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# Eusyllinae (Polychaeta: Syllidae) from Australia with the Description of a New Genus and Fifteen New Species

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ABSTRACT. Large collections of Syllidae (Polychaeta) from around Australia, housed at the Australian Museum (Sydney), have been examined and identified. Australian material from the Hamburgische Zoologische Museum der Universität, Hamburg, Germany was also examined. All known Australian species of the subfamily Eusyllinae (Syllidae) are described and figured. Some were examined using the Scanning Electron Microscope to illustrate characters and methods of reproduction in this subfamily. Keys to genera and species are given. A total of 53 species are reported from Australia belonging to 14 genera: *Amblyosyllis* Grube, 1857 (3 species); *Anoplosyllis* Claparède, 1868 (1 species); *Astreptosyllis* Kudenov & Dorsey, 1982 (2 species); *Eusyllis* Malmgren, 1867 (3 species); *Nudisyllis* Knox & Cameron, 1970 (1 species); *Odontosyllis* Claparède, 1863 (9 species); *Opisthodonta* Langerhans, 1879 (3 species); *Paraehlersia* San Martín, 2003 (2 species); *Paraopisthosyllis* Hartmann-Schröder, 1991 (4 species); *Pionosyllis* Malmgren, 1867 (15 species); *Psammosyllis* Westheide, 1990 (1 species); *Streptodonta* n.gen. (1 species); *Streptosyllis* Webster & Benedict, 1884 (3 species); and *Syllides* Örsted, 1845 (5 species). A total of 15 new species are described: *Amblyosyllis enigmatica, A. multidenticulata, Odontosyllis marombibooral; Opisthodonta hanneloreae, Paraopisthosyllis alternocirra, P. ornaticirra, Syllides tam, Pionosyllis rousei, P. kalimna, P. yolandae, P. mariae, P. mayteae, P. ancori, P. koolalya*, and *P. heterochaetosa*. A new name, *Pionosyllis hartmannschroederae*, is proposed for *Typosyllis (Langerhansia) longisetosa* Hartmann-Schröder, 1990 as this is junior homonym of *Pionosyllis longisetosa* (Hartmann-Schröder, 1965).

Additionally, five species are new records for Australia: *Odontosyllis gravelyi* Fauvel, 1930; *Opisthodonta morena* Langerhans, 1879; *Pionosyllis corallicola* Ding & Westheide, 1997; *Streptodonta pterochaeta* (Southern, 1914) and *Syllides japonicus* Imajima, 1966. A discussion of the reproduction and systematics of the subfamily is given.

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This is the second contribution to the Australian Syllidae, based on the large collections housed in the Australian Museum from all around Australia, and revision of material collected and described by Hartmann-Schröder (1979–1991). The material examined was collected predominantly from southern Australia, and no material was examined from north of 14°S on either the west or east coast of Australia. This paper also summarises material already published by San Martín (2002, 2005) and San Martín & López (2003). A general introduction to the family Syllidae is given by

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San Martín (2005) in his revision of the subfamily Exogoninae in Australian waters. In this paper, all species belonging to the subfamily Eusyllinae are described and figured, and keys for identification provided. Comments are given on the other genera of Eusyllinae not currently known from Australia. Subsequent papers will deal with the subfamilies Syllinae and Autolytinae.

The subfamily Eusyllinae was erected by Malaquin (1893), for the genera *Syllides* Örsted, 1845; *Opisthodonta* Langerhans, 1879; *Pionosyllis* Malmgren, 1867; *Eusyllis* Malmgren, 1867; *Odontosyllis* Claparède, 1863; and *Amblyosyllis* Grube, 1857. Subsequently, Fauvel (1923) included the genera *Fauvelia* Gravier, 1900 (now considered a doubtful genus), *Streptosyllis* Webster & Benedict, 1884; and *Parapionosyllis* Fauvel, 1923 (now considered as belonging to the Exogoninae). Later, San Martín (2003) re-erected *Anoplosyllis* Claparède, 1868, and erected *Neopetitia* and *Paraehlersia* and placed them in the subfamily. Other genera considered to belong to the subfamily are *Palposyllis* Hartmann-Schröder, 1977; *Miscellania* Martín, Alós & Sardá, 1990; *Dioplosyllis* Gidholm, 1962; *Paraopisthosyllis* Hartmann-Schröder, 1991 (although with some doubts, see below); *Astreptosyllis* Kudenov & Dorsey, 1982; and *Streptospinigera* Kudenov, 1983. The genus *Psammosyllis* Westheide, 1990, which was not assigned to a subfamily when erected, is herein considered to belong to the Eusyllinae. In this paper, we erect a new genus, *Streptodonta*. Other genera previously assigned to this subfamily include: *Irmula* Ehlers, 1913 (now transferred to Hesionidae); *Clavisyllis* Knox, 1957; *Lamellisyllis* Day, 1960 (both questionable members of this subfamily); and *Rhopalosyllis* Augener, 1913 (now assigned to the Syllinae). *Nudisyllis* Knox & Cameron, 1970 is redefined. Currently 14 of these genera are known to occur in Australia.

This subfamily is heterogeneous and probably should be divided into several monophyletic groups (Glasby, 1994; San Martín, 2003). Until a detailed analysis (currently in preparation by senior author) is completed, however, we prefer to use the traditional classification of Eusyllinae.

A consistent diagnosis of this subfamily is difficult to provide because of the variability of many of the characters. Like most syllids, they are dorsally arched, convex, ventrally flat or concave. Size range of the subfamily Eusyllinae varies from minute to more than 30 mm long, occupying a similar range of habitats to members of Exogoninae (see San Martín, 2005). They often are fragile and Museum collections rarely contain complete, well-preserved specimens necessary for detailed studies. Eusyllinae typically lack colour markings. The palps are fused, partially fused or free from each other, depending upon the genera. Even within a genus, the degree of fusion of palps varies. *Nudisyllis* was originally described as lacking antennae and dorsal cirri, but this was based on data obtained from examination of damaged specimens, intact specimens have 3 antennae and dorsal cirri, so all Eusyllinae have three antennae that are typically long, extending beyond palps. Four lensed eyes and sometimes two additional eyespots are present, although these may fade with time on preserved material. The peristomium has two pairs of tentacular cirri, usually long and slender, and may be modified dorsally to form an occipital flap. Nuchal organs consist of two dorsolateral, densely ciliated grooves between the prostomium and peristomium. The genus *Amblyosyllis* (as well as *Clavisyllis* and *Lamellisyllis*) is characterized by having a nuchal organ consisting of two nuchal lappets, which strongly resemble those found in the subfamily Autolytinae. The pharynx is straight, except in *Amblyosyllis*, typically with a conical tooth that is located on the anterior margin opening or behind the anterior rim, or in the middle or posterior part of the pharynx. Other genera (*Syllides, Anoplosyllis, Streptosyllis, Astreptosyllis, Streptospinigera*) lack a pharyngeal tooth. These latter genera resemble each other and perhaps should be removed from the subfamily. *Amblyosyllis* has a long, slender, coiled pharynx, with a trepan, lacks a tooth, and margins of the pharynx are ornamented with soft papillae. This genus together with *Clavisyllis* and *Lamellisyllis* may also need to be removed from the Eusyllinae, since they have nuchal lappets instead of ciliated grooves as nuchal organs.

Parapodia are uniramous, with dorsal and ventral cirri, although dorsal cirri may be absent on chaetiger 2. Dorsal cirri typically are long, filiform, smooth, not articulated, although in *Paraopisthosyllis* and some species of *Pionosyllis* all or some are club-shaped and other species of *Pionosyllis* has short, exogonid-like dorsal cirri, although anteriorly they are long and smooth. Members of the Eusyllinae reproduce by epigamy (Garwood, 1991; Franke, 1999; San Martín, 2003). The eyes enlarge (see Figs 38A, 22A), colour patterns if present become far more marked and long, capillary notochaetae develop on middle and posterior segments (Figs 36D, 45E, 71B), which presumably are used in swimming. Members of the subfamily Exogoninae also reproduce by epigamy, but they attach their eggs either dorsally by means of capillary notochaetae of females, or ventrally by attaching them to the nephridial pore (San Martín, 2005). Some members of the genus *Nudisyllis* have been shown to brood dorsally, and some members of *Syllides* and *Pionosyllis* breed ventrally, but other information is lacking. San Martín (2005) has shown the usefulness of reproductive characters in the Exogoninae that may also prove useful in the Eusyllinae when more genera have been examined for these characters.

Some species of syllids are restricted to small geographical areas, and many examples can be found within the Australian fauna, but others have apparently wide distributions, and are regarded as being "cosmopolitan" species. Although increasingly such so-called "cosmopolitan" species are being found to represent suites of sibling species (see Westheide, 1971; Westheide & Hass-Cordes, 2001). In some of these examples, species exhibit no morphological differences and molecular techniques must be used to separate the species. Westheide & Hass-Cordes (2001) have used such techniques on syllids and found it useful. In some cases upon careful examination of these so-called "cosmopolitan" species has revealed small but consistent morphological differences and we have therefore described them as separate species. In other cases, we have been unable to find any morphological differences and so tentatively accept that the Australian Eusyllinae fauna includes these widely distributed species.

## Material and methods

The material examined was mainly from the collections in The Australian Museum (AM), and was collected by many people including: N. Coleman, G. Wilson, J.K. Lowry, R.T. Springthorpe, H.E. Stoddart, P.A. Hutchings, A. Murray, T.J. Ward, P.C. Young, A. Jones, and others. Australian

material from the Zoologisches Museum of Hamburg (HZM), collected and identified by Hartmann-Schröder, has been re-examined. The specimens are preserved in 70% ethanol after having been fixed in formalin. Examinations were made using a compound microscope with interference contrast optics (Nomarsky). Drawings were made using a camera lucida drawing tube. Scanning Electron Microscope observations and photographs were made in the SIDI (Servicio Interdepartamental de Investigación) of the Universidad Autónoma de Madrid, Spain and at the SEM unit at the Australian Museum.

Information about aboriginal words for the names of several new taxa was obtained from Endacott (1973).

Some structures, e.g., nuchal organs or eyespots, are difficult to see. They are described only when they were visible on the specimens, although their presence cannot be excluded and certainly some species lack eyespots.

Categories of sizes of specimens given in the text are: small (<5 mm in length), medium (5–10 mm in length) and large (>10 mm in length). In syllids, the length of chaetal blades within fascicle typically decreases from dorsal to ventral (dorsoventral gradation); and also the shape and length of the chaetae may vary along the body, and therefore all descriptions include this information.

A useful compilation of polychaete terms are provided by Glasby *et al*. (2000) and by San Martín (2005).

The Material examined section lists material in a clockwise direction around Australia.

The following abbreviations are used in the Material examined:

| | |
|---|---|
| AM | The Australian Museum, Sydney, NSW, Australia |
| BMNH | The Natural History Museum, London, UK |
| HMZ | Zoologisches Museum of Hamburg, Germany |
| LACM | Los Angeles County Museum, Los Angeles, USA |
| MNHN | Museum national d'Histoire naturelle, Paris, France |
| MNCNM | Museo Nacional de Ciencias Naturales de Madrid, Spain |
| NFMN | Naturhistorisches Forschungsinstitut Museum für Naturkunde, Berlin, Germany |
| SMNH | Naturhistoriska Riksmuseet, Stockholm, Sweden |
| SMF | Senckenberg Museum, Frankfurt, Germany |
| USNM | National Museum of Natural History, Washington, D.C, USA |
| MPUW | Museum Przydnicze Uniwersytetu Wroclawskiego, Wroclaw, Poland |

**Key to genera of Eusyllinae recorded from Australia**

1 Body, rough, densely papillated; with short, inflated antennae and dorsal cirri (Fig. 50A) ..... *Paraopisthosyllis*

—— Body elongated, smooth, without epidermal papillae; antennae and cirri not inflated (except in some species of *Pionosyllis*, with some cirri inflated) ..... 2

2 Nuchal organs as lappets (Fig. 2C). Pharynx long, highly convoluted with trepan, without mid-dorsal pharyngeal tooth (Fig. 3A) ..... *Amblyosyllis*

—— Nuchal organs as two ciliated grooves between prostomium and peristomium. Pharynx straight, not convoluted ..... 3

3 Pharynx unarmed ..... 4

—— Pharynx armed with single tooth, and or pharyngeal denticles ..... 7

4 Aciculae of some anterior parapodia with inflated tips (Fig. 82I) ..... *Streptosyllis*

—— Aciculae without inflated tips (Fig. 6E) ..... 5

5 Dorsal cirri all smooth, more or less club-shaped (Fig. 6A) ..... *Anoplosyllis*

—— Dorsal cirri from chaetiger 3 distinctly articulated (Fig. 90A) ..... 6

6 Dorsal simple chaetae with distinct, longitudinally striated, distal hood (Fig. 9C). Compound chaetae unidentate. Ventral cirri of posterior parapodia distinctly elongated ..... *Astreptosyllis*

—— Dorsal simple chaetae without hood, or if present, small and not striated. Compound chaetae bidentate. Ventral cirri not elongated ..... *Syllides*

7 Pharynx with incomplete trepan formed by few teeth, backwardly directed, without mid-dorsal tooth (Fig. 20A) ..... *Odontosyllis*

—— Pharynx with mid-dorsal tooth ..... 8

8 Pharyngeal tooth surrounded by incomplete circle of small denticles, forwardly directed, forming incomplete trepan (Fig. 10C) ..... *Eusyllis*

—— Single pharyngeal tooth present, trepan absent ..... 9

9 Blades of compound chaetae with tendon connecting proximal tooth with margin (Fig. 74D). Pharyngeal tooth located near anterior rim, on middle of pharynx or posteriorly in mid line (Fig. 74A) ..... *Pionosyllis* (in part)

—— Blades of compound chaetae lacking such tendon ..... 10

10 Pharyngeal tooth located far from anterior rim ..... 11
—— Pharyngeal tooth located on, or close to anterior rim ..... 14

11 Tentacular and some dorsal cirri inflated, club-shaped (Fig. 60A) ..... *Pionosyllis* (in part)
—— Without inflated dorsal cirri ..... 12

12 Several anterior parapodia with distally inflated aciculae (Fig. 81A,C) ..... *Streptodonta* n.gen.
—— Without distally inflated aciculae ..... 13

13 Palps free, not fused at base. Dorsal cirri long, slender, filiform, twice width of body. Ventral cirri of most anterior parapodia partially fused to parapodial lobes (Fig. 38E). Pharyngeal tooth located medially ..... *Opisthodonta*
—— Palps fused at bases and for most of their length. Dorsal cirri relatively short, about half width of body, ventral cirri not fused to parapodial lobes. Pharyngeal tooth located laterally (Fig. 80A) ..... *Psammosyllis*

14 Ventral cirri inserted medially or distally on parapodial lobes (Fig. 59B). Dorsal cirri of two lengths, long filiform and extremely short exogonid-like dorsal cirri that alternate along body (Fig. 59A) ..... *Pionosyllis* (in part)
—— Ventral cirri inserted at bases of parapodia. Dorsal cirri similar throughout or else differences between short and long cirri not as pronounced ..... 15

15 Antennae, tentacular and anterior dorsal cirri articulated (adults) ..... 16
—— Antennae and cirri smooth, sometimes rugose, pseudoarticulated ..... 17

16 Segments posterior to proventricle fused in units of 2–3 segments (Fig. 78A). Subcirral papilla absent. Palps completely free ..... *Pionosyllis* (in part)
—— Segments not fused. Small subcirral papilla present on parapodia, shorter than width of dorsal cirrus (Fig. 44B). Palps fused at base ..... *Paraehlersia*

17 Dorsal cirri (except some anteriormost) exogonid-like, short, slightly longer than parapodial lobes (Fig. 56A) ..... *Pionosyllis* (in part)
—— Dorsal cirri long ..... 18

18 Small to minute size (<5 mm in length). Pharynx short, shorter than proventricle, with a long tooth (Fig. 17A). Compound chaetae unidentate or provided with small, spine-like proximal tooth ..... *Nudisyllis*
—— Medium to large size (>5 mm in length). Pharynx long. Compound chaetae bidentate ..... 19

19 Distinct prechaetal lobe present (Fig. 66B). Acicula straight, extending beyond parapodial lobes. Blades of compound chaetae without long, fine spines; without spiniger-like chaetae. Large size, distinctly macrofaunal (>10 mm in length) ..... *Pionosyllis* (in part)
—— Prechaetal lobe absent. Acicula distally knobbed, with 2 unequal lobes (Fig. 68J). Blades of compound chaetae with long, fine, distally ornamented spines (Fig. 63G); sometimes with spiniger-like chaetae (Fig. 63F). Medium size (>5 mm in length) ..... *Pionosyllis* (in part)

## Genus *Amblyosyllis* Grube, 1857

*Amblyosyllis* Grube, 1857: 186.
*Gattiola* Johnston, 1865: 195.
*Nicotia* Costa, 1864: 160.
*Pterosyllis* Claparède, 1863: 46.
*Thylaciphorus* Quatrefages, 1865: 55.
*Pseudosyllides* Czerniavsky, 1882: 173.

**Type species**. *Amblyosyllis rhombeata* Grube, 1857 by monotypy.

**Diagnosis**. Body less than 5 mm in length, dorsoventrally flattened, extremely fragile, with few segments; peristomium and last segment without parapodia and chaetae, each with 2 pairs of cirri. Intersegmental constrictions strongly marked, midbody segments typically trapezoidal in shape. Prostomium with 3 antennae, 4 eyes, and usually 2 anterior eyespots, sometimes ventrally located. Palps short, less than length of prostomium, basally fused, divergent, usually ventrally folded, and difficult to see dorsally. Peristomium shorter than following segments, with 2 pairs

of tentacular cirri, and 2 nuchal organs, forming nuchal lappets, usually ciliated. Antennae, tentacular and dorsal cirri long, greater than body width, usually strongly coiled, sometimes forming skeins, smooth to indistinctly articulated, fragile. Pigmentary glands on dorsal and ventral cirri, sometimes forming distinct vesicles. Pharynx long, slender, highly convoluted, with trepan formed by several teeth, lacking median tooth. Proventricle proportionally small to body width. Ventral cirri large, located latero-posteriorly to parapodial lobes, similar in length. Compound chaetae, heterogomph, bidentate falcigers, numerous, present on all chaetigers, other types of chaetae rarely present; chaetae similar in all species. Pygidium with 2 long anal cirri, third length of dorsal cirri.

**Remarks**. Species belonging to this genus appear to be uncommon and are typically known from damaged incomplete specimens. Distinguishing species is therefore difficult. The structure of the nuchal organs and trepan are useful characters. The method of reproduction not well known, although a mature male has been observed with natatory chaetae and one species is known to brood eggs in a gelatinous mass, suggesting that the species of this genus are epigamic (Pernet, 1998).

### Key to Australian species of *Amblyosyllis*

1 Nuchal lappets elongated, reaching middle of chaetiger 1 ..... *A. enigmatica* n.sp.

—— Nuchal lappets rounded, small, not extending beyond peristomium ..... 2

2 Dorsal cirri with few, large, distinct vesicles (Fig. 5A). Compound chaetae with blades all similar, with small dorsoventral gradation in length (Fig. 5C). Trepan with monocuspid teeth ..... *A. vesiculosa*

—— Dorsal cirri with small, numerous granules (Fig. 3A). Compound chaetae with blades elongated (50–102 µm in length) (Fig. 3D), with distinct dorsoventral gradation in length. Trepan with 6 penta cuspid teeth, 2 of them separated by single monocuspid tooth ..... *A. multidenticulata* n.sp.

### *Amblyosyllis enigmatica* n.sp.

Figs 1A–C, 2A–E

?*Amblyosyllis granosa*.—Augener, 1913: 243. Not Ehlers, 1897: 58.

**Material examined**. HOLOTYPE (AM W28943) AUSTRALIA: NEW SOUTH WALES: NW corner of Bowen Is., Jervis Bay, 35°06.81'S 150°46.11'E, dense bryozoan community under rock ledge, 13 m, coll. P. Serov & G.D.F. Wilson, 8 Dec 1993.

**Additional material examined**. Elizabeth Reef, Tasman Sea, 29°55.8'S 159°01.3'E, algae, reef flat, near wreck "Yoshin Maru Iwaki", 0.5 m, Elizabeth & Middleton Reefs Expedition, 1987, 14 Dec 1987, 6 + 3 on SEM stub (AM W28923).

**Description**. All specimens incomplete; holotype (Fig. 1A) mature, epigamic specimen, with regenerating posterior end, 3.5 mm long, 0.6 mm wide, with 10 chaetigers plus regenerating segments. Body large, segments trapezoidal (Fig. 2A), especially those of midbody, fragile; some specimens colourless, others strongly pigmented with 2–4 dorsal transverse dark bands on each segment, more marked on midbody. Prostomium oval, posteriorly notched, with 4 large red eyes in trapezoidal arrangement, covering lateral margins (Fig. 1A). Antennae long, inserted on anterior margin of prostomium, with distinct ceratophores (Fig. 2B). Palps free, fused basally, ventrally directed. Peristomium shorter than subsequent segments, with 2 pairs of tentacular cirri, dorsal ones twice as long as ventral; 2 ciliated, elongated nuchal lappets (Figs 1A, 2A–C), extending to middle of chaetiger 1, with dorsal, longitudinal row of pigment (Fig. 1A). Dorsal cirri long, as wide as body, indistinctly articulated, with numerous dark, granular inclusions, irregularly arranged in 3 longitudinal rows (Fig. 1A). Parapodial lobes long, conical, with long, digitiform prechaetal papilla (Fig. 2D). Ventral cirri conical, large, broad, arising ventrolaterally (Fig. 2D), upwardly directed, with granular, dark inclusions (Fig. 1A). Parapodia with 16–18 compound, heterogomph chaetae (Fig. 2E), blades distinctly bidentate; within fascicle blades exhibiting dorsoventral gradation in length (Fig. 1C), about 100 µm in length dorsally, 43 µm in length ventrally, with short spines on margin; about 6–8 aciculae per parapodium, straight, distally pointed. Pharynx slender, with several coils (Fig. 1A); trepan composed of 6 teeth each with 5 denticles (Fig. 1B). Proventricle extending through 1.5 segments, with 11–13 muscle cell rows. Holotype with notoacicula and capillary notochaetae, curved, digitiform, fleshy, dark structure arising from cirrophores from chaetiger 6 onwards (Fig. 1A, arrows); also, some ciliary bands present on lateral areas of first 4 chaetigers (Fig. 1A). Curved structure present on holotype missing on other material examined; function unknown.

**Remarks**. This species is characterized by having elongated nuchal lappets and a trepan with 6 teeth, each with 5 denticles; no species of the genus has been described with such a combination of characters. The general body form is almost identical to *Amblyosyllis granosa* Ehlers, 1897, from Magellan Strait and Galápagos Islands. Ehlers (1897) originally described this species with the anterior margin of the pharynx lacking teeth; subsequently, Westheide (1974) reported the same species from Galápagos, describing a trepan with 6 teeth, each formed by a long, median cusp and 2 lateral, much smaller ones. Examination of 1 specimen of the type series of *Amblyosyllis granosa* from Punta Arenas (Chile) (NFMN 5318) did not reveal any teeth on anterior margin of pharynx, as originally described, so, we are describing the Australian material as a new species *A. enigmatica*. A previous record of *A. granosa* from Australia by Augener (1913) is also referred with caution to *A. enigmatica* n.sp. Augener's material is not available for examination in the HZM and is presumed lost. *Amblyosyllis granosa*, however, could be present in Australian waters.

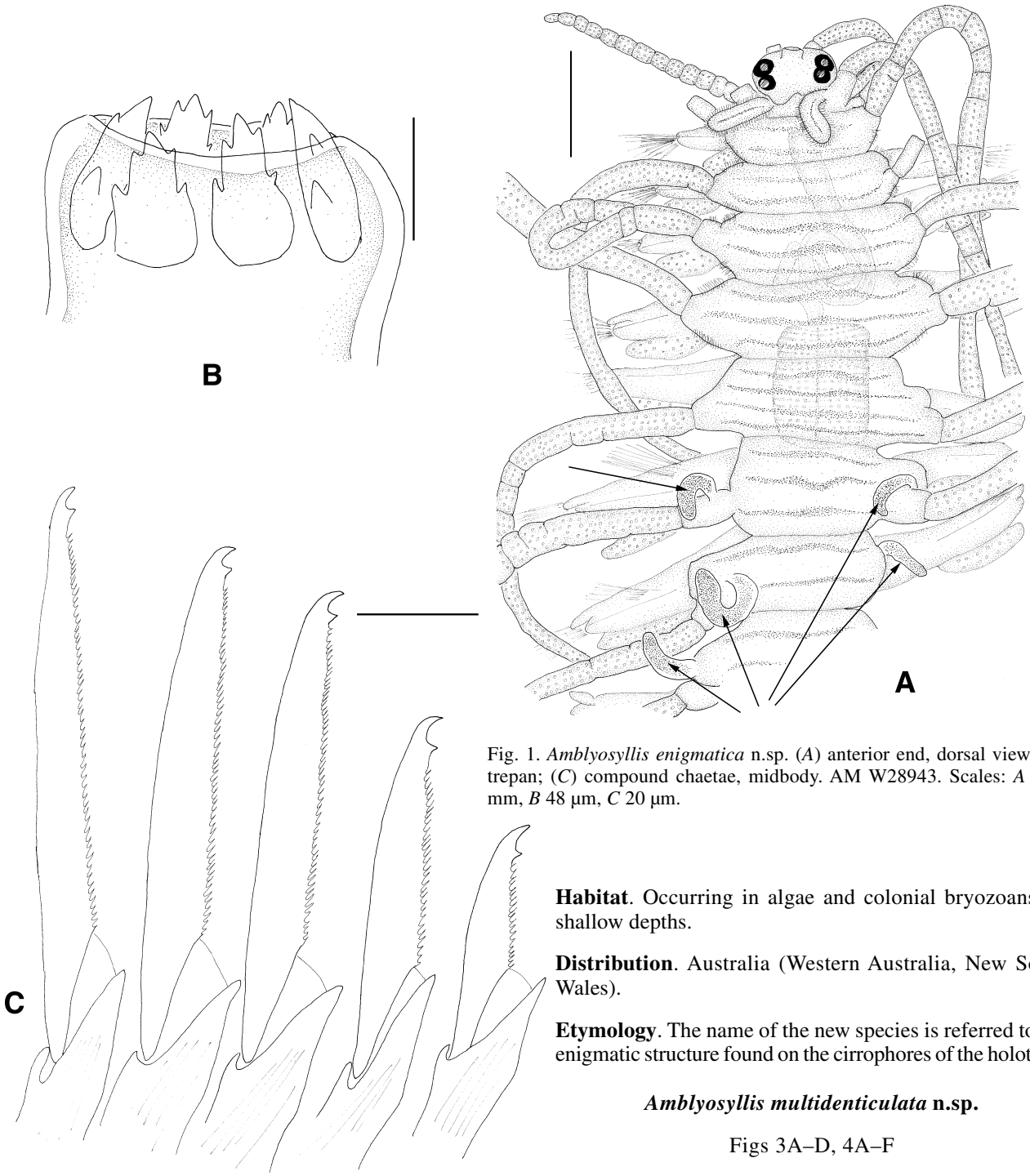



Fig. 1. *Amblyosyllis enigmatica* n.sp. (*A*) anterior end, dorsal view; (*B*) trepan; (*C*) compound chaetae, midbody. AM W28943. Scales: *A* 0.38 mm, *B* 48 µm, *C* 20 µm.

*Amblyosyllis formosa* (Claparède, 1863) from European coasts is also similar to *A. enigmatica* n.sp., with regards to body form and the presence of long nuchal lappets; this species, however, has a trepan with 6 unidentate teeth (San Martín, 2003).

Little is known about reproduction within *Amblyosyllis*. The digitiform structures arising from cirrophores of chaetiger 6 onwards have never been described before, and their significance is unknown, but they may be used in reproduction, since they are only present on the single epigamic specimen examined. Knowing whether such structures occur in other species of the genus would be of interest.

**Habitat**. Occurring in algae and colonial bryozoans, in shallow depths.

**Distribution**. Australia (Western Australia, New South Wales).

**Etymology**. The name of the new species is referred to the enigmatic structure found on the cirrophores of the holotype.

### *Amblyosyllis multidenticulata* n.sp.

Figs 3A–D, 4A–F

*Amblyosyllis spectabilis*.—Haswell, 1920 (in part): 108, pl. 13, figs 4–10. Not Johnston, 1865: 195.

**Material examined**. HOLOTYPE (AM W502) AUSTRALIA: NEW SOUTH WALES: Port Jackson, 33°51'S 151°16'E, Feb 1920, coll. W.A. Haswell, mounted on microscope slide. PARATYPES NW corner of Bowen Is., Jervis Bay, 35°06.81'S 150°46.11'E, dense bryozoan community under rock ledge, 13 m, coll. P. Serov & G.D.F. Wilson, 8 Dec 1993, 3 on SEM stub (AM W26323); Halfway Reef, 200 m S of Sullivan Reef, Ulladulla, 35°21.42'S 150°29.31'E, red algae on rock ledges at base of wall, 13 m, coll. A. Murray, 3 May 1997, 2 (AM W28229); Port Jackson, 33°50'S 151°16'E, 1 (AM W25245), mounted on slide, id. W.A. Haswell as *A. spectabilis*.

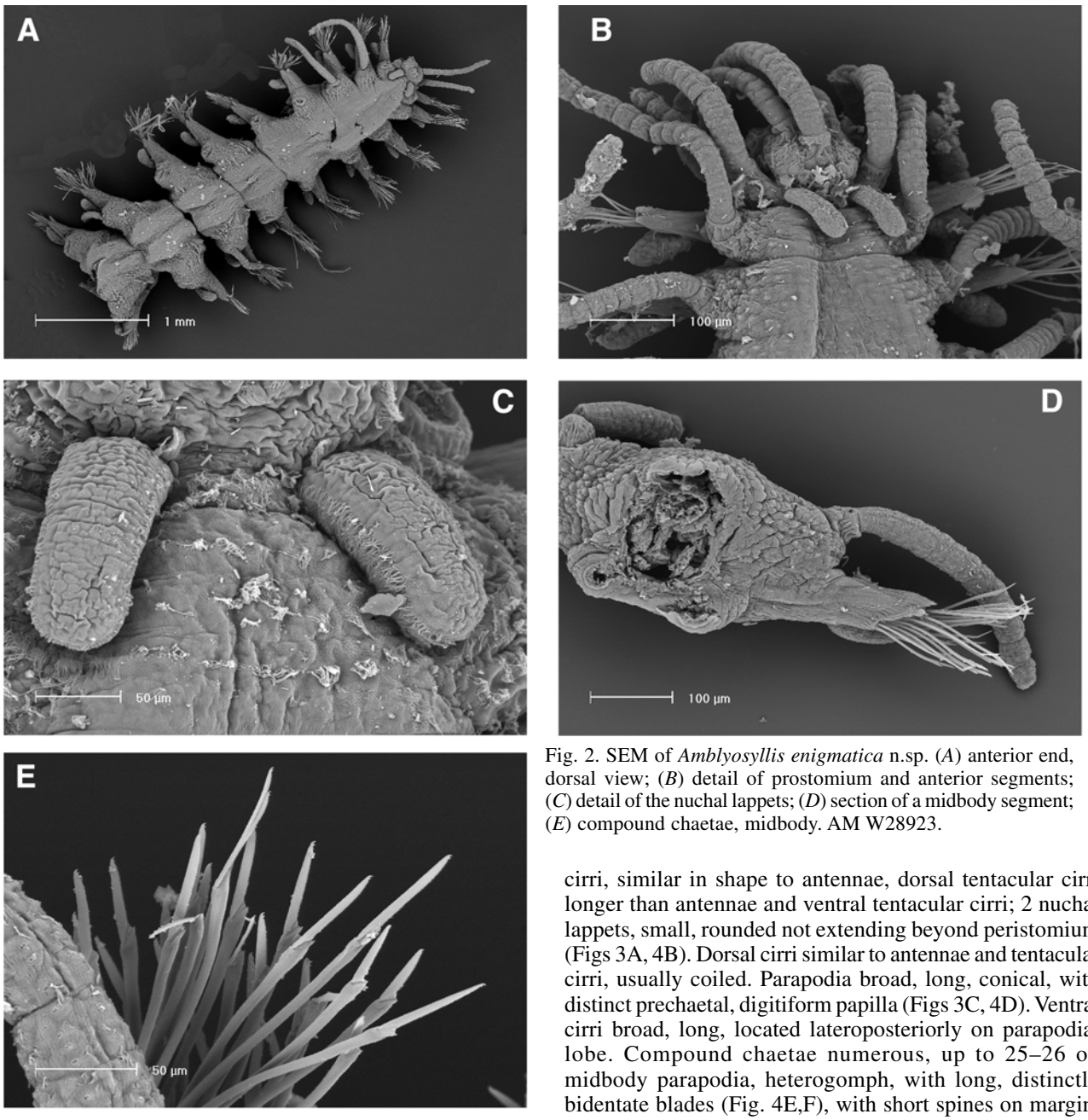



Fig. 2. SEM of *Amblyosyllis enigmatica* n.sp. (*A*) anterior end, dorsal view; (*B*) detail of prostomium and anterior segments; (*C*) detail of the nuchal lappets; (*D*) section of a midbody segment; (*E*) compound chaetae, midbody. AM W28923.

**Description**. Body compact (Fig. 4A), longest complete specimen examined 5.7 mm long, 0.6 mm wide, with 13 chaetigers and 1 posterior segment without parapodia or chaetae. Colour pattern variable; holotype collected in 1920 colourless. More recently collected paratypes with several dark, violet transverse dorsal bands of pigment on each segment; intensity of bands differs between individuals. Antennae, tentacular, dorsal and ventral cirri provided with numerous, dark, small globular glands (Fig. 3A). Prostomium wider than long, margins rounded, with 2 pairs of eyes in open trapezoidal arrangement (Fig. 3A), and 2 anterior, ventrally located, small eyespots. Antennae long, 3 times width of prostomium, distinctly articulated, with numerous articles, arising on anterior margin of prostomium from distinct ceratophores (Figs 3A, 4B). Palps ventrally directed (Fig. 4C), forming double lip over mouth, nearly invisible dorsally (Fig. 3A). Peristomium about half of length of subsequent segments, with 2 pairs of tentacular cirri, similar in shape to antennae, dorsal tentacular cirri longer than antennae and ventral tentacular cirri; 2 nuchal lappets, small, rounded not extending beyond peristomium (Figs 3A, 4B). Dorsal cirri similar to antennae and tentacular cirri, usually coiled. Parapodia broad, long, conical, with distinct prechaetal, digitiform papilla (Figs 3C, 4D). Ventral cirri broad, long, located lateroposteriorly on parapodial lobe. Compound chaetae numerous, up to 25–26 on midbody parapodia, heterogomph, with long, distinctly bidentate blades (Fig. 4E,F), with short spines on margin, and dorsoventral gradation in length of blades (Fig. 3D), length in midbody segments about 102 µm, 50 µm in length ventrally on midbody. Parapodia with 5–6 aciculae, straight, distally pointed. Pharynx long extending to chaetiger 5, narrow width, with several coils visible inside pharynx (Fig. 3A); trepan formed by 6 large teeth with 5 denticles separated by 1 unidentate, much smaller tooth (Fig. 3B). Proventricle small, located on chaetiger 5 (Fig. 3A), with 17–18 muscle cell rows. Pygidium small, trapezoidal, with 2 long anal cirri, half length of dorsal cirri.

**Remarks**. Haswell (1920) referred his Australian specimens to the European species *Amblyosyllis spectabilis* (Johnston, 1865), a poorly known species usually considered as a synonym of *A. formosa*, which may represent a suite of sibling species. Johnston's description of *Gattiola spectabilis* states that the pharynx is short and barrel shaped without teeth and long nuchal lappets are illustrated. In contrast, Haswell (1920) reported that teeth were present

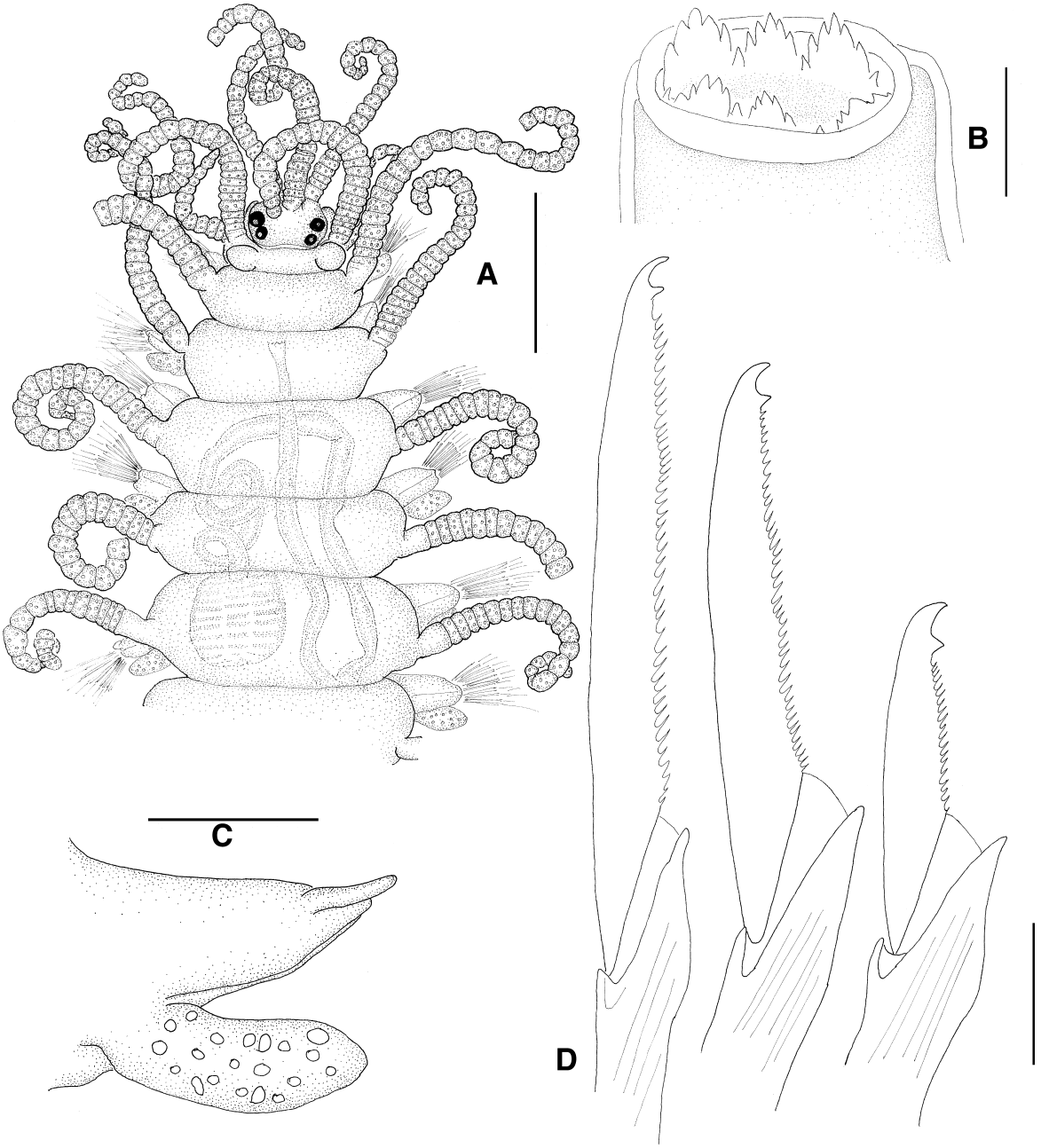



Fig. 3. *Amblyosyllis multidenticulata* n.sp. (*A*) anterior end, dorsal view; (*B*) trepan; (*C*) parapodial lobe and ventral cirrus; (*D*) compound chaetae, midbody. *A*: AM W502 (holotype); *B,C*: AM W28229 (paratypes); *D*: AM W26323 (paratypes). Scales: *A* 0.38 mm, *B* 48 µm, *C* 0.18 mm, *D* 20 µm.

in the pharynx. Re-examination of this material has shown that it belongs to a new species, *Amblyosyllis multidenticulata*. This new species is characterized by having small nuchal lappets and a trepan comprising 6 teeth each with 5 denticles, which are each separated by 1 small tooth (Fig. 3B); no other described species of this genus has been described with this arrangement of teeth on the trepan. The most similar species is *Amblyosyllis madeirensis* Langerhans, 1879, which occurs along European coasts; both species have small nuchal lappets, similar colour pattern, and body shape. The European species, however, has only 6 pentacuspid teeth on the trepan, and the segment that bears the proventricle is distinctly larger than other segments (San Martín, 2003). We are thus describing the Australian material as a new species. Haswell (1920) also reported some specimens 10 mm long, with 14–30 segments, these were not available for examination and because of their size we suggest that they probably represent another species.

**Habitat**. Occurring among bryozoans and others colonial animals, in shallow depths.

**Distribution**. Australia (New South Wales).

**Etymology**. The specific name refers to the highly denticulated trepan.

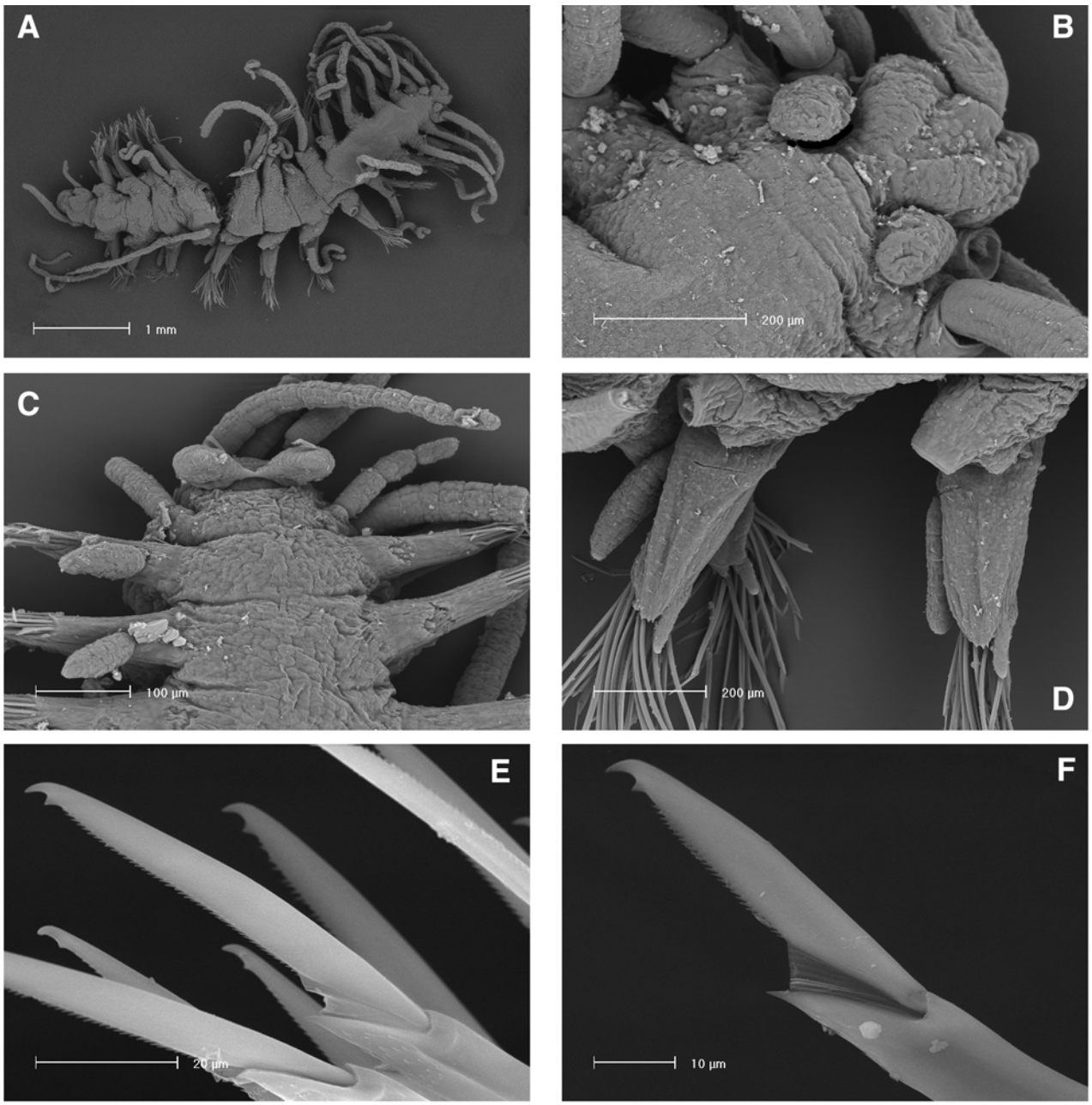



Fig. 4. SEM of *Amblyosyllis multidenticulata* n.sp. (*A*) complete specimen; (*B*) nuchal lappets; (*C*) anterior end, ventral view; (*D*) midbody parapodia, dorsal view; (*E*) superior compound chaeta; (*F*) inferior compound chaeta. AM W26323 (paratypes).

### *Amblyosyllis vesiculosa* Hartmann-Schröder, 1989

Fig. 5A–C

*Amblyosyllis vesiculosa* Hartmann-Schröder, 1989: 25, figs 28–33.

**Material examined**. AUSTRALIA: NEW SOUTH WALES: Lake Macquarie, 33°03'S 151°38'E algae & epibionts, intertidal, coll. G. Hartmann-Schröder, holotype (HZM P-19661).

**Description**. Specimen complete, but broken in two pieces, in good condition. Body small, 2 mm long, 0.2 mm wide, with 13 chaetigers. Prostomium rounded; 4 eyes in trapezoidal arrangement. Antennae inserted on anterior margin of prostomium, median one with about 11 articles, lateral ones with about 7 articles (Fig. 5A). Palps ventrally folded, not visible dorsally. Nuchal lappets rounded, extending to anterior margin of chaetiger 1 (Fig. 5A). Peristomium visible dorsally; tentacular cirri similar to antennae; dorsal tentacular cirri with about 12 articles, ventral ones with 2–3 articles. Dorsal cirri about twice width of body, distinctly articulated, with about 12–14 articles; large, hyaline inclusions common throughout cirri and antennae (Fig. 5A). Ventral cirri, rounded, similar length to parapodial lobes, sometimes with large inclusions. Parapodial lobes length similar to body width, blunt, distally bilobed (Fig. 5B). Parapodia with compound chaetae, about 13–15 anteriorly, 9 posteriorly, heterogomph, with short, bidentate blades, with small dorsoventral gradation in length, with fine spines on margin (Fig. 5C). Pharynx, strongly coiled, extending to chaetiger 5 (Fig. 5A); trepan

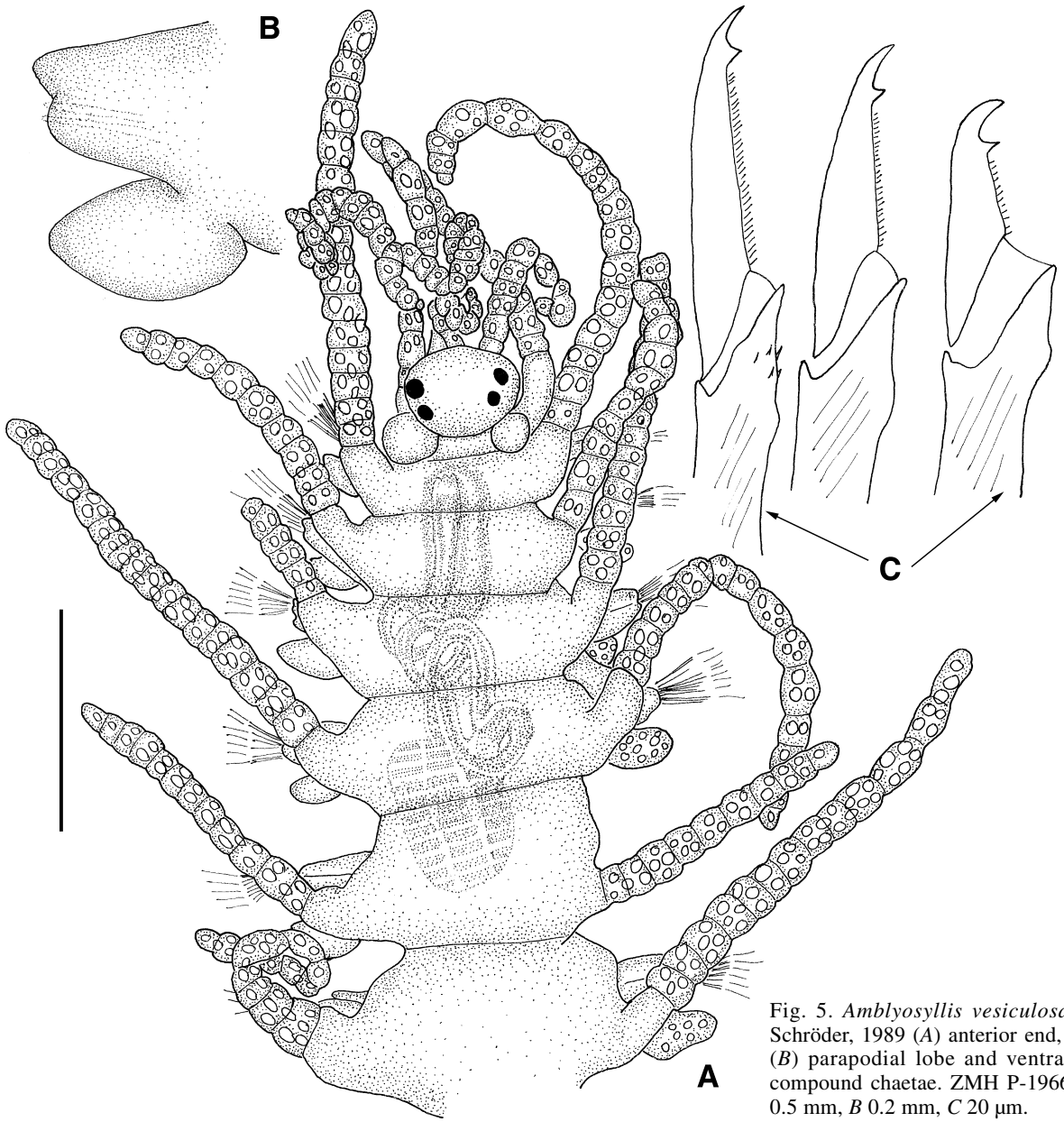



Fig. 5. *Amblyosyllis vesiculosa* Hartmann-Schröder, 1989 (*A*) anterior end, dorsal view; (*B*) parapodial lobe and ventral cirrus; (*C*) compound chaetae. ZMH P-19661. Scales: *A* 0.5 mm, *B* 0.2 mm, *C* 20 µm.

small, formed by 6 unidentate teeth (according to original description by Hartmann-Schröder, 1989), not verified. Proventricle on chaetiger 5, about length of segment, with about 14 muscle cell rows. Pygidium compact, with 2 coiled anal cirri.

**Habitat**. Occurring on algae, intertidally.

**Distribution**. Australia (New South Wales).

### Genus *Anoplosyllis* Claparède, 1868

*Anoplosyllis* Claparède, 1868: 214.—San Martín, 2003: 134.

**Type species**. *Anoplosyllis edentula* Claparède, 1868, by monotypy.

**Diagnosis**. Body small, (<5 mm in length), with up to 30 chaetigers. Prostomium rectangular, similar width to anterior segments, with 2 pairs of eyes and 2 anterior eyespots. Three antennae. Palps small, fused basally, without median furrow. Nuchal organs as 2 ciliated grooves between prostomium and peristomium. Two pairs of tentacular cirri. Antennae, tentacular and dorsal cirri smooth, club-shaped, tapered basally, longer than parapodial lobes. Compound chaetae heterogomph, blades slender, elongate, unidentate or indistinctly bidentate. Dorsal and ventral simple chaetae present on some parapodia. Pharynx shorter than proventricle, unarmed. Proventricle large, almost as wide as body. Some species brood eggs in gelatinous masses.

**Remarks**. Fauvel (1923) synonymized *Anoplosyllis* with *Syllides*. Species of *Syllides*, however, have long, articulated cirri from chaetiger 3, and bidentate compound chaetae. Although these genera are closely related, San Martín (2003) proposed the resurrection of *Anoplosyllis*, and transferred species of *Syllides* with smooth dorsal cirri into the genus.

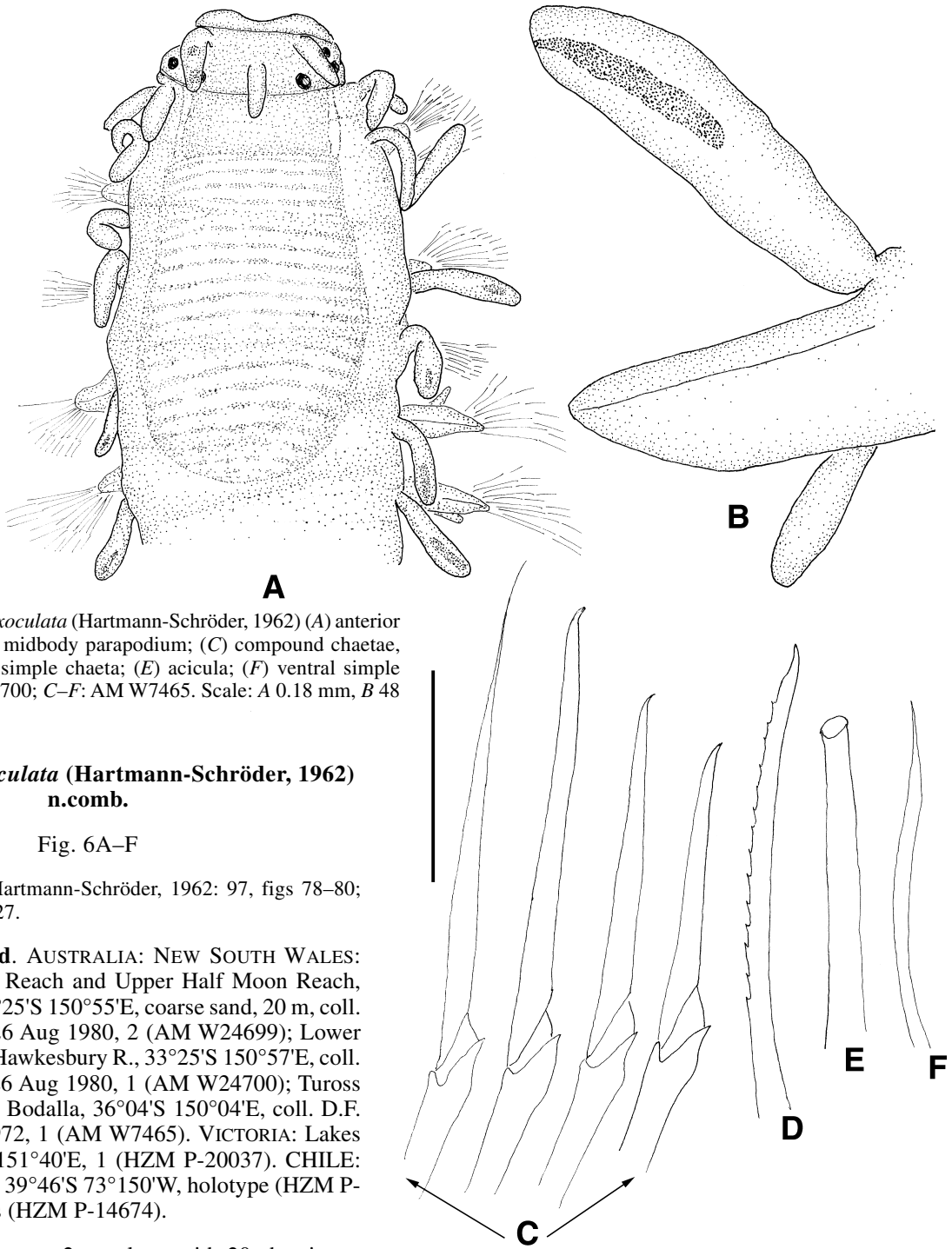



Fig. 6. *Anoplosyllis sexoculata* (Hartmann-Schröder, 1962) (*A*) anterior end, dorsal view; (*B*) midbody parapodium; (*C*) compound chaetae, midbody; (*D*) dorsal simple chaeta; (*E*) acicula; (*F*) ventral simple chaeta. *A,B*: AM W24700; *C–F*: AM W7465. Scale: *A* 0.18 mm, *B* 48 µm, *C–F* 20 µm.

### *Anoplosyllis sexoculata* (Hartmann-Schröder, 1962) n.comb.

Fig. 6A–F

*Syllides sexoculata* Hartmann-Schröder, 1962: 97, figs 78–80; 1974: 128; 1989: 27.

**Material examined**. AUSTRALIA: NEW SOUTH WALES: Between Liverpool Reach and Upper Half Moon Reach, Hawkesbury R., 33°25'S 150°55'E, coarse sand, 20 m, coll. A. Jones & party, 26 Aug 1980, 2 (AM W24699); Lower Half Moon Reach, Hawkesbury R., 33°25'S 150°57'E, coll. A. Jones & party, 26 Aug 1980, 1 (AM W24700); Tuross R., at Princes Hwy, Bodalla, 36°04'S 150°04'E, coll. D.F. Boesch, 23 May 1972, 1 (AM W7465). VICTORIA: Lakes Entrance, 33°05'S 151°40'E, 1 (HZM P-20037). CHILE: Niebla bei Valdivia, 39°46'S 73°150'W, holotype (HZM P-14673), 3 paratypes (HZM P-14674).

**Description**. Body up to 2 mm long with 20 chaetigers; complete specimen 1.4 mm long, 0.2 mm wide, 20 chaetigers. Prostomium oval, more than twice as wide as long; 4 eyes arranged in open trapezoidal pattern and 2 distinct anterior eyespots, similar in size to eyes (Fig. 6A). Antennae short, similar to width of prostomium, club-shaped; median antenna inserted between posterior eyes, lateral antennae near anterior margin of prostomium (Fig. 6A). Palps small, shorter than prostomium. Tentacular cirri similar to antennae, dorsal ones longer than ventral ones. Dorsal cirri similar to antennae and tentacular cirri (Fig. 6A), smooth, club-shaped, slightly longer than parapodial lobes, some with distinct dark inclusion (Fig. 6B), which opens via terminal pore. Parapodial lobes elongate; ventral cirri digitiform, shorter than parapodial lobes (Fig. 6B). Compound chaetae heterogomph, smooth, slender, blades elongate, thin, unidentate, smooth (Fig. 6C), numbering 12–18 per parapodium, with dorsoventral gradation in length of blades, 48 µm in length dorsally, 29 µm in length ventrally. Dorsal simple chaetae from chaetiger 1, slender, unidentate, with minute spines on margin (Fig. 6D). Ventral simple chaetae on posterior chaetigers, similar to dorsal simple chaetae, but thinner and smooth (Fig. 6F). Aciculae solitary, slender, distally rounded (Fig. 6E). Pharynx partially everted, short, probably through 1–2 chaetigers. Proventricle, massive, through 4 segments (Fig. 6A); number of muscle cell rows not possible to assess. Pygidium small, triangular, with 2 filiform anal cirri and compact median papilla.

**Remarks**. The Australian material is represented by a few juvenile individuals and while they closely resembles the type material of *Anoplosyllis sexoculata* from southern Chile, they possess a shorter proventricle. At this stage we are referring them to this species, but mature individuals are really needed to confirm this.

**Habitat**. Occurring interstitially in fine to coarse sand, on algae, on colonies of sabellariids; intertidally to about 20 m.

**Distribution**. Southern Chile, Namibia, Australia (Victoria, New South Wales).

### Genus *Astreptosyllis* Kudenov & Dorsey, 1982

*Astreptosyllis* Kudenov & Dorsey, 1982: 575.

**Type species**. *Astreptosyllis acrassiseta* Kudenov & Dorsey, 1982, by original designation.

**Diagnosis**. Body of meiofaunal size. Prostomium with 2 pairs of eyes and 3 antennae. Palps fused basally, small but visible dorsally without median furrow. Nuchal organs as 2 ciliated grooves between prostomium and peristomium. Two pairs of tentacular cirri. Antennae, tentacular cirri and dorsal cirri of 2 anterior chaetigers unarticulated, club-shaped, slender basally and distally slightly inflated, longer than body width; from chaetiger 3 onwards, dorsal cirri articulated, articles elongated to pyriform, with dark, glandular inclusions. Parapodial lobes subrectangular on anterior parapodia, conical and elongated from midbody; ventral cirri short and broad on anterior parapodia, posteriorly becoming more elongated, digitiform. Compound chaetae heterogomph or hemigomph falcigers. Dorsal simple chaetae thick, provided with distal, longitudinally striated hood. Ventral simple chaetae sometimes present on far posterior parapodia, but usually lacking. Pharynx unarmed, with distal crown of soft papillae. Pygidium with 2 anal cirri.

**Remarks**. The genus is only known from Australia. Details on reproduction unknown, probably it reproduces as other similar genera by epigamy.

### Key to Australian species of *Astreptosyllis*

1 Compound chaetae similar throughout ..... *A. similiseta*

—— Compound chaetae of chaetigers 1–6 enlarged, hemigomph, with short, thick blades (Fig. 7E), different to compound chaetae of other parapodia (Fig. 7G) ..... *A. acrassiseta*

### *Astreptosyllis acrassiseta* Kudenov & Dorsey, 1982

Figs 7A–I, 8A–F

*Astreptosyllis acrassiseta* Kudenov & Dorsey, 1982: 576, fig. 1.

**Material examined**. AUSTRALIA: NEW SOUTH WALES: Off Bass Point, 34°36'S 150°54'E, 50 m, 1 Feb 1990, 1 (AM W22995). VICTORIA: Port Phillip Bay, 38°16.3'S 144°41.5'E, medium sand, 13 m, Feb 1971, 1 paratype, (AM W18587). WESTERN AUSTRALIA: Ned's Camp, Cape Range National Park, 21°59'S 113°55'E, limestone reef near shore, fine sediment & sand from patches in reef, 1 m, coll. H.E. Stoddart, 2 Jan 1984, 1 (AM W26780).

**Description**. Body up to 3.1 mm long, 0.3 mm wide, with 42 chaetigers. Prostomium rectangular, 2 pairs of eyes in trapezoidal arrangement; antennae slightly club-shaped, unarticulated, usually missing; median antenna arising from posterior margin of prostomium, between posterior eyes, lateral antennae originating between anterior eyes. Palps large, similar in length to prostomium, basally totally fused (Figs 7A, 8A), directed anteriorly, provided with distal constriction. Tufts of cilia on lateral areas of prostomium and peristomium (Fig. 7A). Tentacular cirri and dorsal cirri of subsequent 2 segments similar to antennae; dorsal cirri from chaetiger 3 articulated (Figs 7A, 8A), slender, slightly longer than body width, with about 6–10 elongated articles, some with 1–2 granular, dark inclusions (Fig. 7A,C). Parapodia of anterior segments relatively broad in contrast, to posterior ones, distally truncated, with some distal incisions (Fig. 7B); becoming elongated and conical from proventricular segments onwards, with dorsal band of long cilia (Fig. 7C). Ventral cirri of anterior parapodia broad, shorter than parapodial length, becoming greatly elongated posteriorly, longer than parapodial length, arising from about middle of ventral side of parapodial lobes (Fig. 7C). Anterior 1–6 chaetigers each with 8–10, sometimes 12, compound chaetae with enlarged shafts, hemigomph articulation, with short, stout, broad blades, apparently unidentate or bifid, with distal incision (Figs 7E, 8B), about 8–15 μm long. From chaetiger 7 onwards, parapodia with 5–8 compound chaetae with shafts much slender than those of anterior chaetae, heterogomph, with fine spines on margin (Figs 7G, 8C,D), and blades slender, unidentate, some with distal hood, with minute spines on margin, and dorsoventral gradation in length of blades within fascicle (Fig. 8C), 27 μm in length dorsally and 15 μm in length ventrally; under SEM, margin with several rows of spines (Fig. 8E) and distal hood composed of minute spines (Fig. 8E). Acicula solitary, distally knobbed (Fig. 7B,H). Dorsal simple chaetae from chaetiger 1, thick, tip tapered, blunt, covered with longitudinally striated, rounded hood (Fig. 7D,F); under SEM, dorsal simple chaetae with "*Banksia*-like" or "artichoke-like" appearance. Ventral simple chaetae usually absent, but one specimen with single thin, smooth, filiform, ventral simple chaeta (Fig. 7 I ) on each fascicle of last parapodium. Pharynx through about 7–8 segments, with crown of 10 soft papillae (Fig. 7A). Proventricle through about 7–8 segments, with 30–32 muscle cell rows. No specimens with anal cirri present, probably present on undamaged specimens.

**Habitat**. Occurring in median to coarse sand; from intertidal to 50 m.

**Distribution**. Australia (Victoria, New South Wales, Western Australia).

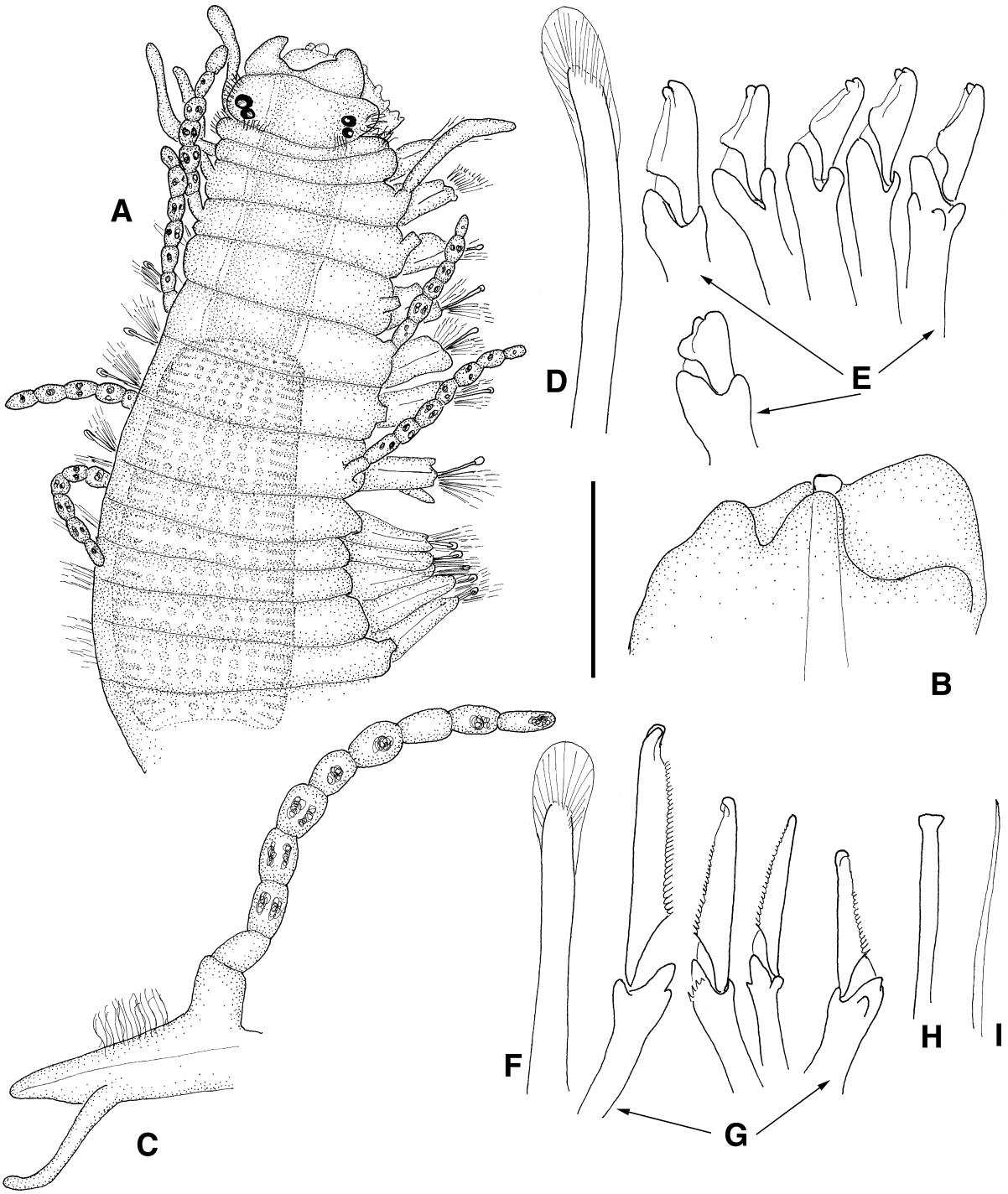



Fig. 7. *Astreptosyllis acrassiseta* Kudenov & Dorsey, 1982 (*A*) anterior end, dorsal view (antennae and some tentacular and dorsal cirri missing); (*B*) anterior parapodial lobe and acicula, dorsal view; (*C*) posterior parapodium; (*D*) dorsal simple chaeta, anterior parapodium; (*E*) compound chaetae, anterior parapodium; (*F*) dorsal simple chaeta, midbody; (*G*) compound chaetae, midbody; (*H*) acicula, midbody; (*I*) ventral simple chaeta. AM W26780. Scales: *A* 0.18 mm; *C* 92 µm; *B, D–I* 20 µm.

### *Astreptosyllis similiseta* Hartmann-Schröder, 1986

Fig. 9A–H

*Astreptosyllis similiseta* Hartmann-Schröder, 1986: 40, figs 16–21.

**Material examined**. AUSTRALIA: SOUTH AUSTRALIA: Port Augusta, 32°30'S 137°13'E, intertidal sediments, 6 Dec 1975, holotype (HZM P-18624) and 3 paratypes (HZM P-18625), coll. G. Hartmann-Schröder.

**Description**. Body, delicate, fragile, entire, without colour markings, 1.8–2.0 mm long, 0.1 mm wide, with 23–28 chaetigers. Prostomium semi-circular, with 4 eyes in open trapezoidal arrangement; antennae fusiform to club-shaped, smooth; median antenna longer than combined length of prostomium and palps, inserted on middle of pharynx, between anterior eyes; lateral antennae similar in shape to median antenna, but shorter, inserted near anterior margin of prostomium (Fig. 9A). Palps small, shorter than

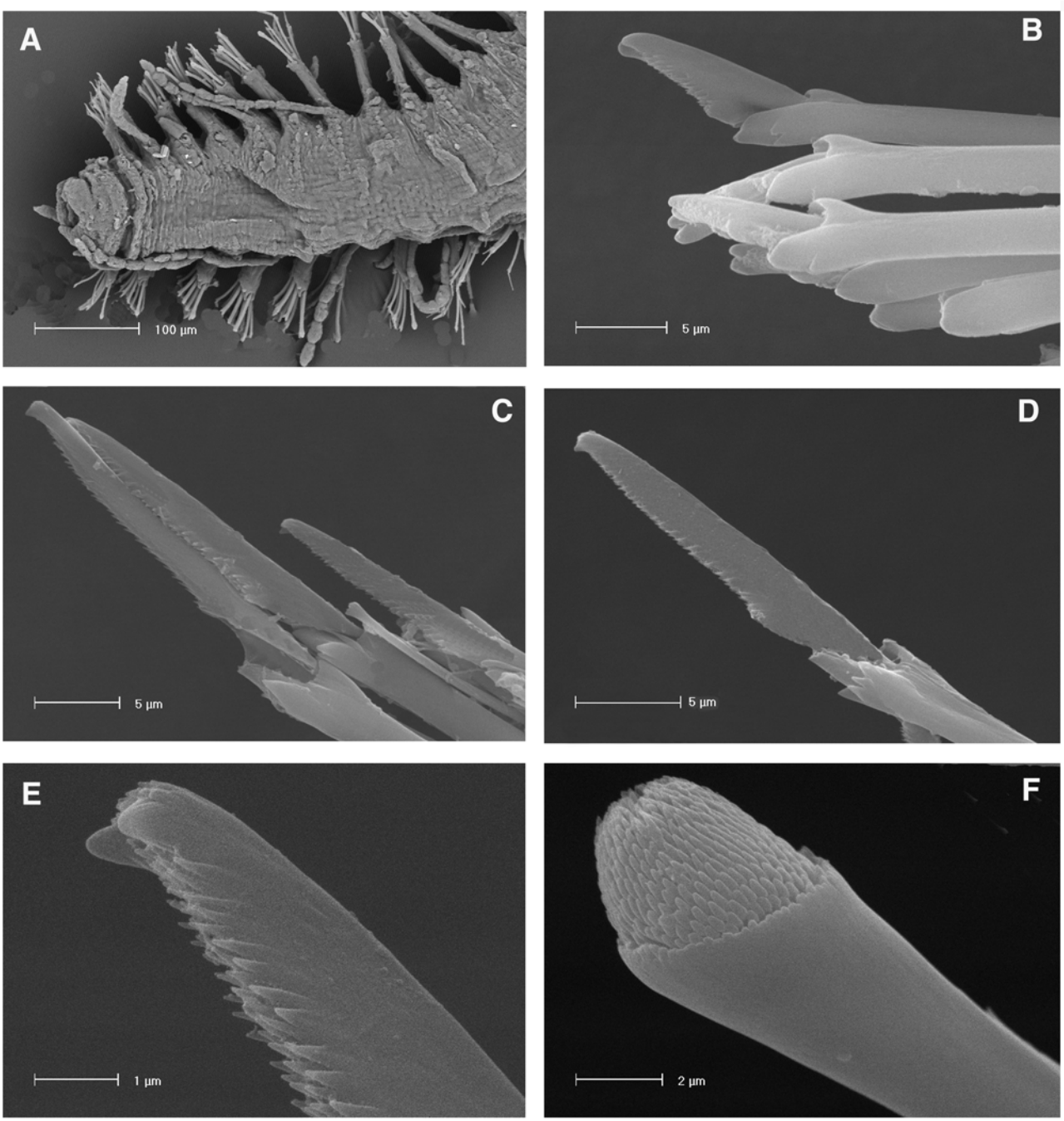



Fig. 8. SEM of *Astreptosyllis acrassiseta* Kudenov & Dorsey, 1982 (*A*) anterior end, dorsal view (antennae and some tentacular and dorsal cirri missing); (*B*) compound chaetae, anterior parapodium; (*C*) compound chaetae, midbody; (*D*) dorsalmost compound chaeta, posterior parapodium; (*E*) detail of tip of the same; (*F*) detail of distal end of dorsal simple chaeta, midbody. AM W26780.

prostomium, fused basally (Fig. 9A). Peristomium similar in size to subsequent segments; tentacular cirri smooth, slightly club-shaped (Fig. 9A); dorsal tentacular cirri similar in length to lateral antenna, ventral ones shorter than dorsal ones. Dorsal cirri of anterior 2 chaetigers similar in shape to antennae and tentacular cirri, and slightly longer; dorsal cirri from chaetiger 3 onwards articulated, with some dark granular inclusions on some articles (Fig. 9A,B), 5–7 articles on midbody chaetigers. Parapodia slender, elongated; ventral cirri digitiform, longer on posterior parapodia (Fig. 9B) becoming of similar length to parapodial lobes. Compound chaetae heterogomph falcigers, with conspicuous spines subdistally on shafts, and unidentate blades with short, apparently smooth spines on margin. Anterior parapodia (1–5 chaetigers) each with several compound chaetae, with slight dorsoventral gradation in length of blades within fascicle, 40 µm in length dorsally, 20 µm in length ventrally (Fig. 9D); on midbody blades of compound chaetae longer, more marked gradation (65 µm dorsally and 23 µm ventrally) (Fig. 9F); posterior parapodia with less marked dorsoventral gradation in length of blades within fascicle (40 µm dorsally and 23 µm ventrally) (Fig. 9G). Dorsal simple chaetae thick, distally unidentate, with distinct distal hood longitudinally striated, similar throughout (Fig. 9C,E,H), present from anterior parapodia. Ventral simple chaetae absent. Pharynx through about 5 segments; proventricle through 4.5 segments (Fig. 9A), with 38–40 muscle cell rows. Pygidium rounded, with single digitiform

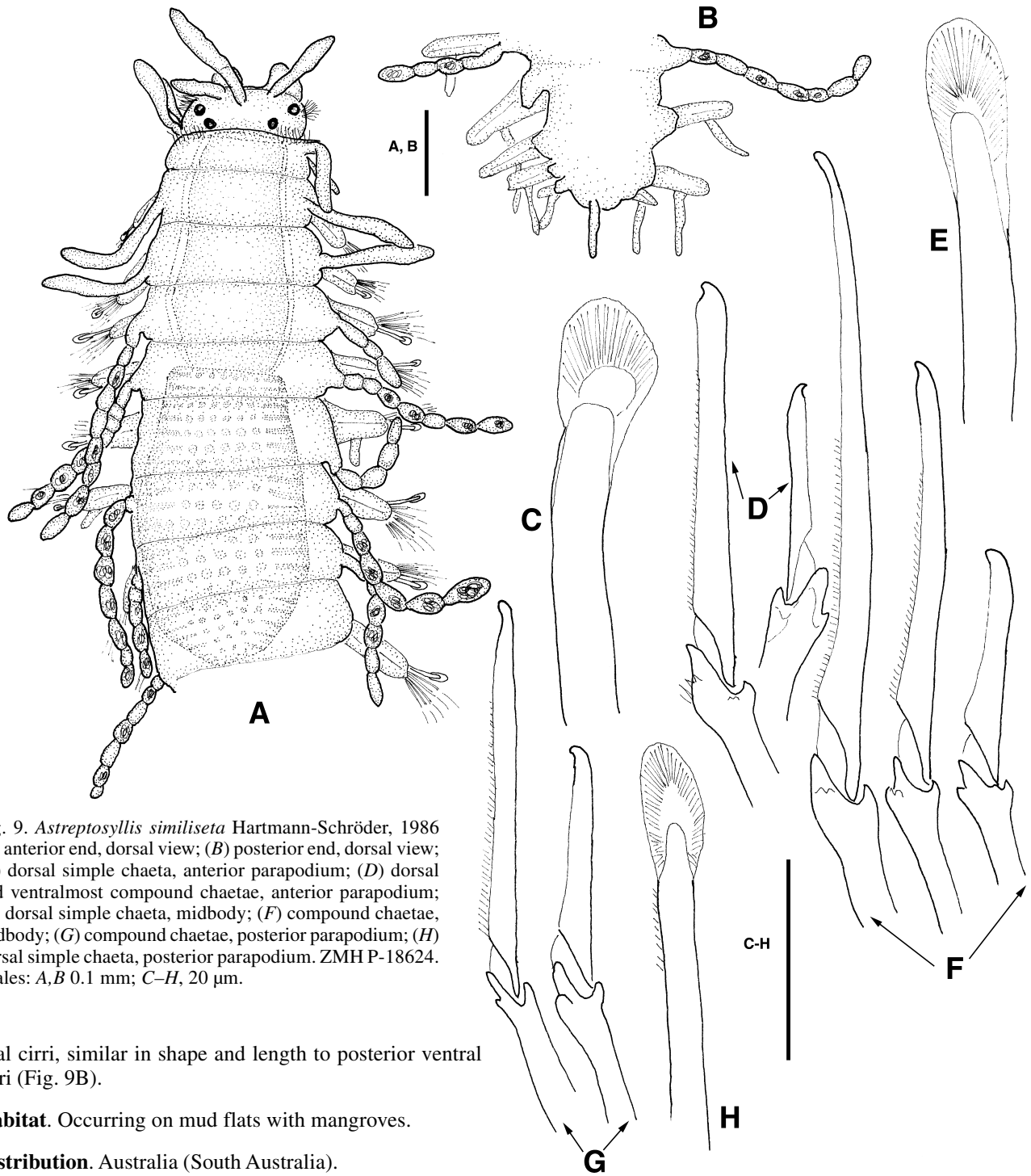



Fig. 9. *Astreptosyllis similiseta* Hartmann-Schröder, 1986 (*A*) anterior end, dorsal view; (*B*) posterior end, dorsal view; (*C*) dorsal simple chaeta, anterior parapodium; (*D*) dorsal and ventralmost compound chaetae, anterior parapodium; (*E*) dorsal simple chaeta, midbody; (*F*) compound chaetae, midbody; (*G*) compound chaetae, posterior parapodium; (*H*) dorsal simple chaeta, posterior parapodium. ZMH P-18624. Scales: *A,B* 0.1 mm; *C–H*, 20 μm.

anal cirri, similar in shape and length to posterior ventral cirri (Fig. 9B).

**Habitat**. Occurring on mud flats with mangroves.

**Distribution**. Australia (South Australia).

### Genus *Eusyllis* Malmgren, 1867

*Eusyllis* Malmgren, 1867: 40.
*Eudontosyllis* Knox, 1960: 105.

**Type species**. *Eusyllis blomstrandi* Malmgren, 1867

**Diagnosis**. Body of medium to small size (10 to <5 mm in length), cylindrical. Prostomium with 4 eyes and sometimes 2 anterior eyespots. Three antennae. Palps either entirely free or fused just basally. Nuchal organs as 2 ciliated grooves, ciliation extending sometimes to prostomium and peristomium, as well as other segments. Two pairs of tentacular cirri. Antennae, tentacular and dorsal cirri non-articulated, sometimes rugose, with pseudoarticulate appearance. Compound chaetae; dorsal and ventral simple chaetae on some parapodia. Pharynx with mid-dorsal tooth, usually large and conspicuous, and incomplete crown of small denticles, anteriorly pointing. Pygidium with 2 anal cirri. Reproduction by epigamy (Garwood, 1991).

**Remarks**. *Eusyllis* is characterized by having an incomplete trepan on the pharynx, with all teeth anteriorly directed, and a mid-dorsal, usually large, tooth. Species of this genus are typically large, even so the denticles of the trepan are small and sometimes difficult to observe, which can lead to misidentifications. *Eusyllis brevicirrata* Knox & Cameron,

1971 from New Zealand, reported in Australia by Hartmann-Schröder (1985), reproduces by schizogamy (San Martín, pers. observ., on Australian material) so we suggest that this species represents a member of the subfamily Syllinae probably an undescribed genus (San Martín *et al.*, in prep.). Australian material agrees with the original description based on New Zealand material. *Eudontosyllis* has been recently proposed as a synonymy of *Eusyllis* by Glasby *et al*., (in press).

