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LUMBRINERIDAE FROM THE ANDAMAN SEA, THAILAND, WITH NOTES ON OENONIDAE AND DORVILLEIDAE (ANNELIDA: POLYCHAETA)

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ABSTRACT

The present paper treats the species of Lumbrineridae, Oenonidae and Dorvilleidae collected in the Andaman Sea, Thailand, during the BIOSHELF Project in 1996–97. Altogether 22 species are reported: 13, 7 and 2 in the three families, respectively. One species, *Abyssoninoe phuketensis*, is described as new to science. The species *Augeneria verdis* Hutchings and Murray, *Augeneria polytentaculata* Imajima and Higuchi, *Cenogenus nagae* (Gallardo), *Lumbrinerides aberrans* (Day), *Lumbrineriopsis paradoxa* (Saint-Joseph), *Ninoe bruuni* Gallardo, *Drilonereis* cf. *longa* Webster, *Notocirrus biaciculus* Gallardo, *Schistomeringos filiforma* Hutchings and Murray, and *Schistomeringos sphairatolobos* Glasby are recorded for the first time from the Indian Ocean. *Lumbriconereis mando* Crossland is synonymized with *Eranno papillifera* (Fauvel), new combination. Several species, especially in the genera *Lumbrineris*, *Arabella* and *Drilonereis,* are of unclear systematic status and fit more or less closely with species described from other parts of the world. A key to the genera of Lumbrineridae is provided.

INTRODUCTION

The Lumbrineridae, Oenonidae and Dorvilleidae are three families belonging to the eunicid group of polychaetes. They have in common the presence of a jaw apparatus consisting of a ventrally situated pair of plates (mandibles) and a dorsally situated set of denticulate plates (maxillae) which may have a rather complicated structure. Parapodia are mostly well-developed, but the notopodia may be more or less reduced. Both simple and composite chaetae are found. Jaw structures, chaetae, parapodia and prostomial appendages are important structures for the systematics both at species and higher taxonomic levels. In recent years, several revisions have been carried out which have led to changes in the definition of the families and the erection of new genera (Orensanz 1973, 1990; Colbath 1989; Frame 1992; Eibye-Jacobsen and Kristensen 1994). The most important changes with regard to the families were made by Orensanz (1990), who redefined Lumbrineridae and Oenonidae to include genera formerly placed in Lysaretidae and Arabellidae. The two latter families are no longer recognized (Orensanz 1990; Fauchald and Rouse 1997).

The families are often treated together in systematic and faunistic works, but the lumbrinerids are generally the most important with regard to occurrence and number of species. This is also reflected in the relevant literature for the present area of study. The most important works include the studies of Crossland (1924) from eastern Africa and the Red Sea, Fauvel (1932, 1953) from India, Wesenberg-Lund (1949) from the Iranian Gulf and Gallardo (1968) from Vietnam. Important contributions from neighbouring subtropical and temperate areas have been given by Day (1963, 1967) from Southern Africa, Imajima and Higuchi (1975) and Imajima (1985) from Japan, Uschakov and Bao-Ling (1979) from the Yellow Sea and Knox and Green (1972, 1973) from

New Zealand. Further, new species have been described by Glasby (1984) and Hutchings and Murray (1984) from Australian waters.

Reports from Thailand and adjacent waters, however, are extremely sparse. In a quantitative study of shallow water benthos on the west coast of Phuket Island, Hylleberg and Nateewathana (1984) ranked the lumbrinerids as number five in numerical importance among the polychaete families, but did not indicate how many species were present. In a check-list of species from Singapore, Tan and Chou (1993) reported four species from the three families. In contrast, Fauvel (1953) and Gallardo (1968) reported 16 and 19 species in their studies from India and Vietnam, respectively.

MATERIALS AND METHODS

The specimens for the present study have been collected during the Thai–Danish BIOSHELF Project in 1996 and 1997. Details of the project and a list of sampling stations with information on depth, bottom type and gear have been provided elsewhere (Aungtonya and Eibye-Jacobsen 2002). In addition, material from Vietnam previously reported by Gallardo (1968) was examined for comparison.

Specimens were studied in alcohol or glycerol under a stereo microscope or a compound microscope with phase contrast. To inspect maxillary structures, a dorsal incision was made and the muscle tissue above the maxillae removed using a pair of fine needles. In a few cases, when the maxillae were partly protruded, a short ventral incision in the mouth opening was made to uncover hidden structures. Drawings were prepared with the aid of an eyepiece measurement graticule. The pairs of maxillary plates are referred to by Roman numerals (mx I – mx V), in accordance with common practice (see, *e.g.*, Fauchald 1970; Frame 1992; Hilbig 1995a, b).

The material has been deposited at the Phuket Marine Biological Center (PMBC), except for selected specimens which have been deposited at the Zoological Museum, University of Copenhagen (ZMUC) and the Museum of Natural History and Archaeology, Vitenskapsmuseet, Trondheim, Norway (VMT).

TAXONOMY

Lumbrineridae Malmgren, 1867

Remarks: The lumbrinerids are generally long cylindrical worms with a rather simple external morphology. The prostomium is well-developed and is usually without appendages, but may carry small occipital antennae or nuchal papillae. There are no tentacular cirri. The parapodia are mostly uniramous, but are sub-biramous with notoaciculae and a short notopodium in some species. Ventral cirri are absent. Chaetae include simple limbates, composite spinigers, and simple and composite hooded hooks. The maxillae consist of a pair of posterior carriers and four or five pairs of maxillary plates. The carriers are broad, mostly short, and are attached to the most posterior pair of maxillae (mx I) by a firm 'click-joint' connection (labidognath arrangement).

A remarkably large number of species of lumbrinerids have been described (*i.e.*, more than 200) on a world-basis (Fauchald 1970; Uebelacker 1984a). Many of the descriptions, however, especially in the older literature, are short and general and do not mention characters which presently are known to be vital for species discrimination. In the most recent reviews of the family, genera and species have been separated on the structure of the maxillae, the types and shapes of the chaetae, and the presence or absence of respiratory parapodial lobes (Orensanz 1973, 1990; Frame 1992). Presently, 13 genera of lumbrinerids are considered to be valid. Orensanz (1990), Frame (1992) and Hilbig (1995a) have accounted for the taxonomic history of the family and have discussed the importance of the diagnostic characters.

Key to Genera of Lumbrineridae

This key is modified from Orensanz (1990) and Frame (1992). Genera not reported from the Indian Ocean and SE Asian waters are marked with an asterisk (*).

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1. Parapodia with cirriform or foliaceous dorsal cirri, prostomium with three occipital antennae 2
– Parapodia without dorsal cirri, antennae absent or reduced to small nuchal papillae 3

2. Mx I bifid, dorsal cirri foliaceous ..... *Lysarete* *
– Mx I unidentate, falcate, dorsal cirri cirriform or papilliform ..... *Kuwaita*

3. All chaetae are simple limbate capillaries, hooded hooks absent ..... *Arabelloneris*
– Hooded hooks present, at least in posterior chaetigers 4

4. Chaetae include composite spinigers, composite hooded hooks, simple hooded hooks and simple limbates ..... *Lumbricalus* *
– Chaetae include hooded hooks and simple limbates, no composite spinigers 5

5. Composite or pseudocomposite hooded hooks present in anterior part of body 6
– All hooded hooks simple 7

6. Mx IV forming a squarish plate with clear central area and black margins. Nuchal papillae may be present at posterior border of prostomium. Aciculae pale to golden ..... *Augeneria*
– Mx IV a triangular to oblong evenly black or brown plate with a marked tooth. Aciculae pale, brown or black ..... *Lumbrineris*

7. Anterior or middle parapodia with postchaetal vascularized processes or branchial lobes 8
– No branchial lobes in anterior parapodia 9

8. Numerous branchial lobes. Prostomium without nuchal papillae ..... *Ninoe*
– One digitiform branchial lobe. Prostomium with a nuchal papilla at posterior border ..... *Cenogenus*

9. Anterior body with transitional hooded hooks, gradually developing from the shape of limbate chaetae into typical hooded hooks over a number of segments. Aciculae yellow. Mx IV and V fused ..... *Abyssoninoe*
– Anterior body with ordinary hooded hooks or with simple limbate chaetae only 10

10. Hooded hooks bidentate 11
– Hooded hooks multidentate 12

11. Hooded hooks with a subdistal tooth or spur. Mx IV with a fringe of denticles on inner margin .... *Lumbrineriopsis*
– Hooded hooks without subdistal tooth. Mx IV without teeth ..... *Lumbrinerides*

12. Mx II short, about half the length of mx I. Maxillary apparatus with an additional pair of plates between mx II and posterior part of mx I ..... *Eranno*
– Mx II about as long as mx I, with 3–5 distinct teeth ..... *Scoletoma*

Abyssoninoe Orensanz, 1990

Diagnosis: Prostomium conical. Parapodia uniramous, with simple limbate chaetae and simple, multidentate hooded hooks. Hooded hooks may have a transitional phase evolving through anterior chaetigers from rounded tip limbate chaetae, to faintly outlined hooks, to clearly defined hooks.

