

AUSTRALIAN MUSEUM SCIENTIFIC PUBLICATIONS

Hutchings, Pat A., & Reid, Amanda, 1990. The Nereididae (Polychaeta) from Australia - Gymnonereidinae sensu Fitzhugh, 1987: *Australonereis*, *Ceratocephale*, *Dendronereides*, *Gymnonereis*, *Nicon*, *Olganereis* and *Websterinereis*. *Records of the Australian Museum* 42(1): 69–100. [23 March 1990].

doi:10.3853/j.0067-1975.42.1990.107

ISSN 0067-1975

Published by the Australian Museum, Sydney

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**The Nereididae (Polychaeta) from Australia —
Gymnonereidinae sensu Fitzhugh, 1987:
Australonereis, *Ceratocephale*, *Dendronereides*,
Gymnonereis, *Nicon*, *Olganereis* and *Websterinereis***

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ABSTRACT. The subfamily Gymnonereidinae (*sensu* Fitzhugh, 1987) is represented in Australian waters by 14 species in seven genera, of which five are new species and these are described: *Ceratocephale aureola* n.sp., *C. setosa* n.sp., *Gymnonereis minyami* n.sp., *G. yurieli* n.sp. and *Nicon rotunda* n.sp. Six species are new records for Australian waters. This subfamily of nereidids is characterised by the lack of chitinous pharyngeal papillae, although soft papillae may be present. A key to the subfamilies of the family Nereididae is given together with a key to the genera and Australian species of the subfamily Gymnonereidinae. This paper represents the first of a series which will describe the Australian nereidid fauna.

HUTCHINGS, P.A. & A. REID, 1988. The Nereididae (Polychaeta) from Australia. Records of the Australian Museum 42(1): 69–100.

The family Nereididae is well represented in Australian waters (Day & Hutchings, 1979) by 17 genera and approximately 67 species. During a study of nereidids from southern Australian waters (Hutchings & Turvey, 1982) it became apparent that many undescribed species existed in more tropical regions of Australia.

We have therefore undertaken a comprehensive study of Australian nereidids and this first paper considers the subfamily Gymnonereidinae *sensu* Fitzhugh (1987). Seven genera are represented: *Australonereis*, *Ceratocephale*, *Dendronereides*, *Gymnonereis*, *Nicon*, *Olganereis* and

Websterinereis. We have followed the order of genera indicated in Fitzhugh's (1987, fig. 1) representation of phylogenetic relationships. We have examined all the nereidid material available in Australian State Museums and some material from ecological surveys lodged with various fisheries organisations. In this paper we describe 14 species of which five are new species and six new records for Australian waters. Fitzhugh (1987) has recently suggested that the subfamily Gymnonereidinae is a natural (=monophyletic) group which can be distinguished from the other two subfamilies, the Namanereidinae and the

Nereidinae due to the presence of biramous parapodia (distinguishing the group from the Namanereidinae) and the absence of paragnaths on the pharynx (unlike the Nereidinae). Soft papillae may be present on both or one of the pharyngeal rings. The relationship between papillae and chitinous paragnaths is unclear, although the papillae often occur in a similar location and arrangement to paragnaths. Fitzhugh (1987) considers the absence of both papillae and paragnaths to be the plesiomorphic condition. Whilst the Gymnonereidinae always lack paragnaths, some members of the Nereidinae possess papillae in addition to paragnaths (for example *Leonnates*).

A recent study of the Namanereidinae indicates that papillae and sometimes paragnaths are indeed present in some species, thus confounding the current subfamily distinctions (Glasby, in preparation). In addition, whilst Fitzhugh (1987) suggests that both Gymnonereidinae and Namanereidinae are monophyletic, the other subfamily, the largest by far, the Nereidinae is a paraphyletic group. Thus the relationships of the three subfamilies to each other is unclear, and will require a far more detailed analysis of the Nereididae. Fitzhugh's (1987) analysis was based purely on the literature and a re-examination of the type species and revision of several problem genera is urgently needed before the relationship of these subfamilies may be further elucidated.

Within the Gymnonereidinae, as in the other subfamilies, the most important characters used to delineate genera include: presence or absence of branchiae; number of pairs of tentacular cirri; presence or absence of accessory dorsal and ventral cirri; ornamentation of the pharynx; number, shape and arrangement of the parapodial lobes and presence or absence of particular types of setae. Species within the genera are additionally distinguished by

the arrangement and type of papillae within a particular area of the pharynx, and distribution and ornamentation of the setae as they occur along the body.

Within the nereidid literature a considerable number of terms have been used to describe the various component parts of the parapodia and setae. We have adopted the terminology proposed by Hylleberg *et al.* (1986) and Hylleberg & Nateewathana (1988), with minor changes (Fig. 1). We have two additional setal types, sesquigomph spinigers and falcigers (Fig. 1c,d). These are referred to as hemigomph by Fauchald (1977), who defined hemigomph as 'with asymmetrical articulation nearly at right angles to the long axis of the shaft'. We prefer to use the term sesquigomph to describe this type of seta, a term previously used by Perkins (1980). 'Sesqui' the Latin prefix for the ratio 3:2, refers to the approximate relationship between the boss and opposing prong of the shaft (as observed using the light microscope) rather than one half, implied by the term hemigomph.

Slight modifications to these terms are required for *Ceratocephale*, *Gymnonereis* and *Nicon*, and these are discussed in the Remarks Section after the relevant generic diagnoses.

The following measurements were recorded for animals examined, total body length, maximum body width excluding setae and parapodia, and the number of body segments. The Australian distribution of each species is indicated at the end of each species account. All existing records are indicated for species recorded from outside Australia.

The following abbreviations have been used in the text: AHF – Allan Hancock Foundation, Los Angeles, California (Polychaete collections now located at the Los Angeles County Museum); AM – Australian Museum, Sydney;

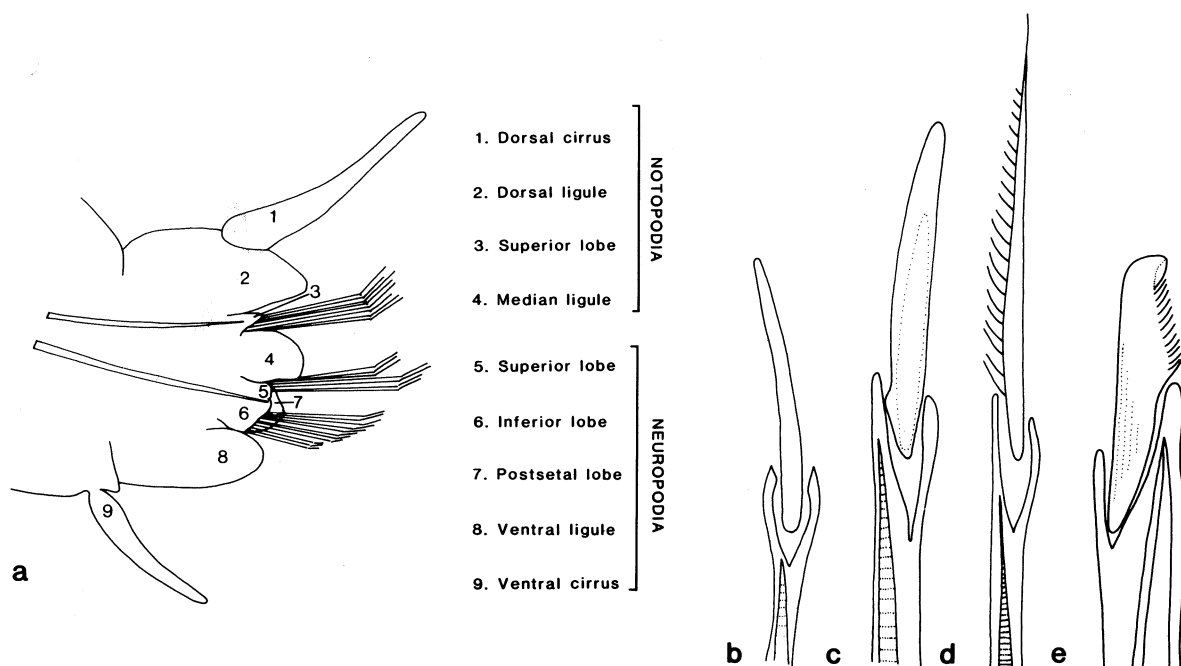


Fig.1. Terminology and diagram of a nereid parapodium; a, left parapodium, anterior view; b, homogomph falciger; c, sesquigomph falciger; d, sesquigomph spiniger; e, heterogomph falciger.

BMNH – British Museum (Natural History), London; NMV – National Museum of Victoria, now Museum of Victoria, Melbourne; NTM – Northern Territory Museum, Darwin; QM – Queensland Museum, Brisbane; SAM – South Australian Museum, Adelaide; TASM – Tasmanian Museum, Hobart; USNM – National Museum of Natural History, Smithsonian Institution, Washington, D.C.; WAM – Western Australian Museum, Perth.

The following abbreviations have been used in the tables: noto – notopodia; neuro – neuropodia; supra – supracicular fascicle; sub – subacicular fascicle; ho – homogomph; he – heterogomph; ses – sesquigomph; sp – spinigers; f – falcigers.

The specific names based on Aboriginal words were

found by consulting 'Australian Aboriginal Words and Place Names and their Meanings' by Sydney E. Endacott (1984).

Tables referred to in the text are included in the Appendix.

Taxonomy

After undertaking a phylogenetic study of the family, Fitzhugh (1987) has proposed three subfamilies within the family Nereididae: Nereidinae, Namanereidinae and the Gymnonereidinae. This classification has been adopted in this study.

Key to the Subfamilies of Family Nereididae (after Fitzhugh, 1987)

1. Paired antennae; 3–4 pairs tentacular cirri; pharynx lacking paragnaths and papillae; parapodia with reduced notopodia or without ligules Namanereidinae
- Paired antennae; 4 pairs tentacular cirri; pharynx with or without paragnaths or papillae; parapodia fully biramous 2
2. Pharynx without chitinous paragnaths, papillae present or absent Gymnonereidinae
- Pharynx with chitinous paragnaths, papillae sometimes present in addition Nereidinae

Gymnonereidinae

Gymnonereidinae Banse, 1977: 611–613.—Fitzhugh, 1987: 174–183.

Diagnosis. Prostomium with paired antennae.

Peristomium with 4 pairs of tentacular cirri. Papillae present or absent on proboscis; on oral and/or maxillary rings. Parapodia fully biramous, with ligules present in various combinations. Setae compound; noto- and neuropodial homogomph spinigers being most common, followed by neuropodial heterogomph falcigers.

Key to Australian Gymnonereidinae*

1. Anterior ventrum with fleshy transverse ridges, maxillary ring with papillae, sometimes with horny tips *Australonereis ehlersi*
- Anterior ventrum without fleshy transverse ridges, pharynx with or without papillae 2
2. Pharyngeal papillae present 3
- Pharyngeal papillae absent *Nicon*, 12
3. Ventral cirri bifid 4
- Ventral cirri not bifid 5

4. Dorsal cirri bifid in anterior parapodia *Gymnonereis*, 6
- Dorsal cirri not bifid *Ceratocephale*, 7
5. Branchiae present *Dendronereides*, 9
- Branchiae absent 10
6. Anterior parapodia with sesquigomph falcigers *Gymnonereis minyami* n.sp.
- Parapodia throughout with spinigers only *Gymnonereis yurieli* n.sp.
7. Ventral cirri bifid from setiger 3 *Ceratocephale setosa* n.sp.
- Ventral cirri bifid from setiger 1 8
8. Eyes absent, all setae spinigers *Ceratocephale ?pacificae*
- Eyes present, sesquigomph falcigers in anterior setigers *Ceratocephale aureola* n.sp.
9. Branchiae fine, tufted; pharynx Area V with 3–4 papillae,
VI with 3–4 papillae *Dendronereides heteropoda*
- Branchiae fingerlike; pharynx Area V with 1 papilla, VI
with 1–2 papillae *Dendronereides zululandica*
10. Papillae on maxillary and oral rings *Olganereis edmondsi*
- Papillae on oral ring only *Websterinereis*, 11
11. Neurosetae with few heterogomph spinigers posteriorly.
Simple setae absent; notopodia and neuropodia not
widely spaced *Websterinereis foli*
- Neurosetae with heterogomph spinigers throughout.
Posterior parapodia with bifid simple setae in supra-
acicular neuropodial fascicle; notopodia and neuropodia
widely spaced in posterior setigers *Websterinereis punctata*
12. Homogomph falcigers in supra-acicular neuropodial
fascicle of anterior setigers *Nicon rotunda* n.sp.
- Homogomph falcigers absent 13
13. Neurosetae homogomph spinigers and heterogomph
falcigers; falcigers with long blades; neuropodial ligule
anteriorly thick and rounded *Nicon maculata*
- Neurosetae with homogomph spinigers and heterogomph
spinigers and falcigers; median neuropodial falciger
blades with recurved distal tooth with distinct tendon;
neuropodial ligule triangular *Nicon moniloceras*

* This key is an artificial one and does not imply any phylogenetic relationships.

Nicon Kinberg, emended

Nicon Kinberg, 1866: 178–179.—Pettibone, 1971: 7.

Type species. *Nicon maculata* (Kinberg, 1866), designated by Pettibone, 1971.

Diagnosis. Prostomium subpyriform, with 2 pairs of eyes. Tentacular cirri with distinct cirrophores. Parapodia of first 2 setigers with notopodium represented by dorsal cirrus and single ligule. Dorsal cirri at bases of upper notopodial ligules. Subsequent notopodia with two ligules and small supra-acicular or presetal lobe between them. Neuropodia with conical or bilobed acicular lobes, digitiform or conical postsetal lobes, and lower ligules. Ventral cirri short, tapered. Notosetae homogomph spinigers only. Neurosetae homogomph and heterogomph spinigers, homogomph and heterogomph falcigers. Pharynx without papillae.

Remarks. The generic diagnosis taken from Pettibone (1971) has been expanded to include the presence of homogomph falcigers. This allows our new species of *Nicon*, *N. rotunda* to be included in the genus as in all other respects it agrees with Pettibone's expanded generic diagnosis.

As the neuropodial lobes of *Nicon* are not divisible into superior and inferior lobes as described in Fig. 1, the single neuropodial lobe is referred to as the acicular lobe in accordance with Pettibone (1971).

The genus *Nicon* was established by Kinberg (1866). He briefly described six new species, which were not figured and no type species for *Nicon* was designated. Hartman (1948) examined Kinberg's types, supplemented their descriptions and figured some of them. She selected *N. pictus* Kinberg as the type species without figuring it or giving a clear diagnosis. Pettibone (1971) in her revision of the genus designated *N. maculata* Kinberg as the type species, as this is the only species originally described by Kinberg (1866) sufficiently well preserved for an adequate diagnosis of the genus to be given. Of the 18 species, which were originally described as *Nicon*, or subsequently referred to it, only two species were retained in the genus by Pettibone (1971), including *N. maculata* Kinberg, 1866, and *N. aestuariensis* Knox, 1951. *Nicon abyssalis* Hartman, 1967 and *N. polaris* Hartman, 1967, have doubtful generic affinities (Pettibone, 1971).

Nicon misakiensis Imajima & Hayashi, 1969, was not considered by Pettibone in her revision. Subsequently, Wu & Sun, 1979 placed this species in the genus *Rullierinereis* Pettibone, 1971. We agree with the removal of this species from *Nicon*. *Rullierinereis misakiensis* has notopodial falcigers, a feature which can be used to distinguish the two genera as defined by Pettibone, 1971. Notopodial falcigers of *Nicon* are all spinigerous. Other species of *Nicon* described since Pettibone's (1971) revision include *N. japonicus* Imajima, 1972, *N. yaguinae* Fauchald, 1977 and *N. sinica* Wu & Sun, 1979.

This is the first time that the genus *Nicon* has been

described from Australian waters.