**Key to Australian species of *Eusyllis***

1 Ventral cirri of chaetiger 1 enlarged, flattened leaf-like (Fig. 15B) ..... *E. lamelligera*

—— Ventral cirri of chaetiger 1 not enlarged, flattened leaf-like ..... 2

2 Aciculae from midbody greatly enlarged, distally curved, extending beyond parapodial lobes (Fig. 10G). Compound chaetae distinctly bidentate (Fig. 10F) ..... *E. assimilis*

—— Aciculae not modified (Fig. 13E). Compound chaetae unidentate (Fig. 13C) ..... *E. kupfferi*

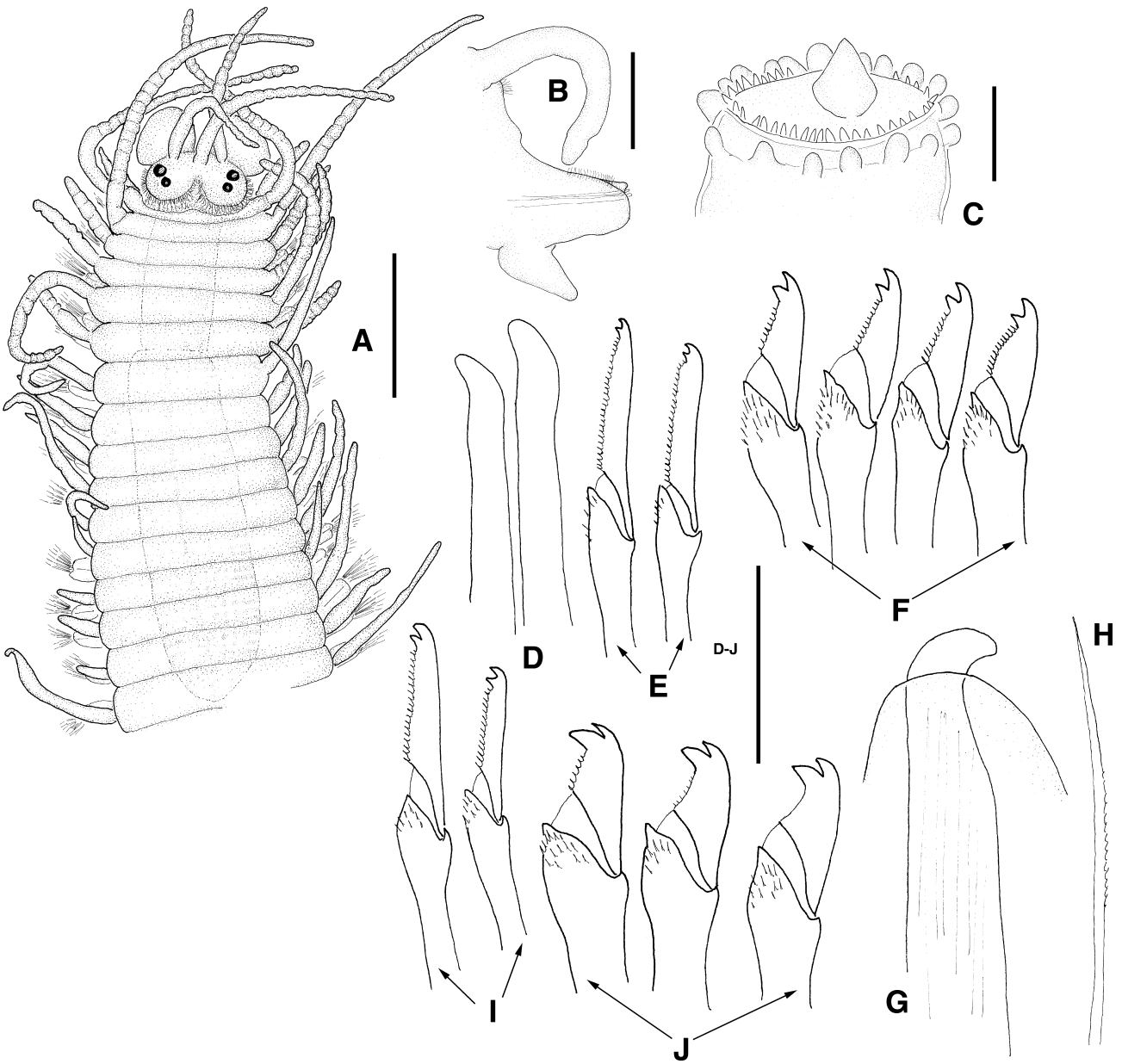



Fig. 10. *Eusyllis assimilis* Marenzeller, 1875 (*A*) anterior end, dorsal view; (*B*) midbody parapodium; (*C*) pharyngeal opening; (*D*) aciculae, anterior parapodium; (*E*) dorsalmost compound chaetae, anterior parapodium; (*F*) remaining compound chaetae, anterior parapodium; (*G*) acicula, posterior parapodium; (*H*) dorsal simple chaeta; (*I*) dorsalmost compound chaetae, posterior parapodium; (*J*) remaining compound chaetae, posterior parapodium. AM W28878. Scales: *A* 0.4 mm, *B* 0.1 mm, *C* 0.1 mm, *D–J* 20 µm.

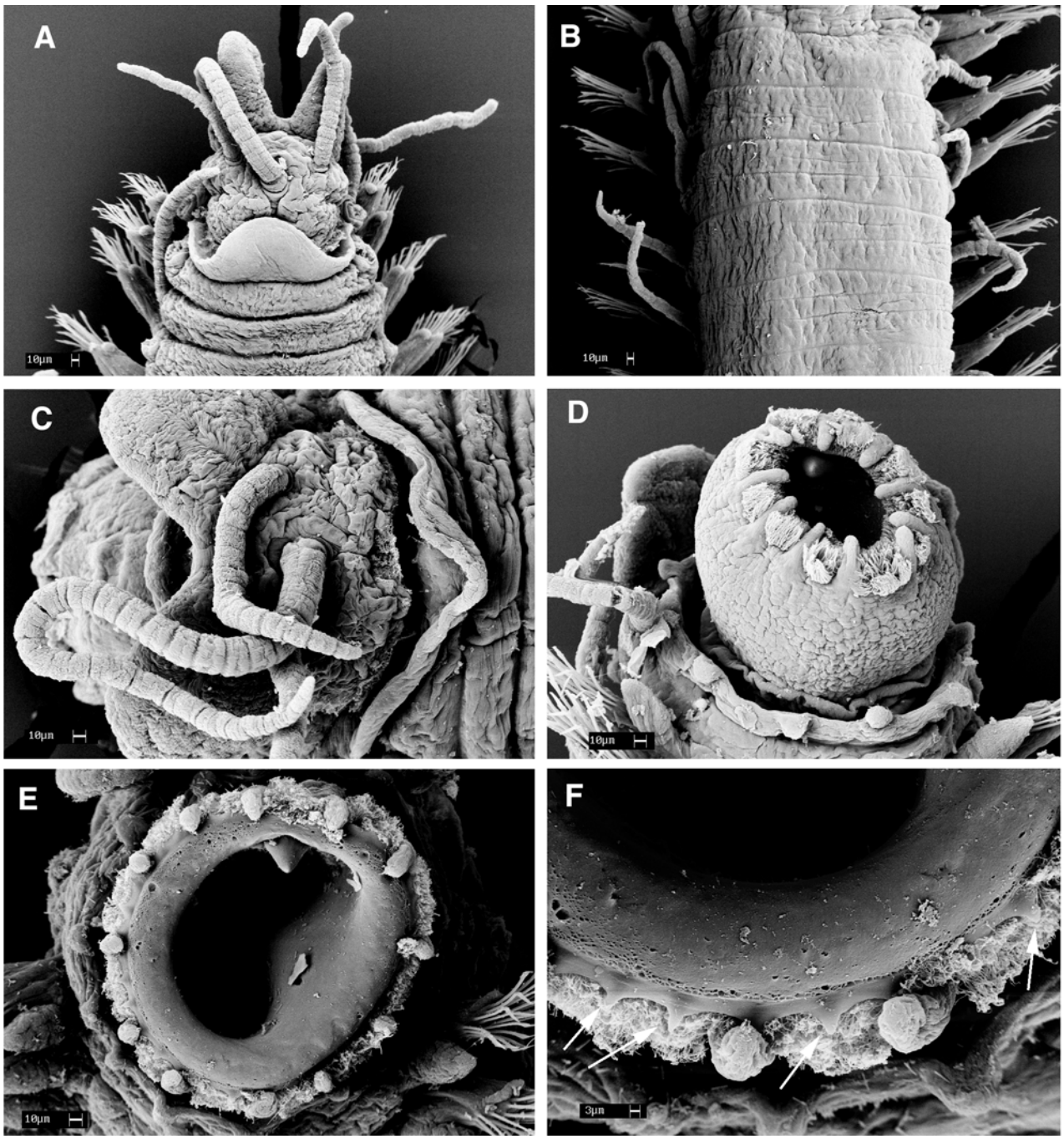



Fig. 11. SEM of *Eusyllis assimilis* Marenzeller, 1878 (*A*) anterior end, dorsal view; (*B*) midbody, dorsal view; (*C*) detail of prostomium, dorsal view; (*D*) everted pharynx; (*E*) pharyngeal opening; (*F*) detail of the same (arrows show denticles). AM W28878, W28879.

### *Eusyllis assimilis* Marenzeller, 1875

Figs 10A–J, 11A–F, 12A–C

*Eusyllis assimilis* Marenzeller, 1875: 158, pl. 3, Fig. 2.—Fauvel, 1923: 294, fig. 112a–g.—San Martín, 2003: 114, figs 52, 53.
?*Eudontosyllis aciculata* Knox, 1960: 105, figs 113–117.

**Material examined**. AUSTRALIA: NEW SOUTH WALES: SW side of South Solitary Is. 30°12'S 153°16'E, coral rubble, 18 m, coll. R.T. Springthorpe, 24 Jun 1992, 1 (AM W28942); Taupo Seamount, Tasman Sea, 33°14.21'S 156°10.68'E, rough marl bottom, 133 m, coll. J.K. Lowry & party on RV "Franklin", 2 May 1989, 2 on SEM stub (AM W28878); Taupo Seamount, Tasman Sea, 33°16.85'S 156°09.15'E, limestone & sand, 244 m, coll. J.K. Lowry & party on RV "Franklin", 2 May 1989, 4 on SEM stub (AM W28879); Taupo Seamount, Tasman Sea, 33°16.85'S 156°09.15'E, limestone & sand bottom, 244 m, coll. J.K. Lowry & party on RV Franklin, 2 May 1989, 17 (AM W28925). SOUTH AUSTRALIA: Lowly Point, 33°00'S 137°47'E, subtidal, 1 (AM W26357); 4 km NW of 5th Creek, Port Pirie, Spencer Gulf, 33°12'S 137°55'E, subtidal, *Posidonia* sp. and *Amphibolus* spp, 4.6 m, T.J. Ward & party, Mar 1980, 1 (AM W28234). WESTERN AUSTRALIA: Red Bluff, Kalbarri, 27°42'S 114°09'E, mixed coralline algae on rocky shore, 3.5 m, coll. J.K. Lowry, 10 Jan 1984, several

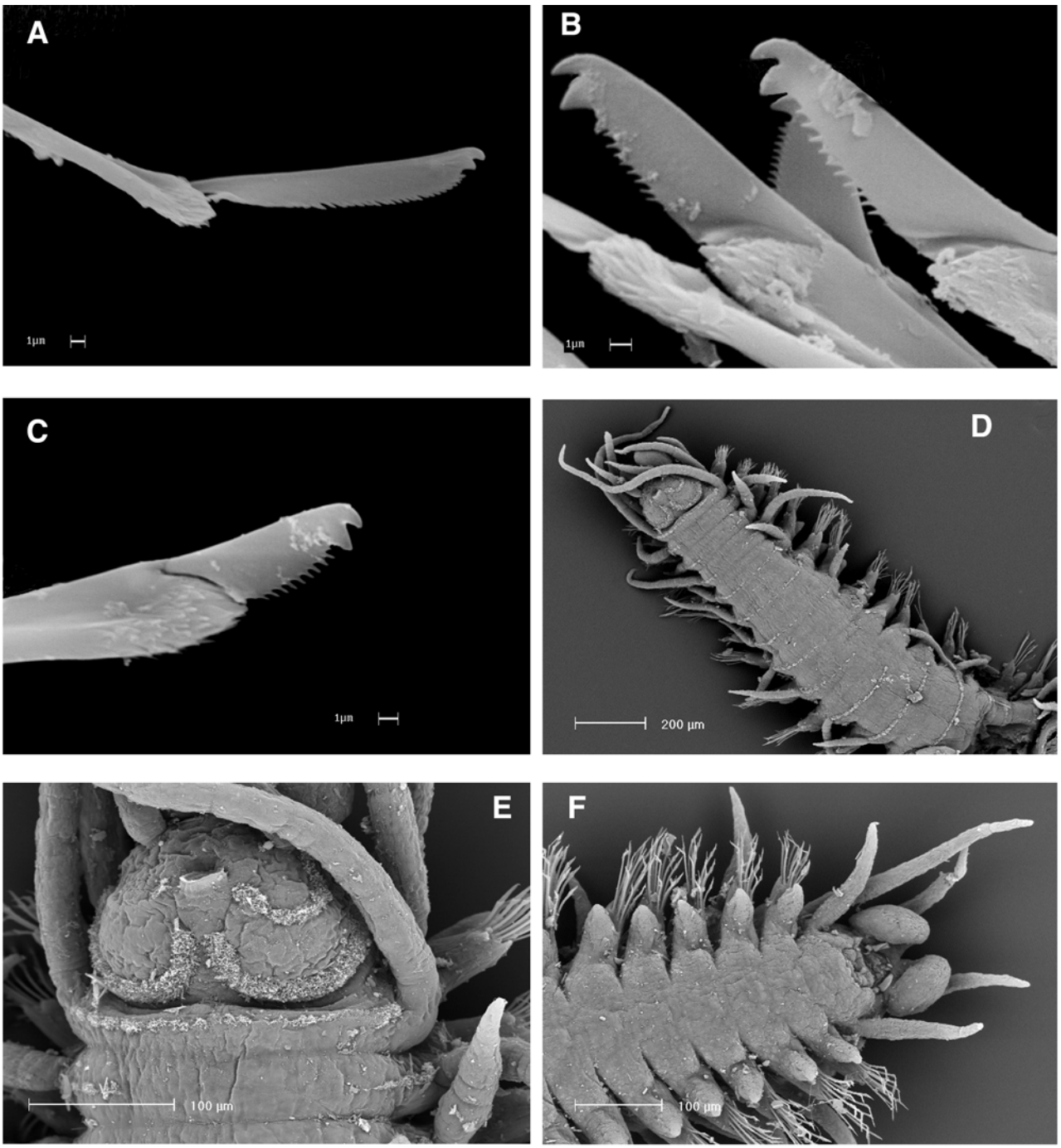



Fig. 12. SEM of *Eusyllis assimilis* Marenzeller, 1878 (*A*) dorsal compound chaeta, midbody; (*B*) compound chaetae, midbody; (*C*) compound chaeta, posterior parapodium. SEM of *Eusyllis kupffferi* Langerhans, 1879 (*D*) anterior end, dorsal view; (*E*) detail of prostomium and anteriormost segments, dorsal view; (*F*) anterior end, ventral view. *A–C*: AM W28878, W28879, *D–F*: AM W28952.

(AM W28941); Bundegi Reef near Point Murat, Exmouth Gulf, 21°49'S 113°11'E, orange finger sponge, 9 m, coll. J.K. Lowry, 4 Jan 1984, WA-398, 1 (AM W26738).

**Additional material examined**. Spain: Off Cabo Cros, Soller, Mallorca, Balearic Is., 39°38.50'N 02°25.13'E, dredged 59–61 m, 6 (MNCNM 8637); Off Ribadeo, Lugo, Galicia, 43°40.59'–43°40.25'N 7°02.77'–7°04.35'E, dredged 114–116 m, 8 (MNCNM 8643).

**Description**. Material examined small to medium size (10 to <5 mm length), described specimen 5 mm long, 0.54 mm wide, with 41 chaetigers (all incomplete specimens), fragile. Elsewhere; specimens exceeding 40 mm in length reported. Prostomium oval, deeply incised posteriorly, forming 2 distinct lobes, densely ciliated on margin (Figs 10A, 11A,C); 4 eyes in open trapezoidal arrangement; antennae long, slender, much longer than combined length of prostomium and palps, irregularly pseudoarticulated; lateral antennae inserted near anterior margin of prostomium, median antenna arising slightly posteriorly to lateral ones (Figs 10A, 11A,C). Palps broad, similar in length to prostomium or slightly longer. Peristomium shorter than subsequent segments; dorsal tentacular cirri long, similar in shape but longer than median antenna, ventral tentacular cirri about quarter length of dorsal ones. Occipital flap

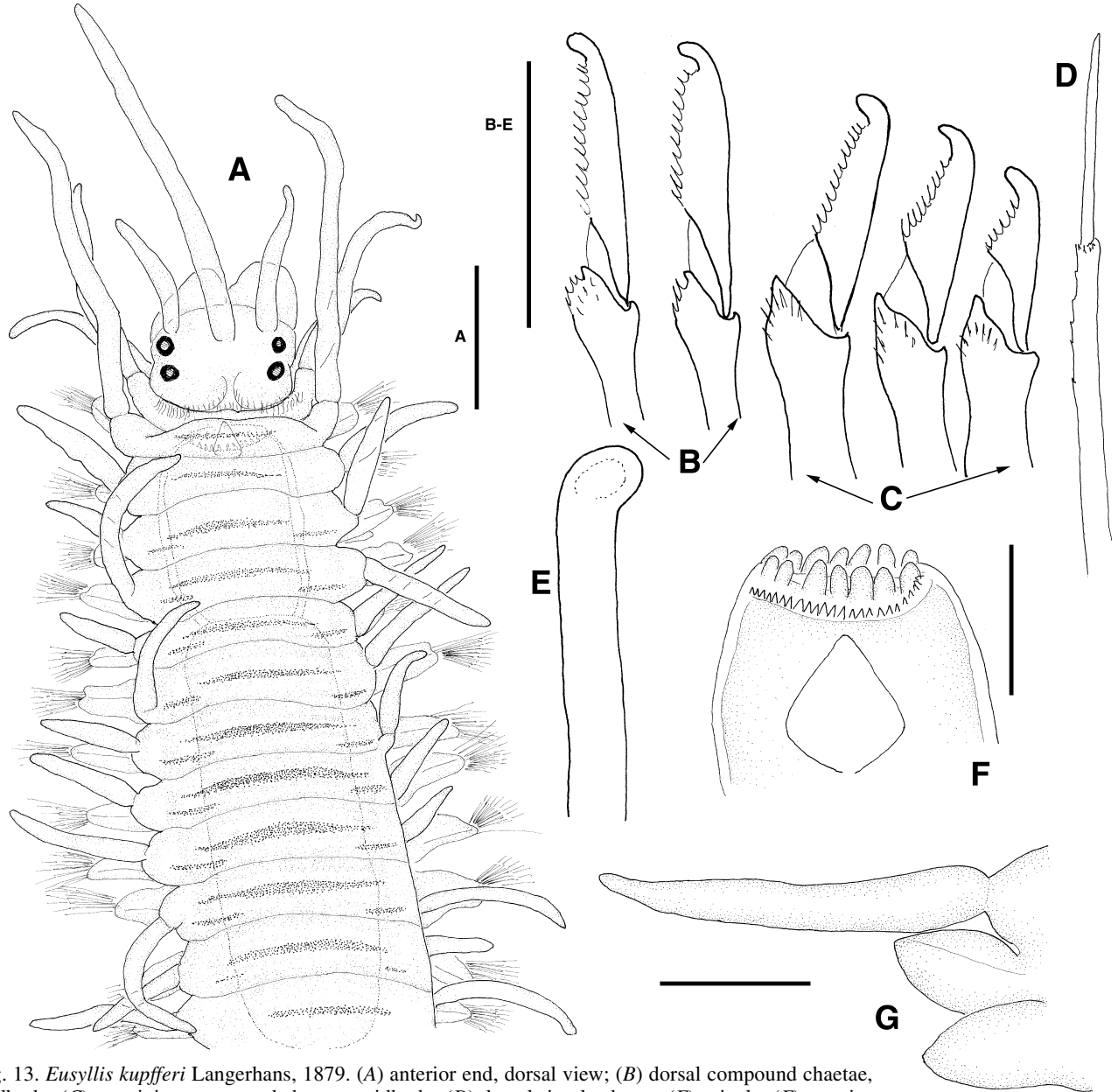



Fig. 13. *Eusyllis kupfferi* Langerhans, 1879. (*A*) anterior end, dorsal view; (*B*) dorsal compound chaetae, midbody; (*C*) remaining compound chaetae, midbody; (*D*) dorsal simple chaeta; (*E*) acicula; (*F*) anterior end of pharynx; (*G*) parapodium, midbody. *A,F*: AM W28404; *B–G*: AM W28408. Scales: *A* 0.2 mm, *B–E* 20 µm, *F* 0.1 mm, *G* 0.18 mm.

present (Fig. 11A,C). Dorsal cirri of chaetiger 1 elongated, longer than dorsal tentacular cirri, also indistinctly articulated; following dorsal cirri irregularly alternating long cirri, slightly longer than half of body width, and others distinctly shorter, all smooth, elongated, tapered (Figs 10A, 11B). Parapodia with prechaetal lobes. Parapodia dorsally with cilia; other groups of cilia dorsally along body close to dorsal cirri (Figs 10B, 11B). Ventral cirri triangular, shorter than parapodial lobes (Fig. 11B). Compound chaetae heterogomph falcigers, with shafts distally covered in numerous, thin spines. Two different types of compound chaetae present, one with slender, bidentate blades, both teeth similar, and short spines on margin (Figs 10E,I, 12A), located dorsally, others with shorter and larger blades, strongly bidentate, both teeth similar on anterior parapodia (Figs 10F, 12B), on posterior parapodia proximal tooth becoming longer and stouter, located more ventrally within bundles (Figs 10J, 12C). Anterior parapodia with 3 compound chaetae of slender type, blades about 20–22 µm in length, and 19–20 compound chaetae of broad type, blades about 15 µm in length. Posteriorly along body, number of compound chaetae decreases, posterior parapodia with 1–2 compound chaetae of slender type, blades 15–22 µm in length, and 6 of broad type, with prominent proximal tooth, and minute spines or smooth on margin, about 16 µm in length. Dorsal simple chaetae slender, capillaries, unidentate, with minute subdistal spines on margin (Fig. 10H), present only on posterior parapodia. Ventral simple chaetae not seen. Anterior parapodia with 2 slender aciculae, with slightly bent tip (Fig. 10D); posteriorly single aciculum present, thicker than anterior ones, distally bent and extending beyond parapodial lobes (Fig. 10G). Pharynx through about 7–8 segments; opening surrounded by a crown of 17–20 soft papillae and dense layer of cilia (Fig. 11D–F); plus crown of 10 smaller papillae basally (Fig. 11D); pharyngeal tooth large, located on anterior margin

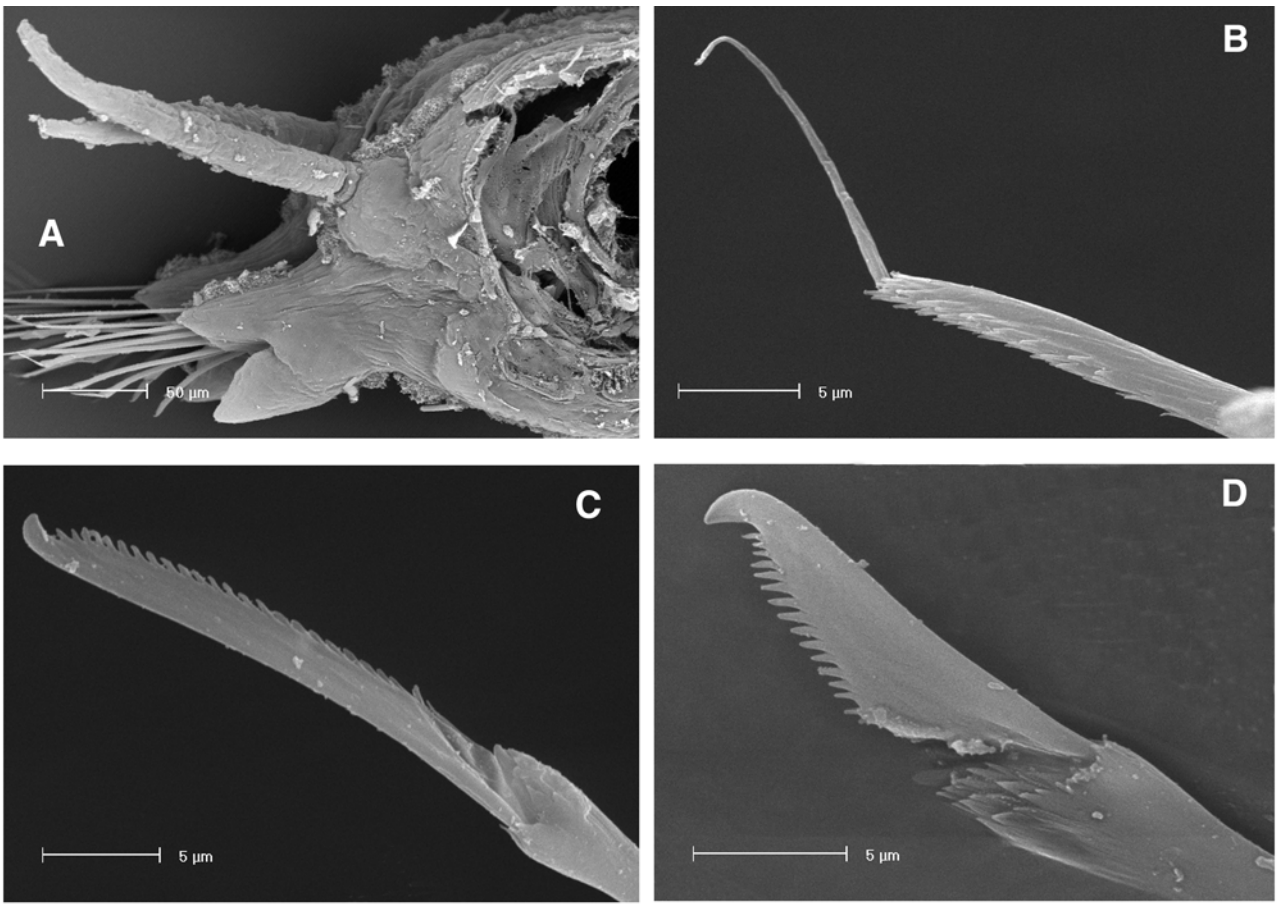



Fig. 14. SEM of *Eusyllis kupfferi* Langerhans, 1879 (*A*) right section of a midbody segment; (*B*) dorsal simple chaeta; (*C*) dorsalmost compound chaeta, anterior parapodium; (*D,E*) short compound chaetae, anterior parapodium. AM W28952.

(Fig. 10C); trepan incomplete, with variable number of teeth, ranging from few to up to 35 separate teeth present (Fig. 11F, arrows). Proventricle elongate, through about 10 segments, tapering posteriorly, with about 50 muscle cell rows.

**Remarks**. This species has been reported from a wide range of habitats and depths and material should be re-examined and a molecular study would be useful to confirm if this is a widely distributed species or a suite of sibling species. We believe that *Eudontosyllis aciculata* Knox, 1960, is identical with *E. assimilis* based on the description. We were unable, however, to borrow this material.

**Habitat**. Occurring in all kind of substrates, from intertidal to more than 500 m depth.

**Distribution**. North Atlantic, Mediterranean Sea, North Pacific, New Zealand, Australia (Western Australia, South Australia, New South Wales).

### *Eusyllis kupfferi* Langerhans, 1879

Figs 12D–F, 13A–G, 14A–E

*Eusyllis kupfferi* Langerhans, 1879: 552, Fig. 14.—San Martín, 1990: 607, figs 12, 13.
*Eusyllis autolytoides* Hartmann-Schröder, 1991: 33, figs 47–53.
*Odontosyllis multidentata* Hartmann-Schröder, 1982: 64, figs 41–46; 1990: 51, fig. 17.

**Material examined**. AUSTRALIA: QUEENSLAND: SW Reef, Heron Is. 23°27'S 151°55'E, reef margin, algae, coral sand & coral debris, 3 Feb 1976, 2 paratypes of *Eusyllis autolytoides* Hartmann-Schröder, 1991, (AM W20387). NEW SOUTH WALES: Off old wharf, Richmond R., near Ballina, 28°52.5'S 153°33.6'E, drift algae, 6 m, coll. S.J. Keable, 5 Mar 1992, 4 (AM W28218); S ledge, Cook Is. 28°11.65'S 153°34.63'E, surface of massive sponges, 14 m, coll. R.T. Springthorpe, 9 Jun 1993, 1 (AM W28402); S ledge, Cook Is. 28°11.65'S 153°34.63'E, *Halimeda* sp., 13 m, coll. E.L.A. Ho, 9 Jun 1993, 1 (AM W28404); SW side of South Solitary Is. 30°12'S 153°16'E, coral rubble, 18 m, coll. R.T. Springthorpe, 24 Jun 1992, few (AM W28215); 1 km S of E end of Spectacle Is. Hawkesbury R., 33°32'S 151°07.5'E, muddy sand, 12 m, coll. A.R. Jones & A. Murray, 8 May 1984, 1 (AM W22149); Green Pt. Croppy Pt. Hawkesbury R., 33°33.5'S 151°14.5'E, mud, 6 m, coll. A. Jones & party, 22 Feb 1980, 1 (AM W196604); E end of Brooklyn Boat Channel, Hawkesbury R., 33°33'S 151°14'E, coll. A. Jones & party, 18 Dec 1979, 1 (AM W196606); E end of Brooklyn Boat Channel, Hawkesbury R., 33°33'S 151°14'E, coll. A. Jones & party, 16 May 1980, 1 (AM W196607); E end of Brooklyn Boat Channel, Hawkesbury R.,

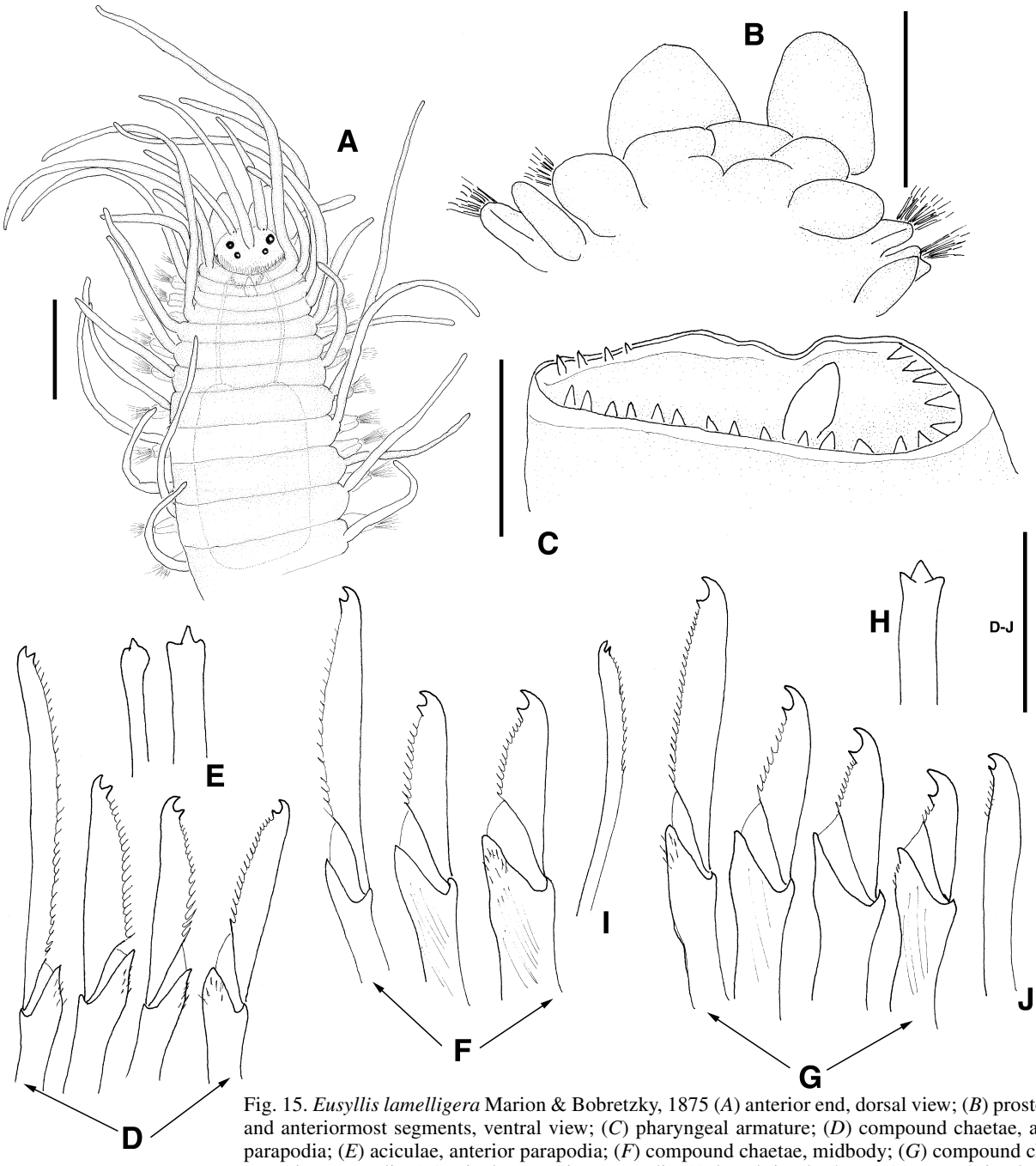



Fig. 15. *Eusyllis lamelligera* Marion & Bobretzky, 1875 (*A*) anterior end, dorsal view; (*B*) prostomium and anteriormost segments, ventral view; (*C*) pharyngeal armature; (*D*) compound chaetae, anterior parapodia; (*E*) aciculae, anterior parapodia; (*F*) compound chaetae, midbody; (*G*) compound chaetae, posterior parapodia; (*H*) acicula, posterior parapodia; (*I*) dorsal simple chaeta; (*J*) ventral simple chaeta. AM W28416. Scales: *A* 0.4 mm, *B* 0.18 mm, *C* 0.1 mm, *D–J* 20 μm.

33°33'S 151°14'E, A. Jones & party, 16 May 1980, 1 (AM W196609); E end of Brooklyn Boat Channel, Hawkesbury R., 33°33'S 151°14'E, coll. A. Jones *et al*., 1 Aug 1979, 2 (AM W196611); E end of Brooklyn Boat Channel, Hawkesbury R., 33°33'S 151°14'E, coll. A. Jones *et al*., 18 Dec 1979, 1 (AM W196612); E end of Brooklyn Boat Channel, Hawkesbury R., 33°33'S 151°14'E, coll. A. Jones & party, 18 Dec 1979, 1 (AM W196613); Barrenjoey Head, Broken Bay, 33°35'S 151°20'E, algae on rocky substrate, 4 m, coll. J.K. Lowry & party 22 Apr 1983, 1 (AM W28408). WESTERN AUSTRALIA: N end of beach, Bundegi Reef, Exmouth Gulf, 21°49'S 114°11'E, rocky rubble, sticky sediment & brown algae with epiphytes, 2 m, coll. H.E. Stoddart, 4 Jan 1984, many + 2 on SEM stub (AM W28952); N end of beach, Bundegi Reef, Exmouth Gulf, 21°49'S 114°11'E, rocky rubble, coralline algae with green epiphyte, 1.5 m, coll. H.E. Stoddart, 4 Jan 1984, several (AM W28953).

**Description**. Body up to 4.5 mm long, 0.3 mm wide, with 40 chaetigers, slightly dorsoventrally flattened, dorsally convex along median line of body, with well marked segments. Distinct colour pattern, with 1 transverse band of red pigment, sometimes 2 bands, and additional narrow bands often laterally located on posterior half of segments (Fig. 13A). Material examined exhibiting great variation in intensity of pigmentation, from highly pigmented to colourless individuals. Prostomium twice as large as 2nd segment, pentagonal to quadrangular, with nuchal notch, ciliated on both sides (Fig. 13A), double semicircle of cilia on anterior part of prostomium (Fig. 12D,E); 4 eyes in open trapezoidal arrangement, occasionally 2 anterior eyespots. Antennae, tentacular and dorsal cirri fusiform, smooth. Lateral antennae arising in front of anterior eyes, length similar to combined length of prostomium and palps, median

antenna typically much longer than lateral antennae, arising slightly posteriorly to lateral antennae (Figs 12D,E, 13A). Palps broad (Fig. 12F), shorter than prostomium. Peristomium shorter than following segments, sometimes covered partially by prostomium and fold of chaetiger 1, provided with some cilia (Figs 12D,E, 13A); dorsal tentacular cirri shorter than median antenna but longer than lateral antennae; ventral tentacular cirri similar to lateral antennae. Dorsal transverse row of cilia on each segment (Figs 12D, 14A); plus some cilia on dorsal surface of parapodial lobes (Fig. 14A). Dorsal cirri of chaetiger 1 long, similar in length to median antenna, longer than body width; remaining dorsal cirri irregularly alternating between cirri similar in length to half of body width, and cirri much shorter (Figs 12D, 13A, 14A). Parapodia short, about third of body width, thick, conical. Ventral cirri broad, shorter than parapodial lobes or similar in length (Figs 13G, 14A). Compound chaetae heterogomph falcigers, shafts with several thin subdistal spines; blades proportionally short, unidentate, with rounded tips, and short spines on margin (Fig. 13B,C). Anterior parapodia with 2 kinds of compound chaetae, one with relatively thin blades, 3 in anterior segments, declining to 1 from midbody onwards (Figs 13B, 14C), blades 20–25 µm in length, located dorsally, other type with thicker and shorter blades (Figs 13C, 14D,E), about 17 µm in length, all similar, 12–14 per parapodium. Dorsal simple chaetae bayonet-shaped (Figs 13D, 14B), from proventricle segments onwards. Ventral simple chaetae absent. Acicula solitary, distally knobbed, apparently hollow at tip (Fig. 13E). Pharynx through 4–5 segments; opening rim smooth on one half and other half with small denticles (Figs 13A,F); material examined exhibiting considerably range in numbers of denticles present, from few to 20–24. Pharyngeal tooth large, conical to rhomboidal; pharyngeal opening provided with crown of about 14 soft papillae (Fig. 13F). Proventricle longer than pharynx, through 7–8 segments, with about 50 muscle cell rows. Pygidium with 2 slender, anal cirri.

**Remark**. Material from all localities listed in the distribution has been examined by the senior author during other studies, and no morphological differences between them can be found. Molecular studies may be useful to confirm if this is a widely distributed species or a suite of sibling species. Specimens described as *Eusyllis autolytoides* by Hartmann-Schröder (1991) and *Odontosyllis multidentata* (Hartmann-Schröder, 1982) agree with the description of *Eusyllis kupfferi*, so we consider them as synonymous.

**Distribution**. Portugal (Madeira), Canary Is., Cuba, Australia (Queensland, Western Australia, New South Wales).

**Habitat**. Occurring on hydroids, *Rhizophora mangle* roots, on algae, algae with sand, debris, dead corals, sand and mud, from intertidal to about 20 m.

### *Eusyllis lamelligera* Marion & Bobretzky, 1875

Figs 15A–J, 16A–F

*Eusyllis lamelligera* Marion & Bobretzky, 1875: 33, pl. 3, figs. 9A–C.—Fauvel, 1923: 294, Fig. 113.—San Martín, 2003: 117, figs 54, 55.
*Eusyllis dentata* Hartmann-Schröder, 1990: 50, figs 13–16.
*Eusyllis habei* Imajima, 1966: 97, text-fig. 31a–k.

**Material examined**. AUSTRALIA: NEW SOUTH WALES: N side of Bannister Head, N of Ulladulla, 35°19.15'S 150°29.12'E, grey sponge from top of boulder, 18 m, coll. K. Attwood, 6 May 1997, 1 (AM W28960); SW of Bowen Is., Jervis Bay, 35°07.49'S 150°45.77'E, small white sponge with pink lobes, from seagrass bed, 7 m, coll. P. Serov & G.D.F. Wilson, 8 Dec 1993, several (AM W28416); SW of Bowen Is., Jervis Bay, 35°07.49'S 150°45.77'E, rock on sandy bottom covered in bryozoa & polychaetes, 7 m, coll. P. Serov & G.D.F. Wilson, 8 Dec 1993, few (AM W28415); Montagu Roadstead, Jervis Bay, 35°02.2'S 150°46.0'E, unvegetated sediment, 12 m, coll. P.A. Hutchings & party, 6 Jun 1990, 1 (AM W28231); NW corner of Bowen Is., Jervis Bay, 35°06.81'S 150°46.11'E, dense bryozoans under rock ledge, 13 m, coll. P. Serov & G.D.F. Wilson, 8 Dec 1993, several (AM W28959); Darling Road, near anchorages, Jervis Bay, 35°7.3'S 150°44.1'E, 18 m, coll. P.A. Hutchings, 23 Jan 1973, 2 (AM W28437); Taupo Seamount, Tasman Sea, 33°16.85'S 156°09.15'E, limestone & sand bottom, 244 m, coll. J.K. Lowry & party, on RV "Franklin", 2 May 1989, 5 on SEM stub (AM W28877); Taupo Seamount, Tasman Sea, 33°16.85'S 156°09.15'E, limestone & sand bottom, 244 m, coll. J.K. Lowry & party on RV "Franklin", 2 May 1989, many (AM W28927); Reef flat, near wreck "Yoshin Maru Iwaki", Elizabeth Reef, Tasman Sea, 29°55.8'S 159°01.3'E, algae, 0.5 m, coll. Elizabeth & Middleton Reefs Expedition, 1987, 14 Dec 1987, several (AM W28928). TASMANIA: Woodchip Jetty, Spring Bay, Triabunna, 42°30'S 147°55'E, muddy bottom, 4 m, coll. D. Cropp, Nov 1982, 1 (AM W199178). SOUTH AUSTRALIA: Billy Lights Point, Port Lincoln, 34°45'S 135°53'E, stone washings from sheltered intertidal rocks, coll. I. Loch, 15 Feb 1985, 1 (AM W28929). WESTERN AUSTRALIA: Goss Passage, Beacon Is. 28°25.5'S 113°47'E, dead plates of *Acropora* coral covered in coralline algae, 24 m, P.A. Hutchings, 21 May 1994, 1 (AM W28374); N end of Long Is. 28°27.9'S 113°46.3'E, dead coral substrate covered in coralline & brown algae, 5.5 m, coll. C. Bryce, 22 May 1994, several (AM W28961).

**Additional material examined** *Eusyllis dentata* AUSTRALIA: NEW SOUTH WALES: Angourie Point, south of Yamba, 29°29'S 153°22'E algae, intertidal, holotype (HZM P-19963), 8 paratypes (HZM P-19964), 1 (HZM P-203313). *Eusyllis habei* JAPAN: Bos Peninsula, Hubara Port, 1, coll. E. Nishi. *Eusyllis lamelligera* SPAIN: off Punta Jovo, W. W Menorca, Balearic Is. 10 m, algae 43°40.27'–43°40.06'N 5°13.36'–5°14.35'E, 6 (MNCNM 8675); NW Cabo de Lastres, Asturias, Cantabrian Sea, NE Atlantic, 39°49.66'–39°47.64'N 2°40.78'–2°38.71'E, 146 m, 8 (MNCNM 8688).

**Description**. Complete specimen 6.3 mm long, 0.5 mm wide, with 50 chaetigers. Prostomium semi-circular; 4 eyes in open trapezoidal arrangement and 2 anterior eyespots. Median antenna more than twice combined length of prostomium and palps, inserted on middle of prostomium, lateral antennae shorter than median antenna, inserted in front of anterior eyes, near anterior margin (Fig. 15A). Palps broad, similar in length to prostomium (Fig. 15A). Nuchal organs with distinct ciliation, extending to posterior margin of prostomium (Figs 15A, 16A). Peristomium similar to subsequent segments; dorsal tentacular cirri long and slender, more than twice as long as body width, ventral tentacular cirri about third length of dorsal cirri. Antennae, tentacular and dorsal cirri smooth, long, slender, distally tapered (Fig. 15A), sometimes rugose to weakly pseudo-articulate (Fig. 16B). Dorsal cirri of chaetiger 1 longer than dorsal tentacular cirri, remaining dorsal cirri irregularly alternating long, and short cirri, long cirri much longer than body width, and short ones, slightly shorter than body width (Fig. 15A). Ventral cirri of chaetiger 1 enlarged, flattened leaf-like; following ones conical (Figs 15B, 16B); ventral cirri with minute pores (Fig. 16D). Lateral tufts of cilia on each segment (Fig. 16C). Compound chaetae heterogomph, with subdistal spines on shafts and bidentate blades, both teeth similar in size, well separated and rounded margin between both teeth, and fine spines on margin (Figs. 15D,F,G, 16E,F). Anterior parapodia with about 20–25 compound chaetae, with strong dorsoventral gradation in

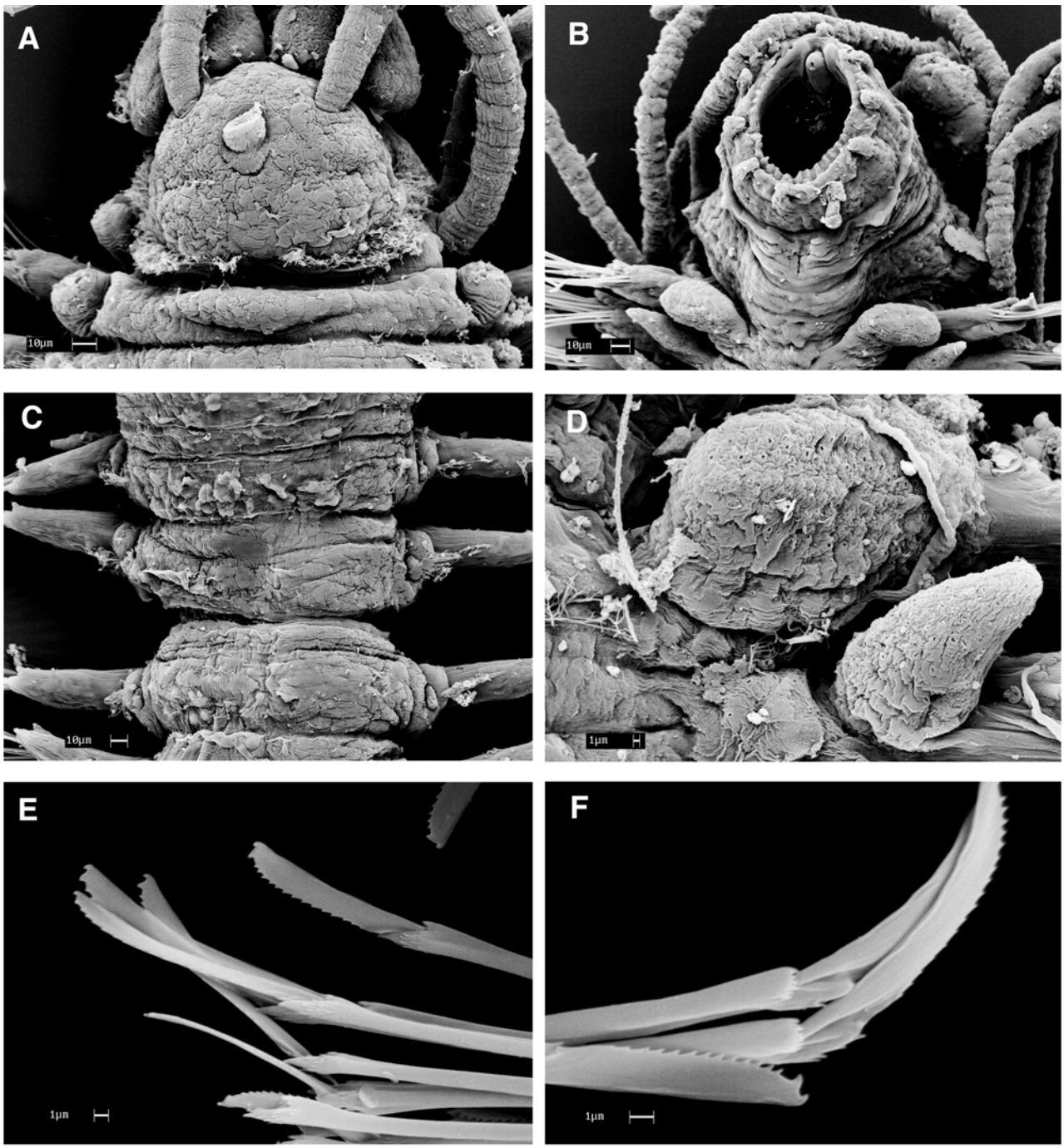



Fig. 16. SEM of *Eusyllis lamelligera* Marion & Bobretzky, 1875 (*A*) prostomium; (*B*) everted pharynx and anteriormost segments, ventral view; (*C*) midbody segments, dorsal view; (*D*) detail of first and second ventral cirri; (*E,F*), compound chaetae. AM W28877

size of blades within fascicle, about 40 µm in length dorsally, 21 µm in length ventrally. Progressively along body, number of compound chaetae per parapodium decreases, to 13–15 on midbody, 10 on posterior parapodia, with thicker shafts and blades, with less marked dorsoventral gradation in length of blades; on midbody, blades about 35 µm in length dorsally, 22 µm in length ventrally, and 30 µm in length dorsally, and 15 µm in length ventrally on posterior parapodia (Fig. 15D,F,G). Dorsal simple chaetae on posterior parapodia, slender, bidentate, both teeth similar, with short spines on margin (Fig. 15I). Ventral simple chaetae on far posterior parapodia, similar to dorsal simple chaetae, but larger and teeth well separated (Fig. 15J). Anterior parapodia with 2 aciculae, one distally knobbed with acute tip, other with tricuspid tip, with lateral ones poorly developed (Fig. 15E); medium and posterior parapodia each with single acicula, distinctly tricuspid (Fig. 15H). Pharynx through about 7 segments; pharyngeal tooth, conical, on anterior margin; trepan variable, ranging from few small teeth present to distinct incomplete crown of up to 24 teeth (Figs 15C, 16B).

**Remarks**. This species is characterized by having enlarged, flattened leaf-like ventral cirri on chaetiger 1, tricuspid aciculae, and compound chaetae with bidentate blades, with both teeth of similar size and well separated by rounded

margin. The Australian specimens were described as *Eusyllis dentata* by Hartmann-Schröder (1990); and these were examined and they are indistinguishable from Mediterranean specimens of *Eusyllis lamelligera*. This species has been reported from a wide range of habitats and depths and material should be re-examined and a molecular study would be useful to confirm if this is a widely distributed species or a suite of sibling species.

*Eusyllis habei* Imajima, 1966, from Japan, is also similar according to the description and may represent the same species according to Imajima (1966). The material examined from Bos Peninsula, Japan appears to be similar to specimens of *E. lamelligera* from the Mediterranean and also to material from the Atlantic and Australia.

**Habitat**. Occurring in a wide variety of substrates and depths, intertidally to depths greater than 500 m.

**Distribution**. North Atlantic, Mediterranean Sea, Australia (New South Wales, Tasmania, Western Australia).

## Genus *Nudisyllis* Knox & Cameron, 1970

*Nudisyllis* Knox & Cameron, 1970: 77, emended.

**Type species**. *Nudisyllis tinihekea* Knox & Cameron, 1970.

**Diagnosis**. Body small, fragile, <5 mm in length. Prostomium large, about width of 2 segments, with 4 eyes and sometimes pair of anterior eyespots. Three antennae. Palps separated, free from each other, sometimes adjacent at base. Median antenna inserted on middle of prostomium or anteriorly, on line with lateral antennae. Two pairs of tentacular cirri. Nuchal organs as 2 ciliated grooves between prostomium and peristomium. Dorsal cirri on all chaetigers, long, cylindrical, smooth or slightly rugose. Ventral cirri not modified. Compound chaetae with both unidentate and bidentate blades on same parapodium, or all unidentate; bidentate blades having proximal tooth small, spine-like. Tips of aciculae tricuspidate or lancet-shaped. Pharynx small, shorter than proventricle; pharyngeal tooth located near anterior rim, usually long. Pygidium with 2 anal cirri. Reproduction by epigamy, probably with dorsal incubation of eggs (only reported on two species) (Pierantoni, 1905; Augener, 1913).

**Remarks**. *Nudisyllis* was described as being characterized by a lack of antennae, tentacular and dorsal cirri. Loss of appendages during fixation and manipulation is usual in some species, suggesting that these structures are absent when in fact they are present. Several of the specimens examined lack all or some appendages; those that lack them are identical to the description and drawings of *Nudisyllis tinihekea*, so we assume that are all the same species; they type specimens represent damaged specimens, having lost appendages during fixation. Some other species described as belonging to *Pionosyllis* have the same characters, but differ from *Nudisyllis* in being of minute size (<5 mm in length), having free palps, short pharynx and a long tooth, and compound chaetae with unidentate to minutely bidentate blades. So, we consider *Nudisyllis* a valid genus, and have

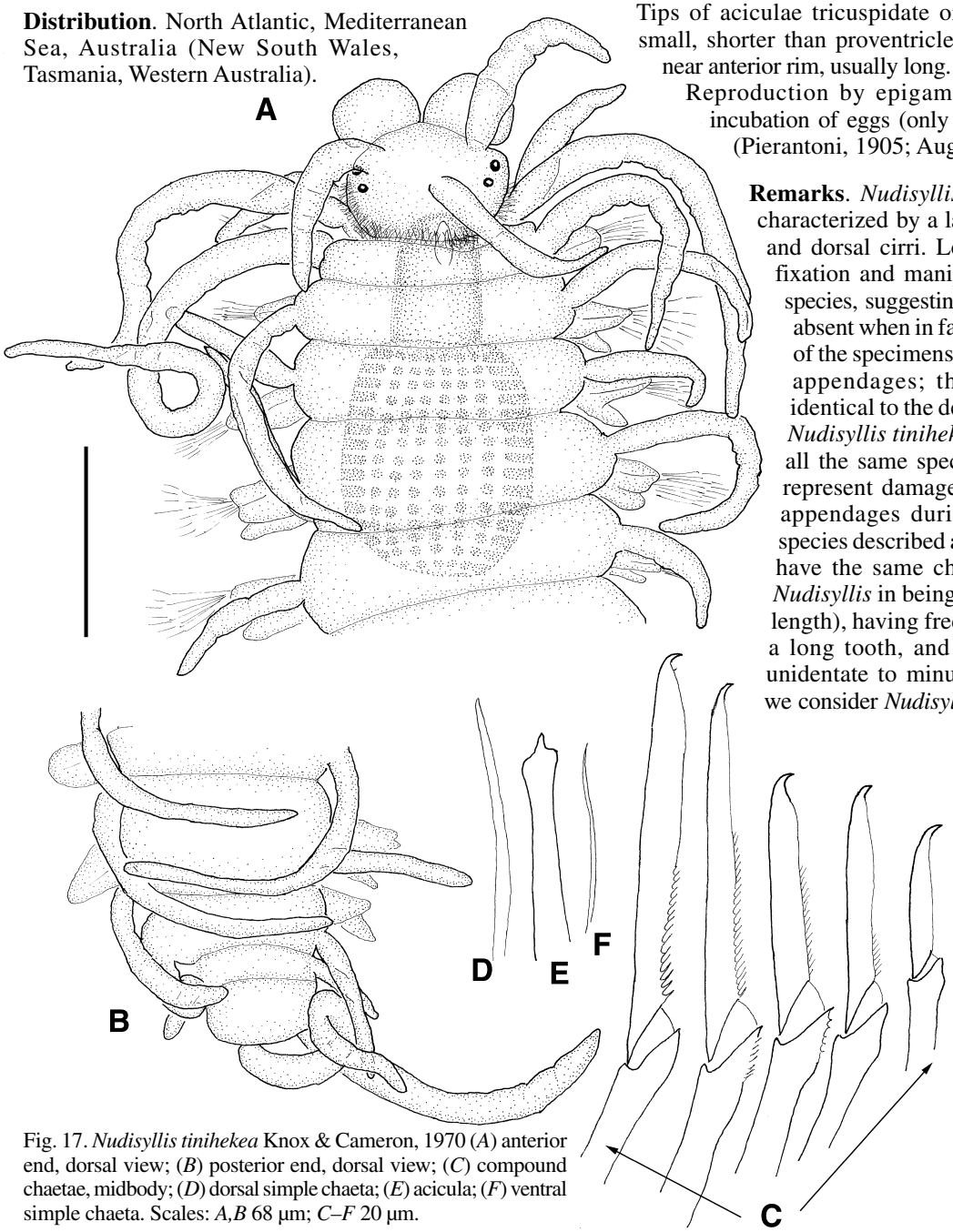



Fig. 17. *Nudisyllis tinihekea* Knox & Cameron, 1970 (*A*) anterior end, dorsal view; (*B*) posterior end, dorsal view; (*C*) compound chaetae, midbody; (*D*) dorsal simple chaeta; (*E*) acicula; (*F*) ventral simple chaeta. Scales: *A,B* 68 µm; *C–F* 20 µm.

emended the diagnosis and the genus now includes some species previously considered belonging to *Pionosyllis*, among them *P. pulligera* (Krohn, 1852); *P. magnidens* Day, 1953; and *P. divaricata* (Keferstein, 1862).

### *Nudisyllis tinihekea* Knox & Cameron, 1970

Fig. 17A–F

*Nudisyllis tinihekea* Knox & Cameron, 1970: 77, figs 6–9.
*Pionosyllis pulligera*.—Augener, 1913: 221, pl. II, fig. 8, text-fig. 29. Not Krohn, 1852: 251.
*Pionosyllis samsonensis* Hartmann-Schröder, 1980: 52, figs 39–43; 1981: 32; 1982: 65. 1983: 130; 1984: 20; 1985: 69; 1986: 41; 1987: 38; 1991: 35.

**Material examined**. AUSTRALIA: NEW SOUTH WALES: Barrenjoey Head, Broken Bay, 33°35'S 151°20'E, algae on rocky substrate, 4 m, coll. J.K. Lowry & party 22 Apr 1983, 1 (AM W28966). WESTERN AUSTRALIA: Red Bluff, Kalbarri, 27°42'S 114°09'E, seagrass in shallow sand on rocky shore, 3.5 m, coll. R.T. Springthorpe, 10 Jan 1984, 2 (AM W28968); Red Bluff, Kalbarri, 27°42'S 114°09'E, mixed coralline algae on rocky shore, 3.5 m, coll. J.K. Lowry, 10 Jan 1984, several (AM W28970); Inshore limestone reef, Ned's Camp, Cape Range National Park, 21°59'S 113°55'E, frilly *Caulerpa* sp., 1 m, coll. J.K. Lowry, 2 Jan 1984, several (AM W28971); Inside outer Ningaloo Reef, Cape Range National Park, 21°59.5'S 113°54.5'E, mixed algae, 2 m, coll. J.K. Lowry, 1 Jan 1984, 2 (AM W28364); Inshore limestone reef, Ned's Camp, Cape Range National Park, 21°59'S 113°55'E, sponge covered with epiphytes, sediment & muddy worm tubes, 1.5 m, coll. R.T. Springthorpe, 2 Jan 1984, 2 (AM W28969); N end of beach, Bundegi Reef, Exmouth Gulf, 21°49'S 114°11'E, rocky rubble, coralline algae with green epiphyte, 1.5 m, coll. H.E. Stoddart, 4 Jan 1984, 1 (AM W28967).

**Description**. Body up to 3.1 mm long with 34 chaetigers, according to literature, longest specimen examined 1.2 mm long, 0.2 mm wide, with 16 chaetigers, extremely fragile, several specimens lack most appendages, others having lost all antennae, tentacular and dorsal cirri. Prostomium squared to pentagonal, densely covered by long cilia on posterior margin and laterals (Fig. 17A), 4 eyes in trapezoidal arrangement, located laterally on prostomium; median antenna inserted on middle of prostomium, fusiform, distally tapered, slightly longer than combined length of prostomium and palps; lateral antennae inserted on anterior margin, slightly shorter than median antenna (Fig. 17A). Palps short, broad, oval. Peristomium dorsally reduced, covered by chaetiger 1 (Fig. 17A); dorsal tentacular cirri long, about twice as long as median antenna; ventral tentacular cirri about one third length of dorsal ones. Dorsal cirri smooth, thick, distally tapered, long on anterior segments, from proventricle posteriorly, cirri consist of long and short cirri that alternate; long cirri longer than body width, and short cirri, shorter than body width (Fig. 17A). Parapodia conical, ending with rounded papilla, provided with some tufts of cilia. Ventral cirri digitiform, shorter than parapodial lobes. Compound chaetae similar throughout, 15 anteriorly, 7 posteriorly, blades elongated, distally slightly hooked, unidentate, longer ones with subdistal spine, smooth or provided with fine spines on margin (Fig. 17C); dorsoventral gradation in length within fascicle, about 42 µm in length dorsally, 15 µm in length ventrally. Dorsal and ventral simple chaetae on far posterior parapodia, slender, smooth, unidentate (Fig. 17D,F). Acicula solitary, with tricuspidate tip (Fig. 17E). Pharynx short, through 2 segments; single pharyngeal tooth on anterior margin (Fig. 17A). Proventricle barrel-shaped, through 3 segments, with about 20 muscle cell rows. Pygidium semi-circular, with 2 anal cirri, similar in shape and length to long dorsal cirri (Fig. 17B).

**Habitat**. Occurring on coralline algae, mixed algae, *Caulerpa*, seagrasses on sand, sand with debris, sponges with epibionts in shallow depths.

**Distribution**. New Zealand, Australia (New South Wales, Western Australia, South Australia, Victoria, Queensland).

## Genus *Odontosyllis* Claparède, 1863

*Odontosyllis* Claparède, 1863: 47.
?*Eurymedusa* Kinberg, 1865: 61.
*Parautolytus* Ehlers, 1900: 213.
?*Alluaudella* Gravier, 1905: 372.
?*Atelesyllis* Pruvot, 1930: 39.
*Pharyngeovalvata* Day, 1951: 26.
*Odontoautolytus* Hartmann-Schröder, 1979: 112.
?*Synpalposyllis* Hartmann-Schröder, 1983: 132.
*Umbellisyllis* Sars, 1869: 254.

**Type species**. *Syllis fulgurans* Audouin & Milne Edwards, 1833, designated by Hartman, 1959.

**Diagnosis**. Body of variable size, from <5 mm to >10 mm in length, with numerous segments, cylindrical, dorsally highly convex, flattened ventrally. Prostomium with 4 eyes and, sometimes, pair of anterior eyespots. Three antennae. Palps broad, free for almost all their length, fused basally. Peristomium usually reduced dorsally; 2 pairs of tentacular cirri. Occipital flap present, usually well developed, covering peristomium dorsally and prostomium partially. Nuchal organs as 2 ciliated grooves between prostomium and peristomium, extending sometimes to lateral areas of prostomium. Dorsal cirri elongated, smooth, distally tapered, but sometimes short or indistinctly articulated. Parapodia usually with pre- and postchaetal lobes. Ventral cirri digitiform to pillow-shaped. Compound chaetae heterogomph, usually with shafts distally spinose. Dorsal and ventral simple chaetae present on some parapodia. Pharynx short, distinctly shorter than proventricle, provided with several teeth, usually few, pointing backwards, pharyngeal mid-dorsal tooth absent; pharynx when not everted situated posteriorly to chaetiger 1, inside tube that leads to mouth opening on peristomium. Proventricle usually long and wide, massive. Pygidium with 2 anal cirri. Reproduction by epigamy; epigamic specimens sometimes strongly modified and phosphorescent (Fischer & Fischer, 1995; Gaston & Hall, 2000).

**Remarks**. The structure of the anterior part of the gut in this genus is distinct and unusual, with the pharynx being short and the opening located posteriorly to the mouth; a tube is present that surrounds the pharynx and that leads to the mouth. This must be removed to see the trepan and the two lateral plates of the pharynx. Occasionally specimens lack any teeth on the trepan, and we suggest that individuals can regenerate these teeth. The genera that we have synonymized with *Odontosyllis* have been inadequately examined previously with regard to the structure of the anterior part of the gut. For example, GSM examined one paratype of *Pharyngeovalvata natalensis* (BMNH 1961.16.16-17, Natal Shore, South Africa Stn. 47.8, coll: J.H. Day) and it is identical to specimens of *Odontosyllis ctenostoma* Claparède, 1868. Both species possess a pharynx with a trepan; even though the description of the

pharynx of *Pharyngeovalvata* by Day (1951) states that the pharynx lacks a trepan, the paratype possesses one. We therefore have synonymized these two species that are the type species of their respective genera and *Pharyngeovalvata* is synonymized with *Odontosyllis*. We suspect that *Atelesyllis* Pruvot, 1930, is also identical to *Odontosyllis* with the pharynx contracted, but the types appear to be lost. We have also examined the holotype of *Synpalposyllis australiensis* Hartmann-Schröder, 1983 (HZM P-17400), a species known only from the holotype, which is less than 5 mm in length, with the prostomium and the anterior part of the pharynx damaged so it is not possible to verify the presence or absence of the palps, but the chaetae and aciculae are similar to those of *O. australiensis*. In our opinion, this specimen may be a juvenile of *O. australiensis*. Types of *Alluaudella madagascariensis* Gravier, 1905 were not available for examination but this species appears to be related to some species of *Odontosyllis* with short dorsal cirri and indistinct ventral cirri, distally located, and partially fused, appearing as absent, although this should be checked on material from the type locality. We have examined type material of the other species of the genus, *Alluaudella longicirrata* Mohammad, 1973, and it is clearly a species of *Odontosyllis*. We suggest that it is likely that the genus *Alluaudella* should be synonymized with *Odontosyllis*, and it certainly does not belong in the subfamily Autolytinae where it has previously been placed (Gravier, 1905).

The key below includes nine species, an additional two species have been reported from Australia, but they are not included in the key. *Odontosyllis hyalina* Grube, 1878, was reported by Hartmann-Schröder (1990); and we have examined the specimen (HZM P-20185) and it is a small, probably a juvenile specimen, belonging to *O. australiensis*; the original description (Grube, 1878) is based on a single, epigamic specimen (MPUW, 325), in poor condition, but the compound chaetae are similar to those of *O. australiensis* but the shafts are proportionally larger, the blades are shorter, some of them almost unidentate. Haswell (1920) reported two specimens of *Odontosyllis suteri* Benham, 1915, from Port Jackson, Sydney, as the type description from New Zealand specimens is incomplete and no details of the chaetae are given it is therefore difficult to verify Haswell's identification, and we suggest that they may represent individuals of *Odontosyllis polycera*. So neither of these records of *O. hyalina* and *O. suteri* from Australia are likely to be valid.

**Key to Australian species of *Odontosyllis***

1 Occipital flap present (Fig. 32A) ..... 2
—— Occipital flap absent or indistinct (Fig. 18A) ..... 6

2 Occipital flap totally covering prostomium and palps ..... *O. marombibooral* n.sp.
—— Occipital flap covering only posterior part of prostomium ..... 3

3 Antennae, tentacular and dorsal cirri ovoid, globular, or sphaerical (Fig. 26A) ..... *O. globulocirrata*
—— Antennae and cirri elongate, not as above ..... 4

4 Dorsal cirri short, slightly longer than parapodial lobes. Blades of compound chaetae elongated, unidentate. Parapodial lobes elongated and distinctly bifid (Fig. 24C) ..... *O. freycinetensis*
—— Dorsal cirri long, filiform, distinctly longer than parapodial lobes Fig. 35A). Compound chaetae either bidentate or bidentate plus unidentate. Parapodial lobes not elongated ..... 5

5 Large size (up to 25 mm long). Occipital flap covering almost all prostomium, reaching to level of base of antennae (Fig. 35A). Ventral cirri pillow-shaped ..... *O. polycera*
—— Medium size (up to 6.6 mm long). Occipital flap covering only posterior part of prostomium (Fig. 20A). Ventral cirri ovoid ..... *O. australiensis*

6 Dorsal cirri ovoid, shorter than parapodial lobes or similar in length. Ventral cirri distally inserted ..... *O. annulatus*
—— Dorsal cirri elongated, distinctly longer than parapodial lobes. Ventral cirri inserted basally on parapodial lobes ..... 7

7 Compound chaetae claw-shaped, unidentate or indistinctly bidentate (Fig. 22C) ..... *O. detecta*
—— Compound chaetae with some elongated blades, some distinctly bidentate ..... 8

8 Blades of compound chaetae mostly unidentate, and some bidentate. Dorsum with dark transverse bands or without colour markings ..... *O. langerhansiaesetosa*
—— All blades bidentate. Dorsum with 3 longitudinal dark rows ..... *O. gravelyi*

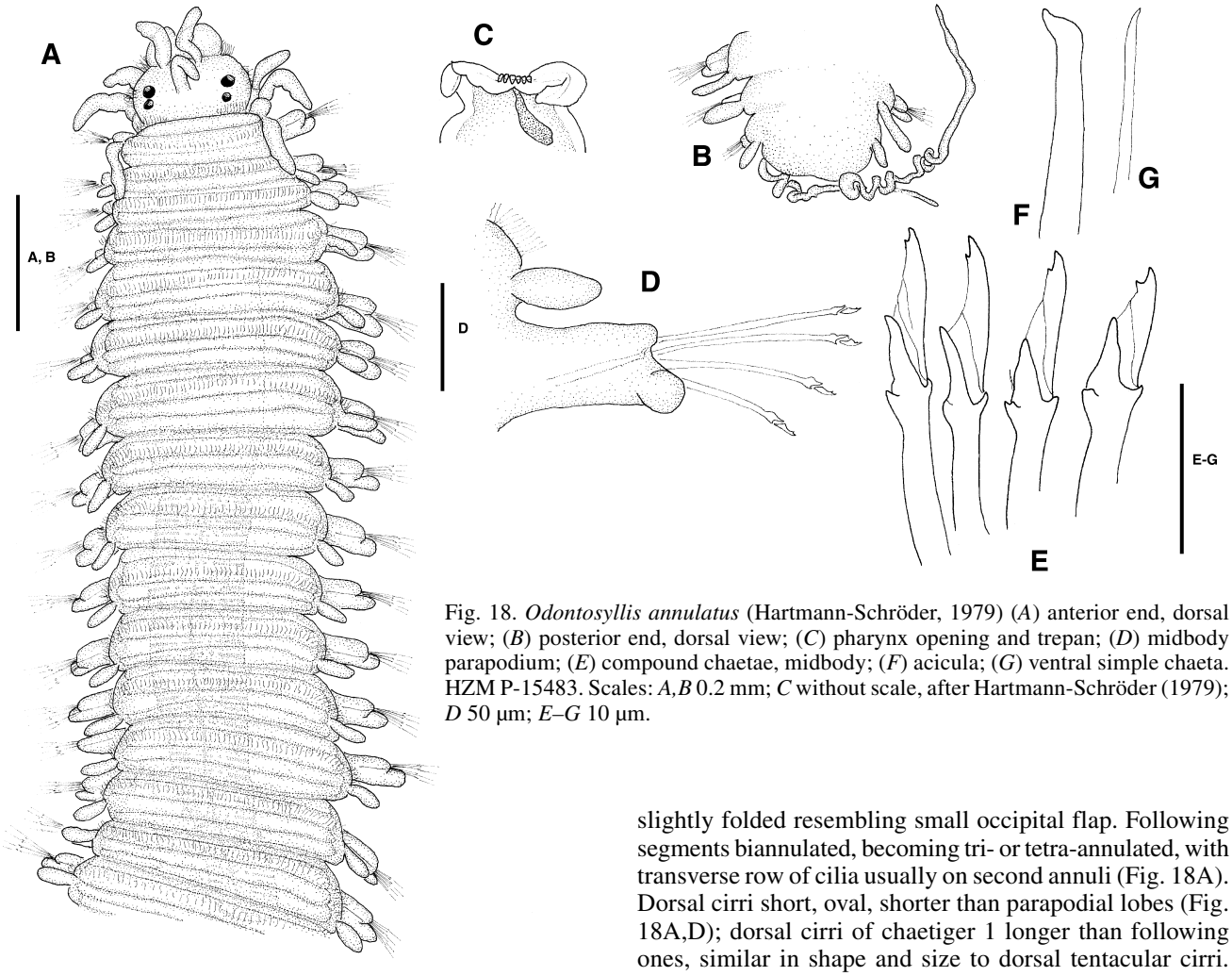



Fig. 18. *Odontosyllis annulatus* (Hartmann-Schröder, 1979) (*A*) anterior end, dorsal view; (*B*) posterior end, dorsal view; (*C*) pharynx opening and trepan; (*D*) midbody parapodium; (*E*) compound chaetae, midbody; (*F*) acicula; (*G*) ventral simple chaeta. HZM P-15483. Scales: *A,B* 0.2 mm; *C* without scale, after Hartmann-Schröder (1979); *D* 50 µm; *E–G* 10 µm.

***Odontosyllis annulatus* (Hartmann-Schröder, 1979)**

Fig. 18A–G

*Odontoautolytus annulatus* Hartmann-Schröder, 1979: 112, figs 178–182.
*Odontosyllis brevicirra* Hartmann-Schröder, 1991: 34, figs 54–56.

**Material examined**. AUSTRALIA: WESTERN AUSTRALIA: Port Hedland, 19°38'S 119°31'E, coarse sediments, intertidal, 28 Sept. 1975, holotype of *Odontoautolytus annulatus* (ZMH P-15482) and 2 paratypes (ZMH P-15483). QUEENSLAND: Gladstone, 23°49'S 151°25'E, coarse sand, 28 Jan 1976, holotype of *Odontosyllis brevicirra* (HZM P-20543) and 1 paratype (HZM P-20544). All material collected Hartmann-Schröder.

**Description**. Body long, slender, (Fig. 18A), about 4.8 mm long, 0.3 mm wide, with 47 chaetigers. Prostomium oval, laterally convex, with 2 lateral and 2 frontal tufts of cilia (Fig. 18A); 4 eyes in rectangular arrangement, those of anterior pair slightly larger than posterior ones; antennae short, digitiform, shorter than prostomium; median antenna inserted between anterior eyes; lateral antennae inserted near anterior margin, close to each other, near midline of margin (Fig. 18A). Palps shorter than prostomium, blunt. Peristomium shorter than subsequent segments; tentacular cirri similar to antennae; dorsal ones longer than ventral ones. Occipital flap absent, although some with peristomium slightly folded resembling small occipital flap. Following segments biannulated, becoming tri- or tetra-annulated, with transverse row of cilia usually on second annuli (Fig. 18A). Dorsal cirri short, oval, shorter than parapodial lobes (Fig. 18A,D); dorsal cirri of chaetiger 1 longer than following ones, similar in shape and size to dorsal tentacular cirri. Ventral cirri fused with parapodial lobes, inserted distally (Fig. 18A,D). Parapodia each with 4 compound chaetae (Fig. 18D), strongly heterogomph, shafts with subdistal large tooth, and short, smooth, triangular, bidentate blades, subdistal tooth small, all similar in shape and length (Fig. 18E), 7–8 µm in length. Solitary ventral simple chaeta on far posterior parapodia of one specimen, slender, smooth, unidentate (Fig. 18G). Dorsal simple chaetae not observed. Solitary acicula on each parapodium, distally acuminate (Fig. 18F). Pygidium large, slightly bilobed, with 2 long, slender, filiform anal cirri (Fig. 18B). Pharynx through about 2 segments, according to original description, trepan with 6 small teeth (Fig. 18C); dark gland near pharynx opening (Fig. 18C). Proventricle long and slender, through about 7–8 segments (Fig. 18A), with about 50 muscle cell rows.

**Remarks**. This species has small ventral cirri, inserted distally. Hartmann-Schröder (1979) made an incorrect interpretation of the parapodia, overlooked the ventral cirri and described it as a new genus, which she placed in the subfamily Autolytinae. Nygren (2004) synonymized *Odontoautolytus* with *Odontosyllis*. After examination of the type series of both species, *Odontoautolytus annulatus* and *Odontosyllis brevicirra*, we suggest that they represent the same species *Odontosyllis annulatus*.

**Habitat**. Occurring in coarse sediments, intertidally.

**Distribution**. Australia (Western Australia, Queensland).

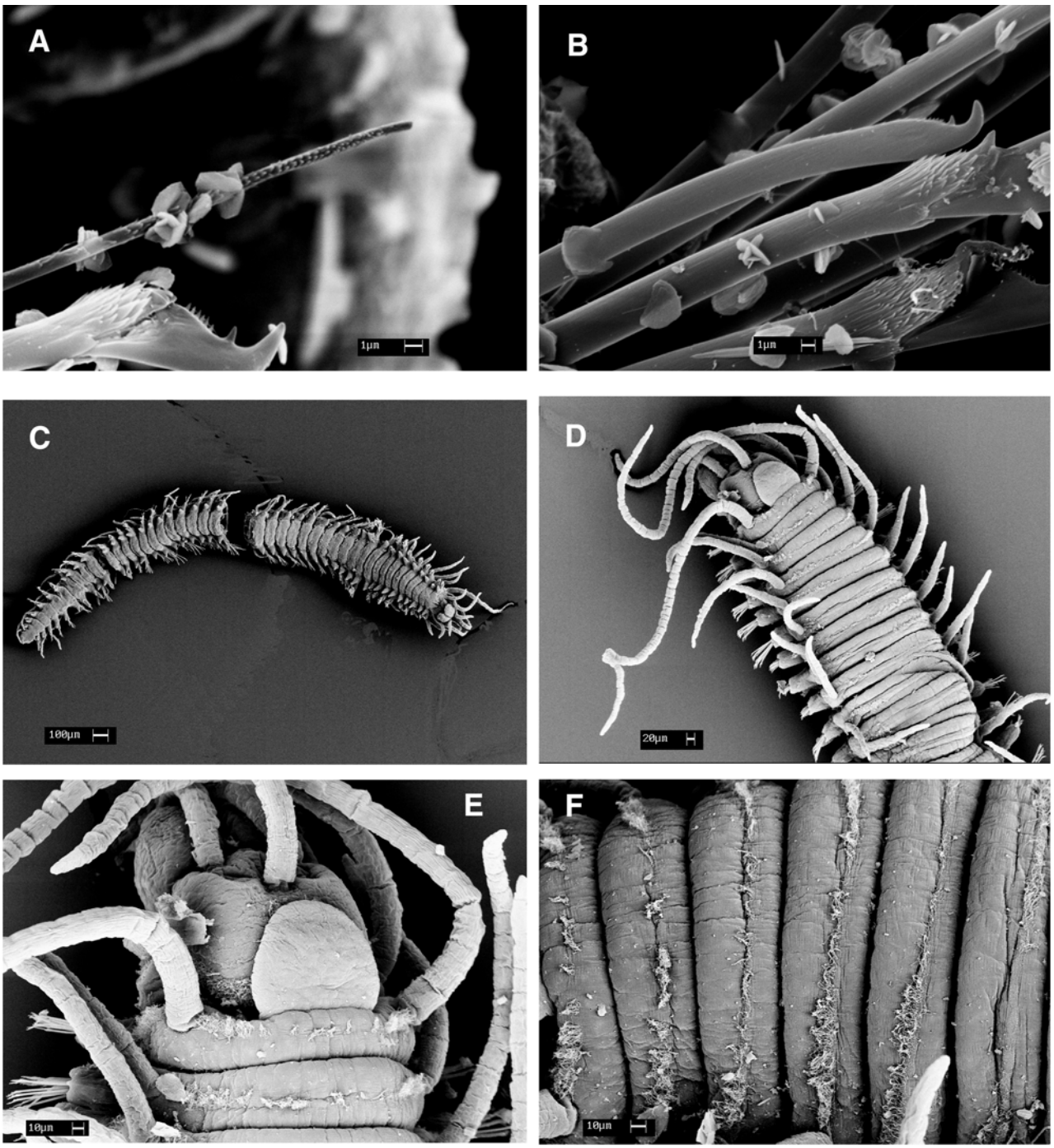



Fig. 19. SEM of *Odontosyllis polycera* Schmarda, 1863 (*A*) dorsal simple chaeta; (*B*) ventral simple chaeta. SEM of *Odontosyllis australiensis* Hartmann-Schröder, 1979 (*C*) complete specimen, ventral view; (*D*) anterior end, dorsal view; (*E*) prostomium and anteriormost segments; (*F*) midbody segments, lateral view. *A,B*: AM W4344; *C–F*: AM W28380.

### *Odontosyllis australiensis* Hartmann-Schröder, 1979

Figs 19C–F, 20A–H, 21A–F

*Odontosyllis australiensis* Hartmann-Schröder, 1979: 95, figs 97–104; 1981: 31; 1984: 20.

?*Odontosyllis hyalina*.—Hartmann-Schröder, 1990: 50. Not Grube, 1878: 129.

*Odontosyllis fulgurans*.—Haswell, 1920: 107. Not Audouin & Milne Edwards, 1834: 229.

*Synpalposyllis australiensis* Hartmann-Schröder, 1983: 132, figs 18–20.

**Material examined**. AUSTRALIA: NEW SOUTH WALES: 100 m NW of Julian Rocks, Byron Bay, 28°36.8'S 15°37.8'E, shell and gravel, 15 m, coll. Ho & party, 3 Mar 1992, 1 (AM W28217). WESTERN AUSTRALIA: N end of Long Is., 28°27.9'S 113°46.3'E, dead coral substrate covered in coralline & brown algae, 5.5 m, coll. C. Bryce, 22 May 1994, 2 on SEM stub, (AM W28380); Lafontaine Is., Kimberley region, 14°10'S 125°47'E, 15m, coll P.A. Hutchings, 19 July 1988, 1 (AM W28933); Reef south of Lucas Is., Brunswick Bay, Kimberley region, 15°16'S 124°29'E, 2 m, coll P.A. Hutchings, 24 July 1988, 1 (AM W28932).

**Additional material**. AUSTRALIA: WESTERN AUSTRALIA. Denmark, Ocean Beach, algae, 18 Nov. 1975, coll. & id. Hartmann-Schröder, holotype of *Synpalposyllis australiensis*, (HZM P-17400). Singapore, syntype of *Odontosyllis hyalina* Grube, 1878: 129, (MPUW 325).