Aciculae yellow. Mx III unidentate. Mx IV and V completely fused, forming broad semicircular plates with a tooth protruding from inferior border.

Remarks: The genus *Abyssoninoe* presently includes about six species. The genus has been treated by Orensanz (1990) and Frame (1992).

Abyssoninoe phuketensis n. sp.
Fig. 1A–G

Material examined: BIOSHELF st. H-1/OS, 7º45' N, 98º16' E, 31 m, mud, 9 May 1996 (1, PMBC 18596); st. I-1/OS, 7º30' N, 98º57' E, 38 m, mud, 3 May 1996 (4, PMBC 18597); st. J-2/OS, 7º15' N, 98º51' E, 61 m, mud, 4 May 1996 (holotype, PMBC 18598 [incomplete, length 8 mm for 59 chaetigers, width 0.6 mm]; 3 paratypes, PMBC 18599 [incomplete]); st. RN-3/OS, 7º30' N, 98º17' E, 72 m, muddy sand, 8 May 1996 (3, PMBC 18600; 1 paratype, ZMUC-POL-1187 [incomplete]).

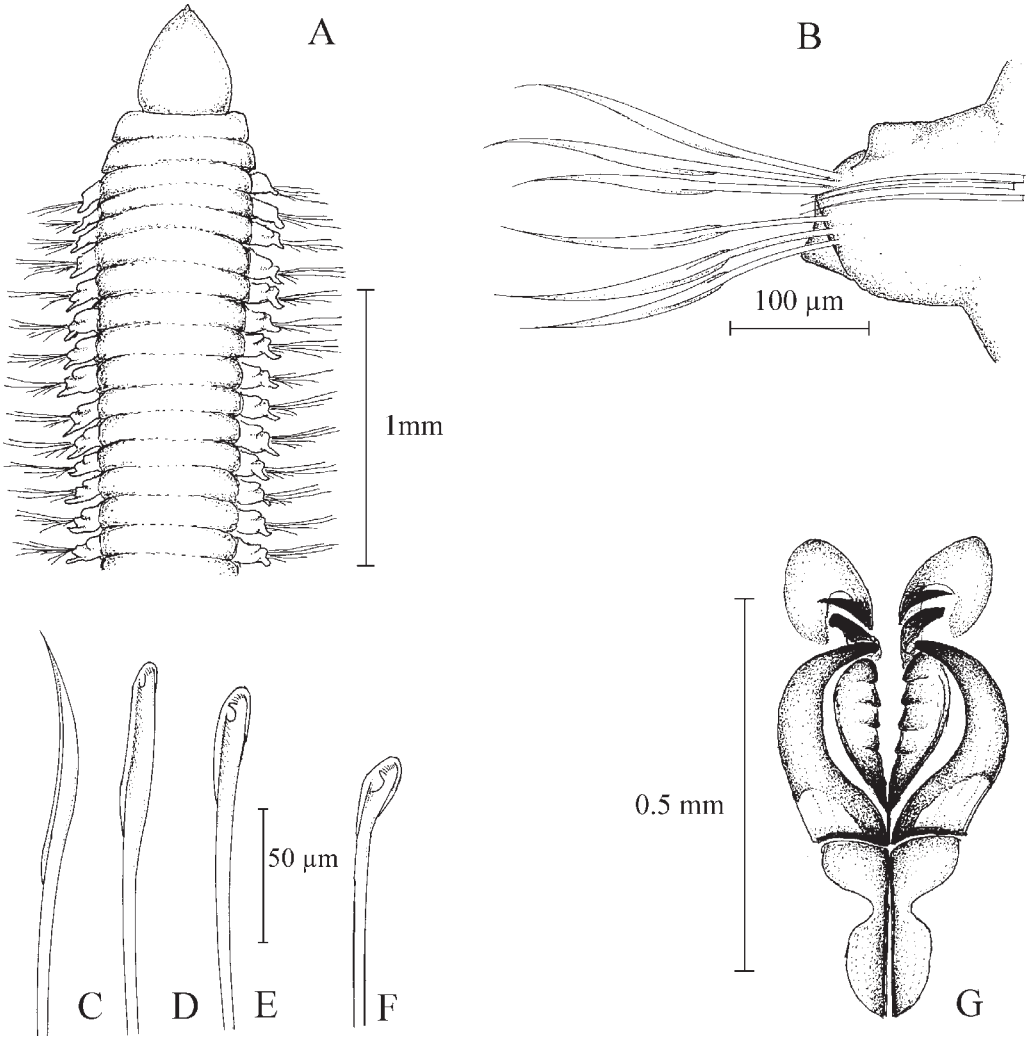

Figure 1 *Abyssoninoe phuketensis* n. sp.: A. Anterior end, dorsal view. B. Right parapodium 10, anterior view. C–E. Chaetae from intermediate position in parapodia showing transition from capillary to hooded hooks: C. Chaetiger 16. D. Chaetiger 17. E. Chaetiger 20. F. Posterior hooded hook, chaetiger 57. G. Maxillary apparatus, dorsal view. – A, C–G of holotype, B of paratype (both from BIOSHELF st. J-2/OS).

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Description: All specimens are incomplete. Largest specimen (paratype) measuring 16 mm for 95 chaetigers, width 0.6 mm. Prostomium conical, about as long as wide. Peristomium with two rings of about equal size (Fig. 1A). Parapodia well-developed, with tuberculate prechaetal lobe and rather large triangular postchaetal lobe, similar throughout (Fig. 1B).

Anterior chaetigers with limbate chaetae only, each fascicle with 6–7 chaetae, all chaetae with outdrawn whip-like tips. From chaetiger 12–13 one chaeta in subventral position shorter than the other ones, becoming gradually shorter until chaetiger 15–16, and being replaced by a long-bladed hooded hook on chaetiger 17–18 (Fig. 1C–D). Following chaetigers with hooks becoming rapidly shorter, each fascicle with 3–4 dorsal limbate chaetae, one hook (Fig. 1E) and one ventral limbate chaeta. From about chaetiger 24, two hooks, and from chaetiger 28–29, three hooks. Dorsal limbate chaetae continuing to chaetiger 24–27 and ventral limbate chaeta to chaetiger 20–22. From about chaetiger 30, one thin capillary chaeta situated among the hooks, continuing past chaetiger 95. Hooded hooks multidentate, with a distinct main tooth and 6-8 small apical teeth (Fig. 1E–F). Aciculae yellow.

Maxillary carriers moderately long, with deep lateral incision. Mx II with 4 or 5 teeth, mx III unidentate. Mx IV fused with mx V forming large semicircular plates, with a strong dorsally directed tooth protruding from inferior border (Fig. 1G). Maxillary parts moderately sclerotized. One specimen (paratype) with eggs measuring 150–190 μm in diameter.

Remarks: *Abyssoninoe phuketensis* is characterized by the very short body section with transitional hooded hooks, the presence of clearly defined hooded hooks form chaetiger 17–18, and the shape of the anterior 'transitional' limbate chaetae having whip-like tips.

Distribution: Only known from the Andaman Sea.

Augeneria Monro, 1930

Diagnosis: Prostomium without antennae, but small nuchal papillae may be present. Parapodia uniramous, with simple and composite multidentate hooded hooks. Mx IV shaped like broad plates with whitish central and dark peripheral areas. Mx V absent.

Remarks: The genus *Augeneria* was originally erected for species having small occipital antennae, but was redefined by Orensanz (1973) based on jaw and chaetal characters. As presently defined the genus includes about six species (Orensanz 1990).

Augeneria verdis Hutchings and Murray, 1984

Augeneria verdis Hutchings and Murray, 1984: 48–49, fig. 15. – Orensanz 1990: 94.

Material examined: BIOSHELF st. E-20m/BC (3, PMBC 18601); st. K-20m/BC (1, ZMUC-POL-1188); st. PB-8/BC (1, PMBC 18602).

Description: Most specimens incomplete, largest complete specimen measuring 21 mm for 128 chaetigers, width 0.4 mm. Prostomium conical to egg-shaped, somewhat longer than wide. Peristomium with two rings of about same size as following segments. Parapodia small, in anterior body with short papilliform prechaetal lobe and well-developed leaf-shaped rounded postchaetal lobe. Postchaetal lobe decreasing in middle body, becoming papilliform and similar to prechaetal lobe by chaetiger 20–25. Far posterior chaetigers with long digitiform vascularized prechaetal lobe. Pygidium rounded, without cirri.

Composite hooded hooks present from the first chaetiger to about chaetiger 12, numbering 1–3 in each fascicle. Hooks with short blades (length/width ratio 2.5–3.5), with main fang and a comb of about 10 small thin teeth. Dorsal limbate chaetae present to chaetiger 19–20, usually 2–3 chaetae per fascicle, most posterior chaetae needle-thin. Single ventral limbate chaeta to chaetiger 12. Middle and posterior body with simple hooded hooks only, 2–3 hooks per fascicle. Aciculae yellow.

Maxillary carriers triangular, wide anteriorly, with shallow lateral incision. Mx II with 3 obtuse rounded teeth, mx III narrow, dorsoventrally

outdrawn, without defined teeth, mx IV squarish, white with dark borders. Maxillary parts moderately sclerotized.

