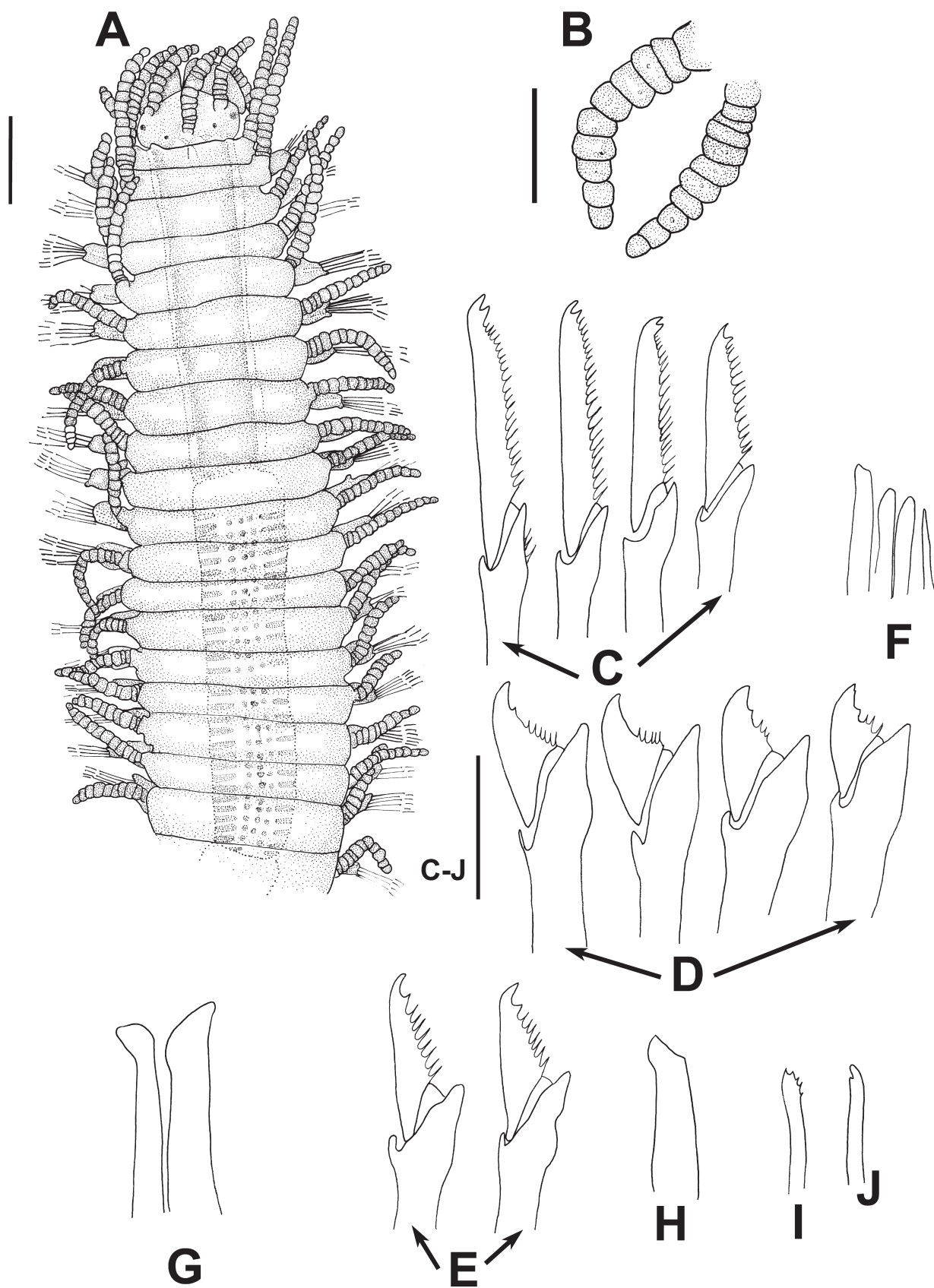


FIGURE 1. *Syllis armillaris* (O. F. Müller, 1776). AM W.53831. A, anterior end, dorsal view. B, long and short dorsal cirri, midbody. C, falcigers, anterior parapodium. D, falcigers, midbody parapodium. E, falcigers, posterior parapodium. F, aciculae, anterior parapodium. G, aciculae, midbody. H, acicula, posterior parapodium. I, dorsal simple chaeta. J, ventral simple chaeta. Scale. A: 0.2 mm. B: 0.1 mm. C–J: 20 µm.

AM W.53827, 2 specimens. NSW 697, 100 m north west of Split Solitary Island, 30° 14' S, 153° 10' 48" E, coll. 7 March 1992, hand collected on SCUBA, under rock ledges, 15 m, AM W.29500, 1 specimen. NSW 457, North West Solitary Island, Manta Reef, 30° 01' 30" S, 153° 16' 30" E, coll. 25 June 1992, hand collected on SCUBA, associated with lace bryozoan, 19 m, AM W.53831, 5 specimens. NSW 443, 100 m south of Split Solitary Island, 30° 15' S, 153° 10' 30" E, coll. 23 June 1992, hand collected on SCUBA, 16.6 m, AM W.53829, 2 specimens. NSW 3427, north east of Kurnell, "Anchor Reef", 34° 00' 33" S, 151° 13' 51" E, coll. 16 March 2009, hand collected on SCUBA, coarse-medium shelly sediment with echinoid spines, 17.6 m, AM W.35409, 1 specimen. NSW 1278, 150 m east of Burrill Rocks, 35° 23' 25" S, 150° 28' 11" E, coll. 1 May 1997, by airlift on SCUBA, surface of sponge, 18 m, depth, AM W.53828, 1 specimen. NSW 1288, 150 m east of Burrill Rocks, 35° 23' 25" S, 150° 28' 11" E, coll. 1 May 1997, hand collected on SCUBA, AM W.53830, 3 specimens. SOUTH AUSTRALIA: SA 112, Boston Bay, Port Lincoln, 34° 51' S, 135° 51' E, coll. 12 Feb 1985, coll. I. Loch, washing from sheltered weedy rock, 2 m, id. A. Murray, AM W.26345, 2 specimens. Billy Lights Point, Port Lincoln, 34° 45' S, 135° 53' E, coll. 15 Feb 1985, coll. I. Loch, stone washings from sheltered intertidal rocks, det. A. Murray, AM W.26346, 3 specimens. SA 115, Pondalowie and Marion Bays, York Peninsula, 34° 14' S, 136° 50' E, coll. 12 Feb 1985 by I. Loch, *Caulerpa* and green algae washings, 3 m, AM W.53833, 1 specimen. WESTERN AUSTRALIA: WA 511, Houtman Abrolhos Islands, Beacon Island, Goss Passage, 28° 25' 30" S, 113° 47' E, coll. 18 May 1994, hand collected on SCUBA, dead branching coral covered in coralline algae, 10 m, AM W.53836, 1 specimen. Houtman Abrolhos Islands, West side of Rat Island, 28° 44' S, 113° 47' E, coll. 21 June 2008, by M.T. Aguado & G. San Martín, dead coral, 2 m, coll., AM W.53832, 3 specimens. WA 539, off south end of Long Island, Beacon Island, 28° 28' 48" S, 113° 46' 18" E, coll. 25 May 1994, hand collected on SCUBA, 4 m, AM W.53834, 1 specimen. North end of Long Island, Goss Passage, 28° 27' 54" S, 113° 46' 18" E, coll. 22 May 1994, hand collected on SCUBA, 5 m, AM W.53835, 3 specimens.

Diagnosis. Body elongate, antennae, tentacular and dorsal cirri short, with few articles. Midbody dorsal cirri thick, fusiform. Midbody compound chaetae falcigers with short, triangular, unidentate or almost unidentate blades; anterior compound chaetae with moderately elongated, bidentate blades. Posterior aciculae acuminate.

Description. Longest examined specimen 11 mm long, 0.45 mm wide, for 107 chaetigers. Body long and slender, elongated. Prostomium pentagonal; four eyes in trapezoidal arrangement. Palps robust, similar in length to prostomium. Median antenna inserted on posterior part of prostomium, between posterior eyes, with 14–16 articles, similar in length to combined length of prostomium and palps; lateral antennae shorter than median one, with 10 articles each, shorter than median antenna. Peristomium similar in length to subsequent segments (Fig. 1A). Dorsal tentacular cirri slightly longer than median antenna, with about 13–17 articles each; ventral tentacular cirri about half length of dorsal ones. Dorsal cirri short all along body, shorter than body width, slightly longer and slender on anterior segments, and shorter and thicker, more or less fusiform, from midbody onwards (Fig. 1A, B), with well defined cirrophores and articles; articles basally and distally smaller than medially; anteriormost dorsal cirri with about 17–13–15–17 articles in the first four segments (Fig. 1A); from midbody onwards, all cirri becoming shorter and markedly thicker, with about 9–10 articles (Fig. 1B). Parapodia conical. Ventral cirri digitiform, longer than parapodial lobes on anterior parapodia, becoming shorter from midbody onwards. Chaetae mostly broken but some parapodia with complete fascicles all along the body. All compound chaetae heterogomph falcigers. Anterior parapodia each with about 10–12 chaetae, blades elongated, bidentate, both teeth similar, and short spines on margin (Fig. 1C), blades about 38 µm long above, 27 µm long below; midbody parapodia with 4–5 compound chaetae (Fig. 1D), with thick shafts and short unidentate to weakly bidentate blades, with short spines on margin, apparently smooth under low magnifications, 20–15 µm long; posterior parapodia with 3–4 compound chaetae (Fig. 1E), similar to those of anterior parapodia but shorter. Dorsal and ventral simple chaetae on far posterior segments of some specimens; dorsal simple chaetae slightly bidentate, with minute spines on margin (Fig. 1I); ventral simple chaetae smooth, slightly bidentate (Fig. 1J). Anterior parapodia with 3–4 slender aciculae (Fig. 1F), two at midbody (Fig. 1G), and single in posteriormost parapodia, acuminate (Fig. 1H). Pharynx long, extending through about 9–10 segments; pharyngeal tooth on anterior margin of pharynx (Fig. 1A). Proventricle similar in length to pharynx, through about 10 segments, with 32–35 muscle cell rows. Pygidium triangular, with two articulated anal cirri and one stylus.

Remarks. This species is easily recognized by having short dorsal cirri, thickened in midbody, and having midbody compound chaetae with short falcigers, not fused to shafts. It is similar to other species such as *Syllis picta* (Kinberg, 1865), *Syllis gracilis* Grube, 1840, and some other species which have a similar body and chaetae, but

these species have some or all midbody chaetae with blades totally or partially fused to shafts. Probably, the most similar species is *Syllis pseudoarmillaris* Nogueira & San Martín, 2002, from Brazil; however, *S. pseudoarmillaris* has the midbody compound chaetae distinctly bidentate, and the posterior aciculae are more markedly acuminate, subdistally more inflated than *S. armillaris* (Nogueira & San Martín, 2002). *Syllis mayeri* Musco & Giangrande, 2005, from Belize, is also very similar, especially with regards to the chaetae, but differs in having distinctly longer antennae, tentacular and anterior dorsal cirri, longer pharynx and a shorter proventricle (Musco & Giangrande, 2005); furthermore, *S. mayeri* is a symbiotic species in sponges.

Syllis monilaris Savigny in Lamarck, 1818, the type species of the genus is also similar; however, *S. monilaris* is a larger species, the dorsal cirri are not thickened in midbody, and all the chaetae are unidentate or very slightly bidentate (see Álvarez-Campos *et al.* 2015a, b; San Martín *et al.* 2017). It is also similar to *S. hyalina* (see below).

Habitat. Common on all kind of hard substrates. From intertidal to more than 100 m depth.

Distribution. Apparently cosmopolitan, reported from all oceans and seas, from polar to tropical. A detailed molecular study of the different populations is necessary to confirm this widespread distribution or whether it represents a suite of cryptic species.

Syllis augeneri Haswell, 1920

Figure 2

Syllis (*Typosyllis*) *augeneri* Haswell, 1920: 98, pl. 11, Figs 19–22.—Aguado *et al.* 2008: 21, fig. 8.

Material examined. AUSTRALIA, NEW SOUTH WALES: Split Solitary, 30° 15' S, 153° 10' 30" E, coll. 23 June 1992, 16.6 m, AM W.53783, 4 specimens. Boat Harbour, south of Port Stephens, 32° 46' 59" S, 152° 06' E, coll. 14 March 2006, 1 m in amongst *Galeolaria*, AM W.53787. Newport, 33° 39' S, 33° 39' S, coll. 28 April 2005, in intertidal rock pools, AM W.32034, 2 specimens. NSW 3397, Sydney Harbour, east side of Cockatoo Island, 33° 50' 53" S, 151° 10' 30" E, coll. 5 March 2009, 4 m on SCUBA, scraping on pontoon, AM W.53785, 1 specimen. Fairlight, Port Jackson, 33° 48' S, 151° 16' 30" E, coll. 19 Feb 2006, C. Fraser & M. Capa, 1 m, balanoid barnacles and sponges, AM W.37695, 2 specimens. WESTERN AUSTRALIA: WA 362, Cape Range National Park, inshore limestone reef off Neds Camp, 21° 59' S, 113° 55' E, coll. 02 Jan 1984, 1 m, AM W.53786, 9 specimens. NORTHERN TERRITORY: NT339, Darwin Harbour, Lee Point, 12° 20' S, 12° 20' S, coll. 16 July 1993, 3 m, on SCUBA, coral rubble, AM W.29548, 3 specimens.

Additional material examined 1 syntype AM W.505, Australia, New South Wales, Port Jackson, 33° 51' S, 151° 16' E.

Diagnosis. Midbody dorsal cirri moderately long; antennae tentacular and anterior dorsal cirri somewhat longer. Compound chaetae of two kinds, few dorsal ones with elongated falcigers and remaining chaetae with distinctly shorter, finely bidentate blades. Posterior aciculae acuminate.

Description. Longest complete specimen, 9 mm long, 0.45 mm wide, with 85 chaetigers. Prostomium oval, wider than long, with two pairs of eyes in trapezoidal arrangement, two eyespots usually indistinct (Fig. 2A). Antennae all of similar length, slightly longer than combined length of prostomium and palps together. Median antenna between posterior eyes, with about 16–18 articles; lateral antennae inserted in front of anterior eyes, with 15–16 articles. Palps broad, triangular, slightly longer than prostomium, fused at base, with distinct median groove. Peristomium shorter than subsequent segments, with two pairs of tentacular cirri (Fig. 2A). Dorsal tentacular cirri slightly longer than lateral antennae, with about 18 articles, ventral ones with 10–11 articles. Dorsal cirri relatively short, shorter or similar in length to body width and small differences of length between long and short cirri; in midbody, long cirri with about 18 articles and short ones with about 13 articles (Fig. 2A). Ventral cirri digitiform, inserted proximally. Compound chaetae including per parapodium few dorsal chaetae with elongated, bidentate blades (Fig. 2B, D, F), and some chaetae with distinctly shorter, bidentate blades, and dorso-ventral gradation in length (Fig. 2C, E, G). Anterior parapodia each with 3–4 long-bladed chaetae, blades 30–36 µm long (Fig. 2B), and 8–10 chaetae with shorter blades 22–23 µm long above, 14 µm below (Fig. 2C); distal tip of long blades curved, with proximal tooth small and close to distal one and short spines on edge (Fig. 2B); remaining blades with short proximal tooth and moderately long spines on margin (Fig. 2C). Midbody chaetigers with two compound long-bladed chaetae, similar to those of anterior parapodia, but longer (50 µm long) (Fig. 2D) and about eight chaetae similar to those of anterior parapodia, 28 µm long above, 18 µm below (Fig. 2E). Posterior parapodia each with one long-bladed chaeta

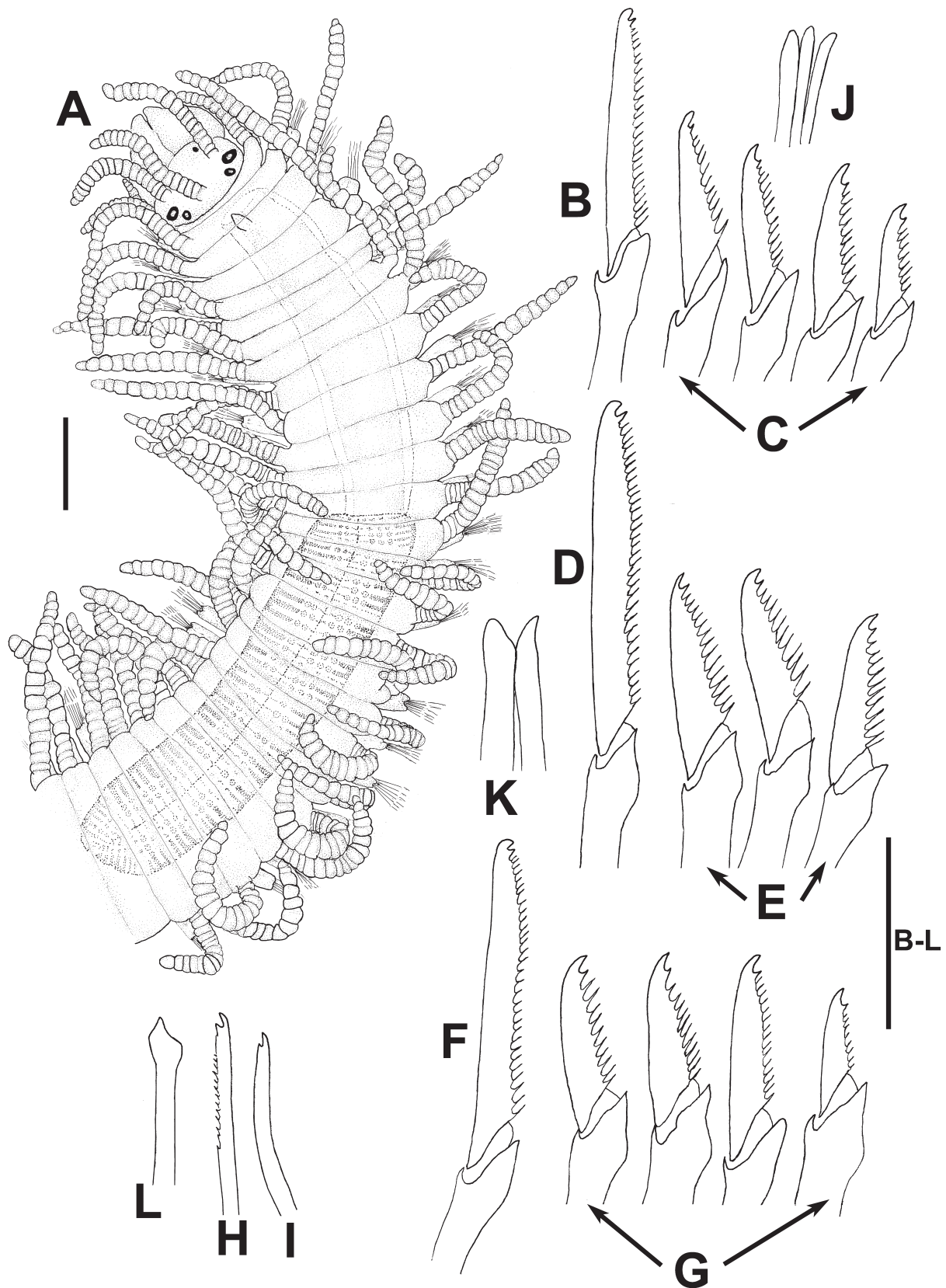


FIGURE 2. *Syllis augeneri* Haswell, 1920. AM W.32040. A, anterior end, dorsal view. B, long-bladed compound chaeta, anterior parapodium. C, falcigers, anterior parapodium. D, long-bladed compound chaeta, midbody. E, falcigers, midbody. F, long-bladed compound chaeta, posterior parapodium. G, falcigers, anterior parapodium. H, dorsal simple chaeta. I, ventral simple chaeta. J, aciculae, anterior parapodium. K, aciculae, midbody parapodium. L, acicula, posterior parapodium. Scale. A: 0.2 mm. B–I: 20 μ m.

(sometimes two, and lacking in most posterior parapodia), about 45 µm long (Fig. 2F), and six compound bidentate chaetae of similar sizes and shape to those of midbody (Fig. 2G). Dorsal simple chaetae slender, slightly bidentate (Fig. 2H), only on posterior parapodia. Ventral simple chaetae on most posterior parapodia only, very slightly bidentate (Fig. 2I). Anterior parapodia each with 2–3 slender aciculae (Fig. 2J), reducing to two on midbody parapodia, one subdistally inflated, acuminate, and other pointed (Fig. 2K), and solitary on posterior parapodia, acuminate (Fig. 2L). Pygidium with two long anal cirri, each with about 20 articles, and one short median stylus. Pharynx long, extending through 8–11 segments; tooth conical, on anterior margin. Proventricle extending through eight segments (up to 14 when body contracted, Fig. 2A), with 30–35 muscle cell rows.

Remarks. *Syllis augeneri* is characterized by having relatively short dorsal cirri and compound chaetae which includes a few dorsal ones with elongated blades, but not as long as to be considered as spiniger-like chaetae, and other falcigers with dorso-ventral gradation in length of blades. The distal tooth of long-bladed chaetae is curved, somewhat rounded, with short proximal tooth, close to distal one.

Aguado *et al.* (2008) examined one syntype from Port Jackson, NSW, and concluded that the single, incomplete examined specimen from Indonesia belongs to this species; although there are some discrepancies between that description and the syntype from Australia, but this could be due to differences in size or maturity.

Habitat. Sand and shells, amongst serpulids and other encrusting organisms, rock pools, inside limestone rocks, coral rubble. Intertidal and shallow substrates.

Distribution. Australia (NSW, WA). Indonesia.

Syllis beneliahuae (Campoy & Alquézar, 1982)

Figure 3

Langerhansia beneliahui Campoy & Alquézar, 1982: 124, fig. 3a, b.—Campoy 1982: 389, pls. 39, 40.

Syllis beneliahuae.—San Martín 1984: 360, pls. 90, 91; 1992: 183, fig. 1K–M; 2003: 405, Figs 222, 223.

Syllis (Ehlersia) cerina.—Augener 1913: 209, pl. 3, fig. 40 a, textfig. 25. Non *Syllis cerina* Grube, 1878.

Typosyllis (Langerhansia) cornuta.—Hartmann-Schröder 1979: 88; 1980: 52; 1981: 29.—Hutchings & Murray 1984: 104. Non Rathke, 1843.

Typosyllis beneliahuae.—Licher 1999: 47, fig. 22.

