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Taxonomy of Polychaetes from the Hawkesbury River and the Southern Estuaries of New South Wales, Australia

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ABSTRACT. The polychaete fauna of the Hawkesbury River and some other estuarine areas in central and southern New South Wales is described. The majority of material comes from Merimbula, Jervis Bay, Port Hacking, Botany Bay, Hawkesbury River, Port Stephens and Broughton Island; often from seagrass habitats. The material from the Hawkesbury River has been collected over several years and detailed habitat and occurrence data are available.

Over 180 species are recorded, of which 28 species and 4 genera are new: *Harmothoe charlottae* n.sp., *Sthenelais pettiboneae* n.sp., *Compsanaitis inflata* n.gen., n.sp., *Podarke microantennata* n.sp., *Augeneria verdis* n.sp., *Schistomeringos filiformis* n.sp., *Caulleriella dimorphosetosa* n.sp., *C. longisetosa* n.sp., *C. retusiseta* n.sp., *Chaetozone platycerca* n.sp., *Tharyx aphelocephalus* n.sp., *Lobochesis bibrancha* n.gen., n.sp., *L. longiseta* n.sp., *Ophelia elongata* n.sp., *O. multibranchia* n.sp., *Notomastus annulus* n.sp., *N. chrysosetus* n.sp., *N. estuarius* n.sp., *Polycirrus rosea* n.sp., *Pseudostreblosoma serratum* n.gen., n.sp., *Streblosoma atos* n.sp., *S. latitudinis* n.sp., *Longicarpus glandulus* n.gen., n.sp., *Nicolea amnis* n.sp., *Terebella pappus* n.sp., *Desdemona aniara* n.sp., *Euchone variabilis* n.sp., and *Laonome triangularis* n.sp. For each species a full description is given except where a recent easily accessible description in English is available, in which case only a reference to that description is given. Habitat data where known is given together with the Australian distribution of the species. Many of the species are new records for Australia or for New South Wales. Keys to the families and species described in the paper are given.

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Records of the Australian Museum (1984), Suppl. 3

From 1977, the Marine Ecology Department at the Australian Museum has undertaken an extensive benthic faunal study of the Hawkesbury River (Lat. 33°35'S, Long. 151°18'E), 50 km north of Sydney. While we were identifying the polychaete fauna it became obvious that many species were undescribed or represented new records from New South Wales, Australia. At the same time, one of us (PH) undertook an extensive survey of Merimbula Estuary on the far south coast of New South Wales (Day and Hutchings, 1984) and in *Posidonia* beds along the New South Wales coast (Collett *et al.*, 1984).

The Hawkesbury fauna showed some similarity with the fauna collected during these other two surveys and it was decided to describe collectively the polychaete fauna from the three surveys. Additional material in the Museum collections from New South Wales estuaries was also examined and in many cases extended the known range of species.

Many of the species identified to genus in Hutchings & Rainer (1980) are fully identified and described in this paper. Keys to the families and species occurring within each family are provided, although the species must be carefully checked against the description; additional species as yet undescribed certainly do occur in New South Wales estuarine areas. The family key and family diagnoses given are after Fauchald (1977), but the order in which the families are presented is after Hartman (1959). A glossary of terms commonly used in describing the morphology of polychaetes is given by both Fauchald (1977) and Day (1967). In the text some species have been identified only to genus, or in some cases subfamily level because of limited or poor material.

Several factors influenced our decision to restrict this paper only to estuarine areas in central and southern New South Wales. Extensive collections from these areas were available from collections we had made and from other environmental surveys. This allowed us to describe the variation occurring within a species and to give a realistic geographical range. The very limited information available from the northern part of the state was not included as it might have led to a distorted distribution range. Estuarine areas along the eastern seaboard of Australia are under considerable threat from development, and many environmental surveys are being carried out in such areas. Identification of the polychaetes is important as they are often a major component of the fauna. As many of the species present in the estuarine areas are new, poorly described or represent new records from either New South Wales or Australia, we felt that publication of even this limited fauna would make a useful contribution to polychaete studies in Australia. To amplify this point, in 1979, Day & Hutchings reported that just over 400 species had been described from all areas and all habitats from Australia, so that this paper which describes over 180 species, many new or previously unreported from Australia, represents a significant contribution. However it also clearly demonstrates the continuing need for polychaete taxonomic research in Australia. Thus the purpose of this paper was to describe the new species, give new records for New South Wales and Australia and provide an identification guide, for the polychaetes occurring in estuarine areas from central and southern New South Wales.

Methods

Details regarding sampling sites (Station no., depth, sediment type, salinity range) in the Hawkesbury (a map of which is shown in Figs 1a, b) are given in Table 1; in Day and Hutchings (1984) for the Merimbula Stations; and in Collett *et al.*, (1984) for the *Posidonia* beds sampled along the coast. Figure 2 provides a detailed map of all localities mentioned in the text. Detailed information on sediment, depth etc. is only available for the Hawkesbury River, Merimbula and *Posidonia* sampling sites. Information from other localities is incomplete in many cases, but all the available data can be requested from the Australian Museum by quoting the registration number.

Remarks on the occurrence of the species are based on quantitative data collected during the three main surveys which form the bulk of the material examined, i.e. Merimbula, *Posidonia* fauna and the Hawkesbury River surveys; in most cases the only extensive data is from Hawkesbury surveys. Material was collected from the entire Merimbula estuary and from the tidal portions of the Hawkesbury River, but in the estuaries selected for the *Posidonia* surveys only these seagrass beds, which tend to occur in the more saline areas of the estuary, were sampled. Additional species or new records may be expected from other habitats in those estuaries, especially the less saline habitats. The distribution records utilize those given by Day and Hutchings (1979) together with any published since and those marked with an asterisk are new records. Localities (in Distribution and in Material Examined) have been listed from south to north within New South Wales. Where large amounts of material were examined, only a selection of that examined is listed. Collection dates and numbers of individuals examined are given, but for the Hawkesbury River no sampling date is included, only station numbers and frequency, as this has been incorporated into the occurrence data. All the material has been deposited in the Australian Museum unless otherwise stated, and appears in the text with the prefix W before the cited registered number.

Abbreviations

AM: Australian Museum, Sydney.
AHF: Allan Hancock Foundation, Los Angeles.
BMNH: British Museum (Natural History), London.
QMG: Queensland Museum, Brisbane.
USNM: National Museum of Natural History, Smithsonian Institution, Washington, D.C.
SSM: Naturhistoriska Riksmuseet, Stockholm

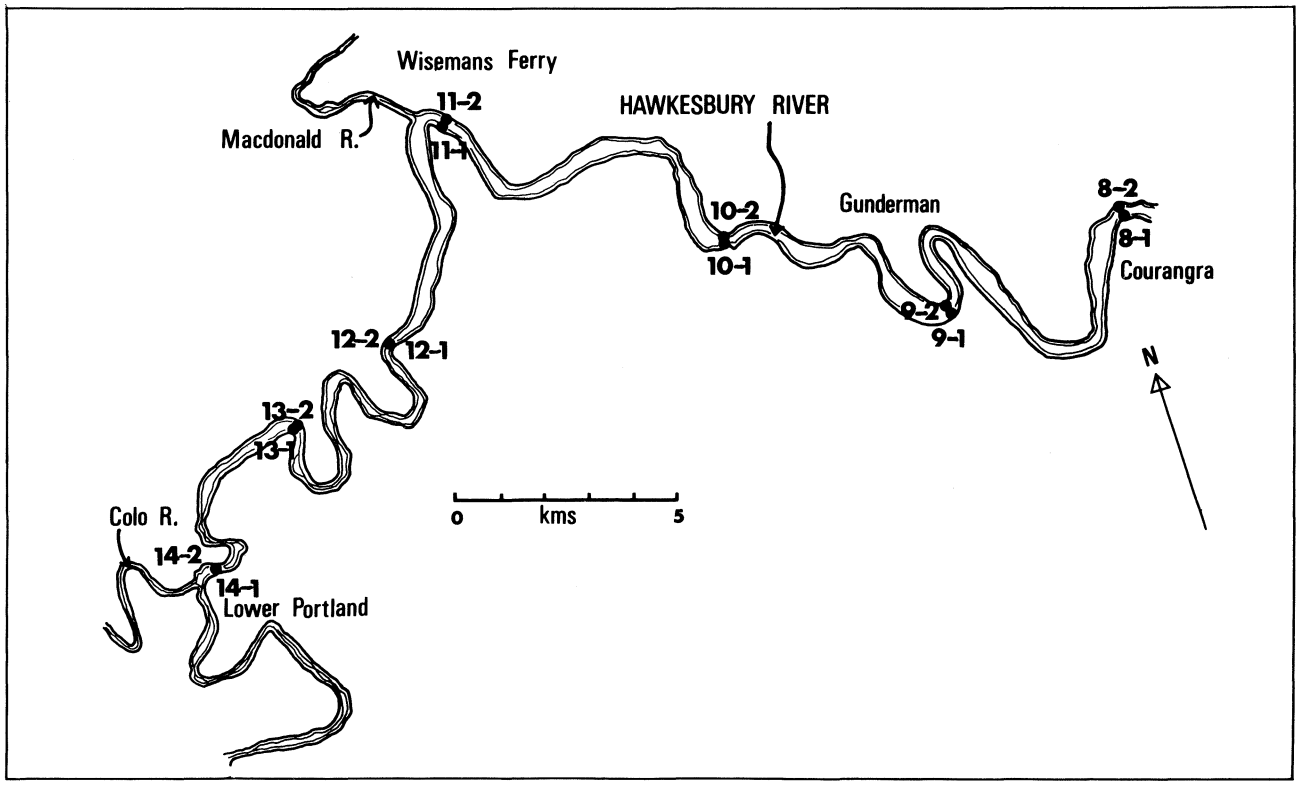

Fig. 1a. Map of upper Hawkesbury River showing location of H.R.S. collection stations 8-1 to 14-2.

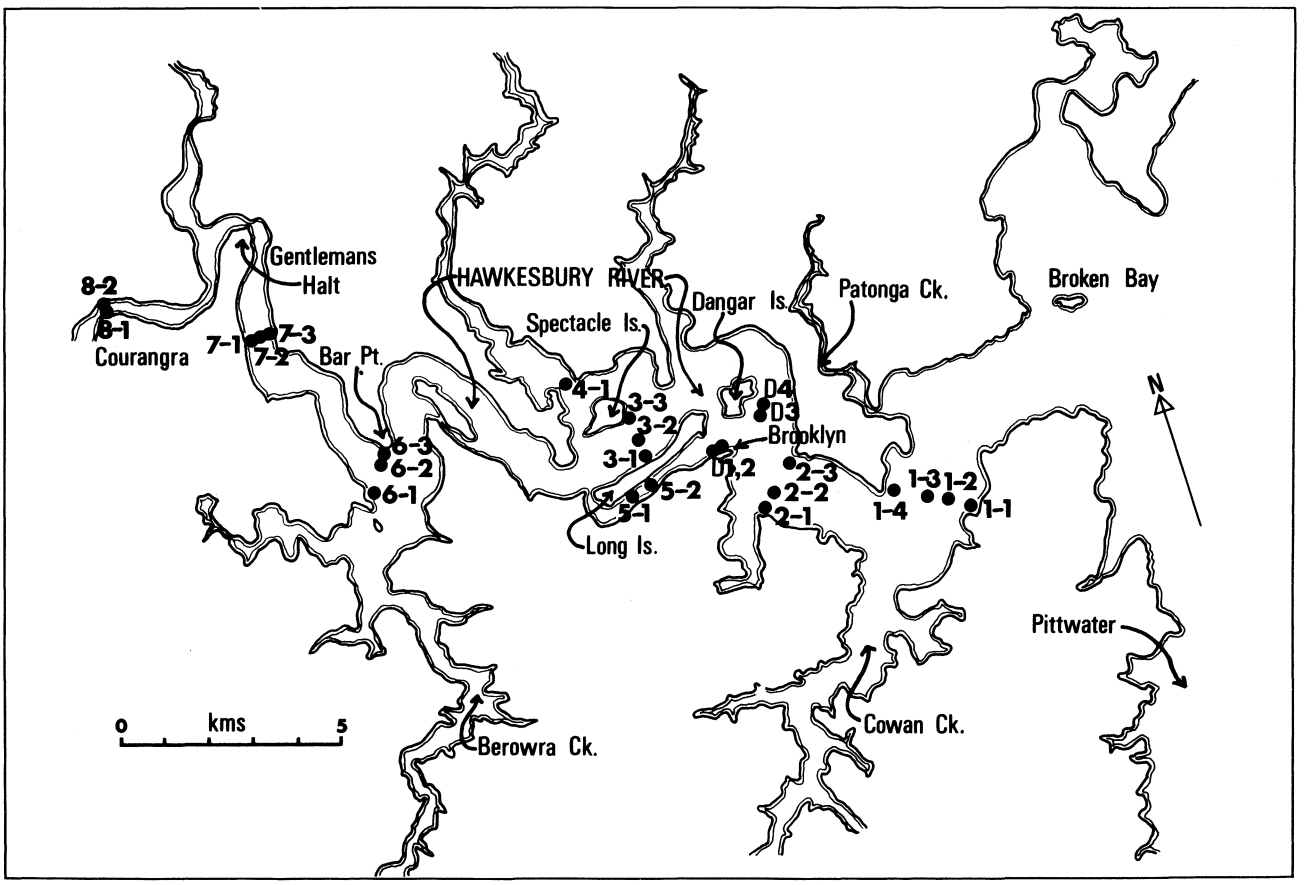

Fig. 1b. Map of lower Hawkesbury River showing locations of H.R.S. collection stations 1-1 to 8-1, and B.D.S. collection sites D1-D4.

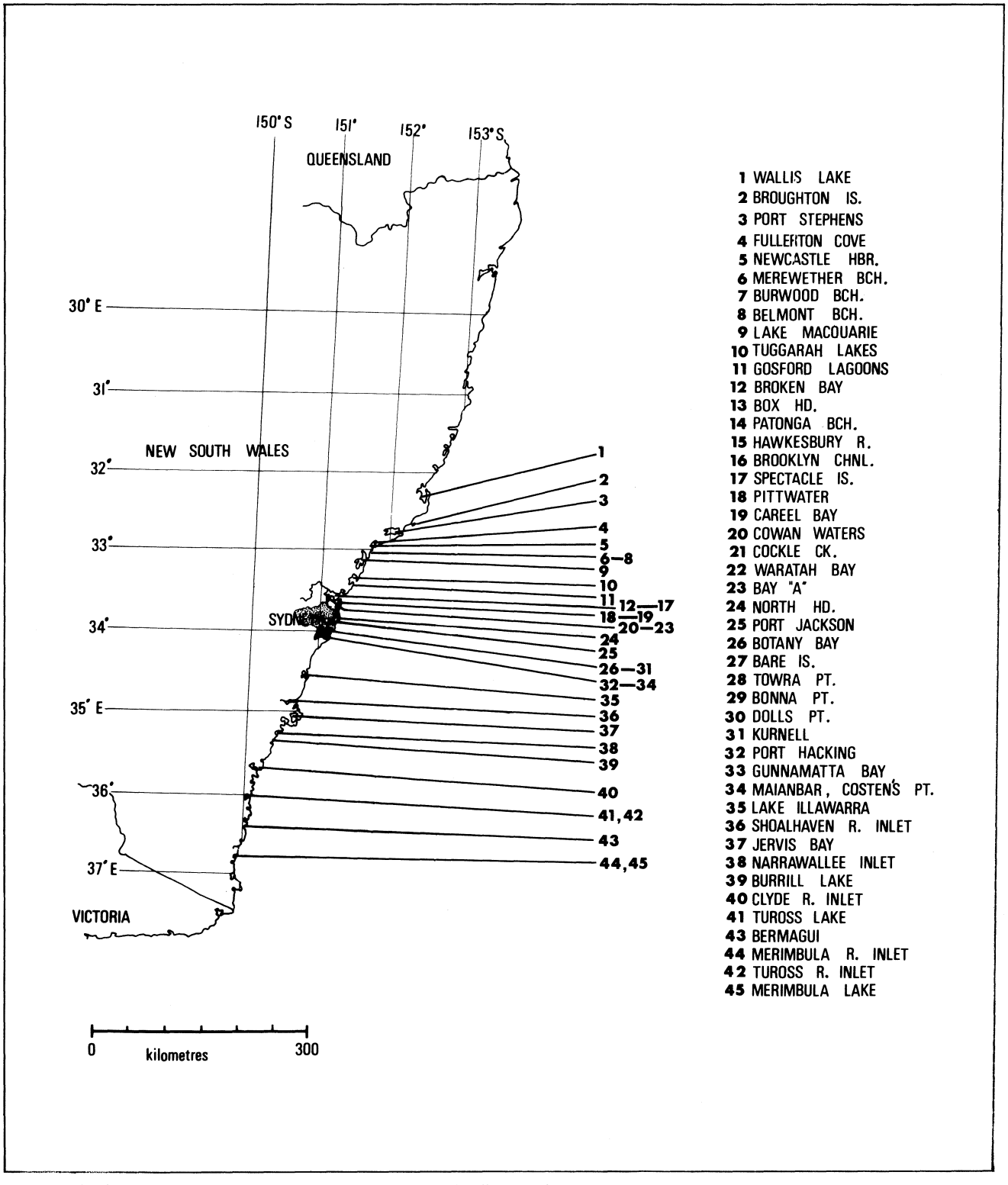

Fig. 2. Map of New South Wales showing location of collection sites.

SPCC: State Pollution Control Commission, New South Wales.

NSWSF: New South Wales State Fisheries.

HRS: Hawkesbury River Benthic Survey (Aust. Mus.).

D1-1 to D1-4 etc.: Stations from survey of effects of dredging at Brooklyn, Hawkesbury River.

1-2-4, etc.: Collection site of Hawkesbury River Benthic Survey, replicate 4 of sample taken at Station 2 on Transect 1.

NMV: Museum of Victoria (formerly National Museum of Victoria), Melbourne.

Table 1 Depth, sediment type and salinity ranges for stations in the Hawkesbury River Survey (H.R.S.), The Brooklyn Dredging Survey (B.D.S.) and the Cowan Waters Survey (C.W.S.).

Project H.R.S.

Date: January 1977 — February 1981

Station	Depth (m)	Sediment type	Salinity Range ‰
1–1	4	Sandy mud	32.6 — 35+
1–2	12	Muddy sand	35+
1–3	10	Muddy sand	34.2 — 35+
1–4	10	Muddy sand	35+
2–1	4	Sandy mud	30 — 35+
2–2	5	Sandy mud	29.8 — 35+
2–3	12	Sandy mud	33 — 35+
3–1	12	Muddy sand	30 — 35+
3–2	6	Muddy sand	29.6 — 35+
3–3	5	Mud	32.4 — 35+
4–1	5	Sandy mud	30.4 — 35
5–1	4	Sandy mud	27.8 — 34.6
5–2	4	Sandy mud	28.6 — 35+
6–1	5	Fine mud	32.4
6–2	8	Muddy sand	30.2 — 33.6
6–3	8	Fine sand	29 — 34.4
7–1	12	Sandy mud	11.8 — 32.6
7–2	8	Muddy sand	14 — 33.8
7–3	6	Sandy mud	25.2 — 32.8
8–1	6	Sandy mud	17 — 28.2
8–2	16	Muddy sand	19.6 — 30
9–1	20	Clay, sandy mud	1 — 26
9–2	6	Muddy sand	1 — 26
10–1	16	Muddy sand	6.4 — 16.4
10–2	6	Sand	6.2 — 18
11–1	4	Sand	0 — 13.4
11–2	16	Sand	2.4 — 11.6
12–1	4	Sand	0 — 9.8
12–2	20	Sand	0 — 8
13–1	4	Sand	0 — 7.8
13–2	20	Sand	0 — 5.8
14–1	4	Sand	0 — 0.4
14–2	25	Sand	0

Project B.D.S.

Date: August 1979 — August 1980

Station	Depth (m)	Sediment Type	Salinity Range ‰
D1		Fine mud	32.6 — 35.7
D2	7	Sandy, shelly mud	32.8 — 35.7
D3	9	Fine mud—sandy mud	34.0 — 35.7
D4	7	Sandy mud	33.8 — 35.6
D5	5	Fine, soft mud	33.2 — 35.6
D6	4	Shelly mud	32 — 35.5

Project: C.W.S.

Date: October 1980

Station	Depth (m)	Sediment Type	Salinity Range ‰
Waratah Bay	0.5–5	Sandy mud—sand	30 — 35
Bay "A"	0.5–20	Fine mud—sand	30 — 35
Apple Tree Bay	0.5	Muddy sand—sand	30 — 32
Cockle Creek	0.5–2	Soft mud—sand	0 — 8

Taxonomic Account

A Key to the Families of Polychaetes Recorded from New South Wales Estuarine Areas (after Fauchald, 1977)

1. Dorsum with series of elytrae (scales) or distinct elytral scars present at the dorsal side of notopodial bases in several segments 2

—— Dorsum without elytrae 4

2. Neurosetae composite ..... Sigalionidae

—— Neurosetae simple 3

3. Spinning glands present; median antenna, if present, attached near the posterior or middle of prostomium; notosetae absent ..... Polyodontidae

—— Spinning glands absent; median antenna attached at the anterior margin of the prostomium; notosetae usually present ..... Polynoidae

4. Notopodia with expanded, golden or brassy setae that more or less cover the dorsum 5

—— Notosetae otherwise (may be absent) 6

5. Prostomium with large facial tubercle and a median antenna; notosetae in rosettes ..... Palmyridae†

—— Prostomium without a facial tubercle; paired lateral antennae and a median antenna present; notosetae in transverse rows ..... Chrysopetalidae†

6. Anterior end with one or several series of long, specialized setae either covering the retractable anterior end or forming an operculum or a series of long protective spines (paleae) 7

—— Anterior end without exceptionally long, specialized setae (note: short, strong hooks may be present) 10

7. Specialized setae long and chambered, forming a protective cage around the retractable anterior end; body with numerous epithelial papillae ..... Flabelligeridae (in part)

—— Specialized anterior setae do not form a protective cage; anterior end not retractable; skin papillae few, smooth or absent 8

8. Specialized setae slender, distally curved, often spinous; prostomium with seven antennae ..... Onuphidae (in part)

—— Specialized setae stout, smooth and not distally curved; prostomium without appendages or with numerous tentacles 9

9. Specialized setae in a transverse row; tube conical, usually formed of densely packed sand grains ..... Pectinariidae

—— Specialized anterior setae as a fan-shaped group of paleae on either side of the anterior end ..... Ampharetidae (in part)

10. Anterior end, including in part the prostomium, transformed into a tentacular crown 11

—— Anterior end not transformed into a tentacular crown 14

11. Tube calcareous; thoracic membrane present 12

—— Tube mucoid or horny, often covered with sand grains; thoracic membrane absent 13

12. Tube irregularly twisted or straight, sometimes coiled near base; body symmetrical; more than four thoracic setigers present ..... Serpulidae

—— Tube completely coiled; body asymmetrical; four thoracic setigers present ..... Spirorbidae

13. Parapodia with uncini in one or a few distinct rows; tentacular crown with smooth or pinnate radioles ..... Sabellidae

—— Small uncini massed in dense fields in the neuropodia only; short tentacular crown with branching tentacles ..... Oweniidae

14. Setiger 4 with a few thick spines; some median parapodia strongly modified, usually fan-shaped ..... Chaetopteridae

—— Setiger 4 without thick spines; no parapodia fan-shaped 15

15. Numerous tentacles on the lower side of the prostomium or on the peristomium; branchiae, if present, limited to a few anterior setigers 16

—— Anterior end with a limited number (10 or fewer pairs usually) of antennae and tentacular cirri, or without appendages 18

16. Branchiae in a transverse or oblique row or grouped in two groups on either side of the anterior dorsum; usually digitiform and smooth, more rarely bipinnate or lamellate; buccal tentacles retractable; uncini with teeth in one or a few rows ..... Ampharetidae (in part)

—— Branchiae, if present, on two or three successive segments, stalked or simple,

branched or as numerous filaments; buccal tentacles non-retractable; uncini with several teeth in one or more transverse rows above the main fang 17

17. Thoracic uncini long-handled, abdominal ones short-handled ..... Trichobranchidae

—— Both thoracic and abdominal uncini short-handled; sometimes with a posterior prolongation in thoracic uncini ..... Terebellidae

18. Prostomium with at least one pair of antennae; peristomium usually with paired palps or tentacular cirri 19

—— Prostomium without appendages or with a single antenna; peristomium with paired dorsal palps, maximally two pairs of tentacular cirri or without appendages 30

19. Palps absent 20

—— Palps present, sometimes as ventrolateral pads on the peristomium or fused to the anterior end of the prostomium so that the latter appears cleft, but usually free and digitate 24

20. Prostomium long and conical, usually annulated, with two pairs of antennae at the tip 21

—— Prostomium no more than twice as long as wide, never annulated; antennae long or short 22

21. Eversible pharynx with four jaws in a cross; parapodia either all uniramous or all biramous ..... Glyceridae (in part)

—— Eversible pharynx with more than four jaws; parapodia uniramous anteriorly and biramous posteriorly ..... Goniadidae (in part)

22. Jaws present, each jaw consisting of a series of denticles in a row ..... Dorvilleidae (in part)

—— Jaws absent 23

23. Dorsal cirri large and foliose ..... Phyllodocidae

—— Dorsal cirri absent ..... Nephtyidae

24. Palps bi- or multiarticulate 25

—— Palps simple, sometimes fused to the prostomium so the latter appears cleft, or forming ventrolateral pads on the peristomium 27

25. Palps multiarticulated; tentacular cirri absent ..... Dorvilleidae (in part)

—— Palps biarticulated; at least one pair of tentacular cirri 26

26. Pharynx with paired jaws; paragnaths or soft papillae or both on the surface of the everted pharynx, or pharynx smooth; parapodia usually biramous ..... Nereididae

—— Pharynx usually without jaws; paragnaths or pharyngeal papillae always absent; everted pharynx often with a circlet of distal papillae or lappets; parapodia often sub-biramous or uniramous ..... Hesionidae

27. Palps ventrolateral pads on the peristomium; five occipital and two frontal antennae ..... Onuphidae

—— Palps either fused anteriorly to the prostomium or as free ventrolateral projections; maximally five antennae 28

28. Palps free ventrolateral projections, sometimes fused to each other ..... Syllidae

—— Palps fused to the prostomium so that the latter appears anteriorly cleft 29

29. Eversible pharynx, if present, unarmed ..... Pilargiidae

—— Eversible pharynx armed with four pairs of upper and one pair of lower jaws ..... Eunicidae

30. Anterior end, including both pro- and peristomium, without appendages 31

—— Prostomium with a single median antenna, or peristomium with paired palps or tentacular cirri, or both pro- and peristomium with palps and tentacular cirri 47

31. Paired palps on the first or one of the first postperistomial segments ..... Cirratulidae (in part)

—— Paired palps absent 32

32. With a single mid-dorsal palp on one of the first setigers (setiger 3–6 usually) ..... Cossuridae

—— Mid-dorsal palp absent 33

33. With series of long, slender branchial filaments and tentacular and dorsal cirri along the body ..... Cirratulidae (in part)

—— Branchial filaments and tentacular cirri absent or limited to a few segments 34

34. Parapodia strongly reduced, so that the setae appear to arise from the body wall; all setae simple, true capillary setae absent ..... Flabelligeridae (in part)

—— Parapodia usually well developed or at least present as low folds; setae usually of several different kinds, including in most cases true capillary setae 35

35. Prostomium an oblique plaque, usually bordered by a flange ..... Maldanidae

—— Prostomium pointed, rounded or blunt 36

36. Body separated into two regions (thorax and abdomen) with different kinds of setae 37

—— Body not separated into regions, setal distribution and parapodial shapes grade along the body 39

37. Thorax with lateral parapodia, abdomen with both noto- and neuropodia in dorsal positions ..... Orbiniidae

—— Parapodia lateral in all parts of the body; notopodia often reduced in posterior segments and neuropodia may form nearly complete cinctures 38

38. Slender capillary setae in thorax; branchiae, if present, retractable filaments on the abdomen ..... Capitellidae

—— Slender capillary setae present on anterior, median and sometimes posterior parts of the body including the branchial region; branchiae non-retractable, bushy or simple filaments ..... Arenicolidae

39. Anterior end with complex jaw apparatus 40

—— Jaw apparatus absent 42

40. Each jaw consisting of a series of small denticles ..... Dorvilleidae (in part)

—— Each jaw consisting of a single piece 41

41. Hooded hooks present in at least some setigers; one pair of maxillary carriers ..... Lumbrineridae

—— Hooded hooks absent; three maxillary carriers ..... Arabellidae

42. Branchiae present on maximally 15–20 segments, starting from one of setigers 4–10 ..... Paraonidae (in part)

—— Branchiae, if present, either limited to extreme anterior end, or found scattered over a large part of the body 43

43. Setae include anterior spines, rostrate long-shafted uncini and spinose or smooth capillaries; segments usually elongated ..... Maldanidae

—— Setal distribution otherwise; segments rarely elongated 44

44. Prostomium an elongated cone, usually more than twice as long as wide, nearly always articulated 45

—— Prostomium less than twice as long as wide, may be bluntly conical, rounded or truncate, never articulated 46

45. Eversible pharynx with four jaws; parapodia either all uniramous or all biramous ..... Glyceridae (in part)

—— Eversible pharynx with more than four jaws; anterior parapodia uniramous, posterior ones biramous ..... Goniadidae (in part)

46. All setae simple capillaries; branchiae cirriform, pectinate or absent; prostomium entire, pointed or rounded ..... Opheliidae

—— Furcate and acicular setae usually present; branchiae, if present, limited to the anterior end and strongly arborescent; prostomium T-shaped or bifid .. .. Scalibregmidae

47. Prostomium with a median antenna 48

—— Prostomium without appendages 49

48. Branchiae present on maximally 15–20 segments first starting from one of setigers 4–10 ..... Paraonidae (in part)

—— Branchial distribution otherwise ..... Spionidae (in part)

49. With multiple series of small, long-shafted uncini in the neuropodia ... . Oweniidae (in part)

—— Uncini in single rows or absent 50

50. Prostomium flattened and spatulate; as wide as the widest part of the body ..... Magelonidae

—— Prostomium not flattened; distinctly narrower than the widest part of the body ..... Spionidae (in part)

† Family not described in this paper, but occurring in New South Wales estuaries and under revision by Charlotte Watson-Russell.

Family POLYNOIDAE Malmgren

Worms with dorsoventrally flattened bodies; one, two or usually, three antennae present. Eversible pharynx with four jaws. Dorsal cirri alternating with elytrae in at least part of the body, elytrae either marginally smooth or fringed. All setae simple, notosetae variously developed but never as felt or harpoon-setae, and usually distinctly lateral in position.

Key to the Species of Polynoidae

1. Lateral antennae attached sub-distally or ventrally on the prostomium (ceratophores below the antennae); parts of the prostomium may be produced into cephalic peaks ..... (Harmothoinae) 2

—— Lateral antennae attached distally on the prostomium (ceratophores continuations of the prostomium) ..... (Lepidonotinae) 4

2. Fifteen pairs of elytrae, notosetae thicker than neurosetae; with rows of spines; neurosetae at least in part bidentate ..... (*Harmothoe*) 3

—— Fifteen or 16 pairs of elytrae; notosetae similar in thickness to neurosetae with spinose pockets and slightly notched tops; neurosetae with semilunar pockets, spinose and distally bidentate ..... *Subadyte pellucida*

3. Dorsal surface of elytra with short conical papillae, margins with elongated papillae ..... *H. praeclara*

—— Dorsal surface of elytra with cylindrical papillae with crowns of 2–6 points and conical ones in areas of elytral overlap, margins with soft papillae ..... *H. charlottae* n.sp.

4. Elytrae with conical or chisel-ended tubercles on dorsal surface plus a few simple globular vesicles, ventral lamellae conspicuous .... *Paralepidonotus ampulliferus*

—— Elytrae with rounded tubercles, including anteromedian group of about 100 golden tubercles ..... *Parahalosydna chrysostichtus*

Harmothoe charlottae n.sp.

Fig. 3.1–10

Material examined. *New South Wales*: HOLOTYPE: Botany Bay, Stn 887, (W.18925) 11 mm long, 4 mm wide, 33 setigers, 1-iv-75. PARATYPES: Botany Bay, Stn 906, Site 29 (AHF POLY 1400) 4 anterior fragments and 4 complete specimens, 7–10 mm long, 4 mm wide, 23–35 setigers; Stn 892, Site 30, (BMNH ZB 1983. 1719-23) 3 anterior fragments and 2 complete specimens, 6–9 mm long, 2–3 mm wide, 25–31 setigers; Hawkesbury R. 2-2-4, (USNM 81495) 15 mm long, 5 mm wide; Botany Bay, Stn 887, 1-iv-75, 3(W.196224).

Additional material. Hawkesbury R. 2-2-3, 1(W.196225), 2-3-2, 1(W.196226), D4-1, 1(W.196227), D4-2, 1(W.196228); Botany Bay, 22-i-75, 13-ii-75, 24-iii-75, 20-vi-77, many (W.18712, W.18759, W.18778, W.18803, W.18837, W.18940, W.18963, W.19015).

Other material examined. Syntypes of *Harmothoe antilopes* McIntosh, 1876, BMNH ZB 1921.5.1.438, one 16 mm long 6 mm wide, 30 setigers incomplete posteriorly, the other 9 mm long, 4 mm wide, 31 setigers complete.

Description. Body widest in segments 7–9 tapering slightly anteriorly and more so posteriorly; oval in cross section. Ovigerous, eggs bursting from between parapodia on anterior sides, in middle segments. Mottled brown pigment present on dorsal surface of all segments, cirrophores, elytrophores, dorsal tubercles, notopodia, styles of dorsal cirri, and facial tubercle. Elytrae large, 15 pairs, first pair orbicular, the rest reniform covering dorsum. First pair of elytrae with fringes of soft papillae on anterior, posterior and outer but not inner margins and a few scattered ones on dorsal surface (Fig. 3.1); tubercles include cylindrical ones with crowns of 2–6 points (Fig. 3.4) covering most of surface, and conical ones (Fig. 3.5) on areas where elytrae overlap on dorsum; pigment around submarginal area except anteriorly, also dark spot over elytral scar. Remaining elytrae with papillae only on outer and posterior margins and numerous ones on surface except for areas where elytrae overlap; tubercles include cylinders with crowns having 2–6 points covering almost entire surface, except where cones occur on inner and anterior medial regions where elytral overlap occurs; pigment present around inner, posterior and outer margins with darker patches on outer border and over elytral scar, often resembling a bull's-eye (Fig. 3.3); tubercles often pigmented in areas where pigment is dark on elytra, clear or translucent in other areas. Prostomium as long as wide, weak cephalic peaks; eyes large, anterior pair anteroventrally near cephalic lobes, visible through the translucent prostomium (Fig. 3.1). Median antenna with large dark-coloured ceratophore; style missing in holotype; paratypes (AHF POLY 1400, BMNH ZB 1983. 1719-23, USNM 81495) show style to be more than twice prostomial length, with subterminal bulbous enlargement and filiform tip, and numerous filiform papillae. Lateral antennae with short, pigmented ceratophores inserted ventrally on prostomium, styles short, only half prostomial length with subterminal enlargements and filamentous tips, and numerous short papillae. Palps 3 times prostomial length, with some pigment and longitudinal rows of small close-set papillae. Tentacular segment with basal lobes each bearing 3–4 setae similar to notosetae of other setigers; tentacular cirri similar to median antenna (Fig. 3.1). Dorsal cirrophores elongated, styles extending beyond setae, similar to median antenna, with mottled pigment basally. Dorsal tubercles conspicuous, rounded. Ventral cirri short, except on 2nd setiger which is 1.5–2 × longer than others, all tapering to filiform tips with numerous papillae. Nephridial papillae inconspicuous, start setiger 6, projecting posterodorsally between parapodia. Notopodia a rounded lobe on anterodorsal face of neuropodium extending into an acicular lobe from which aciculum projects (Fig. 3.6). Notosetae numerous (40–60), forming an anterior radiating bundle, light amber-coloured, slightly more stout than neurosetae (~0.03–.04 mm wide) with long spinous regions (~50 rows of spines) and short, blunt, bare tips (Fig. 3.10). Neuropodium tapers distally to a thick acicular lobe from which aciculum projects, digitiform post-acicular lobe projects beyond acicular lobe (Fig. 3.6). Neurosetae numerous (40–60), arranged in transverse rows, light amber-coloured, rather slender (0.012–0.025 mm in diameter basally) with distal enlargements above which short spinous rows begin, leaving long tips bare; neurosetae of 4 kinds; ~4–14 superior ones with slender tips minutely bidentate, with long secondary tooth, closely appressed (Fig. 3.9); ~30 median ones that have stouter tips, with a more bulbous distal enlargement, with more rows of spines (16–20 rows), and strongly bidentate with a slender secondary tooth (Fig. 3.8); a more inferior and posterior fascicle of neurosetae (5–7) similar to the median fascicle but without the secondary tooth; and an inferior group of much shorter unidentate setae (10) with fewer, more faint spinous rows (7–12 rows), and with the distal ends shaped like dagger blades (Fig. 3.7).

Remarks. The material examined varies in the number of setigers, the coloration of elytrae, the number of setae in the tentacular segment, and the type of tips of superior neurosetae. The intensity of brown

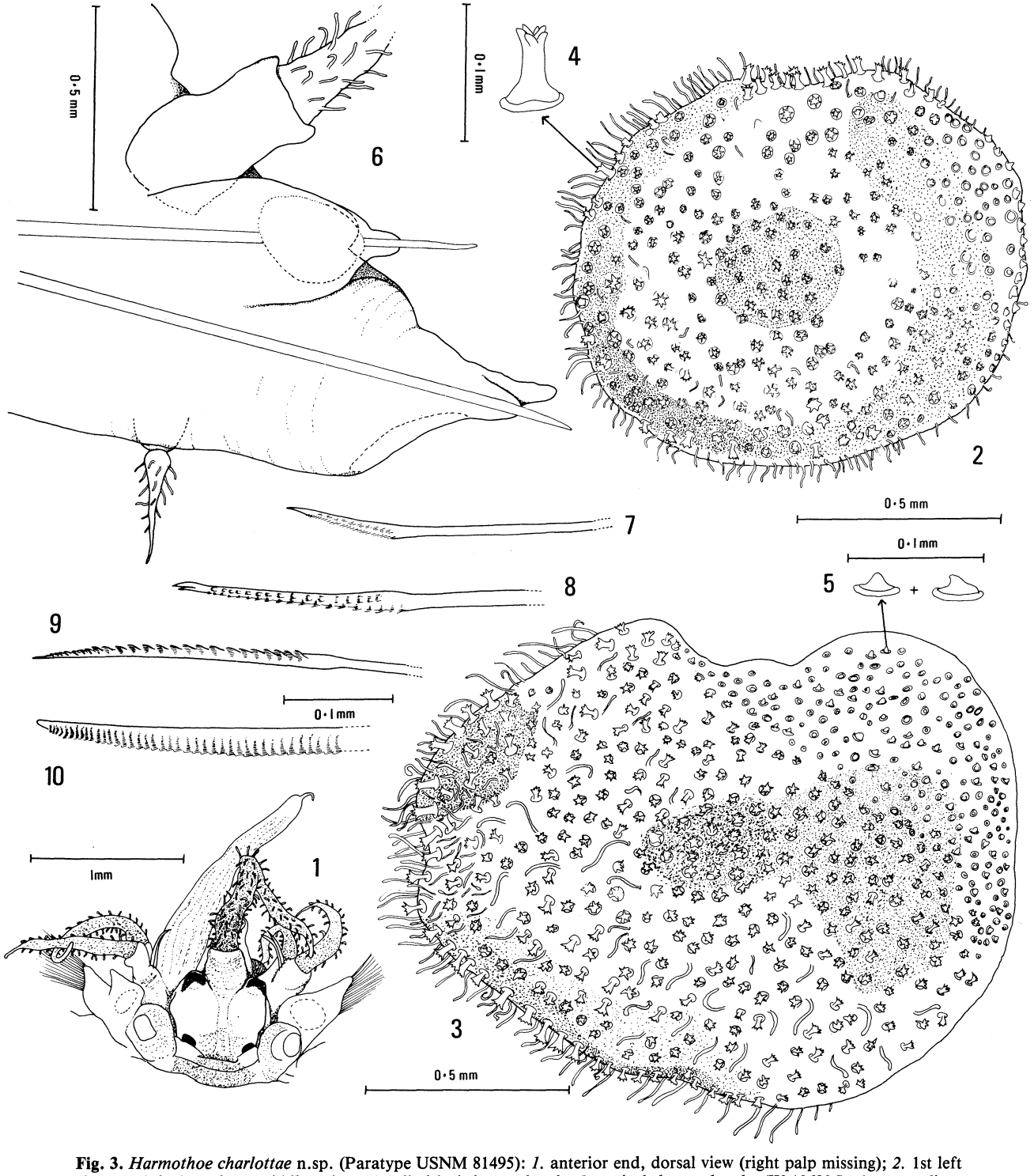

Fig. 3. *Harmothoe charlottae* n.sp. (Paratype USNM 81495): *1.* anterior end, dorsal view (right palp missing); *2.* 1st left elytra; *3.* left elytra from middle setiger; *4.* cylindrical elytra tubercle; *5.* conical elytra tubercle. (W.196226): *6.* parapodium of middle segment, anterior view; *7.* inferior neuroseta; *8.* median neuroseta; *9.* superior neuroseta; *10.* notoseta.

pigmentation on the elytrae also varies but the arrangement of pigment does not; in all cases there are spots of pigment over elytral scars and on outer and posterior edges; material collected in 1975 still shows the characteristic and often still intense pigmentation, e.g. BMNH ZB 1983. 1719-23, whereas USNM 81495 has elytrae that look faded but still retain the "bull's-eye" pattern. Two specimens from Brooklyn have a greenish pigmentation. Paratype USNM 81495 has 1–2 setae in the tentacular segment; AHF POLY 1400 and BMNH ZB 1983, 1719-23 have 2–4 and other specimens have 1–4 setae. Variation in the dentition of the superior neurosetae also occurs. Some of the paratypes have a few (1–4) pointed spinous setae completely lacking a

secondary tooth. Such setae may also occur in the holotype, as not every parapodium was examined in detail. The additional material also confirms that these are in fact unidentate neurosetae rather than setae with the secondary tooth broken off.

Discussion. We examined the syntypes of *Harmothoe antilopes* McIntosh, 1876 and found that they resemble this species very closely. Tebble and Chambers (1982) have examined recently collected material, the description of which also closely resembles our material. However, we have described a new species for the following reason: consistent minor morphological differences occur between *H. antilopes* and *H. charlottae* n.sp. The morphological differences include the distinct pigmentation of the elytrae and on the dorsal surfaces of *H. charlottae* n.sp. which is retained even after 7 years in alcohol. McIntosh (1876) described *H. antilopes* as having "a slight brownish coloration on the dorsal surface where they [the elytrae] touch each other; but the rest of the scale is pale", and certainly makes no mention of any other body surface being pigmented. Tebble and Chambers (1982) indicate no pigmentation and neither does Day (1963, 1967) and although we hesitate to use pigmentation or lack of it as a diagnostic feature, in these species it appears constant. Other differences include the general proportions of the body, and the length of the setae compared to the overall length of parapodia; this ratio of setal:parapodial length is smaller in *H. antilopes* syntypes than in *H. charlottae* n.sp. This latter species also appears to mature at a small size (holotype is gravid at 11 mm long). The two species were collected from widely differing habitats; *H. antilopes*, which has only been recorded from northwest Europe, the Hebrides, in the Mediterranean and off South Africa in depths of 68 m to 570 fms, appears to be a deep-water species. We could not find any further reference to the specimens collected off Senegal in "shallow" water, mentioned only by Day (1967). *Harmothoe charlottae* n.sp., however was collected from estuarine conditions in shallow water (under 15 m depth) and has not been collected anywhere off the New South Wales coast at great depths.

We have noted also that some characters may be variable within the species *H. antilopes*, such as the dentition of the neurosetae (Hartmann-Schröder, 1971), and the ornamentation of the elytrae. Day (1967) reports some tubercles shaped like cylinders with three saucer-like depressions at the end, whereas Fauchald (1974) describes tubercles as bifid and trifid. These reports may not all refer to the same species and perhaps the specimens should be re-examined.

Etymology. *Harmothoe charlottae* n.sp. is named after Charlotte Watson-Russell, who was involved in much of the early collecting, sorting and identification of the Hawkesbury River material which forms the basis of this paper.

Habitat. In Hawkesbury R., collected from mud to sandy mud in salinities of 33.8–35‰. Data for Botany Bay unavailable.

Occurrence. Uncommon in Hawkesbury R., collected only from Transect 2 in January 1977, August and November 1979 and from Brooklyn area in August 1980, not seasonal. More common in Botany Bay.

Australian distribution. New South Wales (Botany Bay, Hawkesbury R.).

Harmothoe praeclara (Haswell, 1883)

Harmothoe praeclara.—Augener, 1922a: 14, fig. 4.—Hutchings & Rainer, 1979: 746.

Material examined. *New South Wales:* Lake Merimbula, 5-x-75, several (W.12665, W.12672, W.12735); Port Hacking, Maianbar, 4-xi-75, 3-xii-75, 2(W.11251, W.14139); Botany Bay, Kurnell, 10-v-72, 7(W.9369), Towra Pt, 12-iv-73, many (W.9633, W.9664, W.9715, W.9768, W.9930); Careel Bay, 16-iv-72, 20-ix-72, 2(W.10087-8); Port Stephens, 27-vii-76, several (W.12466, W.12502, W.12570).

Remarks. These specimens do not differ from descriptions by Augener (1922a), and Hutchings & Rainer (1979).

Habitat. Seagrass beds.

Occurrence. Both widespread and frequent in estuaries in New South Wales.

Australian distribution. Western Australia, New South Wales (widespread).

Parahalosydna chrysostichtus Hutchings & Rainer, 1979

Parahalosydna chrysostichtus Hutchings & Rainer, 1979: 746–748, fig. 1 A–D.

Material examined. *New South Wales:* Lake Merimbula, sample 5, 1(W.11300); Port Hacking, Maianbar, 29-v-75, 1(W.14141); Careel Bay, 21-x-72, 1(W.10570); Lake Macquarie, Sept. '78, 1(W.17859); Port Stephens, Aug. '76, 1(W.12886).

Remarks. Agrees well with the original description. However there are some printing errors in the original description. On p.746, 3 lines from the bottom, after "(only visible under high", the first 7 lines from p.747 should follow, beginning with "magnification) . . ." and ending with "nephridial papillae present at the base of parapodia, notopodium with rounded margin". The third line from the bottom of p.746 then follows on from "rounded margin" on p.747.

Habitat. *Posidonia, Zostera* seagrass beds.

Occurrence. Found in low numbers.

Australian distribution. New South Wales (Merimbula*, Port Hacking, Careel Bay, Lake Macquarie*, Port Stephens*).

Paralepidonotus ampulliferus (Grube, 1878)

Polynoe ampullifera Grube, 1878: 35–36, pl. 111, fig. 5.
Paralepidonotus ampulliferus.—Hutchings & Rainer, 1979: 748–749.

Material examined. *New South Wales:* Botany Bay,

Towra Pt, 10-ii-81, 1(W.195059), Silver Bch, Kurnell, 29-vi-81, 1(W.194910); Hawkesbury R., 2-1-3, 1(W.196411), 2-2-2, 2(W.196412-3), 2-2-3, 1(W.196414); Lake Macquarie, 1(W.195009).

Remarks. Agrees well with description in Hutchings & Rainer (1979). Degree and intensity of pigmentation very variable. Gravid individuals found in summer samples with eggs situated inside body cavity, visible along mid-dorsal groove and some emerging from gonoducts on anterior side of each parapodium.

Habitat. In Hawkesbury R., in salinities of 33–35‰, sediments of fine to sandy mud, at depths of 2.5–10 m; other localities, in *Zostera* seagrass beds, sandy sediments.

Occurrence. Infrequent; found mostly at Transects 1, 2 in the Hawkesbury R., and at Brooklyn in low numbers at different seasons but not every year; collected in other localities throughout the year.

Australian distribution. Tasmania, Victoria, New South Wales.

Subadyte pellucida (Ehlers, 1864)
Fig. 4.1–5

Subadyte pellucida.—Pettibone, 1969: 8–10, fig. 4. See also for synonymies.

Material examined. *New South Wales:* Hawkesbury R., 2-1-2, 1(W.196222), 2-1-3, 1(W.196223); Botany Bay, 22-i-75, 10-ii-75, several, (W.18838, W.18852, W.19014).

Description. Body flattened, fragile, elongate oval; all six specimens small and incomplete, the longest having only 19 segments, 5 mm long and 2 mm wide including setae. All elytrae missing but elytrophores on segments 2, 4, 5, 7 and alternate segments (to at least 19). Prostomium lacks distinct cephalic peaks. Styles of median and lateral antennae with short claviform papillae. Ceratophore of median antenna inserted dorsally, lateral antennae inserted ventrally. Tentacular segment 1 achaetous, with two pairs tentacular cirri, facial tubercle absent. Buccal segment 2 with small nuchal fold, with long ventral buccal cirri (Fig. 4.1).

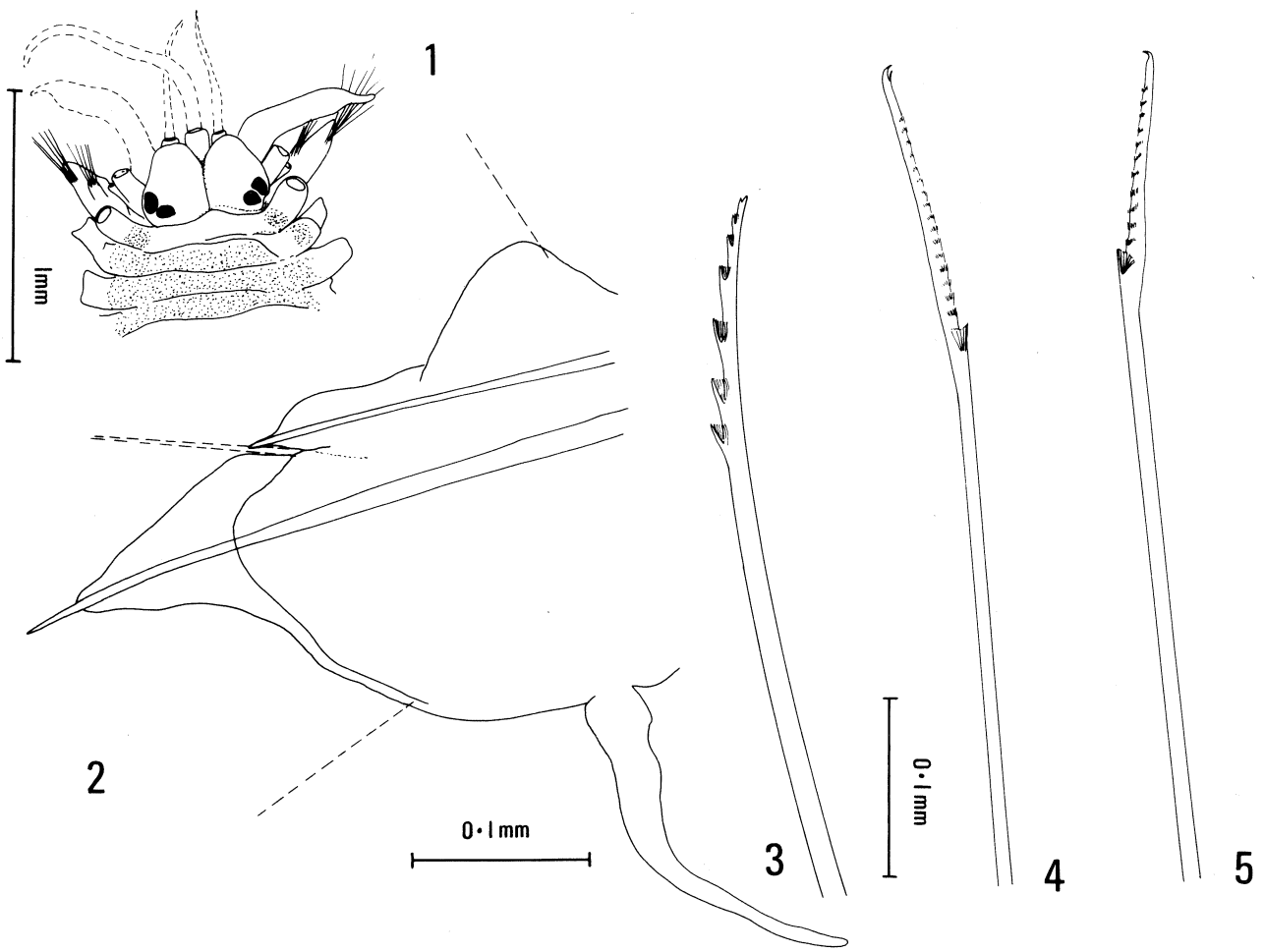

Fig. 4. *Subadyte pellucida* (W.18852): *1.* anterior end, dorsal view. (W.196222): *2.* parapodium, posterior view; *3.* notoseta; *4.* superior neuroseta; *5.* inferior neuroseta.

Parapodia sub-biramous (Fig. 4.2), notopodia with short projecting acicular lobes, and curved notosetae, notosetae slightly stouter than neurosetae, with denticled pouches along convex side (6–10), blunt tipped and notched (Fig. 4.3). Neuropodia with long, projecting, presetal acicular lobes from which tips of acicula project, and shorter rounded postsetal lobes, cirriform appendages below acicula absent. Neurosetae with basal semilunar pockets and distal spinous regions with tips hooked; superior neurosetae bidentate with secondary teeth shorter and more narrow than main teeth (Fig. 4.4), median and inferior neurosetae unidentate with tips curved (Fig. 4.5). Dorsal cirri with cylindrical cirrophores, bulbous basally; styles papillate, long and tapering. Dorsal tubercles inconspicuous; ventral cirri short, subulate. Nephridial papillae distinct, small, beginning on segment 6. Two transverse dorsal ciliated bands per segment. Dorsum with brown pigment.

Remarks. Due to the small size of the specimens and the absence of posterior regions and of all elytrae, this identification is tentative. There are also some minor differences from the specimens described by Pettibone in 1969, in the presence of unidentate inferior neurosetae and fewer pouches on notosetal shafts. These variations are not considered valid grounds on which to erect a new species, when one compares the characters used to differentiate species in the genus *Subadyte*. These differences from Pettibone's description might be accounted for by the immaturity of the specimens, especially if setal replacement occurs with age.

Habitat. In Hawkesbury R., collected from mud at 34‰. Habitat data from Botany Bay unavailable.

Occurrence. Rare in the Hawkesbury R., only 3 specimens found in August, November and December, 1979. In Botany Bay, also rare, only 3 specimens found.

Australian distribution. Western Australia (Shark Bay), New South Wales (Botany Bay*, Hawkesbury R.*).

Family POLYODONTIDAE Buchanan

Scale worms with dorsoventrally flattened bodies. Two or three antennae present, median antenna when present attached dorsally or posteriorly on the prostomium. Pharynx eversible with four jaws. Dorsal cirri alternating with elytrae, along entire body. Elytrae marginally fringed or smooth. All setae simple. Spinning glands present.

Polyodontes australiensis (McIntosh, 1885)

Fig. 5.1–5

Eupompe australiensis McIntosh, 1885: 135–139, pl. 21, figs 4, 5, pl. 23, fig. 8, pl. 24, fig. 4, pl. 13A, figs 2–6.—Benham, 1915: 202–203.

Polyodontes australiensis.—Hartman, 1939: 82; 1966: 361, pl. 36.

Material examined. *New South Wales:* Hawkesbury R. 1-3-4, 21-ii-78, 1(W.196336); Pittwater, June '62, 1(W.3754) i.d. Hartman.

Description. Tubiculous; a posteriorly incomplete specimen, measuring 38 mm long and 10 mm wide with 38 setigerous segments. Prostomium bilobed with median ridge and with anterior pair of eyes stalked, large and well pigmented and with a small sessile pair posteriorly. Median antenna as long as prostomium, inserted dorsally, style slightly tapering from the base then constricted suddenly into a filiform appendage, lateral antennae similar and as long as, and hidden under, the ommatophores. Tentacular segment 1 directed forward, with two pairs of tentacular cirri and several fine setae. Numerous branchial vesicles on anterior parapodia beginning approximately setiger 10. Elytrae oval to elliptical in outline, not meeting across dorsum, except for anterior elytrae 1–5; surface finely areolated, all margins smooth, pale but with irregular dots of brown pigment; outer edges tending to curl up to form a pocket. Notopodia present only as anterodorsal folds above very stout neuropodia (Fig. 5.1).

Notosetae few, smooth and very fine capillaries. Neuropodium widest distally, possessing several kinds of setae: superior ones including hastate, tapering setae with distally hairy blades, some with slight proximal bulge (Fig. 5.2), others without bulge (Fig. 5.3), and some much finer non-hirsute ones (0.01 mm wide at base) that are minutely spinulose along one edge; median ones, about 10 very stout (~0.8 mm wide) acicular aristate setae, some with subterminal hairy spikes (Fig. 5.4), and others with spike broken or worn off; dense ventral fascicle of fine tapering hairy capillaries which are more densely and regularly hirsute than the superior group of hastate neurosetae, giving a "feathery" appearance (Fig. 5.5).

Remarks. Agrees well with McIntosh's (1885) and Hartman's (1966) descriptions and figures, except for the presence on McIntosh's specimen of anterior marginal papillae on the 1st and 2nd elytrae. First record since Hartman (1966). Description based on Hawkesbury River specimen.

Habitat. Collected at a depth of approximately 10 m, in sandy mud, and in salinity of 35‰.

Occurrence. Rare, single specimen collected in Hawkesbury R., in summer 1978.

Australian distribution. Victoria, New South Wales (Pittwater, Hawkesbury R.*), Queensland.

Family SIGALIONIDAE Malmgren

Scale worms with quadrangular or flattened bodies. One to three antennae present; four jaws present. Marginally fringed elytrae alternate with dorsal cirri on anterior setigers and are present on all posterior setigers. Neurosetae compound and notosetae simple.

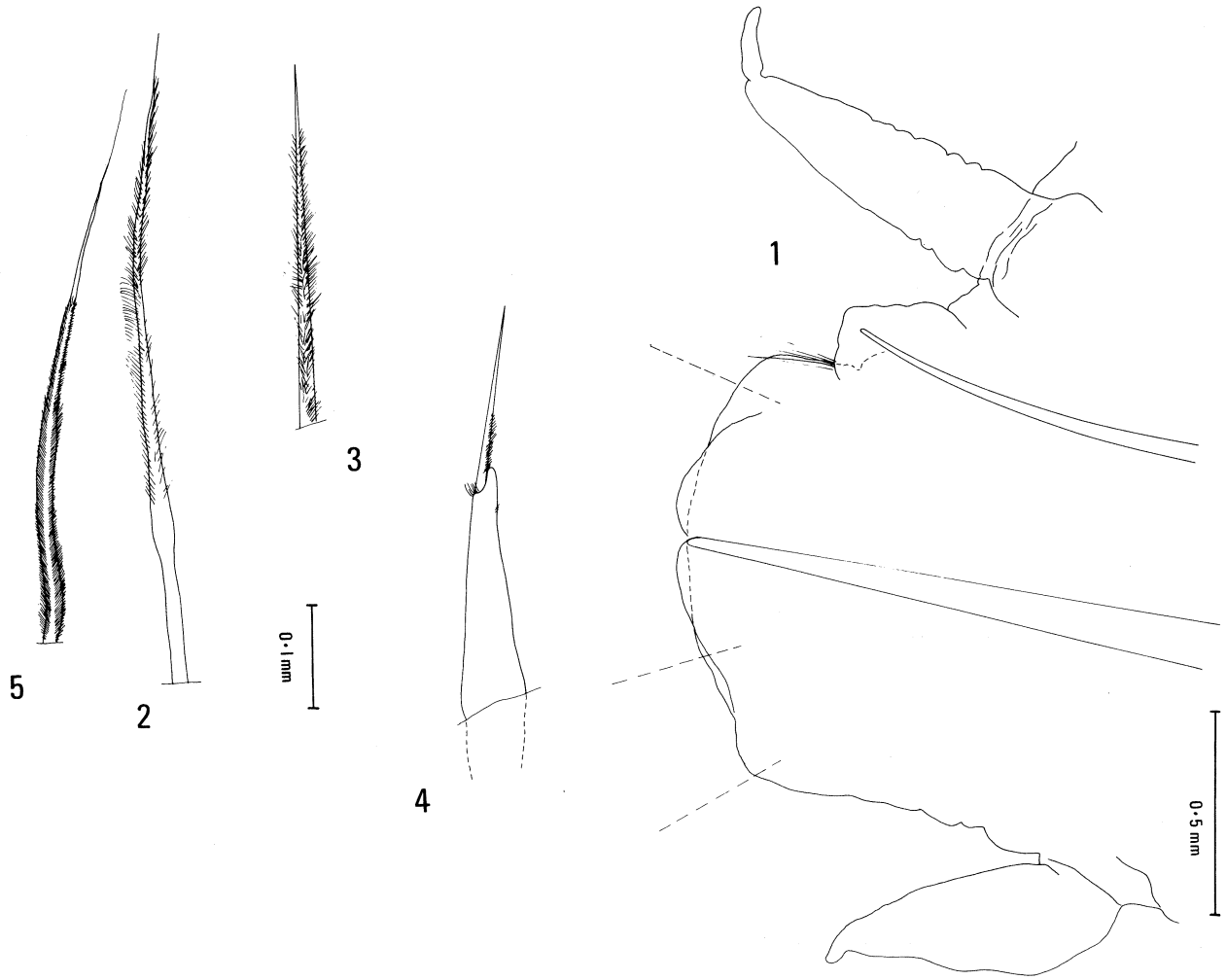

Fig. 5. *Polyodontes australiensis* (W.196336): *1.* 8th left parapodium; *2.* superior neuroseta; *3.* superior neuroseta; *4.* median neuroseta; *5.* inferior neuroseta.

Key to the Species of Sigalionidae

1. Two lateral antennae present; auricles absent
   ..... *Sigalion bandaeensis*
— Three antennae present; auricles present
   ..... *Sthenelais pettiboneae* n.sp.

Sigalion bandaeensis Horst, 1917

Sigalion bandaeensis Horst, 1917: 110-111, pl. 22, figs 4, 5.

Material examined. *New South Wales:* Lake Merimbula, May, Oct., Dec. '75, Mar. '76, many (W.12048-12056, W.15740-15744); Burrill Lake, 30-xi-81, several (W.195175); Lake Illawarra, 22-xi-76, 1(W.19221); Port Hacking, 6-xi-74, 2(W.195283); Botany Bay, 1-ii-77, 1(W.14912), Towra Pt, 12-iv-73, 1(W.10988), 25-x-81, 1(W.195062); Georges R., Sept. '72, 1(W.7679); Hawkesbury R., Patonga Bch, 3-viii-79, 2(W.17652, W.17659).

Description. Body elongate,>15 cm long (over 200 setigers), most specimens incomplete posteriorly. Prostomium trapezoidal, anterior edge broadest; two papilliform lateral antennae. Pharynx muscular, jaws and 13 pairs marginal papillae present. Eyes mid-prostomial, 2 small pairs set very closely together. Palps, long, filiform, projecting from beneath 1st setiger which is directed forwards and bears 2 tentacular cirri; ventral slightly longer than dorsal cirri. Dorsal cirri absent from all other setigers. Ventral cirri on all setigers long, cirriform. Ciliated cirriform branchiae present on 3rd and 4th setigers as slender papillae, reaching full development on the 5th and present on all subsequent segments.