Body green-coloured, strongest colour in transversal bands dorsally and ventrally on segments. Prostomium and most anterior segments with weak or no colour.

Remarks: *Augeneria verdis* is characterized by its small size, the distribution of chaetae, the arrangement of teeth on mx II and the green colour pattern. The present specimens differ somewhat from the description by Hutchings and Murray (1984) in not having middle segments with less intense colouring. Nuchal papillae were not observed.

Distribution: Australia, Andaman Sea.

Augeneria polytentaculata Imajima and Higuchi, 1975
Fig. 2

Augeneria polytentaculata Imajima and Higuchi, 1975: 8–10, fig. 1. – Orensanz 1990: 94.

Material examined: BIOSHELF st. E-3/OS (1, PMBC 18603).

Description: The specimen (incomplete) measures 16 mm for 38 chaetigers, width 1.6 mm. Prostomium triangular, slightly wider than long. Peristomium with two rings, separated from prostomium by a distinct furrow. Dorsally in furrow two distinct pits, partly concealed under anterior peristomial ring. Parapodia well-developed, most anterior parapodia with prominent laterally directed triangular postchaetal lobes. From chaetiger 8–10 gradually developing upwards directed triangular prechaetal lobes, postchaetal lobes becoming narrower and turning upwards (Fig. 2). Pre- and postchaetal lobes in mid-body about equal in size, digitiform, pointing upwards.

Composite hooded hooks present in anterior 19 chaetigers, with moderately long appendages, numbering 4–8 per fascicle. Dorsal limbate chaetae present past chaetiger 38, numbering 4–6 per fascicle in anterior parapodia, posterior chaetae thin, inserted between hooded hooks from chaetiger 29. Ventral limbate chaetae present to chaetiger 22. Hooded hooks with main fang surmounted by 5–8 small teeth. Aciculae yellow, numbering 5–6 in anterior parapodia.

Maxillae with triangular carriers almost without lateral incision, anterior width about half of width of posterior part of mx I. Mx II with three obtuse teeth. Mx III triangular to squarish plates without defined teeth. Mx IV large, quadrangular plates with white center and dark rims.

Remarks: Imajima and Higuchi (1975) indicated that the presence of many (seven) nuchal papillae is a distinguishing character of *Augeneria polytentaculata*. The present specimen lacks nuchal papillae, but it has distinct pits at the place of the papillae, suggesting that the papillae are retractable. The presence of nuchal papillae is known to vary in other species of *Augeneria* (Orensanz 1990). The specimen agrees well with *A. polytentaculata* in other respects, in particular in the shape and distribution of the parapodial lobes and the distribution and numbers of composite hooded hooks. The specimen also resembles *A. albidentata* (Ehlers, 1908) from Southern Africa by the well-developed parapodial lobes, but this species has composite hooded hooks extending to about chaetiger 30 (Day 1967).

Distribution: Japan, Andaman Sea.

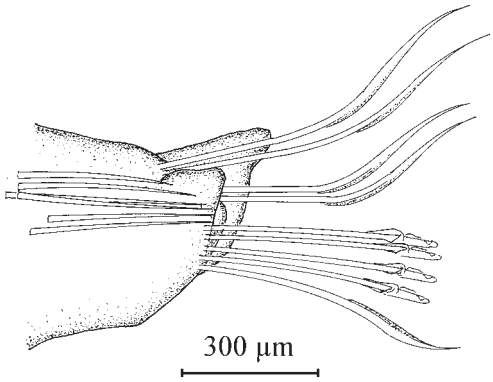

Figure 2 *Augeneria polytentaculata*: Left parapodium 10, anterior view. – Specimen from BIOSHELF st. E-3/OS.

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Cenogenus Chamberlin, 1919

Paraninoe Levenstein, 1977.

Diagnosis: Prostomium conical, with a nuchal papilla. Parapodia uniramous, with simple limbate chaetae and simple multidentate hooded hooks. Anterior body with long-bladed hooded hooks with slender tips, or simple chaetae only. Anterior parapodia with simple digitate postchaetal branchial lobes, extending back over a variable number of median segments. Mx III and IV unidentate. Mx V lacking.

Remarks: The genus *Cenogenus* has recently been reinstated and emended by Carrera-Parra (2001). *Paraninoe* Levenstein is regarded as a junior synonym of *Cenogenus*. The species may be distinguished by the number of teeth on mx II and the position and shape of hooded hooks. The genus (as *Paraninoe*) has been partially revised by Miura (1980) and Frame (1992).

Cenogenus nagae (Gallardo, 1968)

Lumbrineris nagae Gallardo, 1968: 85–86, pl. 34, fig. 6–13.
Paraninoe nagae. – Frame 1992: 203.
Cenogenus nagae. – Carrera-Parra 2001: 721.

Material examined: BIOSHELF st. H-1/OS (8, PMBC 18604); st. H-2/OS (1, ZMUC-POL-1189); st. J-2/OS (1, VMT); st. K-20m/BC (1, PMBC 18605); st. PB-5/BC (1, PMBC 18606); st. PB-7/BC (1, PMBC 18607); st. PB-8/BC (1, ZMUC-POL-1190).

Comparative material studied: Vietnam, Nha Trang, Gallardo st. 29 (1 paratype, ZMUC-POL-1202); st. 133 II (1 paratype, ZMUC-POL-1203); st. 178 (1 paratype, ZMUC-POL-1204).

Description: All specimens are incomplete, largest specimen measuring 10 mm for 58 chaetigers, width 1.1 mm. Prostomium triangular, longer than wide or as long as wide, with two longitudinal dorsal lines. Nuchal papilla present in some specimens, situated in a small pit at the border to the peristomium. Peristomium with two about equally wide rings. Anterior parapodia small and rounded, gradually developing in size to about chaetiger 15, with a digitiform vascularized postchaetal lobe. Tuberculate prechaetal lobe appears at chaetiger 22–32. Both prechaetal and postchaetal lobes increasing in size to about chaetiger 40–50, digitiform, thereafter diminishing in size. Prechaetal lobe attaining a size of one half to one third of the length of the postchaetal lobe.

Anterior and midbody chaetigers with limbate chaetae only. Anterior chaetigers with straight and apparently rather stiff chaetae, numbering 5–8 in each fascicle, from about chaetiger 20–25 most chaetae curved and with long outdrawn tips. Simple hooded hooks present posterior to chaetiger 40–60. Aciculae brown to black.

Maxillary apparatus comparatively large, reaching back to chaetiger 10–12. Maxillary carriers long and slim, anteriorly flared, semicircular, posteriorly long outdrawn rods. Carriers connected to mx I by a narrow joint. Mx II short, about half the length of mx I, with 5–6 teeth, some specimens with more teeth on the right than on the left plate. Mx III and IV rather large unidentate squarish plates. Maxillary parts mostly moderately sclerotized.

Remarks: The specimens agree with the original description in all important characters. Gallardo (1968) reported the number of teeth on mx II to be 4 on the left and 6 on the right. One of the examined type specimens, however, was found to have 6 teeth on both plates. The carriers were anteriorly distinctly wider than figured by Gallardo (plate 34, fig. 8). It may therefore seem that the shape of the maxillary parts may vary somewhat. The general shape of the carriers, however, which have a superficial resemblance to oenonid carriers, is exceptional and separates the species from other members of *Cenogenus*.

It is possible that *Lumbriconereis pseudo-bifilaris* Fauvel, 1932 from Burma represents the same species. The description, which was made from one incomplete specimen (Fauvel 1932, 1953), agrees in most characters, but Fauvel did not observe hooded hooks and stated that the number of teeth on mx II was higher on the left plate (8) than on the right plate (5).

Distribution: Andaman Sea, Vietnam.

Eranno Kinberg, 1865

Diagnosis: Prostomium conical, nuchal papillae may be present. Parapodia uniramous, with simple limbate and simple multidentate hooded hooks. Mx II proportionally short, connected to base of mx I by wide sclerotized ligament or pair of additional plates. Mx V present, partially fused to mx IV or free.

Remarks: The genus *Eranno* was originally erected for species having small occipital antennae, but was redefined by Orensanz (1990) based on jaw and chaetal characters. Frame (1992) and Hilbig (1995a) partly refined the diagnosis. As presently defined the genus includes about ten species. Frame (1992) provided a table to most species.

Eranno papillifera (Fauvel, 1918) comb. nov.

Lumbriconereis papillifera Fauvel, 1918: 508–509, fig. 4a–i.
Lumbriconereis mando Crossland, 1924: 41–44, figs. 53–56. **New synonymy.**
Lumbrineris papillifera. – Day 1967: 442, figs. 17.17p–s. – Gibbs 1971: 164.
Ninoe mando. – Gallardo 1968: 88–89, pl. 33, figs. 1–8.

Material examined: BIOSHELF st. L-1/BC (1, PMBC 18608); st. PB-3/BC (1, ZMUC-POL-1191); st. PB-5/BC (1, PMBC 18609).

Comparative material studied: Nha Trang, Vietnam (published in Gallardo 1968 as *Ninoe mando*), Gallardo st. 38 (1, ZMUC-POL-1214); st. 97 II (1, ZMUC-POL-1215); st. 133 II (1, ZMUC-POL-1216); st. 184 (fragments, ZMUC-POL-1217); st. 202 (1, ZMUC-POL-1218).

