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Eunicid Polychaetous Annelids from Japan—III*

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Résumé: Cinq espèces appartenant aux genres *Eunice*, *Marphysa* et *Nematonereis*, sont décrites. Trois espèces sont nouvelles pour la faune japonaise. *Eunice gracilicirrata* possède des soies aciculaires bidentees de couleur jaune. *E.* cf. *investigatoris* est caractérisé par les branchies développées dans les parapodes antérieurs ainsi que dans les parapodes postérieurs. Deux spécimens juvéniles récoltés à Kominato sont identifiés à *Marphysa conferta*. Les deux espèces *Eunice afra* et *Nematonereis unicornis* sont communes dans les eaux peu profondes de la région indo-pacifique.

1. Introduction

In the present study, five species belonging to the three genera *Eunice*, *Marphysa* and *Nematonereis* are studied. Three of them, *Eunice gracilicirrata*, *E.* cf. *investigatoris* and *Marphysa conferta*, are newly added to the Japanese fauna.

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The collections are deposited in the National Science Museum, Tokyo.

2. Materials and methods

Each specimen examined is presented here under the heading "Material" description of each species. The details for this section are given in a preceding report (MIURA, 1977a).

3. Description

Family Eunicidae SAVIGNY, 1818
Genus *Eunice* CUVIER, 1817

Eunice afra PETERS, 1817
(Fig. 1, a-n)

Eunice afra: CROSSLAND, 1904, pp. 289-296, pl. 20, figs. 1-5; OKUDA, 1937, pp. 276-278, figs. 18-19; HARTMAN, 1944, pp. 110-111, pl. 6, figs. 135-139; OKUDA, 1940, p. 17; IMAJIMA and HARTMAN, 1964, p. 250; FAUCHALD, 1970, pp. 16-18, pl. 1, figs. h-i.

Material

A	B	C	D	E	F	G	H	I	J
E 180	Apr. 17, 1976 Ishigaki	7.5	16-1	200-1	21-1	233	5	6.0	C S
E 181	,,	10.0	16-1	190-1	23-1	207	5	5.5	S C

Description: Two specimens were collected at Kabira, Ishigaki Island, in intertidal dead coral rock.

A complete worm measures 125 mm long by 6.0 mm wide including parapodia with 233 setigers. The body is cylindrical anteriorly with numerous white dots. The fourth setiger

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is colorless (Fig. 1, a). The prostomium is shallowly incised in front. The two oval eyes are outside the inner lateral antennae. The five antennae are irregularly annulated; the central longest one is two and a half times as long as the prostomium and has eight articulations, the inner lateral ones are almost equal to the central in length and in number of articulations, the outer lateral ones are one and a half times as long as the prostomium and have three to five articulations. The first peristomial ring projects forward on both ventro-lateral sides and is three times as long as the second one. A pair of short, irregularly annulated peristomial cirri are