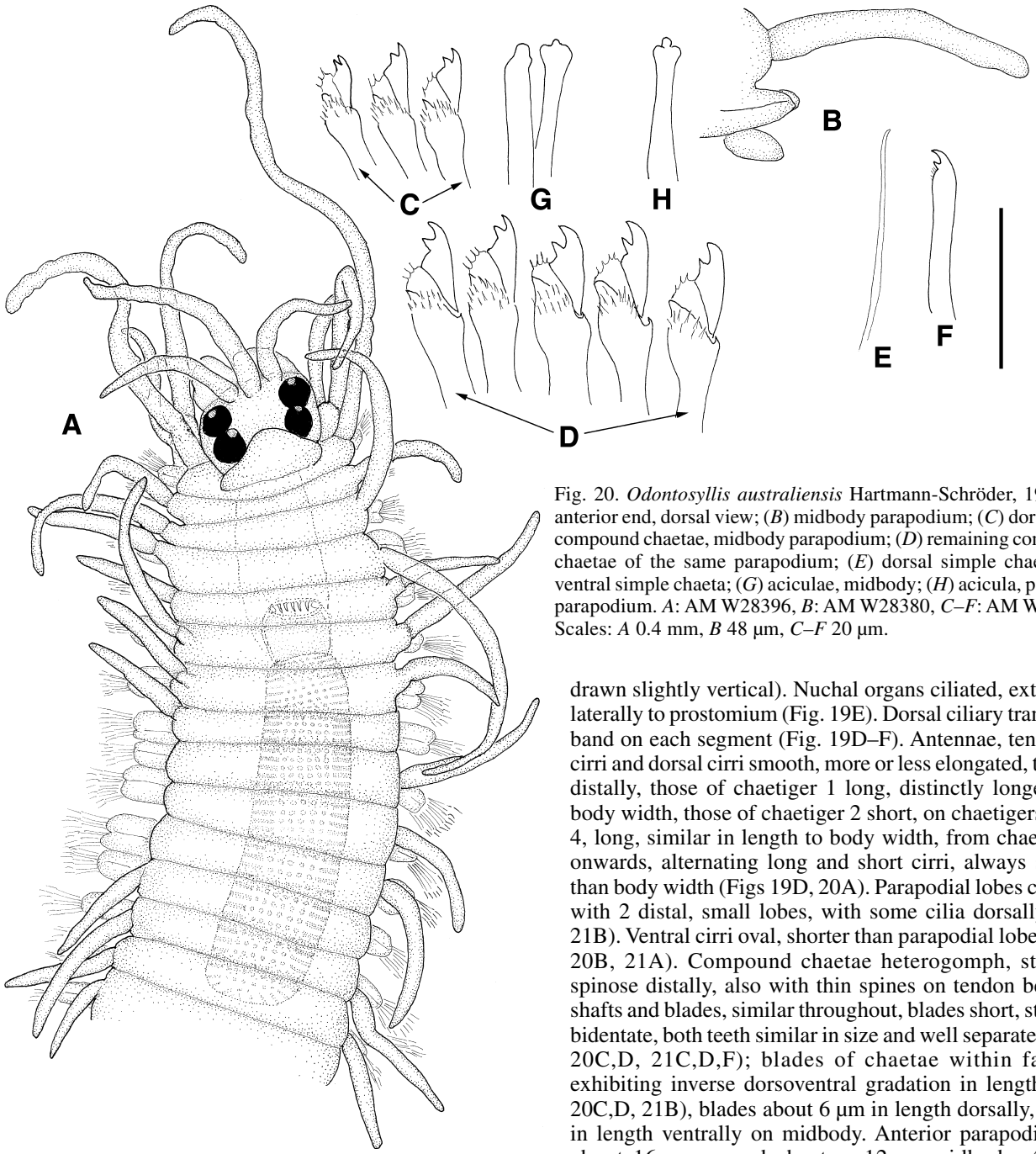



Fig. 20. *Odontosyllis australiensis* Hartmann-Schröder, 1979 (*A*) anterior end, dorsal view; (*B*) midbody parapodium; (*C*) dorsalmost compound chaetae, midbody parapodium; (*D*) remaining compound chaetae of the same parapodium; (*E*) dorsal simple chaeta; (*F*) ventral simple chaeta; (*G*) aciculae, midbody; (*H*) acicula, posterior parapodium. *A*: AM W28396, *B*: AM W28380, *C–F*: AM W28395. Scales: *A* 0.4 mm, *B* 48 μm, *C–F* 20 μm.

**Description**. Body about 4.4 mm long, 0.3 mm wide, with 44 chaetigers (Fig. 19C); maximum size reported 6.6 mm long for 55 chaetigers (Hartmann-Schröder, 1981), without colour pattern, yellowish in alcohol. Prostomium almost round; 4 eyes in open trapezoidal arrangement, large on epigamic specimens (Fig. 20A). Antennae originating near anterior margin, close to each other, median antenna inserted slightly posterior to lateral ones (Figs 19D,E, 20A), distinctly longer than combined length of prostomium and palps, lateral antennae shorter than median one. Palps shorter than prostomium, ventrally folded (Fig. 21A). Peristomium reduced dorsally, covered by occipital flap (Fig. 19D); dorsal tentacular cirri elongated, nearly twice as long as median antenna, ventral tentacular cirri shorter than dorsal ones. Occipital flap distinct, small, covering posterior margin of prostomium (Figs 19D,E, 20A, Fig. 20A drawn slightly vertical). Nuchal organs ciliated, extending laterally to prostomium (Fig. 19E). Dorsal ciliary transverse band on each segment (Fig. 19D–F). Antennae, tentacular cirri and dorsal cirri smooth, more or less elongated, tapered distally, those of chaetiger 1 long, distinctly longer than body width, those of chaetiger 2 short, on chaetigers 3 and 4, long, similar in length to body width, from chaetiger 5 onwards, alternating long and short cirri, always shorter than body width (Figs 19D, 20A). Parapodial lobes conical, with 2 distal, small lobes, with some cilia dorsally (Fig. 21B). Ventral cirri oval, shorter than parapodial lobes (Figs 20B, 21A). Compound chaetae heterogomph, strongly spinose distally, also with thin spines on tendon between shafts and blades, similar throughout, blades short, strongly bidentate, both teeth similar in size and well separated (Figs 20C,D, 21C,D,F); blades of chaetae within fascicle exhibiting inverse dorsoventral gradation in length (Figs 20C,D, 21B), blades about 6 μm in length dorsally, 12 μm in length ventrally on midbody. Anterior parapodia with about 16 compound chaetae, 12 on midbody, 4–5 on posterior parapodia. Dorsal simple chaetae on posterior parapodia, thin, unidentate (Fig. 20E) (minutely bifid, according to Hartmann-Schröder, 1979), with short spines on margin (Fig. 21E). Ventral simple chaetae on far posterior chaetigers, bidentate, with short spines on margin (Figs 20F, 21F). Aciculae distally knobbed, ending with short terminal process; 3–4 aciculae on anterior parapodia, and 1 on posterior parapodia (Fig. 20G,H). Pharynx short, through 1–2 segments, with 5 teeth and 2 lateral plates. Proventricle long and slender (Fig. 20A), through about 8 segments, with 50 muscle cell rows. Pygidium with 2 anal cirri similar to dorsal ones.

**Remarks**. This species seems to be similar to *Odontosyllis hyalina* Grube, 1878 from Singapore; the description of that species was made on the basis of a single, epigamic specimen, in which some characters can be modified in

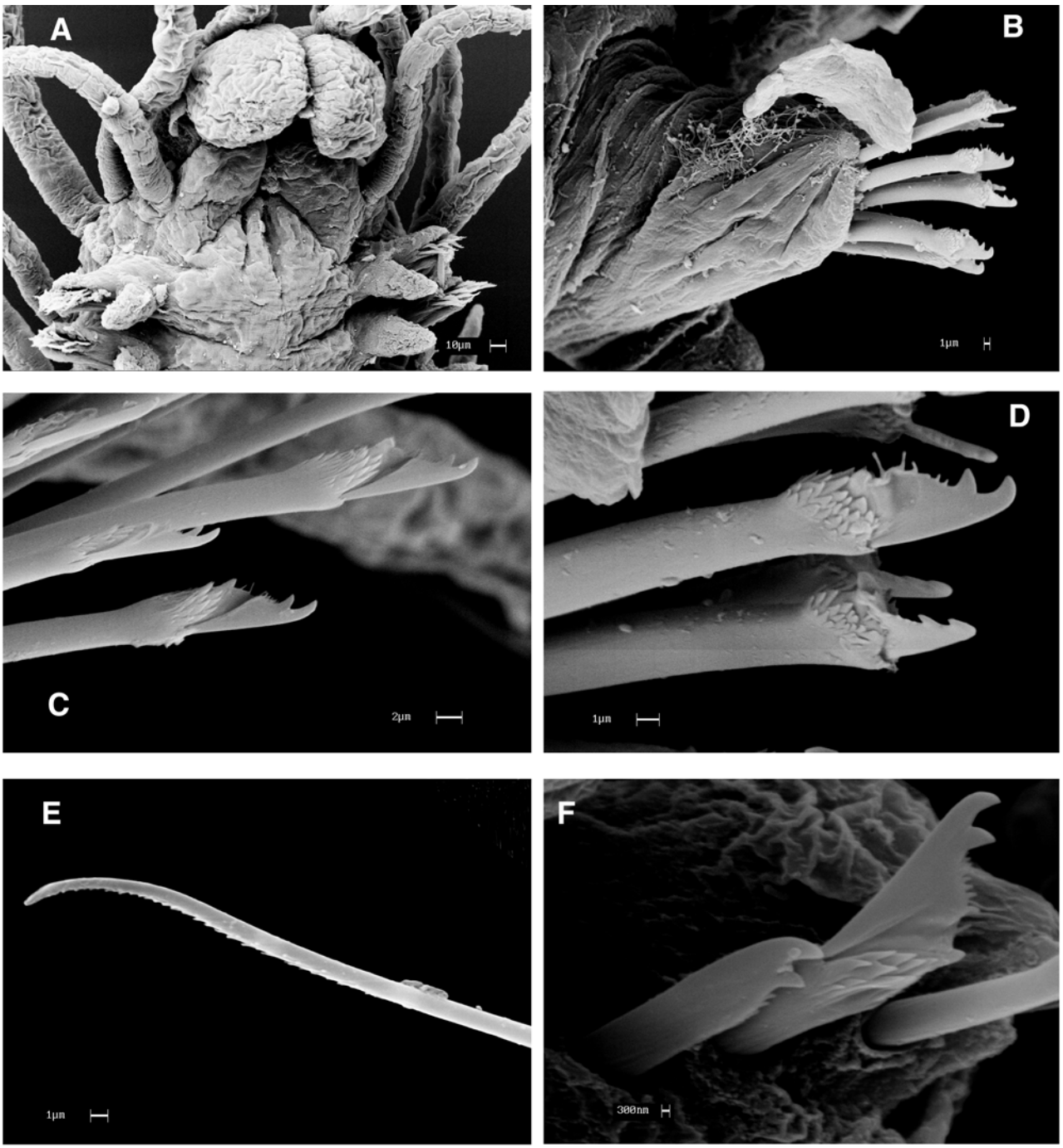



Fig. 21. SEM of *Odontosyllis australiensis* Hartmann-Schröder, 1979 (*A*) prostomium and anteriormost segments, ventral view; (*B*) posterior parapodium; (*C,D*): compound chaetae, midbody; (*E*) dorsal simple chaeta; (*F*) ventral simple and compound chaetae. AM W28380.

comparison to non-epigamic specimens, and it is difficult to assess if both species are valid or synonymous. The syntype (MPUW, 325) is in poor condition, covered by crystals of formalin, but the chaetae appear different (see above); so at this stage we are accepting both species as valid.

**Habitat**. Occurring on algae, dead coral and coarse sediments, from intertidal to shallow depths.

**Distribution**. Australia (Western Australia, New South Wales, Queensland).

### *Odontosyllis detecta* Augener, 1913

Fig. 22A–C

*Odontosyllis detecta* Augener, 1913: 236, pl. III, Fig. 33, text-fig. 34; 1927: 153.—Haswell, 1920: 105.—Imajima, 1966: 103, figs 33a–m.—Hartmann-Schröder, 1985: 69.—San Martín, 1990: 613, fig. 16.

**Material examined**. AUSTRALIA: NEW SOUTH WALES: Port Jackson, 33°51'S 151°16'E, donated by W.A. Haswell, Feb 1920, 1 (slide) (AM W501).

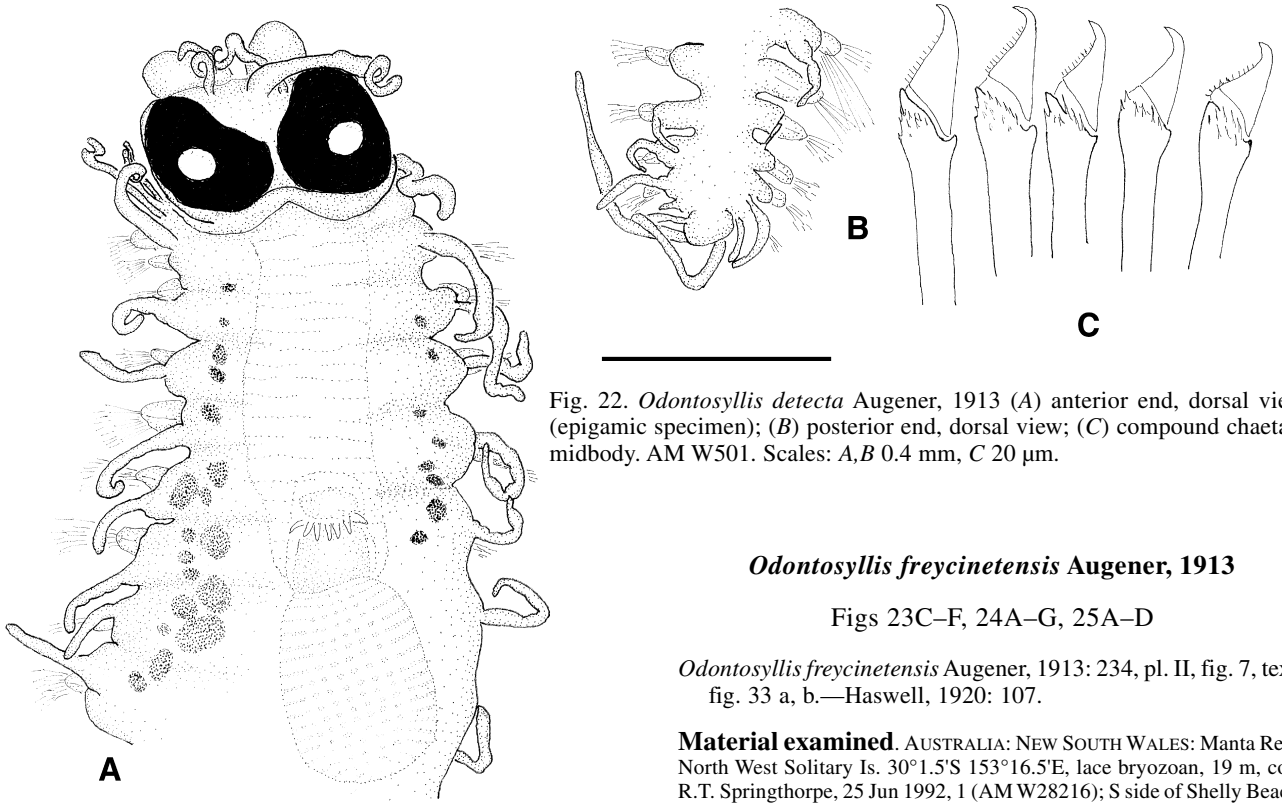



Fig. 22. *Odontosyllis detecta* Augener, 1913 (*A*) anterior end, dorsal view (epigamic specimen); (*B*) posterior end, dorsal view; (*C*) compound chaetae, midbody. AM W501. Scales: *A,B* 0.4 mm, *C* 20 µm.

**Description**. Only examined specimen, mature, epigamic male, 5 mm long, 0.1 mm wide, with 37 chaetigers, on permanent, stained slide. Adult, non-epigamic specimens from Japan, 6–9 mm long, 1 mm wide, with 40–52 chaetigers (Imajima, 1966). Specimen from Port Jackson with 2 large, black eyes, small palps and coiled cirri (Fig. 22A). Occipital flap absent. 4–5 compound chaetae per parapodium, with distally spinose shafts and short, curved, unidentate blades, with short spines on margin (Fig. 22C). Dorsal simple chaetae from midbody, thin, unidentate, smooth. Ventral simple chaetae absent. Acicula solitary, distally knobbed, with short tip. Pharynx through 2 segments, with 5 teeth and 2 lateral plates. Proventricle through 2 segments (Fig. 22A). Pygidium semi-circular, with 2 long anal cirri, extending for 6 chaetigers (Fig. 22B).

Japanese non epigamic specimens (fide Imajima, 1966), with antennae, dorsum and dorsal cirri dark red; with ciliary bands across dorsum, nuchal ridges present; lacking occipital flap. Dorsal cirri alternating in length, shorter than body width, and ventral simple chaetae on posterior parapodia, unidentate, slightly hooked, with short, fine spines on margin.

**Remarks**. As the only Australian material available for examination was a mature epigamic male, it is difficult to relate this to the non epigamic individuals recorded from Japan by Imajima (1966), but we believe them to represent the same species.

**Habitat**. Occurring in sand, seagrass, algae; intertidally.

**Distribution**. Australia (Western Australia, South Australia, New South Wales), Japan, Cuba.

### *Odontosyllis freycinetensis* Augener, 1913

Figs 23C–F, 24A–G, 25A–D

*Odontosyllis freycinetensis* Augener, 1913: 234, pl. II, fig. 7, text-fig. 33 a, b.—Haswell, 1920: 107.

**Material examined**. AUSTRALIA: NEW SOUTH WALES: Manta Reef, North West Solitary Is. 30°1.5'S 153°16.5'E, lace bryozoan, 19 m, coll. R.T. Springthorpe, 25 Jun 1992, 1 (AM W28216); S side of Shelly Beach, Fairy Bower, 33°48.18'S 151°17.4'E, in between large boulders & under small ones, 8 m, coll. P.A Hutchings, 24 Oct 1971, 1 on SEM stub (AM W24679); Grotto Point, Port Jackson, 33°49'S 151°15'E, algae, 4 m, coll. P. Colman, 18 July 1983, 1 (AM W28915); Summer Cloud Bay, Wreck Bay, 35°10.5'S 150°41'E, 15 m, coll. P.A. Hutchings, 29 Nov 1971, 1 (AM W26325). WESTERN AUSTRALIA: Off S end of Long Is. Beacon Is. 28°28.8'S 113°46.3'E, dead coral substrate covered in coralline algae, 4.5 m, coll. P.A. Hutchings, 25 May 1994, 2 (AM W28390).

**Description**. Body broad anteriorly, tapered posteriorly (Fig. 23C), largest complete specimen examined 10 mm long, 0.5 mm wide, with 59 chaetigers, sometimes without colour pattern, but usually with 2–3 dark, dorsal spots on some anterior chaetigers (Fig. 24A), others dark. Prostomium oval, large, with long cilia laterally (Fig. 24A); 4 eyes in open trapezoidal arrangement; antennae short, fusiform, shorter than prostomium (Figs 23D, 24A), median antenna originating between anterior eyes, lateral antennae near anterior margin of prostomium, close to median antennae. Palps small, shorter than prostomium, ventrally folded (Fig. 24A). Nuchal organs distinct, with long cilia between prostomium and peristomium (Figs 23D, 24A). Peristomium distinct, similar in length to subsequent segments. Occipital flap covering posterior part of prostomium (Figs 23D, 24A). Tentacular cirri similar in shape to antennae, but longer. Dorsal cirri fusiform, some more elongated than antennae, those of chaetiger 1 slightly longer than others, shorter than half of body width, slightly longer than parapodial lobes (Figs 23E, 24C). Parapodial lobes elongated, almost rectangular, distally bilobed (Figs 23E, 24C); anterior parapodia with distal, digitiform papilla; progressively, posteriorly parapodia becoming more elongated, and distinctly bilobed distally, and distal papilla becoming fused. Ventral cirri digitiform, elongated, reaching or extending beyond parapodial lobes (Fig. 24C). Compound chaetae slender, with elongated, unidentate blades, with slightly hooked tips (Figs 23F, 24E,F, 25A),

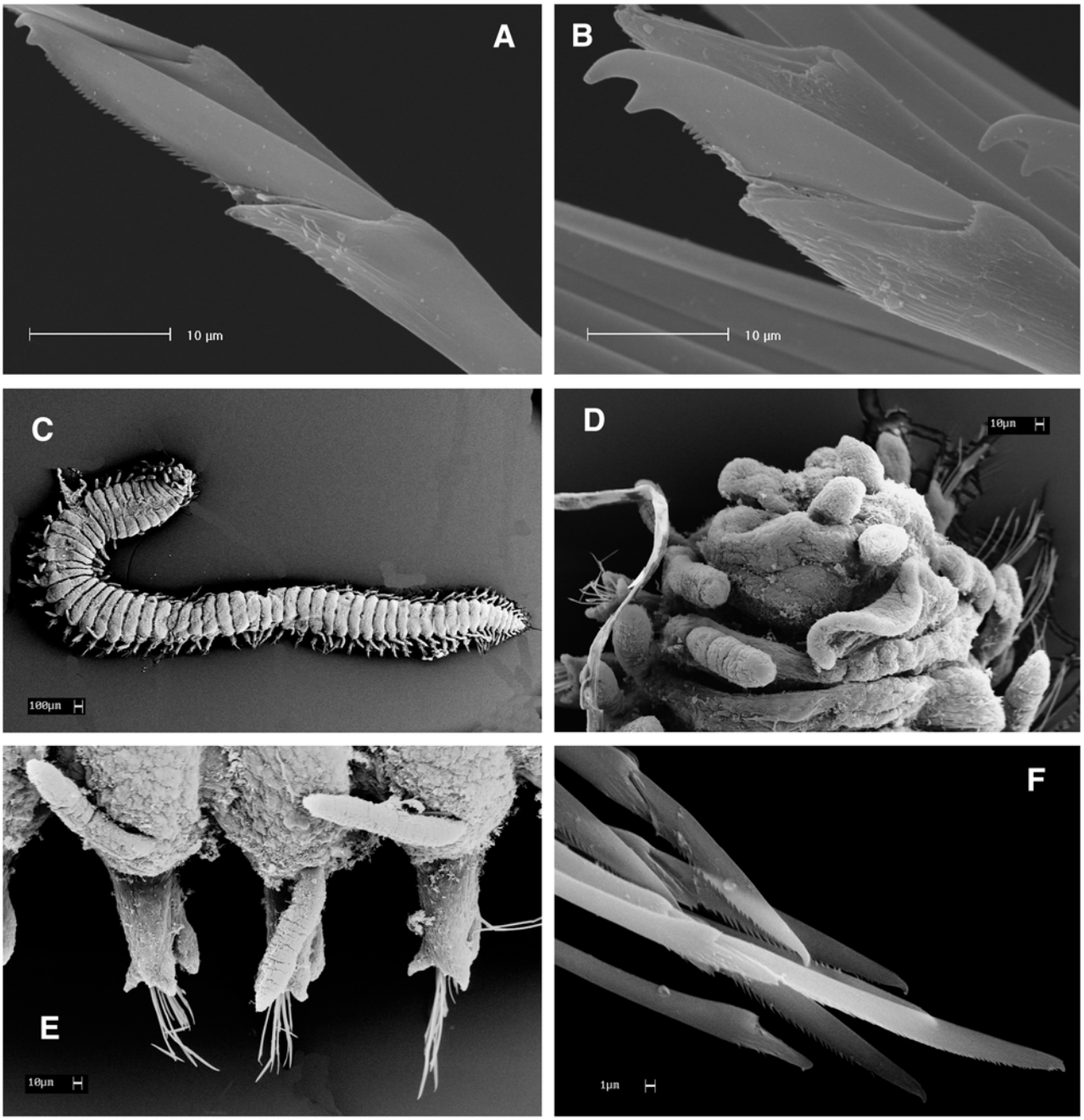



Fig. 23. SEM of *Odontosyllis marombibooral* n.sp. (*A*) dorsal compound chaeta, posterior parapodium; (*B*) ventral compound chaeta, posterior parapodium. SEM of *Odontosyllis freycinetensis* Augener, 1913 (*C*) complete specimen, dorsal view; (*D*) prostomium and anteriormost segments; (*E*) midbody parapodia, dorsal view; (*F*) anterior compound chaetae. *A,B*: AM W5496, *C–F*: AM W24679.

with margins either smooth or with short spines. Anterior parapodia with about 16–18 compound chaetae, with dorsoventral gradation in length of blades within fascicle, 40 µm in length dorsally, 20 µm in length ventrally; number of compound chaetae per parapodium decreasing posteriorly, up to about 9 on posterior parapodia, blades of similar lengths to anterior ones; blades with short, minute subdistal spine (Fig. 25B–D, arrows). Dorsal and ventral simple chaetae on posterior parapodia, thin, smooth, dorsal ones bifid (Fig. 24H) and ventral unidentate (Fig. 24I). Anterior parapodia with 2–3 aciculae, becoming solitary after proventricular segments, distally acuminate (Fig. 24D,G). Pharynx wide, through 2–3 segments, with 5 teeth and 2 lateral plates. Proventricle wide, short, slightly longer than pharynx (Fig. 24A), through about 4 segments, with 28–30 muscle cell rows. Pygidium rectangular, small, with 2 lateral, short anal cirri, and 1 median, digitiform papilla (Fig. 24B).

**Habitat**. Occurring on algae, bryozoans, dead corals; intertidal and shallow depths.

**Distribution**. Australia (Western Australia, New South Wales).

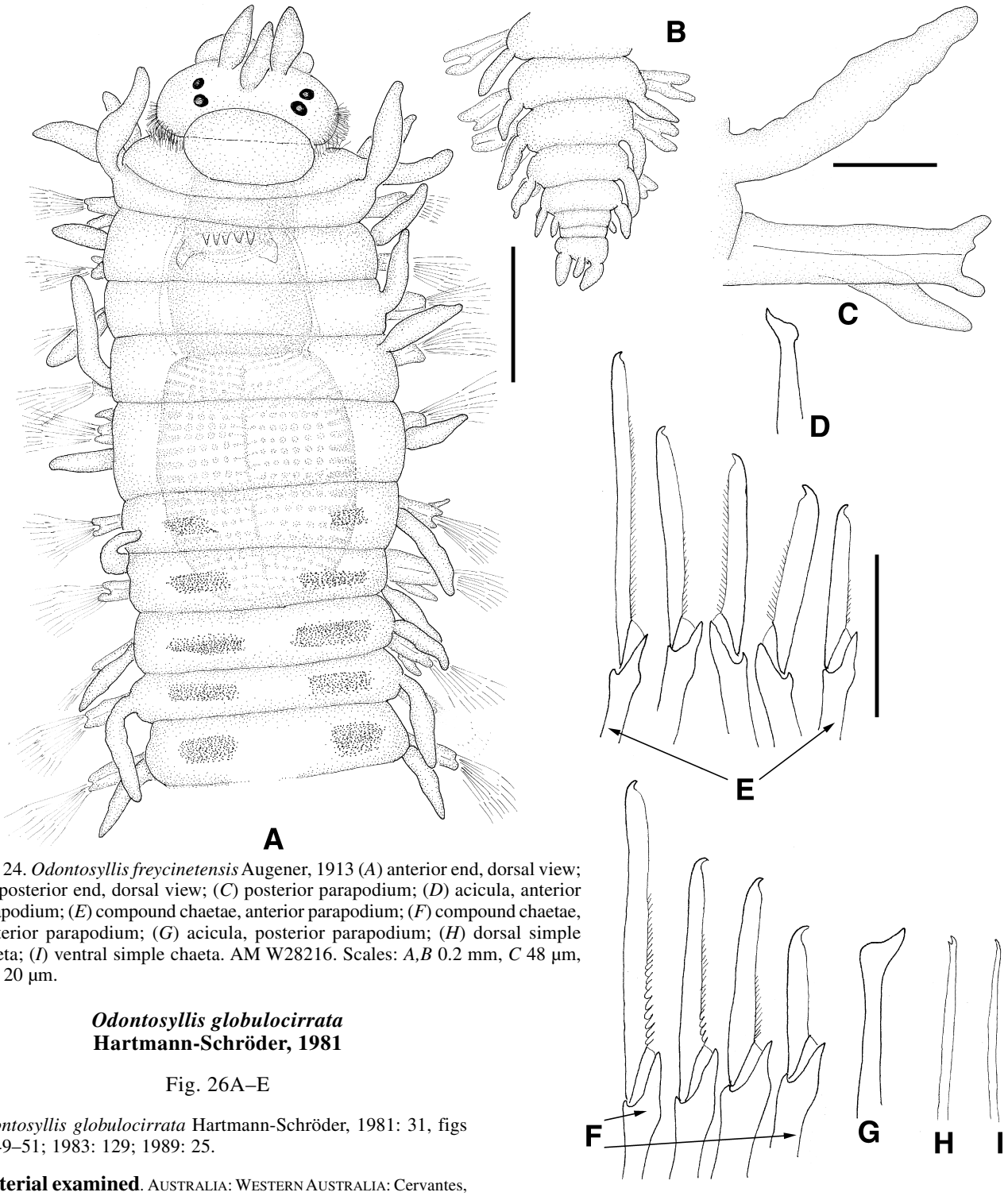



Fig. 24. *Odontosyllis freycinetensis* Augener, 1913 (*A*) anterior end, dorsal view; (*B*) posterior end, dorsal view; (*C*) posterior parapodium; (*D*) acicula, anterior parapodium; (*E*) compound chaetae, anterior parapodium; (*F*) compound chaetae, posterior parapodium; (*G*) acicula, posterior parapodium; (*H*) dorsal simple chaeta; (*I*) ventral simple chaeta. AM W28216. Scales: *A,B* 0.2 mm, *C* 48 µm, *D–I* 20 µm.

### *Odontosyllis globulocirrata* Hartmann-Schröder, 1981

Fig. 26A–E

*Odontosyllis globulocirrata* Hartmann-Schröder, 1981: 31, figs 49–51; 1983: 129; 1989: 25.

**Material examined**. AUSTRALIA: WESTERN AUSTRALIA: Cervantes, 30°30'S 115°03'E, fine sand with *Posidonia*, coll. G. Hartmann-Schröder, 24 Oct 1972, 2 paratypes (AM W17725). NEW SOUTH WALES: Halfway Reef, 200 m S of Sullivan Reef, Ulladulla, 35°21'25"S 150°29'19"E, airlift over wall of sponges, Bryozoa, Hydrozoa, 15m, coll. P.B. Berents, K.B. Attwood & A. Murray, 3 May 1997, 1 (AM W29375).

**Description**. Paratype examined 8.1 mm long, 0.8 mm wide, with 43 chaetigers; holotype 10 mm long for 48 chaetigers according to Hartmann-Schröder. Body broad anteriorly, tapering posteriorly, lightly coloured on dorsum of some segments, with 2–4 dark spots (Fig. 26A). Prostomium oval, about 3 times wider than long; 4 eyes arranged in open trapezoidal pattern, posterior ones covered by occipital flap (Fig. 26A); antennae short, globular, median antenna slightly longer than lateral ones (Fig. 26A,B), originating between anterior eyes, lateral antennae inserted on anterior margin of prostomium. Palps small, short. Peristomium dorsally reduced (Fig. 26A,B). Tentacular cirri globular, similar in size to antennae. Occipital flap oval, covering only posterior margin of prostomium (Fig. 26A,B). Dorsal cirri globular, sphaerical, shorter than parapodial lobes, those inserted dorsolaterally on chaetigers 1, 4, and 6-8-10-…, slightly larger and more elongate than those on chaetigers 2, 3, 5-7-

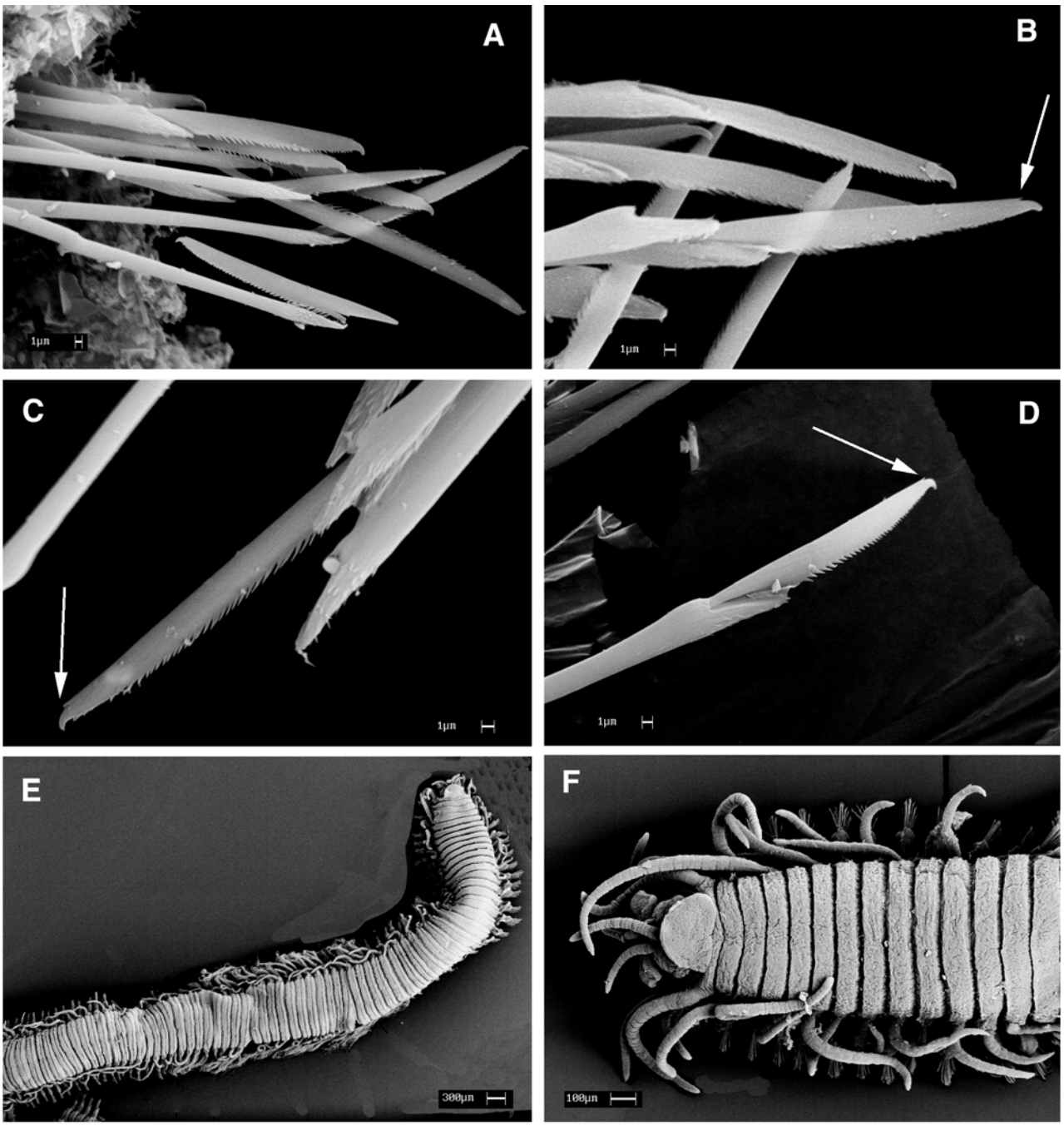



Fig. 25. SEM of *Odontosyllis freycinetensis* Augener, 1913 (*A,B*), compound chaetae, midbody; (*C*) long-bladed compound chaeta, midbody; (*D*) short bladed compound chaeta, midbody. SEM of *Odontosyllis polycera* Schmarda, 1863 (*E*) anterior end and midbody, dorsal view; (*F*) anterior end, dorsal view. *A–D*: AM W24679, *E*: AM W195387, *F*: AM W194258.

9-…, inserted adjacent to parapodial lobes (Fig. 26B,C). Parapodial lobes elongated, distinctly bilobed distally (Fig. 26A–C). Ventral cirri short, conical, inserted near distal part of parapodial lobes. Compound chaetae numerous, about 20 on midbody parapodia, with smooth shafts, or provided with minute subdistal spines, and elongate, unidentate blades, distally slightly hooked, provided with short, fine spines on margin (Fig. 26E), blades of chaetae within fascicle exhibiting dorsoventral gradation in length, about 33 µm in length dorsally, 25 µm in length ventrally. Dorsal and ventral simple chaetae not seen nor previously described. Aciculae solitary, slender, straight. Pharynx wide, short, with 7 teeth (fide Hartmann-Schröder; not seen in material examined) and 2 lateral plates. Proventricle large, 2.5× longer than pharynx (Fig. 26D), with about 40 muscle cell rows. Pygidium with 2 globular anal cirri, similar to dorsal ones.

**Habitat**. Occurring on algae and sediment, intertidal.

**Distribution**. Australia (Western Australia, New South Wales).

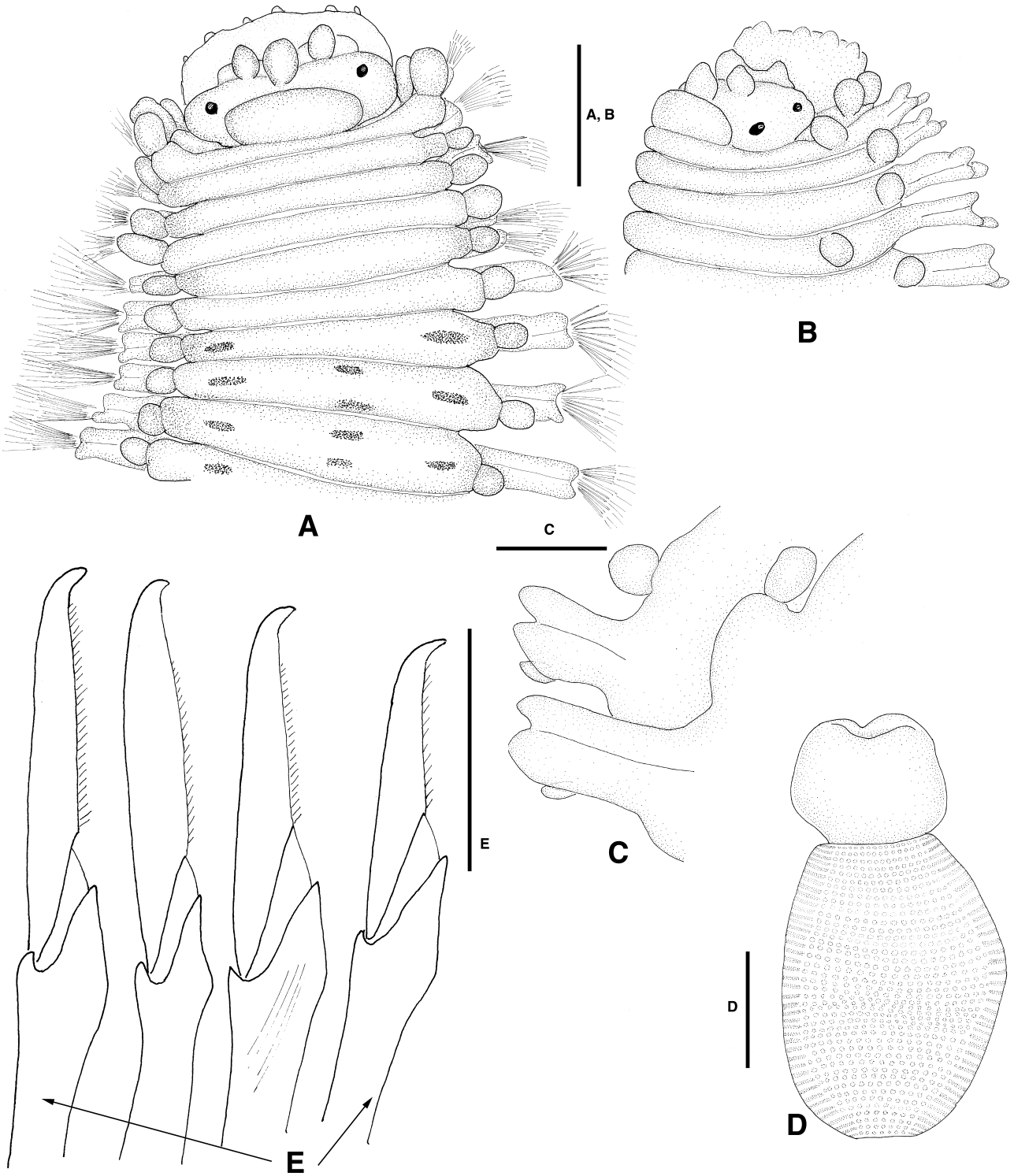



Fig. 26. *Odontosyllis globulocirrata* Hartmann-Schröder, 1981 (*A*) anterior end, dorsal view; (*B*) anterior end, dorsolateral view; (*C*) midbody parapodia; (*D*) pharynx and proventricle; (*E*) compound chaetae, midbody. AM W17725. Scales: *A,B* 0.4 mm, *C* 0.1 mm, *D* 0.4 mm, *E* 20 μm.

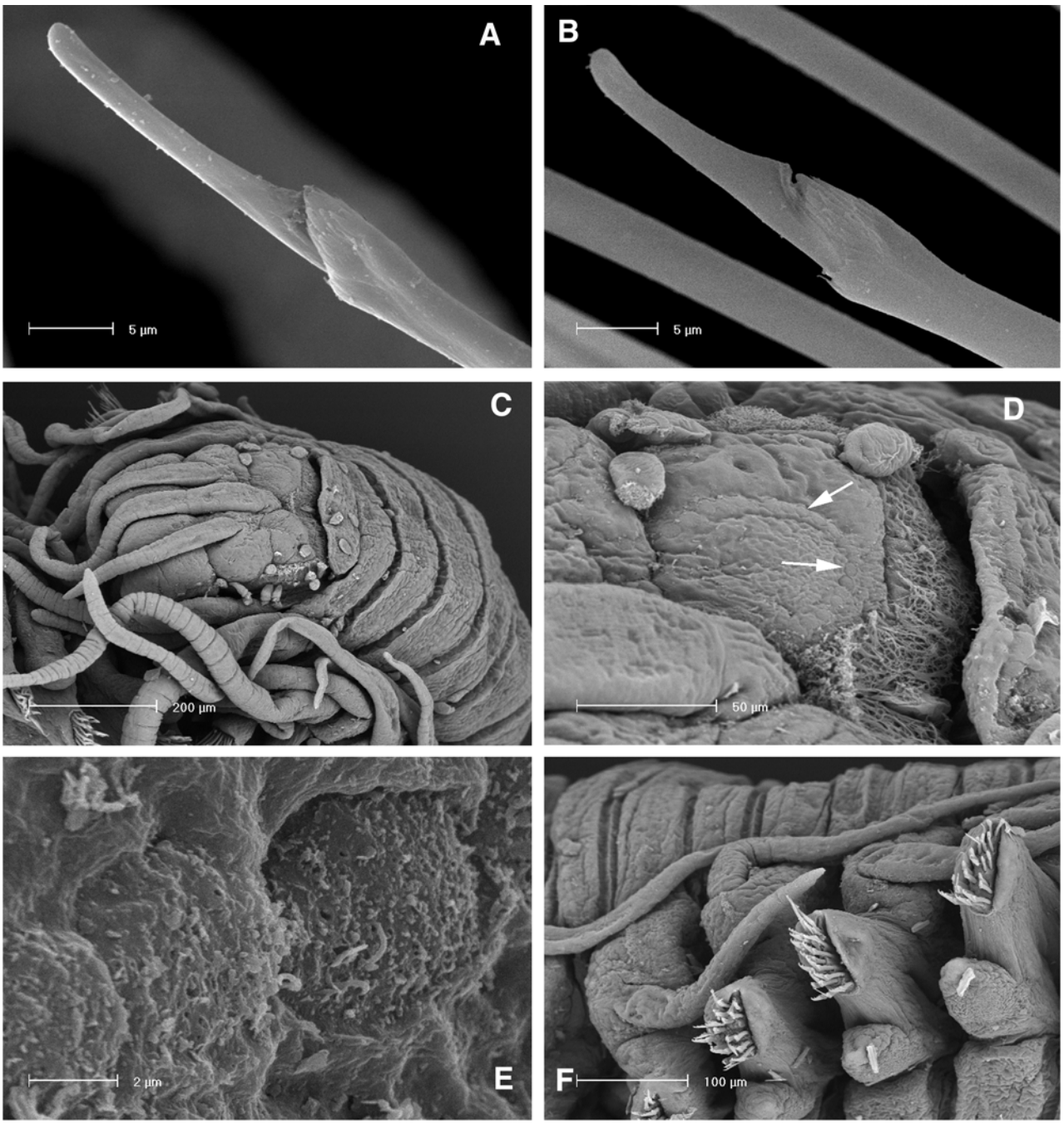



Fig. 27. SEM of *Odontosyllis langerhansiaesetosa* Hartmann-Schröder, 1979 (*A*) long falciger, midbody; (*B*) short falciger, midbody. SEM of *Odontosyllis gravelyi* n.sp. (*C*) anterior end, dorsal view; (*D*) detail of prostomium (arrows showing the mounds with minute pores); (*E*) detail of mounds with pores on prostomium; (*F*) midbody parapodia. *A,B*: AM W198069, W202639; *C–F*: AM W202645.

### *Odontosyllis gravelyi* Fauvel, 1930

Figs 27C–F, 28A–H, 29A–F

*Odontosyllis gravelyi* Fauvel, 1930: 16, figs. 3–4; 1953: 160, figs. 81–82.

**Material examined**. AUSTRALIA: NEW SOUTH WALES: Careel Bay, Pittwater, 33°37'S 151°19'E, *Zostera*, coll. P.A. Hutchings, 4 Nov 1973 (AM W11110). QUEENSLAND: Calliope R., 23°51'S 151°10'E, coll. P. Saenger, 1974, 7 (AM W199367). Triangular Islets, Shoalwater Bay, 22°23'S 150°31'E, coll. J.A. Lewis & J.R. Forsyth, 1981, 10 on SEM stub (AM W202645).

**Description**. Body 14 mm long, 1.2 mm wide, with 50 chaetigers; distinct, median longitudinal black band, and large lateral spots, resembling 3 longitudinal stripes (Fig. 28A). Prostomium small, hidden under most anterior segments (Figs 27C, 28A–C) (probably contracted), with 2 black lateral spots and posterior transverse band; antennae short and slender, inserted in front of anterior eyes, median antenna longer than lateral antennae, inserted slightly posteriorly (Figs 27C, 28B,C), similar to combined length of prostomium and palps. Prostomium with 2 slightly raised mounds with minute pores (see arrows Fig. 27D,E). Two densely ciliated, semi-circular nuchal organs (Fig. 27C,D). Palps small, fused basally, ventrally folded. Peristomium

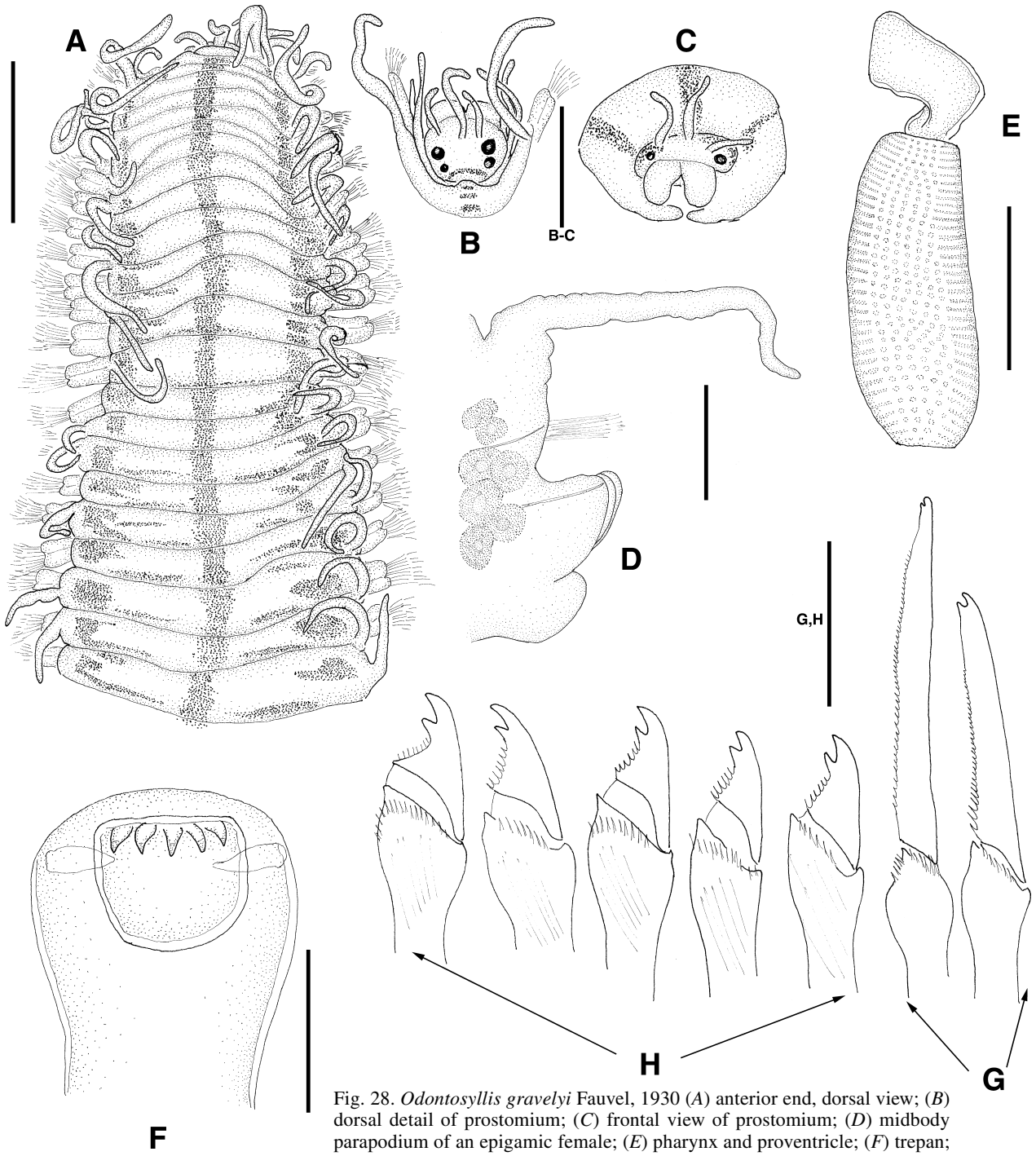



Fig. 28. *Odontosyllis gravelyi* Fauvel, 1930 (*A*) anterior end, dorsal view; (*B*) dorsal detail of prostomium; (*C*) frontal view of prostomium; (*D*) midbody parapodium of an epigamic female; (*E*) pharynx and proventricle; (*F*) trepan; (*G*) long-bladed compound chaetae, midbody; (*H*) falcigers, midbody. Holotype AM W11110, except *B*, AM W202645. Scales: *A–C,E*: 0.8 mm, *D*: 0.2 mm, *F*: 0.18 mm, *G,H*: 20 µm.

small, dorsally nearly covered by small lobe of chaetiger 1 (Figs 27C, 28B); tentacular cirri similar to antennae, but slightly longer. Anterior dorsal cirri elongated, smooth, distally tapered, rugose to pseudoarticulate (Figs 27C, 28A) becoming progressively shorter along body (Figs 27F, 28D), slightly longer than parapodial lobes. Parapodia with 2–3 parallel lobes (Figs 27F, 28D, 29A). Ventral cirri short, pillow-shaped (Figs 27F, 28D). Compound chaetae numerous, shafts distally spinose, and blades of 2 kinds, most dorsal ones with elongate, bidentate blades (Fig. 28G), short spines on margin, and remaining chaetae with short, triangular, distinctly bidentate blades (Figs 28H, 29A–E); on midbody, parapodia with about 6–7 compound chaetae of slender type, 37–45 µm in length, and 28–30 chaetae with short blades, all similar, about 16–18 µm in length; compound chaetae slightly longer on anterior parapodia (Fig. 29A,B). Aciculae slender, distally blunt, numerous in anterior parapodia, reduced to 2–3 on posterior parapodia. Dorsal simple chaetae slender, thin, unidentate (Fig. 29C). Ventral simple chaetae on posterior parapodia, bidentate, with short spines on margin (Fig. 29C,F). Pharynx through 3–4 segments, with 5 teeth and 2 lateral plates (Fig. 28F). Proventricle long, slender (Fig. 28E), through 9 segments, with about 80 muscle cell rows.

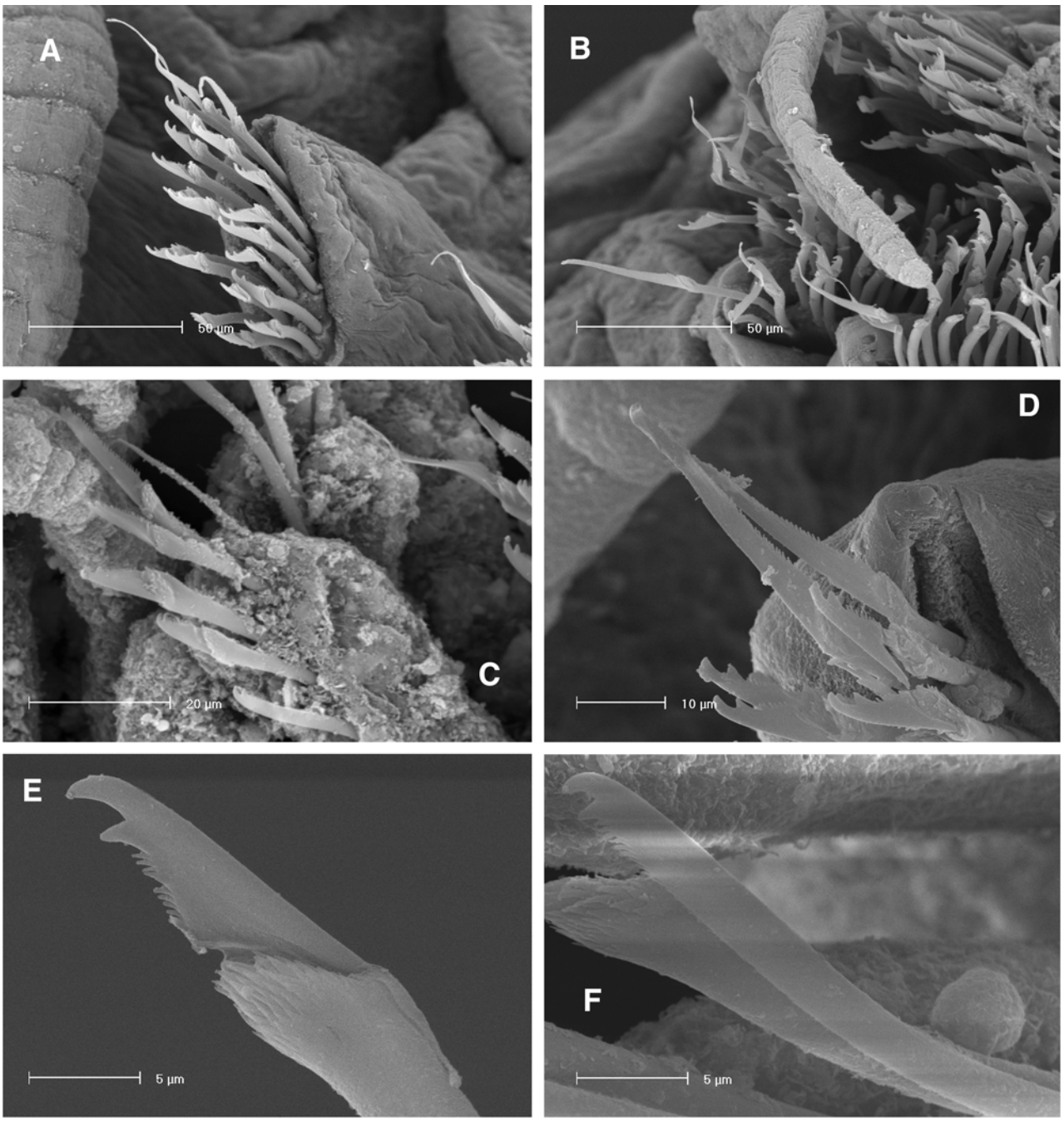



Fig. 29. SEM of *Odontosyllis gravelyi* Fauvel, 1930 (*A*) chaetal fascicle, anterior parapodium; (*B*) chaetal fascicles, midbody parapodia; (*C*) chaetal fascicle, posterior parapodium; (*D*) compound chaetae, posterior parapodium; (*E*) falciger, midbody; (*F*) ventral simple chaeta. AM W11110.

**Remarks**. The small lobe on the peristomium is not regarded as an occipital flap. This species is characterized by its colour pattern, a lack of an occipital flap, and two kinds of compound chaetae being present. *Odontosyllis trilineata* Imajima, 2003 has a similar colour pattern and chaetae, but they differ in that *O. gravelyi* also has long-bladed chaetae, and *O. trilineata* has a distinct occipital flap and 9 teeth on trepan (Imajima, 2003).

**Habitat**. Occurring in coarse sand and gravel and mud, shallow depths often in estuarine conditions.

**Distribution**. Australia (New South Wales, Queensland) and southeast India.

### *Odontosyllis langerhansiaesetosa* Hartmann-Schröder, 1979

Figs 27A,B, 30A–K, 31A–F

*Odontosyllis langerhansiaesetosa* Hartmann-Schröder, 1979: 94, figs 91–96; 1980: 50; 1990: 51.

**Material examined**. AUSTRALIA: QUEENSLAND: Triangular Islets, Shoalwater Bay, 22°23'S 150°31'E, coll. J.A. Lewis & J.R. Forsyth, 1981, 5 + 1 on SEM stub (AM W202639); Calliope R., 23°51'S 151°10'E, coll. P. Saenger, 1974, few (AM W28947); Auckland Creek, Gladstone, 23°51'S 151°14'E, coarse gravel, 1.3 m, coll. P. Saenger, Apr 1977, 1 (AM W198068); Auckland Creek, Gladstone, 23°51'S 151°14'E, coarse sand, 2.8 m, coll. P. Saenger, July 1979, 1 on SEM stub (AM W198069); Branch of Calliope R., Gladstone, 23°51'S 151°10'E, coarse gravel, 2.3

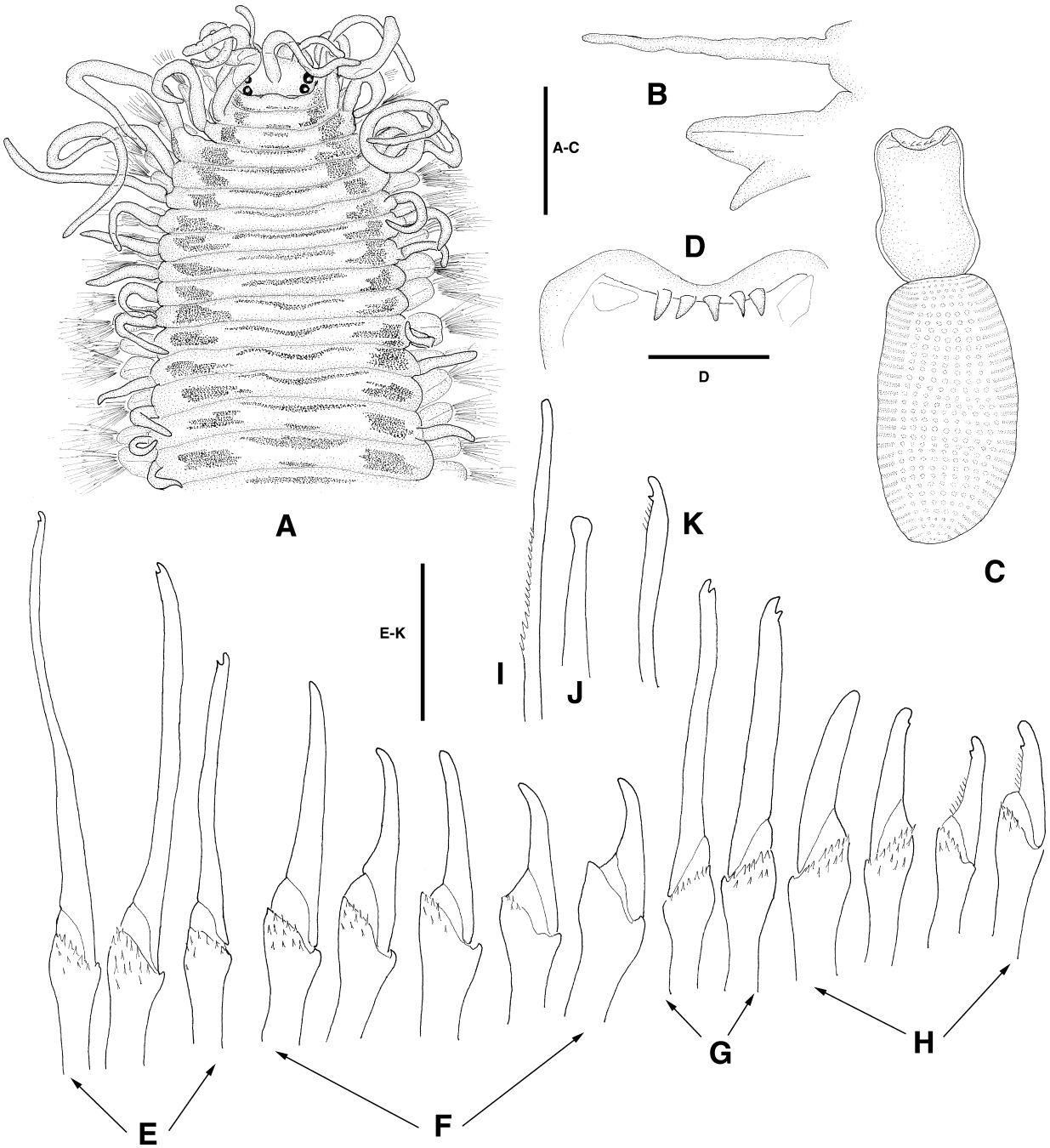



Fig. 30. *Odontosyllis langerhansiaesetosa* Hartmann-Schröder, 1979 (*A*) anterior end, dorsal view; (*B*) midbody parapodium; (*C*) pharynx and proventricle; (*D*) trepan; (*E*) long-bladed compound chaetae, anterior parapodium; (*F*) falcigers, anterior parapodium; (*G*) long-bladed compound chaetae, posterior parapodium; (*H*) falcigers, posterior parapodium; (*I*) dorsal simple chaeta; (*J*) acicula; (*K*) ventral simple chaeta. *A,B,E–K*: AM W198073; *C*: AM W198068. Scales: *A* 0.4 mm, *B* 0.18 mm, *C* 0.1 mm, *D* 0.2 mm, *E–K* 20 µm.

m, P. Saenger, July 1979, 1 (AM W198070); Calliope R., Gladstone, 23°51'S 151°10'E, silty sand, 3.4 m, P. Saenger, July 1979, 1 (AM W198071); Auckland Creek, Gladstone, 23°51'S 151°14'E, coarse sand, 2.3 m, coll. P. Saenger, July 1979, 1 (AM W198072); Black Harry Creek, Gladstone, 23°51'S 151°10'E, soft mud, 0.7 m, coll. P. Saenger, Sept. 1981, 1 (AM W198073). NEW SOUTH WALES: Green Point, Hawkesbury R., 33°34'S 151°14'E, mud, 12 m, coll. A. Jones & party, 13 Nov 1979, 1 (AM W28946).

**Description**. Body broad anteriorly, tapered posteriorly, up to 9.6 mm long, 0.9 mm wide, 72 chaetigers; colour pattern variable, some apparently lacking pigmentation to others, dark, with distinct pattern (Fig. 30A) of dark band on dorsum of each anterior segment, split into 3 or more spots, and sometimes on midbody segments. Prostomium oval, about twice as wide as long; 4 eyes in trapezoidal arrangement. Median antenna longer than combined length of prostomium and palps, originating on middle of prostomium; lateral antennae about half of length of median one, inserted on anterior margin of prostomium (Figs 30A, 31A). Palps short, ventrally folded (Fig. 31C). Peristomium distinct dorsally, slightly shorter than subsequent segments (Figs 30A, 31A), with dorsal, small lobe covering posterior margin of prostomium (Fig. 30A). Occipital flap absent. Tentacular cirri and most anterior dorsal cirri elongated, longer than body width (Figs 30A, 31A), smooth; remaining dorsal cirri shorter (Figs 30A, 31B), slightly longer than parapodial lobes, distally tapered (Figs 30B, 31D). Parapodial lobes

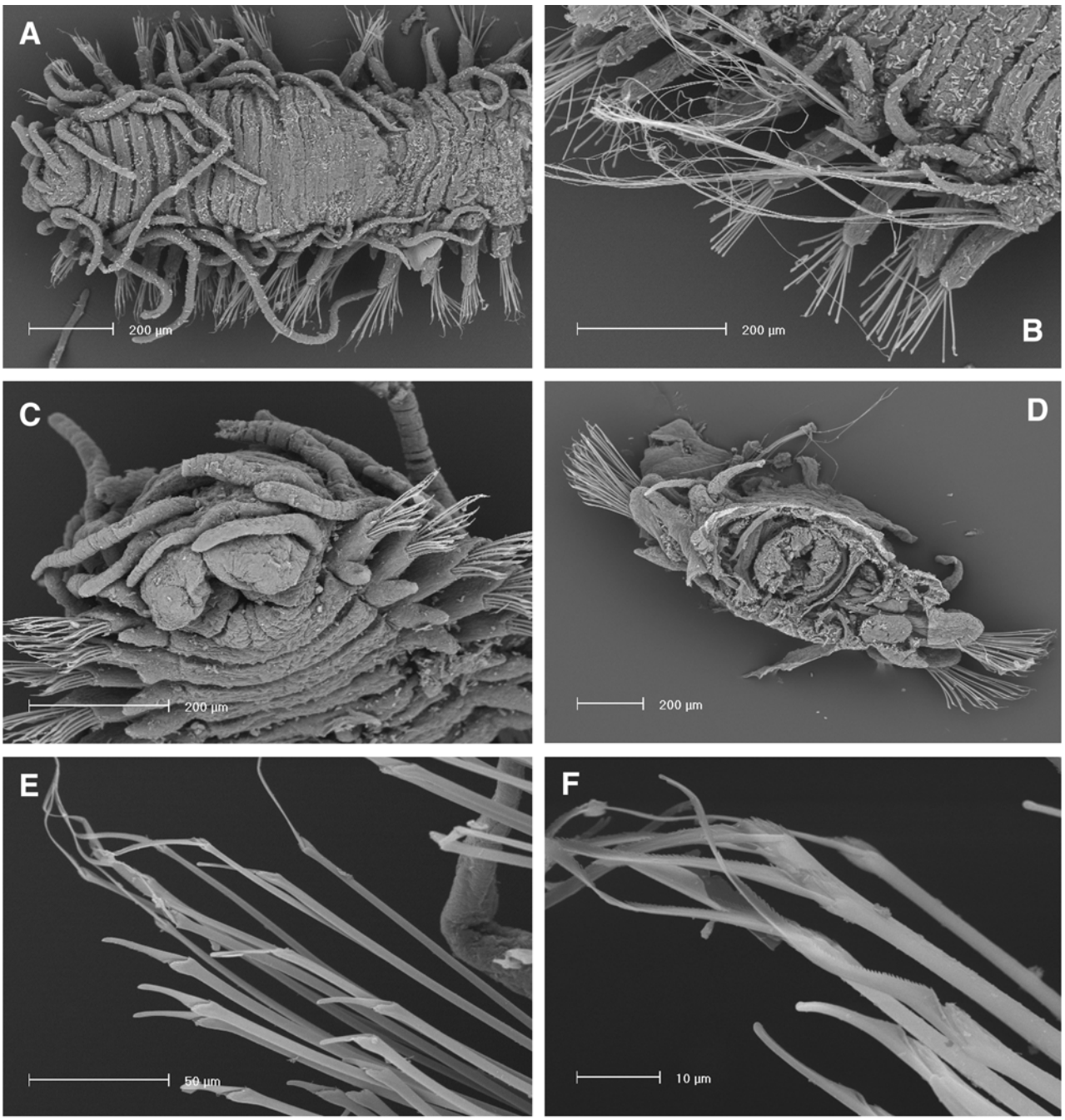



Fig. 31. SEM of *Odontosyllis langerhansiaesetosa* Hartmann-Schröder, 1979 (*A*) anterior end, dorsal view; (*B*) midbody parapodia of an epigamic specimen, showing the natatory chaetae; (*C*) anterior end, ventral view; (*D*) cross section of a midbody segment; (*E,F*) compound chaetae, anterior parapodium. AM W198069, W202639.

conical; ventral cirri triangular to digitiform, shorter than parapodial lobes. Compound chaetae with spinose shafts and 2 kinds of blades; most superior chaetae with elongated, slender, distally bidentate blades (Figs 30E,G, 31E,F), margin smooth, and others similar but blades shorter, unidentate or weakly bidentate (Figs 30F,H, 27A,B); tendon partially fused to blades. Anterior parapodia with about 6 long-bladed chaetae, 38–60 µm long, and 10 short-bladed chaetae, with dorsoventral gradation in length of blades, 35 µm in length dorsally, 18 µm in length ventrally. Progressively along body, number of compound chaetae per parapodium decreasing to 4 long-bladed, 37–40 µm in length, and 4–5 short bladed, 25 µm in length dorsally, 15 µm in length ventrally. Dorsal simple chaetae on posterior parapodia, slender, unidentate, distally blunt, with some short, subdistal spines on margin (Fig. 30I). Ventral simple chaetae on most posterior parapodia, bidentate, with fine spines on margin (Fig. 30K). Several aciculae on anterior parapodia, decreasing to 1 on posterior parapodia, slender, distally knobbed (Fig. 30J). Pharynx about half of length of proventricle (Fig. 30C), through about 6 segments, with 5 teeth and 2 lateral plates (Fig. 30D). Proventricle through about 9–10 segments, with 50 muscle cell rows.

**Habitat**. Occurring in coarse sand, silt, gravel, mud, from intertidal to shallow depths.

**Distribution**. Australia (Western Australia, Queensland, New South Wales).

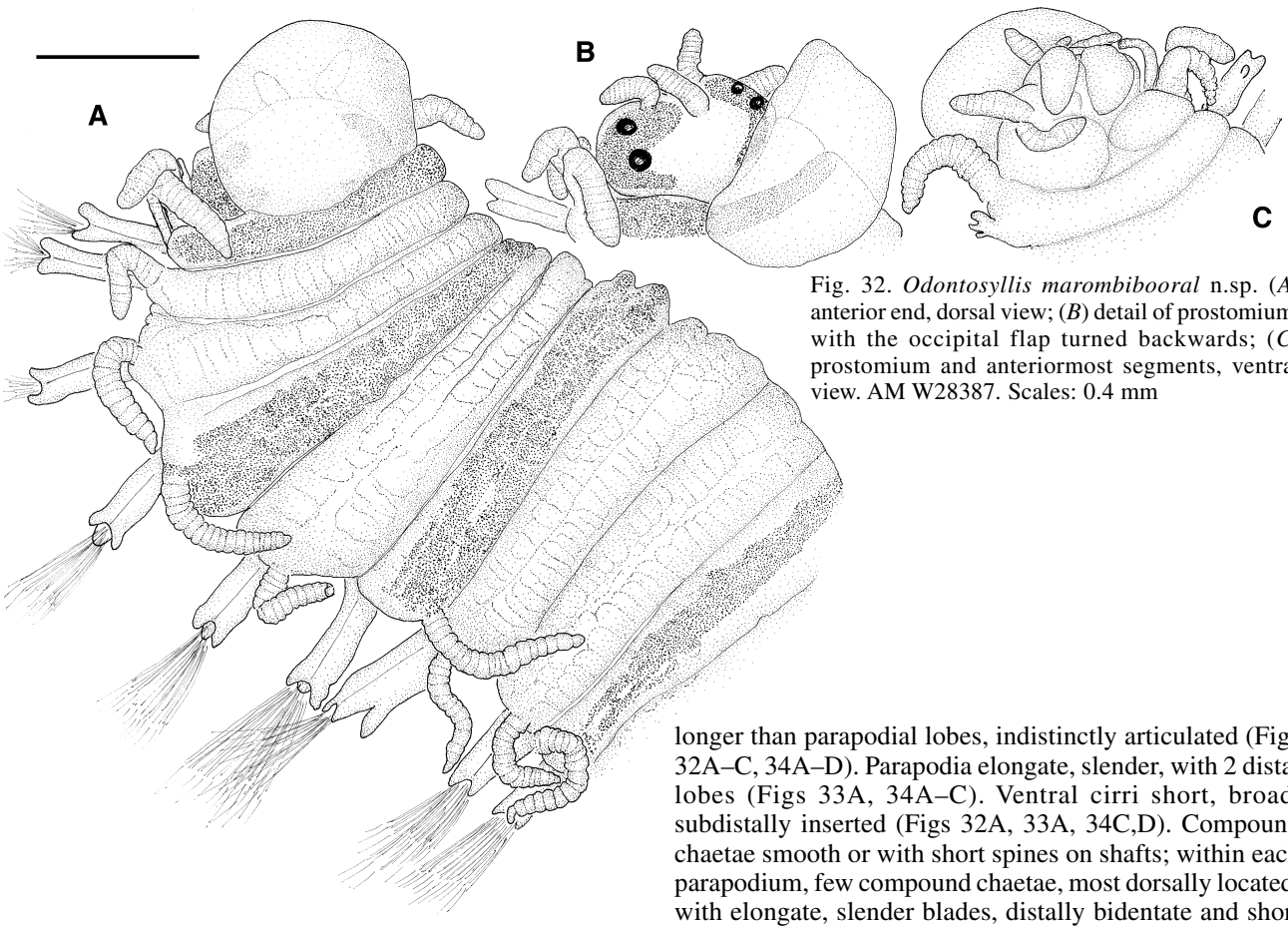



Fig. 32. *Odontosyllis marombibooral* n.sp. (*A*) anterior end, dorsal view; (*B*) detail of prostomium, with the occipital flap turned backwards; (*C*) prostomium and anteriormost segments, ventral view. AM W28387. Scales: 0.4 mm

***Odontosyllis marombibooral* n.sp.**

Figs 23A,B, 32A–C, 33A–F, 34A–E

**Material examined**. HOLOTYPE (AM W28387) AUSTRALIA: WESTERN AUSTRALIA: Off jetty adjacent to Fisheries Hut, Beacon Is. 28°25.5'S 113°47'E, dead coral substrate, plate-like *Acropora* and *Montipora* spp., 12 m, coll. P.A. Hutchings, 23 May 1994. PARATYPES: 1 on SEM stub (AM W5496) Blow Holes, Quobba, 24°29'S 113°25'E, in sponge, 2 m, coll. N. Coleman, 20 Jun 1972; E side of Mangrove Is. 20°56'S 116°09'E, in dead coral, 1 m, coll. Aquinas College, 9 Jan 1968, 1 (AM W194813).

**Description**. Body broad, robust anteriorly, tapered posteriorly, 25 mm long, 2 mm wide, with 93 chaetigers. Distinctly coloured (Fig. 32A) with transverse black rows and other yellowish areas on preserved specimens; 2 kidney-shaped black spots on prostomium (Fig. 32B); chaetigers 1, 4, 6, 9 darkly pigmented, subsequent segments, consisting of one darkly pigmented segment followed by unpigmented segment, this striped pattern continues to mid body, following segments with reduced pigmentation; each segment slightly biannulate with dorsum rugose. Prostomium almost circular, totally covered by occipital flap (Figs 32A, 34A,B), with 4 eyes in rectangular pattern, antennae short and thick, shorter than prostomium, indistinctly wrinkled (Fig. 32B,C), originating close to each other, all similar size, median antenna originating slightly posteriorly to lateral antennae, all antennae covered by occipital flap. Palps triangular, ventrally folded (Fig. 32C). Peristomium dorsally reduced, covered by chaetiger 1 and occipital flap (Fig. 32A), forming 2 lobes ventrally (Fig. 32C). Occipital flap large (Figs 32A–C, 34A,B) colourless. Tentacular and dorsal cirri similar, short, thick, slightly longer than parapodial lobes, indistinctly articulated (Figs 32A–C, 34A–D). Parapodia elongate, slender, with 2 distal lobes (Figs 33A, 34A–C). Ventral cirri short, broad, subdistally inserted (Figs 32A, 33A, 34C,D). Compound chaetae smooth or with short spines on shafts; within each parapodium, few compound chaetae, most dorsally located, with elongate, slender blades, distally bidentate and short spines on margin; remaining chaetae with shorter and wider blades that progressively along body, become strongly bidentate, with short spines on margin (Figs 33B,D, 34E, 23A,B). Anterior compound chaetae shorter and more slender than posterior ones, about 20 per parapodium, with dorsoventral gradation in length of blades within fascicle, 38 µm in length dorsally, 16 µm in length ventrally, those of posterior parapodia, numbering about 15 per parapodium, 46 µm in length dorsally, 26 µm in length ventrally. Dorsal and ventral simple chaetae not seen. Aciculae slender, distally broad, numerous on anterior parapodium, numbers decreasing posteriorly to 2–3 on posterior parapodia (Fig. 33C). Pharynx about half of length of proventricle (Fig. 33E), with 5 teeth and 2 lateral plates (Fig. 33F). Proventricle long and wide, with about 56 muscle cell rows (Fig. 33E).

**Remarks**. *Odontosyllis marombibooral* n.sp. differs from all other species of the genus in having a large occipital flap, which covers totally the prostomium and antennae, a distinctive colour pattern, bifid parapodia with distal ventral cirri, and short, pseudoarticulated dorsal cirri. No other species has this combination of characters. The most similar species is *Odontosyllis picta* (Kinberg, 1865 described as *Eurymedusa picta*), from New Zealand (Ehlers, 1904) (also questionably reported for Australia), which also has a large occipital flap, but not as large as the one present in *Odontosyllis marombibooral* n.sp. *Odontosyllis picta* also has black transverse stripes, but they are arranged in a different pattern to those of *Odontosyllis marombibooral*, and the compound chaetae have all short blades, whereas *Odontosyllis marombibooral*, has two types of chaetae present. *Odontosyllis rubrofasciata* (Pruvot, 1930), from

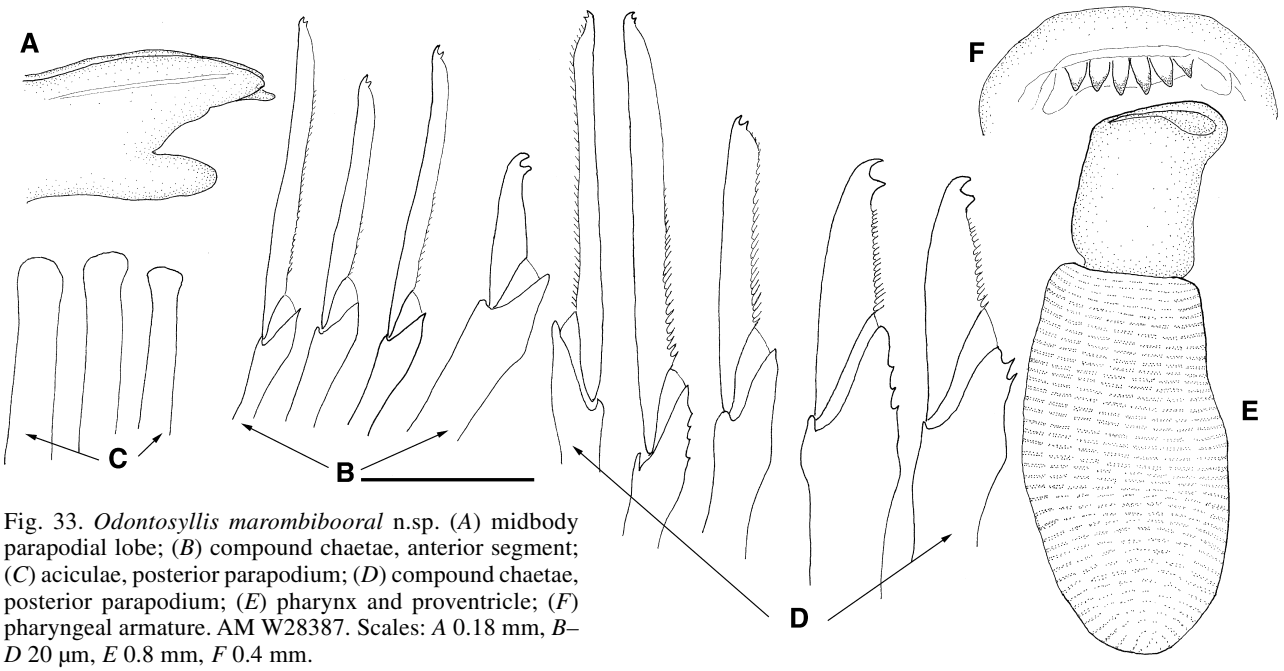



Fig. 33. *Odontosyllis marombibooral* n.sp. (*A*) midbody parapodial lobe; (*B*) compound chaetae, anterior segment; (*C*) aciculae, posterior parapodium; (*D*) compound chaetae, posterior parapodium; (*E*) pharynx and proventricle; (*F*) pharyngeal armature. AM W28387. Scales: *A* 0.18 mm, *B–D* 20 μm, *E* 0.8 mm, *F* 0.4 mm.

New Caledonia, (described as *Atelesyllis rubrofasciata*), and *O. rubrofasciata* Grube, 1878 (a possible homonym), have strikingly similar colour patterns, short dorsal cirri, and compound chaetae that resemble those present in *Odontosyllis marombibooral*, but the occipital flap is much smaller and this character easily separates these three species. Fauvel, in the notes given after the description of *Atelesyllis rubrofasciata* considered that is a different species to *O. rubrofasciata* Grube, 1879. *Odontosyllis rubrofasciata* (Pruvot, 1930) has transverse stripes, but only from the midbody onwards, the prostomium has 4 lobes. The chaetae, although similar to those of *O. marombibooral* are slightly different, with long blades not as elongated and short blades with distal tooth not as curved as those present in *O. marombibooral*. In the description of *Atelesyllis rubrofasciata* (Pruvot, 1930), pharyngeal teeth are not mentioned as being present, although examining a range of species of *Odontosyllis* some individuals appear to lack these teeth. In all other characters, however, they are identical to specimens with teeth, suggesting they may lose these teeth and be able to regenerate them.

**Habitat**. Occurring in dead corals and sponges, from depths of 1–12 m.

**Distribution**. Australia (Western Australia).

**Etymology**. The name of this species comes from two aboriginal words, *marombi*, meaning shield, and *booral*, meaning big, or large, in reference to the large occipital flap present.

### *Odontosyllis polycera* (Schmarda, 1861)

Figs 19A,B, 25E,F, 35A–F, 36A–F

*Syllis polycera* Schmarda, 1861: 72, pl. 28, fig. 219
*Odontosyllis polycera* Augener, 1927: 152.—Day, 1967: 260, fig. 12.—Hutchings & Murray, 1984: 32.—Hartmann-Schröder, 1984: 20; 1985: 68, figs 14–17; 1986: 41; 1989: 25; 1990: 51.
?*Odontosyllis suteri* Non Benham, 1915.—Haswell, 1920: 107.