Notopodium with three ctenidia on upper surface between base of notopodium and branchia; and with long digitiform stylode at distal extremity of notopodial lobe; neuropodium with tubercular papilla on dorsal surface. Two acicula present in each parapodium. Notosetae long, slender capillaries with numerous rows of fine teeth and forked tips. Neurosetae divided into 2 fascicles, of which upper contains 2–3 kinds of setae: 2–8 simple spinous setae; ~ 6 multiarticulate compound setae with chela-shaped tips, some with 2–6 rows of spines on distal end of the shaft; in some fascicles up to 2 stout single-jointed compound setae with chela-shaped tips and smooth shafts. Inferior neurosetal fascicle contains 1–2 types of setae: numerous long

slender compound falcigers with chela-shaped tips; and in some fascicles 1-5 stout compound setae with chela-shaped tips, of which 1-2 single-jointed, rest multi-articulate.

Elytra cover dorsum, present on setigers 2, 4, 5, 7 and every alternate segment to end of body. Elytra thin, anterior ones small and oval, gradually becoming larger and rectangular posteriorly; on external border 7-14 pinnate papillae arise, bearing 2-15 pinnules; on more posterior elytra, single papilla at base of each pinnate papilla.

Remarks. This species has been previously recorded by Rullier in 1965 from Brisbane who also noted more simple spinous neurosetae in the upper fascicle than in Horst's (1917) type specimens from Banda, India, a feature which our specimens also display. Our specimens from throughout New South Wales also possess a greater number of pinnules (2-15) on the elytral papillae, a character which *Sigalion ovigerum,* Monro, 1924 also shares, whereas Horst recorded a maximum of 5-6 pinnules for his *Sigalion bandaeensis. Sigalion ovigerum*, although described from Port Jackson, New South Wales, by Monro, 1924, lacks the single-jointed compound neurosetae that are characteristic of our specimens and of Horst's *S. bandaeensis*. However, in our material, these special neurosetae are absent from some setigers along the body length, depending on the size of the specimen; in small specimens (2-2.5 mm width excluding setae), they are absent from anterior and median setigers, and the large specimens examined (3.5-4 mm width), reveal a more anterior initial development of these stout single-jointed compound neurosetae along the length of the body, suggesting setal replacement with increasing size and presumably age. A similar phenomenon appears to be present in *Sthenelais pettiboneae* n.sp., also described in this paper.

Because of this range of variation in our material of elytral papilla pinnules, and of the presence/absence of single-jointed compound neurosetae, we therefore suspect that our species is intermediate between the two species *S. ovigerum* and *S. bandaeensis*, if in fact they are separate species. We have preferred in this paper to retain the name *Sigalion bandaeensis* for our material, because of the importance of the presence of specialized neurosetae, since we have not yet examined the types of either species and cannot thus determine whether *S. ovigerum* is a valid species or should be synonymized with *S. bandaeensis.*

Habitat. Collected in clean to muddy sand at depths 0-15 m water, often near mangroves or *Zostera, Halophila* seagrass patches.

Occurrence. Infrequently found. Collected at Merimbula throughout the year, no seasonal data from other sites.

Australian distribution. New South Wales (Merimbula*, Burrill Lake*, Lake Illawara*, Port Hacking*, Botany Bay*, Georges R.*, Hawkesbury R.*), Queensland (Brisbane).

Sthenelais pettiboneae n.sp.

Figs 6.1-7; 7.1-12; 8.1-10

Material examined. *New South Wales:* HOLOTYPE: Hawkesbury R., Stn 2-2-1, 2-viii-79 (W. 196265) 55 mm long, 3 mm wide, incomplete posteriorly, 100 setigers. PARATYPES: Stn 2-1-3, 12-xi-79 (AHF POLY 1401) 35 mm long, 3 mm wide, 4 fragments, about 80 setigers; Stn 2-2-2, 2-viii-79 (BMNH ZB 1983.1724) 35 mm long, 3 mm wide, 2 fragments, about 75 setigers; Stn 1-1-3, 12-i-77 (USNM 81496) several anterior and middle fragments.

Additional material. Botany Bay, Dec. '76, Feb. '77, several, (W.13844, W.13855, W.13858); Georges R., July, Sept. '72, many (W.7642, W.7645, W.7788, W.7805, W.7886, W.9355); Hawkesbury R., selection of material from Brooklyn area and Transects 1 and 2, including 1-1-3, 2(W.196330), 1-2-2, 2(W.196331), 1-3-2, 2(W.196332), 2-2-2, 3(W.196333-4), 2-2-3, 1(W.196335); D1-1, 4(W.196266); Newcastle Harbour, 1-xii-81, 5(W.19114); all specimens posteriorly incomplete.

Description. Body elongate with numerous segments (100 setigers), fragile; widest from segment 7-15; ovigerous. Pharynx with eleven pairs of papillae and two pairs of jaws. Mid-dorsal ridge present on some anterior segments, no lateral ctenidia bordering ridge (Fig. 6.6). Elytrae numerous pairs, on segments 2,4,5,7, then on alternate segments to 27, then on all segments. Elytrae large, thin, covering dorsum except in some anterior segments; transparent to opaque, more anterior ones with brown pigmentation; 1st pair orbicular, then reniform changing gradually to cordiform posteriorly; surface covered with microtubercules and with lateral fringes of papillae. First pair with fringe of short papillae on anterior and lateral margins with numerous submarginal papillae concentrated on lateral and anterior areas of elytrae; surface covered with numerous microtubercles (Fig. 6.1). Second pair with lateral fringe of papillae and a few submarginal ones (Fig. 6.2); anterior and middle elytrae (Figs 6.3, 6.4) with decreasing number of papillae on lateral margins. All elytrae with uniformly distributed microtubercles; more posterior elytrae also with large round pits or scars on ventral surface in anterior area of elytrae, these pits become more abundant in posterior elytrae; very few lateral papillae on posterior elytrae, often absent (Fig. 6.5). Elytrae mottled with brown pigment decreasingly on posterior ones; pigment present around margin of each elytrae except lateral area which folds down the side of the body to the parapodium; more posterior elytrae with pigment on inner posterior regions only (Figs 6.1, 6.5).

Dorsal tubercles on segments 3,6,8, and alternate segments to 26. Prostomium rounded, broader than long, fused to tentacular segment; prostomium pigmented, medially darker in an H-shape with bases deflected laterally (Fig. 6.6). Median antenna with large lateral auricles and long tapered terminal style on stout cylindrical ceratophore; short, subulated lateral antennae fused to inner dorsal sides of tentacular parapodia. Two pairs of eyes arranged in square, posterior pair much larger than anterior pair which are

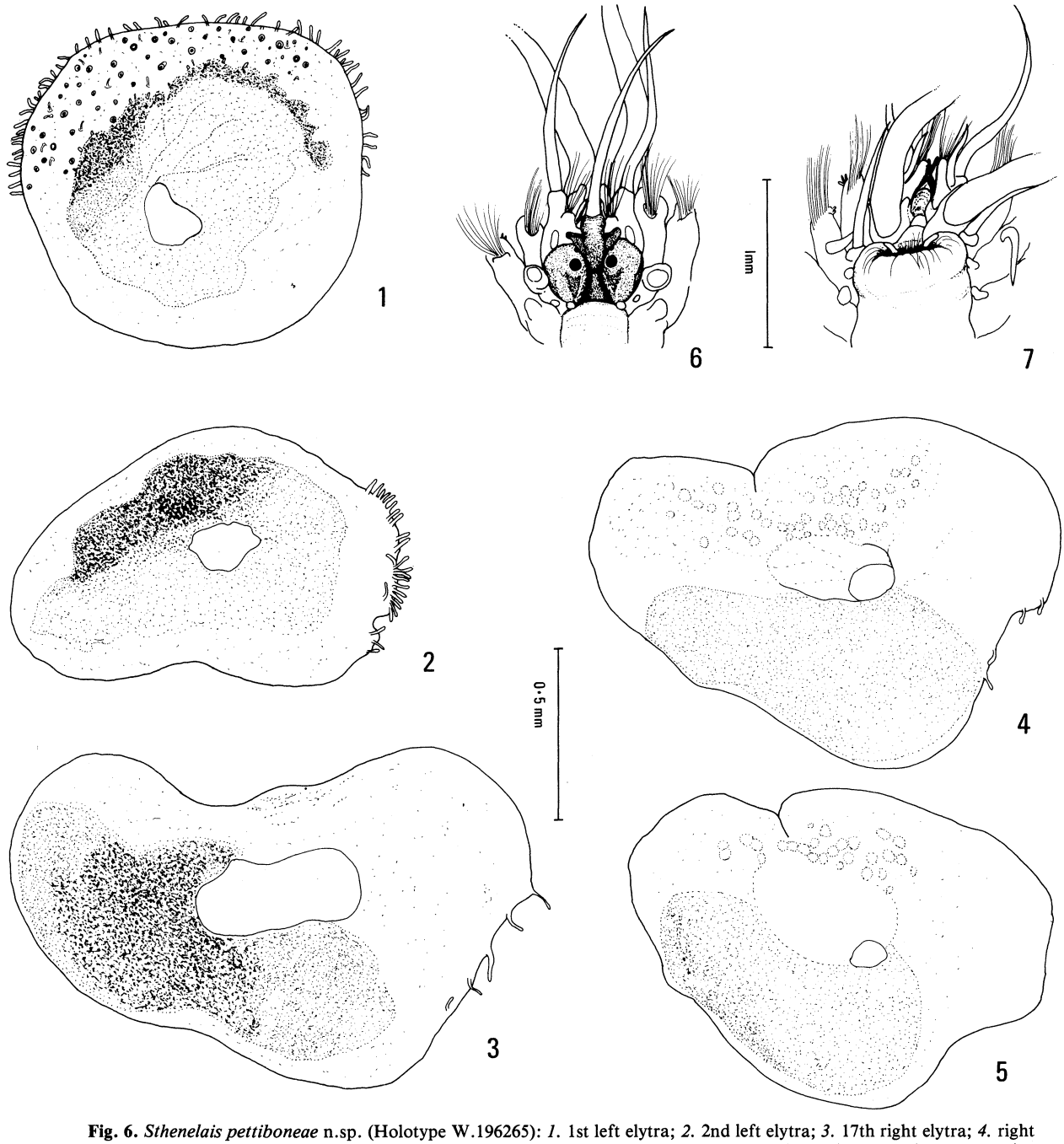

Fig. 6. *Sthenelais pettiboneae* n.sp. (Holotype W.196265): *1.* 1st left elytra; *2.* 2nd left elytra; *3.* 17th right elytra; *4.* right elytra from middle segment; *5.* right elytra from posterior segment. (W.196266): *6.* anterior end, dorsal view; *7.* anterior end, ventral view.

nearly hidden by antennal auricles. Palps long, emerging ventral to tentacular parapodia, extend to setiger 12; paired nuchal organs emerging between prostomium and mid-dorsal ridge; pair of dorsal ctenidia on segment 2, alongside nuchal organs. Tentacular parapodia extending anteroventrally to prostomium, each with dorsal tentacular cirrus similar in length to median antenna, ventral tentacular cirrus about one-third as long as dorsal cirrus, single aciculum, two bundles of capillary setae, an L-shaped inner tentacular lobe with ciliated ridge and fused to inner palpal sheath (ventral cirrus extends beyond inner tentacular lobe), and an elongate ciliated dorsal ctenidium. Parapodia of segment 2 extending anteriorly with ventral (buccal) cirri longer than those following; parapodia of segment 3 also directed anteriorly; pair of elongate ctenidia on lateral lips. Additional elongate ctenidia medial to ventral cirri on segments 2–30. Tubercle not fused to elytrophore of segment 2; parapodial ctenidia cup-shaped, ciliated, 3 per parapodium, beginning on segment 2 (Figs 6.6, 6.7). Branchiae cirriform beginning on segment 4, and on all following elytrophores and

dorsal tubercles. Parapodia with accessory bracts and stylodes; stylodes not papillate. Notopodia clavate with pairs of bracts nearly encircling acicular lobes; similarly neuropodia clavate, with a bilobed posterior bract (dorsal and ventral lobes) (Figs 7.1, 7.7, 7.12, 8.6). Neuropodial anterior bracts present, both dorsal and ventral bracts indistinct (Figs 7.2, 7.11, 8.7). Notopodia of first few segments (2–4 at least) with bracts with stylodes, anterior stylodes more numerous, but about same length as dorsoposterior ones (Figs 7.1, 7.2, 7.7); notopodia of anterior and middle parapodia with similarly numerous stylodes. Neuropodia of first few segments with numerous stylodes on acicular lobes. Upper lobes of bilobed posterior bracts with numerous stylodes on upper anterior part; lower lobes with many (~ 5–9) stylodes in first few parapodia. Anteroventral bracts low, without stylodes, and anterior upper bracts indistinct, also without stylodes (Figs 7.1, 7.2, 7.7). Neuropodia with decreasing number of stylodes in posterior setigers, 0–1 on acicular lobes, upper and lower lobes of bilobed posterior bracts with 2–4 stylodes, but anteroventral and anterodorsal bracts without any stylodes at all in more posterior parapodia (Figs 7.11, 7.12, 8.6, 8.7).

Notosetae numerous, arranged in semicircular rows on notopodia and directed posteriorly, finely spinous, and tapering to capillary tips. Neurosetae arranged in three groups; upper group within anterior dorsal bracts; C-shaped group of setae within posterior bracts; lower arched group of more slender neurosetae within antero-

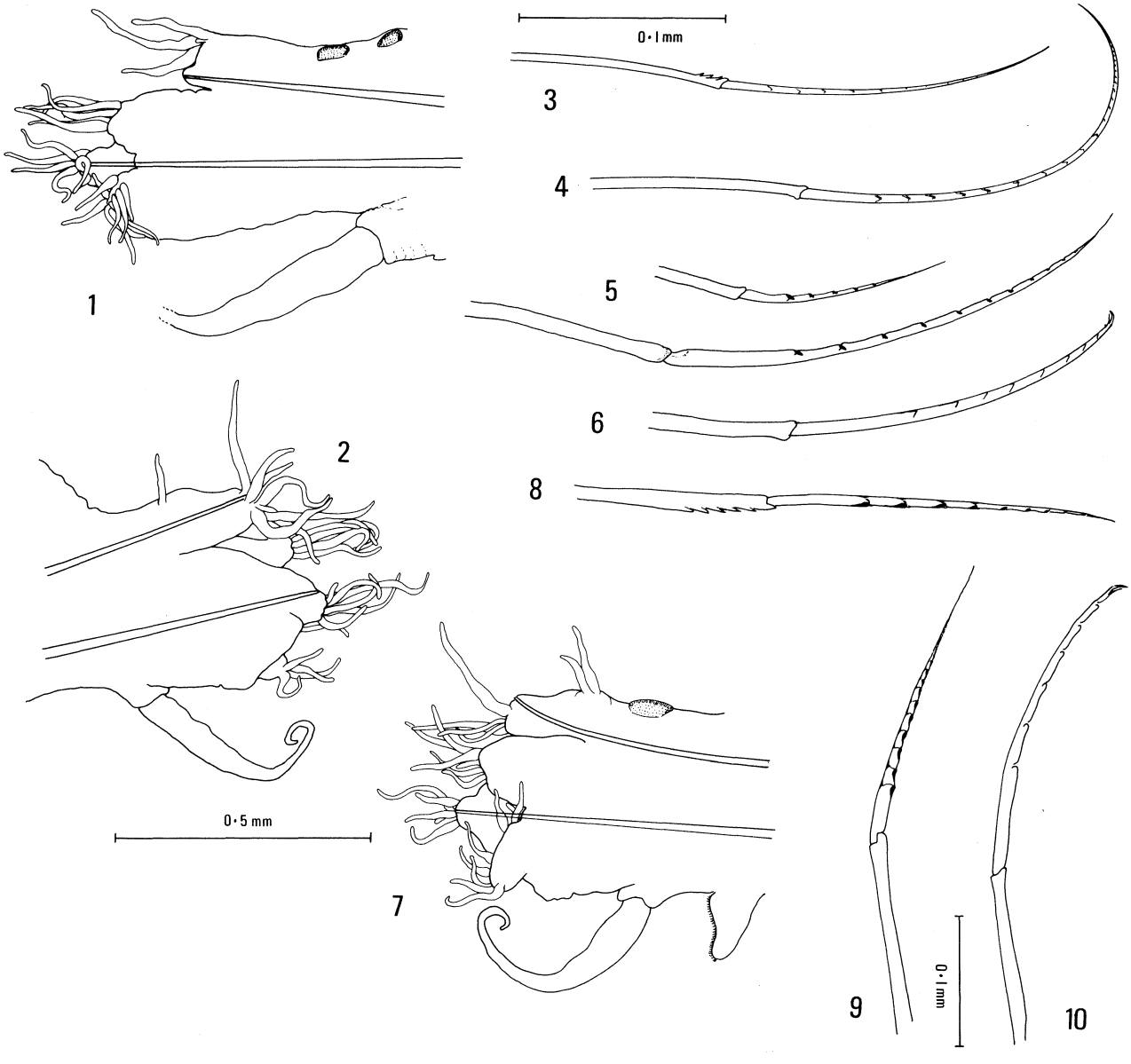

Fig. 7. *Sthenelais pettiboneae* n.sp. (Holotype W.196265): *1. 2nd left parapodium, posterior view; 2.* 3rd left parapodium, anterior view; *3.* upper neuroseta from parapodium 3; *4.* median neuroseta from parapodium 3; *5.* lower spinigerous neuroseta from parapodium 3 (2 lengths); *6.* lower falcigerous neuroseta from parapodium 3; *7.* 4th left parapodium, posterior view; *8.* upper neuroseta, parapodium 4; *9.* median neuroseta, parapodium 4; *10.* lower inferior neuroseta, parapodium 4.

ventral bracts.

Neurosetae of segments 2,3,4, all compound setae: superior ones, fine compound spinigers with blades canaliculate and tapering to fine tips, stems with a few spinous rows (~ 4) (Figs 7.3, 7.8); median neurosetae fine compound canaliculate spinigers with smooth stems (Figs 7.4, 7.9); inferior setae of several kinds, fine compound canaliculate spinigers with smooth stems, but with long or short blades (Fig. 7.5) and fine compound multiarticulate falcigers (4–12 articles) with smooth stems and bifid tips (Figs 7.6, 7.10).

Neurosetae of anterior segments include C-shaped group of compound canaliculate spinigers of 2 lengths (upper longer than lower ones), both tapering to fine

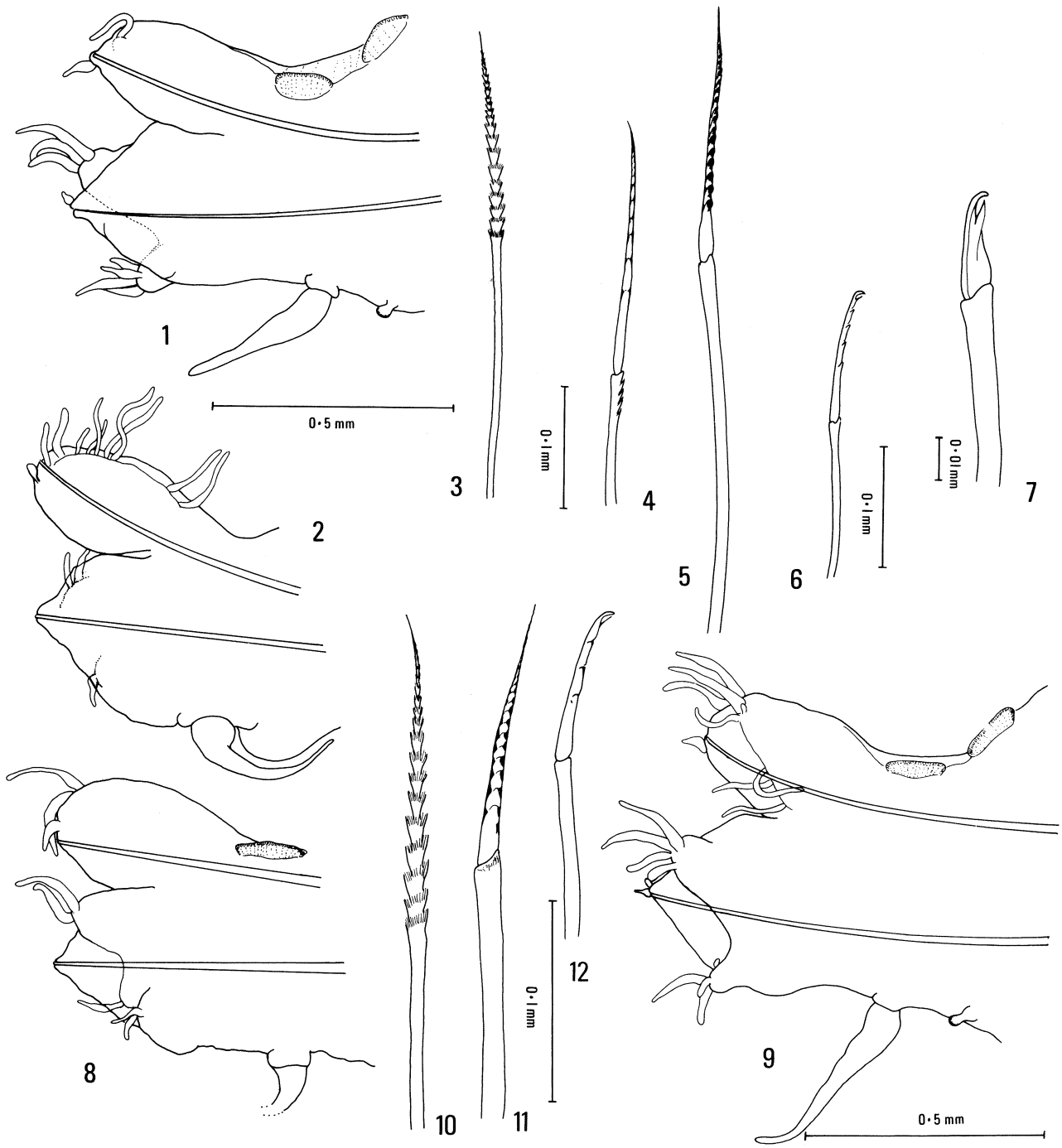

Fig. 8. *Sthenelais pettiboneae* n.sp. (Holotype W.196265): *1.* 25th parapodium, anterior view; *2.* 25th parapodium, posterior view; *3.* upper superior neuroseta, 25th parapodium; *4.* upper neuroseta 25th parapodium; *5.* median neuroseta, 25th parapodium; *6.* lower inferior neuroseta, 25th parapodium; *7.* (W.196266) short-stemmed falciger, 25th parapodium. (Holotype W.196265): *8.* parapodium from middle segment, posterior view; *9.* parapodium from middle segment, anterior view; *10.* upper simple superior neuroseta, middle parapodium; *11.* middle neuroseta, middle parapodium; *12.* inferior neuroseta, middle parapodium.

tips and with smooth stems (Fig. 8.3) and 1–3 simple spinous setae, some compound canaliculate spinigers with spinous stems (~ 5 rows spines) longer than "C-group" setae in an anterior group of neurosetae (Figs 8.1, 8.2). Anteroventral neurosetae slender, compound multiarticulate falcigers with 2–6 articles and with smooth stems (Fig. 8.4).

Neurosetae of middle to more posterior segments include a C-shaped group of long-stemmed, short-bladed compound canaliculate spinigers with smooth stems (Fig. 8.9); an anterodorsal group of about 3–4 simple spinous setae (Fig. 8.8), and about 2–3 compound canaliculate spinigers with spinous stems; and finally an anteroventral group of compound multi-articulate (~ 4 articles) falcigers with slender blades, smooth stems, bifid tips (Fig. 8.10). From about setiger 28 to posterior setigers, 1–3 compound falcigerous neurosetae with 1–2 articled blades, shorter and more stout than the inferior falcigers, occurring in median part of C-shaped group (Fig. 8.5).

Ventral cirri subulate without basal knobs, no long papillae on medial bases. Ventral papillae absent (Figs 7.1, 7.2, 7.7, 7.11, 7.12, 8.6, 8.7).

Remarks. The arrangement of certain types of neurosetae along the length of the body varies considerably in the material examined. In AHF POLY 1401, no simple spinous neurosetae appear until after setiger 25 (in holotype, they occur from setiger 10), and the shorter, median, falcigerous neurosetae are only irregularly present in some parapodia from 25th setiger (in holotype, they occur in most parapodia from the 28th setiger). Paratype (BMNH ZB 1983.1724) has the median falcigers (2–3) in each parapodium from at least setiger 25. In paratype (USNM 81496) however, the largest fragment exhibits simple spinous neurosetae in setiger 10, and no short median falcigers in any of its ~ 75 segments, nor are any present in any of the other smaller anterior fragments. Other specimens exhibit similar variations in the start of the simple spinous neurosetae and in the presence of stout falcigerous neurosetae. Some variation in the numbers of lateral papillae bordering the elytrae in anterior segments was also noted.

Ovigerous specimens have been found, these were the largest specimens but not all these had short, falcigerous median neurosetae in middle segments. The smallest specimens often had entirely compound canaliculate spinigerous neurosetae in anterior segments. The absence of median short falcigers on any of the smaller specimens (< 2 mm width), and their presence on specimens wider than 3 mm suggests setal replacement as maturation occurs. The spinigerous condition is the immature one, and with increasing age, more frequently, short, median compound falcigers occur, replacing spinigers in middle segments first, then in posterior and then some late anterior segments; similarly simple spinous setae occur in more anterior segments (about setiger 10) as the polychaete matures (and gets larger). Two specimens from Newcastle Harbour were also examined; both were large and incomplete (~ 4 mm wide including setae), however neither had any compound falcigerous median neurosetae. Because of such inconsistencies, setal replacement may not occur in all populations. However, the fragility of the species resulting in collections of extremely fragmented material, with only anterior and middle segments intact on all large specimens (longest fragment 72 mm), prevents an examination of neurosetae in posterior segments. The problem will be resolved by the collection of large whole specimens.

Discussion. This species belong to a new genus of sigalionids that Pettibone is erecting (pers. comm.), but it most closely approaches species of the genus *Sthenelais*. In particular *S. verruculosa* Johnson, 1897, with which it shares neurosetal characteristics: the domination of compound canaliculate spinigers and the presence in most setigers of slender multi-articulate compound falcigers. Several conflicting descriptions of this species occur in the literature. The presence even if rare, of median short compound falcigers in our species indicate a difference from Hartman's (1939) description of *S. verruculosa* from California and Western Mexico. But Pettibone (1953) in describing *S. verruculosa* from Puget Sound on the West Coast of the U.S.A., records "a few" stout falcigers, although her description differs from our Hawkesbury River species in the absence of lateral antennae, the presence of at least one extra pair of ctenidia on either side of the mid-dorsal ridge and the presence of medial elytral microtubercles surrounded by pigment. In Hartman's (1939) specimens, lateral antennae are present, but the ventrum is papillated or pustuled, and the first elytra has an "anterior prolongation" indicating that these are perhaps a different species to Pettibone's. We suspect that Johnson's species from Southern California, and Hartman's species from California and Western Mexico, are the same, but that Pettibone's species from Puget Sound is a different species, and that the Hawkesbury River species is different from these other two.

Etymology. *Sthenelais pettiboneae* n.sp. is named after Dr. Marian Pettibone, in appreciation of her sigalionid revisionary work.

Habitat. Hawkesbury R. material from 4–12 m depth in fine to sandy mud and in salinities of 30–35‰. Detailed information on habitat in other localities not known.

Occurrence. Common, in Hawkesbury R., collected over a period of 4 years, every season, most abundant in summer.

Australian distribution. New South Wales (Georges R., Botany Bay, Hawkesbury R., Newcastle).

Family PHYLLODOCIDAE Williams

Long, slender bodies, prostomium with four or five antennae. Eyes present. Two to four pairs of tentacular cirri present. Parapodia usually uniramous, or biramous with the notopodia represented by a small acicular lobe and foliose dorsal cirri, rarely with aciculae or setae. All neurosetae compound; notosetae, when present, simple.

Key to the Species of Phyllodocidae

1. Prostomium with four antennae and nuchal papilla 2
——— Prostomium with five antennae and indistinct nuchal papilla ..... *Eumida sanguinea*
2. Pharynx with basal papillae 3
——— Pharynx completely smooth on proximal half ..... *Compsanaitis inflata* n.gen. n.sp.
3. Pharynx with papillae arranged in longitudinal rows ..... *Phyllodoce novaehollandiae*
——— Pharynx with irregularly arranged papillae 4
4. Prostomium heart-shaped with 4 antennae and nuchal papilla ..... *Anaitides longipes*
——— Prostomium rectangular with 4 antennae, nuchal papilla absent ... *Phyllodoce* (G.) *castanea*

Anaitides longipes (Kinberg, 1866)

Phyllodoce (Anaitides) longipes.—Day, 1967: 144, fig. 5.2 a-c.
Anaitides longipes.—Poore *et al.*, 1975: 27.

Material examined. *New South Wales:* Jervis Bay, Murray's Basin, 17-x-72, 2(W.194585-6); Botany Bay, 17-i-75, several (W.195681, W.195719).

Description. Length up to 25 mm, anterior segments dusky, subsequent ones with 3 dark spots on dorsum. Prostomium elongate with deep posterior notch, occipital papilla absent. Four antennae. Eyes, large, spherical. Eversible pharynx, proximally 6 pairs of long, lateral, regular rows of papillae, about 14 per row, distally rugose ridges. First tentacular segment not visible dorsally, second indistinct, third distinct. Tentacular cirri cylindrical, setae absent on all tentacular segments. Dorsal cirri large and cordate anteriorly, becoming broader almost reniform posteriorly. Setigerous lobe with presetal tip long and pointed. Ventral cirri elongate with pointed tips extending just beyond setigerous lobe. Setae compound with oval striated shaft heads and serrated tapering blades.

Remarks. First record from New South Wales.

Habitat. Sand, seagrass beds.

Occurrence. Rare.

Australian distribution. Victoria (Port Phillip Bay), New South Wales (Jervis Bay*, Botany Bay*).

Compsanaitis n.gen.

Type-species. *Compsanaitis inflata* n.gen., n.sp.

Body narrow with well developed parapodia whose bases are swollen. Prostomium with anteriorly produced margin, with four antennae and a nuchal papilla. Pharynx completely smooth lacking any macro-papillae. Tentacular segments 1 and 2 fused to form a dorsal collar enveloping base of prostomium. Setae first present from tentacular segment 3. Parapodia uniramous, with spinigerous setae. Ventral cirri lamellar.

This new genus resembles *Paranaitis* Southern, 1914, in that in both genera, tentacular segments 1 and 2 are fused to form a dorsal collar enveloping the base of the prostomium. No other genus of Phyllodocidae shares this feature (Bergström, 1914). However *Compsanaitis* n.gen. can be distinguished from *Paranaitis* easily by the lack of any macro-papillae on the surface of the pharynx. In *Paranaitis* two lateral rows of papillae occur on the pharynx.

Etymology. The name *Compsanaitis* is derived from the Greek, *compso*, which means elegant or pretty.

Compsanaitis inflata n.gen., n.sp.

Fig. 9.1-9

Material examined. *New South Wales:* HOLOTYPE: Hawkesbury R. 3-3-2, 1(W.196585), 13 mm long, 1.5 mm wide, complete with ~ 100 setigers and proboscis everted. PARATYPES: 3-1-3, 2(W.196582), posteriorly incomplete, 2.5 mm long, 1.5 mm wide and 15 mm long, 1.3 mm wide; D4-1, 1(BMNH ZB 1983.1725), complete, 12 mm long, 1.0 mm wide; D2-2, 1(USNM 81484), incomplete posteriorly, 16 mm long, 1.2 mm wide; 2-2-4, 1(AHF POLY 1404) incomplete posteriorly, 15 mm long, 1.2 mm wide; D4-3, 3(W.196598) all incomplete posteriorly but proboscis on one specimen fully extended.

Additional material. 1-1-1 (W.196568-9), 1-1-2 (W.196570), 1-1-3 (W.196571-2), 1-1-4 (W.196573).

Description. Body narrow with well developed parapodia. Ventrum with discrete segmental bars of brown pigment, bars expanded towards parapodia, so bar resembles dumb bell. Pigment within a band mottled. Additional pigment at bases of anterior parapodia and dorsal cirri (Fig. 9.1). Scattered ventral

cirri heavily pigmented. Pygidium with two ovate cirri, with intensely orange-golden pigment, rest of body pale golden in colour.

Prostomium with anterior shield-like extension, almost transparent, at the base of this extension, arranged laterally, four short globular antennae. Pair of subdermal oval eyes on the posterior part of the prostomium which is opaque. Small nuchal papilla present mid-dorsally (Fig. 9.1).

Four pairs of tentacular cirri, on segments 1, 2 and 3. First and second segments fused to form a dorsal collar which encircles the base of the prostomium.

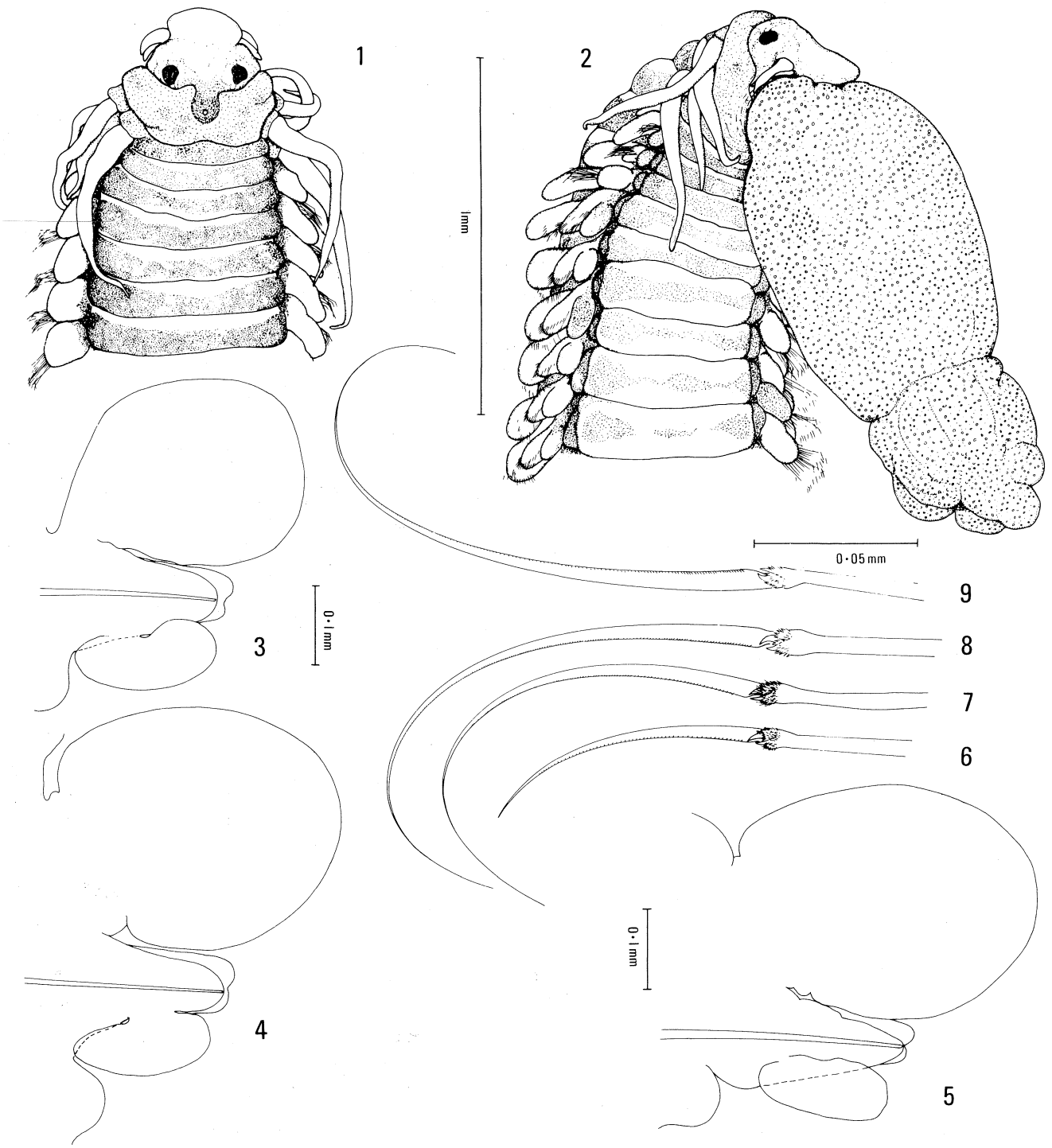

Fig. 9. *Compsanaitis inflata* n.gen., n.sp. (Paratype W.196598, 3 specimens): *1.* anterior end, dorsal view; *2.* anterior end, ventral view, pharynx everted; *3.* 10th parapodium, posterior view; *4.* middle parapodium, posterior view; *5.* posterior parapodium, posterior view; *6.* short, inferior spiniger from anterior setiger; *7.* long, superior spiniger from anterior setiger; *8.* superior spiniger, middle setiger; *9.* superior spiniger, posterior setiger.

Collar with a median dorsal depression in which the nuchal papilla sited. First tentacular segment with tentacular cirri, cylindrical, tapered at one end, length equal to width of body. Second tentacular segment with two tentacular cirri and no setae. Third tentacular segment with tentacular cirrus and parapodium with setae. First and second tentacular cirri shorter than third and fourth.

Pharynx unarmed, bilobed (Fig. 9.2), surface smooth, under high magnification, surface covered in very small micropapillae, based on Paratype (W.196598).

Dorsal cirri anteriorly ovate, posteriorly becoming more rounded. Ventral cirri well developed lamellar, equal in length to parapodia. Parapodia uniramous with golden internal aciculum. Base of parapodia swollen, this more pronounced in mid and posterior setigers (Fig. 9.2). Parapodia with presetal lobe slightly bifid, both lobes rounded, postsetal lobe bluntly pointed and a little shorter than presetal lobe (Fig. 9.3). Middle parapodia with presetal lobe bifid, and postsetal lobe becoming more blunt (Fig. 9.4). Posterior parapodia with 2 lobes equal in size (Fig. 9.5).

Setae all compound, spinigerous. Anterior parapodia (setiger 10) with superior group of 6 spinigers and an inferior group of 3 setae. Superior setae with long-handled blades unidentate and finely serrated along one axis. Shaft of spiniger expanded and strongly ornamented. Surface of head denticulate with some denticles considerably enlarged to form teeth. Inferior setae with much shorter blades, and head of shaft less swollen and less ornamented than superior setae (Fig. 9.6). Middle parapodia with about 11 long-bladed setae, all ~ same length and posterior parapodia with 9 long-bladed setae. Ornamentation of the head of the shaft becomes reduced progressively along body but posterior setae still with ornamented head (Figs 9.7–9).

Remarks. Intensity of pigmentation varies within the material examined. This new genus and species is presently known only from the Hawkesbury River.

Etymology. The specific name refers to the swollen bases of the parapodia.

Habitat. Collected from muddy sand and sandy mud, at water depths of 4–12 m, in salinites of 30–35 + ‰.

Occurrence. Infrequently found in the Hawkesbury R., always in low numbers and in most seasons but not every year.

Australian distribution. New South Wales (Hawkesbury R.).

Eumida sanguinea (Oersted, 1843)

Eulalia sanguinea Oersted, 1843: 28.
Eumida sanguinea.—Hutchings & Rainer, 1979: 750.

Material examined. *New South Wales:* Jervis Bay, Murray's Bch, Apr. '72, 1(W.193235); Hawkesbury R., D1–1, 1(W.196378), D2–1, many (W.196379-81), D2–3, many (W.196382-3), D2–4, 1(W.196384), D4–2, 1(W.196388, 2-2-3, several (W.196393-5), 3-1-3, 2(W.196398-9); Lake Macquarie, 18-xi-76, 1(W.19244).

Remarks. Agrees well with description in Hutchings and Rainer (1979).

Habitat. In salinities of 32–36‰, sediments of sandy mud with shell and seagrass detritus, in Hawkesbury R. No habitat data for Jervis Bay; in *Zostera* seagrass beds in Lake Macquarie.

Occurrence. Rare in Hawkesbury R., found at Transects 2 and 3 and at Brooklyn for most of year.

Australian distribution. New South Wales (Jervis Bay*, Hawkesbury R.*, Pittwater, Lake Macquarie*).

Phyllodoce (*Genetyllis*) *castanea* (Marenzeller, 1897)

Phyllodoce castanea.—Augener, 1924a:16; 1924b:301.—Day, 1967: 149, fig. 5.3. d–f.

Material examined. *New South Wales:* Lake Merimbula, 3(W.11273), 6-x-75, 5(W.12691); Port Hacking, Maianbar, May '75, several, (W.9414, W.9428, W9445); Botany Bay, Towra Pt, 12-iv-73, several, (W.9983, W.10043, W.10931, W.10966); Hawkesbury R., 2-1-4, 1(W.196625), 7-1-1, 1(W.196626), 7-1-3, 1(W.196627); Port Stephens, Research Stn, 27-vii-76, 2(W.12552, W.12888).

Description. Body short, with some red pigmentation. Prostomium bluntly triangular with 4 antennae. Occipital tentacle absent. Eversible pharynx, covered with small irregularly arranged papillae. Tentacular segments separate from prostomium, often 1st fused to 2nd, 3rd always separate and distinct dorsally. Tentacular cirri short; 2nd and 3rd with setae; the formulae being $1 + S\frac{1}{1} + \frac{1}{n}$. Dorsal cirri cordate and reddish. Parapodial lobes rounded apically. Ventral cirri ovate. Setae, few with long shafts ending in truncate and strongly striated shaft heads, blades short and dagger-like.

Remarks. First record from Australia.

Habitat. *Posidonia* seagrass beds; in Hawkesbury R., from mud in 4–12 m, in salinities of 20–33‰.

Occurrence. Regularly present in seagrass and sediments in low numbers.

Australian distribution. New South Wales (Merimbula*, Port Hacking*, Botany Bay*, Hawkesbury R.*, Port Stephens*).

Phyllodoce novaehollandiae Kinberg, 1866

Phyllodoce novaehollandiae Kinberg, 1866: 241.—Augener, 1922a: 16–17, fig. 5.—Hutchings & Rainer, 1979: 749–750.

Material examined. *New South Wales:* Lake Merimbula, 4-xii-75, several, (W.15818); Jervis Bay, Murray's Bch, 25-iv-72, 2(W.17574); Port Hacking, Maianbar, 21-ix-76, 1(W.14138); Botany Bay, 11-ii-75, 1(W.195720); Hawkesbury R., Spectacle I., 13-ii-72, 1(W.195007).

Remarks. Agrees well with the published descriptions.

Habitat. In Hawkesbury R., in sandy mud with much shell at 5 m depth in salinity of 33.8‰; other locations, in fine sand, mud and *Posidonia* seagrass beds.

Occurrence. Rare in Hawkesbury R., but found frequently and widespread in most New South Wales estuaries.

Australian distribution. New South Wales, Queensland.

Family HESIONIDAE Sars

Relatively short-bodied, dorsoventrally flattened worms. Two or three antennae, occasionally absent; palps present or absent, if present with one to three articles. Palps and antennae very fragile, often lost or damaged. Two to eight pairs of tentacular cirri present. Jaws may be present. Parapodia uniramous or biramous, but notopodia always reduced compared to the neuropodia. Dorsal cirri long and slender. Neurosetae compound, notosetae if present simple.

Key to the Species of Hesionidae

1. Six pairs of tentacular cirri* ..... *(Podarke)* 2

—— Eight pairs of tentacular cirri† ..... *Podarkeopsis galangaui*

2. Furcate notosetae present; median antenna ⅓ length of lateral antennae ..... *P. angustifrons*

—— Furcate notosetae absent; median antenna minute ..... *P. microantennata* n.sp.

* We suspect that *Nereimyra* sp. may be present in the Sydney region but material collected has been too damaged to identify to generic level. This genus has 6 pairs of tentacular cirri, but has only 2 antennae.

† There may be *Gyptis* sp. present in the Sydney region, but again, collected material was unidentifiable to genus. This genus also has 8 pairs of tentacular cirri, but has setae initially from segment 2.

Pokarke angustifrons (Grube, 1878)
Fig. 10.1–6

Irma angustifrons Grube, 1878: 108, pl. 6, fig. 7.
Podarke angustifrons.—Augener, 1924: 40–42.—Fauvel, 1953: 109, fig. 52 a–d.

Material examined. *New South Wales:* Lake Merimbula, 1(W.11386), 6-x-75, many (W.15751-5); Port Hacking, Maianbar, 4-xi-75, several, (W.11010, W.11016, W.11047, W.11224); Botany Bay, Banksmeadow, 20-xii-76, 1(W.14622); Hawkesbury R., D2-3, 18-xii-79, 1(W.196337), I-viii-79, 1(W.197113).

Description. Body fragile, up to at least 11 mm for 36 setigers, widest from setigers 1 to 10, tapering very gradually towards posterior end, convex dorsally, flattened ventrally. Few specimens complete posteriorly. Proboscis muscular, papillae, fimbriae and jaws all absent. Prostomium bilobed, rectangular with 2 pairs of eyes, anterior pair larger and wider apart than posterior pair (Fig. 10.1). Palps biarticulate similar in length to lateral antennae, with short palpophores and elongate palpostyles. Three antennae, lateral antennae longer than prostomium; median antenna one-third the length of lateral antennae, situated on small medial lobe on prostomium. Six pairs of fusiform tentacular cirri borne on short ceratophores, present on buccal and next two dorsally reduced segments, setae start from segment 4. Parapodia sub-biramous (Fig. 10.2), notopodium reduced to an aciculum, 1–4 notosetae, including smooth capillaries and furcate setae (Fig. 10.3); dorsal cirrus with short ceratophore and long fusiform cirrostyle about twice parapodial length. Neuropodium with one aciculum, triangular presetal lobe, rounded postsetal one; neurosetae ~ 20 falcigers with long blades and bidentate tips grading from long slender blades superiorly to shorter more stout blades with strongly bidentate tips inferiorly (Figs 10.4–6). Ventral cirrus long, fusiform extending slightly beyond tip of neuropodium.

Remarks. The specimens agree well with Grube's (1878) original description of the species but not with Day's (1967) description. Day describes a minute papilliform median antenna and minutely bidentate falcigerous neurosetae being present, and we suggest Day is describing another species. *Podarke angustifrons* (Grube) should not be considered synonymous with *Ophiodromus latifrons* (Grube, 1878) which according to Grube (1878) and Monro (1926) has distinctly different parapodial and setal characteristics in terms of the length and number of falcigerous neurosetae. Because of the fragility of the species, the antennae, dorsal and tentacular cirri are often missing, making specific identification dependent upon the length of the dorsal ceratophores, and on parapodial and setal characteristics. We have placed this species within the genus *Podarke,* sometimes still considered synonymous with *Ophiodromus*, but preferred in this case because of the unfused nature of the first 3 achaetous segments.

Habitat. Found in sand to muddy sand of salinities 35‰, often in *Posidonia, Zostera* or *Halophila* seagrass patches.

Occurrence. Uncommon. One specimen only found in the Hawkesbury R., at D2–3 in December 1979. In Botany Bay, Port Hacking and Merimbula, found during summer months during years 1975, 1976.

Australian distribution. New South Wales (Twofold Bay, Merimbula*, Port Hacking*, Botany Bay*, Port Jackson, Hawkesbury R.*).

Podarke microantennata n.sp.

Fig. 10.7–12

Material examined. *New South Wales:* HOLOTYPE: Botany Bay, Stn 22, 3-xii-76, (W.14619) 30 mm long, 4 mm wide (including setae), complete individual but in 2 fragments, 42 setigers. PARATYPES: Stn 22, 2-xii-76 (USNM 81494) 3 anterior (6–11 mm long, 3–4 mm wide) and 2 posterior

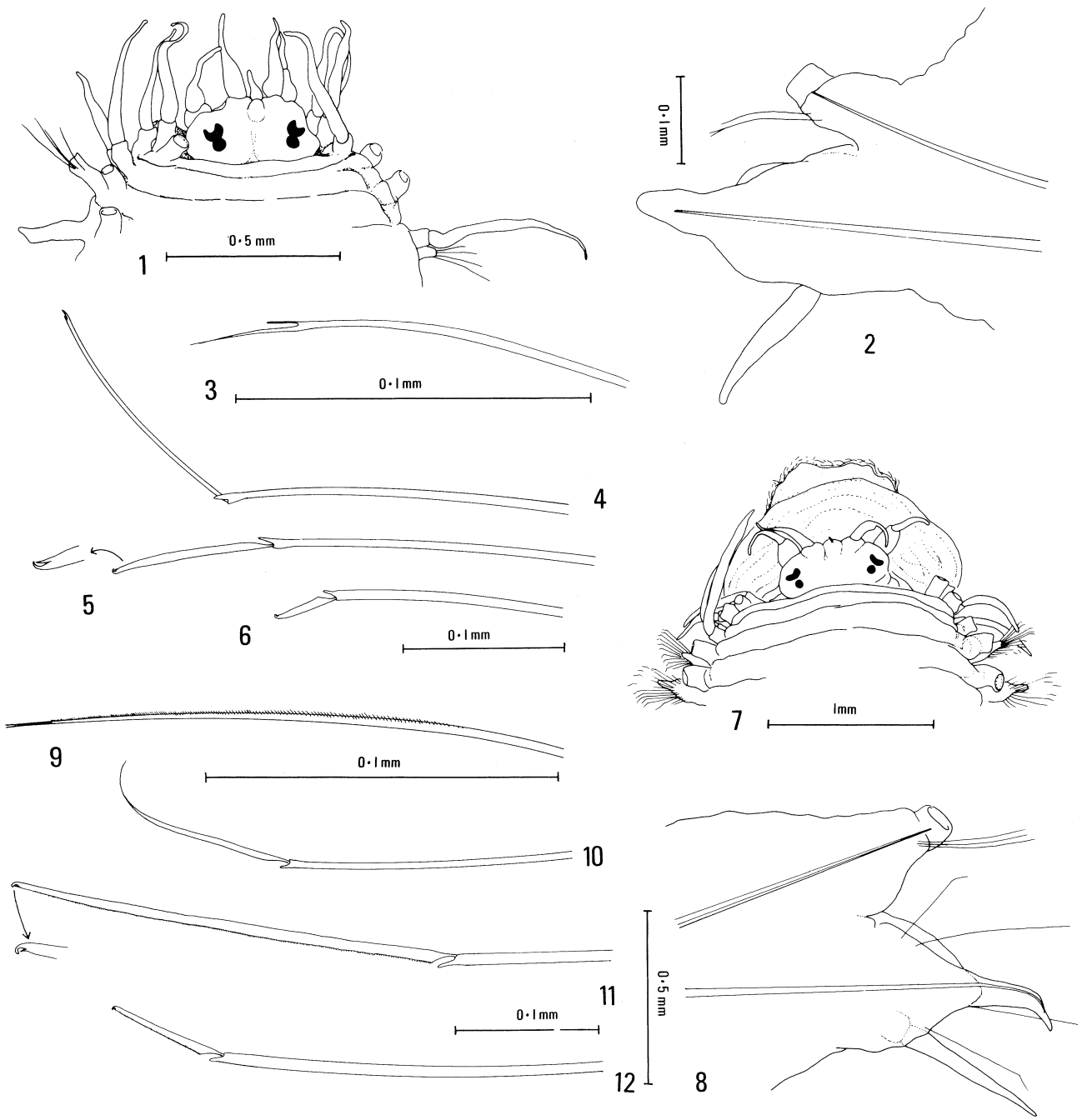

Fig. 10. *Podarke angustifrons* (W.197113): *1.* anterior end, dorsal view. (W.11386): *2.* parapodium, anterior view; *3.* notoseta; *4.* superior neuroseta; *5.* median neuroseta; *6.* inferior neuroseta. *Podarke microantennata n.sp.* (Holotype W.14619): *7.* anterior end, dorsal view; *8.* parapodium, anterior view; *9.* notoseta; *10.* superior neuroseta; *11.* median neuroseta; *12.* inferior neuroseta.

fragments; Stn 87, 4-ii-77 (BMNH ZB 1983.1726), 1 specimen complete but posterior regenerating, 10 mm long, 5 mm wide, 32 setigers; Stn 24, 3-xii-76 (AHF POLY 1402) 1 complete specimen, 9 mm long, 4 mm wide, 43 setigers; Stn 87, 4-xi-77, (W.14625) 2 anterior fragments 7–8 mm long, 5 mm wide. All type material from Botany Bay.

Additional material. Lake Merimbula, 6-x-75, 3-xii-75, 3(W.15756-8, W.196221); Botany Bay, Banksmeadow, Dec. '76, Jan. '77, several, (W.14621, W.14623-4), Jan. '75, Feb. '75, several, (W.18699, W.19011, W.196213); Hawkesbury R., D6–1, 21-viii-80, 1(W.196338).

Description. Body soft, fragile, widest from setiger 7 to 15, tapering gradually posteriorly and less so anteriorly, convex dorsally, flattened ventrally with median groove and with segments deeply incised laterally. Proboscis everted and muscular, without jaws or papillae, fimbriae present. Prostomium bilobed, twice as broad as long, two pairs of reddish eyes, anterior pair largest, cup shaped, wider apart than posterior pair (Fig. 10.7); pair of biarticulate palps, palpophores short and with palpostyles tapering and similar to pair of lateral antennae all slightly longer than prostomial length. Median antenna minute, papilliform, on medial anterodorsal lobe of prostomium. Six pairs of tentacular cirri, varying length, each with short ceratophore and smooth tapering style placed laterally on first three achaetous segments. Buccal segment indistinguishable from prostomial segment with 2 pairs tentacular cirri lateral to prostomium. The following 2 tentacular segments, distinct but reduced dorsally, each with 2 pairs of cirri. Setae start from segment 4. Parapodia basically all similar, sub-biramous (Fig. 10.8); notopodium reduced to dorsal cirrus, elongate ceratophore with two pale aciculae, and smooth, tapered cirrostyle extending to tip of setal bundle, with 1–10 notosetae. Notosetae all fine capillaries, either smooth or spinulose. The spinulose setae occasionally with split or bifid tips visible only under oil immersion (Fig. 10.9); furcate notosetae absent. Neuropodium with one aciculum, digitiform presetal lobe and rounded postsetal lobe (Fig. 10.8); neurosetae numerous, all compound falcigers with long, slender, serrated blades of varying lengths, superior ones smaller, finer than median ones, inferior ones with shorter blades whose width equals that of median falcigers (Figs 10.10–12), tips minutely bidentate. Ventral cirrus long, tapering, tip reaching apex of presetal lobe.

Remarks. Little variation between types and additional material. Because of the extreme fragility of this species, antennae, tentacular cirri, and dorsal cirri are often missing, making identification difficult; however, parapodial and setal characteristics can be used for species determination. The middle antenna is often visible only from the ventral side. Some variation in the shape of the prostomium is evident between the type specimens and additional material, generally the prostomium is much broader than long as in the types, but specimens W.18699 and W.19011 have a more rounded prostomium.

This species is named *Podarke* rather than *Ophiodromus* because of the absence of fusion of segments 1–4, a character that Fauchald suggests may be diagnostic for the genus *Podarke*, although the two genera are still usually considered synonymous (Fauchald, 1977).

Podarke microantennata resembles several other species previously placed in the genera *Ophiodromus* and *Podarke*. *Ophiodromus latifrons* (Grube, 1878) has a median antenna just half the size of the laterals, and is not minute, as in *P. microantennata*. *Ophiodromus angustifrons* sensu Day, 1967, also has a minute median antenna, but has furcate notosetae which are absent in *P. microantennata*. *Ophiodromus berrisfordi* Day, 1967, has a minute median antenna, similar neurosetal characteristics to *P. microantennata* but lacks notosetae. *Ophiodromus didymocerus* (Schmarda, 1861) was resurrected by Hartman (1939) after Augener (1927) synonymized it with *O. angustifrons* (Grube, 1878) but the type specimens have all the antennae missing, and neither Schmarda nor Augener describe in sufficient detail the length, number, or nature of the falcigerous tips of the neurosetae, to determine how *O. didymocerus* is related to the species described here. The combination of characters of this new species, minute median antenna, smooth and serrated capillary notosetae, furcate setae absent, very long, slender and numerous bidentate neurosetae, elongate dorsal ceratophores, digitiform presetal lobes are, we believe, a unique combination in the genus.

Etymology. The specific name refers to the minute median antenna.

Habitat. Found in sand to muddy sand in 35‰ sometimes associated with *Zostera, Halophila* seagrass patches, at depths of 2–10 m.

Occurrence. Uncommon, found usually in summer months during years 1975 to 1977.

Australian distribution. New South Wales (Merimbula, Botany Bay, Hawkesbury R.).

Podarkeopsis galangaui Laubier, 1961

Podarkeopsis galangaui Laubier, 1961: 211–217, Fig. 1 a–f.

Material examined. *New South Wales:* Port Hacking, Costen's Pt, 1(W.11195), 6-xi-74, 1(W.195285); Botany Bay, Towra Bch, 12-iv-73, many (W.9738, W.10011, W.10056, W.196219, W.196220), Nov., Dec. '76, Jan., Mar. '77, many (W.14608-18). A selection of material examined.

Description. Body fragile, small, narrow, and tapering gradually towards posterior end, convex dorsally, flattened ventrally. Most specimens incomplete but complete ones approximately 50 setigers, 11–12 mm long including everted pharynx, 1.2 mm wide including setae. Eversible pharynx with 10 papillae on distal margin, jaws absent. Prostomium rectangular, with bilobed anterior margin, 4 eyes on mid-prostomium, anterior pair the larger. Two biarticulated palps inserted ventrally and laterally on anterior margin, same length as prostomium; 3 dorsal antennae, lateral pair similar

to palps, median one shorter, approximately 1/5 of length of lateral antennae. Eight pairs of lateral tentacular cirri borne on 4 segments, first 2 pairs on peristomial segment, other 6 pairs on first 3 body segments, setae start on 4th segment; all tentacular cirri with superficial annulation, segments indistinct and minute, dorsally arising tentacular cirri longer than ventral ones. Parapodia all sub-biramous, dorsal cirrus superficially annulated, longer than parapodium, ventral cirrus reaching to end of presetal lobe on neuropodium: notopodium reduced to an aciculum, a small, round, presetal lobe with a few notosetae, and the dorsal cirrus; neuropodium larger with a long triangular presetal lobe and a rounded flap-like post setal lobe.

Notosetae, 6–8 simple bifurcate setae, with forks of unequal lengths, with distally serrated shafts (~ 4–10 serrations), and with notched tips; also 1–2 simple acicular pointed setae. Neurosetae all compound falcigers, with varying blade lengths, median neurosetae with longest blades, all with pseudo-bidentate tips i.e. under oil immersion, the specimens display hoods covering the tip, arising just below the terminal curved tooth and thickest in concave section of main tooth, resembling a fine secondary tooth, when viewed up to x 400 magnification.

Remarks. Agrees well with Laubier's description and figures (1961) including the discussion of hooded neurosetae and notched tips on the bifurcate notosetae; however we observed greater numbers of serrations on the distal part of the notosetal shaft. However, we have reservations concerning how a species recorded only from France can also be found in New South Wales estuaries. We have not examined the type and because it is a monotypic genus, we suggest that other species of the genus *Gyptis* be examined in the light of Laubier's erection of the genus *Podarkeopsis*. There are no *Gyptis* species so far recorded from Australia, so this species *Podarkeopsis galangaui* is a new Australian record under any circumstances.

Habitat. Collected from mud, muddy sand, sand, from intertidal to depths of water of 13 m, and in marine salinites; also found in *Zostera* seagrass beds.

Occurrence. Infrequently found; limited to a few New South Wales estuaries only, no seasonal preference shown, low numbers.

Australian distribution. New South Wales (Port Hacking*, Botany Bay*).

Family PILARGIDAE Saint-Joseph

Nereid-like worms with ribbon-shaped or cylindrical bodies. Two or three antennae present, rarely absent. Palps simple or biarticulated; two pairs of tentacular cirri normally present. Proboscis eversible, unarmed. Parapodia biramous but notopodia always reduced. Setae simple, notosetae may be absent, sometimes reduced to a thick spine or hook.

Sigambra parva (Day, 1963)

Ancistrosyllis parva Day, 1963: 395, fig. 3 g-k.—1967: 216–218, fig. 10.1. f-j.
Sigambra parva.—Pettibone, 1966: 181.

Material examined. *New South Wales:* Port Hacking, 17-xii-74, 7(W.195223); Botany Bay, Silver Bch, Kurnell, 29-vi-81, 1(W.194913); Hawkesbury R., 1-1-2, 4(W.196527), 1-2-4, 3(W.196528), 1-4-1, 1(W.196529), 2-2-1, 2(W.196530), 3-1-4, 1(W.196531); Lake Macquarie, Feb. '79, 1(W.17843).

Description. Body up to 10 mm in length, colourless. Prostomium short, squat. Palps basally swollen with small globular palpostyles. Eyes absent. Three antennae with the median longest. Pharynx eversible with papillated anterior rim, dorsal papillae largest, lacking teeth or jaws. Two pairs of tentacular cirri. Body smooth, anterior segments shorter than posterior ones. Setiger 1 with dorsal cirrus elongated, a setigerous lobe and a ventral cirrus. Setiger 2 with no ventral cirrus and short dorsal cirrus. Following setigers with tapered dorsal cirrus borne on a stout cirrophore, a rectangular setigerous lobe and a smaller ventral cirrus. Notosetae absent from setigers 1-3, from setiger 4 onwards, a stout notosetal hook present, other notosetae absent. Neurosetae, all simple capillaries, short outer ones with spinulose blades and longer median ones with smooth blades.

Remarks. First record from Australia.

Habitat. Intertidal *Zostera* seagrass beds; in Hawkesbury R., from mud to sandy mud in depths of 6–10 m, salinities of 28–37‰.

Occurrence. Found frequently in Hawkesbury R., in low numbers in most seasons (not every year) at Transects 1–3. Uncommon in New South Wales estuaries.

Australian distribution. New South Wales (Port Hacking*, Botany Bay*, Hawkesbury R.*, Lake Macquarie*).

Family SYLLIDAE Grube

Small to medium sized nereidiform polychaetes, usually with slender bodies, sometimes dorsoventrally flattened. Three antennae and simple palps present, latter sometimes fused together to varying degrees. One to two pairs of tentacular cirri. Eversible pharynx armed with a single tooth or a circlet of smaller teeth or unarmed. A muscular region of anterior part of the gut, the proventricle, usually present. Parapodia uniramous, dorsal cirri usually conspicuous, setae simple or composite.

Probably many species of syllids occur in New South Wales estuaries, other than those described here. Many syllids are small and fragile and are easily damaged during collecting.