Description: One specimen (st. L-1/BC) is complete, measuring 75 mm for 205 chaetigers, width 1.0 mm; largest specimen (incomplete) width 1.5 mm. Prostomium triangular, somewhat longer than wide. Peristomium with two rings, posterior ring smaller than anterior ring and following segments. Anterior parapodia with low rounded prechaetal lobes and well-developed triangular dorsally skewed postchaetal lobes. Parapodia and lobes decreasing in size in midbody. Proximally on parapodia a small often faintly visible tuberculate notopodial remnant. Posterior body with longer parapodia with prolonged triangular upward turned postchaetal lobes. Posterior segments with a prominent tuberculate to digitiform papilla, situated posterior and slightly ventral to parapodium, beginning at chaetiger 85 in the complete specimen, posterior to chaetiger 109 (last chaetiger of anterior fragment) of largest specimen. Pygidium with four cirri in a quadratic arrangement.

Anterior chaetigers with limbate chaetae only, each parapodium with 7–10 chaetae. Simple hooded hooks present from chaetiger 25–30, numbering 1–3 in each fascicle, with main fang and a comb of 6–8 small apical teeth. Limbate chaetae present to chaetiger 46, last chaetigers with one chaeta situated among hooded hooks. Parapodia in posterior body with 3–4 hooded hooks. Aciculae yellow, about 5 in anterior parapodia. Notopodial remnant with small, thin notoaciculae.

Maxillary apparatus in chaetigers 1–8. Carriers large, ovoid in shape, largest width about middle. Mx I falcate, long and slim, with distinct posterolateral spur at junction to carrier. Mx II short, about half the length of mx I, with four teeth. Between mx II and base of mx I a pair of flat triangular to squarish plates, less strongly sclerotized than other maxillary parts. Mx III with two acute teeth. Mx IV broadly triangular, somewhat irregular in shape, with a posterior acute tooth, central area whitish. Mx V ovoid, closely connected to upper border of mx IV. All maxillary parts, except additional plates, strongly sclerotized.

Remarks: *Eranno papillifera* is characterized by the structure of the maxillary parts, the posterior occurrence of hooded hooks, and the strong ventrolateral papillae in the posterior part of the body. The species was described from eastern African waters (Fauvel 1918). Crossland (1924) based his description of *Lumbriconereis mando* on an incomplete specimen from Suez (50 segments).

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His figures of maxillae and bristles agree in detail with *E. papillifera*. Gallardo (1968) extended Crossland's description based on specimens from Vietnam, but misinterpreted the posterior papillae and described them as dorsal branchiae. Examination of specimens from Gallardo's material confirmed that the papillae are situated ventrolaterally. One of his specimens (ZMUC-POL-1216, 142 chaetigers) is fairly well preserved and agrees with *E. papillifera* in all important characters.

The species fits well with the present diagnosis of *Eranno*, and is here referred to this genus.

Distribution: Madagascar, tropical East Africa, Red Sea, Andaman Sea, Vietnam, Pacific islands.

Lumbrinerides Orensanz, 1973

Diagnosis: Prostomium long, distally pointed. Parapodia uniramous, with simple limbate chaetae and simple bidentate hooded hooks. Aciculae yellow or black. Mx I usually with 1–2 accessory teeth on inner margin. Mx III with two aliform expansions. Mx IV without teeth. Mandibles usually fused for entire length.

Remarks: The genus *Lumbrinerides* presently includes about 20 species. The genus has been partially revised by Perkins (1979) and Miura (1980). Following this, new species have been described by Imajima (1985).

Lumbrinerides aberrans (Day, 1963)

Lumbrineris aberrans Day, 1963: 411–412, fig. 8.
Lumbrinerides aberrans. – Orensanz 1973: 373. – Perkins 1979: 419, fig. 1b. – Miura 1980: 1023.

Material examined: BIOSHELF st. RY-2/BC (1, PMBC 18610).

Description: The specimen (incomplete) measures 16 mm for 79 segments, width 0.7 mm. Prostomium acorn-shaped with small apical papilla, somewhat longer than wide, with about 10 secondary rings. Peristomium with two incomplete rings, annulation faintly visible dorsally and ventrally. Anterior 6–7 parapodia small, fully developed parapodia from chaetiger 9. Following parapodia with low prechaetal lobe and triangular postchaetal lobe, similar throughout.

Limbate chaetae and hooded hooks present throughout from chaetiger 1. Anterior small parapodia with about 3 short limbate chaetae and 1–2 hooded hooks. Following chaetigers with distinctly longer limbate chaetae. From about chaetiger 25, 1–2 small thin limbate chaetae. Hooks distinctly bidentate, small on anterior segments, increasing in size backwards. Aciculae yellow.

Maxillae with large and anteriorly expanded carrier. Mx I with one subdistal accessory tooth. Mx II with 3 rounded teeth. All maxillary parts markedly sclerotized.

Remarks: The specimen agrees with characters of *Lumbrinerides aberrans* given by Perkins (1979) and Miura (1980). The species is characterized by the number of small anterior parapodia, mx I having one accessory tooth, and hooded hooks starting on chaetiger 1. Perkins (1979) provided a figure of the maxillae from the holotype. The specimen differs, however, somewhat from the original description by Day (1963) in having a shorter prostomium. Day (1963) also indicated that the hooded hooks start on chaetiger 4.

Distribution: South Africa, Andaman Sea.

Lumbrinerides sp.

Material examined: BIOSHELF st. E-3/BC (1, PMBC 18611); st. I-2/BC (1, PMBC 18612).

Description: Both specimens are incomplete. Largest specimen measures 12 mm for 66 segments, width 0.3 mm. Prostomium long, conical, 2.5–3.5 times as long as wide, with small terminal papilla. Peristomium with two incomplete and faintly visible rings. Anterior 4–5 parapodia small, fully developed parapodia from chaetiger 6. Anterior and middle parapodia with small papilliform to triangular postchaetal lobe. Parapodia from chaetiger 50–60 with long digitiform vascularized postchaetal lobe.

Anterior chaetigers with limbate chaetae only,

each fascicle with 3–5 chaetae. Bidentate hooded hooks present in middle and posterior body, apparently not present anterior to chaetiger 10. Posterior chaetigers mostly with one limbate chaeta and 2–3 hooks. Aciculae yellow.

Maxillae with large and anteriorly expanded carrier. Mx I with two low indistinct accessory teeth, one subdistal and one proximal, widely separated. All maxillary parts markedly sclerotized.

Remarks: Both specimens have lost most bristles, so bristle characters cannot be determined with certainty. The specimens are characterized by the very long prostomium and the rather posterior appearance of hooded hooks. Species with similar characteristics include *L. crassicephala* (Hartman, 1965) and *L. platypygos* (Fauchald, 1970) from the western Atlantic and eastern Pacific, respectively.

Lumbrineriopsis Orensanz, 1973

Diagnosis: Parapodia uniramous, with simple limbate chaetae and simple bidentate hooded hooks. Mx III with two aliform expansions. Mx IV finely denticulate. Pygidium discoidal.

Remarks: The genus *Lumbrineriopsis* presently includes about six species. The genus was partially revised by Miura (1980).

Lumbrineriopsis paradoxa (Saint-Joseph, 1888)

Lumbriconereis paradoxa Saint-Joseph, 1888. – Not Fauvel 1923.
Lumbriconereis mucronata Ehlers, 1908 *fide* Miura 1980: 1032–1033.
Lumbrineris mucronata. – Gallardo 1968: 84–85, pl. 34, figs. 1–5. – ? Knox and Green 1973: 247–250, fig. 1.
Lumbrineriopsis paradoxa. – Miura 1980: 1032–1033, fig. 7. – Not George and Hartmann-Schröder 1985.

Material examined: BIOSHELF st. C-1/OS (2, ZMUC-POL-1192); st. C-3/OS (1, PMBC 18613); st. E-20m/BC (1, PMBC 18614); st. E-20m/OS (1, VMT); st. E-1/BC (1, PMBC 18615); st. RY-1/BC (1, PMBC 18616).

Description: Specimens are small and slim. Largest complete specimen measuring 29 mm for 193 segments, width 0.45 mm. Prostomium elongate, about twice as long as wide, rounded anteriorly. Peristomium with one ring. Parapodia small, with short digitiform postchaetal lobe, similar throughout. Pygidium rounded, without cirri.

Limbate chaetae and hooded hooks present from chaetiger 1 to posterior end. Most anterior chaetigers (about 10) with 2 dorsal limbate chaetae, 1–2 hooded hooks and one ventral limbate chaeta. Following chaetigers with 2 limbate chaetae and 1 hook. Limbate chaetae short, distinctly bent. Hooded hooks stout, with two teeth and a subdistal tooth at about base of hood. Limbate chaetae and hooks similar throughout. Aciculae yellow.

Maxillae with long narrow posteriorly expanded carrier. Mx II about two thirds of the length of mx I, with 5–6 teeth. Mx IV with about 10 small teeth along dorsal margin. Maxillary parts moderately sclerotized.