**Material examined**. AUSTRALIA: QUEENSLAND: Lagoon, Low Islets, 16°23'S 145°34'E, British Great Barrier Reef Expedition 1928–1929, 3 Oct 1928, id. as *O. hyalina*, 1 epigamic specimen, (AM W2952). NEW SOUTH WALES: NE of Mary's Rock, Cook Is., 28°11.42'S 153°34.79'E, orange frilly bryozoan, 19 m, coll. R.T. Springthorpe, 8 Jun 1993, 1 (AM W28400); NW of Split Solitary Is., 30°14'S 153°10.8'E, orange sponge, 14 m, coll. R.T. Springthorpe, 7 Mar 1992, 1 (AM W28219); Green Point, Hawkesbury R., 33°34'S 151°14'E, mud, 12 m, coll. A. Jones & party, 13 Nov 1979, 1 (AM W196605); Hawkesbury R., E end of Brooklyn Boat Channel, 33°33'S 151°14'E. A. Jones & party, 18 Dec 1979, 1 (AM W196420); Grotto Point, Port Jackson, 33°49'S 151°15'E, algae, 4 m, coll. P. Colman, 18 July 1983, 2 (AM W28407); W of La Perouse, Botany Bay, 33°59.4'S 151°12.8'E, St. 99, mud, 13 m, coll. SPCC, 10 Mar 1977, P.A. Hutchings (id.), 1 epigamic female, (+ 2 midbody pieces on SEM stub) (AM W14203); S of Banksmeadow, Botany Bay, 33°58'S 151°12'E, mud, 19 m, 8 Dec 1976, coll. SPPC, 1 (AM W14197); Botany Bay, 33°59.3'S 151°13.1'E, coll. NSW Fisheries, 31 Jan 1975, 1 epigamic specimen on SEM stub (AM W195387); Botany Bay, 34°0.5'S 151°11'E, coll. NSW Fisheries, 1 (AM W195520); N of Kurnell, Botany Bay, 34°00'S 151°12'E, mud, 13 m, 10 March 1977, P.A. Hutchings (id.), 1 (AM W14204); Port Botany, Botany Bay, 33°58.75'S 151°11.093'E, 7 m, 7 Apr 1992, A. Murray (id.), 1 (AM W21628); W of La Perouse, Botany Bay, muddy sand, 19 m, 4 Feb 1977, coll. SPCC, 2 (AM W14201); off Bass Point, 34°36'S 150°54'E, 50 m, coll. The Ecology Lab, 1 Feb 1990, several (AM W22990); 100 m, Jervis Bay, 35°06'S 150°44'E, coll. P.A. Hutchings & party, Feb 1989, 1 (AM W20828); Jervis Bay, off Murrays Beach, 35°7.5'S 150°45.5'E, coll. NSW Fisheries, 25 Apr 1972, 1 on SEM stub (AM W194258); Jervis Bay, Murrays Basin sandbank, coll. NSW Fisheries, 17 Oct 1972, 1 (AM W194540); Jervis Bay, Murrays Basin 35°7.5'S 150°45.5E, sand, coll. NSW Fisheries, 17 Oct 1972, 1 (AM W194290); Jervis Bay, off Murrays Beach, 35°7.5'S 150°45.5'E, NSW Fisheries, Apr 1972, 1 (AM W17559); Plantation Point, Jervis Bay, 35°4.35'S 150°41.80'E, intertidal rock platform, coll. A. Murray, 24 Oct 1998, 1 (AM W24937). TASMANIA: Fancy Point, Bruny Is. 43°16'S 147°19'E, algae, 3–6 m, coll. G. Edgar, 10 Nov 1980, 1 (AM W18189). SOUTH AUSTRALIA: 2 km off First Creek, Spencer Gulf, Port Pirie, 33°12'S 138°00'E, subtidal, *Posidonia* and *Amphibolus* spp seagrass, 4.1 m, T.J. Ward, Mar 1980, 1 (AM W28233); Sleaford Bay, Port Lincoln, 34°54'S 135°47'E, algal washings, coll. P.A. Hutchings, 10 Mar 1979, 4 (AM W26356). WESTERN AUSTRALIA: Bramble Point, Princess Royal Harbour, 35°02'S 117°55'E, *Posidonia sinuosa*, 1–1.5m, coll. P.A. Hutchings & party, Jan 1988, 1 (AM W20305); Cottlesloe Beach, 6 miles W of Perth, calcareous algae & *Idanthyrsus* tubes, 6 m, coll. H. Paxton, 14 Feb 1970, G. Hartmann-Schröder (id.), 6 (+ 2 fragments on SEM stub), (AM W4344); Red Bluff, Kalbarri, 27°42'S 114°09'E, mixed coralline algae on rocky shore, 3.5 m, coll. J.K. Lowry, 10 Jan., 1984, 2 (AM W28365).

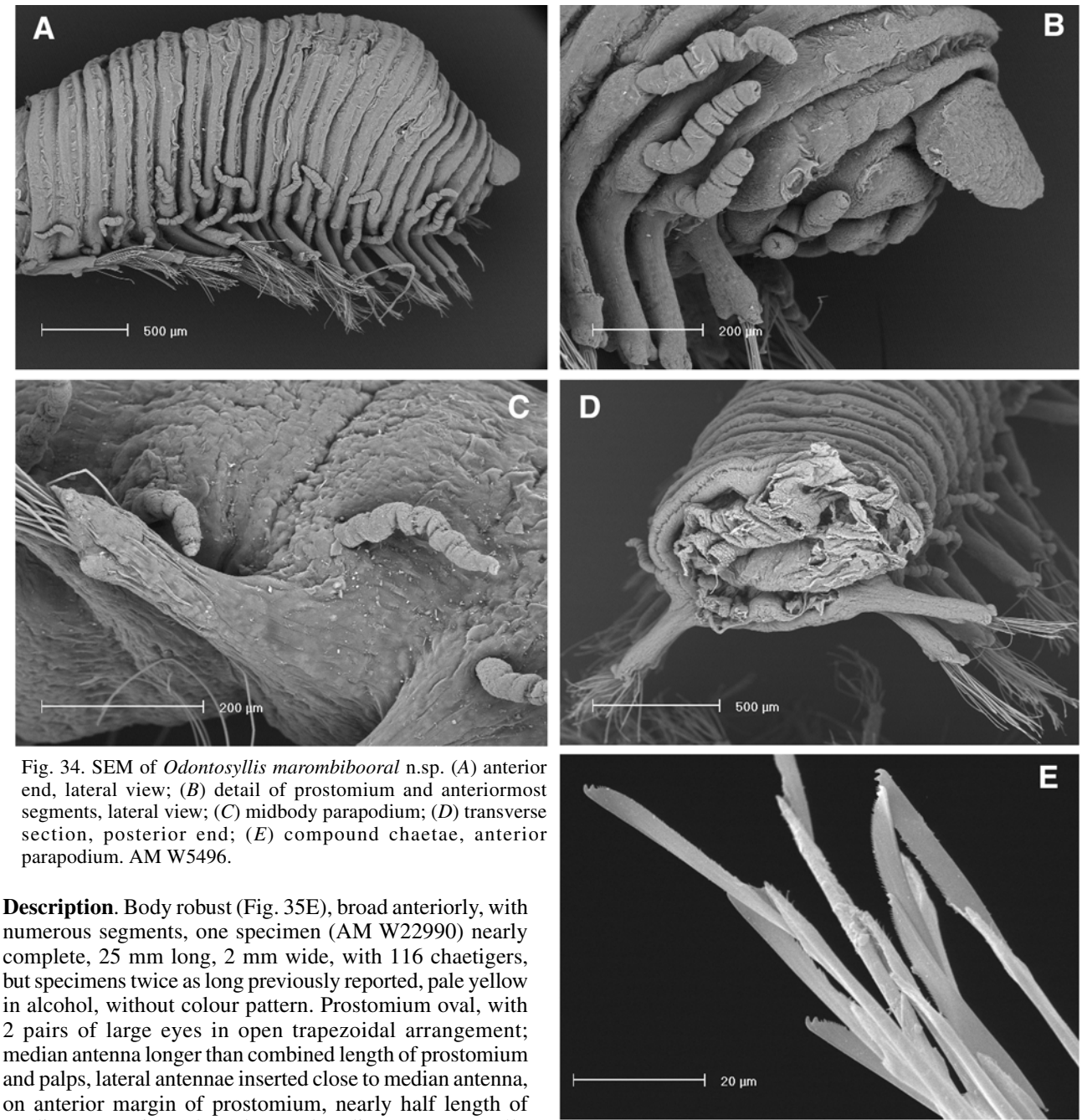



Fig. 34. SEM of *Odontosyllis marombibooral* n.sp. (*A*) anterior end, lateral view; (*B*) detail of prostomium and anteriormost segments, lateral view; (*C*) midbody parapodium; (*D*) transverse section, posterior end; (*E*) compound chaetae, anterior parapodium. AM W5496.

**Description**. Body robust (Fig. 35E), broad anteriorly, with numerous segments, one specimen (AM W22990) nearly complete, 25 mm long, 2 mm wide, with 116 chaetigers, but specimens twice as long previously reported, pale yellow in alcohol, without colour pattern. Prostomium oval, with 2 pairs of large eyes in open trapezoidal arrangement; median antenna longer than combined length of prostomium and palps, lateral antennae inserted close to median antenna, on anterior margin of prostomium, nearly half length of median one (Figs 25F, 35A). Palps divergent, ventrally folded, free for almost their length, fused basally. Dorsal tentacular cirri slightly longer than antennae, ventral tentacular cirri shorter. Peristomium reduced dorsally, covered by large, long occipital flap, that also covers most of prostomium (Figs 25E,F, 35A); anterior edge of occipital flap with band of cilia (Fig. 36A, arrow); midbody segments divided in two sections by one furrow, each section with row of cilia (Fig. 36B, arrows). Antennae, tentacular, and dorsal cirri elongated, smooth, distally tapered, with short cirrophore (Figs 25E, 35A), dorsal cirri becoming shorter posteriorly (Fig. 25E); dorsal cirri of chaetigers 1, 3, 4 and 6 long, alternating dorsal cirri long and short on remaining segments. Parapodia conical, ending in 2 distal lobes (Fig. 35B). Ventral cirri rounded, stout, pillow-shaped, shorter than parapodial lobes (Figs 35B, 36C,D). Compound chaetae heterogomph falcigers, with spinose ending shafts and short, bidentate blades, slightly hooked, proximal tooth well separated from distal ones (Figs 35E,F, 36F), sometimes on middle of margin; few, short spines, on margin, also some thin spines on tendons between shafts and blades, becoming more marked on posterior chaetae (Fig. 35E,F). Length of blades of chaetae within fascicle increasing ventrally (Figs 35E,F, 36E). Anterior parapodia with about 50 compound chaetae, blades 15–17 µm in length dorsally, 23 µm in length ventrally; number of compound chaetae per parapodium diminishing progressively along body to 25–27 on posterior segments, blades increasing in length within fascicle from 18 µm dorsally to 25 µm ventrally. Anterior parapodia with 3 slender aciculae with trilobed tips, numbers decreasing posteriorly with only 1 on posterior parapodia, similar to anterior ones (Fig. 35D), but larger. Dorsal simple chaetae on posterior parapodia, thin, unidentate, with short spines on margin (Fig. 19A).

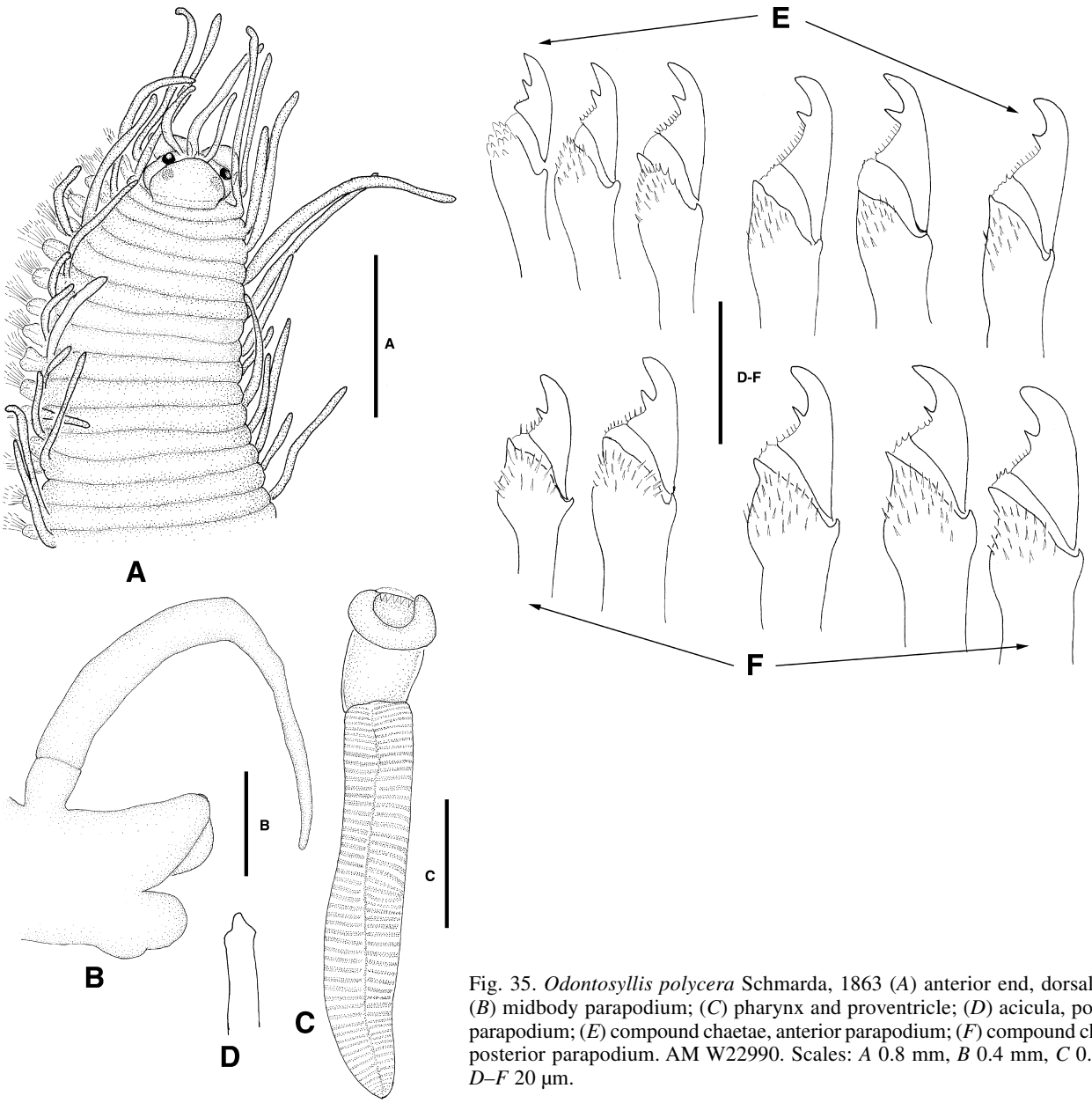



Fig. 35. *Odontosyllis polycera* Schmarda, 1863 (*A*) anterior end, dorsal view; (*B*) midbody parapodium; (*C*) pharynx and proventricle; (*D*) acicula, posterior parapodium; (*E*) compound chaetae, anterior parapodium; (*F*) compound chaetae, posterior parapodium. AM W22990. Scales: *A* 0.8 mm, *B* 0.4 mm, *C* 0.5 mm, *D–F* 20 μm.

Ventral simple chaetae on far posterior segments of few specimens, with minute subdistal spines on margin, distally hooked, with short proximal tooth (Fig. 19B). Pharynx short, through about 4 segments, with 5–8 teeth, and 2 lateral plates. Proventricle long, relatively slender, more than 3 times length of pharynx (Fig. 35C), through 9–10 segments, with about 130 muscle cell rows. Pygidium, with 2 long anal cirri. Several specimens epitokous, with long natatory chaetae on midbody parapodia (Fig. 36D).

**Remarks**. This species, which was described from Table Bay, South Africa, has been reported widely, and a detailed study should be undertaken to confirm such a wide distribution and depth range.

**Habitat**. Occurring in sand, mud, algae, calcareous substrata, bryozoans, sponges, from intertidal to 90 m (Hartmann-Schröder, 1984).

**Distribution**. Angola, Namibia, South Africa, USA (Southern California), Panama, Indo-Pacific, New Zealand, Australia (Queensland, New South Wales, Tasmania, South Australia, Western Australia).

### Genus *Opisthodonta* Langerhans, 1879

*Opisthodonta* Langerhans, 1879: 547.

**Type species**. *Opisthodonta morena* Langerhans, 1879.

**Diagnosis**. Body long, with numerous segments, stout, dorsally convex, of macrofaunal size (>10 mm in length). Prostomium provided with 2 pairs of eyes, and sometimes 2 anterior eyespots. Three antennae. Median antenna

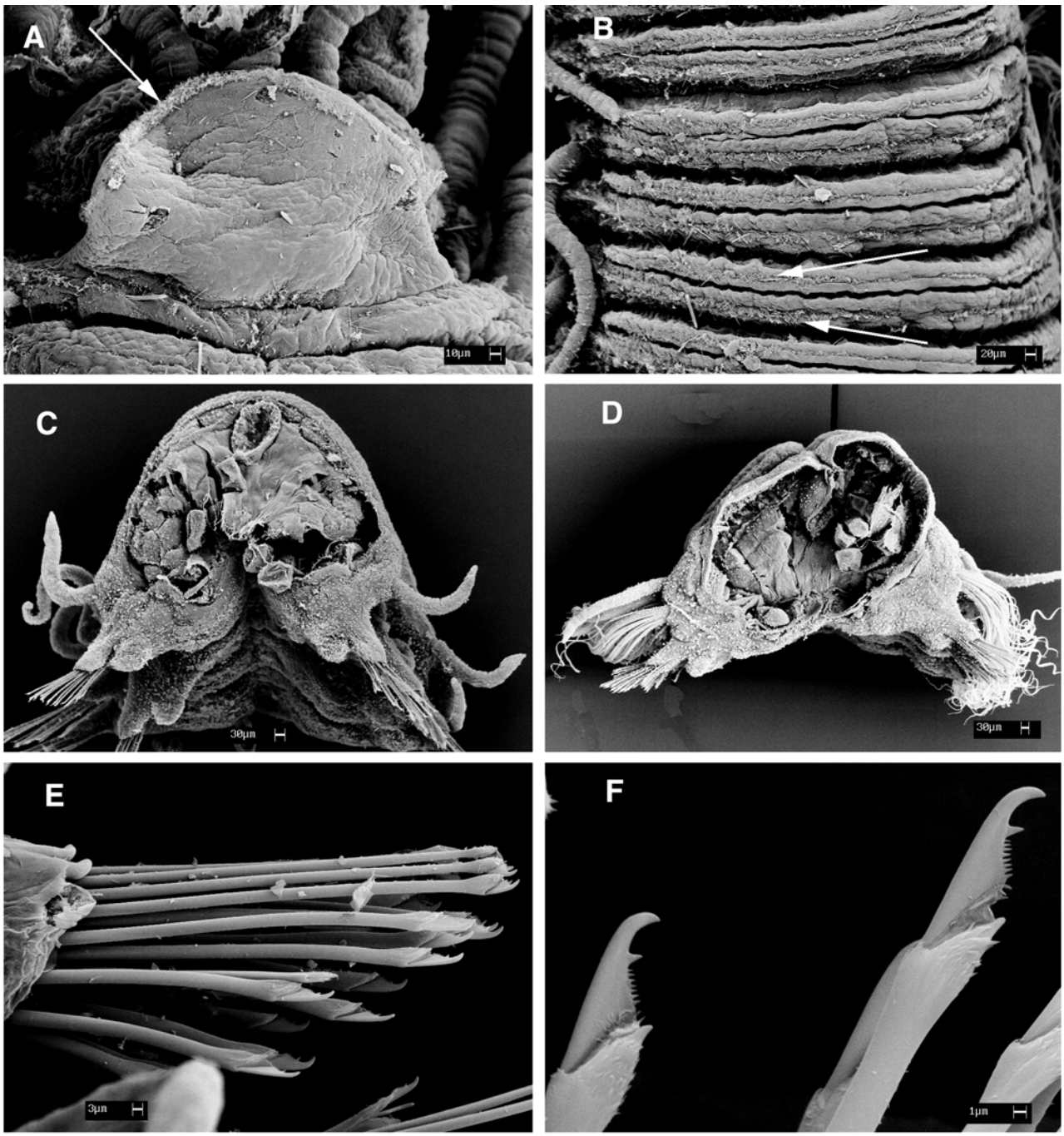



Fig. 36. SEM of *Odontosyllis polycera* Schmarda, 1863 (*A*) occipital flap; (*B*) detail of dorsum of midbody segments; (*C*) transverse section, midbody of an atokous specimen; (*D*) transverse section, midbody of an epigamic specimen; (*E*) fascicle of chaetae, midbody; (*F*) compound chaetae, midbody. *A,B*: AM W195387; *C*: AM W4344; *D*: AM W14203; *E,F*: AM W4344.

inserted on middle of prostomium or slightly in front of anterior eyes. Palps apparently free from each other, basally fused. Peristomium small, partially covered by prostomium and first chaetiger, with 2 pairs of tentacular cirri. Nuchal organs as 2 ciliated grooves between prostomium and peristomium. Dorsal cirri on all chaetigers, cylindrical, long to extremely long, smooth or slightly rugose. Parapodia elongate; ventral cirri of anterior parapodia, ovate, foliaceous almost completely fused with parapodial lobe, provided with hyaline inclusions, perhaps glands. Subsequent ventral cirri conical to digitiform, neither foliaceous nor fused to parapodial lobes, inserted at base of parapodia. Chaetal bundles formed of numerous compound chaetae, including falcigers provided with long, thick proximal tooth and short distal tooth and sometimes a few chaetae with long, slender, spiniger-like blades. Dorsal simple chaetae apparently lacking. Aciculae with button-shaped tips with crown of spines, or tricuspidate. Pharynx and proventricle similar in length. Pharynx with crown of soft papillae on anterior rim and single mid-dorsal tooth, inserted on anterior third or middle of pharynx. Reproduction by epigamy (Garwood, 1991).

**Key to Australian species of *Opisthodonta***

1 Pharyngeal tooth inserted mid to far posterior of pharynx. Spiniger-like chaetae absent ..... *O. morena*

—— Pharyngeal tooth located in front of middle of pharynx. Spiniger-like chaetae present ..... 2

2 Spiniger-like chaetae about 84 µm in midbody, bidentate. Dark, transverse rows of pigment on anterior segments ..... *O. melaenonephra*

—— Spiniger-like chaetae about 175 µm in midbody, weakly bidentate to unidentate. Lacking any colour pattern ..... *O. hanneloreae* n.sp.

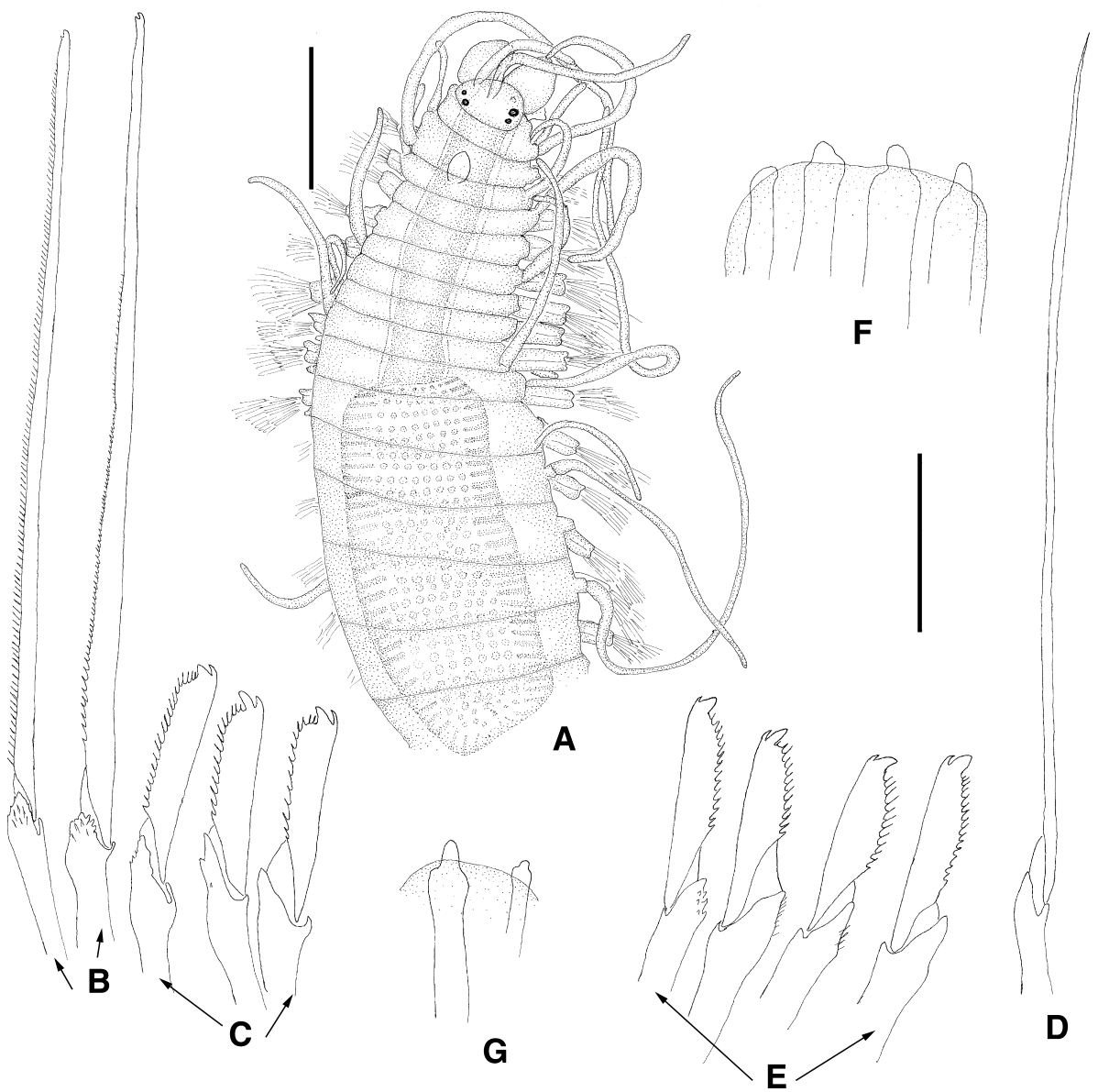



Fig. 37. *Opisthodonta hanneloreae* n.sp. (*A*) anterior end, dorsal view; (*B*) spiniger-like compound chaetae, anterior parapodium; (*C*) falcigers, anterior parapodium; (*D*) spiniger-like compound chaeta, midbody; (*E*) falcigers, midbody; (*F*) aciculae, anterior parapodium; (*G*) aciculae, midbody. AM W28393. Scales: *A* 0.18 mm, *B–G* 20 µm.

### *Opisthodonta hanneloreae* n.sp.

Fig. 37A–G

**Material examined**. HOLOTYPE (AM W28393). AUSTRALIA: WESTERN AUSTRALIA: Wallabi Group of Is., 28°23.99'S 113°46.73'E, shell debris from scallop beds, 39 m, coll. P.A. Hutchings on WA FRV *Flinders*, 30 May 1994. PARATYPES Wallabi Group of Is., 28°24'S 113°46.26'E, scallop beds, shell debris, 35 m, coll. P.A. Hutchings on WA FRV *Flinders*, 30 May 1994, few (AM W28372); Off S end of Long Is. Beacon Is. 28°28.8'S 113°46.3'E, dead coral substrate covered in coralline algae, 4.5 m, coll. P.A. Hutchings, 25 May 1994, 1 (AM W28950); Goss Passage, Beacon Is. 28°25.5'S 113°47'E, dead coral substrate, in fine sediment at foot of reef slope, 33 m, coll. P.A. Hutchings, 23 May 1994, 1 (AM W28951).

**Description**. Body fragile, all fragmented specimens, strongly convex dorsally, colourless, longest anterior fragment 2.8 mm long, 0.6 mm wide, with 18 chaetigers. Prostomium oval, with 4 eyes in open trapezoidal arrangement and sometimes 2 anterior eyespots; median antenna inserted in front of line between anterior eyes, about twice as long as combined length of prostomium and palps; lateral antennae inserted near anterior margin, about half length of median antenna (Fig. 37A). Palps trapezoidal, sometimes ventrally folded, slightly longer than prostomium. Peristomium similar in length to following segments; dorsal tentacular cirri long, filiform, longer than median antenna, ventral tentacular cirri about one third length of dorsal cirri. Dorsal cirri, as well as antennae and tentacular cirri, smooth, filiform, alternating irregularly, long cirri, longer than body width, and short cirri, shorter than body width (Fig. 37A). Parapodial lobes rectangular, ending with pre-chaetal lobe. Ventral cirri large, triangular, partially fused to parapodial lobes on anterior parapodia, with some granular inclusions, becoming digitiform, not fused to parapodial lobes, on subsequent segments. Compound chaetae compound heterogomph, shafts distally spinose, and two kinds of blades, long, spiniger-like chaetae, anteriorly bifid (Fig. 37B), apparently unidentate on posterior parapodia (Fig. 37D), and bidentate falcigers, elongate, with short spines on margin and margins of blades weakly convex on anterior parapodia, bidentate, with unequal teeth, proximal tooth longer and broader than distal tooth (Fig. 37C), becoming more marked on posterior chaetae (Fig. 37E). Anterior parapodia with about 3 spiniger-like chaetae, blades 90–175 µm in length; and about 50 falcigers with blades 25–27 µm in length; progressively posteriorly number of compound chaetae decreasing to 1–2 spiniger-like, about 105 µm in length, smooth and unidentate, and 25 falcigers, 25–22 µm in length, on mid-posterior parapodia. Simple dorsal and ventral chaetae not seen. Aciculae distally slightly enlarged, ending in button, 4 on most anterior parapodia (Fig. 37F), reducing to 2 on mid-posterior parapodia, one large and other slender (Fig. 37G). Pharynx long and slender, through about 11 segments; pharyngeal tooth long and large, oval, located slightly anteriorly to middle of pharynx (Fig. 37A). Proventricle large, through about 6 segments, with 23 muscle cell rows. Details of posterior end unknown.

**Remarks**. *Opisthodontha hanneloreae* n.sp. is similar to *O. melaenonephra*, but lacks any colour pattern, the spiniger-like chaetae are distinctly longer and more slender, unidentate from midbody onwards. *Opisthodonta morena* Langerhans, 1879 (see above), and *O. mitchelli* Kudenov & Harris (1995) have much shorter spiniger-like chaetae than *O. hanneloreae*.

**Habitat**. Occurring in dead corals and in shell debris, in shallow water.

**Distribution**. Australia (Western Australia).

**Etymology**. The species is named after Dr Hannelore Paxton an Australian polychaetologist.

### *Opisthodonta melaenonephra* (Haswell, 1920) n.comb.

Figs 38A–G, 39A–O

*Pionosyllis melaenonephra* Haswell, 1920: 103, pl. 12, figs 11–16, pl. 13, fig. 1.—Hutchings & Murray, 1984: 32.

**Material examined**. AUSTRALIA: NEW SOUTH WALES: Offshore from Hungry Beach, Hawkesbury R., 33°35'S 151°17'E, sandy mud, 4 m, coll. A.R. Jones & A. Murray, 9 Nov 1982, 2 (AM W22122); Offshore from Hungry Beach, Hawkesbury R., 33°35'S 151°17'E, sandy mud, 4 m, coll. A.R. Jones & A. Murray, 5 Aug 1983, 1 (AM W22123); Offshore from Hungry Beach, Hawkesbury R., 33°35'S 151°17'E, sandy mud, 4 m, coll. A.R. Jones & A. Murray, 11 Nov 1983, 1 (AM W22124); Offshore from Hungry Beach, Hawkesbury R., 33°35'S 151°17'E, sandy mud, 4 m, coll. A.R. Jones & A. Murray, 17 May 1982, 1 (AM W22126); Offshore from Hungry Beach, Hawkesbury R., 33°35'S 151°17'E, sandy mud, 4 m, A.R. Jones & A. Murray, 26 May 1981, 1 (AM W22127); Offshore from Hungry Beach, Hawkesbury R., 33°35'S 151°17'E, sandy mud, 4 m, coll. A.R. Jones & A. Murray, 9 Nov 1982, 1 (AM W22128); mid-stream between Juno Head and Hungry Beach, Hawkesbury R., 33°34'S 151°16'E, muddy sand, 10 m, coll. A.R. Jones & A. Murray, 9 Nov 1984, 1 (AM W22129); 50 m NE of Green Point, Hawkesbury R., 33°34'S 151°13.5'E, muddy sand, 4 m, coll. A.R. Jones & A. Murray, 9 Nov 1982, 1 (AM W22131); 50 m NE of Green Point, Hawkesbury R., 33°34'S 151°13.5'E, muddy sand, 4 m, coll. A.R. Jones & A. Murray, 5 Aug 1983, 2 (AM W22132); 300 m NE of Green Point, Hawkesbury R., 33°34'S 151°13.5'E, sandy mud, 5 m, coll. A.R. Jones & A. Murray, 26 May 1981, 1 (AM W22133); 300 m NE of Green Point, Hawkesbury R., 33°34'S 151°13.5'E, sandy mud, 5 m, coll. A.R. Jones & A. Murray, 7 Aug 1981, 1 (AM W22134); 300 m NE of Green Point, Hawkesbury R., 33°34'S 151°13.5'E, sandy mud, 5 m, coll. A.R. Jones & A. Murray, 26 May 1981, 1 (AM W22135); 300 m NE of Green Point, Hawkesbury R., New South Wales, Australia, 33°34'S 151°13.5'E, sandy mud, 5 m, coll. A.R. Jones & A. Murray, 11 Nov 1983, 1 (AM W22136); 1 km S of E end of Spectacle Is., Hawkesbury R., 33°32'S 151°07.5'E, muddy sand, 12 m, coll. A.R. Jones & A. Murray, 5 Aug 1983, 1 (AM W22138); 1 km S of E end of Spectacle Is., Hawkesbury R., 33°32'S 151°07.5'E, muddy sand, 12 m, coll. A.R. Jones & A. Murray, 21 Aug 1984, 1 (AM W22139); 300 m NE of Green Point, Hawkesbury R., 33°34'S 151°13.5'E, sandy mud, 5 m, coll. A.R. Jones & A. Murray, 4 Feb 1983, 1 (AM W22140); 300 m NE of Green Point, Hawkesbury R., 33°34'S 151°13.5'E, sandy mud, 5 m, coll. A.R. Jones & A. Murray, 11 Feb 1981, 1 (AM W22141); 300 m NE of Green Point, Hawkesbury R., 33°34'S 151°13.5'E, sandy mud, 5 m, coll. A.R. Jones & A. Murray, 27 May 1983, 1 (AM W22142); 300 m NE of Green Point, Hawkesbury R., 33°34'S 151°13.5'E, sandy mud, 5 m, coll. A.R. Jones & A. Murray, 11 Feb 1981, 3 (AM W22143); 300 m NE of Green Point, Hawkesbury R., 33°34'S 151°13.5'E, sandy mud, 5 m, coll. A.R. Jones & A. Murray, 7 Aug 1981, 1 (AM W22144); 300 m NE of Green Point, Hawkesbury R., 33°34'S 151°13.5'E, sandy mud, 5 m, coll. A.R. Jones & A. Murray, 7 Aug 1981, 1 (AM W22145); 1 km S of E end of Spectacle Is., Hawkesbury R., 33°32'S 151°07.5'E, muddy sand, 12 m, coll. A.R. Jones & A. Murray, 9 Feb 1984, 1 (AM W22147); 1 km S of E end of Spectacle Is., Hawkesbury R., 33°32'S 151°07.5'E, muddy sand, 12 m, coll. A.R. Jones & A. Murray, 21 Aug 1984, 1 (AM W22148); E end of Brooklyn Boat Channel, Hawkesbury R., 33°33'S 151°14'E, 12 m, coll. A. Jones *et al*., 18 Dec 1979, 1 (AM W196608). E end of Brooklyn Boat Channel, Hawkesbury R., 33°33'S 151°14'E, A. Jones *et al*., 1 Aug 1979, 5 (AM W196610); 200 m S of E end of Spectacle Is., Hawkesbury R., 33°32.5'S 151°13.5'E, sandy mud, 5 m, coll. A.R. Jones & A. Murray, 11 Nov 1983, 1 (AM W22150). Pittwater, 33°35.87'S 151°18.71'E, mud, 15.9 m, coll. Australian Museum Party, 15 Dec 1994, 1 (AM W23929); Port Jackson, 33°51'S 151°16'E, Feb 1920. Syntypes: Port Jackson, 33°51'S 151°16'E, Feb 1920, 2 (AM W513), 8 (AM W6175), 1 on microscope slide (AM W494). Rock platform, Murray's Beach, Jervis Bay, 35°07.5'S 150°46'E, dead barnacles encrusted with sponges, in intertidal pools, 0.5 m, coll. H.E. Stoddart, 28 Jun 1981, 1 (AM W28412); Summercloud Bay, Jervis Bay, 35°10.4'S 150°41.2'E, 15.8 m, coll. P.A. Hutchings, 29 Nov 1971, 1 (AM W28435); Murrays Basin, Jervis Bay, 35°07.5'S 150°45.5'E, sand, *Zostera* sp., coll. NSW State Fisheries, 17 Oct 1972, 1 (AM W194168).

**Description**. Body long (>10 mm in length) and broad, fragile, strongly convex dorsally, dark, 1–3 transverse dark bands on dorsum of anterior segments, as well as two black

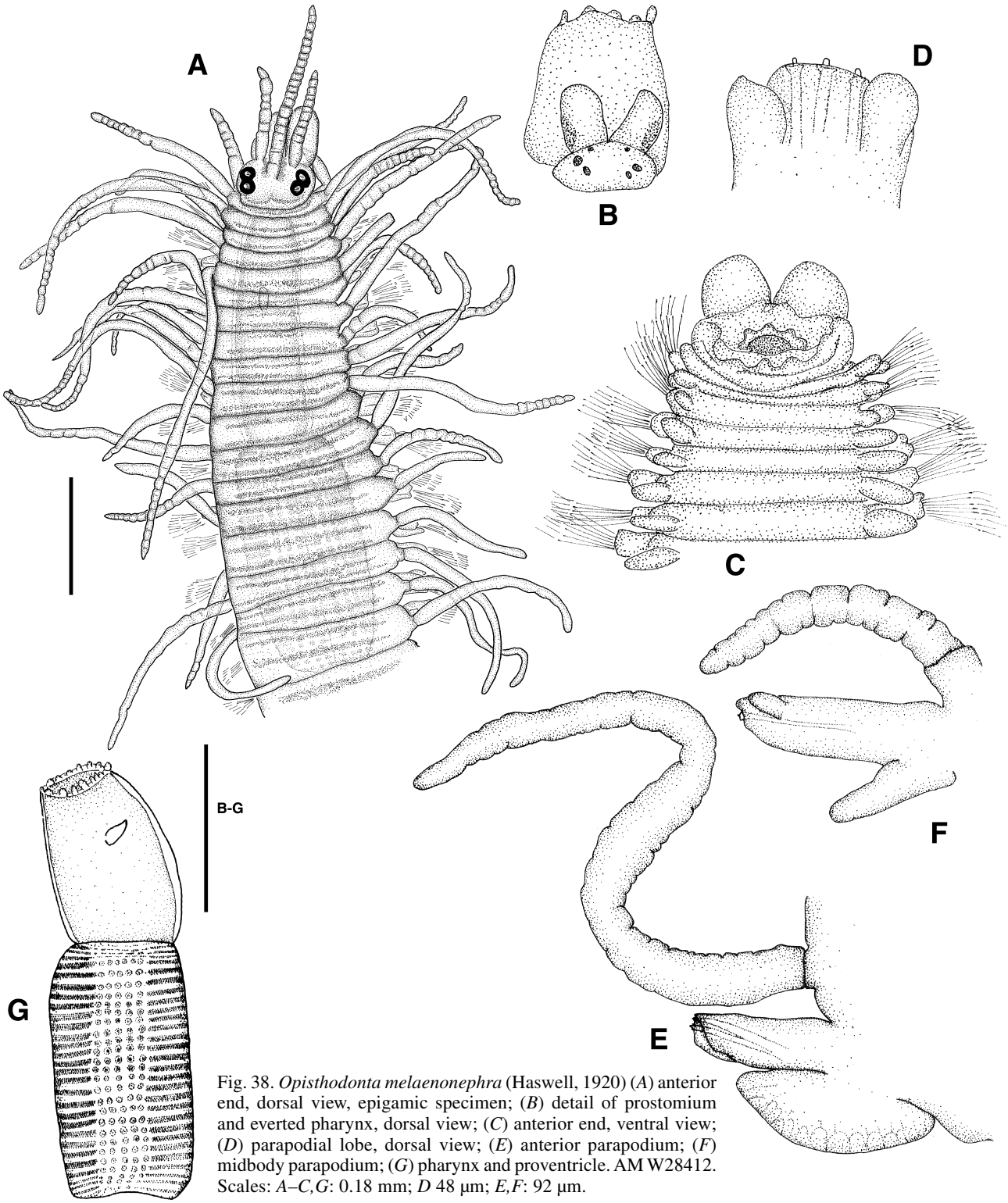



Fig. 38. *Opisthodonta melaenonephra* (Haswell, 1920) (*A*) anterior end, dorsal view, epigamic specimen; (*B*) detail of prostomium and everted pharynx, dorsal view; (*C*) anterior end, ventral view; (*D*) parapodial lobe, dorsal view; (*E*) anterior parapodium; (*F*) midbody parapodium; (*G*) pharynx and proventricle. AM W28412. Scales: *A–C,G*: 0.18 mm; *D* 48 µm; *E,F*: 92 µm.

spots on each palp, with dark pigment on prostomium; one epigamic specimen (AM W28412) with this pattern well developed (Fig. 38A), but others less pigmented. (Haswell recorded an individual 14 mm long, 1 mm wide for 65–75 segments). Prostomium ovate with 4 eyes arranged in open trapezoidal pattern and, sometimes 2 small anterior eyespots. Median antenna long, inserted on middle of prostomium, between anterior eyes, slightly longer than twice combined length of prostomium and palps; lateral antennae shorter, about half of median antenna, arising in front of anterior pair of eyes (Fig. 38A). Palps apparently basally free, ovate (Fig. 38B), sometimes ventrally folded. Dorsal tentacular cirri similar in length to median antenna, ventral tentacular cirri similar to lateral antennae. Antennae, tentacular cirri and dorsal cirri long, slender, cylindrical, smooth on midbody and posterior segments, to rugose, not articulated, supported by short cirrophores or indistinctly articulated on antennae, dorsal tentacular cirri and most anterior dorsal cirri (Fig. 38A,E). Dorsal cirri alternating, twice as long as body width on most anterior segments, and short, similar

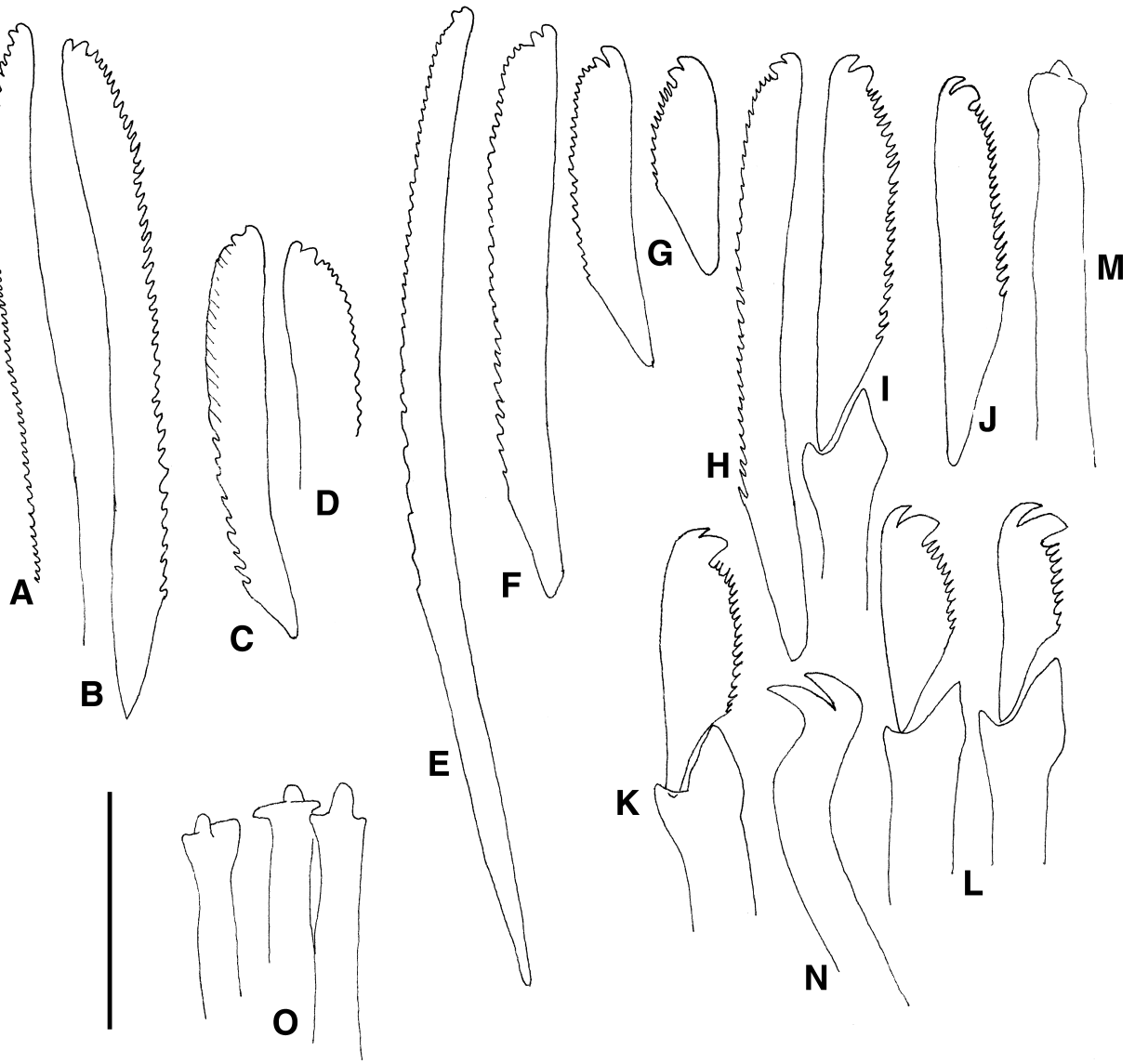



Fig. 39. *Opisthodonta melaenonephra* (Haswell, 1920) (*A*) distal end of spiniger-like chaeta, anterior parapodium; (*B*) blade of spiniger-like chaeta, anterior parapodium; (*C,D*) blades of falcigers, anterior parapodium; (*E*) spiniger-like chaeta, midbody; (*F,G*) blades of falcigers, midbody; (*H*) spiniger-like blade, posterior parapodium; (*I–L*) blades and falcigers, posterior parapodium; (*M*) acicula, posterior parapodium; (*N*) ventral simple chaeta; (*O*) aciculae, anterior parapodium. AM W494. Scales: 20 µm.

in length to body width. Parapodia slender, elongate, subrectangular, with 2 rounded lobes on anterodorsal and posterodorsal margins of parapodia (Fig. 38D). Ventral cirri of anterior parapodia foliaceous, thick, partially fused to base of parapodial lobe, with hyaline inclusions near ventral surface (Fig. 38E), becoming progressively shorter, not fused to parapodial lobe, digitiform (Fig. 38F). Anterior parapodia, except those of 2–3 most anterior segments, with 2–3 compound chaetae with long, slender, spiniger-like blades, about 125 µm long, indistinctly bifid distally (Fig. 39A,B), with proximal tooth slightly larger than distal tooth and short, indistinct spines on margin, and about 15 compound falcigerous chaetae, with elongate, bidentate blades provided with short and slightly hooked distal tooth (Fig. 39C,D), larger and triangular proximal tooth, and short, straight spines on margin; dorsoventral gradation in length of blades within fascicle, 65 µm in length dorsally, 25 µm in length ventrally, ventral blades larger with marked difference in size of teeth (Fig. 39E–G); blades with margins weakly convex, becoming more marked ventrally within fascicle. Posteriorly, blades of spiniger-like chaetae becoming progressively shorter, and falcigers with wider blades; posterior parapodia with single compound chaetae with elongate, spiniger-like blade (Fig. 39H), about 60 µm in length, and 3–4 chaetae with falcigerous blades with dorsoventral gradation in length within fascicle, 50 µm in length dorsally, 25 µm in length ventrally; spiniger-like blade with margins weakly convex and distally bidentate, with both teeth almost equal (Fig. 39I–L). Dorsal simple chaetae not seen, probably absent. Ventral simple chaetae only seen on far posterior parapodia of holotype, sigmoid, stout, strongly bidentate, bearing proximal tooth longer than distal tooth (Fig. 39N). Anterior parapodia with 3 tricuspidate tipped aciculae (Fig. 39 O) remaining parapodia, except posteriormost ones, with 2 similar aciculae. Posteriormost parapodia, each with single acicula, tip distally rounded, with button (Fig. 39M). Pharynx short and wide, extending through about 7–8 segments, with crown of about 16 soft papillae; pharyngeal tooth conical, large, located just in front of middle of pharynx (Fig.

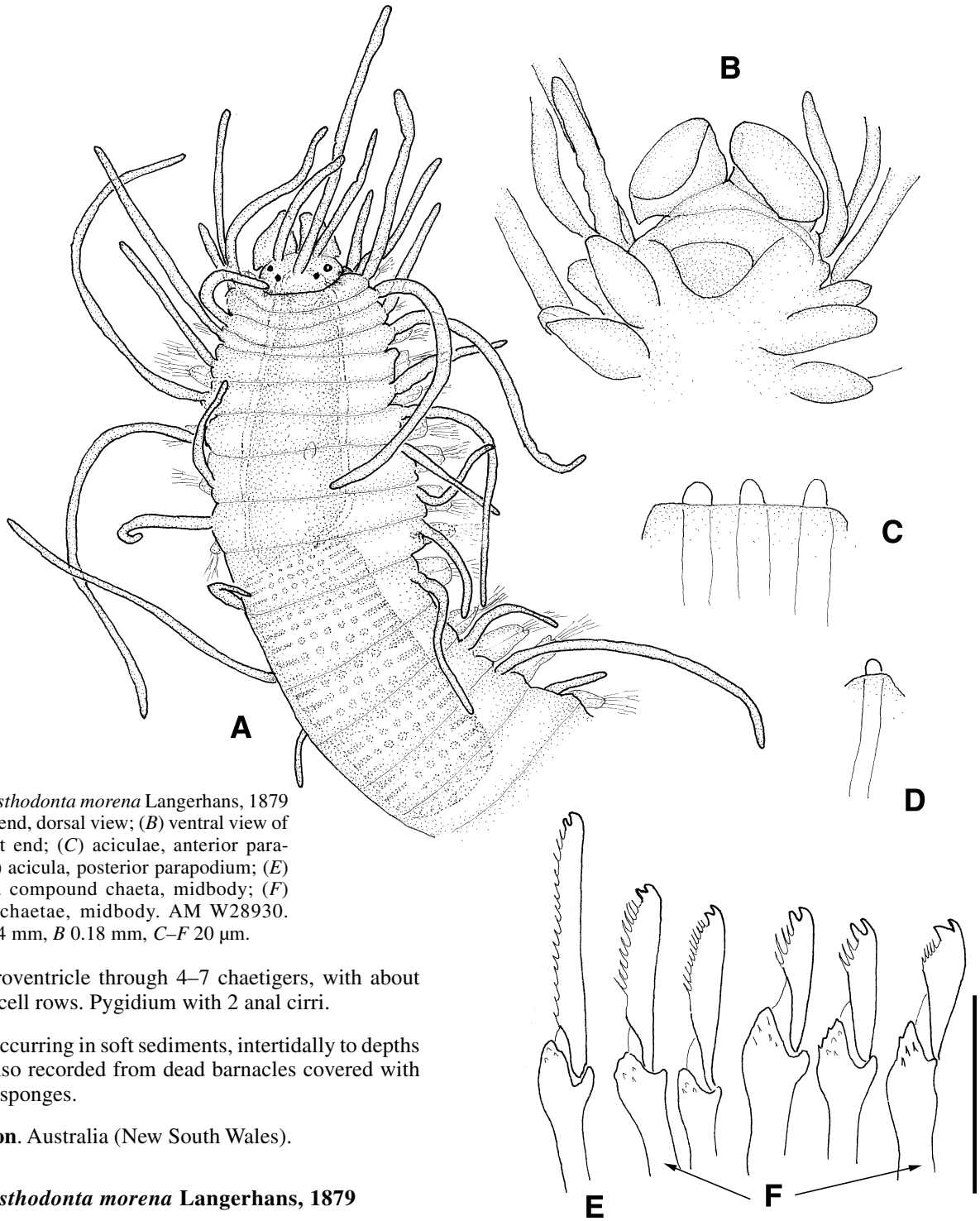



Fig. 40. *Opisthodonta morena* Langerhans, 1879 (*A*) anterior end, dorsal view; (*B*) ventral view of anteriormost end; (*C*) aciculae, anterior parapodium; (*D*) acicula, posterior parapodium; (*E*) long-bladed compound chaeta, midbody; (*F*) compound chaetae, midbody. AM W28930. Scales: *A* 0.4 mm, *B* 0.18 mm, *C–F* 20 µm.

38A,G). Proventricle through 4–7 chaetigers, with about 23 muscle cell rows. Pygidium with 2 anal cirri.

**Habitat**. Occurring in soft sediments, intertidally to depths of 50 m; also recorded from dead barnacles covered with encrusting sponges.

**Distribution**. Australia (New South Wales).

### *Opisthodonta morena* Langerhans, 1879

Figs 40A–F, 41A–F, 42A,B

*Opisthodonta morena* Langerhans, 1879: 547, fig. 12.—Pérès, 1954: 107, figs 3–6.—Laubier, 1966: 249.—Storch, 1966: 173, pl.1, fig. 2.—Hartmann-Schröder, 1971: 100, Figs 1–3.—Campoy, 1982: 307.—San Martín, 2003: 54, figs 15, 16.

**Material examined**. TASMAN SEA: Reef flat near *Yoshin Maru Iwaki* wreck, Elizabeth Reef, 29°55.8'S 159°01.3'E, reef flat at low tide, 14 Dec 1987, 1 on SEM stub (AM W28874); Taupo Seamount, 33°16.85'S 156°09.15'E, limestone & sand bottom, 244 m, coll. J.K. Lowry & party, 2 May 1989, 2 on SEM stub (AM W28875); Taupo Seamount, 33°16.85'S 156°09.15'E, limestone & sand bottom, 244 m, coll. J.K. Lowry & party, 2 May 1989, 2 (AM W28930). WESTERN AUSTRALIA: Goss Passage, Beacon Is., 28°25.5'S 113°47'E, dead *Acropora* plates covered in algae, sponges & ascidians, 23 m, coll. P.A. Hutchings, 19 May 1994, 1 (AM W28384); N end of Long Is., 28°27.9'S 113°46.3'E, dead coral substrate covered in coralline & brown algae, 5.5 m, coll. C. Bryce, 22 May 1994, 1 (AM W28954). N end of Long Is., 28°28.3'S 113°46.3'E, dead coral substrate, coralline algae, boring bivalves, 8 m, coll. C. Bryce, 22 May 1994, 1 (AM W28955); Goss Passage, Beacon Is., 28°25.5'S 113°47'E, dead plates of *Acropora* coral covered in coralline algae, 8 m, coll. P.A. Hutchings, 22 May 1994, 1 (AM W28956); Goss Passage, Beacon Is., 28°25.5'S 113°47'E, dead plates of *Acropora* coral, 8 m, coll. P.A. Hutchings, 19 May 1994, 1 (AM W28957); Off jetty adjacent to Fisheries Hut, Beacon Is., 28°25.5'S 113°47'E, dead coral substrate, plate-like *Acropora* & *Montipora* spp., 12 m, coll. P.A. Hutchings, 23 May 1994, 1 (AM W28958); Reef S of Lucas Is., Brunswick Bay, Kimberley region, 15°16'S 124°29'E, 2 m, coll. P.A. Hutchings, 24 July 1988, several (AM W28931).

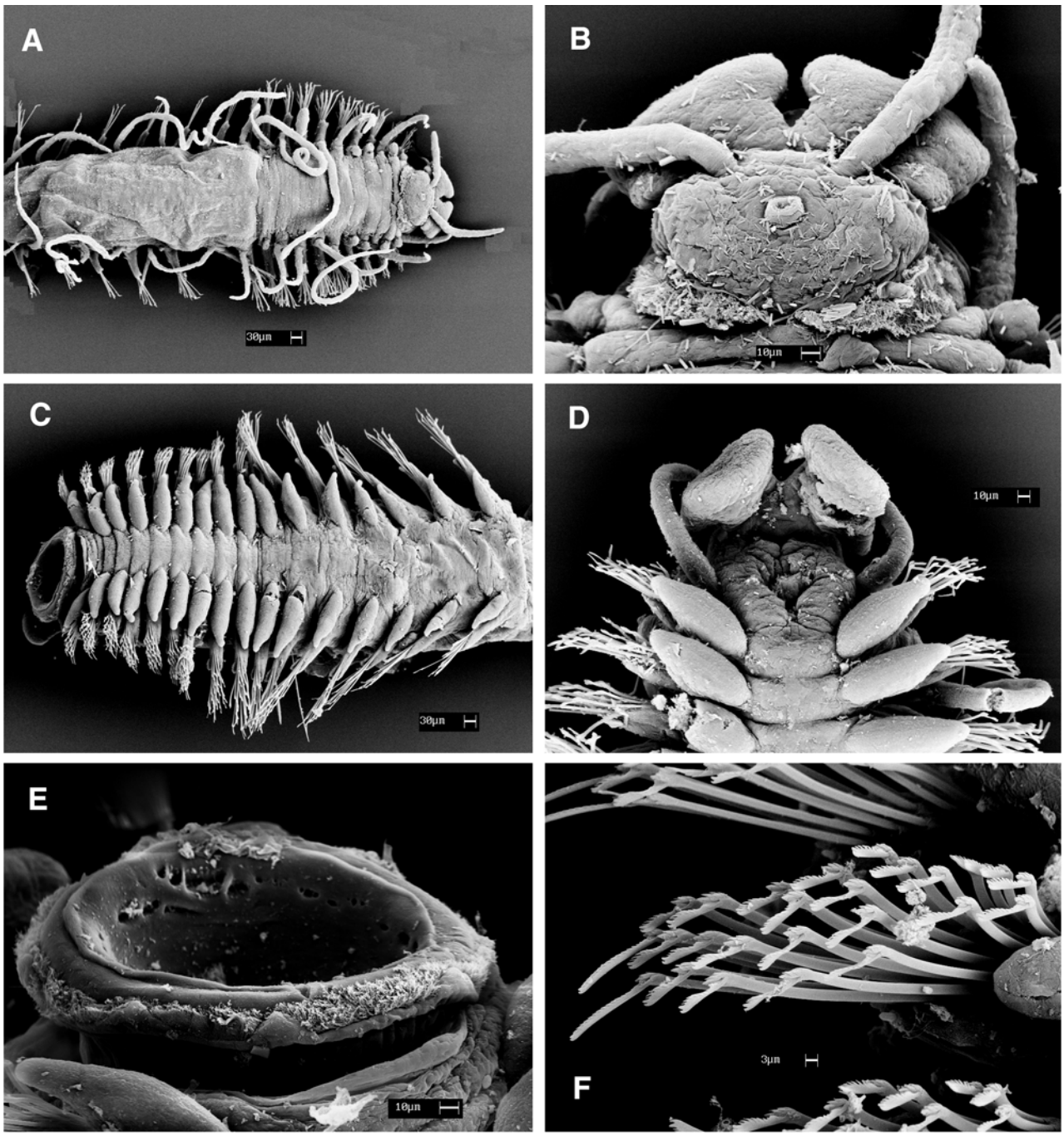



Fig. 41. SEM of *Opisthodonta morena* Langerhans, 1879 (*A*) anterior end, dorsal view; (*B*) detail of prostomium (median antenna missing); (*C*) anterior end, ventral view; (*D*) detail of anteriormost end, ventral view; (*E*) pharyngeal opening; (*F*) compound chaetae, anterior parapodium. AM W28874, AM W28875.

**Description**. Body fragile from proventricular segments, only anterior fragments examined, longest fragment 3.7 mm long, 0.4 mm wide, with 26 chaetigers. Prostomium oval to pentagonal (Figs 40A, 41B), with 2 pairs of eyes in trapezoidal arrangement and 2 anterior eyespots; median antenna inserted on middle of prostomium, more than three times combined length of prostomium and palps; lateral antennae about half length of median antenna, inserted near anterior margin of prostomium. Palps broad, large, trapezoidal, thin, usually ventrally folded (Figs 40B, 41D); apparently free from each other (Fig. 40A), but fused basally (Fig. 41B). Peristomium dorsally reduced, covered by chaetiger 1; dorsal tentacular cirri similar to median antenna, but shorter, ventral tentacular cirri about two thirds length of dorsal ones. Posterior margin of prostomium and nuchal organs densely ciliated (Figs 40A, 41B) dorsal cirri similar to antennae, smooth, filiform, long and slender, long on anterior segments, (Figs 40B, 41A), alternating long cirri, twice body width, and short cirri, shorter than body width, from proventricular segments onwards. Parapodial lobes conical, distally bifid (Fig. 40B). Ventral cirri large, ovate, partially fused to parapodial lobes on anterior segments (Figs 40C, 41D), conical, shorter and not fused from proventricular segments onwards (Fig. 41C). Compound chaetae numerous, 17–23 anteriorly, decreasing to about 7 on midbody, heterogomph, shafts subdistally spinose, similar throughout; on midbody, 2–3 compound chaetae with slender, elongate, bidentate blades (Figs 40E, 41F,

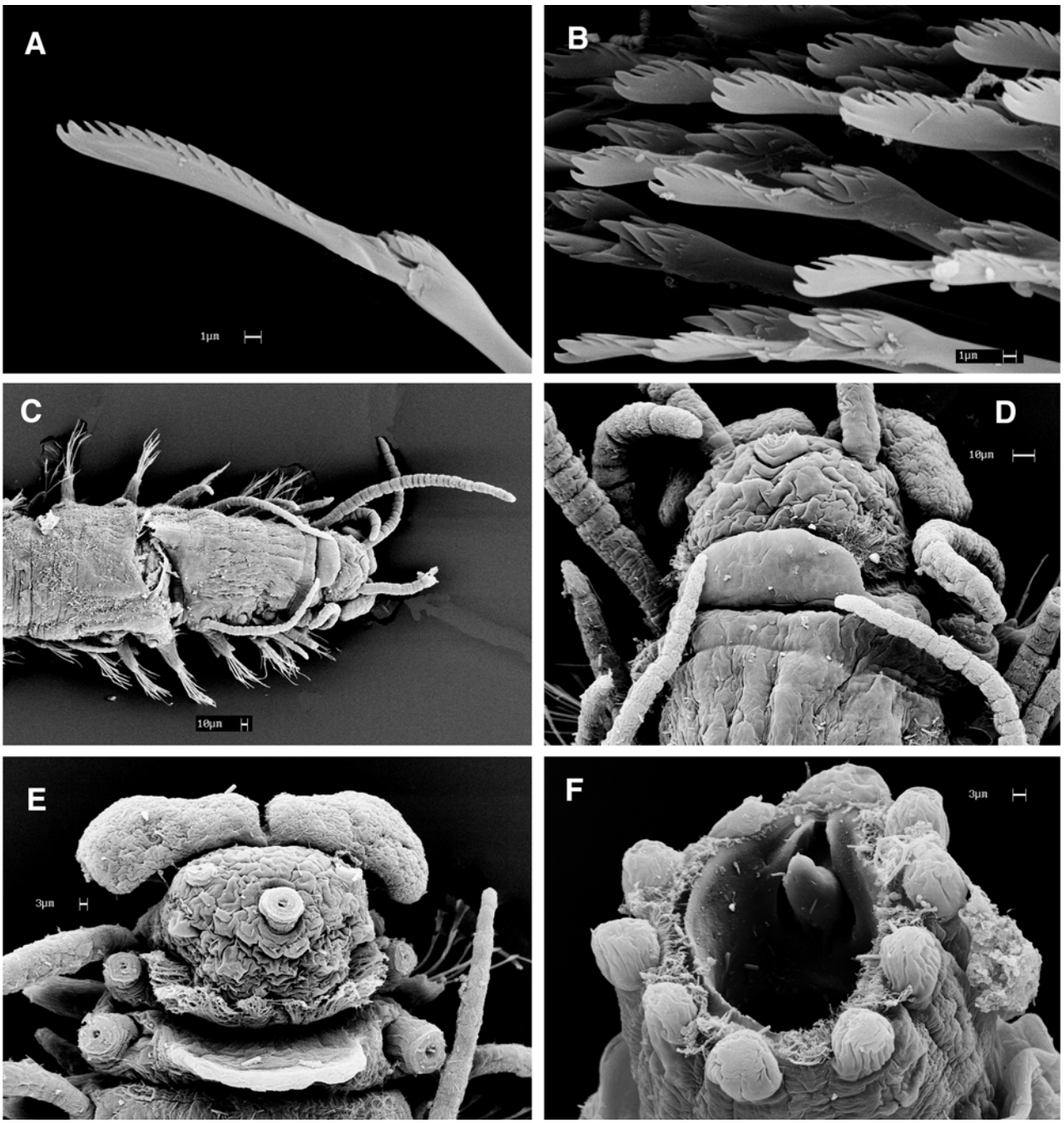



Fig. 42. SEM of *Opisthodonta morena* Langerhans, 1879 (*A*) long-bladed compound chaeta; (*B*) compound chaetae. SEM of *Pionosyllis yolandae* n.sp. (*C*) anterior end, dorsal view; (*D,E*) detail of prostomium and anteriormost segments; (*F*) pharyngeal opening. *A,B*: AM W28874, AM W28875; *C–F*: AM W28876.

42A), about 25–26 µm in length, short spines on margin, 2 compound chaetae with similar blades but shorter, 15–16 µm in length, marginal spines, distally directed, and remaining compound chaetae with short, bidentate blades, proximal tooth longer than distal tooth, and few spines on margin (Figs 40F, 41F, 42B), moderate in length, distally directed, dorsoventral gradation in length within fascicle, 13 µm in length dorsally, 8 µm in length ventrally. Dorsal and ventral simple chaetae absent. Anterior parapodia with 3 aciculae, straight, distally broad (Fig. 40C), diminishing to single acicula posteriorly (Fig. 40D). Pharynx long and wide, through 9–11 segments, pharyngeal tooth inserted posteriorly (Fig. 40A), on about chaetigers 7–8; pharyngeal opening with some soft papillae and dense layer of cilia (Fig. 42E). Proventricle through 6 segments, with about 24 muscle cell rows.

**Remarks**. This species has been reported widely from tropical and subtropical regions; we have examined material from the Mediterranean, and the European Atlantic coast and they appear morphologically similar. A molecular study would be useful to confirm whether this is a widely distributed species or a suite of sibling species.

**Habitat**. Occurring interstitially in coarse and coral sand, seagrasses, mud, from intertidal to depths greater than 240 m.

**Distribution**. Western Atlantic, Mediterranean, Red Sea, Australia (New South Wales, Western Australia).

## Genus *Paraehlersia* San Martín, 2003

*Paraehlersia* San Martín, 2003: 61.

**Type species**. *Ehlersia ferrugina* Langerhans, 1881, designated by San Martín, 2003.

**Diagnosis**. Body long, stout, with numerous segments, adults 5 mm or greater in length, dorsally convex. Prostomium with 4 eyes and pair of anterior eyespots. Three antennae. Median antenna inserted on middle of prostomium. Palps basally fused, with dorsal furrow. Two pairs of tentacular cirri. Nuchal organs as 2 ciliated grooves between prostomium and peristomium. Antennae, tentacular cirri and anterior dorsal cirri of adults articulated to irregularly articulated depending upon size, remaining dorsal cirri smooth. Dorsal ciliary bands on segments. Parapodia without prechaetal lobes; digitiform, retractile papilla between parapodial lobes and dorsal cirri of some parapodia. Compound chaetae heterogomph, including one or more chaetae with spiniger-like blades and several bidentate falcigerous blades, anteriorly with both teeth similar, posteriorly with proximal tooth longer and more robust than distal tooth. Aciculae acuminate. Pharynx and proventricle of similar size. Pharyngeal tooth anteriorly located. Reproduction by epigamy (San Martín, 2003).

### Key to Australian species of *Paraehlersia*

1 Falcigers and ventral simple chaetae provided with distal long spines on margin, reaching or extending beyond level of proximal tooth ..... *P. weissmannioides*

—— Chaetae with short spines on margin (Fig. 44D) ..... *P. ehlersiaeformis*

## *Paraehlersia ehlersiaeformis* (Augener, 1913) n.comb.

Figs 43D–F, 44A–K, 45A–F, 46A–C

*Pionosyllis ehlersiaeformis* Augener, 1913: 225, figs 31, 32.

*Syllis (Ehlersia) ferrugina*.—Haswell, 1920: 101, pl. 12, figs 3–10. Not Langerhans, 1881: 104.

*Typosyllis (Langerhansia) ferrugina*.—Hartmann-Schröder, 1981: 30; 1987: 37; 1989: 23; 1991: 33. Not Langerhans, 1881: 104.

**Material examined**. AUSTRALIA: NEW SOUTH WALES: Taupo Seamount, Tasman Sea, 33°16.85'S 156°09.15'E, limestone & sand bottom, 244 m, coll. J.K. Lowry & party on RV *Franklin*, 2 May 1989, 1 on SEM stub (AM W28899); Taupo Seamount, Tasman Sea, 33°16.85'S 156°09.15'E, limestone & sand bottom, 244 m, coll. J.K. Lowry & party on RV *Franklin*, 2 May 1989, 22 (AM W28939); Pittwater, 33°35.78'S 151°18.33'E, sand, 13.8 m, coll. Australian Museum Party, 22 Apr 1994, 2 (AM W23925); Pittwater, 33°35.77'S 151°18.34'E, muddy sand, 14.9 m, coll. Australian Museum Party, 9 Oct 1995, 1 on SEM stub (AM W23926); Bass Point, 34°36'S 150°54'E, 50 m, The Ecology Lab for RMI/Pioneer Project, 1 Feb 1990, 1 (AM W23063); Halfway Reef, 200 m S of Sullivan Reef, Ulladulla, 35°21.42'S 150°29.31'E, airlift over sponges, Bryozoa & Hydrozoa, 15 m, coll. K. Attwood & party, 3 May 1997, 1 on SEM stub (AM W28221); N side of Bannister Head, north of Ulladulla, 35°19.15'S 150°29.12'E, grey sponge from top of boulder, 18 m, coll. K. Attwood, 6 May 1997, few (AM W28223); Murray's Beach, Jervis Bay, 35°07.5'S 150°46'E, 10 m, coll. P.A. Hutchings, 23 Jan 1973, 2 (AM W28413); 350 m S of southern entrance to Jervis Bay, 35°7.7'S 150°46.05'E, 23 m, coll. P.A. Hutchings, 22 July 1972, 1 (AM W28436); S of Worang Point, Calle Calle Bay, Twofold Bay, 37°3.6'S 149°56.5'E, 6.1 m, coll. S. Keable, P. Albertson, 21 Feb 1985, 1 (AM W28440). SOUTH AUSTRALIA: 7 km NW of Port Davis Creek, Port Pirie, Spencer Gulf, 33°16'S 137°51'E, subtidal, unvegetated, 9.3 m, coll. T.J. Ward & party, Mar 1980, 1 (AM W21772); Boston Bay, Port Lincoln 34°51'S 135°51'E, washings from sheltered weedy rock, 2 m, coll. I. Loch, 12 Feb 1985, 1 (AM W28937); Billy Lights Point, Port Lincoln, 34°45'S 135°53'E, stone washings from sheltered intertidal rocks, coll. I. Loch, 15 Feb 1985, 1 (AM W28938). WESTERN AUSTRALIA: Goss Passage, Beacon Is., 28°25.5'S 113°47'E, dead plates of *Acropora* coral, 8 m, coll. P.A. Hutchings, 19 May 1994, several (1 epigamic on SEM stub) (AM W28373); Goss Passage, Beacon Is., 28°25.5'S 113°47'E, dead plates of *Acropora* coral covered in coralline algae, 8 m, coll. P.A. Hutchings, 22 May 1994, several (AM W28375); NE entrance to Goss Passage, Beacon Is., 28°27.9'S 113°46.7'E, dead branching *Acropora*, coralline & brown algae, 24 m, coll. P.A. Hutchings, 25 May 1994, 4 (AM W28377); Off S end of Long Is., Beacon Is., 28°28.8'S 113°46.3'E, dead coral substrate covered in coralline algae, 4.5 m, coll. P.A. Hutchings, 25 May 1994, 1 (AM W28379); Goss Passage, Beacon Is., 28°25.5'S 113°47'E, dead branching coral covered in coralline algae, 10 m, coll. P.A. Hutchings, 18 May 1994, 1 (AM W28382); Goss Passage, Beacon Is., 28°25.5'S 113°47'E, dead *Acropora* plates covered in algae, sponges & ascidians, 32 m, coll. P.A. Hutchings, 19 May 1994, 1 (AM W28383); Goss Passage, Beacon Is., 28°25.5'S 113°47'E, dead *Acropora* plates covered in coralline algae, 20 m, coll. P.A. Hutchings, 20 May 1994, 1 (AM W28385); E side of West Wallabi Is., 28°27.9'S 113°40.9'E, in *Posidonia* root mat, plus epifauna, 1.5 m, coll. P.A. Hutchings, 26 May 1994, several (AM W28388); NE entrance to Goss Passage, Beacon Is., 28°27.9'S 113°46.7'E, under boulders in coral sand at foot of reef slope, 33 m, coll. P.A. Hutchings, 25 May 1994, 2 (AM W28389); Wallabi Group of Is., 28°34.65'S 113°46.46'E, diverse sponges & rubble, 49 m, coll. P.A. Hutchings on WA FRV *Flinders*, 28 Jun 1994, 1 (AM W28391); Wallabi Group of Is., 28°23.61'S 113°45.09'E, sponge & shell debris from scallop beds, 35 m, coll. P.A. Hutchings on WA FRV *Flinders*, 30 May 1994, 1 (AM W28394); Off S end of Long Is., Beacon Is., 28°28.8'S 113°46.3'E, dead coral substrate covered in coralline algae, 4.5 m, coll. P.A. Hutchings, 25 May 1994, 2 (AM W28934); N end of Long Is., 28°28.3'S 113°46.3'E, dead coral substrate, coralline algae, boring bivalves, 8 m, coll. C. Bryce, 22 May 1994, few (AM W28972); N end of Long Is., 28°27.9'S 113°46.3'E, dead coral substrate covered in coralline & brown algae, 5.5 m, coll. C. Bryce, 22 May 1994, several (AM W28973); Wallabi Group of Is., 28°27.05'S 113°45.10'E, medium to fine sand & shell debris from scallop beds, 36.5 m, coll. P.A. Hutchings on WA FRV *Flinders*, 30 May 1994, 1 (AM W28935); 5 km offshore, Bush Bay, 30 km S of Carnarvon, 25°10'S 113°39'E, shallow strap-leaved seagrass beds, 2 m, coll. J.K. Lowry & R.T. Springthorpe, 6 Jan 1984, 1 (AM W28371); N end of beach, Bundegi Reef, Exmouth Gulf, 21°49'S 114°11'E, rocky rubble, coralline algae with green epiphyte, 1.5 m, coll. H.E. Stoddart, 4 Jan 1984, 1 (AM W28936); Reef S of Lucas Is., Brunswick Bay, Kimberley region, 15°16'S 124°29'E, 2 m, coll. P.A. Hutchings, 24 July 1988, 1 (AM W28940); north end of beach, Bundegi Reef, Exmouth Gulf, 21°49'S 114°11'E, rocky rubble, coralline algae with green epiphyte, 1.5 m, coll. H.E. Stoddart, 4 Jan 1984, several (AM W28974). Syntype: ZMH (P-8786), Sharks Bay, Western Australia.

**Description**. Body without colour markings, some specimens broad anteriorly (Fig. 43D), others slender, filiform, about 9 mm long, 0.4 mm wide, with 75 chaetigers. Prostomium oval to circular, 4 eyes arranged in open trapezoidal pattern. Median antenna long, slender, with numerous articulations, usually 2–3 times longer than combined length of prostomium and palps, inserted on middle of prostomium; lateral antennae similar to median one, but shorter, inserted in front of anterior eyes. Palps slightly longer than prostomium, triangular (Figs 43E, 44A). Peristomium distinct, similar in length to subsequent segments; tentacular cirri similar to antennae, dorsal tentacular cirri slightly longer than lateral antennae, ventral ones about two thirds length of dorsal ones. Anterior dorsal cirri irregularly articulated (Figs 43E, 44A), becoming

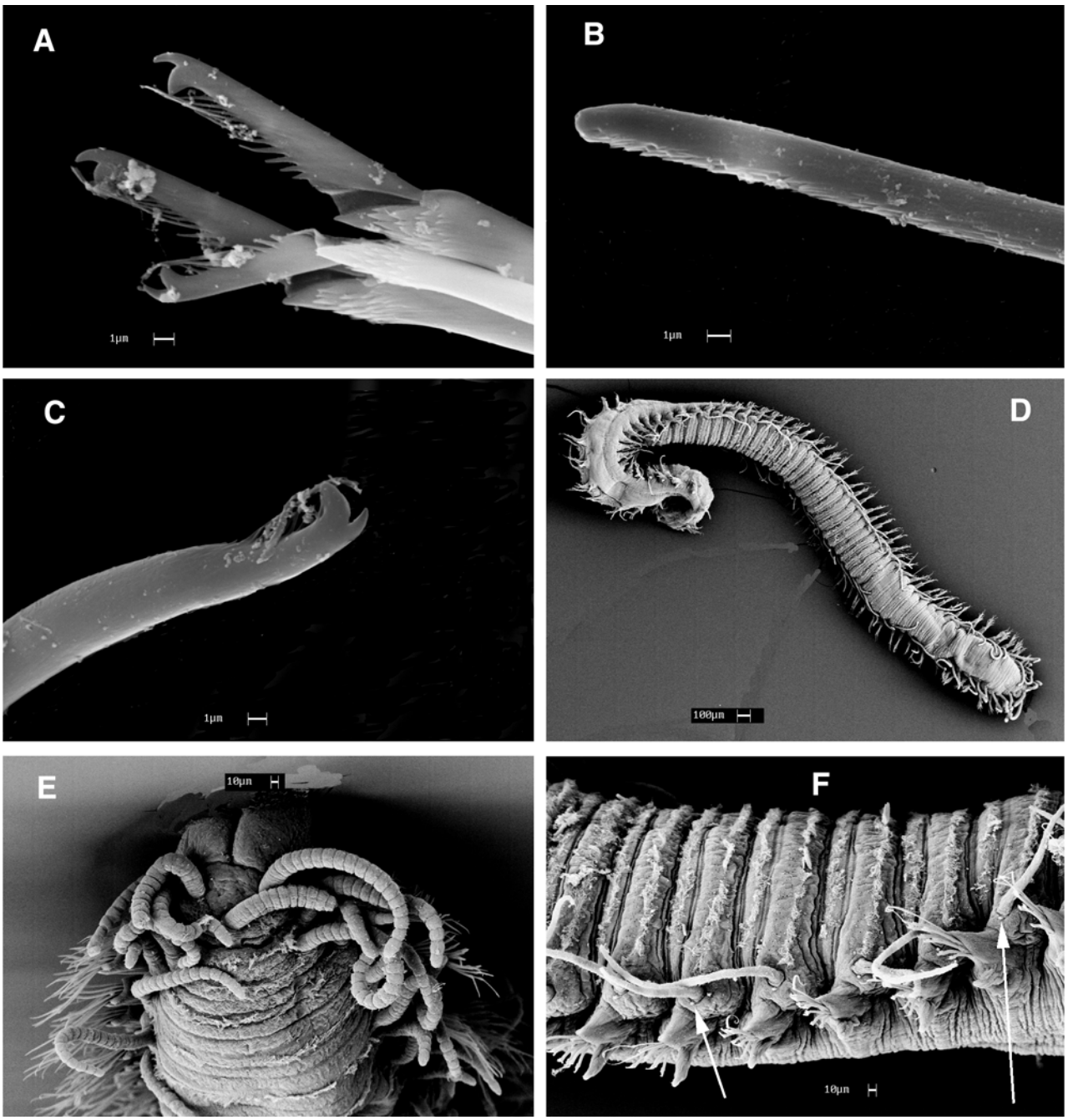



Fig. 43. SEM of *Paraehlersia weissmannioides* (Augener, 1913) (*A*) compound chaetae, posterior parapodium; (*B*) dorsal simple chaeta; (*C*) ventral simple chaeta. SEM of *Paraehlersia ehlersiaeformis* (Augener, 1913) (*D*) complete specimen, dorsal view; (*E*) anterior end, dorsal view; (*F*) lateral view, midbody (arrows showing subcirral papillae). *A–C*: AM W28224; *D–F*: AM W23926, W28221, W28899.

smooth, filiform (Figs 43F, 44A), from chaetiger 5–6, shorter than anterior ones, alternating irregularly long cirri, slightly longer than body width, and shorter ones about equal to body width. Dorsum of each segment with 2 rows of cilia (Figs 43F, 45B), except anteriormost, with only 1 row (Fig. 43E). Subcirral papilla small (Figs 43F, 44B, 45B arrows, 45C), difficult to see, present on anterior and midbody segments. Parapodial lobes sub-rectangular (Fig. 44B). Ventral cirri digitiform, similar in length to parapodial lobes. Anterior parapodia with up to 12 compound chaetae, 2–4 with elongated, slender, blades about 33 µm in length, bidentate with both teeth similar (Fig. 44C), and short spines on margin; remaining chaetae with shorter blades, bidentate, both teeth similar, and dorsoventral gradation in length within fascicle (Fig. 44D), 18 µm in length dorsally and 11 µm in length ventrally. Progressively along body, 1–2 blades of dorsalmost compound chaetae becoming more elongated, spiniger-like, indistinctly bidentate, with short spines on margin (Fig. 44F,I), 47 µm in length on midbody, 50 µm in length on posterior parapodia. Blades of falcigers with large proximal tooth and shorter distal tooth, short spines on margin (Figs 44G,J, 45D,F, 46A), 10–15 µm in length on midbody, 10–11 µm in length on posterior parapodia; about 6–7 falcigers on midbody parapodia and 4–5 posteriorly. Dorsal simple chaetae from mid-posterior segments, distally bifid, with short subdistal spines (Figs 44H, 46B). Ventral

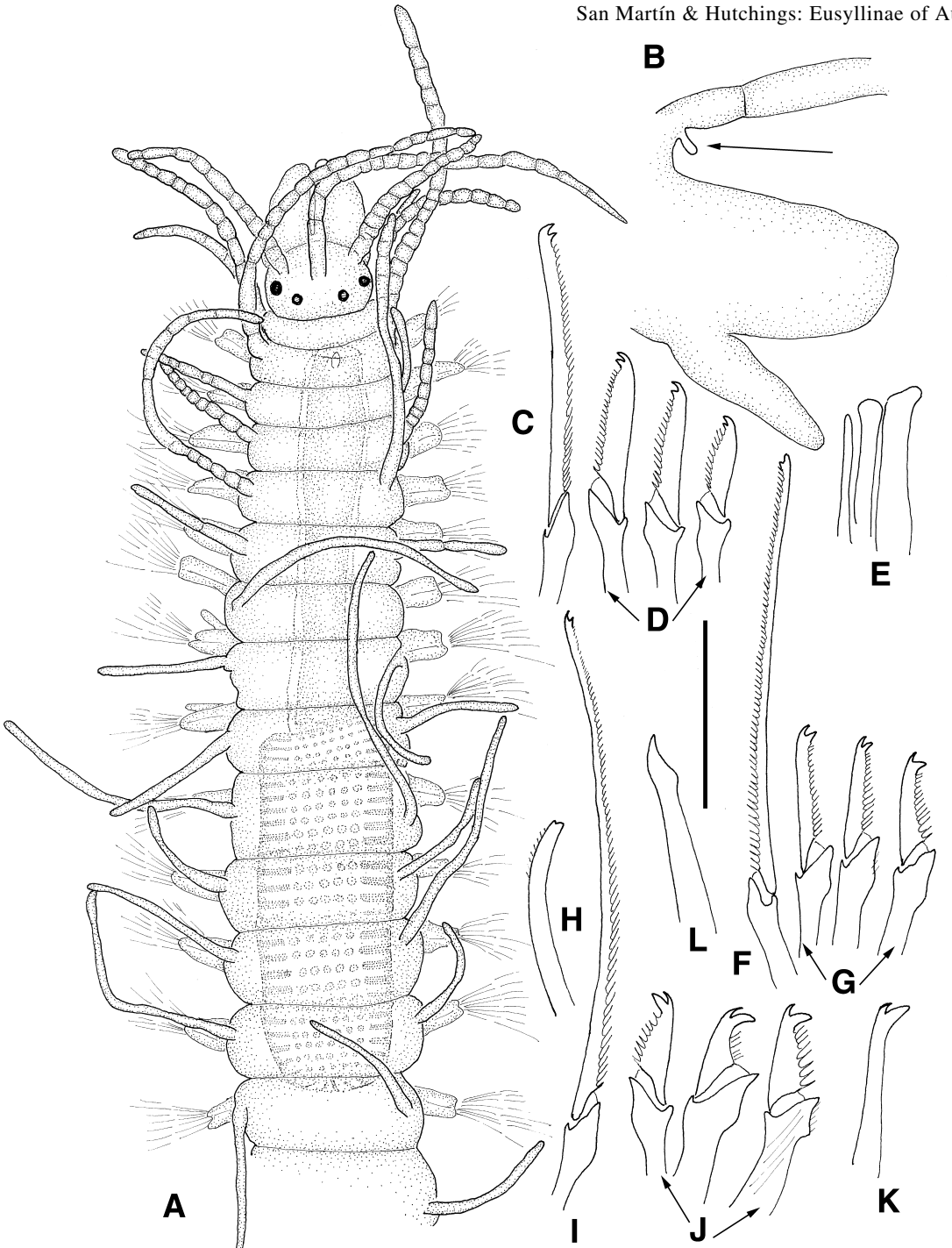



Fig. 44. *Paraehlersia ehlersiaeformis* (Augener, 1913) (*A*) anterior end, dorsal view; (*B*) anterior parapodium (arrow showing subcirral papilla); (*C*) spiniger-like chaeta, anterior parapodium; (*D*) falcigers, anterior parapodium; (*E*) aciculae, anterior parapodium; (*F*) spiniger-like compound chaeta, midbody; (*G*) falcigers, midbody; (*H*) dorsal simple chaeta; (*I*) spiniger-like compound chaeta, posterior parapodium; (*J*) falcigers, posterior parapodium; (*K*) ventral simple chaeta; (*L*) acicula, posterior parapodium. AM W28377. Scales: *A* 0.18 mm, *B* 48 µm, *C–L* 20 µm.

simple chaetae on posterior segments, smooth, strongly bidentate, proximal tooth long, robust, and distal tooth small (Figs 44K, 46C). Anterior parapodia with 3 aciculae (Fig. 63E), reducing to 1 from midbody, distally acuminate or lancet-shaped (Fig. 44L). Pharynx through 7 segments; pharyngeal tooth on anterior margin (Fig. 44A), surrounded by crown of 10 soft papillae and layer of cilia (Fig. 45A). Proventricle through 5 segments, with about 21 muscle cell rows. Pygidium with 2 long, filiform anal cirri and median papilla. Some specimens in epigamic reproductive phase, with long capillary chaetae on some parapodia (Fig. 45E).