Nicon maculata Kinberg
Table 3

Nicon maculata Kinberg, 1866: 178.—Pettibone, 1971: 8–11, figs 1–2.—Wu & Sun, 1979: 101–102, fig. 4a–k.—Wu, *et al.*, 1985: 55–56, fig. 28a–k. See Pettibone, 1971 for synonymy.

Material examined. Australia: Tasmania: St Patricks Head 41°34.7'S 148°44.6'E, 109–1150m, 13 Dec. 1978, 1(AM W202509), 1(TASM K1095).

Description. Australian material posteriorly incomplete. 2 specimens, 29 mm long, 4 mm wide for 38 setigers and 50 mm long, 3 mm wide for 79 setigers were examined. Pharynx without papillae or paragnaths. Jaws amber coloured with approximately 14 rows teeth along cutting edges.

Anterior notopodia with cirriform dorsal cirri, bluntly conical dorsal and median ligules of approximately equal length, and small superior lobe. Dorsal cirri exceed notopodial ligules in length. Neuropodia with conical acicular and digitiform postsetal lobes, thick rounded to bullet-shaped lower neuropodial ligule and short, tapered ventral cirrus. Median and posterior parapodia with rami more widely separated. Dorsal cirri become more elongate posteriorly, notopodial and neuropodial lobes subconical to triangular rather than rounded. Neuropodial lobes and ventral ligule reduced in posterior setigers.

Notosetae with homogomph spinigers throughout. Neurosetae with homogomph spinigers and heterogomph falcigers. Heterogomph spinigers absent. Heterogomph falcigers long bladed anteriorly. Median and posterior parapodia, supra-acicular neuropodial falcigers with short, stout blades. Pygidium with long anal cirri.

Remarks. This species has been comprehensively described and illustrated by Pettibone (1971). Although we have not seen the type material, we are confident that the Australian material belongs to this species.

Habitat. Collected from 1090 to 1150 m. Substrate muddy sand. Pettibone (1971) gives the depth range of this species as 92 to 1153 m.

Distribution. Australia (Eastern Tasmania), East and South China Seas, Subantarctic and Antarctic waters. This is the first record of *Nicon maculata* from Australian waters.

Nicon moniloceras (Hartman)
Fig. 2a–f, Tables 1 and 3

Leptonereis glauca moniloceras Hartman, 1940: 217, pl. 34, figs 42–46.

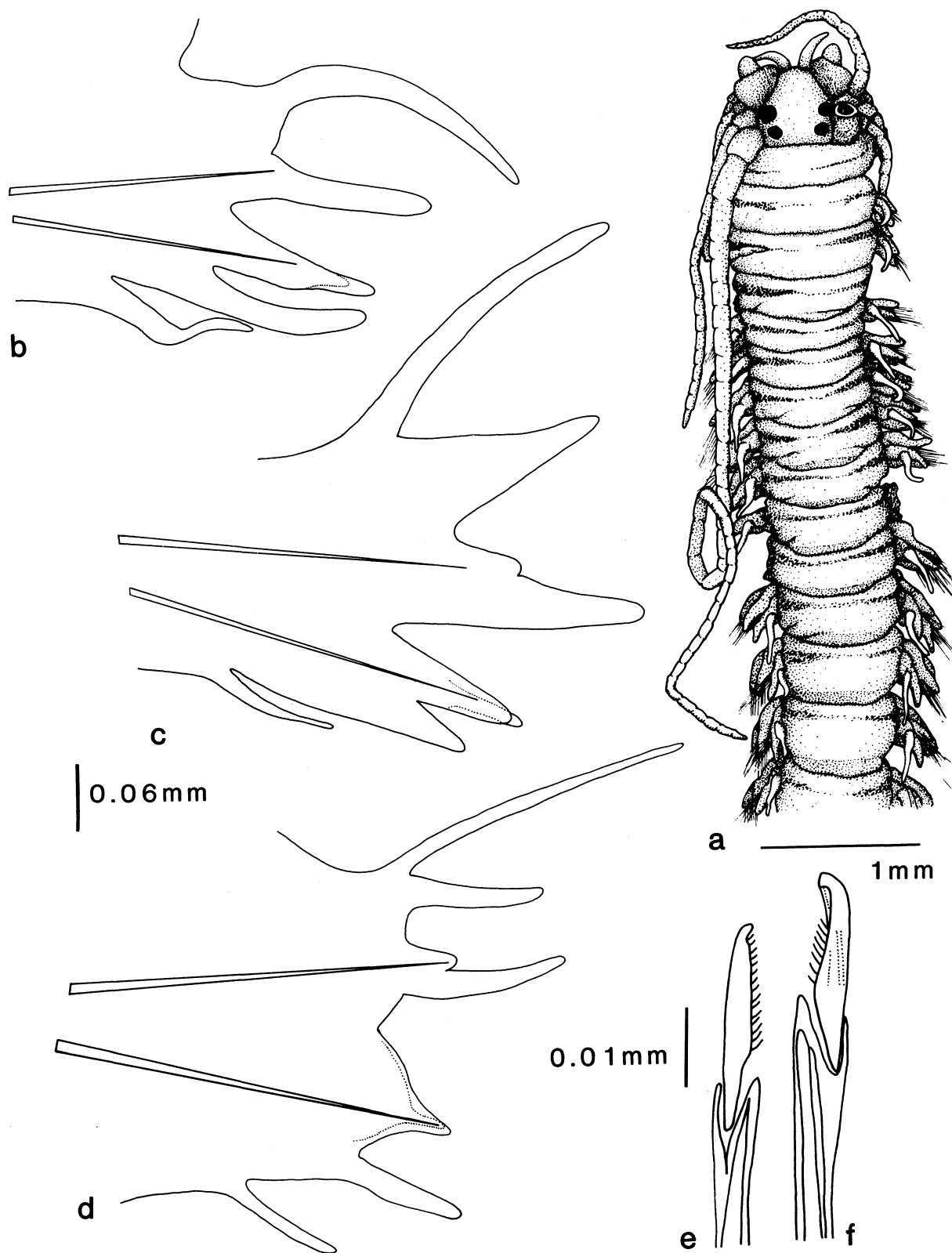


Fig.2. *Nikon moniloceras*: a, dorsal view of head end; b, anterior view of parapodium 3; c, anterior view of parapodium 10; d, anterior view of parapodium 50; e, heterogomph falciger parapodium 20; f, heterogomph falciger parapodium 50.

Nicon moniloceras.—Hartman, 1958: 265; 1959: 245, 274.—Imajima & Hartman, 1964: 150–151, pl. 35, figs a–c.—Imajima, 1972: 53–55, fig. 8.a–j.—Wu & Sun, 1979: 99, 101–104, fig. 5a–j.

Material examined. Australia: New South Wales: Wollongong 34°24'S, 151°19'E, 270–274 m, 13 Dec. 1978, 13(AM W202510), 10(AM W202511). HOLOTYPE: USA: California, Santa Catalina Island 33°24.35'N, 118°21.15'W, 72 m, 18 Nov. 1938, 1(AHF 0815); USA: California, Santa Catalina Island, 0.48 km east of Long Point 33°24.30'–33°24.15'N, 118°21.33'–118°21.35'W, 76–121 m, 25 June 1952, 1(AHF 2128-52); San Estaban Island, (south end) 28°39.40'N, 112°35.35'W, 27 Mar. 1937, 1(AHF 728-37); California, Baya, Ildefonso Island 26°37.20'N, 111°29.10'W, 90 m, 15 Mar. 1937, 1(AHF 677-37); California, Baja, Isabel Island 21°52.20'N, 105°51.35'W, 2 Apr. 1938, 1(AHF 748-37). Japan: Cape Shiriya-zaki, 41°24'N, 141°30'E, 140 m, Feb. 1956, 1(AHF N11091).

Description. Australian material, 13 specimens range from 0.5–1.0 mm wide. One specimen complete with 57 setigers. Gravid female with no sign of epitoky. Colour in alcohol pale brown with darker brown transverse bands on lateral, anterior edges of dorsum of anterior setigers (excluding apodous segment) after which bands very faint. Prostomial length slightly exceeds width. Eyes, large, black. Palps, stout with globular palpostyles, antennae approximately equal in length to prostomium (Fig. 2a). Tentacular cirri faintly annulated, longest extending to setiger 17. Jaws golden, translucent with 8 distinct teeth.

Setiger 3 (Fig. 2b) with single digitiform median notopodial ligule, from setiger 4 dorsal notopodial ligule present, approximately the same size and shape as median ligule. Between these, a smaller digitiform superior lobe (Fig. 2c). Posteriorly, dorsal and median ligules triangular, with dorsal ligule reduced in size in far posterior setigers.

Dorsal cirrus slightly longer than notopodial lobes throughout.

Neuropodia with blunt, triangular acicular lobe and slightly longer digitiform postsetal lobe (Fig. 2c). Ventral neuropodial ligule digitiform anteriorly, triangular posteriorly, slightly exceeds length of acicular lobe. Ventral cirrus narrow, tapering approximately two thirds length of neuropodium throughout.

Notosetae homogomph spinigers. Supra-acicular fascicle of neurosetae include homogomph spinigers and heterogomph falcigers. Subacicular fascicle of neurosetae include heterogomph spinigers and heterogomph falcigers. Falcigers with hooked distal tooth (Fig. 2e), increasingly hooked and with distinct tendon in far posterior setigers (Fig. 2f).

Pygidium with long anal cirri.

Setal counts for 10 specimens are shown in Table 1.

Remarks. The Australian material agrees well with the descriptions of Hartman (1940) and Imajima (1972). Pettibone (1971) examined the holotype, a single female heteronereid dredged from 37 m off Catalina Island,

Southern California (AHF 0815). She tentatively assigned the species to *Platynereis* because of the presence of long tentacular cirri and setae. She suggests that the shape of the prostomium is more like *Platynereis* than *Nicon* and suggests that the minute paragnaths may have been overlooked. The holotype is in very good condition and in our opinion is correctly assigned to the genus *Nicon*. No paragnaths or traces of paragnaths can be detected in the holotype or additional material examined from California or Japan. Although paragnaths are often absorbed in heteronereids, in our experience this is usually only partial and generally in such specimens some traces of paragnaths can be seen. Long tentacular cirri, particularly the dorsalmost pair are characteristic in this species. Other diagnostic characters are shown in Table 3. The species is well figured and described by Imajima (1972).

Habitat. Australian material occurring in thick fibrous tubes with attached sand grains, at 270 to 274 m. Holotype collected at 72 m in habitat of rock, brachiopods and sponges. Other material examined collected between 75 to 140 m, sand, gravel and amongst *Laqueus* shells.

Distribution. Eastern Australia, California south to western Mexico, China, northern Japan.

Nicon rotunda n.sp.

Fig. 3a–g, Tables 2, 3

Material examined. HOLOTYPE: Australia: Northern Territory: Port Darwin 12°27'S, 130°50'E, subtidal, 6 Mar. 1965, 1(AM W202512), 50 mm long, 3.5 mm wide, 92 setigers, complete. PARATYPES: Northern Territory, Port Darwin 12°27'S, 130°50'E, subtidal, 6 Mar. 1965, 1(AM W202513). New South Wales: Newcastle 33°06.2'S, 156°09.3'E, 154–164 m, 7 Oct. 1982, 1(AM W202514), 1(AHF POLY 1490), 1(BMNH ZB 1988.14), (USNM 120509), (NMV F57446). Paratypes range from 0.75–1.25 mm wide. 2 specimens complete, the largest 1(AHF POLY 1490), 18 mm long, 0.75 mm wide, 70 setigers.

Description. Preserved animal, pale yellow in colour. Pale brown glands visible on dorsal surface of dorsal notopodial ligule and at base of dorsal cirri posteriorly. Paired brown blotches on either side of posterior ventrum. Holotype a gravid male with enlarged eyes, but no other signs of epitoky.

Prostomium elongate, trapezoidal, with blunt anterior margin, and prominent dorsal furrow. Eyes coalesced, present on lateral margins of prostomium. Palps with globular palpophores and small rounded palpostyles. Tentacular cirri indistinctly annulated, longest extending to setiger 2. Fine jaws, not heavily sclerotised, translucent, pale golden with 9 teeth along the cutting margin (Fig. 3a). Setiger 1 with broad-based, dorsal cirri extending beyond bluntly conical, dorsal notopodial ligule. Neuropodia with narrow, triangular, acicular lobe and slightly longer, triangular, postsetal lobe. Neuropodial ligule thick and rounded, slightly longer than notopodial ligule. Ventral

cirri broad, tapering, and slightly shorter than neuropodial ligule. Parapodia 3, 10 and 20 (Fig. 3b–d) with dorsal and ventral cirri as described for setiger 1. Both cirri persist in similar proportions posteriorly but become proportionally narrower from about setiger 20. Anterior notopodia with

widely separated, dorsal and median ligules with digitiform superior lobe. Both dorsal and median ligules conical in shape in anterior setigers, becoming triangular in posterior setigers (Fig. 3d,e). Dorsal notopodial ligule slightly exceeds median ligule in size in all parapodia.

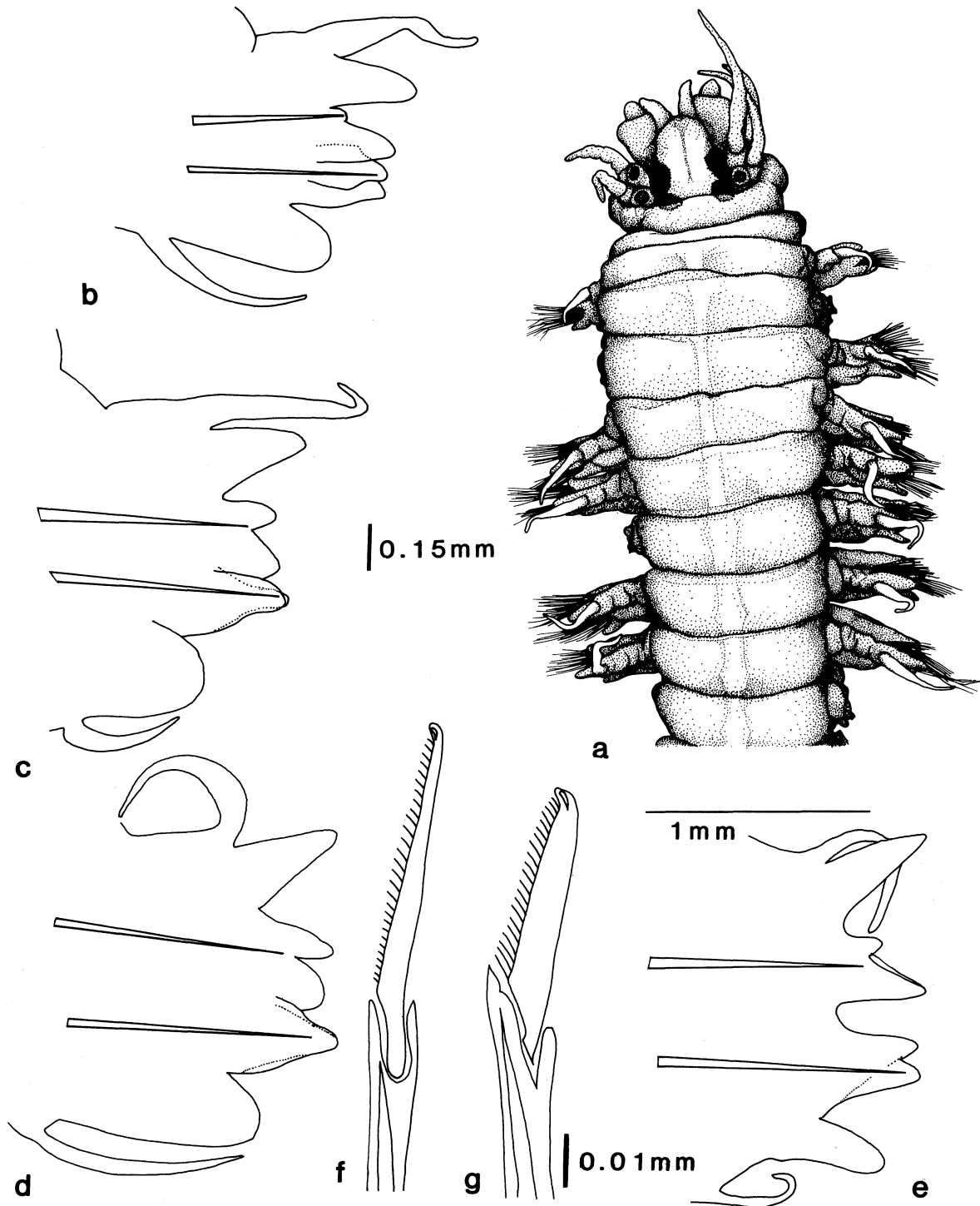


Fig.3. *Nicon rotunda* n.sp., holotype (AM W202513): a, dorsal view of head end; b, anterior view of parapodium 3; c, anterior view of parapodium 10; d, anterior view of parapodium 20; e, anterior view of parapodium 50; f, homogomph falciger, subacicular fascicle, parapodium 10; g, heterogomph falciger, subacicular fascicle, parapodium 20.

