

Eunicid Polychaetous Annelids from Japan—II*

Tomoyuki MIURA**

Résumé: L'auteur décrit dans cet article sept espèces des quatre genres (*Eunice*, *Palola*, *Marphysa* et *Lysidice*) de la famille Eunicidae.

Les échantillons sont collectés dans les eaux peu profondes de la presqu'île d'Oga, de Kominato sur la presqu'île de Boso, de la Baie de Suruga et de l'île Ishigaki, ainsi qu'à des profondeurs de 20-200 m de la Baie de Kagoshima.

Deux espèces sont premièrement ajoutées ici à la faune japonaise; *E. (Nacidion) cariboea* et *M. disjuncta*. Et on y met aussi l'une, *E. spinea* qui est nouvelle pour la science. Elle se caractérise par des antennes longues, des branchies à 1-3 filaments et des soies composées à long article cultriform localisées sur une courte partie antérieure du corps.

1. Introduction

In this paper, seven species in four genera, *Eunice*, *Palola*, *Marphysa* and *Lysidice* are presented. Two species, *Eunice (Nacidion) cariboea* and *Marphysa disjuncta*, are newly added to the Japanese fauna. One species, *Eunice spinea*, is described as new to science.

The author is deeply indebted to Dr. Kristian FAUCHALD of the University of Southern California, Los Angeles, California for critically reading the manuscript. The author wishes to express his thanks to Dr. Minoru IMAJIMA of National Science Museum, Tokyo and Prof. Dr. Tatsuyoshi MASUDA of the Tokyo University of Fisheries, Tokyo for their very valuable advice. Thanks are due to Director Takashi TAKEUCHI of the Akitaken-Oga Aquarium and the members of Tokai University and Seikai

Regional Fisheries Research Laboratory, who donated many of the specimens examined in this study.

The type specimens and most of the remaining collections are deposited in the National Science Museum, Tokyo.

2. Material and method

Each specimen examined is presented here under the heading "Collection" description of each species. The detail of this section is given by the preceding report (MIURA, 1977), except of a column K for *Eunice*, which is defined as follows.

K: First occurrence of compound falcigers, counted from the anterior end as the number of the setiger, on which the first compound falciger occurred.

3. Description

Family Eunicidae SAVIGNY, 1818

Genus *Eunice* CUVIER, 1817

Eunice vittata (DELLE CHIAJE, 1828)

(Fig. 1, a-o)

Eunice vittata: MCINTOSH, 1885, pp. 275-276, fig. 36, pls. 39, fig. 18 and 21A, figs. 10-11; FAUVEL, 1923, pp. 404-405, fig. 158, h-n; HARTMAN, 1944, p. 118; HARTMAN, 1948, pp. 77-78; IMAJIMA and HARTMAN, 1964, p. 258; DAY, 1967, p. 385, fig. 17, 3, a-e; FAUCHALD, 1970, pp. 48-49, pl. 3, figs. 1-m. ?*Eunice medicina* MOORE, 1903, pp. 441-444, pl. 25, figs. 49-51; IZUKA, 1912, pp. 125-126, pl. 14, fig. 8; IMAJIMA and HARTMAN, 1964, p. 257.