Material examined. AUSTRALIA, QUEENSLAND: Liz 52-2, Outer Yonge Reef, Great Barrier Reef, 14° 36' S, 145° 38' E, coll. 24 Jan 1977, hand collected coral rubble, 30 m, AM W.53779, 1 specimen. WESTERN AUSTRALIA: WA 536, Houtman Abrolhos Islands, Beacon Island, northeast entrance to Goss Passage, 28° 27' 54" S, 113° 46' 42" E, coll. 25 May 1994, hand collected on SCUBA underneath boulders embedded in coral sand, 33 m, AM W.53778, 1 specimen. WA 518, Houtman Abrolhos Islands, Beacon Island, Goss Passage, 28° 25' 30" S, 113° 47' E, coll. 22 May 1994, hand collected on SCUBA, dead coral plates covered in coralline algae, 8 m, AM W.53776, 1 specimen. WA 524, Goss Passage, south east of Long Island, 28° 28' 48" S, 113° 46' 30" E, coll. 22 May 1994, 30 m, hand collected in calcareous substrate, AM W.53777, 3 specimens. WA 521, Goss Passage, north end of Long Island, 28° 28' 18" S, 113° 46' 18" E, coll. 22 May 1994, 8 m, hand collected dead coral covered in coralline algae, AM W.53775, 4 specimens. Site 70, Kimberley region, Descartes Island, 14° 11' S, 125° 40' E, coll. 20 July 1988, P. Hutchings, intertidal sand flats and mangroves, AM W.29542, several specimens. St. 115, Kimberley region, Shirley Island, St. 115, 16° 17' S, 123° 26' E, coll. 26 July 1988, coll. P. Hutchings, intertidal, in mangroves, sand and reef, AM W.29544, 1 specimen.

Diagnosis. Body slender. Midbody dorsal cirri moderately long, alternating long and short; antennae tentacular and anterior dorsal cirri markedly longer. Compound chaetae of two kinds, few dorsal ones with bidentate spiniger-like blades and remaining chaetae with distinctly shorter, finely bidentate blades. Posterior aciculae acuminate.

Description. Complete specimens, 8–9 mm long, 0.2 mm wide, with 81–91 chaetigers. Body relatively small, slender, filiform, without colour pattern. Prostomium rounded; four small eyes in trapezoidal arrangement. Palps elongated, longer than prostomium (Fig. 3A). Median antenna arising between posterior eyes, with about 16–22 articles, almost twice as long as combined length of prostomium and palps together; lateral antennae shorter than median one, with about 13–15 articles. Peristomium dorsally markedly shorter than subsequent segments (Fig. 3A). Dorsal tentacular cirri longer than lateral antennae and similar in length or shorter than median antenna, with about 18–20 articles; ventral tentacular cirri about half of length of dorsal ones, with 10–12 articles. Dorsal parapodial

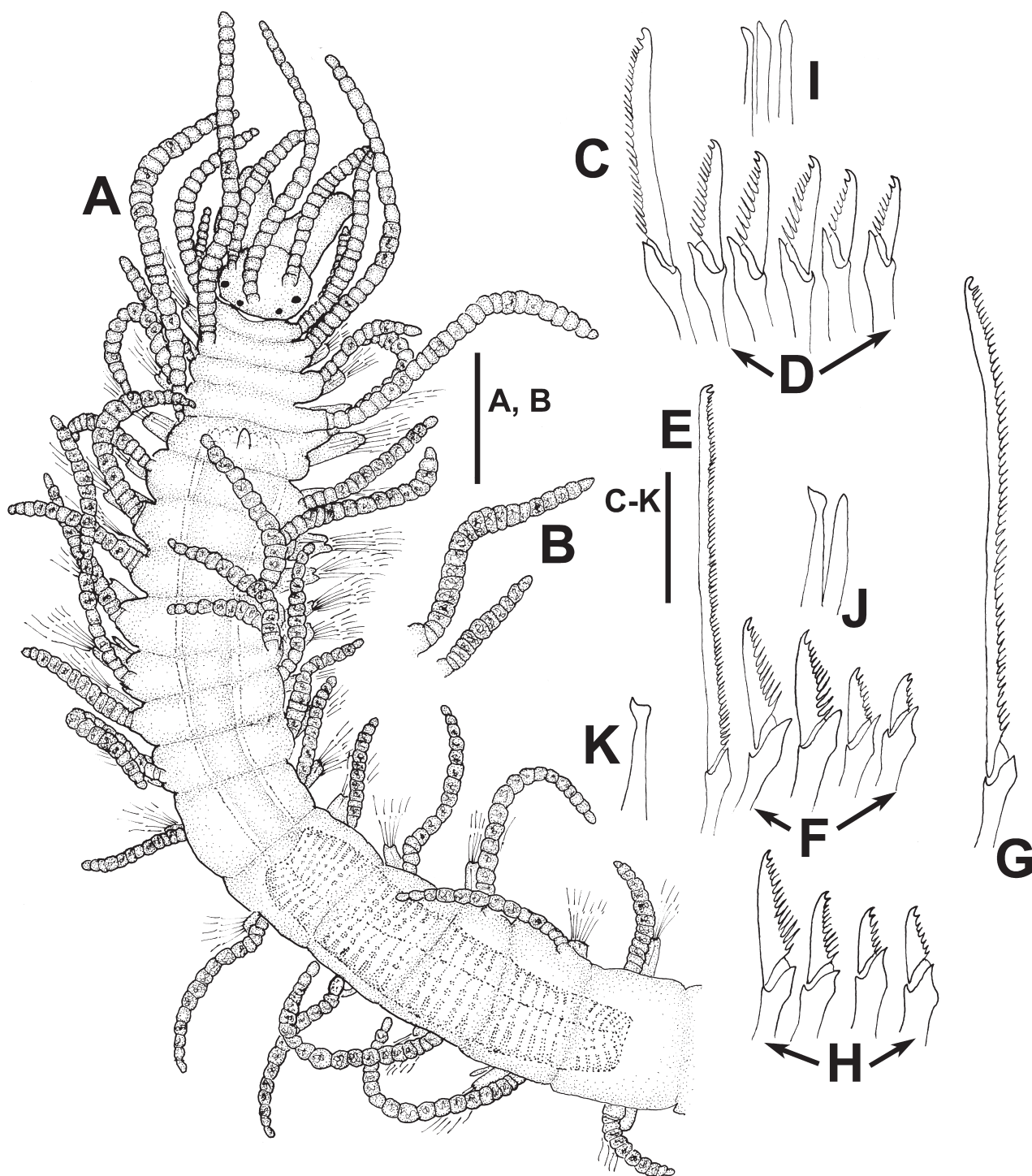


FIGURE 3. *Syllis beneliahuae* (Campoy & Alquézar, 1982). AM W.29542. A, anterior end, dorsal view. B, long and short dorsal cirri, midbody. C, pseudospiniger, most anterior parapodia. D, falcigers, most anterior parapodia. E, pseudospiniger, midbody. F, falcigers, midbody. G, pseudospiniger, mid-posterior parapodia. H, falcigers, mid-posterior parapodia. I, aciculae, anterior parapodia. J, aciculae, midbody. K, acicula, posterior parapodium. Scale. A, B: 0.2 mm. C–K: 20 µm.

cirri of chaetigers 1 and 4 distinctly long, with about 25–27 articles, those of chaetiger 2 and 3 shorter, with 14–15 articles, remaining dorsal cirri alternating long and short; in midbody, long ones with about 20–22 articles, longer than body width; short ones with 10–11 articles, shorter than body width (Fig. 3B); articles of dorsal cirri with distinct, spiralized inclusions inside, especially from proventricular segments onwards (Fig. 3A, B). Parapodia conical. Ventral parapodial cirri digitiform, slightly longer than parapodial lobes. Compound chaetae of each parapodium

with pseudospinigers and falcigers; one (sometimes two on most anterior parapodia) dorsalmost chaetae provided with distinctly longer and slender blades, pseudospinigers, distally bidentate, proximal tooth smaller than distal one, and straight, moderate spines on margins (Fig. 3C, E, G), 38 μm on anterior parapodia (Fig. 3C), 60 μm on midbody (Fig. 3E) and longer from midbody onwards, 80 μm long (Fig. 3G). Falcigers short, bidentate, proximal tooth shorter than distal one, and moderately long, straight spines on margin (Fig. 3D, F, H); anterior parapodia with 6–8 falcigers, 20–12 μm long (Fig. 3D); midbody and posterior parapodia each with four falcigers, with longer spines on margin, slightly distally curved on most dorsal ones, of similar length than those of anterior parapodia (Fig. 3F, H). Dorsal simple chaetae only seen in last parapodia of some specimens, minute, distally pointed and finely bidentate. Ventral simple chaetae only on most posterior segments of some specimens, similar to dorsal ones, smooth. Anterior parapodia with three slender aciculae each, distally pointed (Fig. 3I), reducing to two in each midbody parapodia, one acuminate and the other straight (Fig. 3J); solitary on posterior parapodia, acuminate (Fig. 3K). Pharynx long, extending through about 8–9 segments; pharyngeal tooth conical, on anterior margin of pharynx (Fig. 3A), usually located on chaetiger 3. Proventricle slightly shorter than pharynx, through 4–5 segments, with about 33–35 muscle cell rows. Pygidium with two anal cirri, and a median stylus.

Remarks. Licher (1999) pointed that the Australian specimens reported as *Syllis* (*Ehlersia*) *cerina* by Augener (1913), *Typosyllis* (*Langerhansia*) *cornuta* by Hartmann-Schröder (1979, 1980, 1981) and *Langerhansia cornuta* by Hutchings & Murray (1984); are all similar but differ from the original description of *Syllis cerina*; the pseudospinigers are longer and unidentate in *S. cerina* from the Philippines, the falcigers have a smaller proximal tooth and shorter spines on their margin. We have followed Licher (1999) in our list of synonymies.

Syllis cornuta Rathke, 1843, from Northern Europe, has longer dorsal cirri, straight acicula in posterior parapodia, and the falcigers are more elongated, with shorter spines on margin than those of *S. beneliahuae* (see Licher 1999).

Habitat. Dead coral, vermetid reefs, calcareous algae, among mussels, coralline algae, sand. Intertidal to more than 30 m.

Distribution. Mediterranean, East Atlantic (Canary Islands), West Atlantic (Caribbean Sea, Cuba), Pacific coast of Panamá. New record for Australia (NSW, WA, QLD). This widespread distribution should be confirmed by molecular studies, as may represent a suite of cryptic species.

Syllis bussettonensis (Hartmann-Schröder, 1982), n. comb.

Figure 4

Typosyllis (*Typosyllis*) *bussettonensis* Hartmann-Schröder, 1982: 62, Figs 31–35; 1983: 127; 1984: 14; 1987: 33; 1989: 19; 1990: 46; 1992: 56.

Typosyllis bussettonensis.—Licher, 1999: 125, fig. 65 D–F.

Material examined. AUSTRALIA, NEW SOUTH WALES: Golf Course bommie, 500 m north-east of Ulladulla Head, 35° 20' 29" S, 150° 29' 12" E, coll. 2 May 1997, 15 m, gravel at base of boulders, AM W.3926, 1 specimen. Broughton Island, Esmeralda Cove, 32° 37' 12" S, 152° 19' E, coll. 11 May 1978, coll. P. Hutchings, St. 2818, NSW Fisheries, kelp holdfast, AM W.53912, 2 specimens. NSW 680, Split Solitary Island, 15–17 m, 7 March 1992, AM W.29504, 1 specimen. SOUTH AUSTRALIA: Pondalowie and Marion Bays, Yorke Peninsula, 35° 14' S, 136° 50' E, coll. I. Loch, 22 Feb 1985, 0–3 m, *Caulerpa* and green algae, AM W.53913, 3 specimens. WESTERN AUSTRALIA: WA 362, Cape Range National Park, inshore limestone reef off Neds Camp, 21° 59' S, 113° 55' E, coll. 2 Jan 1984, 1 m, frilly *Caulerpa*, AM W.53910, 2 specimens. WA 391, Exmouth Gulf, beach at north end of Bundegi Reef, 21° 49' S, 114° 11' E, coll. 4 Jan 1984, 1–2 m, rocky rubble, coralline algae with green epiphyte, AM W.53906, 4 specimens. WA 392, Exmouth Gulf, beach at north end of Bundegi Reef, 21° 49' S, 114° 11' E, coll. 4 Jan 1984, 1–2 m, coral rubble, brown alga with epiphytic growth, sticky sediment, AM W.53882, 17 specimens.

Diagnosis. Midbody dorsal cirri slender, moderately long; antennae, tentacular and anterior dorsal cirri longer than those of midbody. Compound chaetae with short, bidentate blades. Pharynx and proventricle short. Pharyngeal tooth elongate, located slightly back from anterior margin of pharynx. Posterior aciculae ending in rounded, apparently hollow, tips.

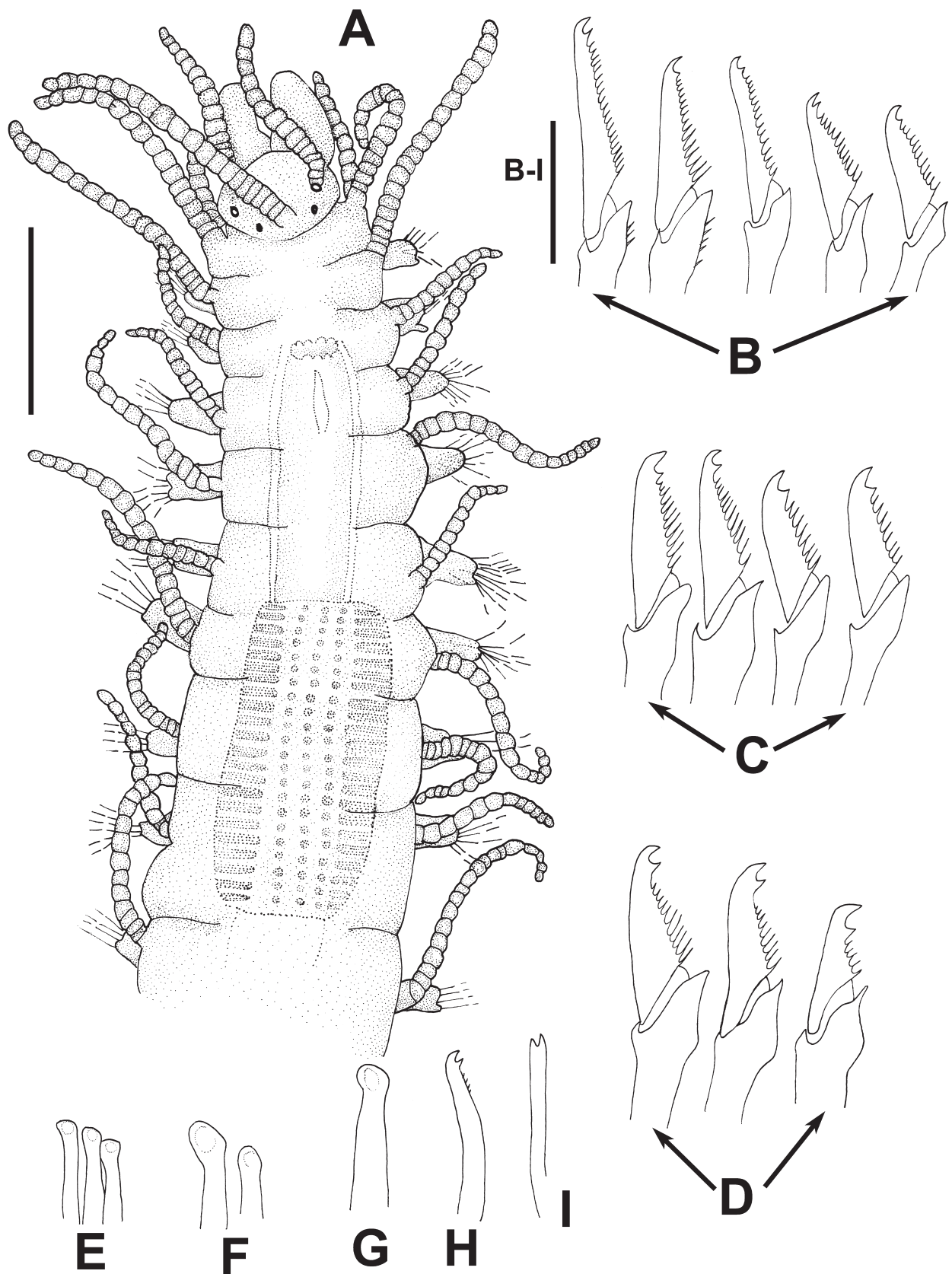


FIGURE 4. *Syllis busseltonensis* (Hartmann-Schröder, 1982), n. comb. AM W.53906. A, anterior end, dorsal view. B, falcigers, anterior parapodium. C, falcigers, midbody parapodium. D, falcigers, posterior parapodium. E, aciculae, anterior parapodium. F, aciculae, midbody parapodium. G, acicula, posterior parapodium. H, dorsal simple chaeta. I, ventral simple chaeta. Scale. A: 0.2 mm. B–I: 20 µm.

Description. Longest complete specimen examined 6 mm long, 0.35 mm wide, with 57 chaetigers. Body slender, pale, without colour markings. Prostomium more or less oval; four eyes in open trapezoidal arrangement. Palps similar in length to prostomium (Fig. 4A). Median antenna arising between posterior eyes, with about 20–25 articles, longer than combined length of prostomium and palps; lateral antennae shorter than median one, with about 14–16 articles. Peristomium similar in length to subsequent segments (Fig. 4A). Dorsal tentacular cirri shorter than median antenna, with about 16–17 articles; ventral tentacular cirri distinctly shorter than dorsal ones, with about 10–12 articles. Dorsal parapodial cirri elongated, alternating long, similar in length to body width, and short, with 18–20 and 14–15 articles (Fig. 4A); dorsal parapodial cirri of first chaetiger slightly longer than dorsal tentacular cirri, with up to 20 articles. Parapodia distally slightly bilobed. Ventral parapodial cirri digitiform. Compound chaetae bidentate falcigers, with proximal tooth smaller than distal tooth (Fig. 4B, C, D) and short to moderate spines on margin, diminishing in length from basal to distal region; shafts of posterior chaetae slightly larger. Anterior parapodia each with 10–12 compound chaetae, blades with dorso-ventral gradation, 30–31 μm long above, 15 μm long below (Fig. 4B); midbody and posterior parapodia each with 6–8 compound chaetae, with less marked dorso-ventral gradation in length than those of anterior parapodia, blades about 25 μm long above, 20 μm long below (Fig. 4C, D). Dorsal simple chaetae on posterior parapodia only, smooth, distally bifid (Fig. 4H). Ventral simple chaetae on far posterior segments only, and only on some specimens, slender, bidentate (Fig. 4I). Aciculae distally rounded, apparently with hollow tips (Fig. 4E, F, G), three on each anterior parapodium, two in midbody parapodia and solitary on posterior ones. Pharynx extending through about 3–4 segments; pharyngeal tooth, dagger-shaped, located posteriorly to anterior margin (Fig. 4A). Proventricle through about 3–5 segments, with about 27–30 muscle cell rows. Pygidium with two anal cirri, with about 15 articles, and median stylus. Several specimens are developing sexual stolons, and others show posterior regeneration after detaching stolons.

Remarks. This species is quite similar to *Syllis prolifera* Kohn, 1852 from European coasts, with a similar body, aciculae and chaetae. Also, both species have a relatively short pharynx and proventricle, with the pharyngeal tooth located distally from the anterior margin (see San Martín 2003). However, *S. busseltonensis* has a longer, dagger-shaped pharyngeal tooth, and the chaetae, although similar, are slightly different being more markedly bidentate.

Hartmann-Schröder (1980) reported *Syllis prolifera* (as *Typosyllis* (*Typosyllis*) cf. *prolifera*) with doubtful records from Exmouth, and Hutchings & Murray (1984) reported *Typosyllis prolifera* from Hawkesbury River; however, their description does not match with that species but with *S. imajimai* n. sp. (see below). So, we conclude that probably *S. prolifera* does not occur in Australia.

Distribution. Australia (NSW, VIC, SA, WA). Polynesia.

Habitat. Among algae, with or without sediments.

Syllis hyalina Grube, 1863

Figure 5

Syllis hyalina Grube, 1863: 45, pl. 4, fig. 8.—San Martín 2003: 426.

Typosyllis hyalina.—Langerhans 1881: 42.—Campoy 1982: 459, fig. 66.—Licher 1999: 199, fig. 86.

Syllis (*Typosyllis*) *hyalina*.—Fauvel 1923: 262, Figs 98 a, b.—Day 1967: 246, fig. 12–1 v–x.—Gardiner 1976: 140, fig. 12 v–w.—Day & Hutchings 1984: 277.

Typosyllis (*Typosyllis*) *hyalina*.—Hartmann-Schröder 1979: 89, Figs 57–61; 1980: 50; 1981: 26; 1982: 59; 1983: 128; 1984: 15; 1990: 47; 1991: 28.

Material examined. AUSTRALIA, QUEENSLAND: Outer Yonge Reef, Great Barrier Reef, 14° 36' S, 145° 38' E, coll. 24 Jan 1977, 30 m, coral rubble, AM W.53889, 1 specimen. NEW SOUTH WALES: MI NSW 8423, north east of Kurnell, “Anchor Reef”, 34° 00' 33" S, 151° 13' 51" E, coll. 16 Mar 2009, 17.8 m, encrusting coralline algae with ascidians, sponges and barnacles, AM W.53891, 2 specimens. NEW SOUTH WALES: MI NSW 8423, north east of Kurnell, “Anchor Reef”, 34° 00' 33" S, 151° 13' 51" E, coll. 16 Mar 2009, 17.8 m, encrusting coralline algae with ascidians, sponges and barnacles, AM W.53891, 2 specimens. Fairlight, Port Jackson, 33.8°S 151.28°E, 0.5 m, subtidal brown algae, coll. C. Fraser & M. Capa, 19 Feb 2006, id. with doubts as *Syllis zonata* by G. San Martín, AM W.37076, 1 midbody fragment. VICTORIA: Rye Pier, Port Phillip Bay, 38° 23' S, 144° 50' E, coll. 23 Oct 2005, AM W.53885, 1 specimen. WESTERN AUSTRALIA: Houtman Abrolhos Islands, Goss Passage, south east of Long Island, 28° 28' 48" S, 113° 46' 30" E, coll. 22 May 1994, 30 m, dead coral in calcareous substrate. AM W.530901,

2 specimens. WA 517, Houtman Abrolhos Islands, Beacon Island, Goss Passage, 28° 25' 30" S, 113° 47' E, coll. 21 May 1994, AM W.53896, 2 specimens. WA 525, Houtman Abrolhos Islands, Goss Passage, south east end of Long Island, 28° 28' 48" S, 113° 46' 30" E, coll. 22 May 1994, 8 m, dead coral covered in coralline algae, AM W.53895, 1 specimen. WA 528, Houtman Abrolhos Islands, Goss Passage, Beacon Island, off jetty adjacent to Fisheries Hut, 28° 25' 30" S, 113° 47' E, coll. 23 May 1994, 12 m, dead coral, AM W.53884, 1 specimen. WA 511, Houtman Abrolhos Islands, Beacon Island, Goss Passage, 28° 25' 30" S, 113° 47' E, coll. 18 May 1994, 10 m, dead branching coral covered in coralline algae, AM W.53893, 1 specimen. WA 522, Houtman Abrolhos Islands, north end of Long Island, Goss Passage, 28° 27' 54" S, 113° 46' 18" E, coll. 22 May 1994, 5–6 m, dead coral covered in coralline and brown algae, AM W.53899, 3 specimens. Houtman Abrolhos Islands, west side of Rat Island, 28° 44' S, 113° 47' E, coll. 21 Jun 2008, 2 m, dead coral, coll. Aguado & San Martín, 21 Jun 2008, AM W.53902, 1 specimen. WA 539, Houtman Abrolhos Islands, off south end of Long Island, Beacon Island, 28° 48" S, 113° 46' 18" E, coll. 25 May 1994, 4–5 m, dead coral covered in coralline algae, AM W.53887, 9 specimens. WA 518, Houtman Abrolhos Islands, Beacon Island, Goss Passage, 28° 25' 30" S, 113° 47' E, coll. 22 May 1994, 8 m, dead coral plates covered in coralline algae, AM W.53919, 5 specimens. WA 528, Goss Passage, Beacon Island, off jetty adjacent to Fisheries Hut, 28° 25' 30" S, 113° 47' E, coll. 23 May 1994, 12 m, dead coral, AM W.53884, 18 specimens. St. 21, Ningaloo Reefs, 22° 17' S, 118° 48' E, coll. 19 June 2008, C. Hesse, algal turf, AM W.53905, 1 specimen, AM W.53890, 1 specimen. WA 362, Cape Range National Park, inshore limestone reefs off Neds Camp, 21° 59' S, 113° 55' E, coll. 2 Jan 1984, 1 m, frilly *Caulerpa*, AM W.53883, 3 specimens. St. 50, Kimberley region, East Montalivet Island, 15° 06' S, 125° 18' E, coll. 15–16 Jul 1988, 0–6 m, some intertidal, AM W.53904, 1 specimen. St. 59, Kimberley region, west side of Cassini Island, 13° 57' S, 125° 37' E, coll. 18 Jul 1988, low tide, P Hutchings, AM W.53900, 1 specimen. St. 68, Kimberley region, Lafontaine Island, 14° 10' S, 125° 47' E, coll. 19 Jul 1988, 15 m, coll. P. Hutchings, AM W.53902, 3 specimens. WA 392, Exmouth Gulf, beach at north end of Bundegi Reef, 21° 49' S, 114° 11' E, coll. 4 Jan 1984, rocky rubble, brown alga with epiphytic growth, sticky sediment, AM W.53882, 2 specimens. WA 521, Exmouth Gulf, beach at north end of Bundegi Reef, 21° 49' S, 114° 11' E, coll. 4 Jan 1984, rocky rubble, covered in brown alga with epiphytic growth, sticky sediment, AM W.53882, 1 specimen, AM W.53897, 100 specimens. NORTHERN TERRITORY: NT 319, off Nightcliff, Old Mans Rock, 12° 28' 30" S, 130° 54' 12" E, coll. 17 Jul 1993, 5–7 m, coral rubble, sponges and hydroids, AM W.53892, 2 specimens. Darwin Harbour, Dudley Point, 12° 24' 54" S, 130° 49' E, coll. 18 Jul 1999, 7–8 m, coral rubble and algae, AM W.53901, 1 specimen. NT 339, Darwin Harbour, Lee Point, 12° 20' S, 130° 53' 48" E, coll. 11 Jul 1993, 3 m, coral rubble, AM W.53894, 2 specimens.