Anterior neuropodia with bluntly, triangular, acicular and postsetal lobes which become, after the first few setigers, approximately equal in length. Posteriorly, neuropodial lobes pointed. Ventral neuropodial ligules, on anterior parapodia, broad and conical, becoming narrower posteriorly and in far posterior setigers triangular in shape. Relative size of this ligule, which is approximately two thirds as long as postsetal and acicular lobes, remains constant in all setigers.

Notosetae all homogomph spinigers. Neuropodial supra-acicular fascicle with homogomph spinigers and heterogomph falcigers. Neuropodial subacicular fascicle with homogomph spinigers, and heterogomph falcigers throughout and homogomph falcigers in dorsal region of subacicular fascicle of anterior parapodia only. Homogomph falcigers with long, narrow blades (Fig. 3f), heterogomph falcigers, also long-bladed with hooked distal tooth, more obviously so in posterior setigers (Fig. 3g).

Pygidium with delicate anal cirri, 1 mm in length.

The number and distribution of setal types for the holotype and paratypes are shown in Table 2.

Remarks. The paratypes exhibit some variation in setal counts compared to the holotype as shown in Table 2, however in other characters, paratypes resemble the holotype closely. *Nicon rotunda* n.sp. can be distinguished from the other described species of *Nicon*, using the characters shown in Table 3.

Nicon rotunda resembles *N. maculata* in the overall structure of the parapodia, particularly with respect to the distinctive thick, rounded, ventral neuropodial ligules present in both species. However, the presence of subacicular neuropodial homogomph falcigers in *Nicon rotunda* can be used to distinguish this species from the two other species of *Nicon* recorded from Australia, *N. maculata* and *N. moniloceras*.

The material from Northern Territory was collected intertidally whereas that from New South Wales was collected from 154 to 164 m. Material from the two localities is morphologically identical and although the habitats are very different we cannot morphologically distinguish between the individuals from these two localities. Limited collecting has been done in shallow subtidal areas between Darwin and NSW and the species may have a more continuous distribution than currently indicated.

Habitat. Specimens from near Darwin were collected intertidally and those from New South Wales from 154 to 164 m.

Distribution. Australia (Northern Territory, New South Wales).

Etymology. The specific name is the Latin *rotundus* and refers to the rounded, ventral neuropodial ligules present in this species.

Australonereis Hartman

Australonereis Hartman, 1954: 19.

Type species. *Australonereis ehlersi* (Augener, 1913), designated by Hartman, 1954.

Diagnosis. Eversible pharynx with papillae on maxillary ring, oral ring bare. Papillae sometimes with horny tips. Notosetae homogomph spinigers, neurosetae homo- and heterogomph falcigers. Fleshy transverse ridges present on anterior ventrum.

Remarks. The presence of horny tips on the pharyngeal papillae is reported for the first time, and included in the generic diagnosis. The genus is known only from Australia.

Australonereis ehlersi (Augener)

Fig. 4

Nereis (*Leonnates*) *ehlersi* Augener, 1913: 142–145, fig. 12a–c, pl. 3 fig. 53.

Leonnates ehlersi.—Monro, 1938: 618–623, fig. 7–13.

Australonereis ehlersi.—Hartman, 1954: 19–23, figs 1–11.—Hutchings & Rainer, 1979: 752–753.—Hutchings & Turvey, 1982: 96–97.—Hutchings & Murray, 1984: 36.

Material examined. Australia: Western Australia: Bunbury, Leschenault Estuary 33°16'S, 115°42'E, 24 June 1965, 1(AM W6813); Swan River 31°45'S, 116°04'E, 24 Mar. 1987, 6(AM W202496). Queensland: Gladstone, Calliope River 23°55'S, 151°10'E, 1974, 4(AM W199374); Frazer Island, Moon Creek 25°22'S, 153°07'E, 30 Dec. 1971, 2(AM W5375); Hervey Bay, Kangaroo Island 25°26'S, 152°53'E, 29 Dec. 1971, 4(AM W5374); Cribb Island, Jackson Creek 27°21'S, 153°07'E, 12(QM G7571); Moreton Bay, Lytton 27°25'S, 153°20'E, 2(QM G7129). New South Wales: Myall River 32°18'S,

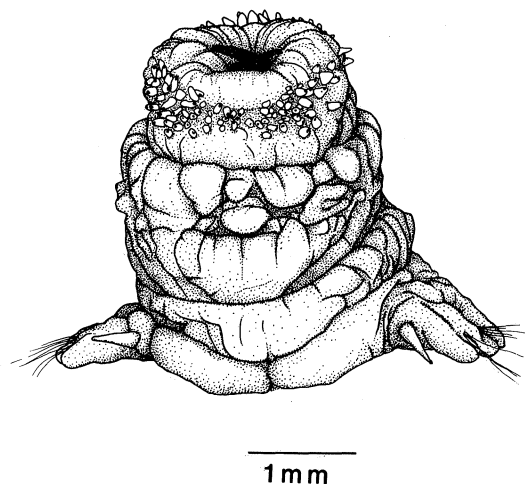


Fig. 4. *Australonereis ehlersi*: ventral view head end showing everted proboscis with horny tipped papillae.

152°11'E, 9 Feb. 1974, 1(AM W6121); Ettalong Beach 33°31'S, 151°19'E, 13 Apr. 1946, 10(AM W3487); Hawkesbury River 33°30'S, 151°10'E, 31 Aug. 1982, 1(AM W9082); Botany Bay, Towra Point 34°00'S, 151°11'E, 4 June 1977, 1(AM W12304); Merimbula Lake 36°54'S, 149°53'E, 17 Mar. 1976, 1(AM W12168). Victoria: Mallacoota Inlet, Gravelly Point 37°34'S, 149°46'E, 18 Feb. 1973, 5(AM W8444); Gippsland Lakes 37°53'S, 148°00'E, many (AM W5514); Inverloch, Venus Bay 38°38'S, 145°44'E, 12 Oct. 1980, 4(AM W18595); Glenelg River 37°17'S, 141°16'E, 17 June 1975, 3(AM W9192). Tasmania: Midway Point 42°48'S, 147°32'E, 9 Dec. 1973, 1(TASM K966). South Australia: The Coorong 35°59'S, 139°31'E, 28 July 1974, 3(AM W8426); Torrens Island 34°47'S, 138°32'E, 11 Jan. 1974, 5(AM W6773); Adelaide, St Vincent Gulf 34°45'S, 137°57'E, 1(SAM E2355); Onkaparinga Estuary 35°00'S, 138°49'E, 1973, many (AM W6061).

A selection of material examined. All specimens collected intertidally.

Description. Material examined range up to 140 mm long and 12 mm wide. Colour in alcohol variable cream-pink, rust-brown, olive green. Often with brown blotches on dorsum of head and first few setigers. In life, animals green-red with anterior setigers darker. Body flattened particularly in median and posterior regions. Pharynx with oral ring smooth, maxillary ring with more than 50 (sometimes in excess of 100) short cirrus-like papillae, with or without horny tips (Fig. 4). Papillae most numerous midventrally, fewest laterally. Papillae larger dorsally than ventrally, anteriormost longer than those on posterior margin. Anterior parapodia and ventrum from approximately setiger 7 to setiger 30 with thickened lobes and thick, glandular transverse ridges (maximum 7–8). Following setigers without such papillae.

Anterior notopodia with short, cirriform dorsal cirri, triangular dorsal and median ligules and small, rounded superior lobe. Anterior neuropodia with rectangular acicular lobe, a bluntly rounded postsetal lobe and a small, cirriform ventral ligule, and ventral cirrus. Median and posterior parapodia, notopodial lobes elongate, exceeding neuropodial lobes in length. Dorsal ligule exceeds length of median ligule, superior lobe greatly reduced. Neuropodia, ventral ligule increases in size posteriorly to approximate size of acicular lobe.

In median to posterior setigers, coelomostomes present as large lobes arising from proximal base of dorsal cirrus.

Setae most numerous anteriorly. Notopodia with homogomph spinigers. Neuropodia with homogomph and sesquigomph spinigers and sesquigomph falcigers. Falcigers terminate in a hooked process which usually overlaps last few distal teeth. Teeth long slightly curved. Falcigers well figured by Hartman (1954).

Remarks. This is the first time that *Australonereis ehlersi* has been reported as having brown horny tips on the pharyngeal papillae. These horny tipped papillae do not occur on all specimens, and animals with and without horny tipped papillae have been found (a) over the entire range of the species, (b) within the same locality and specimen lot, (c) in specimens of different size ranges, (d)

in specimens of both sexes, (e) within material from the type locality, the Swan River. In some individuals the papillae appear to have darkened or shiny tips but they are not fully sclerotised. It appears therefore that the species may or may not possess papillae with horny tips and this is unrelated to size, maturity, sex or locality. We have therefore expanded the species description and the generic diagnosis.

Hartman (1954) reported coelomostomes to occur only in ovigerous specimens, however they also occur in mature males.

This species is well represented in collections from southern and south-eastern Australia. The northernmost extent of its range on the east coast is Gladstone, Queensland, 23°55'S, 151°10'E and on the west coast, specimens have been collected only as far north as the type locality, Swan River, 31°45'S, 116°04'E.

Habitat. Lives in muddy sand and sand flats consisting of fine coarse grained sediment, in angular, flimsy, sandy tubes, which protrude slightly above the surface. Often associated with *Posidonia*, *Halophila*, *Zostera* seagrass beds and *Rhizophora* mangroves.

Distribution. Australia (Gladstone, Qld to Bunbury, W.A.).

Dendronereides Southern

Dendronereides Southern, 1921: 602–603.—Day, 1967: 302.

Type species. *Dendronereides heteropoda* Southern, 1921, by original designation.

Diagnosis. Pharynx with soft papillae on oral and maxillary rings. In the anterior region, the dorsal notopodial lobe of the notopodium is divided to form a simple series of branchial filaments. Inferior lobe of neuropodium absent. Parapodial lobes reduced and simplified posteriorly.

Dendronereides heteropoda Southern

Fig. 5a, Table 4

Dendronereides heteropoda Southern, 1921: 603–607, fig. 10a–f, pl. 21 fig. 6A–N.—Hanley, 1985: 244 (in part, rest = *D. zululandica* Day).

Material examined. Australia: Northern Territory: Daly River 13°55'S, 130°56'E, 15 Aug. 1985, 1(NTM W2015), 9 Jan. 1985, 1(NTM W2748); Browns Creek 13°41'S, 130°40'E, 8 Jan. 1985, 1(NTM W2741), 1(NTM W2743), 1(NTM W2744), 1(NTM W2745), 1(NTM W2746); Palmerston Island 13°21'S, 130°19'E, 15 Aug. 1984, 1(NTM W2012), 9(NTM W2013), 1(NTM W2014), 1(NTM W2016); Wollanna Station 13°39'S,

130°39'E, 5 Jan. 1985, 1(NTM W2467), 1(NTM W2711), 6 Jan. 1985, 1(NTM W2725), 1(NTM W2727), 1(NTM W2728), 1(NTM W2729), 1(NTM W2730), 1(NTM W2731), 1(NTM W2732), 1(NTM W2734), 1(NTM W2735), 1(NTM W2738), 1(NTM W2739); McArthur River, Carrington Channel 15°50'S, 136°35'E, 8 Aug. 1985, 1(NTM W3717), Curie Channel, 7 Aug. 1985, 1(NTM W3088), 1(NTM W3099), 1(NTM W3102), 1(NTM W3104), 1(NTM W3105), 1(NTM W3106), 1(NTM W3108), 1(NTM W3109), 1(NTM W3113), 1(NTM W3167), 1(NTM W3175), 1(NTM W3176), 1(NTM W3178), 1(NTM W3499), 1(NTM W3501).

A selection of material examined. All specimens collected intertidally.

Description. Smallest specimen 7 mm long, 0.5 mm wide for 39 setigers, posteriorly complete. Largest specimen, posteriorly incomplete, 52 mm long, 3.0 mm wide, 122 setigers. Prostomium with deep median furrow. Jaws with many fine teeth (10–20). Pharynx with papillae arranged as follows: Area I–IV, a band of fine, pointed papillae, 4–5 deep with those on dorso-lateral edge of the maxillary ring longer than those in dorsal and lateral positions. Area V = 3–4, VI = 3–4, VII–VIII = a band in 2–4 rows.

Anterior parapodia, notopodia from setiger 3 with short, stout subconical dorsal cirri, triangular-subconical dorsal ligules and slightly longer median ligules. Superior lobes present as a low rounded fillet, lying anterior to the median ligule. Neuropodia with 3 digitiform lobes, 2 acicular and 1 postacicular lobe. Ventral cirrus short, blunt subconical. Median and posterior parapodia, notopodial dorsal ligule divided forming branchiae which begin on setiger 6 or 7 and continue to setiger 29 or 30. Branchial filaments fine,

feathery, branch in all directions from a basal point (Fig. 5a).

Remaining lobes as for anterior parapodia with notopodial median ligule increasing in size posteriorly. Neuropodial lobes decrease in size posteriorly, with ventral acicular lobe absent in far posterior setigers. Branchial filaments decrease in number posteriorly until in far posterior setigers, no dorsal ligule present.

Setae consist of homogomph spinigers, sesquigomph spinigers and homogomph falcigers. Posteriorly, supra-acicular neuropodial spinigers heavily chitinated.

The number of setal types found along the body for a number of individuals are shown in Table 4. Setal types homogomph and sesquigomph have been grouped together, as, when setae are dense and overlapping as seen in the neuropodia, shaft type is difficult to ascertain.

Remarks. Some of the material from Wollianna station, Daly River, (NTM W2739), (NTM W2730), (NTM W2467), (NTM W2734) has fewer branchial filaments than other material examined, however it agrees well in other respects to the description given by Southern (1921). The number of branchial filaments appears to be related to size, smaller specimens having fewer filaments per setiger. The specimen described by Southern (1921) which was 66 mm long, had a maximum development of branchiae on setiger 21 with 60–75 filaments. Our largest specimen also has approximately 60 filaments on setiger 21.