* Received March 5, 1977

** Laboratory of Aquatic Zoology, Tokyo University of Fisheries, Minato-ku, Tokyo, 108 Japan

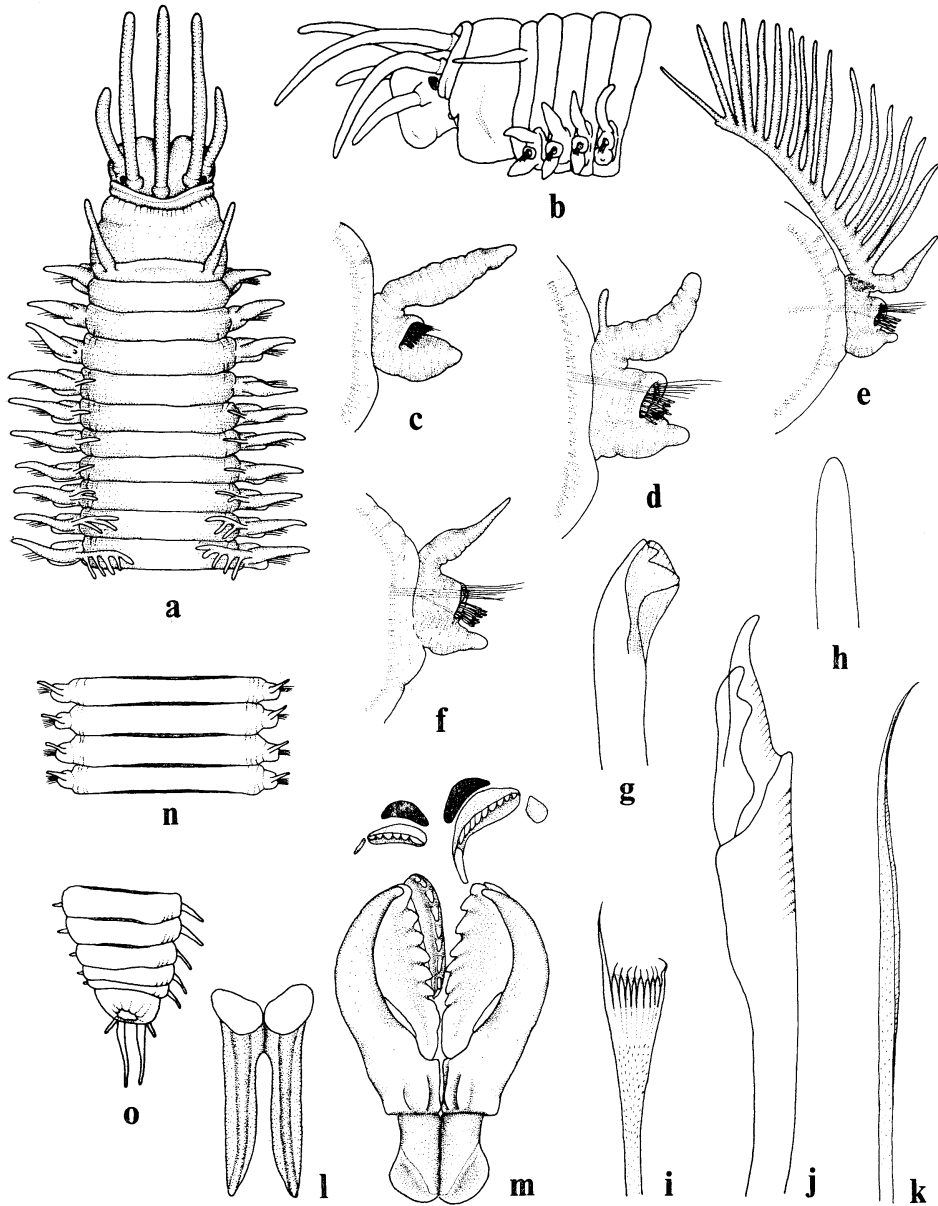


Fig. 1. *Eunice vittata* (DELLE CHIAJE, 1828). a, Anterior end, in dorsal view, $\times 15$. b, The same, in lateral view, $\times 15$. c, First parapodium, in anterior view, $\times 40$. d, Parapodium 3, in anterior view, $\times 40$. e, Parapodium 40, in anterior view, $\times 25$. f, Parapodium 60, in anterior view, $\times 40$. g, Subacicular hook, $\times 400$. h, Aciculum, $\times 400$. i, Comb seta, $\times 800$. j, Compound seta, $\times 800$. k, Capillary seta, $\times 400$. l, Mandibles, in ventral view, $\times 25$. m, Maxillae, in dorsal view, $\times 40$. n, Posterior segments, in dorsal view, $\times 10$. o, Caudal region, in dorsal view, $\times 25$.

		Collection								
A	B	C	D	E	F	G	H	I	J	
E 50	Oct. 7, 1975 Kominato	7.2	3-1	49-1	38-1	200	17	4.5	C S	
E 51	„	6.8	4-1	48-1	35-1	49	17	4.5	A F	
E 52	Nov. 19, 1975 Kominato	5.9	3-1	47-1	35-1		15	4.5	C S	
E 134	Sep. 1, 1972 Suruga Bay	4.0	3-1	44-1	29-1	99	9	2.8	A F	
E 139	Feb. 18, 1976 Kominato	7.7	6-1	51-1	38-1	192	17	4.3	C S	
E 140	„	7.8	6-1	49-1	40-1	84	20	4.2	A F	
E 141	„	5.1	3-1	44-3	27-1	99	8	2.4	A F	
E 142	„	8.1	3-1	49-6	38-1	110	16	3.7	A F	
E 143	„	-	-	-	-	-	-	-	P F	
E 144	„					Only tube				

Description: A complete specimen (E 50) measures 100 mm long by 4.5 mm wide including parapodia with about 200 setigers. In life, the same specimen was 150 mm long and 3.5 mm wide.

The color of dorsum is reddish brown and anterior setigers are darker than posterior. The prostomium is colorless. The two peristomial rings are also colorless or light yellow. The first two setigers show distinct brown bands. In the branchial and postbranchial regions, the basal part of each dorsal cirrus is marked by a reddish brown patch. Furthermore, posterior furrows are dark brown (Fig. 1, n).

The prostomium is relatively small and bilobed in front. The five occipital antennae are smooth with basal swellings; the longest and central one is three times as long as the prostomium, the inner lateral pair are almost the same length as the central, and the outer pair are half the length of the others. Two eyes are situated outside the bases of the inner lateral antennae. The anterior part of first peristomial ring overlaps the posterior part of the prostomium. The peristomium is wider posteriorly than anteriorly in proportion 3:2. The second peristomial ring has a pair of cirri as long as the two peristomial rings combined (Fig. 1, a-b).

Parapodia are uniramous. The dorsal cirri are digitiform, anteriorly with a rounded tip (Fig. 1, c) but posteriorly with a tapered end (Fig. 1, f). They are irregularly wrinkled. The ventral cirri are conical with a swollen proximal part. Branchiae start from parapodium 3 as a single filament (Fig. 1, d). At parapodium 10, each branchia has five filaments; the branchial

stem becomes increasingly stout and has 13 filaments at parapodium 15. From parapodium 20 to parapodium 45, branchiae have more than 15 filaments (Fig. 1, e). The maximal number is 20. Thereafter the number of filaments decreases gradually to about parapodium 50 where the branchiae are absent abruptly. The last branchiae have six to seven filaments.

Yellow subacicular hooks appear from about setiger 35 and usually occur singly. The tip is tridentate and hooded (Fig. 1, g). Acicula are also yellow with a blunt tip and number two in each parapodium (Fig. 1, h). Comb seta has eight to ten inner spines and asymmetrical extensions (Fig. 1, i). Each bidentate compound falciger is hooded. The hood is long and tapered with a blunt end (Fig. 1, j). Limbate setae are situated in the supracicular fascicles (Fig. 1, k).

The mandibles are well-developed with anterior calcifications at the cutting edges (Fig. 1, l). The maxillary carriers are broad with rounded distal end. The maxillary formula is Mx. I=1+1, Mx. II=(6-7)+(7-8), Mx. III=(6-8)+0, Mx. IV=(5-7)+(9-11), Mx. V=1+1 (Fig. 1, m).