Diagnosis. Body slender. Dorsal cirri short, not thick as in *S. armillaris*. Compound chaetae of midbody with short, bidentate blades. Midbody aciculae protruding out from parapodial lobes. Posterior aciculae acuminate.

Description. Longest examined specimen 19 mm long, 0.42 mm wide, for 125 chaetigers. Body long and slender, elongated, without colour markings, but some small specimens with single transverse dark brown stripe on some anterior segments. Prostomium pentagonal to oval; four eyes in trapezoidal arrangement. Palps robust, similar in length to prostomium. Median antenna inserted on posterior part of prostomium, between posterior eyes, with 9–10 articles, slightly shorter than combined length of prostomium and palps; lateral antennae shorter than median one, with eight articles each, shorter than median antenna. Peristomium shorter than subsequent segments (Fig. 5A). Dorsal tentacular cirri slightly longer than median antenna, with about 15 articles each; ventral tentacular cirri with about nine articles. Dorsal cirri short all along body, shorter than body width, somewhat longer and more slender on anterior segments; dorsal cirri of chaetiger 1 distinctly longer, with 19 articles; and shorter and thicker, more or less fusiform, from midbody onwards (Fig. 5A), with well defined cirrophores and articles; from midbody onwards, dorsal cirri alternating short, with about eight articles and slightly longer ones, with about 9–10 articles (Fig. 5A). Parapodia conical. Ventral cirri digitiform. All compound chaetae heterogomph falcigers. Anterior parapodia each with about 10–12 chaetae, blades elongated, bidentate, proximal tooth short, and short spines on margin (Fig. 5B), blades about 30 µm long above, 15 µm long below; midbody parapodia with 6–7 compound chaetae (Fig. 5C), with thick shafts and short bidentate blades, all similar, with short spines on margin, 17–15 µm long; posterior parapodia with 3–4 compound chaetae (Fig. 5D), similar to those of anterior parapodia but shorter. Dorsal and ventral simple on far posterior segments of some specimens; dorsal simple chaetae slightly bidentate, with minute spines on margin (Fig. 5E); ventral simple chaetae smooth, bidentate (Fig. 5F). Anterior parapodia with 3–4 slender aciculae aciculae (Fig. 5G), two at midbody (Fig. 5H), thick, one distally pointed and other acuminate, slightly protruding from parapodial lobes, and single, acuminate acicula in posterior parapodia (Fig. 5I). Pharynx long, extending through about 8–10 segments; pharyngeal tooth on anterior margin of pharynx (Fig. 5A). Proventricle similar in length to

pharynx, through about 8–10 segments, with 29–30 muscle cell rows. Pygidium triangular, with two articulated anal cirri and one stylus.

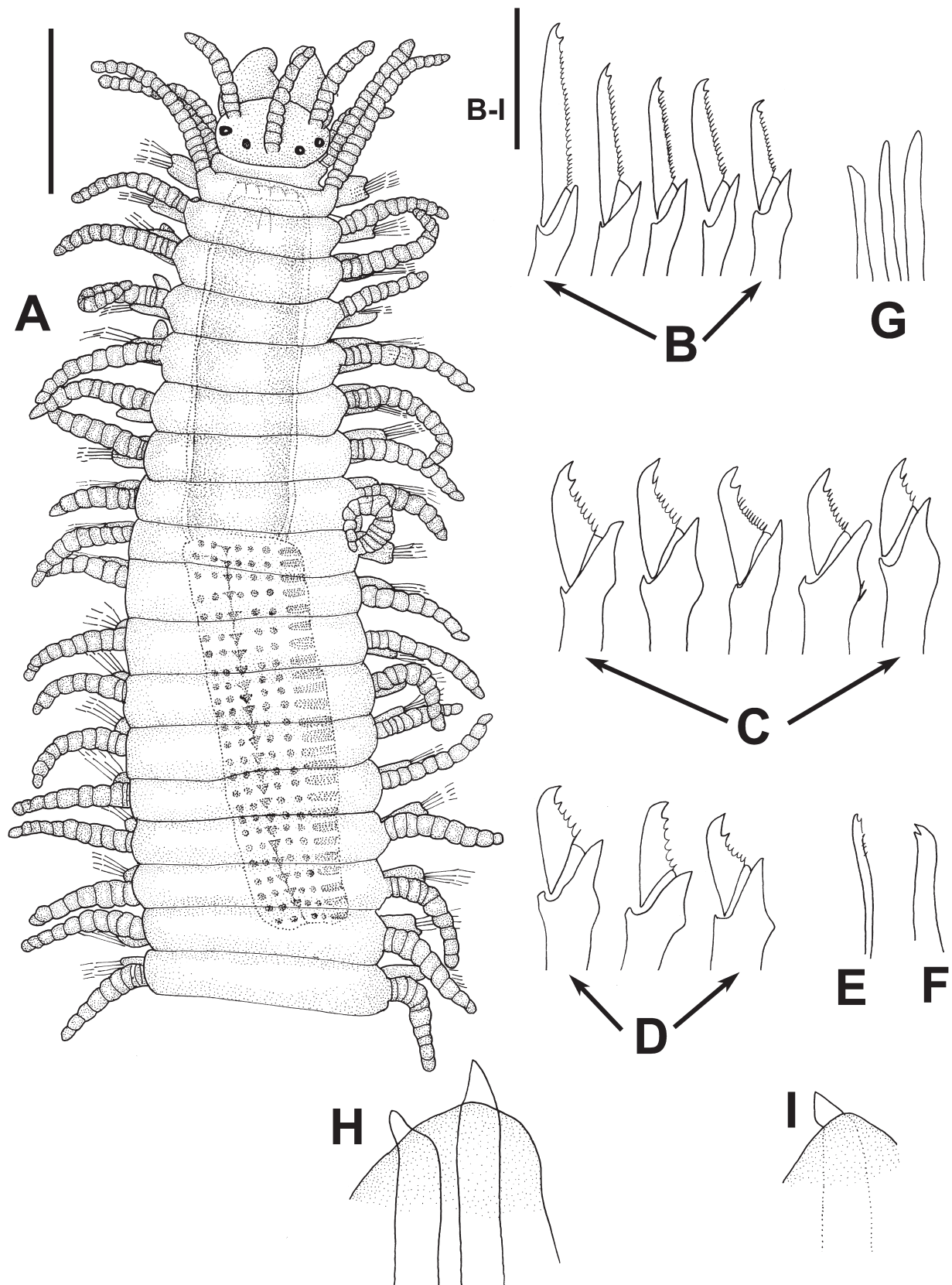


FIGURE 5. *Syllis hyalina* Grube, 1863. AM W.53905. A, anterior end, dorsal view. B, falcigers, anterior parapodium. C, falcigers, midbody parapodium. D, falcigers, posterior parapodium. E, dorsal simple chaeta. F, ventral simple chaeta. G, aciculae, anterior parapodium. H, aciculae, midbody parapodium. I, acicula, posterior parapodium. Scale. A: 0.2 mm. B–I: 20 μ m.

Remarks. This species is very similar to *Syllis armillaris*, above described, and related species (see Remarks of *S. armillaris*). Both species have long and slender bodies, without colour pattern (except on some small specimens), with short and relatively thick dorsal cirri, and similar chaetae. However, *S. armillaris* has thicker dorsal cirri on midbody, with compound chaetae unidentate, and also differs in regard to the aciculae. Both species have been described with pentacerous stolons; however, we have not found any stolons on the Australian material, although several specimens of both species exhibited signs of stolonization. *Syllis glandulata* Nogueira & San Martín, 2002, from Brazil, has a similar body and chaetae, but has numerous remarkable refringent glands on lateral margins of each segment (Nogueira & San Martín, 2002).

Habitat. Common in all littoral and sublittoral substrates, especially on hard bottoms (algae, calcareous algae, dead corals) but also on sand.

Distribution. Apparently Cosmopolitan. Reported all around Australia, but this needs to be confirmed by molecular studies as may represent a species complex.

Syllis imajimai n. sp.

Figure 6

Typosyllis prolifera.—Imajima 1966: 292, text-fig. 65.—Hutchings & Murray 1984: 34. Non Krohn, 1852.

Material examined. AUSTRALIA. NEW SOUTH WALES. Hawkesbury River, just downstream from junction with Colo River, 33° 26' 30"S, 150° 53'E, small beach, 40 m off beach, 4 m, fine clean sand sediment, Jones *et al.* coll., 11 May 1979, id. as *Typosyllis prolifera* by Hutchings & Murray, Holotype, AM W.196660.

Diagnosis. Body robust, dark, reddish-brown, with numerous rounded hyaline dermal inclusions. Dorsal cirri slender and short. Compound chaetae with short, bidentate blades. Posterior aciculae slightly acuminate.

Description. Holotype 8 mm long, 0.61 mm wide, for 54 chaetigers. Body broad, robust, contracted, very dark and opaque, reddish-brown, especially on anterior segments, except peristomium, with numerous minute rounded hyaline inclusions on dorsum (Fig. 6A), extending also to ventral side although less numerous. Prostomium pentagonal to oval, with some pigment spots; four eyes in trapezoidal arrangement and two anterior eyespots. Palps robust, similar in length to prostomium. Median antenna inserted on posterior part of prostomium, between posterior eyes, with 20 articles, longer than combined length of prostomium and palps; lateral antennae shorter than median one, with 14–15 articles each, shorter than median antenna. Peristomium shorter than subsequent segments, covering posterior part of prostomium, less pigmented than subsequent segments (Fig. 6A). Dorsal tentacular cirri with about 15 articles each; ventral tentacular cirri with about 10 articles. Dorsal cirri shorter than body width, somewhat longer on anterior segments; dorsal cirri of chaetiger 1, distinctly longer, with 19 articles, with well defined cirrophores and articles; in midbody, with about 20–23 articles, usually coiled (Fig. 6A). Parapodia conical, distally bilobed (Fig. 6B). Ventral cirri digitiform. All compound chaetae heterogomph falcigers with relatively short, markedly bidentate blades and small dorsoventral gradation in length and shape (Fig. 6C, D, E). Anterior parapodia each with about 16–18 chaetae, blades elongated, proximal tooth similar to distal one, and short spines on margin (Fig. 6C), blades about 24–21 µm long; midbody parapodia with 13–14 compound chaetae (Fig. 6D), with thick shafts and short bidentate blades, all similar, with short spines on margin, 20–17 µm long; posterior parapodia with eight compound chaetae (Fig. 6E), similar to those of anterior parapodia but with thicker shafts and more marked proximal teeth, about 17 µm long. Dorsal simple chaeta from midbody parapodia, markedly bidentate, apparently smooth (Fig. 6F, G); ventral simple chaetae smooth, bidentate (Fig. 6H), on far posterior segments. Anterior parapodia with three slender aciculae (Fig. 6I), two at midbody (Fig. 6J), and single, slightly acuminate acicula in posterior parapodia (Fig. 6K). Pharynx long, extending through about six segments; pharyngeal tooth not seen because of opacity of anterior segments (Fig. 6A). Proventricle, through about six segments, with 28 muscle cell rows. Pygidium triangular, with two articulated anal cirri and one stylus.

The holotype is developing a sexual dicerous stolon.

Remarks. This species is characterised by its colour pattern, reddish-brown with small hyaline, refringent dermal inclusions, especially marked on anterior segments, dorsal cirri similar in length or shorter than body width, and compound chaetae with relatively short falcigers, with strong, acute proximal and distal teeth, especially from midbody onwards. The Australian examined specimen agrees very well with the Imajima' description of *Typosyllis*

prolifera, but differs in many aspects with the descriptions of this species from European coasts, a non pigmented species, with aciculae ending in rounded, hollow tips, and pharyngeal tooth located just behind the anterior margin of pharynx (see Fauvel 1923; Campoy 1982, San Martín 2003). Imajima (1966) states that the pharyngeal tooth is located on the anterior margin. Also, the dorsal simple chaetae are very characteristic, markedly bidentate, with the proximal teeth prominent on his material which is why we have recognized his material as our new species *Syllis imajimai* n. sp.

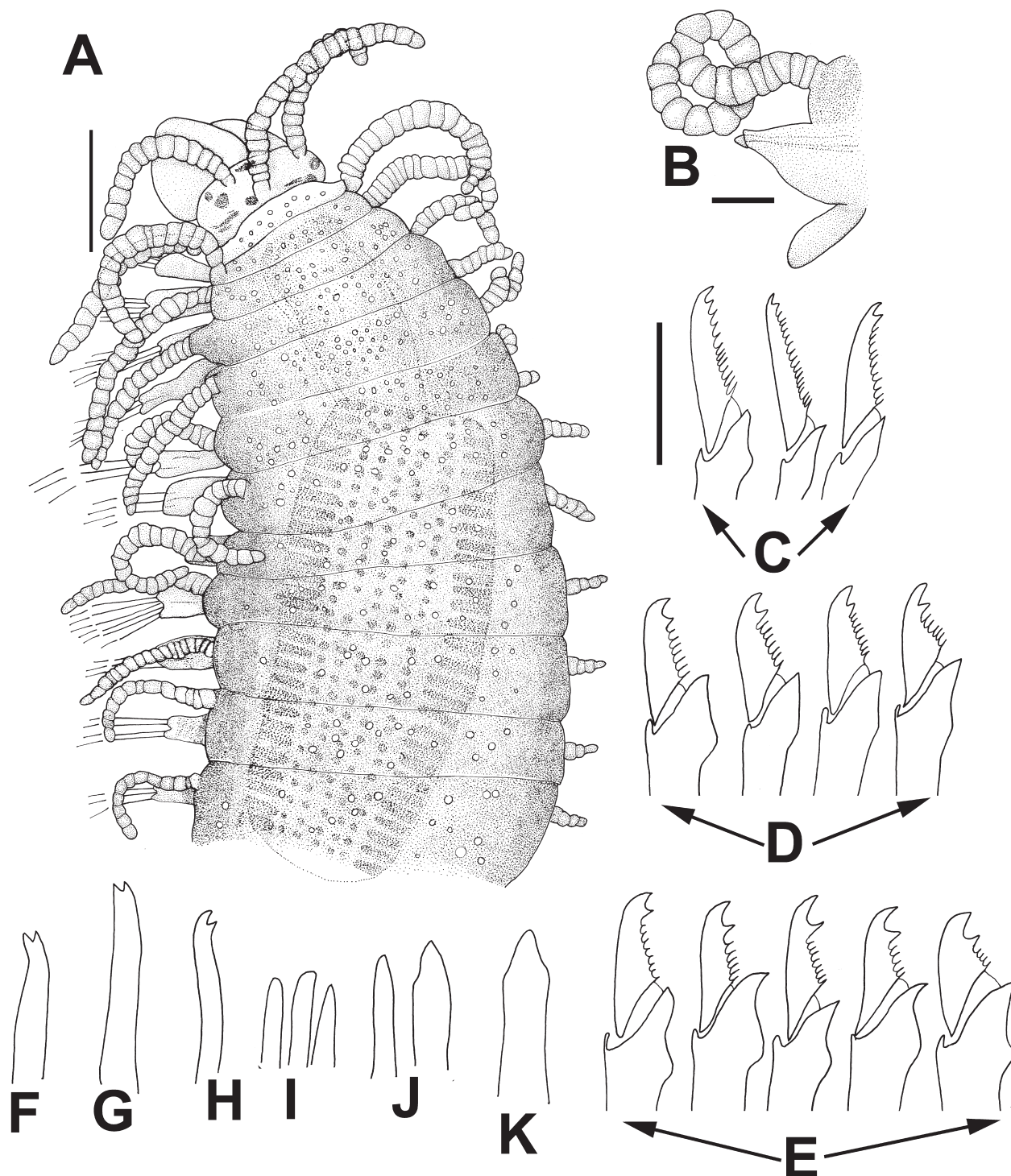


FIGURE 6. *Syllis imajimai* n. sp. Holotype. AM W.196660. A, anterior end, dorsal view. B, midbody parapodium. C, falcigers, anterior parapodium. D, falcigers, midbody parapodium. E, falcigers, posterior parapodium. F, dorsal simple chaeta, midbody parapodium. G, dorsal simple chaeta, posterior parapodium. H, ventral simple chaeta. I, aciculae, anterior parapodium. J, aciculae, midbody parapodium. K, acicula, posterior parapodium. Scale. A: 0.2 mm. B: 50 µm. C–K: 20 µm.

Other species with hyaline, refringent dermal inclusion are *Syllis pharobroomensis* (Hartmann-Schröder, 1979), n. comb. (see this paper), *Syllis deleoini* Salcedo-Oropeza, San Martín & Solís-Weiss, 2012, from southern Mexican Pacific, and *Syllis ergeni* Çinar, 2005, from the Aegean Sea, Turkey. *Syllis ergeni* is also a strongly pigmented species, the compound chaetae and dorsal simple chaetae are not as markedly bidentate as in *S. imajimai* n. sp. *Syllis deleoini* lacks colour pattern, the compound chaetae are similar, with relatively short bidentate blades, but both teeth are short, somewhat broader and close to each other (Salcedo-Oropeza *et al.* 2012).

Etymology. The species is named after Dr Minoru Imajima, a Japanese polychaetologist, who made important contributions to our knowledge of the family Syllidae.

Habitat. Fine clean sand sediment. Intertidal and shallow depths.

Distribution. Australia (NSW). Japan.

Syllis narranuk n. sp.

Figures 7, 8

Material examined. AUSTRALIA, WESTERN AUSTRALIA: St. 115, Kimberleys, Shirley Island, 16° 17' S, 123° 26' E, coll. 20 July 1988, by P. Hutchings, Holotype, AM W.53791.

Diagnosis. Body slender. Dorsal cirri slender, alternating long and short on midbody. Two kinds of spiniger-like chaetae, one with longer blades, both unidentate, with short spines on margin basally, apparently smooth distally; falcigers slender, slightly bidentate, with long and fine spines on margin. Posterior aciculae acuminate.

Description. Holotype complete specimen, 6 mm long, 0.28 mm wide, with 80 chaetigers. Body relatively small, slender, filiform, without colour pattern. Prostomium oval; four small eyes in trapezoidal arrangement and pair of anterior minute eyespots. Palps broad, slightly longer than prostomium (Fig. 7A). Median antenna arising between posterior eyes, with about 16 articles, somewhat longer than combined length of prostomium and palps together; lateral antennae shorter than median one, with about 12 articles. Peristomium dorsally distinctly shorter than subsequent segments (Fig. 7A). Dorsal tentacular cirri similar in length or shorter than median antenna; ventral tentacular cirri about half the length of dorsal ones. Dorsal parapodial cirri of chaetigers 1 and 4 longer than remaining, with about 19 articles, those of chaetiger 2 and 3 shorter, with 10–11 articles, remaining dorsal cirri alternating long and short; in midbody, long ones with about 14 articles; short ones with nine articles, all shorter than body width (Fig. 7B). Parapodia conical. Ventral parapodial cirri digitiform, shorter than parapodial lobes. Compound chaetae of each parapodium with long pseudospinigers (Fig. 8A, E, I), short pseudospinigers (Fig. 8B, F, J) and falcigers (Fig. 8C, G, K); all types of chaetae with slender shafts and elongated, thin blades, with moderate to long, very thin spines on margin. Spiniger-like chaetae unidentate and apparently smooth distally; falcigers slightly bidentate, with a minute proximal tooth. Anterior parapodia with 2–3 long spiniger-like chaetae (Fig. 8A), with long blades, about 88 µm, 3–4 short spiniger-like chaetae (Fig. 8B), 30 µm long, and about 8 falcigers (Fig. 8C), 20–9 µm long; midbody segments with two long spiniger-like chaetae (Fig. 8E), 140 µm long, two short spiniger-like chaetae (Fig. 8F), 35 µm long, and five falcigers (Fig. 8G), 20–13 µm long; posterior parapodia with single long spiniger-like chaeta (Fig. 8I), blade 110 µm long, one short spiniger-like (Fig. 8J), 33 µm long, and 2–3 falcigers (Fig. 8K), 19–12 µm long. Dorsal simple chaetae only present in some posterior parapodia, relatively thick, smooth, distally markedly bidentate (Fig. 8L). Ventral simple chaetae only on most posterior segments, slender, smooth, weakly bidentate (Fig. 8M). Anterior parapodia with 3–4 slender aciculae each, distally pointed (Fig. 8D), reducing to single in midbody and posterior parapodia, slender and acuminate (Fig. 8H, N). Pharynx long, everted, extending through about 8–9 segments (occupying probably 11 when retracted); pharyngeal tooth conical, on anterior margin of pharynx (Fig. 7A). Proventricle shorter than pharynx, through seven segments, with about 28 muscle cell rows. Pygidium with two anal cirri, and a median stylus.

Remarks. *Syllis narranuk* n. sp. is characterized by having two kinds of spiniger-like chaetae on each parapodium, some with very long blades and others shorter, and also some falcigers, with slightly bidentate blades and moderate to long, very thin spines on margin. None of the described species of this genus have similar chaetae, and so we have described this as a new species, although we found only a single specimen.