Dendronereides heteropoda has previously been recorded from northern Australia by Hanley (1985). Re-examination of this material showed that two species had been confused, *Dendronereides zululandica* Day, 1951 and *D. heteropoda*. The two species have overlapping geographical distributions. *Dendronereides heteropoda* can be separated from *D. zululandica* by the arrangement

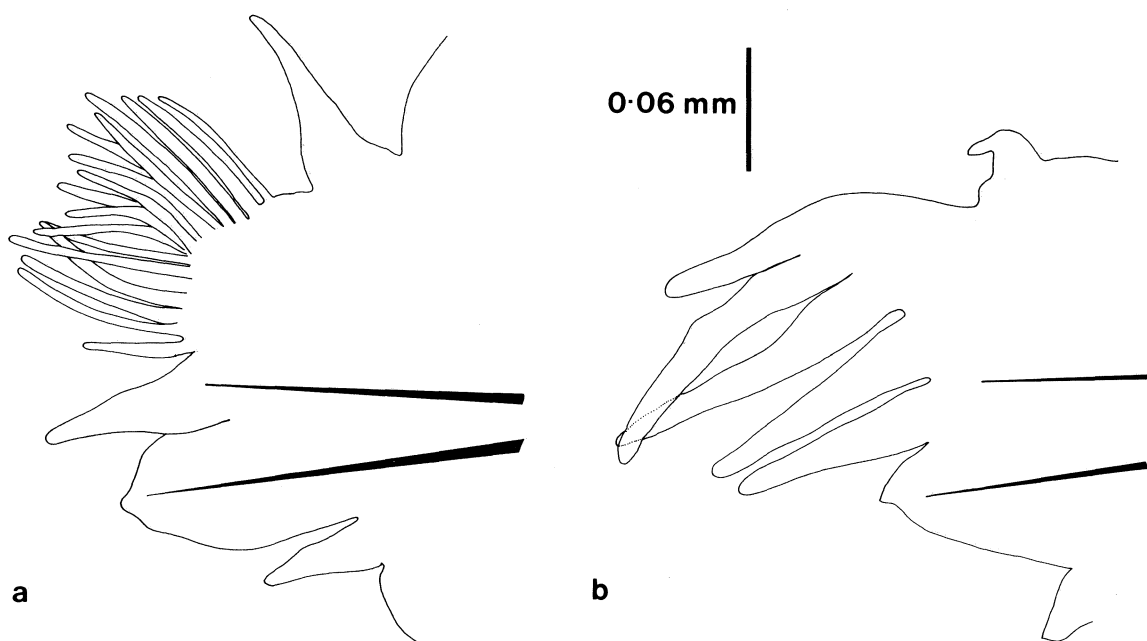


Fig. 5. *Dendronereides heteropoda* (NTM W2013): a, parapodium 25. *Dendronereides zululandica* (NTM W2060): b, parapodium 25.

of the papillae on the pharynx, shape of the branchiae and setal types. Heterogomph spinigers and falcigers seen in *D. zululandica* are not present in *D. heteropoda*. Some differences in setal form occur within these two species, the heavily chitinised sesquigomph spinigers present posteriorly in *D. heteropoda* are absent in *D. zululandica*.

Storch & Welsch (1972) collected *D. heteropoda* in mangrove swamps of Belawan, Sumatra for a physiological study.

Habitat. In Australia, the species occurs on mud flats seaward of mangroves *Avicennia marina* and *Rhizophora*. Southern (1921) describes the habitat as brackish pools and salt lakes with variable, but never high salinity.

Distribution. Australia (Northern Territory). India (Barantolla), Sumatra (Belawan).

Dendronereides zululandica Day

Fig. 5b, Table 5

Dendronereides zululandica Day, 1951: 30–32, fig. 5a–j.—Day, 1967: 302–304, fig. 14.3 g–l.

Material examined. Australia: Western Australia: King River, Wyndam 15°47'S, 128°12'E, 21 Mar. 1985, 1(NTM W2618), 23 Mar. 1985, 1(NTM W2623), 21 Mar. 1985, 1(NTM W2628), 21 Mar. 1985, 1(NTM W2629). Northern Territory: Micketts Creek, Shoal Bay 11°48'S, 130°39'E, 21 June 1982, 2(NTM W2060); Gunn Point 12°10'S, 131°00'E, 3 Oct. 1981, 3(NTM W210); McArthur River; Carrington Channel 15°50'S, 136°35'E, 8 Aug. 1985, 1(NTM W3721); Cora Point, 3 Aug. 1985, 1(NTM W3120), 3 Aug. 1985, 1(NTM W3425); Muggs Mistake 15°55'S, 136°36'E, 1 Aug. 1985, 1(NTM W3738). HOLOTYPE: South Africa, Zululand, St Lucia Estuary, 28°32'S, 32°25'E (BMNH 5.5.1/28).

Description. All material examined posteriorly incomplete, ranging from 6.0–20 mm long, 0.5–2.0 mm wide, 39–68 setigers. Prostomium semicircular with median furrow. Pharynx with papillae arranged as follows: Areas I–IV=26–44, V=1 large papilla, VI=1–2 papillae (if 2 papillae present one small), VII–VIII=6–12 in 2 alternating rows with largest papillae occurring toward maxillary end of oral ring.

Anterior notopodia with short, pointed dorsal cirrus, triangular dorsal and median ligules. Superior lobe present after first few setigers. From approximately setigers 7–30, dorsal ligule divided to form long, fingerlike branchiae (Fig. 5b). Branchiae project in a plane approximately parallel to parapodia. Neuropodia with single, broad, rounded lobe not divided into separate acicular and post acicular portions. Ventral cirrus short, pointed. Posteriorly, notopodial lobes reduced in number to 2 then 1 lobe. Neuropodia a single conical lobe.

Setae consist of homogomph and heterogomph spinigers and homogomph and heterogomph falcigers. The variation in the distribution of setae along the body is given in Table 5.

Remarks. The Australian material closely resembles the type of *D. zululandica*. This represents the first record of *D. zululandica* from outside South Africa. The specimens in northern Australia were found in a similar estuarine habitat to that of the type locality.

The two species of *Dendronereides* found in Australia occur together in the McArthur River (Carrington Channel). *Dendronereides heteropoda* has also been collected from Port Essington and the Daly River but to date no *D. zululandica* have been collected from these more westward localities.

Habitat. In Australia the species occurs on mud flats in front of mangroves (*Avicennia marina* and *Rhizophora* sp.). Day, (1967) records specimens occurring in tropical estuaries.

Distribution. Australia (Western Australia, Northern Territory), South Africa.

Ceratophale Malmgren

Ceratophale Malmgren, 1867: 176–177.—Hartman, 1952: 15–16.—Banse, 1977: 613–614. See Banse, 1977 for synonymy.—Hylleberg & Nateewathana, 1988: 5.

Type species. *Ceratocephale loveni* Malmgren, 1867 by original designation.

Diagnosis. Pharynx with papillae on oral ring. Dorsal cirri simple throughout. Median body region with dorsal cirri on elongated vascularised cirrophores, with or without mid-dorsal transverse flaps and with conspicuous neuropodial presetal ligules.

Remarks. We have partially adopted the terminology used by Hylleberg & Nateewathana (1988) to describe the complex parapodia of *Ceratocephale* and *Gymnonereis*.

Notopodia and neuropodia consist of presetal ligules and postsetal lobes. The acicula are embedded in the noto- and neuro-acicular papillae respectively.

We have retained the term ventral ligule to describe the ligule immediately ventral to the neuropodial presetal ligule and postsetal lobe. Ventral cirri are described as bifid, with the dorsalmost cirrus of the pair called the primary cirrus (after Banse, 1977).

Hylleberg & Nateewathana (1988) and Pettibone (1970) refer to the ventral ligule, as a subpodal ligule, retaining the term ventral ligule for the primary ventral cirrus.

It is difficult to decide whether the bifid ventral cirri of *Ceratocephale* are homologous with the single ventral cirri of other nereidids (ie. bifidness is a state of the character ventral cirri-form), or whether the dorsalmost one of the pair is homologous with the ventral ligule of other nereidids. Therefore, by following the terminology of Banse, 1977 in describing the ventral cirri as bifid we are not necessarily implying homology.

***Ceratocephale aureola* n.sp.**

Fig. 6a–f, Tables 6, 9

Material examined. HOLOTYPE: Australia: Western Australia: Dampier Archipelago, Enderby Island 20°36'S, 116°30'E, 3 Mar. 1987, 1(AM W202515) 13 mm long, 0.75 mm wide, 62 setigers, posteriorly incomplete.

Collected intertidally.

Description. Alcohol preserved worm pale brown in colour with no pigment patterns, parapodia with prominent dark brown acicula and golden brown setae. Setae more abundant on anterior 10 setigers compared with subsequent setigers.

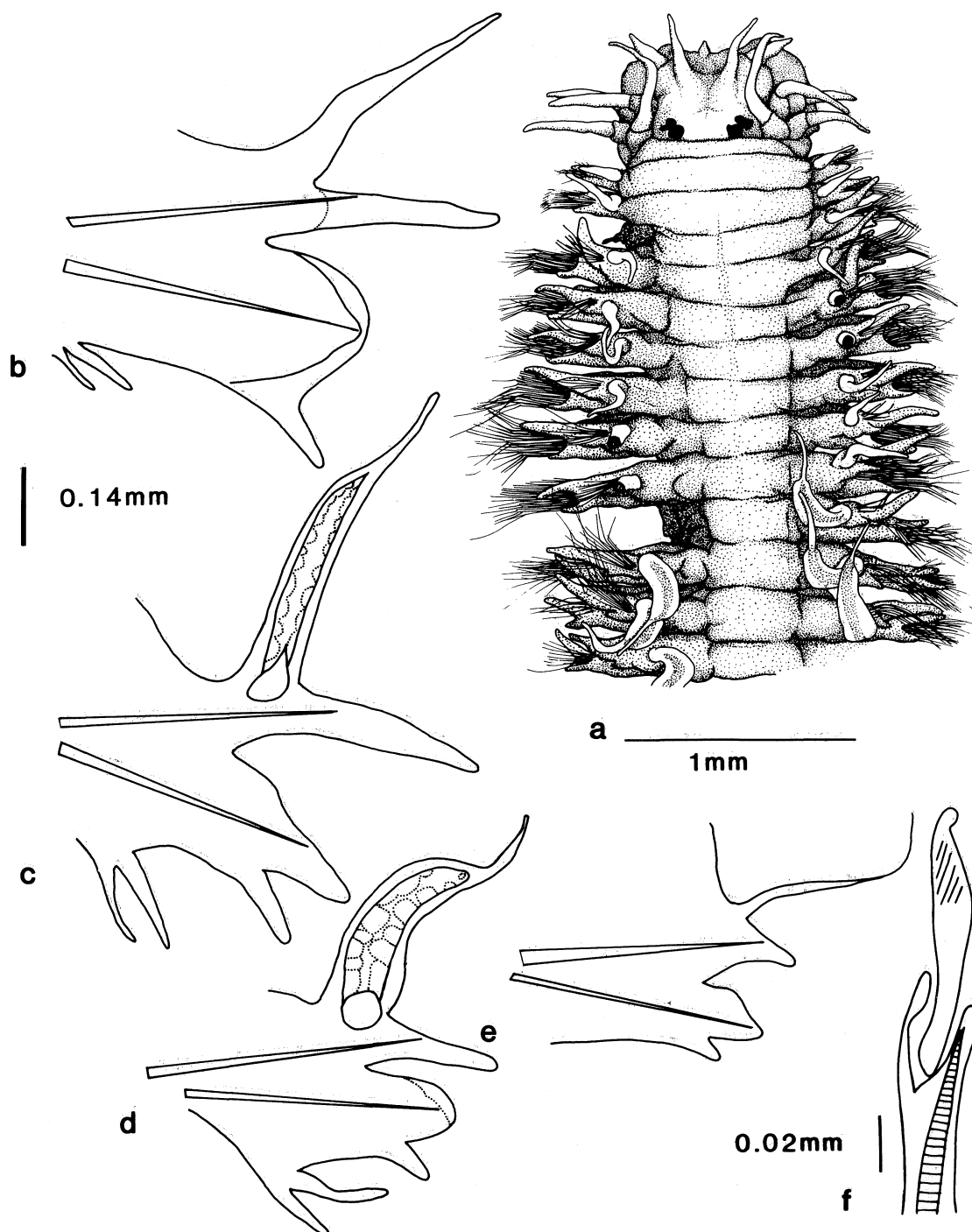


Fig. 6. *Ceratocephale aureola* n.sp., holotype (AM W202515): a, dorsal view of head end; b, anterior view of parapodium 3; c, anterior view of parapodium 10; d, anterior view of parapodium 20; e, anterior view parapodium 50; f, sesquigomph falciger, parapodium 3.

Prostomium narrow, rectangular with a pair of widely spaced, biarticulate antennae. Antennae with elongate, globular ceratophores and narrow, elongate ceratostyles, both components similar in length. Palps situated on extreme lateral margins of prostomium, palpophores globular and fused laterally to antennae, palpostyles triangular, similar in length but thicker than ceratostyles of antennae. Eyes black, arranged diagonally at the base of prostomium. Anterior pair of eyes kidney-shaped and posterior pair almost spherical in shape (Fig. 6a).

Peristomium narrow, tentacular cirri of equal length, extending to setiger 2. Pharynx with pair of light brown, poorly sclerotised jaws with 8 teeth. Basal ring with elongate, colourless papillae arranged as follows: Area V=1, VI=1, VII-VIII=7.

Dorsal cirri initially small, narrow, triangular lobe, gradually increasing in size and by setiger 10, dorsal cirri elongated and expanded with a distinctive terminal flag (Fig. 6c). Dorsal cirri approximately 1.5 times as long as parapodial lobes along entire length of animal. Ventral cirri unequally bifid from setiger 1. Primary cirri longest with ventralmost cirri increasing in length over first 10 setigers to approximate length of primary cirri. Posteriorly, ventralmost cirri decreases in length.

Setiger 1, neuropodia with triangular postsetal lobe, digitiform neuro-acicular papilla, elongate presetal ligule which slightly exceeds postsetal lobe in length. Ventral ligule triangular, shorter than superior lobe.

Setiger 3 (Fig. 6b), notopodial presetal ligule triangular, with short, rounded postsetal lobe. Notopodial lobes twice as long as neuropodial lobes. Neuropodia with very small, neuro-acicular papilla, conical presetal ligule and slightly longer, rounded postsetal lobe and blunt, triangular ventral ligule.

Setiger 10 (Fig. 6c), with vascularised, expanded dorsal cirrus. Notopodia, as for setiger 3 with notopodial presetal ligule approximately 1.5 times as long as neuropodial lobes. Neuropodia small, pointed, superior neuro-acicular papilla, elongate, triangular presetal ligule and longer, rounded postsetal lobe. Ventral ligule triangular.

Setiger 50 (Fig. 6e), presetal notopodial ligule elongate. Neuropodia with broad, triangular postsetal lobe and shorter, rounded presetal ligule, plus small, blunt, triangular ventral ligule.

Parapodia decrease in size posteriorly from setiger 20.

Setae consist of homogomph spinigers, sesquigomph spinigers and sesquigomph falcigers in far anterior neuropodia.

Setal counts for selected parapodia of the holotype are shown in Table 6.

Body wall ventrally smooth, dorsally with distinct transverse ridges connecting parapodia; ridges most prominent on setigers 10–25, then ridges gradually disappear. Gut full of calcareous sand. Holotype not gravid.

Remarks. *Ceratocephale aureola* n.sp. can be separated from *Ceratocephale setosa* n.sp. as the latter has bifid ventral cirri from setiger 3. Setae of *C. ?pacifica* are all spinigers whereas *C. aureola* and *C. setosa* have

sesquigomph falcigers in anterior setigers. In Table 9, the diagnostic characters which separate *Ceratocephale aureola* from other species of *Ceratocephale* are given. Although only a single specimen of this new species was collected, we felt justified in describing it as a new species, as it clearly differs from all other described species of the genus (Table 9).

Habitat. The single specimen was found on an intertidal mud flat in front of mangroves.

Distribution. Australia (Western Australia).

Etymology. The specific name *aureola* refers to the golden setae occurring in this species, and is derived from the Latin *aureolus*, meaning golden.