The pygidium has four smooth anal cirri; the dorsal pair are three times as long as the ventral (Fig. 1, o).

Distribution: Mediterranean Sea; Atlantic, Pacific and Indian oceans, in warm waters; Japan.

Discussion: *Eunice vittata* is very similar to *E. indica*. in having yellow tridentate subacicular hooks, elongate hoods on the compound setae, the first occurrence of the branchiae (setiger 3), anteriorly restricted distribution of

branchiae and the rather small prostomium. The two species can be distinctly separated on one character, i. e. the number of subacicular hooks per parapodium. *E. indica* has more than three subacicular hooks in a parapodium. On the other hand, *E. vittata* has a single or rarely two subacicular hooks in a parapodium. The numbers of subacicular hooks quoted in *E. vittata* and *E. indica* previously are shown below.

Eunice vittata

1: MCINTOSH, 1885; IMAJIMA and HARTMAN, 1964.

1, 2: HARTMAN, 1948.

2, 3: IZUKA, 1912, pp. 120-121, pl. 12, figs. 7-9.

Eunice indica

4: OKUDA, 1938, p. 95; DAY, 1967, p. 386, fig. 17, 3, f-j.

1 (bidentate): IZUKA, 1912, pp. 114-116, pl. 13, figs. 7-9.

The *E. vittata* of IZUKA, 1912, had been referred

to *E. indica* by FAUVEL (1936). However, the *E. indica* of IZUKA, 1912, has bidentate subacicular hooks and thus differed from *E. indica* KINBERG and was referred to *E. kubiensis* MCINTOSH, 1885. *E. medicina* MOORE, 1903, has also yellow tridentate subacicular hooks, long pointed hoods on the compound setae and branchiae starting from setiger 3 (somite V of MOORE). The specimens described by MOORE are very small, i. e. 2.0 mm wide as maximum, and have seven filaments in the fully developed branchia and subacicular hooks starting from setiger 19 (somite XXI of MOORE). They also have brown spots at dorsal base of each parapodium and asymmetrical comb setae with 12 short spines. These characters fit the specimens examined here, especially the smaller ones. *E. medicina* MOORE, 1903, is here tentatively referred to *E. vittata*. The former may be considered as young forms of the latter.

Eunice spinea sp. nov.

(Fig. 2, a-p)

Collection

A	B	C	D	E	F	G	H	I	J	K
NSMT-Pol. H-138	Aug., 1975 Kagoshima Bay (200 m)	5.5	9-1		29-1	53	3	4.5	A F	30
NSMT-Pol. P-139	Jan. 8, 1974 Kagoshima Bay (20 m)	4.5	10-1		26-1	30	1	2.8	A F	25
	" (60 m)	3.5	8-1		23-1	30	2	2.6	A F	26
	" (100 m)	4.5	11-1		28-1	190	2	3.0	S C	23
	" (,)	2.6	10-1		23-1	76	1	2.4	A F	23
	" (,)	4.0	10-1		33-1	35	1	3.7	A F	?
	" (,)	5.3	10-1		27-1	86	2	3.5	A F	35
	" (110 m)	2.8	8-1		25-1	30	1	2.5	A F	25
	" (,)	2.3	12-1		22-1	41	1	1.9	A F	25
	" (,)	2.4	10-1		21-1	28	1	1.9	A F	20
	" (,)	3.5	12-1		?	18	1	2.9	A F	?
	" (,)	1.9	8-1		15-1	25	1	1.6	A F	14
	" (,)	3.3	8-1		?	11	1	1.9	A F	?
	" (,)	4.0	?		?	20	?	2.1	A F	?
	" (,)	2.8	12-1		20-1	31	1	1.5	A F	28
	" (,)	2.6	9-1		23-1	24	1	2.5	A F	24
	" (,)	3.0	12-1		20-1	23	1	2.0	A F	19
	" (,)	2.3	9-1		19-1	54	1	1.5	A F	19
	" (,)	3.2	8-1		24-1	30	1	2.6	A F	25
	" (,)	3.0	9-1		?	16	1	2.0	A F	?
	" (,)	4.2	10-1		25-1	32	1	3.0	A F	25
	" (,)	3.3	11-1		25-1	36	1	2.4	A F	23
	" (,)	3.5	9-1		25-1	62	1	3.0	A F	28

