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Contribution to the Study of Australian Nephtyidae (Polychaeta)

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c/o The Australian Museum, Sydney

Figures 1-13.

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ABSTRACT

Records of Australian Nephtyidae are reviewed. Two new species, *Inermonephtys palpata* and *Nephtys vikingensis*, are described. *Nephtys paradoxa* is newly recorded from Australian waters. A key to the seven Australian species is included.

INTRODUCTION

Six species of Australian nephtyids in two genera have been recorded so far (Fauchald, 1965; Knox and Cameron, 1971). One of these, *Nephtys mirocirrus* is referred to the older *N. gravieri*. Some records of *Aglaophamus dibranchis* and *A. macroura* refer to *A. verrilli*. Two new species in two genera are described here. *Nephtys picta* reported by Knox and Cameron is referred to one of these, *Nephtys vikingensis*, n. sp. This brings the total number of Australian nephtyids to seven species in three genera. The results are detailed in the systematic account below.

The material on which this study is based is deposited in the Allan Hancock Foundation, Los Angeles (AHF), The Australian Museum, Sydney (AMS), British Museum (Natural History), London (BMNH), National Museum of Victoria, Melbourne (NMV), and Queensland Museum, Brisbane (QM).

Aglaophamus Kinberg, 1866**Aglaophamus dibranchis** (Grube, 1878)

Nephtys dibranchis.—Augener, 1922: 17–20, fig. 5; 1927: 116–118.—Fauvel, 1932: 117 (in part).

Nephtys (Aglaophamus) dibranchis.—Day, 1967: 341, figs 15.I.a-h.

Remarks.—No specimens are available.

Distribution.—New Guinea, Australia, New Zealand, Indian Ocean.

Aglaophamus verrilli (McIntosh, 1885)

Nephtys verrilli McIntosh, 1885: 163–164, pl. 36, figs 6, 7, pl. 32A, fig. 8.

?*Nephtys macrura*[sic].—Benham, 1915: 203–205, fig. 57. (Not *Nephtys macroura* Schmarda, 1861).

Nephtys dibranchis.—Fauvel, 1932: 117 (in part).—Monro, 1936: 139.—Rullier, 1965: 182–183.

Aglaophamus dicirris Hartman, 1950: 122–124, pl. 18, figs 1–8.

Aglaophamus verrilli.—Knox, 1960: 115.

Material examined.—Queensland (QM G3920–3923; as *N. dibranchis* by Rullier, 1965). Bass Strait, 40 miles east-north-east of Babel Island, approx. 39° 04'S, 148° 43'E, 1200 fms, F.I.S. *Endeavour*.—anterior fragment (AMS E5113; as *N. macrura* by Benham, 1915).

Remarks.—*Aglaophamus verrilli* is closely related to *A. dibranchis*. The two species differ in that the former has twenty-two rows of subterminal proboscicial papillae, of which none is distinctly larger and middorsal or -ventral, while the latter has fourteen rows and a long middorsal papilla. The interramal cirrus of *A. dibranchis* starts on setiger 4 (Day, 1967: 341), while its origin varies from setiger 5–8 in *A. verrilli* (Pettibone, 1963: 190). Both preacicular lobes of *A. verrilli* are short; the neuropodial one is incised. The corresponding lobes of *A. dibranchis* are also small, but both are complete and of auricular shape. The postacicular lobes of the former are rounded while those of the latter are auricular.

The specimens reported by Rullier (1965) as *N. dibranchis* were examined and are referred to *A. verrilli*. The everted probosces showed in all cases twenty-two rows of subterminal papillae as mentioned by Rullier. The interramal cirri were first present from setiger 7, rarely 8, never 5 as stated by Rullier. The parapodia were characteristic for *A. verrilli*.

Benham (1915) reported *Nephtys macrura* from Bass Strait. He mentioned that his specimen differed from the original description with respects to its proboscicial papillae, head proportions and notopodial lobes. The specimen was examined; it does not represent *A. macroura* as redescribed by Hartman (1967: 74–76, pl. 23). The specimen resembles most closely *A. verrilli*, to which it is referred as a questionable record. The parapodia (fig. 1) differ from those of the Queensland specimens, in that the erect neuropodial lobes and interramal cirri are shorter and thicker in the former. No lyrate setae could be found, but they may be broken off. The interramal cirri are present from setiger 8, not 9 as stated by Benham.