Ceratocephale ?pacifica Hartman

Fig. 7a–e, Tables 7, 9

Ceratocephale loveni pacifica Hartman, 1960: 94–96, pl. 8, figs 1,2.

Ceratocephale pacifica Banse, 1977: 617, fig. 2a. (in part)

Material examined. Australia: Victoria, Bass Strait 38°27.8'S, 148°53.6'E, 2350 m, 15 Nov. 1981 1(NMV F50060). Bass Strait 38°24.5'S, 148°42.1'E, 1200 m, 15 Nov. 1988, 1(NMV F50059).

Description. 2 specimens posteriorly incomplete, 2.0 and 6.0 mm long, 0.4 mm and 1.0 mm wide, with 14 and 23 setigers respectively. Alcohol preserved material, pale cream in colour with golden setae and dark brown aciculae slightly emergent. Prostomium rectangular and bulbous, with pair of long, thin, triangular antennae lying closely against palps. Globular palps with triangular palpophores. Eyes absent. Tentacular cirri with longest extending to setiger 1 (Fig. 7a).

Pharynx with a pair of pale brown, sclerotised jaws with about 8 teeth, papillae absent.

Setiger 1 with narrow, bifid ventral cirrus, ventralmost branch half length of primary branch. Neuropodia with triangular postsetal lobe and slightly longer, triangular presetal ligule. Ventral neuropodial ligule, short, digitiform, half length of primary ventral cirrus. Dorsal cirrus fine tapering, longer than neuropodial ligules. Subsequently, dorsal cirri expand in width and length with apex of cirri drawn out forming finely tapered tip. Fully expanded vascularised dorsal cirri present from setiger 8. Notopodia with elongate, triangular presetal ligule and very short, blunt postsetal lobe. Neuropodia with bluntly, triangular postsetal lobe and very short, neuro-acicular papilla and digitiform presetal ligule which exceeds length of postsetal lobe. Ventral neuropodial ligule short, triangular (Fig. 7b). Ventral cirri bifid throughout, with ventralmost cirri slender to setiger 5, subsequently broad, globular at base and half to two thirds as long as slender primary cirri (Fig. 7d).

Notopodial setae arranged in 2 bundles on either side of

presetal ligule. Neuropodial setae similarly arranged.

Setae consist of homogomph and sesquigomph spinigers with finely serrated blades (Fig. 7e). The number of sesquigomph spinigers present per parapodia increases along length of animal. Number of homogomph spinigers per parapodium increases to setiger 10, subsequently decreases and by setiger 20, only sesquigomph spinigers

present in neuropodia. Table 7 shows setal counts for specimens (NMV F50060). Setae far more numerous on setigers 3–9 than on subsequent setigers. Setae straw coloured. Narrow transverse dorsal ridges connecting the parapodia present on setigers 10–19.

Specimen (NMV F50060) gravid with no sign of epitokal modifications.

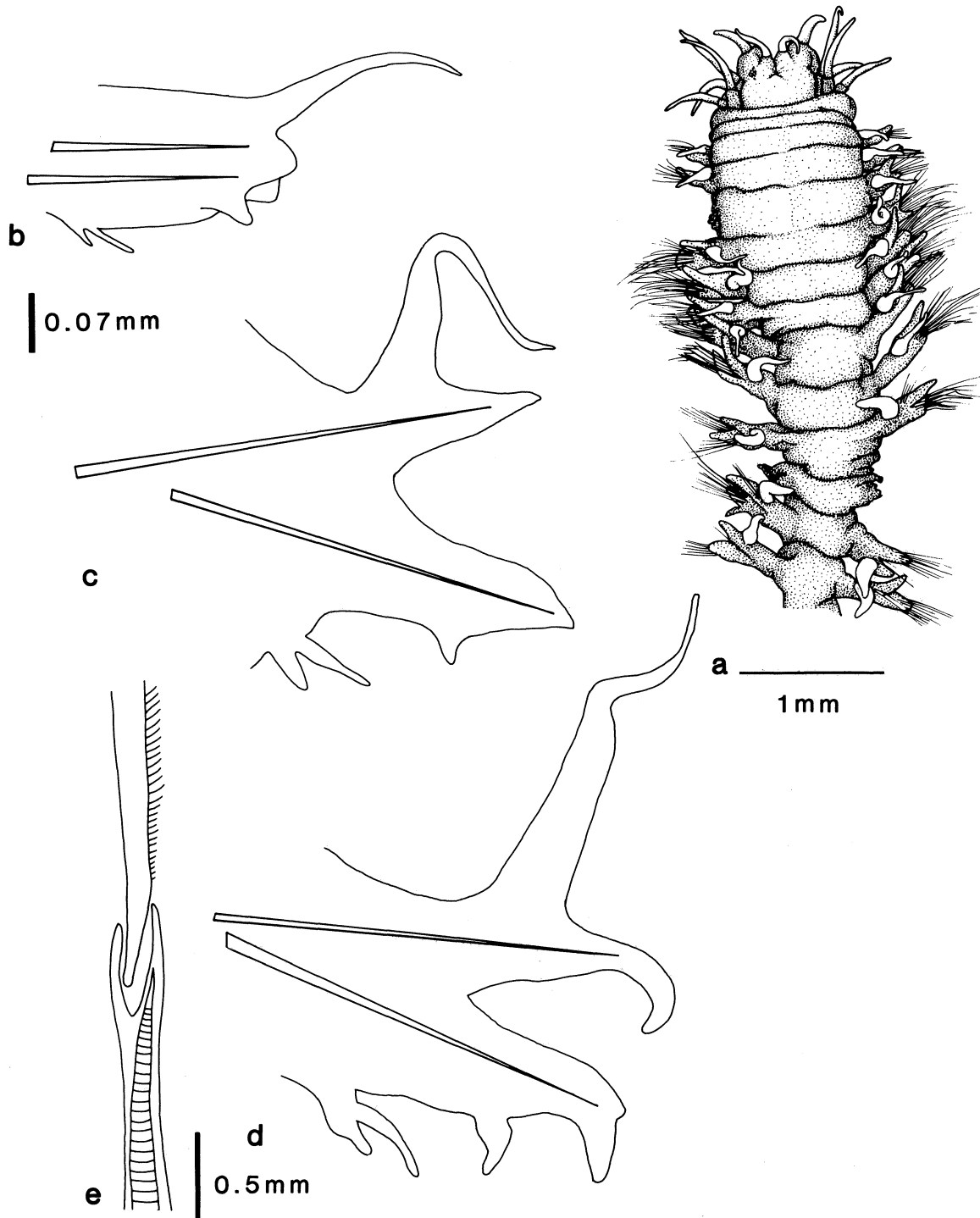


Fig. 7. *Ceratocephale ?pacifica* (NMV F50059): a, anterior end, dorsal view; b, anterior view of parapodium 3; c, anterior view of parapodium 10; d, anterior view of parapodium 20; e, sesquigomph spiniger (part) parapodium 20.

Remarks. This species closely resembles *Ceratocephale pacifica* as described originally by Hartman (1960) as *C. loveni pacifica* and subsequently re-examined by Banse (1977). Banse elevated the subspecies to the species level and indicates that two species were confused by Hartman (1960) and that not all specimens designated as type material belong to *C. pacifica*, the remainder belonging to a second species *C. hartmanae* Banse, 1977. Thus in Table 9 we have listed the characters as outlined by Banse (1977) for *C. pacifica*. Hartman describes dorsal ridges as present from setiger 8, however they appear to start from setiger 10 in our material. As we have seen only two small specimens of this species and have not examined the type material, we have tentatively assigned them to *Ceratocephale* ?*pacifica* until more material becomes available. Table 9 shows a comparison of selected characters of the seven described species of *Ceratocephale*. *Ceratocephale* ?*pacifica* and *C. aureola* n.sp. both have bifid ventral cirri from setiger 1, however the latter can be distinguished from *C. ?pacifica* by the presence of sesquigomph falcigers. *Ceratophale setosa* has bifid ventral cirri from setiger 3. No papillae could be seen in *C. ?pacifica*, however both specimens are extremely small and the head of one specimen is dorsoventrally flattened making detection of papillae difficult.

Habitat. The Australian material was collected from depths of 1200 to 2350 m, in mud. The type of *C. pacifica* was collected from depths of over 1800 m, in the West Cortes Basin off Southern California, USA also in mud.

Distribution. Australia (Victoria).

***Ceratocephale setosa* n.sp.**

Fig. 8a–e, Tables 8, 9

Material examined. HOLOTYPE: Australia: Victoria: Port Phillip Bay 38°18.7'S, 144°53.3'E, 18 m, 10 Feb. 1970, 1(AM W16093) 15 mm long, 1.5 mm wide, 54 setigers, incomplete posteriorly. PARATYPES: Victoria: Port Phillip Bay 38°18.7'S, 144°42.9'E, 18 m, 10 Feb. 1970, 1(NMV F54174), 11 mm long, 1.5 mm wide, 24 setigers; Port Phillip Bay 38°04.7'S, 144°42.9'E, 15 m, 10 Feb. 1970, 1(AHF POLY 1489), 10 mm long, 1.0 mm wide, 36 setigers; Port Phillip Bay 38°04.7'S, 144°42.9'E, 15 m, 10 Feb. 1970, 1(BMNH ZB 1988.13), 10 mm long, 0.9 mm wide, 30 setigers; Port Phillip Bay 38°04.7'S, 144°42.9'E, 15 m, 10 Feb. 1970, 1(USNM 120512), 7 mm long, 1.0 mm wide, 29 setigers. All paratypes posteriorly incomplete. Non-type material: Victoria: Port Phillip Bay, 38°04.7'S, 144°42.9'E, 15 m, 10 Feb. 1970, 3(AM W16092). South Australia: Upper Spencer Gulf 33°24'S, 137°37'E, 9.3 m, Apr. 1979, 1(AM W202508).

Description. Alcohol preserved worm pale cream in colour, with pale golden setae. Anterior 12 segments inflated, body then tapers and all subsequent segments similar in width. Anterior setigers with numerous setae,

following setigers with fewer setae.

Prostomium, oblong with two pairs of eyes on basal, lateral margins, arranged in an oblique line. Basal pair largest, circular in shape, anterior pair elliptical, eye pigment brownish purple.

Pair of stout antennae, basally globular, widely separated, as long as palps. Pair of elongate palps, basally very swollen with long, triangular palpostyles. Longest tentacular cirri extending to setiger 3 (Fig. 8a).

Peristomium narrow ring, dorsally forming a narrow collar which overlaps base of prostomium, continues ventrally as narrow ring.

Pharynx not everted, dissected with pair of pale brown, sclerotised jaws with about 10 teeth. Elongate simple papillae, present on the oral ring only, arranged as follows: Area V=1, VI=1, VII–VIII=7.

Setiger 1 with elongate, narrow, triangular dorsal cirrus, and slightly shorter, triangular ventral cirrus. Neuropodium with small neuro-acicular papilla and large, triangular presetal ligule. Postsetal lobe broad and rounded, shorter than presetal ligule. Ventral neuropodial ligule triangular, slightly shorter than neuropodial presetal ligule.

From setiger 3, anterior setigers with broad-based dorsal cirrus, slightly shorter, triangular notopodial ligule with rounded postsetal lobe (Fig. 8b). Notopodial presetal ligule longer and notopodial postsetal lobe shorter than neuropodial ligules throughout. Neuropodia as described for setiger 1.

Parapodial lobes increase proportionally in size to approximately setiger 10, after which parapodial lobes gradually decrease in size and become less robust.

Ventral cirri bifid unequally from setiger 3, with ventralmost cirrus, initially approximately half length of primary cirrus, increasing in length posteriorly to become approximately three quarters its length by setiger 10 (Fig. 8c).

Dorsal cirri expanded, leaf-like and vascularised from setiger 11 (Fig. 8d), greatly exceed length of notopodial presetal ligule.

Setae include homogomph and sesquigomph spinigers and sesquigomph falcigers (Fig. 8e). Notosetae arranged in 2 bundles, 1 dorsal and 1 ventral to notopodial presetal ligule. Supra-acicular neurosetae arranged in U-shape around neuro-acicular papillae. Subacicular neurosetae dense, numerous, brush-like, occur posteriorly and ventrally to presetal neuropodial ligule. Holotype setal counts are shown in Table 8.

Dorsal transverse ridges occur on dorsum of setigers 10 to at least setiger 20, connecting parapodia together, at level of the dorsal cirri.

Pygidium unknown. Holotype not gravid.

Variation. Pigmentation varies from cream to pink in alcohol in the paratypes and the additional material examined. In all specimens the setae are straw-golden in colour, and very numerous on the first 10–15 setigers. All specimens have the following arrangement of pharyngeal papillae: Area V=1, VI=1, VII–VIII=5–7, with a distinct gap between VI and VIII. Ventral cirri are double from setiger

3–5 posteriorly, (most commonly from setiger 3). In small specimens it is difficult to detect the ventralmost branch. Dorsal transverse ridges occur in all specimens, and first appear at approximately setiger 10 and present on all subsequent setigers at least to setiger 36 (AHF POLY 1489).

Remarks. Banse (1977) revised the genus *Ceratocephale* Malmgren and recognised four species,

C. loveni Malmgren, 1867; *C. pacifica* Hartman, 1960, *C. hartmanae* Banse, 1977 and *C. oculata* Banse, 1977. It is unclear as to Banse's (1977) opinion of *C. abyssorum* (Hartman & Fauchald, 1971) which Hartmann-Schröder (1977) transferred to *Ceratocephale*, although Banse does refer to her paper. At this stage, we accept this species as belonging to the genus.

In addition, a new species *C. andaman* has recently been

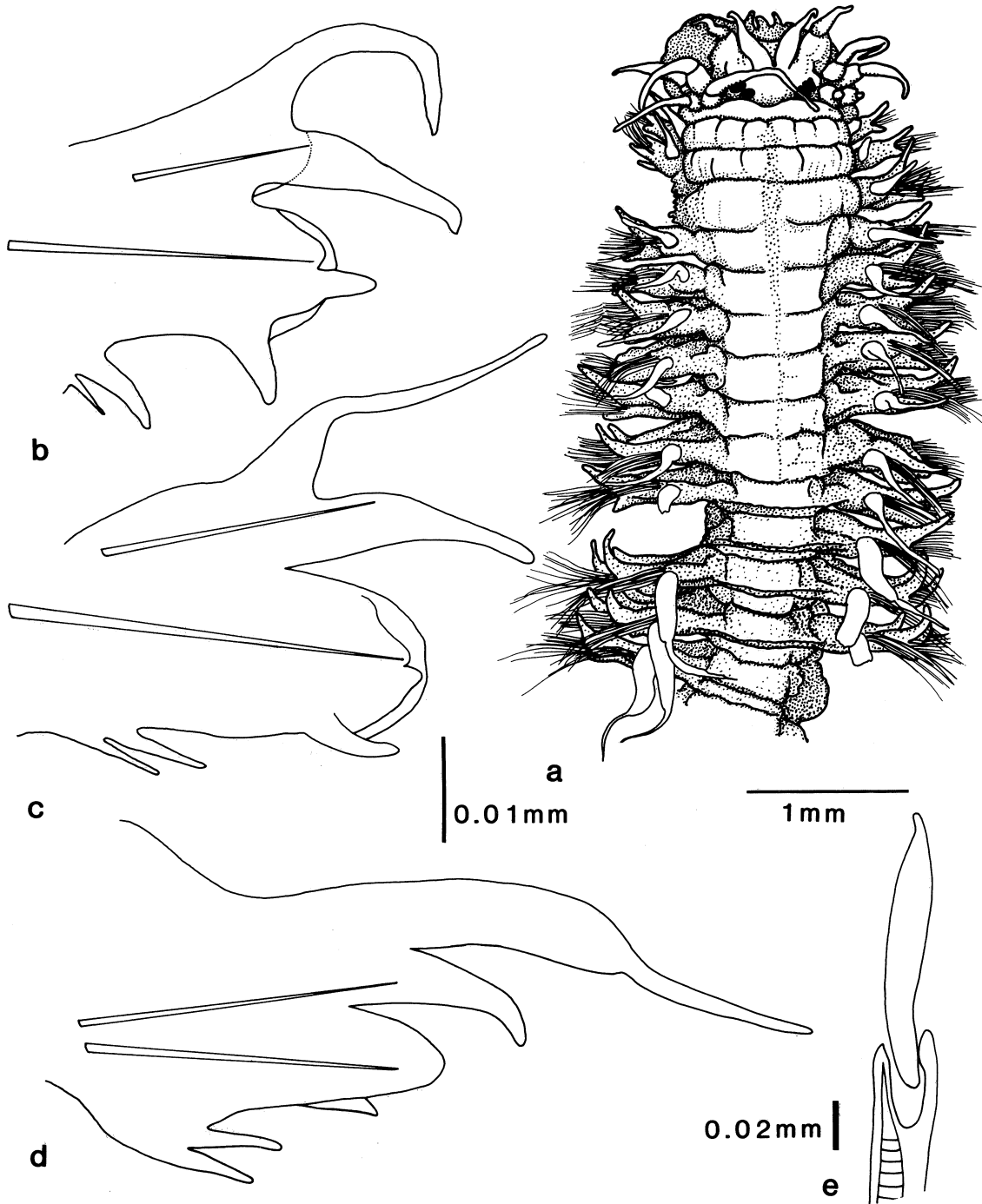


Fig.8. *Ceratocephale setosa* n.sp., holotype (AM W16093): a, anterior end, dorsal view; b, anterior view of parapodium 3; c, anterior view of parapodium 10; d, anterior view of parapodium 20; e, sesquigomph falciger, parapodium 3.

described by Hylleberg & Nateewathana (1988). In Table 9, the distinguishing characters of the currently recognised species of *Ceratocephale* are given. As can be seen from the Table, several of the previously described species are incompletely known, however a generic revision of the genus was beyond the scope of this study. As can be seen from the table, all *Ceratocephale* with the possible exception of *C. abyssorum* have mid-dorsal ridges, however the setiger at which ridges are visible is largely dependent upon the size and state of preservation of the specimen.