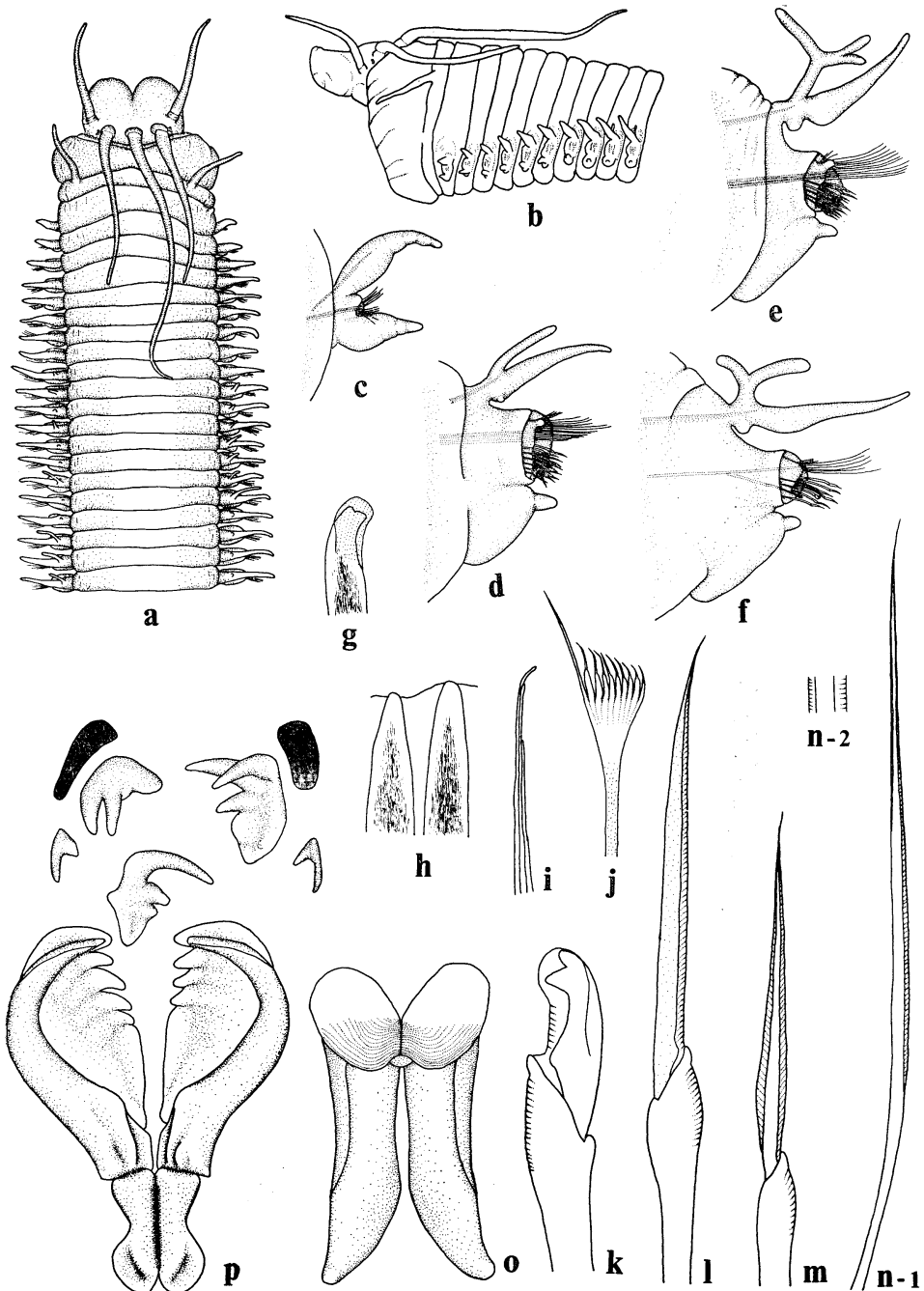


Fig. 2. *Eunice spinea* sp. nov. a, Anterior end, in dorsal view, $\times 15$. b, The same, in lateral view, $\times 15$. c, First parapodium, in anterior view, $\times 40$. d, Parapodium 15, in anterior view, $\times 40$. e, Parapodium 22, in anterior view, $\times 40$. f, Parapodium 38, in anterior view, $\times 40$. g, Subacicular hook, $\times 400$. h, Acicula, $\times 400$. i, Notoacicular setae, $\times 200$. j, Comb seta, $\times 800$. k, Compound falcigerous seta, $\times 800$. l, Unilimbate compound spinigerous seta, $\times 800$. m, Bilimbate compound spinigerous seta, $\times 800$. n-1, Capillary seta, $\times 400$. n-2, The same, enlarged of part, $\times 2000$. o, Mandibles, in ventral view, $\times 40$. p, Maxillae, in dorsal view, $\times 40$.

Description: Many specimens were collected from Kagoshima Bay in 20–200 m depth. The holotypus has lost a considerable number of posterior segments and measures 23 mm long by 4.5 mm wide including parapodia for 53 setigers.

The prostomium is deeply notched in front and two reniform eyes are situated at the bases of the inner lateral occipital antennae (Fig. 2, a). The body has cylindrical peristomial rings and becomes flattened immediately posterior to this (Fig. 2, b). The segment height is 2.8 mm at the first peristomial ring, 2.2 mm at setiger 10 and 1.8 mm at setiger 40. Five occipital antennae are smooth and slender. Each is mounted on a low basal projection. The central and largest one reaches to the posterior end of setiger 11. The inner lateral pair reaches to setiger 4. The outer pair reaches to setiger 2. The first peristomial ring is narrower dorsally than laterally, the second one is short with a pair of peristomial cirri which reach to setiger 3.

The parapodia (Fig. 2, c–f) have characteristically shaped setal lobes. They have a supracular, digitiform protuberance in the anterior branchial parapodia (Fig. 2, d–e) and become almost triangular on the posterior setigers of the fragment. The postsetal lobe always extends beyond the setal lobe and has a rounded end. The dorsal cirri, supported by a bundle of notopodial embedded acicular setae, are short and conical in the first few segments (Fig. 2, c). They become longer and each one has a ventral knob in the branchial region. The ventral cirri are simple and conical in anterior setigers, but have a basal pad in posterior setigers. The basal pad becomes transversely elongated and lower near the posterior end of the fragment. Branchiae start on setiger 9 on the left and on setiger 10 on the right, as a simple papilla. They continue to the posterior end of the fragment. Branchiae, generally, have a single filament, but become bifurcate in the posterior end of the holotypus and occasionally have three filaments, such as on setigers 22 and 42 (Fig. 2, e).