There are some other Australian species with spiniger-like compound chaetae, but they are very different to *S. narranuk* n. sp. *Syllis broomensis* (Hartmann-Schröder, 1979) has a single kind of spiniger-like chaetae, with spines on margin up the tip, more markedly bidentate falcigers, with longer spines on margin (Hartmann-Schröder 1979,

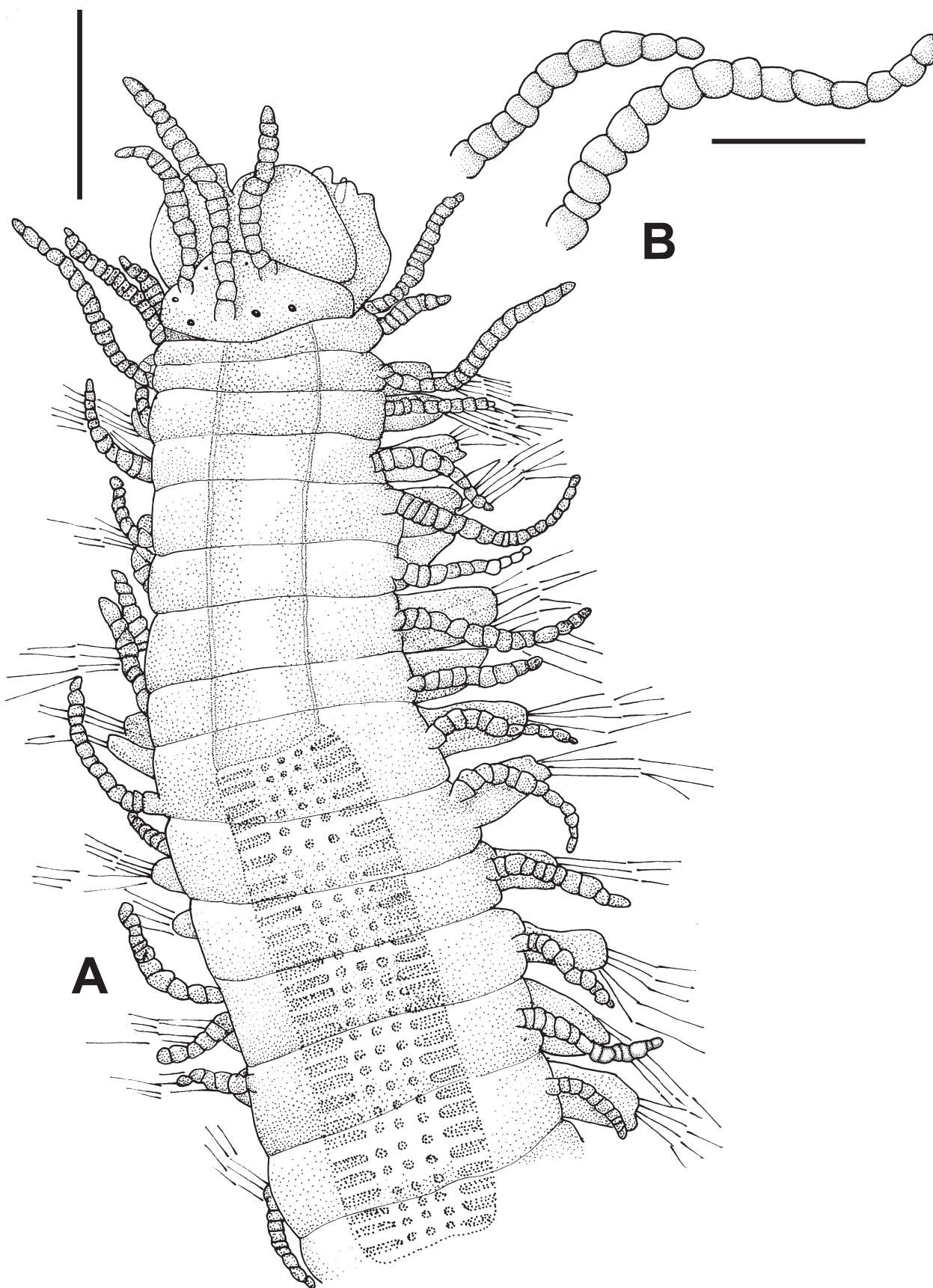


FIGURE 7. *Syllis narranuk* n. sp. Holotype, AM W.53791. A, anterior end, dorsal view. B, short and long midbody dorsal cirri. Scale. A: 0.2 mm. B: 0.1 mm.

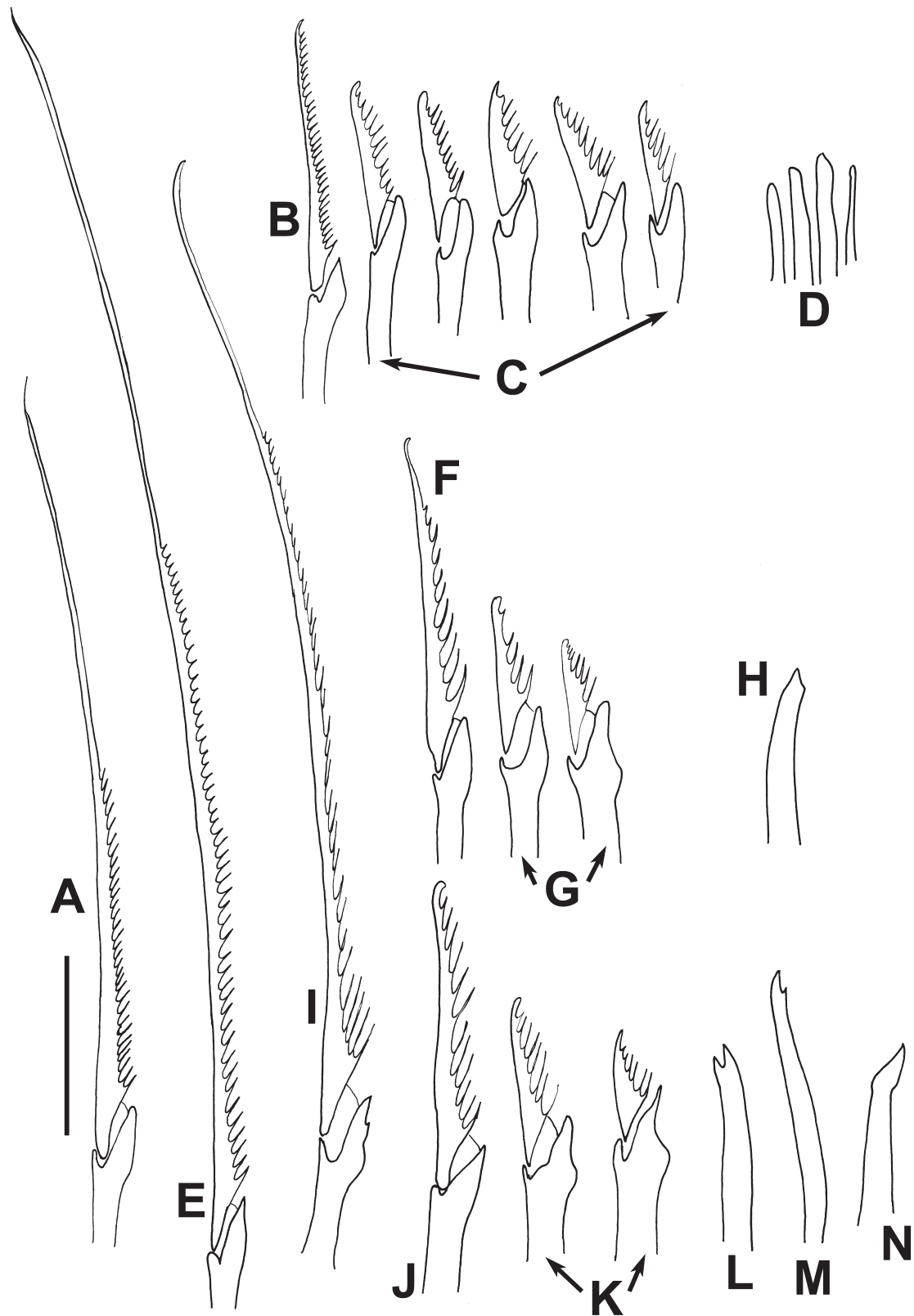


FIGURE 8. *Syllis narranuk* n. sp. Holotype, AM W.53791. A, long-bladed spiniger-like chaeta, anterior parapodium. B, short-bladed spiniger-like chaeta, anterior parapodium. C, falcigers, anterior parapodium. D, aciculae, anterior parapodium. E, long-bladed spiniger-like chaeta, midbody parapodium. F, short-bladed spiniger-like chaeta, midbody parapodium. G, falcigers, midbody parapodium. H, acicula, midbody parapodium. I, long-bladed spiniger-like chaeta, posterior parapodium. J, short-bladed spiniger-like chaeta, posterior parapodium. K, falcigers, posterior parapodium. L, dorsal simple chaeta. M, ventral simple chaeta. N, acicula, posterior parapodium. Scale. 20 μ m.

Álvarez-Campos *et al.* 2015a). *Syllis boggemanni* San Martín, Álvarez-Campos & Hutchings, 2017 has bidentate spiniger-like chaetae with short spines, except distally, and the falcigers are longer than those of *S. narranuk* n. sp., distinctly bidentate (San Martín *et al.* 2017). *Syllis rosea* (Langerhans, 1879) has very different compound chaetae, the dorsal simple chaeta is truncated and the posterior aciculae are “foot-like” (San Martín *et al.* 2017) instead of acuminate as found in *S. narranuk* n. sp. Finally, *Syllis yallingupensis* (Hartmann-Schröder 1982) has much longer antennae, tentacular and dorsal cirri, the spiniger-like chaetae are spinulated on the margin up the distal part, the falcigers are markedly bidentate, with proximal tooth longer than distal one, and the distal spines are long (Hartmann-Schröder, 1982, San Martín *et al.* 2017).

Etymology. The specific name “narranuk” is an aboriginal name to “hair”, in reference to the long, slender chaetae, appearing as long hairs in the parapodia.

Habitat. Intertidal on sand/mudflats in front of extensive stands of mangroves.

Distribution. Only known from the Kimberley region, Western Australia.

Syllis cf. nigrescens Grube, 1878

Figure 9

Syllis nigrescens Grube, 1878: 124.

Typosyllis nigrescens.—Licher 1999: 267, fig. 112.

Typosyllis (Typosyllis) ornata Hartmann-Schröder, 1965a: 101, Figs 25–27. (?)

Typosyllis ornata Hartman 1966: 201 (?).

Material examined. AUSTRALIA, NEW SOUTH WALES: SE of Bate Bay, T3-141, 34° 06' 48" S, 151° 1' E, coll. 29 Oct 1900, 65–70 m, Smith McIntyre grab, AM W.53792, 4 specimens.

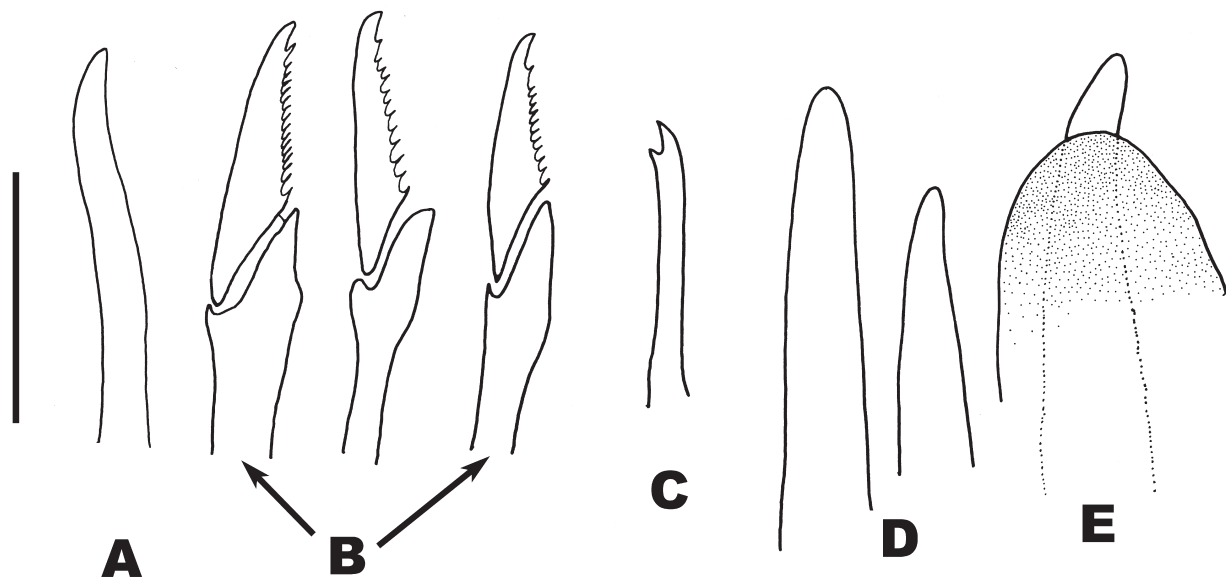


FIGURE 9. *Syllis cf. nigrescens* Grube, 1878. AM W.53792. A, dorsal simple chaeta. B, falcigers, midbody. C, ventral simple chaeta. D, aciculae, anterior parapodium. E, acicula, posterior parapodium. Scale. 20 μ m.

Description. All specimens in poor condition. One complete specimen 15 mm long, 0.2 mm wide, 108 chaetigers. Body slender, filiform. Almost all appendages lost; only few dorsal cirri present, short, with 16–13 articles. Compound chaetae falcigers; blades bidentate, proximal tooth small and short spines on margin (Fig. 9B); anterior parapodia with about 16 chaetae, diminishing progressively to 6–8 on posterior parapodia, blades all similar, 23–20 μ m long. Anterior parapodia each with three thick, distally blunt aciculae, two on midbody and posterior parapodia, thicker than those of anterior parapodia, one distinctly thicker than rest (Fig. 9D), straight, distally pointed, and single on most posterior parapodia, very thick, protruding beyond parapodial lobes (Fig. 9E). Dorsal simple chaetae in posterior parapodia, slightly curved, unidentate (Fig. 9A). Ventral simple chaetae on most posterior parapodia, smooth, distally bidentate with smooth proximal tooth (Fig. 9C).

Remarks. These NSW specimens are in poor condition, so we cannot provide a more detailed description or a diagnosis. Compound chaetae and aciculae agree quite well with Licher's description and drawings, based on a syntype, and we believe that our specimens may correspond with this species. However, both Grube's and Licher's descriptions state that the dorsal cirri are longer than the few ones present on our specimens, and so this must be considered a tentative identification.

Licher (1999) considered the species *Typosyllis ornata* described by Hartmann-Schröder (1965a) from Hawaii to be synonymous with *Syllis nigrescens*. However, we suggest that they may represent two different species, since the chaetae in Hartmann-Schröder's description are distinctly bidentate. A detailed molecular study is needed to confirm this identification.

Habitat. Sediments, 65–70 m.

Distribution. Philippines. Hawaii (?). Australia (NSW) (?).

Syllis noolinga n. sp.

Figures 10, 11

Material examined. AUSTRALIA, NEW SOUTH WALES: Newport 33° 39'S, 151° 19' E, coll. 22 July 2005, *Corallina* sp. in rock pools, AM W.53780, Holotype. Port Jackson, Fairlight, 33° 48' S, 151° 17'E, coll. 19 Feb 2006, 0.5 m, subtidal brown algae, AM W.53781, Paratypes 2 specimens.

Diagnosis. Body slender. Two dark, almost black, transversal bands on each segment; most anterior segments with only one band. Dorsal cirri long, alternating in length in midbody segments. Compound chaetae with short, strongly bidentate blades. Posterior aciculae thick, slightly oblique distally. Pharynx and proventricle long.

Description. Holotype incomplete, only lacking most posterior segments and pygidium, with a stolon developing two heads (Fig. 10C), 9.2 mm long, 0.4 mm wide, 69 chaetigers (stolons included). Body elongated, with a distinctive colour pattern; anterior segments each with a single wide dark grey to black band of pigment, becoming a double band after 5–6 segments (Fig. 10A); after segments of proventricle, posterior band disappears, remaining as a single, anterior band on mid-posterior segments, and finally absent on most posterior segments. Prostomium semicircular, with two pairs of eyes in open trapezoidal arrangement, and two anterior eyespots (Fig. 10A). Palps robust, similar in length to prostomium. Median antenna inserted between eyes, longer than combined length of prostomium and palps together, with 16–18 articles; lateral antennae much shorter, with about 15 articles, inserted in front of anterior eyes. Peristomium shorter than subsequent segments, forming a small lobe dorsally (Fig. 10A). Dorsal tentacular cirri similar in length to lateral antennae, with 15 articles; ventral tentacular cirri shorter than dorsal ones, with 10 articles; both dorsal and ventral tentacular cirri difficult to see, covered by dorsal cirri of anterior segments. Dorsal cirri of anterior segments distinctly long and thick, with about 25–20 to 23–25 articles on most anterior segments; subsequent segments also with long dorsal cirri, longer than body width, alternating long and short, long ones with 23–25 articles, short ones with 15–18 articles (Fig. 10A, B). Parapodial lobes subrectangular, slightly bilobed distally; ventral cirri digitiform, shorter than parapodial lobes. Compound chaetae distinctly bidentate falcigers, relatively short, with proximal tooth acute, shorter than distal one, and short, slightly distally curved, spines on margin (Fig. 11A–C). Anterior parapodia each with 10–12 chaetae, blades with dorso-ventral gradation, 35 µm above, 25 µm below (Fig. 11A); midbody parapodia with eight chaetae, thicker than those of anterior segments, and less marked dorso-ventral gradation in length, 27 µm above, 22 µm below (Fig. 11B); posterior parapodia each with six chaetae, with thick shafts and relatively short, large blades, all similar, 25–22 µm long (Fig. 11C). Anterior parapodia each with three slender aciculae, one acute, one distally blunt and one forming almost a right angle (Fig. 11D); midbody parapodia with two aciculae each, one slender, distally slightly oblique and one much thicker, almost straight, distally slightly oblique (Fig. 11E), slightly protruding from parapodial lobes; posterior parapodia with single, thick acicula, almost straight, slightly oblique distally (Fig. 11F). Dorsal simple chaetae on posterior parapodia, unidentate, distally blunt, smooth (Fig. 11G). Ventral simple chaetae on most posterior parapodia, very slender, smooth, distally slightly bidentate (Fig. 11H). Pharynx long, through about 14 segments; pharyngeal tooth located on anterior margin (Fig. 10A). Proventricle long, through about 7–8 segments; number of muscle cell rows difficult to assess, since the pigmentation covers part of them; about 40.

Holotype is developing an unusual stolon, apparently with two heads separated by two segments (Fig. 10C), packed with oocytes; each head is provided with one pair of large dorsal and one pair of ventral eyes, but only the anterior head shows a pair of short, non-articulate ventral appendages (Fig. 10C).

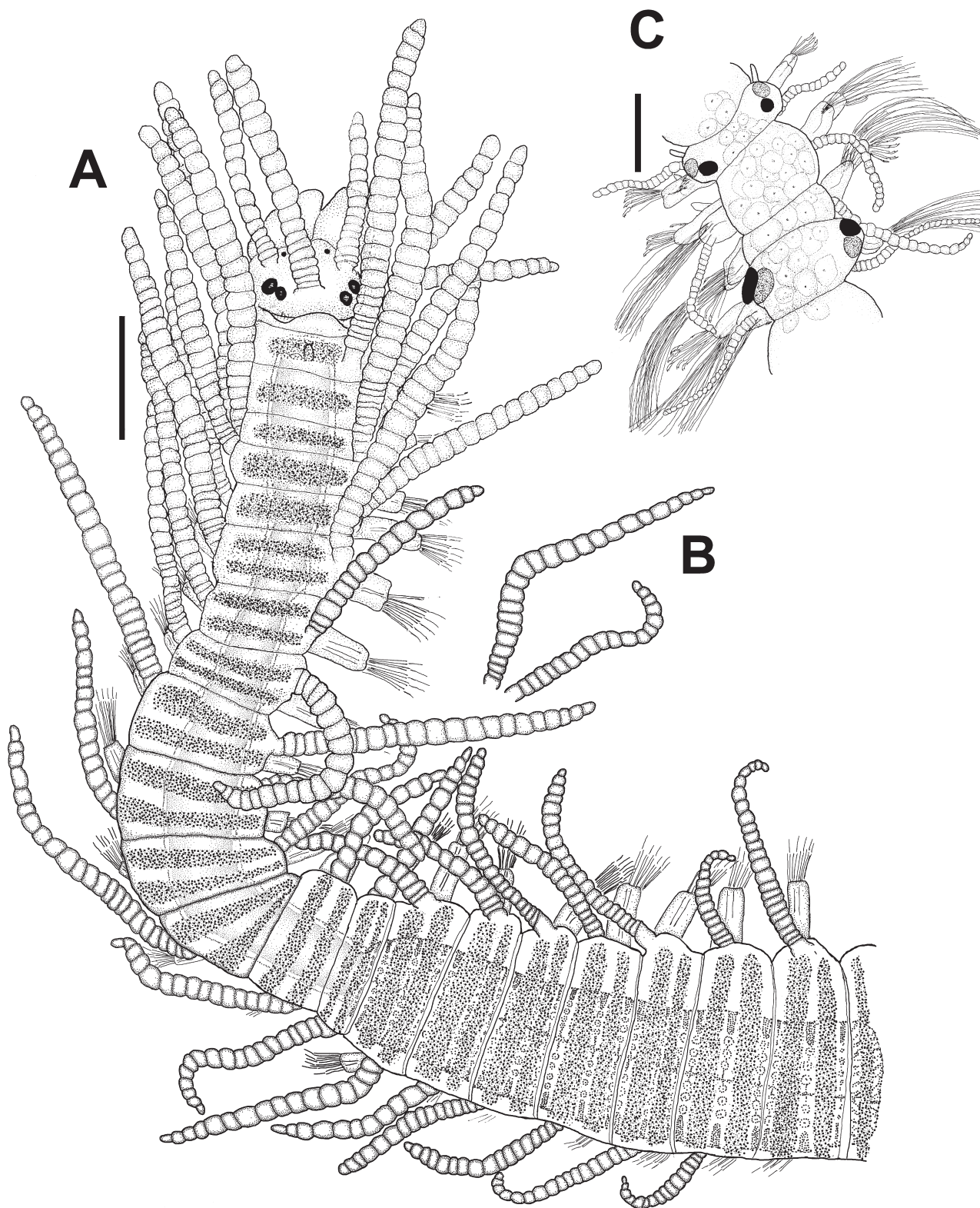


FIGURE 10. *Syllis noolinga*, n. sp. Holotype, AM W.53780. A, anterior end, dorsal view. B, midbody long and short dorsal cirri. C, heads of the stolon. Scales. A, B: 0.1 mm. C: 0.2 mm.