Although we have given information on the presence or absence of eyes, we believe this character should not be used as the sole character to distinguish species. *Ceratocephale oculata* Banse, and *Ceratocephale andaman* Hylleberg & Nateewathana have been described as with or without eyes suggesting that eye pigment is prone to fading, perhaps as a result of preservation in specimens of this genus.

Characters distinguishing *Ceratocephale setosa* n.sp. from other species of *Ceratocephale* are shown in Table 9.

Habitat. Occurs in muddy or silty sand in 15 to 55 m depth.

Distribution. Australia (Victoria, South Australia).

Etymology. The specific name is derived from the Latin *setosus* meaning bristly which refers to the numerous setae present on anterior parapodia.

Gymnonereis Horst, emended

Gymnorhynchus Horst 1918: 247.—Pre-occupied by *Gymnorhynchus* Rudolphi, 1819; Cestoda (paper cited from Pettibone, 1970).

Gymnonereis Horst, 1919: 64.—Pettibone, 1970: 234.—Banse, 1977: 621–622 (in part).

Type species. *Gymnonereis sibogae* (Horst) 1918, by monotypy.

Diagnosis. Body elongate, depressed, attenuated posteriorly. Prostomium with frontal margin deeply incised between bases of frontal antennae.

Eversible pharynx with jaws having cutting edge smooth or serrated, with papillae on the oral ring. Notopodia with accessory dorsal cirri attached to dorsal cirrophores in anterior region only, with presetal ligules and short, rounded postsetal lobes. Median segments with dorsal cirrophores greatly elongated and highly vascularised (except in *G. crosslandi*) and lacking accessory cirri. Dorsal transverse ridges present or absent. Setae homogomph or sesquigomph spinigers and homogomph or sesquigomph falcigers may be present. Setae very numerous in anterior setigers.

Remarks. The above definition which is a synopsis of

the generic diagnoses given by Pettibone (1970), Banse (1977) and Hylleberg & Nateewathana (1988), in part, has been modified to include species which have homogomph or sesquigomph falcigers. We have excluded reference to conspicuous presetal neuropodial ligules as this is not a character of *G. sibogae*.

Gymnonereis differs from another of the Gymnonereidinae *sensu* Fitzhugh, 1987, *Tambalagama* which has vascularised dorsal transverse folds present, these folds are absent in *Gymnonereis*.

Pettibone (1970) synonymised *Tambalagama* with *Gymnonereis* however Banse (1977) retained the genus due to the presence of these folds with the qualification that '...these skin folds are much more conspicuous than the narrow mid-dorsal flaps of *Ceratocephale hartmanae*'. Hylleberg & Nateewathana (1988) emended the generic diagnosis of *Gymnonereis* to include a new species (*G. phuketensis*) with large triangular mid-dorsal flaps thereby effectively synonymising *Tambalagama* with *Gymnonereis*.

We have doubts about the validity of the genus *Tambalagama* and suspect it should be synonymised with *Gymnonereis* but until the two genera have been thoroughly revised and type material re-examined we prefer to recognise them as separate genera.

The two new species from Australia, *G. yurieli* and *G. minyami* do possess dorsal ridges but they are not as well developed as those figured by Pillai (1961) or Banse (1977) for *Tambalagama fauveli*. For this reason we have placed these two species in the genus *Gymnonereis* rather than *Tambalagama*.

Banse (1977) recognises the following species of *Gymnonereis*, *G. sibogae* (Horst, 1918); *G. fauveli* (Hartmann-Schröder, 1962) and *G. crosslandi* (Monro, 1933).

The parapodia of *Gymnonereis* have been described partially following the terminology of Hylleberg & Nateewathana (1988). See also the remarks following the generic diagnosis of *Ceratocephale*. In cases where the dorsal cirri are paired or bifid, we have called the ventralmost branch of the pair the accessory dorsal cirrus. Hylleberg & Nateewathana (1988) call this branch the dorsal ligule.

Gymnonereis minyami n.sp.

Fig. 9a–f, Tables 10, 12

Material examined. HOLOTYPE: Australia: South Australia, Upper Spencer Gulf 34°30'S, 136°55'E, 9.3 m, 26 Apr. 1979, 1(AM W202517), 13 mm long, 2 mm wide, 35 setigers. PARATYPES: Upper Spencer Gulf 34°30'S, 136°55'E, 7.3 m, 26 Apr. 1979, 1(AM W202518) 8.8 mm long, 1.9 mm wide, 27 setigers, 1(SAM E2129) 4 anterior fragments, 32°35'S, 137°46'E, 6 m, Nov. 1985, 1(AHF POLY 1487) 7.2 mm long, 0.9 mm wide, 30 setigers, 32°47.18'S, 137°50'E, 11 m, 1(BMNH ZB 1988.12) 9 mm long, 2.5 mm wide, 21 setigers, 33°05'S, 137°57.3'E, 6 m, Nov. 1985, 1(USNM 120511) 8 mm long, 2.5 mm wide, 21 setigers. All type material posteriorly incomplete. Non-type material: Upper Spencer Gulf, 32°42.2'S,

137°47.26'E, 15 m, (SAM E2122), 33°01'S, 137°38'E, 7 m, (SAM E2123), 32°35.04'S, 137°46.08'E, 6 m, (SAM E2124), 33°01'S, 137°37.38'E, 7 m, (SAM E2125), 33°01'S, 137°49'54'E, 12 m, (SAM E2126), 33°01'S, 137°49.54'E, 12 m, (SAM E2127), 32°40'S, 137°46.28'E, 13 m, (SAM E2128), incomplete all material collected Feb. 1986. Victoria: Bass Strait 40°14.4'S, 148°30.0'E, 60 m, 14 Nov. 1981 (NMV 5054); 39°03.2'S, 146°39.5'E, 55

m, 18 Nov. 1981 (NMV 5055). All non-type material posteriorly incomplete.

Description. Alcohol preserved animal, cream with golden setae, which are abundant on anterior setigers. Holotype not gravid.

Prostomium rectangular, deeply incised anteriorly

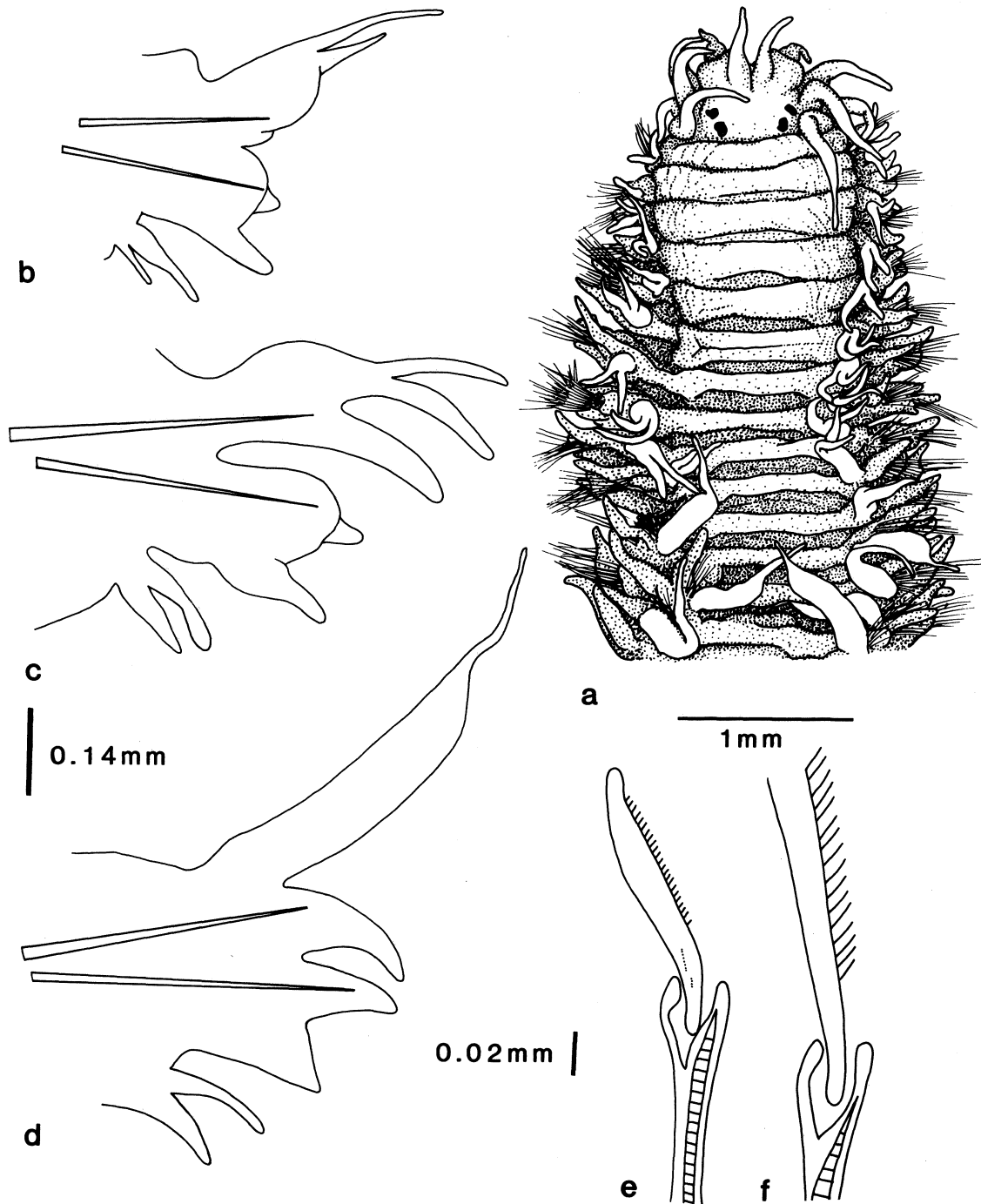


Fig.9. *Gymnonereis minyami* n.sp., holotype (AM W202517): a, anterior view, head end; b, anterior view of parapodium 3; c, anterior view of parapodium 10; d, anterior view of parapodium 20; e, sesquigomph falciger, parapodium 3; f, sesquigomph spiniger, parapodium 10 (part).

mid-dorsally, with a pair of stout antennae, longer than palps. Palps with swollen globular palpophores and short digitiform palpostyles. Eyes arranged basally and obliquely, anterior pair rectangular, posterior pair spherical (Fig. 9a). Longest tentacular cirri extending to anterior margin of setiger 3.

Peristomium narrow, pharynx with a pair of narrow jaws, heavily sclerotised along cutting margin, with 10–15 fine teeth. Papillae digitiform, present on oral ring arranged as follows: Area V=1, VI=1, VII–VIII=5, maxillary ring bare.

Setigers 1 and 2 with dark brown aciculum, tip curved and just emergent. Setigers 1–10 with bifid dorsal cirri. Accessory dorsal cirri anteriorly, two thirds length of dorsal cirri, posteriorly half as long as dorsal cirri. By setiger 11, dorsal cirrophore expanded, lamellate, appears vascularised, cirrostyle drawn out into fine tip. Lamellate dorsal cirri present on all subsequent setigers (35) on holotype.

Ventral cirrus unequally bifid on all setigers. Ventralmost branch one half-two thirds as long as primary branch.

Setiger 1, neuro-acicular papilla small, rounded and lies posteriorly to large triangular presetal ligule. Postsetal lobe rounded, shorter than presetal ligule. Ventral neuropodial ligule broad, subtriangular, slightly longer than inferior lobe.

Setiger 3 with basally swollen, triangular notopodial presetal ligule with a short, rounded postsetal lobe. Setae in 2 bundles, 1 either side of notopodial presetal ligule. Aciculum deeply embedded (Fig. 9b). Neuropodium as for setiger 1. Neurosetae in 2 fascicles with dorsalmost bundle arranged in a semicircle around neuro-acicular papilla and ventralmost bundle posterior and ventral to presetal ligule. This arrangement continues along length of animal. Remaining anterior parapodia as for setiger 3 (Fig. 9c,d).

Posteriorly, notopodial and neuropodial ligules and lobes decrease in size proportionately, with both notopodial and neuropodial postsetal lobes tending to triangular rather than ovoid shape.

Setae consist of homogomph and sesquigomph spinigers and sesquigomph falcigers present from setigers 2–7. Setal counts for the holotype are shown in Table 10.

Setigers 3–13, parapodia elongate and well separated from body wall, following parapodia compact and short. Transverse, dorsal raised-ridges connecting setigers 5–13, with ridges best developed on setigers 7–11.

Pygidium unknown.

Variation. The following variations are exhibited by the paratypes and additional material examined. The dorsal cirri are bifid from setiger 1 to setigers 9–11. Cirrophores are anteriorly expanded become narrower posteriorly after setigers 30–35. Ventralmost branch of ventral cirri is delicate and easily detached in small specimens. Transverse dorsal ridges occur from setiger 6–8. The exact number of following setigers on which transverse ridges occur is difficult to ascertain as all specimens are incomplete posteriorly, and the ridges become less prominent on posterior setigers. They are maximally developed on

setigers 7–13.

Pharyngeal papillae are arranged as follows: Area V=1, VI=1, VII=5–7.

Remarks. Banse (1977), in a revision of *Gymnonereis* Horst, emended the generic diagnosis and recognised three species, *G. crosslandi* (Monro, 1933), *G. fauveli* (Hartmann-Schröder, 1962) and *G. sibogae* (Horst, 1918). *Gymnonereis minyami* n.sp. can be distinguished from *G. crosslandi* by the development of accessory dorsal cirri on the first 1 to 11 setigers, whereas in *G. crosslandi* they are restricted to the first 2 setigers. *Gymnonereis minyami* differs from *G. sibogae* in that the dorsal cirrus is expanded as a lamellate lobe from setiger 11, whereas in *G. sibogae* such an expansion does not occur until setiger 16. Toothed jaws are absent in the latter species and present in *G. minyami* n.sp. *Gymnonereis fauveli* completely lacks dorsal transverse ridges in contrast to *G. minyami* which has well developed dorsal ridges on setigers 5 to 13. These details are summarised in Table 12.