Subacicular hooks are black and have bidentate hooded tips (Fig. 2, g). The apical tooth is smaller than the other. They are first present on setiger 30 on the left and on setiger 29 on

the right, and continue the posterior end of the specimen. They always occur singly in a parapodium. Black acicula are almost completely embedded in the setal lobe and number three on each of the anterior parapodia (Fig. 2, h). The number decreases to one at the posterior end of the fragment. The yellow notoacicular setae are very slender and make up a bundle in the dorsal cirri (Fig. 2, j). They occur three to six in a bundle. The comb seta has 8–9 inner teeth and asymmetrical lateral extensions (Fig. 2, j). The larger extension is twice as long as the shorter one. Bilimbate setae are present (Fig. 2, n). In subacicular position, there are two kinds of compound setae. The compound spinigers are restricted anteriorly and the falcigers are present only from setiger 30 in the holotypus. In the paratypes, they start from about the setiger which has the first subacicular hook. Each compound falciger is bidentate and hooded (Fig. 2, k). The spinigers mostly have unilimbate blades (Fig. 2, l), but sometimes bilimbate ones (Fig. 2, m).

The mandibles have short and broad shafts. The cutting edge are well calcified and sculptured by 18–19 dark lines (Fig. 2, o). The maxillae are well developed. The dentition is distinct and each plate has long stout teeth (Fig. 2, p). The maxillary formula is Mx. I=1+1, Mx. II=5+4, Mx. III=3+0, Mx. IV=2+3, Mx. V=1+1. There are broad black bodies lateral to the maxillae IV. The maxillary carriers are long, slender and basally rounded.

In one of paratypes, the pygidium has two pairs of anal cirri. The dorsal one is slender and four times as long as the ventral.

Type locality: Kagoshima Bay.

Type-series: Holotypus, NSMT-Pol. H-138.

Paratypes, NSMT-Pol. P-139.

Discussion: *Eunice tubifex* GROSSLAND, 1904 (pp. 303–310, figs. 52–55, pl. 21, figs. 1–8) is known to have compound spinigers. *E. spinea* is clearly distinguished from *E. tubifex* in that it has very long antennae, reniform eyes and subacicular hooks singly in each parapodium instead of short articulated antennae, rounded eyes and two to three subacicular hooks in a parapodium. In other respects, *E. spinea* and *E. tubifex* resemble each other closely, for ex-

ample, in the short stout mandibular shafts, in the well-developed proximal pads on the ventral

cirri, and in the poorly developed branchiae in the anterior part of the body.

Eunice (Nigidion) cariboea GRUBE, 1865

(Fig. 3, a-n)

Eunice (Nigidion) cariboea: HARTMAN, 1944, pp. 123-124, pls. 7, figs. 157-163 and 8, fig. 178; FAUCHALD, 1970, pp. 38-39; NONATO and LUNA, 1970, p. 83.

Eunice (Nigidion) kinbergi: HARTMAN, 1944, p. 124; NONATO and LUNA, 1970, p. 84.

Nigidion kinbergii: TREADWELL, 1921, pp. 91-93, figs. 324-332, pl. 6, figs. 5-8.

?*Marphysa posterobranchia*: DAY, 1962, p. 645, fig. 4, a-e.

Collection

A	B	C	D	E	F	G	H	I	J	
E 136	Feb. 14, 1976	Kominato	3.0	100-1	133-1	31-1	133	1	1.5	C S
E 137	„	„	2.7	88-1	120-1	26-1	120	1	1.2	C S
E 138	„	„	3.2	-	-	27-1	95	-	1.5	A F

Description: Two complete specimens (E 136, 137) and one anterior fragment (E 148) were collected from an intertidal rocky shore on the Boso Peninsula. The habitat was covered with seaweeds, such as *Colpomenia sinuosa*, *Sargassum thunbergii*, *Hizikia fusiforme*, *Padina arborescens* and *Corallina pilulifera*, with much sand captured in the holdfasts of these algae.

One complete specimen (E 136) measures 34 mm long by 1.5 mm wide including parapodia for 133 setigers. The body is somewhat flattened anteriorly and cylindrical in the last third of the specimen. The segment length increases posteriorly to become one third of the width.

The color of anterior dorsum is reddish brown with many white spots; they are grouped posterior to setiger 4 looking like islands on a map. The lateral sides of the prostomium, the five occipital antennae and their basal parts, the peristomial cirri and the dorso-posterior part of the peristomium are white; sometimes also setigers 5 and 6 have a white band. The middle of the body is greenish and transparent with the red dorsal blood vessel clearly visible. About the last 20 segments have dark brown septa and the last several caudal segments become dark.

The prostomium is bilobed in front and nearly equal in length to the two peristomial segments combined. There are five club-shaped occipital antennae; they are narrow proximally and subequal in length; they are sometimes irregularly annulated (Fig. 3, a). Two eyes

situated outside the inner lateral antennae are oblong and slightly concave along their ventral margins (Fig. 3, b). The first peristomial ring is twice as long as the second one which carries a pair of short, smooth peristomial cirri.

Parapodia are uniramous and both dorsal and ventral cirri are present. The dorsal cirri are smooth and cylindrical, and become slightly prolonged in the middle part of the body. The conical ventral cirri are simple in the anterior-most parapodia (Fig. 3, c), but are provided with a proximal pad from about parapodium 10 (Fig. 3, d); the pads and also the ventral cirri themselves become lower posteriorly (Fig. 3, e). The setal lobes are high and distally rounded in parapodia anterior to the first subacicular hooks; the rounded end is replaced with by a triangular one posteriorly. Branchiae start from setiger 100 on the right and 105 on the left, and are irregularly absent such as on 102 and 108 on the right and 112, 113 and 115 on the left (E 136). Each branchia is larger than the corresponding dorsal cirrus; it emerges from the dorsum and is simple crumpled (Fig. 3, f), whereas the dorsal cirri are smooth.

Subacicular hooks are black, bidentate and hooded (Fig. 3, g), and are first present on parapodia 26-31. Dark acicula are bluntly tapered and occur one on each parapodium (Fig. 3, h). Comb setae start before parapodium 10 and have 9-12 inner teeth and almost symmetrical lateral extensions (Fig. 3, i). The bidentate hooded compound falcigers are curved distally (Fig. 3, j);

they number seven to eight at about parapodium 10, five at p. 19, four at p. 36, two at p. 109. After parapodium 121, compound setae are absent. Simple unilimbate setae have short spines (Fig. 3, k).