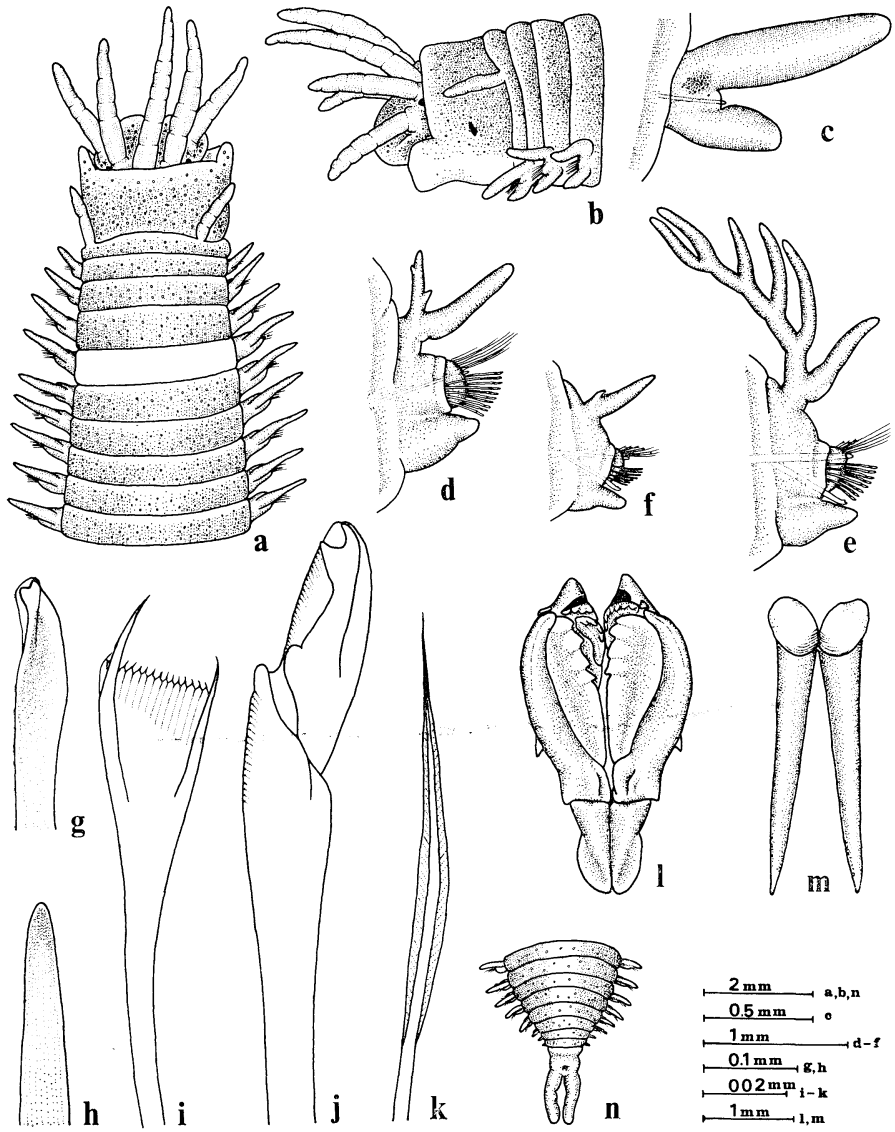

Fig. 1. *Eunice afra* Peters, 1817. a. Anterior end in dorsal view. b, The same, in lateral view. c, First parapodium, in anterior view. d, Parapodium 16. e, Parapodium 49. f, Parapodium 200. g, Subacicular hook. h, Aciculum. i, Pectinate seta. j, Compound falciger. k, Capillary seta. l, Maxillae, in dorsal view. m, Mandibles, in ventral view. n, Posterior end, in dorsal view.

as long as the prostomium (Fig. 1, b).

The ventral cirrus of the first parapodium is simple, digitiform and the dorsal one cylindrical (Fig. 1, c). Several anterior setigers have two acicula per parapodium (Fig. 1, d). Each posterior parapodium has an aciculum and a subacicular hook (Fig. 1, e–f). The rounded setal lobe always projects beyond the presetal lobe. Branchiae start from setiger 16 with a single or more filaments. The number of filaments increases rapidly, the maximal is five at about setiger 50 (Fig. 1, e), then it gradually decreases until the posterior end. The posterior branchial filament forms a simple papilla on the dorsal cirrus (Fig. 1, f).

The dark subacicular hooks are bidentate and hooded (Fig. 1, g). They are first present from setigers 21–23 and occur singly in a parapodium. Both teeth are directed distally. The acicula are stout and have dark blunt ends (Fig. 1, h). Each pectinate seta has asymmetrical extensions and 15 or more inner teeth (Fig. 1, i). The compound falcigers are bidentate and hooded (Fig. 1, j). Both teeth are directed obliquely upward. The cutting margin of each hood has 20–25 serrated minute teeth. The stem has 15–20 rows of short spines. Capillary setae are bilimbate (Fig. 1, k).

The maxillary formula is Mx. I=1+1 (forceps), Mx. II=4+4, Mx. III=(5–6)+0, Mx. IV=3+(6–9), Mx. V=1+1 (Fig. 1, l). The maxillary carriers are twice as long as wide. The mandibles are long and slender with oval calcified bodies (Fig. 1, m). The distal cutting edge has 7–10 lines. The shaft is more than five times as long as wide. The pygidium has two anal cirri (Fig. 1, n).

Discussion: The arrangement of branchia is variable. According to FAUCHALD (1970), *Eunice afra* includes forms with branchiae from setigers 11–20 and a maximum of nine filaments. The Japanese form was noted by IMAJIMA and HARTMAN (1964), as having branchiae from setigers 15–16 and a maximum of six filaments. The specimens from Ishigaki are considered as belonging to *E. afra* especially as described from Japan.

Distribution: Indo-Pacific area and West Indies in shallow waters; Southern Japan.

Eunice gracilicirrata (TREADWELL, 1922)
(Fig. 2, a–r)

Leodice gracilicirrata TREADWELL, 1922, pp. 149–150, figs. 36–38, pl. 5, figs. 1–8.