Key to the Species of Syllidae

1. Small forms, palps fused for at least half their lengths† ..... (Exogoninae) 3
— Large forms, palps, if fused at all only fused basally† 2
2. Palps fused at base; dorsal cirri smooth or irregularly wrinkled ..... (Eusyllinae) 7
— Palps free to base or absent; dorsal cirri articulated..... (Syllinae) 9
3. Dorsal cirri long and filiform, ventral cirri as long as setal lobe ..... *Brania* sp.
— Dorsal and ventral cirri shorter than setal lobe 4
4. Dorsal cirri flask-shaped; body often covered with adhesive papillae ... (*Sphaerosyllis*) 5
— Dorsal cirri ovoid or papilliform; body never covered with adhesive papillae . ..... *Exogone heterosetosa*
5. Dorsal cirrus absent from setiger 2; body lacking adhesive papillae ..... *S. sublaevis*
— Dorsal cirrus present on setiger 2; adhesive papillae may be present 6
6. Adhesive papillae present ..... *S. semiverrucosa*
— Adhesive papillae absent ..... *Sphaerosyllis* sp.
7. Occipital flap present ..... *Odontosyllis polycera*
— Occipital flap absent 8
8. Pharynx without teeth ..... *Syllides longocirrata*
— Pharynx with single tooth ..... *Pionosyllis melaenonephra*
9. Mainly compound setae with a few large Y-shaped simple setae in middle setigers ..... *Syllis gracilis*
— All compound setae, or with a few simple acicular setae in posterior setigers 10
10. Blades of a few superior setae much longer than others; dorsal cirri short with 10–18 articles ..... *Langerhansia cornuta*
— Blades of setae decrease evenly in length; dorsal cirri long or short ..... (*Typosyllis*) 11
11. Setae all compound, minutely bidentate anteriorly, unidentate in middle of body ..... *T. armillaris*
— Mostly strongly bidentate compound setae with single simple seta in middle and posterior setigers 12
12. Pharynx short, two continuous dark bars across the dorsum of each anterior segment ..... *T. prolifera*
— Pharynx long, a pattern of broken brown bars across the dorsum of each anterior segment ..... *T. variegata*

† All species described here have ventral cirri. However, some species of Autolytinae (in which ventral cirri are absent) have been found in marine areas of harbours, bays, etc., on rocky shores and in algae. These areas were not adequately sampled during the surveys.

Brania sp.

Material examined. *New South Wales:* Hawkesbury R., 9-1-3, 1(W.196615).

Description. Incomplete anterior fragment 1.5 mm in length, pale brown pigment. Palps fused for at least half their length. Prostomium rectangular with 3 eyes on one side and 4 on the other. Three antennae, and probably 2 pairs of tentacular cirri, but only stumps remain. Pharynx with single anterior tooth.

Dorsal cirri cylindrical, only one remaining on setiger 2, all the rest have been lost. Ventral cirri cone-shaped. Setae, include 1 simple superior seta with fine teeth along one margin, unidentate, and 15–20 unidentate compound setae with long blades.

Remarks. We have not attempted to identify this

single specimen to species as it is in poor condition. Three species of *Brania* have been reported from New South Wales by Haswell (1920b) *B. kerguelensis* (McIntosh, 1885), *B. pusilloides* (Haswell, 1920b) and *B. quadrioculata* (Augener, 1913), but none of these resemble the above specimen. More material is needed to positively identify the species.

Habitat. Muddy clay at 20 m depth in salinity of 21‰.

Occurrence. Single specimen collected in February 1979.

Exogone heterosetosa McIntosh, 1885

Exogone heterosetosa McIntosh, 1885: 205, pl. 33, figs 15–16; pl. 34A, fig. 11.—Haswell, 1920b: 221–222.

Material examined. *New South Wales:* Hawkesbury R., Bay A, Cowan Creek, 25(W.196617), Juno Heads, Hungry Bch, 1-1-4, 1(W.196618), 1-2-1, 1(W. 196619), 1-3-1, 1(W.196620), D2–2, 1(W.196621), 2-2-1, 2(W.196622), D2–4, 1(W.196623), Waratah Bay, Cowan Creek, 24(W.196624).

Description. Small worms 2–3 mm in length but some individuals gravid, these 5–6 mm in length. Elongate palps, longer than prostomium and peristomium, completely fused. Three antennae, median extends to tips of palps. Dorsal cirri small and ovate, absent on setiger 2. Ventral cirri smaller than dorsal cirri.

Setae include bidentate acicular simple setae and long-bladed heterogomph falcigers. Falcigers with finely serrated blades and minutely bidentate tips. Some variation in lengths of blade. Sexually mature specimens have in addition bundles of long flowing capillary setae from setiger 12 to 13 onwards.

Remarks. First record of this species since Haswell recorded it from Port Jackson in 1920. Haswell's figures are very simple and do not show the serrated blades, these are only visible under high magnification.

Habitat. Found in sandy mud and muddy sand at depths of 4–12 m in salinities of 35‰.

Occurrence. Rare; found in low numbers at few sites in the Hawkesbury R., only in summer and autumn months, not every year.

Australian distribution. New South Wales (Port Jackson, Hawkesbury R.*).

Langerhansia cornuta Rathke, 1845

Syllis (Ehlersia) cornuta.—Fauvel, 1923: 267, fig. 100 g–i.
Syllis (Langerhansia) cornuta.—Day, 1967: 244, fig. 12.2 s–u.

Material examined. *New South Wales:* Jervis Bay, Murray's Bch, 25-vi-72, 1(W.194524); Botany Bay, 20-iii-75, 1(W.195775).

Description. Body threadlike, 10–15 mm in length. Palps completely separate. Prostomium with 4 eyes and 2 ocular specks. Pharynx with single anterior dorsal tooth. Three antennae and 2 pairs of tentacular cirri, all articulated. Dorsal cirri short with 10–18 articles clearly defined. Setae include 1–3 superior setae with very long blades and about 6 with bidentate blades with slender secondary tooth.

Remarks. First record from Australia.

Habitat. Mud, subtidal, and *Posidonia* seagrass beds.

Occurrence. Rare.

Australian distribution. New South Wales (Jervis Bay*, Botany Bay*).

Odontosyllis polycera (Schmarda, 1861)

Odontosyllis polycera.—Augener, 1927: 152–153.—Day, 1967: 260, fig. 12.7 i–m.

Material examined. *New South Wales:* Botany Bay, several (W.14197-8, W.14201-2, W.14204); Hawkesbury R., D2–3, 2(W.196419-20), D2–4, 1(W.196421).

Description. Length up to 50 mm, width 2 mm. Two pairs of large prostomial eyes. Palps fused basally. Median antenna arises posterior to lateral antennae, all smooth. Large occipital flap covers most of prostomium. Pharynx armed with a semi-circle of recurved teeth. Four pairs of smooth tentacular cirri. Anterior dorsal cirri, long, smooth, decrease in length posteriorly. All setae compound, with short triangular bidentate blades, secondary tooth posteriorly displaced. Ventral cirri inflated and pillow-shaped.

Remarks. First Australian record since Augener recorded it from Sydney in 1927.

Habitat. Found in mud with much shell, at 5–7 m depth, in 34–35‰ salinities.

Occurrence. Rare, only 5 specimens collected from Brooklyn area in August and December, 1979, and in February, 1980.

Australian distribution. New South Wales (Botany Bay*, Port Jackson*, Hawkesbury R.*).

Pionosyllis melaenonephra Haswell, 1920

Pionosyllis melaenonephra Haswell, 1920b: 103–104, Pl. XII, figs 11–16, Pl. XIII, fig. 1.

Material examined. *New South Wales:* Hawkesbury R., 2-2-2, 1(W.196604), 7-1-4, 1(W.196605), D2–1, 2(W.196606-7), D2–2, 7(W.196608-10), D2–3, 3(W.196611-12), D2–4, 1(W.196613).

Description. All material incomplete, fragile. Colourless except for a transverse black line across the prostomium with a vertical line between the eyes and transverse bars across the anterior segments. Two pairs of large globular palps fused basally. Prostomium rectangular with two pairs of eyes, anterior pair the largest. Three pairs of weakly articulated antennae, median antenna extending beyond palps, lateral antennae extending to tips of palps. Tentacular and dorsal cirri well developed, faintly articulated, as long as width of body. Ventral cirri small. Setae, long-bladed falcigers, bidentate with finely serrated blades.

Remarks. All the material is incomplete and the details of the posterior setae cannot be given. Haswell (1920b) indicates that from segment 23 a distinct notopodial rudiment with a small aciculum appears and this continues to the pygidium. He also indicates that posteriorly the falcigerous setae change, with the blade becoming shorter and the secondary tooth considerably enlarged relative to the terminal tooth. This is the first record of the species since Haswell recorded it from Port Jackson. Some of the specimens appeared to be tubiculous, living in a sandy tube.

Habitat. Collected from mud, sandy mud, mud with shell in water depths of 5–12 m in salinities of 30–35‰.

Occurrence. Rare, few specimens found from Hawkesbury R., inconsistently collected at different seasons and not every year.

Australian distribution. New South Wales (Port Jackson, Hawkesbury R.*).

Sphaerosyllis sublaevis Ehlers, 1913

Sphaerosyllis sublaevis.—Day, 1960: 316.—Hutchings & Rainer, 1979: 750.

Material examined. *New South Wales:* Hawkesbury R., D2–4, 18-xii-79, 1(W.196415); Careel Bay, 30-vii-73, 1(W.11109).

Remarks. Agrees well with the above descriptions. These records represent the second record of the species in Australia.

Habitat. Found in muddy sediment with much shell at 4 m depth in salinity of 34.4‰, and in *Zostera* seagrass beds.

Occurrence. Rare in Hawkesbury R., collected only at Brooklyn in December, 1979.

Australian distribution. New South Wales (Careel Bay, Hawkesbury R.*).

Sphaerosyllis semiverrucosa Ehlers, 1913

Sphaerosyllis semiverrucosa Ehlers, 1913: 483, pl. 32, figs 5–9.—Day, 1967: 276, fig. 12.11 a–e.

Material examined. *New South Wales:* Hawkesbury R., D1–1, 2(W.196422-3), D1–4, 1(W.196424), D2–1, several (W.196425-7), D2–3, 1(W.196428).

Description. Length 3–4.5 mm for 26–34 setigers. Prostomium with 2 pairs of eyes, pair on each side adjacent, almost fused, palps short, broad, completely fused dorsally; antennae short, flask-shaped, median antenna very short and partially overlapping the prostomium, with one pair of tentacular cirri similar to antennae. Five to six anterior segments smooth, succeeding ones covered with minute papillae and 4 longitudinal rows of large papillae on dorsum. Dorsal cirri present on all setigers, each small and globular, ventral cirri digitiform as long as parapodial rami. Compound setae with short unidentate, recurved blades, minute spines on concave edge, a simple curved superior seta present in all parapodia.

Remarks. This is the first record of this species from Australia, although Hutchings and Rainer (1979) recorded a similar form as *S.* nr. *semiverrucosa* from Careel Bay, Pittwater.

Habitat. Found in muddy sediments at 5–6 m depth in salinities of 33.8–36.4‰.

Occurrence. Rare, collected in Hawkesbury R., off Green Point, in November, 1977 and at Brooklyn in May, 1980.

Australian distribution. New South Wales (Hawkesbury R.*).

Sphaerosyllis sp.

Material examined. *New South Wales:* Hawkesbury R., Waratah Bay, Cowan Creek, 2(W.196616).

Description. Small colourless worms, 1–2 mm in length. Body surface smooth. Palps fused for basal half. Prostomium with three small antennae and three pairs of eyes. Single pair of tentacular cirri. Dorsal cirri flask-shaped present from setiger 2. Setae include compound long-bladed unidentate falcigers and one superior simple seta.

Remarks. These specimens may represent an undescribed species, but we have insufficient material to give a detailed description.

Habitat. Subtidal, 5 m in sandy mud in 35‰ salinity.

Occurrence. Rare.

Syllides longocirrata Oersted, 1845

Syllides longocirrata.—Haswell, 1920b: 102.—Fauvel, 1923: 248, fig. 108 a–g.—Day, 1967: 259, fig. 12.7 a–d.

Material examined. *New South Wales:* Hawkesbury R., 13-1-1, 1(W.196657), 13-2-1, 3(W.196658), 13-2-1, 21(W.196659).

Description. Small colourless worms, 1–2 mm long, with 12 setigers. Palps very reduced, fused at base. Prostomium with three smooth antennae and three pairs of eyes. Two pairs of smooth tentacular cirri. Pharynx very short with ten terminal papillae, teeth absent. Dorsal cirri easily lost, on setiger 3 compact, following ones elongate, anterior dorsal cirri smooth, subsequent ones articulated. Ventral cirri larger than parapodia. Setae include superior simple thick curved acicular setae and heterogomph unidentate falcigers. Shaft of falciger with split base. Blades of falcigers varying in length.

Remarks. The material is not in good condition.

Habitat. Collected from sandy mud and sand in salinities of 8–35‰.

Occurrence. Rare.

Australian distribution. Western Australia, Victoria (Port Phillip Bay), New South Wales (Sydney region).

Syllis gracilis Grube, 1840

Syllis gracilis.—Haswell, 1920b: 97, Pl. x, fig. 15.—Augener, 1927: 148–150.
Syllis longissima.—Fauvel, 1917: 188–189, fig. xii a–e.

Material examined. *New South Wales:* Botany Bay, Bonna Pt, 22-i-75, 1(W.18971); Broughton I., 11-v-78, 1(W.18522). Queensland, Brisbane R., 1963, 6(W.19087).

Description. Body slender, up to 35 mm in length. Anterior segments with 2 transverse pigmented bars. Palps separate. Four eyes. Three stout antennae with 8–12 joints. Pharynx with single anterior dorsal tooth. Proventriculus from setiger 10–14. Dorsal cirri stout, strongly jointed, decreasing in length posteriorly. Anterior setae compound and bidentate, replaced in middle setigers with 2–3 stout Y-shaped simple setae formed by loss of blades of compound setae. Slender compound setae again present in posterior setigers.

Habitat. Seagrass or kelp habitats.

Occurrence. Rarely collected.

Australian distribution. South Australia, New South Wales (Botany Bay*, Sydney region, Broughton I.*), Queensland (Moreton Bay).

Typosyllis armillaris (Müller, 1776)

Syllis (*Typosyllis*) *armillaris.*—Day, 1967: 249, fig. 12.4 a–d.
Syllis hyalina.—Fauvel, 1917: 193–194. *Non* Grube.

Material examined. *New South Wales:* Pambula, 25-vii-75, several (W.15809); Merimbula, 24-vii-75, several (W.15808); North Head, 20-ii-73, 1(W.6413); Hawkesbury R., D2–1, 1(W.196416), D2–2, 1(W.196417), D2–3, 2(W.196418).

Description. Body up to 25–35 mm in length. Palps not fused, large. Prostomium with 2 pairs of eyes. Pharynx with a single anterior dorsal tooth. Antennae and tentacular cirri elongated and jointed. Dorsal cirri short, stout and with 8–12 joints. All setae compound, with short, often unidentate blades but a small secondary tooth may be present in setae from anterior and posterior parapodia, which have longer blades.

Habitat. Intertidal to 20 m, on rocky shores, *Posidonia* seagrass beds; and in shelly mud.

Occurrence. Rare; few specimens found in Hawkesbury R., in December 1979, May 1980.

Australian distribution. Western Australia, South Australia, Victoria, New South Wales (Eden, Pambula*, Merimbula*, Sydney region, Hawkesbury R.*).

Typosyllis prolifera Krohn, 1852

Syllis (*Typosyllis*) *zonata* Augener, 1913: 195, Pl. 3, fig. 22, text-fig. 21.
Syllis (*Typosyllis*) *prolifera.*—Fauvel, 1923: 261, fig. 97 a–g.—Day, 1967: 248, fig. 12.3 g–l.

Material examined. *New South Wales:* Hawkesbury R., 14-1-4, 1(W.196660).

Description. Body small, complete, 4 mm long and 1 mm wide. Anterior segments with black pigmentation, intensity of pigmentation decreasing gradually posteriorly. Palps globular and completely separate. Three antennae, median one the longest. Pharynx with a single anterior tooth. Dorsal cirri with about 20 joints, curled over dorsum. Setae include a single superior simple seta per parapodium from setiger 16, plus compound falcigerous setae. Blades of compound setae decreasing in length posteriorly, head of shaft swollen and blades with bidentate tips.

Remarks. Our only reservation on the identification of this species is that our single specimen has fairly intense solid pigmentation anteriorly rather than transverse pigment bars.

Habitat. Fine clean sand in 4 m water depth.

Occurrence. Rare.

Australian distribution. Western Australia, New South Wales (Sydney region).

Typosyllis variegata (Grube, 1860)

Syllis (*Typosyllis*) *variegata.*—Augener, 1913: 206–207; 1922a: 23.
Typosyllis variegata.—Hutchings & Rainer, 1979: 752.

Material examined. *New South Wales:* Jervis Bay, Murray's Bch, 25-iv-72, 1(W.194517); Botany Bay, Silver Bch, Kurnell, 12-x-81, 1(W.194915), Bonna Pt, 22-i-75, 3(W.18850); Careel Bay, 6-ix-73, 1(W.11108); Hawkesbury R., 14-1-4, 1(W.196661).

Remarks. Agrees well with Hutchings and Rainer's (1979) description. The specimen from the Hawkesbury lacks any pigment and from setiger 18 a single acicular seta is present. This may represent another species but in all other respects it agrees with *T. variegata.*

Habitat. Intertidal *Zostera* seagrass beds.

Occurrence. Rare.

Australian distribution. Western Australia, New South Wales (Jervis Bay*, Botany Bay*, Port Jackson, Careel Bay).

Family NEREIDIDAE Johnston

Elongated worms with numerous segments. Two, rarely one, antennae; palps biarticulated. Two or four pairs of tentacular cirri. Eversible pharynx with jaws and often ornamented with chitinous paragnaths or soft papillae. Parapodia typically biramous, usually with complex flattened lobes and cirri. Setae compound or simple, spinigerous or falcigerous.

Key to the Species of Nereididae after Hutchings & Turvey, 1982

1. Ventrum of anterior setigers (7–30) with rows of papillae ..... *Australonereis ehlersi*

— Ventrum of anterior setigers smooth 2

2. Chitinous paragnaths on both oral and maxillary ring or only on one ring of pharynx, papillae absent from either ring 3

— Chitinous paragnaths only on maxillary ring, soft papillae on oral ring of pharynx..... *Leonnates stephensoni*

3. Chitinous paragnaths all pectinate rows with many minute, fused points .... *(Platynereis)* 4

— Chitinous paragnaths not as above 5

4. Notopodia with simple, heavy hooks in median and posterior setigers; VII and VIII with a continuous narrow band of pectinae ..... *P. bicanaliculata*

— Notopodia without simple, heavy hooks in median and posterior setigers; VII and VIII with 5 small groups of minute pectinae ..... *P. dumerilii antipoda*

5. Notopodia posteriorly with homogomph falcigers 6

— Notopodia without homogomph falcigers 9

6. Prostomium deeply divided between antennae ..... *Ceratonereis mirabilis*

— Prostomium not as above 7

7. Pale, slender notopodial homogomph falcigers present from setiger 3 .... *Nereis cockburnensis*

— Notopodial homogomph falcigers appearing later 8

8. Area III of pharynx bare, rarely with a single cone, oral ring of pharynx with sparse paragnaths ..... *Nereis bifida*

— Area III of pharynx with transverse row of cones, oral ring of pharynx bare ..... *Nereis maxillodentata*

9. Middle and posterior neuropodia with giant simple hooks above aciculum 10

— Simple hooks absent 12

10. Oral ring of pharynx with paragnaths ..... *Neanthes uncinula*

— Oral ring of pharynx bare ..... *(Ceratonereis)* 11

11. Posterior ventral neuropodial lobe well developed ..... *C. limnetica*

— Posterior ventral neuropodial lobe reduced to a small tubercle .... *C. pseudoerythraeensis*

12. Paragnaths in area IV conical i.e. with circular base, or absent 13

— Paragnaths in area VI elongate transverse bars or a transverse series of short bars which may be pointed but with rectangular base 15

13. Notopodia with prominent foliaceous lobe in middle and posterior segments . ..... *Neanthes oxypoda*

— Notopodia without prominent foliaceous lobe 14

14. Areas V, VI, VII, VIII continuous band, five deep ventrally, two deep dorsally ..... *Neanthes cricognatha*

— Area V with three cones in a triangle , occasionally only two or with a few extra but not in a longitudinal series ..... *Neanthes vaalii*

15. Paragnaths in area VI numerous short, transverse bars in transverse series ... . *Perinereis nuntia*

— Paragnaths in area VI forming a single transverse bar ..... *Perinereis barbara*

Australoneres ehlersi (Augener, 1913)

Nereis (Leonnates) ehlersi Augener, 1913: 142–145, pl. 3.
Australonereis ehlersi.—Hartman, 1954: 19–23, figs 1–11. —Hutchings & Rainer, 1979: 752–753.

Material examined. *New South Wales:* Lake Merimbula, 3-xii-75, 1(W.12170); Botany Bay, Towra Pt, 10-ii-81, 4(W.195038); Hawkesbury R., 3-2-1, 1(W.196489), 4-1-2, 2(W.196490), 9-2-1, 1(W.196493).

Remarks. Agrees well with the published descriptions.

Habitat. In salinities of 5–37‰, sediments of muddy sand, also sand flats (fine to coarse-grained).

Occurrence. Frequently abundant at Transects 7 & 9, at Brooklyn, and in Cowan Waters, in all seasons; widespread in all New South Wales estuaries.

Australian distribution. Western Australia, South Australia, Victoria, New South Wales, Queensland.

Ceratonereis limnetica Hutchings & Glasby, 1982

Ceratonereis limnetica Hutchings & Glasby, 1982: 515–519, fig. 1 a–e.

Material examined. *New South Wales:* Hawkesbury R., 9-1-1, 3(W.194626), 9-1-2, 2(W.194629), 9-2-2, 4(W.194635), 9-2-3, 10(W.194636). A selection of material examined.

Remarks. Hawkesbury River is the type locality of this species. Many other upstream areas in New South Wales have been sampled but no specimens of *C. limnetica* have yet been found.

Habitat. Found in fine to coarse sand, in salinities of 0–23‰.

Occurrence. Abundant in all seasons (not every year) in Hawkesbury R., from Transects 9–14.

Australian distribution. New South Wales (upper reaches of Hawkesbury R.).

Ceratonereis mirabilis Kinberg, 1866

Ceratonereis mirabilis.—Hutchings & Rainer, 1979: 753–754.— Hutchings & Turvey, 1982: 98.

Material examined. *New South Wales:* Lake Merimbula, 13-xii-77, 3(W.19252); Jervis Bay, Murray's Bch, 25-iv-72, 1(W.194477); Port Hacking, Costens Pt, 15-v-75, 1(W.9420); Botany Bay, Towra Pt, 4-vi-77, 1(W.12285); Lake Macquarie, 2(W.194010); Port Stephens, Research Pt, 27-vii-76, many (W.12484, W.12512). A selection of material examined.

Remarks. Agrees well with the description by Hutchings & Turvey (1982).

Habitat. Seagrass beds, and rocky substrates in estuarine aras.

Occurrence. Commonly present in low numbers, in most New South Wales estuaries.

Australian distribution. Western Australia, South Australia, New South Wales, Queensland.

Ceratonereis pseudoerythraeensis Hutchings & Turvey, 1982

Ceratonereis pseudoerythraeensis Hutchings & Turvey, 1982: 98–101, fig. 2a–e.
Ceratonereis erythraeensis.—Hutchings & Rainer, 1979: 753. *Non* Fauvel.

Material examined. *Victoria:* Mallacoota Inlet, 26-iv-75, many (W.195113-5). *New South Wales:* Botany Bay, Towra Pt, 12-ii-81, (W.195067); Hawkesbury R., Brooklyn, 6-ix-75, many (W.7900-09); Broken Bay, Box Head, 11-iv-81, 2(W.19346).

Remarks. Agrees well with the description by Hutchings & Turvey (1982). *Ceratonereis pseudoerythraeensis* is currently under revision by Hutchings & Glasby, and will be published subsequently in the Records of the Australian Museum.

Habitat. In salinities of 34‰ in sediments of mud with shell and also in sublittoral weed holdfasts (Box Head); on sandy flats and in muddy sands.

Occurrence. Common, at Brooklyn only in September 1975, and at Box Head, Broken Bay in April 1981, but widespread in estuarine areas.

Australian distribution. Western Australia, South Australia, Victoria (Mallacoota Inlet*), New South Wales (Botany Bay*, Hawkesbury R.*), Queensland (Frazer I.*, Calliope R.*).

Leonnates stephensoni Rullier, 1965
Fig. 11.1–4

Leonnates stephensoni Rullier, 1965: 174–177, fig. 4 a–i.

Material examined. *New South Wales:* Hawkesbury R., 1-1-4, 12-i-77, 1(W.196445), 1-3-2, 7-v-79, 1(W.196446), 1-3-4, 7-v-79, 1(W.196447), 2-2-2, 3-xi-77, 1(W.196448), 2-2-2, 7-v-79, 1(W.196449).

Description. Colourless, but with prominent glands in dorsal cirri and notopodial supra-acicular lobes. Prostomium longer than wide with long glandular palps, 2 long antennae, 4 pairs of tentacular cirri, basal and medio-dorsal pairs extend to setiger 17, others much shorter. Two pairs of eyes, anterior pair reniform, posterior spherical. Pharynx with very pale conical paragnaths arranged as follows: I = 0, II = 2, III = 0, IV = 2-3, V = 3 small papillae, VI = 2 papillae, VII–VIII = about 20 papillae irregularly arranged. Segment 1 achaetous, setiger 2 uniramous, subsequent ones biramous. Parapodia with triangular lobes all approximately the same length. Anterior parapodia with digitiform dorsal cirrus, notopodial supra-acicular triangular lobe with expanded globular base, setal lobe short and subacicular lobe flail-shaped. Neuropodia with bifid triangular supra-acicular lobe and flail-shaped subacicular lobe. Ventral cirrus digitiform (Figs 11.1–2). Middle parapodia with expanded notopodial supra-acicular lobe, neuropodial supra-acicular lobe U-shaped from which dorsal fascicle of setae emerge, subacicular lobe flail-shaped. Ventral and dorsal cirri become

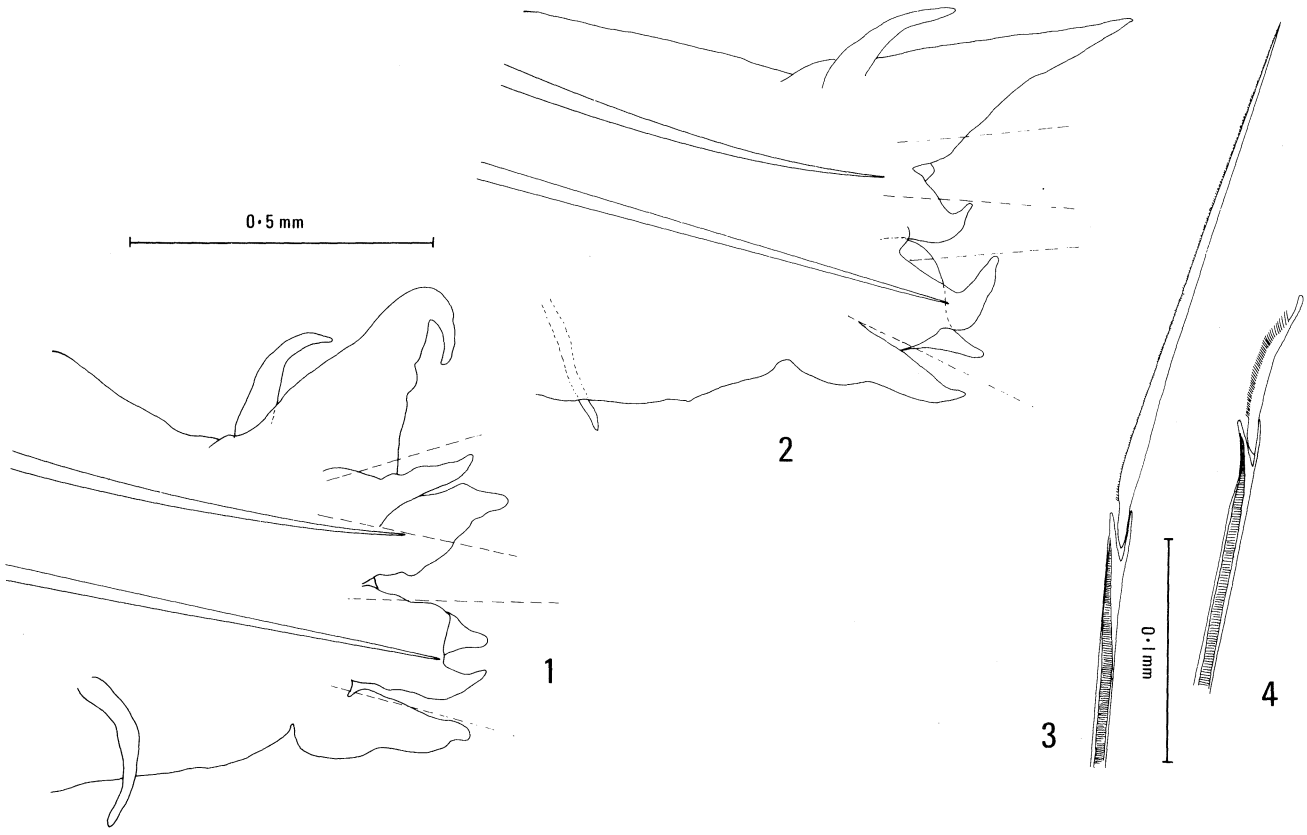

Fig. 11. *Leonnates stephensoni* (W.196449): *1.* parapodium 15, anterior view; *2.* parapodium 15, posterior view; *3.* superior neuroseta; *4.* inferior neuroseta.

thinner and more cylindrical posteriorly.

Aciculae black, setae all homogomph, of 2 types, most spinigers with blades finely denticulate (Fig. 11.3), and spinigers with shorter broader blades strongly denticulate with terminal rectangular projection (Fig. 11.4), number of denticles reduces progressively towards pygidium. The first kind of spinigers restricted to notopodia and dorsal fascicle of neuropodia.

Remarks. First record from New South Wales, previously only known from Moreton Bay, Queensland.

Habitat. Muddy sediments in 4–10 m in salinities of 34–39‰.

Occurrence. Rare, only 5 specimens collected in 1977 in January and November, and in May 1979, at Transects 1 & 2.

Australian distribution. New South Wales (Hawkesbury R.*), Queensland (Moreton Bay).

Neanthes cricognatha Ehlers, 1904

Neanthes cricognatha.—Hutchings & Turvey, 1982: 110–111.

Material examined. *New South Wales:* Jervis Bay, Murray's Basin, 17-x-72, 9(W.194577); Botany Bay, Kurnell, 10-v-72, several (W.196143); Port Stephens, Shoal Bay, Aug. 1976, several (W.196144-5); Broughton I., 1-ix-76, many (W.13136).

Remarks. As described by Hutchings & Turvey (1982).

Habitat. Sand and *Posidonia* seagrass beds.

Occurrence. Rare, but widespread in New South Wales.

Australian distribution. Western Australia, South Australia, Victoria, New South Wales, Queensland.

Neanthes oxypoda (Marenzeller, 1879)
Fig. 12.1–6

Nereis oxypoda.—Izuka, 1911: 171–173.—Monro, 1938: 614-617, figs 1–5.
Neanthes oxypoda.—Hartman, 1954: 19.

Material examined. *New South Wales:* Port Hacking, Dec. '74, 1(W.195222, W.195244, W.195305), Hawkesbury R., D2-2, 1(W.196461), D2-3, 2(W.196462), D4-3, 1(W.196463); Lake Macquarie, Jan. '78, 2(W.17830).

Description. Anterior body broad and slightly flattened, tapers posteriorly. Prostomium slightly globular with heavy brown pigment, palps with less intense pigmentation. Intense pigmentation continues to about setiger 14, then gradually fades. Two pairs of prostomial eyes on posterior margin of prostomium (Fig. 12.1). Peristomium achaetous. Pharynx with conical separate paragnaths arranged as follows: I =

2 in vertical line, II = elongate obtuse patch of about 14, III = 4, IV = rectangular patch of 15, V = single cone, VI = diamond patch of ~8, VII–VIII = 2–3 continuous rows of irregular sized cones, tendency for basal row to contain smaller cones, and 3 rows mid-ventrally reducing to 2 on either side. Setiger 1 without notosetae or aciculum but with long narrow dorsal cirri and notopodial lobe; neuropodium with pre- and postsetal lobes, ventral cirrus and neurosetae. Setiger 2 similar to setiger 1, but notoaciculum present. Setiger 3 with notosetae and development of pre- and post-notosetal lobes. On subsequent setigers, notopodia consists of 3 elongate triangular lobes (all similar in length) and narower dorsal cirrus. From setiger 7, slight expansion at base of dorsal cirrus occurs (Fig. 12.2), and by setiger 16 this lobe is developed into a prominent lobe; by middle segments becomes large, foliaceous and triangular (Fig. 12.3). In far posterior segments this lobe and superior notopodial lobe fuse basally to form bifid structure (Fig. 12.4). Neuropodia change little along body. All setae homogomph spinigers (Figs 12.5–6).

Remarks. Monro (1938) assumed that the large foliaceous lobe was branchial in function, yet no blood vessels are visible. Monro also suggested that the species was an estuarine or brackish water species. Our material was found in salinities of 33.8–35.8‰ and appears to have a very restricted range in New South Wales, which suggests that factors other than salinity determine its distribution. First record from eastern Australia,

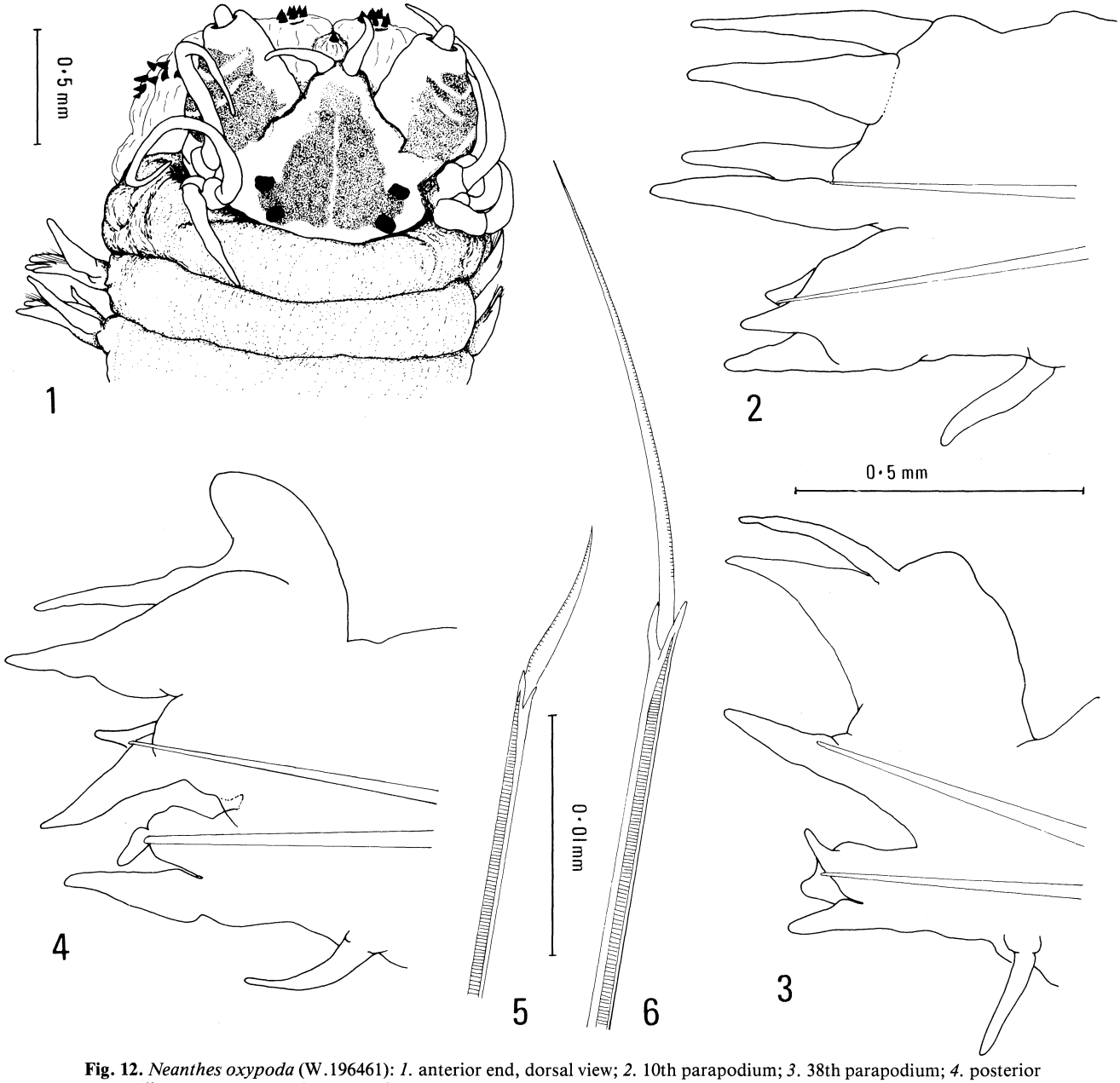

Fig. 12. *Neanthes oxypoda* (W.196461): *1.* anterior end, dorsal view; *2.* 10th parapodium; *3.* 38th parapodium; *4.* posterior parapodium; *5.* neuroseta from anterior parapodium; *6.* notoseta from posterior parapodium.

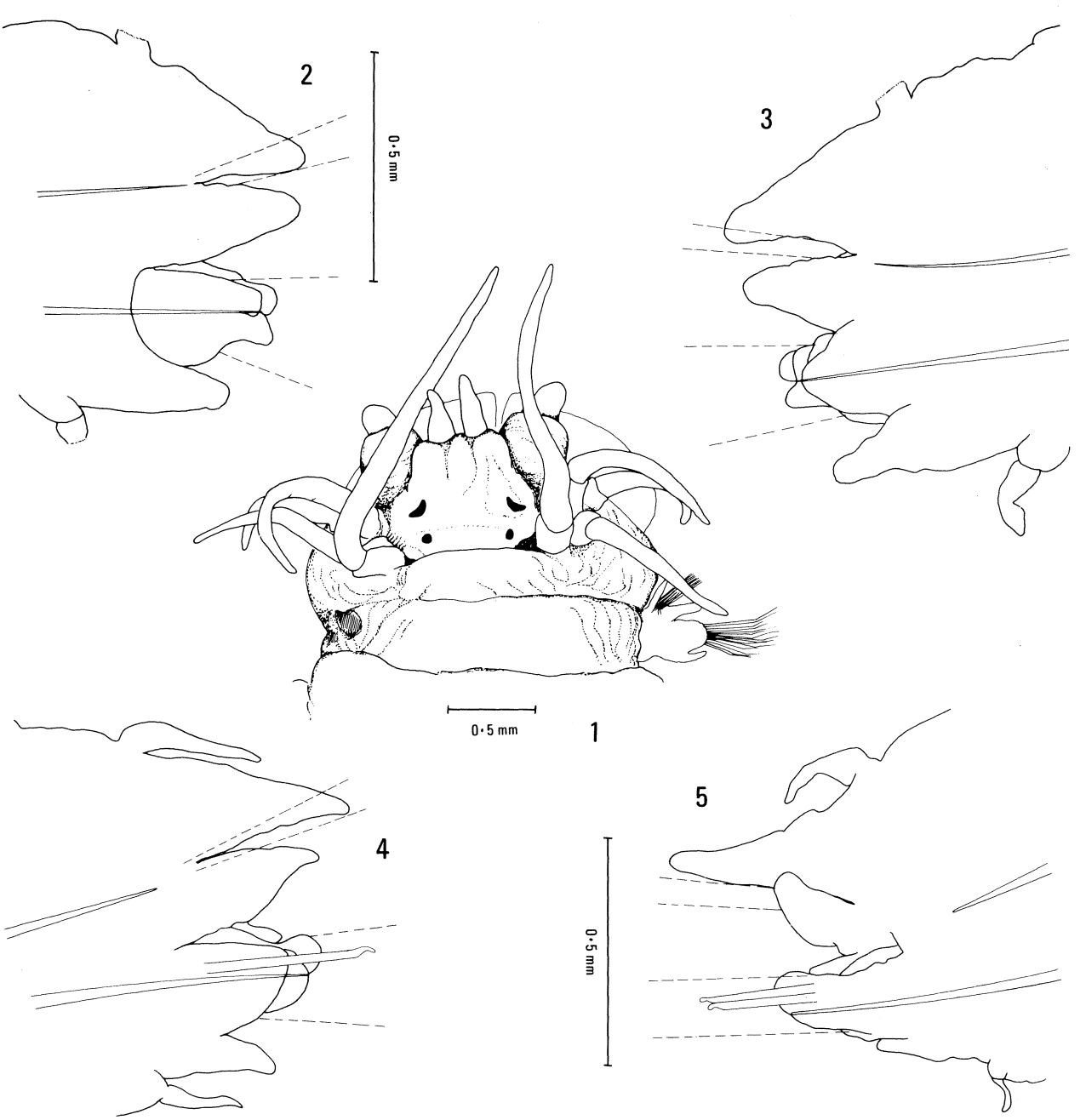

Fig. 13. *Neanthes uncinula* (Neotype QMG 3957): *1.* anterior end, dorsal view; *2.* anterior parapodium, posterior view; *3.* anterior parapodium, anterior view; *4.* middle parapodium, posterior view; *5.* middle parapodium, anterior view.

previously only known in Australia from Swan River, Perth.

Habitat. Mud with shell at depths of 5–6 m, in salinities of 33.8–35.8‰.

Occurrence. Rare; collected only in May and August, 1980 at Brooklyn. First record from New South Wales.

Australian distribution. Western Australia (Swan R.), New South Wales (Port Hacking*, Hawkesbury R.*, Lake Macquarie*).

Neanthes uncinula Russell, 1962
Figs 13.1–5; 14.1–5

Neanthes uncinula Russell, 1962: 8–10, figs 2–8.—Rullier, 1965: 178–181, fig. 6 a–c.

Material examined. *New South Wales:* Botany Bay, Oct. '62, 2(W.4773); Hawkesbury R., Cowan Waters, Waratah Bay, 3-x-80, 1(W.194698); Lake Macquarie, 18-ix-53, many (W.4780); Wallis Lake, 23-v-68, 2(W.4210, W.4217). *Queensland:* Dunwich, Moreton Bay, intertidal, NEOTYPE (QMG 3957) id. Rullier; Sandgate (QMG 3956), Deception Bay (QMG 5535), Serpentine Creek, Cribb I. (QMG 7521, QMG 7563), Golden Bch, Caloundra (QMG 5536).

Description. *Neotype*: 70 mm long, 25 mm wide anteriorly, posteriorly incomplete with 137 setigers. Alcohol-preserved animal colourless except for prominent, darkly-pigmented glandular areas at bases of dorsal cirri. Bluntly triangular prostomium with 2 pairs of faded eye spots, anterior pair semi-circular, posterior pair spherical; pair of bulbous palps with small globular palpostyles. Four pairs of tentacular cirri, 3rd pair longest extending to posterior margin of setiger 3 (Fig. 13.1).

Pharynx with pair of dark brown jaws and pale brown conical paragnaths arranged as follows: I = 0, II = 10–20 cones in 3 rows, arranged in inverse acute angled triangle, III = irregular transverse row of 18, IV = 30 in inverted triangle, V = 0, VI = 0, VII–VIII = 3 transverse rows of 8–10 widely spaced cones. Peristomium achaetous.

Anterior parapodia (Figs 13.2–3) with digitiform dorsal cirrus slightly swollen at base; notopodia with equal sized bluntly triangular supra- and subacicular lobes; acicular lobes small, rectangular. Neuropodium with broadly based, blunt-tipped supra-acicular lobe; subacicular lobe thick, digitiform; acicular lobe small, rounded; ventral cirrus narrow, cylindrical. In median parapodia (Figs 13.4–5), neuropodial lobes shorter than notopodial lobes, and subacicular lobes become basally swollen. Notopodial lobes remain triangular and equal in size, dorsal cirrus becomes shorter progressively. Posteriorly, both lobes still large, triangular and subequal in size; subacicular neuropodial lobe reduced to small triangular lobe (Figs 14.1–2).

Acicular dark brown. Notosetae all homogomph spinigers with faintly denticulate blades. Neurosetae with supra-acicular fascicle of homogomph spinigers with denticulate blades (Fig. 14.3); subacicular fascicle with unidentate heterogomph falcigers (Fig. 14.4) and hetero- and homogomph spinigers. From setiger 35, 1–2 large, simple unidentate hooks present in supra-acicular fascicle of neuropodia (Fig. 14.5).

Remarks. Russell (1962) clearly states that the holotype is deposited in the Queensland Museum although no registration number was given. Extensive searches at the Queensland Museum have not located the type and it seems likely that the material was never taken from the Zoology Department, University of Queensland to the Queensland Museum (Russell, pers. comm.) and no trace of it exists in the Zoology Department. For these reasons a neotype of *Neanthes uncinula* has been designated (QMG 3957) which was collected from the type locality, Dunwich, Moreton Bay.

Habitat. Shallow protected sandy beaches, in marine salinities.

Occurrence. Rare; single individual found in Hawkesbury R. First record for New South Wales.

Australian distribution. New South Wales (Botany Bay*, Hawkesbury R.*, Lake Macquarie*, Wallis Lake*), Queensland (Moreton Bay, Caloundra).

Neanthes vaalii Kinberg, 1866

Neanthes vaalii.—Hutchings & Rainer, 1979: 754–755.—

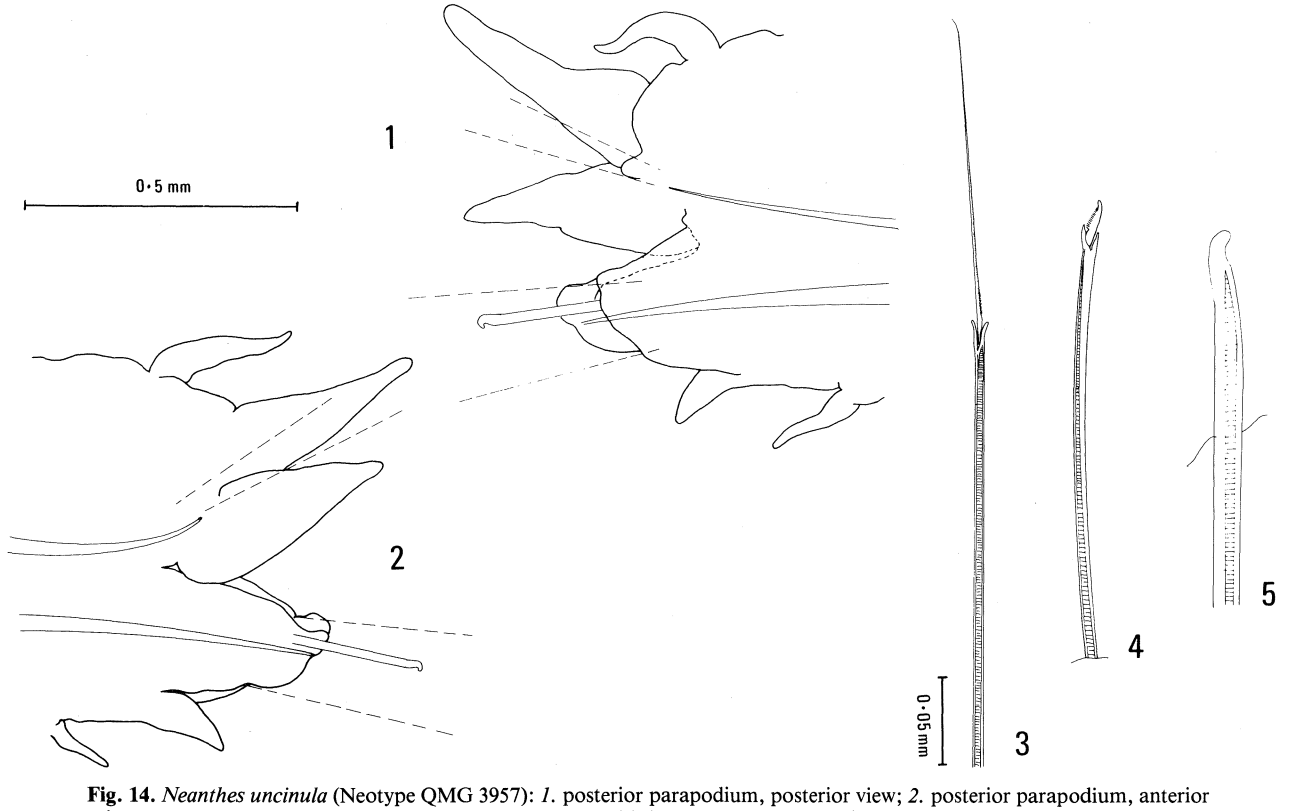

Fig. 14. *Neanthes uncinula* (Neotype QMG 3957): *1.* posterior parapodium, posterior view; *2.* posterior parapodium, anterior view; *3.* notoseta, middle parapodium; *4.* neuroseta, middle parapodium; *5.* hook, middle parapodium.

Hutchings & Turvey, 1982: 116.

Material examined. *New South Wales:* Merimbula, Dec. '75, Mar. '76, many (W.15765-67); Botany Bay, Woolaware Bay, 22-ii-72, 2(W.18503), Towra Pt, 10-ii-81, 1(W.195044); Port Jackson (W.4778-79); Hawkesbury R., 1-1-4, 21-ii-78, 1(W.19347).

Remarks. Agrees with the published descriptions. Posterior dorsal cirri and adjacent body wall very glandular.

Habitat. Found in mud at 4 m depth in salinity of 31.8‰.

Occurrence. Widespread in New South Wales estuaries. Rare in Hawkesbury R., only in February, 1978 at Station 1-1. In Botany Bay associated with *Avicennia* mangroves.

Australian distribution. Western Australia, South Australia, Tasmania, New South Wales, Queensland (Hervey Bay*).

Nereis bifida Hutchings & Turvey, 1982

Nereis bifida Hutchings & Turvey, 1982: 116-119, fig. 9 a-c.

Material examined. *New South Wales:* Jervis Bay, Murray's Bch, Apr. '72, 2(W.194233).

Remarks. Typical. Agrees with the original published description.

Habitat. Seagrass beds.

Occurrence. Uncommon. First record from New South Wales.

Australian distribution. South Australia, New South Wales (Jervis Bay*).

Nereis cockburnensis Augener, 1913

Nereis cockburnensis Augener, 1913: 153-156, pl. 3. fig. 47. text figs 15 a-c.—Hutchings & Turvey, 1982: 121-124, fig. 4b.

Material examined. *New South Wales:* Broken Bay, Box Head, 11-iv-81, 4(W.19351).

Remarks. Agrees well with description given by Hutchings & Turvey (1982).

Habitat. Found among *Phyllospora* fronds, low intertidal zone.

Occurrence. Rare; collected in April 1981; previously only recorded from Port Jackson and Manly in New South Wales.

Australian distribution. Western Australia, South Australia, Victoria, New South Wales (Sydney region, Broken Bay*).

Nereis maxillodentata Hutchings & Turvey, 1982

Nereis maxillodentata Hutchings & Turvey, 1982: 130-132, fig. 14 a-c.

Nereis jacksoni.—Augener, 1927: 130-133.—Hartman, 1954: 31, text figs 26-29 (in part). *Non* Kinberg.

Material examined. *Victoria:* Corner Inlet, 30-iv-77, 1(W.13636). *New South Wales:* Jervis Bay, Hare Bay, 18-x-72, 7(W.17457); Broken Bay, Box Head, 11-iv-81, 1(W.19352); Botany Bay, Towra Bch, 12-iv-73, many (W.9647, W.9681, W9819); Port Stephens, Shoal Bay, Aug. '78 1(W.12896); Broughton I., 1-ix-76, 1(W.14982).

Description. Pharynx with paragnaths arranged as follows: I = 0, II = 4–6 in double oblique row with larger cones medially, III = 4 in single transverse row, IV = 8–10 irregularly arranged in elongate, oblique triangular patch; oral ring bare. Notosetae initially homogomph spinigers, then replaced by homogomph falcigers. Neurosetae in dorsal fascicle homogomph spinigers and heterogomph falcigers, and in ventral fascicle heterogomph spinigers and falcigers. Homogomph falcigers from setiger 18 with large subterminal tooth similar in size to terminal tooth, making appendage effectively bifid; up to 3–4 much smaller teeth present basally.

Remarks. This species of *Nereis* is unusual in lacking paragnaths on the oral ring but the development of the setae, especially the homogomph falciger, clearly places the species within *Nereis* and within the *"N. jacksoni"* complex. For further discussion see Hutchings & Turvey (1982).

Habitat. Found among *Phyllospora* fronds and *Posidonia* seagrass beds, low intertidal zone.

Occurrence. Single specimen collected in April 1981, off Box Head, Broken Bay.

Australian distribution. Victoria (Corner Inlet*), New South Wales (Jervis Bay*, Sydney region, Port Stephens*, Broughton I.*), Queensland (Port Molle).

Perinereis barbara Monro, 1926

Perinereis barbara Monro, 1926: 316-317, figs 3-5.

Material examined. *New South Wales:* Lake Merimbula, 23-vii-75, 6-x-75, 2/4-xii-75, 16-iii-76, many (W.15769-74); Bermagui, 25-v-60, 2(W.4798); Broken Bay, Box Head, 11-iv-81,. many (W.19353-6).

Description. Prostomium and anterior segments faintly pigmented, bluntly triangular with 2 pairs of discrete eyes at the base on the lateral margins; antennae bluntly pointed; large, swollen palps with large, globular palpode. Pharynx with conical paragnaths and solid bars, arranged as follows: I = 3 in triangle, II = triangular patch of about 12 cones, III = a small patch of about 9 cones, IV = a large crescentic group, V = a longitudinal row of 4 cones, VI = single transverse bar, VII–VIII = 3–4 rows of paragnaths reduced to 2 rows at sides. Setigers 1–2 uniramous; setiger 3 and all subsequent ones biramous. All setigers with well developed elongate dorsal cirri. Anterior setigers with short, triangular bluntly rounded parapodial lobes. Middle setigers with supra-acicular notopodial lobe thicker and longer than subacicular lobe; neuropodial lobes similar in size. Posteriorly, dorsal cirrus and supra-acicular lobe; neuropodial lobes smaller than noto-

podial, with supra-acicular lobe becoming flattened. Notosetae all homogomph spinigers; neurosetae heterogomph falcigers unidentate and short-bladed, and hetero- and homogomph spinigers with long smooth blades.

Remarks. The species has not been reported since Monro's (1926) original description of material from Port Jackson.

Habitat. Amongst *Pyura* and algal holdfast in salinity of 35‰.

Occurrence. Rare; few specimens collected, no seasonal preference shown.

Australian distribution. New South Wales, (Merimbula*, Bermagui*, Port Jackson, Hawkesbury R.*).

Perinereis nuntia Savigny, 1822

Lycoris nuntia Savigny, 1822: 33.
Perinereis nuntia.—Fauvel, 1932: 108-111.—Hutchings & Turvey, 1982: 139-140.
Perinereis vallata.—Hartman, 1954: 35. *Non* Grube.

Material examined. *New South Wales:* Lake Merimbula, 5-x-75, 2(W.15775); Botany Bay, Woolaware Bay, 22-ii-72, 1(W.18506); Hawkesbury R., D2-2, 1-viii-79, 1(W.19359), Cowan Waters, Waratah Bay, 3-x-80, 2(W.19357), Bay A, 6-1, 4-x-80, 1(W.19358).

Description. Anterior prostomium pigmented. Pharynx with paragnaths arranged as follows: I = 0–2 cones, II = 6–12 occasionally as few as 3 cones in triangular patch, III = 7–30 cones arranged in transverse oval or rectangular patch, often with 1–3 separated on either side of main patch, IV = 20–34 cones in crescent, V = 1–2 cones arranged longitudinally at the same level as, or slightly posterior to, rows of bars in VI, VI = 7–15, rarely as few as 5 short, low to pointed bars arranged in a transverse arc, VII–VIII = 2 irregular rows of large and slightly smaller cones tapering to 1 row at sides.

Remarks. See Hutchings & Turvey (1982) for comments concerning the synonymizing of various subspecies with the stem species *P. nuntia.*

Habitat. At Brooklyn, in mud with much shell and detritus in water of 7 m depth; in Cowan Waters, in sandy mud at 1–2 m depth water. Salinities of 35‰.

Occurrence. Rare; previously only recorded from Sydney region, and from Twofold Bay. Collected in winter and summer months.

Australian distribution. Western Australia, South Australia, Victoria, New South Wales, Queensland.

Platynereis bicanaliculata (Baird, 1863)

Platynereis bicanaliculata.—Hartman, 1954: 36–39, fig. 38–39.

Material examined. *New South Wales:* Botany Bay, Towra Pt, 17-i-75, 1(W.19033), Kurnell 25-v-75, 1(W.7952); Port Jackson, Feb. '10, several (W.68, W.70, W.85, W.94).

Description. Pharynx with paragnaths arranged as follows: I, II and V bare, III = broad oval patch, IV = broad crescent of 7–10 irregular rows, VI = 2–3 rows of pectinae, VII–VIII = continuous, 5 transverse rows of pectinae with faint indication of 2 additional rows at ends proximal to VI. From setiger 12–13, 1–2 dark brown, simple, bifid notopodial hooks; neurosetae all compound falcigers.

Habitat. *Posidonia* seagrass beds.

Occurrence. Rare.

Australian distribution. New South Wales (Port Hacking, Botany Bay*, Port Jackson).

Platynereis dumerilii antipoda Hartman, 1954

Platynereis dumerilii antipoda Hartman, 1954: 35–36, figs 33–37.—Hutchings & Rainer, 1979: 757–758.

Material examined. *New South Wales:* Lake Merimbula, 5-x-75, several (W.12666, W.18681); Jervis Bay, Murray's Basin, 17-x-72, 8(W.194574); Broken Bay, Box Head, 11-iv-81, many (W.19349-50); Hawkesbury R., Cowan Waters, Bay A, 4-x-80, 4(W.19348); Port Stephens, Shoal Bay, Aug. '76, 2(W.196146).

Remarks. Agrees well with previous descriptions. Variety of sizes of individuals at the one site, ranging from 4 mm to incomplete specimens 15 mm in length. No mature individuals found.

Habitat. In algal clumps at salinities of 35‰.

Occurrence. Widespread in marine areas of Australian estuaries.

Australian distribution. Western Australia, South Australia, Tasmania, New South Wales, Queensland.

Family NEPHTYIDAE Grube

Long slender worms, quadrangular in cross section. One pair of antennae and one pair of very short palps present. Eversible pharynx with numerous papillae and a pair of lateral jaws. Parapodia biramous, both rami well developed with complex pre- and postsetal lobes. All setae simple. Interramal, respiratory cirri present in most species.

For a comprehensive survey of nephtyids reported from Australia see Hutchings & Rainer, 1977.

Key to the Species of Nephtyidae

1. Interramal cirri rudimentary or absent ..... *Micronephthys sphaerocirrata*
—— Interramal cirri well developed, recurved or involute 2
2. Interramal cirri recurved ..... *(Nephtys)* 3
—— Interramal cirri involute ..... *Aglaophamus verrilli*
3. Prostomium expanded anteriorly, resembling a shield; long flowing setae ..... *N. longipes*
—— Prostomium not expanded anteriorly ; setae short 4
4. Branchiae recurved, from setiger 4; pharynx with 22 longitudinal rows of papillae and a single median papilla ..... *N. australiensis*
—— Branchiae recurved, from setiger 5; pharynx with 20 longitudinal rows of papillae and no single median papilla ..... *N. inornata*

Aglaophamus verrilli (McIntosh, 1885)

Nephtys verrilli McIntosh, 1885: 163–164, Pl. 26, fig. 6, 7, Pl. 32a, fig. 8.
Aglaophamus verrilli.—Paxton, 1974: 199, fig. 1.—Hutchings & Rainer, 1977: 316–320, figs 7–11, 41: Table 3.

Material examined. *New South Wales:* Hawkesbury R., 1-3-2, 13-xi-79, 1(W.196460).

Remarks. Typical; fits Hutchings & Rainer's (1977) description well.

Habitat. Sandy mud, at 10 m depth, in salinity of 34.8‰.

Occurrence. Rare; single specimen found in November, 1979. First record from New South Wales.

Australian distribution. New South Wales (Hawkesbury R.*), Queensland (Moreton Bay, Townsville).

Micronephthys sphaerocirrata (Wesenberg-Lund, 1949)

Nephtys sphaerocirrata Wesenberg-Lund, 1949: 294–296, figs 24–26.
Micronephthys sphaerocirrata.—Rainer & Hutchings, 1977: 320–322, figs 12–16.

Material examined. *New South Wales*: Botany Bay, Towra Pt, 17-i-75, 1(W.19031); Hawkesbury R., Cowan Waters, Waratah Bay, 3-x-80, 1(W.196465), Bay A, 4-x-80, (W.19466), 1-1-1, 11-ii-81, 1(W.196630), 1-1-2, 20-vii-80, 1(W.196631), 1-1-3, 22-ii-80, 1(W.196464), 2-1-2, 18-xi-80, 1(W.196632).

Remarks. Agrees closely with Rainer & Hutchings (1977) description.

Habitat. Collected from Hawkesbury R., in salinities of 30–36‰, in 3–5 m, in sand and muddy sand.

Occurrence. Rare; collected in summer and winter months in very small numbers. First record from New South Wales.

Australian distribution. New South Wales, (Botany Bay*, Hawkesbury R.*), Queensland.

Nephtys australiensis Fauchald, 1965

Nephtys australiensis Fauchald, 1965: 334–335, figs 1–2.—Rainer & Hutchings, 1977: 322–324.—Hutchings & Rainer, 1979: 758.

Material examined. *New South Wales*: Lake Burrill, 6-xii-81, 1(W.195177); Botany Bay, Towra Pt, 10-ii-81, 3(W.195037); Hawkesbury R., 1-1-1, 23-v-78, 5(W.194040), 1-1-2, 14-viii-78, 1(W.194042), 1-1-3, 23-v-78, 3(W.194045), 1-1-4, 8-xi-78, 5(W.194039), 1-3-1, 23-v-78, 2(W.194048), 2-1-4, 21-viii-78, 1(W.194036), 2-2-4, 3-viii-77, 1(W.194035), 7-1-3, 8-xi-78, 2(W.194037), 7-2-3, 8-xi-78, 3(W.194038), 3-1-1, 2-xi-77, 1(W.194071). A selection of material examined.

Remarks. Agrees with the published descriptions.

Habitat. Collected from salinities of 5–39‰, and sediments of fine mud to muddy sand, and fine sand.

Occurrence. Abundant and widespread in New South Wales estuaries in all seasons.

Australian distribution. South Australia, Tasmania, Victoria, New South Wales, Southern Queensland.

Nephtys inornata Rainer & Hutchings, 1977

Nephtys inornata Rainer & Hutchings, 1977: 327–332, figs 23–28.

Material examined. *New South Wales*: Jervis Bay, Murray's Bch, 25-iv-72, 7(W.194198); Port Hacking, 22-xii-74, 2(W.195291); Botany Bay, 13-ii-75, 1(W.195430); Hawkesbury R., 2-1-3, 20-viii-80, 1(W.196459).

Remarks. Agrees well with the original description.

Habitat. In the Hawkesbury R., in mud at 4 m depth, salinity of 32–36‰; in Botany Bay, in mud, sand and shelly sand.

Occurrence. Frequent and widespread in marine areas of New South Wales estuaries; collected in all seasons.

Australian distribution. Victoria, New South Wales.

Nephtys longipes Stimpson, 1856

Nephtys longipes.—Rainer & Hutchings, 1977: 332–334, figs 29, 43.
Nephtys vikingensis Paxton, 1974: 204–207, figs 8–13.

Material examined. *New South Wales*: Narrawallee Inlet, 3-xii-81, 1(W.195176); Lake Illawarra, 5-xii-77, 1(W.19224); Botany Bay, Towra Pt, 10-ii-81, several (W.195057); Hawkesbury R., Patonga Bch, 3-viii-79, several (W.17651).

Remarks. Agrees well with previous descriptions.

Habitat. Clean sandy estuarine beaches, intertidal to shallow subtidal.

Occurrence. Common in restricted habitats.

Australian distribution. Victoria, New South Wales, Southern Queensland.