The mandibles have seven to eight lines on the cutting distal part and lack a calcified edge. The shaft is very long (Fig. 3, m). The maxillary formula is Mx. I=1+1, Mx. II=(4-5)+(5-7), Mx. III=5+0, Mx. IV=5+7, Mx. V=

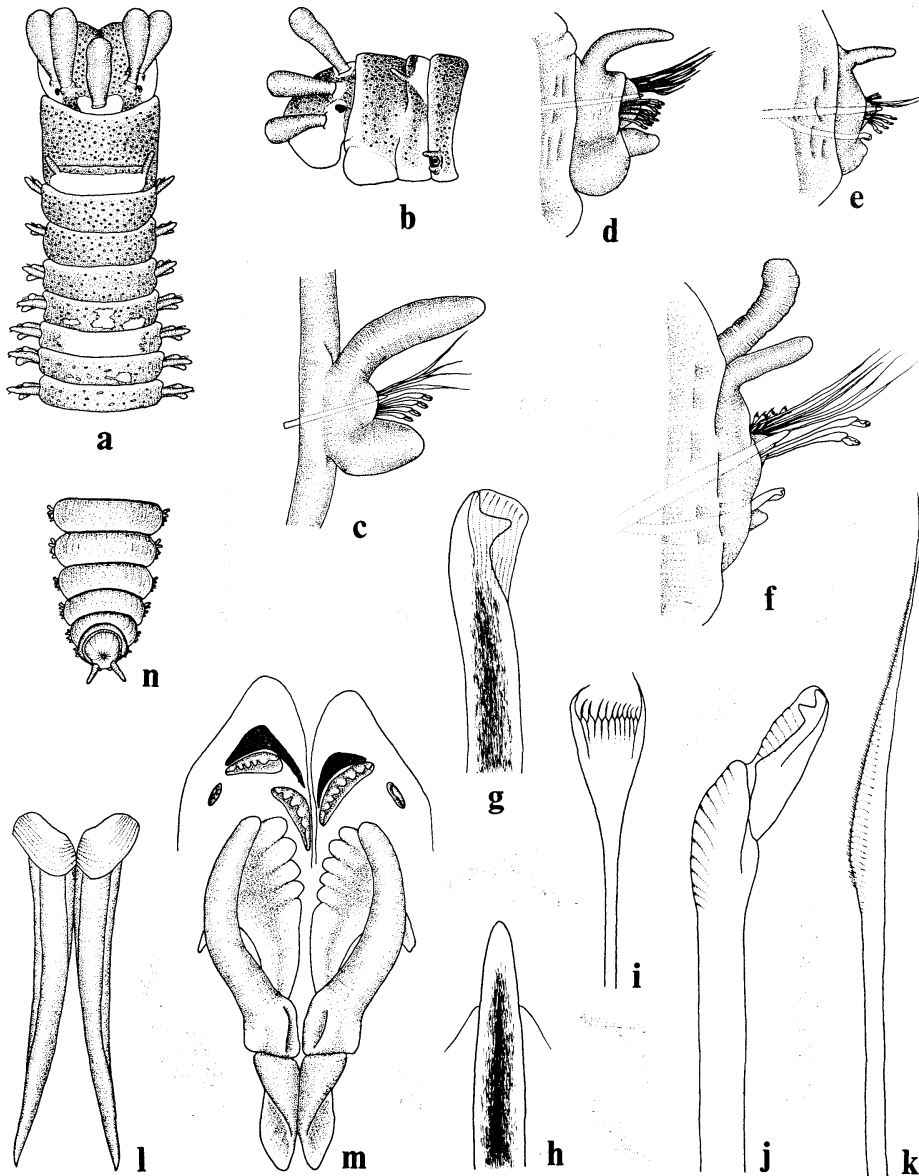


Fig. 3. *Eunice (Nacidion) cariboea* GRUBE, 1865. a, Anterior end, in dorsal view, $\times 40$. b, The same, in anterior view, $\times 40$. c, First parapodium, in anterior view, $\times 200$. d, Parapodium 10, in anterior view, $\times 100$. e, Parapodium 36, in anterior view, $\times 100$. f, Parapodium 109, in anterior view, $\times 100$. g, Subacicular hook, $\times 800$. h, Aciculum, $\times 800$. i, Comb seta, $\times 800$. j, Compound seta, $\times 1600$. k, Capillary seta, $\times 800$. l, Mandibles, in ventral view, $\times 100$. m, Maxillae, in dorsal view, $\times 100$. n, Caudal region, in dorsal view, $\times 40$.

1+1. The maxillary carriers are long and slender (Fig. 3, l).

The pygidium has two smooth dorsal and two very short ventral cirri (Fig. 3, n).

This species is described here as new to Japan.

Distribution: West Indies, Bermuda, Gulf of California, eastern Pacific ocean; Japan.

Discussion: One specimen (E 137) described above lacks peristomial cirri, and the shape of head resembles the condition in the genus *Marphysa*. The specimen was collected with two other specimens from the same habitat at the same time, and there are no significant difference between the three (E 136-138), except for the absence of the peristomial cirri. Thus this specimen (E 137) was referred to *E. (Nacidion) cariboea*.