Remarks: The specimens comply with characters of *Lumbrineriopsis paradoxa* given by Miura (1980) in having a prolonged prostomium, peristomium with one ring, yellow aciculae and mx II with 5 teeth each. They also agree well with specimens from Vietnam reported as *Lumbrineris mucronata* by Gallardo (1968), except that mx II of the latter species have 6 teeth each. Specimens from New Zealand reported as *L. mucronata* by Knox and Green (1973), however, differ by having more teeth on mx II (7–8) and mx IV (14) and hooded hooks starting on chaetiger 11, and hence may belong to a different species.

Miura (1980) examined the type specimens of *L. paradoxa* Saint-Joseph and *L. mucronata* Ehlers and considered them synonymous, a synonymy previously established by Hartman (1965).

Distribution: Atlantic Ocean, Mediterranean Sea, Vietnam, Andaman Sea.

Lumbrineris Blainville, 1828, emended Frame 1992

Diagnosis: Prostomium conical or globular, without antennae but occasionally with a single

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papilla in nuchal fold. Parapodia uniramous, with composite multidentate hooded hooks in the anterior parapodia, simple limbate chaetae and simple multidentate hooded hooks. Aciculae yellow or black. Mx III unidentate or bidentate. Mx V free standing, displaced outwards to mx IV.

Remarks: Most lumbrinerids without gills (*i.e.*, not belonging in the genus *Ninoe*) were originally described in the genus *Lumbrineris,* which in the past was rather widely defined. Various attempts have been made to subdivide the genus (*e.g.*, Fauchald 1970). The genus was restricted by Orensanz (1973, 1990) and Frame (1992) who separated out species based on maxillary and chaetal characters.

Lumbrineris* cf. *latreilli Audouin and Milne Edwards, 1834
Fig. 3

Lumbrineris latreilli Audouin and Milne Edwards, 1834. – Imajima and Higuchi 1975: 32–36, fig. 13. – Hilbig 1995: 298, fig. 11.8.
Lumbriconereis latreilli. – Crossland 1924: 10–32 (part), figs. 9–12. – Fauvel 1932: 152; 1953: 266, fig. 134.

Material examined: BIOSHELF st. H-1/OS (6, PMBC 18617); st. J-2/OS (7, ZMUC-POL-1193).

Description: Largest specimen (incomplete) measuring 13.6 mm for 39 chaetigers, width 2.0 mm. Prostomium triangular to conical, about as long as wide. Parapodia with low rounded prechaetal lobe and well-developed triangular to digitiform, vascularized postchaetal lobe, with sinuous ventrolateral border (Fig. 3).

Composite hooded hooks present in anterior 22–28 chaetigers, numbering 4–7 per fascicle. Anterior hooks with long blades (length/width ratio 7.5–11), blade rapidly becoming shorter after chaetiger 18–20, with an apical comb of small teeth (>10). Dorsal limbate chaetae present past chaetiger 39, ventral limbate chaetae present to chaetiger 30–33. Hooded hooks in middle and posterior chaetigers stout, with obtuse main fang surmounted by about 10 small teeth. Aciculae yellow, anterior parapodia with 4 aciculae, middle parapodia with 2 aciculae.

Maxillae with moderately large carrier and strong falcate forceps (mx I). Mx II almost as long as mx I, with 4 teeth. Mx III elongate, with two rounded teeth, the second tooth in some specimens worn and appearing as a subdistal bulge. Mx IV large, with one marked tooth. Mx V free, semicircular. Mx V light brown, other maxillary parts strongly sclerotized.

Remarks: The specimens agree in most respects with present descriptions of *L. latreilli* (*e.g.*, Imajima and Higuchi 1975; Ramos 1976; Hilbig 1995a). The shape of the parapodial lobes and the long blades of composite hooded hooks is as described by Crossland (1924). *Lumbrineris latreilli* is, however, a poorly characterized species and has been reported to be variable (Ramos 1976; Hilbig 1995a).

Distribution: Reported from world-wide areas.

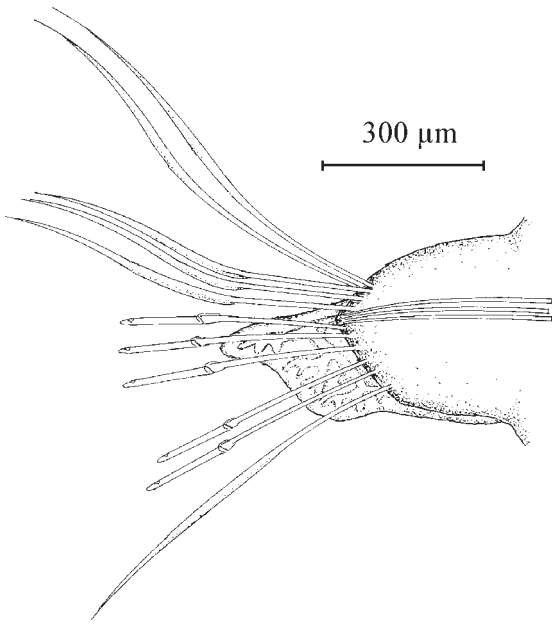

Figure 3 *Lumbrineris* cf. *latreilli*: Right parapodium 7, anterior view. – Specimen from BIOSHELF st. H-1/OS.

Lumbrineris* cf. *cingulata (Ehlers, 1897)
Fig. 4A–E

Lumbriconereis cingulata Ehlers, 1897: 76, pl. 5.
Lumbrineris cingulata. – Orensanz 1990: 82–85, pl. 22. – Frame 1992: 198–200, fig. 5.
Lumbrineris ? *amboinensis*. – Gallardo 1968: 82–83, pl. 29, figs. 9–10, pl. 30, figs. 1–8.

Material examined: BIOSHELF st. A-1/BC (2, ZMUC-POL-1194); st. C-1/BC (1, VMT); st. E-20m/BC (2, ZMUC-POL-1195); st. E-1/TD (6, PMBC 18618); st. G-1/BC (1, PMBC 18619); st. G-2/OS (4, PMBC 18620); st. H-1/OS (1, PMBC 18621); st. H-2/OS (1, PMBC 18622); st. I-20m/OS (1, PMBC 18623); st. I-1/OS (3, VMT); st. K-3/OS (1, PMBC 18624).

Description: All specimens are incomplete. Largest specimen measuring 14 mm for 70 segments, width 0.65 mm. Prostomium rounded to conical, about as long as wide. Anterior parapodia with a low rounded prechaetal lobe with a small dorsal process and a moderately developed auricular postchaetal lobe (Fig. 4A). Posterior parapodia with a short digitiform vascularized prechaetal lobe and a somewhat shorter tuberculate to digitiform postchaetal lobe.

Composite hooded hooks present in anterior 15–17 chaetigers; up to 6 hooks per fascicle. Hooks with fairly short blades (length/width ratio 2.5–4.0), with 6–8 small apical teeth (Fig. 4B). Limbate chaetae present in first 20–22 chaetigers, following 10–20 chaetigers with a single needle-thin capillary bristle inserted between hooded hooks. Middle and posterior hooded hooks stout, with main fang surmounted by 4–5 distinct teeth and some smaller teeth above these (Fig. 4C). Aciculae yellow.

Maxillae with moderately large carrier and strong falcate forceps (mx I). Mx II almost as

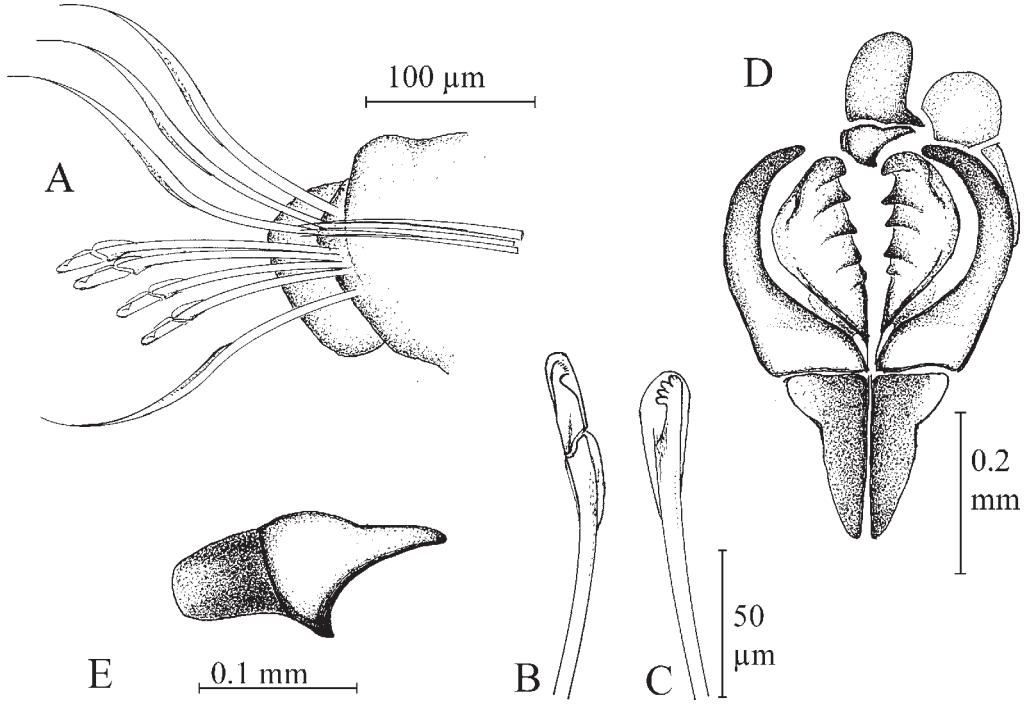

Figure 4 *Lumbrineris* cf. *cingulata*: A. Right parapodium 8, anterior view. B. Composite hooded hook, chaetiger 5. C. Posterior hooded hook, chaetiger 45. D. Maxillary apparatus, dorsal view, left mx III-V omitted. E. Right mx III, viewed from the side and flattened to show details. – A–C of specimen from BIOSHELF st. H-1/OS, D–E of specimen from BIOSHELF st. I-20m/OS.