Family GLYCERIDAE Grube

Long slender bodies and conical prostomia. Long eversible pharynx with four jaws. Parapodia either all biramous or all uniramous. Neurosetae compound; notosetae, when present, simple.

Key to the Species of Glyceridae

1. Branchiae non retractile, simple; pharyngeal papillae of two types, one with distal flange ..... *Glycera tridactyla*

— Branchiae retractile, branched; pharyngeal papillae of two types, without distal flange ..... *Glycera americana*

Glycera americana Leidy, 1855

Glycera americana.—Augener, 1922c: 29–30.—Hutchings & Rainer, 1979: 758–759.

Material examined. *New South Wales*: Lake Merimbula, 5-x-75, 1(W.15748); Jervis Bay, Murray's Bch, Apr. '72, 1(W.17494); Port Hacking, Maianbar, 4-xi-75, 2(W.11211); Botany Bay, Towra Pt, 10-ii-81, 2(W.195036), 11-ii-75, 1(W.195788); Hawkesbury R., 1-1-1, 3(W.196500), 1-2-1, 1(W.196501), 1-3-2, 1(W.196502), 1-4-3, 1(W.196503), 2-2-2, 1(W.196504); Lake Macquarie, July '77, 1(W.17840).

Remarks. Agrees well with the published description from Australia and New Zealand, however the Australian material should be compared to the type for confirmation that the species really is as widespread as reported in literature.

Habitat. In muddy sand, salinities of 32.2–39‰, in *Zostera* and *Posidonia* seagrass beds.

Occurrence. Frequently found in low numbers throughout the year in most marine areas of estuaries.

Australian distribution. South Australia, Victoria, New South Wales, Queensland.

Glycera tridactyla Schmarda, 1861

Glycera tridactyla.—Augener, 1927: 193–195.

Material examined. *Victoria*: Venus Bay, 20-ii-81, 1(W.18617). *New South Wales*: Port Hacking, 12-iii-75, 3(W.195228); Botany Bay, 30-i-75, several (W.195417, W.1954254), 13-ii-75, 8(W.195432); Hawkesbury R., 1-3-1, 1-3-2, 1-4-1, 2-1-3, 3-1-2, many (W.196494-99).

Description. Length up to 120 mm for 150 setigers. Body elongate, rounded in section and tapered at both ends. Prostomium a long pointed cone with 4 small antennae at the tip. Proboscis with 4 jaws, each with an unequal V-shaped support. Surface of proboscis uniformly covered with papillae of two types: one broadly conical, the other cylindrical with a distal flange shaped like a fingernail.

Peristomium and following segment uniramous, all subsequent setigers with biramous parapodia. Anteriorly, superior postsetal lobe pointed, inferior one shorter and rounded; posteriorly, superior postsetal lobe becomes more elongated but still conical. Dorsal cirrus small spherical palpode and ventral cirrus hardly discernible except as small basal swelling. Notosetae all simple capillaries, neurosetae compound spinigers. Branchiae start from setiger 30, arising from base of superior postsetal lobe, each a single filament longer than parapodial lobes.

Remarks. First record from New South Wales since Augener's (1927) record from Twofold Bay. This is also the first record from Victoria.

Habitat. Mud to muddy sand, subtidal to 10 m depth, in salinities of 33–38‰.

Occurrence. Uncommon in Hawkesbury R., mostly found at Transects 1 and 2 in low numbers, in all seasons, not every year; collected in low numbers from other restricted New South Wales estuarine areas.

Australian distribution. Victoria (Venus Bay*), New South Wales (Twofold Bay, Port Hacking*, Botany Bay*, Hawkesbury R*.).

Family GONIADIDAE Kinberg

Long, slender bodies, with conical prostomia. Long eversible pharynx with a circlet of smaller and larger jaw-pieces. Parapodia anteriorly uniramous, posteriorly biramous, rarely all parapodia uniramous. Neurosetae compound, notosetae simple.

Key to the Species of Goniadidae

1. Pharyngeal chevrons absent; papillae large and of several kinds ..... *(Glycinde)* 2

— Pharyngeal chevrons present; papillae small, mainly of one kind ..... *Goniada maculata*

2. Parapodia biramous after setiger 34 .... *G. armigera*†

— Parapodia biramous after setiger 30 .... *Glycinde* sp.†

† Species not described in this paper but reported by Hutchings & Rainer, 1980.

Goniada maculata Oersted, 1843

Goniada maculata.—Hartman, 1950: 20, Pl. 1 figs 7-8.—Day, 1967: 367, fig. 16.4. k-n.

Material examined. *New South Wales*: Botany Bay, Feb. '75, 1(W.19045), Hawkesbury R., 1-1-1, 1-1-2, 1-1-3, 1-1-4, 1-2-1, 1-2-2, 1-2-3, 1-2-4, 1-3-1, 1-3-2, 1-3-3, 1-3-4, 1-4-4, 2-2-3, many (W.195816-38).

Description. Body up to 100 mm in length, with scattered brown pigmentation; divided into 2 regions, anteriorly with uniramous parapodia, posteriorly with biramous parapodia. Conical prostomium with 8–10 rings, eyes absent. Proboscis eversible, with 7–11 chevrons at base, and densely covered with low cordate papillae. Mouth with dorsal arc of four micrognaths, ventral arc of three micrognaths and pair of ventrolateral macrognaths with 4–8 teeth. First 35–40 setigers uniramous with blade-shaped dorsal cirrus; setigerous lobe with pre- and postsetal lobes fused in first 18 setigers, subsequently small digitiform presetal lobe present and small postsetal lobe. In posterior uniramous setigers additional presetal lobe present. Ventral cirri initially blade-like, subsequently digitiform. Biramous parapodia with notopodium and dorsal cirrus, and inferior setigerous lobe with capillary notosetae; neuropodium with 2 digitiform presetal lobes and shorter, bluntly triangular, postsetal lobe, digitiform ventral cirrus and spinigerous compound setae.

Remarks. First record from Australia.

Habitat. Found in sediments of mud, sandy mud or shelly mud, at depths of 5–12 m, in salinities of 34–37‰.

Occurrence. Uncommon, but occurs in low numbers throughout the year; mostly found in Transect 1, some at Brooklyn sites.

Australian distribution. New South Wales (Botany Bay*, Hawkesbury R.*).

Family ONUPHIDAE Kinberg

Prostomium with two frontal and five occipital antennae. Well developed jaws consisting of several pairs of lateral maxillae, and one pair of lower, mandibles. Maxillary carriers short, third carrier absent. Maxilla 1 smooth and curved. Notopodia represented by the base of the branchiae and the dorsal cirri, often supported by internal acicula. Setae include compound and pseudo-compound hooks and spinigers, pectinate setae, limbate setae and subacicular hooks. Many species tubiculous, often large individuals.

Key to the Species of Onuphidae

1. Branchiae pectinate, first present from setiger 6, absent posteriorly; acicular hooks from setiger 23 .... *Onuphis mariahirsuta*

— Branchiae spiralled, first present from setiger 5, absent posteriorly; acicular hooks from setiger 5 ..... *Diopatra dentata*

Diopatra dentata Kinberg, 1865

Diopatra dentata Kinberg, 1865: 560.—Augener, 1922c: 27.—Hartman, 1948: 86–87, Pl. XII, figs 1–7.

Material examined. *New South Wales*: Jervis Bay, Murray's Bch, 25-iv-72, 4(W.17475); Botany Bay, Towra Pt, 12-iv-73, many (W.9644, W.9883, W.10050); Hawkesbury R., 1-3-4, 12-i-77, 1(W.196434), 1-4-1, 23-v-78, 2(W.196435), D2-1, 21-viii-80, 1(W.196436), D2-3, 1-viii-79, 1(W.196437).

Description. Tubiculous worm. Prostomium with 2 black eyespots; 5 equally long occipital antennae; basal ceratophores with 10 annulations. Peristomial cirri cirriform and about as long as ceratophores. Peristome achaetous as wide as setiger 1. First setiger slightly larger than second. Each setiger with long digitiform dorsal cirrus and small ventral cirrus, initially digitiform from setiger 5 then globular, and a postsetal lobe intermediate in size. Branchiae first present from setiger 5, 1st and 2nd pairs the largest, decreasing in size posteriorly by setiger 40; branchial stem no longer than dorsal cirrus, with 6 filaments (absent in posterior setigers). Branchiae terminate between setigers 42–52. Anterior branchiae with spiralled stalk effect, disappearing posteriorly. Long, falcate hooded setae, bifid in first 4 setigers; acicular setae from setiger 15; comb setae present from setiger 16; capillary setae throughout. Notopodia with slender embedded fascicle of acicula projecting into dorsal cirrus.

Jaws consist of ventral mandible, basal parts long and slender, calcareous portions eroded, dorsal maxillae larger. Carriers short, broad and basally rounded. Maxillary formula: Mx. II = 8 + 9, MX.III = 9 + 12, MX. IV = 6 + oval piece; slight variation in maxillary dentition between individuals.

Habitat. Mud to sandy mud with shell, at depths of 4–10 m, in salinities of 32.8–38‰. Also found in *Posidonia* seagrass beds.

Occurrence. Rare in Hawkesbury R., collected in different seasons. Uncommon in Botany Bay.

Australian distribution. Western Australia, New South Wales, (Jervis Bay*, Sydney, Hawkesbury R.*, Botany Bay*).

Onuphis mariahirsuta Paxton,1979

Onuphis mariahirsuta Paxton, 1979: 277–283, fig. 19–33.

Material examined. *New South Wales:* Murray's Bch, Jervis Bay, 1(W.19412), 5(W.194119).

Remarks. Agrees well with Paxton's (1979) original description.

Occurrence. Few records; these records increase the southern limit of distribution of the species.

Habitat. Sand and seagrass beds.

Australian distribution. New South Wales (Jervis Bay*, north coast), Queensland (south coast to Yeppoon).

Family EUNICIDAE Savigny

Long, multisegmented worms with one to five occipital antennae. Two to five pairs of lateral maxillae, and one pair of lower mandibles. Maxillary carriers short, third carrier absent. Maxilla 1 smooth and curved. Notopodia represented by branchiae and dorsal cirri, sometimes supported by internal aciculae. Setae include composite falcigers and spinigers, limbate setae, pectinate setae and subacicular hooks.

Fauchald (per. comm.) is currently revising the eunicids from eastern Australia and the names used here may be incorrect. The findings of his study will be published in the Records of the Australian Museum.

Key to the Species of Eunicidae

1. Five occipital antennae present 2
—— One occipital antenna present ..... *Nematonereis unicornis*
2. Tentacular cirri present ..... *(Eunice)* 3
—— Tentacular cirri absent ..... *(Marphysa)* 4
3. Anterior margin of prostomium deeply notched between palps; antennae deeply annulated; acicular yellow with curved tips; branchiae continue to about middle of body ..... *E. australis*
—— Anterior margin of prostomium rounded; antennae indistinctly ringed distally; acicula yellow with faintly curved and blunt tips; branchiae end about setiger 45 ..... *E. vittata*
4. Compound setae spinigerous only 5
—— Compound setae both spinigerous and falcigerous ..... *M. depressa*
5. Acicular setae bidentate; body broad and oval in section ..... *M. sanguinea*
—— Acicular setae unidentate; body rounded in section ..... *M. macintoshi*

Eunice australis Quatrefages, 1865

Eunice australis.—Hutchings & Rainer, 1979: 759.

Material examined. *New South Wales*: Jervis Bay, 19-x-72, 4(W.17492); Botany Bay, Towra Pt, 12-iv-73, 4(W.10984); Careel Bay, 6-ix-73, 1(W.10079); Lake Macquarie, 18-xi-76, 3(W.19243); Port Stephens, Aug. '76, 8(W.12936); Broughton I., 1-ix-76, 105(W.13163).

Remarks. Agrees well with description of Hutchings & Rainer (1979).

Habitat. *Posidonia* seagrass beds, muddy sand in ~35‰ salinities.

Occurrence. Frequently found in marine areas of New South Wales estuaries.

Australian distribution. Western Australia, South Australia, Victoria, New South Wales, Queensland.

Eunice vittata (delle Chiaje, 1828)

Eunice vittata.—Augener, 1927: 170–172.—Day, 1967: 385, fig. 17.3 a–e.—Knox, 1960: 125, figs 187–9.

Material examined. *New South Wales*: Jervis Bay, 25-iv-72, 14(W.194085), Murray's Basin, 17-x-72, 30(W.194488); Botany Bay, Bonna Pt, 22-i-75, 3(W.195692), 17-i-75, 8(W.195676).

Description. Length up to 50 mm. Anterior segments with red bars which fade in alcohol. Two partially fused cushion-like palps, shallowly notched. Five long antennae, ringed distally. Tentacular cirri and anterior dorsal cirri very long and tapered. Maxillary formula: Mx. I = 1 + 1, Mx. II = 9 + 10, Mx. III = 9 + 0, Mx. IV = 10 + 13, Mx. V = 1 + 1.

Branchiae from setiger 3, 10–20 filaments by setiger 20, and absent by setiger 45. Acicula yellow with blunt tips, slightly curved. Acicular setae yellow and tridentate with small apical tooth. Compound setae falcigerous, possessing bidentate blades with long pointed guards, lightly striated near base.

Habitat. Seagrass beds, sand.

Occurrence. Frequently found in low numbers at

restricted sites in New South Wales estuaries.

Australian distribution. Victoria, New South Wales, (Twofold Bay, Jervis Bay*, Botany Bay*, Sydney region).

Marphysa depressa (Schmarda, 1861)

Marphysa depressa.—Day, 1967: 395-396, figs 17.5, n-t.

Material examined. *New South Wales*: Hawkesbury R., 7-2-3, 14-i-77, 1(W.196566). *Queensland*: Brisbane R., 1963, 1(W.19095).

Remarks. Fits Day's (1967) description well. New record for Australia.

Habitat. Collected in sediment of medium-grained sand in 8 m water depth and a salinity of 28.6‰.

Occurrence. Rare, single specimen collected from Hawkesbury R.

Australian distribution. New South Wales (Hawkesbury R.*), Queensland (Brisbane*).

Marphysa macintoshi Crossland, 1903

Marphysa macintoshi.—Day, 1967: 396-397, fig. 17.6, a-e.

Material examined. *New South Wales*: Hawkesbury R., 6-1-1, 13-i-77, 1(W.196556), 6-2-3, 22-ii-78, 1(W.196557); Bellenger estuary, near Arrawarra, 5-xi-75, 1(W.10103). *Queensland*: Moreton Bay, Victoria Pt, 12-xi-62, 1(W.19068).

Remarks. Agrees well with Day's (1967) and the original description. New record for New South Wales and Queensland.

Habitat. Collected in Hawkesbury R., in sediments of fine mud to muddy sand, in 4-12 m water depth and salinities of 12-36‰. No data for specimens from Bellenger Estuary and Moreton Bay.

Occurrence. Rare in Hawkesbury R., found in very low numbers at Transects 3-2 to 7-2, in different seasons in different years.

Australian distribution. Western Australia, New South Wales, (Hawkesbury R.*, Bellenger Estuary*), Queensland (Moreton Bay*).

Marphysa sanguinea (Montague, 1815)

Marphysa sanguinea.—Monro, 1938: 623.—Rullier, 1965: 184-185.—Hutchings & Rainer, 1979: 760.

Material examined. *New South Wales*: Lake Merimbula, 6-x-75, 1(W.12704); Jervis Bay, 18-x-72, 1(W.194520); Port Hacking, Maianbar, 4-xi-75, 1(W.11027); Botany Bay, Towra Pt, 25-x-81, 1(W.195064); Hawkesbury R., Brooklyn 20-xii-81, 1(W.195187), 5-1, 6-1, 7-1, 7-2, 7-3, 8-1, 8-2, 9-1, 9-2, many (W.196546-55); Lake Macquarie, 2-xii-77, 1(W.19226); Port Stephens, 27-vii-76, 4(W.12511).

Remarks. The material agrees well with the published Australian description, except for the large variation in the form of the parapodial acicula (dentition and guard variable). This may only be due to excessive wear. This species, which appears to be a cosmopolitan species, should be checked with material from the type locality of *M. sanguinea* which is in southern England.

Habitat. In fine mud to medium-grained muddy sand in salinities of 11-33.2‰; also found in *Zostera* seagrass beds.

Occurrence. Frequently found at Tansects 5-9 of Hawkesbury R., and at Brooklyn, in low numbers throughout the year (not all years); common and widespread in New South Wales estuaries.

Australian distribution. Western Australia, New South Wales, Queensland.

Nematonereis unicornis (Grube, 1840)

Nematonereis unicornis.—Fauvel, 1923: 412, fig. 162, h-n.—Day, 1967: 403-404, fig. 17.8, j-n.

Material examined. *New South Wales*: Lake Merimbula, 5-xii-75, 1(W.15785); Jervis Bay, Murray's Bch, Apr. '72, 1(W.194136), 17-x-72, several (W.194182, W.194273, W.194391); Botany Bay, Bonna Pt, 22-i-75, many (W.18843, W.18861, W18961), 17-i-75, several (W.195677, W.195718).

Description. Body slender up to 150-200 mm. Palps completely fused, forming an ovoid prostomium. Single median antenna. Pair of spherical eyes. Mandibles concave. Mx.I falcate and Mx.V reduced to pale chitinous patches; dental formula as follows: Mx.I = 1 + 1, Mx.II = 4 + 5, Mx.III = 4 + 0, Mx.IV = 4 + 6. Dorsal cirri longer than compressed, truncate, coned-shaped, setigerous lobes. Ventral cirri papilliform with swollen bases. Acicular setae from about setiger 20, dark, strongly bidentate. Superior setae include winged capillaries and broad comb-setae. Inferior setae bidentate falcigers, secondary tooth longer than apical one.

Remarks. First record from Eastern Australia.

Habitat. Seagrass beds, sand.

Occurrence. Uncommon; collected in spring, summer and autumn months only.

Australian distribution. Western Australia (Broome, Geraldton), New South Wales (Merimbula*, Jervis Bay*, Botany Bay*).

Family LUMBRINERIDAE Malmgren

Prostomium without appendages but sometimes with one to three nuchal papillae emerging from a pocket between the pro- and peristomium. Maxillary carriers short, third carrier absent. Maxilla I smooth and curved. Notopodia either absent or represented by small button-shaped projections, sometimes with internal acicula. Setae include limbate setae, simple and composite hooks. Subacicular hooks and pectinate (comb) setae absent.

Key to the Species of Lumbrineridae

1. Anterior parapodia with compact pseudocompound hooks; maxillae II with 3 rounded teeth and maxillae IV very expanded .... *Augeneria verdis* n.sp.

— Anterior parapodia with long-bladed compound hooks; simple hooks posteriorly; maxillae not as above .... *Lumbrineris latreilli*

Augeneria verdis n.sp.

Fig. 15.1–2

Lumbineris sp. Hutchings & Rainer, 1980: 40.

Material examined. *New South Wales:* HOLOTYPE: Hawkesbury R., D4–2(W.18637) 10 mm long, 0.5 mm wide, incomplete posteriorly, 75 setigers. PARATYPES: Lake Macquarie (AHF Poly 1405) 20 mm long, 0.5 mm wide, posteriorly incomplete, about 100 setigers; Botany Bay, (BMNH ZB 1983. 1727-29) several anterior and middle body fragments; Hawkesbury R., (USNM 81483) several anterior fragments, none complete; Port Stephens (W.12451, W.12538, W.12595); Botany Bay (W.13700, W.13703, W.13710, W.14900); Careel Bay (W.8222). No type material complete.

Additional material. Hawkesbury R., D1-1, D1-3, many (W.194842-9), D5-1, many (W.194851-56), D6-1, several (W.194864-6). A selection of material examined.

Description. Anterior setigers colourless, subsequent ones with varying amounts of green pigment. Pigmentation persists in alcohol-preserved specimens. Pigment in transverse bands of varying intensities on both dorsal and ventral surfaces. Prostomium and peristomium colourless. Setigers 1–5 with faint biannulate rings of green pigment, the following 23 setigers with very dark stripes of green pigment on both dorsum and ventrum; then 5 setigers with less intense banding; next 10–15 setigers heavily banded; remaining setigers with faint bands of pigment.

Prostomium bluntly conical (Fig. 15.1), eyes and prostomial tentacles absent, 3 nuchal antennae present, but hidden by prostomial fold. Mandibles and maxillae poorly chitinised. Maxilla I simple curved triangle, Mx.II with 3 very well-developed deep cusps, Mx.III and IV with no defined teeth. Carriers bluntly triangular.

Anterior parapodia with pre- and postsetal lobes digitiform, postsetal slightly larger than presetal; posteriorly both lobes elongate and become equal in length by setiger 10, this pattern maintained on all remaining setigers.

Setiger 1 with 4 broadly winged capillaries (wings strongly striated) and 1 pseudocompound hooded hook with multi-toothed head and inflated sheath (Fig. 15.2); setiger 10 with 2 pseudocompound hooks and 5 capillaries; by setiger 18 all setae hooks, 2–3 per parapodia. Pseudocompound hooded hooks replaced by simple hooded hooks by setiger 12. Setigers 10–12 with mixture of pseudo- and simple hooks. Simple hooks similar in size throughout body. Yellow acicula.

Remarks. The arrangement and intensity of pigmentation varies within the paratypes and additional material, but material collected in the early 1970s still shows distinct pigmentation. Paratype (AHF Poly 1405) with less intense pigmentation than holotype, scattered single setigers and groups of 2–3 setigers with intense pigment scattered throughout body. Paratype (USNM 81483) with one fragment showing orange pigmented head, but all fragments showing evidence of banding, often with 1–2 segments showing intense pigmentation. Amongst the paratype fragments (W.14900) there is a posterior fragment (exact position along body unknown) with an elongate digitate process which has a glandular irregular surface, and may be branchial in function. Some fragments are gravid, with similar proportions to rest of material, indicating that this species matures at a small size.

Fauchald (1970) synonymized the genus *Augeneria* Monro, 1930, with *Lumbrineris* as he considered that the generic feature used by Monro to distinguish it from *Lumbrineris* was inadequate. Monro had characterised *Augeneria* as having 3 occipital antennae whereas Fauchald suggested that they were in fact eversible

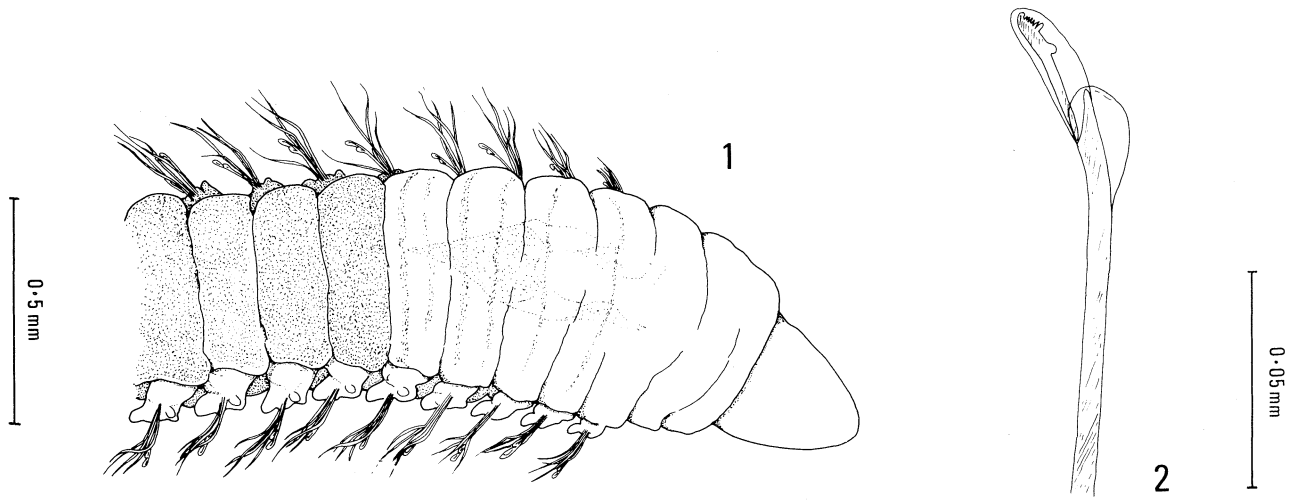

Fig. 15. *Augeneria verdis* n.sp. (Holotype W.18637): *1.* anterior end, dorsolateral view; *2.* pseudocompound hook.

nuchal organs and of little generic significance. Orensanz (1973) in a major review of the Lumbrinerids decided that *Augeneria* Monro was a valid genus but shifted the definition to emphasize other characters. *Augeneria* is now characterized by anterior parapodia with compact pseudocompound hooks, maxillae II with 3 rounded teeth and maxillae IV very expanded with a clear central area. Orensanz placed in this genus, *A. albidentata* (Ehlers, 1908), *A. albidentata sadko* (Annenkova, 1952), *A. bidens* (Ehlers, 1887), *A. meteorana* (Augener, 1931) and *A. tentaculata* Monro (1930). Since then Imajima & Higuchi, (1975) have described an additional species in this group *Augeneria polytentaculata. Augeneria verdis* n.sp. with 3 nuchal antennae, differs from *A. polytentaculata,* which has 7 nuchal antennae and from *A. albidentata* and *A. tentaculata* in the distribution of hooded hooks. *Augeneria albidentata, A. bidens* and *A. meteorana* differ in the arrangement of development of teeth on maxillae II.

Etymology. The specific name is latin for green and refers to pigmentation which persists even after several years of alcohol storage.

Habitat. Estuarine, often associated with seagrass beds. In Hawkesbury R., found in fine mud to muddy sand, in 4–12 m water depth and salinities of 20–36.6‰.

Occurrence. Widespread and abundant in the Hawkesbury R., in all seasons in most years.

Australian distribution. New South Wales (Botany Bay, Careel Bay, Hawkesbury R., Lake Macquarie, Port Stephens).

Lumbrineris latreilli Audouin & Milne Edwards, 1834

Lumbrineris latreilli.—Knox & Cameron, 1971: 112.—Hutchings & Rainer, 1979: 760.

Material examined. *New South Wales*: Jervis Bay, Murray's Basin, 7-x-72, 2(W.194576); Botany Bay, Towra Pt, 10-ii-81, 2(W.195042), 17-i-75, 2(W.195484); Hawkesbury R., 1-1-1, 1(W.194776), 1-3-1, 1(194785), 1-4-1, 1(W.194800), 2-1-2, 1(W.194802), 2-2-4, 1(W.194812), 3-1-1, 4(W.194814), 3-2-1, 1(W.194833), 4-1-1, 2(W.194840). A selection of material examined.

Remarks. Agrees well with the Australian descriptions of the species which is reported to be a cosmopolitan species. This identification should be confirmed by examining material from the type locality, France.

Habitat. Found in fine mud to sandy mud with some shell; in salinities of 29–35‰.

Occurrence. Frequently found in Hawkesbury R. at Transects 1-3 and at Brooklyn all year round. Widespread in marine areas of New South Wales estuaries.

Australian distribution. Victoria, New South Wales, Queensland.

Family ARABELLIDAE Hartman

Prostomium distinct, lacking any appendages. Eversible muscular pharynx with well developed jaws. Maxillary carriers long and narrow, a third carrier present. Maxilla I smooth or basally dentate. Notopodia absent. Setae include limbate setae and in some species thick emergent spines.

Arabella iricolor iricolor (Montagu, 1804)

Arabella iricolor.—Augener, 1927: 191.
Arabella iricolor iricolor.—Day, 1967: 446, fig. 17.18 i-m.—Knox & Cameron, 1971: 32.

Material examined. *New South Wales*: Jervis Bay, 1(W.17441).

Remarks. Agrees well with Day's (1967) description.

Habitat. *Posidonia* seagrass beds in muddy sand.

Occurrence. Single specimen collected in October 1972.

Australian distribution. Western Australia, Victoria (Port Phillip Bay), New South Wales (Jervis Bay*, Sydney), Queensland (Moreton Bay).

Family DORVILLEIDAE Chamberlin

Prostomium with 2 pairs of articulated antennae. Maxillae consist of one or two series of small jawpieces and paired carriers; mandibles present. Notopodia reduced, but with setae and acicula in most species. Setae include simple and composite hooks, furcate and limbate setae.

Key to the Species of Dorvilleidae

1. Body short and stout; dorsal cirri first appear by setiger 2 ..... *Schistomeringos loveni*

— Body thread-like; dorsal cirri first appear by setiger 5 ..... *Schistomeringos filiforma* n.sp.

Schistomeringos filiforma **n.sp.**
Figs 16.1–7

Material examined. *New South Wales:* HOLOTYPE: Botany Bay, west of La Perouse, 24-i-77, (W.13656), 14 mm long, 0.6 mm wide, 108 setigers. PARATYPES: Botany Bay, 1(BMNH ZB 1983. 1730) 10 mm long, 0.5 mm wide, 100 setigers, 1(USNM 81481) 12 mm long, 0.5 mm wide, 95 setigers, 1(W.19048) incomplete, 10 mm long, 0.6 mm wide, 87 setigers.

Description. Body long, thread-like, approximately cylindrical in section. Width equal to length of parapodia plus setae, except in far anterior segments. Prostomium dorsoventrally flattened, slightly longer than wide, rounded anteriorly (Fig. 16.1). One pair of

minute eyes situated immediately above base of palps. Palps biarticulate with short, oval palpostyle. Antennae moniliform with 9 articles, twice length prostomium, 1½ times length of palps; basal articles longer than the rest.

Mandibles denticulate anteriorly with lateral extension of 4–5 'free' teeth. Maxillae with carriers, and superior rows of denticles fused posteriorly; inferior rows free posteriorly; basal plates denticulate. Teeth of inferior rows smaller and finer than corresponding teeth in superior rows (Figs. 16.2–3). Teeth at anterior end of rows smaller, more elongate and denticulate than teeth nearer the basal plates (Fig. 16.3).

Parapodia sub-biramous. Dorsal cirri with fine internal acicula present from setiger 5, extend just beyond tip of parapodia anteriorly, about ½ length of parapodia posteriorly. Cirrostyle somewhat rounded distally; indistinct junction between cirrostyle and cirrophore. Parapodia essentially bilobate throughout with low, rounded dorsal lobe and prominent digitiform

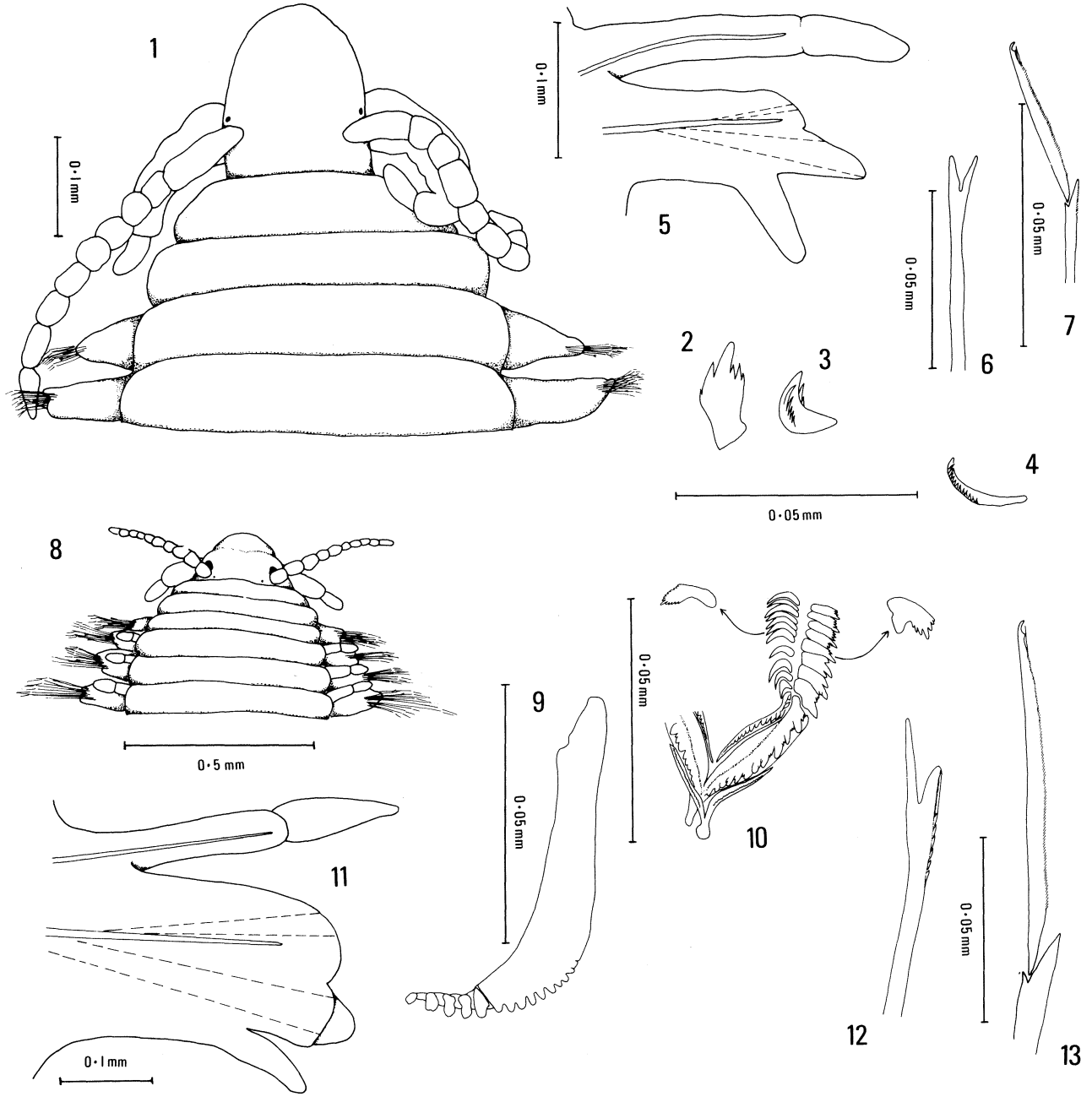

Fig. 16. *Schistomeringos filiformis* n.sp. (Holotype W.13656): *1.* anterior end, dorsal view; *2.* first free denticle in superior row of maxilla; *3.* first free denticle in inferior row of maxilla; *4.* denticle from inferior row of maxilla near anterior end of row; *5.* middle parapodium, anterior view; *6.* furcate seta; *7.* superior compound seta. *Schistomeringos loveni* (W.196903): *8.* anterior end, dorsal view; *9.* mandible; *10.* half of maxillae, and enlargements of teeth of superior and inferior rows; *11.* middle parapodium, anterior view; *12.* furcate seta; 13. superior compound falciger.

ventral lobe (Fig. 16.5). Dorsal setal fascicle with 1-3 capillaries, coarsely serrated on one side; 1-2 furcate setae, present from setiger 1, with fine prongs approximately equal in length, without sub-distal serrations (Fig. 16.6). Ventral setal fascicle with many bifid heterogomph falcigers, each with a fine guard partially covering teeth; blade length increases superiorly (Fig. 16.7).

Pygidium with two pairs ventrally produced anal cirri, both weakly annulated; dorsal-most pair about 3 times longer than ventral pair, extending over last 5-6 setigers.

Remarks. The paratype material closely resembles the holotype. *Schistomeringos filiforma* is found together with *Schistomeringos loveni* (Kinberg, 1864) in Botany Bay, although *S. filiforma* appears to be less abundant. It is easily distinguished from *S. loveni* by being thread-like rather than short and stout; in having dorsal cirri first appear by setiger 5 rather than setiger 2; and in the prong length ratio of the furcate setae which is approximately 1 : 1 in *S. filiforma* and 1 : 2 in *S. loveni*. The only other *Schistomeringos* species having furcate setae with equal prong length, *S. neglecta* (Fauvel, 1923), differs in having dorsal cirri from setiger 2.

Etymology. The specific name refers to the thread-like body form.

Habitat. Sand, 18-21 m in protected bay.

Occurrence. Very rare. Found in February, 1975 and January, 1977 only.

Australian distribution. New South Wales (Botany Bay).

Schistomeringos loveni (Kinberg, 1864)

Figs 16.8-13

Staurocephalus loveni Kinberg, 1864: 574.—Kinberg, 1910: 50, Pl. XXI, fig. 1.
Stauronereis loveni.—Augener, 1922c: 31-32.—Augener, 1924: 435-6.
Schistomeringos loveni.—Jumars, 1975: 132.
Staurocephalus australis Haswell, 1886: 15-16, Pl. 111.
Stauronereis australis.—Augener, 1913: 293-296.
Schistomeringos australis.—Jumars, 1974: 132.

Material examined. *New South Wales:* voucher material, Port Jackson, Sow and Pigs reef, 30-ix-76 (W.196903) 6.2 mm long, 1.1 mm wide, 46 setigers, 3 (BMNH ZB 1983. 1731-33) 4.3-6.8 mm long, 0.8-1.3 mm wide, 41-52 setigers, 3(USNM 81482) 4.0-7.8 mm long, 1.0-1.2 mm wide, 36-52 setigers, 3 (AHF POLY 1403) 3.3-9.3 mm long, 1.0-1.3 mm wide, 28-58 setigers, 3 (SSM 3219) 6.0-9.0 mm long, 1.0-1.2 mm wide, 45-52 setigers, 47 (W.6464) range from 4.0 mm long, 0.8 mm wide, 26 setigers, to 12.0 mm long, 1.4 mm wide, 66 setigers.

All voucher material from New South Wales, Port Jackson, North Head, collected 26-v-72, which is the type locality for this species.

Selected additional material. Lake Merimbula, (W.12658, W.12723, W.12764); Botany Bay (W.14896, W.18761, W.19049); Port Stephens (W.12889, W.12892).

Description. Body small, robust, nearly cylindrical, tapered slightly anteriorly and more so posteriorly, flattened ventrally, arched dorsally. Segment width 5-10 times length. Prostomium approximately hemispherical, slightly flattened anteriorly, about ¾ width of peristome at junction (Fig. 16.8). Anterior pair of eyes large, reniform, situated between bases of antennae and palps; posterior pair of eyes minute, situated dorsally at bases of antennae. Palps biarticulate with short, oval palpostyle. Antennae moniliform with 10 articles, about twice length of prostomium, extending just beyond tips of palps.

Mandibles denticulate anteriorly with lateral extension of 5 'free' teeth (Fig. 16.9). Maxillae with a toothed pair of posteriorly fused carriers and 4 rows of denticles; two superior rows with toothed and posteriorly fused basal plates, and two inferior rows with free, toothed basal plates (Fig. 16.10). Teeth of superior row with 2-6 denticles on either side of main fang (Fig. 16.10); corresponding teeth of inferior row more delicate with 5-12 denticles (Fig. 16.10); size of teeth decreases away from basal plates.

Parapodia sub-biramous. Dorsal cirri with fine, internal acicula, present from setiger 2, extending to level with or slightly beyond tip of parapodia; distally a small, pointed cirrostyle. Parapodia long, essentially bilobate throughout, with low rounded dorsal lobe and larger, conical ventral lobe (Fig. 16.11). Dorsal setal fascicle with a few long capillary setae (coarsely serrated on one side) and 1-4 furcate setae present from setiger 1, sub-distally serrated, with the longer prong a little more than twice the length of the shorter one (Fig. 16.12). Ventral setal fascicle with numerous heterogomph falcigers, minutely bifid with fine guards; superior setae with longer blades (Fig. 16.13).

Pygidium with two pairs of ventrally produced anal cirri, both pairs weakly annulated; dorsal-most pair about 3 times longer than ventral pair, extending over last 4 setigers.

Remarks. The holotype was not examined, however according to Augener (1922c), the only original specimen remaining consists of two fragments with a total of 32 segments and a length of at most 8mm and is without a head. As the holotype is damaged, we have given a comprehensive description of a specimen which we believe to be *S. loveni* collected from as near the type locality as possible. We also sent out voucher material, again from the type locality, to the Naturhistoriska Riksmuseet, Stockholm (which holds the holotype), and to other institutions.

Material from the type locality (Port Jackson) and many other places in New South Wales, including Lake Merimbula, Botany Bay and Port Stephens, is consistent with Kinberg's original description and drawings published subsequently in 1910. There are however some important variations in the species that have not been alluded to previously. The posterior pair of eyes varies considerably in size (although always smaller than the anterior pair), and are often very prominent. The size and shape of the anterior pair of eyes is more consistent,

being large and reniform; in a few specimens both pairs of eyes are absent. Length of antennae varies from 1–2 times the prostomial length, and the number of articles varies from 4–12. The shape of the ventral-most pair of anal cirri varies slightly between individuals, from long, slim processes to more stout, triangular processes. Parapodial lobe-shape varies considerably both within and between individuals; dorsal and ventral lobes may be equally well or poorly developed, or one lobe (often ventral one) will be more prominent. Dorsal cirri may extend from ¾ length of the parapodial lobe to just beyond. Most specimens showed no pigmentation after being stored in alcohol, however a few individuals from Port Jackson, North Head, had some speckled brown pigment forming a medial line extending from head to tail on the dorsum, as well as some scattered pigment over the rest of the body.

The only other species of *Schistomeringos* recorded from Australia, *S. australis* (Haswell, 1886), was also described from Port Jackson. We have reviewed Haswell's original description and examined a slide of *S. australis* from the University of Sydney (later deposited at The Australian Museum). The slide appears to have been identified by Haswell. Both the description and the mounted specimen agree well with the above description if the afore-mentioned variation in the species is accepted. According to Haswell (1886) the two species differ in that *S. loveni* has "the eyes small and the second pair of antennae twice as long as the first". Clearly such differences are unimportant when one considers the range of variability in these characters. Therefore we consider that *S. australis* and *S. loveni* are synonymous.

Augener (1922c) also regarded the two species as synonymous but Jumars (1974), having insufficient information to assess Augener's synonymy retained them as separate species.

Schistomeringos incerta (Schmarda, 1861) described from New Zealand, has also been confused with the above species. Schmarda's description is based solely on a headless specimen which subsequently has been destroyed. As many of the more important diagnostic characters are associated with the head region, the description is considered grossly inadequate and the species must be regarded as indeterminable. Therefore Augener's (1913) suggestion that *S. australis* is synonymous with *S. incerta* is not valid.

Habitat. Intertidally to 30 m in protected bays and coastal lagoons; sand.

Occurrence. Frequently found in low numbers at restricted sites in coastal and estuarine areas.

Australian distribution. South Australia, Victoria, New South Wales (widespread), Queensland.

Family ORBINIIDAE Hartman

Prostomium without appendages, up to two asetigerous anterior segments. Palps absent; eversible pharynx sac-like. Peristomium lacking appendages. Parapodia biramous, laterally oriented in thoracic region and usually with dorsal parapodia in an abdominal region. All setae simple, including capillaries; simple hooks and sometimes brush-tipped bifid or furcate setae.

Key to the Species of Orbiniidae after Day, 1977†

1. Prostomium pointed 2
—— Prostomium rounded to square in front ..... *Naineris grubei australis*
2. Not more than 5 foot-papillae and stomach-papillae combined on posterior thorax; usually only one or two foot-papillae and no stomach-papillae 3
—— More than 4 foot-papillae and stomach-papillae combined on posterior thorax; usually several foot-papillae and many stomach-papillae ..... *Phylo felix*
3. No hooks (uncini) or brush-tipped setae among thoracic neurosetae; no stomach-papillae on posterior thorax ..... *(Leitoscoloplos)* 4
—— At least an anterior row of hooks among thoracic neurosetae, but no brush-tipped setae; 0–3 stomach-papillae on posterior thorax 5
4. Two foot-papillae from about 10th neuropodium; minute branchiae from setiger 8–11 to end of thorax; and large ones on first abdominal segment; thorax of 19–22 setigers ..... *L. bifurcatus*
—— One foot-papilla on posterior thoracic neuropodia; branchiae well developed from setiger 15–16, sometimes preceded by branchial papillae on two previous segments; thorax of 14–15 setigers ..... *L. normalis*
5. Branchiae appear on setiger 8 or later usually only a few slender hooks among thoracic neurosetae ..... [*Scoloplos (Scoloplos)*] 6
—— Branchiae appear on setiger 5–7; 3–4 rows of hooks among thoracic

neurosetae ..... *Scoloplos (Leodamas) johnstonei*

—— Branchiae dichotomously branched from mid-abdomen onwards ..... *S. (S.) cylindrifer*

—— Branchiae not branched 7

7. Thorax of 20 or more setigers; abdominal neuropodia with 2 subequal short lobes ..... *S. (S.) novaehollandiae*

—— Thorax with 13–17 setigers; abdominal neuropodia with inner lobe longer than outer ..... *S. (S.) simplex.*

†Several other species of orbiniids occur along the east coast of Australia, and for a complete key to the orbiniids see Day, 1977.

Leitoscoloplos bifurcatus (Hartman, 1957)

Haploscoloplos bifurcatus Hartman, 1957: 277.
Leitoscoloplos bifurcatus.—Day, 1977: 233-224.

Material examined. *New South Wales*: Port Hacking, 22-xii-74, 2(W.195292); Botany Bay, 13-ii-75, many (W.18731, W.18780, W.18781), 12-vii-76, 1(W.195573), 17-iii-75, 1(W.195601); Hawkesbury R., 1-1-1, 1-2-3, 1-3-2, 1-3-4, 1-4-1, 2-1-1, 2-2-1, 2-2-2, many (W.195849-58); Lake Macquarie, 18-xi-76, 1(W.19227).

Remarks. Agrees with Hartman's (1957) description.

Habitat. In Hawkesbury R., in salinities of 30–39‰, sediments of fine mud with some shell and detritus; also collected from muddy sand and *Posidonia, Zostera* seagrass beds.

Occurrence. Frequently abundant at Transect 1 in Hawkesbury R., (also present Transects 2, 3 and at Brooklyn) all year round. Widespread in marine areas of New South Wales estuaries.

Australian distribution. South Australia, Victoria, New South Wales, Queensland, Northern Territory.

Leitoscoloplos normalis Day, 1977

Leitoscoloplos normalis Day, 1977: 224-225, fig. 1 a-d.—Hutchings & Rainer, 1979: 761.

Material examined. *New South Wales*: Botany Bay, Silver Bch, Kurnell, 18-ix-79, several (W.17245); Hawkesbury R., 7-1, 7-2, 8-2, 9-2, 10-1, 10-2, many (W.195839-48); Wallis Lake, Dec. '70, 1(W.11058).

Remarks. Agrees well with Day's description.

Habitat. In salinities of 3–34‰, usually more abundant at lower salinities; sediments of mud or clay to medium sand.

Occurrence. Collected at Transect 7 in Hawkesbury R., (also present at Transects 9, 10, 11) in low numbers all year round; widespread in estuarine areas.

Australian distribution. Western Australia, Victoria, New South Wales, Queensland.

Naineris grubei australis Hartman, 1957

Naineris grubei australis Hartman, 1957: 303, pl. 39, figs 1–14.—Hutchings & Rainer, 1979: 761.

Material examined. *New South Wales*: Jervis Bay, Murray's Bch, Apr. '72, 2(W.17533, W.194238); Botany Bay, Towra Pt, July '81 2(W.195061), 12-iv-73, 1(W.9928); Careel Bay, 30-vii-73, 1(W.8199); Broughton I., 1-ix-76, 4(W.13161).

Remarks. Agrees with Hutchings & Rainer's (1979) description.

Habitat. Seagrass beds, and sandy mud.

Occurrence. Rare. Widespread in estuaries.

Australian distribution. South Australia, Victoria, New South Wales.

Phylo felix Kinberg, 1866

Phylo felix.—Hartman, 1957: 262, pl. 23, figs 1–7.—Day 1977: 234.—Hutchings & Rainer, 1979: 762–763.

Material examined. *New South Wales*: Lake Merimbula, 4-xii-75, 3(W.11877); Jervis Bay, Murray's Bch, Apr, '72, 5(W.194122, W.194193, W.194268); Port Hacking, Maianbar, 15-ix-76, 1(W.11177); Botany Bay, Towra Pt, 3-vi-77, 1(W.12279, W.12293), 4-ii-77, 12(W.14897).

Remarks. Agrees well with Hutchings & Rainer's (1979) description.

Habitat. Seagrass beds, sand.

Occurrence. Present in low numbers throughout the year; not present in all estuaries.

Australian distribution. Victoria, New South Wales, Queensland.

Scoloplos (Leodamas) johnstonei Day, 1934

Scoloplos johnstonei Day, 1934: 58, fig. 11 a-e.
Scoloplos (Leodamas) johnstonei Day, 1977: 231–232.

Material examined. *New South Wales*: Port Hacking, 31-xii-74, 1(W.195236); Botany Bay, 31-i-75, 1(W.195375), 13-ii-75, many (W.195431, W.195625); Hawkesbury R., 1-3, 1-4, 3-2, many (W.194904-8, W.194935-7); Belmont Bch, Nov. '75 1(W.8944).

Remarks. Agrees well with Day's (1934) description. Previously reported by Day (1977) from Botany Bay, New South Wales.

Habitat. Sandy, subtidal, seagrass beds; 34–37‰ salinity in Hawkesbury R., in sandy mud at 6–10 m depth.

Occurrence. Found frequently in Botany Bay; uncommon in Hawkesbury R.

Australian distribution. Victoria (Westernport Bay), New South Wales (Port Hacking*, Botany Bay, Hawkesbury R.*, Belmont Bch*), Queensland.

Scoloplos (Scoloplos) cylindrifer Ehlers, 1904

Scoloplos (Scoloplos) cylindrifer Ehlers, 1904: 45, pl. 6, figs 16-19.— Day, 1977: 226.

Material examined. *New South Wales*: Port Hacking, 1(W.7332); Bottle and Glass Rocks, Sydney Harbour, 1(W.4334); Long Reef, 8(W.7336).

Remarks. Agrees well with Day's (1977) description.

Habitat. Intertidal to subtidal on rocky shores.

Occurrence. Abundant at restricted sites.

Australian distribution. Western Australia, South Australia, Victoria, New South Wales.

Scoloplos (Scoloplos) novaehollandiae (Kinberg, 1866)

Scoloplos Novae Hollandiae.—Augener, 1922c: 40, fig. 9; 1927: 212.
Scoloplos (Scoloplos) novaehollandiae.—Day, 1977: 227-228, fig. 1 h-l.

Material examined. *New South Wales*: Jervis Bay, Murray's Bch, 17-x-72, 2(W.17586-7).

Remarks. Agrees with Day's (1977) description. Previously only known from Port Jackson.

Habitat. Seagrass beds, sand.

Occurrence. Rare; collected only in October 1972 in Jervis Bay.

Australian distribution. New South Wales (Jervis Bay*, Port Jackson), Queensland (Tincan Bay).

Scoloplos (Scoloplos) simplex (Hutchings, 1974)

Haploscoloplos simplex Hutchings, 1974: 118, fig. 2 A-D.
Scoloplos (Scoloplos) simplex.—Hutchings & Rainer, 1979: 761-762.

Material examined. *New South Wales*: Lake Merimbula, 6-x-75, 2(W.15108); Lake Illawara, 12-ix-75, many (W.12200); Botany Bay, Towra Pt, 10-ii-81, 1(W.195060); 12-iv-73, 1(W.9840); Hawkesbury R., 9-2, 11-1, many (W.196653-6), Cowan Waters, Cockle Ck, Stn 1, 25-x-80, many (W.196647-8), Cowan Ck, Apple Tree Bay, 9-1, 9-2, many (W.196649-52); Port Stephens, Aug. '76, 1(W.12856).

Remarks. Agrees well with Hutchings & Rainer's (1979) description. However, much more variation in the initial position of branchiae on the thorax noted; some specimens do not appear to have thoracic branchiae.

Habitat. Occurs in Hawkesbury R., in salinities, 20.8-30.4‰, and in Cowan Creek from 15-35‰. Intertidal sand flats, and seagrass beds in other localities.

Occurrence. Abundant in February, 1979 at Transects 7, 9 of the Hawkesbury R., and October, 1980 in Cowan Creek. Widespread in New South Wales estuaries, lakes and lagoons.

Australian distribution. Western Australia, South Australia, Victoria, New South Wales (widespread), Queensland.

Family PARAONIDAE Cerruti

Body long and slender with lateral biramous parapodia. Prostomium without appendages except sometimes a single antenna present; maximally two asetigerous anterior segments present. Palps absent; eversible pharynx. Branchiae typically present on a limited number of median setigers. All setae simple, including capillaries; various, usually post-branchial hooks or otherwise modified setae.

Key to the Species of Paraonidae

1. Median antenna present; posterior neurosetae include curved unidentate hooks; 20-24 pairs of branchiae ..... *Aricidea fauveli*

— Median antenna absent; posterior neurosetae include sigmoid acicular hooks; 3-14 pairs of branchiae .... *Paraonis gracilis gracilis*

Aricidea fauveli Hartman, 1957

Aricidea fauveli Hartman, 1957: 318.—Day, 1967: 560, fig. 24.2, a-d.—Poore *et. al.*, 1975: 30, 57.

Material examined. *New South Wales*: Jervis Bay, Murray's Bch, 25-iv-72, 1(W.194403); Botany Bay, 13-ii-75, 1(W.18747); Hawkesbury R., 1-1, many dates, many (W.196049-69), 1-2, many dates, many (W.196070-83), 1-3, many dates, many (W.196084-91). A selection of material examined. Lake Macquarie, 19-xi-76, 6(W.19233).

Description. Body long and slender. Prostomium bluntly triangular with indistinct eyes and a long median antenna. Anterior segments dorsoventrally flattened. Branchiae from setiger 4, extend over 20-24 segments. Anterior branchiae meet mid-dorsally, posteriorly becoming stouter and shorter. Postsetal lobes of anterior notopodia well developed, reduced posteriorly. Anterior setae, both noto- and neurosetae curved, tapered capillaries. Postbranchially, number of setae reduced; notosetae long, fine capillaries; neurosetae similar capillaries plus 4 curved unidentate hooks with delicate pointed hoods covering convex side of apex.

Remarks. First record from New South Wales.

Habitat. Mud to mudy sand, intertidal to 12 m water depth, in salinities of 29-35‰.

Occurrence. Found in low numbers throughout the year in Hawkesbury R. Rare in other New South Wales estuaries.

Australian distribution. Victoria, New South Wales (Jervis Bay*, Botany Bay*, Hawkesbury R.*, Lake Macquarie*).

Paraonis gracilis gracilis (Tauber, 1879)

Aonides gracilis Tauber, 1879: 115.
Paraonis gracilis gracilis.—Hartman, 1957: 330, pl. 44, figs 4-5.—Day, 1967: 566, fig. 24.4a-b.

Material examined. *New South Wales*: Hawkesbury R., 1-1, 1-3, 1-4, 3-2, 6-2, many dates, many individuals (W.196100-21).

Description. Agrees well with Hartman's and Day's descriptions.

Remarks. Poore *et al* (1975) recorded *P. gracilis gracilis* from Port Phillip Bay, Victoria. First record from New South Wales.

Habitat. Sandy mud to muddy sand at depths of 4–12 m in salinites of 27–35‰.

Occurrence. Found in low numbers throughout the year, at Hawkesbury R., Transects 1–6.

Australian distribution. Victoria, New South Wales (Hawkesbury R.*).

Family SPIONIDAE Grube

Elongate body. Prostomium anteriorly blunt with frontal horns, or pointed; an occipital papilla may be present, other appendages lacking. Prostomial palps present. Parapodia biramous, parapodial lobes cirriform or foliose. Setae all simple, including capillaries and hooded or non-hooded hooks which may be either bi- or multidentate.

Key to the Species of Spionidae after Blake & Kudenov, 1978†

1. Branchiae absent; setiger 1 with 1–2 large curved neuropodial spines in addition to normal capillaries ..... *Spiophanes bombyx*
—— Branchiae present; setiger 1 without large neuropodial spines 2
2. Setiger 5 modified, with specialized setae 3
—— Setiger 5 not modified, without specialised setae 14
3. Branchiae beginning on setiger 2 4
—— Branchiae beginning on setigers 6–12 6
4. Major spines of setiger 5 of one type, simple falcate with smaller companion setae ..... *(Boccardiella)* 5
—— Major spines of setiger 5 of two types, about 4 simple falcate spines, and 4 spines with distal concavity and central cone ..... *Boccardia chilensis*
5. Posterior end highly modified with two types of acicular notopodial spines; hooded hooks change from bidentate to unidentate posteriorly ..... *B. bihamata*
—— Posterior end with well developed groove on ventral surface; acicular notopodial spines absent; hooded hooks bidentate throughout body ..... *B. limnicola*
6. Setiger 5 slightly to moderately modified, usually with prominent parapodia; major spines of two types, usually arranged in U- or J-shaped row ..... *(Pseudopolydora)* 7
—— Setiger 5 greatly modified with reduced parapodia; major spines of one or two types not in U- or J-shaped row 9
7. Prostomium entire ..... *P. paucibranchiata*
—— Prostomium incised 8
8. Prostomium with two widely-flaring anterior lobes; occipital tentacle just behind eyes; caruncle continuing posteriorly to setigers 3–4; branchiae without glands ..... *P. kempi*
—— Prostomium with two rounded anterior lobes; nuchal tentacle at posterior end of caruncle on setiger 2; branchiae with glands ..... *P. glandulosa*
9. Setiger 5 with spines of one type, variously shaped, with or without companion setae ..... *(Polydora)* 10
—— Setiger 5 with spines of two types, some with expanded tips, others with falcate tips, one or both types usually with bristles ..... *(Carazziella)* 12

10. Hooded hooks with constriction on shaft; major spines of setiger 5 with one accessory flange located just ahead of an accessory tooth ..... *P. haswelli*

—— Hooded hooks without constriction on shaft; major spines of setiger 5 simple, falcate, without accessory structure but may have subterminal enlargement 11

11. Occipital tentacle present; major spines of setiger 5 simple falcate ..... *P. tentaculata*

—— Occipital tentacle absent; major spines of setiger 5 with subterminal boss ... *P. socialis*

12. Hooded hooks beginning on setiger 7; superior dorsal fascicle with distinctive fimbriated setae ..... *C. hirsutiseta*

—— Hooded hooks beginning on setiger 8; superior dorsal fascicle with simple, unilimbate setae, or such setae absent 13

13. Setiger 1 without notosetae; notopodium short, same length as neuropodium; prostomium rounded ..... *C. victoriensis*

—— Setiger 1 with notosetae; notopodium longer than neuropodium; prostomium bifid ..... *C. phillipensis*

14. Prostomium distally pointed, with or without subdistal lateral horns 15

—— Prostomium not distally pointed, with or without distal lateral or frontal horns, broadly rounded or incised on anterior margin 20

15. Branchiae beginning on setiger 1 16

—— Branchiae beginning on setiger 2 17

16. Prostomium appearing tripartite; setigers 6–9 with dense setal fascicles; notosetae of setiger 1 similar in length to those of succeeding setigers; accessory branchiae absent ..... *Australospio trifida*

—— Prostomium conical, lacking lateral horns; setiger 6–9 without dense setal fascicles; notosetae of setiger 1 long, thin; accessory branchiae present .... *Dispio glabrilamellata*

17. Branchiae fused to dorsal lamellae, at least basally, continuing to end of body ... . *(Scolelepis)* 18

—— Branchiae completely free from dorsal lamellae, present on setigers 2–20 .... *Aonides oxycephela*

18. Notosetae present on setiger 1; multidentate hooded hooks beginning in neuropodia of setiger 15–20 ..... *S. precirriseta*

—— Notosetae absent on setiger 1; multidentate hooded hooks beginning in neuropodia from setigers 14–15 or 24–25 19

19. Caruncle posteriorly elevated into foliose lobe; branchiae free at tips ..... *S. occipitalis*

—— Caruncle posteriorly elevated, pointed not foliose; branchiae completely fused to dorsal lamellae ..... *S. towra*

20. Prostomium with lateral or frontal horns; branchiae beginning on setiger 1; hooded hooks only in neuropodia of posterior segments ..... (*Malacoceros*) 21

—— Prostomium without lateral or frontal horns; branchiae beginning on setiger 1 or 2; hooded hooks in both noto- and neuropodia, or only neuropodia 23

21. Neuropodial lamellae of middle and posterior segments with nipple-like projections ..... *M. indicus*

—— Neuropodial lamellae of middle and posterior segments rounded without projections 22

22. Neuropodia with tridentate hooded hooks from setiger 31; inferior sabre setae from setiger 25 ..... *M. tripartitus*

—— Neuropodia with bidentate hooded hooks from setiger 22; inferior sabre setae from setiger 22 ..... *M. divisus*

23. Branchiae concentrated in 1–22 anterior setigers, absent posteriorly 24
—— Branchiae present over most of body length 31
24. Branchiae beginning on setiger 1, continuing for 18–22 segments, all cirriform . ..... *Orthoprionospio cirriformia*
—— Branchiae beginning on setiger 2, often only 4 pairs, smooth and/or pinnate 25
25. Branchiae 6–12 pairs, all cirriform ..... *Minuspio cirrifera*
—— Branchiae all pinnate, or pinnate and cirriform ..... (*Prionospio*) 26
26. Branchiae all pinnate 27
—— Branchiae both pinnate and cirriform 28
27. Three pairs of pinnate branchiae; low dorsal crest on setiger 7 ..... *P. aucklandica*
—— Four pairs of pinnate branchiae; dorsal crests absent ..... *P. multipinnulata*
28. First and third pairs of branchiae pinnate (pinnules sparse), second and fourth pairs cirriform ..... *P. paucipinnulata*
—— Branchiae otherwise 29
29. First 3 pairs of branchiae cirriform, fourth pair pinnate; hooded hooks tridentate ..... *P. tridentata*
—— First and fourth pairs of branchiae pinnate, second and third pairs cirriform; hooded hooks multidentate 30
30. Membranous dorsal crest developed from setiger 7, continuing for numerous setigers ..... *P. multicristata*
—— Membranous dorsal fold on setiger 5, and low dorsal crests on variable number of setigers from setiger 9 ..... *P. queenslandica*
31. Branchiae beginning on setiger 1 ..... *Spio pacifica*
—— Branchiae beginning on setiger 2 32
32. Prostomium inflated; anteriorly tapered branchiae at least partially fused to notopodial postsetal lobe; bidentate hooded hooks from setiger 24 ..... *Nerinides vexillatus*
—— Prostomium bilobed, deeply incised on anterior margin; branchiae connected basally to notopodial postsetal lobe; tridentate hooded hooks from setiger 9 .... *Microspio granulata*

†Many other species of Spionidae have been recorded from estuarine areas in Eastern Australia and therefore species keyed out above should be carefully checked against the description.

Aonides oxycephela (Sars, 1862)

Aonides oxycephela.—Blake and Kudenov, 1978: 189–191.—Hutchings & Turvey, 1984: 1–20.

Material examined. *New South Wales:* Lake Merimbula, 4-xii-75, 3(W.11734); Jervis Bay, Murray's Basin, 17-x-72, 7(W.194384), Murray's Bch, 25-iv-72, 11(W.194437); Port Hacking, Maianbar, 3-xii-75, 1(W.11250); Botany Bay, 23-i-75, 1(W.18915).

Remarks. Agrees with Blake & Kudenov's (1978) description. Previously only recorded from Merimbula.

Habitat. Seagrass beds, sand.

Occurrence. Uncommon, collected throughout year in small numbers.

Australian distribution. South Australia, Victoria, New South Wales (Merimbula, Jervis Bay*, Port Hacking*, Botany Bay*).

Australospio trifida Blake & Kudenov, 1978

Australospio trifida Blake & Kudenov, 1978: 193–195, fig. 11 a–j.

Material examined. *New South Wales:* Lake Merimbula, 6-x-75, 1(W.11730), 5-x-75, 1(W.12738); Port Hacking, Maianbar, May '75, 2(W.9503); Botany Bay, Towra Pt, 2-v-81, 1(W.195048).

Remarks. Agrees with Blake & Kudenov's (1978) description.

Habitat. Mud and seagrass beds.