Distribution.—New Zealand, Australia, India, North America to Panama.

Inermonephtys Fauchald, 1968**Inermonephtys palpata**, new species

(Figs 2-6)

Material examined.—Queensland, Queens Beach, Port Denison, Bowen, approx. 20° 03'S, 148° 15'E, sandflat, 27 July, 1925, E. H. Rainford, collector—holotype (AMS W1710).

Description.—The description is based on a single, complete specimen. It measures 150 mm by 4.5 mm without and 6 mm with parapodia and consists of 215 setigers.

The preserved specimen is pale with orange colour spots. This pigmentation lightly covers the prostomium, runs in two stripes from the nuchal organs to the second setigerous segment, then continues as a longitudinal middorsal band through three segments (fig. 2). Lateral markings are also prominent on the 3rd and 4th setigers. On the ventrum pigmentation occurs around the mouth and bases of the neuropodia in the anterior thirty segments.

The prostomium is subrectangular, slightly longer than wide, with rounded frontal corners. Frontal antennae are absent as typical of the genus. The bifid, ventrally attached lateral antennae (fig. 3) consist of a large palp-like organ projecting beyond the prostomium and carrying a small digitate process. The nuchal organs are present as everted digitiform processes slightly below the postectal margins of the prostomium. The left side bears three cirriform processes, the right side has two and the place of attachment for the third is visible. No eyespots can be discerned.

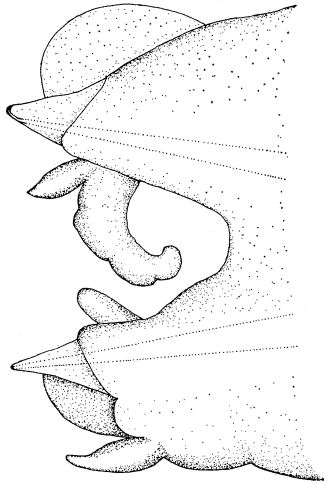
The proboscis was examined by dissection; it lacks papillae. The jaws are spindle-shaped.

The first segment is directed forward at either side of the prostomium; it is continuous across the middorsum. The notopodial acicular and preacicular lobes are little developed, while the postacicular ones are rounded and inflated, padlike. The notopodial cirri are well developed with a bulbous base and slender tip. All three lobes of the first neuropodium are rudimentary. The neuropodial cirri are of the same length as later ones. They have a bulbous base with irregularly shaped tips. At the base of the neuropodium is a well developed lamella. These lamellae are rudimentary in the following anterior segments but come to be larger again in median and posterior segments.

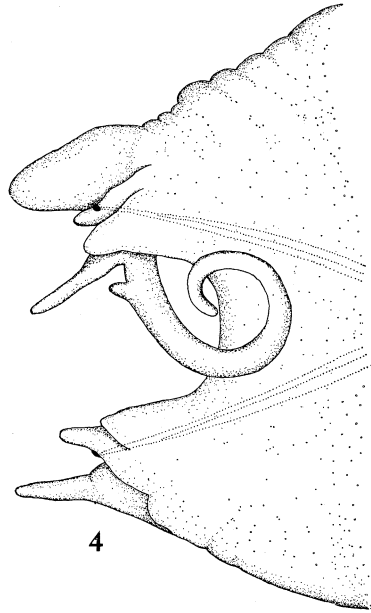
In well-developed segments (fig. 4) the two rami are widely separated. The notopodial acicular lobe has a bulbous base ending in a digitiform lobe. The aciculum projects at the junction at the superior side. The preacicular lobe is slender, with a rounded tip; it increases in size towards median segments where it reaches the size of the postacicular lobe. The postacicular lobes have rounded tips and are inflated in the first thirty segments. Thereafter they are flatter and more slender. The notopodial cirrus is digitate and slender, its length exceeding the notopodial lobes in median segments.