Material

A	B	C	D	E	F	G	H	I	J
E 193	Apr. 16, 1976 Ishigaki	6.2	3-1	239-1	56-1	343	8	4.2	S C

Description: One complete specimen separated in two pieces was collected at Kabira, Ishigaki Island in intertidal dead coral rock. The two pieces combined measure 140 mm long by 6.0 mm wide with 343 setigers. Some anterior and posterior setigers are cylindrical and the middle ones flattened. The prostomium is bilobed in front. The two small eyes are outside the inner lateral antennae and are nearly triangular with concave upper margins. Prostomial antennae are irregularly annulated; the central one with twelve annulations is two and a half times as long as the prostomium, the inner lateral ones are almost equal to the central, the outer ones with seven to eight annulations are twice as long as the prostomium. Peristomial cirri are long, slender and reach beyond the anterior margin of the prostomium. The first ring is twice as long as the second one (Fig. 2, a). The first one does not project forward on the ventro-lateral sides (Fig. 2, b).

Parapodia are characterized by their very long dorsal cirri. The dorsal cirri are three to five times as long as the ventral cirri. The annulation of dorsal cirri is distinct in the anterior parapodia (Fig. 2, c–e), and indistinct or absent in the remaining parapodia (Fig. 2, h–j). Ventral cirri are digitiform in the anterior few parapodia (Fig. 2, c–d), with proximal pads in the middle parapodia (Fig. 2, e–g), and are simple cones in the posterior parapodia (Fig. 2, h–j). Branchiae start from setiger 3 with single

slender filament (Fig. 2, d). The number of filaments increases rapidly, the maximal number is eight at about parapodium 40, thereafter it decreases gradually and is five at setiger 100.