Occurrence. Uncommon. Restricted to a few New

South Wales estuaries.

Australian distribution. Victoria, New South Wales, (Merimbula, Port Hacking*, Botany Bay).

Boccardia chilensis Blake & Woodwick, 1971

Boccardia chilensis Blake & Woodwick, 1971: 36.—Blake & Kudenov, 1978: 238-240, fig. 33d-e.—Hutchings & Turvey, 1984: 1-20.

Material examined. *New South Wales:* Lake Merimbula, 23-viii-75, 3(W.11695), 6-x-75, 1(W.12705); Port Hacking, Maianbar, May '75, 1(W.9612), 4-ix-75, 1(W.11011); Botany Bay, Kurnell, Silver Bch, 12-xi-79, 1(W.194923), Towra Bch, 12-iv-73, several (W.15648-51).

Remarks. Agrees well with Blake & Kudenov's (1978) description.

Habitat. Wide variety of estuarine habitats including *Posidonia* and *Zostera* seagrass beds.

Occurrence. Frequently found in some New South Wales estuaries.

Australian distribution. South Australia (Venus Bay*, Coorong*), Victoria, New South Wales.

Boccardiella bihamata Blake & Kudenov, 1978

Boccardiella bihamata Blake & Kudenov, 1978: 265-266, fig. 48 a-n.

Material examined. *New South Wales:* Hawkesbury R., D2-2, 1-viii-79, 1(W.196362), D2-3, 1-viii-79, 2(W.196363).

Remarks. Agrees well with Blake and Kudenov's (1978) description. Previously only known from Botany Bay.

Habitat. Sandy mud with much shell at 5 m in salinities of 33-35‰.

Occurrence. Rare; specimens found only at Brooklyn in 1979-1980, not year round.

Australian distribution. New South Wales (Botany Bay, Hawkesbury R*).

Boccardiella limnicola (Blake & Woodwick, 1976)

Boccardia limnicola Blake & Woodwick, 1976: 123.
Boccardiella limnicola.—Blake & Kudenov, 1978: 266-267.

Material examined. *New South Wales:* Port Hacking, Maianbar, 19-viii-76, 1(W.15425); Hawkesbury R., 9-1, many (W.196505-6), 11-1, several (W.196507), 13-2, many (W.196508), 14-1, 1(W.196509).

Remarks. Agrees well with Blake & Woodwick's (1976) description. First record from New South Wales.

Habitat. Found in recorded salinites of 0-12‰, in a sand or clay sediment; also found in sand and *Posidonia* seagrass beds.

Occurrence. Abundant at Station 9-1 in the Hawkesbury R., all year round (numbers vary year to year); present also at Stns 11-1, 13-2, 14-1. Restricted to a few localities in New South Wales.

Australian distribution. Victoria, New South Wales (Port Hacking*, Hawkesbury R*), Queensland.

Carazziella hirsutiseta Blake & Kudenov, 1978

Carazziella hirsutiseta Blake & Kudenov, 1978: 245, fig. 37 a-h.

Material examined. *New South Wales:* Lake Merimbula, 5-x-75, 2(W.15349, W.15661); Port Hacking, Maianbar, May '75, many (W.15654, W.15656-7); Botany Bay, Towra Pt, 12-iv-73, several (W.15658-60).

Remarks. Agrees with Blake & Kudenov's (1978) description. Only previously recorded from Botany Bay.

Habitat. *Posidonia* seagrass beds.

Occurrence. Rare.

Australian distribution. New South Wales (Merimbula*, Port Hacking*, Botany Bay).

Carazziella phillipensis Blake & Kudenov, 1978

Carazziella phillipensis Blake & Kudenov, 1978: 242, fig. 35 a-d.

Material examined. *New South Wales:* Botany Bay, Kurnell, Silver Bch, 19-iii-81, 1(W.194919).

Remarks. Agrees with Blake & Kudenov's (1978) description. Not previously recorded from New South Wales.

Habitat. Intertidal *Zostera* seagrass beds.

Occurrence. Rare.

Australian distribution. Victoria, New South Wales (Botany Bay*).

Carazziella victoriensis Blake & Kudenov, 1978

Carazziella victoriensis Blake & Kudenov, 1978: 240-242, fig. 34 a-i.

Material examined. *New South Wales:* Port Hacking, 22-xii-74, 1(W.195299); Botany Bay, 13-ii-75, 1(W.18779), 24-iii-75, 1(W.18950); Hawkesbury R, 1-1, many (W.196296-302), 1-2, many (W.196303-5), 1-3, many (W.196306-9), 2-1, several (W.196310-2), 2-2, 2(W.196313), 5-2, 1(W.196314), 7-2, many (W.196315-9).

Remarks. Agrees well with Blake & Kudenov's (1978) description. First record from New South Wales.

Habitat. Salinities of 23-25‰, sediments of fine mud to sandy mud with shell and detritus; *Posidonia* seagrass beds.

Occurrence. Frequently found in Hawkesbury R., at Transects 1, 2, 3, and at Brooklyn all year round (not all years). Rare at other localities.

Australian distribution. Victoria, New South Wales (Port Hacking*, Botany Bay*, Hawkesbury R.).

Dispio glabrilamellata Blake & Kudenov, 1978

Dispio glabrilamellata Blake & Kudenov, 1978: 191-193, fig. 10 a-g.

Material examined. *New South Wales:* Jervis Bay, Murray's Bch, 25-vi-72, 1(W.194554); Botany Bay, 30-i-75, 1(W.19636).

Remarks. Agrees well with Blake & Kudenov's (1978) description. First record from estuarine areas in New South Wales.

Habitat. Seagrass beds.

Occurrence. Rare.

Australian distribution. Victoria, New South Wales (Jervis Bay*, Botany Bay*), Queensland.

Malacoceros divisus Hutchings & Rainer, 1979

Malacoceros divisus Hutchings & Rainer, 1979: 763–765, fig. 3 A–F.

Material examined. *New South Wales:* Lake Merimbula, Apr. '77, 1(W.11408), 5-x-75, many (W.12659, W.12750, W.12765, W.15637). *Queensland:* Moreton Bay, Jan. '71, 1(W.7113).

Remarks. Agrees with Hutchings & Rainer's (1979) description.

Habitat. *Posidonia* seagrass beds.

Occurrence. Rare.

Australian distribution. New South Wales (Merimbula*, Careel Bay), Queensland (Moreton Bay*).

Malacoceros cf. *indicus* (Fauvel, 1928)

Malacoceros indicus.—Pettibone, 1963: 99.—Blake & Kudenov, 1978: 195.

Material examined. *New South Wales:* Lake Merimbula, 5-x-75, 1(W.12688).

Remarks. Material in poor condition. This may represent the first record from New South Wales.

Habitat. *Posidonia* seagrass beds.

Occurrence. Rare.

Australian distribution. New South Wales (Merimbula*), Queensland (Low Isles).

Malacoceros tripartitus Blake & Kudenov, 1978

Malacoceros tripartitus Blake & Kudenov, 1978: 197, fig. 12 a–g.

Material examined. *New South Wales:* Lake Merimbula, Stn 5, 1(W.15403); Jervis Bay, Murray's Bch, Apr. '72, (W.194139).

Remarks. Agrees with Blake & Kudenov's (1978) description. First record from New South Wales.

Habitat. Seagrass beds, sandbanks.

Occurrence. Rare.

Australian distribution. Victoria, New South Wales (Lake Merimbula*, Jervis Bay*).

Microspio granulata Blake & Kudenov, 1978

Microspio granulata Blake & Kudenov, 1978: 232, fig. 30–31.—Hutchings & Turvey, 1984: 1–20.

Material examined. *New South Wales:* Jervis Bay, Murray's Bch, Murray's Basin sandbank, 25-iv-72, many (W.194091, W.194251, W.194472, W.194510), 19/ 17/ 10-x-72, many (W.194229, W.194328, W.194419, W.194472).

Remarks. Agrees with Blake & Kudenov's (1978) description.

Habitat. *Zostera* seagrass beds and sandy substrates.

Occurrence. Abundant in Jervis and Botany Bays.

Australian distribution. South Australia (Streaky Bay*), New South Wales (Jervis Bay*, Botany Bay).

Minuspio cirrifera (Wirén, 1883)

Minuspio cirrifera.—Foster, 1971: 108–112, figs. 262–275.—Hutchings & Rainer, 1979: 765.—Hutchings & Turvey, 1984: 1–20.

Prionospio (Minuspio) cirrifera.—Blake & Kudenov, 1978: 222–224.

Material examined. *New South Wales:* Jervis Bay, 25-iv-72, 1(W.194090); Botany Bay, Towra Pt, 17-iv-73, several (W.16907-10); Hawkesbury R, 1-1, many (W.194939-51). A selection of material examined.

Remarks. Agrees well with previous descriptions. Foster (1971) erected the genus *Minuspio* for members of the *Prionospio* complex with only cirriform branchiae and although Blake & Kudenov (1978) reduced it to a sub-genus, we believe that it is a valid genus, within the *Prionospio* complex.

Habitat. Found in salinities of 23–35‰, sediments of mud and sandy mud with shell, in *Posidonia* and *Zostera* seagrass beds.

Occurrence. Abundant; most frequently found at Hawkesbury R, Transects 1 and 2 (and at Brooklyn), all year round. Widespread in New South Wales estuaries.

Australian distribution. South Australia (Streaky Bay*), Victoria, New South Wales, Queensland.

Nerinides vexillatus Hutchings & Rainer, 1979

Nerinides vexillatus Hutchings & Rainer, 1979: 771–773, fig. 6 a–g.

Material examined. *New South Wales:* Port Stephens, Research Stn, 27-vii-76, 2(W.12563, W.12607).

Remarks. Agrees with the original description. Both specimens posteriorly incomplete so no description of the posterior end can be given. First record since a single specimen was recorded from Careel Bay, Pittwater. The type is also posteriorly incomplete.

Habitat. *Posidonia* seagrass beds.

Occurrence. Rare.

Australian distribution. New South Wales (Careel Bay, Port Stephens*).

Orthoprionospio cirriformia Blake & Kudenov, 1978

Orthoprionospio cirriformia Blake & Kudenov, 1978: 211, fig. 19 a–h.

Material examined. *New South Wales:* Lake Merimbula, NSWSF sample 1, 2(W.11395); Botany Bay, Towra Bch, 12-iv-73, 1(W.16914), 17-iii-75, 1(W.195590).

Remarks. Agrees well with Blake & Kudenov's (1978) description. Previously only recorded from Georges River.

Habitat. *Posidonia* seagrass beds, in reduced salinities.

Occurrence. Rare.

Australian distribution. Tasmania, Victoria, New South Wales (Merimbula*, Georges R., Botany Bay*).

Polydora haswelli Blake & Kudenov, 1978

Polydora haswelli Blake & Kudenov, 1978: 259-260, fig. 44 a–f.

Material examined. *New South Wales:* Botany Bay, Towra Bch, 12-iv-73, many (W.9763, W.9845, W.9937, W.10982), Bonna Pt, 22-i-75, several (W.18969, W.195713).

Remarks. Agrees with Blake & Kudenov's (1978) description.

Habitat. *Posidonia* seagrass beds, sand.

Occurrence. Rare.

Australian distribution. New South Wales (Port Jackson, Botany Bay).

Polydora tentaculata Blake & Kudenov, 1978

Polydora tentaculata Blake & Kudenov, 1978: 250–252, fig. 39 a–e.

Material examined. *New South Wales:* Botany Bay, 14-iv-75, 2(W.195660).

Remarks. Agrees well with the original description; Botany Bay is the type locality.

Habitat. Sand, shell grit.

Occurrence. Rare.

Australian distribution. Queensland (Moreton Bay), New South Wales (Botany Bay).

Prionospio aucklandica Augener, 1923

Prionospio aucklandica Augener, 1923: 69.—Blake & Kudenov, 1978: 221–222, fig. 25 b–g.

Material examined. *New South Wales:* Jervis Bay, Murray's Bch, 25-iv-72, 1(W.194186); Port Hacking, Maianbar, 29-v-75, 25(W.15398); Botany Bay, Towra Pt, 26-vii-81, 1(W.195050); Hawkesbury R., D2-2, 18-xii-79, 1(W.196472), D2-3, 18-xii-79, 1(W.196473); Lake Macquarie, 20-v-78, 1(W.19232). A selection of material examined.

Remarks. Agrees well with Blake & Kudenov's (1978) description except that the ridge on setiger 7 is poorly developed. This species may occur in the Hawkesbury River, but we only have damaged material, lacking branchiae.

Habitat. *Halophila, Posidonia* and *Zostera* seagrass beds, and in sandy mud, reduced salinities.

Occurrence. Uncommon, but widespread in New South Wales.

Australian distribution. South Australia, Victoria, New South Wales.

Polydora socialis (Schmarda, 1861)

Polydora socialis.—Blake & Kudenov, 1978: 248–250, fig. 38 d–e.—Hutchings & Rainer, 1979: 767.—Hutchings & Turvey, 1984: 1–20.

Material examined. *New South Wales:* Port Hacking, Maianbar, 4-xi-75, 2(W.15666); Botany Bay, Towra Bch, 12-iv-73, 5(W.15665); Hawkesbury R., D2-2, D2-3, D2-4, D3-1, D3-4, D4-1, D4-2, D5-3, many (W.196667-75). A selection of material examined. *Queensland:* Hervey Bay, 31-ix-72, 2(W.15716).

Remarks. Agrees well with previous description, the intensity of pigmentation highly variable; the presence/absence of eyes also varies.

Habitat. Salinities of 33–35‰, sandy mud with shell and detritus; also *Posidonia* seagrass beds.

Occurrence. Uncommon; found mostly at Stns D2-2, in the Hawkesbury R., in July, and only in summer months; also collected from Port Stephens. Widespread in New South Wales.

Australian distribution. South Australia (Streaky Bay*), Victoria, New South Wales, Queensland (Hervey Bay*).

Prionospio multicristata Hutchings & Rainer, 1979

Prionospio multicristata Hutchings & Rainer, 1979: 768–771, fig. 5 a–i.—Hutchings & Turvey, 1984: 1–20.

Material examined. *New South Wales:* Lake Merimbula, NSWSF Stn 11, 1(W.15430); Jervis Bay, 25-iv-72, 2(W.194089); Port Hacking, 17-xii-74, 4(W.195218); Botany Bay, 30-i-75, 1(W.195749); Hawkesbury R., 9-2-1, 13-xi-79, 1(W.196470). *Queensland.* Auckland Ck, Aug. '76, 1(W.13216). A selection of material examined.

Remarks. Agrees well with Hutchings & Rainer (1979); previously recorded only from Careel Bay.

Habitat. Collected in Hawkesbury R., from sediment of medium-grained sand, at a depth of 6 m in salinity of 23‰; in other locations, from seagrass beds.

Occurrence. Rare in the Hawkesbury R. only one specimen found in November, 1979; usually frequent in New South Wales in estuarine areas in low numbers.

Australian distribution. South Australia (Port Wakefield*, Port Lincoln*, Streaky Bay*), New South Wales (Merimbula*, Jervis Bay*, Port Hacking*,

Botany Bay*, Careel Bay, Hawkesbury R.*), Queensland (Gladstone*).

Prionospio multipinnulata Blake & Kudenov, 1978

Prionospio multipinnulata Blake & Kudenov, 1978: 219-221, fig. 24 a-f.—Hutchings & Turvey, 1984: 1-20.

Material examined. *New South Wales:* Jervis Bay, Murray's Basin sandbank, 17-x-72, 2(W.194500).

Remarks. Agrees with Blake & Kudenov's (1978) description.

Habitat. Seagrass beds, sand.

Occurrence. Rare.

Australian distribution. Victoria (Port Phillip Bay), New South Wales (Merimbula, Jervis Bay*).

Prionospio paucipinnulata Blake & Kudenov, 1978

Prionospio paucipinnulata Blake & Kudenov, 1978: 217-219, fig. 22 a-h.

Material examined. *New South Wales:* Jervis Bay, Murray's Basin, 19-x-72, 1(W.194600); Port Hacking, Maianbar, May '75, 2(W.9443).

Remarks. Agrees with Blake & Kudenov's (1978) description. First record from New South Wales.

Habitat. Sand, *Posidonia* seagrass beds.

Occurrence. Rare.

Australian distribution. Victoria, New South Wales (Jervis Bay*, Port Hacking*).

Prionospio queenslandica Blake & Kudenov, 1978

Prionospio queenslandica Blake & Kudenov, 1978: 215-217, fig. 21 a-i.

Material examined. *New South Wales:* Pittwater, 30-iii-77, 2(W.196469).

Remarks. Agrees well with Blake & Kudenov's (1978) description. In Pittwater, two closely related species of *Prionopsio* occur, *P. queenslandica* and *P. multicristata* Hutchings & Rainer. They can be distinguished by the development of the dorsal folds, pattern of the pinnae on the 1st and 4th branchiae, and the shape of the parapodial lobes. This is the first record of this species from New South Wales.

Habitat. In sand, at 4 m depth, in salinity of 35‰; in sandy-mud at 12 m depth in salinity of 36‰.

Occurrence. Only two specimens collected off Mackeral Bch, in Pittwater in March, 1977.

Australian distribution. New South Wales (Pittwater*), Queensland.

Prionospio tridentata Blake & Kudenov, 1978

Prionospio tridentata Blake & Kudenov, 1978: 219, fig. 23 a-d.

Material examined. *New South Wales:* Lake Merimbula, NSWSF Stn 5, 1(W.15375); Port Hacking, 6-xi-74, 6(W.195288); Botany Bay, Silver Bch, Kurnell 29-vi-81, 1(W.194922); Hawkesbury R., 1-4, several (W.196481-2), 2-1-2, 20-vii-80, 1(W.196483), D3-1, 1-viii-79, 1(W.196474), D4-1, 26-ii-80, 2(W.196475). A selection of material examined.

Remarks. Agrees well with Blake & Kudenov's (1978) description.

Habitat. In the Hawkesbury R., collected from sandy mud sediments at a depth of 12 m in salinities of 36.4-35‰, and in other locations from intertidal *Zostera* seagrass beds.

Occurrence. Rare in Hawkesbury R., widespread in Botany Bay and Port Hacking. Collected in all seasons.

Australian distribution. New South Wales (Merimbula*, Port Hacking*, Botany Bay, Hawkesbury R*, Burwood Bch).

Pseudopolydora glandulosa Blake & Kudenov, 1978

Pseudopolydora glandulosa Blake & Kudenov, 1978: 269, fig. 49 a-e.

Material examined. *New South Wales:* Hawkesbury R., 2-1, several (W.196541-2), 2-2, 1(W.196543), 5-2, 1(W.196544), 7-3, 1(W.196545).

Remarks. Agrees well with Blake & Kudenov's (1978) description.

Habitat. Found in sediments of fine to sandy mud in salinities of 20.8-35‰.

Occurrence. Rare; found at Transects 1, 2, 3, 5, 7 and at Brooklyn, not present all year or every year; no seasonal preference shown.

Australian distribution. Victoria, New South Wales (Botany Bay, Hawkesbury R.*). Queensland.

Pseudopolydora kempi (Southern, 1921)

Pseudopolydora kempi.—Blake & Kudenov, 1978: 268-269.—Hutchings & Rainer, 1979: 773-774.—Hutchings & Turvey, 1984: 1-20.

Material examined. *New South Wales:* Jervis Bay, Murray's Bch, Apr. '72, 1(W.194099); Botany Bay, Towra Pt, 12/19-iv-73, many (W.9924, W.16921); Lake Macquarie, 1-xii-77, (W.19231).

Remarks. Agrees well with previous description.

Habitat. *Posidonia, Halophila* seagrass beds, sand.

Occurrence. Uncommon; previously recorded from Merimbula.

Australian distribution. South Australia, New South Wales (Merimbula, Jervis Bay*, Botany Bay*, Lake Macquarie*), Queensland.

Pseudopolydora paucibranchiata Okuda, 1937

Polydora (Carazzia) paucibranchiata Okuda, 1937: 231.
Pseudopolydora paucibranchiata.—Blake & Kudenov, 1978: 268.—Hutchings & Turvey, 1984: 1-20.

Material examined. *New South Wales:* Jervis Bay, Murray's Bch, Apr. '72, 1(W.194245); Lake Merimbula,

5-x-75, 1(W.12771); Port Hacking, Maianbar, May '75, 2(W.9502); Hawkesbury R., 1-1, 2-1, 2-2, 3-1, many (W.196534-8). A selection of material examined.

Remarks. Agrees well with published descriptions.

Habitat. In Hawkesbury R., found in salinities 32–35‰ in fine mud to sandy shelly mud with much detritus.

Occurrence. Frequent at H.R.S. Transects 1, 2, 3 and at Brooklyn for most of year. Widespread in New South Wales estuaries.

Australian distribution. South Australia (Port Lincoln*, Torrens I.*), Victoria, New South Wales (Merimbula*, Jervis Bay, Port Hacking*, Botany Bay, Hawkesbury R.*).

Scolelepis occipitalis Blake & Kudenov, 1978

Scolelepis occipitalis Blake & Kudenov, 1978: 180–182, fig. 4 a–k.

Material examined. *New South Wales:* Pittwater, 30-iii-77, 2(W.196471).

Remarks. Agrees well with Blake & Kudenov's (1978) description. Previously only known from oceanic beaches.

Habitat. Found in sand at 4 m depth in salinity of 35‰.

Occurrence. Rare; collected off Great Mackeral Bch, Pittwater.

Australian distribution. New South Wales (Burwood Bch, Pittwater*).

Scolelepis precirriseta Blake & Kudenov, 1978

Scolelepis precirriseta Blake & Kudenov, 1978: 183–186, fig. 6 a–h.

Material examined. *New South Wales:* Botany Bay, 20-vi-77, 1(W.18710).

Remarks. Agrees with Blake & Kudenov's (1978) description.

Habitat. Seagrass beds.

Occurrence. Rare; previously only recorded from Wallis Lake, in New South Wales.

Australian distribution. New South Wales (Botany Bay*, Wallis Lake), Queensland.

Scolelepis towra Blake & Kudenov, 1978

Scolelepis towra Blake & Kudenov, 1978: 183, fig. 5 a–h.

Material examined. *New South Wales:* Port Hacking, 12-iii-75, 6(W.195227), 6-xi-74, 5(W.195287); Botany Bay, Towra Pt, 17-i-82, 1(W.195053).

Remarks. Agrees with Blake & Kudenov's (1978) description.

Habitat. Sandy mud, artificial reef in Port Hacking.

Occurrence. Rare; previously only recorded from Botany Bay.

Australian distribution. New South Wales (Botany Bay, Towra Pt, Port Hacking*).

Spio pacifica Blake & Kudenov, 1978

Spio pacifica Blake & Kudenov, 1978: 228–230, fig. 28 a–k.—Hutchings & Turvey, 1984: 1–20.

Material examined. *New South Wales:* Lake Merimbula, 5-x-75, 1(W.11732); Jervis Bay, Murray's Basin, 19-x-72, 3(W.194227); Port Hacking, Maianbar, May '75, 1(W.9550), 19-viii-76, 3(W.11158); Hawkesbury R., D4-4, 21-viii-80, (W.196467), 3-3-2, 13-xi-79, 1(W.196468); Lake Macquarie, 18-xi-76, 1(W.19235). A selection of material examined.

Remarks. Agrees well with original description.

Habitat. All 5 specimens found in sandy mud at depths of 4–10 m in salinities of 29.8–35‰.

Occurrence. Rare in Hawkesbury R., found at 4 sites: off Juno Head, in Pittwater, off Dangar I., and off the east end of Spectacle I.; spasmodically throughout 1977–1978 with no seasonal pattern. Frequent in Botany Bay, Jervis Bay, and other New South Wales estuaries.

Australian distribution. Victoria, New South Wales (Merimbula*, Jervis Bay*, Port Hacking*, Botany Bay, Hawkesbury R*, Stockton Bch, Lake Macquarie*, Broughton I.*), Queensland.

Spiophanes bombyx (Claparède, 1870)

Spiophanes bombyx.—Foster, 1971: 41 (for synonymy).—Light, 1977: 80.—Blake & Kudenov, 1978: 224.

Material examined. *New South Wales:* Botany Bay, 13-ii-75, many (W.19030, W.195438, W.195473, W.195508); Hawkesbury R., 1-1-4, 5-v-77, 1(W.196350), 1-3, many (W.196351-6), 1-4, many (W.196357-61).

Remarks. Agrees well with Blake & Kudenov's (1978) description.

Habitat. Collected from sandy mud, at depths of 10–12 m, in salinities of 33–35‰; in Botany Bay from sand, shell grit.

Occurrence. First record in New South Wales. Uncommon in Hawkesbury R., found at Transect 1 in most seasons, not collected after winter 1978. Uncommon in Botany Bay.

Australian distribution. Victoria (Gippsland Lakes), New South Wales (Botany Bay*, Hawkesbury R*), Queensland (Moreton Bay).

Family MAGELONIDAE Cunningham & Ramage

Long slender worms separated into two regions. Prostomium flattened and anteriorly ovate or truncate, without appendages. Palps at the junction of the prostomium and peristomium on the ventral side. Setae include capillaries and hooded hooks, either bidentate or multidentate.

Currently all magelonids are assigned to a single genus *Magelona*.

An extremely abundant species of *Magelona*, from the Hawkesbury R. is undescribed. Dr Meredith L. Jones, of the National Museum of Natural History, Smithsonian Institution, Washington D.C., is describing the species, and the description will appear shortly in the Proceedings of the Biological Society of Washington.

Magelona dakini Jones, 1978

Magelona dakini Jones, 1978: 355-360, figs 69-90.—Hutchings & Rainer, 1979: 774.

Material examined. *New South Wales:* Merimbula, MER 289U, MER 34C, MER 124C, MER 273Z, MER 297Q, MER 340F, many (W.17132-7); Botany Bay, Towra Pt, Stn 224, 226, 238, 240-242, several (W.9709, W.9742, W.9919, W.9965, W.9994, W.10017); Port Stephens, Stn 14, 1, 9, 10, 7, 6, 2, several (W.12481, W.12490, W.12498, W.12549, W.12565, W.12576).

Remarks. Typical; agrees with Jones' (1978) description.

Habitat. Seagrass beds, subtidal.

Occurrence. Widely distributed and often abundant.

Australian distribution. Victoria, New South Wales, Queensland.

Family CHAETOPTERIDAE Malmgren

Body with two or three distinct body regions. Prostomium with palps, and peristomium may have one or two pairs of tentacular cirri. Anterior region with uniramous parapodia, median and posterior regions with biramous parapodia. Setae include capillary setae and modified spines in setiger 4. Pectiniform uncini present in posterior setigers.

Key to the Species of Chaetopteridae

1. Median notopodia bilobed 2
— Median notopodia never bilobed, maybe fused 3
2. A pair of small tentacular cirri present at base of large palps .... *Phyllochaetopterus*†
— Tentacular cirri absent; palps large .... *Spiochaetopterus* sp.
3. Some median notopodia fused to form dorsal fans; palps very short .. *Chaetopterus variopedatus*
— Notopodia never fused; palps large .... *Mesochaetopterus minutus*

†Not present in the Australian Museum collections, but *Phyllochaetopterus socialis* was recorded by Augener (1927), from New South Wales, as *P. pictus*.

Chaetopterus variopedatus (Renier, 1804)

Chaetopterus variopedatus.—Knox & Cameron, 1971: 33.—Hutchings & Rainer, 1979: 774-775.

Material examined. *New South Wales:* Merimbula estuary, 3-xii-75, 1(W.11779); Port Hacking NSWSF, 2(W.195253); Botany Bay, La Perouse, 24-i-77, 7(W.14169); Hawkesbury R., 1-1, 2-viii-79, 1(W.196400), 2-2, 22-ii-80, 1(W.196401). A selection of material examined.

Remarks. A common cosmopolitan species.

Habitat. Present in salinities of 21-35‰, and sediments of mud and sandy mud; intertidal to 20 m water depth.

Occurrence. Widespread; occurs in most New South Wales estuaries and found in Transect 1 and at Brooklyn in the Hawkesbury R., in all seasons.

Australian distribution. Western Australia, Victoria, New South Wales, Queensland, Northern Territory.

Mesochaetopterus minutus Potts, 1914

Mesochaetopterus minutus Potts, 1914: 963, pl.2, fig. 4, pl.3, figs 7-8; text figs 4 and 5.—Day, 1967: 531, fig. 22.2 h-n.

Material examined. *New South Wales:* Lake Merimbula, 5-xii-75, 4(W.17112); Jervis Bay, Murray's Basin, 17-x-72, 1(W.194850); Port Hacking, Oct. '74, 3(W.195252); Botany Bay, Towra Bch, 12-iv-73, 1(W.10945); Lake Macquarie, Salt's Bay, 10-vii-73, 5(W.9398); Port Stephens, Aug. '76, 11(W.12938). A selection of material examined.

Description. A small species, about 15 mm long, living gregariously in dense masses of fragile sandy tubes. Body divided into 3 regions, colourless. Prostomium ovoid with a pair of eyes. Buccal segment with long grooved palps, but no tentacular cirri. Anterior body region of 10-13 segments. Setiger 4 with 4-7 modified setae, oar-shaped with serrated apex, one serration enlarged to form a major blunt tooth. Middle body region of 2 long segments with simple flattened notopodia with 2-3 setae. A small cupule or depression in middle of second segment. Neuropodia notched, and uncinigerous tori divided into 2. Uncini pectinate with 7-9 teeth. Posterior body region with numerous segments, each with short conical notopodia with a single seta; further posteriorly notopodia become globular.

Remarks. First record from New South Wales.

Habitat. *Posidonia* and *Zostera* seagrass beds, and shelly sand.

Occurrence. Present in low numbers.

Australian distribution. New South Wales (Merimbula*, Jervis Bay*, Botany Bay*, Lake Macquarie*, Port Stephens*).

? *Spiochaetopterus* sp.

Material examined. *New South Wales:* Port Hacking, Maianbar, 29-v-75, (W.9440), 15-ix-76, (W.11171), 4-xii-75, (W.11246); Botany Bay, 21-i-77 (W.14180-3), 10-iii-77 (W.14184-5); Port Stephens (W.12862); Broughton I., 1-ix-76, 7(W.13059).

Description. Poorly preserved individuals up to 15 mm long, in transparent chitinous ringed tubes. Palps missing and tentacular cirri not seen, presumed absent. Setiger 4 with single modified spine, expanded end with smooth margins. Anterior region of 6 segments. Middle region with 3 segments.

Remarks. We suspect that these specimens are *Spiochaetopterus* because of the type of modified setae on setiger 4, and the apparent lack of tentacular cirri. However the specimens are poorly preserved. This genus was recorded by Hutchings & Rainer (1980) from New South Wales but that material is also poorly preserved.

Habitat. *Posidonia* seagrass beds or sandy mud.
Occurrence. Locally common.

Family CIRRATULIDAE Carus

Body cylindrical. Prostomium conical or blunt, lacking appendages; eversible pharynx; peristomium fused with at least two segments. One pair of grooved palps, or a group of grooved palps on one or several post-peristomial segments. Parapodia reduced; slender, filiform or clavate branchiae present on at least some setigers. All setae simple, including capillaries and curved or excavate hooks.

Key to the Species of Cirratulidae

1. A pair of long, grooved palps attached on the anterior dorsum 2
—— Two groups of grooved palps present ..... *(Cirriformia)* 10
2. All setae slender, distally pointed, either smooth or weakly serrated ..... *(Tharyx)* 3
—— At least some setae either curved hooks or spines 4
3. Elongate buccal segment; dorsally placed branchiae; serrated geniculate neurosetae from setiger 40 ..... *T. aphelocephalus* n.sp.
—— Compact buccal segment; branchiae arise adjacent to notopodia; all setae smooth-tipped capillaries ..... *T.*cf.*multifilis*
4. Acicular spines in posterior segments distally entire, arranged in dorsolateral arcs ..... *(Chaetozone)* 5
—— Acicular spines in posterior segments distally bi- or multifid, not arranged in dorso-lateral arcs ..... *(Caulleriella)* 6
5. Eye spots present; neuropodial spines from setiger 23; tail region dorsoventrally flattened ..... *C. platycerca* n.sp.
—— Eye spots absent; neuropodial spines from setiger 50–80; tail region not dorsoventrally flattened ..... *C. setosa*
6 Neuropodial hooks from setiger 3 or 4 7
—— Neuropodial hooks appearing much later 8
7. Neuropodial hooks completely replace capillaries by setiger 3; notopodial hooks from setiger 6–9 (but not completely replacing capillaries) ..... *C. bioculatus*
—— Neuropodial hooks completely replace capillaries by setiger 4; notopodial hooks from setiger 21–22 (but not completely replacing capillaries) ..... *C. tricapillata*
8. Posterior neuropodia from setiger 45 with hooks and capillary setae ..... *C. retusiseta* n.sp.
—— Posterior neuropodia with hooks only 9
9. Neuropodia with hooks from setiger 58; notopodia with hooks and capillaries from setiger 70 ..... *C. longisetosa* n.sp.
—— Neuropodia with hooks from setiger 33, tips finely serrated; notopodia lacking hooks but acicular spines from setiger 100 ..... *C. dimorphosetosa* n.sp.
10. Tentacular cirri arise from setigers 3–4; slender spines from setiger 12 ..... *C. capensis*
—— Tentacular cirri arise from setigers 4–6; slender spines from setiger 12 ..... *C. filigera*

Caulleriella bioculatus (Keferstein, 1862)

Heterocirrus bioculatus.—Fauvel, 1927: 96, fig. 33 i.
Caulleriella bioculatus.—Day, 1967: 509, fig. 20.2. q.

Material examined. *Victoria:* Port Phillip Bay, 16-xi-71, 1(W.16319). *New South Wales:* Jervis Bay, Murray's Basin, 17-x-72, 1(W.194579); Wallis Lake, Dec. '70, 1(W.8973). A selection of material examined.

Description. Body up to 40 mm long. Prostomium pointed with one pair of eye spots. Pair of long grooved palps arise from peristomium and setiger 1 (easily lost). Branchial filaments from setiger 1 to middle of body. Notopodia with capillaries throughout and 1–3 acicular hooks from setiger 6–9 onwards. Neuropodia with capillaries in setigers 1 and 2, subsequently all hooks. Hooks unequally bidentate, secondary tooth much smaller.

Remarks. First record from Australia.

Habitat. Sand, *Zostera* seagrass beds.

Occurrence. Rare; few specimens collected at different times of year.

Australian distribution. Victoria, (Port Phillip Bay*), New South Wales (Jervis Bay*, Wallis Lake*).

Caulleriella dimorphosetosa n.sp.

Figs 17.1–8

Material examined. *New South Wales*: HOLOTYPE: Botany Bay, Stn 906, 13-ii-75, (W.196533) 11 mm long, 0.9 mm wide, 128 setigers, complete posteriorly. PARATYPES: (AHF POLY 1420) 14 mm long, 0.9 mm wide, 137 setigers, complete; (USNM 81473) 18 mm long, 1.5 mm wide, 157 setigers complete; (BMNH ZB 1983.1734) 16 mm long, 1 mm wide, 149 setigers; (W.18928) 5 complete specimens, 9 anterior fragments. All type material from Botany Bay, New South Wales.

Additional material. *New South Wales:* Port Hacking, Nov., Dec., '74, Mar. '75, many (W.195226, W.195237, W.195264-5, W.195286, W.195293, W.195310); Botany Bay, many dates, many individuals, (W.18706, W.18734, W.18755, W.18772, W.18791, W.18805, W.18823, W.18894, W.18928, W.18957, W.18984, W.19034, W.195556-7, W.195588, W.195639, W.195727, W.195780); Hawkesbury R., Cowan Waters, Bay A, 4-x-80, 5(W.196532).

Description. Body unpigmented, robust, elongate, swollen anteriorly between setigers 2–30, tapering to the dorsoventrally flattened broad tail region, terminating in dorsal anus and ventral flattened flange. Prostomium with conical palpode; peristomium with 3 annuli, first annulus inflated and dorsally lobate, with long posteriorly-directed lobe reaching almost to 1st setiger; stout pair of palps arise between peristomial dorsal lobe and margin of 2nd annulus; pair of adjacent branchiae arise from margin of 3rd annulus. Eyes large, near palpode on 1st annulus, placed laterally (Fig. 17.1). Branchiae present on most setigers in pairs, represented as basal stumps placed dorsolaterally, each one slightly posterior to notopodial fascicle on parapodial mound; branchiae absent from far posterior setigers.

Mound-shaped parapodia biramous throughout. Setae include long and short, smooth-edged capillaries, serrated curved hooks and straight, pointed acicular spines; all setae have basal golden-brown inclusions. Notopodia with capillaries, short and broadly limbate anteriorly (Fig. 17.3), becoming longer in middle setigers (Fig. 17.4), and more robust and longer posteriorly (Fig. 17.5). Also present posteriorly are 5–6 long, fine capillaries (Fig. 17.6) and from ~100th setiger, pointed acicular spines (Fig. 17.7) which increase to 2–3 per fascicle near the pygidium. Neurosetae include capillaries similar to notopodial ones anteriorly; from setiger 33, serrated, curved, robust hooks appear (Fig. 17.8), increasing to 4 per fascicle posteriorly, accompanied by 2–3 fine capillaries to the pygidium (Fig. 17.2). Posterior region with broad flattened tail; parapodia with discrete neuro- and notosetal fascicles, restricted laterally; dorsolateral fans of hooks and setal cinctures of the body absent. Notopodial hooks, similar to neuropodial ones, completely absent, replaced by straight spines.

Remarks. The start of the neuropodial hook varies with size in the paratypes and additional material, from setigers 24–40, but all possess the straight notopodial spines that develop posteriorly around setiger 100–104. Such acicular spines combined with the presence of serrated neuropodial hooks have been reported only for the species *Chaetozone gracilis* sensu Hartman (1961); the latter species lacks eyes, however. *Chaetozone gracilis* sensu Hartman (1961) has only been reported from great depths off southern California, and we would hestitate to refer to our estuarine specimens as the same species, because of these drastically differing habitats. We have placed this species in the genus *Caulleriella* and not in *Chaetozone* because of the presence of serrated hooks, a diagnostic characteristic for the genus *Caulleriella* as defined by Fauchald (1977) and Hobson & Banse (1981). We feel justified in describing our specimens as a new species, on the basis of the presence of two different kinds of acicular setae: serrated, sigmoid neuropodial hooks, and straight notopodial spines; the presence of a pair of large prostomial eyes; dorsoventrally flattened tail region and the different types of capillary setae including long, fairly broadly limbate notopodial ones, shorter neuropodial ones, and long, fine capillaries in both noto- and neuropodia posteriorly. The dorsally lobate prostomium is probably another distinguishing characteristic of our species, but this cannot be confirmed from the literature, due to the inadequate nature of cirratulid illustrations. We suspect that *Caulleriella* sp. 1 of the Port Phillip Bay survey, Victoria, can be referred to *C. dimorphosetosa*, but more material is needed to confirm this.

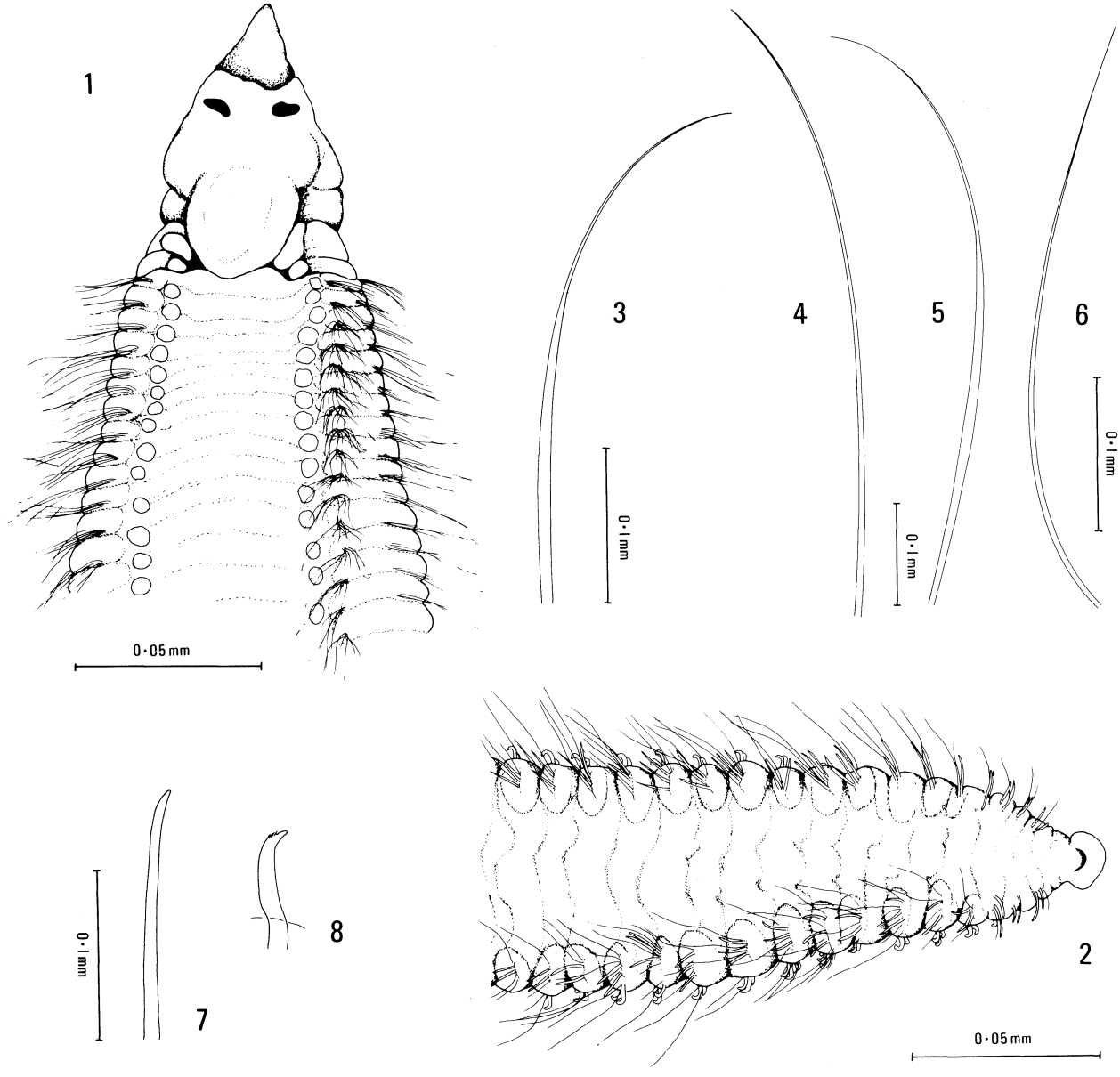

Fig. 17. *Caulleriella dimorphosetosa* n.sp. (Paratype W.18928): *1.* anterior end, dorsal view; *2.* posterior end, dorsal view; *3.* limbate notoseta from anterior setiger; *4.* notoseta from middle setiger; *5.* notoseta from posterior setiger; *6.* fine capillary notoseta from posterior setiger; *7.* notosetal acicular spine from posterior setiger; *8.* neurosetal hook from posterior setiger.

Etymology. The specific name, *dimorphosetosa*, refers to the two types of acicular spines present, and is derived from the latin.

Habitat. Found in wide variety of sediment types: mud, fine sand, sand/shell, shellgrit; also from *Posidonia* seagrass core samples. Collected in marine environments in 30+‰ salinities; subtidal.

Occurrence. Occurs in low numbers; specimens collected randomly during 1975, 1977 (Jan.–July) in Botany Bay, and during 1974 (Nov.—Dec.) and 1975 (March) in Port Hacking, also during Oct. 1980 from Cowan Creek. No preference for seasons is apparent.

Australian distribution. New South Wales (Port Hacking, Botany Bay, Cowan Waters).

Caulleriella longisetosa n.sp.

Figs 18.1–8

Material examined. *New South Wales*: HOLOTYPE: Hawkesbury R., D4-1, 21-viii-80, (W.196680) 8.5 mm long, 0.6 mm wide, 90 setigers, complete posteriorly. PARATYPES: (USNM 81474) D4-4, 9 mm long, 0.6 mm wide, 98 setigers; (AHF POLY 1418) D4-1, 8 mm long, 0.4 mm wide, 93 setigers; (BMNH ZB 1983.1735-36) 7 mm long, 4 mm wide, 77 setigers; all posteriorly complete.

Additional material. *New South Wales:* Hawkesbury R., D4-1, D4-4, D1-1, D1-2, D1-3, D1-4, D2-1, D2-2, D2-3, D2-4, D3-1, D3-2, D3-3, D3-4, D4-1, D4-2, D4-3, D4-4, D5-1, D5-3, D5-4, D6-1, D6-2, 1-1-1, many dates, many individuals (W.196681-726).

Description. Body small, thin, threadlike; pigment, and eyes absent. Epidermis thin, gut showing through body wall as twisting golden yellow strand in anterior region. Prostomium with short conical palpode; peristomium triannulate, with inflated buccal region and pair of strong palps arising dorsally at posterior margin of 3rd annulus accompanied by a pair of branchiae placed slightly posteriorly and laterally to palps (Fig. 18.1). Body cylindrical for first 25 setigers, somewhat dorsoventrally flattened in middle segments, tapering posteriorly from segment 51; tail portion not flattened but rounded in cross-section; anus dorsal with flattened ventral flange (Fig. 18.2). One pair of branchial filaments on most segments, represented by basal stumps in lateral branchial grooves, each one posterodorsal to notopodial fascicle of each setiger (Fig. 18.1). Parapodia biramous with capillary setae and hooks present. Notosetae capillaries of 2 lengths, both smooth-edged; short, limbate capillaries (Fig. 18.3) more abundant than the very long, extremely fine ones (Fig. 18.4) present from setigers 2–76, but not on every setiger. Notopodial hooks (Fig. 18.5) from setiger 70, up to 3 per fascicle near pygidium. Neuropodia with short, smooth-edged capillaries anteriorly (Fig. 18.6),

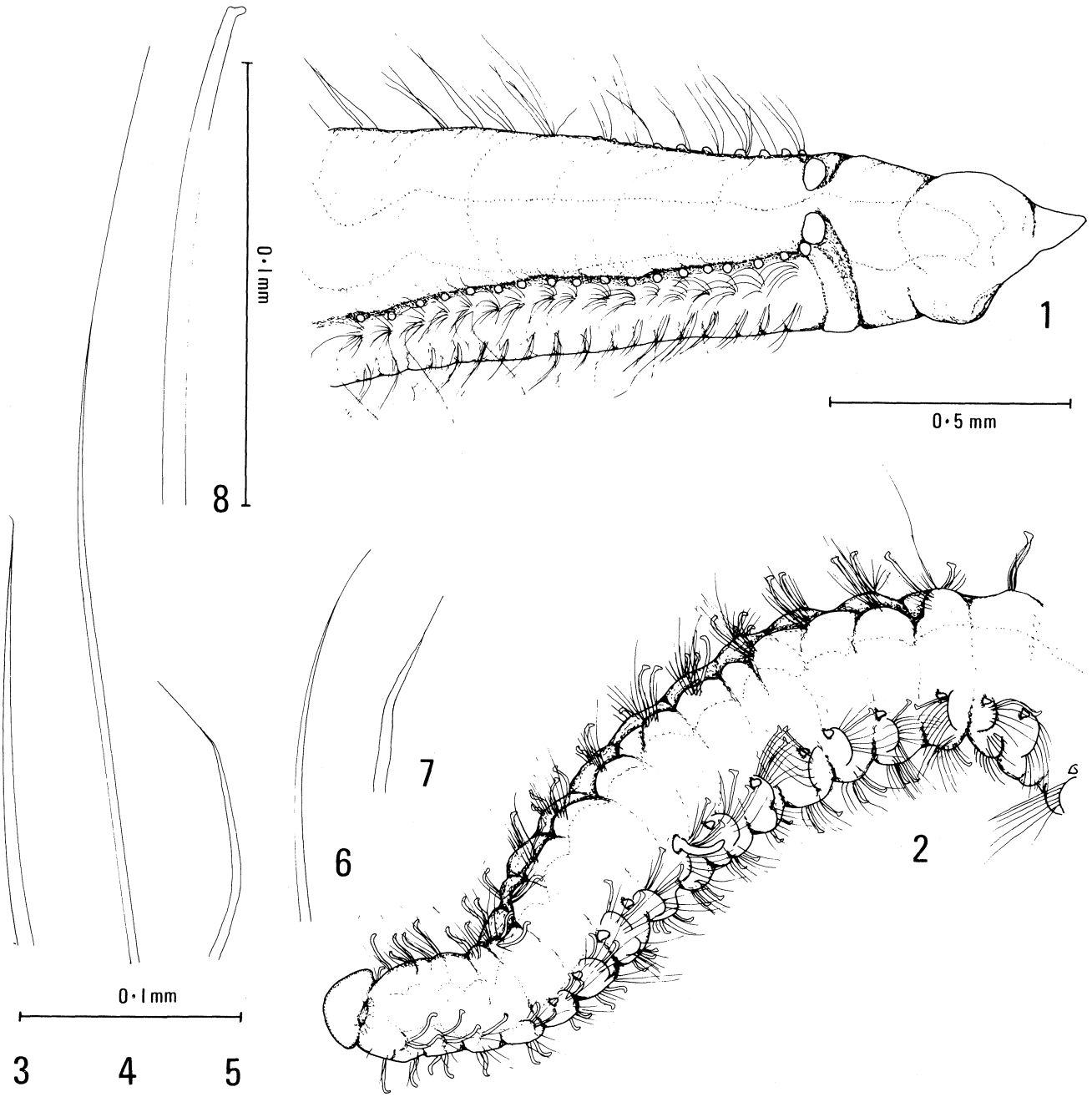

Fig. 18. *Caulleriella longisetosa* n.sp. (Holotype W.196680): *1.* anterior end, lateral view; *2.* posterior end, laterodorsal view; *3.* notoseta from anterior setiger; *4.* long, fine notoseta; *5.* notoseta from posterior setiger; *6.* neuroseta from anterior setiger; *7.* neuroseta from posterior setiger; *8.* hook from notopodium.

these shorter than notopodial short capillaries, especially in later setigers (Figs 18.7–8); neuropodial hooks similar to notopodial ones (Fig. 18.5) from setiger 58, up to 4 per fascicle near the pygidium. All hooks long, increasing in length towards posterior region (except in the last few setigers), with pale, faintly striated shafts, and hooked tips with distal edge; slightly concave or shallowly notched, rather than bifid or serrated. Noto- and neurosetal fascicles of far posterior region slightly divergent and forming dorsolateral "fans" on each side of the body, with mid-dorsal and mid-ventral spaces. Capillary setae present in all parapodia to pygidium.

Remarks. Much variation was observed in paratypes and additional material, regarding the position along the body of the development of noto- and neuropodial hooks; the paratypes show neuropodial hooks starting from setiger 52 (AHF POLY 1418), setiger 83 (USNM 81474), and setiger 59 (BMNH ZB 1983.1735-36); the additional material displays similar characteristics, the most anterior occurrence is from setiger 51, the most posterior from setiger 85. The additional material also shows variation in the starting position of the long capillary setae, many specimens had long tufts of setae from middle setigers onwards.

We have placed this species, and also *Caulleriella retusiseta* n.sp. in *Caulleriella*, despite the ambiguous nature of the hook-shape, because we feel that the blunt, distally knobbed, minutely-notched tip, agrees more with the definition of this genus than with *Chaetozone*, with its characteristic spine-like, distally entire, pointed acicular setae. Although posterior dorsolateral fans of hooks are generally ascribed to species of *Chaetozone*, we feel that this is a less important generic character than the hook-shapes of the two genera as defined by Fauchald (1977) and Hobson & Banse (1981).

Caulleriella longisetosa is distinguished from *C. annulosa* (Hartman, 1965) by the very long, fine capillaries and the dorsolateral fans of hooks in the former; both features are absent in the latter. Both species possess neuropodial hooks beginning on the same segment, and similarly-shaped hooks. Banse & Hobson (1968) placed *C. annulosa* within this genus although it was originally described by Hartman (1965) as *Tharyx annulosus*. *Caulleriella longisetosa* and *C. retusiseta* n.sp., both have similar hooks and long fine capillaries, but differ because of the earlier start of the hooks and the dorsoventrally flattened tail in the latter. *Chaetozone spinosa* Moore, 1903, also resembles *C. longisetosa* in possessing long fine capillaries but they are easily distinguished by different setal hook-shapes. Of all described species in the genus, only *C. longisetosa*, *C. annulosa* (Hartman, 1965) and *C. retusiseta* possess hooks that are not quite bifid or distally serrated, and have relatively posteriorly starting hooks, from setiger 24 to ~50, compared with previously described species, where hooks usually start from setiger 1–17.

Etymology. The specific name *longisetosa* refers to the extremely long, very fine capillary setae present in anterior to posterior setigers, and is derived from the latin.

Habitat. Present in 2–12 m water, in mud to sandy, shelly mud and in salinities of 32–35‰.

Occurrence. Common in Hawkesbury R.; not collected elsewhere. Present in all seasons after February 1979, no preference for season. Collected from Hawkesbury sites 1-1, 1-3, 2-1, 2-2, 3-1 and Brooklyn sites D1-D6.

Australian distribution. New South Wales (Hawkesbury R.).

Caulleriella retusiseta n.sp.

Figs 19.1–6

Material examined. HOLOTYPE: (W.196601) 11 m long, 1 mm wide, 113 setigers, complete posteriorly, 31-i-75. PARATYPES: (AHF POLY 1419) 12 mm long, 1.2 mm wide, 111 setigers, complete; (USNM 81475) 12 mm long, 1 mm wide, 127 setigers, complete; (BMNH ZB 1983.1737) 13 mm long, 1.5 mm wide, 125 setigers, complete.

Additional material. (W.19021, W.19035), 17-iii-75, all material including types from New South Wales, Botany Bay Stn 826, 865.

Description. Body thick, soft broad, cylindrical from setigers 1–35; swollen and flattened in middle segments to setigers 82; tapering posteriorly to dorsoventrally flattened broad tail, 0.05 mm wide. Peristomium triannulate, with conical palpode, buccal region inflated; eyes absent. Pair of palps arising at posterior margin of prostomium, on 3rd annulus, with an adjacent pair of branchiae placed posterolaterally. Branchiae numerous, absent from first setiger, a pair on almost every succeeding setiger except for posterior region, arising dorsally in shallow dorsolateral groove extending down each side of body (Fig. 19.1). Pygidium with dorsal anus and round flattened ventral flange (Fig. 19.2).

Parapodia biramous throughout, as mounds, with capillary setae and hooks posteriorly. Notopodia with capillary setae in all setigers to pygidium; two types capillaries, one short, limbate, the other fine and long, becoming shorter posteriorly, both smooth-edged (Figs 19.3–4). Notopodial hooks (Fig. 19.5) start at setiger 70, increasing to 3 per fascicle, then decreasing to 1 near pygidium. Neuropodial capillary setae in all setigers to pygidium; some short and limbate (Fig. 19.3), other short fine ones, similar to notopodial capillaries, occurring posteriorly (Fig. 19.6). Neuropodial hooks (Fig. 19.5) start at setiger 45, increasing to 4 per fascicle then decreasing to 1 near pygidium. Posterior parapodia with discrete and lateral bundles of setae; dorsolateral fans of hooks and capillaries absent; noto- and neuropodial fascicles separate (Fig. 19.2). All hooks slightly knobbed with distal end minutely concave, or very minutely bifid (Fig. 19.5).

Remarks. The position along the length of the body of the start of the noto- and neuropodial hooks varies with size of the specimen, from setiger 24–75, with smaller specimens of the paratype and additional material having the more anteriorly starting hooks. This

species is very similar to *Caulleriella longisetosa* n.sp. (described in this paper) in general appearance especially with long, fine setae and hook-shape, but is distinguished from it by the flattened tail shape, the absence of transverse rows of hooks almost encircling the body posteriorly, the presence of parapodial mounds, the absence of branchiae on setiger 1, the more anterior development of neuropodial hooks, and the larger broader body form. No other described species of *Caulleriella* have distally knobbed hooks.

Caulleriella retusiseta closely resembles specimens referred to as *Caulleriella* sp.3 by Poore *et al.*, (1975) from Port Phillip Bay, Victoria, but more complete material is needed to positively confirm this.

Etymology. The specific name is latin and refers to the peculiar shape of the distal end of the setal hook; knobbed, slightly notched, and blunted. This is a character of both this species and *Caulleriella longisetosa.*

Habitat. Sand, subtidal.

Occurrence. Rare; a few specimens only, collected from Botany Bay in January and March of 1975.

Australian distribution. New South Wales (Botany Bay).

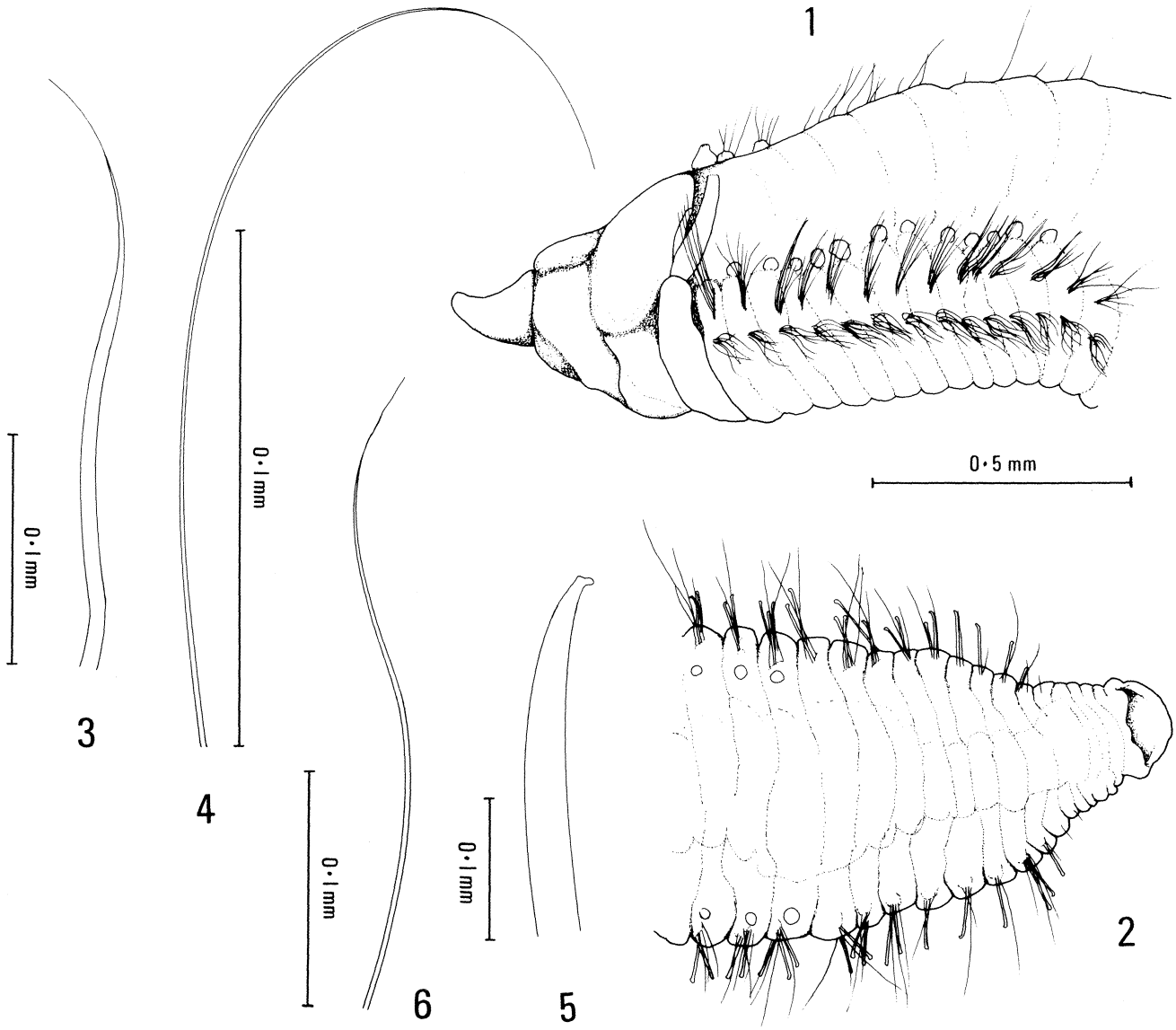

Fig. 19. *Caulleriella retusiseta* n.sp. (Holotype W.196601): *1.* anterior end, dorsal view; *2.* posterior end, dorsal view; *3.* limbate notoseta from anterior setiger; *4.* capillary notoseta from anterior setiger; *5.* hook from notopodium; *6.* capillary neuroseta from posterior setiger.

Caulleriella tricapillata Hutchings & Rainer, 1979

Caulleriella tricapillata Hutchings & Rainer, 1979: 775–777, fig. 7 A–D.

Material examined. *New South Wales:* Lake Merimbula, 5-x-75, 1(W.12684); Jervis Bay, Murray's Basin, 19-x-72, 2(W.194342, W.194594); Port Hacking, Maianbar, May '75, 1(W.9606); Botany Bay, Towra Pt, 23-ix-80 several (W.195921); Lake Macquarie, Salt's Bay, 10-vii-73, 1(W.9388); Port Stephens, NSWSF Stn 3, 1(W.15111). A selection of material examined.

Remarks. Agrees well with the original description.

Habitat. *Posidonia* seagrass beds.

Occurrence. Widespread in New South Wales estuaries, but in low numbers.

Australian distribution. New South Wales (widespread).