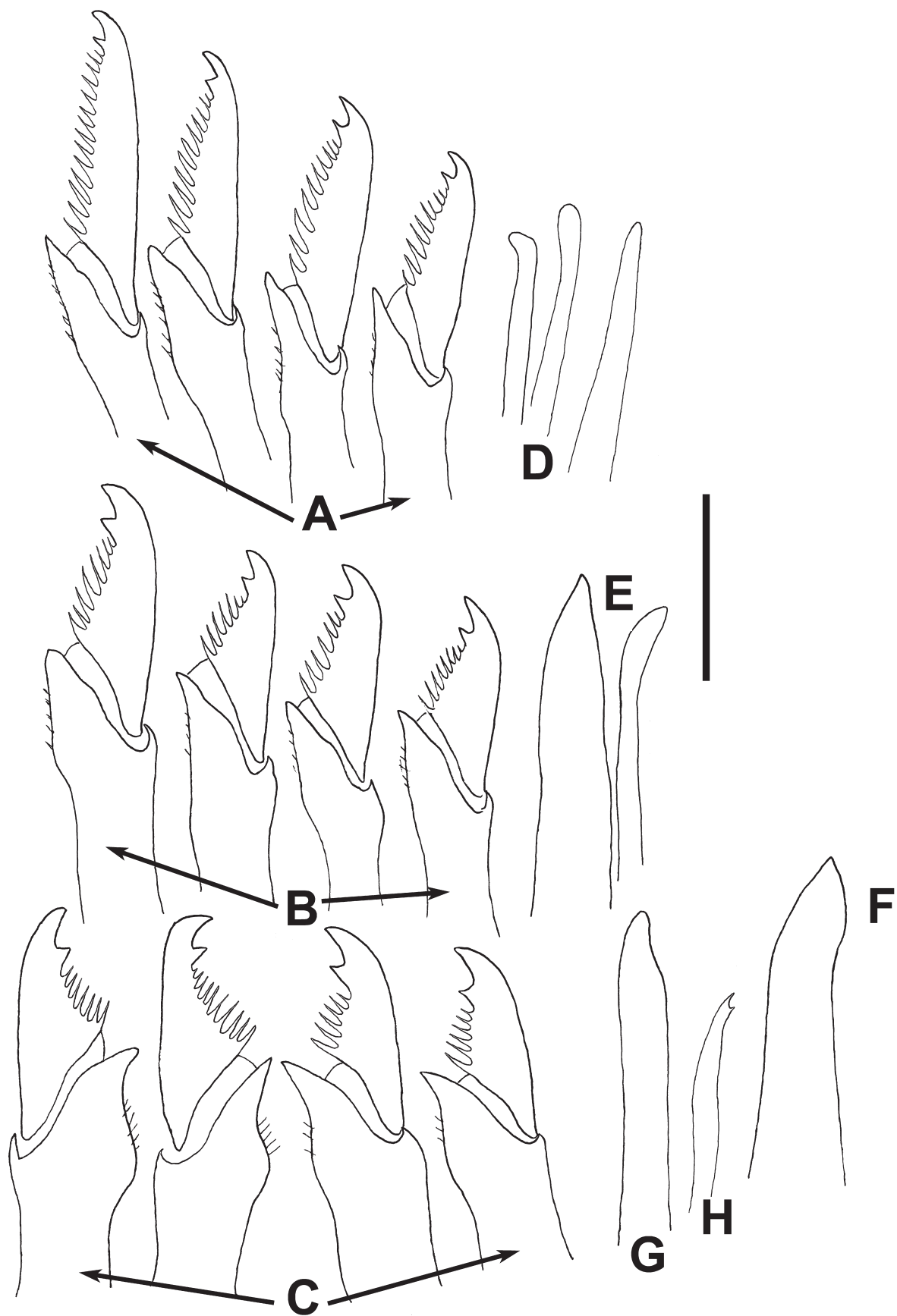


FIGURE 11. *Syllis noolinga*, n. sp. Holotype, AM W.53780. A, falcigers, anterior parapodium. B, falcigers, midbody parapodium. C, falcigers, posterior parapodium. D, aciculae, anterior parapodium. E, aciculae, midbody parapodium. F, acicula, posterior parapodium. G, dorsal simple chaeta. H, ventral simple chaeta. Scale. 20 μ m.

Remarks. *Syllis noolinga* n. sp. is characterized by its distinctive colour pattern, with a single-double-single band of dark, almost black, pigmentation per segment on anterior segments, strongly bidentate blades and thick posterior acicula, with tips extending slightly from the parapodial lobes. No other species of this genus has this combination of characters. The compound chaetae and aciculae are similar to those of *Syllis corallicola* Verrill, 1900 from the Caribbean region and the Mediterranean, and especially to those of *Syllis columbreensis* Campoy, 1982 from the Mediterranean, but the colour pattern and simple dorsal and ventral chaetae are different, and the blades of compound chaetae of *Syllis noolinga* n. sp. have longer spines on margin (see Licher 1999; San Martín 2003). The most similar species is *Syllis schulzi* (Hartmann-Schröder, 1960) from the Red Sea and Southern Mediterranean (San Martín 2003, Ba-Akdah *et al.* 2018); aciculae and chaetae are very similar, but the pigmentation pattern is different, being reddish, with one anterior large band and another narrow one in the posterior segments in *S. schulzi*; furthermore, the proventricle is much shorter in *S. schulzi*, through four segments, being much longer in *S. noolinga* n. sp. (Hartmann-Schröder 1960; San Martín 2003; Ba-Akdah *et al.* 2018). Finally, *Syllis marugani* Aguado, San Martín & Nishi, 2006, from Japan, has similar compound chaetae and also thick anterior dorsal cirri, but the aciculae are slender, and the colour pattern is different, being orange-red in *S. marugani* (Aguado *et al.* 2006).

The holotype of *Syllis noolinga* n. sp. is developing an unusual stolon, with two heads; only one other has been described with this type of stolon, *S. ergeni* Çinar, 2005, from Turkey, but that species is very different, having a bright orange colour and other kinds of chaetae and aciculae (see Çinar 2005).

Etymology. The name *noolinga* comes from the aboriginal word meaning “dark”, in reference to its distinctive pigmentation pattern.

Habitat. Among algae, intertidal and subtidal.

Distribution. Australia (NSW).

***Syllis patriciae* (Hartmann-Schröder, 1981) n. comb.**

Figure 12

Typosyllis (*Typosyllis*) *patriciae* Hartmann-Schröder, 1981: 29, Figs 37–42; 1982: 59; 1987: 35; 1989: 21.

Typosyllis patriciae.—Licher 1999: 90, fig. 43.

Material examined. AUSTRALIA, SOUTH AUSTRALIA: Port Lincoln, Billy Lights Point, 34° 45' S, 135° 53' E, coll. 15 Feb, 1985, I. Loch, 0 m, stones from sheltered intertidal rocks, AM W.53921, 1 specimen. WESTERN AUSTRALIA: Longreach Bay, Rottnest Island, 32° 00' S, 115° 30' E, coll. 25 June 2008, T. Aguado & G. San Martín algae, 1 m, AM W.33400, 1 specimen. WA 524, Houtman Abrolhos Islands, Goss Passage, south east end of Long Island, 28° 28' 48" S, 113° 46' 30" E, coll. 22 May 1994, 30 m, dead coral in calcareous substrate, AM W.53901, 2 specimens. WA 518, Houtman Abrolhos Islands, Goss Passage, Beacon Island, 28° 25' 30" S, 113° 47' E, coll. 22 May 1994, 8 m, dead coral plates covered in coralline algae, AM W.53895, 1 specimen. Cape Range National Park, inshore limestone reef off Neds Camp, 21° 59' S, 113° 55' E, coll. 2 Jan 1984, 1 m, frilly *Caulerpa*, AM W.5318, 1 specimen. WA 391, Exmouth Gulf, beach at north end of Bundegi Reef, 21° 49' S, 114° 11' E, coll. 4 Jan 1984, 1–2 m, rocky rubble, coralline algae with green epiphyte, AM W.53922, 3 specimens. WA 362, Kimberleys, Condilac Island, 14° 06' S, 125° 33' E, coll. 6 Jun 1988, P. Hutchings, 6 m, sand, AM W.29538, 6 specimens.

Diagnosis. Body slender. Dorsal cirri moderately long, alternating in length in midbody. Compound chaetae bidentate with short spines on margin; one of each parapodium slightly longer and slender than rest. Posterior aciculae acuminate. Pharynx long and slender.

Description. Longest complete specimen examined 6.7 mm long, 0.3 mm wide, with 59 chaetigers (up to 7.1 mm with 92 chaetigers; *fide* Hartmann-Schröder, 1982; Licher 1999). Body of medium size, slender, without colour pattern. Prostomium oval, with four eyes in trapezoidal arrangement and two anterior eyespots (Fig. 12A). Palps slightly shorter than prostomium. Median antenna arising between posterior eyes, with 19 articles, longer than combined length of prostomium and palps; lateral antennae distinctly shorter than median one, with 14 articles. Peristomium distinctly shorter than subsequent segments (Fig. 12A). Dorsal tentacular cirri similar in length to lateral antennae, with about 15 articles; ventral tentacular cirri slightly shorter than dorsal ones. Dorsal parapodial cirri relatively short, except some of anterior segments (Fig. 12A), with distinct coiled, dark, refracting inclusions in most articles, irregularly alternating long and short; long dorsal parapodial cirri similar in length to body width, with about 13–15 articles in midbody, short dorsal parapodial cirri in midbody with about 9–10 articles. Ventral

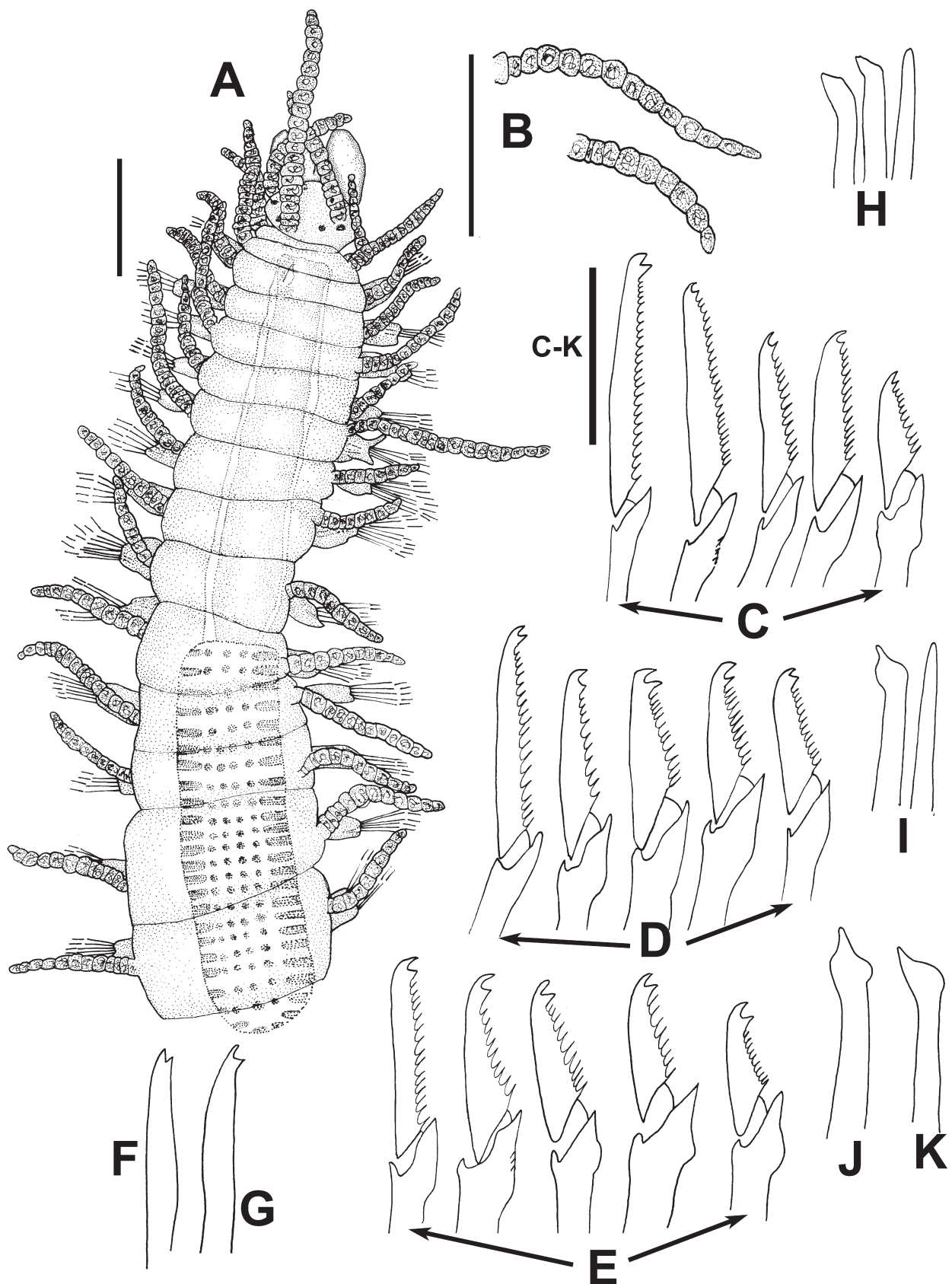


FIGURE 12. *Syllis patriciae* (Hartmann-Schröder, 1981 n. comb. AM W.29487. A, anterior end, dorsal view. B, long and short dorsal cirri, midbody. C, compound chaetae, anterior parapodium. D, compound chaetae, midbody parapodium. E, compound chaetae, posterior parapodium. F, dorsal simple chaeta. G, ventral simple chaeta. H, aciculae, anterior parapodium. I, aciculae, midbody parapodium. J, K, acicula, two views, posterior parapodium. Scale. A, B: 0.2 mm. C–K: 20 µm.

parapodial cirri digitiform. Compound chaetae heterogomph falcigers, similar throughout body, with bidentate blades, both teeth similar, proximal tooth well marked (Fig. 12C, D, E); blades with short, thin, spines. On each parapodia, few (1–3) most dorsal falcigers with slender, elongated blades, and remaining shorter, more markedly bidentate (Fig. 12C, D, E). Anterior parapodia each with 10–12 compound chaetae; blades 26 µm long above, 13 µm long below (Fig. 12C); midbody parapodia with 8–9 compound chaetae each, blades 22 µm long above, 14 µm long below (Fig. 12D); posterior parapodia with 4–6 compound chaetae each, with blades 19 µm long above, 13 µm long below (Fig. 12E). Dorsal simple chaetae only on posterior parapodia, slightly bidentate (Fig. 12F). Ventral simple chaetae only on far posterior segments, slender, markedly bidentate (Fig. 12G). Anterior parapodia with three aciculae, one straight and two slightly acuminate (Fig. 12H); midbody parapodia with two aciculae, one straight and other markedly acuminate, subdistally inflated (Fig. 12I), solitary and strongly acuminate, subdistally inflated in posterior parapodia (Fig. 12J, K). Pharynx long, slender, extending through about nine segments; pharyngeal tooth on anterior margin of pharynx (Fig. 12A). Proventricle through 5–6 segments, with about 28–30 muscle cell rows. Pygidium with two anal cirri, similar to long dorsal cirri, and median stylus.

Habitat. From intertidal to 30 m, associated with sand, algae and coral rubble.

Distribution. Australia (SA, WA).

Syllis pharobroomensis (Hartmann-Schröder, 1979), n. comb.

Figure 13

Typosyllis (*Typosyllis*) *pharobroomensis* Hartmann-Schröder, 1979: 92, Figs 77–81.

Typosyllis pharobroomensis.—Licher 1999: 269.

Material examined. AUSTRALIA, WESTERN AUSTRALIA: Houtman Abrolhos Islands, Goss Passage, north end of Long Island, 28° 28' 18" S, 113° 46' 18" E, coll. 22 May 1994, 8 m, hand collected on SCUBA, dead coral covered in coralline algae, AM W.53795, 6 specimens. Houtman Abrolhos Islands, off south end of Long Island, Beacon Island, 28° 28' 48" S, 113° 46' 18" E, coll. 25 May 1994, 4 m, hand collected on SCUBA, dead coral covered in coralline algae, AM W.53794, 2 specimens. WA 362, Cape Range National Park, inshore limestone reef off Neds Camp, 21° 59' S, 113° 55' E, coll. 02 Jan 1984, hand collected intertidally in *Caulerpa*, AM W.53793, 2 specimens. St. 115, Kimberley region, Shirley Island, 16° 17' S, 123° 26' E, coll. 26 July 1988, coll P. Hutchings, intertidal in amongst mangroves, sand and reef, AM W.53796, 1 specimen. NORTHERN TERRITORY: NT 319, Darwin Harbour, Dudley Pt., 12° 24' 54" S, 130° 49' E, coll. 18 July 1993, 8 m, coral rubble and algae, AM W.53797, 1 specimen.

Diagnosis. Body densely provided with very numerous, rounded to convoluted dermal glands. Dorsal cirri slender, moderately long, alternating in length in midbody. Compound chaetae bidentate falcigers with short spines on margin. Posterior aciculae straight and distally pointed.

Description. Longest specimen (AM W.53793) 7 mm long, 0.4 mm wide, with 80 chaetigers; single specimen from NT longer (AM W.53797), 10 mm long for 78 chaetigers. Body without colour pattern, but provided dorsally with dark, dense dermal glands, also some ventral glands, rounded, some convoluted in a few specimens (Fig. 13A, B); dorsal dermal glands appearing on proventricular segments on some specimens, but on all segments in other specimens (Fig. 13A). Antennae, tentacular cirri and dorsal cirri with dark inclusions (Fig. 13A, B). Prostomium oval; four eyes in trapezoidal arrangement. Palps broad, similar in length to prostomium or shorter (Fig. 13A). Median antenna arising between posterior eyes, thick, long, with about 16–25 articles, distinctly longer than combined length of prostomium and palps; lateral antennae shorter than median one, with about 12–18 articles. Peristomium similar to subsequent segments, short; becoming longer gradually posteriorly (Fig. 13A). Dorsal tentacular cirri similar in length to lateral antenna, with about 17–26 articles; ventral tentacular cirri shorter than dorsal ones, with 10–17 articles. Dorsal cirri tapered, with coiled inclusions inside articles, alternating long cirri similar in length to body width or slightly shorter, with about 20–30 articles, and short cirri, with about 14–20 articles, in midbody; dorsal cirri dorsally coiled over dorsum, more markedly in longer ones (Fig. 13A, B). Parapodial lobes distinctly bilobed (Fig. 13A, B). Ventral parapodial cirri digitiform, shorter than parapodial lobes. Compound chaetae with short bidentate falcigers, blades with proximal tooth slightly smaller than or similar in size to distal one, and short to moderate spines on margin (Fig. 13C, D, E); some shafts with few, short subdistal spines, smooth on posterior segments, especially in ventral-most chaetae, being thicker ventrally posteriorly. Anterior parapodia each with about

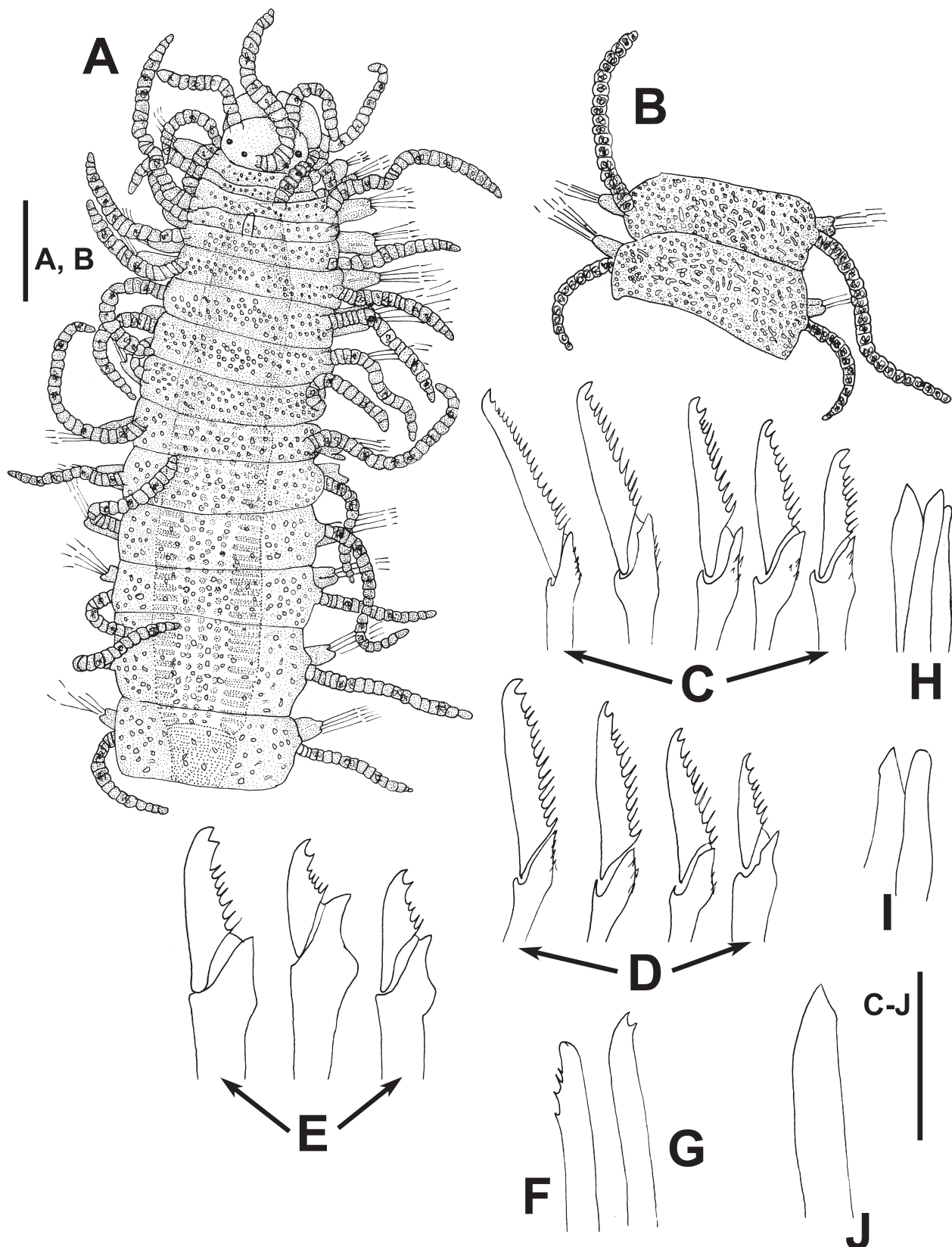


FIGURE 13. *Syllis pharobroomensis* (Hartmann-Schröder, 1979). AM W.53795. A, anterior end, dorsal view. B, midbody segments, dorsal view. C, falcigers, anterior parapodium. D, falcigers, midbody parapodium. E, falcigers, posterior parapodium. F, dorsal simple chaeta. G, ventral simple chaeta. H, aciculae, anterior parapodium. I, aciculae, midbody parapodium. J, acicula, posterior parapodium. Scale. A, B: 0.2 mm. C–J: 20 µm.