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long as mx I, with 4–5 teeth (Fig. 4D). Mx III elongate, with one tooth and occasionally a small subdistal boss. Posterodorsal cutting edge arcuate, darkly sclerotized, leading to a prominent posterior expansion approaching the shape of a tooth, giving the impression of a plate with two widely separated teeth (Fig. 4E). Mx IV large, with one marked tooth, mx V free, squarish. Maxillary parts usually moderately sclerotized, in particular posterior parts of forceps and dorsal parts of mx III.

Remarks: This species fits into a group of small *Lumbrineris* species which are characterized by having composite hooded hooks with short blades, yellow aciculae and unidentate mx III with a strongly arcuate cutting edge. It is generally similar to *Lumbrineris cingulata* (Ehlers, 1897) from Atlantic waters, which was treated in detail by Orensanz (1990). In this group may also be included a small species from Vietnam tentatively assigned to *L. amboinensis* by Gallardo (1968). This species, however, is generally smaller and has lower numbers of bristles than *L. cingulata*.

Distribution: Andaman Sea, Vietnam?, Atlantic Ocean.

***Lumbrineris* sp.**
Fig. 5A–D

Material examined: BIOSHELF st. E-20m/BC (1, PMBC 18625); st. E-2/TD (1, PMBC 18626); st. I-3/BC (1, PMBC 18627).

Description: Largest specimen (incomplete) measuring 150 mm for 232 segments, width 2.4 mm. Prostomium broadly triangular, somewhat longer than wide. Anterior parapodia with low rounded prechaetal lobe and triangular to tongue-shaped postchaetal lobe (Fig. 5A). Postchaetal lobe gradually becoming digitiform in middle segments. Far posterior chaetigers with well-developed digitiform prechaetal and postchaetal lobes, both vascularized.

Composite hooded hooks present in anterior 20–25 chaetigers; up to 10 hooks per fascicle (Fig. 5A). Hooks with medium long blades (length/width ratio 3.5–4.5), with 5–7 apical teeth (Fig. 5B). Limbate chaetae present in first 30–35 chaetigers, following 10–20 chaetigers with a single needle-thin capillary bristle inserted between hooded hooks. Middle and posterior hooded hooks stout, with distinct main fang and 5–7 smaller teeth (Fig.

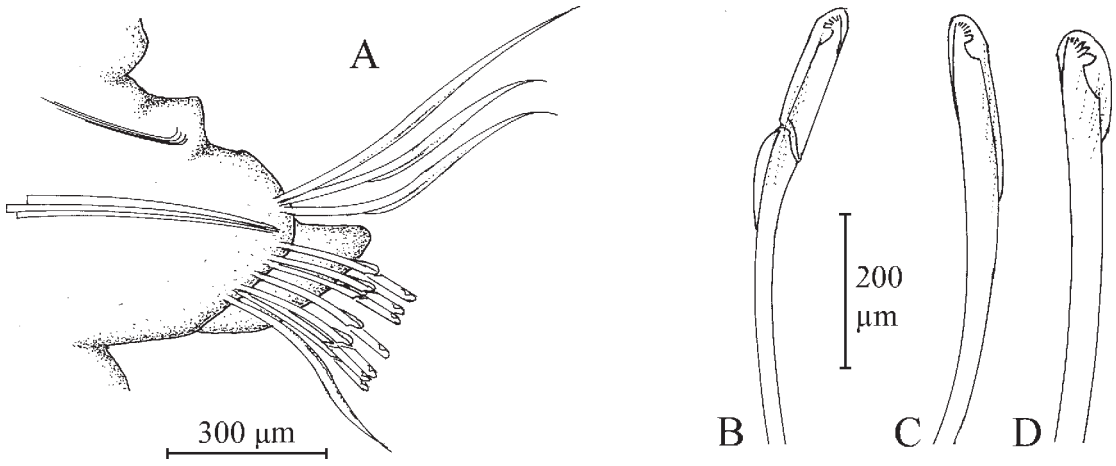

Figure 5 *Lumbrineris* sp.: A. Left parapodium 11, anterior view. B. Composite hooded hook, chaetiger 11. C. Simple hooded hook, chaetiger 26. D. Posterior hooded hook, chaetiger 210. – Specimen from BIOSHELF st. I-3/BC.

5C–D). Anterior parapodia with 3-4 aciculae, posterior parapodia with 1–2 aciculae. Aciculae yellow, in far posterior parapodia with dark brown core.

Maxillae with moderately large carrier and strong falcate forceps (mx I). Mx II almost as long as mx I, with 5 teeth. Mx III elongate, with one blunt rounded tooth; mx IV large, triangular, with one marked tooth. Mx V free, squarish. All maxillary parts strongly sclerotized.

Remarks: This form is generally similar to *Lumbrineris cruzensis* Hartman, 1944, by having prolonged chaetal lobes in posterior chaetigers, yellow aciculae and mx III with one tooth (see Hilbig 1995a). It differs, however, by being of larger size, by having longer composite chaetae, and by having less strongly produced posterior chaetal lobes. Uschakov and Bao-Ling (1979) reported *L. cruzensis* from the Yellow Sea.

Ninoe Kinberg, 1865

Diagnosis: Prostomium conical, with a pair of dorsal slit-like organs. Parapodia uniramous, with simple limbate chaetae and simple multidentate hooded hooks. Anterior parapodia with a number of digitiform postchaetal branchial lobes. Mx IV or mx III and IV with denticulate incisive edges.

Remarks: The genus *Ninoe* includes about 20 species. The species may be separated by the position of hooded hooks, the extension of the branchial region and development of branchiae, and the dentition of the maxillae. The genus has been partially revised by Orensanz (1973, 1990).

Ninoe bruuni Gallardo, 1968
Fig. 6A–B

Ninoe bruuni Gallardo, 1968: 88, pl. 36, figs. 4–9.
– Orensanz 1990: 100.

Material examined: BIOSHELF st. C-2/BC (1, PMBC 18628); st. C-2/OS (6, ZMUC-POL-1196); st. E-20m/OS (1, PMBC 18629); st. E-3/OS (1, PMBC 18630); st. G-1/OS (1, PMBC 18631); st. G-1/TD (1, PMBC 18632); st. G-2/OS (3, VMT); st. H-1/BC (1, PMBC 18633); st. H-1/OS (11, PMBC 18634); st. H-2/BC (2, PMBC 18635); st. H-2/OS (2, PMBC 18636); st. I-20m/OS (1, PMBC 18637); st. K-20m/BC (1, PMBC 18638); st. K-20m/OS (1, PMBC 18639); st. RN-1/BC (1, PMBC 18640); st. RN-2/OS (1, PMBC 18641); st. RN-3/OS (3, ZMUC-POL-1197); st. PB-3/BC (1, PMBC 18642); st. PB-5/BC (2, PMBC 18643); st. PB-7/BC (1, PMBC 18644); st. PB-8/BC (1, PMBC 18645); st. PB-8/OS (1, PMBC 18646).

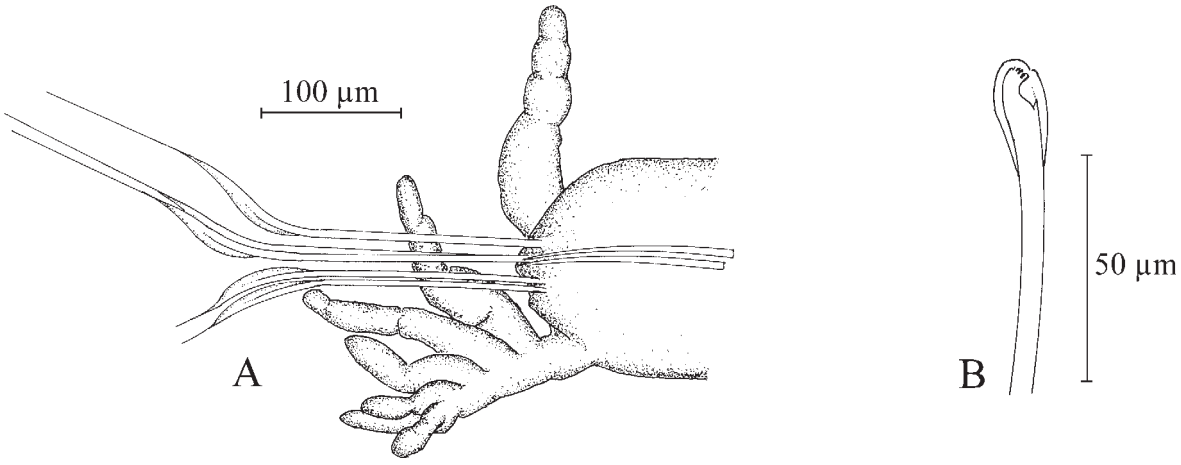

Figure 6 *Ninoe bruuni*: A. Right parapodium 24, anterior view. B. Posterior hooded hook, chaetiger 53. – Specimen from BIOSHELF st. H-1/OS.