Chaetozone platycera **n.sp.**

Figs 20.1–5

Material examined. *New South Wales:* HOLOTYPE: Botany Bay, Stn 898, 13-ii-75, (W.19042) 20 mm long, 0.9 mm wide, 198 setigers, complete posteriorly. PARATYPES, Belmont Bch, (AHF POLY 1421) 18 mm long, 0.9 mm wide, >190 setigers, complete; Burwood Bch, (BMNH ZB1983.1738) 40 mm long, 1.2 mm wide, >240 setigers, complete; Belmont Bch, (USNM 81476) 22 mm long, 1 mm wide, >203 setigers,

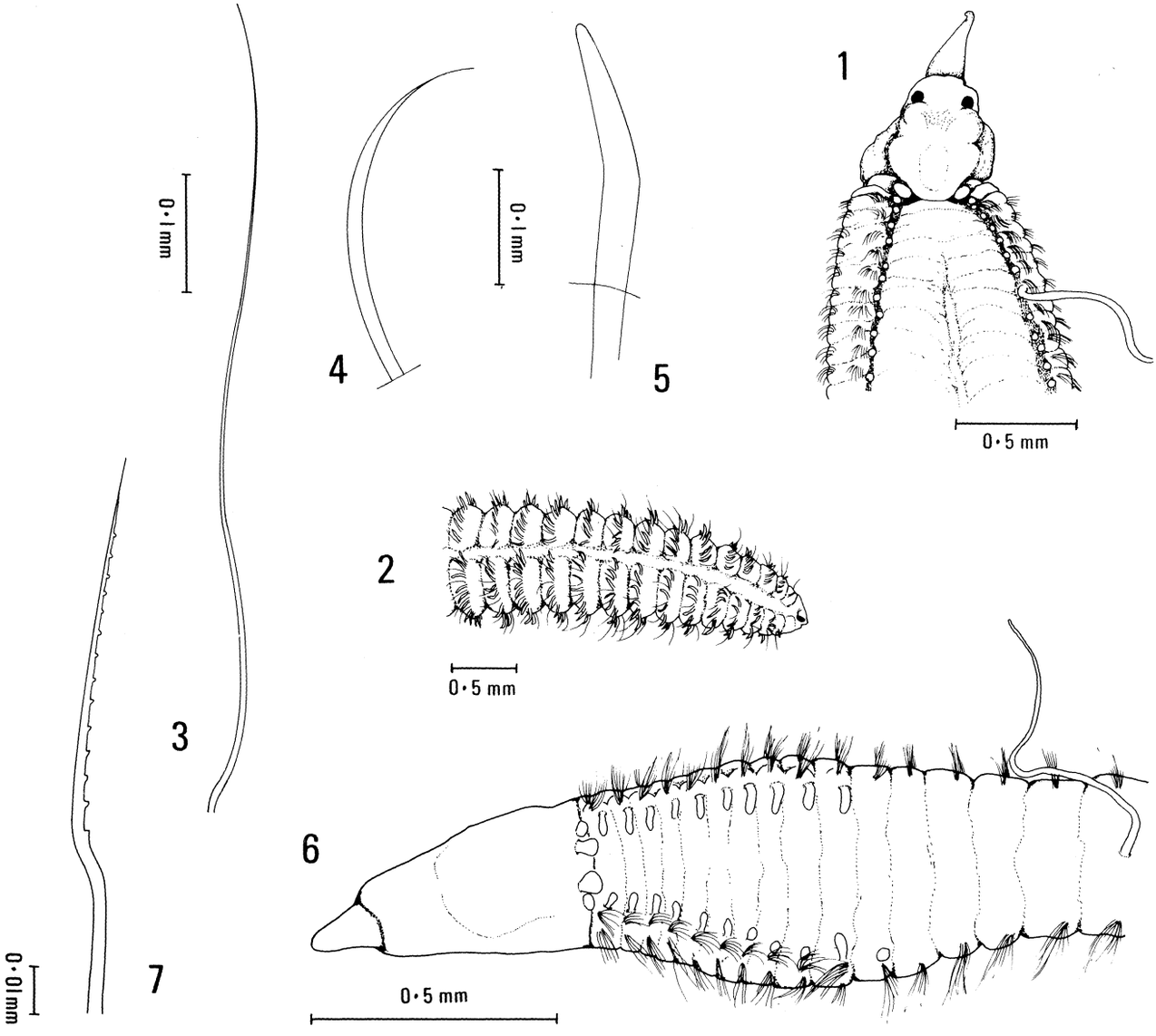

Fig. 20. *Chaetozone platycerca* n.sp. (Paratype BMNH ZB 1983.1738): *1.* anterior end, dorsal view; *2.* posterior end, dorsolateral view; *3.* limbate notoseta from anterior setiger; *4.* long fine capillary notoseta from anterior setiger; *5.* notosetal hook from posterior setiger. *Tharyx aphelocepalus* n.sp. (Paratype AHF POLY 1422): *6.* anterior end, dorsal view; *7.* seta from middle setiger.

complete; (W.7379) 3 specimens, all >200 setigers, complete.

Additional material. Belmont Bch, near Newcastle, many, various collection dates (W.7376-8, W.7380-3, W.7385-6, W.7398, W.8736-8).

Description. Body large, coiled, robust, unpigmented and broadest between setigers 2–70, tapering slightly posteriorly; tail region flattened dorsoventrally, terminating in ventral flattened anal flange and dorsal anus; distinct deep ventral groove. Prostomium with conical palpode, peristomial annuli indistinct and with inflated posterior lobe present dorsally; pair of stout palps occurring dorsolaterally, and posterior to margin of peristomial lobe, accompanied by pair of lateral branchiae that are inserted between inflated peristomial dorsal lobe and first setiger. Peristomial eyes present laterally (Fig. 20.1). Pair of branchiae present on each setiger almost to pygidium, inserted laterally, adjacent to notopodial mound and slightly posterior to it.

Parapodia biramous: setae include long and short, smooth-edged capillaries, and curved acicular spines with distally entire points. Notopodia with broadly limbate capillary setae anteriorly (Fig. 20.3), notosetae gradually becoming narrower and longer in median and posterior segments; in middle setigers some very long, fine capillaries present (Fig. 20.4). Notopodial hooks start on 47th setiger and continue to pygidium, increasing to 5–6 per fascicle posteriorly (Fig. 20.5). Neurosetae include similarly broadly limbate capillaries, becoming narrower, longer, finer in middle setigers, then decreasing in length posteriorly; present to pygidium. Neurosetal hooks start on setiger 23; hooks worn distally in anterior setigers, often resembling serrations, but in median and posterior setigers have smoothly pointed tips (Fig. 20.5); these spines or hooks increase in number to 5–6 per fascicle in far posterior setigers. Noto- and neuropodial fascicles indistinct and forming dorsolateral arcs of spines encircling body on each setiger, almost joined mid-dorsally and ventrally. Dorsolateral setal fascicles include 11–13 pale golden pointed spines and 10–12 fine capillaries (Fig. 20.2).

Remarks. The position of development of neuropodial spines is fairly consistent and varies only between the 24th and 26th setigers in the paratypes and additional material; the notopodial hooks show greater variation but still display a small range of position of initial development, from setigers 45–55. All specimens display the characteristically flattened form and eyes are present.

Although *Chaetozone platycerca* resembles *Chaetozone setosa* Malmgren, 1867, they are distinguished by the former's distinctly dorsoventrally flattened body and tail region, the more anterior development of neuropodial spines and the presence of small lateral eyes. We have collections of *C. setosa* from New South Wales estuaries at different times of the year, and these specimens are generally much smaller and narrower than the specimens of *C. platycerca* collected from similar sites and dates, indicating that *C. platycerca* appears to be a larger, more robust species. *Caulleriella dimorphosetosa*, described in this paper, also resembles *Chaetozone platycerca*, but differs by having serrated acicular hooks, not distally entire spines.

No other recorded *Chaetozone* species has this combination of characters: flattened body, development of distally entire, pointed, curved spines without wings from setigers 23–26, and semi-cinctured appearance of the far posterior setigers.

Etymology. The specific name *platycerca*, refers to the flattened tail region, and is derived from the greek *platys*, meaning broad or wide.

Habitat. No data available; found at depths of 12–22 m.

Occurrence. Uncommon; collected randomly during years 1975 (February, from Botany Bay; March, April, May, July, September, from Belmont Bch, near Newcastle) and 1976 (January from Belmont Beach).

Australian distribution. New South Wales (Botany Bay, Belmont Bch).

Chaetozone setosa Malmgren, 1867

Chaetozone setosa Malmgren, 1867: 206, pl.15, fig. 4.—Fauvel, 1927: 101, fig. 35.—*Non* Day, 1967: 510, fig. 20.1.1-p.

Material examined. *New South Wales:* Port Hacking, Oct., Dec. '74, several (W.195269, W.195294); Botany Bay, many NSWSF Stn, Jan., Feb., Mar., Apr., Jul. '75, Jul. '76 (W.18698, W.18707, W.18735, W.18754, W.18771, W.18792, W.18804, W.18874, W.18895, W.18916, W.18927, W.18939, W.18975, W.18983, W.18991, W.19006, W.19020, W.19046, W.195440-41, W.195468-9, W.195497, W.195515, W.195554, W.195570-1, W.195586, W.195622, W.195703, W.195730-1, W.195751, W.195777-8); Hawkesbury R., 1-3-1, 22-xi-80, 1(W.196567); Tuggerah Lakes, Aug. '73, many (W.5739, W.5861).

Description. Body thin, threadlike; swollen between setigers 10–26. Peristomial eyes absent. Pair of palps dorsolaterally at junction of peristome and setiger 1. Pair of branchiae present on each setiger to far posterior region. Setae include smooth-edged, limbate capillaries and acicular spines; neuropodial spines distally entire, beginning at approximately 50–80th setiger depending on size of specimen, and increasing to 6 or 7 per fascicle posteriorly; notopodial spines start much more posteriorly than neuropodial ones and also increase to 6 or 7 per fascicle posteriorly; together the fascicles form transverse rows cincturing body posteriorly. All setae with golden-brown inclusions at base.

Remarks. Agrees well with most published descriptions except that of Day (1967) in which he describes neuropodial hooks as beginning on setiger 3. We suggest that Day's material may belong to another species because of the very anterior development of hooks.

Specimens from Port Phillip Bay survey, referred to as *Chaetozone* sp.1, agree well with specimens of *C. setosa*, but more complete material is needed to confirm this.

Habitat. Collected from a wide range of sediments, from silty-clay, mud, fine sand, to shellgrit, in a marine environment; also found in *Posidonia* seagrass beds.

Occurrence. Abundant in Botany Bay; collected randomly during different seasons (January, February, March, April, June, July, August) over the years 1973, 1975–77, and in November, 1980.

Australian distribution. New South Wales (Port Hacking*, Botany Bay*, Hawkesbury R.*, Tuggerah Lakes*).

Cirriformia capensis (Schmarda, 1861)

Cirriformia capensis.—Day, 1967: 517, fig. 20.4, n–o.

Material examined. *New South Wales:* Hawkesbury R., Brooklyn, D2-1, 18-xii-79, 3(W.196805).

Description. Prostomium broadly conical, eyes absent; tentacular cirri arise from setigers 3–4; branchiae occur from setiger 1 to middle or posterior segments of body, arising dorsolaterally, at a distance from the notosetae that is greater than the distance of noto- from neurosetae. Capillaries in all setigers; short, slender spines appear from setiger 12.

Remarks. The above description agrees well with Day's (1967) description. First record from Australia.

Habitat. Collected in Hawkesbury R., in shelly mud, in 7 m water, salinity 34.4‰.

Occurrence. Very rare; only 3 specimens collected (2 very small) from Brooklyn Channel in December, 1979.

Australian distribution. New South Wales (Hawkesbury R.*).

Cirriformia filigera (delle Chiaje, 1828)

Cirriformia filigera.—Fauvel, 1927: 92, fig. 32 h–m.—Day, 1967: 518, fig. 20.4 p–q.

Material examined. *South Australia:* Port Wakefield, Apr. '81, 4(W.19373). *New South Wales:* Lake Merimbula, 6-x-75, many (W.15944-5); Jervis Bay, Murray's Bch, Apr. '72, 1(W.194123); Port Hacking, Maianbar, May '75, 1(W.9483); Botany Bay, Towra Pt, 23-ix-80, several (W.195922), Stn 901, 12-vii-76, 2(W.195572); Hawkesbury R., Cowan Waters, Waratah Bay, 3-x-80, 15′ grab, 2(W.196781); Port Stephens, Shoal Bay, Aug. '76, 4(W.12926). A selection of material examined. *Queensland:* Brisbane R., 1963, 2(W.19099), i.d. L. Amoureux.

Description. Prostomium broadly conical, eyes absent; tentacular cirri arise from setigers 4–6, not, as in *C. capensis*, from 3–4. Branchiae from setiger 1; capillary setae present in all setigers; spines appear from setiger 12.

Remarks. Agrees well with Day's (1967) and Fauvel's (1927) descriptions. Recorded previously in New South Wales only by Quatrefages in 1865 from Jervis Bay.

Habitat. Found in sediments of mud to muddy sand; *Zostera* and *Posidonia* beds; intertidally down to depths of 12 m.

Occurrence. Common; widespread in New South Wales estuaries.

Australian distribution. Western Australia, South Australia (Port Wakefield*), Victoria, New South Wales (Merimbula*, Jervis Bay, Port Hacking*, Botany Bay*, Hawkesbury R.*, Port Stephens*), Queensland (Brisbane R.*).

Tharyx aphelocephalus n.sp.

Fig. 20.6–7

Material examined. *New South Wales:* HOLOTYPE: Hawkesbury R., 1-1-4, 26-v-81, (W.196868) 12 mm long, 0.3 mm wide, 50 setigers, posteriorly incomplete. PARATYPES: 11-ii-81, 1-1-2 (AHF POLY 1422) 3 anterior fragments; 1-1-1, 11-ii-81 (USNM 81477) 4 anterior fragments, some ovigerous; 1-1-1, 20-vii-80 (BMNH ZB 1983.1739) 3 anterior fragments; 1-1-2, 26-v-81, (W.196862), 4 anterior ends, some fragments.

Additional material. 1-1-1, 22-ii-80, 2(W.196874), 1-1-3, 26-v-81, 3(W.196871), 1-4-1, 3-xi-77, (W.196875), 1-3-4, 18-xi-80, several (W.196872), 2-1-4, 11-ii-81, 1(W.196873). All material, including type specimens, incomplete; width at widest part of body, in middle to posterior segments, ranges from 0.15–0.5 mm.

Description. Body small, threadlike; prostomium conical, tapering peristomial segments fused, smooth and elongate, length equal to length of first 7–10 setigers, no annulation visible; eyes absent (Fig. 20.6). Pair of stout palps arise on posterior border of peristomium with pair of laterally adjacent branchiae. First 14 setigers closely crowded together; body swollen anteriorly for first 11 setigers, then tapering to setiger 16; body widens again in middle to posterior segments to its greatest width, where setigers become more elongate, as long as wide, and becoming somewhat moniliform. Branchiae arise laterally for approximately first 16 setigers, placed slightly posterior to notosetae on notopodial ridge, then become displaced mid-dorsally after 16th setiger; many mising, only a few remaining adhering to body. Posterior end and pygidium unknown in holotype or in any of the other material. Parapodia slightly raised in anterior setigers; notosetae and neurosetae slender, hairlike capillaries, noto- longer than neurosetae for first 30 setigers, thereafter approximately the same length; at approximately setiger 40, serrated, geniculate neurosetae appear (Fig. 20.7), serrations visible only under at least 400 x magnification and appear rounded under oil immersion; some notosetae also finely serrated by setiger 50, rest of setae smooth capillaries; setae longer anteriorly.

Remarks. The paratypes show some variation in position of initial development of serrated neurosetae and notosetae; the smaller specimens, 0.15–0.2 mm wide, often displaying more anterior development than the larger, wider specimens, 0.35–0.5 mm wide. Many of the small specimens have both noto- and neurosetae

serrated by setiger 40. All specimens smaller than most previously recorded species, except *Tharyx dorsobranchialis*. Some specimens, however, are ovigerous and swollen posteriorly, so the species matures at a small size. Ovigerous specimens (USNM 81477) with markedly moniliform setigers.

Tharyx aphelocephalus resembles *T. dorsobranchialis* (Kirkegaard, 1959) in small body size, the dorsally placed branchiae and the finely serrated noto- and neurosetae. However, the two species can be distinguished by the presence of the fused, elongate buccal segment and the anterior smooth-edged capillaries in *Tharyx aphelocephalus*, and the more posterior appearance of serrated noto- and neurosetae in *Tharyx aphelocephalus* than in *Tharyx dorsobranchialis*. These characters have been used to separate species within the genus *Tharyx*. Many species of *Tharyx* have been poorly described and although a major revision of the genus is needed, this is beyond the scope of the present study. It is recognised that when a generic revision is undertaken *T. aphelocephalus* may be synonymised with a currently poorly described species, or moved to another genus.

Etymology. The specific name, *aphelocephalus,* is a Greek noun with a masculine termination following the gender indicated by the original author of the genus *Tharyx*, Webster & Benedict (1887). It refers to the smooth, fused, buccal region of the head.

Habitat. Collected from sediments of sandy mud to muddy sand in the Hawkesbury R., only, in 4–12 m water, in 35‰ salinity.

Occurrence. Rare; found in low numbers in all seasons, but not every year.

Australian distribution. New South Wales (Hawkesbury R.).

Tharyx cf. *multifilis* Moore, 1909

Tharyx multifilis Moore, 1909: 267-268, pl.9, fig. 43.—Hartman, 1961: 112.—*Non* Banse & Hobson, 1968: 37.

Material examined. *New South Wales:* Botany Bay, 13-ii-75, 1(W.18790).

Description. Peristomium triannulate but annulation indistinct; eyes absent but slight discolouration near posterior border may represent the eyes. Palps dorsolateral, arising at junction of last peristomial segment and setiger 1, with a pair of branchiae adjacent to palps and slightly superior; lateral branchiae occur irregularly on setigers, and arise adjacent to dorsal side of notopodia. All setigerous segments short closely crowded together; setae all slender, smooth, hairlike; notosetae longer than neurosetae. First 10 setigerous parapodia are not lateral but are displaced dorsolaterally, twisting gradually and becoming lateral after the 10th setiger. The specimen is ovigerous and setae are very long and fine along the whole body length, notosetal length equals body width. Tail end not inflated but tapering to pygidium with central anus.

Remarks. Although this specimen mainly conforms to Moore's (1909) and Hartman's (1961) descriptions of *Tharyx multifilis*, there are some differences. The non-moniliform body shape agrees with Moore's 1909 specimens, but our single specimen is much smaller, only 22 mm long and 1 mm wide.

More material is needed to confirm whether this may be a new species or simply *T. multifilis* exhibiting geographical variation. *Tharyx multifilis* has not been recorded from Australia.

Habitat. Data not available.

Occurrence. Single specimen found in February, 1975, at NSWSF Stn 906, Site 29 in Botany Bay.

Family COSSURIDAE Day

Prostomium without appendages; a single peristomial asetigerous segment present. A single median palp present on the dorsum of an anterior setiger, usually between setigers 3 and 6. Proboscis a ventral pad. Parapodia biramous with reduced parapodial lobes. All setae simple, including bilimbate or hirsute setae in two or more fascicles; thick spines and capillary setae present in the abdomen of some species.

Cossura sp.

Material examined. *New South Wales:* Hawkesbury R., 1-1-1, 2-viii-79, 1(W.196738), 1-1-1, 22-ii-80, 1(W.196739), 2-2-1, 7-v-79, 1(W. 196741), 2-2-2, 13-xi-79, 2(W.19744). A selection of material examined.

Description. Specimens incomplete, no posterior ends collected, only anterior ends possessing up to 30 setigers. Prostomium conical, followed by two achaetous segments which together are slightly longer than the first uniramous setiger. Tentacle inserts at posterior border of setiger 2 which is biramous. All setigers thereafter biramous. Each ramus of each parapodium bears setae of two lengths: anterior ones short, tapered capillaries with fine hairs at edge; posterior ones longer, limbate, with similar finely serrated edges proximally, smooth and finely tipped distally. Both types of setae with golden brown basal inclusions.

Remarks. These fragments cannot be specifically identified because of the missing posterior ends, but this species agrees well with the original description of *Cossura soyeri* Laubier (1964) for which no posterior ends were available, and with Banse's (1981) description of the anterior regions of specimens of *C. soyeri*. It is likely that our specimens are *Cossura soyeri* but complete material is needed to confirm this. This represents the second record of species from the genus *Cossura* from Australia, neither of which have been identified to species.

Habitat. Collected at 4–5 m depth from sandy mud in salinities of 33.4–35 + ‰.

Occurrence. Found in low numbers in most seasons, not all years, only at Stations 2-2 and 1-1 of the Hawkesbury R.

Family FLABELLIGERIDAE Saint-Joseph

Body cylindrical or fusiform, most forms with epidermis covered by papillae. Prostomium and peristomium retractable between the first three setigers. Prostomium a slender ridge with palps situated posterolaterally. Peristomium with an expanded dorsal membrane bearing branchiae. Notosetae capillaries either smooth or annulated; neurosetae either similar or more thickened spines, sometimes compound with falcate, unidentate or bidentate appendages.

Diplocirrus sp.

Material examined. *New South Wales:* Hawkesbury R., 1-1-1 (W.196835), 1-1-3 (W.196833), 1-1-4 (W.196834), D2-3 (W.196836).

Description. Small, maggot-shaped body, 3–4 mm long and 0.4 mm wide; surface epithelium covered in elongate papillae and sand grains. Cephalic cage poorly developed. Buccal apparatus consists of a pair of stout grooved palps, 3 lips and a cephalic hood. Several small filamentous branchiae arise from the cephalic hood. All setae capillaries; neurosetal capillaries golden with strong annulations and curved unidentate tips.

Remarks. This is the first record of *Diplocirrus* from New South Wales, however the material is too incomplete for a species determination to be made.

Habitat. Collected in 4–7 m water, from sandy mud (often shelly) in salinites of 33–35 + ‰.

Occurrence. Few specimens collected throughout the year, at Stations 1-1 and D2-3, in the Hawkesbury R.

Family SCALIBREGMIDAE Malmgren

Body short and stumpy or long and slender, often anteriorly inflated. Prostomium anteriorly bifid or with T-shaped frontal horns; otherwise lacking appendages. Parapodia biramous with small triangular or button-shaped parapodia. Setae include capillaries and furcate setae, and occasionally acicular spines.

Key to the Species of Scalibregmidae

1. Body elongated; T-shaped prostomium; branchiae present; dorsal and ventral cirri present ..... *Scalibregma inflatum*

— Body elongated; T-shaped prostomium; branchiae, dorsal and ventral cirri absent ..... *Hyboscolex dicranochaetus*

Hyboscolex dicranochaetus (Schmarda, 1861)

Hyboscolex dicranochaetus.—Kudenov & Blake, 1978; 433–435, fig. 15–20.

Hyboscolex longiseta.—Hutchings, 1974: 185.—Hutchings & Rainer, 1980: 44.

Material examined. *New South Wales:* Botany Bay, Towra Pt, 12-iv-73, 1(W.10963), Bonna Pt, 22-i-75, several (W.18842, 18959), La Perouse, 13-xii-76, 1(W.13747); Port Stephens, 27-vii-76, many (W.12426, W.12440, W.12453, W.12472, W.12485, W.12495, W.12516, W.12533, W.12542, W.12556).

Remarks. Agrees well with Kudenov & Blake's (1978) description.

Habitat. Seagrass beds, exposed intertidal areas.

Occurrence. Uncommon; found in low numbers in some but not all, estuaries.

Australian distribution. Western Australia, South Australia, New South Wales.

Scalibregma inflatum Rathke, 1843

Scalibregma inflatum .—Kudenov & Blake, 1978: 428–430.

Material examined. *New South Wales:* Port Stephens, 27-vii-76, 1(W.15683); Hawkesbury R., D2-4, 1-1, 2-2, 3-1, 7-1, many dates, many (W.196522-26).

Remarks. Agrees well with Kudenov & Blake's (1978) expanded description. First record from New South Wales.

Habitat. Seagrass beds; sandy mud, muddy sand at depths of 4–12 m in salinities of 12–35‰.

Occurrence. Rare, in most locations. Present in Hawkesbury R., in low numbers from Transects 1 to 7, all year round, in most years.

Australian distribution. Victoria, New South Wales (Hawkesbury R*, Port Stephens*), Queensland (Moreton Bay).

Family OPHELIIDAE Malmgren

Body with a limited number of segments; often with a deep ventral furrow. Prostomium lacking appendages, blunt or conical. Parapodia biramous or uniramous with small inconspicuous parapodial lobes; all setae capillary, either smooth or marginally dentate.

Key to the Species of Opheliidae

1. Body fusiform without ventral groove; branchiae simple from setiger 2 almost to pygidium ..... *Travisia lithophila*

—— Body cylindrical with at least posterior ventrum deeply grooved; branchiae present or absent, if present either simple or bifid 2

2. Anterior setigers inflated with lateral lobe developed ..... (*Lobochesis* n.gen.) 3

—— Anterior setigers not inflated, lateral lobes absent 4

3. Bifid branchiae on setigers 12–33; pygidial funnel with elongated margins with 8 pairs of papillae ..... *L. bibrancha* n.gen. n.sp.

—— Bifid branchiae on setigers 14–28, pygidium with flattened ventral anal plate ... . *L. longiseta* n.gen. n.sp.

4. Ventral groove present in posterior party of body only ..... (*Ophelia*) 5

—— Ventral groove present along the whole body 6

5. Thirty setigerous segments; branchiae from setigers 9–15 ..... *O. elongata* n.sp.

—— Twenty-seven setigerous segments; branchiae from setigers 8–24 . *O. multibranchia* n.sp.

6. Branchiae from setiger 2 extending over 24–25 setigers; body colourless .... *Armandia intermedia*

—— Branchiae completely absent; body with brown dorsal pigment bands .... *Polyophthalmus pictus*

Armandia intermedia Fauvel, 1902

Armandia intermedia Fauvel, 1902: 86, figs 29-30.— Hutchings & Rainer, 1979: 782.

Material examined. *New South Wales:* Lake Merimbula, 5-x-75, 16(W.12743); Jervis Bay, Murray's Basin, 9-x-72, 1(W.194434); Port Hacking, Maianbar, 4-xi-75, 1(W.11212); Botany Bay, Towra Pt, 10-ii-81, 2(W.195058); Port Jackson, Sow and Pigs Reef, 30-ix-76, 2(W.194959); Hawkesbury R., 1-1, 5-ii-79, 1(W.196438). A selection of material examined.

Remarks. Agrees with Hutchings & Rainer's (1979) description.

Habitat. Found in fine to sandy mud with shell, in salinities of 33–35‰. *Zostera* and *Posidonia* seagrass beds.

Occurrence. Found in low numbers throughout the year, widespread in most New South Wales estuaries.

Australian distribution. Western Australia, South Australia, Victoria, New South Wales, Queensland.

Lobochesis n.gen.

Type-species. *Lobochesis bibrancha* n.sp.

Fusiform body with ventral groove running along either entire or most of body. Pointed prostomium. Body consists of anterior abranchiate setigers, followed by numerous branchiate setigers and posterior abranchiate setigers. Branchiae digitiform, bifid. Eye spots absent. Parapodia poorly developed with capillary noto- and neurosetae. Anterior and posterior setigers with elongated capillary setae. Anterior setigers often inflated; lateral fold developed on at least one anterior segment. Pygidial funnel with numerous marginal papillae.

Lobochesis is described as a new genus because of the lateral folds developed anteriorly, and the inflated anterior and posterior parts of the body with elongated setae. *Euzonus* Grube, 1866 is also characterised by having a body divided into three regions, but it has branchiae limited to posterior setigers and specialised notopodia present on the last anterior setiger; both features are not found in *Lobochesis* n.gen. Another important characteristic of *Lobochesis* n.gen. is the presence of bifid branchiae. The majority of described genera of Opheliidae have unbranched branchiae if present at all. Pectinate branchiae occur in *Euzonus dillonensis* (Hartman, 1938), and *Euzonus williamsi* (Hartman, 1938) has branchiae with crenulated inferior margins and irregular pinnae on the superior margins. *Lobochesis* n.gen. can be distinguished from all other currently described genera within the family by the presence of the anterior lateral folds. This feature has been incorporated into the generic name, which is derived from the greek, *lobos.*

Lobochesis bibrancha n.gen. n.sp.

Fig. 21.1-2

Material examined. HOLOTYPE: (W.194965), 20 mm long, 2 mm wide maximum. PARATYPES: 1(USNM 81490), 7 mm long, 2 mm wide; 1(AHF POLY 1415), 12 mm long, 2.5 mm wide; 1(BMNH ZB 1983.1740), 10 mm long, 2.0 mm

wide; 11(W.194966). All type material from New South Wales, Merimbula, MER 11OD, 25-vii-75.

Additional material. *New South Wales*: Clyde R., (W.17674); Shoalhaven R., 2(W.17673); Merewether Bch, (W.8815); Belmont Bch, (W.8814). *Queensland*: Pallarenda Bch, Townsville, 2(W.17257).

Description. Preserved material colourless. Preserved body soft and flabby; septa apparently absent; segmentation not clearly defined. Prostomium acutely pointed; peristomium achaetous. Anterior setigers inflated, bulbous; median ventral groove from setiger 3 to pygidium. First 11 anterior setigers abranchiate, followed by 22 with branchiae; last 6 setigers abranchiate. Achaetous preanal segment (Fig. 21.1). Branchiae bifid, branches simple, digitiform, equal in length, uniformly developed along body (Fig. 21.2). Anterior parapodia poorly developed, consisting of small semicircular lobes arising from raised glandular areas; maximum development of parapodial lobes in median setigers. Noto- and neurosetae all capillaries, those of anterior inflated setigers much longer than those of median setigers. Last 5–6 setigers narrower than anterior or median ones, but considerably inflated with elongated setae. Pygidial funnel elongated dorsoventrally with margins surmounted by 8 pairs of papillae. Glandular patches occur inter-segmentally between parapodia. Setiger 10 with prominent glandular fold, arch-shaped, resembling a lateral fold.

Remarks. The type material exhibits various degrees of contraction and inflation. Some specimens with everted voluminous proboscis. Many individuals have guts packed with sand grains.

Lobochesis bibrancha belongs to the new genus

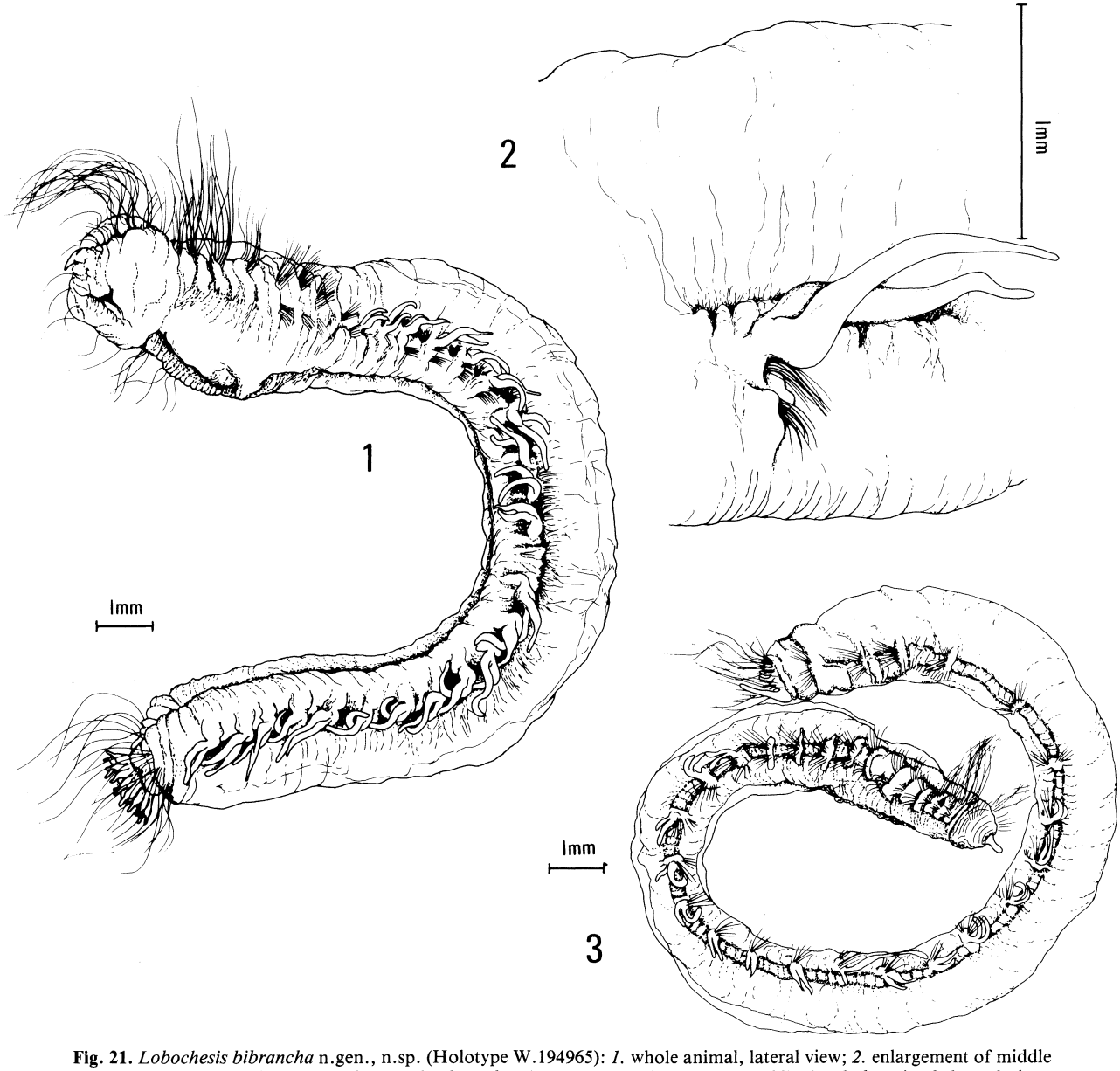

Fig. 21. *Lobochesis bibrancha* n.gen., n.sp. (Holotype W.194965): *1.* whole animal, lateral view; *2.* enlargement of middle setiger showing branchia, lateral view. *Lobochesis longiseta* n.sp. (Holotype W.195000): *3.* whole animal, lateral view.

because of the anterior development of lateral lobes. Two species have so far been described in this genus (both in this paper) and the development of the pygidium appears to be an important specific characteristic.

Etymology. The specific name *bibrancha* is derived from latin and refers to the bifid nature of the branchiae.

Habitat. Sandy intertidal protected beaches, often at seaward margins of estuary.

Occurrence. Locally abundant.

Australian distribution. New South Wales (Merimbula, Shoalhaven, Merewether Bch, Belmont Bch), Queensland (Pallarenda Bch, Townsville).

Lobochesis longiseta n.gen. n.sp.

Fig. 21.3

Material examined. HOLOTYPE: 17-vi-81, (W.195000) 15 mm long, 2.0 mm wide. PARATYPES: 1(BMNH ZB 1983.1741), 14 mm long, 1.5 mm wide; 1(USNM 81491), 14 mm long, 1.5 mm wide; 2(AHF POLY 1414), 7 mm long, 1.0 mm wide.

Additional material. All posteriorly incomplete (W.195001-2). All type and additional material collected from New South Wales, Ocean Bch, on 23-xi-80 and 17-vi-81.

Description. Preserved material colourless; blood red when alive but body wall transparent; gut contents visible. Soft, flabby, maggot-shaped body. Pointed digitiform prostomium, peristomium achaetous. Anterior 13 setigers, abranchiate; first 2 setigers with parapodia displaced dorsally, followed by 15 setigers with branchiae; last 6 setigers abranchiate. Anterior to pygidium, distinct achaetous segments forming an anal collar. Pygidium with flattened leaf-like ventral anal plate with elongated apex. Elongated anus with 10 equal-sized cirri on each side arranged dorsoventrally to anal plate, surrounded by a dorsolateral collar of numerous elongate capillary setae forming a pygidial cage. Ventral groove extends from setiger 10 to pygidium. Setiger 10 with anterior development of thickened glandular ridge resembling a lateral lobe (Fig. 21.3). Noto- and neurosetae all capillaries, those of anterior segments and around the pygidial funnel elongate. Parapodia poorly developed, setae arise from glandular area of body wall. Branchiae bifid with swollen base, each branch equally developed, digitiform with tapered tips and crenulate margins.

Remarks. *Lobochesis longiseta* clearly belongs to the new genus *Lobochesis* but differs from *L. bibrancha* in having the ventral groove restricted to middle and posterior setigers, fewer branchiferous segments and the development of the anal plate.

Etymology. The specific name is latin and refers to the elongate setae present on the anterior and posterior segments.

Habitat. Sandy, exposed beach, intertidal.

Occurrence. Species so far only known from Ocean Beach, where very small individuals were collected in November, and adults were only recorded in November and June. Individuals occur at mid to low tide levels and a maximum density of 1/m² was recorded during 1980–81. The collector, D. Dexter, kindly provided this information.

Australian distribution. New South Wales (Ocean Bch).

Ophelia elongata n.sp.

Fig. 22.1

Material examined. *New South Wales:* HOLOTYPE: Burwood Bch, 17-iii-75 (W.8812), 5 mm long, 1 mm wide, maximum. PARATYPES: 1(USNM 81492), 4.5 mm long, 1 mm wide; 1(BMNH ZB 1983.1742), 4 mm long, 1 mm wide, both from Belmont Bch, Newcastle; Burwood Bch, 1(AHF POLY 1416), 7 mm long, 1.5 mm wide.

Additional material. Botany Bay, Dolls Pt, (W.196231, W.196233-6); Trial Bay, (W.196232).

Description. Preserved material colourless; swollen body pointed at both ends. Elongated conical prostomium with elongate achaetous peristomium. Prominent ventral groove from setiger 9 to posterior part of body. Thirty setigerous segments; first 8 with no branchiae, followed by 7 branchiated segments; remaining ones lacking branchiae. Two achaetous preanal segments. Pygidium an elongate funnel with margins surmounted by 10 equal-sized papillae (Fig. 22.1). Parapodia very poorly developed with very small discrete lobes and a small triangular interramal cirrus. Posteriorly, slight elevation of parapodial region associated with development of glandular material. Noto- and neurosetae all elongate capillaries. Branchiae simple digitiform, about 1/3 length of capillaries.

Remarks. The paratype material closely resembles the holotype. Specimens collected in April at Dolls Point were gravid.

Ophelia elongata n.sp. is characterised by the number of setigerous and branchiferous segments. For additional comments see *O. multibranchia* n.sp. (below).

Etymology. The specific name refers to the elongate nature of the prostomium and peristomium, and is derived from the latin *elongatus.*

Habitat. Sandy sub-tidal surf beach.

Occurrence. Patchy distribution.

Australian distribution. New South Wales (Dolls Pt, Trial Bay, Burwood Bch, Merewether Bch).

Ophelia multibranchia n.sp

Fig. 22.2

Material examined. HOLOTYPE: (W.19029), 6 mm long, 1 mm wide. PARATYPES: 3(USNM 81493); 3(BMNH ZB 1983.1743-45); 3(AHF POLY 1417); 32(W.196230), 20(W.195651), 34(W.195646); range in size from 4–6 mm long,

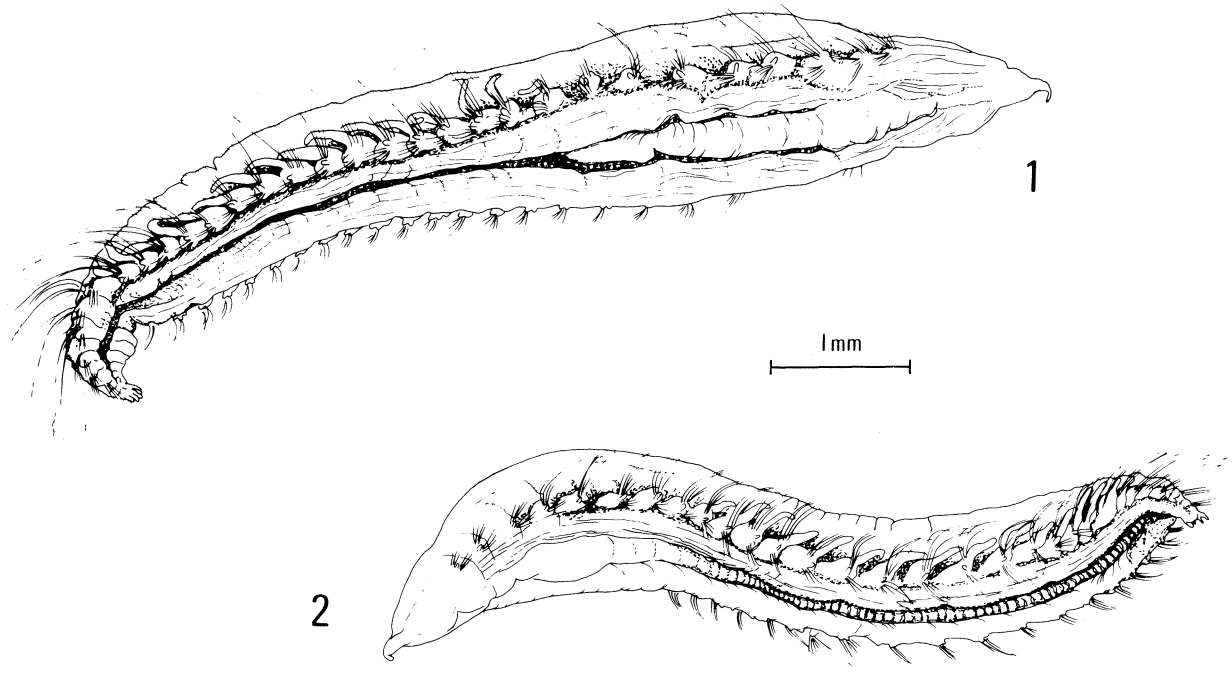

Fig. 22. *Ophelia elongata* n.sp. (Holotype W.8812): *1.* whole animal, lateroventral view. *Ophelia multibranchia* n.sp. (Holotype W.19029): *2.* whole animal, lateroventral view.

0.8–1.0 mm wide. All type material from New South Wales, Botany Bay, 30-i-75, 13-ii-75, 14-iv-75.

Description. Preserved material colourles, slightly maggot-shaped with pointed extremities. Pointed prostomium, achaetous peristomium. Body with ventral groove well-defined from about setiger 10; 27 pairs of setigers plus 2 achaetous preanal segments. Branchiae from setiger 8 to setiger 24, simple digitiform, about half length of capillaries (Fig. 22.2). Noto- and neuropodia poorly defined; notopodia with small triangular lobe; neuropodia with slightly greater development of lobe; small triangular interramal cirrus. Noto- and neurosetae all long capillaries, increasing in length posteriorly. Elongate pygidial funnel trumpet-shaped, margins with 10 papillae, 2 of these slightly longer than rest. Gravid female.

Remarks. Almost all of the paratype specimens are gravid, and came from only a few stations in Botany Bay.

Ophelia multibranchia differs from the 2 other species described from Australia, *Ophelia ashworthi* Fauvel, 1917 and *O. dannevigi* Benham, 1916, in the number of setigers and the distribution of branchiae. Tebble (1953) undertook a revision of the genus *Ophelia*, and suggested that the relative positions of the branchiate and abranchiate setigers were important specific features in the genus. However, he did recognise that the numbers of pairs of branchiae increases as the individual ages and grows by the addition of segments. Thus presumably only mature specimens of *Ophelia* can be identified to species. Our specimens of *O. multibranchia* are virtually all gravid. Tebble (1935) recognised 17 species of *Ophelia: O. africana* Tebble, 1953; *O. ashworthi* Fauvel, 1917; *O. assimilis* Tebble, 1953; *O. bicornis* Savigny, 1822; *O. bipartita* Monro, 1936; *O. borealis* Quatrefages, 1865; *O. dannevigi* Benham, 1916; *O. denticulata* Verrill, 1875; *O. formosa* (Kinberg, 1866); *O. limacina* (Rathke, 1843); *O. magna* (Treadwell, 1914); *O. praetiosa* (Kinberg, 1866); *O. pulchella* Tebble, 1953; *O. radiata* (delle Chiaje, 1827); *O. radiata* var. *barquii* Fauvel, 1927; *O. rathkei* McIntosh, 1908, and *O. roscoffensis* Augener, 1910. For each species Tebble provided a body formula which indicated the number of branchiate and abranchiate setigers. The majority of described *Ophelia* species have 32 or more setigers; only *Ophelia rathkei*, has less (23 or 24 setigers including 8–10 branchiate setigers). *Ophelia multibranchia* can be distinguished from all other described species by the total number of setigers and the distribution of branchiferous setigers. For these reasons a new species is described.

Etymology. The specific name refers to the numerous pairs of branchiae and is derived from the latin.

Habitat. Sand, in protected bay at 3–4 m.

Occurrence. Abundant only during January, February and April of 1975.

Australian distribution. New South Wales (Botany Bay).

Polyophthalmus pictus (Dujardin, 1839)

Polyophthalmus pictus.—Hutchings & Rainer, 1979: 782–783.

Material examined. *New South Wales:* Lake Merimbula, 17-iii-76, 1(W.17125); Jervis Bay, Greenpatch, 28-ii-76, 3(W.194955), Murray's Bch, 25-iv-72, 17-x-72, many

(W.194153, W.194177, W.194302, W.194529, W.194530); Botany Bay, 31-i-75, 2(W.195517), 12-vii-76, 1(W.195583); Lake Macquarie, 31-i-76, many (W.4723); Port Stephens, 27-vii-76, 1(W.12550). A selection of material examined.

Remarks. Agrees with the description given by Hutchings & Rainer (1979) who discussed the synonomy of the species. Intensity of pigmentation highly variable.

Habitat. Seagrass beds and muddy sand, 6–8 m.

Occurrence. Regularly found in low numbers in most New South Wales estuaries.

Australian distribution. Western Australia, Victoria, New South Wales, Queensland.

Travisia lithophila Kinberg, 1866

Travisia lithophila Kinberg, 1866: 256.—Augener, 1922c: 32–33.

Material examined. *New South Wales:* Hawkesbury R., 1-3-1, 8-xi-78, 1(W.194927).

Description. Fusiform, colourless, 11 mm long, 2 mm wide, swollen body, ventral groove absent. Small pointed conical prostomium; peristomium achaetous. About 44 setigerous segments plus 3–4 achaetous preanal segments. Swollen, stumpy pygidial funnel surrounded by 5 swollen papillae and 2 lateral thinner papillae with elongate cirri, forming a rosette surrounding anus. Segments smooth, biannulated. Branchiae simple, digitiform from setiger 2 to almost last setiger; best developed in median setigers, posteriorly smaller and stumpier. Anterior parapodia, poorly developed with setae emerging from body wall; middle setigers with small globular lobes representing dorsal and ventral cirri. Noto- and neurosetae fine hispid capillaries.

Remarks. Single specimen collected. This represents only the second record of the species. Augener (1922c) examined Kinberg's type and redescribed the species. Our specimen is considerably smaller both in size and number of setigers than Kinberg's specimen, but otherwise they are similar.

Occurrence. Single specimen in November, 1978.

Australian distribution. New South Wales (Port Jackson, Hawkesbury R.).

Family CAPITELLIDAE Grube

Body cylindrical, usually slender. Prostomium short and truncate without appendages. Thorax and abdomen defined on internal structures and parapodial development; typically thorax with capillary setae and abdomen with hooded hooks. Incomplete anterior fragments of capitellids are difficult to identify and in some cases identifications can only be made when intact individuals are available.

Key to the Species of Capitellidae

1. First thoracic segment with setae ..... (*Capitella*) 2
—— First thoracic segment without setae 3
2. First 5 thoracic setigers all with capillaries ..... *Capitella* sp.
—— First 7 thoracic setigers all with capillaries ..... *Capitella capitata*
3. Thorax with 11 segments; one asetigerous segment present, following 4 with capillaries, the rest with hooded hooks ..... *Mediomastus californiensis*
—— Thorax with 12 or more segments, of which one is asetigerous 4
4. Thorax of 11 setigers, all with capillaries ..... (*Notomastus*) 5
—— Thorax otherwise 8
5. Setiger 1 with both noto- and neurosetae ..... (*Notomastus* in part) 6
—— Setiger 1 with notosetae only ..... (*Notomastus* in part) 7
6. Prominent eye spots present; branchiae developed as small lobes from notopodia of 1st abdominal setiger ..... *N. annulus* n.sp.
—— Eye spots absent; from about 140th abdominal setiger, small retractile branchiae occur ..... *N. estuarius* n.sp.
7. Prostomium with elongate blunt palpode; abdominal tori 2 small branchial projections from setiger 40 ..... *N. chrysosetus* n.sp.
—— Prostomium with rounded palpode; glandular branchial expansions from setiger 110 to near pygidium ..... *N. torquatus*

8. Thorax of 12 segments, 11 setigerous 9
—— Thorax of 13 segments, 12 setigerous 10
9. Setigers 1–5 with capillaries, the rest with hooded hooks ..... *Heteromastus filiformis*
—— Setigers 1–6 with capillaries, the rest with hooded hooks ..... *Barantolla lepte*
10. Expanded anal plaque with acicular embedded spines ..... *Scyphoproctus djiboutiensis*
—— Pygidium a small truncate cone without acicular spines ..... *?Leiochrides* sp.

Barantolla lepte Hutchings, 1974

Barantolla lepte Hutchings, 1974: 185–186, fig. 3 a–d.—Hutchings & Rainer, 1979: 777.

Material examined. *Victoria:* Glenelg R., (W.9191); Mallacoota, 26-iv-75, 5(W.195116). *New South Wales:* Merimbula, 5-xii-75, several, (W.11816); Jervis Bay, Murray's Bch, 25-iv-72, 4(W.194479); Port Hacking, 22-xii-74, 2(W.195298); Botany Bay, Towra Pt, 1-ii-81, 2(W.195051), 31-i-75, 1(W.195376); Hawkesbury R., D3-4, 16-v-80 (W.196203), 1-1, many dates, many (W.196269-79), 2-1, many (W.196281-6), 2-2, many (W.196287-95). A selection of material examined.

Remarks. Agrees well with original description. Thoracic setal pattern is constant and eye spots persistent even after lengthy storage in alcohol.

Habitat. Found in sediments of fine mud to mud with sand, shell and detritus, in salinities of 28–35‰; also found in *Posidonia* and *Zostera* seagrass beds.

Occurrence. Widespread.

Australian distribution. New South Wales, Queensland.

Capitella capitata (Fabricius, 1780)

Capitella capitata.—Augener, 1914: 59–60.—Warren, 1976: 196–201.—Hutchings & Rainer, 1979: 777–778.

Material examined. *New South Wales:* Hawkesbury R., Cowan Waters, Apple Tree Bay, 4-x-80, many (W.196209-10), Cockle Creek, 25-x-80, (W.196206), Bay A, 4-x-80, 1(W.196207), Waratah Bay, 3-x-80, 3(W.196208).

Description. Small, colourless worms 3–4 mm long. Eye spots absent. Thorax of 9 segments, all setigerous. Some variation in setal pattern. Majority with first seven pairs of noto- and neurosetae all capillaries, remaining 2 pairs with hooded hooks in females, and hooded hooks and genital spines in males. Some individuals with first 7 notopodia with capillaries, followed by 2 with genital setae or hooded hooks; first 6 neuropodia with capillaries and rest with hooded hooks. A single specimen from Waratah Bay has the following setal formula: $\frac{5c + 4h}{4c + 1hc + 4h}$; genital setae absent.

Habitat. Collected from sandy mud, intertidally and to depths of 10 m in marine salinities, >30‰.

Occurrence. Locally abundant.

Australian distribution. Western Australia, New South Wales. (Many of the records fail to give detailed setal counts and several species within the *C. capitata* complex are probably confused.)

Capitella sp.

Material examined. *New South Wales:* Hawkesbury R., 9-1-2, 21-v-80, 1(W.196205).

Description. Small individual, 3 mm long, 0.5 mm wide; body heavily speckled with black pigmentation. Prostomium very flattened, ovoid, eye spots absent. Thorax of 9 segments, all setigerous; 1st 5 setigers with capillaries in both noto- and neuropodia, followed by 2 with hooded hooks; remaining 2 with genital spines in notopodia and hooded hooks in neuropodia.

Remarks. Single individual found. The specific status of this individual is unclear. It may be an aberrant *Capitella capitata* or a separate species. More material is needed to clarify the situation.

Habitat. Found in clayey, sandy mud at a depth of 20 m in a salinity of 17.2‰.

Occurrence. Rare.

Heteromastus filiformis Claparède, 1864

Capitella filiformis Claparède, 1864: 49–50, pl. 4, fig. 10.
Heteromastus filiformis.—Hutchings & Rainer, 1979: 778; 1981: 373–380.

Material examined. *New South Wales:* Lake Merimbula, 6-x-75, several (W.11915); Jervis Bay, Murray's Bch, 25-iv-72, 9(W.194161); Botany Bay, 11-ii-75, 4(W.195783); Hawkesbury R., 1-1, several (W.195900-1), 1-3, several (W.195902-3), 2-3, 1(W.195904). A selection of material examined.

Remarks. Agrees with Hutchings & Rainer's (1979) revised description of the species.

Habitat. In Hawkesbury R., present in salinities of 33.8–35‰, in sediments of mud to sandy mud.

Occurrence. Uncommon in Hawkesbury R., found at Transects 1, 2, 3 and at Brooklyn in all seasons, in most years. Widespread in New South Wales estuaries.

Australian distribution. Victoria, New South Wales, Queensland.

?Leiochrides sp.

Material examined. *New South Wales:* Hawkesbury R.,

D2-1, 18-xii-79, 1(W.196204).

Description. Incomplete posteriorly. Thorax of 13 segments, 1st asetigerous, followed by 12 with capillaries in both noto- and neuropodia. Abdominal segments with hooded hooks, only 2-3 remaining.

Remarks. This fragment could belong to three described genera of Capitellidae, *Leiochrides, Heteromastides* and *Scyphoproctus*. No anal plates have been found. *Leiochrides* is known to occur in eastern Australia, (unpublished A.M. records) so this fragment is tentatively assigned to *Leiochrides*.

Habitat. Collected from muddy, shelly sediments at Brooklyn in a salinity of 34.4‰ at a depth of 7 m.

Mediomastus californiensis Hartman, 1944

Mediomastus californiensis Hartman, 1944: 264–265, pl. 25, figs 64–65.—Hutchings & Rainer, 1979: 779.

Material examined. *New South Wales:* Jervis Bay, 25-iv-72, 1(W.194189); Port Hacking, 12-iii-75, 1(W.195231); Botany Bay, Towra Pt, Jul. '81, 2(W.195066), 11-ii-75, 15(W.195784); Hawkesbury R., 1-1, many dates, many (W.195905-8); Port Stephens, 27-vii-76, 7(W.12567).

Remarks. The material agrees well with the expanded description given by Hutchings and Rainer (1979).

Habitat. In the Hawkesbury R., found in soft to sandy mud with shells, in salinities of 32–35‰; in *Zostera* and *Posidonia* seagrass beds in other localities.

Occurrence. Common all year round at Transects 1 and 2 and at Brooklyn in the Hawkesbury R. Widespread in New South Wales estuaries.

Australian distribution. Victoria, New South Wales.

Notomastus annulus n.sp.
Fig. 23.1

Material examined. HOLOTYPE: D2-1, 18-xi-79, (W.18618), 6 mm long, 1.0 mm wide, posteriorly incomplete, 11 thoracic setigers and 11 abdominal setigers. PARATYPES: D2-1 (USNM 81470), 7 mm long, 0.8 mm wide, posteriorly incomplete, thorax and 11 abdominal setigers; D2-3 (BMNH ZB 1983. 1746), 7 mm long, 0.6 mm wide, posteriorly incomplete, thorax and 9 abdominal setigers; D3-3 (AHF POLY 1412), 6 mm long, 0.7 mm wide, posteriorly incomplete, thorax and 7 abdominal setigers; D2-3, 1-viii-79, (W.18619), 5 mm long, 0.6 mm wide, posteriorly incomplete, thorax and 7 abdominal setigers; D1-2, 1-viii-79, (W.18620), 4 mm long, 3 mm wide, posteriorly incomplete, thorax and 6 abdominal setigers.

Additional material. D3-4, 16-v-80, 1(W.18621), D4-1, 21-viii-80, 1(W.18622), 1-1-1, 13-xi-79, 1(W.196339). All type and other material collected from New South Wales, Hawkesbury R.

Description. Small pinkish body. Prostomium a truncated cone with spherical palpode. Prominent elongate patch of eye spots on prostomium, individual eye spots clearly discernible. Achaetous peristomium. All 11 thoracic setigers with capillary setae only, 6–9 setae per fascicle. Thorax with tesselated epithelium, prominent on setigers 1–4 which are considerably inflated, subsequent setigers less inflated, and less tesselated. Posterior thorax with biannulated segments and marked intersegmental grooves. Transition from thorax to abdomen marked by sharp waist, and change in the orientation of setae, which become more laterally orientated. Adjacent abdominal notopodial and neuropodial tori fused together to form a single row of hooded hooks (Fig. 23.1). Fused abdominal tori arranged on raised glandular strip encircling the body in the form of a girdle on anterior margin of setiger. Abdominal tori on apex of elevated girdle, elongated and triangular in cross section. Notopodial margin of girdle free, forming a globular lobe, probably branchial in function (Fig. 23.1). Globular lobe developed from 1st abdominal setiger. Abdominal setae, hooded hooks; dental formulae main fang plus 3–4 rows, each with numerous teeth. Under oil emersion it is not possible to accurately count number of teeth. Hooks small, strongly striated, with tear-shaped hood; base of shaft slightly swollen; approximately 50 hooks per torus, number constant over the abdominal segments present. Abdominal setigers expand posteriorly as the non-glandular portion of each setiger increases in length. Lateral organs absent. No evidence of nephridiopores on abdomen or thorax. Coelomic gametes not visible.

Remarks. Within the type material examined, the development of the glandular girdle appears to be related to the size of the animal, increasing with increasing size and presumable age. All the material comes from a restricted locality, so this does not appear to be an environmentally determined factor.

Notomastus annulus belongs to the genus *Notomastus*, as defined by Sars 1850, because all the thoracic setae are capillaries. Hartman (1960) expanded the diagnosis of the genus by describing a new species, *N. precosis*, which has eleven thoracic setigers, of which the last 3 thoracic neuropodia have hooded hooks instead of capillaries. The specific name refers to the precocious development of the hooded hooks. However, this expanded definition of the genus does not seem to have been generally followed by other workers. *Notomastus precosis* has since been described by Fauchald (1972) from an area further south than the original locality, but still in deep water. Fauchald's material has only the last two thoracic neuropodia with hooks. More material of this species is needed to clarify the characteristics of this species. If the number of thoracic hooks really is variable, it would necessitate a major critical review of the valid generic characteristics of capitellids.

The genus *Notomastus* has been split into two subgenera, *Notomastus* and *Clistomastus*. *Notomastus annulus* belongs to the subgenus *Clistomastus*. Within his subgenus, 11 species have been described. Many of these lack neurosetae on setiger 1 and can therefore be readily distinguished from *Notomastus annulus* which

has neurosetae on setiger 1. Two previously described species in this subgenus have both noto- and neurosetae on setiger 1: *N. lineatus* Claparède, 1870 and *N. annenkowae* Zachs, 1933. *Notomastus lineatus* has the superior edge of the abdominal neuropodia inflated and expanded, whereas *N. annulus* has the notopodia inflated, and the neuro- and notopodial tori fused to form a single lateral torus on each side. In *N. lineatus* the neuro- and notopodial tori are separate. *Notomastus annenkowae* has 2 slender papillae on the posterior half of each anterior abdominal segment; such papillae are absent in *Notomastus annulus*.

Etymology. The specific name refers to the development of the girdle in the abdominal setigers.

Habitat. Collected from sediment of sandy mud with much shell, and in salinities of 33–35‰.

Occurrence. Rare in Hawkesbury R., present at Transect 1 and more abundant at Brooklyn all year round.

Australian distribution. New South Wales (Hawkesbury R.).

Notomastus chrysosetus n.sp.

Fig. 23.2–3

Notomastus sp. Hutchings & Rainer, 1980:45.

Material examined. *New South Wales:* HOLOTYPE: Hawkesbury R., D4-1, 26-11-80 (W.18623), 25 mm long, anteriorly 0.75 mm wide, posteriorly incomplete,

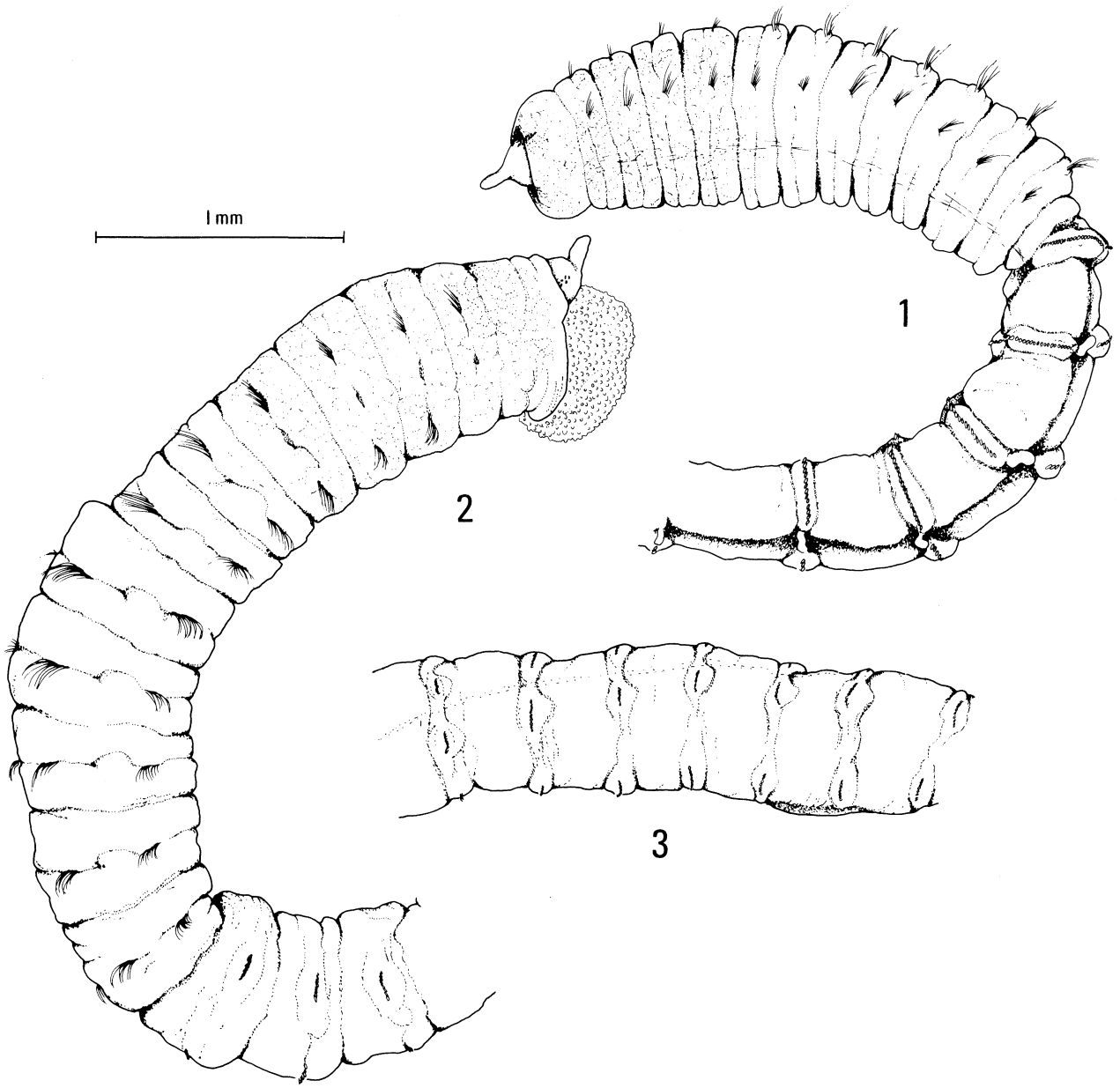

Fig. 23. *Notomastus annulus* n.sp. (Paratype W.18620): *1.* anterior end, lateroventral view. *Notomastus chrysosetus* n.sp. (Holotype W.18623): *2.* anterior end, lateral view; *3.* abdominal segments, dorsolateral view.

approximately 60 abdominal setigers. PARATYPES: D4-3 (AHF POLY 1411), 15 mm long, 0.6 mm wide, posteriorly incomplete, approximately 50 abdominal setigers; D3-4 (BMNH ZB 1983 1747), 20 mm long, 0.8 mm wide, posteriorly incomplete, approximately 40 abdominal setigers; 1-1-2 (USNM 81471), 75 mm long, 1.0 mm wide, posteriorly incomplete in 2 fragments, posterior fragments with well developed gills.

Additional material. D3-1, 1-viii-79, 2(W.18626), D3-1, 16-v-80, 2(W.18627), D3-3, 16-v-80, 1(W.18628), D3-4, 1-viii-79, 3(W.18629), D4-2, 1-viii-79, 2(W.18625), D4-3, 18-xii-79, 1(W.18624), D2-1, 1-viii-79, 1(W.18631), D2-3, 18-xii-79, 1(W.18632), D3-4, 26-ii-80, 1(W.18630); posteriorly too incomplete for development of branchiae. Gunnamatta Bay, G2/1A, 18-ii-75, several (W.196785). A selection of additional material examined.

Description. Preserved body creamy yellow, golden setae, gut contents readily seen through translucent body walls. Prostomium bluntly conical with elongated blunt palpode; elongate patch of irregularly sized pigment spots. Pharynx partially everted with fine papillae. Thoracic epithelium strongly aereolated.