Opposite

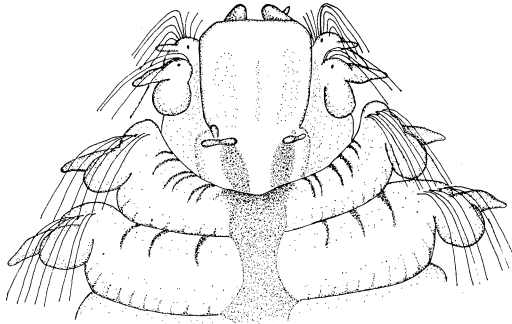
Aglaophamus ?verrilli (specimen E5113): Figure 1, twenty-fifth parapodium in anterior view, setae omitted, X 50. *Inermonephtys palpata*, n. sp. (holotype W1710): Figure 2, anterior end through third segment, in dorsal view, X 12.5. Figure 3, anterior end through third segment, in ventral view, X 12.5. Figure 4, twenty-fifth parapodium in anterior view, setae omitted, X 25. Figure 5, subdistal part of preacicular, barred seta in lateral view, X 250. Figure 6, postacicular lyrate seta, X 250.



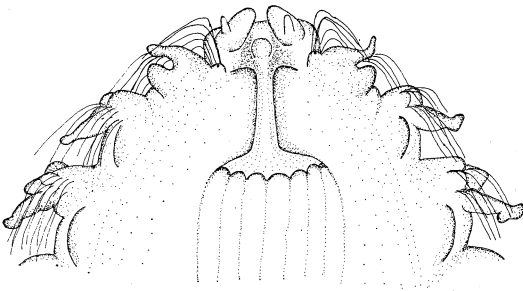
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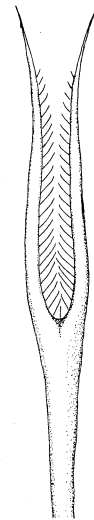
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6

The neuropodial acicular lobe also has a bulbous base and a digitate lobe after the projection of the aciculum at the inferior side. The preacicular lobe is shortest in the anterior segments. Its length increases towards median segments to surpass the acicular lobe. The postacicular lobe is short and rounded throughout. The neuropodial cirrus is irregularly formed in the first fifteen segments. Thereafter they have broad bulbous bases with slender tips. Due to their posterior position they can be mistaken as postacicular lobes.

The interramal cirrus starts on setiger 2 and is involuted by setiger 5. It is slender and becomes long, filling the interramal space; it decreases slightly towards the end of the body and is absent from the last six segments. An accessory cirrus is present after the first ten segments.

The setae of the anteriormost segments are strongly geniculate and long, thereafter they decrease in length. Setae emerge as an open spiral around the acicular lobe, with the opening at the preacicular lobe, thus giving the impression of a divided preacicular fascicle. The preacicular fascicle has short, stout, slightly geniculate setae with rows of small denticles towards the distal half. They grade from clear to barred setae, showing various degrees of bars. Even the strongly barred setae retain their denticles (fig. 5). Two acicula are present in each ramus. They project at a common point and are capped by a conspicuous reddish plaque.

The postacicular fascicles consist of longer, straighter setae also with closely-set denticles along the whole length as in the preacicular ones. A few lyrate setae (fig. 6) are also present in noto- and neuropodial postacicular fascicles.

I. palpata differs from the two known species of *Inermonephtys*, *I. inermis* (Ehlers, 1887) from Florida, and *I. gallardi* Fauchald, 1968 from Vietnam, in that the first has bifid, palp-like lateral antennae, three eversible nuchal processes, and denticulated barred preacicular setae. The parapodia of *I. palpata* resemble those of *I. gallardi* in having digitiform lobes on the acicular lobes and divided preacicular fascicles; they differ in the shape of the post-acicular lobes.

Nephtys Cuvier, 1817

Nephtys australiensis Fauchald, 1965

(Fig. 7)

Nephtys gravieri.—Augener, 1927: 116.—Rullier, 1965: 182.

Nephtys australiensis Fauchald, 1965: 334–335, figs 1, 2.

Material examined.—South Australia, Port Vincent, Yorke Peninsula, sand—holotype (AMS W3783). Numerous specimens from eastern Australia and one station from Western Australia, Leschenault Estuary, Bunbury (AMS W4335).

Other material examined.—Queensland (QM G3635, G3637; as *N. gravieri* by Rullier, 1965).

Remarks.—This species is the commonest Australian nephtyid. It occurs in sandy, muddy estuaries and is often found with the nereid, *Australonereis ehlersi* Hartman, 1954.