Gymnonereis minyami n.sp. closely resembles the other new species of *Gymnonereis*, *G. yurieli* n.sp. from Australia but can be distinguished by the presence of falcigers and fewer papillae on Areas VII–VIII in *G. minyami* n.sp. as shown in Table 12.

Habitat. Occurs in medium-coarse sand in 6 to 60 m.

Distribution. Australia (South Australia, Victoria)

Etymology. The specific name is derived from the Aboriginal word *minyama*, meaning many, referring to the large number of setae occurring in anterior setigers of this species.

Gymnonereis yurieli n.sp.

Fig. 10a–d, Tables 11, 12

Material examined. HOLOTYPE: Australia: Queensland, Halifax Bay 19°10'S, 146°44'E, 5 m, Jan. 1977, (AM W202015), 9 mm long, 1 mm wide, 37 setigers, posteriorly incomplete. PARATYPES: Queensland, Halifax Bay 19°10'S, 146°38'E, 5 m, Jan. 1977, 1(AM W202622), 19°10'S, 146°38'E, 5 m, Jan. 1977 1(AM W202621), 4(NMV F54177), 19°09'S, 146°37'E, 5 m, Jan. 1977, 3(AHF POLY 1488), anterior fragments; 19°10'S, 146°38'E, 5 m, Jan. 1977, 1(BMNH ZB 1988.11), 7.5 mm long, 0.8 mm wide, 96 setigers, complete; 19°09'S, 146°37'E, 5 m, Jan. 1977, 4(USNM 120510), anterior fragments. All specimens with exception of BMNH ZB 1988.11 posteriorly incomplete. Non-type material: Moreton Bay, 1 specimen posteriorly incomplete (QM G10347).

Description. Alcohol preserved animal pale cream with dark brown acicula and numerous light golden setae on anterior setigers.

Prostomium with eyes arranged obliquely on lateral margins, posterior pair, slightly larger, both pairs dark

reddish brown. Prostomium squat, rectangular in shape with deep cleft between 2 antennae (Fig. 10a).

Palps with large, bulbous base and short, triangular palpostyle. Antennae as long as palps. Tentacular cirri with first pair longest extending to setiger 4, shortest extending to base of palps.

Peristomium narrow.

Pharynx with a pair of lightly sclerotised jaws with

numerous teeth. Oral ring with papillae arranged as follows: Area V=1, VI=1, VII–VIII=8; maxillary row bare.

Setigers 1–11 with bifid dorsal cirri with accessory cirri slightly shorter than dorsal cirri. Ventral cirri bifid throughout. From setigers 11–22, dorsal cirrophores expanded and vascularised. On subsequent setigers, dorsal cirri narrow, elongate.

Setigers 1 and 2 with tip of aciculum slightly emergent.

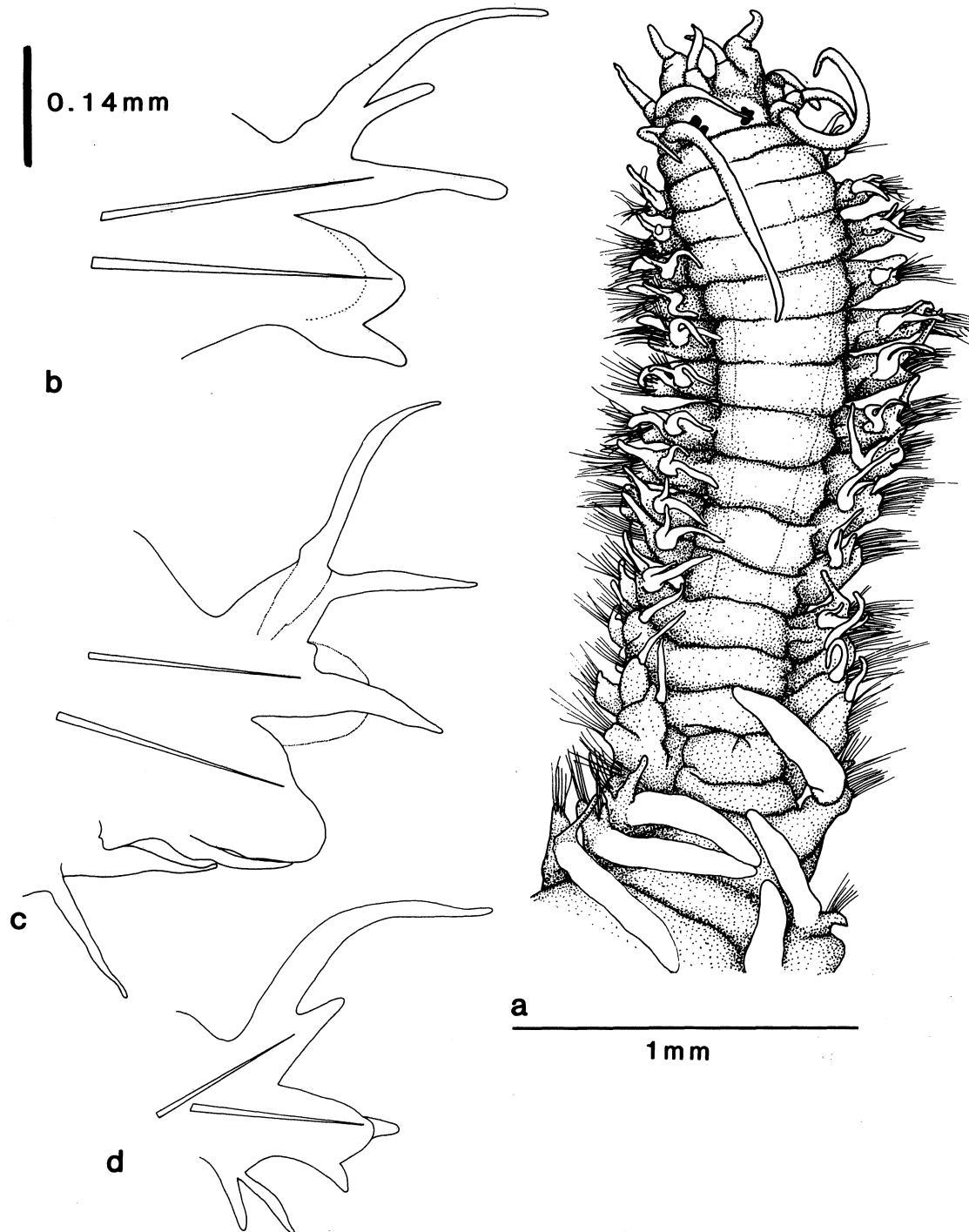


Fig. 10. *Gymnonereis yurieli* n.sp., paratype (BMNH ZB 1988.11): a, anterior view, head end; b, anterior view of parapodium 3; c, anterior view of parapodium 10; d, anterior view of parapodium 50.

Setiger 1 with very small, rounded neuro-acicular papilla bearing the slightly emergent aciculum, large triangular presetal ligule and ventral ligule and rounded postsetal lobe. Presetal ligule equal in length to accessory dorsal ligule, exceeding length of postsetal lobe. Ventral ligule slightly shorter than presetal ligule. Setae arranged in 2 bundles, one dorsal to and other arranged in a semicircle around presetal ligule.

Setiger 3 (Fig. 10b), dorsal cirri and accessory dorsal cirri greatly elongate, exceeding length of all other parapodial lobes. Notopodia with broad based, triangular presetal ligule 1.5 times as long as neuropodial presetal ligule. Bluntly triangular postsetal lobe slightly exceeds neuropodial postsetal lobe in length.

Subsequent parapodia (Fig. 10c,d) as described for setiger 3, with lobes proportionately similar, but less robust and with fewer setae in posterior setigers. Ventral neuropodial ligule is reduced in size in far posterior setigers. Transverse dorsal ridges occur from setiger 10 as narrow raised-ridges connecting parapodia together, ridges continue to about setiger 19–20.

Notosetae consist of homo- and sesquigomph spinigers with laddered shafts and finely serrated blades. Neurosetae consist of sesquigomph spinigers with laddered shafts and blades either strongly or finely serrated. Neurosetae consist of short and long setae arranged in 2 fascicles. Setal counts for holotype are shown in Table 11.

These counts are approximate as the tufted arrangement of the setae often overlapping each other makes counting difficult, for this reason also, counts for homogomph and sesquigomph spinigers have been grouped as the difference between homogomph and sesquigomph shafts cannot be determined when setae are overlapping.

Variation. Only one paratype is complete (BMNH ZB 1988.11), has long anal cirri and last few segments are asetigerous and glandular. The type material, all from Halifax Bay, exhibits little variation.

The additional material (QM G10347) and (AM W15540) consist of incomplete animals which are considerably larger than any of the type material. However no differences can be detected between these larger specimens and the type material except in the number of setae, which are greater for both these specimens than the type material. This may be a function of size. The numerous, anterior setae are extremely robust and conspicuous, as are the dorsal transverse folds, in these larger specimens.

Remarks. *Gymnonereis yurieli* n. sp. differs from the three previously described species of *Gymnonereis*, *G. sibogai* Horst, 1918, *G. crosslandi* Monro, 1933 and *G. fauveli* Hartmann-Schröder, 1962, in having dorsal transverse ridges present from setiger 10. Such ridges are completely absent in these previously described species. The jaws of *G. yurieli* n.sp. are finely toothed whereas in *G. sibogai*, *G. crosslandi* and *G. fauveli* the jaws are smooth. *Gymnonereis yurieli* n.sp. lacks prominent mid-dorsal flaps

which are present in *G. phuketensis* Hylleberg & Nateewathana, 1988.

Gymnonereis yurieli n.sp. can be separated from the other new species of *Gymnonereis minyami* n.sp. from Australia due to the presence of sesquigomph falcigers in *Gymnonereis minyami* n.sp. which are absent in *G. yurieli* n.sp. In Table 12 a summary of the diagnostic characters of the five species of *Gymnonereis* are given.

Habitat. Occurs on intertidal mud flats.

Distribution. Australia (Queensland).

Etymology. The specific name is derived from an Aboriginal word *yuriel* which means a coastal bay and refers to the type locality, Halifax Bay.

Olganereis Hartmann-Schröder

Olganereis Hartman-Schröder, 1977: 147.

Type species. *Olganereis edmondsi* (Hartman, 1954), designated by Hartmann-Schröder, 1977.

Diagnosis. Prostomium subpyriform, with 2 pairs of eyes. Tentacular cirri with distinct cirrophores. First 2 setigers uniramous subsequent setigers biramous. In anterior notopodia, dorsal cirri at bases of dorsal notopodial ligule. Notopodia with 2 ligules and superior lobe. Neuropodia with conical or bilobed acicular lobes and ventral ligules. Ventral cirri tapered. Notosetae homogomph and heterogomph spinigers and heterogomph falcigers. Pharynx with papillae on both maxillary and oral rings.

Olganereis edmondsi (Hartman)

Ceratocephala edmondsi Hartman, 1954: 23, figs 12–17.

Olganereis edmondsi.—Hartmann-Schröder, 1977: 147–149, pl. 2a–e, 3a–c.—Hutchings & Turvey, 1982: 138–139.

Material examined. Australia: Tasmania: Great Bay, Bruny Island 43°12'S, 147°22'E, 30 May 1974, 1(TASM K1106); Tamar Estuary, George Town 41°20'S, 147°02'E, Feb. 1984, 6(AM W198691). South Australia: Torrens Island 34°47'S, 138°32'E, 7 Mar. 1979 1(AM W18295); Kangaroo Island 35°50'S, 137°15'E, 8 Mar. 1978, 2(AM W18290), 7 Mar. 1978, many (AM W18291); 1 Mar. 1979, 1(AM W18292); 2 Mar. 1979, 3(AM W18293); 3 Mar. 1979, 1 (AM W18294); Port Augusta 32°30'S, 137°46'E, 14 Mar. 1979, 5(AM W18299); Coobowie, Yorke Peninsula 35°03'S, 137°43'E, 10 Feb. 1980, 2(AM W18460); Flinders Cairn, Port Lincoln 34°49'S, 135°47'E, 10 Mar. 1979, 6(AM W18296); Venus Bay, Inverloch 37°26'S, 140°51'E, 11 Mar. 1979, 1(AM

W18297), many (AM W18298), 27 Mar. 1981, many (AM W18597). Western Australia: Albany 35°03'S, 117°53'E, 14 Jan. 1988, 1(AM W202836).

All specimens collected intertidally.

Description. Pharynx with long, fine papillae arranged as follows: Area I = 0–1, II = 0, III–IV = 3–6, V = 0, VI = 1, VII–VIII = 7–12. Anterior notopodia, dorsal cirri exceed length of dorsal and median ligules. Notopodial lobes subtriangular, superior lobe present. Neuropodia with bilobed acicular lobe and postsetal lobe of equal length. Ventral ligule conical. Posteriorly, dorsal cirri greatly exceed length of remaining lobes. Dorsal ligule and superior lobe greatly reduced. Acicular lobes not distinctly bilobed. Postsetal lobe exceeds acicular lobe in length. Ventral ligule reduced. Ventral cirrus exceeds length of ventral ligule throughout. Notosetae homogomph spinigers. Supra-acicular neuropodia with homogomph spinigers and 1–4 robust, heavily sclerotised heterogomph falcigers. Subacicular neuropodia with heterogomph spinigers and falcigers.

Remarks. This genus is monospecific, and occurs only in southern Australia. Material varies from the original description and from paratype redescribed by Hartmann-Schröder (1977) only in the number of papillae. Hartmann-Schröder (1977) gives number of papillae in Area I = 1, III–IV = 5 and VII–VIII = 9. These differences can be attributed to variation in size and distributional range of material examined in this study and does not warrant specific distinction.

Habitat. Occurs on intertidal sand and mud flats, often associated with mussel clumps, *Zostera* seagrass beds and encrusting fauna, in fibrous tubes embedded with sand grains.

Distribution. Australia (Victoria, Tasmania, South Australia, Western Australia).

Websterinereis Pettibone

Websterinereis Pettibone, 1971: 19–20.

Type species. *Nereis tridentata* Webster, 1880, designated by Pettibone, 1971.

Diagnosis. Prostomium with 2 pairs of eyes. Pharynx with papillae on oral ring, large papillae on Area VI and single row of minute papillae on Areas VII–VIII.

Notopodia with 2 ligules and usually superior lobe present. Neuropodia with postsetal lobes and ventral ligules, with or without presetal lobes distinct from acicular lobes. Ventral cirri short, tapered. Notosetae homogomph spinigers only. Neurosetae homogomph and heterogomph spinigers and heterogomph falcigers.

Websterinereis foli (Fauvel)

Leptonereis foli Fauvel, 1930: 520–522, fig. 3.

Laeonereis foli.—Hartman, 1948: 55–56, 1959: 245.

Ceratocephala (sic) *corallicola* Reish, 1968: 215–217, fig. 4 (1–5).

Websterinereis foli.—Pettibone, 1971: 23–25, figs 10a–h, 11a–k.

Material examined. Australia: Western Australia: Port Murat, Exmouth Gulf 21°51'S, 114°10'E, 27 Apr. 1972, 1(AM W202516); New South Wales: Long Reef 33°45'S, 151°19'E, 41 m, 27 Apr. 1972, 1(AM W6879). South Australia: Spencer Gulf, Eastern Shoal 33°05'S, 137°49.8'E, Feb. 1986, 8 m, 1(SAM E2351), 33°01'S, 137°45'E, Feb. 1986, 15 m, 1(SAM E2352), Mangrove Point 33°02.24'S, 137°37.88'E, no date, 10 m, 1(SAM E2354); Whyalla, 32°42.20'S, 137°47.26'E, Aug. 1986, 15 m, 1(SAM E2353).