Transition from thorax to abdomen marked by inflation of anterior abdominal segments in comparison to those of posterior thorax, and slight change in orientation of setae (Fig. 23.2). Yellowish glandular stripe running mid-dorsally along abdomen. Abdominal segments poorly demarcated.

From setiger 5–11, rectangular glandular flap present between noto- and neuropodia (Fig. 23.2). Prominent lateral organs dorsal to these flaps on setigers 4–11. Nephridial papillae not seen. Coelomic gametes not visible.

Eleven thoracic setigers; setiger 1 with notosetae only. Thoracic setae all narrow-winged capillary setae with broad blades and dark orange bases; about 30 capillaries per fascicle. Abdominal setae, hooded hooks with spherical hoods and straight shafts; large main fang with 3 rows of teeth containing 3, 2 and α teeth respectively (MF:3:2:α), about 13 per torus. Torus short and discrete, no fusion of noto- and neuropodia. Abdominal torus on a glandular strip encircling the body. In mid-abdominal setigers about 40th, ventrally from the glandular ring, 2 small projections develop, posteriorly directed, presumably branchial in function (Fig. 23.3). The abdominal setigers poorly defined anteriorly; posteriorly, with the development of branchiae, becoming better defined.

Remarks. *Notomastus chrysosetus* n.sp. belongs to the subgenus *Clistomastus* as defined by Hartman (1947) using the criterion of nephridial papillae either absent or restricted to a few on the thorax. Hartman also used the relative size of the hooded hook to split the genus. This character is far less precise. The hood in *N. (C). chrysosetus* n.sp. appears to be intermediate in size and falls between the two subgenera.

Notomastus chrysosetus belongs to a small group of *Notomastus (Clistomastus)* which lack neurosetae on setiger 1, and have branchiae. This group includes *N. (C.) hemipodus* Hartman, 1947, *N. (C.) tenuis* Moore, 1909 and *N. (C.) torquatus* Hutchings & Rainer, 1979. Hutchings & Rainer (1979) discuss the differences between the three species, (p.781) of which type material has been seen in all cases. *Notomastus (C.) chrysosetus* n.sp. differs from these species in the dentition of the hooded hooks, the presence of rectangular glandular flaps on setigers 5–11 and the type of development of the branchiae.

Notomastus (C.) chrysosetus occurs at stations D4-2 and D4-3 with *N. torquatus*, but normally *N. torquatus* is restricted to more marine conditions and is common in Broken Bay into which the Hawkesbury River flows. Gunnamatta Bay, Port Hacking is a similar habitat. This species was referred to as *Notomastus* sp. in the key to New South Wales polychaetes by Hutchings & Rainer (1980).

Etymology. The specific name refers to the characteristic golden capillary setae, and is derived from the greek word *chryos.*

Habitat. Collected from sediments of mud to muddy sand, in salinities of 27–35‰.

Occurrence. Abundant at Hawkesbury R., Transects 1-3, all year round.

Australian distribution. New South Wales (Gunnamatta Bay, Hawkesbury R.).

Notomastus estuarius n.sp.

Fig. 24.1–3.

Notomastus sp. Hutchings & Rainer, 1980: 45.

Material examined. *New South Wales:* HOLOTYPE: Avoca Lagoon, 23-ii-75 (W.18635), 75 mm long, 1.4 mm wide anteriorly and 0.5 mm at posterior, complete, ~200 abdominal setigers. PARATYPES: Avoca Lagoon, (USNM 81472), 30 mm long, 1.4 mm wide, posteriorly incomplete, >150 abdominal setigers; (AHF POLY 1413), 35 mm long, 1.5 mm wide, posteriorly incomplete >150 abdominal setigers; (BMNH ZB 1983. 1748), 45 mm long, 1.3 mm wide, complete, >200 abdominal setigers.

Additional material. Merimbula, 24-vii-75, 14/15-iii-76, several (W.11795-7); Hawkesbury R., range of material from 7-1, 7-2, 8-1, 8-2, 9-2, 10-1, 10-2, 11-1, 11-2, 12-1, 12-2, 13-1, 13-2, 14-1, many (W.195351-72, W.195397-416, W.195791-815), 31-viii-72, (W.9083), small individuals, 11-1-1, (W.19281, W.11286), 11-1-2 (W.19272-3, W.19269-72, W.19282, W.19289), 11-1-3, (W.19278), 11-1-4 (W.19275); Avoca Lagoon, 23-ii-75, many (W.18636); Fullerton Cove, Hunter R., 8-vi-75, 1(W.12031); Lower Myall R., 17-ix-75, 3(W.8162).

Description. Preserved worm creamish yellow, anterior thoracic segments with strongly aereolated epithelium, less marked in posterior thorax. Prostomium short, squat with rounded palpode. Eye spots absent. Peristomium achaetous with anterior margin slightly inflated and truncated. Width of thoracic segments increases gradually posteriorly; posterior segments markedly biannulated, with well-demarcated intersegmental grooves. Posterior segments become rectangular and segments contracted. Transition

from thorax to abdomen marked only by changes in type of setae and slight change in orientation of setae (Fig. 24.1). Posteriorly, abdominal segments become very narrow, possibly reflecting a regenerating tail. Pygidium glandular ring with 1 small anal cirrus (Fig. 24.3).

Eleven thoracic setigers all with capillary noto- and neurosetae. Capillaries narrow winged, approximately 10–15 per fascicle. Abdominal setae all hooded hooks; straight shafts and simple hoods. Dental formula, MF:4:3:α. Number of setae in noto- and neuropodium about 20, no decline in numbers posteriorly. Abdominal setae arranged on 4 discrete tori per setiger, surrounded by glandular tissue which forms a narrow encircling ring that becomes somewhat laterally expanded in the region of the tori (Fig. 24.2). Posteriorly, glandular ring becomes slightly expanded and raised to form narrow fold, from about setiger 27, gradually increasing in size, but even by setiger 90 not conspicuous (Fig. 24.3). At about abdominal setiger 140, small retractile digitiform branchiae occur. Branchiae on holotype emergent over 10–15 segments, posteriorly to notopodia from below the triangular glandular flap on which notopodia occur. Each branchia, 2–3 simple filaments, sometimes only 1 emergent. Nephridial papillae present on thorax between setigers 8–9, 9–10 and 10–11, and at intersections of last thoracic and first abdominal setigers.

Remarks. The paratypes show some variation from the holotype in the number of branchiae exposed. Branchiae are emergent on paratypes for 5–20 segments. In the non-type material some small individuals (presumably juveniles) are present ranging in length from 3–4 mm and 0.2–0.3 mm in width. These individuals show a range of setal types:

8c + 1ch + 2h;	9c + 1ch + 1h;	8c + 3h;	7c + 4h
8c + 1ch + 2h;	9c + 1ch + 1h;	7c + 4h;	7c + 4h

strongly suggesting that setal types are replaced with increasing size until all 11 thoracic setigers have capillaries in both noto- and neuropodium. Ewing

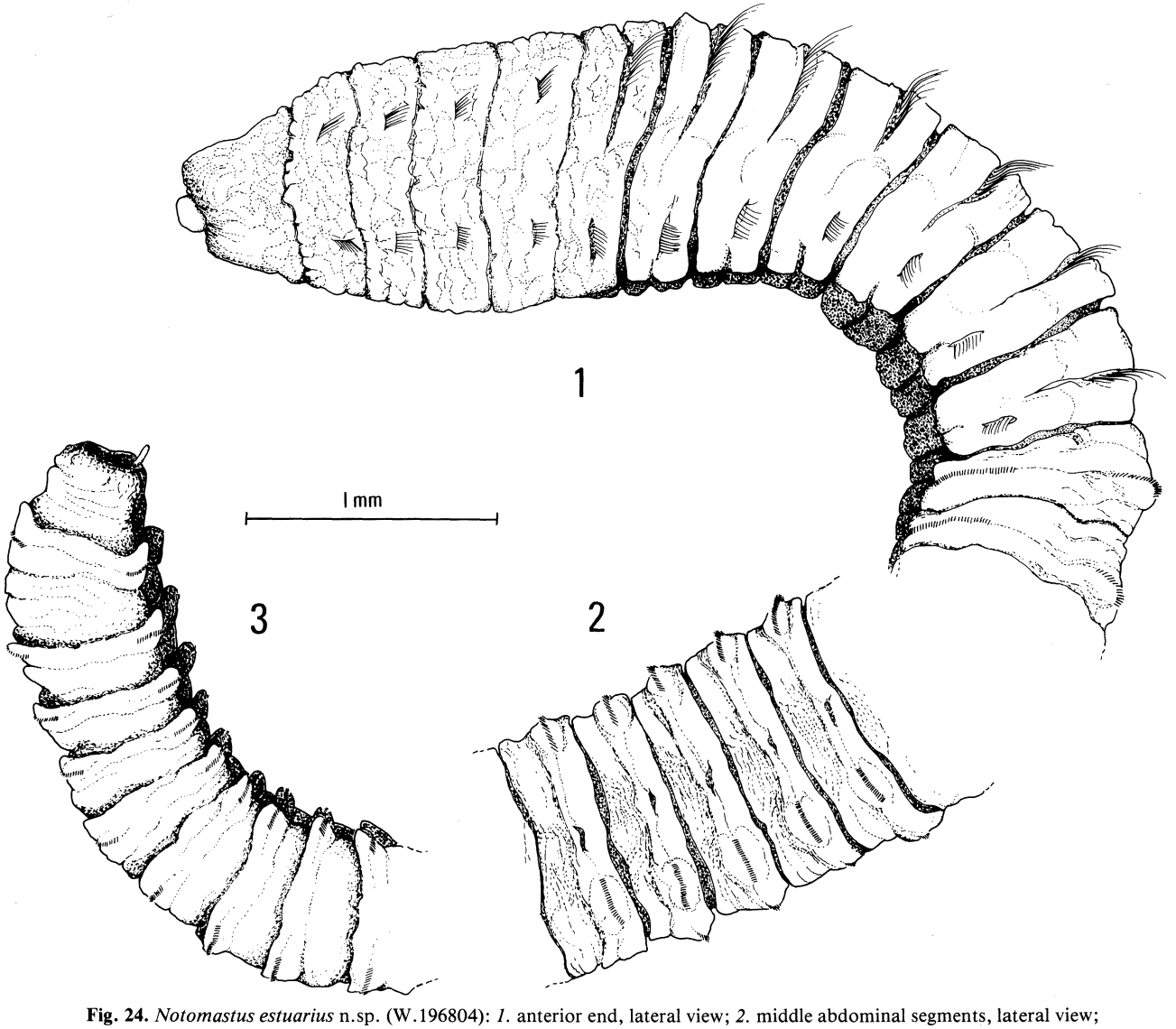

Fig. 24. *Notomastus estuarius* n.sp. (W.196804): *1.* anterior end, lateral view; *2.* middle abdominal segments, lateral view; *3.* posterior end, lateral view.

(1982) has made similar suggestions. We believe that these juveniles are *Notomastus estuarius* as no other species of *Notomastus* occurs at this upstream site.

Notomastus estuarius belongs to the subgenus *Clistomastus* as defined by Hartman (1947). Within the genus 11 species can be assigned to this subgenus of which only *Notomastus lineatus* (Claparède, 1870), *N. fauveli* Day, 1955 and *N. sonorae* Kudenov, 1975 appear to have both noto- and neurosetae on the 1st thoracic setiger. In *N. lineatus* the superior edge of the neuropodium is inflated and branchial, *N. fauveli* has up to 20 filaments per branchia, thus clearly differing from the branchial development in *N. estuarius*. *Notomastus sonorae* has abdominal noto- and neuropodia connected by an interramal ridge; the rings are separated mid-dorsally and mid-ventrally, whereas in *N. estuarius* the ridge forms a narrow complete ring. *Notomastus sonorae* has the superior margin of each abdominal neuropodium raised to form a digitate projection that may be branchial. Such branchial projections are absent in *N. estuarius* n.sp. Of the other species of *Notomastus* that cannot be assigned to a subgenus on their published descriptions, *N. variegatus* Berkeley & Berkeley, 1950 lacks branchiae and *N. exsertilis* Saint-Joseph, 1906, has branched branchiae from abdominal setiger 27; both these species have noto- and neurosetae on setiger 1.

Etymology. The name is derived from latin and refers to the habitat in which the species occurs; it is always found in the upper reaches of rivers and is widespread in New South Wales.

Habitat. In Hawkesbury R., found in sediments of muddy sand (fine to coarse) and in salinities of 0–29‰.

Occurrence. Widespread in reduced-salinity environments. Abundant in Hawkesbury R., at Transects 7-14, throughout the year.

Australian distribution. New South Wales (widespread).

Notomastus torquatus Hutchings & Rainer, 1979

Notomastus torquatus Hutchings & Rainer, 1979: 779–782, fig. 8 a-b.

Material examined. *New South Wales:* Botany Bay, Towra Pt, 10-ii-81, many (W.195054); Hawkesbury R., all seasons, 1-1, many (W.194708-14), 2-1, many (W.194715-25), 2-2, many (W.194726-36). A selection of material examined.

Remarks. Agrees well with the original description. Small specimens of *Notomastus* occur in the Hawkesbury with mixed setae in posterior thoracic setigers. These have been described as *Notomastus* sp., but may represent juveniles of any of the four species of *Notomastus* which occur in the Hawkesbury River.

Habitat. Fine to sandy mud in salinities of 28–35‰.

Occurrence. Abundant at Transects 1, 2 & 3 and at Brooklyn, for most of the year in the Hawkesbury R. Widespread in New South Wales estuaries.

Australian distribution. Victoria, New South Wales, Queensland.

Notomastus spp.

Material examined. *New South Wales:* Hawkesbury R., 1-3-2 (W.19268), 1-3-3 (W.19279), 12-1-1 (W.19280), 12-1-2 (W.19274, W.19276), 12-1-3 (W.19277), D2-1 (W.19288), D4-2 (W.19287).

Description. Small, posteriorly incomplete specimens. Prostomium with small spherical palpode, eye spots present or absent. First segment achaetous. Eleven thoracic setigers, 1st setiger with both noto- and neurosetae, but in W.19268, W.19287-88, neurosetae absent on setiger 1. Thoracic setae include winged capillaries anteriorly and hooded hooks posteriorly.

Within the material examined considerable variation in the thoracic setal pattern occurs. Thoracic notosetae with winged capillaries in first 6–10 setigers (mean value of 8.6), followed by 1–2 segments, often with mixed setae of hooded hooks and capillaries; remaining thoracic notosetae with hooded hooks only. Thoracic neurosetae with capillaries in the first 6–10 setigers (mean value 8.6), followed by 0–3 segments with mixed setae; remaining thoracic neurosetae with hooded hooks only. Transition from thorax to abdomen marked by slight change in orientation of torus, and by an increase in number of hooded hooks. Posteriorly, number of hooks diminishes in the fragments possessing several abdominal segments. No branchiferous segments visible.

Remarks. We have hesitated to include these anterior fragments in any of the species of *Notomastus* described from the Hawkesbury River, because of the presence of several posterior thoracic setigers with mixed fascicles. It may be that the setal pattern of *Notomastus* changes with age and that setal replacement occurs as the thorax is being differentiated. Far more material of complete individuals of varying sizes (and presumably ages) is needed before this situation can be clarified, and the validity of the accepted definition of *Notomastus,* with 11 thoracic setigers, all with capillaries, can be determined. We suspect that these small specimens represent juveniles of *Notomastus torquatus* and *N. chrysosetus*.

It seems likely that generic definitions as currently written of capitellid genera are valid only for adults, and that a qualifying statement should be added that juvenile capitellids change their thoracic setal patterns with increasing age and size. Recently, Ewing (1982) has described *Notomastus daueri* with mixed posterior thoracic fascicles, which he also suggests may be a juvenile feature.

Habitat. Two different habitats: in mud at 35‰, and in sandy mud at 0‰.

Occurrence. Few specimens, and collected only in autumn and winter of 1979 at Transects 1, 12 and at D2, D4.

Australian distribution. New South Wales (Hawkesbury R.).

Scyphoproctus djiboutiensis Gravier, 1904

Scyphoproctus djiboutiensis.—Day, 1967: 604-605.—Hutchings, 1974: 187.

Material examined. *New South Wales:* Botany Bay, Towra Pt, 3/4-vi-77, many (W.12271, W.12281, W.12296, W.12305); Broughton I., 1-ix-76, many (W.13057, W.13065, W.13076, W.13079).

Remarks. Agrees well with published descriptions.

Habitat. *Posidonia* seagrass beds.

Occurrence. Abundant in restricted areas.

Australian distribution. New South Wales (Botany Bay*, Broughton I.*, Wallis Lake).

Family ARENICOLIDAE Johnston

Body cylindrical, separated into two or three distinct regions. Prostomium without appendages. Notopodia bluntly truncate; neuropodia elongated tori. Notosetae capillary or limbate; neurosetae rostrate hooks. Branchiae present on some setigers in the median or posterior region.

Arenicola bombayensis Kewalramani, Wagh & Ranade, 1959

Arenicola bombayensis Kewalramani, Wagh & Ranade, 1959: 109-115.—Hutchings, 1974: 187-188.—Hutchings & Recher, 1974: 105, 120.

Material examined. *Victoria:* Malacoota Inlet, 12-ii-73, 1(W.12196). *New South Wales:* Careel Bay, 10-vi-73, 1(W.5753); Riley's I., Brisbane Waters, May '73, 7(W.5609).

Remarks. Agrees well with descriptions by Hutchings (1974).

Habitat. Seagrass beds, intertidal mud flats.

Occurrence. Rare.

Australian distribution. Western Australia, South Australia, Victoria, New South Wales.

Family MALDANIDAE Malmgren

Capitelliform polychaetes with long cylindrical bodies, usually truncate at one or both ends; most species with long cylindrical segments resembling bamboo. Prostomium without appendages, with a pair of nuchal slits and a median cephalic keel. Notopodia short and rounded; neuropodia elongated tori. Notosetae smooth or spinose capillaries; neurosetae rostrate hooks; anterior modified spines in some genera.

Other species and genera of Maldanids occur in New South Wales but the material currently available is too fragmented to allow complete identification. Some of these genera have been included in the key.

Key to the Species of Maldanidae

1. Cephalic plate absent; cephalic keel well marked; pygidium petaloid with central anus ..... *Petaloproctus*†
— Cephalic plate well defined, surrounded by raised margin; cephalic keel and pygidium variable 2
2. Pygidium as a slanting plate with a dorsal anus; anal cirri absent 3
— Pygidium encircled by anal cirri with anus sunken in funnel 4
3. Cephalic keel well marked; rim of cephalic plate notched laterally ..... *Maldane sarsi*
— Cephalic keel low and broad; rim of cephalic plate very deeply incised laterally ..... *Asychis*†
4. Neurosetae of setigers 1-3, four dentate crested hooks, similar to subsequent ones ..... *Axiothella*†
— Neurosetae of setigers 1-3, four acicular setae, different from subsequent ones .. .. *Euclymene trinalis*

† Genera not described in this paper but recorded from New South Wales estuaries by Hutchings and Rainer, 1980.

Euclymene trinalis Hutchings, 1974

Euclymene trinalis Hutchings, 1974: 188-189, fig. 4 a-f.

Material examined. *New South Wales:* Lake Merimbula, 4-xii-75, 1(W.17121); Jervis Bay, Hare Bay, 18-x-72, 1(W.17480); Port Hacking, Maianbar, 4-xi-75, 2(W.11015); Botany Bay, Towra Pt, 12-iv-73, 1(W.10965); Lake Macquarie, Feb. '78, 1(W.17851); Port Stephens, Aug. '76, 1(W.12916). A selection of material examined.

Remarks. Agrees well with the original description.

Habitat. *Posidonia* seagrass beds.

Occurrence. Present in low numbers but widespread in New South Wales.

Australian distribution. New South Wales (Merimbula*, Jervis Bay*, Port Hacking*, Botany Bay*, Lake Macquarie*, Port Stephens*, Wallis Lake).

Maldane sarsi Malmgren, 1866

Maldane sarsi.—Day, 1967: 645, fig. 30.8 a-e.

Material examined. *New South Wales.* Hawkesbury R., 1-3-1, 7-v-79, 1(W.196369), 2-2-1, 12-i-77, 1(W.196370), 2-2-1, 4-v-77, 1(W.196371).

Description. Body up to 100 mm long and encased

in a fine mud tube. Head with a well marked, strongly arched cephalic keel, surrounded by a slanting cephalic plate with a raised margin. Nuchal grooves short, almost straight. Cephalic rim low, deeply notched laterally but smooth posteriorly. Nineteen setigers, 2 short; indistinct achaetous preanal segment before the pygidium. Anal plate oval and slanting, notched laterally. Setiger 1 with notosetae only, subsequent setigers with both noto- and neurosetae. Notosetae winged capillaries and spinulose setae. Neurosetae, hooks with main fang surmounted by a transverse arc of about 12 large teeth, and above that numerous smaller teeth.

Remarks. Australian specimens agree well with Day's (1967) description, but perhaps the type of this cosmopolitan species should be re-examined and compared with material collected throughout its distributional range.

Habitat. Found in mud to sandy mud in 32.2–35‰ salinities.

Occurrence. Rarely found in Hawkesbury R., collected only at Stations 2-2 and 1-3 at different times of different years.

Australian distribution. New South Wales (Lake Macquarie, Hawkesbury R.*).

Family OWENIIDAE Rioja

Body cylindrical with long anterior segments and short posterior ones; tubiculous. Notosetae all capillaries; neurosetae very small, bi- or tridentate hooks in dense rows.

Only a single species of this family has been recorded from Australia.

Owenia fusiformis Delle Chiaje, 1841

Owenia fusiformis.—Rullier, 1965: 194–195.—Hutchings & Rainer, 1979: 783.

Material examined. *New South Wales:* Lake Merimbula, Mar. '76, many (W.11840-42); Jervis Bay, Murray's Bch, 25-iv-72, many (W.17561-2); Port Hacking, Maianbar, May '75, 1(W.9475); Botany Bay, Towra Pt, 12-ii-81, 3(W.195056); Hawkesbury R., all seasons, D2-2, 16(W.196484), D2-4, many (W.196485-6), D4-3, D4-4, many (W.196487-8). A selection of material examined.

Remarks. Agrees with published descriptions.

Habitat. Found in sediments of sandy mud or mud with much shell and detritus, in salinities of 30.4–35‰.

Occurrence. Abundant in Hawkesbury R., at Transects 2, 3, 7, and at Brooklyn's D2 in most seasons. Widespread in New South Wales estuaries.

Australian distribution. Western Australia, South Australia, Victoria, New South Wales, Queensland.

Family PECTINARIIDAE Quatrefages

Body divided into three regions, including thorax, abdomen and a posterior scaphe. Prostomium reduced. Setiger 1 with expanded, modified setae (paleae) forming a comb. Other setae include short capillaries, pectiniform uncini and scaphal spines. Tubes short, cone-shaped, composed of relatively large sand grains.

Pectinaria papillosa Caullery, 1944

Pectinaria papillosa Caullery, 1944: 71.—Day, 1967: 685, fig. 34.2 e-g.

Material examined. *New South Wales:* Jervis Bay, Murray's Basin, Stns, 28, 34, 37, 38, 40, 55, 151, 153, 154, 167, 181, many (W.194145, W.194230-1, W.194259, W.194358, W.194372, W.194398, W.194469, W.194491, W.194521, W.194584).

Description. Large species up to 60 mm long. Tube made of coarse irregularly sized sand grains. Head with opercular plate smooth, 10 pairs of golden paleae. Cephalic veil joined to operculum medially but free from bases of 2 pairs of lateral tentacular cirri. Tentacular cirri small, second pair lateral in origin and borne on a flange extending from dorsolateral surface across ventrum, flange with smooth margins. Forty-six digitiform velar cirri. Setiger 2 with prominent ventral ridge. First 3 setigers with notosetae only. Thirteen abdominal segments with both notosetae and neurosetal uncini, followed by prescaphal segment with notosetae only. Three to four strongly curved scaphal hooks. Scaphe oval, margins scalloped, surface papillose. Anal ligule cordate. Notosetae stout with narrow hispid wings with spinulose tips. Uncini with 2 rows of 7 large teeth, followed by 2–3 rows each with 3 smaller teeth preceding basal protruberance.

Remarks. First record from Australia. A small individual with only 10 pairs of paleae instead of the more normal 13 pairs.

Habitat. Sand.

Occurrence. Collected only in April and October, 1972.

Australian distribution. New South Wales (Jervis Bay*).

Family AMPHARETIDAE Malmgren

Body with two regions; anterior region with biramous parapodia; posterior region with well-developed neuropodia; notopodia reduced or absent. Prostomium simple or complex with lateral folds and glandular folds. Two to four pairs of smooth, lamellate or pinnate branchiae. Notopodia with capillary setae, neuropodia with uncini in both thorax and abdomen. Thoracic uncini with major teeth in one or a few rows, rarely crested; abdominal uncini similar but more often crested. Nuchal hooks and anterior acicular setae or

paleae often present. Tubiculous.

Although only two ampharetids are described, additional species do occur in New South Wales estuaries, some of which are undescribed. However, these will not be described until intact specimens are collected.

Key to the Species of Ampharetidae

1. First few neuropodia with fine acicular setae, subsequently with uncini; four pairs of branchiae, two smooth and two papillose; nuchal hooks present; paleae absent; buccal tentacles smooth ..... *Isolda pulchella*

— First few neuropodia without acicular setae, all neurosetae uncini; four pairs of branchiae all smooth; nuchal hooks absent; paleae present; buccal tentacles papillose ..... *Pseudoamphicteis papillosa*

Subfamily MELINNINAE

Isolda pulchella Müller, 1858

Isolda pulchella.—Augener, 1918: 517, pl. 7, fig. 229, text fig. 88.—Hutchings, 1977: 3-4

Material examined. *New South Wales:* Botany Bay, Bare I. 1(W.195143); Shelley Bch, Fairy Bower (W.196199); Hawkesbury R., Brooklyn, D2, several (W.196450-2), 2-2-1, 2-2-3, several (W.196423-4).

Remarks. Agrees with Hutchings' (1977) description.

Habitat. Hawkesbury R., in mud, in salinities of 34–35‰; elsewhere collected from *Posidonia* seagrass beds, and sand banks.

Occurrence. Rare in Hawkesbury R., collected from Transect 2 and Brooklyn's D2, D4 during spring and summer months only.

Australian distribution. New South Wales (Botany Bay*, Shelley Bch*, Hawkesbury R.*, Port Stephens*), Queensland.

Subfamily AMPHARETINAE

Pseudoamphicteis papillosa Hutchings, 1977

Pseudoamphicteis papillosa Hutchings, 1977: 5-6, fig. 3 a-e.

Material examined. *New South Wales:* Jervis Bay, Murray's Bch, Stn 58, 1(W.17585); Botany Bay, Stn 903a, 1(W.195786); Shelley Bch, Fairy Bower, 1(W.6494).

Remarks. Agrees with the type material. First record from New South Wales.

Habitat. Hawkesbury R. in mud, in salinities of 33–35‰; also *Posidonia* seagrass beds, and muddy sand.

Occurrence. Rare in Hawkesbury R., collected mostly from Transect and Brooklyn's D2 at all times of year. From other localities known only from 1–2 specimens.

Australian distribution. New South Wales (Jervis Bay*, Botany Bay*, Shelley Bch*), Queensland.

Subfamily AMPHARETINAE

Material examined. *New South Wales:* Jervis Bay, Murray's Bch, 25-iv-72, 1(W.194255).

Description. Single, complete, colourless individual, 4 mm long, 0.5 mm wide. Smooth buccal tentacles. Prostomium, without glandular ridges or eye spots. Paleae absent. Four pairs of branchiae; inner 2 pairs smooth, outer 2 pairs missing. Branchiae not arranged segmentally except for last pair. Twelve uncinigerous thoracic setigers. All thoracic uncini arranged in short compact rows; no modified thoracic notopodia; notopodial cirri absent; 2 short caudal cirri.

Remarks. This is probably an undescribed genus, but because of the poor quality of the material and the absence of some of the branchiae, it is not being described.

Habitat. *Posidonia* seagrass beds.

Occurrence. Rare; even though extensive sampling was carried out by NSWSF, in Jervis Bay.

Subfamily AMPHARETINAE

Material examined. *New South Wales:* Hawkesbury R., 2-2-2, 13-xi-79, 1(W.196201).

Description. One small individual, posteriorly incomplete, 8 mm long, 1.0 mm wide. Prostomium and peristomium brown-pigmented, rest of body colourless. Buccal tentacles papillose. Paleae absent. Elongated peristomium forming a tripartite flap; four pairs of branchiae arranged on anterior margin of this flap. Branchiae all simple elongate filaments. At least 18 setigerous segments and 16 uncinigerous segments. Notopodia with lateral cirri. Pectinate uncini with at least 2 rows each with seven teeth. Gravid.

Remarks. Probably represents an undescribed genus but because of the incomplete nature of the material it will not be described until additional material becomes available.

Habitat. Collected from sandy mud at 4–5 m depth, in salinity of 34–35‰.

Occurence. Rare.

Subfamily AMPHARETINAE

Material examined. *New South Wales:* Cowan Ck, Waratah Bay, 15' grab, 1(W.196200).

Description. Body 2 mm long, 0.5 mm wide, colourless. Paleae absent. Buccal tentacles smooth. Branchiae absent, represented by 3 pairs of scars, not arranged segmentally. Twelve uncinigerous thoracic segments. Notopodial cirri absent.

Remarks. This specimen cannot be assigned positively to a genus but differs from other ampharetids occurring in estuarine areas of New South Wales. Hopefully additional material will become available to fully describe it.

Habitat. Collected from sandy mud at 5 m depth, in salinity of 35‰.

Occurence. Rare, collected only in October, 1980.

Family TEREBELLIDAE Malmgren

Body in two regions; anterior region with biramous parapodia and a posterior region with perhaps only neuropodia. Numerous smooth buccal tentacles not retractile into mouth. Prostomium compact, or shaped like a proboscis, or expanded into a tripartite frilled structure. Branchiae, when present, include 1–3 pairs on anterior segments, each one associated with a particular segment. Notosetae all capillaries, either smooth or serrated. Neurosetae, when present, usually with a large main fang and a crest of smaller teeth. Many species are tubiculous but some are free-living, often bright red in colour.

Key to the Species of Terebellidae

1. Thoracic uncini in double or alternating rows in at least some setigers ..... (*Amphitritinae*) 10
—— Thoracic uncini in single rows throughout or completely absent 2
2. Branchiae completely absent ..... (*Polycirrinae*) 3
—— Branchiae present as simple filaments ..... (*Thelepinae*) 6
3. Neurosetae completely absent ..... (*Lysilla*) 4
—— Neurosetae present either as long-shafted spines or as uncini with strongly bent shafts (avicular) 5
4. Notosetae simple capillaries, 10 pairs ..... *L. apheles*
—— Notosetae barbed, 9–12 pairs ..... *L. pacifica*
5. Neurosetae long-shafted spines ..... *Amaeana trilobata*
—— Neurosetae uncini, from setiger 8 to pygidium ..... *Polycirrus rosea* n.sp.
6. Notosetae from segment 2 7
—— Notosetae from segment 3 9
7. Notosetae smooth-tipped capillaries ..... (*Streblosoma*) 8
—— Notosetae serrated-tipped capillaries ..... *Pseudostreblosoma serratum* n.gen., n.sp.
8. About 50 pairs of branchial filaments over segments 2, 3 and 4, distinct median gap; 23 pairs of notosetae ..... *S. latitudinis* n.sp.
—— About 75 pairs of branchial filaments over segments 2, 3 and 4, those on 2 form a continuous band; 25–29 pairs of notosetae ..... *S. acymatum*
—— About 23 pairs of branchial filaments over segments 2, 3 and 4, distinct median gap; 25 pairs of notosetae ..... *S. atos* n.sp.
9. Tentacular lobe expanded ventrally; uncini from setiger 6 ..... *Rhinothelepus lobatus*
—— Tentacular lobe compact; uncini from setiger 3 ..... *Thelepus setosus*
10. Notosetae smooth-tipped 11
—— Notosetae with finely-serrated tips 17
11. Anterior thoracic uncini long-handled hooks, or long-shafted and avicular 12

——Anterior thoracic uncini similar to posterior thoracic uncini, no long shaft developed 15

12. First 4 rows of uncini heavily chitinised long-handled hooks, followed by avicular uncini ..... *Hadrachaeta aspeta*

——Anterior thoracic uncini avicular with shaft length gradually decreasing posteriorly ..... (*Pista*) 13

13. Two pairs of branchiae, club-shaped ..... *P. typha*

——Three pairs of branchiae, not club-shaped 14

14. Branchiae short-tufted ..... *P. trina*

——Branchiae with short branches along the side of main stem ..... *P. pectinata*

15. Uncini pectinate with 6–7 teeth in a vertical row ..... *Loimia medusa*

——Uncini avicular 16

16. Lateral lobes on segments 2–4 absent; 2 pairs of branchiae; 16 pairs of notosetae ..... *Nicolea amnis* n.sp.

——Lateral lobes present on segments 2–4; 3 pairs of branchiae; 17 pairs of notosetae ..... *Eupolymnia nebulosa*

17. Lateral lobes well developed on segments 2–4 ..... *Amphitrite rubra*

——Lateral lobes absent or poorly developed on segments 2–4 18

18. Anterior thoracic uncini with well-crested heads and long, heavily-chitinised shafts; shafts lost by mid-thoracic segments ..... *Longicarpus glandulus* n.gen. n.sp.

——All thoracic uncini similar, no shaft developed; notosetae continue almost to pygidium ..... *Terebella pappus* n.sp.

Amaeana trilobata (Sars, 1863)

Amaeana trilobata.—Day, 1967: 718-719, fig. 36.3 e-h.—Hutchings, 1977: 9.

Material examined. *New South Wales:* Botany Bay, Stn 881, 20-iii-75, 1(W.195769), Stn 903a, 11-ii-75, 1(W.195782); Hawkesbury R., 1-1-1, 1-1-2, 1-1-3, 1-1-4, 1-3-2, 1-3-3, 1-3-4, 2-1-1, 2-1-2, 2-1-3, 2-1-4, 2-2-1, 2-2-2, 2-2-3, 2-2-4, 3-1-1, 3-1-2, 3-1-3, 3-1-4 (W.195859-99).

Remarks. Agrees well with Hutchings (1977) description; considerable variation in the intensity of pigmentation.

Habitat. Collected in 3–10 m depths, from soft to sandy mud, in salinities of 30.4–35‰. Also found in fine sand from Botany Bay in *Zostera* beds in Lake Macquarie and in *Posidonia* seagrass beds from Port Stephens.

Occurrence. Abundant in Hawkesbury R., at Transects 1, 2, 3 and at Brooklyn D2 in most seasons (not every year).

Australian distribution. Victoria, New South Wales (widespread), Queensland.

Lysilla apheles Hutchings, 1974

Lysilla apheles Hutchings, 1974: 190-191, fig. 5.—1977: 10–11.

Material examined. *New South Wales:* Hawkesbury R., 1-2-3, 3(W.19332), 1-4-4 1(W.19333).

Remarks. Agrees well with original description except that posterior notopodia are smaller than anterior ones.

Habitat. In sandy mud, at 10–12 m, in salinity of 35‰.

Occurrence. Rare, found only in January 1977 at Transect 1.

Australian distribution. New South Wales (Hawkesbury R.*, Wallis Lake), Queensland (Moreton Bay).

Lysilla pacifica Hessle, 1917

Lysilla pacifica.—Hutchings, 1974: 191; 1977: 11.—Hutchings & Rainer, 1979: 786.

Material examined. *New South Wales:* Hawkesbury R., Cowan Waters, Waratah Bay, Stn 1, 1(W.196782), Bay "A" Stns 5-1 and 5-2, 2(W.196783-4); Botany Bay, Kurnell, 29-vi-81, 1(W.194917), Towra Pt, 10-ii-81, several (W.195047).

Remarks. Agrees well with Hutchings' (1974) description.

Habitat. Found in salinity of ~35‰, in muddy sand, and intertidal *Zostera* beds.

Occurrence. Rare in Hawkesbury R., collected only in Cowan Waters Bay "A" and Waratah Bay in October 1980. Widespread; occurs in most New South Wales estuaries.

Australian distribution. New South Wales (widespread), Queensland.

Polycirrus rosea n.sp.

Fig. 25.1–5

Material examined. *New South Wales:* HOLOTYPE: Hawkesbury R., 1-1-4 (W.196900), 8 mm long, 0.5 mm wide.

Description. Preserved worm, pale pink. Tentacular lobe expanded to form circular flattened lobe, with convoluted margins and diffuse marginal patches of pigmentation. Few buccal tentacles remaining, all similar in size, short, globular. Eye spots absent. Ten pairs of smooth-tipped notosetae (Figs 25.1–2). Neurosetae from setiger 8 (Fig. 25.4) continue to pygidium; initially 3–4 uncini per torus then increasing to 8–10 per torus; uncini small, elongate with strongly crested head (Fig. 25.5). Posterior tori prominent, short, rectangular. Anterior thorax with ventral ridges of glandular material; mid-thorax with slightly defined ventral groove (Fig. 25.2) continuing onto abdomen. Abdominal segments very globular and bead-like; far posterior segments smaller and more compact (Fig. 25.3). Pygidium small, globular. Nephridial papillae not seen.

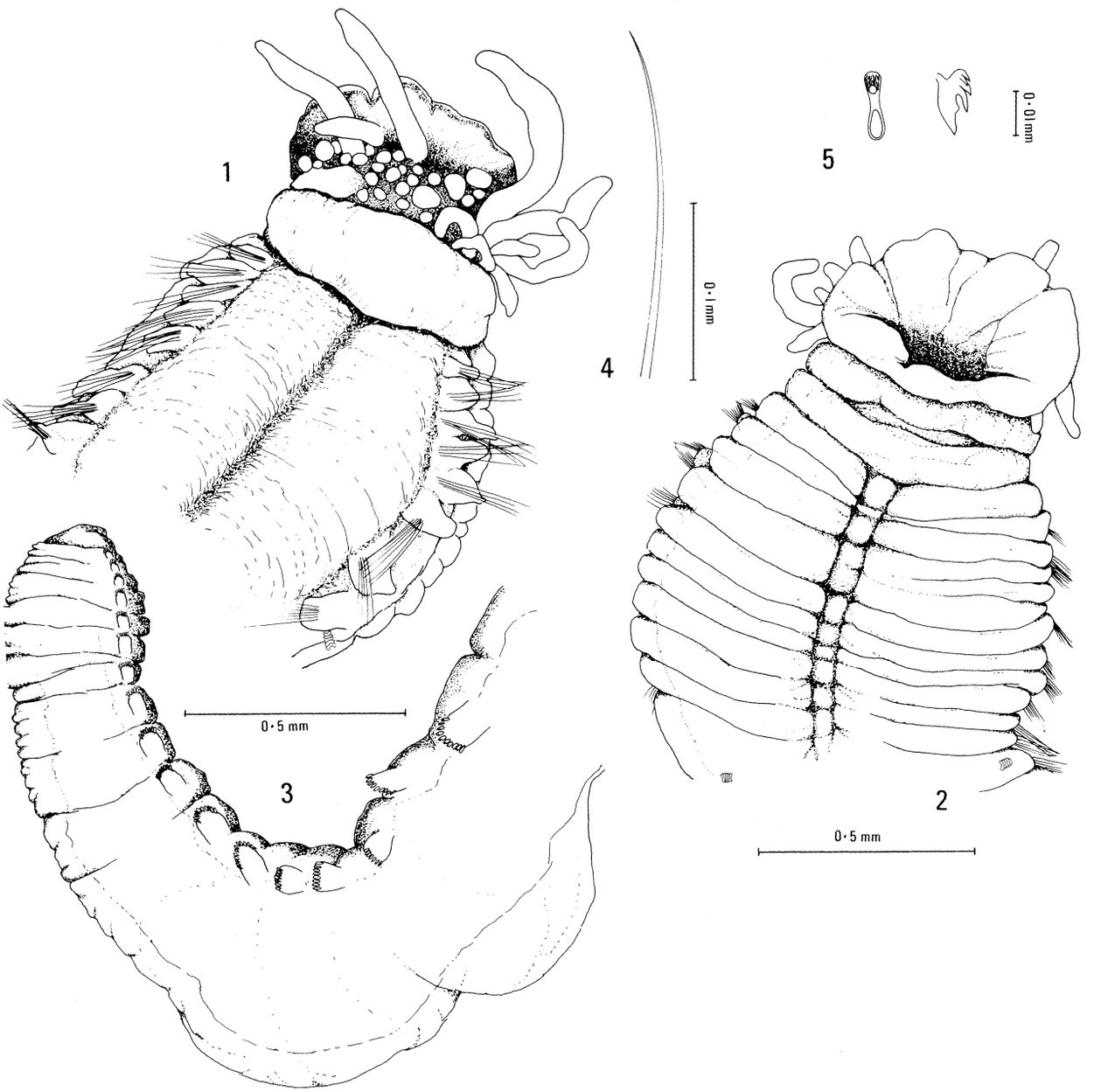

Fig. 25. *Polycirrus rosea* n.sp. (Holotype W.196900): *1.* anterior end, dorsal view;*2.* anterior end, ventral view; *3.* posterior end, lateral view; *4.* thoracic notoseta; *5.* uncinus, dorsal and lateral views.

Remarks. The only species of *Polycirrus* previously recorded from Australia are *Polycirrus boholensis* Grube, 1878, *P. broomensis* Hartmann-Schröder, 1979 and *P. porcata* Knox & Cameron, 1971. *Polycirrus rosea* differs from all 3 of these species in the number of pairs of notopodia; *P. porcata* has 12 segments with notosetae, as does *P. broomensis.* All capillary setae are smooth in *P. rosea;* in the other species the notosetae are ornamented in various ways. The absence of any nephridial papillae may be due to the very small size of the type specimen, indicating that it may be immature.

Etymology. The specific name refers to the colour of the preserved material, and is derived from latin.

Habitat. Found in mud at depth of 4 m in a salinity of 33.4‰,.

Occurrence. Rare; found in November 1979, at Transect 1.

Rhinothelepus lobatus Hutchings, 1974

Rhinothelepus lobatus Hutchings, 1974: 192-193.—Hutchings & Rainer, 1979: 786-787.

Material examined. *New South Wales:* Port Hacking, Maianbar, Stns 1047, 1051, 1056, 1059, many (W.11631, W.11104, W.11145, W.11216); Botany Bay, Towra Pt, 1(W.195043); Hawkesbury R., 9-2, 1(W.196455); Port Stephens, Stns 5, 10, 12, several (W.12933, W.12974, W.12981).

Remarks. Fits original description well. Distribution of the species has been considerably expanded within New South Wales.

Habitat. Found in Hawkesbury R., at 6 m depths in medium-grained sand in a salinity of 20.8‰; in *Zostera* seagrass beds in Botany Bay; *Posidonia* seagrass beds in Port Stephens and Port Hacking.

Occurrence. Rare in Hawkesbury R., single specimen collected in February 1979; common in many New South Wales estuaries, collected in many seasons.

Australian distribution. New South Wales (Port Hacking*, Botany Bay*, Careel Bay, Hawkesbury R.*, Port Stephens*, Wallis Lake).

Pseudostreblosoma n.gen.

Type-species. *Pseudostreblosoma serratum* n.gen.n.sp.

Compact prostomium. Three pairs of branchiae on segments 2, 3 and 4, each composed of numerous sessile filaments. Lateral lobes absent. Notosetae narrow-winged capillaries with serrated tips; from segment 2, continuing for a variable number of segments. Uncini avicular, with pronounced prow; from setiger 4, continuing to pygidium; arranged in single rows throughout.

Pseudostreblosoma n.gen. belongs to the subfamily Thelepinae because of the arrangement of uncini in single rows throughout. The presence of simple, unbranched, sessile branchial filaments also tends to be characteristic of Thelepinae although there are some species of Amphitritinae with simple branchiae but these originate from a basal stalk rather than as individual filaments as in the Thelepinae. Although the new genus shares many of the characteristics of *Streblosoma* it differs in the presence of serrated notosetae, and the Amhitritinae-like uncini rather than Thelepinae-like uncini in *Streblosoma.* The presence of serrated notosetae in the Terebellidae is considered to be an important generic characteristic. Until now, genera with serrated notosetae were restricted to the Polycirrinae and the Amphitritinae. At this stage *Pseudostreblosoma* n.gen. is placed within the sub-family Thelepine because of the arrangement of uncini in single rows and the sessile branchial filaments, although it does share some characteristics of the Amphitritinae in the shape of the uncini. Thus *Pseudostreblosoma* has some characteristics of both the Thelepinae and the Amphitritinae. Perhaps these characters represent primitive characters of the family.

Etymology. The generic name refers to the similarity of the genus to *Streblosoma*, both of which are neuter.

Pseudostreblosoma serratum n.gen., n.sp.

Fig. 26.1-3

Material examined. HOLOTYPE: (W.18949), incomplete posteriorly, 13-14 mm long and 2 mm wide. PARATYPE: (USNM 81487), anterior fragment only. All type material from New South Wales, Botany Bay, underneath Captain Cook Bridge.

Description. Compact prostomium with many grooved buccal tentacles. Numerous peristomial eye spots. Lateral lobes absent. Three pairs of branchiae on segments 2, 3 and 4, composed of numerous sessile filaments; each branchial segment with about 7 filaments on either side, distinct medial gap separating right and left hand groups of filaments. A few filaments on segment 2 slightly displaced laterally. Notosetae from segment 2, continuing for at least 26 segments; narrow-winged capillaries with serrated tips (Fig. 26.2). Uncini from setiger 4, present on all subsequent segments (Fig. 26.1), arranged in single rows throughout; anteriorly arranged on slightly thickened glandular tori; progressively along the body, tori become elevated and free, and uncini arranged in slightly curved rows. Tori become shorter in posterior part of body; uncini avicular (Fig. 26.3), with dental formula MF:2:3:α. Nephridial papillae absent. Ventrum with glandular pads arranged as segmental stripes.

Remarks. The paratype has only 22 pairs of notosetae present on the fragment. *Pseudostreblosoma serratum* is the type species of the new genus, and the features which may be important at the species level in this genus are the number of pairs of notosetae, and the number and arrangement of branchial filaments.

Etymology. The specific name refers to the serrated

notosetae, and is derived from the latin word for saw, *serra*.

Habitat. Muddy sand, subtidal.

Occurrence. Rare; collected from Botany Bay only 24-iii-75.

Australian distribution. New South Wales (Botany Bay).

Streblosoma acymatum Hutchings & Rainer, 1979

Streblosoma acymatum Hutchings & Rainer, 1979: 787-789, Fig. 10 A-B.

Material examined. *New South Wales:* Botany Bay Stn 886, 5(W.195617); Port Stephens, Stn 13(W.12460).

Remarks. Agrees well with the type description except that the description of the distribution of branchial filaments is slightly confused in the original description. Branchiae occur on segments 2, 3 and 4; branchial filaments form a complete band across segment 2, whereas those on segments 3 and 4 (2nd and 3rd pairs of branchiae) have filaments arranged in 2 group with a distinct median gap.

Habitat. *Posidonia* seagrass beds. Same habitat as for type locality.

Occurrence. Rare.

Australian distribution. New South Wales (Botany Bay*, Port Jackson, Careel Bay, Port Stephens*, Wallis Lake), Queensland (Moreton Bay).

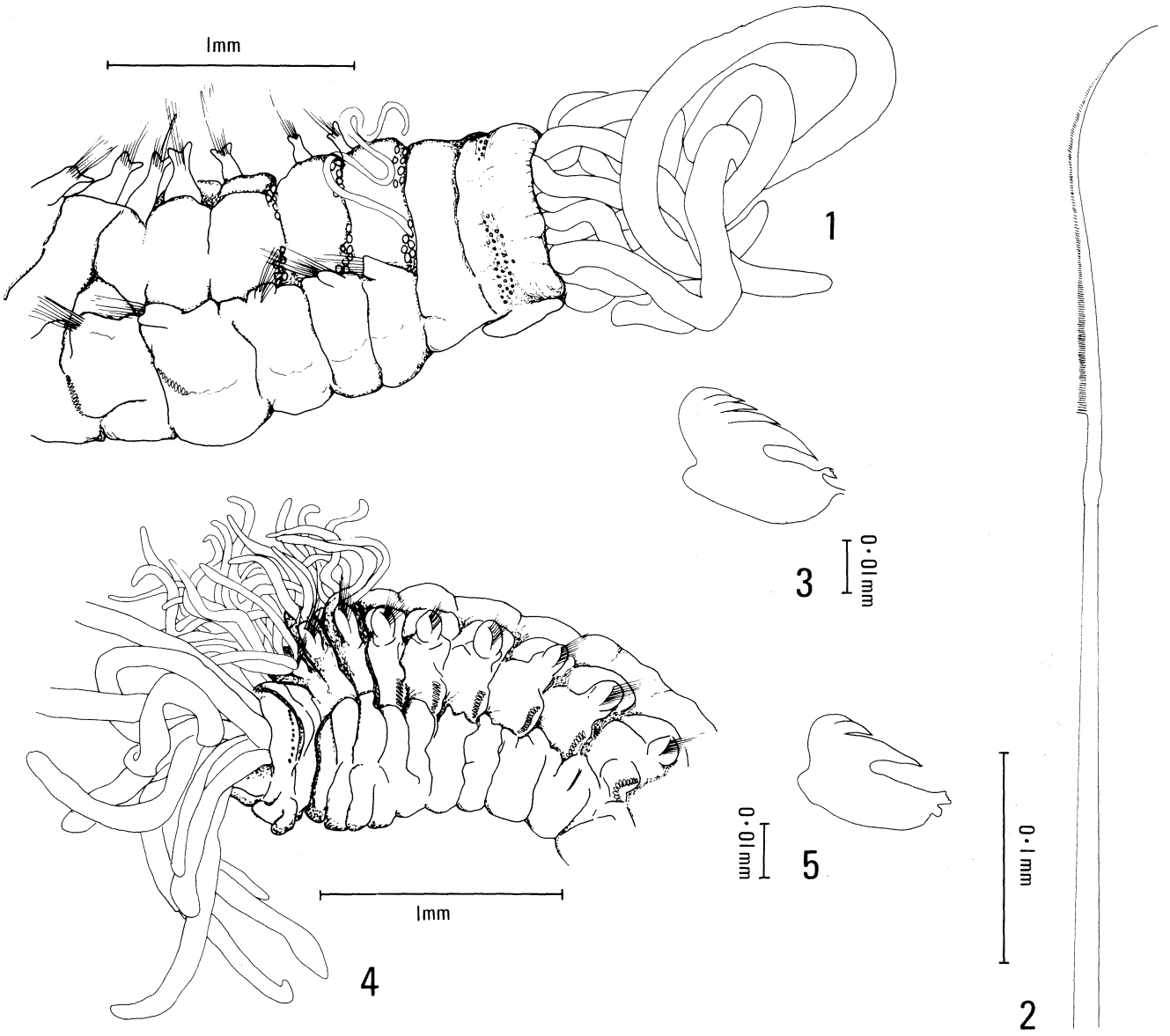

Fig. 26. *Pseudostreblosoma serratum* n.gen., n.sp. (Holotype W.18949): *1.* anterior end, lateral view; *2.* thoracic notoseta; *3.* abdominal uncinus, lateral view. *Streblosoma atos* n.sp. (Holotype W.13053): *4.* anterior end, lateral view; *5.* uncinus, lateral view.

Streblosoma atos n.sp.

Fig. 26.4–5

Material examined. *New South Wales:* HOLOTYPE: Kurnell, Botany Bay, 26-vii-72 (W.13053), 7 mm long, 3 mm wide maximum, posteriorly incomplete.

Description. Preserved specimen reddish brown. Prostomium not expanded, with numerous buccal tentacles. Peristomial eye spots present but sparse. Branchiae on segments 2, 3, 4 each composed of numerous sessile filaments; segment 2 with 12, segment 3 with 5 and segment 4 with 6 on each side. Filaments on segment 2 displaced slightly laterally, distinct medial gap separating right and left hand groups of filaments (Fig. 26.4). Notosetae occurring from segment 2 and continuing for 25 setigers, winged capillaries with narrow elongate tips, surface of wings finely striated. All setae within a bundle similar in length. Uncini from setiger 4, occurring on all segments present, 25 setigerous plus an additional 10 uncinigerous.

Anterior thoracic uncinial tori on thickened glandular rectangular ridges; by posterior thorax, tori becoming slightly elevated, row of uncini developing a shallow curve at either end. Uncini with elongated prow and a distinct subterminal button. Dental formula MF:3:5–7 (Fig. 26.5). Lateral lobes absent. Glandular ventral pads present forming a distinct V-shaped pad, although segmental origins distinct. Anterior ventral pads form a series of ventral collars (Fig. 26.4).

Remarks. At this stage, extensive collecting in other estuarine areas in New South Wales has not yielded additional specimens. This species can be clearly distinguished from the two other described species of *Streblosoma* from New South Wales. *Streblosoma acymatum* Hutchings & Rainer, 1979, has branchial filaments extending right across segment 2, whereas in *S. atos* a distinct median gap occurs. *Streblosoma atos* and *S. latitudinis* (described in this paper) can be distinguished by the ratios of gill filaments present on the 3 branchiferous segments, and the shape and dentition of the uncini. Additional collecting in estuarine areas along the east coast of Australia is needed to provide additional material and allow the variations occurring within species of *Streblosoma* to be described.

Etymology. The specific name is derived from the greek *atos* referring to the medial space separating the groups of branchial filaments.

Habitat. Amongst mangroves, *Avicennia marina*, in muddy sediment.

Occurrence. Apparently rare; collected only on 27-vii-77.

Australian distribution. New South Wales (Botany Bay).

Streblosoma latitudinis n.sp.

Fig. 27.1–3

Material examined. HOLOTYPE: (W.12446), posteriorly incomplete, 17 mm long, 2.5 mm wide. PARATYPE: (USNM 81488), 7 mm long, 3 mm wide. All type material from New South Wales, Port Stephens, *Posidonia* seagrass beds.

Additional material. Hawkesbury R., D2-1, 9(W.196211), D2-4, 5(W.196212).

Description. Colourless when preserved. Swollen thorax, tapering abdomen. Prostomium not expanded, with large number of grooved buccal tentacles. Peristomium with several rows of eye spots. Three pairs of branchiae on segments 2, 3 and 4; each branchia composed of numerous sessile, flattened, ribbon-like filaments. Segment 2 with approximately 24–26 filaments, segment 3 with 12–14 and segment 4 with 10–12 on either side. Exact numbers of filaments difficult to determine. Filaments on segment 2 extend laterally, and on segments 3 and 4, 1 or 2 filaments also displaced laterally. Distinct median gap between left and right hand group of filaments (Fig. 27.1). Notosetae from segment 2, 23 pairs of narrow-winged capillaries with smooth, long, fine tips. Neurosetae from setiger 4, present on all subsequent segments. Anterior uncini arranged on thin, flattened, rectangular, free tori; progressively along the body the tori become glandular and thicker, and length of uncinial row decreases. Uncini in single rows throughout, although in mid to posterior thorax, rows develop a slight curvature. Uncini with elongate prow and terminal, slightly upturned button; dental formula MF:2:2–3 (Fig. 27.3). Distinct ventral glandular pads, surface slightly corrugated. Anterior ventral pads form a semi-circular flap which lies mid-ventrally (Fig. 27.2). Lateral lobes absent. Nephridial papillae on segments 3–6, rectangular narrow pinnules. No evidence of coelomic gametes.

Remarks. The paratype is also posteriorly incomplete, having 27 pairs of notosetae. The absolute number of notosetae is not considered to be an important specific characteristic. The development of a flap on the anterior ventral pads is not as marked in the paratype, although the anterior pads are thickened and corrugated as in the holotype. The additional material is all very small, 2–3 mm in length, and many of the individuals have lost their branchiae.

Hutchings (1977) in a review of terebelliform polychaetes from eastern Australia reported that two species of *Streblosoma* occurred: *S. amboinense* and *S. gracile*, both described by Caullery (1944) from Indonesia. Since then, Caullery's types have been examined. They are in poor condition, described by Hutchings & Rainer (1979), and probably both are indeterminable unless additional material from the type locality can be obtained. Both clearly differ from the Australian material. Thus neither *S. amboinense* or *S. gracile* occur in Australia. Material originally described as *S. amboinense* was described as *S. acymatum* by Hutchings & Rainer (1979), and material identified as *S. gracile* will shortly be described as a new species. Therefore, on the east coast of Australia, 5 species of *Streblosoma* occur: *S. acymatum, S. latitudinis, S. atos* and two undescribed species from Moreton Bay and

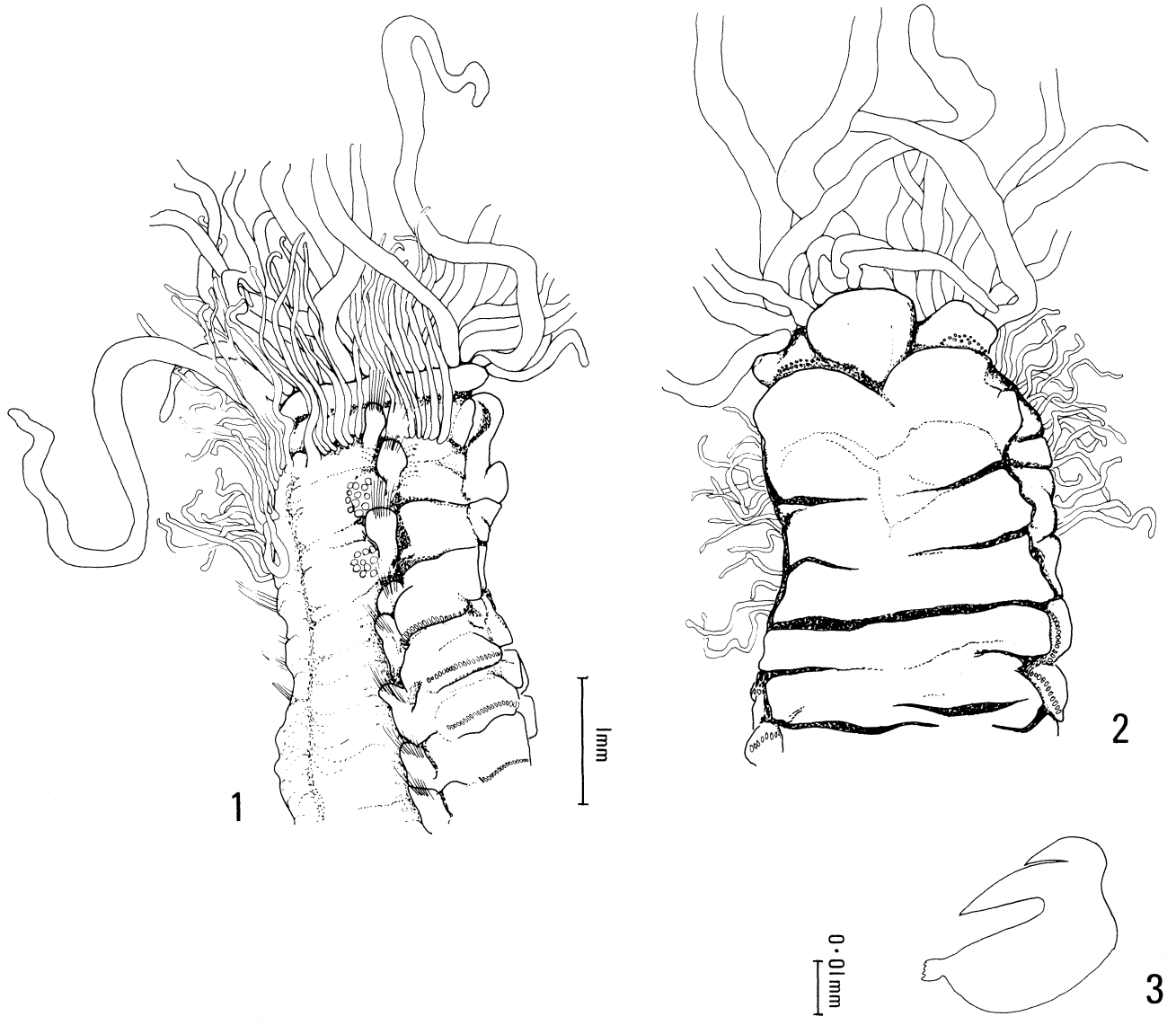

Fig. 27. *Streblosoma latitudinis* n.sp. (Holotype W.12446): *1.* anterior end, lateral view; *2.* anterior end, ventral view; *3.* uncinus, lateral view.

Calliope River in Queensland.

These species occur in estuarine seagrass beds, except for *S. atos* which occurs in mangroves. *Streblosoma latitudinis* can be distinguished from *S. acymatum* Hutchings & Rainer, 1979, and *S. atos* by the number and type of branchial filaments, and the shape of the uncini. Hutchings & Rainer (1979) discussed the genus *Streblosoma* and the features important at the species level. Similar features were used by Kritzler (1971) in his partial key to the species of *Streblosoma*. *Streblosoma latitudinis* can be separated from *S. chilensis* (McIntosh, 1885), *S. polybranchia* Verrill, 1900, *S. abranchiata* Day, 1963, *S. hesslei* Day, 1955, *S. bairdi* (Malmgren, 1866), *S. bairdi antarctica* Monro, 1936, *S. caespitosa* (Willey, 1905), *S. intestinale* Sars, 1872, *S. longiremis* Caullery, 1915, *S. magna* Treadwell, 1937, *S. persica* (Fauvel, 1908), *S. quadridentatum* Caullery, 1944, *S. spiralis* (Verrill, 1874), *S. verrilli* Treadwell, 1914, *S. longifilis* Rioja, 1962, *S. japonica* Hessle, 1917 and *S. hartmanae* Kritzler, 1971, and the new species of *Streblosoma* described in this paper from Australia, can be distinguished from all the above species by a combination of numbers and arrangement of branchial filaments, and the numbers of notosetae.

Etymology. The specific name refers to the lateral extension of the branchial filaments on segment 2, and is derived from latin.

Habitat. *Posidonia* seagrass beds.

Occurrence. Rare.

Australian distribution. New South Wales (Port Stephens).

Thelepus setosus (Quatrefages, 1865)

Thelepus setosus.—Day, 1967: 729-730, fig. 36.6A.—Knox & Cameron, 1971: 36.—*non* Hutchings & Recher, 1974: 105.

Material examined. *New South Wales:* Lake Merimbula, Stns 12, 16, several (W.11443, W.12700); Botany Bay, several (W.196197); Hawkesbury R., D2-3, 3(W.19336), D2-4 (W.196516). A selection of material examined.

Description. Lives in lightly chitinous tube with embedded sand grains. Compact prostomium, eye spots present. Lateral lobes absent. Segments 2, 3 and 4 with 12, 8 and 10 simple branchial filaments respectively on each side, with a distinct medial gap. Branchial filaments on segment 2 displaced laterally on either side. Smooth-tipped notosetae from segment 3 (2nd branchiferous), continuing for 26-30 segments. Neurosetae from setiger 3 to pygidium, uncini always arranged in single row. Uncini with dental formula MF:2-3:3; uncinial tori gradually becoming erect, and in abdomen forming discrete elongate rectangular tori. Broad glandular ventral pads in thorax coalesced to form a single glandular pad. Nephridial papillae absent.

Remarks. Specimens small, 12-20 mm, but often quoted in the literature as being much larger. First record from New South Wales, but widespread.

Habitat. In mud with much shell, at 7 m depth in salinity of 34.4‰.

Occurrence. Rare in Hawkesbury R., collected only in December, 1979 at Brooklyn; widespread in New South Wales estuaries, but found in low numbers.