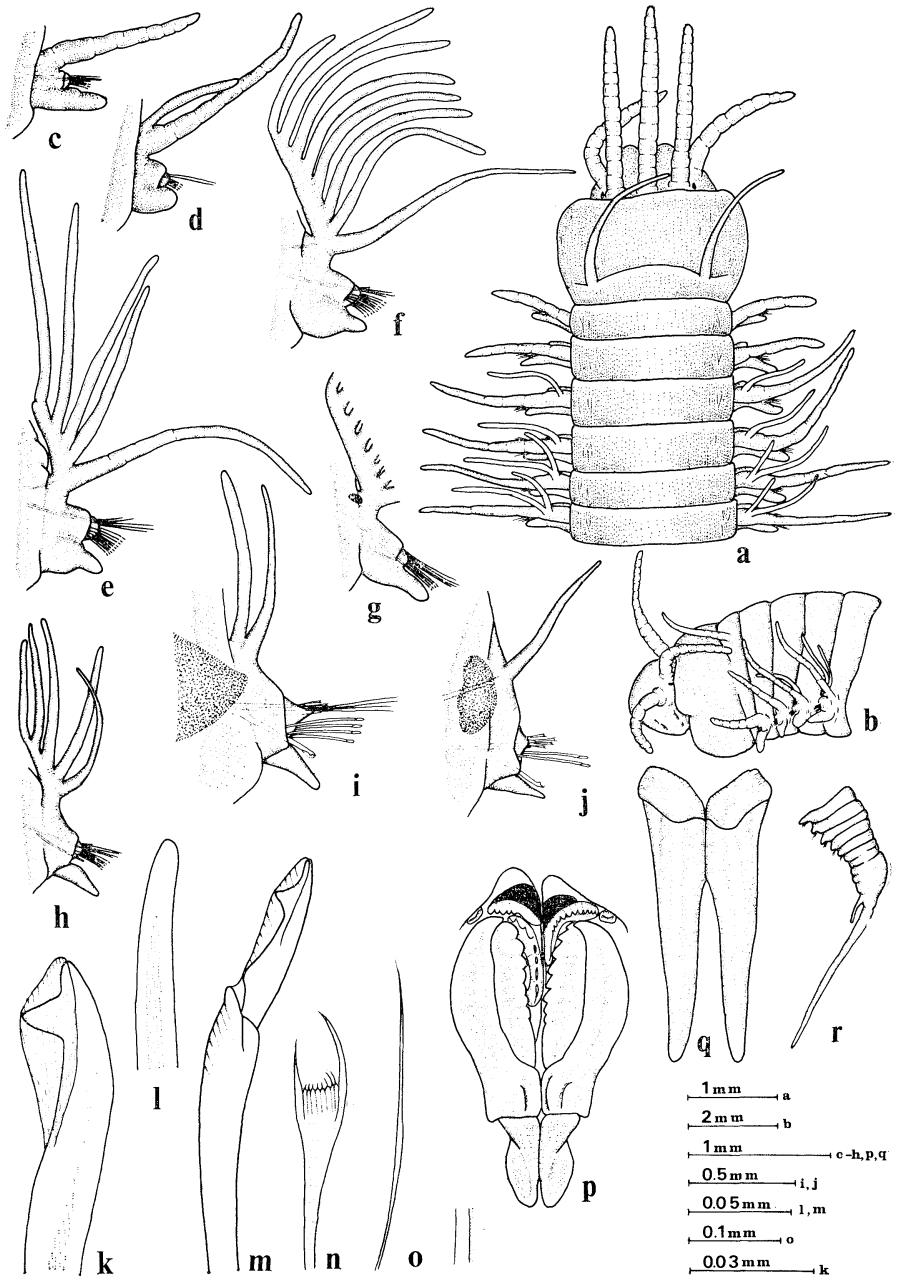

Fig. 2. *Eunice gracilicirrata* (Treadwell, 1923). a, Anterior end, in dorsal view. b, The same, in lateral view. c, First parapodium, in anterior view. d, Parapodium 3. e, Parapodium 15. f, Parapodium 30. g, Parapodium 70. h, Parapodium 120. i, Parapodium 200. j, Parapodium 240. k, Subacicular hook. l, Aciculum. m, Compound seta. n, Pectinate seta. o, Capillary seta. p, Maxillae, in dorsal view. q, Mandibles, in ventral view. r, Posterior end, in lateral view.

four at setiger 120 (Fig. 2, h) and one at setigers 180–240 (Fig. 2, i). Far posterior parapodia lack branchiae (Fig. 2, j).

Yellow subacicular hooks are first present from setigers 56–58 and occur singly in a parapodium. They are bidentate and hooded, the two teeth are equal in size and at right angles to each other (Fig. 2, k). Two yellow acicula occur on each parapodium, their tips are stout, slightly curved and project from the setal lobes (Fig. 2, l). Compound falcigers are bidentate and hooded, the appendage is rather long, the two teeth are widely separated, the hood has six to twelve rows of short spines; the shaft seven to ten rows on the cutting side (Fig. 2, m). Pectinate setae have seven to eight inner teeth and asymmetrical lateral extensions (Fig. 2, n). Capillary setae are slender and limbate (Fig. 2, o).

The maxillary formula is Mx. I=1+1 (forceps), Mx. II=7+8, Mx. III=6+0, Mx. IV=5+10, Mx. V=1+1. The maxillary carriers are concave at the distal ends (Fig. 2, p). The mandibles are stout and rather short, the distal cutting edges have 19–20 lines (Fig. 2, q). The pygidium has two long dorsal and two short ventral cirri, the dorsal one is seven to eight times as long as the ventral one (Fig. 2, r).

Discussion: *Eunice gracilicirrata* resembles *E. armillata* (TREADWELL, 1922) and they have been considered synonymous by HARTMAN (1956). *E. gracilicirrata* has branchiae with a maximal number of seven filaments from setiger 3 to about the 125th parapodium from the pygidium, whereas *E. armillata* has a maximal number of two filaments from setiger 6 to the 10th parapodium from the pygidium. The dorsal cirri of *E. gracilicirrata* are long and slender instead of short and stout as in *E. armillata*. The present author considers that *E. gracilicirrata* is a valid species. The specimen from Ishigaki agrees with *E. gracilicirata* with respects to the branchial distribution and of the shape of dorsal cirri.

Distribution: Suba Harbor, Fiji; Southern Japan.

Eunice cf. *investigatoris* FAUVEL, 1932
(Figs. 3 and 4, a–o)

Eunice investigatoris FAUVEL, 1932, pp. 137–138, fig. 19, a–f.