Most well-preserved specimens display a typical pigmentation pattern which covers the prostomium and anterior setigers (fig. 7). The teeth of the coarsely denticulated postaciclar setae are not in a single row at the cutting edge as described by Fauchald (1965) but in transverse rows.

Augener's (1927: 116) record is referred to this species as suggested by Fauchald (1965) since the neotopodial cirri are almost egg-shaped in outline.

The specimens reported by Rullier (1965) as *N. gravieri* were examined and are referred to *N. australiensis*. These two species have similar parapodia and setae. They differ in that *N. australiensis* has broad, foliaceous notopodial cirri and complete conical lobes whereas *N. gravieri* has digitiform notopodial cirri and incised acicular lobes in median segments.

Distribution.—Queensland, New South Wales, Victoria, South Australia and Western Australia.

***Nephtys gravieri* Augener, 1913**

Nephtys gravieri Augener, 1913: 123–125, pl. 2, fig. 5, text-figs 6a-c.—Fauvel, 1932: 118; 1953: 226, figs 114a-c (in part).

Nephtys mirocirris Fauchald, 1965: 335–336, figs 3, 4.

Material examined.—South Australia, Clinton, Yorke Peninsula, sand—holotype of *N. mirocirris* (AMS W3782).

Remarks.—The type specimen of *N. gravieri* comes from Fremantle, Western Australia. Augener considered the coarsely denticulated postaciclar setae as characteristic for the species which he otherwise believed to be close to *N. palatii* Gravier. He did not mention whether the proboscis had a middorsal papilla, whether its proximal surface was smooth or prickly, and at which setiger the interramal cirri originated.

Fauvel (1932) reported *N. gravieri* from the Bay of Bengal, India. His description agreed with that of Augener. Fauvel (1953) repeated this description and gave two figures. The figure of prostomium and anterior segments (fig. 114a) is a copy of Augener (pl. 2, fig. 5) while the parapodium (fig. 114b) does not agree with *N. gravieri* since it has an involute interramal cirrus characteristic of *Aglaophamus*.

Fauchald (1965) described *N. mirocirris* agreeing in most respects with *N. gravieri* Augener, 1913. The two differ in that the first has a deep incision in the notopodial acicular lobe and prickles on the proximal surface of the proboscis; Fauchald presumed that both features are lacking in *N. gravieri*. Augener (1913: 124) did not mention that the notopodial acicular lobe is incised, but his text-fig. 6c clearly shows it as being so. There are no barred preacicular setae in this species contrary to the description of Fauchald (1956: 336).

The two species are identical, with *N. mirocirris* the junior synonym. The account of Augener can be emended to include: the proximal surface of the proboscis is covered with minute prickles and it lacks a subterminal median papilla. The interramal cirri are first present from setiger 3.

Distribution.—Fremantle, Western Australia and Yorke Peninsula, South Australia; Bay of Bengal, India.

Nephtys longipes Stimpson, 1855

Nephtys longipes Stimpson, 1855: 7; 1856: 392.

Remarks.—This species was described from Botany Bay, Australia. It is considered as indeterminable on the basis of its insufficient description.

Nephtys paradoxa Malm, 1874

Nephtys paradoxa.—Fauchald, 1963: 13–15, figs 1A, 2B, 3C.

Material examined.—New South Wales, 33 miles from Green Cape. approx. 37° 16'S, 150° 10'E, 470 fms., 2 October, 1912, F.I.S.

Endeavour.—1 specimen (AMS W5247).

Remarks.—The anterior fragment measures 35 mm long by 8 mm wide for thirty-seven segments. The proboscis is fully everted and displays twenty-two rows each with five to six papillae. The proximal surface of the proboscis is smooth. Interramal cirri are present from setiger 12, become foliaceous from setigers 14 to 18 and are fully developed from setigers 20 to 34. From setiger 35 they are abruptly small again.

Distribution.—*N. paradoxa* is a deep-water species widely distributed in the northern Atlantic Ocean. It has been reported from the Sea of Japan and the Sea of Okhotsk (Ushakov, 1955: 216) and subantarctic areas off Chile (Hartman, 1967: 81–82). This is a new record from Australian waters.