Marphysa posterobranchia DAY, 1962, was originally described from only one specimen; it differs from the members of the genus *Paramarphysa* which lacks branchia entirely, in that the former has branchiae restricted to the posterior end. Excluding the one character, *i.e.* the presence or absence of peristomial cirri,

M. posterobranchia DAY, 1962, resembles *E. (Nacidion) cariboea* in the many respects: 1. Black, bidentate subacicular hooks appear from about setiger 30, and occur singly in a parapodium. 2. The bidentate compound falcigerous setae have the distal end of the stem to the opposite side of cutting margin occurred. 3. The body is small (about 30 mm long for about 130 setigers) and rounded in cross-section. 4. The first branchia appears from about setiger 90. 5. Capillary setae are winged and comb setae have about 12 teeth. *M. posterobranchia* is here considered a possible synonym of *E. (Nacidion) cariboea*.

The prostomial antennae appear to vary widely in shape, e.g. 'antenas comprimidas, triangulares, pouco mais longas que o prostômio' in NONATO and LUNA [1970, as *E. (Nacidion) kinbergi*], 'cylindrical and irregularly annulated' from the illustration by TREADWELL (1912, as *Nacidion kinbergii*) and 'club-shaped', here. The shape of the prostomial antennae may have little significance as HARTMAN (1944) has suggested.

Genus *Palola* GRAY, 1847

Palola siciliensis (GRUBE, 1840)

(Fig. 4, a-j)

Palola siciliensis: HARTMAN, 1944, p. 131; IMAJIMA and HARTMAN, 1964, p. 261; FAUCHALD, 1970, pp. 68-69; NONATO and LUNA, 1970, pp. 86-87; WU *et al.*, 1975, pp. 83-84.

Eunice siciliensis: OKUDA, 1937, pp. 279-280, figs. 22-23; OKUDA, 1938, p. 95.

Eunice (Palola) siciliensis: DAY, 1967, p. 382, fig. 17, 2, a-f.

Palola viridis: GRAY, 1847, pp. 15-17.

Leodice cariboea: TREADWELL, 1921, pp. 47-49, figs. 136-147, pl. 4, figs. 1-4.

Collection

A	B	C	D	E	F	G	H	I	J
E 56	May 31, 1975 Kominato	2.4	-	-	-	30	-	1.2	A F
E 57	Jun. 1, 1975 Kominato	4.1	-	-	-	118	-	1.5	A F
E 58	Oct. 5, 1975 Kominato	2.7	-	-	-	296	-	1.7	A F
E 151	Feb. 14, 1976 Kominato	3.2	-	-	-	202	-	2.2	S C
E 152	Feb. 19, 1976 Kominato	2.7	57-1	213-1	-	239	1	2.5	S C
E 153	"	2.4	-	-	-	44	-	2.3	A F
E 154	"	2.6	-	-	-	136	-	2.5	C S
E 155	"	2.7	-	-	-	84	-	2.4	A F
E 157	"	5.7	-	-	-	55	-	4.0	A F
E 166	Apr. 16, 1976 Ishigaki	1.8	-	-	-	-	-	1.3	C S
E 167	"	2.0	56-1	-	-	136	1	0.9	C S
E 171	Apr. 17, 1976 Ishigaki	6.8	123-1	-	-	747	1	5.1	S C
E 182	"	5.3	119-1	-	-	511	1	5.0	C S
E 189	Apr. 21, 1976 Ishigaki	4.7	66-1	-	-	285	1	3.0	C S

E 190	Apr. 21, 1976	Ishigaki	5.9	-	-	-	116	-	4.5	A F
E 191	"	"	6.2	-	-	-	26	-	4.2	A F
E 192	Apr. 16, 1976	Ishigaki	1.9	37-1	-	-	147	1	1.8	C S
E 194	Apr. 18, 1976	Ishigaki	7.8	122-1	-	-	732	1	5.9	C S

Description: Many specimens were collected. They were found at the bases of seaweeds, such as *Ecklonia cava* and *Eisenia bicyclis*, in crevices of rocks at Kominato on the Pacific coast of the Boso Peninsula and within corals at Kabira of Ishigaki Island.

The largest one (E 171) autotomised into two pieces measures 210 mm long by 5.1 mm wide including parapodia and has 747 setigers.

The color of the anterior dorsum is greenish brown in large specimens or beige in small ones. Other parts of the body is colorless or