**Remarks**. The specimens from Australia are similar to specimens of *P. ferrugina* Langerhans, 1879, which has been widely reported from Europe and northern Atlantic. Examination of one syntype of *P. ehlersiaeformis* (HZM P-8786) reveals that some blades of chaetae from posterior-most segments are slightly wider than those described from *P. ferrugina*. At this stage, we prefer to regard *P. ehlersiaeformis* and *P. ferrugina* as separate species. Augener (1913) reported *Syllis (Ehlersia) ferrugina* from Western Australia. This record, however, seems to be another species, probably belonging to the subfamily Syllinae.

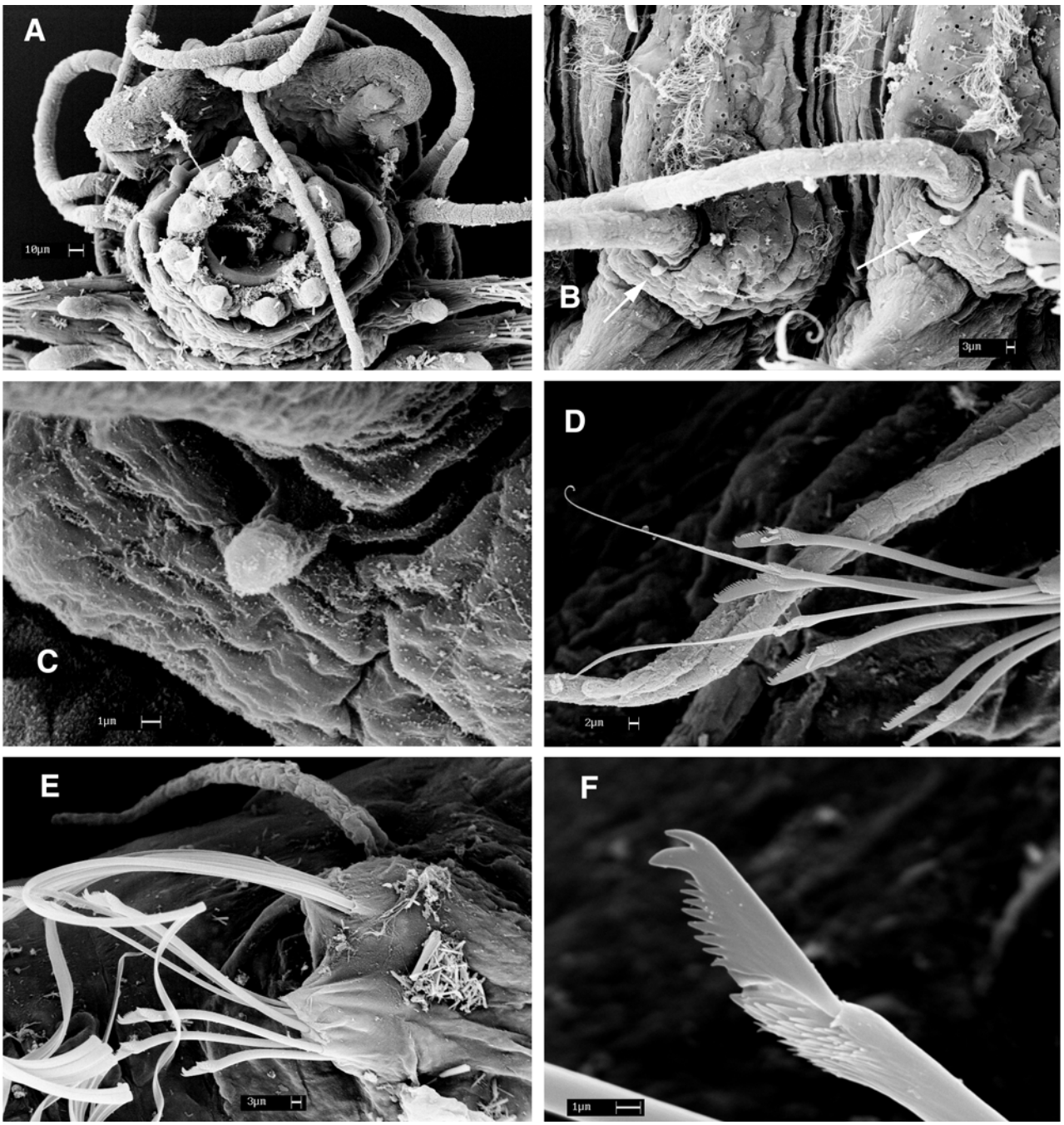



Fig. 45. SEM of *Paraehlersia ehlersiaeformis* (Augener, 1913) (*A*) everted pharynx; (*B*) subcirral papillae, showed by arrows; (*C*) detail of subcirral papilla; (*D*) compound chaetae, mid-anterior parapodium; (*E*) midbody parapodium of epigamic specimen, showing capillaries and notochaetae; (*F*) falciger, midbody. AM W23926, W28221, W28899.

**Habitat**. Reported from wide variety of substrates, especially abundant in algae and coralline concretions, from shallow waters to depths greater than 100 m.

**Distribution**. Australia (all States).

### *Paraehlersia weissmannioides* (Augener, 1913) n.comb.

Figs 43A–C, 47A–I, 48A–F, 49D–F

*Pionosyllis weissmannioides* Augener, 1913: 223, fig. 30.
?*Ehlersia ferrugina* non Langerhans, Böggemann & Westheide, 2004: 418, fig. 6.

**Material examined**. AUSTRALIA: NEW SOUTH WALES: S ledge, Cook Is., 28°11.65'S 153°34.63'E, sand & shelly grit, 15 m, coll. K. Attwood, 9 Jun 1993,1 on SEM stub (AM W28224); E of North Head, Port Jackson, 33°48.77'S 151°20.98'E, sandy substratum, 60 m, coll. Australian Museum party, 12 Apr 1989, 1 (AM W20442). WESTERN AUSTRALIA: holotype (ZMH V-7949), Shark Bay, Useless Inlet, 26°08'S 113°21'E, 7 m depth.

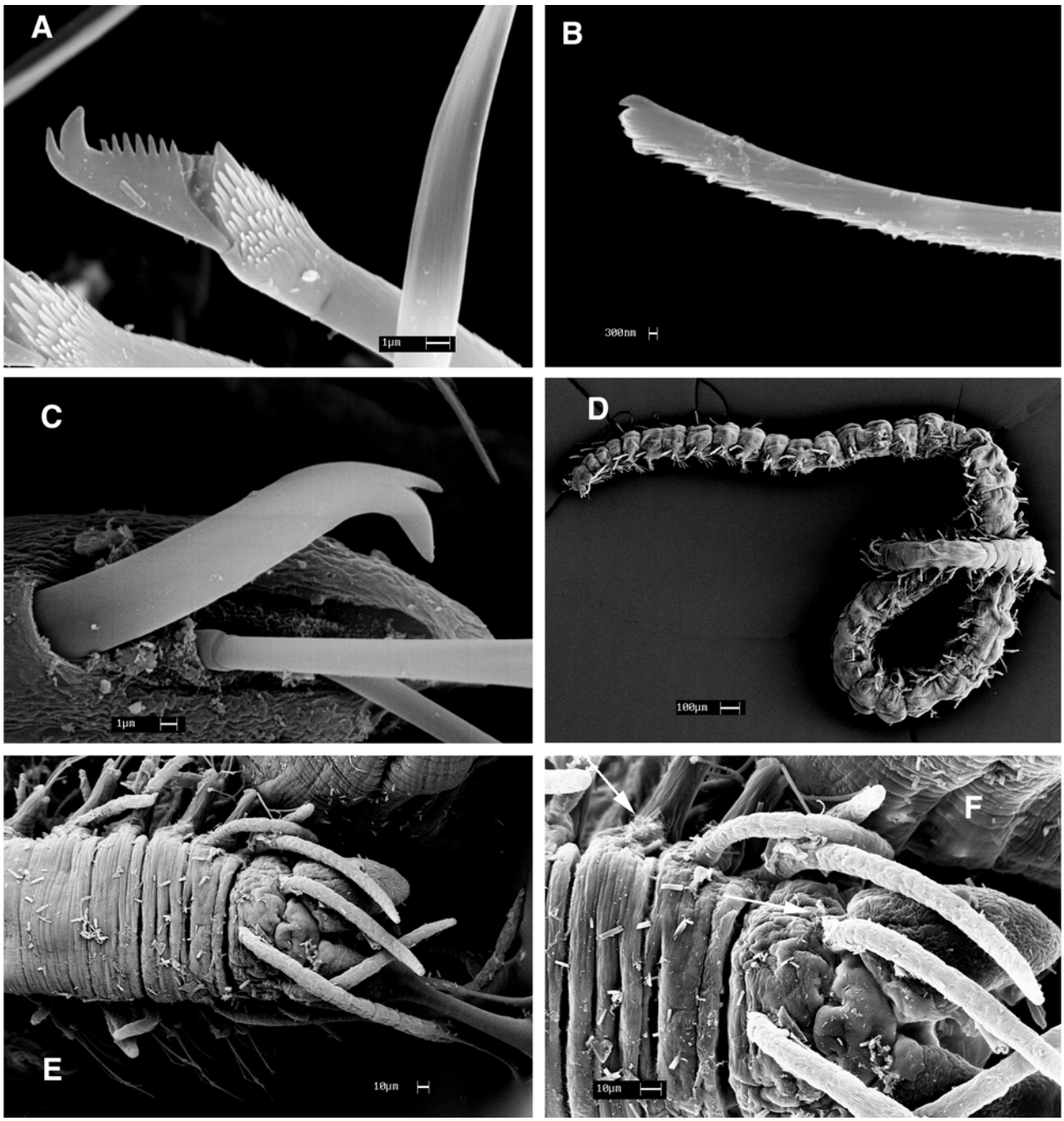



Fig. 46. SEM of *Paraehlersia ehlersiaeformis* (Augener, 1913) (*A*) falciger, posterior parapodium; (*B*) dorsal simple chaeta; (*C*) ventral simple chaeta. SEM of *Pionosyllis mariae* n.sp. (*D*) complete specimen; (*E*) anterior end, dorsal view; (*F*) detail of the same (arrows showing tufts of cilia). *A–C*: AM W23926, W28221, W28899; *D–F*: AM W28873.

**Description**. Body broad anteriorly (Fig. 49D), tapering posteriorly, yellowish, 7.2 mm long, 0.3 mm wide, with 61 chaetigers. Prostomium oval, nearly twice as wide as long; 4 eyes in open trapezoidal arrangement, and 2 anterior eyespots; median antenna longer than combined length of prostomium and palps, normally more than twice length, inserted near line between posterior eyes; lateral antennae about half of length of median antenna, inserted in front of anterior eyes (Fig. 49E), behind eyespots (Fig. 47A). Palps broad, slightly longer than prostomium, triangular. Peristomium distinct, similar in length to following segments; dorsal tentacular cirri longer than lateral antennae, shorter than median antenna; ventral tentacular cirri about two third length of dorsal tentacular cirri. Antennae, tentacular, and anterior dorsal cirri, elongated, articulated except basally (Figs 47A, 49E), with up to 20 articles; dorsal cirri becoming shorter and smoother; posterior to proventricle segments onwards, shorter than body width, totally smooth. Nuchal organs as 2 ciliated grooves between prostomium and peristomium (Fig. 49E,F). Dorsum of each segment provided with 2 ciliary bands and minute pores between bands (Fig. 47A,B). Subcirral papilla small, inconspicuous, but present on anterior and midbody segments (Figs 47B, 48B arrows, C). Parapodia conical, slightly elongate, distally bilobed (Fig. 49B). Ventral cirri digitiform, shorter than parapodial lobes. Most anterior

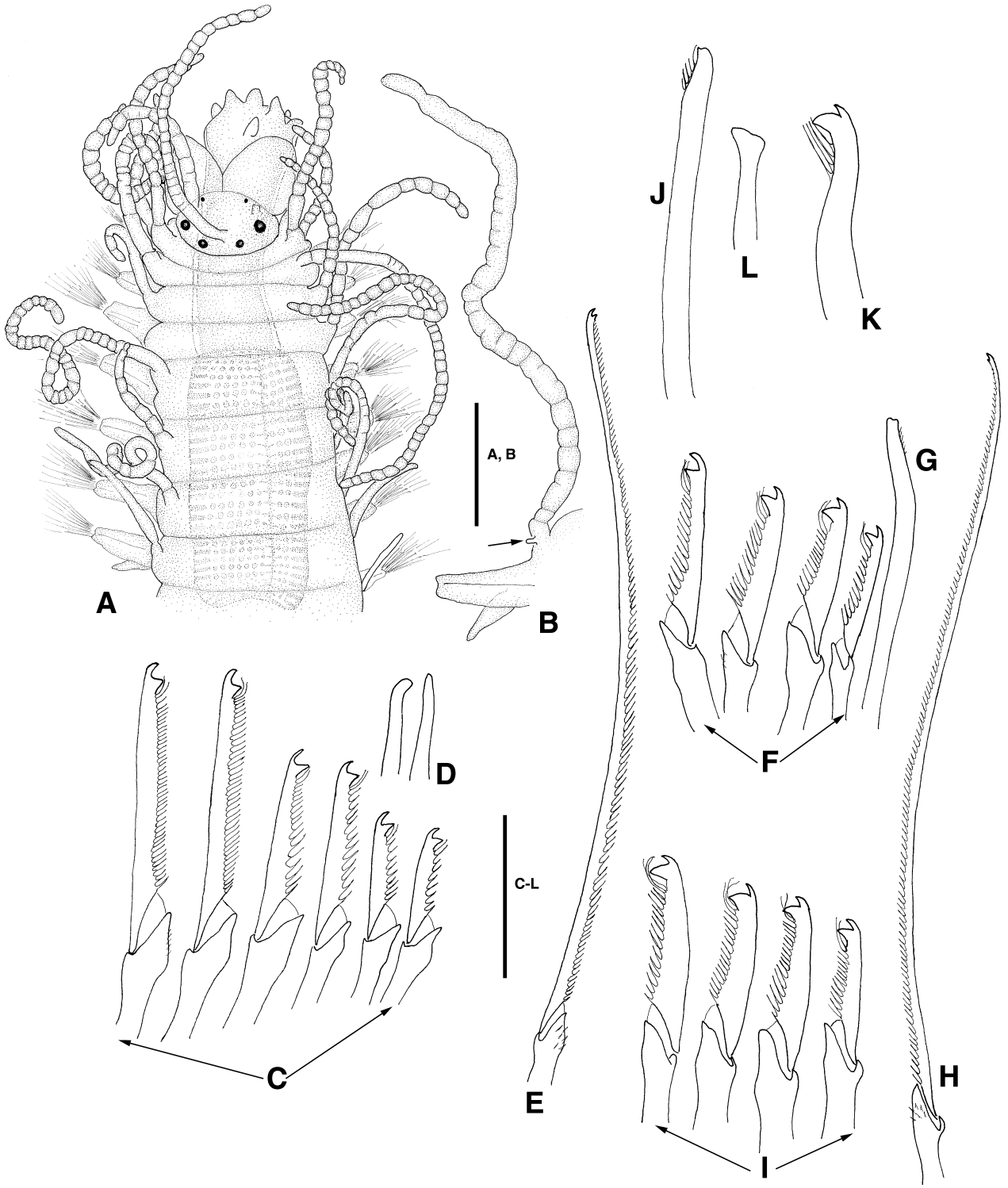



Fig. 47. *Paraehlersia weissmannioides* (Augener, 1913) (*A*) anterior end, dorsal view; (*B*) anterior parapodium, lateral view (arrow showing subcirral papilla); (*C*) compound chaetae, anterior parapodium; (*D*) aciculae, anterior parapodium; (*E*) spiniger-like compound chaeta, midbody; (*F*) falcigers, midbody; (*G*) dorsal simple chaeta, midbody; (*H*) spiniger-like compound chaeta, posterior parapodium; (*I*) falcigers, posterior parapodium; (*J*) dorsal simple chaeta, posterior parapodium; (*K*) ventral simple chaeta; (*L*) acicula, posterior parapodium. AM W20442. Scales: *A* 0.18 mm, *B* 97.5 µm, *C–L* 20 µm.

parapodia with about 15 compound chaetae, with strongly bidentate blades, both teeth well separated from each other, distal tooth slender, proximal robust, and long, fine spines on margin, 2–3 most distal ones longer than others, longer than proximal teeth (Figs 48C, 43D,E). Progressively posteriorly, most dorsal compound chaetae becoming longer and slender, spiniger-like, blades 95 µm in length on midbody, about 100 µm on posterior parapodia with fine, moderate spines on margin, spiniger like chaetae absent from last parapodia (Fig. 47E,H), indistinctly bidentate. Remaining compound chaetae similar to those of anterior segments (Figs 47F, 48F), progressively along body becoming larger, with stronger proximal tooth, slightly hooked (Figs 43A, 47I), reducing to 5. Dorsal simple chaetae

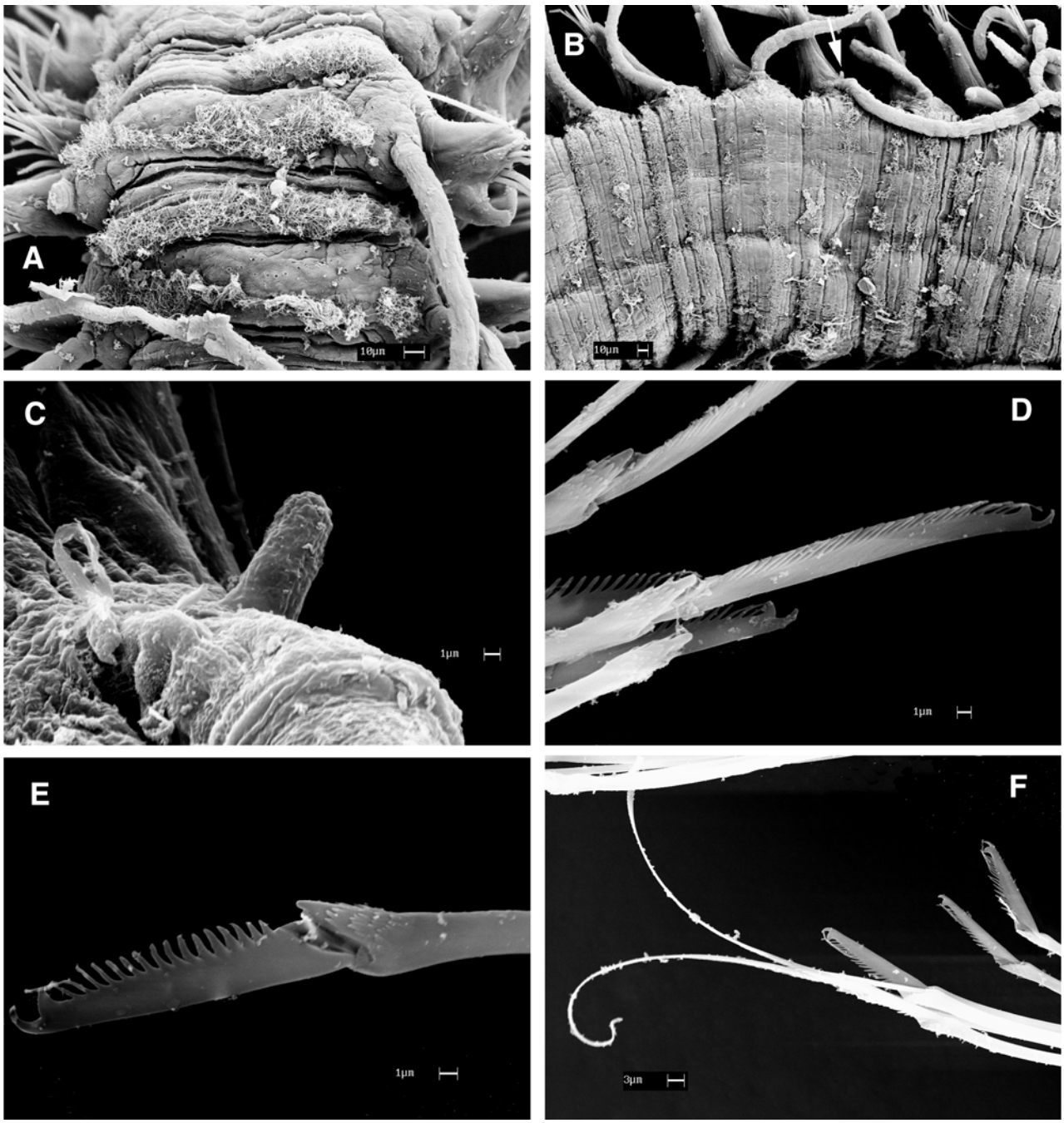



Fig. 48. SEM of *Paraehlersia weissmannioides* (Augener, 1913) (*A*) midbody segments, dorsal view; (*B*) same (arrow showing subcirral papilla); (*C*) subcirral papilla; (*D*) dorsal compound chaeta, anterior parapodium; (*E*) ventral compound chaeta, anterior parapodium; (*F*) compound chaetae, midbody. AM W28224.

from midbody, slender, distally slightly truncate and bifid, with short spines on margin (Figs 47G,J, 43B). Ventral simple chaetae on posterior parapodia, thick, strongly bidentate, with proximal tooth large, slightly hooked, and distal tooth much shorter than proximal one, with about 4 long spines on margin, reaching level of proximal tooth (Figs 47K, 43C). Anterior parapodia with 2–3 slender aciculae, one straight, others distally rounded (Fig. 47D); from proventricular segments onwards, acicula solitary, with oblique, short tip (Fig. 47L). Pygidium with 2 long anal cirri and median papilla. Pharynx everted on examined specimens, through about 7 segments; pharyngeal tooth anteriorly located, surrounded by crown of 10 soft papillae (Fig. 47A). Proventricle rectangular, through 4–5 segments, with about 22 muscle cell rows.

**Remarks**. The description of *Ehlersia ferrugina* by Böggemann & Westheide (2004) from specimens collected in coralline sand in Mahé (Seychelles) is similar to Australian specimens of *Paraehlersia weissmannioides* and they may represent the same species; but, the anterior compound chaetae seem to have both teeth less well separated, and the dorsal simple chaetae appear to be distally entire, not truncate and bifid, as occurs in the Australian material.

**Habitat**. Occurring in sand and shelly grit, in shallow depths, up to 15m.

**Distribution**. Australia (Western Australia, New South Wales); ?Seychelles.

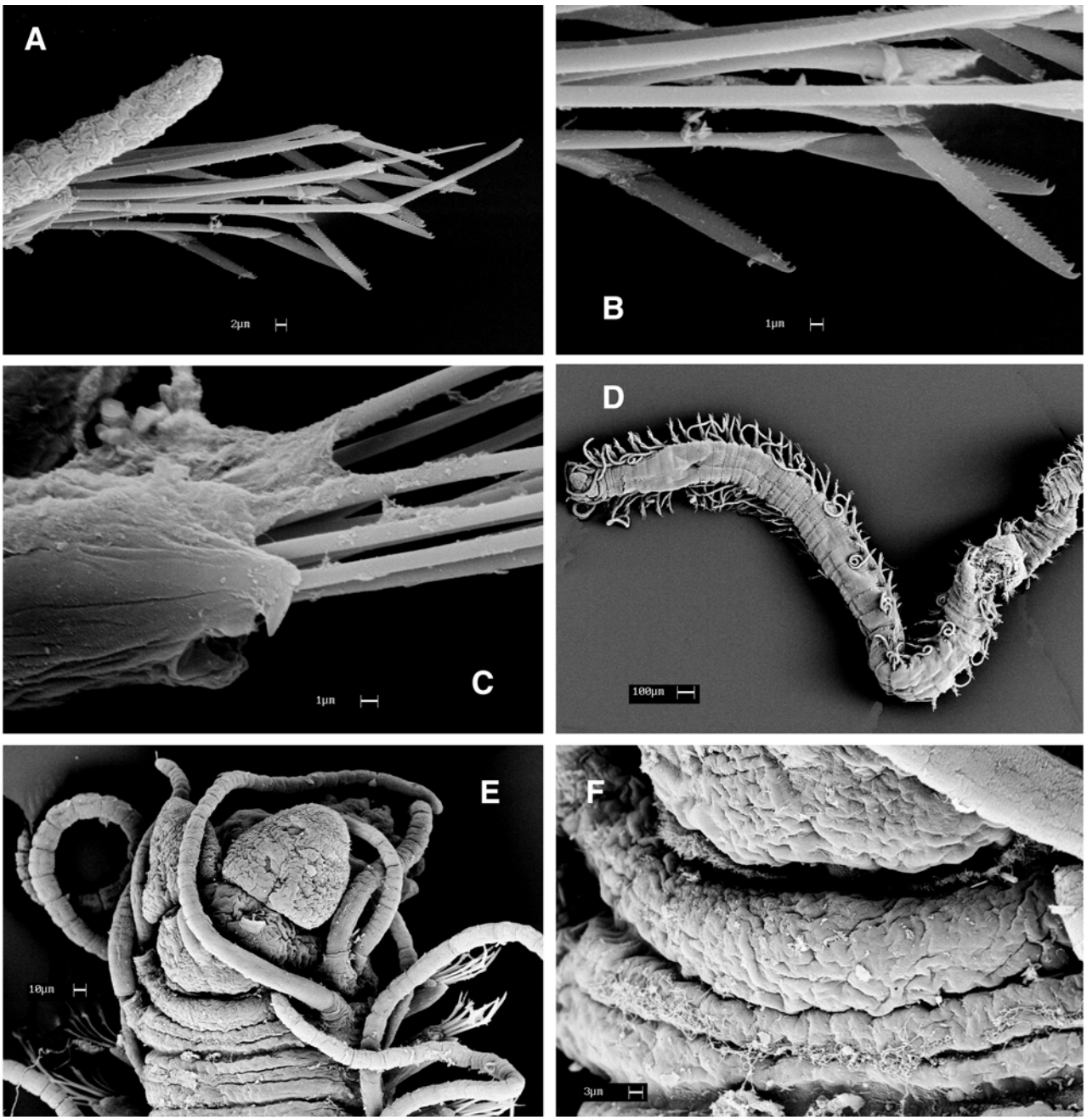



Fig. 49. SEM of *Pionosyllis yolandae* n.sp. (*A*) compound chaetae, anterior parapodium; (*B*) detail of the same; (*C*) parapodial lobe and acicula, midbody. SEM of *Paraehlersia weissmannioides* (Augener, 1913) (*D*) anterior part and midbody, dorsal view; (*E*) prostomium and anteriormost segments; (*F*) detail of nuchal organs. *A–C*: AM W28876, *D–F*: AM W28224.

### Genus *Paraopisthosyllis* Hartmann-Schröder, 1991

*Paraopisthosyllis* Hartmann-Schröder, 1991: 27.

**Type species**. *Opisthosyllis brevicirra* Hartmann-Schröder, 1979, designated by Hartmann-Schröder, 1991.

**Diagnosis**. Body robust, cylindrical, broad anteriorly, tapered posteriorly, with many segments. Dorsal and ventral surfaces covered with numerous, small papillae. Prostomium with 4 lensed eyes and 3 antennae. Palps broad, fused at base, ventrally folded. Peristomium shorter than subsequent segments, sometimes covered dorsally by chaetiger 1; 2 pairs of tentacular cirri. Nuchal organs as 2 ciliated grooves between prostomium and peristomium. Dorsal and ventral cirri on all chaetigerous segments. Antennae, tentacular, anal and dorsal cirri smooth, enlarged, club-shaped to foliaceous. Dorsal cirri usually provided with distinct cirrophores; on some species, dorsal cirri of anterior segments alternating in size between large and small ones, larger cirri arising more dorsally. Parapodia with compound, heterogomph chaetae, and dorsal and ventral simple chaetae on posterior parapodia. Pharynx wide, with pharyngeal tooth inserted far from anterior rim. Proventricle wide, voluminous. Pygidium small, with 2 anal cirri.

**Remarks**. According to Hartmann-Schröder (1991), this genus belongs to the Eusyllinae. It has some unusual morphological characters, however, such as the shape and

arrangement of dorsal cirri, epidermal papillae, shape of pharynx and proventricle; its method of reproduction is unknown. It appears to be closely related to *Rhopalosyllis*, and therefore should be considered as a member of the subfamily Syllinae. Until its method of reproduction is determined, we are retaining it within the Eusyllinae according to its original designation. The genus is known only from Australia.

**Key to Australian species of *Paraopisthosyllis***

1 Dorsal cirri inflated, club-shaped (Fig. 50A) ..... 2
—— Dorsal cirri otherwise ..... 3

2 Blades of some dorsal compound chaetae bidentate. Dorsal cirri alternating in size, larger ones located more dorsally than others ..... *P. alternocirra* n.sp.
—— All blades unidentate. Dorsal cirri all similar in size except those of chaetiger 1, inserted close to parapodial lobes (Fig. 53A) ..... *P. brevicirra*

3 Some dorsal cirri foliaceous (Fig. 55A). Pharyngeal tooth located on anterior half of pharynx ..... *P. phyllocirra*
—— Anterior dorsal cirri provided with distal, digitiform button (Fig. 54A). Pharyngeal tooth located on posterior half of pharynx ..... *P. ornaticirra* n.sp.

### *Paraopisthosyllis alternocirra* n.sp.

Figs 50A–E, 51A–H, 52A–I

*Opisthosyllis brevicirra*.—Hartmann-Schröder, 1982: 57 (in part).

**Material examined**. HOLOTYPE (AM W26734) AUSTRALIA: WESTERN AUSTRALIA: Red Bluff, Kalbarri, 27°42'S 114°09'E, mixed coralline algae, 4 m, coll. J.K. Lowry, 10 Jan 1984. PARATYPES Red Bluff, Kalbarri, 27°42'S 114°09'E, round-leaved seagrass in shallow sand on rocky shore, 3.5 m, coll. R.T. Springthorpe, 10 Jan 1984, 3 (AM W28366); Rocky shore, Red Bluff, Kalbarri, 27°42'S 114°09'E, dictyotalean alga from cave, 4 m, coll. J.K. Lowry, 10 Jan 1984, 4 (AM W26784); Rocky shore, Red Bluff, Kalbarri, 27°42'S 114°09'E, brown algae from surf zone, 0.5 m, coll. H.E. Stoddart, 9 Jan 1984, 1 (AM W26783); Red Bluff, Kalbarri, 27°42'S 114°09'E, mixed coralline algae, 4 m, coll. J.K. Lowry, 10 Jan 1984, 7 + 1 on SEM stub (AM W28984); Inshore limestone reef, Ned's Camp, Cape Range National Park, 21°59'S 113°55'E, sponge covered with epiphytes, sediment & muddy worm tubes, 1.5 m, coll. R.T. Springthorpe, 2 Jan 1984, 1 (AM W28368).

**Additional material examined**. WESTERN AUSTRALIA: Rockingham, Point Peron, 32°17'S 115°44'E 115, algae, intertidal, coll. G. Hartmann-Schröder, 1 (HMZ P-17049); identified by Hartmann-Schröder as *Opisthosyllis brevicirra*.

**Description**. Complete specimen. Body anteriorly broad, tapered posteriorly (Fig. 52A), 6.7 mm long, 0.5 mm wide, with 59 chaetigers. Dark area of pigment dorsally on each segment, sometimes divided into 2 dorsal areas, anterior and posterior lateral areas; dark areas forming incomplete transverse row on posterior segments (Fig. 50A–C). Small, scattered papillae on lateral and ventral surfaces, more numerous on dorsum (Figs 50A,C, 52C,D). Prostomium oval, 4 small eyes arranged in open trapezoidal pattern, almost in straight line; lateral antennae inserted near anterior margin, oval, slightly rugose, shorter than combined length of prostomium and palps, median antenna similar to lateral but thicker, slightly longer, provided with dark inclusions, inserted slightly posteriorly to lateral ones, in front of eyes (Fig. 50A). Palps broad, longer than prostomium, ventrally folded (Figs 50D,E, 52C). Peristomium shorter than subsequent segments; tentacular cirri similar in shape to lateral antennae, but larger. Dorsal cirri of chaetiger 1 distally inflated, club-shaped, provided with dark inclusions, and located laterodorsally, anteriorly directed, partially covering prostomium (Fig. 50A,C,D); dorsal cirri of chaetigers 4 and 6 similar, but less inflated and more laterally inserted, subsequent dorsal cirri club-shaped, not as inflated as those of chaetigers 1, 4 and 6, without dark inclusions; alternating dorsal cirri laterodorsally located and others slightly smaller, more laterally located, cirri becoming smaller posteriorly (Fig. 50C,D). Dorsal cirri with cirrophores. Anterior parapodia with 7 compound, heterogomph chaetae, shafts with some spines on distal margin, and curved blades; 2 dorsalmost compound chaetae with relatively short, bidentate blades, with both teeth close to each other, and short spines on margin (Fig. 51C), 16 µm long; remaining compound chaetae with smooth, unidentate blades (Figs 51C, 52G), within fascicle slight dorsoventral gradation in length of blade, 22 µm in length dorsally, 17 µm in length ventrally. Progressively along body, chaetal blades becoming shorter and less bidentate; posterior parapodia with 6 compound chaetae, decreasing to 3 on posteriormost chaetigers, blades slightly hooked, smooth on margin, unidentate (Figs 51G, 52H), blades 15 µm in length dorsally, 10 µm in length ventrally. Dorsal simple chaetae slender, unidentate, smooth (Fig. 51F), present on posterior chaetigers (Fig. 52I). Ventral simple chaetae smooth, distally bent, unidentate, present on most posterior parapodia (Figs 51H, 52I). Anterior parapodia with 3–4 aciculae, distally rounded, single acicula on posterior parapodia (Fig. 51E). Pharynx wide, through 3–4 segments; pharyngeal tooth located about one third from anterior margin of pharynx (Fig. 51A). Margin of pharynx with 10 papillae (Figs 51A, 52E), each papilla with short cilia (Fig. 52F). Proventricle, longer than pharynx, extending through 3 segments, with 25–30 muscle cell rows. Pygidium small, with 2 anal cirri with dark inclusions, inflated and oval (Fig. 50B).

**Remarks**. This species is similar to *P. brevicirra* Hartmann-Schröder, 1979 (see below) but *P. alternocirra* has short and long dorsal cirri alternating along the anterior part of the body, distinct dark inclusions on the median antenna and large dorsal cirri, a colour pattern, and some dorsal compound chaetae on anterior and midbody parapodia with

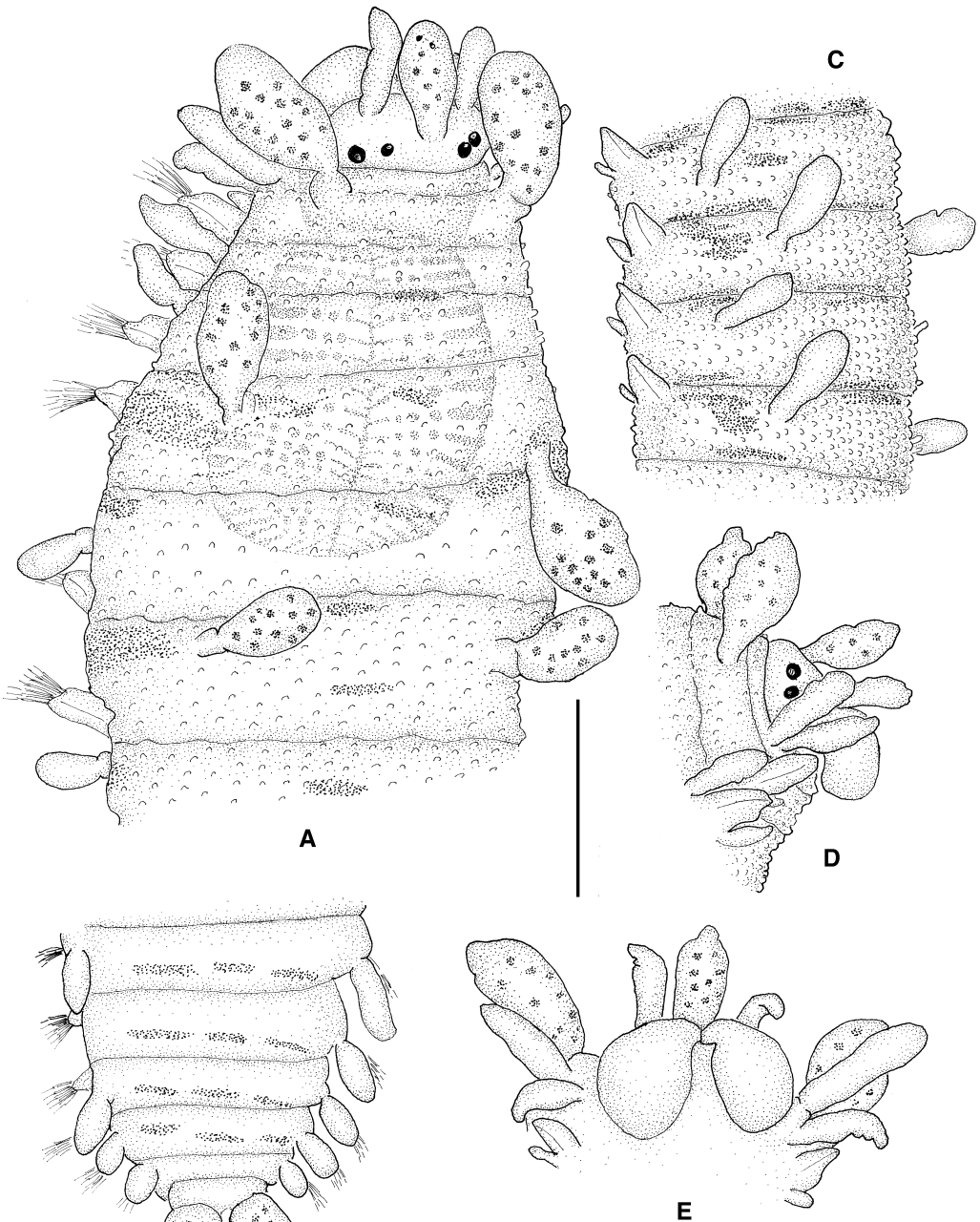



Fig. 50. *Paraopisthosyllis alternocirra* n.sp. (*A*) anterior end, dorsal view; (*B*) posterior end, dorsal view; (*C*) midbody, lateral view; (*D*) prostomium and anteriormost segments, lateral view; (*E*) same, ventral view. *A,B,E*: AM W26734; *C,D*: AM W26783. Scales: 0.18 mm

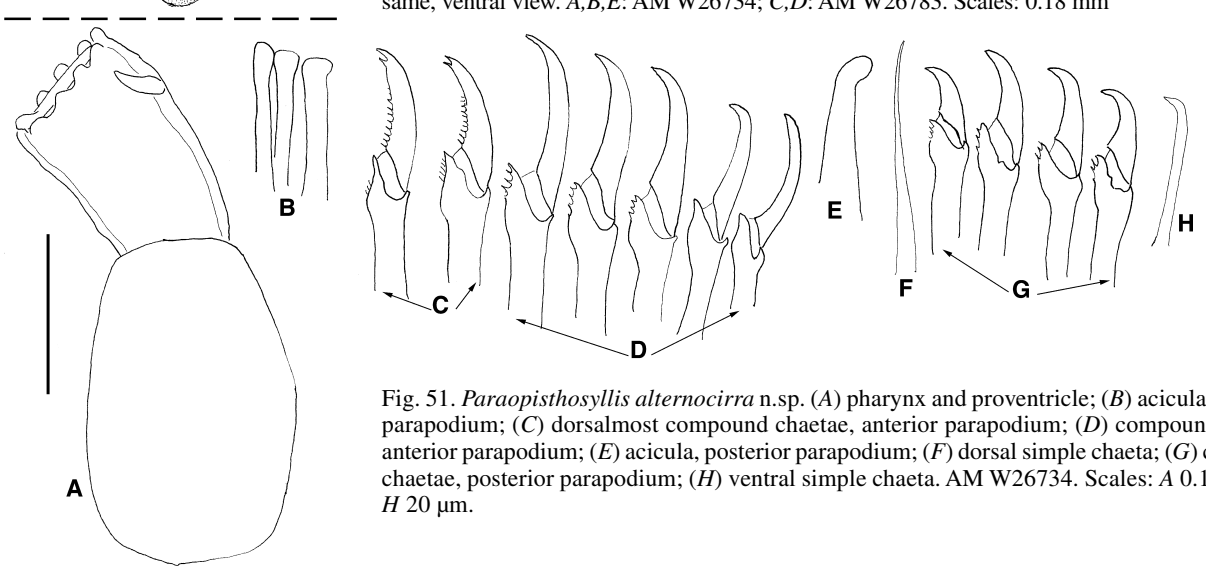



Fig. 51. *Paraopisthosyllis alternocirra* n.sp. (*A*) pharynx and proventricle; (*B*) aciculae, anterior parapodium; (*C*) dorsalmost compound chaetae, anterior parapodium; (*D*) compound chaetae, anterior parapodium; (*E*) acicula, posterior parapodium; (*F*) dorsal simple chaeta; (*G*) compound chaetae, posterior parapodium; (*H*) ventral simple chaeta. AM W26734. Scales: *A* 0.18 mm, *B–H* 20 μm.

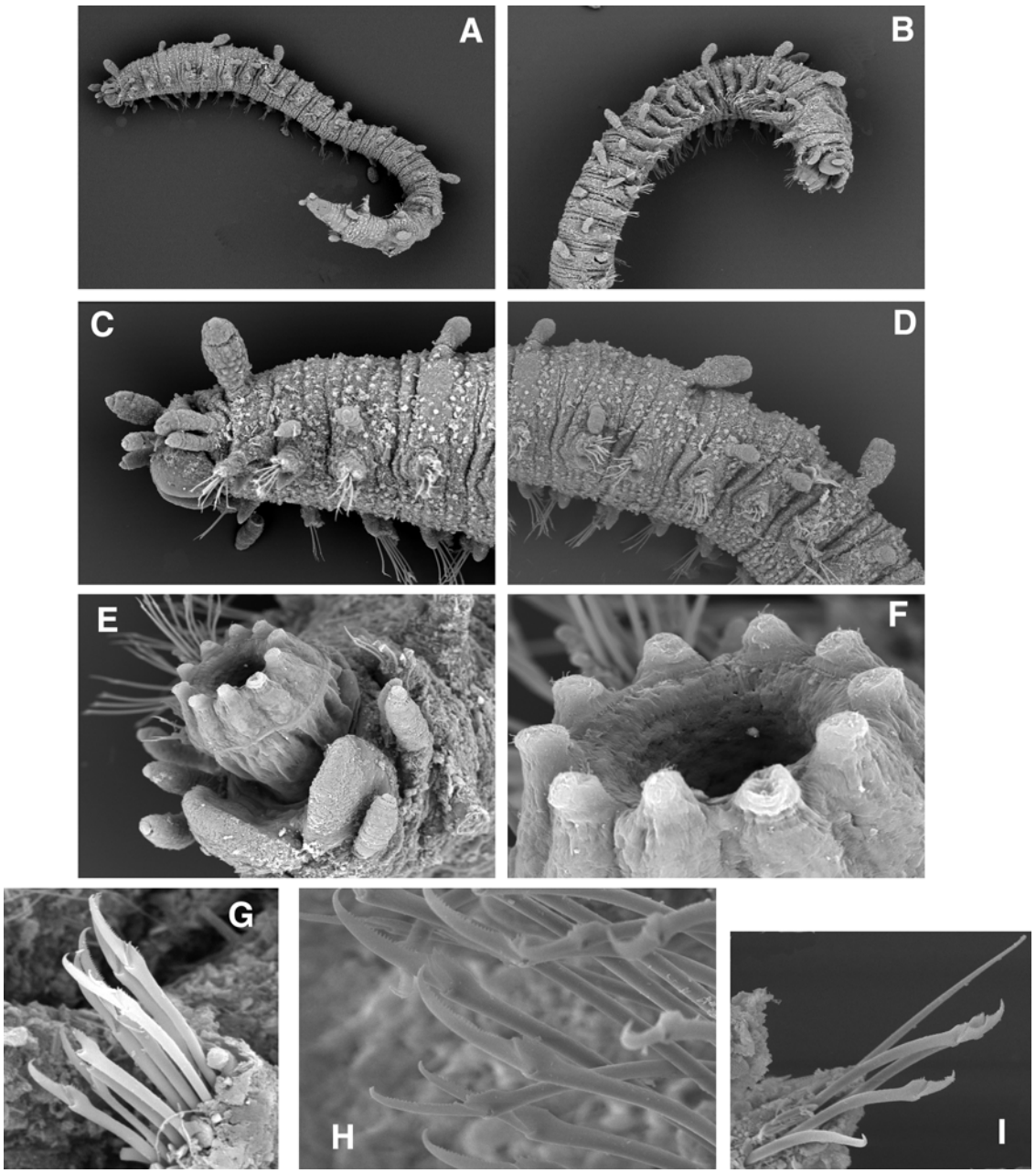



Fig. 52. SEM of *Paraopisthosyllis alternocirra* n.sp. (*A*) complete specimen, lateral view; (*B*) anterior end, lateral view; (*C*) prostomium and anterior segments, lateral view; (*D*) midbody, lateral view; (*E*) everted pharynx; (*F*) detail of pharyngeal papillae; (*G*) fascicle of chaetae, anterior parapodium; (*H*) midbody fascicle of chaetae; (*I*) posterior fascicle of chaetae. AM W28984.

bidentate blades. In contrast, *P. brevicirra* has only unidentate chaetae, dorsal cirri not as inflated and lacks dark inclusions on the antennae and cirri, and is colourless. The specimen reported as *Opisthosyllis brevicirra* by Hartmann-Schröder (1982) belongs to this new species and differs from the holotype of the taxon.

**Habitat**. Occurring in algae, seagrasses, and sponges; from intertidal to shallow depths.

**Distribution**. Australia (Western Australia).

**Etymology**. The specific name refers to the alternating sizes of the dorsal cirri along the body.

### *Paraopisthosyllis brevicirra* (Hartmann-Schröder, 1979)

Fig. 53A–C

*Opisthosyllis brevicirra* Hartmann-Schröder, 1979: 57, figs 43–45. Not *Opisthosyllis brevicirra* Hartmann-Schröder, 1982: 57.

**Material examined**. AUSTRALIA: WESTERN AUSTRALIA: holotype (HZM P-15499), Port Hedland, close to Highway Motel, 19°38'S 119°31'E, filamentous algae with sand & debris, intertidal, 27 Sept. 1975, coll. G. Hartmann-Schröder.

**Description**. Incomplete specimen, 4.5 mm long, 0.5 mm wide, with 28 chaetigers, without pigment pattern (Fig. 53A). Numerous, scattered, rounded papillae covering

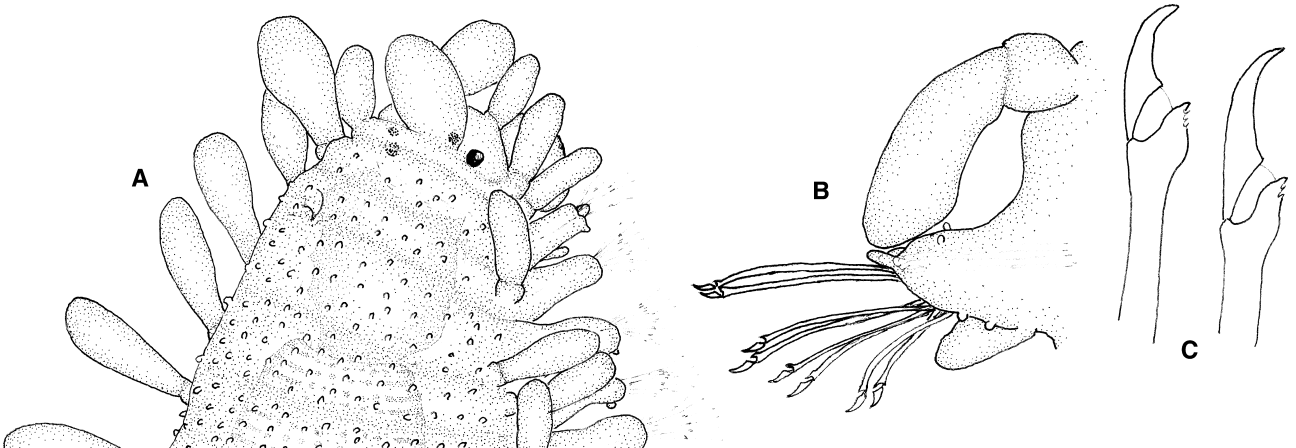



Fig. 53. *Paraopisthosyllis brevicirra* (Hartmann-Schröder, 1979) (*A*) anterior end, dorsal view; (*B*) midbody parapodium; (*C*) compound chaetae. HZM P-15499. Not scaled. Modified from Hartmann-Schröder, 1979.

dorsal and ventral surfaces, extending onto parapodia. Prostomium oval, 4 eyes arranged in open trapezoidal pattern; lateral antennae inserted near anterior margin, oval, shorter than combined length of prostomium and palps, median antenna similar to lateral but distinctly thicker, slightly longer, inserted posteriorly to lateral ones (Fig. 53A). Palps broad, longer than prostomium, ventrally folded (Fig. 53A). Peristomium shorter than subsequent segments; tentacular cirri similar in shape to lateral antennae, but longer. Dorsal cirri of chaetiger 1 distally inflated, club-shaped, laterodorsally located (Fig. 53A). Remaining dorsal cirri smaller, club-shaped, slightly elongate, not as inflated as those of chaetiger 1, inserted more laterally (Fig. 53A,B). Dorsal cirri with distinct cirrophores (Fig. 53B). Parapodia conical, with 2 distal papillae (Fig. 53B). Anterior parapodia with 8–9 compound, heterogomph chaetae, shafts with some spines on distal margin, and curved, unidentate blades, slightly shorter dorsally than ventrally, smooth on margin (Fig. 53C). Dorsal and ventral simple chaetae not seen. Anterior parapodia each with 3–4 aciculae, distally rounded, reducing to single acicula on posterior parapodia. Pharynx wide, extending through 3 segments; pharyngeal tooth located about one third from anterior margin of pharynx (Fig. 53A). Proventricle large, longer than pharynx, through 3 segments, with 25–26 muscle cell rows.

**Remarks**. One specimen 1 (HMZ P-17049) identified by Hartmann-Schröder as *Opisthosyllis brevicirra* belongs to *P. alternocirra* n.sp.

**Habitat**. Occurring in sand and debris, intertidally.

**Distribution**. Australia (Western Australia).

### *Paraopisthosyllis ornaticirra* n.sp.

Fig. 54A–K

**Material examined**. HOLOTYPE (AM W28949) AUSTRALIA: WESTERN AUSTRALIA: Inshore limestone reef, Ned's Camp, Cape Range National Park, 21°59'S 113°55'E, *Caulerpa* sp., 1 m, coll. J.K. Lowry, 2 Jan 1984.

**Description**. Complete specimen. Body broad and robust anteriorly, tapered posteriorly, 7.8 mm long, 0.6 mm wide, with 63 chaetigers. Segmented pigmentation absent, but median antenna and anterior dorsal cirri each with 2 dark transverse areas, large dorsal cirri with more extensive pigmented area, anal cirri with single transverse band of pigment (Fig. 54A,C,D). Dorsal and ventral surfaces densely covered with small, rounded papillae (Fig. 54A). Prostomium rectangular, with 2 pairs of eyes arranged almost in line. Lateral antennae inserted in front of eyes, relatively short and slender; median antenna longer and thicker than lateral antennae, arising between eyes (Fig. 54A). Palps broad, as wide as prostomium, ventrally folded (Fig. 54A,B). Peristomium dorsally reduced, covered by chaetiger 1; dorsal tentacular cirri similar in shape to median antenna slightly longer and thicker, ventral tentacular cirri similar but smaller than dorsal ones. Dorsal cirri of chaetigers 1, 4, and 6 distinctly longer and larger than remaining dorsal cirri, inflated, except for chaetiger 6, with digitiform, non-pigmented terminal lobe, arising dorso-laterally (Fig. 54A). Remaining dorsal cirri with cirrophores; cirrostyles tapered, fusiform, shorter than half of body width, with 1–2 bands of dark pigment, midbody dorsal cirri lacking such pigment (Fig. 54D); posterior dorsal cirri oval, shorter than those of anterior chaetigers. Parapodia with anterior and posterior lobes (Fig. 54D). Compound chaetae with thick shafts, distally provided with strong serration, and short, strongly bidentate blades, with short, few spines on margin; anterior parapodia with about 15 compound chaetae, blades slender (Fig. 54F), about 13 µm in length. Compound chaetae becoming progressively thicker posteriorly, with blades bidentate; about 10–14 compound chaetae on midbody parapodia, blades 10–12 µm in length, terminal teeth increasing in size ventrally within fascicle (Fig. 54G). Number of compound chaetae per parapodium decreasing posteriorly, with only 3 on most posterior parapodia, similar to those of midbody (Fig. 54I). Dorsal simple chaetae on posterior parapodia, distally serrated and bifid (Fig. 54J). Ventral simple chaetae on most posterior parapodia, thick, strongly bidentate, smooth on margin (Fig. 54K). Anterior parapodia with 3 aciculae,

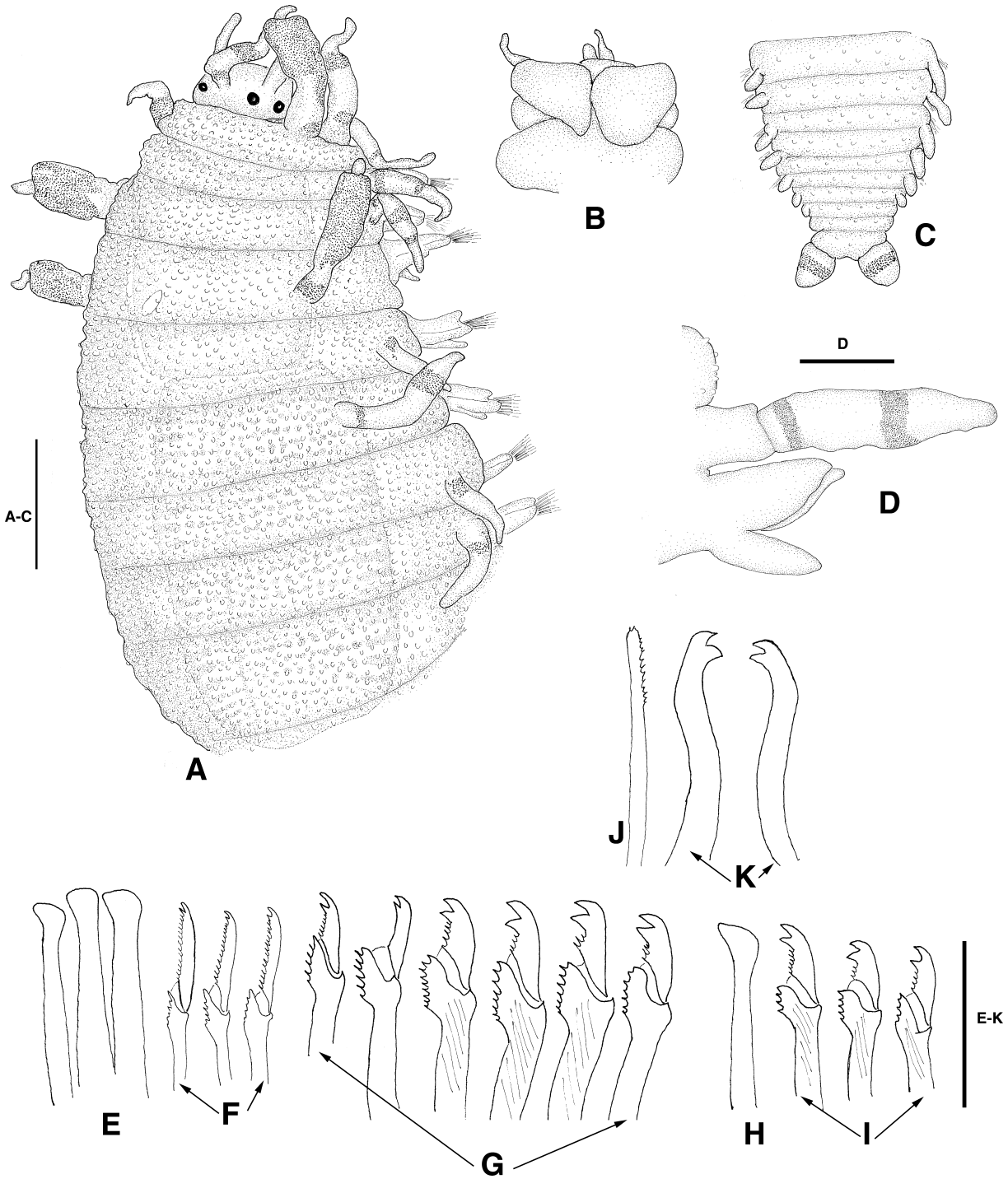



Fig. 54. *Paraopisthosyllis ornaticirra* n.sp. (*A*) anterior end, dorsal view; (*B*) prostomium and palps, ventral view; (*C*) posterior end, dorsal view; (*D*) midbody parapodium; (*E*) anterior aciculae; (*F*) compound chaetae, anterior parapodium; (*G*) compound chaetae, midbody; (*H*) acicula, posterior parapodium; (*I*) compound chaetae, posterior parapodium; (*J*) dorsal simple chaeta; (*K*) ventral simple chaetae. AM W28949. Scales: *A–C*: 0.18 mm, *D*: 92 μm, *E–K*: 20 μm.

distally rounded (Fig. 54E), posteriorly single acicula present, slightly bent at tip (Fig. 54H). Pharynx wide, through 3–4 segments; pharyngeal tooth located posteriorly. Proventricle similar in size to pharynx, with 30–35 muscle cell rows. Pygidium trapezoidal; anal cirri larger than posterior dorsal cirri, oval to egg-shaped.

**Remarks**. This species is easily distinguished from the other members of this genus by the shape of the enlarged dorsal cirri of chaetigers 1, 4, and 6, the pigment pattern present on the dorsal cirri and median antenna, and the presence of compound chaetae with strongly bidentate blades.

**Habitat**. Occurring in *Caulerpa*, in shallow depths.

**Distribution**. Australia (Western Australia).

**Etymology**. The species is named after the characteristic pigmentation pattern of the dorsal cirri.

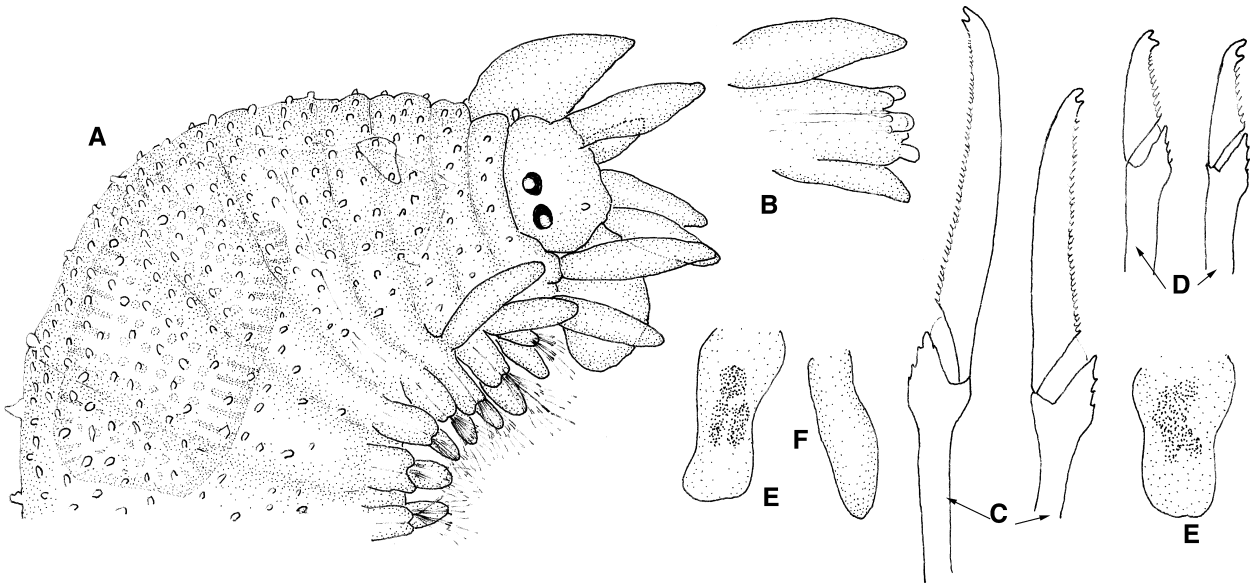



Fig. 55. *Paraopisthosyllis phyllocirra* Hartmann-Schröder, 1991 (*A*) anterior end, dorsolateral view; (*B*) anterior parapodium; (*C*) long and short compound chaetae, anterior parapodium; (*D*) same, posterior parapodium; (*E*) modified dorsal cirrus, posterior parapodia; (*F*) non-modified dorsal cirrus, posterior parapodium. HZM P-20533. Not scaled. Modified from Hartmann-Schröder, 1991.

### *Paraopisthosyllis phyllocirra* Hartmann-Schröder, 1991

Fig. 55A–F

*Paraopisthosyllis phyllocirra* Hartmann-Schröder, 1991: 27, figs 26–29.

**Material examined**. HOLOTYPE (HZM P-20533), AUSTRALIA: QUEENSLAND: Heron Is., Great Barrier Reef, 23°27'S 151°55'E, coralline sand, intertidal, coll. G. Hartmann-Schröder.

**Description**. Incomplete specimen, 3.5 mm long, with 32 chaetigers, with some indistinct red-brownish spots dorsally and laterally. Numerous, scattered, rounded papillae covering dorsal (Fig. 55A) and ventral surfaces. Prostomium oval, 4 eyes arranged in open trapezoidal pattern; lateral antennae inserted near anterior margin, oval, shorter than combined length of prostomium and palps together, median antenna similar to lateral, originating slightly posterior to lateral antennae (Fig. 55A). Palps broad, longer than prostomium, ventrally folded (Fig. 55A). Peristomium slightly shorter than subsequent segments; tentacular cirri similar in shape to lateral antennae, but larger. Dorsal cirri of chaetiger 1 inflated, leaf-shaped, laterodorsally located (Fig. 55A), right one missing. Following dorsal cirri smaller, oval, not as inflated as those of chaetiger 1, arising more laterally (Fig. 55A,B); some dorsal cirri of posterior segments flattened, truncated, with some dark pigment (Fig. 55E), alternating with non modified dorsal cirri (Fig. 55F). Parapodia sub-rectangular, with 4–5 distal papillae (Fig. 55B). Anterior parapodia with 7–9 compound, heterogomph chaetae, shafts with some spines on distal margin, and curved, bidentate blades, within fascicle dorsoventral gradation in length of blades (Fig. 55C), with short spines on margin. Posterior compound chaetae similar to anterior ones, but with shorter blades and without any dorsoventral gradation in length within fascicle (Fig. 55D). Dorsal and ventral simple chaetae absent. Anterior parapodia with 3 aciculae, distally rounded, single acicula on posterior parapodia. Pharynx wide, through 3–4 segments; pharyngeal tooth occurs about third from anterior margin of pharynx (Fig. 55A). Proventricle large, longer than pharynx, through 3 segments, with 25 muscle cell rows.

**Remarks**. Shape of posterior dorsal cirri were not described in the original description.

**Habitat**. Occurring in coralline sand, intertidally.

**Distribution**. Australia (Queensland).

## Genus *Pionosyllis* Malmgren, 1867

*Pionosyllis* Malmgren, 1867: 40.

**Type species**. *Pionosyllis compacta* Malmgren, 1867 by monotypy.

**Diagnosis**. Body ranges from meiofaunal to macrofaunal size (<5 to >10 mm in length), dorsally convex. Prostomium with 4 eyes, sometimes also pair of eyespots, sometimes without eyes. Three antennae. Prostomium sometimes with cheeks or lobes on large specimens. Median antenna inserted on middle of prostomium or anteriorly. Palps fused at bases, with dorsal furrow, or free from each other. Two pairs of tentacular cirri. Nuchal organs as 2 ciliated grooves between prostomium and peristomium. Antennae, tentacular cirri and dorsal cirri smooth, sometimes rugose, long, filiform, all similar; weakly articulated on some species. Ventral cirri not fused to parapodial lobes, those of anterior parapodia somewhat inflated on some species, inserted basally or distally on parapodial lobes. Heterogomph compound chaetae with bidentate falcigerous blades, teeth similar in size; some dorsal anterior and midbody falcigers slightly longer than others, decreasing in size in dorsoventral gradation within fascicle; some species with hemigomph or homogomph articulations and blades of compound chaetae different to those described above. Dorsal and ventral simple chaetae on some posterior parapodia, bidentate, with both teeth similar, sometimes absent. Parapodia

with or without prechaetal lobes. Pharynx and proventricle similar in size. Pharyngeal tooth anteriorly located, some species with tooth on middle of pharynx. Reproduction by epigamy. Pygidium small, with 2 smooth anal cirri.

**Remarks**. *Pionosyllis* as above defined is a heterogeneous, probably a polyphyletic group in need of revision. Currently, GSM and other authors are preparing a major revision of the group.

### Key to Australian species of *Pionosyllis*

1 Blades of compound chaetae with tendon connecting proximal tooth with margin (Fig. 74D). Pharyngeal tooth located near anterior rim, on middle of pharynx or posteriorly in mid line ..... 2

—— Blades of compound chaetae without such tendon ..... 3

2 Pharyngeal tooth located just in front of middle of pharynx. Compound chaetae including short, strongly bidentate falcigers (Fig. 74C,D) ..... *P. rousei* n.sp.

—— Pharyngeal tooth located close to anterior margin of pharynx. Compound chaetae all elongated, with proximal tooth distinctly larger than distal tooth ..... *Pionosyllis* sp.

3 Pharyngeal tooth located far from anterior rim (Fig. 65A). Some dorsal cirri inflated ..... 4

—— Pharyngeal tooth located on anterior rim or close to (Fig. 56A) ..... 5

4 Body dark. Inflated dorsal cirri with distal button (Fig. 60D). Dorsoventral gradation in length of blades of compound chaetae ..... *P. fusigera*

—— Body with small red spots. Inflated dorsal cirri without distal button (Fig. 65B). Inverse dorsoventral gradation in length of blades of compound chaetae ..... *P. kalimna*

5 Ventral cirri inserted medially or distally on parapodial lobes. Dorsal cirri of 2 lengths, long and filiform and extremely short, exogonid-like dorsal cirri that alternate along body (Fig. 59A) ..... *P. corallicola*

—— Ventral cirri inserted at bases of parapodia. Dorsal cirri similar throughout or else differences between short and long cirri not so pronounced (Fig. 78A) ..... 6

6 Segments posterior to proventricle fused in units of 2–3 segments. Palps completely free ..... *P. yolandae* n.sp.

—— Segments not fused. Palps fused at bases ..... 7

7 Dorsal cirri (except some anteriormost) exogonid-like, short, slightly longer than parapodial lobes ..... 8

—— Dorsal cirri long ..... 10

8 Dorsal cirri more or less truncate, with some internal glands (Fig. 70C) ..... *P. mariae* n.sp.

—— Dorsal cirri otherwise, without internal glands (Fig. 56D) ..... 9

9 Compound chaetae including spiniger-like, with elongated blades. Dorsal simple chaetae truncate (Fig. 56I) ..... *P. ancori* n.sp.

—— Compound chaetae only falcigers. Dorsal simple chaetae pointed, unidentate (Fig. 73G) ..... *P. mayteae* n.sp.

10 Distinct prechaetal lobe present. Acicula straight, extending beyond parapodial lobes (Fig. 67L). Blades of compound chaetae without long, fine spines; without spiniger-like chaetae. Large size, (>10 mm in length) ..... *P. kerguelensis*

—— Prechaetal lobe absent. Acicula distally knobbed, with 2 unequal lobes. Blades of compound chaetae with long, fine, distally ornamented spines; sometimes with spiniger-like chaetae. 5–10 mm in length ..... 11

11 Without long, spiniger-like compound chaetae ..... 12
—— With long, thin, spiniger-like compound chaetae (Fig. 63D) ..... 13

12 Anteriormost parapodia distinctly enlarged, with compound chaetae provided with large, thick shafts, and short blades (Fig. 75B) ..... *P. serrata*
—— Parapodia and compound chaetae similar throughout ..... *P. koolalya* n.sp.

13 Anterior parapodia without elongated, spiniger like compound chaetae ..... *P. heterochaetosa* n.sp.
—— Spiniger-like chaetae from anterior chaetigers ..... 14

14 Compound chaetae of anterior segments with coarse serration and distal tooth more or less broad, rounded. Falcigers without double curvature ..... *P. augeneri*
—— Compound chaetae similar throughout. Some falcigers provided with double curvature (Fig. 61C) ..... *P. hartmannschroederae* n.comb.

### *Pionosyllis ancori* n.sp.

Fig. 56A–M

**Material examined**. HOLOTYPE (AM W29244). AUSTRALIA: QUEENSLAND: Outer Yonge Reef, Great Barrier Reef, 14°36'S 145°38'E, rock covered with pink coralline algae, encrusting sponges, 9 m, coll. P.A. Hutchings, 21 Jan 1977. PARATYPES 4 (AM W28455), Outer Yonge Reef, Great Barrier Reef, 14°36'S 145°38'E, rock with *Lithothamnion* & *Halimeda*, 30 m, coll. P.A. Hutchings, 24 Jan 1977.

**Additional material examined**. QUEENSLAND: Outer Yonge Reef, Great Barrier Reef: 14°36'S 145°38'E, rock with *Lithothamnion* & *Halimeda*, 30 m, coll. P.A Hutchings, 24 Jan 1977, 4 (AM W28962). NEW SOUTH WALES. Elisabeth & Middleton Reef, 33°16.85'S 19°9.15'E, 244 m, Franklin, May 1998; Elisabeth & Middleton Reef, 33°16.85'S 159°9.15'E, 30 m, *Lithothamnion* & *Halimeda*, 24 Jan. 77, P.A. Hutchings coll. 8 (AM W28838); Taupo Seamount, 33°16'51"S 156°09'09"E, limestone & sand bottom, 244 m, coll. J.K. Lowry, 2 May 1989, 2 (AM W28839). WESTERN AUSTRALIA Kimberley, Lafontaine Is. 68, 14°10'S 125°47'E, 9–15 m, 19 July 1988, coll. P.A. Hutchings, 1 (AM W28841).

**Description**. Body slender, strongly filiform, 8 mm long, 0.2 mm wide, with 50 chaetigers. Prostomium sub-pentagonal, without eyes, only 2 anterior eyespots (Fig. 56A); median antenna inserted near posterior margin of prostomium, longer than combined length of prostomium and palps; lateral antennae nearly one third length of median antenna length, similar in length to palps, inserted posteriorly to eyespots; 2 transverse furrows behind lateral antennae (Fig. 56A). Palps long, triangular, free from each other, fused basally, longer than prostomium. Peristomium distinct, about half of length of subsequent segments; dorsal tentacular cirri longer than lateral antennae but shorter than median one, similar in length to body width; ventral tentacular cirri about as long as dorsal ones (Fig. 56A). Dorsal cirri, oval, papilliform, slightly longer than parapodial lobes, without internal glands, distally tapered, absent on chaetiger 2 (Fig. 56A). Parapodial glands with granular material present on segments posterior to proventricle (Fig. 56A). Parapodial lobes elongate, conical, with distal papilla (Fig. 56D). Ventral cirri digitiform, shorter than parapodial lobes. Compound chaetae hemigomph, shafts smooth, and blades of 2 kinds; most dorsal compound chaetae with elongate, bidentate blade, short spines on margin, apparently joined by membrane on anterior and midbody parapodia (Fig. 56E,G), about 33 µm in length on anterior parapodia, 27 µm in length on midbody parapodia, 20 µm in length on posterior parapodia (Fig. 56J); remaining chaetae with shorter blades, bidentate, with short spines on margin, 15–8 µm on anterior parapodia, 10–8 µm on midbody parapodia, about 10 µm on posterior parapodia, 3 on anterior and midbody parapodia (Fig. 56F,H), 2 on posterior parapodia (Fig. 56K). Dorsal simple chaetae truncated, with few spines on margin (Fig. 56I), present from mid to posterior parapodia. Ventral simple chaetae on posterior parapodia, acicular, bidentate with both teeth hooked, proximal tooth larger than distal one, provided with small translucent hood (Fig. 56L). Solitary acicula, with oblique tip (Fig. 56M). Pharynx through 5 segments; anterior end on chaetiger 1, with small pharyngeal tooth located on anterior rim (Fig. 56A). Proventricle through two and half segments, with 30 muscle cell rows. Pygidium small, semi-circular, with 2 long, filiform anal cirri, extending for 3 segments (Fig. 56C).

**Remarks**. Specimens from Western Australia and Elisabeth and Middleton Reef have dorsal cirri of chaetiger 1 long and 4 small eyes are visible (Fig. 56B) and have parapodial glands larger than those present on the holotype. At this stage we prefer to regard these as variations within *Pionosyllis ancori*, as the eyes on some specimens have become faded, and cirri can easily become detached or damaged. *Pionosyllis ancori* n.sp., differs from the other Australian species of the genus in having some compound chaetae as long-bladed falcigers, long and simple dorsal chaetae truncated, and having a thread-like body. The closest species is *Pionosyllis weismanni*, which is a much more robust species, with dorsal cirri on chaetiger 2, and glands inside the dorsal cirri; the compound chaetae are similar in both species, but the ventral simple chaetae are smaller than in *P. ancori*, with the distal tooth longer and markedly curved.

**Habitat**. Occurring in encrusting algae and sponges, in depths of 9 to 244 m.

**Distribution**. Australia (Queensland, Western Australia, northern New South Wales).

**Etymology**. The species is named in honour to Ancor Núñez Brito, son of our friend who recently died.

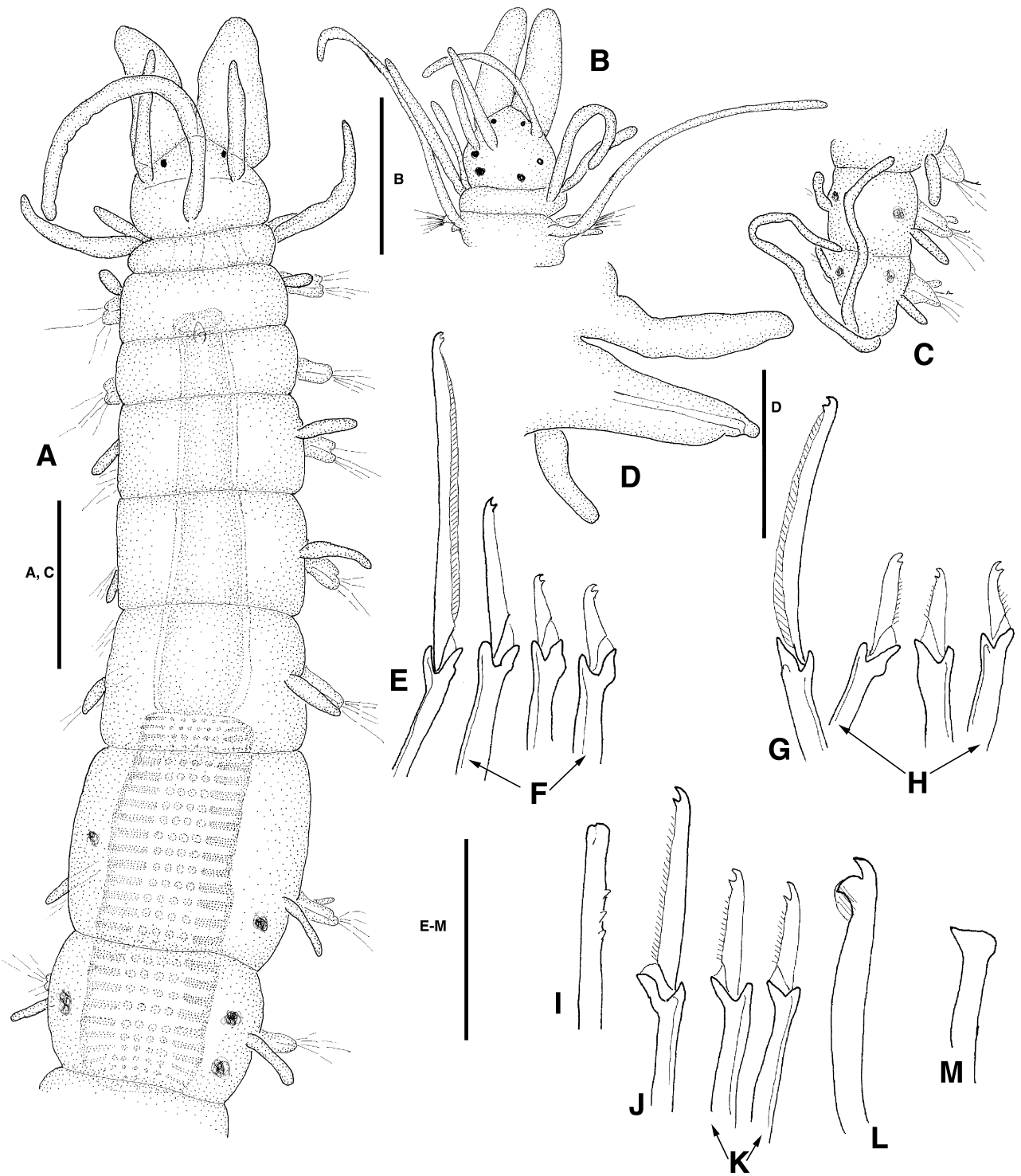



Fig. 56. *Pionosyllis ancori* n.sp. (*A*) anterior end, dorsal view; (*B*) prostomium and anteriormost segments of one specimen with long cirri on chaetiger 1; (*C*) posterior end, dorsal view; (*D*) midbody parapodium; (*E*) elongated, spiniger-like compound chaeta, anterior parapodium; (*F*) falcigers, anterior parapodium; (*G*) elongated, spiniger-like compound chaeta, midbody; (*H*) falcigers, midbody; (*I*) dorsal simple chaeta. (*J*) elongated compound chaeta, posterior parapodium; (*K*) falcigers, posterior parapodium; (*L*) ventral simple chaeta; (*M*) acicula. Scales: *A,C* 68 µm, *B* 0.18 mm, *D* 37 µm, *E–M* 20 µm. *A,C–M:* AM W29244; *B:* AM W28838.