Material

A	B	C	D	E	F	G	H	I	J
E 216	Fukaura, 30 m depth	22.5	8-3	169-1	40-1	169	23	10.0	A F
E 217	,,	22.0	9-2	163-11	42-1	163	25	10.0	A F

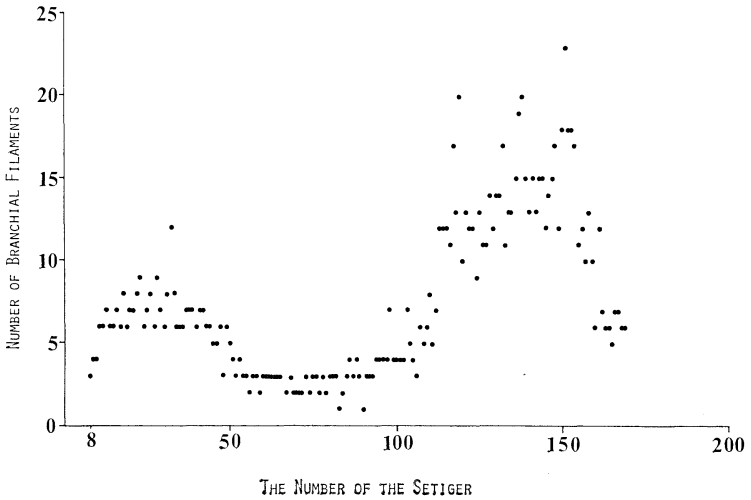

Fig. 3. Branchial distribution in specimen E 216 of *Eunice* cf. *investigatoris* Fauvel, 1932.

Description: Two specimens were collected from Fukaura, North-west coast of Honshu in 30 m depth. Specimen E 216 has a parchment-like tube partially covered with small gravels, and measures 290 mm long by 10 mm wide for 169 setigers. Both specimens lack some caudal