Nephtys vikingensis, new species

(Figs 8–13)

Nephtys picta.—Knox and Cameron, 1971: 28, figs. 15–16.

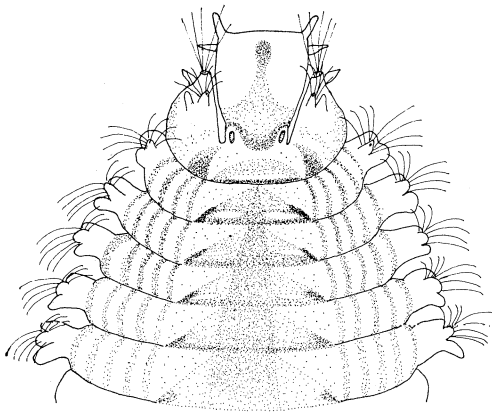
Material examined.—New South Wales, Bateman's Bay, approx. 35° 62'S, 150° 11'E, sandflat, December 1960, I. Bennett, collector—HOLOTYPE (AMS W5251) and 4 PARATYPES (AMS 5253–4; AHF Poly 1002; BMNH ZB.1973.6). Wallis Lake, approx. 32° 15'S, 152° 30'E, Prof. O'Gower and students, collectors—PARATYPE (AMS W5252). Queensland, Moreton Bay, J. D. Ogilby, collector—1 specimen (AMS W5401).

Other material examined.—Victoria, Anglesea, Port Philip Survey, 1957–63—1 specimen (NMV G1789; as *N. picta* by Knox and Cameron, 1971).

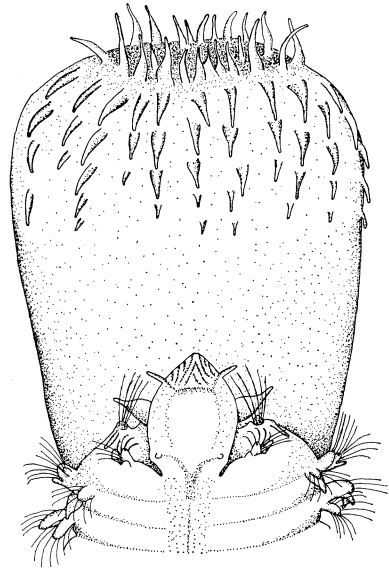
Description.—The holotype is a complete specimen. It consists of 143 setigers and measures 82 mm by 3 mm without and 4 mm with parapodia at anterior segments. Three paratypes are complete (AMS W5252, AHF Poly 1002, BMNH ZB.1973.6), consisting of 123, 139 and 143 setigers, with lengths of 56, 72 and 88 mm respectively. Two paratypes (AMS W5253–4) consist of anterior fragments of 109 and 83 setigers, with lengths of 103 and 40 mm respectively.

Opposite

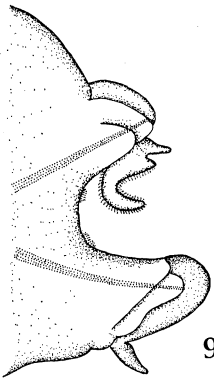
Nephtys australiensis (specimen W4980): Figure 7, anterior end through sixth segment, in dorsal view, X 20. *Nephtys vikingensis*, n. sp. (holotype W 5251, except where otherwise indicated): Figure 8, anterior end with everted proboscis through third segment, in dorsal view, X 12.5. Figure 9, thirtieth parapodium in anterior view, setae omitted, X 12.5. Figure 10, thirtieth parapodium of paratype W5253 in anterior view, setae omitted, X 25. Figure 11, part of preacicular barred seta in lateral view, X 400. Figure 12, subdistal part of strongly denticulated postacicularseta, X 200. Figure 13, enlarged part of same seta, X 600.