10–14 compound chaetae, with blades 24 µm long above, 17 µm long below (Fig. 13C); midbody parapodia with 8–11 compound chaetae each, blades similar to anterior ones, more markedly bidentate (Fig. 13D); posterior parapodia with 3–6 compound chaetae each, blades all similar, strongly bidentate, wide and short, 20 µm long above, 15 µm long below (Fig. 13E). Dorsal simple chaetae on posterior parapodia, apparently unidentate, with a minute distal notch, and few, short subdistal spines (Fig. 13F). Ventral simple chaetae on posterior-most segments only, smooth, bidentate (Fig. 13G). Anterior parapodia with three slender aciculae each (Fig. 13H), becoming progressively fewer in number and larger in size, only two in each midbody parapodia, one straight and pointed, and other distally blunt (Fig. 13I), and finally one solitary acicula in each posterior parapodia, straight and distally pointed, slightly protruding beyond parapodial lobes (Fig. 13J). Pharynx extending through about seven segments; pharyngeal tooth on anterior margin of pharynx. Proventricle through 5–6 segments, with about 33 muscle cell rows. Pygidium with two anal cirri, with up to 22 articles, and a median stylus.

Remarks. *Syllis pharobroomensis* is characterized by having numerous and densely distributed glands on dorsum and compound falcigers with short, bidentate blades. These dermal glands are quite unusual in the genus (see Remarks of *S. imajimai* n. sp., above). The specimen from the NT is markedly longer than those from WA, with more numerous articles on the antennae and dorsal cirri and compound chaetae more elongated.

Habitat. Dead corals covered by algae, algae. Intertidal and sublittoral.

Distribution. Australia (WA, NT).

Syllis pharyncircunfusata (Hartmann-Schröder, 1979) n. comb.

Figure 14

Typosyllis (*Typosyllis*) *pharyncircunfusata* Hartmann-Schröder, 1979: 94, Figs 88–90. *Typosyllis pharyncircunfusata*.—Licher 1999: 156, fig. 69.

Material examined. AUSTRALIA. WESTERN AUSTRALIA: Broome, cavity in calcareous crust, intertidal, Hartmann-Schröder leg. id., ZHM P-15471, holotype.

Diagnosis. Body slender. Dorsal cirri short. Compound chaetae with slightly bidentate blades. Dorsal simple chaetae truncate. Posterior aciculae distally bent in right angle. Pharynx long and proventricle short. Anterior part of pharynx surrounded by a transparent, spherical structure with double wall and a longitudinal line.

Description. Small size, 8–9 mm long incomplete and partially damaged specimen, 0.16 mm wide, 69 segments. Body colourless, slender, with segments not well marked. Prostomium oval, with four small eyes in open trapezoidal arrangement (Fig. 14A). Palps slightly longer than prostomium. Median antenna arising between anterior pair of eyes, similar in length to prostomium and palps together, with about 15 articles; lateral antennae shorter than median one, inserted in front of anterior eyes, with about nine articles. Peristomium shorter than subsequent segments; dorsal tentacular cirri similar in length to median antenna, with about 14 articles; ventral tentacular cirri about half of length of dorsal ones, with about 10 articles. Dorsal cirri relatively short, fusiform, mostly broken; dorsal cirri of first chaetiger longer than subsequent ones, with about 19–22 articles; midbody dorsal cirri with about 12 articles (Fig. 14B). Articles of dorsal cirri with numerous convoluted inclusions (Fig. 14A, B). Parapodia conical, slightly bilobed distally. Ventral cirri conical, shorter than parapodial lobes. Anterior parapodia with about 10 compound, heterogomph chaetae, reducing progressively to 6–8 on midbody-posterior parapodia. Blades of compound chaetae bidentate, with proximal tooth slender and slightly shorter than distal one and fine, short spines on margin; marked dorso-ventral gradation in size, 25 µm above, 10 µm below, in midbody (Fig. 14C). Shafts smooth, with small and fine spines on margin of most dorsal chaetae. Dorsal simple chaetae on most posterior parapodia, truncate, with minute subdistal spines (Fig. 14D). Ventral simple chaetae not seen. Aciculae solitary on all parapodia except most anterior ones, with two aciculae, slender, stout, distally slightly bent at right angle (Fig. 14E). Pharynx long, slender, through eight segments; pharyngeal tooth located on anterior margin, surrounded by a crown of 10 soft papillae; anterior part of pharynx surrounded by a transparent, spherical to ovate, probably a chitinous structure, with a double wall and a median, longitudinal line (Fig. 14A). Proventricle shorter than pharynx, through four segments, with around 30 muscle cell rows.

Remarks. *Syllis pharyncicunfusata* belongs to the group of species with truncate dorsal simple chaetae and aciculae bent in right angle. This species is very similar to *Syllis erikae* (Hartmann-Schröder, 1981), also from Western Australia, but the proventricle is shorter (through 2–3 segments), the dorsal cirri are not fusiform, as in *S.*

pharynxcircunfusata, and the blades of compound chaetae are shorter. Other species of this group in Australia are *Syllis albanyensis* (Hartmann-Schröder, 1984), *Syllis rosea* (Langerhans, 1879), *Syllis edensis* (Hartmann-Schröder, 1989), and *Syllis augeneri* Haswell, 1920, but clearly differ in several characters such as proventricle length, dorsal cirri and chaetae (see Álvarez-Campos *et al.* 2015a; San Martín *et al.* 2017). None of the described species of *Syllis* have the characteristic hyaline, structure surrounding the pharynx, of unknown function, of *S. pharynxcircunfusata*. Although we have examined a large number of species and specimens of the genus *Syllis* from samples all around Australia, we have not seen any specimen with such a structure nor any other specimen of that species; perhaps it is simply an artifact, but since this species also differs from other species, we are maintaining *S. pharynxcircunfusata* as a valid species.

Habitat. Inside crevices in calcareous concretions, intertidal.

Distribution. Only known from the type-locality, Broome, Western Australia.

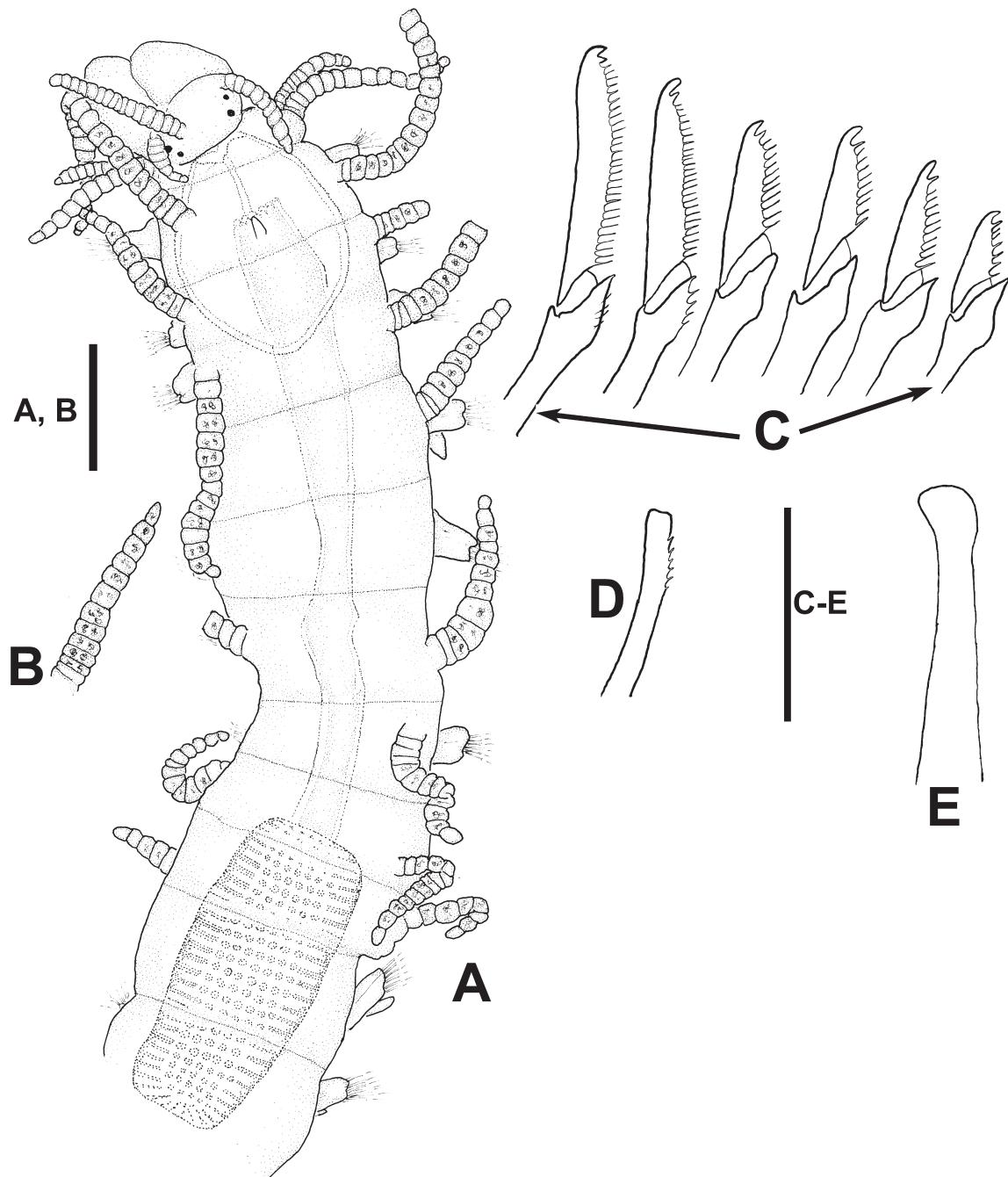


FIGURE 14. *Syllis pharynxcircunfusata* (Hartmann-Schröder, 1979) n. comb. HZM P-15471 Holotype. A, anterior end, dorsal view. B, midbody dorsal cirrus. C, falcigers, midbody parapodium. D, dorsal simple chaeta. E, acicula, posterior parapodium. Scale. A, B: 0.1 mm. C–E: 20 µm.

Syllis profunda Cognetti, 1955

Figures 15, 16

Syllis variegata profunda Cognetti, 1955: 3, Fig. 2b; 1957: 20–21, Fig. 4b.

Syllis alternata non Moore, 1908.—San Martín & Viéitez 1984: 153, Figs 1, 2.—San Martín 2003: 354, Figs 192, 193.—Çinar & Gambi 2005: 754–755.—Çinar & Ergen 2003: 777–778, in partim.—Aguado *et al.* 2008: 20.

Syllis profunda.—Langeneck *et al.* 2018: 209, Fig. 7.

Typosyllis cf. *variegata*.—Hartmann-Schröder 1960: 75, Figs 16–20.

Material examined. AUSTRALIA, NEW SOUTH WALES: NSW 699, 100 m south of Split Solitary Island, 30° 15' S, 153° 10' 30" E, coll. 23 June 1992, 16.6 m, hand collected on SCUBA, lace bryozoan, AM W.29503, 7 specimens. North West Solitary Island, Manta Reef, 30° 01' 30" S, 153° 16' 30" E, coll. 25 June 1992, 19 m, hand collected on SCUBA, lace bryozoan, AM W.29510, 7 specimens. Elizabeth Reef, reef flat near “Yoshin Maru Iwaki” wreck, 29° 55' 48" S, 159° 01' 18" E, coll. 14 Dec 1987, intertidal, small heads of *Acropora valida*, *Pocillopora damicornis*, AM W.53819, 1 specimen. Bass Point, 34° 36' S, 150° 54' E, coll. 03 Jan 1991, 40 m, Smith-McIntyre Grab, AM W.29516, 1 specimen. NSW 1336, Northern side of Bannister Head, 35° 19' 09" S, 150° 29' 07" E, coll. 6 May 1997, 18 m, hand collected on SCUBA, grey sponge from top of boulder, AM W.53821. WESTERN AUSTRALIA: WA 222, Houtman Abrolhos Islands, Goss Passage, north end of Long Island, 28° 28' 18" S, 113° 46' 18" E, coll. 22 May 1994, 8 m, hand collected on SCUBA, dead coral covered in coralline and brown algae, AM W.53826, 5 specimens. WA 523, Houtman Abrolhos Islands, north end of Long Island, Goss Passage, 28° 27' 54" S, 113° 46' 18" E, coll. 22 May 1994, 8 m, hand collected on SCUBA, dead coral covered in coralline algae, AM W.53824, 1 specimen. WA 521, Houtman Abrolhos Islands, Goss Passage, north end of Long Island, 28° 28' 18" S, 113° 46' 18" E, coll. 22 May 1994, 8 m, hand collected on SCUBA, dead coral covered in coralline algae, AM W.53822, 1 specimen. WA 528, Houtman Abrolhos Islands, Goss Passage, Beacon Island of jetty adjacent to Fisheries Hut, coll. 12 m, 23 Jun 1994, AM W.53815, 3 specimens. WA 518, Houtman Abrolhos Islands, Beacon Island, Goss Passage, 28° 25' 30" S, 113° 47' E, coll. 22 May 1994, 8 m, hand collected by SCUBA, dead coral covered in coralline algae, AM W.53817, 6 specimens. St.101, Kimberley region, south-west corner of Lucas Island, 15° 13' S, 124° 31' E, coll. 24 July 1988, 30 m, hand collected of SCUBA, AM W.53818, 3 specimens. St. 54, Kimberley region, Condillac Island, 14° 06' S, 125° 33' E, coll. 16 Jul 1988, coll. P. Hutchings, AM W.53820, 1 specimen. Site 50, Kimberley region, East Montalivet Island, 15° 06' S, 125° 18' E, coll. 15 July 1988, intertidal, AM W.53816, 1 specimen. NORTHERN TERRITORY: NT 319, Darwin Harbour, Dudej Point, 12° 24' 54" S, 130° 49' E, coll. 18 July 1993, 8 m, collected on SCUBA, coral rubble & algae, AM W.53823, 1 specimen.

Diagnosis. Body of very large size. Antennae, tentacular and dorsal cirri very long, slender. Compound chaetae bidentate falcigers, with short spines on margin of blades. Posterior aciculae straight, protruding out from parapodial lobes. Pharynx and proventricle long.

Description. Large, pale, colourless species. Body long and relatively slender, with long to very long, slender dorsal cirri. Longest complete specimen, 21 mm long, 1.35 mm wide, with 145 chaetigers; average size specimen, 14 mm long, 1 mm wide, for 117 chaetigers. Prostomium semicircular, with two pairs of eyes in trapezoidal arrangement (Fig. 15A). Median antenna long, distinctly longer than combined length of prostomium and palps together, inserted between posterior eyes, with about 44 articles; lateral antennae inserted in front of anterior eyes, with 28–30 articles. Palps broad, triangular, slightly longer than prostomium, fused at base, with distinct median groove. Peristomium much shorter than subsequent segments, dorsally covered by first chaetiger, with two pairs of tentacular cirri (Fig. 15A). Dorsal tentacular cirri slightly longer than lateral antennae, with about 33 articles, ventral ones with 22 articles. Dorsal cirri very long, several times longer than body width; dorsal cirri of first chaetiger very long, with 57–60 articles, those of chaetiger 2 and three short, with 28 and 35 articles respectively, those of chaetiger 4 longer, with 55 articles; remaining dorsal cirri alternating long and shorter ones, with marked difference of length between long and short cirri; in midbody, long cirri with more than 50 articles and short ones with about 25–30, sometimes 40 articles (Fig. 15B, C). Ventral cirri digitiform, inserted proximally, elongated, longer than parapodial lobes, or similar in length (Fig. 15B, C). Parapodial lobes conical, with pre- and postchaetal lobes, prechaetal longer than postchaetal. Compound chaetae falcigers, with distinctly bidentate blades, short spines on margin (Fig. 16A, B, C), and dorso-ventral gradation in length. Anterior parapodia each with 11–12 chaetae, blades 43 µm long above 28 µm long below (Fig. 16A); midbody chaetigers with eight compound chaetae, similar to those of anterior parapodia, but more robust, with thicker shafts, shorter blades and more markedly bidentate, blades 36

μm long above, $25\ \mu\text{m}$ below (Fig. 16B). Posterior parapodia each with six compound chaetae, with thick shafts and a subdistal protuberance, short and markedly bidentate blades, small dorso-ventral gradation, about $26\ \mu\text{m}$ long above, $21\ \mu\text{m}$ below (Fig. 16C). Dorsal and ventral simple chaetae on far posterior segments, similar, bidentate, both teeth similar, short subdistal spines. Anterior parapodia each with five aciculae (sometimes 6–7 in larger specimens), three of them larger than remaining, distally pointed, and two smaller, one pointed and one distally bent (Fig. 16D), reducing to two on midbody parapodia, one larger and other smaller, pointed (Fig. 16E), and solitary on posterior parapodia, very thick, somewhat blunt distally, straight, protruding beyond parapodial lobes (Fig. 16F). Pygidium with two long anal cirri, each with about 20–24 articles, and one short median stylus. Pharynx long, extending through 10–11 segments; tooth conical, on anterior margin. Proventricle extending through 14 segments, with about 33 muscle cell rows.

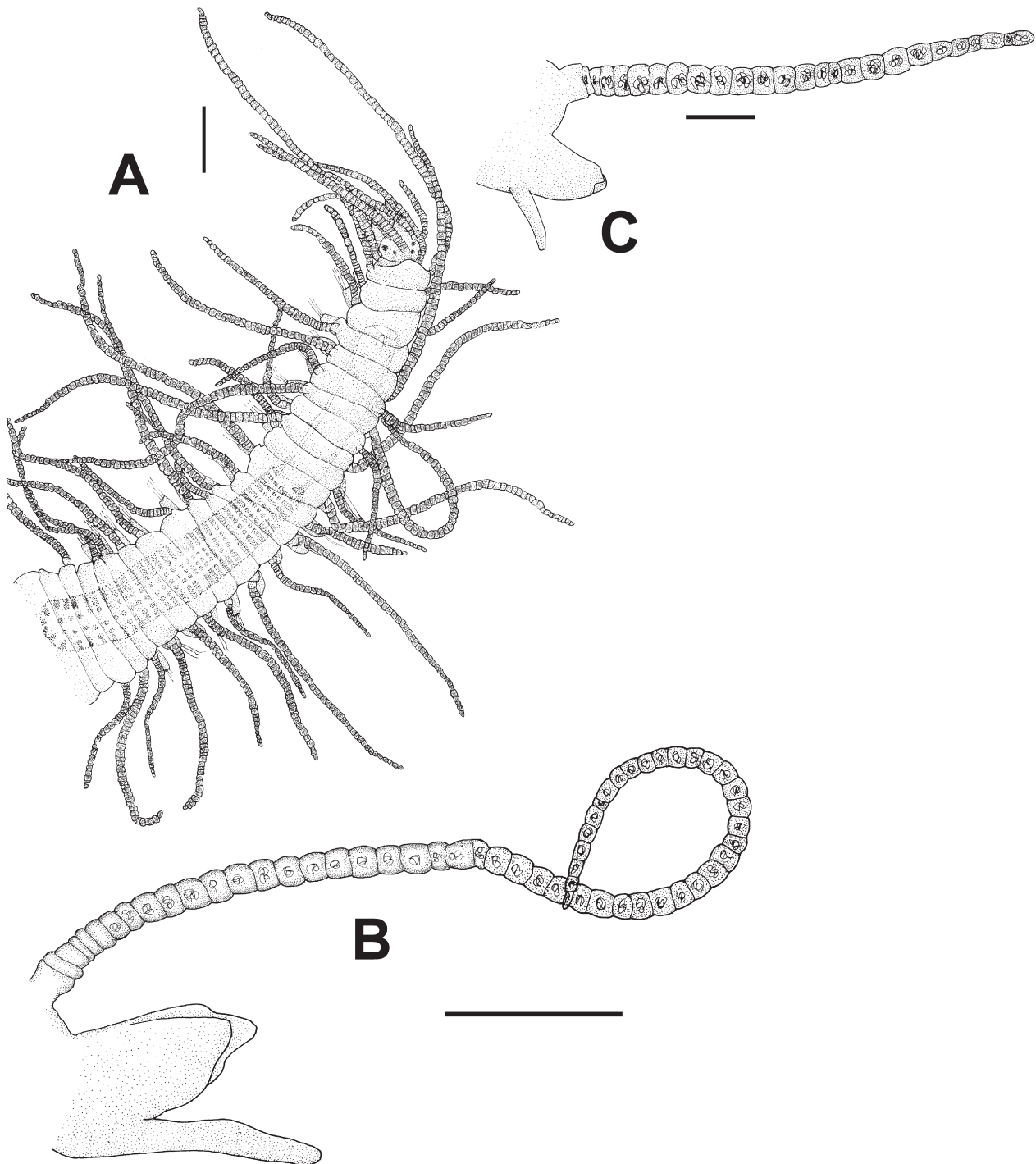


FIGURE 15. *Syllis profunda* Cognetti, 1955. AM W.29503. A, anterior end, dorsal view. B, midbody parapodium with long dorsal cirrus, lateral view. C, midbody parapodium with short dorsal cirrus, lateral view. Scales. A: 0.1 mm. B, C: 0.1 mm

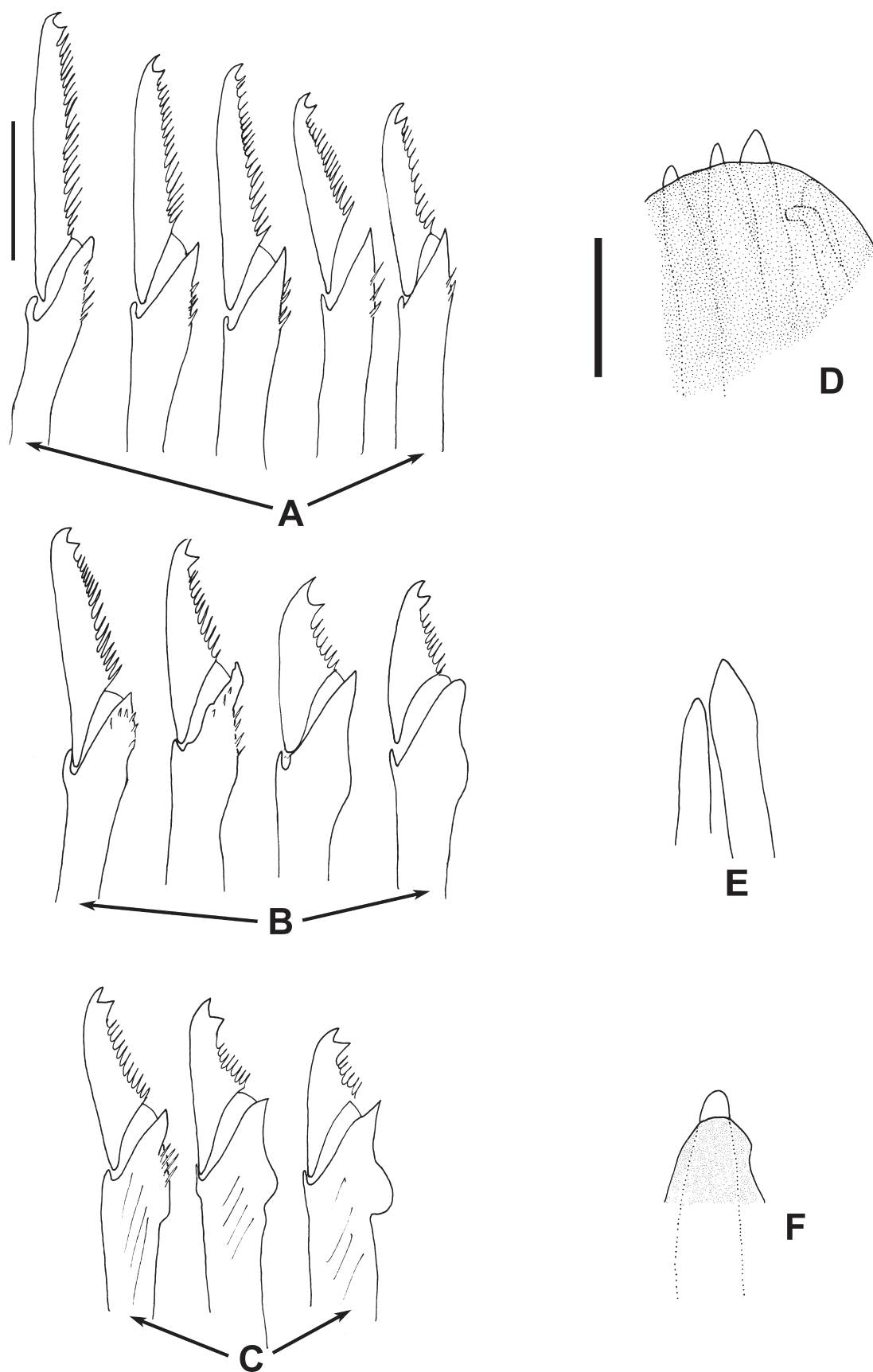


FIGURE 16. *Syllis profunda* Cognetti, 1955. AMW.29503. A, falcigers, anterior parapodium. B, falcigers, midbody parapodium. C, falcigers, posterior parapodium. D, aciculae, anterior parapodium. E, aciculae, midbody parapodium. F, acicula, posterior parapodium. Scale: 20 μ m.