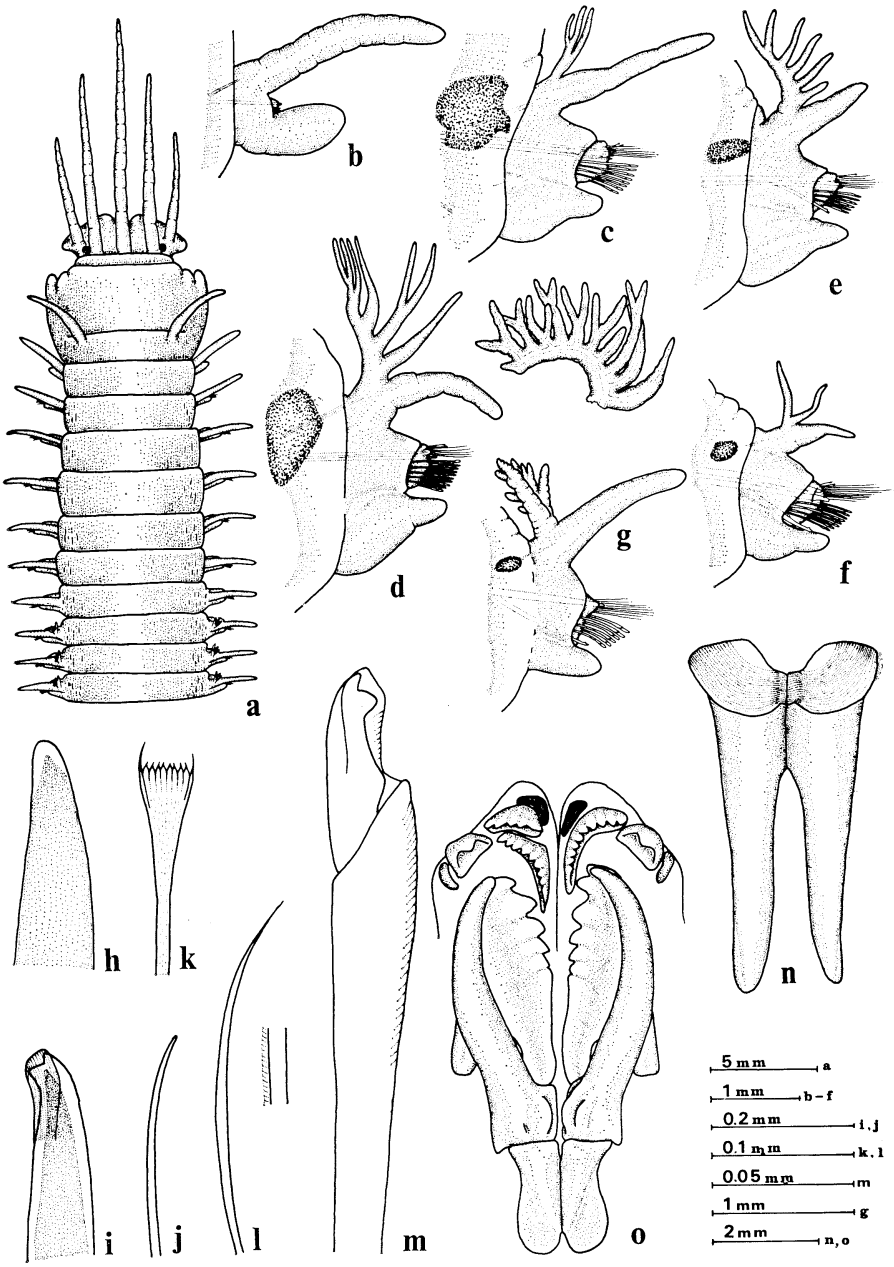

Fig. 4. *Eunice* cf. *investigotoris* Fauvel, 1932. a, Anterior end, in dorsal view. b, First parapodium, in anterior view. c, Parapodium 8. d, Parapodium 20. e, Parapodium 40. f, Parapodium 70. g, Parapodium 150 in anterior view and the branchia in lateral view. h, Aciculum. i, Subacicular hook. j, Notoacicular seta. k, Pectinate seta. l, Capillary seta. m, Compound falciger. n, Mandibles, in ventral view. o, Maxillae, in dorsal view.

segments. The coloration could not be described on alcoholic specimens. The body is cylindrical anteriorly and relatively flattened posteriorly.

The prostomium is deeply notched in front and is twice as wide as long. The two rounded eyes are outside the inner lateral antennae. There are five occipital antennae; the central one with twelve annulations reaches the anterior margin of setiger 4, the inner lateral ones with ten annulations reach the middle of setiger 3, the outer ones with seven to eight annulations reach the anterior margin of the second peristomial ring. The anterior part of the first peristomial ring overlaps the posterior part of the prostomium and is projected forward on lateral sides. The second ring has a pair of cirri as long as the first ring and they have five annulations. The peristomial rings combined are wider than long (Fig. 4, a).

The first parapodium has a cylindrical dorsal cirrus, a digitiform ventral one and a few setae (Fig. 4, b). The dorsal cirri are longer and stouter than the branchial filaments or stems in all branchial setigers. The ventral cirri bear anteriorly basal swellings (Fig. 4, c-f) and are simple and digitiform posteriorly (Fig. 4, g). The setal lobes are rounded with small papillae in the supracicular portion (Fig. 4, c-e). Branchiae are first present from setiger 8 with three filaments (Fig. 4, c). The number of branchial filaments increases to eight to 12 on setigers 26-33, then decreases to one to three on setigers 55-94, thereafter it increases again to 20-23 on setigers 130-154 and decreases again to five to six in the posterior end of the incomplete specimen. The exact distribution of branchial filaments is given in Fig. 3. The branchiae anterior to setiger 100 are directed parallel with the dorsal cirri and the posterior branchiae at a right angle to the cirri (Fig. 4, d-g).

Each parapodium has one to three dark acicula (Fig. 4, h). The subacicular hooks are present from setiger 40 as a single seta. They are dark, bidentate and hooded (Fig. 4, i). Notoacicular setae inside of the base of the dorsal cirrus, are slender and number four to five in a bundle (Figt 4, j). Each pectinate seta has lateral asymmetrical extensions and about eight inner teeth (Fig. 4, k). Capillary setae are long, slender and limbate (Fig. 4, l). Compound falcigers are bidentate and hooded; the hood has 10-12 serrations on the cutting edge, the stem has many short spines in 30-50 rows (Fig. 4, m).

The pharyngeal apparatus is black. The mandibles have stout shafts and the calcified bodies with more than 20 lines (Fig. 4, n). The maxillary supports are long. The maxillary formula is Mx. I=1+1, Mx. II=5+6, Mx. III =8+0, Mx. IV=5+9, Mx. V=1+1 (Fig. 4, o).

Discussion: *Eunice investigatoris* shows a bi-modal distribution of branchiae. Such distribution was mentioned by FAUVEL (1932) for this species and for *E. antennata* (SAVIGNY, 1820). *E. antennata* can be distinguished from this species in that it has yellow, tridentate subacicular hooks.

Branchiae were present from setiger 8 or 9 in our specimens and from setiger 6 in the original material of *E. investigatoris*. The maximal number of branchial filaments on the anterior part is about ten in our specimens and were 18-20 in Fauvel's.

Distribution: Persian Gulf, 45 m; Fukaura, 30 m.