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Comparative material studied: Nha Trang, Vietnam, Gallardo st. 45 (1 paratype, ZMUC-POL-1207); st. 75 (1 paratype, ZMUC-POL-1208); st. 228 (1 paratype, ZMUC-POL-1209).

Description: Most specimens are incomplete, width 0.4–0.6 mm. Largest complete specimen (width 0.48 mm) measuring 12 mm for 88 chaetigers, largest incomplete specimen measuring 14 mm for 103 chaetigers. Prostomium broadly triangular, longer than wide (length/width ratio 1.6–1.8). Anterior parapodia small, with low rounded prechaetal lobe and papilliform postchaetal lobe. Gills appear on chaetiger 3–4, continuing to chaetiger 24–27, situated ventral to postchaetal lobe. Most anterior gills unbranched digitiform (2–3 chaetigers), then branched with 2 filaments (2–3 chaetigers), then 3 filaments, increasing to a maximum of 5–6 filaments (Fig. 6A). Branched gills pectinate, with a main stem usually curved inwards and with upright filaments. Postchaetal lobe vascularized digitiform in gill region, after gill region small papilliform. Pygidium flattened, with two short anal cirri.

Anterior region with limbate chaetae only, up to 7 chaetae per fascicle in gill region. Dorsal limbate chaetae with rather short wing and long distal whip. Simple hooded hooks appear at about the last branchiate chaetiger, continuing to posterior end (Fig. 6B). Chaetal fascicles in postbranchial region with 2–3 limbate chaetae and 2–3 hooks. From about chaetiger 50–60 usually 3 hooks and 1 thin capillary chaeta situated among the hooks. Most posterior chaetigers with hooks only. Aciculae dark brown.

Maxillary apparatus with moderately large carrier and strong falcate forceps (mx I). Mx II shorter than forceps, with 5 teeth. Mx III triangular, with one tooth and a subapical lobe. Mx IV forming a curved roughly crescent-shaped plate with one tooth and about ten small teeth along incisive margin, anterior part touching mx V. Maxillary parts moderately sclerotized.

Remarks: This species is distinguished from most other members of *Ninoe* in that the hooded hooks do not appear until at the end of the branchial region. It is also characterized by the number of teeth on mx II and by having a generally short branchial region. *Ninoe bruuni* is most similar to *N. pulchra* Wesenberg-Lund, 1949 from the Iranian Gulf. In *N. pulchra*, however, the hooded hooks appear from chaetiger 35 and the gill region extends back to about chaetiger 30 (Wesenberg-Lund 1949).

In the description of *N. bruuni*, Gallardo (1968) reported the number of gill filaments to be not more than three (at chaetigers 16–20). Examination of specimens from his material confirmed the number of filaments, but in two specimens three filaments appear at a more anterior position (chaetiger 11–14), and in one specimen there are a few gills with four filaments. The higher number of gill filaments in the Andaman Sea specimens was hence judged not to be important for their systematic status.

Distribution: Andaman Sea, Vietnam.

Species of uncertain position

'*Kuwaita*' *notocirrata* (Fauvel, 1932)

Lumbriconereis notocirrata Fauvel, 1932: 156–158, fig. 23, pl. 7; 1953: 271–274, figs. 138, 139.

Material examined: BIOSHELF st. PB-3/BC (fragments, PMBC 18647).

Description: Largest fragment (anterior body) measuring 70 mm for 102 chaetigers, width 7 mm, head and pharyngeal apparatus missing. Parapodia well-developed, with distinct tuberculate dorsal cirrus. Anterior parapodia with low rounded prechaetal lobe and long, dorsally outdrawn postchaetal lobe. Postchaetal lobe becoming more slender and upwards directed in posterior chaetigers. Parapodia with about 4 aciculae and a bundle of small thin notoaciculae running into dorsal cirrus.

Anterior parapodia with limbate chaetae only, most anterior parapodia with about 15 long chaetae, following parapodia with about 10 shorter chaetae. Simple hooded hooks present from chaetiger 38 of fragment, hooks and limbate chaetae present on rest of fragment. Hooded hooks stout, with

apparently two blunt teeth and a group of smaller teeth in between, mostly worn.

Remarks: The fragments agree well with the characters of *Lumbriconereis notocirrata* as described by Fauvel (1932). The parapodia and hooded hooks are particularly characteristic and apparently distinguish the species from all other lumbrinerids. Orensanz (1990) separated the species from *Lumbrineris*, but did not assign it further to genus. The species is here considered to be related to *Kuwaita* because of the dorsal cirrus, but it cannot yet be included in that genus because the maxillary parts are insufficiently known.

Distribution: India, Andaman Sea.

Oenonidae Kinberg, 1865

Remarks: The oenonids are generally long cylindrical worms with rather simple external morphology. They superficially resemble the lumbrinerids, but differ by the absence of hooded hooks and by the basic shape of the maxillary apparatus, having long slender carriers loosely attached to mx I (prionognath arrangement). Usually there is an unpaired additional plate ventral to the carriers. The prostomium is well-developed and is often dorsoventrally flattened. In some genera stout acicular spines are present in the parapodia.

The family Oenonidae was originally erected for a few species with well-developed notopodia and maxillae with long slender carriers. Orensanz (1990) redefined the family and merged it with the Arabellidae, which is no longer recognized. An account of the taxonomic history of the family is given by Hilbig (1995b).

In the present material, seven species belonging to the genera *Arabella*, *Drilonereis* and *Notocirrus* were found. *Drilonereis* and *Notocirrus* are characterized by having strong acicular spines in the parapodia, and are distinguished by *Drilonereis* having mx I with falcate tips, whereas *Notocirrus* has rather simple mx I with denticulate inner margins. In *Arabella,* mostly simple limbate chaetae are present, but some species have acicular chaetae with pointed hoods in middle and posterior chaetigers. Mx I may be either falcate (subgenera *Arabella, Cenothrix*) or denticulate (subgenus *Notopsilus*) (see Orensanz 1974; Hilbig 1995b).

Arabella (*Notopsilus*) sp. A

Material examined: BIOSHELF st. E-1/TD (1, PMBC 18648).

Remarks: The specimen is small and slim, complete, with 133 chaetigers, measuring 0.35 mm in width. It has a long triangular prostomium with four eyes at the posterior border, parapodia with well-developed postchaetal lobes, and a short rounded pygidium with two short anal cirri. In middle and posterior chaetigers there are smooth and serrated limbate chaetae in upper position and smooth, thin limbates and a hooded acicular chaeta in lower position. Mx I are dentate and asymmetrical, the left piece has 11–12 teeth along the inner border and is larger than the right piece which has 9–10 teeth. The most anterior teeth are somewhat stronger than the other, but do not appear falcate. The mandibles are rod-like with curved anterior parts.

Crossland (1924) described a series of smaller forms with asymmetrical maxillae as *Arabella novecrinita* var. *asymmetrica*. Some of the forms did not have falcate mx I. The present specimen may seem to fall within the range of variation illustrated by Crossland. It differs, however, clearly from the nominate form of *A. novecrinita* (= *A. multidentata* (Ehlers, 1887)) which has strongly falcate symmetrical mx I (Crossland 1924; Perkins 1979).

Arabella (*Notopsilus*) sp. B

? *Arabella mutans*. – Fauvel 1953: 274–275, fig 140i–l (*A. geniculata*), 143g–i. – Not Chamberlin, 1919.

Material examined: BIOSHELF st. H-1/OS (1, PMBC 18649).

Remarks: The specimen is rather stout, bronze-coloured and iridescent. It is incomplete, in three

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pieces; anterior piece measures 18 mm for 66 chaetigers, width 1.0 mm at chaetiger 10. The prostomium is fairly short, conical, with four indistinct eyes concealed by the anterior fold of the peristomium. The parapodia have a small notopodial rudiment and a well-developed digitiform postchaetal lobe. Anterior chaetigers have up to ten limbate chaetae. In middle and posterior chaetigers there are smooth and serrated limbate chaetae in upper position and smooth, thin limbates and a hooded acicular chaeta in lower position. The hood is long and gradually tapering with a whip-like distal part. The aciculae are emergent and with pointed outdrawn tips. Mx I and II are dentate and asymmetrical, left mx I and right mx II are distinctly larger than the right and left pieces, respectively, and have numerous teeth along the inner margin.

The specimen agrees with the description of *Arabella mutans* by Fauvel (1953) in a number of respects, but seems to differ by having more teeth on mx I and II, and by having longer and more outdrawn hooded acicular chaetae.