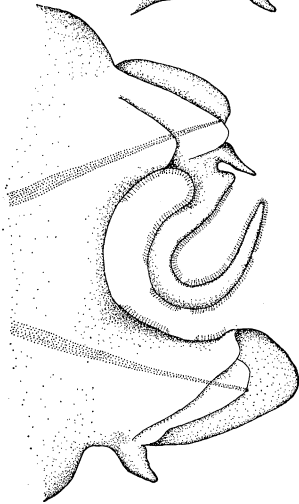
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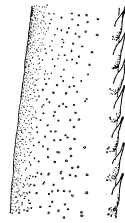
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13

The most striking feature of this species is the cephalic end (fig. 8). The prostomium is oval, slightly longer than wide. A thin, preantennal lobe, also found in other species of *Nephtys*, has been developed as a triangular translucent lobe, marked by an intricate pattern of slightly thicker tissue. The frontal antennae are slender and arise at the sides of the base of the preantennal lobe. The lobe with the frontal antennae give the impression of a Viking helmet, hence the specific name.

The lateral antennae are longer than the frontal; each has a bulbous base and slender tip. The everted nuchal organs appear as small papillae at the postectal margins of the prostomium.

The proboscis of the holotype is not completely everted. The description is that of paratype W5254. The proboscis has twenty bifid terminal papillae, ten of each side set apart by a smaller, single middorsal and midventral one. The subterminal papillae are in twenty-two irregular, longitudinal rows. Each row has five to seven papillae decreasing in size proximally. None of the papillae are distinctly middorsal or midventral. The proximal surface of the proboscis is covered with minute prickles.

The first setigerous segment is greatly prolonged. It is as long as the next two segments combined. The median part of the first setiger is covered by a brown pigment in some specimens. The pigment is continued on the following segments, getting lighter posteriorly and fading out by the tenth segment.

The first parapodia are directed forwards to lie at the sides of the prostomium. The notopodium has a rounded acicular lobe; the other lobes are little developed. The notopodial cirrus is short and digitate. The notopodial fascicle bears barred setae and geniculate spinigers.

The first neuropodium has a pointed acicular lobe. It bears a digitate cirrus, longer and more slender than the notopodial cirrus. The setae consist of straight and slightly geniculate spinigers. They are directed forward, reaching to the base of the frontal antennae.

The notopodial acicular lobes of fully developed parapodia (fig. 9) are rounded, with the aciculum projecting at the superior side. The notopodial postacicular lobe is rounded, and of the same length as the acicular lobe. The preacicular lobe is short and rounded. The notopodial cirrus is digitate, broader at its base. The neuropodial acicular, post- and preacicular lobes are rounded, the preacicular being the smallest, and the postacicular the largest. The neuropodial cirrus is digitate.

The interrampal cirrus is first present from setiger 3 and is recurved from setiger 4. It has a pronounced knob close to the notopodial cirrus, and is digitate and recurved. The interrampal cirrus of the holotype and other small but mature specimens never fills the interrampal space while in larger specimens (fig. 10) it is long and slender and fills the entire space. The cirrus becomes smaller in posterior segments, is not recurved and is completely absent from the last eight to ten segments. The interrampal area and cirri are distinctly ciliated.

The setae are long and flowing, in most cases as long as the body is wide. They consist of three kinds. The preacicular fascicles contain short, barred setae (fig. 11) and less numerous long, finely denticulated setae. The postacicular fascicle contains a few of the latter but mainly geniculate setae (figs 12, 13) with transverse rows of coarser denticles. The setae end in long, slender tips. Most of the strongly denticulated geniculate setae are light yellow, while some are much darker and under high magnification are seen to be punctate. There seems to be no relationship between the age of setae and being punctate.

N. vikingensis differs from all other species of *Nephtys* in having a large preantennal lobe. It is related to *N. gravieri* and *N. serratus* in having the interramal cirrus from the third setiger and the absence of a middorsal subterminal papilla on the proboscis. It is related to *N. longosetosa* with respect to the position of the interramal cirrus, the long setae and presence of a thin preantennal lobe. *N. vikingensis* differs from all three species in having a greatly prolonged first segment.

The specimen reported as *N. picta* by Knox and Cameron (1971) was examined; it is unquestionably *N. vikingensis*.

Distribution.—*N. vikingensis* has been collected in New South Wales, Victoria and Queensland; it occurs in clean sand. In some stations from Wallis Lake it was found together with *N. australiensis*.