Description. Material examined ranges in size from 11–30 mm long (complete specimens), 0.3–0.6 mm wide and up to 131 setigers. Prostomium with mid-dorsal depression. Peristomium uniformly rust coloured, anterior setigers with narrow bands of pigment. Pharynx, maxillary ring without paragnaths or papillae, oral ring with single large papillae on Area VI and a row of 6–7 smaller papillae on Areas VII–VIII.

Anterior parapodia with triangular dorsal and median ligules and shorter but prominent superior lobe. Dorsal cirri long, tapering, exceed length of dorsal ligules. Neuropodia with shorter, triangular acicular and postsetal lobes. Ventral ligule conical, ventral cirrus triangular, tapering. Posterior parapodia as for anterior parapodia with dorsal ligule increasing gradually in size. Ventral ligule slightly exceeds length of acicular lobe.

Notosetae homogomph spinigers. Supra-acicular neurosetae with homogomph spinigers and short heterogomph falcigers. Falcigers robust with short blades and broad shaft with distal thickening of boss at the point of blade insertion. Subacicular neurosetae with heterogomph falcigers. These falcigers blades relatively longer in anterior than posterior parapodia. Posterior parapodia sometimes with single short-bladed heterogomph spiniger in subacicular bundle of neurosetae.

Remarks. Agrees well with Pettibone's (1971) description. Specimens are small, and pharyngeal papillae difficult to detect and could be overlooked. Pigmentation varies, some specimens more heavily pigmented anteriorly than others.

This is the first record of the species from Australia and represents a considerable range extension.

Habitat. The Australian material was collected from depths of 10 to 41 m, and in Spencer Gulf in coarse sand. Non-Australian material collected has been associated with coral habitats.

Distribution. Australia (Western Australia, New South Wales, South Australia), Central Pacific (New Caledonia, Marshall Islands).

Websterinereis punctata (Wesenberg-Lund)

Leptonereis punctata Wesenberg-Lund, 1949: 289, figs 21–23.

Laeonereis anklyoseta Day, 1957: 83–84, fig. 5a–j; 1960: 321.—Hartman, 1959: 243.

Nicon punctata.—Hartman, 1958: 265–266; 1959: 245, 274.

Websterinereis punctata.—Pettibone, 1971: 25–27, fig. 12a–i, fig. 13a–h.—Stephenson *et al.*, 1974: 112.

Material examined. Australia: Queensland: Moreton Bay, Peel Island 27°30'S, 153°21'E, 1(QM G10477); Bramble Bay 27°18'S, 153°06'E, 1(QM GH4039).

Description. Material examined 1.9–3.5 mm wide, posteriorly incomplete, maximum length 70 mm with 78 setigers. Maxillary ring of pharynx bare, without paragnaths or papillae. Oral ring with single large papillae on Area VI and a row of 6–7 small papillae on Areas VII–VIII.

Anterior parapodia, notopodia with long triangular dorsal and median ligules. Dorsal ligule exceeds length of median ligule. Superior lobe present, slightly shorter than median ligule. Dorsal cirrus conical slightly shorter than dorsal ligule. Neuropodia with bluntly rounded acicular lobe and longer triangular postsetal lobe. Ventral ligule triangular, approximately equal to postsetal lobe in length. Posterior parapodia, dorsal cirri exceed length of dorsal ligule. Superior lobe reduced. Remaining as for anterior parapodia. Notopodial and neuropodial lobes widely spaced posteriorly. Notoetae long bladed homogomph spinigers. Anterior parapodia supra-acicular neurosetae with homogomph spinigers and long bladed heterogomph falcigers. Subacicular neuropodia with long bladed heterogomph spinigers dorsally, long bladed heterogomph falcigers and short bladed heterogomph spinigers ventrally.

Median and posterior parapodia, supra-acicular neurosetae, long bladed heterogomph falcigers replaced by stout heterogomph falcigers with bifid tips. Medially, blades partially fused to shaft and posteriorly blades and shafts completely fused. Subacicular neuropodial falcigers and spinigers short bladed medially. Posteriorly, subacicular neuropodial falcigers as for anterior parapodia.

Remarks. Agrees well with Pettibone's (1971) description. This species is also very similar in features of the parapodia and setae to *Nicon japonicus* Imajima, 1972, however *Websterinereis punctata* can be distinguished due to the presence of papillae on the oral ring, which are absent in *N. japonicus*.

Habitat. In Australia the species occurs in sandy mud and shelly sand in Moreton Bay in depths of 4 m. This species has been collected in 49 to 59 m in the Persian Gulf and 2 to 55 m in South Africa. Habitat includes sand, clay, mud, shells and coral.

Distribution. Australia (Queensland), Persian Gulf (northern and central part), South Africa, Natal, Mozambique.

ACKNOWLEDGEMENTS. We wish to thank the following people for their generous help in providing loans and information to enable us to carry out this study: Leslie Harris (AHF), David George and Alex Muir (BMNH), Kristian Fauchald (USNM), C.C. Lu and Robin Wilson (NMV), Russell Hanley and Melanie Burke (NTM), Patricia Mather (QM), Shane Parker (SAM), Alison Green (TASM) and Gary Morgan (WAM). We would also like to thank Australian Biological Resources Scheme for supporting this project and providing the salary for one of us (AR). We are grateful to Chris Glasby and Libby Howitt for their encouragement and advice and to Jan Howarth for typing the manuscript. Two anonymous referees provided constructive criticism of the manuscript, which improved the style of the paper. Anna Murray prepared all of the anterior views of the species.

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Accepted 8 August, 1989

Appendix

Table 1. The variation in the distribution and type of setae along the body of Australian material (10 individuals) of *Nicon moniloceras*. (see Introduction for abbreviations).

Parapodia			homogomph spinigers	heterogomph spinigers	heterogomph falcigers
3	noto		4-7	0	0
	neuro	supra	3-7	0	1-4
		sub	0	6-10	0
10	noto		7-15	0	0
	neuro	supra	5-8	0	2-4
		sub	0	6-11	1-2
20	noto		7-15	0	0
	neuro	supra	4-7	0	2-4
		sub	0	6-11	2-6
50	noto		7-8	0	0
	neuro	supra	3-4	0	2-3
		sub	0	2-3	3-4

Table 2. Distribution and type of setae along the body of *Nicon rotunda* n.sp. holotype (holo) and six paratypes (para). Counts for paratypes are shown in brackets.

Parapodia			homogomph spinigers		homogomph falcigers		heterogomph falcigers	
			holo	para	holo	para	holo	para
3	noto		15	(2-8)	0		0	
	neuro	supra	8	(2-4)	0		0	(2-3)
		sub	3	(0-4)	10	(2-6)	11	(2-7)
10	noto		18	(1-14)	0		0	
	neuro	supra	8	(3-7)	0		3	(1-4)
		sub	3	(0-3)	6	(2-7)	12	(3-7)
20	noto		1	(3-12)	0		0	
	neuro	supra	13	(2-6)	0		3	(2-4)
		sub	3	(0-3)	2	(1-9)	9	(3-6)
50	noto		15	(3-7)	0		0	
	neuro	supra	8	(2-4)	0		2	(1-2)
		sub	7	(2-4)	0		4	(2-4)

Table 3. The diagnostic features of the species of *Nicon*. *See comments *Websterinereis punctata* page. **Poorly known species - Pettibone (1971) suggests probably not *Nicon*. Supra – neuropodial supra-acicular setae, sub – subacicular setae. Question marks indicate shaft type eg. homogomph or hetergomph not known. Neuropodial position (i.e. supra or subacicular) not known for *N. abyssalis*, *N. polaris* and *N. yaguinae*. Abbreviations: ho sp = homogomph spinigers, he sp = hetergomph spinigers, ho f = homogomph falcigers, he f = hetergomph falcigers.

Species	Setae (Neuropodia)				Diagnostic features	Distribution
	ho	sp	he	f		
<i>Nicon maculata</i> Kinberg, 1866	supra-	x			Neuropodia conical acicular lobe, digitiform postsetal lobes. Anterior neuropodial ligules, thick, rounded. Neuropodial (supra) falcigers thickened posteriorly.	Antarctic and subantarctic waters, East and South China Seas, southern Australia.
	sub-	x				
<i>Nicon moniloceras</i> Hartman, 1940	supra-	x			Notopodial ligules digitiform, subequal. Rudimentary superior lobe. Dorsal notopodial ligule reduced posteriorly. Median neuropodial falcigers recurved distal tooth with distinct tendon. Long tentacular cirri.	Eastern Australia, California – western Mexico Japan.
	sub-		x			
<i>Nicon astuarensis</i>	supra-	x	x	x	Notopodial ligules conical superior lobe	New Zealand

Table 4. The variation in the distribution and type of setae along the body of Australian material (20) of *Dendronereides heteropoda*.

Parapodia			homogomph and sesquigomph spinigers	homogomph falcigers
3	noto		4-11	0
	neuro	supra	7-24	2-8
		sub	11-24	3-7
10	noto		8-21	0
	neuro	supra	7-21	4-7
		sub	11-24	4-12
20	noto		7-25	0
	neuro	supra	5-23	3-6
		sub	5-30	3-7
50	noto		4-10	0
	neuro	supra	12-20	2-4
		sub	0	0

Table 5. The variation in the distribution and type of setae along the body of Australian material (14) of *Dendronereides zululandica*.

Parapodia			homogomph spinigers	heterogomph spinigers	homogomph falcigers	heterogomph falcigers
3	noto		3-7	0	0	0
	neuro	supra	3-7	4-6	0	3-5
		sub	0	5-11	0	4-9
10	noto		2-9	0	0	0
	neuro	supra	2-6	3-4	3-6	3-6
		sub	0	3-7	0	2-6
20	noto		3-4	0	0	0
	neuro	supra	3-5	0	0	0
		sub	0	4-6	2-6	2-6
50	noto		2-3	0	0	0
	neuro	supra	6-9	2-6	1-3	0
		sub				

Table 6. Distribution and type of setae along the body of the holotype (AM W202515) of *Ceratocephale aureola* n.sp.

Parapodia			homogomph spinigers	sesquigomph spinigers	sesquigomph falcigers
3	noto		2	3	0
	neuro	supra	0	12*	2
		sub	0	15**	2
10	noto		0	14	0
	neuro	supra	0	18	0
		sub	0	21	0
20	noto		0	18	0
	neuro	supra	0	15	0
		sub	0	20	0
50	noto		0	11	0
	neuro	supra	12	0	0
		sub	12	0	0

Notes:

* 4 short bladed, 7 long bladed, 1 with broad blade with long teeth or serrations

** 9 long bladed, 5 short bladed, 1 with broad blade with long teeth or serrations

Anteriorly spinigers primarily sesquigomph, posteriorly tending to homogomph. From setiger 10, all spinigers are long bladed.

Table 7. The variation in the distribution and type of setae along the body of Australian material (2) of *Ceratocephale ?pacificus*.

Parapodia			homogomph spinigers	sesquigomph spinigers
3	noto		9	0
	neuro	supra	2	6
		sub	3	3
10	noto		4-10	9
	neuro	supra	0	8-10
		sub	1-10	0-5
20	noto		4	18
	neuro	supra	0	18
		sub	0	15

Table 8. Distribution and type of setae along the body of holotype (AM W16093) of *Ceratocephale setosa* n.sp.

Parapodia			homogomph spinigers	sesquigomph spinigers	sesquigomph falcigers
3	noto		0	6	0
	neuro	supra	0	14	0
		sub	0	13	7
10	noto		8	0	0
	neuro	supra	0	18	8
		sub	0	21	0
20	noto		5	0	0
	neuro	supra	0	10	0
		sub	0	17	0

Table 9. The diagnostic features of the species of *Ceratocephale*. *Eyes originally recorded, but no longer visible on type. # Ridge mid-dorsally a high, narrow flap. ** Ventral setae described as slightly falcigerous.

Species	Eye spots	First bifid ventral cirri (parapodia)	Setigers with expanded dorsal cirrophores	Setigers with dorsal cirrophores connected by low ridges	Setae	Papillae (oral ring)
<i>Ceratocephale loveni</i> Malmgren, 1867	absent*	3	10 onwards	? 6 onwards	ho sp, ses sp	Dorsally 3 Ventrally 2 rows : 7 and 3.
<i>Ceratocephale pacifica</i> Hartman, 1960	absent	1	8 onwards	8 onwards	ho ses	Unknown.
<i>Ceratocephale abyssorum</i> Hartman & Fauchald, 1971	absent	1	?all	? absent	ho sp**	Unknown.
<i>Ceratocephale hartmanae</i> Banse, 1977	absent	3	? unknown	9 onwards #	ho sp	I row, 3 dorsal 7 ventral.
<i>Ceratocephale oculata</i> Banse, 1977	present	1	10 onwards	4 onwards	ho sp	Unknown.
<i>Ceratocephale andaman</i> Hylleberg & Nateewathana, 1988	present or absent	1	8 or 9-30	5-12 sometimes #	ho sp	V-VI=3, VII-VIII=7
<i>Ceratocephale aureola</i> n.sp.	present	1	10 onwards	10 onwards	ho sp, ses sp, ses f	V=1, VI=1, VII-VIII=7
<i>Ceratocephale setosa</i> n.sp.	present	3	11 onwards	absent	ho sp, ses sp, ses f	V=1, VI=1, VII-VIII=5-7.

Table 10. Distribution and type of setae along the body of holotype (AM W202517) of *Gymnonereis minyami* n.sp.

Parapodia			homogomph spinigers	sesquigomph spinigers	sesquigomph falcigers
3	noto		0	9	0
	neuro	supra	14	0	1
		sub	0	17	6
10	noto		9	4	0
	neuro	supra	9	0	0
		sub	0	>18	0
20	noto		15	0	0
	neuro	supra	12	0	0
		sub	15	0	0

Table 11. Distribution of setae along the body of holotype (AM W202015) of *Gymnonereis yurieli* n.sp.

Parapodia			homogomph and sesquigomph spinigers
3	noto		18
	neuro	supra	11
		sub	22
10	noto		20
	neuro	supra	20
		sub	26
20	noto		17
	neuro	supra	11
		sub	14

Table 12. The diagnostic features of the species of *Gymnonereis*.

Species	Jaw teeth	Oral ring papillae (Area)	Setigers with dorsal cirri bifid	Setae	Setigers with dorsal transverse 1. ridges 2. prominent flaps	Setigers with enlargement of dorsal cirrophores
<i>Gymnonereis sibogae</i> Horst, 1918	absent	V–VI=3 VII–VIII=7	1–10	ho sp ses sp *ses f	absent	15 or 16 ?
<i>Gymnonereis crosslandi</i> Monro, 1933	absent	V=1, VI=1, VII–VIII=7 + 3 pairs short transverse ridges	Setigers 1 and 2 only	sp	absent	absent
<i>Gymnonereis fauveli</i> Hartmann-Schröder 1962	absent	V–VI=5 VII–VII=7	3–14	ho sp ses sp	absent	15–50 or 60
<i>Gymnonereis phuketensis</i> Hylleberg & Nateewathana, 1988	present or absent	V=VI=3 VII=VIII=7	1–13	ho sp **ses sp	2. present on setigers with enlarged cirrophores	14 for 10–24 setigers
<i>Gymnonereis minyami</i> n.sp.	present	V=1, VI=1 VII=VIII=5–7	1–11	ho sp ses sp se f	1. present setigers 5–13	11–30 or 35
<i>Gymnonereis yurieli</i> n.sp.	present	V=1, VI=1 VII=VIII=8	1–11	ho sp ses sp	1. present from setigers 10–20	11 onwards

N.B. Ventral cirri are bifid on all setigers in each species. *These were described by Pettibone (1970) as spinigers with short blunt blades. ** Described by Hylleberg & Nateewathana (1988) as slightly heterogomph.