Remarks. The Australian specimens agree with the Mediterranean specimens described as *Syllis alternata* Moore, 1908 by San Martín (2003) and later considered by Langeneck *et al.* (2018) as *Syllis profunda* Cognetti, 1955, which was originally described as a subspecies of *Syllis variegata* Grube, 1860. It is a species of large size (some Mediterranean specimens reach up to 40 mm long), with marked alternation of dorsal cirri length, being long, slender, whip-shaped. Preserved specimens lack colour pattern; however, some live Mediterranean specimens have a very slender orange transverse line on anterior margin of segments.

Licher's (1999) description of *S. alternata* based on the type specimens from N. Pacific, shows compound chaetae with more elongated blades, provided with small proximal tooth; instead, both the Australian and Mediterranean specimens have more robust blades with a marked, triangular proximal teeth on blades. Although similar in body shape, they are two different species.

Habitat. In the Mediterranean this species lives in *Posidonia oceanica* rhizomes, calcareous biogenic concretions, dead corals and even as epibionts on some gorgonians, in some depth, absent on shallow habitats. In Australia it seems to live in shallow water habitats.

Distribution. Mediterranean. Indonesia. Australia (NSW, WA, NT). Red Sea. This widespread distribution should be confirmed by molecular studies as it may represent a suite of cryptic species.

Syllis similisunzima n. sp.

Figures 17, 18

Material examined. AUSTRALIA. NEW SOUTH WALES: NSW 3382, Pittwater, pontoon 400 m east of The Basin, 33° 36' 09" S, 151° 17' 49" E, coll. 4 May 2009, 11.9 m, hand collected on SCUBA, scraping of pontoon, Holotype AM. W.35404; Sydney Harbour, White Bay Berth 3, 33° 51' 47" S, 151° 11' 00" E, coll. 5 March 2009, 11.8 m, hand collected on SCUBA, scraping of wharf, AM W.53806, 5 paratypes.

Diagnosis. Single transversal, purple to brown, band on anterior segments; double band from segments anterior to proventricle backwards. Dorsal cirri long and slender, alternating in length in midbody. Compound chaetae bidentate falcigers, with small proximal tooth and short spines on margin. Posterior aciculae distally rounded, apparently hollow on tips. Pharyngeal tooth located back from anterior margin of pharynx.

Description. Longest complete paratype, broken into two pieces, 7 mm long, 0.47 mm wide, 61 chaetigers. Holotype smaller, an anterior part with regenerating posterior end, 4.2 mm long, 31 chaetigers. Body of medium size, elongate, cylindrical, with a distinctive colour pattern, anterior segments dorsally dark, each segment with a purple to brown or reddish band, anteriorly less marked; from proventricle onwards two slender transverse bands, anterior larger and less marked, posteriorly thin and darker; from midbody, only one thin transverse band, present just before intersegmental furrow, and some scattered spots of pigment dorsally on segments (Fig. 17A), or forming two rows, anterior light and posterior darker; some scattered pigment on prostomium. Prostomium oval, with two pairs of red eyes in trapezoidal arrangement and pair of anterior eyespots (Fig. 17A). Palps triangular, as long as prostomium. Antennae, tentacular and dorsal cirri slender and distinctly articulated (Fig. 17A, B). Median antenna much longer than prostomium and palps together, with about 37 articles, arising between posterior pair of eyes; lateral antennae distinctly shorter than median one, about half the length, with about 30–32 articles, originating in front of anterior pair of eyes (Fig. 17A). Peristomium shorter than subsequent segments; dorsal tentacular cirri similar to median antenna, with about 30 articles, ventral pair shorter, with about 18 articles. Dorsal cirri longer than body width, longer on anterior segments, with about 40, 15, 34, 37 articles on first four segments, and alternating in length in midbody and posteriorly, with about 36 articles longer, 20 articles shorter ones (Fig. 17B), diminishing in length posteriorly. Ventral cirri short, digitiform, not extending beyond parapodial lobes. Parapodial lobes distally bilobed (Fig. 17A). All falcigers heterogomph, bidentate with proximal tooth small, distally hooked, with long, thin spines on margin, numbering 7–8 per parapodium throughout; slight dorso-ventral gradation on anterior parapodia (Fig. 18A), 40 µm above, 25 µm below; compound chaetae of midbody all similar (Fig. 18B), broader than those of anterior segments, 33 µm above, 25 µm below; posterior compound chaetae (Fig. 18C) with smaller blades, 23–16 µm. Dorsal simple chaeta on posterior chaetigers, slender, subdistally spinulated, finely bidentate (Fig. 18D); ventral simple chaetae thin, sinuous, finely bidentate (Fig. 18E). Three aciculae in each anterior parapodium, distally rounded, difficult to see (Fig. 18F), two in midbody, distally rounded and hollow (Fig. 18G) and solitary in mid-posterior and posterior parapodia, distally hollow (Fig. 18H). Pharynx long, extending through 8–10 segments; large,

conical tooth distinctly distant to anterior margin (Fig. 17A). Proventricle similar in length to pharynx, extending through 6–8 segments, with about 40–48 muscle cell rows, with midline (Fig. 17A). Pygidium rounded, with a digitiform median stylus and two long anal cirri, with about 40 articles.

Remarks. *Syllis similisunzima* n. sp. is very similar to *Syllis unzima* Simon, San Martín & Robinson, 2014, from South Africa; both have similar colour pattern, size, shape of dorsal cirri, bilobed parapodial lobes, long and distinct pharyngeal tooth located distally from anterior margin of pharynx, and compound chaetae with slightly hooked blades. However, *S. similisunzima* n. sp. has darker pigmentation on anterior segments, the transverse row of pigment on midbody and posterior segments is just in front of the subsequent intersegmental furrow, not after, as happens in *S. unzima*, the blades of compound chaetae in *S. similisunzima* are bidentate (although the proximal tooth is small), whereas they are unidentate in *S. unzima*, the anterior chaetae in *S. similisunzima* are longer than those of *S. unzima*, the compound chaetae of *S. unzima* have longer spines on the margin than those of *S. similisunzima*, and finally, *S. similisunzima* has a longer proventricle than *S. unzima*, with more muscle cell rows and a marked midline, which is lacking in *S. unzima*.

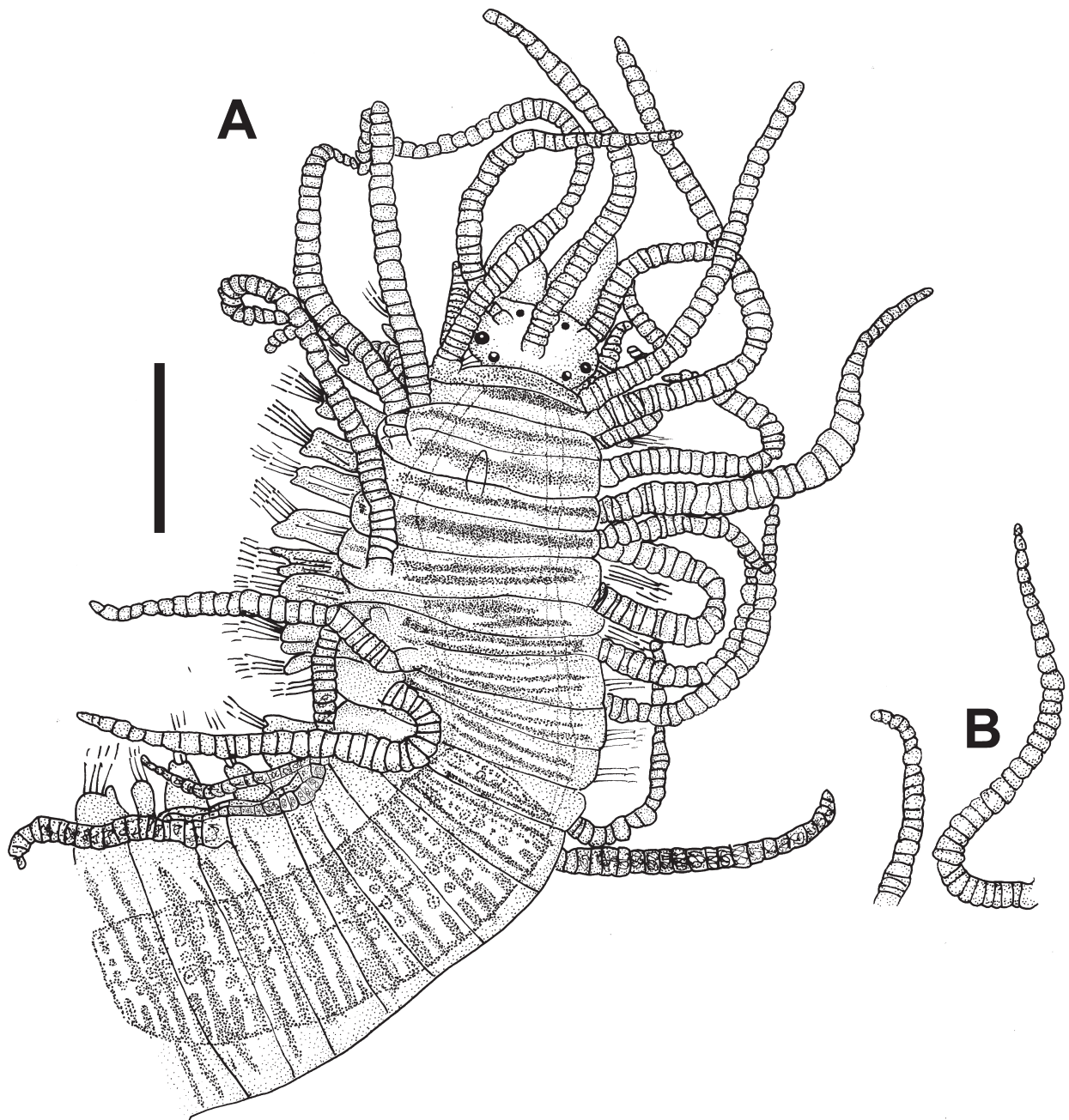


FIGURE 17. *Syllis similisunzima* n. sp. Holotype, AM. W.35404. A, anterior end, dorsal view. B, midbody long and short dorsal cirri. Scale. 0.2 mm

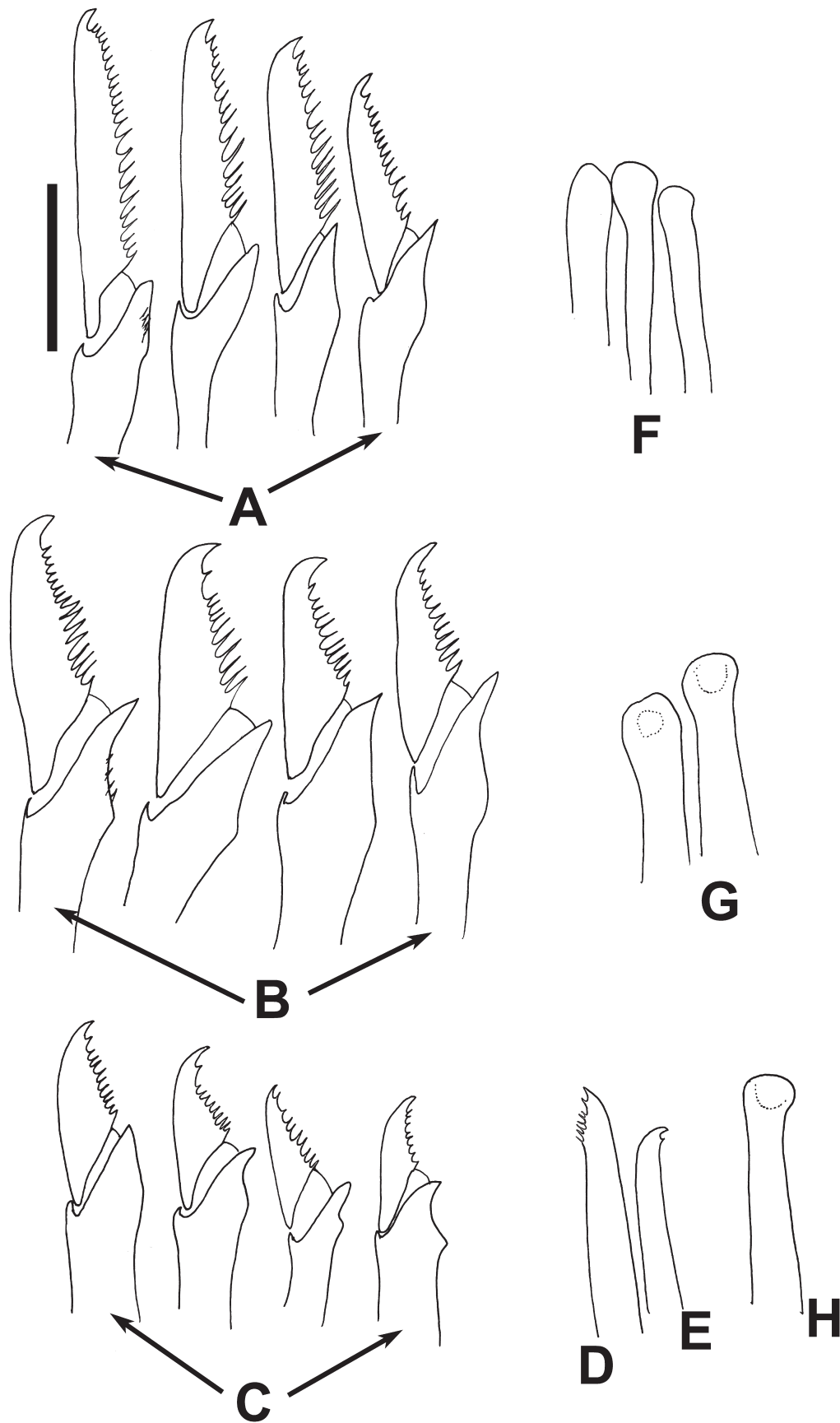


FIGURE 18. *Syllis similisunzima* n. sp. Holotype, AM. W.35404. A, falcigers, anterior parapodium. B, falcigers, midbody parapodium. C, falcigers, posterior parapodium. D, dorsal simple chaeta. E, ventral simple chaeta. F, aciculae, anterior parapodium. G, aciculae, midbody parapodium. H, acicula, posterior parapodium. Scale. 20 μ m.

Furthermore, *S. unzima* is a viviparous species living associated with sea cucumbers of the genus *Holothuria*; none of the specimens of *S. similisunzima* shows any sign of viviparity, and they are free living.

Etymology. The species is named after its similarity to *Syllis unzima* Simon, Robinson & San Martín, 2014; *similis* is a latin word that means “similar to”.

Habitat. Scrapings of pylons in 12 m depth.

Distribution. Australia (NSW).

Syllis thylacine n. sp.

Figure 19

Material examined. AUSTRALIA, NEW SOUTH WALES: MI NSW3427, north east of Kurnell, “Anchor Reef”, 34° 00' 33" S, 151° 13' 51" E, coll. 16 Mar 2009, 17.6 m, coarse-medium shelly sediment with echinoid spines, holotype AM W.53916, paratypes, AM W.53917, 2 specimens.

Additional material examined: NEW SOUTH WALES: Maroubra Beach, 33° 57' S, 151° 15' E, coll. 21 Apr 2005, 0.5 m, M. Capa, algae *Corallina* and *Udotea* in intertidal pools, AM W.53915, 2 specimens.

Diagnosis. Single, slender, transverse reddish band on posterior part of each segment and two spots on bases of cirrophores. Dorsal cirri long, alternating in length in midbody. Compound chaetae bidentate falcigers. Posterior aciculae distally rounded, with apparently hollow tips. Pharynx and proventricle of similar length.

Description. Holotype, complete specimen, 5 mm long, 0.4 mm wide, with 55 chaetigers. Body wide, orange-yellowish, with a slender transverse reddish band on the posterior margins of each segment and a lateral spot on bases of each cirrophore (Fig. 19A). Prostomium almost pentagonal; four eyes in open trapezoidal arrangement and two anterior eyespots. Palps similar in length to prostomium. Median antenna arising in center of prostomium, with about 33–35 articles, distinctly longer than combined length of prostomium and palps; lateral antennae shorter than median one, with about 22–23 articles (Fig. 19A). Peristomium markedly shorter than subsequent segments (Fig. 19A). Dorsal tentacular cirri longer than median antenna, with about 38–40 articles; ventral tentacular cirri distinctly shorter than dorsal ones, with about 15 articles. Dorsal parapodial cirri long, those of anterior chaetigers longer than subsequent ones with 40–42/30/34/40/25 articles on first five chaetigers; remaining dorsal cirri alternating long, longer than body width, and short, similar to body width, with 28–30/20 articles respectively (Fig. 19A). Parapodia distally slightly bilobed. Ventral parapodial cirri digitiform. Compound chaetae all markedly bidentate falcigers, with proximal teeth similar or larger than distal teeth (Fig. 19B–D) and short to moderate straight spines on margin, diminishing in length from basal to distal parts; shafts of posterior chaetae somewhat larger and more strongly bidentate than those of anterior parapodia. Anterior parapodia each with 10–12 compound chaetae, blades with dorso-ventral gradation, 25 µm long above, 13 µm long below (Fig. 19B); midbody parapodia each with about 6–8 compound chaetae, with less marked dorso-ventral gradation in length than those of anterior parapodia and blades strongly bidentate, less marked dorso-ventral gradation in length of blades, about 22 µm long above, 12 µm long below (Fig. 19C); posterior parapodia each with six compound chaetae, strongly bidentate blades, similar in length to those on midbody. Dorsal simple chaetae on midbody and posterior parapodia, distally bifid, with minute spines on margin (Fig. 19F). Ventral simple chaetae on far posterior segments, slender, smooth, bidentate, (Fig. 19G). Aciculae distally rounded, apparently hollow on tips (Fig. 19H–J), two on each anterior parapodium, and solitary on each midbody and posterior parapodia. Pharynx extending through about eight segments; pharyngeal tooth dagger-shaped, located close to anterior margin (Fig. 19A). Proventricle through about seven segments, with about 32 muscle cell rows. Pygidium with two anal cirri, and median stylus.

Remarks. *Syllis thylacine* n. sp. is similar to the Australian species *S. busseltonensis* Hartmann-Schröder, 1982, described above, and *S. prolifera* Krohn, 1852, an apparently world- wide species, but these species lack any colour pattern, the dorsal cirri are not as long as in *S. thylacine* n.sp. and there are some small differences in the details of the chaetae, although similar in all these species. These species have slender aciculae, ending in a rounded tip, apparently hollow. There are only a few other species of *Syllis* with this type of aciculae, such as *S. vivipara* Krohn, 1869; *S. proluxa* Ehlers, 1901, from Southern Chile and Argentina, as well as Antarctica; *S. rubicunda* Aguado, San Martín & Nishi, 2006, from Japan; *S. antoniae* Salcedo-Oropeza, San Martín & Solís-Weiss, 2012, from the Pacific coast of México; *S. zahri* Sedick & Simon, 2019, and *S. unzima* Simon, San Martín & Robinson, 2014, both from South Africa; *S. escribanoi* San Martín, Lucas & Westheide, 2021, from China; and the above described species

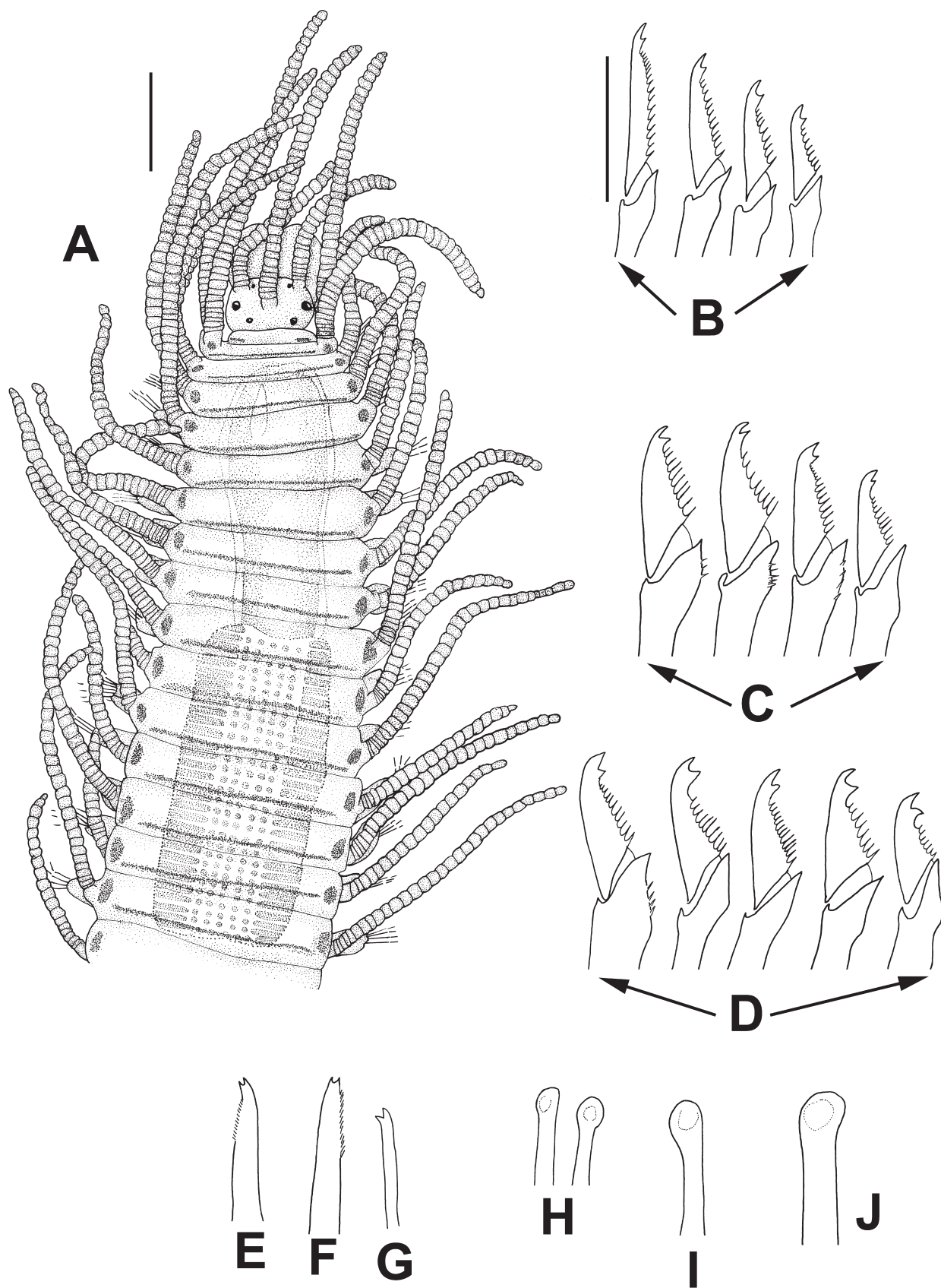


FIGURE 19. *Syllis thylacine* n. sp. Holotype, AM W.53916. A, anterior end, dorsal view. B, falcigers, anterior parapodium. C, falcigers, midbody parapodium. D, falcigers, posterior parapodium. E, dorsal simple chaeta, midbody parapodium. F, dorsal simple chaeta, posterior parapodium. G, ventral simple chaeta. H, aciculae, anterior parapodium. I, acicula, midbody parapodium. J, acicula, posterior parapodium. Scale. A: 0.2 mm. B–J: 20 µm.