Genus *Marphysa* QUATREFAGES, 1865
Marphysa conferta MOORE, 1911 (juvenile)
(Fig. 5, a-j)

Marphysa conferta MOORE, 1911, pp. 252-254, pl. 16, figs. 29-34; HARTMAN, 1944, p. 129; 1961, p. 83; FAUCHALD, 1970, pp. 59-60.

Material

A	B	C	D	E	F	G	H	I	J
E 198	July 31, 1976, Kominato	1.7	8-4	17-5	18-1	70	5	1.3	S C
E 199	,,	1.7	7-3	16-3	16-1	34	5	1.3	A F

Description: Two juvenile specimens were collected from a subtidal rocky shore of Kominato. They lived in the roots of *Phyllospadix japonica*. A complete specimen measures 4.7 mm long by 1.3 mm wide for 70 seitgers. The body is cylindrical and colorless except for the black eyes. The prostomium is rounded anteriorly and longer than wide. There are three occipital antennae; all of them are smooth and do not reach beyond the anterior margin of the prostomium. The two eyes are outside the paired antennae. The first peristomial ring is U-shaped in dorsal view and slightly longer than the second one (Fig. 5, a).

The dorsal cirri are cylindrical and slender. The ventral cirri have proximal pads. The setal lobes are triangular. The postsetal lobes are conical and higher than the setal lobes in the parapodia anterior to setiger 20. Ten pairs of branchiae are present. They start at setiger 7 or 8 with three to four filaments (Fig. 5, b). The maximal number of filaments is five.

Yellow acicula are present singly in a parapodium (Fig. 5, c). Subacicular hooks are yellow, bidentate and hooded (Fig. 5, d). They start at setigers 16–18 and occur singly in a parapodium. Compound falcigers are bidentate and hooded (Fig. 5, e). Compound spinigers are absent. Each pectinate seta has asymmetrical lateral extensions and six to eight inner teeth (Fig. 5, f). Capillary setae have numerous spines on their cutting margins (Fig. 5, g).

The mandibles have long shafts and their cutting edges have three lines (Fig. 5, h). The maxillary carriers are long and have narrow basal wings. The maxillary formula is Mx. I=1+1, Mx. II=6+6, Mx. III=6+0, Mx. IV=4+10, Mx. V=1+1 (Fig. 5, i). The pygidium has a pair of anal cirri (Fig. 5, j).

Discussion: *Marphysa conferta* as originally described by MOORE (1911) measures 24 mm long for 57 setigers. Our specimens are juvenile in that they have only three antennae. The larger one measures 4.7 mm long for 70 setigers.

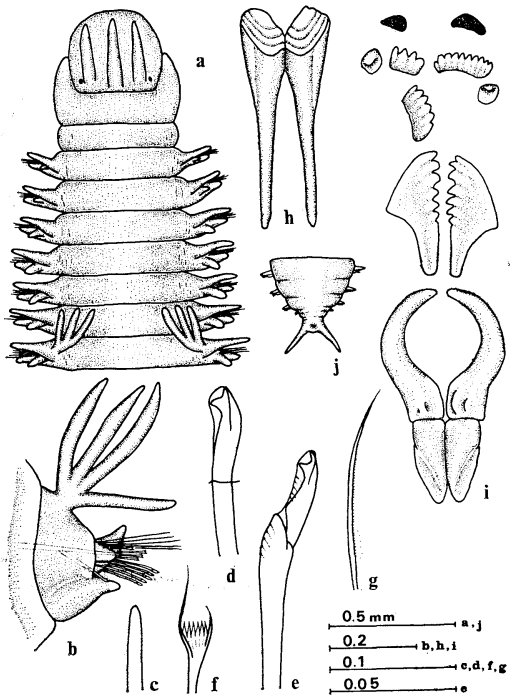

Fig. 5. *Marphysa conferta* Moore, 1911 (juvenile). a, Anterior end, in dorsal view. b, Parapodium 16, in anterior view. c, Aciculum. d, Subacicular hook. e, Compound falciger. f, Pectinate seta. g, Capillary seta. h, Mandibles, in ventral view. i, Maxillae, in dorsal view. j, Posterior end, in dorsal view.

According to FAUCHALD (1970), two species are characterized by the presence of the branchia limited to an anterior region of the body, the presence of compound falcigers and the absence of compound spinigers. *M. adenensis* GRAVIER, 1900 has branchia from setiger 13 to setiger 29. *M. conferta* has branchiae from setiger 8 to setiger 16 (X–XVII after MOORE). The present specimens fit with *M. conferta* in that they have branchiae from setiger 7 or 8 to setiger 16 or 17.