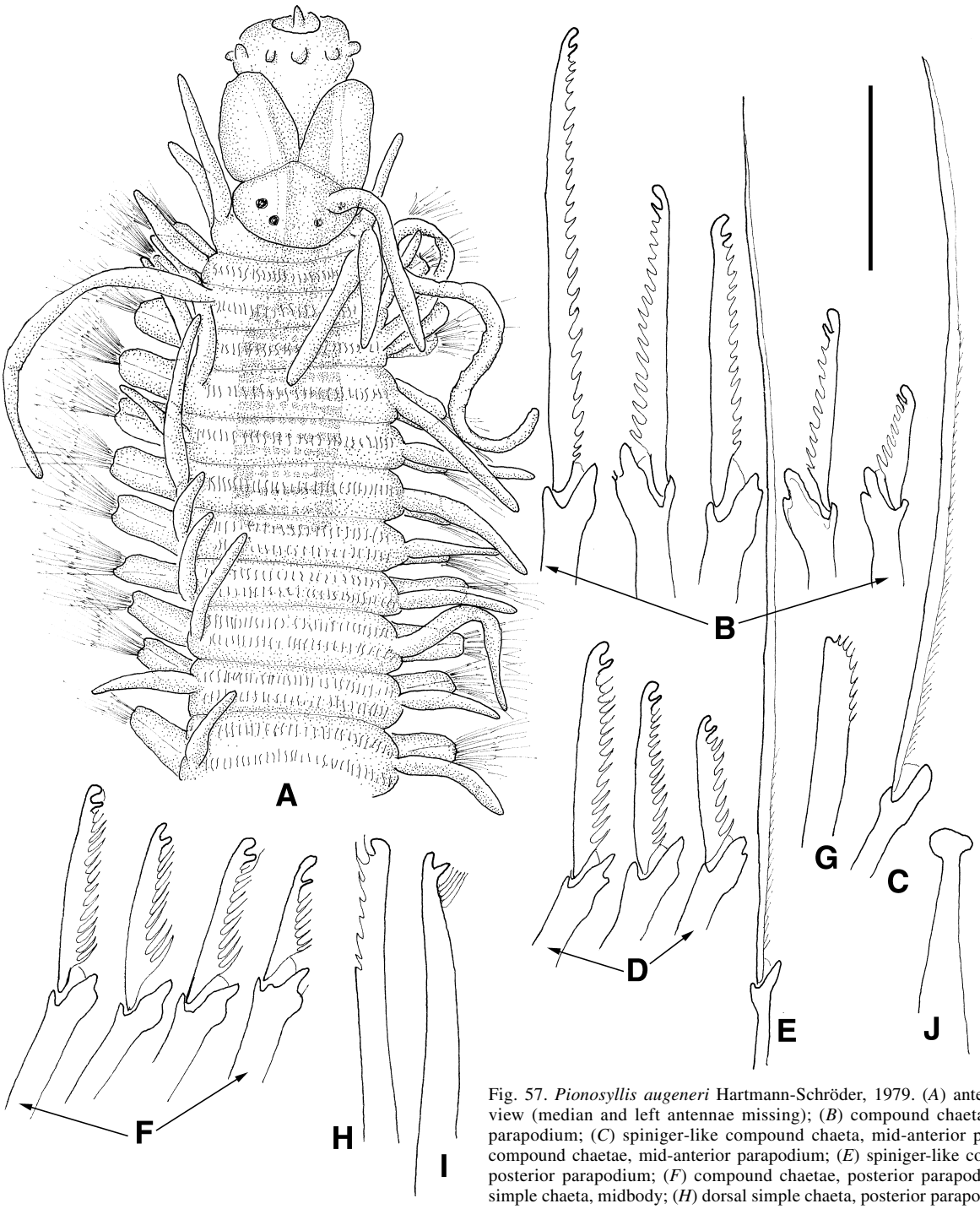



Fig. 57. *Pionosyllis augeneri* Hartmann-Schröder, 1979. (*A*) anterior end, dorsal view (median and left antennae missing); (*B*) compound chaetae, anteriormost parapodium; (*C*) spiniger-like compound chaeta, mid-anterior parapodium; (*D*) compound chaetae, mid-anterior parapodium; (*E*) spiniger-like compound chaeta, posterior parapodium; (*F*) compound chaetae, posterior parapodium; (*G*) dorsal simple chaeta, midbody; (*H*) dorsal simple chaeta, posterior parapodium; (*I*) ventral simple chaeta; (*J*) acicula, posterior parapodium. HZM P-15474. Scales: *A* 0.1 mm, *B–J* 20 μm.

### *Pionosyllis augeneri* Hartmann-Schröder, 1979

Figs 57A–J, 58A–F

*Pionosyllis augeneri* Hartmann-Schröder, 1979: 98, figs 119–125; 1980: 52; 1981: 32, fig. 52. Non Hartmann-Schröder 1991: 35.

**Material examined**. HOLOTYPE (HMZ P-15474), PARATYPES (HMZ P-15475, P-21018, P-16796) AUSTRALIA: WESTERN AUSTRALIA: Broome, 17°58'S 122°14'E, mangrove, sand & detritus, intertidal. NEW SOUTH WALES: Palm Beach, Pittwater, 33°35'S 151°19'E, *Halophila* & *Posidonia* seagrass beds, sand, 3 m, coll. J.K. Lowry & R.T. Springthorpe, 28 Apr 1983, 3 (AM W28406) + 1 on SEM stub (AM W28898); Midstream between Juno Head & Hungry Beach, Hawkesbury R., 33°34'S 151°16'E, muddy sand, 10 m, coll. A.R. Jones & C. Watson-Russell, 12 Jan 1977, 1 (AM W22130). SOUTH AUSTRALIA: 1 km NW of 5th Creek, Port Pirie, Spencer Gulf, 33°12'S 137°55'E, 0.8 m, *Zostera*, T.J. Ward *et al*. coll, Mar 1980, 1 (AM W22106), 1 (AM W22105); Boston Bay, Port Lincoln, 34°51'S 135°51'E, washings from sheltered weedy rocks, 2 m, coll. I. Loch, 12 Feb 1985, 1 on SEM stub (AM W28880). QUEENSLAND: Halifax Bay, 19°10'S 146°44'E, 5 m, Queensland Nickel, Feb 1985, Judell, Platt, Thomas & Assoc., 2 (AM W28206). Halifax Bay, 19°10'S 146°44'E, 5 m, Queensland Nickel, Feb 1985, Judell, Platt, Thomas & Assoc., 2 (AM W28459). Triangular Islets, Shoalwater Bay, 22°23' 150°31'E, J.A. Lewis & J.R. Forsyth, 1981, 17 (AM W202630); Heron Island, 23°27'S 151°55'E, sand, intertidal, (HMZ P-21018, P-16796).

**Description**. Body fragile, holotype 3.8 mm long with 36 chaetigers, longest specimen 4.9 mm long, with 52 chaetigers; normally colourless, but some with black spots. Anterior part of body enlarged, after proventricle, body

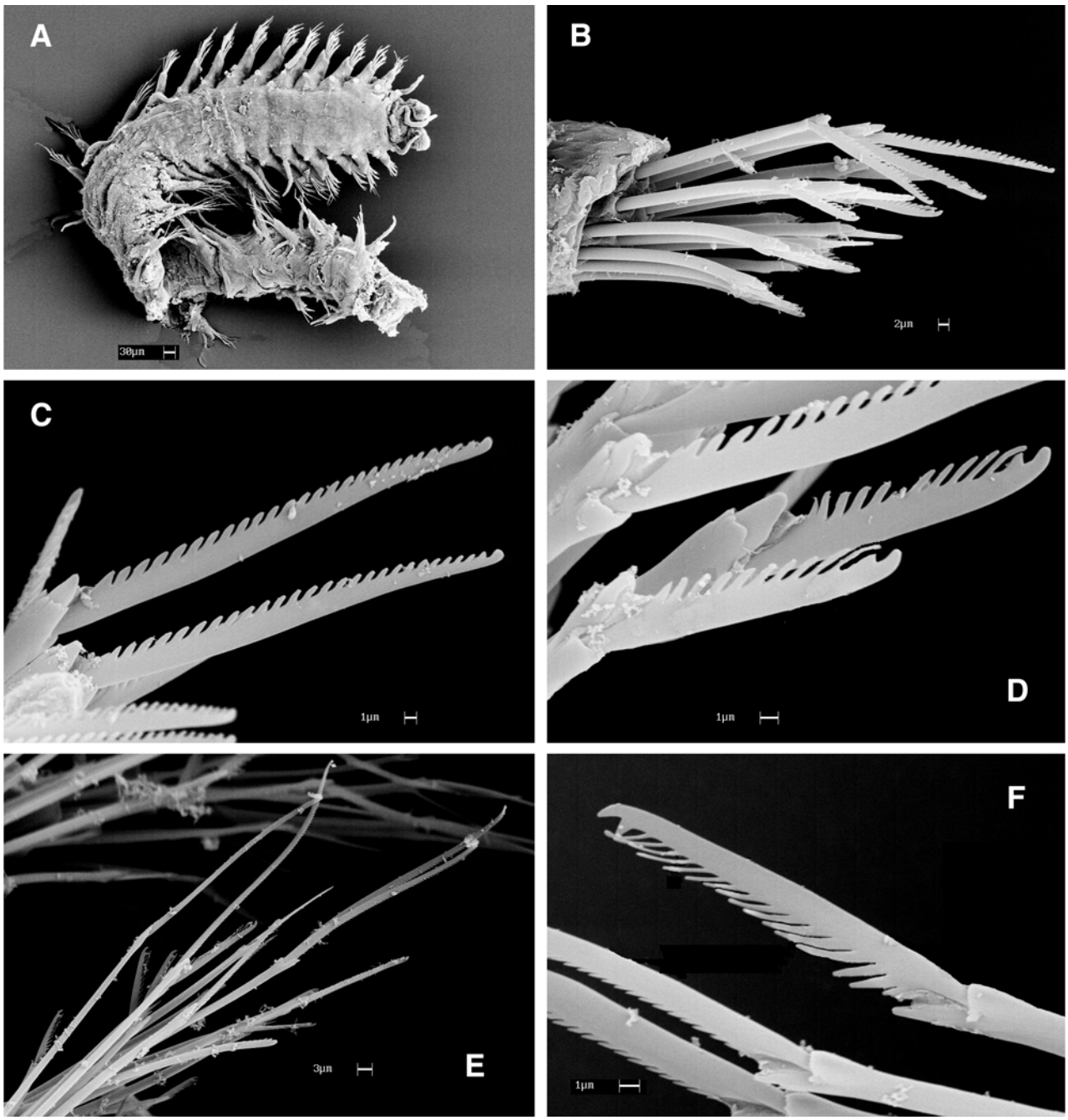



Fig. 58. SEM of *Pionosyllis augeneri* Hartmann-Schröder, 1979. (*A*) incomplete specimen, dorsal view; (*B*) anterior compound chaetae; (*C*) long, spiniger-like compound chaetae, anterior parapodium; (*D*) falcigers, midbody; (*E*) compound chaetae, midbody; (*F*) falcigers with long basal spines, posterior parapodium. AM W28898.

becoming thinner. Prostomium pentagonal, sometimes eyes absent in fixed material, but normally 4 eyes in open trapezoidal arrangement (Fig. 57A). Antennae cylindrical, smooth, long; median antenna inserted between posterior eyes, longer than combined length of prostomium and palps; lateral antennae inserted close to anterior eyes, shorter than median antenna. Palps longer than prostomium, triangular, basally fused (Figs 57A, 58A). Peristomium similar in length to subsequent segments; tentacular cirri similar to antennae; usually dorsal tentacular cirri longer than ventral tentacular cirri. Some dorsal cirri of anterior segments long, slender, filiform, others slightly shorter than body width, rest shorter than half of body width (Figs 57A, 58A); on midbody dorsal cirri alternating long and short. Parapodia of anterior segments large, subrectangular, becoming slender from proventricle segments (Fig. 57A). Ventral cirri digitiform, shorter than parapodial lobes. Anterior segments with transverse row of long cilia; from proventricular segments, 2 rows of dorsal cilia per segment (Fig. 57A). Anterior parapodia with numerous compound chaetae, about 15, with elongated blades, distally stout, with short subdistal tooth, and coarse spines on margin (Figs 57B, 58B,C), spines slightly longer on ventral chaetae (Fig. 58D); from proventricle posteriorly, some compound chaetae becoming more elongated, spiniger-like, with filiform blades, apparently unidentate (Figs 57C, 58E); other chaetae

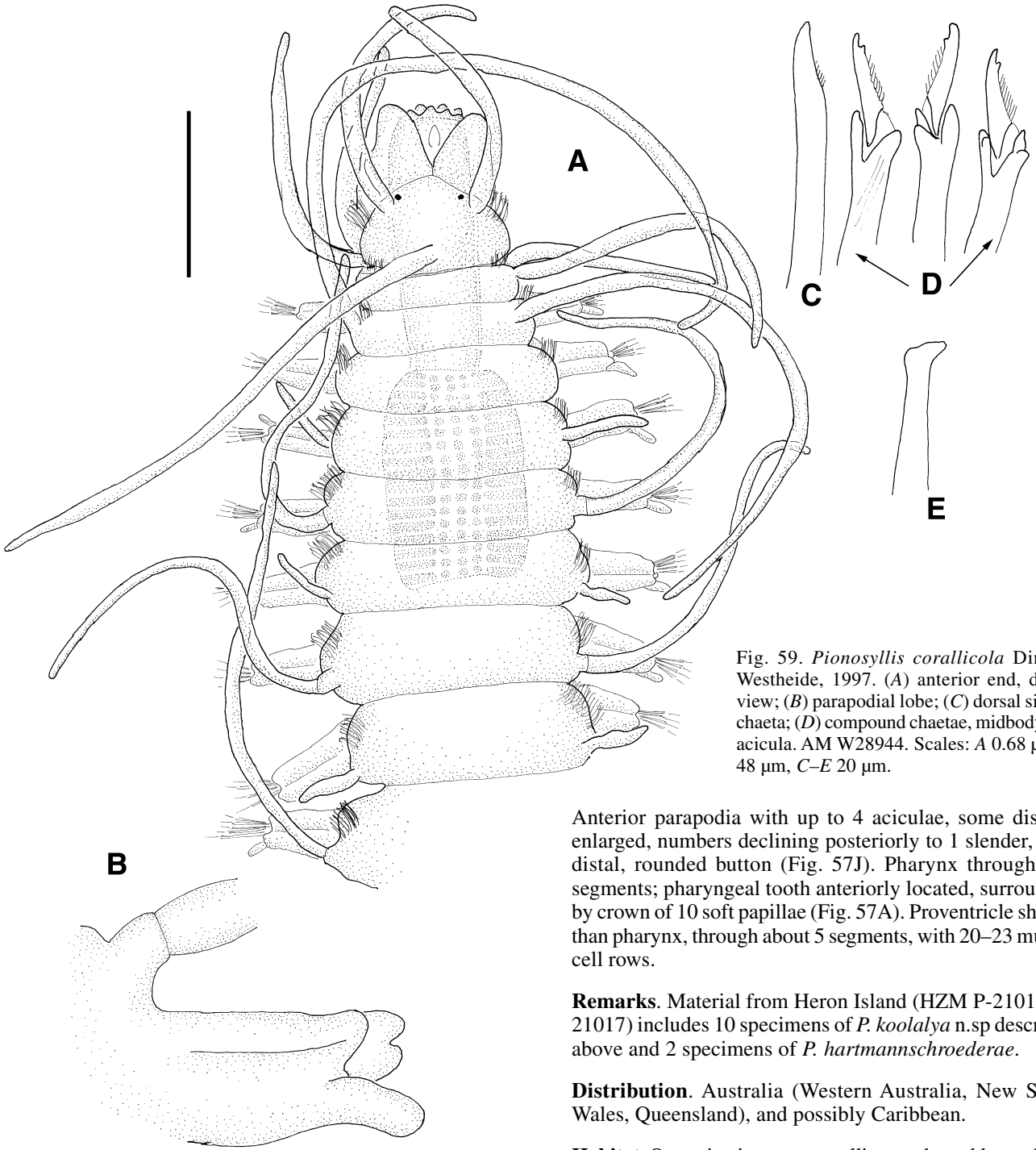



Fig. 59. *Pionosyllis corallicola* Ding & Westheide, 1997. (*A*) anterior end, dorsal view; (*B*) parapodial lobe; (*C*) dorsal simple chaeta; (*D*) compound chaetae, midbody; (*E*) acicula. AM W28944. Scales: *A* 0.68 μm, *B* 48 μm, *C–E* 20 μm.

with blades falcigerous, distally rounded, with subdistal tooth, and long spines distally directed (Fig. 57D). Posteriorly, falcigers with shorter blades, with longer and thinner spines on margin, especially basally (Fig. 57F), and longer spiniger-like chaetae (Fig. 57E). Midbody and posterior parapodia with 1 spiniger-like chaetae and 6 falcigers; posteriorly 1 spiniger-like and 4 falcigers (Figs 57F, 58F), some with long basal spines on margin. Dorsal simple chaetae from midbody, distally provided with spines of varying length (Fig. 57G), longer spines on posterior parapodia (Fig. 57H). Ventral simple chaetae on posterior parapodia, distally bidentate, both teeth similar and well separated, with some long subdistal spines (Fig. 57I). Anterior parapodia with up to 4 aciculae, some distally enlarged, numbers declining posteriorly to 1 slender, with distal, rounded button (Fig. 57J). Pharynx through 6–7 segments; pharyngeal tooth anteriorly located, surrounded by crown of 10 soft papillae (Fig. 57A). Proventricle shorter than pharynx, through about 5 segments, with 20–23 muscle cell rows.

**Remarks**. Material from Heron Island (HZM P-21018; P-21017) includes 10 specimens of *P. koolalya* n.sp described above and 2 specimens of *P. hartmannschroederae*.

**Distribution**. Australia (Western Australia, New South Wales, Queensland), and possibly Caribbean.

**Habitat**. Occurring in coarse coralline sand, muddy sand, and sediment in seagrasses beds, from intertidal to shallow depths.

### *Pionosyllis corallicola* Ding & Westheide, 1997

Fig. 59A–E

*Pionosyllis corallicola* Ding & Westheide, 1997: 285, fig. 6.

**Material examined**. AUSTRALIA: WESTERN AUSTRALIA: 5 km offshore, Bush Bay, 30 km S of Carnarvon, 25°10'S 113°39'E, strap-leaved seagrass beds, 2 m, coll. J.K. Lowry & R.T. Springthorpe, 6 Jan 1984, 1 (AM W28944).

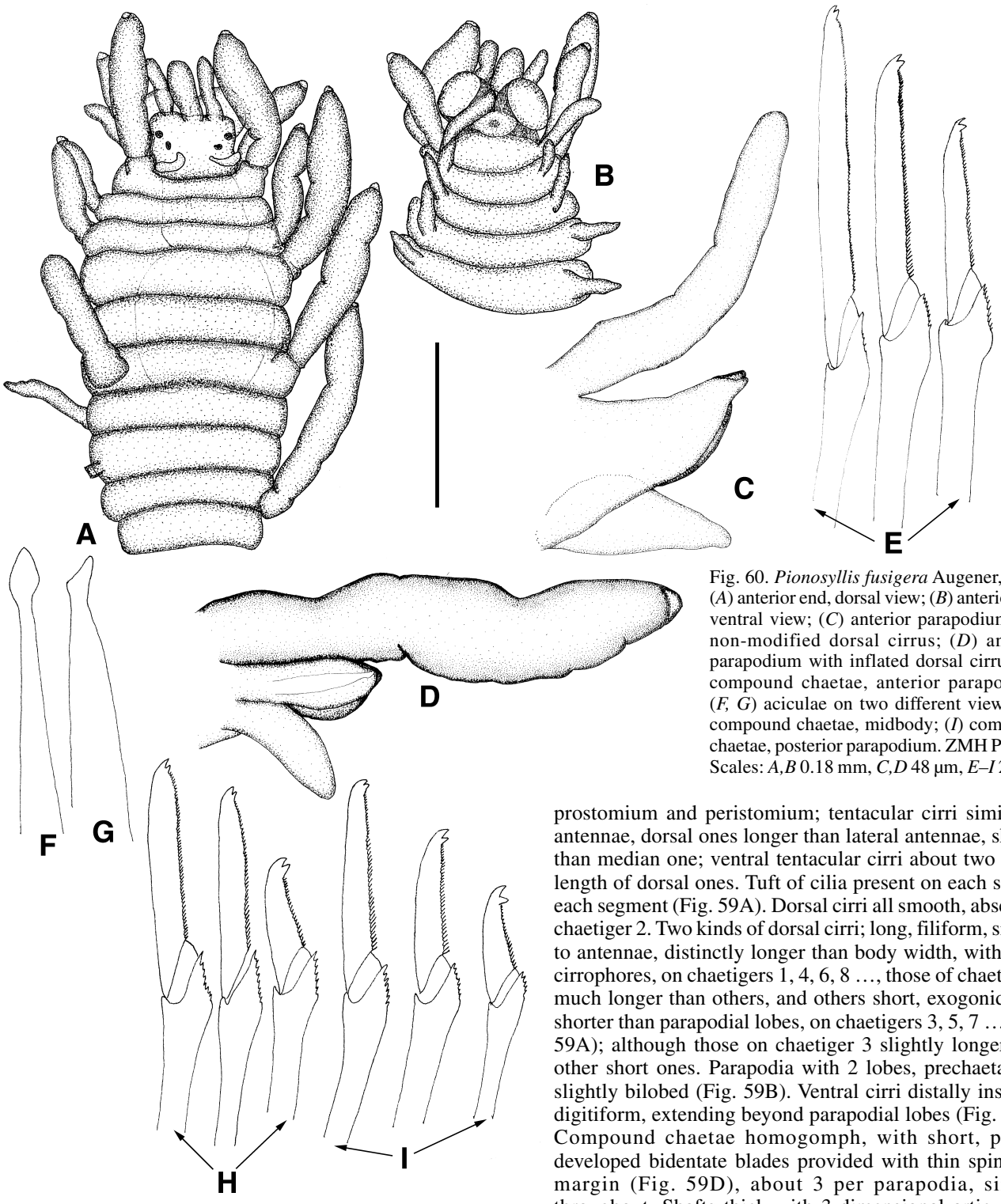



Fig. 60. *Pionosyllis fusigera* Augener, 1913. (*A*) anterior end, dorsal view; (*B*) anterior end, ventral view; (*C*) anterior parapodium with non-modified dorsal cirrus; (*D*) anterior parapodium with inflated dorsal cirrus; (*E*) compound chaetae, anterior parapodium; (*F, G*) aciculae on two different views; (*H*) compound chaetae, midbody; (*I*) compound chaetae, posterior parapodium. ZMH P-7951. Scales: *A,B* 0.18 mm, *C,D* 48 µm, *E–I* 20 µm.

**Description**. Body 3.6 mm long, 0.2 mm wide, with 38 chaetigers. Prostomium semi-circular to pentagonal, with 2 tufts of cilia on each side, and 2 anterior eyespots (Fig. 59A). Antennae filiform, long and slender; median antenna inserted near posterior margin of prostomium, more than 3 times combined length of prostomium and palps; lateral antennae about half of length of median antenna, inserted on anterior margin of prostomium, close to eyespots. Palps triangular to oval, similar in length to prostomium (Fig. 59A). Peristomium similar in length to following segments; nuchal organs distinct, as 2 ciliated grooves between prostomium and peristomium; tentacular cirri similar to antennae, dorsal ones longer than lateral antennae, shorter than median one; ventral tentacular cirri about two thirds length of dorsal ones. Tuft of cilia present on each side of each segment (Fig. 59A). Dorsal cirri all smooth, absent on chaetiger 2. Two kinds of dorsal cirri; long, filiform, similar to antennae, distinctly longer than body width, with short cirrophores, on chaetigers 1, 4, 6, 8 …, those of chaetiger 1 much longer than others, and others short, exogonid-like, shorter than parapodial lobes, on chaetigers 3, 5, 7 … (Fig. 59A); although those on chaetiger 3 slightly longer than other short ones. Parapodia with 2 lobes, prechaetal one slightly bilobed (Fig. 59B). Ventral cirri distally inserted, digitiform, extending beyond parapodial lobes (Fig. 59B). Compound chaetae homogomph, with short, poorly developed bidentate blades provided with thin spines on margin (Fig. 59D), about 3 per parapodia, similar throughout. Shafts thick with 3-dimensional articulation (Fig. 59D). Dorsal simple chaetae unidentate, thick, with few thin spines on margin (Fig. 59C). Ventral simple chaetae absent. Acicula solitary, distally expanded laterally (Fig. 59E). Pharynx through 4 segments, pharyngeal tooth on anterior rim, surrounded by crown of 10 soft papillae (Fig. 59A). Proventricle through 3 segments, with about 14 muscle cell rows. Pygidium semi-circular, with 2 filiform anal cirri.

**Habitat**. Occurring interstitially in coralline sand.

**Distribution**. China (Hainan Is.), Australia (Western Australia).

### *Pionosyllis fusigera* Augener, 1913

Fig. 60A–I

*Pionosyllis fusigera* Augener, 1913: 227, pl. III Fig. 34, text-fig. 32a–c.

**Material examined**. Syntype 1 (HZM V-7951) AUSTRALIA: WESTERN AUSTRALIA: Sharks Bay, Surf Point, Outer Bar, 25°16'S 113°28'E, 1–3.5 m, 16 Jun 1905.

**Description**. Specimen in poor condition, covered with crystals of formalin. Body fragile, without colour pattern, but dark, cylindrical, flattened ventrally, convex dorsally, 4 mm long, 0.5 mm wide for 38 chaetigers, incomplete. According to Augener (1913), dorsal cirri, prostomium and palps pigmented brown and anterior segments with brown dorsal bands. Prostomium sub-quadrangular with rounded corners; 4 eyes almost equal in size, arranged in open trapezoidal pattern; 2 nuchal lobes, kidney shaped, located behind posterior pair of eyes (Fig. 60A). All antennae located on anterior margin of prostomium, short, similar in shape and size, slightly enlarged distally, as long as prostomium; lateral antennae thinner than median one (Fig. 60A). Palps broad, large, fused basally, widely separated distally, folded ventrally (Fig. 60B). Peristomial ring shorter than following segments, dorsally covered between first chaetiger and prostomium and visible only laterally and ventrally, with two pairs of tentacular cirri. Dorsal tentacular cirri and some dorsal cirri similar in shape, smooth, thick, club-shaped, basally slender and gradually becoming wider distally, terminating in globular papillae; most anterior cirri slightly shorter than middle and posterior cirri (Fig. 60B); ventral tentacular cirri similar in shape and size to lateral antennae. Long, club-shaped dorsal cirri alternating with shorter, thinner, digitiform cirri, as long as half of body width (Fig. 60A). Ventral cirri conical to digitiform, distally pointed, almost as long as parapodia. Parapodia with prechaetal lobe larger than postchaetal one (Fig. 60C,D). Compound chaetae heterogomph falcigers; shafts with distal short spines; blade tips bidentate, distal tooth hooked, proximal tooth similar in size to distal one (Fig. 60E,H,I). About 12 compound chaetae on anterior parapodium, number progressively decreasing posteriorly; dorsalmost compound chaetae on each parapodium with elongate, slender, minutely bidentate blade, with numerous fine, short spines on edge, 60 µm in length on anterior parapodia, shorter, about 36 µm in length, posteriorly. Blades of remaining chaetae more strongly bidentate, all similar in shape with slight dorsoventral and anteroposterior gradation in size, blades progressively becoming shorter and wider posteriorly, about 54 µm in length dorsally and 28 µm in length ventrally on anterior parapodia; blades on posterior parapodia about 31 µm in length dorsally and 20 µm in length ventrally (Fig. 60H,I). Anterior parapodia with 2 straight, thick, acuminate, distally pointed aciculae; posterior parapodia with single acicula (Fig. 60F,G). Pharynx, removed from specimen, reaching segment 4, pharyngeal tooth on segment 2 (fide Augener, 1913). Proventricle barrel shaped, extending through 3 chaetigers (from 4 to 7) (Fig. 60A) with about 18 muscle cell rows.

**Habitat**. Occurring in depths of 1 to 3.5m.

**Distribution**. Australia (Western Australia).

### *Pionosyllis hartmannschroederae* n.nom.

Fig. 61A–F

*Typosyllis (Langerhansia) longisetosa* Hartmann-Schröder, 1990: 49, figs 9–12.

*Pionosyllis augeneri*.—Hartmann-Schröder, 1991: 35. Not Hartmann-Schröder, 1979: 98.

**Material examined**. AUSTRALIA: NEW SOUTH WALES: Angourie Point, 29°29'S 153°22'E, algal beds, intertidal, holotype of *Typosyllis (Langerhansia) longisetosa*, (HZM P-19661), paratype (HZM P-19962). WESTERN AUSTRALIA: Goss Passage, Beacon Is., 28°25.5'S 113°47'E, dead coral substrate, in fine sediment at foot of reef slope, P.A Hutchings, 23 May 1994, 4 (AM W28386); NE entrance to Goss Passage, Beacon Is, 28°27.9'S 113°46.7'E, terebellids on rocks in coral sand at foot of slope, 33 m, P.A. Hutchings, 25 May 1994. 1 (AM W26455); inshore limestone reef, Ned's Camp, Cape Range National Park, 21°59'S, fine sediment & sand from patches between reefs, H.E. Stoddart, 2 Jan 1984, 4 (AM W26785); 5 km offshore Bush Bay, 30 km S of Carnarvon 25°10'S 113°55'E, shallow strap-leaved seagrass beds, 2 m, coll. J.K. Lowry & R.T. Springthorpe, 6 Jan 1984, 1 (AM W28926); Descartes Is., Kimberleys, 14°11'S 125°40'E, sandflats & mangroves, coll. P.A. Hutchings, 20 July 1988, 1 (AM W28397).

**Description**. Body 1.4 mm long, 0.2 mm wide, with 53 chaetigers. Prostomium oval to circular, with 4 eyes in open trapezoidal arrangement (Fig. 61A), absent in some specimens (probably lost after fixation); median antenna about two and half times longer than combined length of prostomium and palps, inserted between posterior eyes; lateral antennae slightly shorter than median antenna, inserted near anterior margin. Palps broad, longer than prostomium (Fig. 61A). Peristomium shorter than following segments; dorsal tentacular cirri elongated, filiform, similar to median antenna, ventral tentacular cirri smaller. Dorsal cirri elongate, slender, smooth, filiform, varying in length in different specimens and in each specimen, some cirri long, several times longer than body width, and some cirri shorter than body width, alternating irregularly (Fig. 61A). Anterior parapodia broad, becoming conical and slender from proventricle segments onwards. Ventral cirri digitiform, shorter than parapodial lobes anteriorly, elongated on posterior parapodia, longer than parapodial lobes. Compound chaetae similar throughout, including 1–2 long, slender, filiform spiniger-like chaetae, 180 µm in length, 1–2 falcigers with bidentate blades, provided with long spines on margin, especially basally, and distal spines extending beyond level of distal tooth, straight margin of blade with convex curvature proximally then concave subdistally (Fig. 61C), 45–47 µm in length, and about 5 chaetae with bidentae blades, with long distal spines, and short basal spines (Fig. 61D) and dorsoventral gradation in length within fascicle, 40 µm in length dorsally, 25 µm in length ventrally. Dorsal simple chaetae from proventricle segments, with distinct, short spines on margin (Fig. 61E). Ventral simple chaetae on posterior segments, distinctly bidentate, proximal tooth prominent, slightly longer than distal tooth, and some thin spines on margin, distal one longer than others, extending to level of distal tooth. Aciculae distally knobbed, with 2 lateral, unequal lobes (Fig. 61F); 2 aciculae on anterior parapodia. Pharynx slender, through about 6–7 segments (Fig. 61A). Proventricle through 4–6 segments, with about 24 muscle cell rows. Pygidium small, with 2 filiform anal cirri.

**Remarks**. Hartmann-Schröder described two different species named *longisetosa* in two different genera, on the

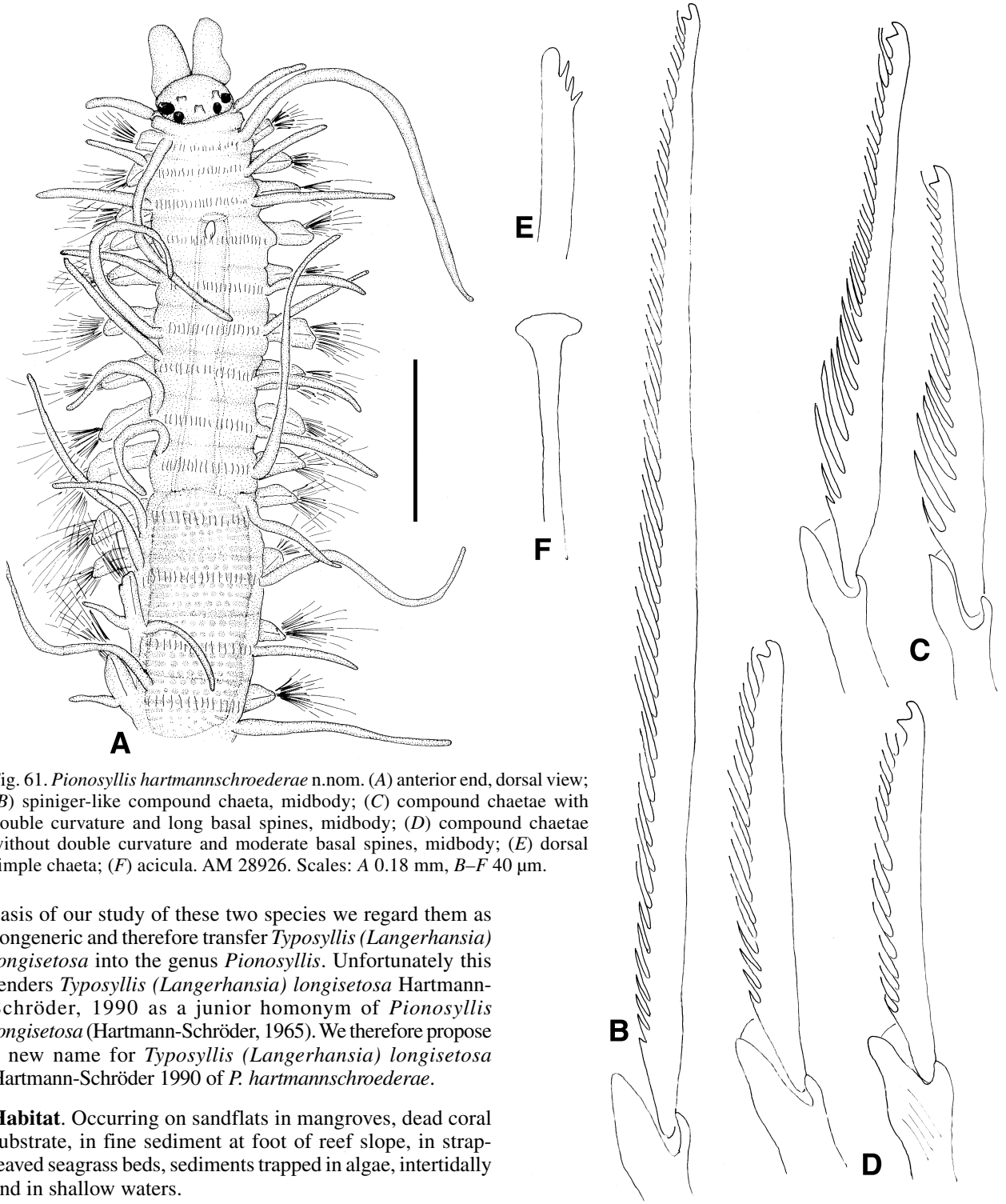



Fig. 61. *Pionosyllis hartmannschroederae* n.nom. (*A*) anterior end, dorsal view; (*B*) spiniger-like compound chaeta, midbody; (*C*) compound chaetae with double curvature and long basal spines, midbody; (*D*) compound chaetae without double curvature and moderate basal spines, midbody; (*E*) dorsal simple chaeta; (*F*) acicula. AM 28926. Scales: *A* 0.18 mm, *B–F* 40 μm.

basis of our study of these two species we regard them as congeneric and therefore transfer *Typosyllis (Langerhansia) longisetosa* into the genus *Pionosyllis*. Unfortunately this renders *Typosyllis (Langerhansia) longisetosa* Hartmann-Schröder, 1990 as a junior homonym of *Pionosyllis longisetosa* (Hartmann-Schröder, 1965). We therefore propose a new name for *Typosyllis (Langerhansia) longisetosa* Hartmann-Schröder 1990 of *P. hartmannschroederae*.

**Habitat**. Occurring on sandflats in mangroves, dead coral substrate, in fine sediment at foot of reef slope, in strap-leaved seagrass beds, sediments trapped in algae, intertidally and in shallow waters.

**Distribution**. Australia (Queensland, Western Australia).

### *Pionosyllis heterochaetosa* n.sp.

Figs 62D–F, 63A–O, 64A–F

**Material examined**. HOLOTYPE (AM W21629) AUSTRALIA: NEW SOUTH WALES: S of airport runway extension, Botany Bay, 33°58.13'S 151°11.16'E, muddy sand, 5 m, coll. Australian Museum party, 6 Apr 1992. PARATYPES S of airport runway extension, Botany Bay, 33°58.13'S 151°11.16'E, muddy sand, 5 m, Australian Museum party, 27 July 1992, 3 on SEM stub (AM W22117); S of airport runway extension, Botany Bay, 33°58.10' 151°11.16'E, muddy sand, 5 m, coll. Australian Museum party, 27 July 1992, 2 (AM W22110); S of airport runway extension, Botany Bay, 33°58.13'S 151°11.16'E, muddy sand, 5 m, Australian Museum party, 6 Apr 1992, 2 (AM W22112); S of airport runway extension, Botany Bay, 33°58.13'S 151°11.16'E, muddy sand, 5 m, coll. Australian Museum party, 27 July 1992, 1 on SEM stub (AM W22116). S of airport runway extension, Botany Bay, 33°58.13'S 151°11.16'E, muddy sand, 5 m, coll. Australian Museum party, 27 July 1992, 2 (AM W22115).

**Description**. Body 4.6 mm long, 0.2 mm wide, with 54 chaetigers. Prostomium circular, with 4 eyes in open trapezoidal arrangement (Fig. 63A); median antenna long, about 3 times longer than combined length of prostomium and palps, inserted between posterior eyes; lateral antennae

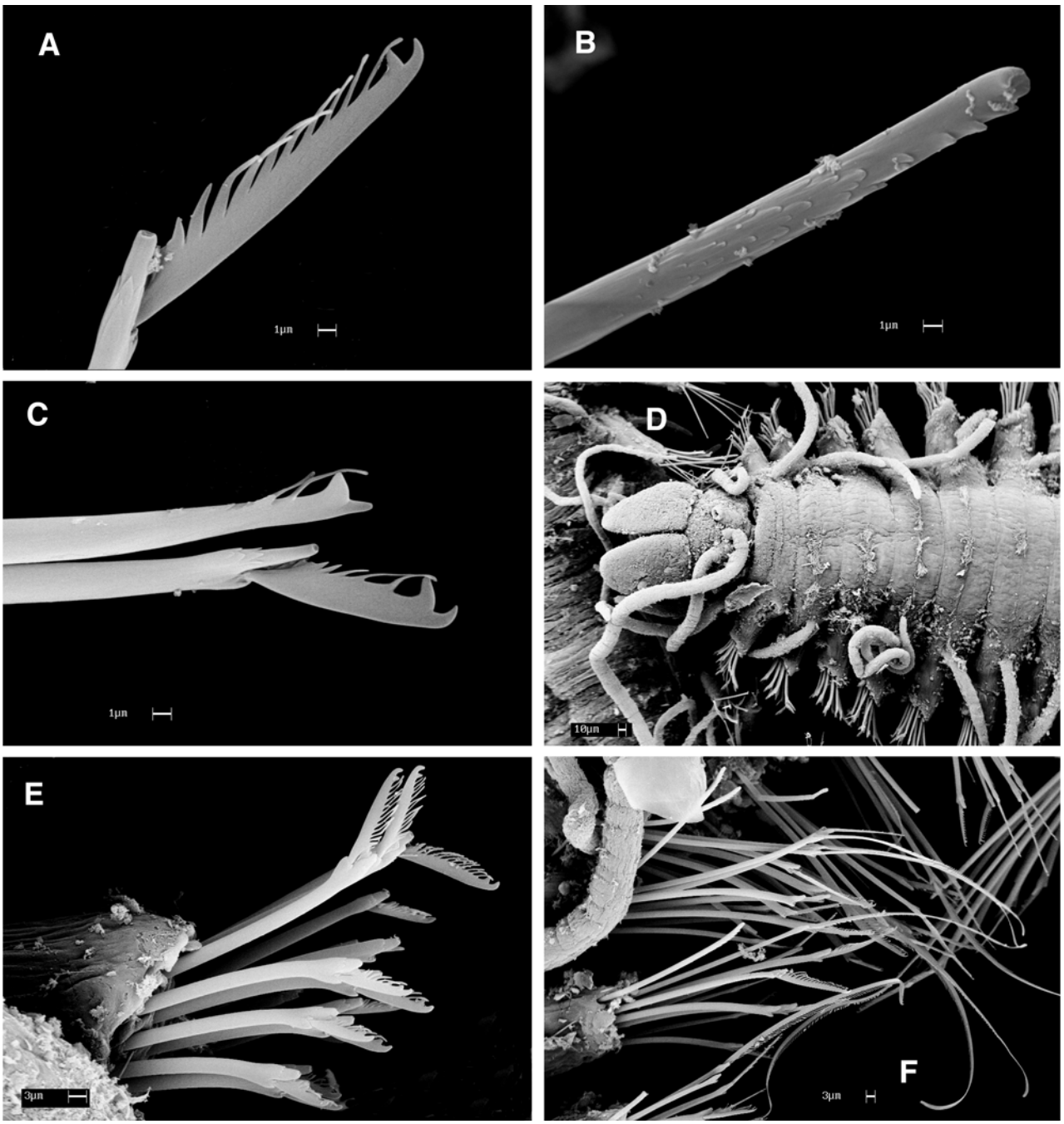



Fig. 62. SEM of *Pionosyllis koolalya* n.sp. (*A*) compound chaeta, midbody; (*B*) dorsal simple chaeta; (*C*) ventral simple chaeta and falciger, posterior parapodium. SEM of *Pionosyllis heterochaetosa* n.sp. (*D*) anterior end, dorsal view; (*E*) compound chaetae, anterior parapodium; (*F*) fascicles of chaetae, midbody. *A–C*: paratype, AM W28409; *D–F*: paratype, AM W22117.

about half or third length of median antenna, inserted near anterior margin. Palps broad, longer than prostomium (Figs 62D, 63A). Peristomium shorter than subsequent segments; dorsal tentacular cirri elongated, filiform, similar to median antenna, ventral tentacular cirri smaller. Dorsum of anterior segments each with transverse band of cilia (Figs 62D, 63A); double row from proventricle segments onwards. Dorsal cirri elongated, slender, smooth, filiform, varying in length in different specimens and in each specimen, some cirri long, several times longer than body width, and some cirri shorter than body width, alternating irregularly (Figs 62D, 63A). Anterior parapodia broad, becoming conical and slender from proventricle segments posteriorly. Ventral cirri digitiform, shorter than parapodial lobes anteriorly, elongated on posterior parapodia, longer than parapodial lobes. Most anterior parapodia with numerous compound chaetae, about 10–15, slightly enlarged shafts, and short, bidentate blades, provided with long spines on margin (Figs 62D,E, 63B), especially on more dorsal chaetae, extending beyond distal tooth, and dorsoventral gradation in length within fascicle, about 16 µm in length dorsally, 5–6 µm in length ventrally. Progressively along body, number of compound chaetae per parapodium decreasing, and blades of more dorsal compound chaetae becoming elongate and more strongly bidentate (Fig. 63C); on chaetiger 5, blades about 22 µm in length dorsally, 12 µm in length ventrally. From proventricular segments, parapodia with 2–3, sometimes only 1, compound chaetae with elongate,

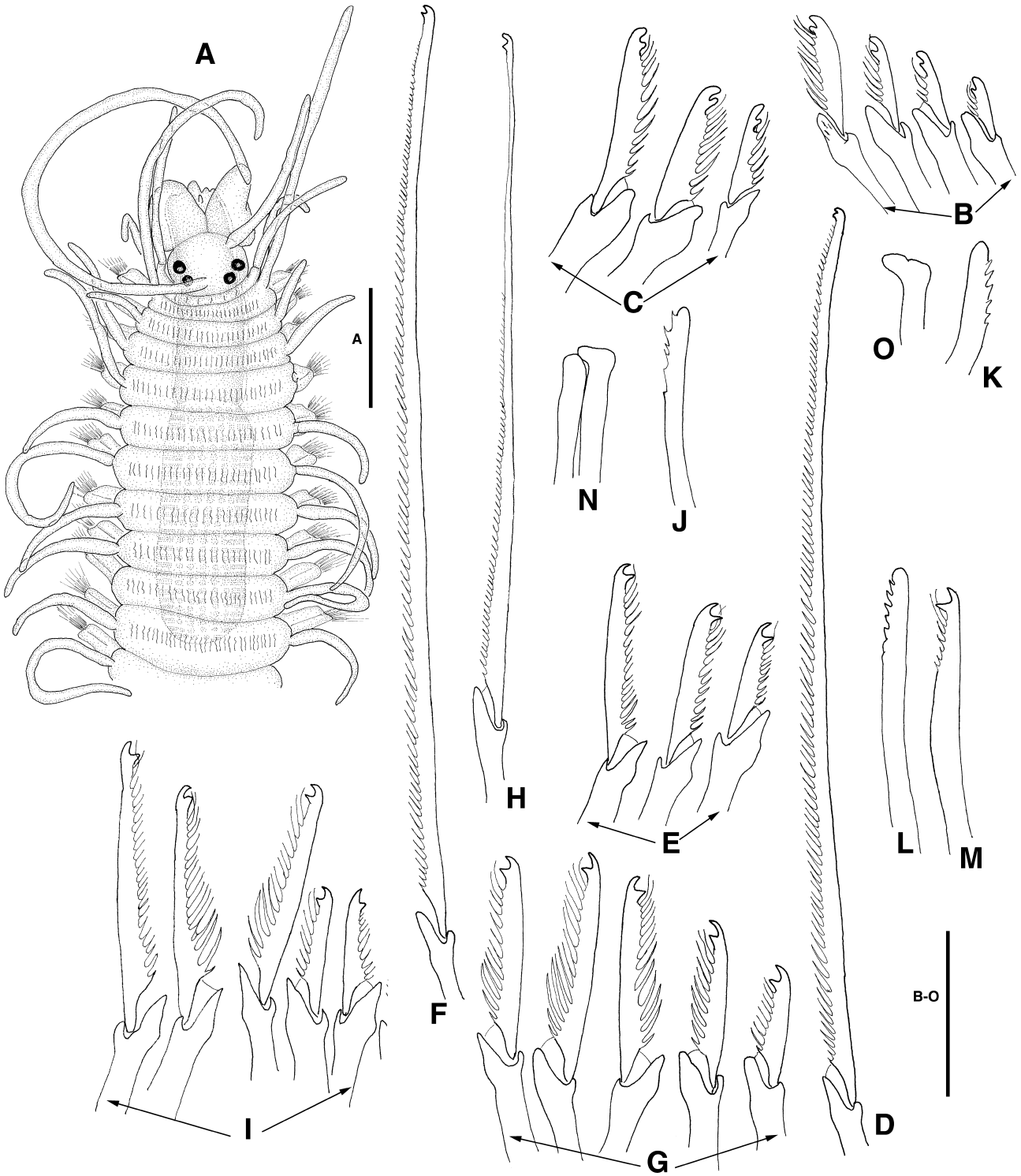



Fig. 63. *Pionosyllis heterochaetosa* n.sp. (*A*) anterior end, dorsal view; (*B*) compound chaetae, anteriormost parapodium; (*C*) compound chaetae, anterior parapodium; (*D*) spiniger-like compound chaeta, mid-anterior parapodium; (*E*) compound chaetae, mid-anterior parapodium; (*F*) spiniger-like compound chaeta, midbody; (*G*) compound chaetae, midbody; (*H*) spiniger-like compound chaeta, posterior parapodium; (*I*) compound chaetae, posterior parapodium; (*J*) dorsal simple chaeta, anterior parapodium; (*K*) same, midbody; (*L*) same, posterior parapodium; (*M*) ventral simple chaeta; (*N*) aciculae, anterior parapodium; (*O*) acicula, posterior parapodium. AM W21629 (holotype). Scales: *A* 0.18 mm, *B–O* 20 μm.

spiniger-like blades (Fig. 62F), about 112 μm in length, weakly bidentate distally, with moderate spines on margin (Fig. 63D,F,H), and 5–6 compound chaetae with falcigerous, bidentate blades, slender, margin with long, distinct, distally pointed basal spines and thin, fine, spines distally (Figs 62F, 63E,G,I, 64B–D), reaching level of distal tooth, and dorsoventral gradation in length within fascicle, 25 μm dorsally, 15 μm ventrally. Dorsal simple chaetae from proventricle segments, distally broad, provided with short spines on margin (Figs 63J–L, 64E). Ventral simple chaetae on posterior segments, bidentate, proximal tooth prominent, slightly longer than distal tooth, and some thin spines on margin, 2–3 distal ones longer than others, reaching to level of distal tooth (Figs 63M, 64F). Aciculae distally knobbed, with 2 lateral, unequal lobes (Fig. 63 O); 2 aciculae on anterior parapodia (Fig. 63N). Pharynx slender, through

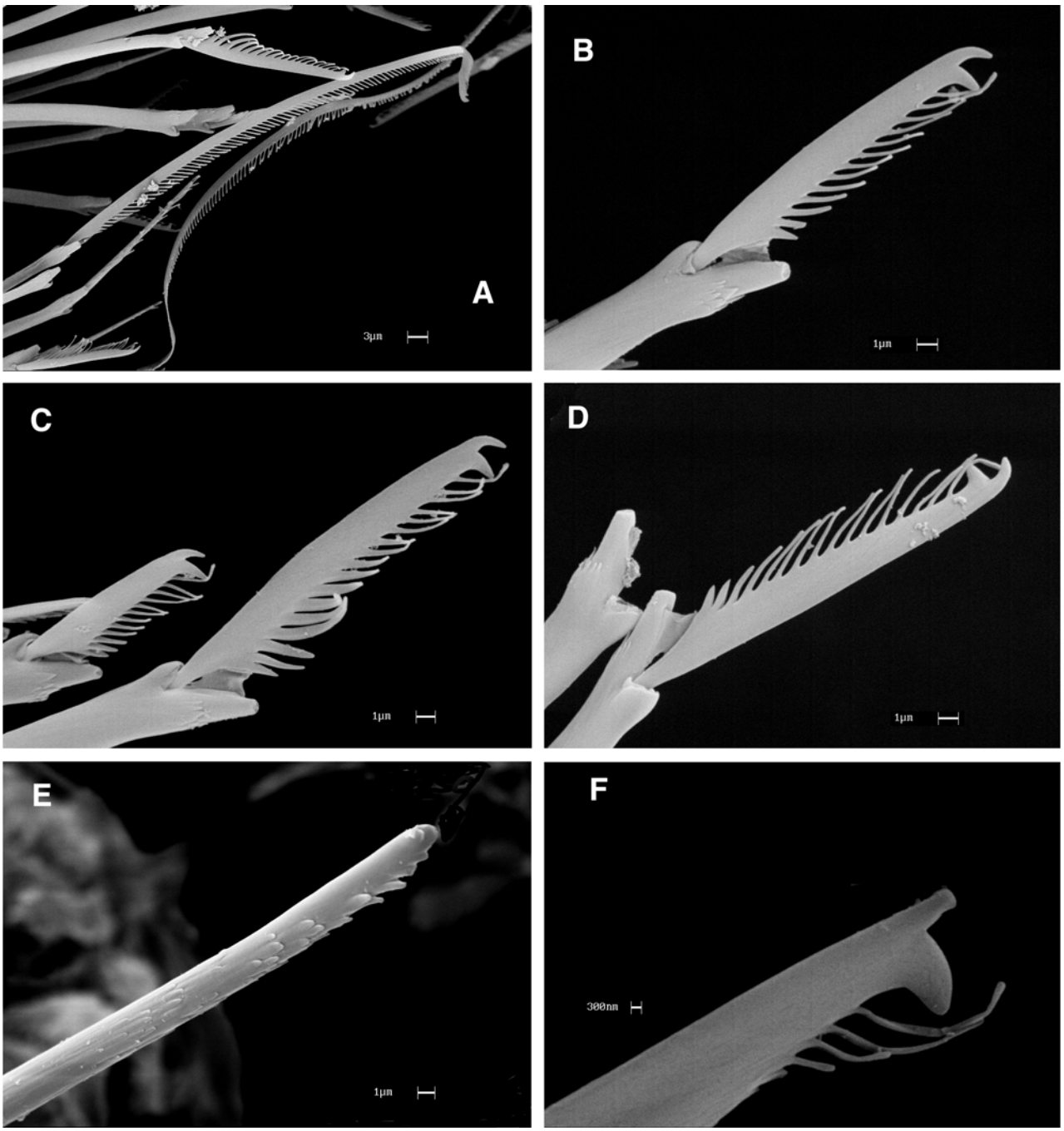



Fig. 64. SEM of *Pionosyllis heterochaetosa* n.sp. (*A*) chaetae, midbody; (*B–D*) compound chaetae, midbody; (*E*) dorsal simple chaeta; (*F*) ventral simple chaeta. AM W22116, AM W22117.

about 6–7 segments (Fig. 63A). Proventricle through 6 segments, with about 24 muscle cell rows. Pygidium small, with 2 filiform anal cirri.

**Remarks**. *Pionosyllis heterochaetosa* n.sp. is characterized by having anterior parapodia without spiniger-like compound chaetae, which appear in post- proventricle segments. *Pionosyllis serrata* and *P. koolalya*, described above, also lack spiniger-like chaetae anteriorly, and posteriorly. All other species of the genus (*P. hartmann-schroederae* and *P. augeneri* described below, as well as *P. spinisetosa* San Martín, 1990, from Cuba, and *P. anophthalma* Capaccioni & San Martín, 1989, from the western Mediterranean Sea), have spiniger-like compound chaetae from chaetiger 1 (see San Martín, 1990, 2003), as well as *P. longisetosa* (Hartmann-Schröder, 1965) from Chile (see Hartmann-Schröder, 1965).

**Distribution**. Australia (New South Wales).

**Habitat**. Occurring in muddy sand at about 5 m depth.

**Etymology**. The specific name refers to the presence of different chaetae on anterior segments compared to others.

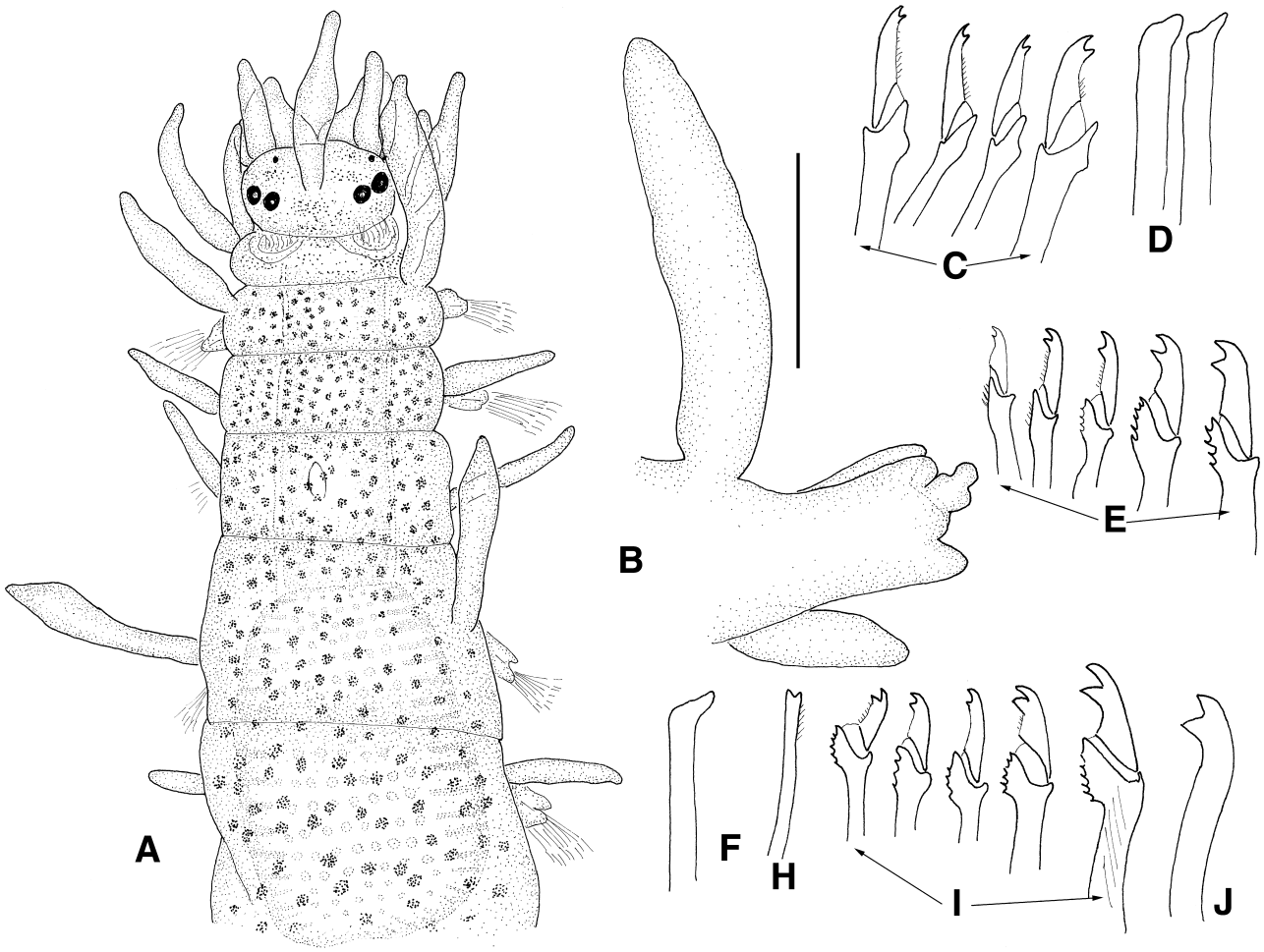



Fig. 65. *Pionosyllis kalimna* n.sp. (*A*) anterior end, dorsal view; (*B*) midbody parapodium; (*C*) compound chaetae, anterior parapodium; (*D*) aciculae, anterior parapodium; (*E*) compound chaetae, midbody; (*F*) acicula, midbody; (*G*) posterior end, dorsal view; (*H*) dorsal simple chaeta; (*I*) compound chaetae, posterior parapodium; (*J*) ventral simple chaeta; (*K*) acicula, posterior parapodium. AM W28948. Scales: *A,G* 0.18 mm; *B* 48 µm; *C–F, H–K* 20 µm.

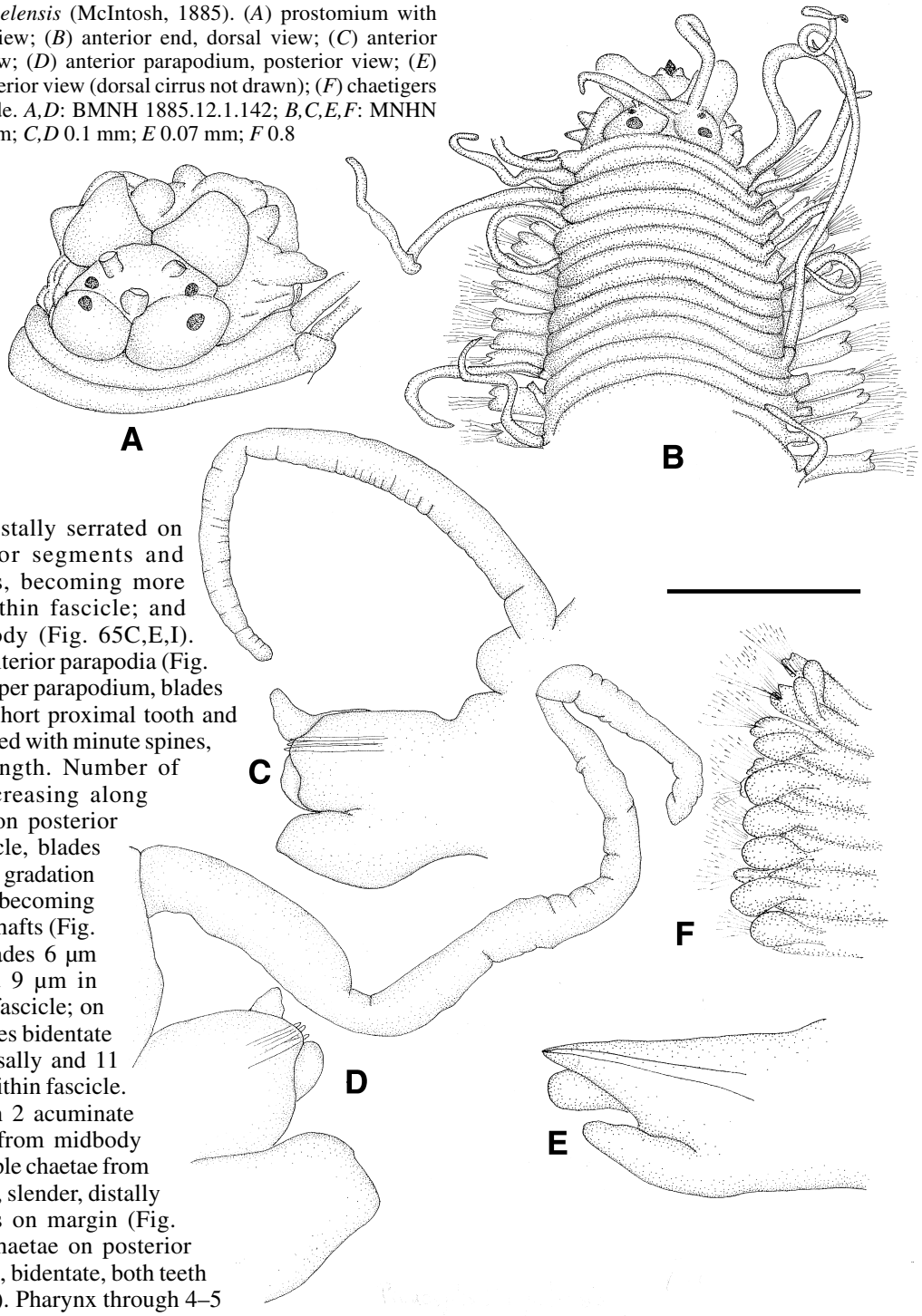
***Pionosyllis kalimna* n.sp.**

Fig. 65A–K

**Material examined**. HOLOTYPE (AM W28948) AUSTRALIA: WESTERN AUSTRALIA: N end of beach, Bundegi Reef, Exmouth Gulf, 21°49'S 114°11'E, rocky rubble, sediment & brown algae with epiphytes, 2 m, coll. H.E. Stoddart, 4 Jan 1984. PARATYPES 2 (AM W26779) N end of beach, Bundegi Reef, Exmouth Gulf, 21°49'S 114°11'E, rocky rubble, coralline algae with green epiphyte, 2 m, coll. H.E. Stoddart, 4 Jan 1984.

**Description**. Body 6.4 mm long, 0.3 mm wide, slightly broad anteriorly, tapering posteriorly, with 39 chaetigers plus 5–6 segments without chaetae (Fig. 65A,G), darkly pigmented prostomium and peristomium, anterior segments covered in numerous red pigment spots (Fig. 65A). Prostomium oval to rectangular, with 4 eyes in open trapezoidal arrangement and 2 anterior eyespots; median antenna inserted between anterior eyes, on middle of prostomium, fusiform, slightly longer than combined length of prostomium and palps; lateral antennae similar to median antenna but less fusiform, inserted in front of anterior margin of prostomium, ventral in relation to median antenna, slightly longer than palps. Palps triangular, divergent, free for most of length, fused basally, slightly shorter than prostomium (Fig. 65A). Peristomium similar in length to subsequent segments, with 2 nuchal organs forming ciliated dorsal pits; dorsal tentacular cirri similar in shape and length to median antenna, ventral tentacular cirri similar to lateral ones. Median antenna, dorsal tentacular cirri, and dorsal cirri of chaetigers 1, 4, and 6, enlarged, fusiform, distinctly longer than remaining appendages (Fig. 65A); remaining dorsal cirri not as fusiform, and shorter, about two thirds length of longer ones. Parapodia with bilobed prechaetal lobe and trilobed postchaetal lobe, medium lobe enlarged at base with rounded tip (Fig. 65B). Ventral cirri digitiform, shorter than parapodial lobes. Compound chaetae heterogomph, with smooth or nearly smooth shafts

Fig. 66. *Pionosyllis kerguelensis* (McIntosh, 1885). (*A*) prostomium with everted pharynx, dorsal view; (*B*) anterior end, dorsal view; (*C*) anterior parapodium, posterior view; (*D*) anterior parapodium, posterior view; (*E*) posterior parapodium, posterior view (dorsal cirrus not drawn); (*F*) chaetigers 1–8, ventral view, right side. *A,D*: BMNH 1885.12.1.142; *B,C,E,F*: MNHN A-921. Scales: *A,B* 0.56 mm; *C,D* 0.1 mm; *E* 0.07 mm; *F* 0.8




anteriorly becoming distally serrated on midbody and posterior segments and bidentate, short blades, becoming more bidentate ventrally within fascicle; and progressively along body (Fig. 65C,E,I). Compound chaetae of anterior parapodia (Fig. 65C) all similar, about 7 per parapodium, blades relatively slender with short proximal tooth and smooth margin or provided with minute spines, about 10–11 µm in length. Number of compound chaetae increasing along body, up to 9 present on posterior parapodia; within fascicle, blades with inverse dorsoventral gradation in length, terminal teeth becoming larger and with thicker shafts (Fig. 65E,I), on midbody, blades 6 µm in length dorsally and 9 µm in length ventrally within fascicle; on posterior parapodia blades bidentate and 6 µm in length dorsally and 11 µm in length ventrally within fascicle. Anterior parapodia with 2 acuminate aciculae (Fig. 65D), 1 from midbody (Fig. 65F,K). Dorsal simple chaetae from mid-posterior parapodia, slender, distally bifid, with short spines on margin (Fig. 65H). Ventral simple chaetae on posterior parapodia, thick, smooth, bidentate, both teeth well separated (Fig. 65J). Pharynx through 4–5 segments; pharyngeal tooth inserted posteriorly to mid pharynx (Fig. 65A), on chaetiger 3. Proventricle through 2 segments, large, with about 30 muscle cell rows, difficult to count. Pygidium semi-circular, with 2 oval, slightly enlarged, anal cirri, slightly longer than pygidium (Fig. 65G).

**Remarks**. *Pionosyllis kalimna* n.sp. is easily distinguished from *P. fusigera* Augener, 1913, by the compound chaetae that are short with two equally well-developed terminal teeth, enlarged dorsal cirri without a distal button; it also differs in the structure of the parapodia, and the colour pattern, black stripes in *P. fusigera*, and small red spots in *P. kalimna*.

**Habitat**. Occurring in rocky rubble, sediment and brown algae with epiphytes, in 2 m depth.

**Distribution**. Australia (Western Australia).

**Etymology**. The specific name comes from an aboriginal word, *kalimna* meaning beautiful.

### *Pionosyllis kerguelensis* (McIntosh, 1885)

Figs 66A–F, 67A–L

*Eusyllis kerguelensis* McIntosh, 1885: pl. 29, fig. 4, pl. 33 fig. 3, Pl. 15a fig. 13. Ehlers, 1897: 42; 1913: 473.—Augener, 1924: 376; 1927: 152.—Monro, 1930: 94, fig. 30a-c; 1936: 130.—Knox, 1951: 73; 1960: 105.—Knox & Cameron, 1998: 49, figs 99–100.—Hartman, 1953: 20; 1964: 81, pl. 25, figs 2–3.—Wesenberg-Lund, 1961: 59, fig. 19.—Hartmann-Schröder, 1965: 115, figs 74; 1986: 77.—Averincev, 1982: 19, pl. II, Figs 1–2.—Hartmann-Schröder & Rosenfeldt, 1988: 39, fig. 16; 1990: 97; 1992: 98.

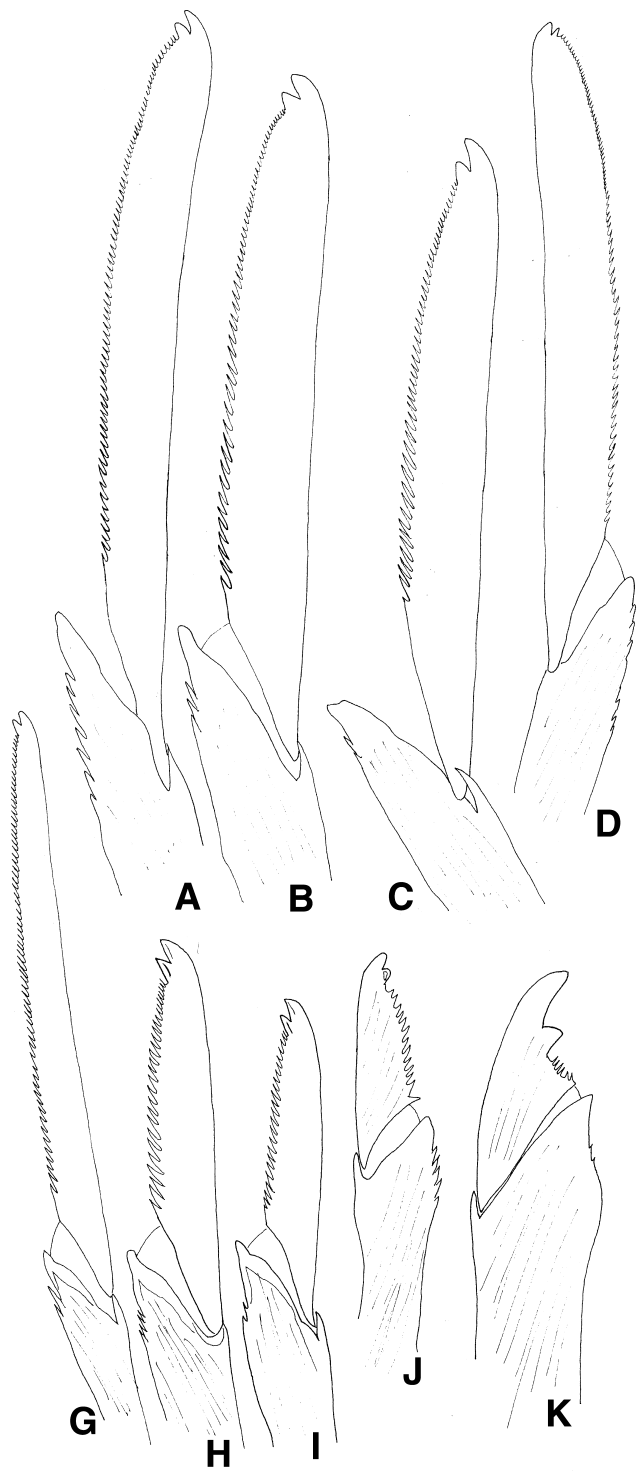
*Pionosyllis comosa* Gravier, 1906: 288.—Ehlers, 1913: 473, pl.32, Figs 1–4.—Benham, 1927: 60.—Monro, 1930: 92; 1936: 128, fig. 20.—Hartman, 1953: 23; 1964: 85, pl. 26 figs 7–8; 1967: 58.

*Pionosyllis cosma* [sic] Knox, 1960: 106.—Knox & Cameron 1998: 51.

*Pionosyllis kerguelensis* San Martín & Parapar, 1997: 291; San Martín, 2004: 16.

**Material examined**. KERGUELEN IS. off Christmas harbour, 49°30'S 69°30'W, 200 m, coll. H.M.S. Challenger, presented McIntosh, syntype of *Eusyllis kerguelensis*, BMNH 1885.12.1.142 (1 ant. end + 2 median parts). FALKLAND ISLANDS: Port Albemarle, 52°11'S 60°26'W, 40 m, sand & algae, coll. Swedish Antarctic Exp. 1901–1903, 8 Sept. 1902, *Pionosyllis comosa*, 2 (SMNH 3332, 3728); Burwood bank, 53°45'S 61°10'W, 137–150 m, shell fragments & stones, coll. Swedish Antarctic Exp. 1901–1903, 12 Sept. 1902, *P. comosa* 1 (SMNH 3660). ARGENTINA: coast of northern Argentina: 37°15'S 56°8'W, 100 m, sand & gravel, coll. Swedish Antarctic Exped. 1901–1903, 23 Dec 1901, *P. comosa* 1 (SMNH 3826). SOUTH GEORGIA: south fjord in front of Nordenskjöld glacier, 54°24'S 36°22'W, 210 m, blue grey mud with few small stones, coll. Swedish Antarctic Exp. 1901–1903, 29 May 1902, *Pionosyllis epipharynx* 1 (SMNH 3033); French Antarctic Exp. Charcot: 1910, *P. comosa* 1 (MNHN A-76), 1906 (*P. comosa*). CROZET ISLANDS: 46°27'S 52°00'E, St. 12, DC 12, *P. comosa*, (MNHN A-921). SOUTH SHETLAND ISLANDS: *Spanish cruise Bentart 94*, coll. *Hespérides*, St. 52, mixed sediment, 62°43'S 60°27'W, 84 m, 1 (MNCNM 1521); St. 71, rocks, 62°43'S 60°26'W, 50 m, 1 (MNCNM 1523); St. 77, mud & organic rests, 62°40'S 60°40'W, 130 m, 1 (MNCNM 1522). TASMAN SEA: 42°17.99'S 170°00.00'E, 958 m depth, 1 (SMF 13225).

**Description**. Body dorsally arched, ventrally flattened, with well defined intersegmental furrows, segments short (Fig. 66B); all specimens fragmented or lacking posterior end; largest specimen examined (SMNH 3033) 29 mm long, 2.5



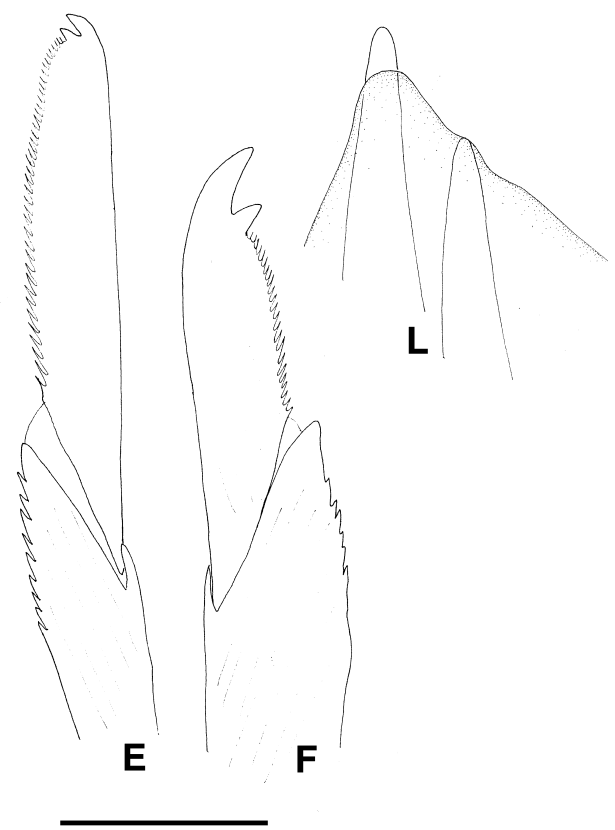




Fig. 67. *Pionosyllis kerguelensis* (McIntosh, 1885) (*A–C*) dorsal, median and ventral compound chaetae, anteriormost parapodium; (*D*) dorsalmost compound chaeta, anterior parapodium; (*E,F*) dorsal and ventral compound chaetae of remaining chaetae, mid-anterior parapodium; (*G*) dorsalmost compound chaeta, mid-posterior parapodium; (*H,I*) dorsal and ventral compound chaetae of remaining chaetae, mid-posterior parapodium; (*J,K*) dorsal and ventral compound chaetae, posterior parapodium; (*L*) aciculae. *A–F*: BMNH 1885.12.1.142; *G–L*: MNHN A-76. Scales: 14 µm.

mm wide for 34 chaetigers; without colour markings (preserved specimens). Prostomium with irregular surface, with longitudinal and transverse grooves forming two posterior cheeks (Fig. 66A,B); 4 eyes arranged in trapezoidal pattern, anterior pair subequal or smaller than posterior one, located on cheeks and often covered by peristomium and chaetiger 1. Palps broad, long, divergent, distally rounded, slightly longer than prostomium, basally fused, with dorsal furrow (Fig. 66A,B). Antennae detached or broken in most specimens; much longer than prostomium (according to Hartman, 1964); median antenna more than twice as long as lateral ones (according to Gravier, 1906), originating just in front of median cleft, lateral antennae inserted on anterior margin of prostomium. Peristomium short, dorsally visible, with 2 pairs of tentacular cirri; dorsal tentacular cirri much longer than ventral ones, similar in shape to antennae and dorsal cirri. Long dorsal cirri smooth basally, weakly crenulated distally, about 4 times as long as body width; short dorsal cirri slightly longer than body width, alternating irregularly with long cirri (Fig. 66B–D). Ventral cirri broad, thick, inflated, almost as large as parapodial lobes on anterior chaetigers (Fig. 66C,D), except those of chaetigers 1–2 (Fig. 66F), shorter and thinner posteriorly (Fig. 66E). Parapodial lobes with long digitiform, dorsal prechaetal papilla (Figs 66C–E). Anterior parapodia with more than 40 compound chaetae, decreasing to about 10 on posterior parapodia. Compound chaetae heterogomph falcigers; shafts increasing in width posteriorly along body and dorsoventrally within fascicle, with spinose endings. Blades bidentate, with short, distally directed spines on margin; with marked dorsoventral and anteroposterior gradation in both shape and size; dorsal blades on anterior and midbody parapodia long, finely spinulated on margin, distal tooth slightly hooked, proximal tooth slightly smaller, ventral blades basally wider, distal tooth hooked and slightly larger than proximal one (Fig. 67A–C); posterior segments with 1–2 dorsal chaetae with elongate, slender blades (Fig. 67D) and remaining chaetae with dorsoventral gradation (Fig. 67E,F); in midbody, this arrangement more marked (Fig. 67G–I); on posterior fascicles, most dorsal chaetae with short blades (Fig. 67J), blades of remaining falcigers similar in length to dorsal ones, but wider, proximal tooth long, triangular (Fig. 67K). Blades of anterior compound chaetae about 100 µm in length dorsally, 40 µm in length ventrally; posterior blades 55 µm in length dorsally, 35 µm in length ventrally. Anterior parapodia with 4–5 straight, thick, aciculae, pointed tip protruding beyond parapodial lobes; posterior parapodia with 1–2 aciculae (Fig. 67L). Dorsal and ventral simple chaetae not seen. Pharynx wide, everted in some specimens, extending through 8–9 chaetigers, with 2 crowns of papillae surrounding opening; pharyngeal tooth conical, located on anterior dorsal rim (Fig. 67A,B). Proventricle barrel shaped, extending to chaetiger 17–18, slightly longer than pharynx.

**Habitat**. Occurring in fine grey sandy mud, volcanic mud, hard bottom, sand and shells, intertidally to 2916 m (Ehlers, 1913).

**Distribution**. Coast of North Argentina, Antarctic and Subantarctic seas: Kerguelen Is. South Georgia, Falkland Is., Magellan area, Davis Sea, Palmer Archipelago, Drake Passage, South Orkney Is. Antarctic Peninsula, South Shetland, Australia (Tasmania, New South Wales), New Zealand, Crozet Is.

### *Pionosyllis koolalya* n.sp.

Figs 62A–C, 68A–P, 69A–F

*Pionosyllis augeneri*.—Hartmann-Schröder, 1991: 359–125. Not Hartmann-Schröder, 1979: 98.

**Material examined**. HOLOTYPE (AM W28945) AUSTRALIA: SOUTH AUSTRALIA: Speeds Point, Streaky Bay, 32°48'S 134°13'E, coll. P.A. Hutchings, 14 Mar 1979. PARATYPE 1 on SEM stub (AM W28409). NEW SOUTH WALES: Bottle & Glass Rocks, Port Jackson, 33°51'S 151°16'E, substrate unknown, 12m, coll. G. Clark, 11 Dec 1989.

**Additional material examined**. QUEENSLAND: Heron Is., 23°27'S 151°55'E, sand, intertidal, coll. G. Hartmann-Schröder, id. as *Pionosyllis augeneri* (HMZ P-21018, P-16796).

**Description**. Holotype 12.8 mm long, 0.3 mm wide, with 71 chaetigers; paratype much smaller. Prostomium oval, with 4 eyes arranged in open trapezoidal pattern (Fig. 68A). Median antenna long, coiled on holotype, several times longer than combined length of prostomium and palps, inserted between posterior eyes; lateral antennae distinctly shorter than median antenna, inserted near anterior margin of prostomium (Figs 68A, 69A–C). Palps broad, similar in length to prostomium or slightly longer. Tentacular and dorsal cirri long, smooth, coiled on holotype, long on anterior segments, becoming shorter on segments beyond proventricle, alternating long cirri (Figs 68C, 69A,B), 2–3 times as long as body width, and short cirri (Fig. 68B), slightly shorter than body width; dorsal cirri with cirrophores. Ciliary bands on dorsum of each segment and areas of dorsal cirri (Fig. 68B–D), distinct on holotype (Fig. 68A); anterior segments with single ciliary band (Fig. 69B,C), double from proventricle segments posteriorly (Fig. 69D). Parapodial lobes conical, ending with 2 lobes (Fig. 68B,D). Ventral cirri digitiform, shorter than parapodial lobes anteriorly, becoming longer posteriorly (Fig. 68B,D). Anterior parapodia with about 10–14 compound chaetae, slightly enlarged, distally truncated shafts, provided with short subdistal spines, and bidentate blades, both teeth similar, with long spines on margin, pointing distally, those of basal part coarse, distal ones thin, reaching or extending beyond proximal tooth, 1–3 slightly longer (Fig. 68E), rest of chaetae within fascicle with slight dorsoventral gradation in length (Fig. 68F), 26 µm in length dorsally, 18 µm in length ventrally. Posteriorly, number of compound chaetae per parapodium decreasing, and blades of 1–3 most dorsal compound chaetae becoming proportionally longer (Figs 68H, 69F) and rest with dorsoventral gradation in length (Figs 68I, 69E); midbody parapodia with 1–2 compound chaetae with relatively long blades, about 31 µm in length, and 4 compound chaetae 15–25 µm in length; proximal tooth proportionally longer than those of anterior chaetae (Fig. 62A). Posterior parapodia with 1 compound chaeta with long blades (Fig. 68K), 33 µm long, and 3 compound chaetae, similar to those of midbody, but with distinctly larger proximal tooth (Figs 68L, 62C), well separated from distal tooth, 18–22 µm in length. Dorsal simple chaetae from midbody, distally bifid to truncate (Figs 68G, 62B), thicker posteriorly, with short, coarse spines on margin (Fig. 68 O ). Ventral simple chaetae on posterior parapodia, sigmoid, thick, strongly bidentate, both teeth well separated, almost at 90°, proximal tooth long, broad, slightly hooked, with few, long subdistal spines, surpassing level of proximal tooth (Figs 68P, 62C). Two aciculae on anterior segments (Fig. 68M), 1 from proventricle segments onwards, distally bilobed (Fig. 68J), thicker on posterior parapodia (Fig. 68N). Pharynx through

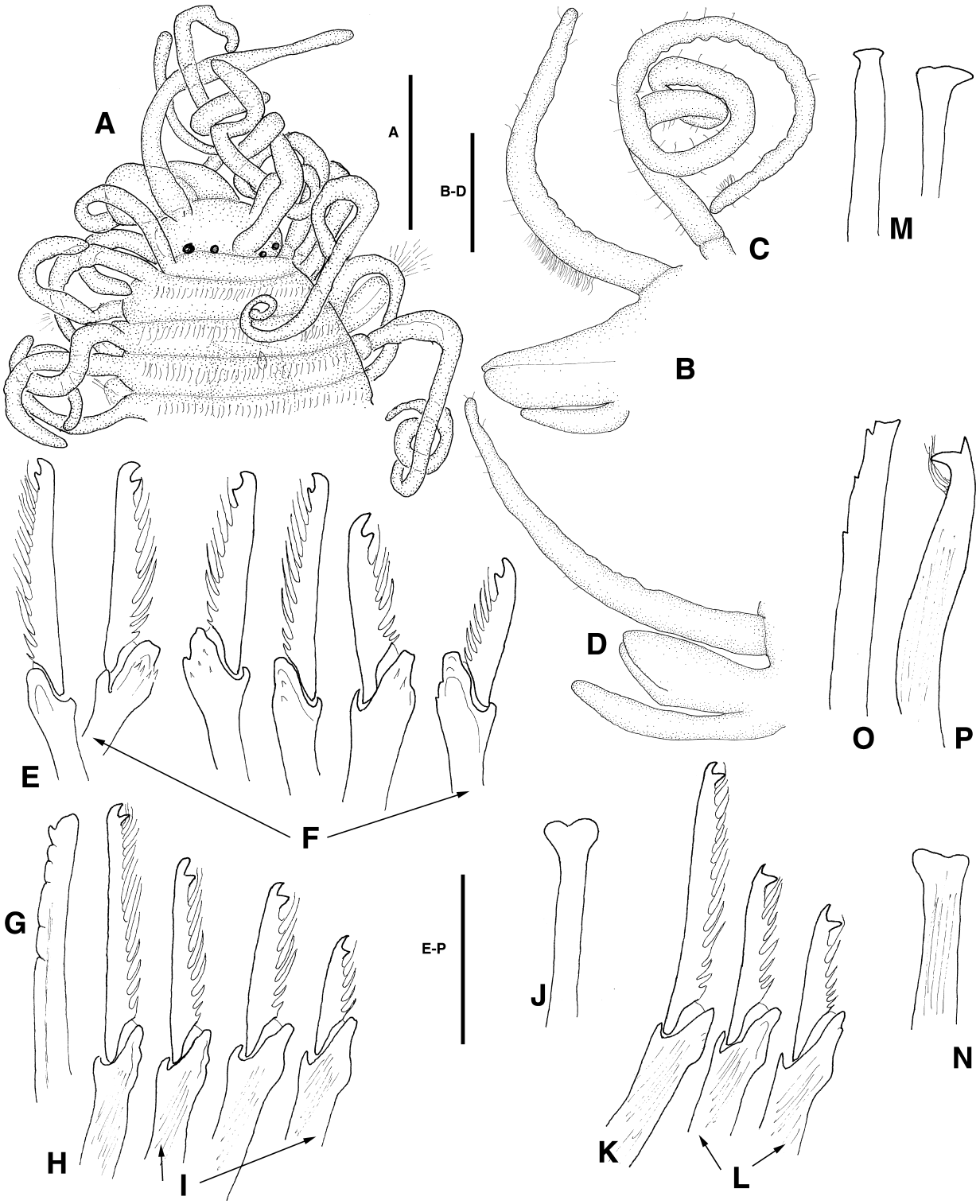



Fig. 68. *Pionosyllis koolalya* n.sp. (*A*) anterior end, dorsal view; (*B*) midbody parapodium with short dorsal cirri; (*C*) long dorsal cirri, midbody; (*D*) posterior parapodium; (*E*) long-bladed compound chaeta, anterior parapodium; (*F*) compound chaetae, anterior parapodium; (*G*) dorsal simple chaeta, midbody; (*H*) long-bladed compound chaeta, midbody; (*I*) compound chaetae, midbody; (*J*) acicula, midbody; (*K*) long-bladed compound chaeta, posterior parapodium; (*L*) dorsal and ventral compound chaetae, posterior parapodium; (*M*) aciculae, anterior parapodium; (*N*) acicula, posterior parapodium; (*O*) dorsal simple chaeta, posterior parapodium; (*P*) ventral simple chaeta. AM W28409. Scales: *A* 0.18 mm, *B–D* 97 μm, *E–P* 20 μm.

about 6 segments, pharyngeal tooth located on anterior rim. Proventricle through 4 segments, with about 26 muscle cell rows. Pygidium small, with 2 anal cirri.