ACKNOWLEDGMENTS

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REFERENCES

- Augener, H., 1913. Polychaeta I. Errantia. In *Die Fauna Südwest-Australiens*. Ergebnisse der Hamburger südwest-australischen Forschungsreise 1905 (ed. Michaelsen and Hartmeyer) Fischer, Jena, Vol. 4 (5): 65-304, 2 pls, 42 text-figs.
- 1922. Australische Polychaeten des Hamburger Zoologischen Museums. *Arch. Naturgesch. Berlin* 88 (Abt. A): 1-37, 9 figs.
- 1927. Polychaeten von Südost- und Süd-Australien. Papers from Dr Th. Mortensen's Pacific Expedition 1914-16. 38. *Vidensk. Meddr. Dansk naturh. Foren* 83: 71-275, 17 figs.
- Benham, W. B., 1915. Report on the Polychaeta obtained by F.I.S. *Endeavour* on the coasts of New South Wales, Victoria, Tasmania and South Australia. Part I. *Biol. Results Fish. Exp. Endeavour* (1904-14) 3 (4): 173-237, pls 38-45.
- Day, J. H., 1967. *A Monograph on the Polychaeta of Southern Africa*. Part I. Errantia. British Museum (Natural History), London. Publ. no. 656, pp i-viii, 1-458, illus.
- Ehlers, E., 1887. Report on the annelids of the dredging expedition of the U.S. coast survey steamer *Blake*. *Mem. Mus. comp. Zool. Harv.* 15: 1-355.
- Fauchald, K., 1963. Nephthyidae (Polychaeta) from Norwegian waters. *Sarsia* 13: 1-32, 9 figs.
- 1965. Some Nephthyidae (Polychaeta) from Australian waters. *Rec. Aust. Mus.* 26: 333-340, 4 figs.
- 1968. Nephthyidae (Polychaeta) from the Bay of Nha Trang, South Viet Nam. *Naga Rep.* 4 (3): 5-33, 5 pls.
- Fauvel, P., 1932. Annelida Polychaeta of the Indian Museum, Calcutta. *Mem. Indian Mus.* 12 (1): 1-262, 9 pls, 40 text-figs.
- 1953. The Fauna of India. Annelida Polychaeta. The Indian Press, Allahabad. Pp. 507, 250 figs.
- Hartman, O., 1950. Goniadidae, Glyceridae and Nephthyidae. *Allan Hancock Pacif. Exped.* 15 (1): 1-181, 19 pls.
- 1967. Polychaetous annelids collected by the USNS *Eltanin* and *Staten Island* cruises, chiefly from Antarctic seas. *Allan Hancock Monogr. mar. Biol.* 2: 1-387, 51 pls.
- Knox, G. A., 1960. "Biological results of the Chatham Islands 1954 Expedition, Part III"—Polychaeta Errantia. *N.Z. Rep. Scient. ind. Res. Bull.* 139 (3): 77-143, figs 1-238.
- and D. B. Cameron, 1971. 4 Polychaeta. Port Phillip Bay Survey 2. *Mem. natn. Mus. Vict.* 32: 21-41, 35 figs.
- McIntosh, W. C., 1885. Report on the Annelida Polychaeta collected by H.M.S. *Challenger* during the years 1873-76. *Rep. Scient. Res. Challenger, Zool.* 12 (3): 1-554, pls 1-55, 1a-39a.
- Monro, C. C. A., 1936. Polychaete worms. II. *Discovery Rep.* 12: 59-198, figs 1-34.
- Pettibone, M. H., 1963. Marine Polychaete Worms of the New England Region. 1. Families Aphroditidae Through Trochochaetidae. *Bull. U.S. natn. Mus.* 227 (1): 1-356, 83 figs.
- Rullier, F., 1965. Contribution à la Faune des Annélides Polychètes de l'Australie. *Pap. Dep. Zool. Univ. Qd.* 2 (9): 163-201, 9 figs.
- Stimpson, W., 1855. Description of some new marine invertebrates. *Proc. Acad. nat. Sci. Philad.* July 31, 1855: 1-10.
- 1856. Description of some new marine invertebrates. *Proc. Acad. nat. Sci. Philad.* 7: 385-395.
- Ushakov, P. V., 1955. Polychaeta of the Far Eastern Seas of the U.S.S.R. (In Russian). *Akad. Nauk SSSR, Zool. Inst., Opred. po faune SSSR* 56: 1-445, 164 figs. (Translated into English, Israel Prog. Scient. Transl., Jerusalem, 1965).