Distribution: off Brockway Point, Santa Rosa Island, 69.5–73.3 m; California; Kominato, Japan.

Genus *Nematonereis* SCHMARDA, 1861

Nematonereis unicornis (GRUBE, 1840)

(Fig. 6, a–g)

Nematonereis unicornis: FAUVEL, 1923, pp. 412-413, fig. 162, h-n; OKUDA, 1937, pp. 290-291, figs. 36-37; 1938, p. 96; IMAJIMA and HARTMAN, 1964, pp. 260-261; IMAJIMA, 1967, pp. 432-433; 1968, p. 31, pl. 12, fig. f; WU *et al.*, 1975, p. 84, fig. 6, 1-9.

Material

A	B	C	D	E	F	G	H	I	J
E 211	July 31, 1976, Kominato	1.4	—	—	11-1	—	23	0.8	A F
E 215	Sep. 7, 1976, Kominato	2.2	—	—	15-1	—	42	0.7	A F

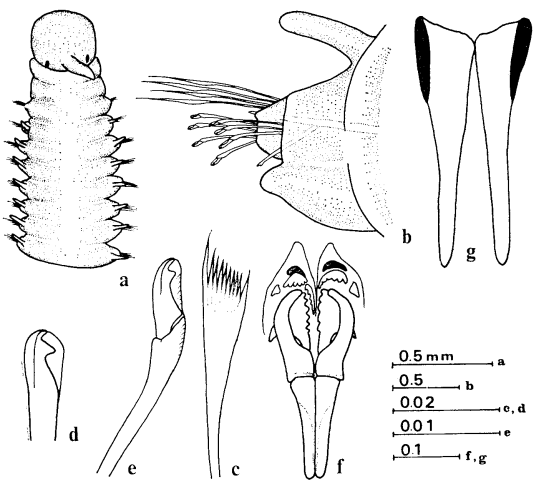

Fig. 6. *Nematonereis unicornis* (Grube, 1840). a, Anterior end, in dorsal view. b, Parapodium 15, in anterior view. c, Pectinate seta. d, Subacicular hook. e, Compound falciger. f, Maxillae, in dorsal view. g, Mandibles, in dorsal view.

Description: Two incomplete specimens were collected from intertidal rocky areas of Kominato. Specimen E 211 measures 3.5 mm long for 23 setigers. The body is filiform. The prostomium is rounded anteriorly with two reddish brown, oval eyes near the posterior margin. There is a smooth occipital antenna shorter than the prostomium. The peristomium consists of two apodous rings (Fig. 6, a). The parapodia are uniramous (Fig. 6, b).

The supracicular setae consist of long capillaries and pectinate setae. Each pectinate seta has nine to ten inner teeth and asymmetrical extensions (Fig. 6, c). Subacicular hooks are bidentate and hooded (Fig. 6, d). They occur singly in a parapodium. The acicula are dark and bluntly tapered. The compound falcigers are bidentate, hooded and distally curved (Fig. 6, e).

The maxillary formula is Mx. I=1+1, Mx. II=6+5, Mx. III=4+0, Mx. IV=5+6, Mx. V=1+1. The maxillary carriers are very long (Fig. 6, f). The mandibles are bigger than the maxillae and not calcified. Each mandible has a dark long support laterally (Fig. 6, g).

Discussion: *Nematonereis unicornis* is a small and common species in the shallow waters of Indo-Pacific area.

WU *et al.* (1975) reported two epitokous specimens collected from Yong-xing Island, the Xisha Islands.

Distribution: Indo-Pacific area; Mediterranean Sea; Japan.

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日本産イソメ科多毛環虫類—III

三　浦　知　之

要旨: 第1・2報に続き，本報では日本産イソメ科多毛類の分類学的研究を進め，次の3未記録種と2既知種について記載報告する。

Eunice afra は2歯黒色の足刺状剛毛を持ち，ひろくインド・太平洋浅海に知られている。*E. gracilicirrata* は2歯黄色の足刺状剛毛を持つが，石垣島から採集され，日本初記録である。*E.* cf. *investigatoris* は2歯黒色の足刺状剛毛を持ち，また体前後部に双極的に発達した鰓を備えた数少ない種のひとつである。本種は青森県深浦沖から採集され，日本初記録である。*Marphysa conferta* はカリフォルニアから知られている種であり，幼若な個体が千葉県小湊から初めて得られた。*Nematonereis unicornis* は日本沿岸に普通である。