**Remarks**. *Pionosyllis koolalya* is similar to *P. serrata* described above but differs mainly in lacking enlarged anterior parapodia with thick compound chaetae with markedly short blades; remaining compound chaetae are rather similar, but the dorsal simple chaeta of *P. koolalya* is truncated, and slightly bifid in *P. serrata*. All other species of the genus are provided with long, spiniger-like chaetae. These two species also have fewer compound chaetae with

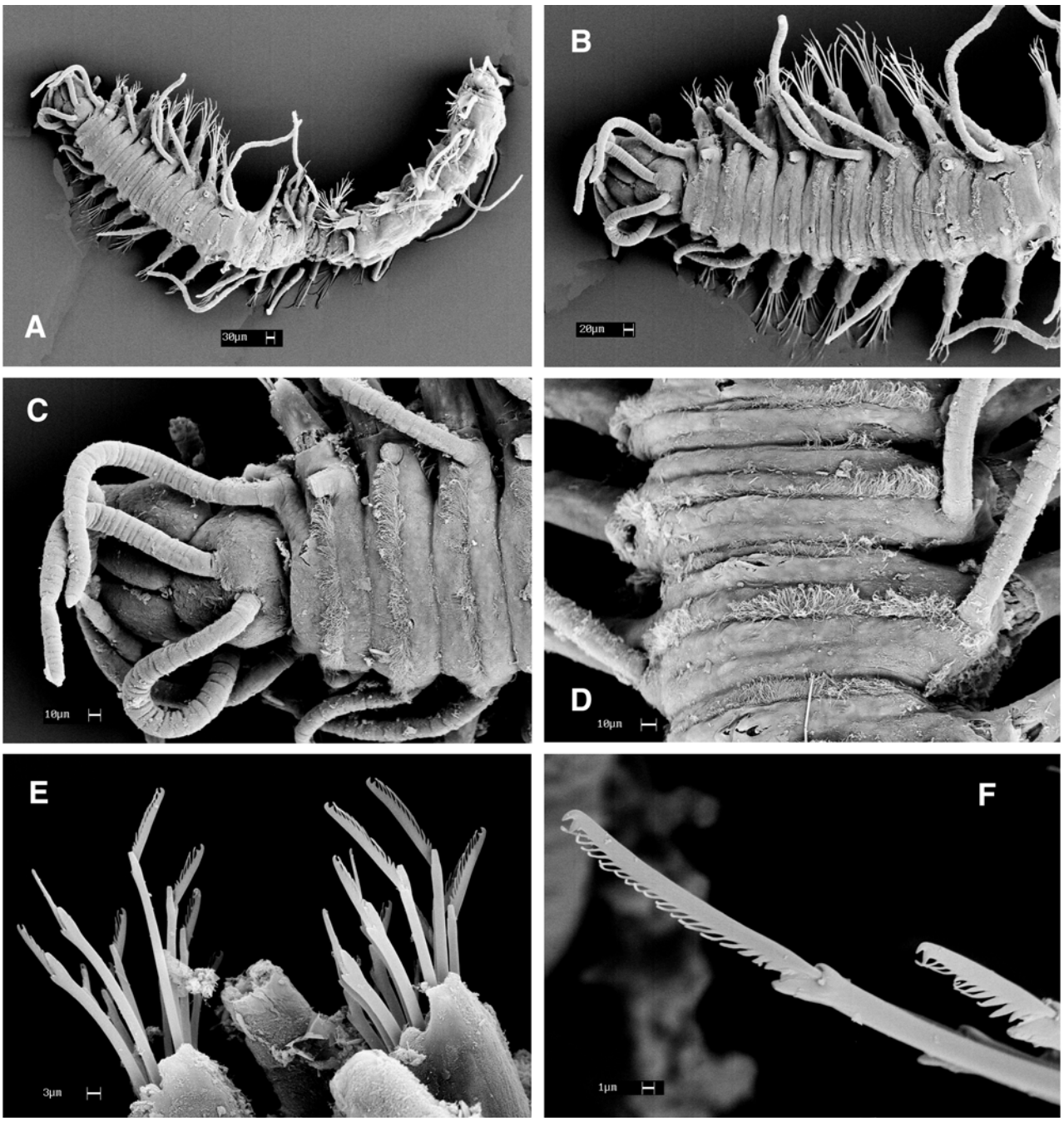



Fig. 69. SEM of *Pionosyllis koolalya* n.sp. (*A*) incomplete specimen, dorsal view; (*B*) anterior end, dorsal view; (*C*) detail of same; (*D*) detail of dorsum, midbody; (*E*) compound chaetae, midbody; (*F*) long-bladed compound chaeta, and one short-bladed, compound chaeta. Paratype, AM W28409.

distinctly longer blades than other chaetae in the fascicle, but they are relatively short and less than half the length of the longest bladed chaetae. Some material of *P. augeneri* (Hartmann-Schröder, 1991) from Heron Island, Queensland, belong to this new species.

**Habitat**. Unknown, occurring from intertidal to 12 m.

**Distribution**. Australia (South Australia, New South Wales, Queensland).

**Etymology**. The specific name comes from an aboriginal word, *koolalya*, meaning feather epaulettes, in reference to the ciliated dorsum.

### *Pionosyllis mariae* n.sp.

Figs 46D–F, 70A–J, 71A–F, 72A–C

**Material examined**. HOLOTYPE (AM W28454) AUSTRALIA: QUEENSLAND: Outer Yonge Reef, Great Barrier Reef, 14°36'S 145°38'E, rock with *Lithothamnion* & *Halimeda*, 30 m, coll. P.A. Hutchings, 24 Jan 1977. PARATYPE (AM W28921) Outer Yonge Reef, Great Barrier Reef, 14°36'S 145°38'E, rock covered with pink coralline algae, encrusting sponges, 9 m, coll. P.A. Hutchings, 21 Jan 1977.

**Other material examined**. NEW SOUTH WALES: Taupo Seamount, Tasman Sea, 33°16.85'S 156°09.15'E, limestone & sand bottom, 244 m, coll. J.K. Lowry & party on RV *Franklin*, 2 May 1989, 1 on SEM stub (AM W28873).

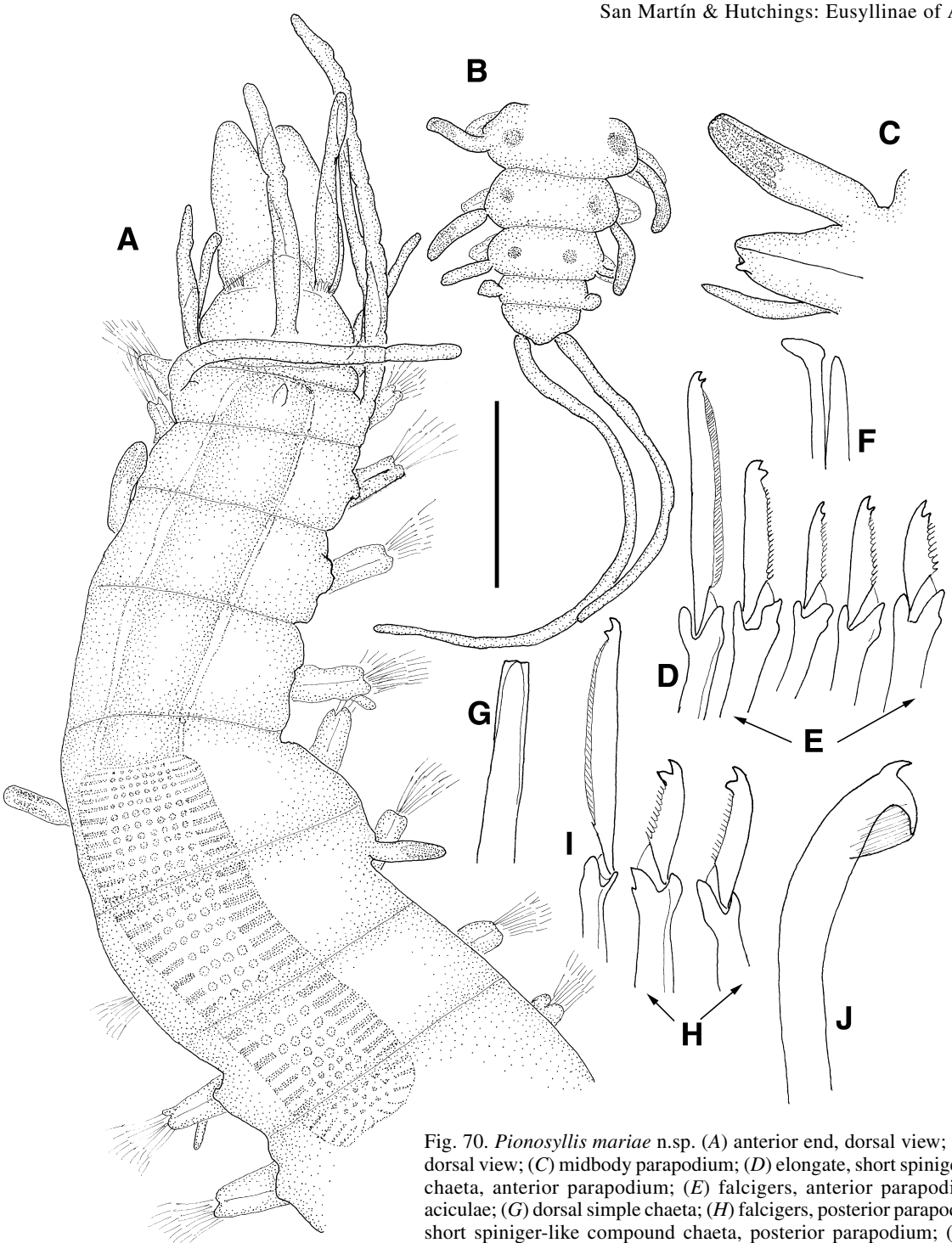



Fig. 70. *Pionosyllis mariae* n.sp. (*A*) anterior end, dorsal view; (*B*) posterior end, dorsal view; (*C*) midbody parapodium; (*D*) elongate, short spiniger-like, compound chaeta, anterior parapodium; (*E*) falcigers, anterior parapodium; (*F*) anterior aciculae; (*G*) dorsal simple chaeta; (*H*) falcigers, posterior parapodium; (*I*) elongate, short spiniger-like compound chaeta, posterior parapodium; (*J*) ventral simple chaeta. AM W28454. Scales: *A,B* 0.18 mm; *C* 92 µm; *D–J* 20 µm.

**Description**. Body slender, filiform (Fig. 46D), 7 mm long, 0.3 mm wide, 54 chaetigers. Prostomium pentagonal to triangular, with 4 eyes in open trapezoidal arrangement, and sometimes 2 anterior eyespots. After fixation, however, eyes may be absent (Fig. 70A). Lateral antennae inserted between anterior eyes and eyespots, near anterior margin of prostomium, smooth, similar in length to palps; median antenna arising between posterior eyes, long, often curled, distally pseudoarticulated, broken on holotype (Fig. 70A), more than twice length of prostomium. Palps longer than prostomium, triangular, directed behind, fused basally. Two transverse, small, ciliated furrows on prostomium (Figs 46F arrow, 70A). Peristomium distinct, slightly shorter than subsequent segments; tentacular cirri elongated, dorsal tentacular cirri longer than lateral antennae, shorter than median one, ventral tentacular cirri shorter than dorsal ones (Figs 46E,F, 70A). Dorsal cirri of chaetiger 1 long, slender, similar to median antenna, sometimes pseudoarticulated distally. Dorsal cirri short, slightly longer than parapodial lobes, fusiform (Fig. 71A,B), distally more or less truncated (Fig. 70A,C), usually with some fibrillar inclusions, with terminal pore (Fig. 71C arrow). Dorsal cirri absent on chaetiger 2, tuft of cilia present (Fig. 46E,F arrow). Parapodia conical, with distal papilla (Figs 70C, 71A).

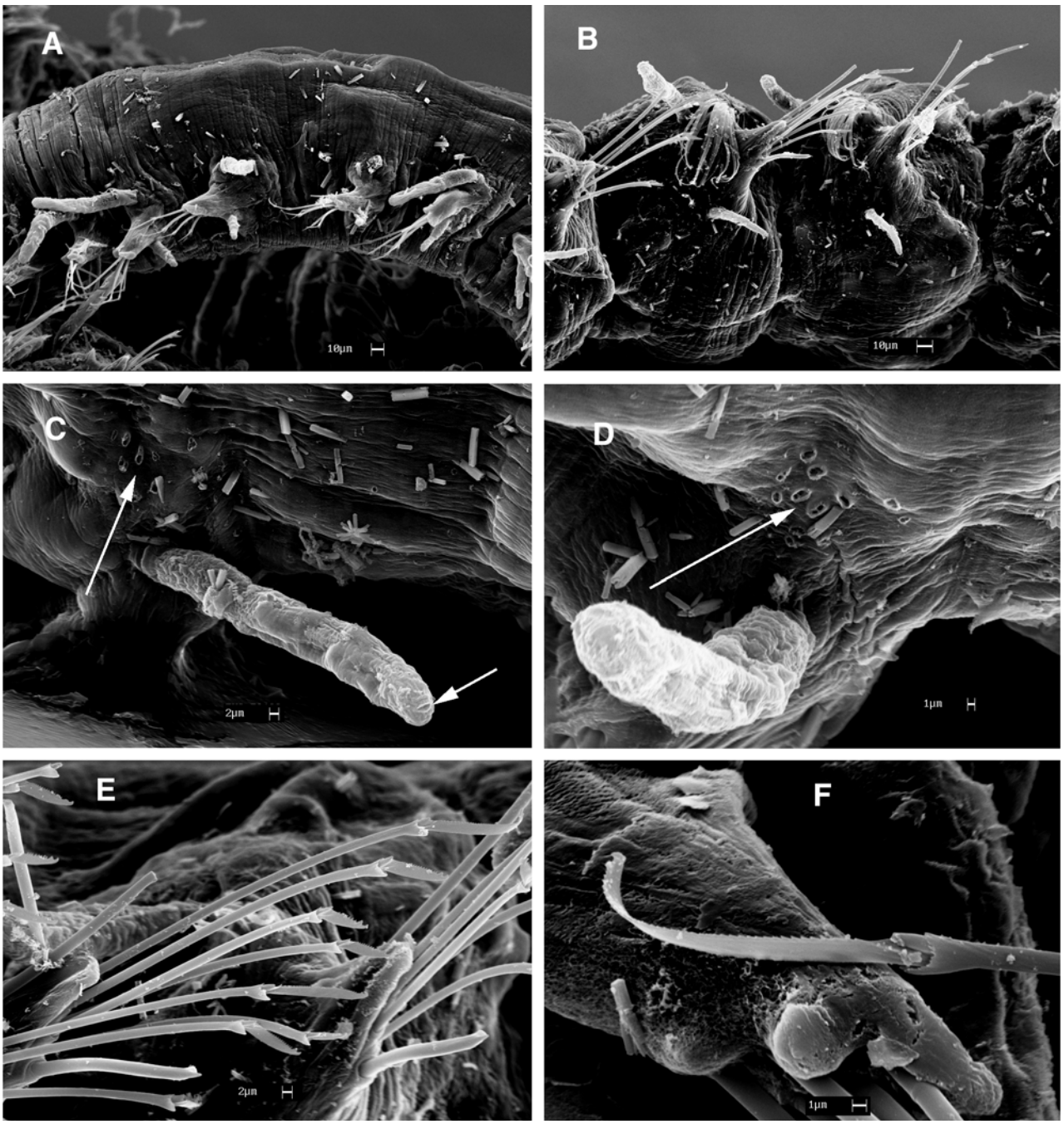



Fig. 71. SEM of *Pionosyllis mariae* n.sp. (*A*) midbody, lateral view; (*B*) the same of an epigamic specimen, showing the capillary notochaetae; (*C*) dorsal pores and distal pore of dorsal cirrus (arrows); (*D*) detail of dorsal pores (arrow); (*E*) chaetal fascicle, mid-posterior parapodium; (*F*) short, spiniger-like chaeta. AM W28873.

Ventral cirri digitiform, slender, slightly longer than parapodial lobes on posterior parapodia. Compound chaetae with hemigomph articulation, smooth distally on shafts; blades of 2 kinds, most dorsal chaetae with elongated, short spiniger-like, bidentate blades, spines on margin apparently jointed by membrane (Figs 70D,I, 71F), remaining chaetae with short, bidentate blades, with short spines on margin (Figs 70E, 71E), more strongly bidentate on posterior parapodia (Figs 70H, 72A). Anterior parapodia each with 1 compound chaetae with elongated blade, about 27 µm in length, and 4 chaetae with shorter blades, 17–12 µm in length; posterior parapodia with 1 compound chaetae with elongate blade and 2–3 short-bladed, all similar in size to anterior ones. Dorsal simple chaetae from midbody, smooth, distally truncate (Fig. 72B), with small, indistinct hood (Fig. 70G). Ventral simple chaetae from mid-posterior parapodia, large, acicular, prominent, with subdistal translucent hood, bidentate, proximal tooth long, hooked, distal tooth smaller, also hooked (Figs 70J, 71E, 72C). Anterior parapodia each with 2 aciculae, one straight, other bent at tip (Fig. 70F); solitary acicula on remaining parapodia, bent tip, thicker than anterior ones. Dark glands on each parapodia from midbody (Fig. 70B) with dorsal pores (Fig. 71C,D arrows). Pharynx through about 4 segments; pharyngeal tooth anteriorly located (Fig. 70A). Proventricle rectangular, through 3–4 segments, with 30–36 muscle cell rows.

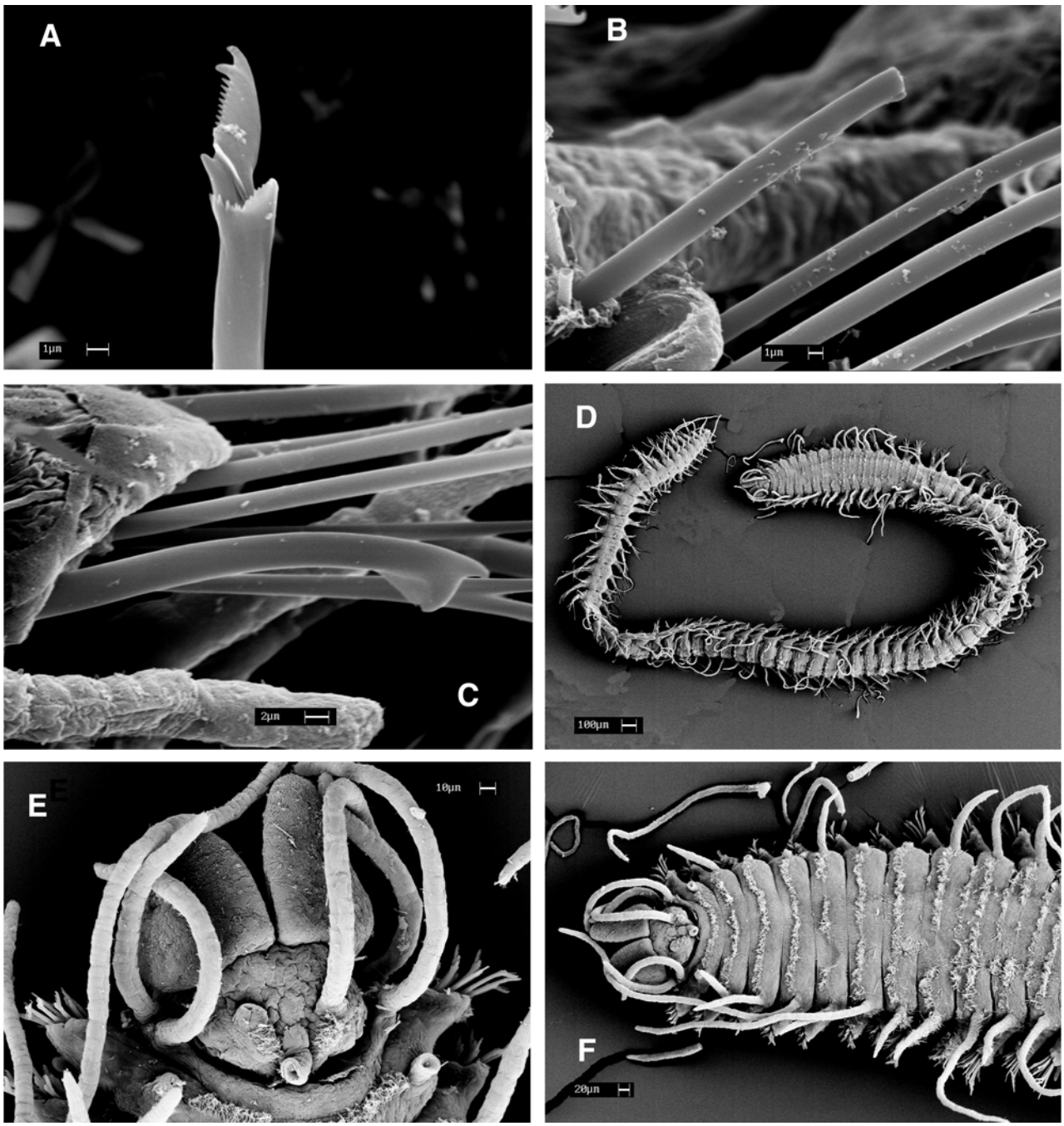



Fig. 72. SEM of *Pionosyllis mariae* n.sp. (*A*) falciger, posterior parapodium; (*B*) dorsal simple chaeta; (*C*) ventral simple chaeta. SEM of *Pionosyllis serrata* (Hartmann-Schröder, 1984) (*D*) complete specimen, dorsal view; (*E*) prostomium and palps, dorsal view; (*F*) anterior end, dorsal view. *A–C*: AM W28873, *D–F*: AM W28913.

Pygidium semi-circular, with 2 long, slender anal cirri (Fig. 70B), similar in length to median antenna. Mature specimen with notoacicula and natatory chaetae from chaetiger 17. One specimen epigamic, with natatory chaetae on midbody and posterior segments (Fig. 71B).

**Remarks**. *Pionosyllis mariae* n.sp. is similar to *P. weismanni* Langerhans, 1879, a worldwide reported species, that probably represents a complex of morphologically similar species (San Martín, 2003), since small differences among specimens from different parts of the world have been reported (see Ben-Eliahu, 1977). The Australian specimens are distinctly smaller than those of the Mediterranean Sea (7 mm versus 18 mm) and lack dorsal cirri on chaetiger 2, which are always present on Mediterranean specimens (see San Martín, 2003).

**Habitat**. Occurring as cryptic species in encrusting communities and in sand, in depths of 9 to 244 m.

**Distribution**. Australia (Queensland, New South Wales).

**Etymology**. The new species is named after María Capa, collaborator and friend.

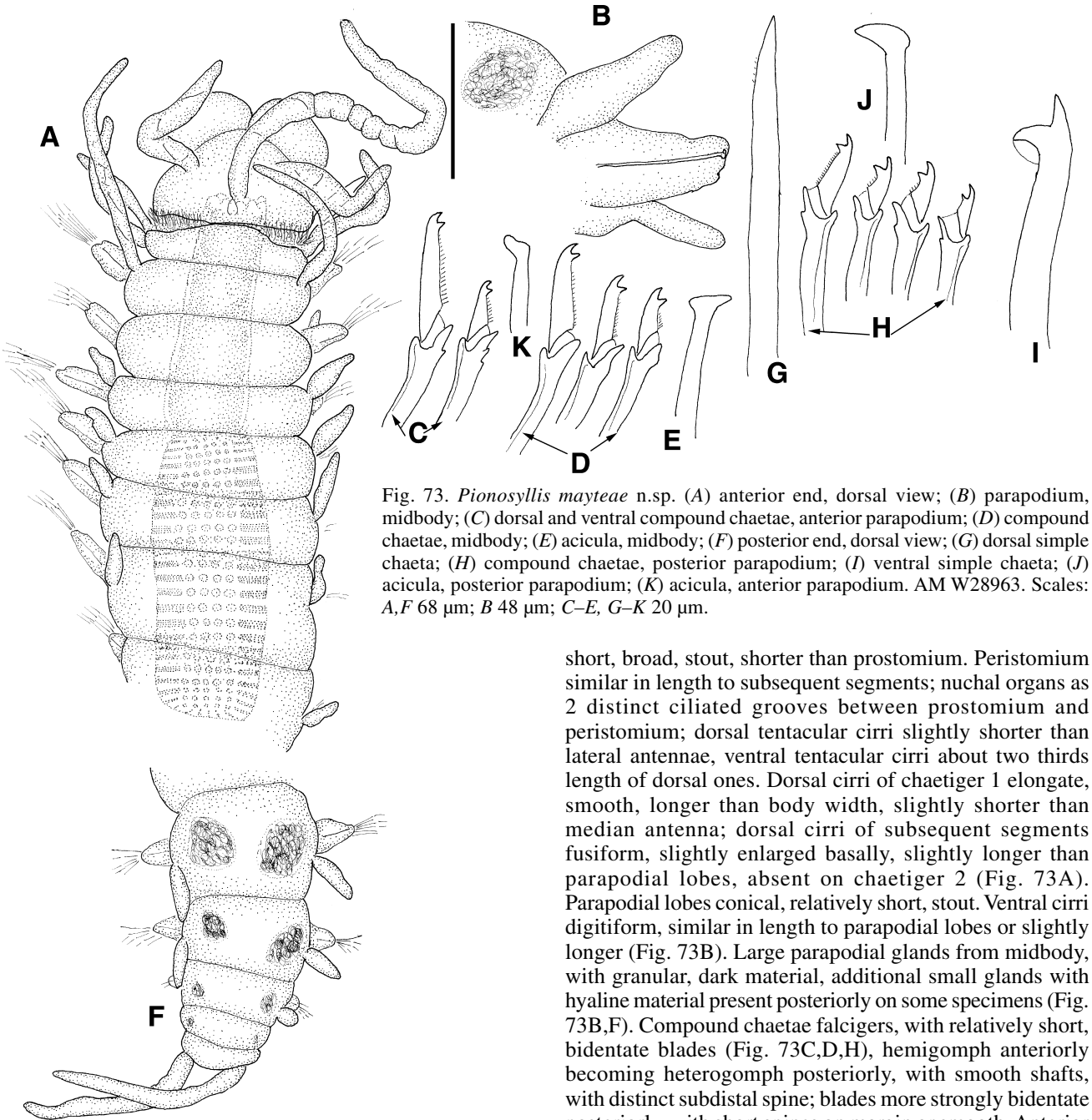



Fig. 73. *Pionosyllis mayteae* n.sp. (*A*) anterior end, dorsal view; (*B*) parapodium, midbody; (*C*) dorsal and ventral compound chaetae, anterior parapodium; (*D*) compound chaetae, midbody; (*E*) acicula, midbody; (*F*) posterior end, dorsal view; (*G*) dorsal simple chaeta; (*H*) compound chaetae, posterior parapodium; (*I*) ventral simple chaeta; (*J*) acicula, posterior parapodium; (*K*) acicula, anterior parapodium. AM W28963. Scales: *A,F* 68 µm; *B* 48 µm; *C–E, G–K* 20 µm.

***Pionosyllis mayteae* n.sp.**

Fig. 73A–K

**Material examined**. HOLOTYPE (AM W29245) AUSTRALIA: QUEENSLAND: Outer Yonge Reef, Great Barrier Reef, 14°36'S 145°38'E, rock with *Lithothamnion* & *Halimeda*, 30 m, coll. P.A. Hutchings, 24 Jan 1977. PARATYPES 5 (AM W28963) Outer Yonge Reef, Great Barrier Reef, 14°36'S 145°38'E, rock with *Lithothamnion* & *Halimeda*, 30 m, coll. P.A. Hutchings, 24 Jan 1977.

**Description**. Body slender, less filiform than other species of the genus above described, 5.4 mm long, 0.2 mm wide, with 44 chaetigers. Prostomium semi-circular to pentagonal, apparently without eyes. Median antenna elongate, about twice combined length of prostomium and palps, rugose to indistinctly articulated, inserted near posterior margin of prostomium; lateral antennae smooth, about half length of median antenna, arising laterally in front (Fig. 73A). Palps short, broad, stout, shorter than prostomium. Peristomium similar in length to subsequent segments; nuchal organs as 2 distinct ciliated grooves between prostomium and peristomium; dorsal tentacular cirri slightly shorter than lateral antennae, ventral tentacular cirri about two thirds length of dorsal ones. Dorsal cirri of chaetiger 1 elongate, smooth, longer than body width, slightly shorter than median antenna; dorsal cirri of subsequent segments fusiform, slightly enlarged basally, slightly longer than parapodial lobes, absent on chaetiger 2 (Fig. 73A). Parapodial lobes conical, relatively short, stout. Ventral cirri digitiform, similar in length to parapodial lobes or slightly longer (Fig. 73B). Large parapodial glands from midbody, with granular, dark material, additional small glands with hyaline material present posteriorly on some specimens (Fig. 73B,F). Compound chaetae falcigers, with relatively short, bidentate blades (Fig. 73C,D,H), hemigomph anteriorly becoming heterogomph posteriorly, with smooth shafts, with distinct subdistal spine; blades more strongly bidentate posteriorly, with short spines on margin or smooth. Anterior and midbody parapodia with 5 compound chaetae, blades 16 µm in length dorsally, 8 µm in length ventrally; 4 compound chaetae on each posterior parapodia, blades 7–10 µm in length. Dorsal simple chaetae from mid-posterior segments, long, straight, acute, distally pointed, with minute subdistal spines on margin (Fig. 73G). Ventral simple chaetae on posterior parapodia, thick, strongly bidentate, teeth at 90°, proximal tooth slightly hooked, with small translucent hood (Fig. 73I). Acicula solitary throughout, slender, slightly larger posteriorly, distally expanded laterally with convex surface (Fig. 73E,J). Pygidium semi-circular, with 2 long anal cirri, smooth, similar in length to dorsal cirri of chaetiger 1 (Fig. 73F). Pharynx through 5 segments; pharyngeal tooth on anterior rim (Fig. 73A). Proventricle through 5 segments, with 20 muscle cell rows.

**Remarks**. *Pionosyllis mayteae* n.sp. differs from similar other species of the genus in lacking compound chaetae

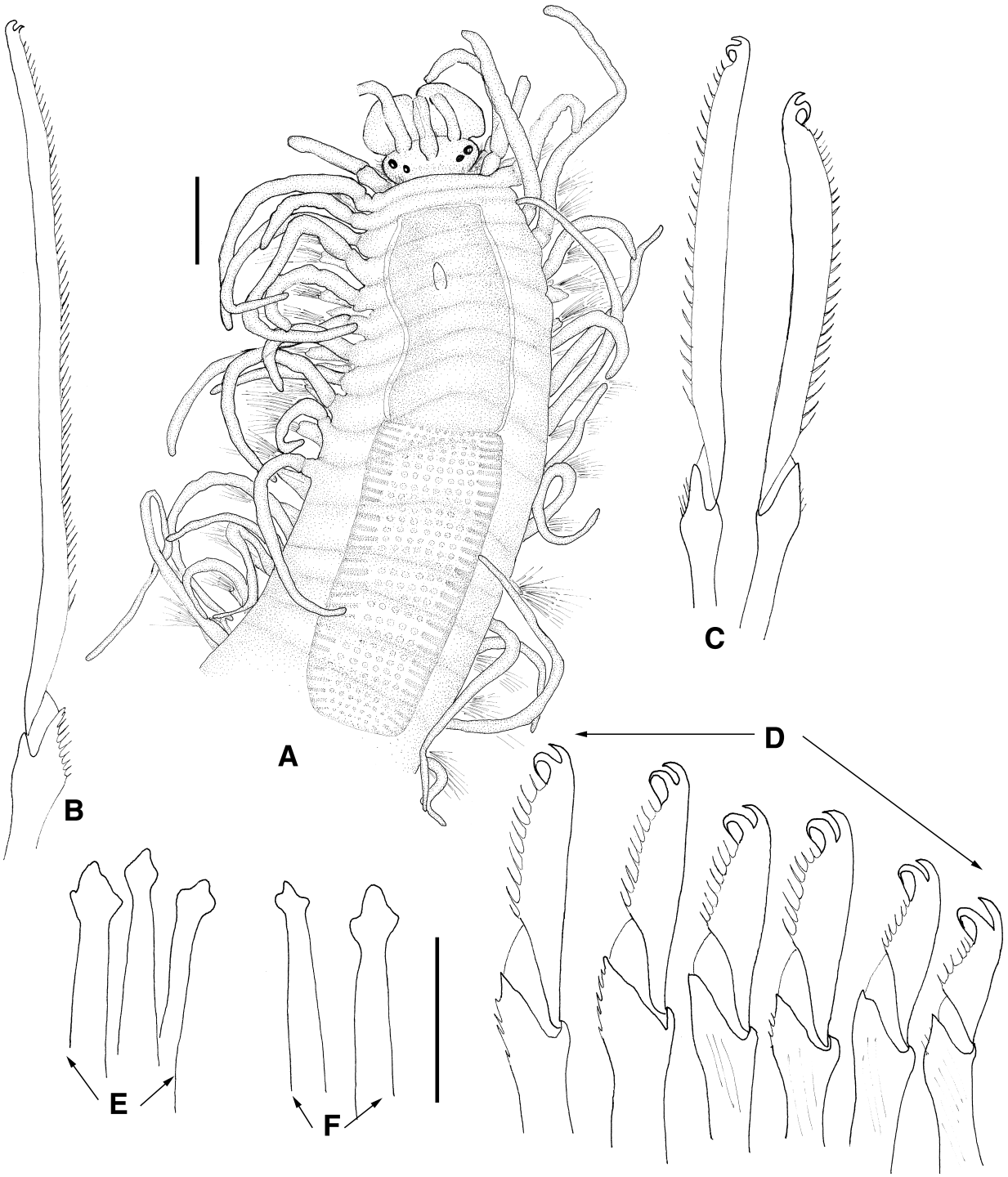



Fig. 74. *Pionosyllis rousei* n.sp. (*A*) anterior end, dorsal view; (*B*) spiniger-like compound chaeta, anterior parapodium; (*C*) spiniger-like compound chaetae, midbody; (*D*) falcigers, midbody; (*E*) aciculae, anterior parapodium; (*F*) aciculae, midbody. AM W28840 (holotype). Scales: *A* 0.18 mm; *B–F* 20 µm.

with elongated blades and having distally pointed dorsal simple chaetae; and ventral simple chaetae bidentate with teeth at 90°.

**Habitat**. Occurring on encrusting *Lithothamnion* and *Halimeda* at depths of 30 m.

**Distribution**. Australia (Queensland).

**Etymology**. The species is named after María Teresa Aguado (Mayte), collaborator and friend.

### ***Pionosyllis rousei* n.sp.**

Fig. 74A–F

**Material examined**. HOLOTYPE (AM W29230), TASMAN SEA: reef flat near *Yoshin Maru Iwaki* wreck, Elisabeth Reef, 29°55.48'S 159°01.18'E, Elisabeth & Middleton Reefs Expedition, St. 43, 14 Dec 1987. PARATYPES 4 (AM W28840), reef flat near *Yoshin Maru Iwaki* wreck, Elisabeth Reef, TASMAN SEA, 29°55.48'S 159°01.18'E, Elisabeth & Middleton Reefs Expedition, St. 43, 14 Dec 1987.

**Additional material examined**. TASMAN SEA: Taupo Seamount, 33°16.51'S 156°09.09'E, limestone & sand bottom, 244 m, coll. J.K. Lowry, on RV Franklin, 2 May 1989, 3 (AM W28836).

**Description**. Holotype best preserved individual, incomplete specimen, 2.2 mm long, 0.6 mm wide, with 22 chaetigers. Body fragile, dorsally arched, cylindrical, without colour pattern, yellowish in alcohol. Prostomium oval, with 4 eyes in open trapezoidal arrangement. Antennae damaged; lateral antennae inserted near anterior margin of prostomium, median antenna inserted on middle of prostomium. Palps large, slightly longer than prostomium, free from each other (Fig. 74A). Nuchal organs ciliated, extending to lateral margins of prostomium (Fig. 74A). Peristomium dorsally reduced, covered by chaetiger 1. Anteriormost segments short, becoming longer from proventricle onwards. Left dorsal tentacular cirrus missing, right one appears broken; ventral tentacular cirri shorter than dorsal cirri. Dorsal cirri smooth, with distinct cirrophores, elongated, alternating irregularly long and short (Fig. 74A), long cirri similar in length to body width, shorter cirri less than half length of longer ones. Parapodial lobes conical. Ventral cirri elongated, similar in length to parapodial lobes. Compound chaetae heterogomph, blades of two kinds, spiniger-like and falcigers. Midbody parapodia with 2 spiniger-like chaetae, with short spines on margin, distinctly bidentate, distal tooth hooked, and proximal tooth curved, with tendon contacting with margin, about 40–35 µm long (Fig. 74C), and 8–11 falcigers, strongly bidentate, long and hooked distal tooth and long, curved proximal tooth, provided with distinct tendon contacting with edge of blade, slight dorsoventral gradation in length of blades within fascicle, 25 µm dorsally and 15 µm ventrally (Fig. 74D), with thin spines on margin. Anteriormost parapodia with 1–2 distinctly long, slender, spiniger-like chaetae present, blades about 86 µm in length, bidentate, with both blades similar in size, proximal tooth slightly recurved, but without tendon (Fig. 74B). Dorsal and ventral simple chaetae not seen. Aciculae tricuspid, 3 on anterior parapodia (Fig. 74E), 2 on midbody parapodia (Fig. 74F). Pharynx wide, though about 7–8 segments; pharyngeal tooth conical, located in front of middle of pharynx (Fig. 74A). Proventricle through 7 segments, similar in size to pharynx, with about 28 muscle cell rows.

**Remarks**. *Pionosyllis rousei* n.sp. is characterized by having compound chaetae distinctly bidentate, with both teeth similar and well separated from each other. *Pionosyllis serratisetosa* (López, San Martín & Jiménez, 1997), from southwestern Mediterranean has similar chaetae, but the teeth on the blades are not separated and are smaller, the blades have a different shape; long spiniger-like compound chaetae are absent, and the pharyngeal tooth is located near anterior margin of pharynx. *Pionosyllis longocirrata* (Saint-Joseph, 1887), from the eastern Atlantic and Mediterranean Sea, also has the pharyngeal tooth located more anteriorly than *P. rousei*, and the blades of compound chaetae either have a minute distal tooth or none (see San Martín, 2003, for more details). *Pionosyllis templadoi* (San Martín, 1991) from Cuba has a similar body and the position of pharyngeal tooth is also similar. The blades of compound chaetae, however, have a small distal tooth and an elongated proximal tooth (San Martín, 1991). *Pionosyllis luquei* (San Martín, 1990), also from Cuba, has similar compound chaetae, although not as strongly hooked, with well-developed teeth, but the dorsal cirri are shorter, and the pharyngeal tooth is located more posteriorly (San Martín, 1990).

**Habitat**. Substrate unknown, recorded from 244 m depth.

**Distribution**. Tasman Sea (Elisabeth and Middleton Reef).

**Etymology**. This species is named after Dr Greg Rouse, an Australian Polychaetologist.

### *Pionosyllis serrata* (Hartmann-Schröder, 1984)

Figs 72D–F, 75A–N, 76A–F, 77A–F

*Eusyllis serrata* Hartmann-Schröder, 1984: 18, figs 23–26.

**Material examined**. AUSTRALIA: NEW SOUTH WALES: East of Bondi, 33°53.1'S 151°17.4'E, sand, 30 m, Fisheries Research Institute, 24 July 1989, 2 (AM W24373); Bass Point, 34°36'S 150°54'E, 50 m, coll. The Ecology Lab, Ready Mixed Industries, 1 Feb 1990, 3 (AM W28922); Bass Point, 34°36'S 150°54'E, 50 m, coll. The Ecology Lab, Ready Mixed Industries, 1 Feb 1990, 2 on SEM stub (AM W28913).

**Description**. Body fragile (Fig. 72D), 8.7 mm long, 0.4 mm wide, with 77 chaetigers, pale in alcohol. Prostomium oval, slightly wider than long, with 4 eyes in open trapezoidal arrangement (Fig. 75A); median antenna more than twice as long as prostomium and palps together, inserted between posterior eyes, near posterior margin of prostomium; lateral antennae shorter than median antenna, similar or slightly longer than combined length of prostomium and palps, inserted near anterior margin; two tufts of cilia posterior to insertion of lateral antennae (Fig. 72E). Palps long and basally broad, triangular, longer than prostomium (Figs 72E, 75A), free for almost entire length, basally fused. Peristomium dorsally reduced. Anterior segments with single transverse row of cilia (Figs 72F, 75A); midbody and posterior segments each with double row of cilia (Fig. 76A,B). Antennae, tentacular and dorsal cirri long, slender, filiform, smooth, sometimes coiled, of 2 sizes, long and short, long ones distinctly longer than body width, short ones similar in length to half of body width (Figs 72D,F, 75A, 76A,B). Dorsal tentacular cirri long, ventral ones short. Parapodia of anterior 8–10 chaetigers enlarged, wide, distally truncated (Fig. 75A) with several small, rounded lobes distally (Fig. 75M), and numerous, about 12–14 short, broad compound chaetae, with enlarged shafts and short, bidentate blades (Fig. 76D), about 22–16 µm in length, with few, long, thick spines on margin, distal ones extending beyond proximal tooth (Figs 75B, 76E). Posterior to proventricle, parapodial lobes becoming conical, slender, with terminal papilla; compound chaetae from proventricle parapodia without enlarged shafts, apparently smooth and distally truncated, and elongated blades with long, thin spines on margin, distally ornamented, distal ones slightly longer than others, extending beyond proximal tooth and sometimes reaching level of distal tooth; most dorsal compound chaetae with more elongate, bidentate blades (Figs 75C,F,I, 76F, 77A), about 40 µm in length on post-proventricle segments, 35 µm on midbody parapodia, 42 µm on posterior parapodia, and several compound chaetae with shorter blades, and dorsoventral gradation in length within fascicle (Figs 75D,G,J,K, 76F, 77B,C), 13–26 µm on proventricle segments, 16–25 µm on midbody parapodia, 16–37 µm on posterior parapodia; compound chaetae 8–10

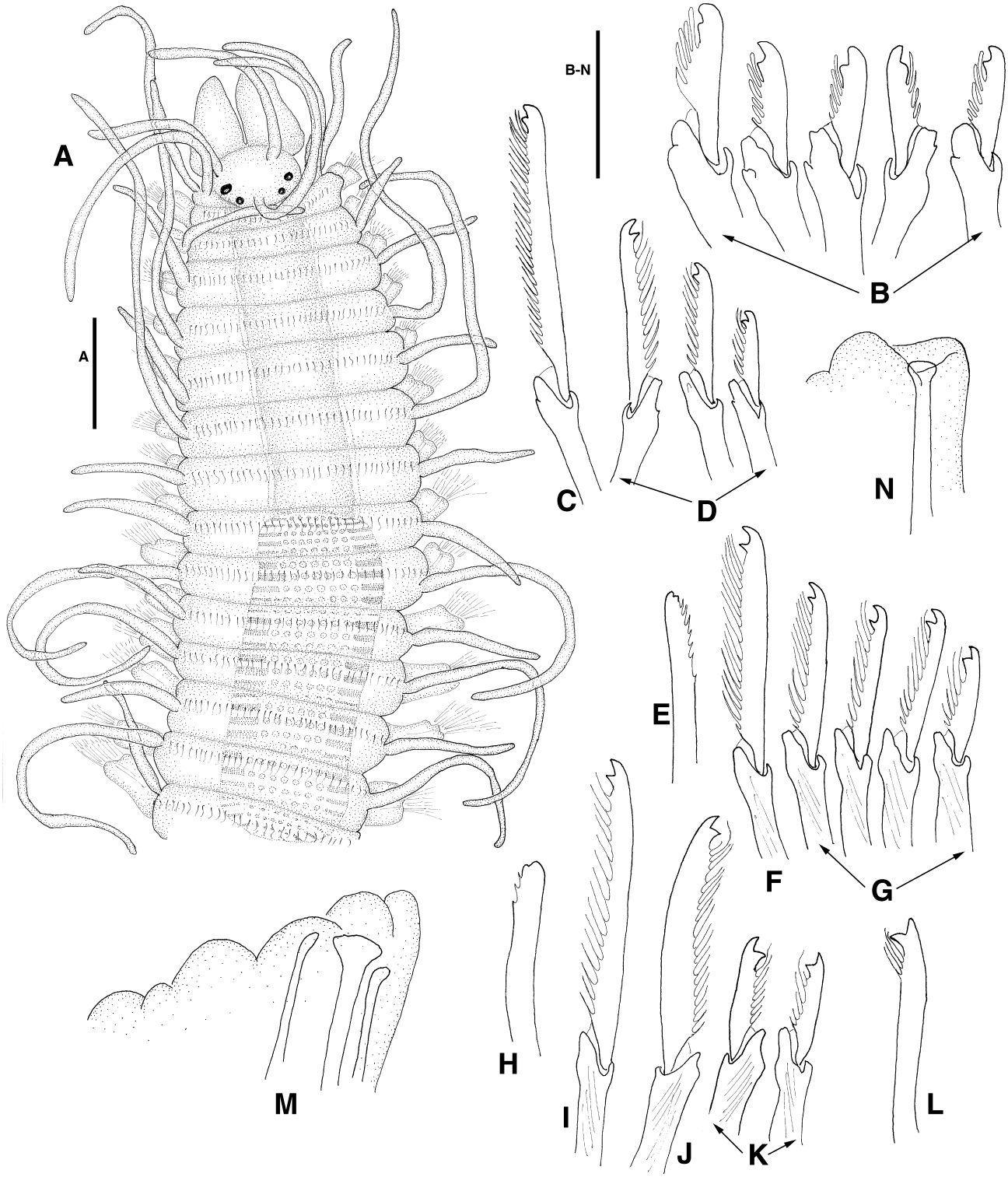



Fig. 75. *Pionosyllis serrata* (Hartmann-Schröder, 1984); (*A*) anterior end, dorsal view; (*B*) compound chaetae, anteriormost parapodium; (*C*) dorsalmost compound chaeta, anterior parapodium; (*D*) compound chaetae, anterior parapodium; (*E*) dorsal simple chaeta, midbody; (*F*) dorsalmost compound chaeta, midbody; (*G*) compound chaetae, midbody; (*H*) dorsal simple chaeta, posterior parapodium; (*I*) dorsalmost compound chaeta, posterior parapodium; (*J,K*) compound chaetae, posterior parapodium; (*L*) ventral simple chaeta; (*M*) aciculae and edge of anteriormost parapodium; (*N*) acicula and edge of posterior parapodium. AM W28922. Scales: *A* 0.18 mm, *B–N* 20 μm.

on proventricle segments, about 7 on midbody, 4 on posterior parapodia. Blades of posterior chaetae markedly bidentate, both teeth well separated, almost at 90°, and slightly convex (Figs 75J,K, 77D). Dorsal simple chaetae from midbody, distally weakly bifid (Fig. 75E), with some spines on margin, becoming thicker posteriorly, with shorter spines on margin (Figs 75H, 77E). Ventral simple chaetae on posterior parapodia, thick, strongly bidentate, both teeth almost at 90°, proximal tooth slightly hooked, and few, long spines on margin, extending beyond proximal tooth (Figs

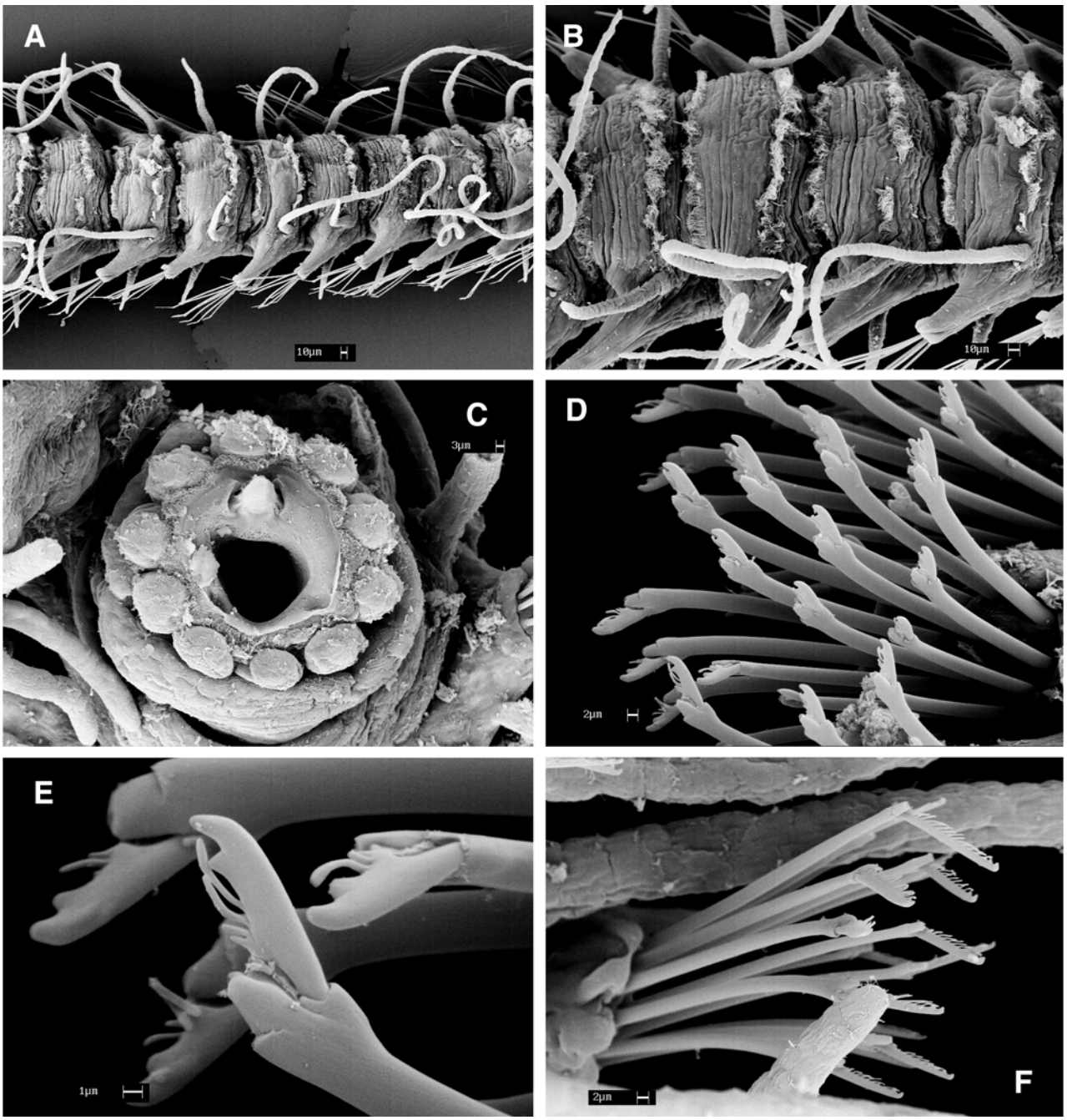



Fig. 76. SEM of *Pionosyllis serrata* (Hartmann-Schröder, 1984) (*A*) midbody, dorsal view; (*B*) detail of the same; (*C*) everted pharynx; (*D*) anteriormost compound chaetae; (*E*) compound chaeta, anteriormost parapodium; (*F*) compound chaetae, midbody. AM W28913.

75L, 77F). Aciculae distally knobbed, 3 on anterior parapodia (Fig. 75M), diminishing progressively along body to 1 (Fig. 75N). Pharynx through about 6–7 segments; pharyngeal tooth located anteriorly, surrounded by crown of 10 soft papillae and layer of cilia (Fig. 76C). Proventricle through 7 segments, with 30 muscle cell rows. Two long, filiform anal cirri (Fig. 72D).

**Habitat**. Occurring in sandy substrates, from intertidal to about 30 m.

**Distribution**. Australia (Western Australia, New South Wales).

### *Pionosyllis yolandae* n.sp.

Figs 42C–F, 49A–C, 78A–J

**Material examined**. HOLOTYPE (AM W28222) AUSTRALIA: NEW SOUTH WALES: Burrill Rocks, 35°23.39'S 150°28.24'E, on gorgonacean, 24 m, coll. R.T. Springthorpe, 7 May 1997. PARATYPES 1 (AM W28401) S ledge, Cook Is., 28°11.65'S 153°34.63'E, colonial ascidian, 14 m, coll. G.D.F. Wilson, 9 Jun 1993; 1 (AM W28964) N side of Bannister Head, N of Ulladulla, 35°19.15'S 150°29.12'E, grey sponge from top of boulder, 18 m, K. Attwood, 6 May 1997.

**Other material examined**. TASMAN SEA Taupo Seamount, 33°16.85'S 156°09.15'E, limestone & sand bottom, 244 m, coll. J.K. Lowry & party, on RV *Franklin*, 2 May 1989, 3 on SEM stub (AM W28876); Taupo Seamount, 33°16.85'S 156°09.15'E, limestone & sand

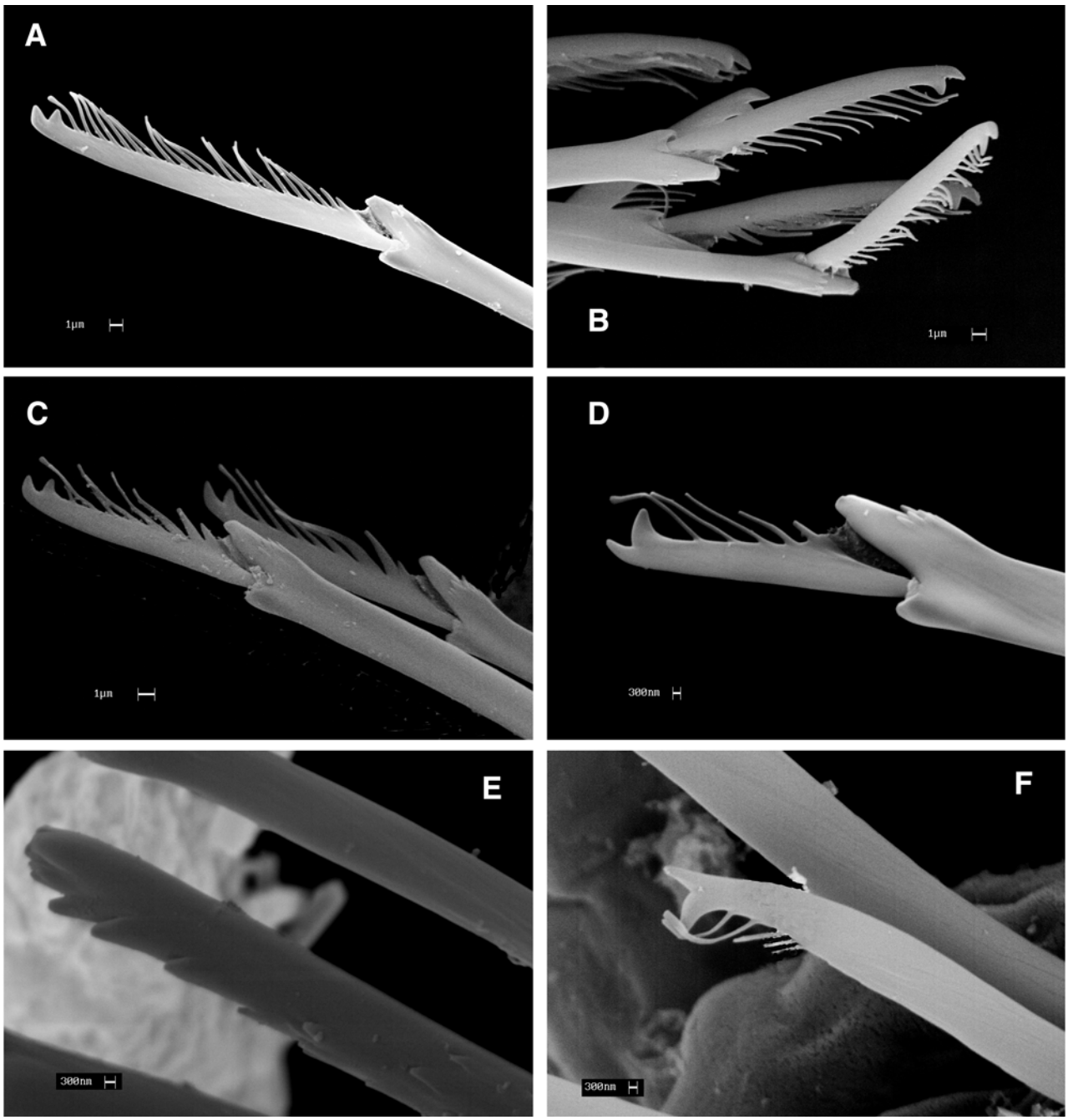



Fig. 77. SEM of *Pionosyllis serrata* (Hartmann-Schröder, 1984) (*A*) dorsalmost compound chaeta, midbody; (*B,C*) dorsal and ventral compound chaetae, midbody; (*D*) ventral compound chaeta, posterior parapodium; (*E*) dorsal simple chaeta; (*F*) ventral simple chaeta. AM W28913.

bottom, 244 m, coll. J.K. Lowry & party, on RV *Franklin*, 2 May 1989, few (AM W28924). WESTERN AUSTRALIA: Reef W of groyne, 2 km S of Cape Peron, 32°16'S 115°41'E, orange sponge in deep channel in limestone reef, 4.5 m, coll. R.T. Springthorpe, 26 Dec 1984, 1 (AM W28965).

**Description**. Body fragile, slender; only anterior fragments examined; longest anterior fragment 2.4 mm long, 0.3 mm wide, with 21 chaetigers; usually colourless, but some specimens with few dark transverse bands on dorsum of anterior segments, varying in intensity. Posterior to proventricle, segments fused, forming suprasegmental structures of 2–3 segments (Fig. 78A). Prostomium oval, with 4 eyes in open trapezoidal arrangement; antennae irregularly articulated, originating on anterior margin of prostomium, median antenna inserted slightly posteriorly behind lateral antennae (Figs 42D,E, 78A). Median antenna with about 15 articles, about twice combined length of prostomium and palps; lateral antennae about half length of median antenna, with about 6–8 articles. Palps blunt, similar in length to prostomium, free from each other, ventrally folded in several specimens (Figs 42E, 78B). Peristomium shorter than subsequent segments, forming small, indistinct occipital flap (Fig. 42C–E); dorsal tentacular cirri irregularly articulated, similar in length to median antenna; ventral tentacular cirri about half length of dorsal ones, almost smooth (Fig. 78A,B). Nuchal organs as 2 dorsal densely ciliated grooves between prostomium and peristomium (Figs 42D,E, 78A). Dorsal cirri of chaetiger 1 elongated, articulated, with about 13 irregular

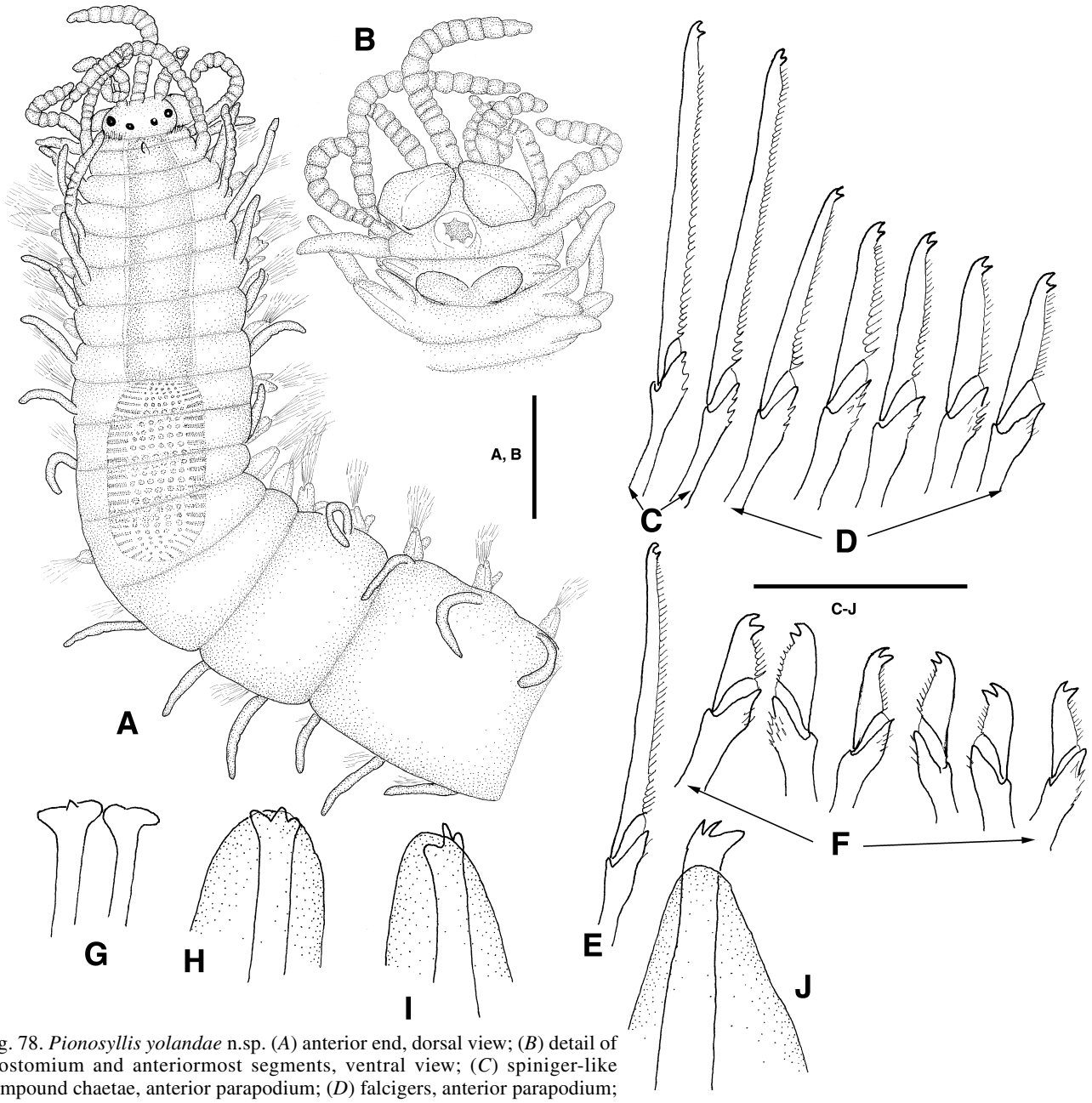



Fig. 78. *Pionosyllis yolandae* n.sp. (*A*) anterior end, dorsal view; (*B*) detail of prostomium and anteriormost segments, ventral view; (*C*) spiniger-like compound chaetae, anterior parapodium; (*D*) falcigers, anterior parapodium; (*E*) spiniger-like compound chaeta, midbody; (*F*) falcigers, midbody; (*G–J*) gradation on number and shape of aciculae from anterior parapodia to midbody. AM W28876. Scales: *A* 0.18 mm, *B* 97.5 μm, *C–J* 20 μm.

articulations; dorsal cirri of remaining anterior parapodia slightly elongated, rugose, shorter than body width, becoming progressively shorter and smooth along body; midbody dorsal cirri alternating in length, longer ones about half of length of body width, shorter ones about two thirds length of longer ones (Fig. 78A). Parapodial lobes conical; ventral cirri digitiform, slightly shorter than parapodial lobes; ventral cirri of chaetiger 1 leaf-like, enlarged, located mid ventrally (Fig. 78B). Anterior parapodia with about 2–3 compound chaetae with slender, spiniger-like blades bidentate, with short spines on margin (Figs 78C, 49A), blades about 36 μm in length; 8–10 compound falcigerous chaetae with distinctly shorter blades, similar in shape but slightly larger (Figs 78D, 49B), with dorsoventral gradation within fascicle, 22 μm in length dorsally, 15 μm in length ventrally. Progressively along body, number of compound chaetae with elongated blades decreases to 1–2 in midbody, 32 μm in length, remaining compound chaetae, about 6, with shorter and wider blades, about 10 μm in length, with prominent proximal tooth, similar in size to distal tooth or longer (Fig. 78E,F). Dorsal and ventral simple chaetae not seen. Anterior parapodia with 2 tricuspid aciculae (Fig. 78G), proventricular segments with single acicula, becoming progressively larger (Fig. 78H,I), extending beyond parapodial lobes, with large tooth and 2 smaller ones (Fig. 78J), similar in shape to subacicular hooks in eunicids (Fig. 49C). Pharynx proportionally long and slender (Fig. 78A), through 8–9 segments, anterior rim with crown of 10 soft papillae and layer of cilia (Fig. 42F); pharyngeal tooth small, located slightly behind anterior rim. Proventricle about half of pharynx length, with about 20 muscle cell rows. Details of posterior segments unknown.

**Remarks**. *Pionosyllis yolandae* n.sp. is similar to *Pionosyllis aciculata* San Martín, 1990, from Cuba; but, this latter species has much shorter compound chaetae, with typical dorsoventral gradation in length of blades within a fascicle, and lacks elongated, spiniger-like compound chaetae (San Martín, 1990). *Pionosyllis lamelligera* (Saint-Joseph, 1887) has spiniger-like chaetae, but it lacks the characteristic enlarged, tridentate aciculae, and the posterior falcigers have the proximal tooth longer than distal tooth present, whereas in *Pionosyllis yolandae* the teeth are of similar size (San Martín, 2003, for a description of *Pionosyllis lamelligera*).

**Habitat**. Occurring on gorgonaceans, ascidians, sponges, and in sand, from 14 to 244 m depths.

**Distribution**. Australia (New South Wales, Western Australia).

**Etymology**. The species is named after Miss Yolanda Lucas, who helped us in many ways, especially collaborating with us on the illustrations of this paper.

### *Pionosyllis* sp.

Fig. 79A–G

?*Pionosyllis divaricata* Haswell, 1920: 104, pl. 13, figs 2, 3. Not Keferstein, 1862: 11.
?*Eusyllis* sp. Hartmann-Schröder, 1984: 19, fig. 27.

**Material examined**. AUSTRALIA: NEW SOUTH WALES: NE corner of Clark Is., Port Jackson, 33°51.85'S 151°14.7'E, within encrustation on outside of bottle, 4.5 m, coll. P.A. Hutchings, 17 Apr 1996, 1 anterior & 1 posterior fragment (AM W28410).

**Description**. Both fragments in poor condition; anterior fragment of 19 segments and mid-posterior fragment of 8 segments. Similar to *Pionosyllis rousei*, but compound chaetae more elongate, with longer spiniger-like chaetae and elongated falcigers; anterior parapodia with numerous compound chaetae, blades of spiniger-like chaetae about 69 µm long, bidentate, both teeth small and equal in size (Fig. 79A); falcigers with blades 45–49 µm in length, proximal tooth distinctly curved but lacking tendon (Fig. 79B). Midbody parapodia with some spiniger-like chaetae, blades about 89 µm in length, teeth distinctly hooked, but lacking tendon (Fig. 79C); falcigers with blades 40–51 µm in length, most provided with tendon (Fig. 79D). Posterior parapodia with single spiniger-like chaetae, long and slender, blades 90 µm in length, with proximal tooth distinctly curved, indistinct tendon (Fig. 79E); falcigers with both teeth marked, curved, proximal tooth longer than distal tooth, with distinct tendon between proximal tooth and blade edge (Fig. 79F) 42–58 µm in length. Dorsal and ventral simple chaetae not seen. Aciculae distally blunt, with short pointed tip; 2 acicula on anterior parapodia (Fig. 79G), and 1 on posterior parapodia (Fig. 79H). Pharynx everted, with crown of 10 long, slender soft papillae, pharyngeal tooth located near anterior margin of pharynx. Proventricle short and wide, through 10 segments, with about 27 muscle cell rows.

**Remarks**. This species does not agree with any other described species within the genus *Pionosyllis*. Additional complete material, however, is necessary before it can be described as new species.

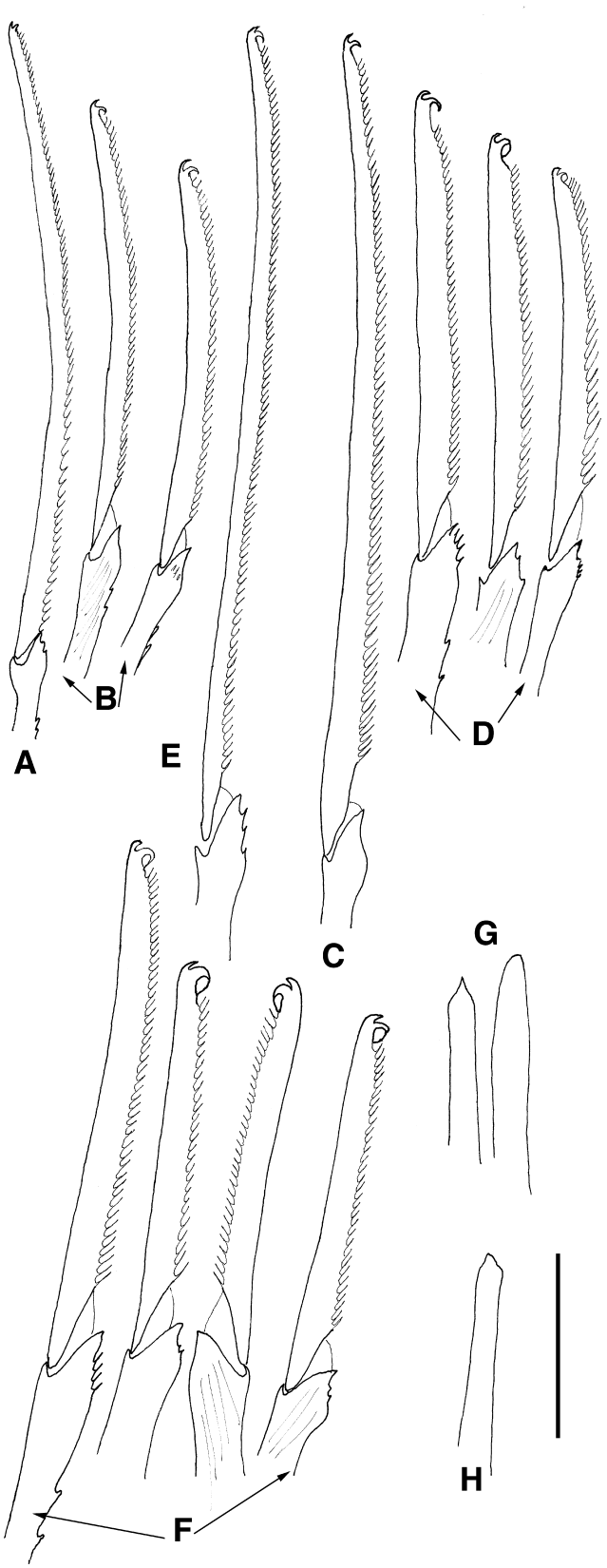



Fig. 79. *Pionosyllis* sp. (*A*) spiniger-like compound chaeta, anterior parapodium; (*B*) falcigers, anterior parapodium; (*C*) spiniger-like compound chaeta, midbody; (*D*) falcigers, midbody; (*E*) spiniger-like compound chaeta, posterior parapodium; (*F*) falcigers, posterior parapodium; (*G*) aciculae, anterior parapodium; (*H*) acicula, posterior parapodium. AM W28410. Scale: 20 µm.

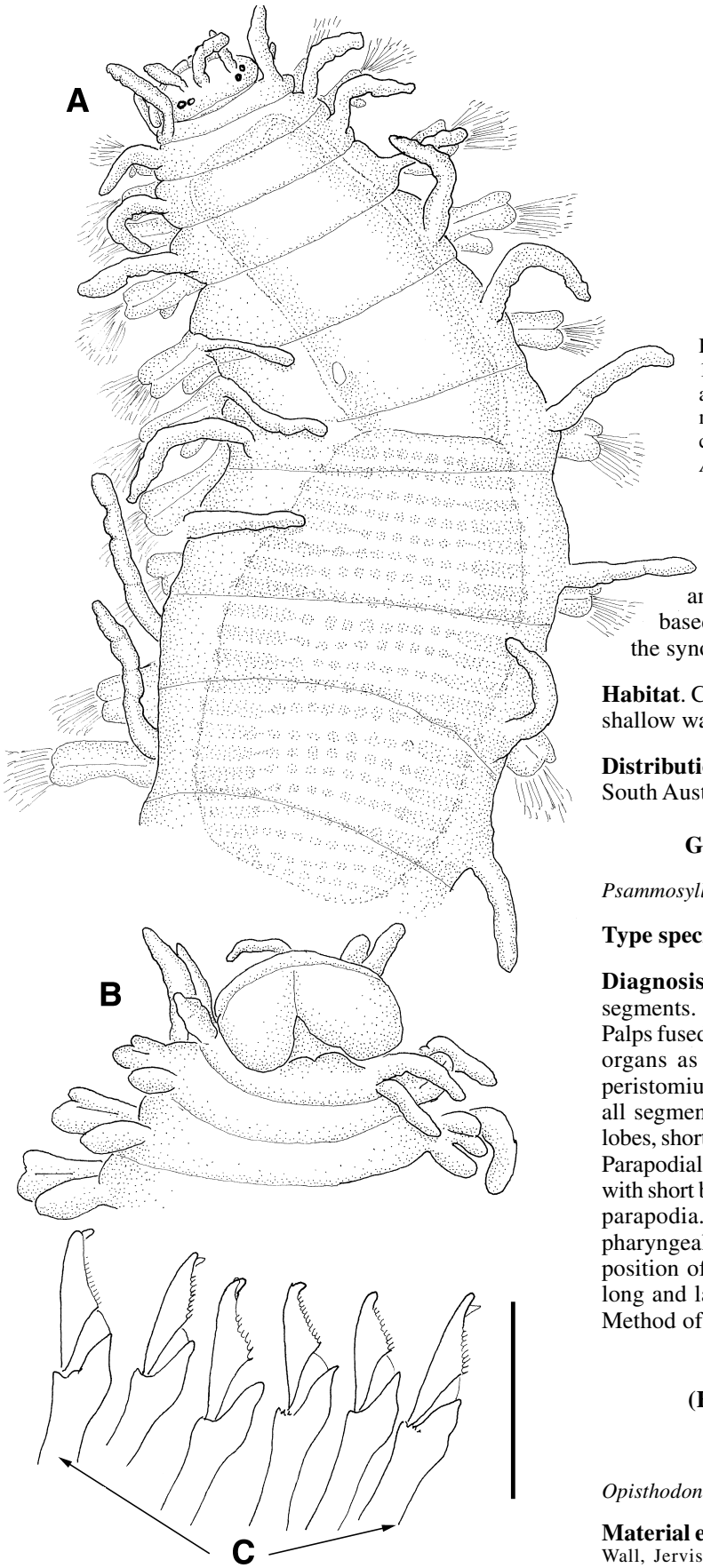



Fig. 80. *Psammosyllis curticirris* (Hartmann-Schröder, 1983) n.comb. (*A*) anterior end, dorsal view; (*B*) anterior end, ventral view; (*C*) compound chaetae, midbody; (*D*) dorsal simple chaeta; (*E*) ventral simple chaeta; (*F*) aciculae, midbody. AM W24704. Scales: *A* 0.1 mm, *B* 0.18 mm, *C–F* 20 µm.

Material described by Haswell as *Pionosyllis divaricata* could not be located for examination, and therefore possible identity of this species is based only on the description and this is reflected in the synonymies.

**Habitat**. Cryptic species on encrusting organisms found in shallow water.

**Distribution**. Australia (New South Wales and possibly South Australia).

### Genus *Psammosyllis* Westheide, 1990

*Psammosyllis* Westheide, 1990: 165.

**Type species**. *Psammosyllis aliceae* Westheide, 1990.

**Diagnosis**. Body small, of meiofaunal size, with few segments. Prostomium with 4 eyes, and 3 short antennae. Palps fused entire length or just leaving distal notch. Nuchal organs as 2 ciliated grooves between prostomium and peristomium. Two pairs of tentacular cirri. Dorsal cirri on all segments, smooth, cylindrical, longer than parapodial lobes, shorter than body width. Ventral cirri digitiform, short. Parapodial lobes bilobed. Compound chaetae heterogomph, with short blades. Dorsal and ventral simple chaetae on some parapodia. Pharynx wide, without papillae on opening, pharyngeal tooth stout, small, located posteriorly on lateral position of pharynx. Proventricle massive, barrel-shaped, long and large. Pygidium with 2 long, filiform anal cirri. Method of reproduction unknown.

#### *Psammosyllis curticirris* (Hartmann-Schröder, 1983) n.comb.

Fig. 80A–F

*Opisthodonta curticirris* Hartmann-Schröder, 1983: 130, figs 11–14.

**Material examined**. AUSTRALIA: NEW SOUTH WALES: Hole-in-the-Wall, Jervis Bay, 35°07.6'S 150°44.8'E, sandy mud, unvegetated sediments, 12 m, coll. P.A. Hutchings & party, 18 Aug 1989, 1 (AM W24706). Paratype WESTERN AUSTRALIA: Dunsborough, 33°36'S 115°06'E, fine sand, intertidal, coll. G. Hartmann-Schröder, 9 Nov 1975, (AM W196215).

**Description**. Body proportionally broad in relation to other species of genus, 3.1 mm long, 0.4 mm wide, with 29 segments. Prostomium oval, width more than twice length; 2 pairs of eyes in open trapezoidal pattern, close to each other, laterally inserted; antennae shorter than combined length of prostomium and palps (Fig. 80A), slightly rugose, median antenna originating between anterior eyes, slightly longer than lateral antennae; lateral antennae shorter than prostomium, inserted near anterior margin of prostomium. Palps broad, fused for almost entire length, except for distinct terminal notch, ventrally folded on one specimen (Fig. 80B). Peristomium shorter than following segments; dorsal tentacular cirri longer than median antenna, similar in shape, ventral tentacular cirri shorter than dorsal ones. Dorsal cirri smooth, similar to antennae and tentacular cirri, rough, slightly enlarged on middle, tapered basally and distally, longer than parapodial lobes (Fig. 80A), shorter than half of body width. Parapodial lobes broad, bilobed dorsally (Fig. 80A). Ventral cirri short, oblong, shorter than parapodial lobes. Compound chaetae similar throughout, heterogomph falcigers, blades short, about 12–14 µm in length, short spines on margin, some apparently unidentate, others with prominent proximal tooth located on different plane (Fig. 80C), about 20–25 per parapodium. Dorsal simple chaetae from anterior segments, unidentate, distally knobbed and provided with small transparent hood and short spines on margin (Fig. 80D). Ventral simple chaetae on posterior chaetigers, smooth, bidentate, both teeth similar (Fig. 80E). Aciculae distally knobbed (Fig. 80F), 3 present anteriorly, decreasing to 1 on most posterior chaetigers. Pharynx wide, through 5–6 segments, pharyngeal tooth located laterally, near proventricle (Fig. 80A). Proventricle barrel-shaped, massive, through 4–5 segments, with about 50 muscle cell rows.

**Remarks**. This species differs in several characters from the recently emended description of *Opisthodonta*, in having fused palps, short cirri, a massive proventricle and large pharynx without soft papillae as well as a pharyngeal tooth located laterally, not mid-dorsally; furthermore, *Opisthodonta* as redefined above is characterized by having ventral cirri of anteriormost segments expanded leaf-like, partially fused with parapodial lobes, whereas in this species the ventral cirri are short and ovoid. We are therefore transferring *Opisthodonta curticirris* Hartmann-Schröder to the genus *Psammosyllis* as the above characters clearly place it in this genus rather than the emended genus *Opisthodonta*. The genus *Psammosyllis* contains only two other previously described species *P. aliceae* Westheide, 1990, described from India, and *P. wui* Ding & Westheide, 1997, described from China. *Psammosyllis curticirris* differs from these two species by having a broader body, dorsal simple chaetae with a distal hood, and compound chaetae with blades unidentate or bidentate with both teeth on different planes (see Westheide, 1990; Ding & Westheide, 1997). This represents the first record of the genus in Australia.