S. similisunizima. *Syllis vivipara* and *S. unzima* are viviparous species (see Krohn, 1869; Goodrich, 1900; San Martín, 2003; Simon *et al.* 2014), with almost unidentate blades; *S. vivipara* lacks any colour pattern and *S. unzima* has a different colour pattern to *S. thylacine* n. sp., with two slender dark bands on each segment. Also *S. escribanoi*, *S. antoniae*; and *S. proluxa*, lack colour patterns and the chaetae are unidentate or with small proximal teeth (Ehlers 1901; Salcedo-Oropeza *et al.* 2012; San Martín *et al.* 2021). *Syllis rubicunda* has broad dorsal cirri and a red or orange uniform colour pattern (Aguado *et al.* 2006). *Syllis zahri* is light pink to light brown, with two dark brown bars across dorsum on anterior and posterior margins of anterior segments, and the chaetae are not as strongly bidentate as in *S. thylacine* n. sp.

Syllis malaquini Ribeiro, Ponz-Segrells, Helm, Egger & Aguado, 2020, has a similar colour pattern, but the body is slender, the dorsal cirri are much shorter, the pharynx and proventricle are much longer and the aciculae are acuminate.

Haswell (1886) described from the same area the species *Gnathosyllis zonata*, which is considered by Licher (1999) as synonym of *S. proluxa*. It was described based on a single, incomplete specimen; the chaetae seem to be similar to those of *S. thylacine* n. sp., but the colour pattern is different, with two transverse bands on the dorsum of each segment and purple rings on dorsal cirri, so we consider them as different species. Unfortunately, the type is lost so the status of this species cannot be confirmed unless additional material is collected and a neotype designated.

Etymology. The species is named after the Tasmanian Wolf (*Thylacinus cynocephalus*), an extinct carnivorous marsupial, which also had distinctive stripes on its back.

Habitat. Shelly sediments with echinoid spines, from intertidal to 11.8 m depth.

Distribution. Australia (NSW).

***Syllis truncata* Haswell, 1920**

Figure 20

Syllis truncata Haswell, 1920: 94, pl. 10, figs 7–14.

Typosyllis truncata.—Licher 1999: 160, pl. 71.

Typosyllis subterranea.—Hartmann-Schröder, 1962: 93, Figs 72–74; 1965b: 288.

Material examined. AUSTRALIA, QUEENSLAND: 01-Liz 52-2, Outer Yonge Reef, Great Barrier Reef, 14°36' S, 145°38'E, coll. 24 Jan 1977, 30 m, hand collected on SCUBA, coral rubble, AM W.53808, 6 specimens. NEW SOUTH WALES: Boat Harbour, south of Port Stephens, 32° 46' 59" S, 152° 06' E, coll. 14 March 2006, hand collected on snorkel, in amongst *Galeolaria caespitosa*, AM W.53811, 4 specimens. Newport, 33° 39' S, 151° 19' E, coll. 22 Jul 2005, intertidal rock pools in *Corallina* sp., AM W.53810, 1 specimen. NSW 3399, Sydney Harbour, White Bay Berth 3, 33° 51' 47" S, 151° 11' 00" E, coll. 05 March 2009, 11.8 m, hand collected on SCUBA, scraping on wharf piles, AM W.53812, 3 specimens. WESTERN AUSTRALIA: St. 21, Ningaloo Reef, 22° 17' 00" S, 118° 48', coll. 19 June 2008, intertidal algal turf, AM W.53809, 2 specimens. St. 50, Kimberley region, East Montalivet Island, 15° 06' S, 15° 06' S, coll. 15 July 1988, intertidal, AM W.53813, 1 specimen.

Additional material examined. AUSTRALIA, NEW SOUTH WALES. Port Jackson, Lectotype, AM W 506.

Diagnosis. Segments wide and short. Dorsal cirri similar in length to body width or shorter. Compound chaetae with few, usually one, dorsal falcigers with blade bidentate and short spines on margin, slender and longer than remaining, distally broad; remaining chaetae with shorter blades, bidentate and moderately long spines on margin. Dorsal simple chaetae truncate. Posterior aciculae with tip ending in right angle.

Description. Longest complete specimen 10 mm long, 0.5 mm wide, with 114 chaetigers. Body relatively long, thick, with wide and short, well-marked segments, without colour pattern (up to 20 mm long, 120 chaetigers, reddish when alive, according to Haswell 1920); small specimens much more slender, filiform. Prostomium rectangular; four eyes in trapezoidal arrangement. Palps broad, similar in length to prostomium (Fig. 20A). Median antenna arising between posterior eyes, with 20–23 articles, almost twice as long as combined length of prostomium and palps; lateral antennae shorter than median one, with 15–17 articles. Peristomium dorsally distinctly shorter than subsequent segments (Fig. 20A). Dorsal tentacular cirri similar in length to, or slightly longer than, median antenna, with about 22 articles; ventral tentacular cirri about 2/3 as long as dorsal ones, with 13–14 articles. Dorsal parapodial cirri shorter than body width, with well marked articles; distinct, large, hyaline inclusions inside the

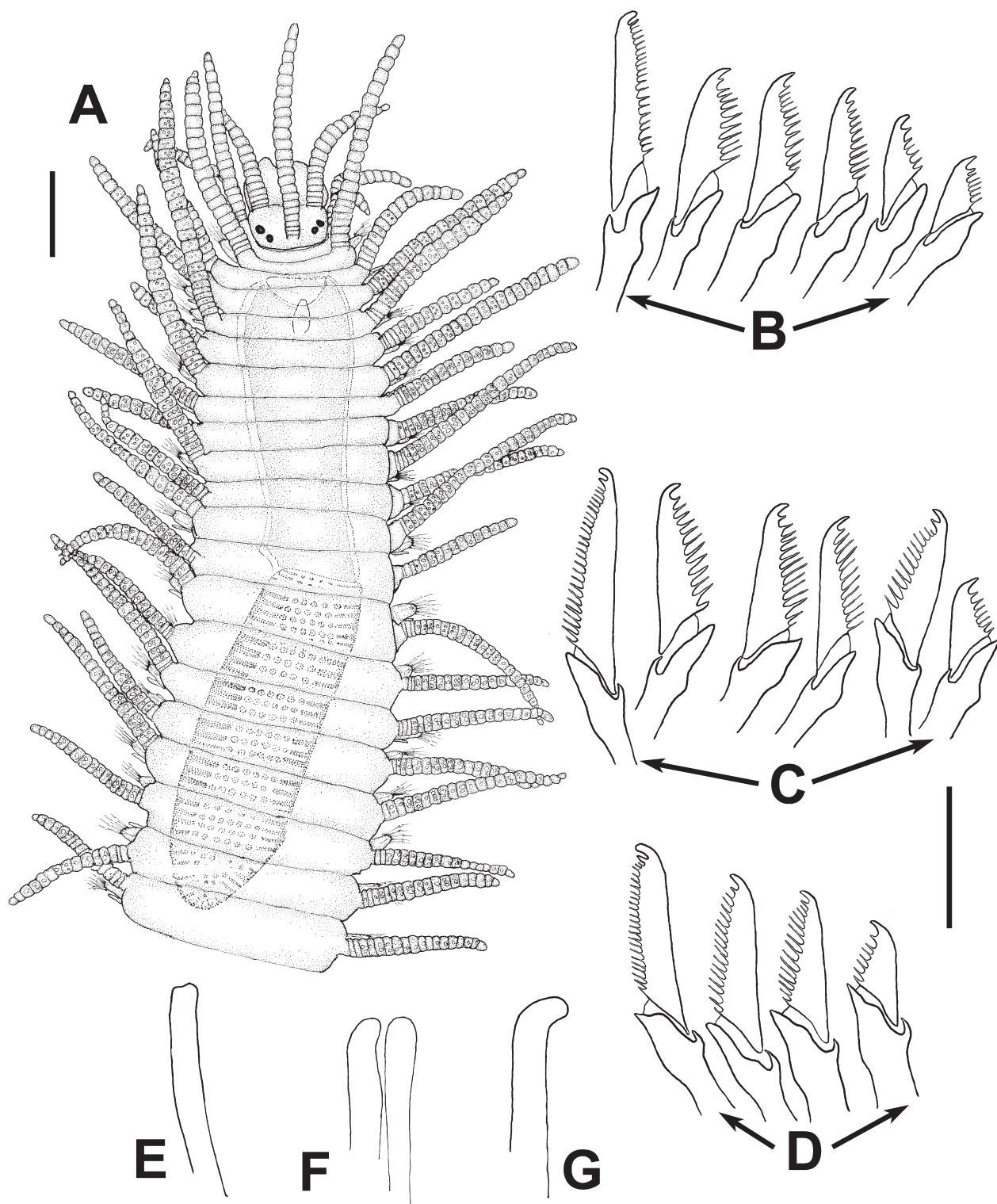


FIGURE 20. *Syllis truncata* Haswell, 1920. AM W.53811. A, anterior end, dorsal view. B, falcigers, anterior parapodium. C, falcigers, midbody parapodium. D, falcigers, posterior parapodium. E, dorsal simple chaeta. F, aciculae, anterior parapodium. G, acicula, posterior parapodium. Scale: A: 0.2 mm. B–G: 20 µm.

dorsal parapodial cirri, especially from proventricular segments onwards (Fig. 20A), alternating long and short, no marked difference of length, with about 22 articles long ones, 15 articles on short ones in midbody (Fig. 20A). Parapodia conical. Ventral parapodial cirri digitiform, shorter than parapodial lobes. Compound chaetae of each parapodium with 1–2 dorsalmost chaetae provided with distinctly longer and slender blades, distally rounded on

tip, and small proximal tooth, close to distal one, straight or slightly curved, and moderate spines on margins (Fig. 20B, C, D, left), 28 µm on anterior parapodia, somewhat longer, 32 µm on midbody and posterior parapodia, and about 8–10 chaetae with shorter blades, distally acute, with proximal tooth smaller than distal one, longer spines on margin, and dorso-ventral gradation in length, 21–13 µm long on anterior parapodia, 25–14 µm on midbody and posterior parapodia. Blades of remaining chaetae of each parapodium with more separated teeth and longer spines on margin (Fig. 20B, C, D), and dorsoventral gradation in length. Dorsal simple chaetae only on posterior parapodia, distally truncate (Fig. 20E). Ventral simple chaetae only on far posterior segments, minute, apparently unidentate, only seen on one specimen. Anterior parapodia with two slender aciculae each, distally rounded (Fig. 20F), reducing to one on midbody and posterior parapodia, distally ending in right angle (Fig. 20G). Pharynx long, extending through about 11 segments; pharyngeal tooth elongated, conical, acute, on anterior margin of pharynx (Fig. 20A). Proventricle similar in length to pharynx, through eight segments, with about 30 muscle cell rows. Pygidium with two anal cirri, and a median stylus.

Remarks. *Syllis truncata* belongs to a group of species with truncate dorsal simple chaeta and posterior aciculae ending in right angle (foot-like). Some Australian species of this group are *S. albanyensis* (Hartmann-Schröder, 1984), *S. erikae* (Hartmann-Schröder, 1981), *S. macrodentata* (Hartmann-Schröder, 1982), *S. rosea* (Langerhans, 1879), *S. edensis* (Hartmann-Schröder, 1989), were redescribed in the two previous papers on Australian *Syllis* (Álvarez-Campos *et al.* 2015, San Martín *et al.* 2017) as well as *S. pharyncircunfusata* (Hartmann-Schröder, 1979) (see above). Other species of this group are the European species *S. amica* Quatrefages, 1865, *S. kabilika* Ben-Eliahu, 1977, *S. pulvinata* (Langerhans, 1881), *S. cryptica* Ben-Eliahu, 1977, *S. thyrrena* (Licher & Kuper, 1998) (see San Martín, 2003) (some also described or reported from other areas). The species of this group in which the sexual stolon is known have the Tetracerous type.

The examined specimens agree with Haswell's type specimen; such specimen was previously examined by Ben-Eliahu (1977) and was also redescribed by Licher (1999).

Habitat. Coral rubble, amongst serpulids, algae. Intertidal and subtidal.

Distribution. Australia (QLD, NSW).

Syllis variegata Grube, 1860

Fig. 21

Syllis variegata Grube, 1860: 85, pl. 3, fig. 6.—San Martín 2003: 351, Figs 190, 191.

Typosyllis (*Syllis*) *variegata*.—Langerhans, 1879: 532.

Syllis (*Typosyllis*) *variegata*.—Augener 1913: 206; 1927: 143.—Haswell 1920: 91, pl. 10, Figs 1, 2.—Fauvel 1923: 262, fig. 97 h–n.

Typosyllis (*Typosyllis*) *variegata*.—Hartmann-Schröder 1980: 50; 1981: 27; 1982: 59.

Typosyllis (*Typosyllis*) cf. *variegata*.—Hartmann-Schröder 1984: 16.

Typosyllis variegata.—Langerhans 1881: 532.—Day 1967: 248, Figs 12.3 g–i.—Hutchings & Rainer 1979: 752.—Hutchings & Murray 1984: 34.—Campoy 1982: 455, pl. 65.—Licher 1999: 101, fig. 49.

Material examined. AUSTRALIA, NEW SOUTH WALES: NSW 1298, Golf Course bommie, 500 m north-east of Ulladulla Head, 35° 20' 29" S, 150° 29' 12" E, coll. 2 May 1997, 15 m, gravel at base of boulders, AM W.53908, 4 specimens. Port Jackson, Middle Harbour, Fairlight, 33° 39' S, 151° 19' E, coll. 22 Jul 2005, 0–9 m, AM W.53923, 1 specimen. Port Jackson, Fairlight, 33° 48' S, 151° 17' E, coll. 19 Feb 2006, 1 m, balanoid barnacles and sponges, AM W.32040, 3 specimens. MI NSW 3427, north east of Kurnell, "Anchor Reef", 34° 00' 33" S, 151° 13' 51" E, coll. 16 Mar 2009, 17.6 m, coarse-medium shelly sediment with echinoid spines, AM W.53914, 1 specimen.

Diagnosis. Body robust. Transversal reddish ∞ shaped on anterior segments (sometimes indistinct after fixation). Dorsal cirri long, alternating in length in midbody. Compound chaetae bidentate falcigers with short spines on margin. Posterior aciculae straight, distally acute, protruding out from parapodial lobes.

Description. Longest complete specimen 9 mm long, 0.8 mm wide, with 86 chaetigers. Body robust, dark, with a light transverse figure of ∞ on dorsum of each anterior segment, absent after proventricular segments. Prostomium almost circular; four eyes in trapezoidal arrangement and two small anterior eyespots. Palps similar in length to prostomium (Fig. 21A), usually ventrally bent. Median antenna arising between posterior eyes, with about 16 articles, slightly longer than combined length of prostomium and palps; lateral antennae shorter than median one, with about 15 articles. Peristomium shorter than subsequent segments. Dorsal tentacular cirri similar

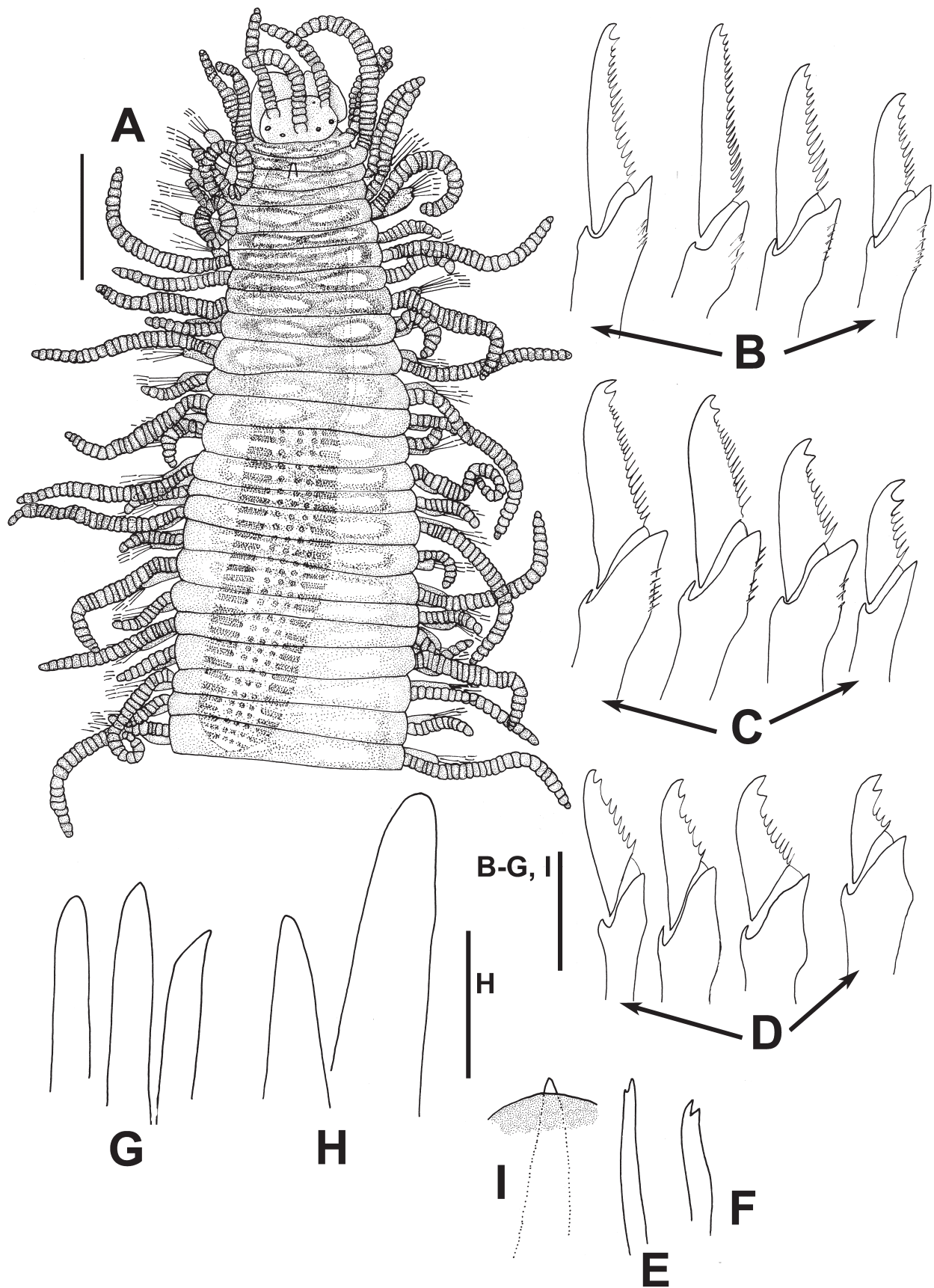


FIGURE 21. *Syllis variegata* Grube, 1860. AM W.53908. A, anterior end, dorsal view. B, falcigers, anterior parapodium. C, falcigers, midbody parapodium. D, falcigers, posterior parapodium. E, dorsal simple chaeta. F, ventral simple chaeta. G, aciculae, anterior parapodium. H, aciculae, midbody parapodium. I, acicula, posterior parapodium. Scale: A: 0.2 mm; B–I: 20 µm.

in length to median antenna, with similar number of articles; ventral tentacular cirri about half as long as dorsal ones. Dorsal parapodial cirri of first chaetiger distinctly longer than subsequent ones, with about 29 articles; dorsal parapodial cirri of anterior body chaetigers coiled over dorsum, with about 24 articles (long ones) to 12 articles (short ones); from proventricular segments, dorsal parapodial cirri alternating long, with about 28 articles, and short, with about 17 articles (Fig. 21A). Dorsal cirri dark, with numerous inclusions inside articles. Parapodia distally slightly bilobed. Ventral parapodial cirri digitiform, shorter than parapodial lobes. Compound chaetae with bidentate blades, proximal tooth shorter than distal one, and short spines on margin (Fig. 21B, C, D). Anterior parapodia with 14 compound chaetae each, with blades 40µm long above, 26µm long below (Fig. 21B); midbody parapodia with seven compound chaetae, with blades 37µm long above, 26µm long below (Fig. 21C); posterior parapodia with 5–6 compound chaetae each, with blades shorter, 26µm long above, 20µm long below (Fig. 21D). Dorsal simple chaetae on posterior parapodia only, slightly bidentate (Fig. 21E). Ventral simple chaetae only on far posterior segments, more distinctly bidentate than dorsal one (Fig. 21F). Anterior parapodia with three aciculae each, distally acute, one more slender than others and slightly distally oblique (Fig. 21G), two aciculae in each midbody parapodium, thick and distally straight, one larger than other (Fig. 21H), and one solitary acicula in each posterior-most parapodium, distally acute, extending beyond parapodial lobes (Fig. 21I). Pharynx extending through about 10 segments; pharyngeal tooth on anterior margin of pharynx (Fig. 21A). Proventricle through 12 segments, with about 30 muscle cell rows and a midline. Pygidium with two anal cirri, with 21–23 articles.

Remarks. All the Australian specimens agree fairly well with the descriptions of this species, but differ in some aspects. They seem to be more robust and some of them lack the typical colour pattern, probably because of the type of fixation and length of time in alcohol, and others have the colour pattern not as marked as those found in Mediterranean specimens. Furthermore, the Mediterranean specimens have the posterior aciculae more or less darkly pigmented, which are yellowish in the Australian examined specimens. *Syllis variegata* is considered as a cosmopolitan species, but seems unlikely; and a revision of worldwide populations *S. variegata* may reveal several cryptic species. Some species having the same characteristic colour pattern have been described, such as *Syllis westheidei* San Martín, 1984; *Syllis ferrani* Alós and San Martín, 1987; and *Syllis alosae* San Martín, 1992, as well as another species still undescribed from the Philippines (see San Martín 1992, 2003; Alós & San Martín 1987). In the case of the Australian specimens, we did not find sufficient morphological differences to describe as a different species, but we suggest that they may be a different species which needs to be confirmed by molecular studies.

Habitat. Found from intertidal to 18 m in shelly sediment.

Distribution. Apparently Cosmopolitan. May be a suite of cryptic species.

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