Drilonereis logani Crossland, 1924

Drilonereis logani Crossland, 1924: 64–70, figs. 80–88. – Not Gallardo 1968.

Material examined: BIOSHELF st. H-1/OS (1, PMBC 18650); st. H-2/BC (1, VMT); st. I-20m/OS (1, PMBC 18651); st. J-2/OS (1, ZMUC-POL-1198); st. PB-5/BC (2, ZMUC-POL-1199); st. PB-7/BC (1, PMBC 18652); st. PB-8/BC (2, PMBC 18653).

Remarks: All specimens are incomplete; the largest specimen measures 70 mm for 220 chaetigers, width 0.45 mm. *Drilonereis logani* is characterized by having poorly developed parapodia, acicular spines present from chaetiger 1–4, mx I with 2–3 teeth at the bases and falcate prongs with crenulated inner margin, mx II with 7–8 teeth, an oblong ventral plate with rounded posterior end, and no mandibles. The parapodia are completely reduced in anterior body and become defined first from chaetiger 10–30. A small tuberculate postchaetal lobe is present from chaetigers 20–25. The specimens agree well with the description given by Crossland (1924), except that abruptly tapering limbate chaetae, which he described from posterior chaetigers, were not seen.

Gallardo (1968) reported *D. logani* from Vietnam, but his specimens differed by having mandibles and by having different numbers of teeth on mx I and II, and hence appear to belong to a different species.

Distribution: Red Sea, Eastern Africa, Andaman Sea.

Drilonereis* cf. *longa Webster, 1879

Drilonereis longa Webster, 1879: 240–241, pl. 7, figs. 84–88. – Uebelacker 1984b: 12–15, fig. 10. – Hilbig 1995b: 330–331, fig. 12.6.

Material examined: BIOSHELF st. C-2/OS (3, PMBC 18654); st. H-2/OS (2, ZMUC-POL-1200).

Remarks: All specimens are incomplete, the largest specimen measures 24 mm for 122 chaetigers, width 0.6–0.7 mm. The specimens agree with the description of *D. longa* given by Uebelacker (1984b) and Hilbig (1995b), except that acicular spines first appear in chaetiger 7–9, rather than in the first chaetiger. The maxillary apparatus, in particular, agrees in detail. *Drilonereis longa* is characterized by having poorly developed anterior parapodia, mx I with 3 strong teeth at the base, mx II with 4 strong teeth, a lanceolate ventral plate, and simple triangular mandibles. The parapodia become defined from chaetiger 8–15. Postchaetal lobes are present from the first chaetiger.

Distribution: Eastern Pacific and Mexico Gulf, Andaman Sea.

***Drilonereis* sp. A**

Material examined: BIOSHELF st. PB-4/BC (2, PMBC 18655); st. PB-6/BC (1, PMBC 18656).

Remarks: All specimens are incomplete, the largest specimen measures 48 mm for 270 chaetigers, width 0.4 mm. The species is

characterized by having a comparatively short triangular prostomium, anterior parapodia reduced, postchaetal lobes from chaetiger 7–10, acicular spines present from chaetiger 5, mx I with 1–2 teeth at the bases and falcate prongs with crenulated inner margin, mx II with 4 teeth, a short oval ventral plate, and no mandibles. Segments in midbody are distinctly three-ringed. The species is similar to *D. logani* in overall appearance, but differs in the shape of the prostomium, the development of the parapodia and the structure of mx II and the ventral plate.

***Drilonereis* sp. B**

? *Drilonereis logani*. – Gallardo 1968: 89–90, pl. 37, figs. 9, 10. – Not Crossland, 1924.

Material examined: BIOSHELF st. G-2/BC (1, PMBC 18657).

Remarks: The specimen is incomplete, measuring 25 mm for 114 chaetigers, width 1.0 mm. It has a triangular prolonged prostomium, reduced anterior parapodia, postchaetal lobes gradually developing from chaetiger 50, acicular spines present from the first chaetiger, mx I with wide bases with 5–6 teeth, mx II with 4 strong teeth, a lanceolate ventral plate, and no mandibles. The bristles are poorly developed in the most anterior chaetigers which appear to have acicular spines only. The number of chaetae is 3–4 at about chaetiger 10 and 5–7 at about chaetiger 25. Parapodia in middle and posterior body have 4–5 comparatively long chaetae.

The species agrees with *D. logani* sensu Gallardo (1968) in maxillary and bristle characters, but differs in that mandibles are present in the latter species. It is also similar to *Drilonereis* sp. D of Uebelacker (1984b), but this species has a short ventral plate and more bristles in anterior parapodia.

Notocirrus biaciculus Gallardo, 1968

Notocirrus biaciculus Gallardo, 1968: 90, pl. 37, figs. 11–13.

Material examined: BIOSHELF st. C-1/BC (2, PMBC 18658); st. C-3/BC (1, ZMUC-POL-1201); st. RY-3/BC (1, PMBC 18659).

Remarks: All specimens are incomplete, the largest specimen measures 16 mm for 91 chaetigers, width 0.3 mm. The specimens agree with the description given by Gallardo (1968), except for the development and symmetry of mx I and II. Mx I are fairly short and have 6–7 teeth each, rather than 8–11 teeth, while mx II are markedly asymmetrical with a short plate on the left with about 6 teeth and a long plate on the right with about 15 teeth. Mx III have 7–10 strong teeth each. *Notocirrus biaciculus* is characterized by its small size, by having two pairs of eyes and by having two acicular spines per chaetal fascicle. The parapodia have a small button-like notopodial remnant and a tuberculate postchaetal lobe. There are 3–4 fairly short, bent limbate chaetae in each fascicle. The most ventral chaetae have a distinct core in the limb and tend in shape towards hooded acicular chaetae with outdrawn hoods.

The specimens are also very similar to *Notocirrus* sp. A of Uebelacker (1984b), but seem to differ in the structure of the maxillae, as this species has a large left mx I. Uebelacker (1984b) reported and illustrated hooded acicular spines from *N*. sp. A. which are similar to the most ventral chaetae of the present specimens. This type of chaeta was not mentioned by Gallardo (1968).

Distribution: Vietnam, Andaman Sea.

Dorvilleidae Chamberlin, 1919

Remarks: The dorvilleids comprise a family of generally small-bodied worms. Most species and genera have been described in recent years, to a large extent as a consequence of routine use of fine-meshed sieves in benthic studies. Presently more than 30 genera are recognized (Eibye-Jacobsen and Kristensen 1994). The dorvilleids are characterized by having a maxillary apparatus consisting of several rows of small plates (ctenognath arrangement) and are unique among the eunicids in having an even number of prostomial appendages. Usually, both simple and composite chaetae are present.

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In the present material, two species, both belonging to the genus *Schistomeringos*, were found. *Schistomeringos* is characterized by having well-developed palps and antennae, notopodia with notoaciculae, furcate chaetae, and mandibles with accessory lateral teeth. The genus was restricted by Wolf (1986), who considered it to be a subgenus of *Dorvillea*. In recent studies it has been variously treated as a subgenus of *Dorvillea* (Hilbig and Blake 1991; Hilbig 1995c) or a separate genus (Orensanz 1990; Eibye-Jacobsen and Kristensen 1994).

Schistomeringos filiforma Hutchings and Murray, 1984

Schistomeringos filiforma Hutchings and Murray, 1984: 49–51, fig 16.1–7.

Material examined: BIOSHELF st. G-5/BC (1, PMBC 18660).

Remarks: The specimen is complete, fairly long and slim and measures 14 mm for 101 chaetigers, width 0.4 mm. It agrees with the description given by Hutchings and Murray (1984), except that the notopodial cirri first appear on chaetiger 4, rather than chaetiger 5. *Schistomeringos filiforma* is characterized by the lack of notopodia in most anterior chaetigers, by having minute eyes, and by having furcate chaetae with short equally long prongs. In the present specimen eyes are not visible, but they may have become invisible by preservation. The prongs of the furcate chaetae are 12–15 µm in length.

Distribution: Eastern Australia (New South Wales), Andaman Sea.

Schistomeringos sphairatolobos Glasby, 1984

Schistomeringos sphairatolobos Glasby, 1984: 101–104, figs. 2, 3.

Material examined: BIOSHELF st. E-20m/BC (1, PMBC 18661); st. L-1/BC (1, PMBC 18662).

Remarks: The largest specimen (incomplete) measures 15 mm in length for 84 chaetigers, width 0.5 mm. It agrees with the description given by Glasby (1984). *Schistomeringos sphairatolobos* is characterized by the presence of well-developed suprachaetal lobes on anterior parapodia. The lobes are best developed at chaetiger 5–20 and decrease posteriorly to chaetiger 25–30. The antennae have about 12 articles and are of about the same length as the palps. There is a pair of distinct reddish eyes between the insertion of the palps and the antennae. Notocirri are present from the second chaetiger. The notocirri are longer than the neuropodium in anterior chaetigers and have pointed cirrostyles. The furcate chaetae have tines of unequal lengths, 5 and 12 µm in length, respectively.

Distribution: Eastern Australia (Queensland), New Zealand, Andaman Sea.

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