**Habitat**. Occurring in sandy substrates, from intertidal to shallow depths.

**Distribution**. Australia (Western Australia, New South Wales).

## Genus *Streptodonta* n.gen.

**Type species**. *Opisthodonta pterochaeta* Southern, 1914, herein designated.

**Diagnosis**. Body long, slender, tapered anteriorly and posteriorly, with numerous segments. Prostomium pentagonal to triangular, with 4 eyes and 2 anterior eyespots. Three antennae. Palps short, fused basally, triangular in shape. Nuchal organs as 2 ciliated grooves between peristomium and prostomium. Two pairs of tentacular cirri. Antennae, tentacular and dorsal cirri elongated, smooth, distally tapered. Ventral cirri triangular. Compound chaetae with translucent hood on margin, ornamented with several rows of minute spines. Dorsal simple chaetae with translucent hood. Ventral simple chaetae probably absent. Aciculae of several anterior parapodia distinctly enlarged. Pharynx and proventricle long, pharyngeal tooth located laterally and distinctly posteriorly, close to proventricle. Reproduction by epigamy.

**Remarks**. The species *Opisthodonta pterochaeta* differs in several characters from the emended diagnosis of *Opisthodonta*, such as having palps fused basally, pharyngeal tooth located laterally, extremely long pharynx and proventricle, and, also having enlarged aciculae on several anterior segments and with different types of chaetae. As suggested by Kudenov & Harris (1995), a new genus was needed for this species.

*Streptodonta* n.gen., is similar to *Streptosyllis* in having enlarged aciculae on some anterior parapodia, but differs in having a pharyngeal tooth, much longer pharynx and proventricle, and in the shape of the compound chaetae.

It is probably more closely related to *Psammosyllis* Westheide, 1990, than to *Opisthodonta*, sharing with the former some unusual characters, such as the position of the pharyngeal tooth (see Westheide, 1990).

**Etymology**. The name of the new genus is a combination of the prefix *streptos*, from the Greek, meaning twisted, (in reference to *Streptosyllis*), and the suffix *donta*, (in reference to *Opisthodonta*), because it shares characters of both genera, thick, enlarged aciculae, like those present in *Streptosyllis* and a posterior pharyngeal tooth, like those present in *Opisthodonta*.

### *Streptodonta pterochaeta* (Southern, 1914), n.comb.

Fig. 81E

*Opisthodonta pterochaeta* Southern, 1914: 30, pl. IV, figs 6A–G.—Fauvel, 1923: 274, fig. 102d–i.—Hartmann-Schröder, 1971: 104, figs 4–6; 1996: 160.—Campoy, 1982: 304, pl. 24.—Bachelet, 1990: 174, fig. 1.—Parapar *et al*., 1993: 370, fig. 4.—San Martín, 2003: 51, figs 13, 14.

**Material examined**. AUSTRALIA: NEW SOUTH WALES: Bass Point, 34°36'S 150°54'E, 50 m, 1 Feb 1990, 1 (AM W22989).

**Description**. Body slender, with numerous segments. Incomplete specimen, 4.2 mm long, 0.4 mm wide, with 31 chaetigers; an entire individual, may reach 10 mm or more. Prostomium pentagonal to triangular, with 2 pairs of eyes arranged in open trapezoidal pattern, and 2 anterior eyespots (Fig. 81A). Median antenna inserted between anterior eyes, slightly longer than combined length of prostomium and

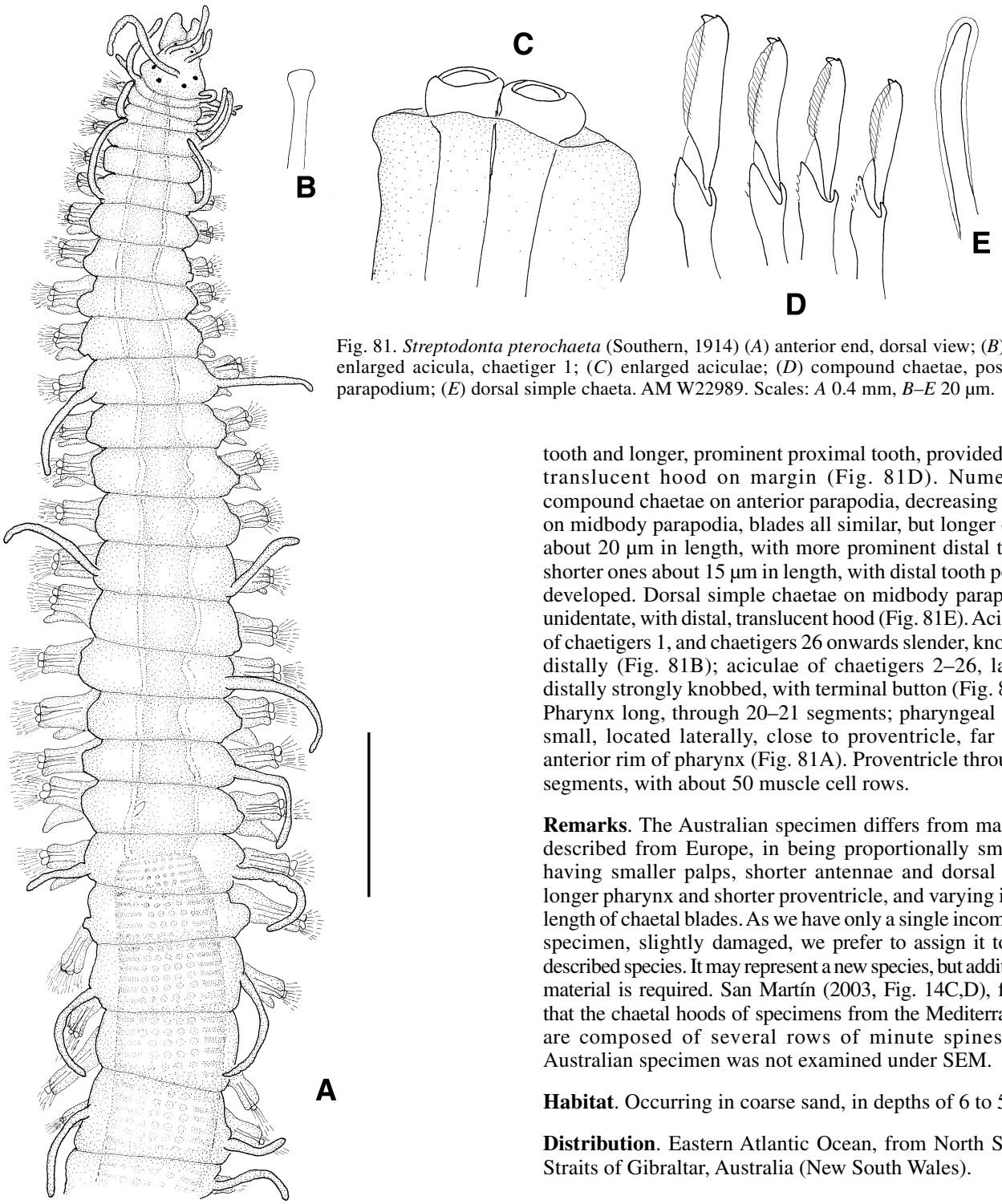



Fig. 81. *Streptodonta pterochaeta* (Southern, 1914) (*A*) anterior end, dorsal view; (*B*) non-enlarged acicula, chaetiger 1; (*C*) enlarged aciculae; (*D*) compound chaetae, posterior parapodium; (*E*) dorsal simple chaeta. AM W22989. Scales: *A* 0.4 mm, *B–E* 20 μm.

palps, lateral antenna in front of anterior eyes. Palps small, triangular, basally fused, shorter than prostomium (Fig. 81A). Peristomium slightly shorter than following segments; dorsal tentacular cirri longer than lateral antennae, shorter than median, ventral tentacular cirri shorter than dorsal ones. Dorsal cirri similar in shape to antennae and tentacular cirri, smooth, elongated, relatively short, shorter than body width (Fig. 81A), detached on most parapodia. Ventral cirri triangular, similar in length to parapodial lobes. Compound chaetae heterogomph falcigers, blades with indistinct distal tooth and longer, prominent proximal tooth, provided with translucent hood on margin (Fig. 81D). Numerous compound chaetae on anterior parapodia, decreasing to 10 on midbody parapodia, blades all similar, but longer ones, about 20 μm in length, with more prominent distal tooth, shorter ones about 15 μm in length, with distal tooth poorly developed. Dorsal simple chaetae on midbody parapodia, unidentate, with distal, translucent hood (Fig. 81E). Aciculae of chaetigers 1, and chaetigers 26 onwards slender, knobbed distally (Fig. 81B); aciculae of chaetigers 2–26, larger, distally strongly knobbed, with terminal button (Fig. 81C). Pharynx long, through 20–21 segments; pharyngeal tooth small, located laterally, close to proventricle, far from anterior rim of pharynx (Fig. 81A). Proventricle through 7 segments, with about 50 muscle cell rows.

**Remarks**. The Australian specimen differs from material described from Europe, in being proportionally smaller, having smaller palps, shorter antennae and dorsal cirri, longer pharynx and shorter proventricle, and varying in the length of chaetal blades. As we have only a single incomplete specimen, slightly damaged, we prefer to assign it to this described species. It may represent a new species, but additional material is required. San Martín (2003, Fig. 14C,D), found that the chaetal hoods of specimens from the Mediterranean are composed of several rows of minute spines, the Australian specimen was not examined under SEM.

**Habitat**. Occurring in coarse sand, in depths of 6 to 50 m.

**Distribution**. Eastern Atlantic Ocean, from North Sea to Straits of Gibraltar, Australia (New South Wales).

### Genus *Streptosyllis* Webster & Benedict, 1884

*Streptosyllis* Webster & Benedict, 1884: 711.

**Type species**. *Streptosyllis arenae* Webster & Benedict, 1884, by monotypy.

**Diagnosis**. Body small (<5 mm in length), with up to about 40 chaetigers, usually 20–30. Prostomium with 4 eyes and 2 anterior eyespots. Three antennae. Palps fused at bases, without median furrow, sometimes terminating with 2 papillae, occasionally reduced and only papillae visible. Nuchal organs as 2 ciliated grooves between prostomium

and peristomium. Dorsal cirri usually smooth or indistinctly articulated, club-shaped to elongated, sometimes with glandular inclusions. Ventral cirri digitiform, sometimes distinctly longer than parapodial lobes and pseudo-articulated, arising from middle of parapodial lobes. Compound chaetae, homogomph to hemigomph, blades falcigerous or, exceptionally, some spiniger-like chaetae. Dorsal simple chaetae present usually from chaetiger 1. Ventral simple chaetae absent. Aciculae from some anterior parapodia distinctly enlarged. Pharynx unarmed, provided with crown of soft papillae. Proventricle with poorly defined muscle cell rows. Reproduction by epigamy (Garwood, 1991).

**Key to Australian species of *Streptosyllis***

1 Palps reduced to 2 small papillae (Fig. 82A). Compound chaetae similar throughout ..... *S. aequiseta*

—— Palps not reduced to papillae. Compound chaetae of some anterior parapodia with distinctly different chaetae to those of remaining parapodia, with short blades ..... 2

2 Enlarged aciculae and chaetae with short blades on chaetigers 2–4 (Fig. 84B). Blades of compound chaetae all unidentate (Fig. 84E). Palps with distal articulation ..... *S. biarticulata*

—— Enlarged aciculae on chaetigers 2–6 and chaetae with short blades on chaetigers 2–6. Compound chaetae with both unidentate and bidentate blades. Palps without distal articulation ..... *S. magnapalpa*

### *Streptosyllis aequiseta* Hartmann-Schröder, 1981

Figs 82A–I, 83A–F

*Streptosyllis aequiseta* Hartmann-Schröder, 1981: 32, figs 53–58; 1983: 131, fig. 15; 1984: 21; 1985: 70; 1989: 26.—Böggemann *et al*., 2003: 21, figs 3, 4.

**Material examined**. AUSTRALIA: NEW SOUTH WALES: Weeney Bay, Botany Bay, 34°01.3'S 151°09.7'E, mud, 1 m, coll. A. Roach & A. Jones, 30 Mar 1995, 1 (AM W23562); Weeney Bay, Botany Bay, 34°01.3'S 151°09.7'E, mud, 1 m, coll. A. Roach & A. Jones, 30 Mar 1995, 1 (AM W23567). WESTERN AUSTRALIA: Bush Bay, 30 km S of Carnarvon, 25°10'S 113°39'E, lumps of algae on shallow sandflats, intertidal, coll. H.E. Stoddart, 6 Jan 1984, 2 (AM W27654); inshore limestone reef, Ned's Camp, Cape Range National Park, 21°59'S 113°55'E, fine sediment & sand from patches in reef, 1 m, coll. H.E. Stoddart, 2 Jan 1984, 2 (AM W26782); N end of beach, Bundegi Reef, Exmouth Gulf, 21°49'S 114°11'E, rocky rubble, coralline algae with green epiphyte, 1.5 m, coll. H.E. Stoddart, 4 Jan 1984, 1 on SEM stub (AM W28370).

**Description**. Up to 4.9 mm long for 36 chaetigers (mature specimen), but usually smaller; examined specimens up to 1.4 mm long, 0.2 mm wide, with 23 chaetigers; fragile, often broken and damaged. Prostomium oval, with 4 eyes arranged in an open trapezoidal pattern and 2 anterior eyespots (Fig. 82A). Antennae smooth, club-shaped, similar in length to prostomium or longer, median antenna inserted between anterior eyes, lateral antennae inserted near eyespots. Palps reduced to 2 small, sometimes indistinct papillae (Figs 82A, 83B). Peristomium shorter than subsequent segments; tentacular cirri similar to antennae, dorsal ones slightly longer than ventral tentacular cirri. Dorsal cirri similar in shape and size to antennae (Fig. 82A) with distinct cirrophores. Parapodial lobes elongated, subrectangular, ending as rounded lobe (Fig. 82B), those of chaetigers 2–6 enlarged and truncated distally. Ventral cirri digitiform, elongated, longer than parapodial lobes, arising from about middle of ventral side of parapodial lobes (Figs 82B, 83A). Compound chaetae with homogomph articulations on anterior parapodia (Figs 82C,D, 83D), and hemigomph on mid to posterior parapodia (Figs 82F, 83C), provided with distinct subdistal spine on shafts, and bidentate blades, with short spines on margin. Anterior parapodia with 2 compound chaetae with elongate blades, about 21 µm long, distinctly bidentate, both teeth well separated (Figs 82C, 83D), and 6 compound chaetae with shorter blades (Fig. 82D), within fascicle blades 10 µm in length dorsally, 6 µm in length ventrally; difference between 2 types of chaetae becoming progressively less marked along body; posterior parapodia with 6 compound chaetae (Fig. 82F), bidentate with short spines on margin, dorsoventral gradation in length of blades within fascicle, 25 µm long dorsally, 9 µm long ventrally. Dorsal simple chaetae from chaetiger 1, unidentate, with minute serration on margin and distinct concave, translucent hood, covering tip of chaetae, small on simple chaetae of anterior parapodia (Figs 82E, 83E) but becoming more developed posteriorly (Figs 82G,H, 83F). Aciculae knobbed at tips, enlarged on chaetigers 2–6 (Fig. 82I). Pharynx extending through 3–4 segments, with crown of 10 soft papillae on margin (Fig. 83A). Proventricle large, pyriform, extending through about 6 segments and 40–48 indistinct muscle cell rows. Pygidium small, with 2 anal cirri and median papilla.

**Remarks**. All Australian specimens have all dorsal cirri smooth; those from the Seychelles (Böggemann *et al*., 2003) have longer dorsal cirri, articulated, with two glands on each article, except anteriormost, which are smooth. Until more material is available, it is unknown as to the levels of variation of articulation of dorsal cirri that may occur within a species. So at this stage we are tentatively accepting the records of this species from the Seychelles.

**Habitat**. Occurring interstitially in coralline sand, fine sand, mud, on algae, from intertidal to shallow depths.

**Distribution**. Australia (Western Australia, South Australia, Tasmania, New South Wales), possibly Seychelles Islands.

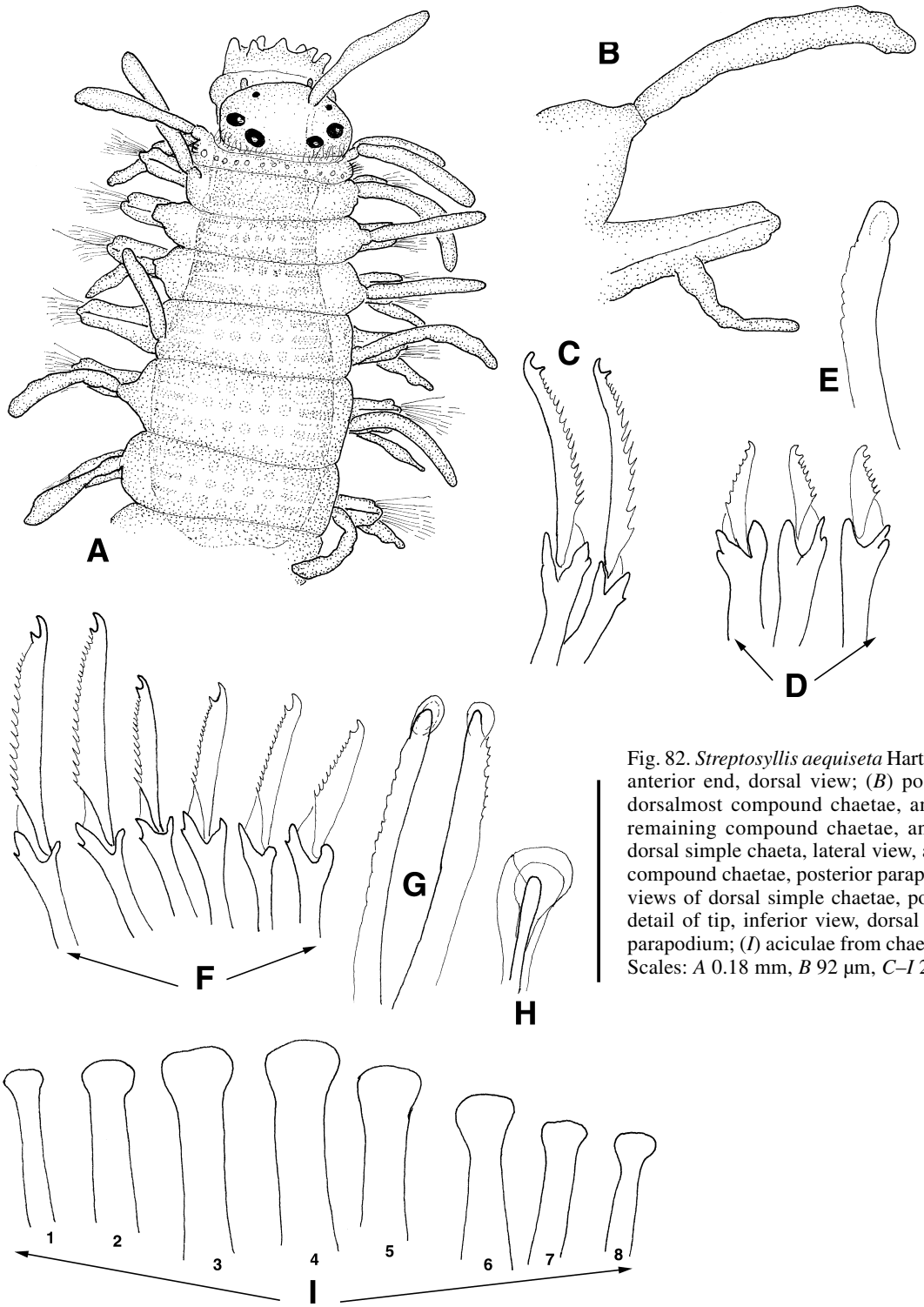



Fig. 82. *Streptosyllis aequiseta* Hartmann-Schröder, 1981 (*A*) anterior end, dorsal view; (*B*) posterior parapodium; (*C*) dorsalmost compound chaetae, anterior parapodium; (*D*) remaining compound chaetae, anterior parapodium; (*E*) dorsal simple chaeta, lateral view, anterior parapodium; (*F*) compound chaetae, posterior parapodium; (*G*) two different views of dorsal simple chaetae, posterior parapodium; (*H*) detail of tip, inferior view, dorsal simple chaeta, posterior parapodium; (*I*) aciculae from chaetigers 1–8. AM W28370. Scales: *A* 0.18 mm, *B* 92 µm, *C–I* 20 µm.

### *Streptosyllis biarticulata* Hartmann-Schröder, 1991

Fig. 84A–F

*Streptosyllis biarticulata* Hartmann-Schröder, 1991: 36, figs 57–61.

**Material examined**. AUSTRALIA: QUEENSLAND: Heron Is., Great Barrier Reef, 23°27'S 151°55'E, coarse sand, intertidal, 4 Feb 1976, coll. G. Hartmann-Schröder, holotype (HZM P-20545).

**Description**. Body 2.5 mm long, 0.2 mm wide, with 35 chaetigers, incomplete specimen. Prostomium oval, with 4 large eyes in trapezoidal arrangement. Antennae broken (and not in vial); point of insertion not visible. Palps shorter than prostomium, fused basally. Peristomium well defined, shorter than following segments; dorsal tentacular cirri with about 6 articles, ventral tentacular cirri smooth, shorter than dorsal ones. Most dorsal cirri detached; dorsal cirri with 4–7 articles. Enlarged aciculae (Fig. 84C) from chaetigers 2–

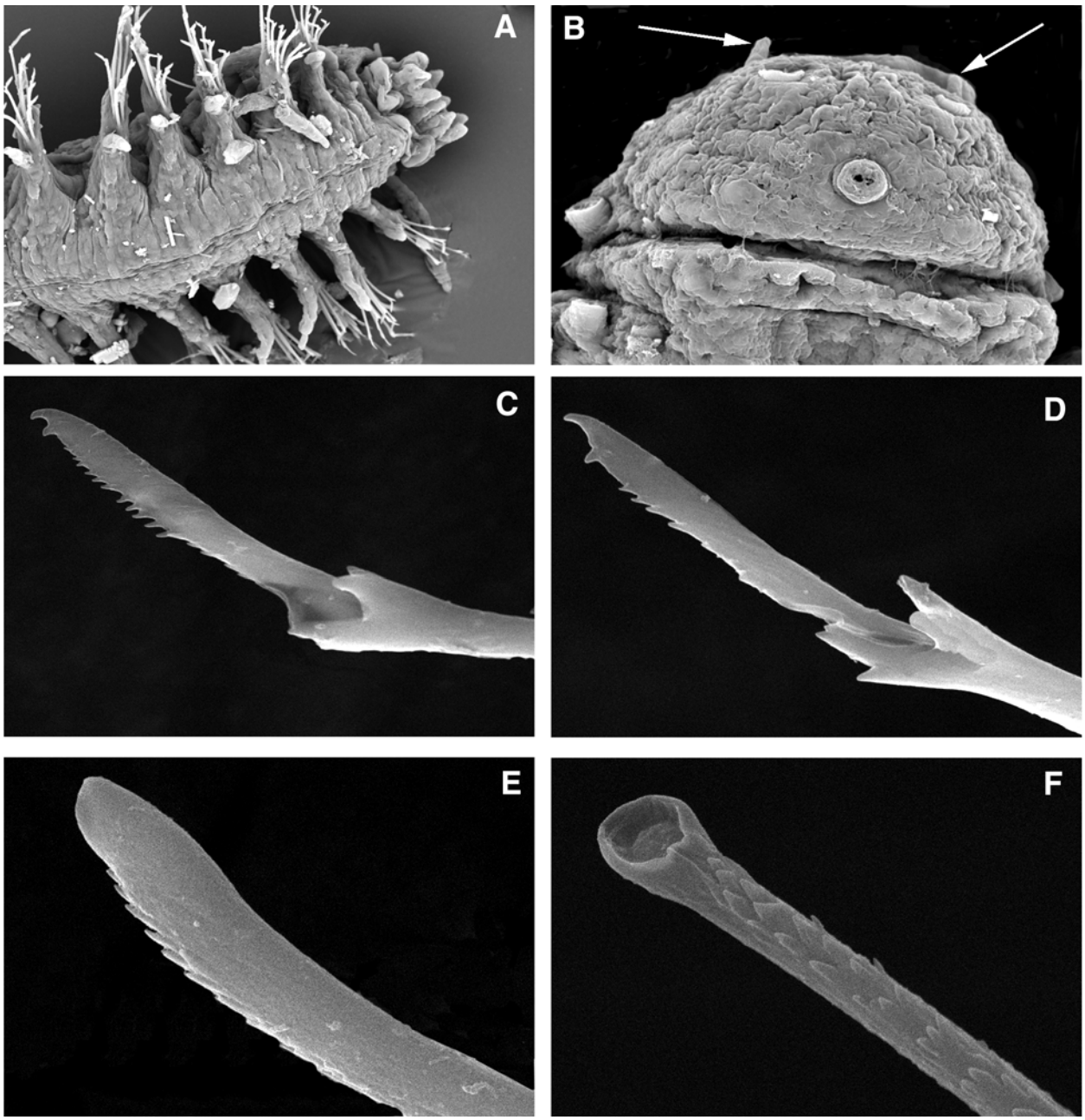



Fig. 83. SEM of *Streptosyllis aequiseta* Hartmann-Schröder, 1981. (*A*) anterior end, ventral view; (*B*) detail of prostomium, showing the papillae of palps; (*C*) dorsal compound chaeta, posterior parapodium; (*D*) same, anterior parapodium; (*E*) dorsal simple chaeta, anterior parapodium, lateral view; (*F*) dorsal simple chaeta, inferior view, posterior parapodium. AM W28370.

4, large basally, distally blunt. Subsequent aciculae and aciculae of chaetiger 1, similar but much thinner (Fig. 84F). Compound chaetae with thick shafts, some of them provided with thin hood distally, and blades distally blunt, unidentate, with short spines on margin, and slight dorsoventral gradation in length of blades within fascicle (Fig. 84E), 13 µm in length dorsally, 7 µm in length ventrally. Compound chaetae of chaetigers 3–4 with distinctly shorter blades, blunt, short, with thick shafts, some covered by translucent hood (Fig. 84B). Dorsal simple chaetae from chaetiger 1, thick, distally blunt, with hood, longitudinally striated (Fig. 84A), becoming thicker posteriorly (Fig. 84D). Ventral simple chaetae absent. Pharynx extends for about 4 segments. Proventricle extending for 3.5 segments, with about 35 muscle cell rows.

**Habitat**. Occurring in coral sand, intertidally.

**Distribution**. Australia (Queensland).

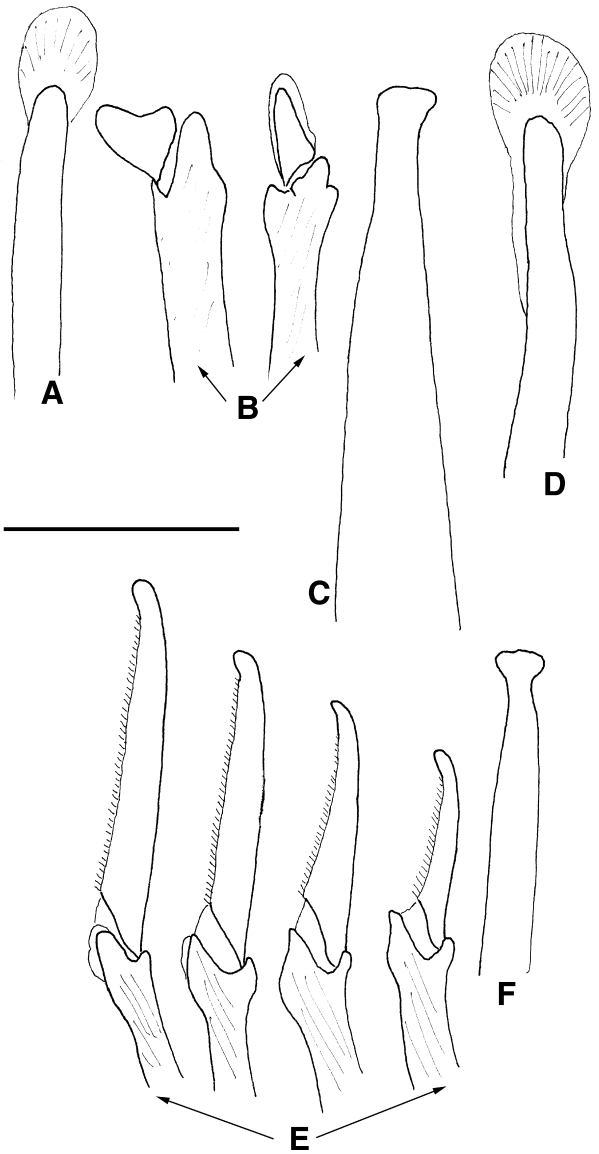



Fig. 84. *Streptosyllis biarticulata* Hartmann-Schröder, 1991 (*A*) dorsal simple chaeta, anterior parapodium; (*B*) compound chaetae from parapodia 2–4; (*C*) enlarged acicula (chaetigers 2–4); (*D*) dorsal simple chaeta, midbody; (*E*) compound chaetae, midbody; (*F*) acicula, midbody. ZMH P-20545. Scale: 20 μm.

### *Streptosyllis magnapalpa* Hartmann-Schröder, 1981

Fig. 85A–H

*Streptosyllis magnapalpa* Hartmann-Schröder, 1981: 33, figs 59–67; 1982: 65, fig. 47; 1983: 13; 1987: 38.

**Material examined**. AUSTRALIA: WESTERN AUSTRALIA: Horrocks, algae, seagrass and sand, 28°23'S 114°26'E, intertidal, 17 Oct 1975, coll. G. Hartmann-Schröder, paratype (HZM P-16488); Cervantes, 30°30'S 115°03'E, fine sand and *Posidonia*, intertidal, coll. G. Hartmann-Schröder, 24 Oct 1975, 1 (HZM P-17019).

**Description**. Body fragile, without colour markings; largest complete specimen 2.8 mm long, 0.2 mm wide, with 37 chaetigers. Prostomium oval, with 4 eyes in open trapezoidal arrangement; tuft of cilia present in front of anterior eyes. Antennae short, smooth, slightly club-shaped; median antenna missing (broken and lost), arising on middle of prostomium; lateral antennae inserted near anterior margin of prostomium (Fig. 85A). Palps shorter than prostomium, fused basally. Peristomium slightly shorter than following segment, provided with some hyaline inclusions (Fig. 85A); tentacular cirri similar to lateral antennae in shape; dorsal tentacular cirri slightly longer than lateral antennae, ventral tentacular cirri shorter than dorsal. Transverse row of cilia on dorsum of each segment (Fig. 85A). Dorsal cirri of anterior 2–3 segments similar to antennae and tentacular cirri, although slightly longer. Subsequent dorsal cirri articulated, with few articles, 4–6, some of them with granular, dark inclusions. Aciculae slender, distally blunt (Fig. 85D); enlarged aciculae on chaetigers 2–6. Compound chaetae of chaetigers 2–6 with thick shafts, short, unidentate blades, some covered by translucent hood, with slight dorsoventral gradation in length of blades within fascicle, 18 μm in length dorsally, and 11 μm in length ventrally (Fig. 85C). Compound chaetae of subsequent chaetigers with elongate, unidentate, distally blunt blades, with short spines on margin, shafts with thick subdistal spine, and dorsoventral gradation in length within fascicle, 47 μm dorsally, 22 μm ventrally (Fig. 85F); progressively on following segments, blades becoming slender, and tips indistinctly bidentate (Fig. 85G). Anterior parapodia with about 6 compound chaetae, reducing to 4 on posterior parapodia. Dorsal simple chaetae from chaetiger 1, thick, distally blunt, with distal, longitudinally striated hood, similar throughout body (Fig. 85B,E,H). Pharynx long, through about 5–6 segments, with distal crown of 10 papillae and subdistal crown of much smaller papillae (Fig. 85A). Proventricle through about 5 segments, with 35 muscle cell rows. Pygidium small, with two long anal cirri and median short papilla.

**Habitat**. Occurring in algae, seagrass, sand, from intertidal to shallow depths.

**Distribution**. Australia (Western Australia, Victoria).

## Genus *Syllides* Örsted, 1845

*Syllides* Örsted, 1845: 408.

**Type species**. *Syllides longocirrata* Örsted, 1845, designated by Hartman, 1959.

**Diagnosis**. Body small, short, with relatively few segments. Prostomium with 4 eyes, typically pair of anterior eyespots. Three antennae. Palps fused basally, without median furrow, sometimes ending with small papilla. Two pairs of tentacular cirri. Nuchal organs as 2 ciliated grooves between prostomium and peristomium. Antennae, tentacular cirri, and dorsal cirri of chaetigers 1 and 2, smooth, non-articulated, club-shaped to fusiform; dorsal cirri from chaetiger 3 onwards, distinctly articulated, with glandular inclusions on some articles. Ventral cirri digitiform. Compound chaetae heterogomph with blades slender, usually bidentate. Dorsal simple chaetae from anterior segments, usually from chaetiger 1. Ventral simple chaetae present in some species. Pharynx unarmed, with crown of soft papillae. Reproduction by epigamy, some species brood eggs ventrally (Heacox & Schroeder, 1978).

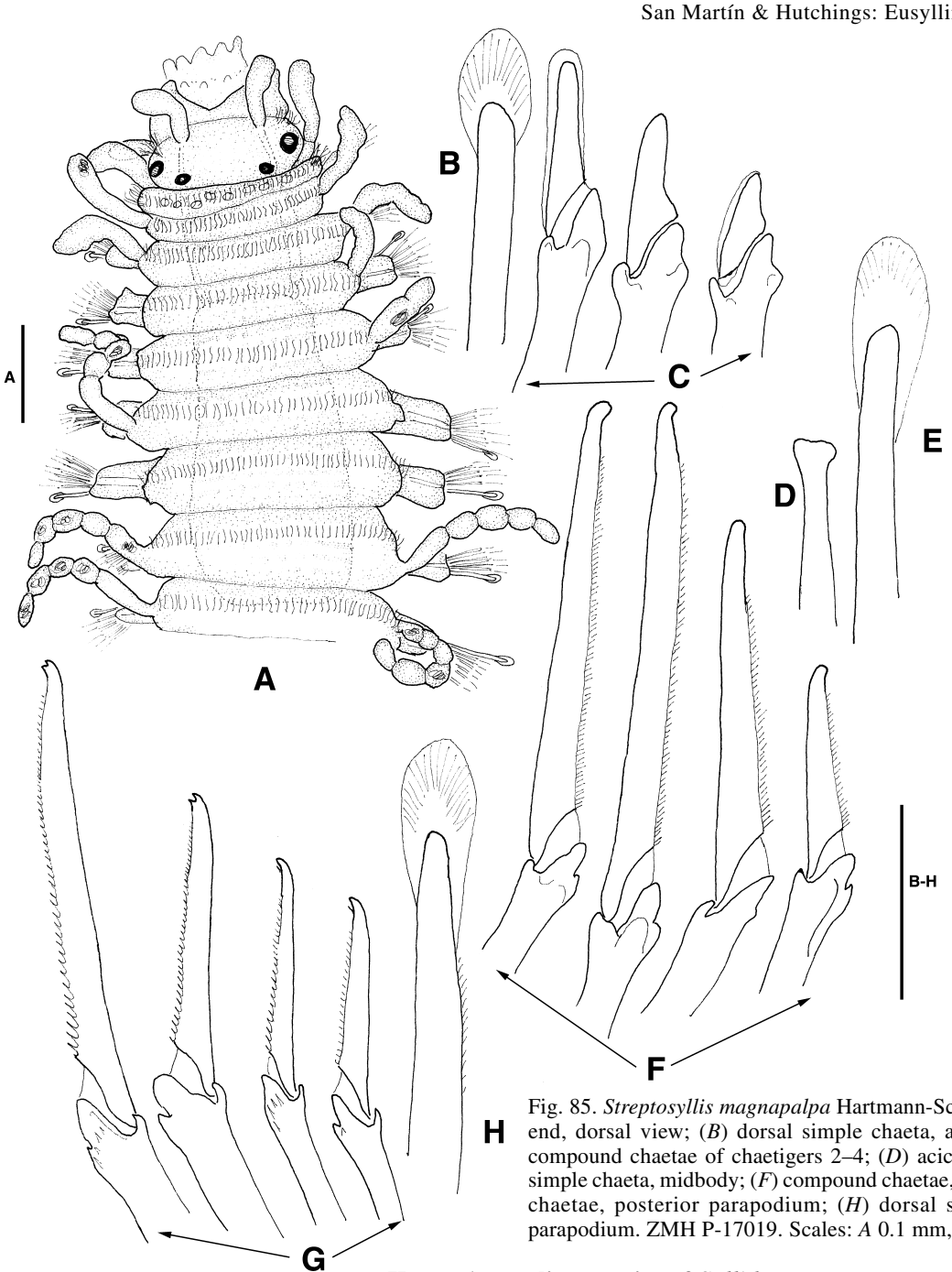



Fig. 85. *Streptosyllis magnapalpa* Hartmann-Schröder, 1981 (*A*) anterior end, dorsal view; (*B*) dorsal simple chaeta, anterior parapodium; (*C*) compound chaetae of chaetigers 2–4; (*D*) acicula, midbody; (*E*) dorsal simple chaeta, midbody; (*F*) compound chaetae, midbody; (*G*) compound chaetae, posterior parapodium; (*H*) dorsal simple chaeta, posterior parapodium. ZMH P-17019. Scales: *A* 0.1 mm, *B–H* 20 µm.

**Key to Australian species of *Syllides***

1 Blades of some compound chaetae provided with long, basal spurs on margin (Fig. 89B) ..... 2

—— Without basal spurs on blades of compound chaetae (Fig. 88D) ..... 4

2 Longest blades of compound chaetae lacking basal spurs, only present on medium-length blades ..... *S. spinosus*

—— Longest blades of compound chaetae with basal spurs ..... 3

3 Dorsal simple chaetae distally rounded, with distal hood (several rows of minute spines, under SEM) ..... *S. tam* n.sp.

—— Dorsal simple chaetae pointed, without hood ..... *S. japonicus*

4 Dorsal simple chaetae distally rounded, with distal hood (several rows of minute spines, under SEM). Proventricle long, through 4 segments ..... *S. pumilus*

—— Dorsal simple chaetae distally bifid, without hood. Proventricle short, through 2 segments ..... *Syllides* sp.

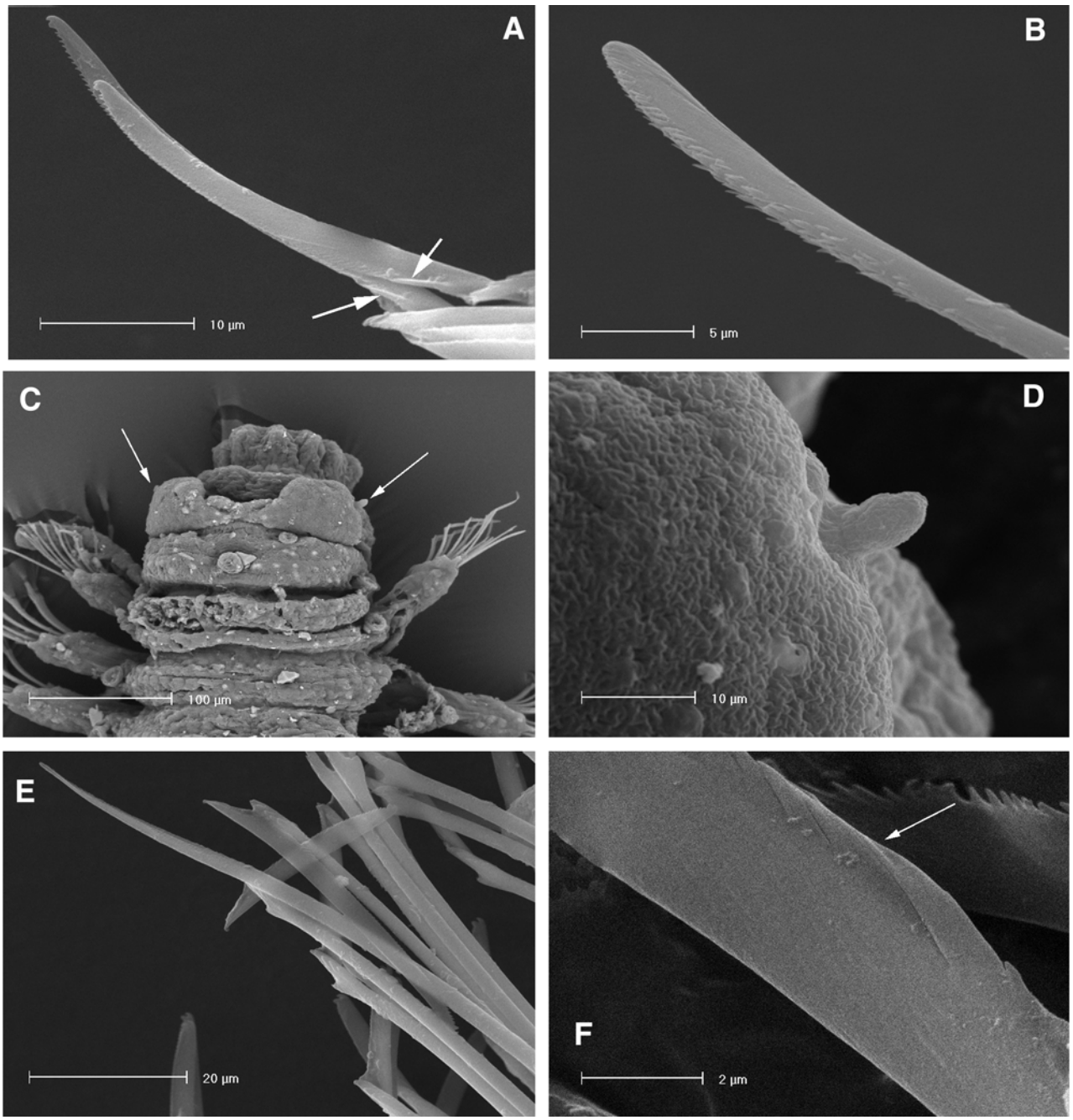



Fig. 86. SEM of *Syllides tam* n.sp. (*A*) compound chaetae of first and second pair (arrows showing basal spurs); (*B*) dorsal simple chaeta. SEM of *Syllides japonicus* Imajima, 1966 (*C*) anterior end, dorsal view (antennae and cirri missing; arrows showing papillae of palpi); (*D*) detail of papilla of palp; (*E*) dorsal simple chaeta and some compound chaetae; (*F*) detail of basal spur of compound chaeta. *A,B*: AM W196520; *C–F*: W23927.

### *Syllides japonicus* Imajima, 1966

Figs 86C–F, 87A–E

*Syllides japonicus* Imajima, 1966: 112, text-fig. 36.—San Martín, 2003: 142, fig. 69.

**Material examined**. AUSTRALIA: NEW SOUTH WALES: 1 km SE of Dangar Is., Hawkesbury R., 33°33'S 151°14'E, shelly mud, 9 m, coll. A.R. Jones & party, 18 Dec 1979, 1 (AM W28467); Pittwater, 33°35.80'S 151°18.31'E, muddy sand, 14.4 m, coll. Australian Museum Party, 31 July 1995, 2 (AM W23927); 1 km SE of Dangar Is., Hawkesbury R., 33°33'S 151°14'E, shelly mud, 9 m, coll. A.R. Jones & party, 1 Aug 1979, 1 (AM W28975); 1.5 km SE of Dangar Is., Hawkesbury R., 33°33'S 151°14'E, sandy mud, 7 m, coll. A.R. Jones & party 18 Dec 1979, 1 (AM W28976). TASMANIA: Fancy Point, Bruny Is. 43°16'S 147°19'E, algae, 4 m, coll. G. Edgar, 10 Nov 1980, 1 (AM W18204). WESTERN AUSTRALIA: Inshore limestone reef, Ned's Camp, Cape Range National Park, 21°59'S 113°55'E, *Caulerpa* sp. algae, 1 m, coll. J.K. Lowry, 2 Jan 1984, 1 (AM W26739); Inshore limestone reef, Ned's Camp, Cape Range National Park, 21°59'S 113°55'E, small purple sponge with *Caulerpa* sp. algae & sticky sediment, 1.5 m, coll. R.T. Springthorpe, 2 Jan 1984, 2 (AM W26781).

**Description**. Body less than 5 mm in length, densely covered with golden inclusions on dorsum of each segment and prostomium (Fig. 87A). Prostomium oval, about twice as wide as long; 4 small eyes in open trapezoidal arrangement; antennae missing on most specimens, short, smooth. Palps broad, fused at bases, shorter than prostomium, each ending with distal, small papilla (Figs

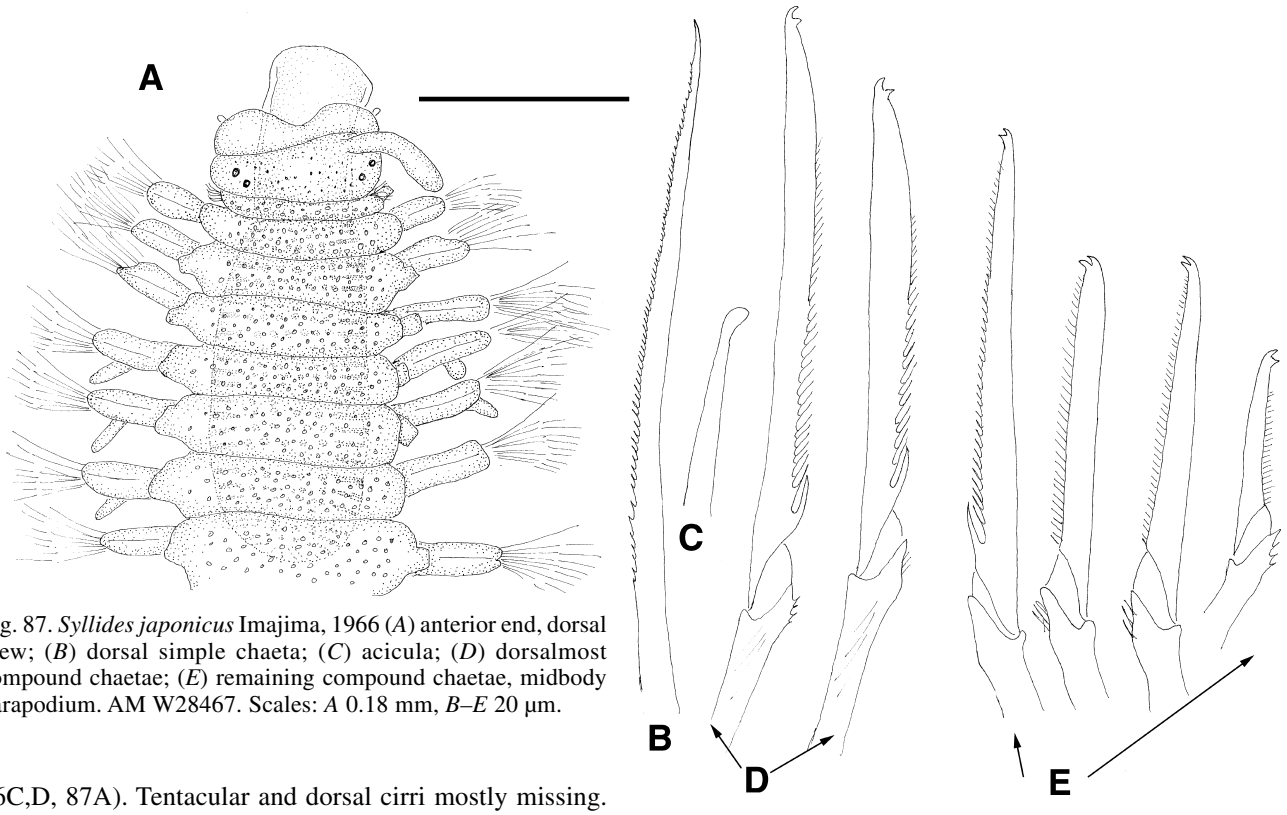



Fig. 87. *Syllides japonicus* Imajima, 1966 (*A*) anterior end, dorsal view; (*B*) dorsal simple chaeta; (*C*) acicula; (*D*) dorsalmost compound chaetae; (*E*) remaining compound chaetae, midbody parapodium. AM W28467. Scales: *A* 0.18 mm, *B–E* 20 µm.

86C,D, 87A). Tentacular and dorsal cirri mostly missing. Parapodia elongated, ventral cirri digitiform. Compound chaetae with elongated, distinctly bidentate blades, arranged in 5 pairs of chaetae within fascicle, each pair of similar shape and length; blades of dorsalmost pair with long blades, about 55 µm long, with basal long spur (Figs 86F, 87D) and short spines on margin; blades of subsequent pair similar (Fig. 87E) but shorter, about 44 µm long; remaining compound chaetae similar in shape, lacking basal spur (Fig. 87E), with dorsoventral gradation in length of blades, 35 µm in length dorsally and 22 µm in length ventrally. Dorsal simple chaetae from chaetiger 1, thin, pointed (Figs 86E, 87B), with short spines on margin (Fig. 87B). Ventral simple chaetae absent. Aciculae slender, distally knobbed (Fig. 87C) pharynx everted on most specimens, through about 4 segments when relaxed. Proventricle long, through 7 segments (Fig. 87A), with about 47 muscle cell rows.

**Remarks**. The original description of the species from Japan and descriptions of Mediterranean specimens do not describe the terminal papillae on the palps; these structures are small and could easily be overlooked. This species is characterized by having basal spurs on the bases of blades of the dorsalmost and second pair of compound chaetae; palps each with a small papilla on the Australian material, and dorsal simple chaetae, slender. *Syllides caribica* Licher, 1996, from Aruba Island in the Caribbean is similar, but differs in the following characters: the spurs on the compound chaetae are shorter, and have a smooth area between the spur and the edge of blade, the proventricle is shorter (through 2 segments), and the dorsal simple chaetae are slightly thicker (see Licher, 1996). *Syllides floridanus* Perkins, 1981 also has papillae on the palps, a long proventricle and slender, distally pointed dorsal simple chaetae; but the blades of the dorsalmost pair of compound chaetae lack basal spurs; they are present only on the second pair (Perkins, 1981).

All the material examined from Australia is damaged and while it closely resembles material examined from the Mediterranean, it may represent an undescribed species, but complete specimens are needed in order to confirm this.

**Habitat**. Occurring in sand, sandy mud, rhizomes of *Posidonia*, on algae and sponges; in shallow depths.

**Distribution**. Japan, Western Mediterranean, USA (Massachusetts), Australia (New South Wales, Tasmania, Western Australia).

### *Syllides pumilus* Hartmann-Schröder, 1983

Fig. 88A–F

*Syllides articulosus pumilus* Hartmann-Schröder, 1983: 131, figs 16, 17; 1984: 21; 1986: 42; 1987: 38; 1989: 26.

**Material examined**. AUSTRALIA: NEW SOUTH WALES: S of airport runway extension, Botany Bay, 33°58.13'S 151°11.16'E, 5 m, coll. Australian Museum party, 6 Apr 1992, 1 (AM W23118); Currambene Creek, Jervis Bay, 35°02'S 150°40'E, intertidal unvegetated sediment, coll. L. Howitt, Dec 1988, 1 (AM W22608). WESTERN AUSTRALIA: Dunsborough, 33°36'S 115°06'E, *Posidonia* & *Halophila* seagrasses, intertidal, coll. G. Hartmann-Schröder, 9 Nov 1975, 2 paratypes (AM W196214); reef W of Groyne, 2 km S of Cape Peron, 32°16'S 115°41'E, orange sponge in deep channel in limestone reef, 4.5 m, coll. R.T. Springthorpe, 26 Dec 1984, 1 (AM W28367); Limestone reef, off Ned's camp, Cape Range National Park, 21°59'S 113°55'E, sponge with epiphytic algae, & muddy worm tubes, 1.5 m, coll. R.T. Springthorpe, 2 Jan 1984, 1 (AM W27652).

**Description**. Body 2.4 mm long, 0.2 mm wide, with 30 chaetigers, dorsum with bright, minute inclusions, density of inclusions varies between individuals, fragile, most appendages missing on all specimens. Prostomium oval, with 4 eyes arranged in open trapezoidal pattern, and 2

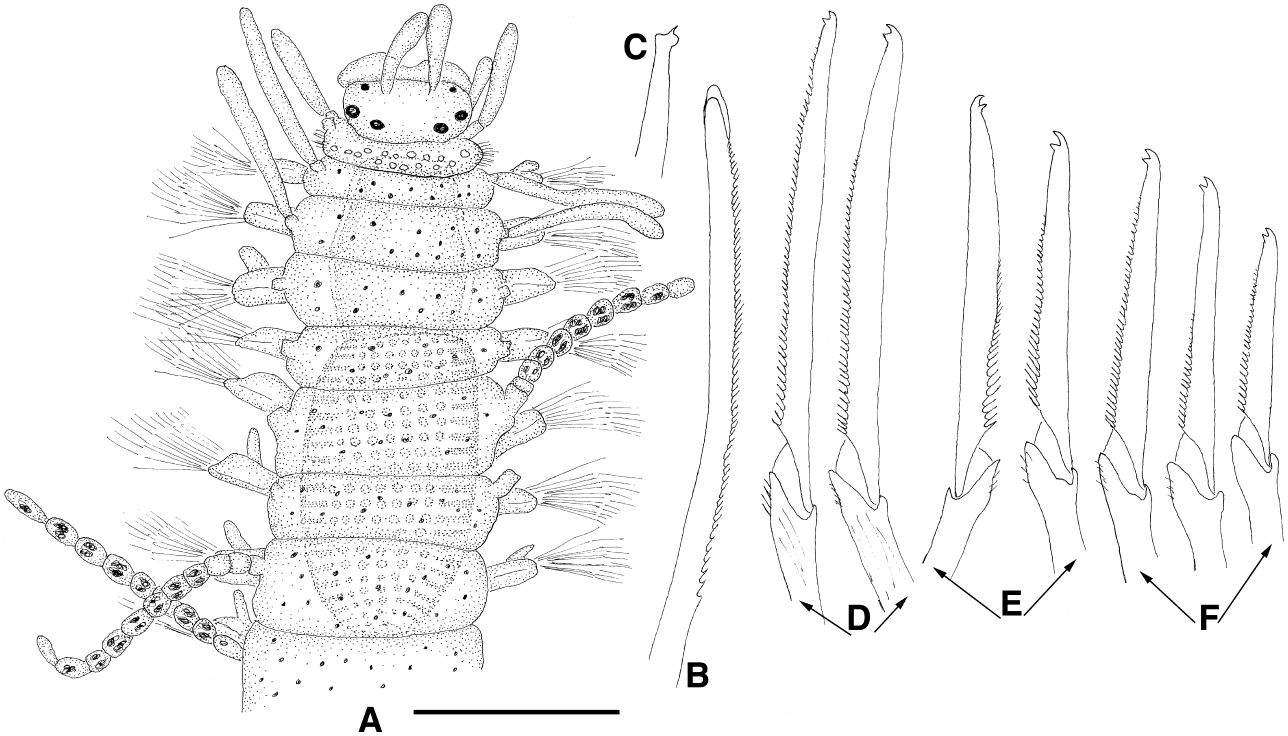



Fig. 88. *Syllides pumilus* Hartmann-Schröder, 1983 (*A*) anterior end, dorsal view; (*B*) dorsal simple chaeta; (*C*) acicula; (*D*) dorsalmost pair of compound chaetae; (*E*) second pair of compound chaetae; (*F*) compound chaetae of remaining pairs, midbody parapodium. AM W26322. Scales: *A* 0.18 mm, *B–F* 20 μm.

anterior eyespots; 3 antennae all similar. Palps basally fused, shorter than prostomium (Fig. 88A). Peristomium with hyaline inclusions, larger than inclusions on dorsum; tentacular cirri elongated, slightly club-shaped, longer than lateral antennae (Fig. 88A), ventral tentacular cirri about two thirds length of dorsal cirri. Dorsal cirri of chaetigers 1, 2, elongated, longer than tentacular cirri, similar in length to body width; from chaetiger 3 onwards, dorsal cirri articulated (Fig. 88A), with about 10 articles (up to 16, fide Hartmann-Schröder), cirri mostly broken, articles usually with 1–2 dark, granular inclusions. Parapodia trapezoidal dorsally, slightly larger on anterior parapodia, becoming conical and slender from mid parapodia onwards. Ventral cirri digitiform, similar in length or shorter than parapodial lobes. About 15 compound chaetae on anterior parapodia, numbers diminishing progressively along body to about 10; shafts with thin subdistal spines; blades elongated, bidentate, with short spines on margin, without basal spurs (Fig. 88D–F), with dorsoventral gradation in length of blades within fascicle, about 50 μm in length dorsally, 20 μm in length ventrally, on midbody. Dorsal simple chaetae from chaetiger 1, distally blunt, with small distal hood and short spines on margin (Fig. 88B). Ventral simple chaetae absent. All parapodia with single acicula, distally knobbed, with filiform, short tip (Fig. 88C). Pharynx through 4 segments. Proventricle through 4 segments (Fig. 88A), with 24–30 muscle cell rows.

**Remarks**. *Syllides articulosus* Ehlers, 1897, from Magellan Strait, in South America, appears to be a different species to the Australian specimens that were described by Hartmann-Schröder (1983) as a subspecies *Syllides articulosus pumilus. Syllides articulosus* has a proventricle distinctly longer than the pharynx (see Ehlers, 1897, pl. II, Fig. 52), and the dorsal simple chaetae are distally pointed, and lack a distal hood (Banse, 1972). We suggest that such differences are sufficient to warrant elevating the subspecies of Hartmann-Schröder to a full species *Syllides pumilus. Syllides bansei* Perkins, 1981, from Florida and the Mediterranean Sea, has similar dorsal simple chaetae, but the blades of the second pair of compound chaetae within each fascicle are provided with a long basal spur (see Perkins, 1981; San Martín, 2003).

**Habitat**. Occurring on sponges, algae, *Posidonia*, and in sediments, from intertidal to shallow depths.

**Distribution**. Australia (Western Australia, South Australia, Victoria, New South Wales).

### *Syllides spinosus* Hartmann-Schröder, 1979

Fig. 89A–C

*Syllides articulosus spinosus* Hartmann-Schröder, 1979: 99, figs 126–128; 1981: 34; 1991: 37.

**Material examined**. AUSTRALIA: NEW SOUTH WALES: NE corner of Clark Is., 33°51.85'S 151°14.47'E, encrustation on outside of bottle, 5 m, coll. P.A. Hutchings, 17 Apr 1996, 2 (AM W26322). WESTERN AUSTRALIA: Exmouth, Tantabiddy Creek, 21.56°S 113°58'E, medium sand, intertidal, coll. G. Hartmann-Schröder, 1 (HZM P-16907).

**Description**. Body 2.2 mm long, 0.3 wide mm with 30 chaetigers. Dorsal cirri long, with hyaline vacuoles on most articles (Fig. 89A). Tufts of cilia in front of each anterior eyespot. Ciliary bands on dorsum of each segment (Fig. 89A). Parapodia with about 5 compound chaetae, relatively long blades, bidentate, both teeth distinctly separated, with short spines on margin; blades of 2 medium length

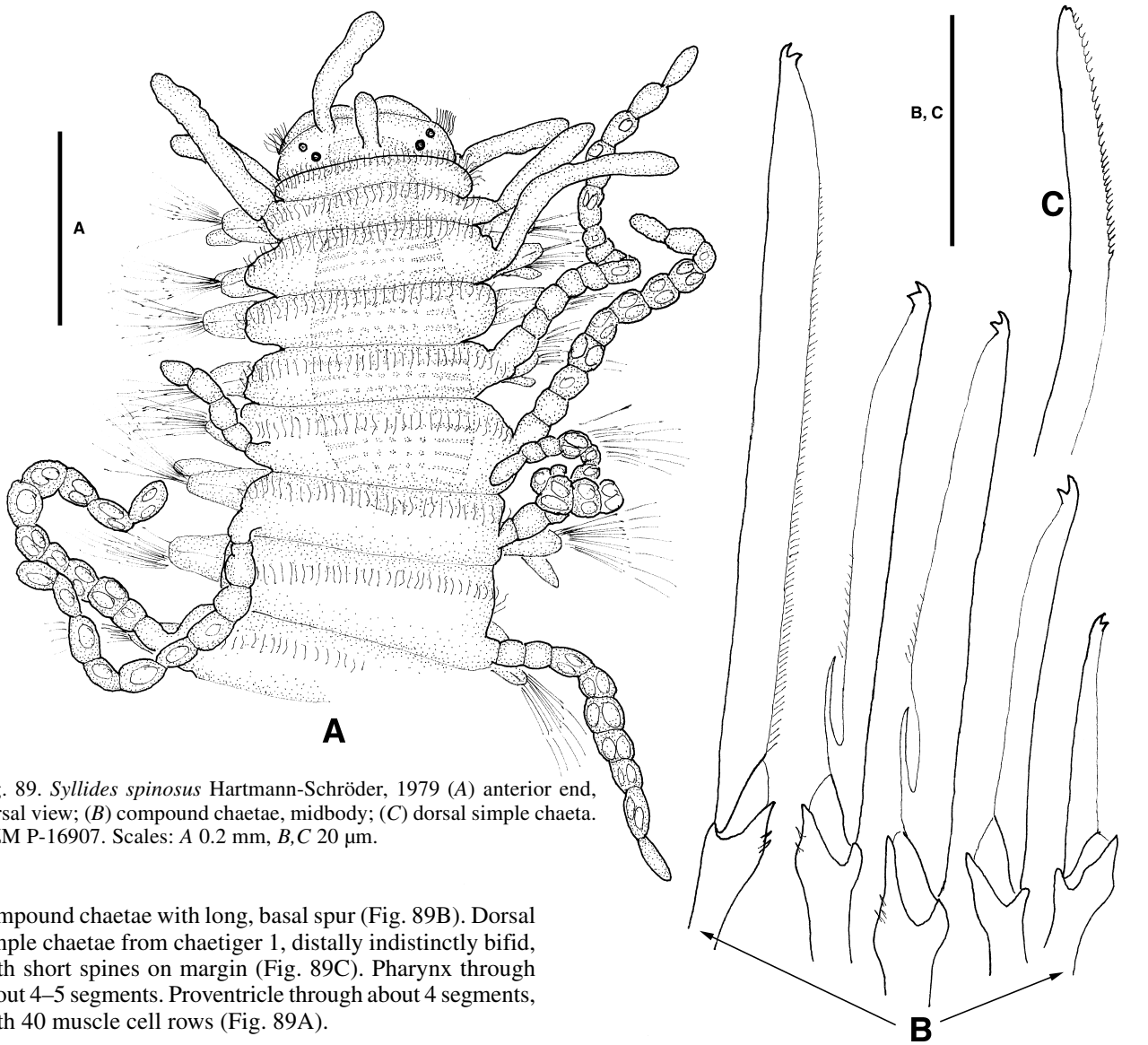



Fig. 89. *Syllides spinosus* Hartmann-Schröder, 1979 (*A*) anterior end, dorsal view; (*B*) compound chaetae, midbody; (*C*) dorsal simple chaeta. HZM P-16907. Scales: *A* 0.2 mm, *B,C* 20 μm.

compound chaetae with long, basal spur (Fig. 89B). Dorsal simple chaetae from chaetiger 1, distally indistinctly bifid, with short spines on margin (Fig. 89C). Pharynx through about 4–5 segments. Proventricle through about 4 segments, with 40 muscle cell rows (Fig. 89A).

**Remarks**. The long, basal spurs on medium-length blades of compound chaetae have not previously been described. This character is considered to be a useful character to distinguish between species in this genus. *Syllides bansei* Perkins, 1981, has similar compound chaetae, but the dorsal simple chaetae differ in having a distal hood (Perkins, 1981). *Syllides edentatus* Westheide, 1974, also has a similar arrangement of chaetae, but the pair of the medium size chaetae have several long spines instead of a single basal spur as occurs in *Syllides spinosus* (Westheide, 1974; San Martín, 2003). *Syllides benedicti* Banse, 1972, also has a single long basal spur on the pair of medium-length bladed chaetae, but the dorsal simple chaetae are distally rounded, with some spines present in addition to the spines on margin (Banse, 1972). For a discussion of the differences between the stem species *S. articulosus* and *S. spinosus* see Hartmann-Schröder, 1979; furthermore, *S. articulosus* lacks long basal spurs on any blade (Somaschini & San Martín, 1997).

**Habitat**. Occurring in coarse and medium sand, on encrustations, from intertidal to shallow depths.

**Distribution**. Australia (Western Australia, Victoria, South Australia, New South Wales).

***Syllides tam* n.sp.**

Figs 86A,B, 90A–G

*Syllides longocirrata*.—Augener, 1913: 229.—Haswell, 1920: 102.—Hutchings & Murray, 1984: 33. Not Örsted, 1845: 11.

**Material examined**. HOLOTYPE (AM W28472) AUSTRALIA: NEW SOUTH WALES: 1.5 km SE of Dangar Is., Hawkesbury R., 33°33'S 151°14'E, sandy mud, 7 m, coll. Jones & party, 21 Aug 1980. PARATYPES. 50 m NE of Green Point, Hawkesbury R., 33°33.5'S 151°14.5'E, sandy mud, 4 m, coll. A.R. Jones & party, 17 May 1982, 1 (AM W24704); 300 m NE of Green Point, Hawkesbury R., 33°34'S 151°13.5'E, sandy mud, 5 m, coll. A.R. Jones & A. Murray, 18 Nov 1980, 1 (AM W28463); 1 km S of E end, Spectacle Is., Hawkesbury R., 33°32'S 151°07.5'E, muddy sand, 12 m, coll. A.R. Jones & A. Murray, 5 Aug 1983, 1 (AM W28464); 1 km S of E end, Spectacle Is., Hawkesbury R., 33°32'S 151°07.5'E, muddy sand, 12 m, coll. A.R. Jones & A. Murray, 11 Nov 1983, 1 (AM W28465); 1 km SE of Dangar Is., Hawkesbury R., 33°33'S 151°14'E, shelly mud, 9 m, coll. A.R. Jones & party, 1 Aug 1979, 1 (AM W28466); 1 km SE of Dangar Is., Hawkesbury R., 33°33'S 151°14'E, shelly mud, 9 m, coll. A.R. Jones & party, 21 Aug 1980, 1 (USNM 1082992); 30 m SE of Brooklyn boat-channel, Hawkesbury R., 33°33'S 151°14'E, shelly mud, 7 m, coll. A.R. Jones & party, 18 Dec 1979, 1 (LACM ex AM W28469); 30 m SE of Brooklyn boat-channel, Hawkesbury R., 33°33'S 151°14'E, shelly mud, 7 m, coll. A.R. Jones & party, 1 Aug 1979, 1 (AM W28470); 1.5 km SE of Dangar Is., Hawkesbury R., 33°33'S 151°14'E, sandy mud, 7 m, coll. A.R. Jones & party, 1 Aug

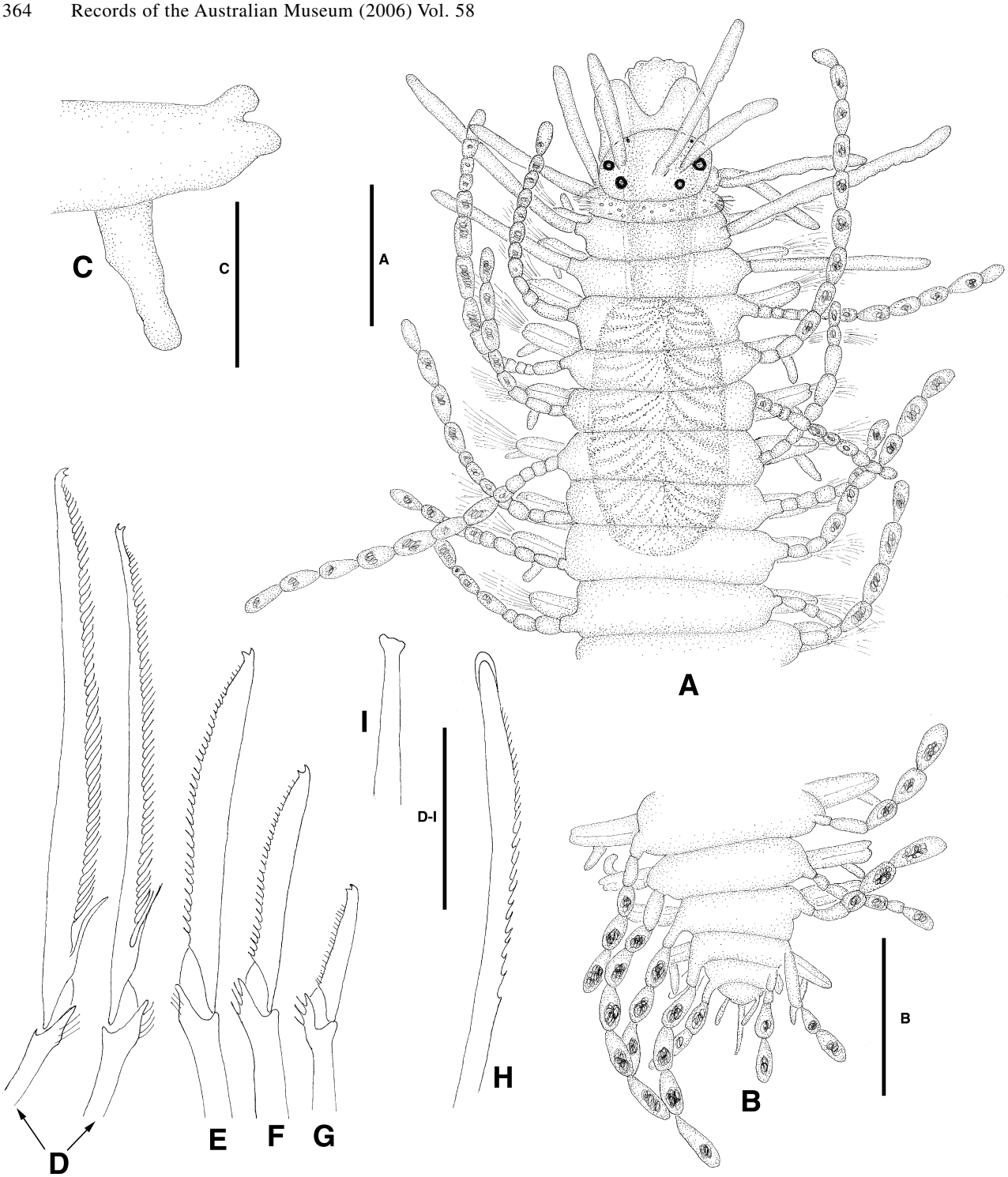



Fig. 90. *Syllides tam* n.sp. (*A*) anterior end, dorsal view; (*B*) posterior end, dorsal view; (*C*) parapodial lobe; (*D*) compound chaetae of longest and second pair, midbody parapodium; (*E*) compound chaeta of third pair; (*F*) compound chaeta of fourth pair; (*G*) compound chaeta of fifth pair; (*H*) dorsal simple chaeta; (*I*) acicula. AM W28472. Scales: *A,B* 0.1 mm; *C* 37 µm; *D–I* 20 µm.

1979, 3 (AM W28471); 1.5 km SE of Dangar Is., Hawkesbury R., 33°33'S 151°14'E, sandy mud, 7 m, coll. A.R. Jones & party, 18 Dec 1979, 1 (AM W28473); Brooklyn boat-channel, Hawkesbury R., 33°33'S 151°14'E, fine mud, 3 m, coll. A.R. Jones, 16 May 1980, 1 (AM W28474); Midway between Green Point and Croppy Point, Hawkesbury R., 33°33.5'S 151°14.5'E, mud, 6 m, coll. A. Jones & party, 22 Nov 1980, 1 (AM W196517); E end Brooklyn boat channel, 1 (AM W196518); Liverpool Reach, Hawkesbury R., 33°25'S 150°56'E, fine sand, 4 m, coll. A. Jones & party, 21 Feb 1980, 1 (AM W196657); Liverpool Reach, Hawkesbury R., 33°25'S 150°56'E, coarse sand, 20 m, coll. A. Jones & party, 21 Feb 1980, 3 (AM W196658); Liverpool Reach, Hawkesbury R., 33°25'S 150°56'E, coarse sand, 20 m, coll. A. Jones & party, 21 Feb 1980, 21 (AM W196659).

**Additional material examined**. QUEENSLAND: At mouth of Althaus Creek, Halifax Bay, 19°10'S 146°36'E, 2 m, coll. Queensland Nickel, Jan 1977, 2 (AM W28207). NEW SOUTH WALES: 0.5 km E. of Dangar Is., Hawkesbury R., 33°33'S 150°14'E, coll. A. Jones & party, 21 Aug 1980, 4 on SEM stub (AM W196520); S of airport runway extension, Botany Bay, 33°58.13'S 151°11.16'E, 5 m, coll. Australian Museum party, 7 Apr 1992, 1 (AM W21631); SW of airport runway extension, Botany Bay, 33°58.33'S 151°10.22'E, 7 m, coll. Australian Museum party, 28 July 1992, 1 (AM W21632); E of Marley, 34°08.08'S 151°09.65'E, sand, 60 m, coll. Fisheries Research Institute (NSW), 2 May 1991, 1 (AM W24377); Bass Point, 34°36'S 150°54'E, 50 m, coll. The Ecology Lab for RMI/Pioneer Project, 1 Feb 1990, few (AM

W22994); Montagu Roadstead, Jervis Bay, 35°02.2'S 150°46'E, 12 m, coll. P.A. Hutchings & party, 6 Jun 1991, 1 (AM W27574). VICTORIA: Port Phillip Bay, 38°09.3'S 144°42.7'E, sand, 3 m, coll. Marine Pollution Studies Group, 11 Jun 1971, 2 (AM W16236).

**Description**. Body about 2.4 mm long, 0.2 mm wide, with 30 chaetigers. Prostomium oval, slightly wider than long; 4 eyes arranged in open trapezoidal pattern and 2 anterior eyespots; median antenna inserted between posterior eyes, about one and half times combined length of prostomium and palps, lateral antennae about two thirds of length of median antenna, inserted near anterior eyes (Fig. 90A). Palps similar in length to prostomium, without distal papillae. Peristomium slightly shorter than subsequent segments, with hyaline, rounded inclusions; dorsal tentacular cirri similar to median antenna, slightly shorter; ventral tentacular cirri about two thirds length of dorsal ones (Fig. 90A). Antennae, tentacular, and dorsal cirri of chaetigers 1 and 2, elongate, slender; dorsal cirri of chaetiger 1 longer than median antenna, those of chaetiger 2 shorter than those of chaetiger 1, similar in length to median antenna. Dorsal cirri of subsequent segments alternating irregularly with long cirri, distinctly longer than body width, with about 10–12 articles; short cirri, similar in length to body width, with about 6–7 articles; articles pyriform, usually with 1 dark inclusion (Fig. 90A). Parapodial lobes elongated, conical, distally bilobed (Fig. 90C). Ventral cirri digitiform, similar in length to parapodial lobes. Compound chaetae similar throughout, shafts with several, long, fine, subdistal spines, and elongated, bidentate blades, within fascicle 5 pairs of chaetae, each pair similar in shape and length (Fig. 90D–G). Blades of most dorsal pair of compound chaetae with single long, distinct basal spur, and moderate, thin spines on margin, about 60–62 µm long; blades of second pair similar to those of most dorsal pair, but shorter, about 52 µm long, with shorter spines on margin (Figs 90D, 86A). Blades of subsequent pairs without basal spur and having short spines on margin (Fig. 90E–G), 40, 27 and 15 µm in length respectively. Dorsal simple chaetae from chaetiger 1, unidentate, distally blunt, provided with distal hood and short spines on margin (under light microscope) (Fig. 90H); under SEM, hood consists of several rows of minute spines (Fig. 86B). Ventral simple chaetae absent. Acicula solitary, distally knobbed (Fig. 90I). Pharynx through 5–6 segments (Fig. 83A). Proventricle barrel-shaped, through about 5–6 segments, with 35 muscle cell rows. Pygidium small, semi-circular, with 2 short, smooth lateral anal cirri and 1 median, longer cirrus (Fig. 90B).

**Remarks**. This species has been reported in Australia as *Syllides longocirrata* (Örsted, 1845), which only occurs in the Northern Atlantic and Northern Pacific areas, and differs from the Australian specimens, which are described as a new species. *Syllides longocirrata* has dorsal simple chaetae that are pointed and without a hood, and the compound chaetae are unidentate (see Banse, 1972), whereas the compound chaetae of *Syllides tam* are distally blunt and hooded. *Syllides japonicus* Imajima, 1966 (see below) and *S. floridanus* Perkins, 1981, also have dorsal simple chaetae that are pointed, and without a hood (Perkins, 1981), which differ from those present in *Syllides tam*.

**Habitat**. Occurring in coarse, medium to muddy sand; from intertidal to 60 m.

**Distribution**. Australia (Queensland, New South Wales, Victoria).

**Etymology**. The species is named after The Australian Museum.

### *Syllides* sp.

Fig. 91A–D

**Material examined**. AUSTRALIA: WESTERN AUSTRALIA: N end of beach, Bundegi Reef, Exmouth Gulf, 21°49'S 114°11'E, rocky rubble & sticky sediment with brown & epiphytic algae, 2 m, coll. H.E. Stoddart, 4 Jan 1984 (AM W28920).

**Description**. Body 2.0 mm long, 0.2 mm wide, with 25 chaetigers. Dorsum of each segment with 2–4 transverse rows, more or less well defined, of small, golden inclusions (Fig. 91A). Prostomium trapezoidal, with 2 distinct tufts of long cilia on anterior corners, and 4 eyes in open trapezoidal arrangement (Fig. 91A); antennae detached. Palps slightly shorter than prostomium. Peristomium similar in length to following segments, tentacular cirri missing. Dorsal cirri of chaetigers 1 and 2 smooth, elongated, longer than body width; remaining dorsal cirri articulated, long, up to 11 articles, with 1 dark inclusion of granular material in most articles (Fig. 91A). Compound chaetae with translucent hooded shafts serrated on edge, and relatively short, bidentate blades, with short spines on margin, and distributed in 5 pairs within fascicle, each pair of similar length (Fig. 91B); dorsal most pair 26 µm in length and ventral most pair 15 µm in length. Dorsal simple chaetae from chaetiger 1, slender, slightly bifid, with short spines on margin, lacking distal hood (Fig. 91C). Acicula solitary, distally knobbed, with distal, filiform tip (Fig. 91D). Pharynx long and slender, through 5 segments. Proventricle short, slender, through 2 segments (Fig. 91A), with about 17 muscle cell rows.

**Remarks**. This specimen is characterized by having a hood on the edge of shafts of compound chaetae, and blades lacking spurs. The most similar species is *Syllides gomezi* San Martín, 1990, from Cuba (San Martín, 1990). The Cuban species, however has a longer proventriculus through 4 segments, instead of through 2 as occurs in *Syllides* sp., and the dorsal simple chaetae are entire, distally pointed, whereas they are bifid in the Australian species. Other species of *Syllides* also lack basal spurs on the blades of compound chaetae, but none have a hood on the edge of shafts. *Syllides sanyaensis* Ding & Westheide (1997) described from China, is similar, but the dorsal simple chaetae are hooded whereas those of this specimen lack such hoods. Since we have a single, somewhat damaged specimen, we prefer not to describe this species as a new species.

**Habitat**. Rocky rubble and sediment with brown and epiphytic algae, in depths of 2 m.

**Distribution**. Australia (Western Australia).

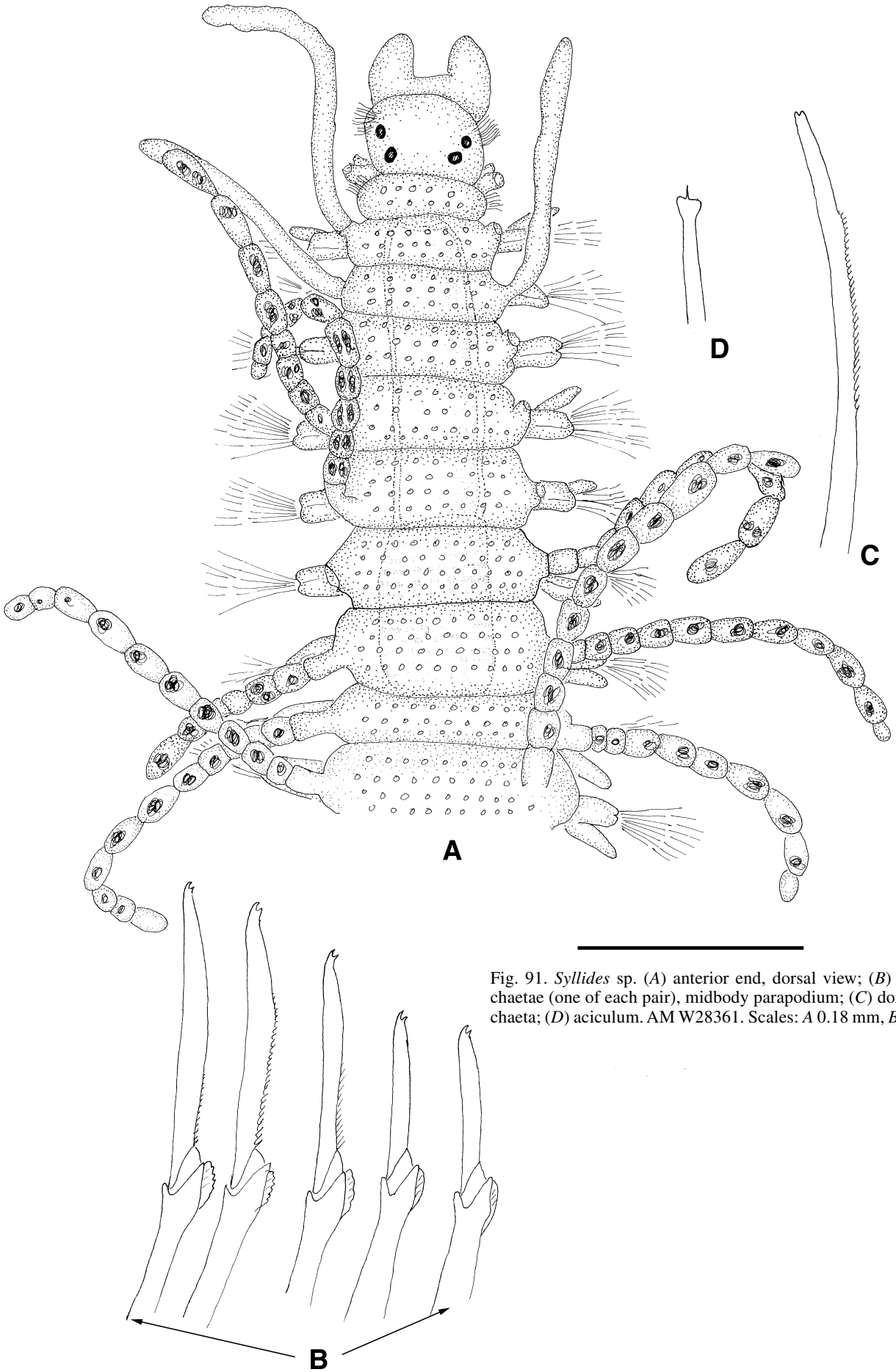



Fig. 91. *Syllides* sp. (*A*) anterior end, dorsal view; (*B*) compound chaetae (one of each pair), midbody parapodium; (*C*) dorsal simple chaeta; (*D*) aciculum. AM W28361. Scales: *A* 0.18 mm, *B–D* 20 µm.

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