Australian distribution. Western Australia, South Australia, New South Wales (Merimbula*, Botany Bay*, Port Hacking*, Port Jackson*, North Head*, Malabar*, Long Reef*, Hawkesbury R.*).

Amphitrite rubra (Risso, 1828)

Amphitrite rubra.—Fauvel, 1917: 265-267, fig. 27.—Hutchings, 1977: 16.

Material examined. *New South Wales:* Botany Bay, Nov. '72 (W.7493-4); Georges R., (W.7827, W.7829, W.7889, W.7891).

Remarks. Agrees well with the descriptions of Hutchings (1977), although some of the material has only 22 pairs of notosetae instead of 23 pairs. Material from the type locality should be examined to ascertain if this is really a cosmopolitan species.

This species has been recorded from Port Phillip Bay, Victoria, by Knox & Cameron (1971), but only some of the material identified by them was *A. rubra.* The majority was an undescribed species *Longicarpus glandulus* n.gen., n.sp., described in this paper.

Habitat. Amongst *Avicennia* mangroves, and in muddy estuarine sediments.

Occurrence. Rare.

Australian distribution. South Australia, Victoria, New South Wales (Sydney region), Queensland.

Eupolymnia nebulosa (Montagu, 1818)

Terebella nebulosa Montagu, 1818: 343, Pl.12, fig.1.
Eupolymnia nebulosa.—Day, 1967: 744, fig.36.9 f-h.—Knox & Cameron, 1971: 38.

Material examined. *New South Wales:* Lake Merimbula, Stn 11, 1(W.19246), MER 366 N-Z, several (W.17109); Malabar, Stn A1, 12-v-72, 3(W.6381); North Head, 19-ii-73, 1(W.6383).

Description. Colourless, complete gravid female with coelomic oocytes. Compact prostomium. Numerous eye spots. Three pairs of long-stalked, loosely branched gills on segments 2, 3, and 4. Notosetae from segment 4, smooth-tipped winged capillaries extending over 17 segments. Neurosetae from setiger 2, continuing to pygidium; uncini arranged in single rows initially, and in double rows from segment 11 (7th uncinigerous). Uncini arranged on prominent rectangular tori. Posterior margins of ventral pads fluted.

Remarks. Agrees well with the published descriptions yet one doubts the recorded distribution of this species. Material from the type locality must be examined and the species carefully described. Another species of this genus, *E. trigonostoma* (Schmarda, 1861), has been recorded from off the New South Wales coast by Schmarda. Hessle (1917) referred *E. congruens* (Marenzeller, 1884) to *E. trigonostoma* (Schmarda, 1861). *Eupolymnia congruens* and *E. nebulosa* appear to be separate species and can be distinguished by the dentition above the main fang of the uncini; *E. nebulosa* has one or two large teeth with few denticles above whereas *E. congruens* has a single main fang with 3 small teeth above. There are also differences in the development of the ventral pads. Material from the type locality of both species, together with material of *E. trigonostoma*, should be re-examined to confirm Hessle's synonymy, the validity of the differences between *E. congruens* and *E. nebulosa,* and that the latter species is really a valid cosmopolitan species.

Habitat. Muddy substrates, *Posidonia* seagrass beds.

Occurrence. Rare.

Australian distribution. South Australia, Victoria, New South Wales (Merimbula*, Malabar*, North Head*).

Hadrachaeta aspeta Hutchings, 1977

Hadrachaeta aspeta Hutchings, 1977: 17, fig. 8 a-d.

Material examined. *New South Wales:* Hawkesbury R., Spectacle I., Site 2, 1(W.195006), Brooklyn, Sites A-4, A-8, several (W.7898).

Remarks. Agrees well with the original description. Individuals small but complete.

Habitat. Intertidal mud flats, in front of *Avicennia* mangroves.

Occurrence. Rare.

Australian distribution. New South Wales

(Hawkesbury R*., Broken Bay), Queensland (Moreton Bay).

Longicarpus n.gen.

Type-species *Longicarpus glandulus* n.gen., n.sp.

Prostomium and peristomium not expanded or proboscis-shaped. Lateral lobes poorly developed. Twenty three pairs of notosetae, with serrated tips, from segment 4. Neurosetae from setiger 2; uncini arranged in double rows from setiger 7; anterior thoracic uncini with well-crested head, and long, well-chitinised shafts, shaft lost by mid-thoracic segments. Three pairs of branched branchiae on segments 2, 3, 4.

Longicarpus combines the possession of serrated-tipped notosetae with long-handled uncini in anterior thoracic segments, a combination not present in any other described genus of Terebellidae. Within the subfamily Amphitritinae, these two characteristics have been widely used to characterize genera. Several genera have serrated notosetae, but all the genera so far reported with long-handled uncini have smooth-tipped notosetae. The relationship of *Longicarpus* to existing genera is at the moment unclear, but within Australian waters other, currently undescribed, species occur belonging to this genus, or to closely related undescribed genera. Superficially the new genus *Longicarpus* resembles *Pista* but differs in the structure of the notosetae, and the poor development of lateral lobes which we believe are important generic characteristics. For these reasons *Longicarpus* is described as a new genus, with *L. glandulus* as the type species.

Etymology. The generic name refers to the long-handled uncini, is derived from the latin, *longi* and is masculine.

Longicarpus glandulus n.gen., n.sp.

Fig. 28.1-5

Amphitrite rubra.—Knox & Cameron, 1971: 36.—*non* Risso, 1828.

Material examined. *New South Wales:* HOLOTYPE: Port Jackson, (W.195332), 100 mm long, 5 mm wide anteriorly and 4 mm posteriorly. PARATYPES: Port Jackson, many (W.195333). *Victoria:* Port Phillip Bay Environmental Survey, Area 28, Stn 286, 9 (USNM 81485), several (AHF POLY 1407); Area 63, Stn 163, (BMNH ZB 1983. 1749); Area 17 Stn 170, 1 (NMVG 1718); Areas 59 Stn 36, several (NMVG 1719), Area 42 Stn 281, several (NMVG 1682); Area 27 Stn 138, 3 (NMVG 3429). Type material varies in length from 8-12 cm and 3-6 mm width.

Additional material. *New South Wales:* Lake Merimbula, 1(W.12703); Port Jackson, 4(W.195311); North Head, 1(W.6403). Numerous specimens are held in NMV and were originally identified as *Amphitrite rubra* by Knox & Cameron 1971; all this material came from Victoria, Port Phillip Bay Environmental Survey.

Description. Colour when preserved in alcohol, creamy white. Prostomium not expanded, numerous grooved buccal tentacles. Prostomial eye spots absent. Three pairs of branchiae on segments 2, 3 and 4; first pair displaced slightly dorsally, 2nd and 3rd pairs arranged laterally, one behind the other. Branchiae with thick main stem and numerous loosely branched filaments; all branchiae approximately equal in size (Fig. 28.1). Anterior segments glandular; lateral lobes poorly developed. Segment 2 with narrow ridge which is glandular, displaced laterally; on segment 3 hardly developed; segment 4 with very small lateral lobe, displaced dorsally.

Notosetae begin on segment 4 (3rd branchiferous) and continue for 23 segments. Notosetae arranged in 2 tiers, narrow-winged capillaries with finely-serrated tips (Fig. 28.5). Neurosetae from setiger 2 continuing to pygidium. Thoracic tori elongate, narrow and glandular, progressively becoming shorter and more erect posteriorly. Uncini in single rows from setiger 2, in double rows from setiger 7, arranged alternately. Uncini of 1st uncinigerous segment with well-crested heads; above main fang, 4-5 rows each with 8-10 teeth and long, well-chitinised shafts. Uncini from 6th uncinigerous segment similar (Fig. 28.2). By the 15th, shaft present only as a remnant, very well-crested head above main fang, 4-5 rows each with 6-8 teeth (Fig. 28.3). Abdominal uncini with a dental formula MF:5-6:7:6-8:α (Fig. 28.4). Pygidium a compact rosette. Ventral glandular pads forming a triangular shield extending to setiger 12, then continuing as a mid-ventral stripe.

Holotype a male, coelom full of spermatids. Gonopores present on segments 3 and 4.

Remarks. Paratype material closely resembles holotype. Four specimens from Port Jackson (W.195311) fit the description well except that they possess 24 pairs of notosetae instead of 23 pairs. It is not known how widespread this variation is. It also raises the problem of how useful the number of pairs of notosetae is as a generic character.

This new species is characterised by the dental formulae of the uncini, the type of branchiae, and the well developed diffused glandular areas on anterior segments, rather than the development of discrete glandular lateral lobes.

Etymology. The specific name refers to the glandular areas on the anterior segments.

Habitat. Protected bay situations; fully marine.

Occurrence. Locally abundant.

Australian distribution. Victoria (Port Phillip Bay), New South Wales (Lake Merimbula, Port Jackson).

Loimia medusa (Savigny, 1818)

Loimia medusa.—Augener, 1922b; 46-48; 1927: 253-254.—Day, 1967: 743, fig. 36.9 a-e.—Hutchings, 1977: 19.

Material examined. *New South Wales:* Jervis Bay Stn 162, 1(W.17516); Careel Bay, 4-viii-82, many (W.194081).

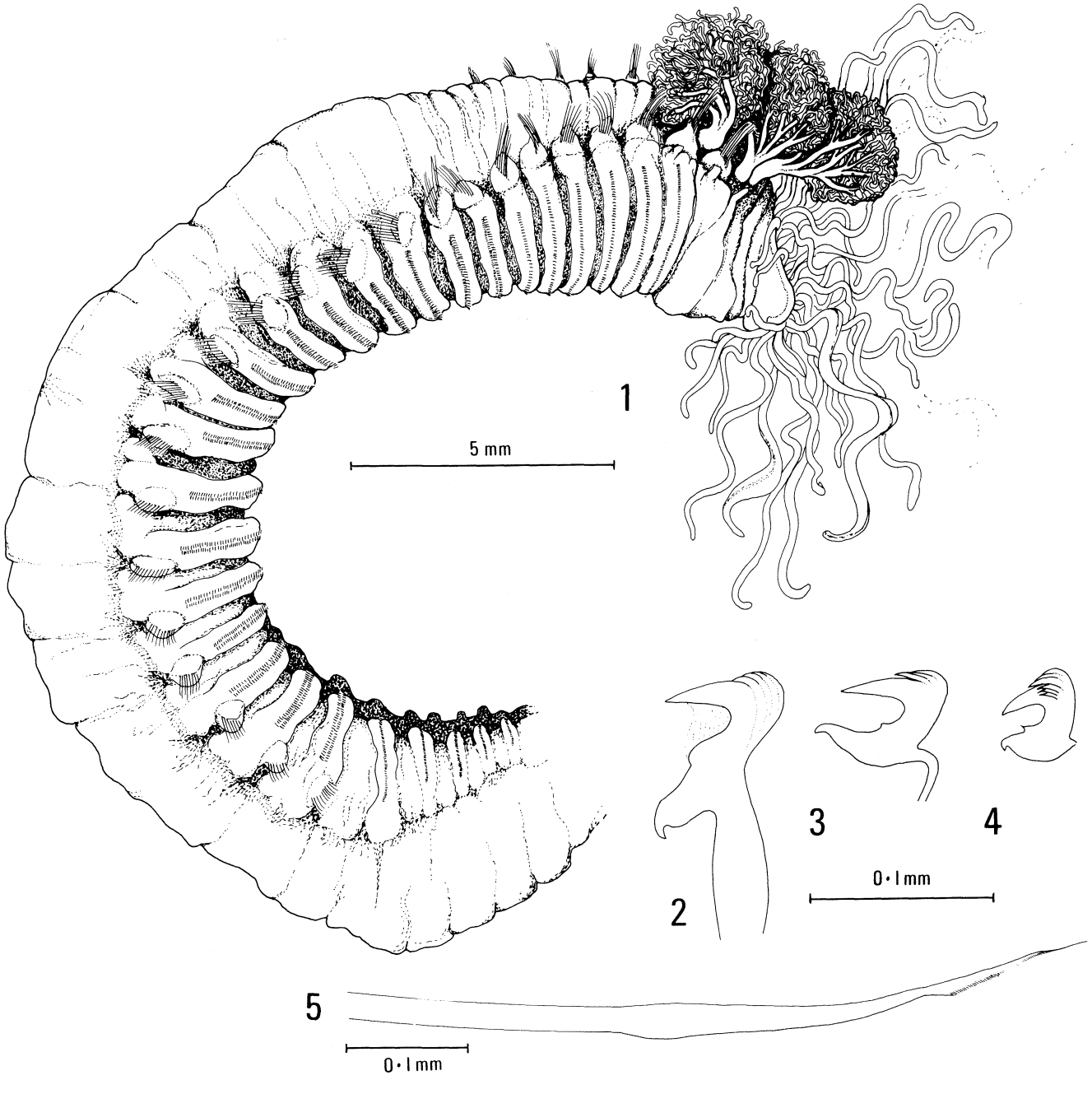

Fig. 28. *Longicarpus glandulus* n.gen., n.sp. (Paratype W.195333): *1.* anterior and middle regions, lateral view; *2.* anterior thoracic uncinus; *3.* posterior thoracic uncinus; *4.* abdominal uncinus; *5.* notoseta.

Remarks. Agrees closely with the above descriptions. All specimens found in rigid, U-shaped tube, heavily ornamented with shell fragments, often with multiple openings. A dense local population was found in August, 1982 amongst the *Zostera* seagrass beds at Careel Bay. Regular sampling had been carried out in this area during the early-mid 70's, and the species was never recorded. All individuals collected in August were of similar size, about 20–25 cm in length, suggesting one successful recruitment. Animals swam vigorously when released from their tubes, using their strongly muscular bodies, and complete septa.

Habitat. *Zostera* and *Posidonia* seagrass beds.

Occurrence. Uncommon.

Australian distribution. Western Australia (Port Hedland), New South Wales (Jervis Bay*, Port Jackson, Careel Bay*), Queensland (Moreton Bay).

Nicolea amnis n.sp.

Fig. 29.1–3

Material examined. *New South Wales:* HOLOTYPE: Botany Bay, 8-ii-78 (W.196218), 12 mm long, 1.5 mm wide

at anterior end. PARATYPES: Jervis Bay (BMNH ZB 1983. 1750-52), 10 mm long, 1.3 mm wide; Botany Bay (AHF POLY 1408), 6 mm long, 1 mm wide; Botany Bay (USNM 81486), 7 mm long, 1 mm wide; (W.196837). Many specimens gravid.

Additional material. Jervis Bay, Murray's Bch, (W.17550) gravid (W.17548, 194550); Botany Bay, Towra Pt, (W.10024), Silver Bch, Kurnell, 29-vi-81, 1(W.194918); Port Stephens (W.12435, W.12477, W.12624, W.12977); Broughton I., (W.13073).

Description. Colourless except for prominent blood vessels along the buccal tentacles and branchiae. Prostomium not expanded, with several rows of scattered eye spots. Two pairs of loosely dichotomously branched branchiae on segments 2 and 3, each branchiae with only 2–3 branches. Lateral lobes absent. Sixteen pairs of notosetae from segment 4, (Fig. 29.1). Notosetae narrow-winged broad-bladed capillaries, within a bundle; setae of 2 lengths (Fig. 29.2). Uncini from segment 5, initially arranged in single rows; in double rows from segment 12 (unciniger 7), arranged face to face (Fig. 29.1). Uncini with a dental formula MF:2:6–8, in posterior thorax (Fig. 29.3). The length of uncinial tori markedly reduced once the notosetae terminate; uncini continue to pygidium. Pygidium forms a rosette. Ventral pads forming a white glandular V-shaped structure which ends posteriorly on setiger 12. Thoracic uncinial tori glandular and markedly raised, becoming progressively more prominent posteriorly along the body. Anterior abdominal segments almost bell-shaped, far posterior ones very compacted. Holotype with only 10 abdominal segments.

Remarks. Many species of *Nicolea* have been described. Hartman (1959, 1965) recognised 20 valid species and no additional species have been described since then. The genus *Nicolea* is apparently a very conservative genus and the types of features which have been used to split the genus are the dentition of the uncini and the type of branching of the branchiae. The number of segments with notosetae varies between 15–40, although the majority have 17 pairs. Many of the descriptions of *Nicolea* are inadequate and many species have not been recorded since the original description. A complete revision of the genus is urgently needed. The only species of *Nicolea* recorded from Australia is *N. bilobata* (Grube, 1878) by Augener, 1914 from Western Australia. *Nicolea amnis* can be distinguished from *N. bilobata* by having only 16 pairs of notosetae instead of 17 and by the dental formula, MF:2:6–8 in *N. amnis*, and MF:4–5:2–1 in *N. bilobata*.

Once the generic revision has been carried out, it may be that *N. amnis* will be found to be a synonym of a

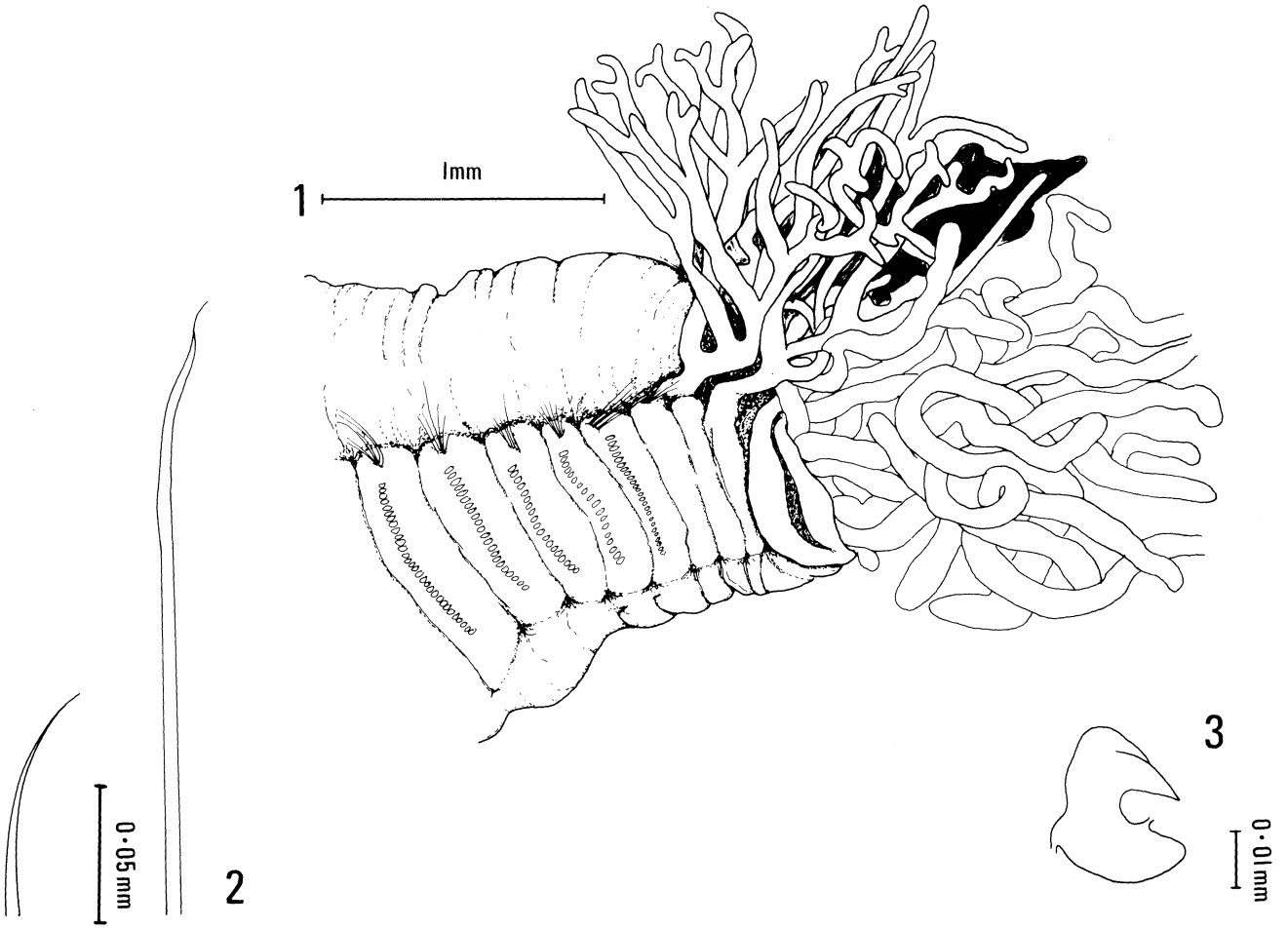

Fig. 29. *Nicolea amnis* n.sp. (Holotype W.196218): *1.* anterior end, lateral view; *2.* notoseta (2 lengths); *3.* uncinus.

previously described species, but at this stage we have decided to describe this species as new.

A specimen collected in Botany Bay (W.194918) in June was gravid and measured 10 mm in length, indicating that this species matures at a small size.

Etymology. The specific name refers to the estuarine habitat of the species and is derived from the latin word *amnis*.

Habitat. Associated with clumps of ascidians, mussels or small solid structures in soft bottom deposits, 10–20 m; also occurs in *Posidonia* seagrass beds.

Occurrence. Widely distributed in New South Wales estuarine areas.

Australian distribution. New South Wales (Jervis Bay, Botany Bay, Port Stephens, Broughton I.).

Pista pectinata Hutchings, 1977

Pista pectinata Hutchings, 1977: 19–20, fig. 9 a–g.

Material examined. *New South Wales:* Hawkesbury R. D2-3, 1(W.19337).

Remarks. Agrees well with the type description. Discrete glandular patches occur dorsally to the notopodia. First record from New South Wales.

Habitat. In sandy mud with much shell, at 5 m depth, in salinity of 33.8‰.

Occurrence. Single individual collected in May, 1980 at Brooklyn D2.

Australian distribution. New South Wales (Hawkesbury R.*), Queensland (Moreton Bay).

Pista trunca Hutchings, 1977

Pista trunca Hutchings, 1977: 20–21, fig. 10 a–f.

Material examined. *New South Wales:* Lake Merimbula, 1(W.11778); Port Hacking, Maianbar, 1(W.11004); Hawkesbury R., D2-3, 1(W.19338, W.196458), D2-4, 2(W.19339), D2-2, 1(W.196457).

Remarks. Agrees well with the original description, except that notosetae of the first three setigers are displaced slightly ventrally. First records from New South Wales.

Habitat. In muddy, shelly sediment at 7 m depth, in salinity of 34.4‰; found in *Posidonia* seagrass beds in Port Hacking.

Occurrence. Rare; found only in December and August 1979 at Brooklyn D2.

Australian distribution. New South Wales (Lake Merimbula*, Port Hacking*, Hawkesbury R.*), Queensland (Moreton Bay).

Pista typha Grube, 1878

Pista typha.—Hutchings, 1977: 22–23, fig. 12 a–b.—Hutchings & Rainer, 1979: 789–790.

Material examined. *New South Wales:* Lake Merimbula, Site 12, 2(W.11436), MER 301V, 1(W.11776), Jervis Bay, Murray's Bch, Stn 20, 1(W.194505); Botany Bay, Stn 891, 5(W.18718), Towra Pt, 1(W.195039); Hawkesbury R., D3-1, 1(W.19340), Cowan Waters, Waratah Bay, 15′ grab (W.19341). A selection of material examined.

Remarks. Agrees well with Hutchings (1977) description, except that notosetae of first 3 setigers are displaced slightly dorsally. This has not been observed before, probably because of the small individuals examined in this study (all < 18 mm in length). Nephridiopores were not apparent in Hawkesbury R. material which did not contain any coelomic gametes, suggesting that their development is a function of sexual maturity and must be used with caution when separating species. The two specimens from Cowan in October 1980 were less than 3 mm in length, and probably only just recently settled. Their gills had relatively few widely spaced tiers of filaments, each with very few branches, and their ventral pads were not yet differentiated.

Habitat. In Hawkesbury R., muddy, shelly sediment at 4 m depth in 34‰ salinity; in Waratah Bay, Cowan Waters, found in mud at 5 m in 35‰ salinity; in other locations found in sandy mud sediments, *Posidonia* and *Zostera* seagrass beds.

Occurrence. Rare; in Hawkesbury R., only collected in May 1980, and in Cowan, newly settled individuals in October 1980; widespread in other New South Wales estuaries.

Australian distribution. Victoria (Port Phillip Bay), New South Wales (Eden, Merimbula, Jervis Bay*, Port Hacking*, Botany Bay*, Careel Bay, Hawkesbury R.*, Port Stephens*), Queensland (Moreton Bay).

Terebella pappus n.sp.

Fig. 30.1-2

Material examined. HOLOTYPE: (W.196195), 20 mm long, 3 mm wide, gravid. PARATYPES: (USNM 81489), 20 mm long, 2.5 mm wide; (AHF POLY 1410), 12 mm long, 2.5 mm wide; (BMNH ZB 1983.1753), 18 mm long, 3 mm wide; 17(W.196196). All material complete, from New South Wales, Merimbula. Stn 385 M-U, 17-iii-76.

Description. Compact prostomium, with a few eye spots. Three pairs of dichotomously branched branchiae on segments 2, 3 and 4, all about the same size. Notosetae from segment 4 continue almost to pygidium, all capillaries. Capillaries of two lengths and types including long, narrow-winged capillaries with distal portion finely serrated, setae not spiralled, a fine boss or slightly greater development of basal tooth occurs at the base of serrations; shorter capillaries with smooth tips. Neurosetae from segment 5, setiger 2, to pygidium; arranged initially in single rows; from uncinigerous segment 7 in double rows face to face (Fig. 30.1). Uncini small with no pronounced terminal button, and a dental formula MF:5:3–4:α. Length of uncinial tori increasing along thorax.

Lateral lobes absent. Ventral pads forming narrow ventral strip (Fig. 30.2), with segmentation obscure,

Key to the Species of Trichobranchidae

1. Large conical proboscis present; 3 pairs of filamentous branchiae on segments 2–4 .... *Artacamella dibranchiata*

— Proboscis absent 2

2. A single branchial trunk with 4 lobes, each lobe with numerous flat branchial lamellae; 18 thoracic setigers ..... *Terebellides stroemii*

— Two pairs of branchiae, each pair consisting of 2 long simple filaments; 15 thoracic setigers ... . *Trichobranchus* sp.

Artacamella dibranchiata Knox & Cameron, 1971

Artacamella dibranchiata Knox & Cameron, 1971: 36–38, figs 32–35.—Hutchings, 1977: 24, fig. 13 a–c.

Material examined. *New South Wales:* Port Stephens, Shoal Bay Stns 9, 12, 14, several (W.12924, W.19251, W.12973).

Remarks. Agrees well with Knox & Cameron (1971), except for some specimens which have 3 pairs of branchiae, instead of 2 pairs. The material is in poor condition so we have decided to refer it all to *A. dibranchiata* however specimens with only 2 pairs of branchiae may represent an undescribed species. First record for New South Wales.

Habitat. Seagrass beds.

Occurrence. Rare.

Australian distribution. Victoria (Port Phillip Bay), New South Wales (Port Stephens*), Queensland (Moreton Bay).

Terebellides stroemii Sars, 1835

Terebellides stroemii.—Day, 1967: 713, fig. 36.1 f-j.—Hutchings, 1977: 25.

Material examined. *New South Wales:* Hawkesbury R., 1-1-1, 1-1-2, 1-1-3, 1-1-4, 1-2-1, 1-2-2, 1-2-3, 1-2-4, 1-3-2, 2-1-1, 2-1-2, 2-1-3, 2-1-4, 2-2-1, 2-2-2, 2-2-3, 2-2-4, 2-3-1, 2-3-2, 3-1-1-, 3-1-2, 3-1-3, 3-1-4, 3-3-1, 3-3-2, 3-3-3, 3-3-4, 4-1-2, 4-1-3, 4-1-4, 5-2-2, many (W.196122-42, W.196147-91, W.196202); Botany Bay, Stn 81, 86, 100, several (W.13978-80), Stns 891, 908, several (W.18719, W.18774).

Remarks. This species is widely quoted as a cosmopolitan species. Williams (1979) in an extensive study has recently suggested that several species are represented within the complex. Within the limited east Australian material she examined, she recognised 3 forms, being described by Williams (in press). More material from Australia is needed to carefully define the species characteristics and their distribution patterns.

Habitat. Found in soft to sandy mud, in salinities of 30.4–35‰.

Occurrence. Abundant; collected in Hawkesbury R., in large numbers from Transects 1,2,3 and at Brooklyn in all seasons; widespread in most New South Wales estuaries.

Australian distribution. Victoria, New South Wales, Queensland.

Trichobranchus sp.

Material examined. *Tasmania:* Huon R. Stns, 24, 25, 28, Feb. '76 (W.11086-88). *New South Wales:* Port Stephens, Shoal Bay, Stn 3, 1(W.12985).

Description. Expanded tentacular lobe, with a frilly margin. Two pairs of branchiae, each pair consisting of 2 long, simple branchial filaments. Notosetae on 15 segments, starting from segment 6; long-shafted neurosetae from same segment. Notosetae smooth-tipped, winged capillaries. Abdominal uncini avicular.

Remarks. Material in poor condition. May represent an undescribed species, *Trichobranchus glacialis*, a widely distributed species, has 3 pairs of branchiae. No species of the genus has been reported from Australia before.

Habitat. *Posidonia* seagrass beds.

Occurrence. Rare.

Family SABELLIDAE Malmgren

Prostomium reduced, fused with the peristomium which forms a large tentacular crown. Body cylindrical with a thorax of few setigers and abdomen with few to many. Notopodia with capillary and/or spatulate setae; neuropodia with uncini, either crested or with teeth arranged in several rows. Setal positions reversed on the abdomen. Tube present in most species, made of varying materials but never calcareous.

Key to the Species of Sabellidae

1. Thoracic uncini with long, gently curved shafts (acicular); companion setae always present .. .. (Fabricinae) 2

— Thoracic uncini with short or long, but always strongly bent shafts (avicular); companion setae present in some forms ..... (Sabellinae) 4

2. Posterior end modified, last several setigers flanged laterally to form a spoon-shaped dorsal cavity ..... *Euchone variabilis* n.sp.

— Posterior end not modified 3

3. Three pairs of completely free radioles .... *Desdemona aniara* n.sp.

— Eight pairs of completely free radioles .... *Jasmineira* sp.

4. Thoracic spatulate setae absent ....*Branchiomma nigromaculata*

— Spatulate thoracic notosetae present .... *Laonome triangularis* n.sp.

continuing as narrow glandular stripe along mid-ventrum to pygidium. Pygidium a circular valve with slight undulations on inside margin. Nephridial papilla on 1st branchiferous segment. Holotype a gravid female.

Remarks. Typically all three pairs of branchiae are similar in size, but in one of the Australian paratypes, one of the 3 pairs of gills is much smaller than others, suggesting regeneration. Many species of *Terebella* have been described, including four from Australia. However, the majority of *Terebella* species are poorly known and the characters used, to differentiate species, confused. All the species in the genus need to be examined, especially the type material, where available, and the species redescribed. Until this is done, we feel that it is better to describe the *Terebella* from Merimbula as a new species, *T. pappus* .

At least two other species of *Terebella* occur in New South Wales estuaries; both are probably undescribed but the material is in too poor condition to even give a basic description.

Etymology. The specific name *pappus* refers to the presence of notosetae almost to the pygidium, and is the latin word for bristle.

Habitat. Intertidal sandy mud flats.

Occurrence. Locally abundant.

Australian distribution. New South Wales (Merimbula).

Family TRICHOBRANCHIDAE Malmgren

Body separated into two regions; anterior region with biramous parapodia, posterior region with neuropodia only. Prostomium expanded as a large hood over mouth. Up to four pairs of branchiae present on anterior segments. Notosetae all capillaries. Anterior neuropodia with long-shafted hooks; subsequent neuropodia with densely crested avicular uncini.

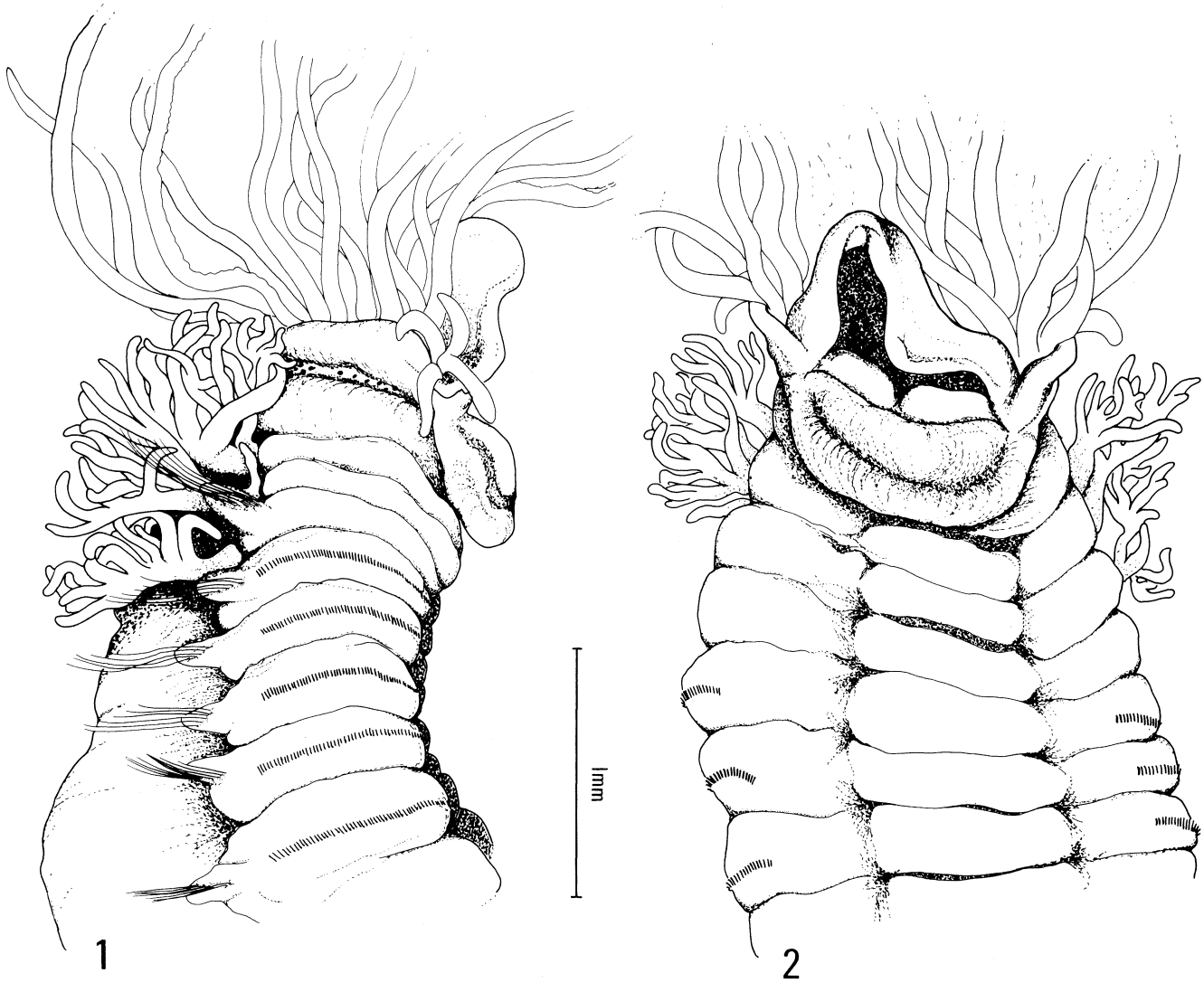

Fig. 30. *Terebella pappus* n.sp. (Paratype W.196196): *1.* anterior end, lateral view; *2.* anterior end, ventral view.

Branchiomma nigromaculata (Baird, 1865)

Dasychone cingulata.—Augener, 1914: 122-128.
Branchiomma nigromaculata.—Hutchings & Rainer, 1979: 790-791.

Material examined. *New South Wales:* Lake Merimbula, sample 4, 1(W.11281); Jervis Bay, Murray's Bch, Stns 18, 45, 56, 177, 178, many (W.17450-54); Botany Bay, Towra Pt, 1(W.195055); Hawkesbury R., D2-2, many (W.196364-5), D2-3, several (W.196366-7), D2-4, 1(W.196368); Port Stephens, Shoal Bay Stns 12, 10, (W.12969).

Remarks. Agrees well with Hutchings & Rainer's (1979) description.

Habitat. Found in Hawkesbury R., in mud to sandy mud with much shell, in salinities of 33.8–35.2‰; in sandy mud and *Posidonia* seagrass beds.

Occurrence. Common at Brooklyn during most seasons at D2; widespread in most New South Wales estuaries throughout year.

Australian distribution. Western Australia, Victoria New South Wales.

Desdemona aniara n.sp.

Fig. 31.1-4

Material examined. *New South Wales:* HOLOTYPE: 9-1-3, 14-ii-79 (W.196856), 2 mm long, 0.3 mm wide. PARATYPES: 9-1-3, 14-ii-79, 18 (USNM 81478); 9-1-2, 8-xi-78, 7 (AHF POLY 1406); 9-1-3, 25-v-78, 7 (BMNH ZB 1983. 1754-61). All material from Hawkesbury R.

Additional material. 8-1-1 (W.196857), 9-1-1 (W.196858-9), 9-1-2 (W.196860-1), 9-1-3 (W.196862-3), 9-1-4 (W.196864-6).

Description. Small, colourless, transparent worm with body contents showing through; palps orange-pigmented. Three pairs of completely free radioli, radiolar backs rounded. Each radiole with about 8–10 lateral pinnae, about ½ length of radiole; smooth-tipped pinnae coming off along one axis. Two pairs of short stout palps about one-fifth length of branchial crown. Pair of prostomial eye spots. Collar divided dorsally and united ventrally. Thorax of 8 segments and abdomen of 9 segments (Fig. 31.1). Thorax with narrow-winged capillaries with long smooth tips (Fig. 31.2), and long-shafted uncini with well-crested heads (Fig. 31.3); exact dental formula not ascertained. Abdomen with setal types reversed; capillary setae and short-handled avicular uncini with 5-6 rows of teeth, each row containing 4-5 teeth (Fig. 31.4). Capillary setae longer in abdomen than in thorax. Number of setae per fascicle small (Table 2). Pygidium bluntly pointed. Animal lives in sandy membranous tube.

Table 2. Number of setae per fascicle for *Desdemona aniara* n.sp.

Thoracic Setiger	Capillaries	Uncini	Abdominal Setiger	Capillaries	Uncini
1	4	3	1	1	10
2	5	3	2	2	9
3	5	3	3	2	10
4	5	3	4	2	10
5	4	3	5	2	12
6	5	3	6	2	10
7	3	2	7	2	10
8	3	2	8	2	9
			9	1	6

Remarks. The material is small and fragile. Some of the additional material examined appears to have only 2 pairs of branchial radioles, suggesting that regeneration is possible. However, it is not possible to detect any stumps of branchial radioles.

The genus *Desdemona* was erected by Banse (1957) and only 2 species have so far been described in the genus, *D. ornata* Banse, 1957 and *D. trilobata* Banse,

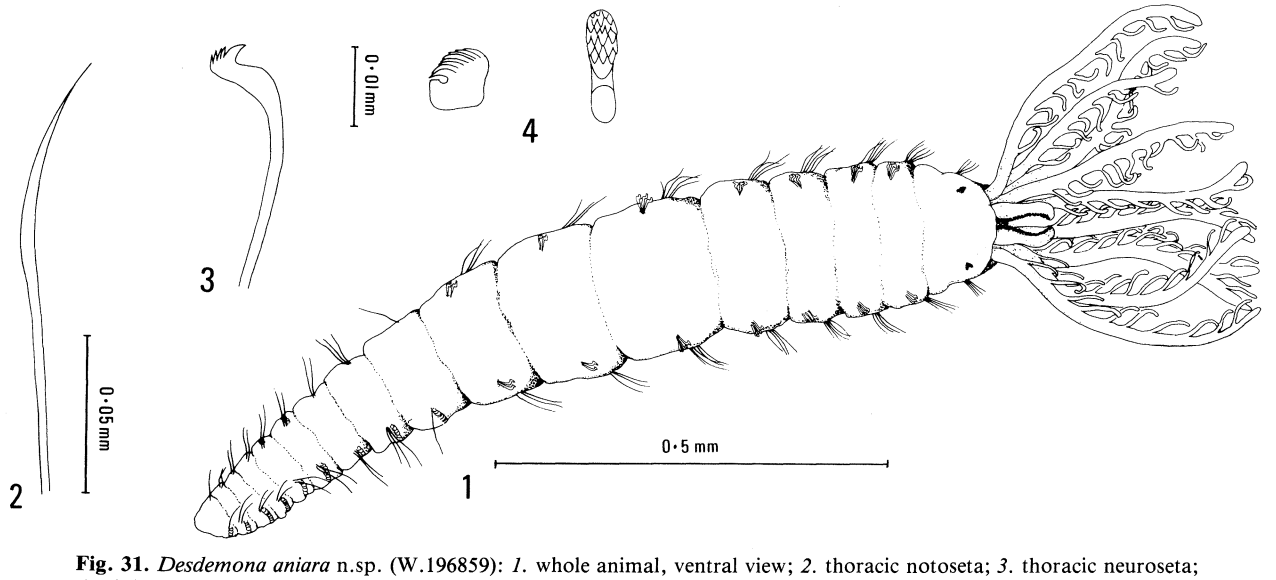

Fig. 31. *Desdemona aniara* n.sp. (W.196859): *1.* whole animal, ventral view; *2.* thoracic notoseta; *3.* thoracic neuroseta; *4.* abdominal uncinus, dorsal and lateral views.

1957. *Desdemona aniara* can be distinguished from *D. ornata* by the greater number of branchial pinnae and thoracic capillary setae present in *D. aniara*. *Desdemona ornata* has also very discrete pigment bands at the base of the radioles; these are absent in *D. aniara*. *Desdemona trilobata* is characterised by a flattened plate-like pygidium whereas *D. aniara* has a simple conical pygidium. Subsequently, *D. trilobata* was placed in the genus *Euchone* by Banse in 1970.

Etymology. The specific name *aniara* refers to the difficulty in identifying these small worms and in describing their morphology.

Habitat. Found in a compact clay-mud sediment at a depth of 20 m, and in salinities of 1–26‰.

Occurrence. Frequently found; in spring and summer months in greater numbers than in autumn and winter of almost every year since 1977.

Australian distribution. New South Wales (Hawkesbury R.).

Euchone variabilis n.sp.

Fig. 32.1–4

Material examined. *New South Wales:* HOLOTYPE: Botany Bay, Stn 895, 10-viii-76 (W.196901), 7 mm long, 1 mm wide. PARATYPES: Botany Bay, Stn 895, 10-viii-76 (AHF POLY 1431), 6 mm long, 1 mm wide; Stn 756, 13-ii-75, 2(BMNH ZB 1983.1762-63), 7 mm long, 1 mm wide, 10 mm long, 1 mm wide; Stn 756, 13-ii-75, 4(USNM 81479), 2 complete individuals with branchial crowns, 5 mm long, 0.8 mm wide, 4 mm long, 0.8 mm wide and 2 individuals lacking branchial crowns, 3 mm long, 1.2 mm wide, 5 mm

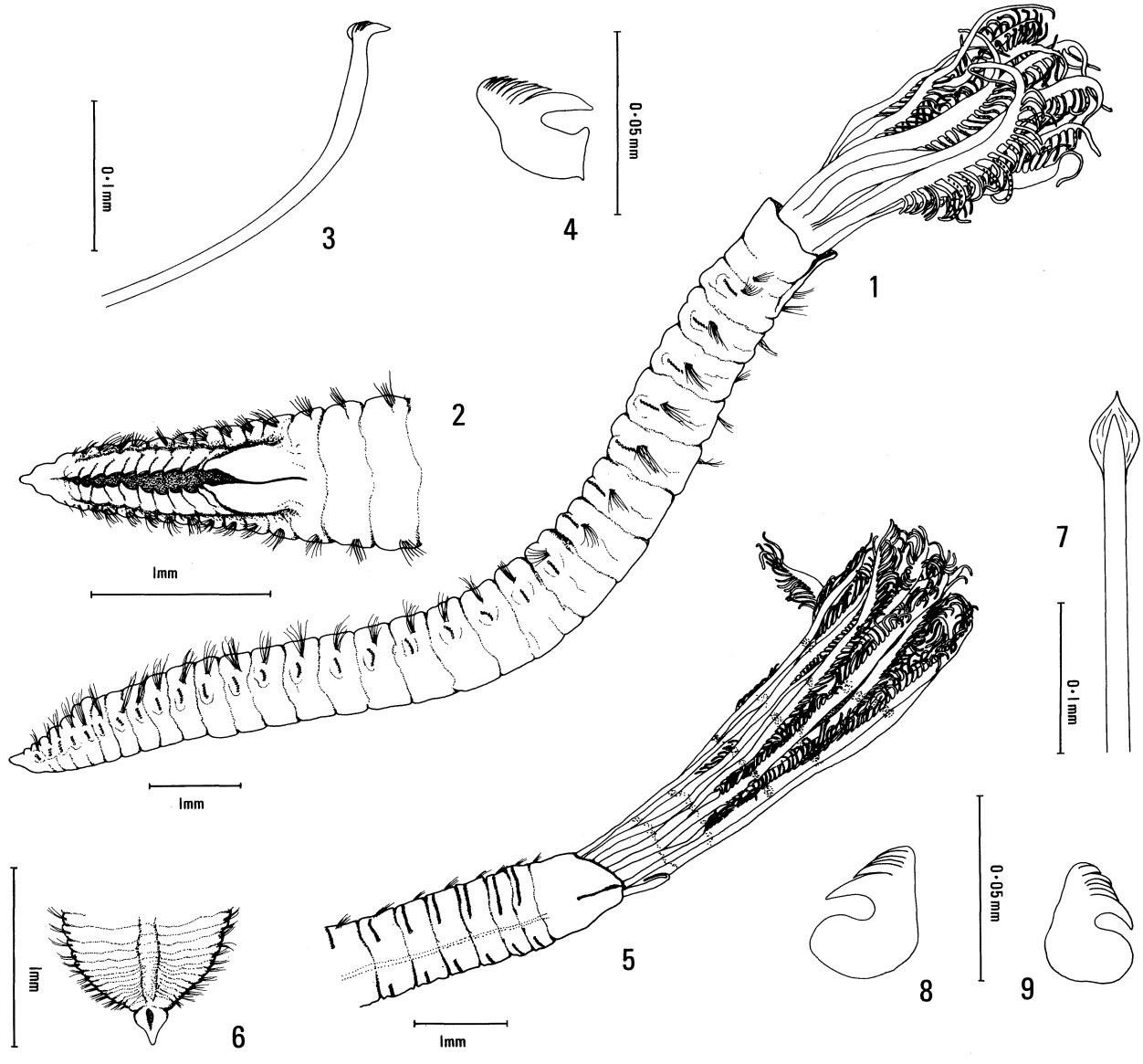

Fig. 32. *Euchone variabilis* n.sp. (Holotype W.196901): *1.* whole animal, lateral view; *2.* posterior end, ventral view; *3.* thoracic uncinus; *4.* abdominal uncinus. *Laonome triangularis* n.sp. (Holotype W.196892): *5.* anterior end, ventral view; *6.* posterior end, ventral view; *7.* thoracic spatulate notoseta; *8.* thoracic uncinus; *9.* abdominal uncinus.

long, 1.0 mm wide; Stn 757, 14-iv-75, 7(W.196902), all complete with crowns varying from 4–6 mm long and 0.8–1.0 mm wide.

Additional material. *New South Wales:* Botany Bay, Stn 865, (W.19025), Stn 868 (W.18980), Stn 891 (W.18722), Stn 892 (W.18733); Stockton Bch (W.8866-7).

Description. Preserved animal pale yellow with a narrow white glandular stripe running along ventrum of thorax. Branchial crown with scattered pigment granules, and with discrete patches of eye spots on some of the pinnules. Branchial crown with 12 radioles, one considerably smaller than the others; base of radioles connected by thin webbing extending up about ¼ length of radiole. Each radiole with about 20 pinnules coming off along one axis; pinnules variable in length. Tip of each radiole extended to form a long narrow flag. Base of branchial crown encased in a well-developed collar, which is complete ventrally and split dorsally. Margins of collar thin and slightly fluted. Thorax of 8 setigers; 1st setiger with capillary setae only (Fig. 32.1). Abdomen of 13 setigers prior to the anal plate, and 7 setigers make up the anal plate. Setae reverse at the junction of the thorax and abdomen. Anal plate flattened with convoluted segmented margins with a dorsal anterior narrow fluted extension (Fig. 32.2). Beyond anal plate an elongated asetigerous blunt projection.

Each thoracic setiger with about 10 broad-bladed capillaries and 11 long-handled heavily crested uncini (Fig. 32.3). Each abdominal setiger with 3–4 slightly longer narrow-bladed capillaries, and 16–17 short-handled avicular uncini with strongly crested head made up of 5 rows of teeth, each with 7–8 teeth (Fig. 32.4). All uncini within a row similar.

Remarks. Considerable variation is exhibited within the paratype material, even though all the material was collected from a small area of Botany Bay over a restricted period. The development of the branchial eye spots varies within the paratypes, (AHF POLY 1431) lacking them completely. Some individuals have only 11 branchial radioles instead of 12 as found in the holotype. One of the AM paratypes has uncini on one side of setiger 1, all other specimens completely lack uncini on setiger 1. However the greatest variation is found in the number of setigers making up the abdomen, including the anal plate. Although it is difficult to ascertain exactly where the anal plate begins because of its anterior narrow extension, the variation encountered is considerable, and shown in detail in Table 3. The number of setigers present before the anal plate varies between 12–17 and the numbers forming the anal plate varies between 7–15. There is no clear relationship between the total numbers of abdominal setigers and the size of the individuals. Obviously far more material needs to be examined in order to clarify this problem.

Banse (1970) reviewed many of the species of *Euchone,* and described and characterised many of the species by a fixed number of abdominal setigers. In many cases Banse examined few individuals of a species, and perhaps if a large amount of material was available for examination the pattern observed in *Euchone variabilis* would be found to be more widespread than is currently believed. The majority of species of *Euchone* described have less than 10 abdominal setigers prior to the anal plate; these species are: *E. arenae* Hartman, 1966b, *E. hancocki* Banse, 1970, *E. incolor* Hartman, 1965, *E. limnicola* Reish, 1960, *E. southerni southerni* Banse, 1970, *E. southerni incisa* Banse, 1970 and *E. trilobata* (Banse, 1957). *Euchone rosea* Langerhans,

Table 3. The number and types of setigers present within *Euchone variabilis* n.sp.

	*Length (mm)	Width (mm)	Nos. of thoracic setigers	Nos. of abdominal setigers prior to anal plate	Nos. of abdominal setigers forming anal plate	Total nos. of abdominal setigers
HOLOTYPE	7	1.0	8	13	7	20
AHF PARATYPE	6	1.0	8	13	10	23
BMNH PARATYPE	7	1.0	8	17	9	26
BMNH PARATYPE	10	1.0	8	17	10	27
USNM PARATYPE	5	0.8	8	14	8	22
USNM PARATYPE	4	0.8	8	13	9	22
USNM PARATYPE	9 (no crown)	1.2	8	17	14	31
USNM PARATYPE	5 (no crown)	1.0	8	17	11	28
AM PARATYPE	4	1.0	8	12	15	27
AM PARATYPE	4	1.0	8	16	14	30
AM PARATYPE	5	1.0	8	16	12	28
AM PARATYPE	6	1.1	8	17	12	29
AM PARATYPE	5	1.1	8	17	14	31
AM PARATYPE	6	1.0	8	17	13	30
AM PARATYPE	6	1.0	8	17	11	28

*Length includes branchial crown except where indicated.

1884 has 10–12 anterior abdominal setigers, with 8 pairs of radioles, which is at least 2 pairs less than *E. variabilis*.

Etymology. The specific name *variabilis* refers to the variation in number of abdominal setigers observed within the type material.

Habitat. Subtidal sand, or sand-shell substrates.

Occurrence. Restricted to a small area of Botany Bay, and Stockton Beach, off Newcastle.

Australian distribution. New South Wales (Botany Bay, Stockton Bch).

Jasminiera sp.

Material examined. *New South Wales:* Hawkesbury R. 1-1-3, 2(W.196628).

Description. One complete individual and an anterior fragment. Body colourless except for faint brown stripes of pigment on ventrum. Branchial crown with 8 pairs of branchioles; webbing completely absent. Each branchiole with numerous pinnules coming off along one axis. Pair of narrow long palps. Collar well-developed, complete ventrally but divided dorsally with the two lobes overlapping. Thorax of 8 setigers and abdomen of 16 setigers, with two asetigerous segments prior to the pygidium. Setiger 1 with notosetae only. Thoracic notosetae include capillaries and hastate setae. Thoracic uncini gently curved, long-handled hooks with strongly-crested heads. Setae reverse at junction of thorax and abdomen. Abdominal setae include capillaries and short-handled avicular uncini with strongly-crested heads. Pygidium a simple cone.

Remarks. This may represent an undescribed species, belong to a genus not previously recorded in Australia. However, we have insufficient material to positively identify the species.

Habitat. Mud, 4 m depth, marine salinities.

Occurrence. Rare; two specimens collected in November, 1980.

Laonome triangularis n.sp.

Fig. 32.5–9

Material examined. HOLOTYPE: (W.196892), 15 mm long, 1.5 mm wide, ~58 setigers. PARATYPES: 2(USNM 81480), 17 mm long, 1.0 mm wide, ~60 setigers, 15 mm long, 1.0 mm wide, ~55 setigers; 2(BMNH ZB 1983.1764-65), 13 mm long, 0.8 mm wide, ~40 setigers, 12 mm long, 0.8 mm wide, ~45 setigers; 2(AHF POLY 1409), 12 mm long, 0.9 mm wide, ~50 setigers, 22 mm long, 1.2 mm wide, ~55 setigers; 90(W.196893), varying in length from 3–17 mm. All lengths include branchial crowns. All type material from New South Wales, Hawkesbury R., D2-3, 18-xii-79.

Additional material. *New South Wales:* Hawkesbury R., D1-1, various dates, many (W.196921-4).

Description. Colourless except for darkly pigmented eye spots on the branchial crown. Eight pairs of radioles, each radiole with a large number of blunt, short pinnules coming off along one axis; tip of radiole extends to form a long narrow filament. Along each radiole 2–3 discrete patches of pigment. A pair of unequal-sized palps. Radioles completely free. Collar well-developed ventrally, forming an anteriorly projecting, bluntly triangular lobe, partially divided (Fig. 32.5); collar incomplete dorsally. Thin, white glandular stripe occurs mid-ventrally extending entire length of body. Posterior abdominal segments dorsoventrally flattened. Pygidium a tripartite lobe (Fig. 32.6). Thorax of 8 setigers, 1st with capillaries only; setae reverse in orientation at junction of thorax and abdomen. Thoracic setigers with 4–5 broad-bladed, narrow-winged capillaries, 6–8 bluntly-pointed, spatulate setae (Fig. 32.7) and about 20 short-handled avicular uncini. Uncini with large main fang and about 6 rows of teeth above main fang. It appears that each row has only a single tooth; an alternative interpretation is that 2 teeth are present, but even under oil immersion it is unclear (Fig. 32.8). Abdominal setigers contain 4–5 long capillaries, broad-bladed and narrow-winged, almost pennoned, longer than thoracic capillaries, and 10–15 short-handled avicular uncini. Uncini with following dental formulae: MF:2:2:3; MF:2:2:2; MF:2:2:1, all occurring within a row (Fig. 32.9).

Remarks. The amount and intensity of branchial pigmentation varies considerably within the type material.

Laonome triangularis can be distinguished from *L. elegans* Gravier, 1906, *L. indica* Southern, 1921 and *L. tridentata* Moore & Bush, 1904, by the numbers of pairs of branchioles; *L. triangularis*, has 8 pairs (16 branchioles) whereas *L. elegans* has 13 branchioles, and *L. tridentata* has 15. The only other species reported that has 8 pairs of branchioles is *L. kroyeri* Malmgren, 1866; *L. triangularis* can be differentiated on the shape of the ventral collar; in *L. kroyeri* the collar is thick and glandular and ventrally lacks the triangular lobes which are present in *L. triangularis*.

Etymology. The specific name refers to the shape of the ventral part of the collar.

Habitat. Found in sediments of sandy mud at depths up to 20 m, in salinities of 19–35‰.

Occurrence. Abundant in Hawkesbury R., mostly at Transect 2, in all years with no seasonal preference.

Australian distribution. New South Wales (Hawkesbury R.).

Family SERPULIDAE Johnston

Prostomium reduced, fused with the peristomium which forms a large tentacular crown, one radiole of which is often modified to form an operculum. Body separated into two regions: a thorax with a thoracic membrane occasionally absent, and an abdomen of numerous segments. Thorax with dorsal capillary setae and ventral

uncini; abdomen with ventral capillary setae and dorsal uncini. Tube calcareous.

Key to the Species of Serpulidae

1. Operculum with calcareous plate surmounted by movable spines; opercular stalk winged; collar setae of one type, short and fine ... . *Galeolaria caespitosa*

— Operculum with or without spines; opercular stalk smooth, well developed; collar setae of two types, not short and fine 2

2. Operculum fig-shaped with concave horny plate, bordered by 1–4 rows of spines curved inwards ..... *Ficopomatus enigmaticus*

— Operculum funnel-shaped with numerous radii, lacking any ornamentation .... *Serpula vermicularis*

Ficopomatus enigmaticus (Fauvel, 1923)

Mercierella enigmatica Fauvel, 1923: 424–430, fig. 1 a–o.
Ficopomatus enigmaticus.—ten Hove & Weerdenburg, 1978: 114–116, figs 2 e-i, 3 d-e, i-q, 4 a-d, s, aa-bb, nn-vv, zz, 5 c.

Material examined. *South Australia:* Coorong, locality 5, 24-iii-82, 5(W.19204). *New South Wales:* Merimbula. Material subsequently misplaced after description was made.

Description. White calcareous tube, semi-circular to circular in cross section, at intervals often bears wide, flaring, sometimes faint, collar-like rings. Branchial filaments free arising from paired lobe, 5–9 on left and 7–10 on right, arranged in 2 semi-circles. Operculum fig-shaped, bilaterally symmetrical, concave part with horny plate bordered by 1–4 rows of inwardly curved spines. Spines sometimes with 1–3 short accessory spines. Collar high and entire, continuous with thoracic membranes. Collar setae of 2 types: coarsely-serrated and limbate. Thoracic uncini with 6–7 curved teeth in a single row, anterior tooth gouged, apparently bifurcated.

Remarks. This species has been widely confused until ten Hove & Weerdenburg (1978) examined a large amount of Australian material and sorted out the taxonomic confusion. It appears that this species occurs in southern New South Wales, and that just north of Sydney, this species is replaced by *Ficopomatus uschakovi* (Pillai, 1960).

Habitat. Hard substrates in estuarine areas.

Occurrence. Locally abundant.

Australian distribution. Western Australia (Swan R.), South Australia (Coorong*, Torrens R.), New South Wales (Merimbula*, Cooks R.), Queensland.

Galeolaria caespitosa Savigny, 1818 in Lamarck

Galeolaria caespitosa.—Augener, 1914: 144–148, figs 18 a-b.—Straughan, 1967: 236.

Material examined. *New South Wales:* Merimbula Stn C14, 16, many (W.12693, W.12751).

Description. Operculum with 3–4 calcareous basal plates surrounded by an outer fringe of small blunt processes; 9–11 movable calcareous spines arising from base of the basal plate. Opercular stalk winged. Collar setae very short and fine.

Habitat. Forms a well-defined mid-littoral zone on exposed coasts, and scattered individuals found at entrances to harbours on exposed breakwaters.

Occurrence. Locally abundant.

Australian distribution. Western Australia, South Australia, Tasmania, Victoria, New South Wales, Queensland.

Serpula vermicularis Linnaeus, 1767

Serpula vermicularis.—Straughan, 1967: 206, fig. 3 a.

Material examined. *New South Wales:* Hawkesbury R., D2-2, 1(W.196515).

Remarks. Agrees well with Straughan's (1967) description.

Habitat. Collected in 5 m water from sandy mud, in a salinity of 33.8‰.

Occurrence. Single specimen collected in May 1980.

Australian distribution. Western Australia, New South Wales, Queensland.

Family SPIRORBIDAE Pillai

Body small, asymmetrical, with calcareous tube coiled in a spiral. Prostomium reduced, fused with the peristomium which forms a large tentacular crown; one radiole modified to form an operculum. Body separated into two regions: a thorax of 3–5 segments each with a setigerous rudiment and a thoracic membrane, and an abdomen of numerous segments. Thorax with dorsal capillary setae and ventral uncini; abdomen with ventral capillary setae and dorsal uncini.

Janua (Dexiospira) brasiliensis (Grube, 1872)

Janua (D.) brasiliensis.—Knight-Jones, *et al.*, 1975: 94-96, fig. 1 a-t.—Hutchings & Rainer, 1979: 791.

Material examined. *New South Wales:* Merimbula, MER 226C, 316H, 287I, 147K-N, several (W.14144-46, W.17153).

Remarks. Agrees well with Knight-Jones *et al* (1975) description.

Habitat. Attached to blades of *Posidonia* seagrass.

Occurrence. Appears to be common in restricted localities.

Australian distribution. New South Wales (Merimbula*, Port Jackson, Pittwater).

DISCUSSION

As indicated in the introduction, the polychaete fauna of Australia is poorly known, although considerable advances have been made since Day & Hutchings (1979). Since that checklist, about 150 new species or new records for Australia have been described (Blake & Kudenov, 1978; Hutchings & Rainer, 1979; Hartmann-Shröder, 1979; Hutchings & Turvey, 1982, 1984; this paper) which represents a 25% increase in the number of species recorded from Australia. Despite the increase in our knowledge, only limited comments can be made on the distribution of polychaete estuarine fauna in the central and southern regions of New South Wales. It appears that a distinct estuarine polychaete fauna exists and this also occurs in sheltered embayments such as Botany Bay, and Jervis Bay. This may be explained by the extensive marine conditions found in most New South Wales estuaries, except during flood conditions. All the areas have in common, sheltered habitats dominated by soft substrates.

Within this estuarine fauna, species exhibit a considerable amount of variation in their distribution patterns. A few species appear to occur only in one estuary, others are restricted to the Sydney region, some occur throughout the study area and many also have been reported from Victoria and South Australia. Unpublished data of Hutchings indicates that some of the species occur in southern Queensland and presumably northern New South Wales. Some species occur from south Australia around to southern Queensland. This suggests that estuarine polychaetes are a very diverse group. It is too premature to comment any further, although we would like to draw attention to the numerous cosmopolitan species (4%) and widely distributed species recorded in our study. Although we are confident that all our specimens of a particular species are the same, we have some doubts about the validity of some cosmopolitan species. Many of the cosmopolitan and widely distributed species were described in the 1800's from Europe, and the types are no longer available. In some cases no types were ever designated or deposited. Material from the type locality must be collected and the species carefully defined, together with an indication of the variation occurring within the species. Subsequently, all material assigned to that species should be compared with the revised and expanded description before the validity of a cosmopolitan species be determined. Many of these cosmopolitan species are commonly identified by non-polychaete workers, and reference material is never deposited in a Museum, making verification difficult.

Many of the species are restricted to estuaries, as they are restricted to muddy sediments. Certain genera such as *Ceratonereis* (F. Nereididae) are almost exclusively estuarine, however many other genera of nereids include estuarine and open rocky shore species. Far more detailed information is needed before specific comments can be made on the relationship of the polychaete fauna in estuarine areas with nearby rocky shore faunas or shallow subtidal faunas. Similarly it is too premature to compare the estuarine fauna described in this study with comparable estuarine studies caried out elsewhere in the world.

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