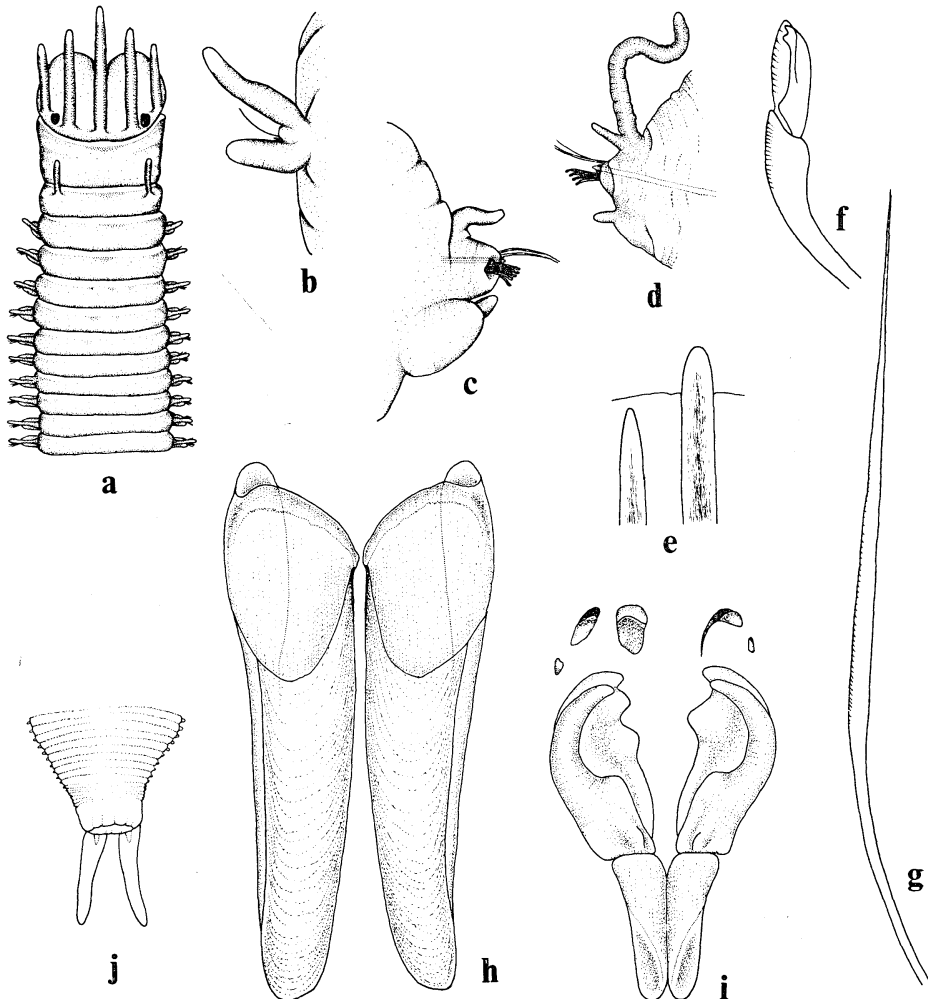


Fig. 4. *Palola siciliensis* (GRUBE, 1840). a, Anterior end, in dorsal view, $\times 25$ (E 57). b, First parapodium, in anterior view, $\times 80$. c, Parapodium 50, in anterior view, $\times 80$. d, Parapodium 158, in anterior view, $\times 25$ (E 182). e, Acicula, $\times 800$ (E 57). f, Compound seta, $\times 800$. g, Capillary seta, $\times 800$. h, Mandibles, in ventral view, $\times 40$ (E 157). i, Maxillae, in dorsal view, $\times 40$. j, Posterior end, in dorsal view, $\times 25$ (E 194).

beige. In epitokous females, the light green eggs can be seen within the posterior body. The male posterior body is pink. Each posterior parapodium is marked by a black pigment spot.

The prostomium is bilobed in front. There are five occipital antennae. All of them are smooth and extend beyond the anterior margin of the prostomium. The central and longest antenna reaches the anterior margin of setiger 7. The inner lateral ones reach setiger 4. The outer ones reach the first setiger. They are irregularly annulated; in a small specimen (E 167) only the median three antennae were present. Two large, ovoid eyes are situated outside the inner lateral antennae (Fig. 4, a). The first peristomial ring is prolonged forwards on the lateral sides; the second ring has a pair of smooth cirri which reach setiger 3.

The first parapodium has a cylindrical ventral cirrus and a filiform dorsal cirrus which is more than twice as long as the other dorsal cirri (Fig. 4b). The dorsal cirri diminish in size posteriorly and the ventral cirri become provided with proximal pads (Fig. 4c). Branchiae are present on posterior parapodia (Fig. 4, d), but the exact distribution could not be determined. The occurrence of branchiae ranges according to the body size of each specimen.

The black acicula are bluntly tapered and number one or two in a parapodium (Fig. 4, e). The compound falcigerous setae in subacicular positions are bidentate and hooded. The stems are characteristically curved (Fig. 4, f). In supracicular positions, there are only capillary setae serrated on one margin (Fig. 4, g).

The pharyngeal apparatus consists of well-developed mandibles and relatively small maxillae. The mandibles have the cutting edges strongly calcified and the shafts are transparent yellow and triangular in the cross-section (Fig. 4, h). They are scoop-shaped. The maxillary supports are long and wide compared to the small maxillary plates. The maxillary formula is Mx. I=1+1, Mx. II=3+2, Mx. III=1+0, Mx. IV=1+1, Mx. V=1+1 (Fig. 4, i).

The pygidium has long dorsal cirri and short ventral cirri (Fig. 4, j).

Distribution: Mediterranean Sea; Atlantic, Indian and Pacific Oceans, in warm waters; Japan.

Discussion: HAUENSCHILD *et al.* (1969) have studied the problems of the lunar-periodic reproduction in *P. siciliensis* (as *Eunice viridis* GRAY, 1847). Recently HOFMAN (1974) dealt with maturation, epitoky and regeneration in this species. These studies have brought us a great deal of knowledge of physiology and ecology of this species.

HARTMAN (1944) named four species of this genus. They are very closely related and the differentiation may be impossible morphologically. Only two species can be separated morphologically in this genus, *i.e.* *P. siciliensis* and *P. paloloides*: HARTMAN, 1944, pp. 131-132. The two species are separated in the dentation of right maxillary plate II, in that the former has two teeth and the latter has three. All specimens examined has two teeth on the right maxillary plate II and thus agree with *P. siciliensis*.

Genus *Marphysa* QUATREFAGES, 1865

Marphysa disjuncta HARTMAN, 1961

(Fig. 5, a-o)

Marphysa disjuncta: HARTMAN, 1961, pp. 81-83, pl. 10, figs. 1-3; FAUCHALD, 1970, pp. 60-61.

Collection

A	B	C	D	E	F	G	H	I	J
E 60	Aug., 1975 Kagoshima Bay	4.4	12-9	25-11	28-1	57	16	2.7	A F
E 61	„	4.6	14-1	25-7	32-1	48	16	2.9	A F
E 62	„	5.3	13-12	27-4	30-1	58	20	3.0	A F

Description: All three specimens collected from the inner part of Kagoshima Bay are anterior fragments. The largest individual (E

62) measures 34.0 mm long and 3.0 mm wide including parapodia, with 86 setigers.

The coloration could not be defined in alcohol

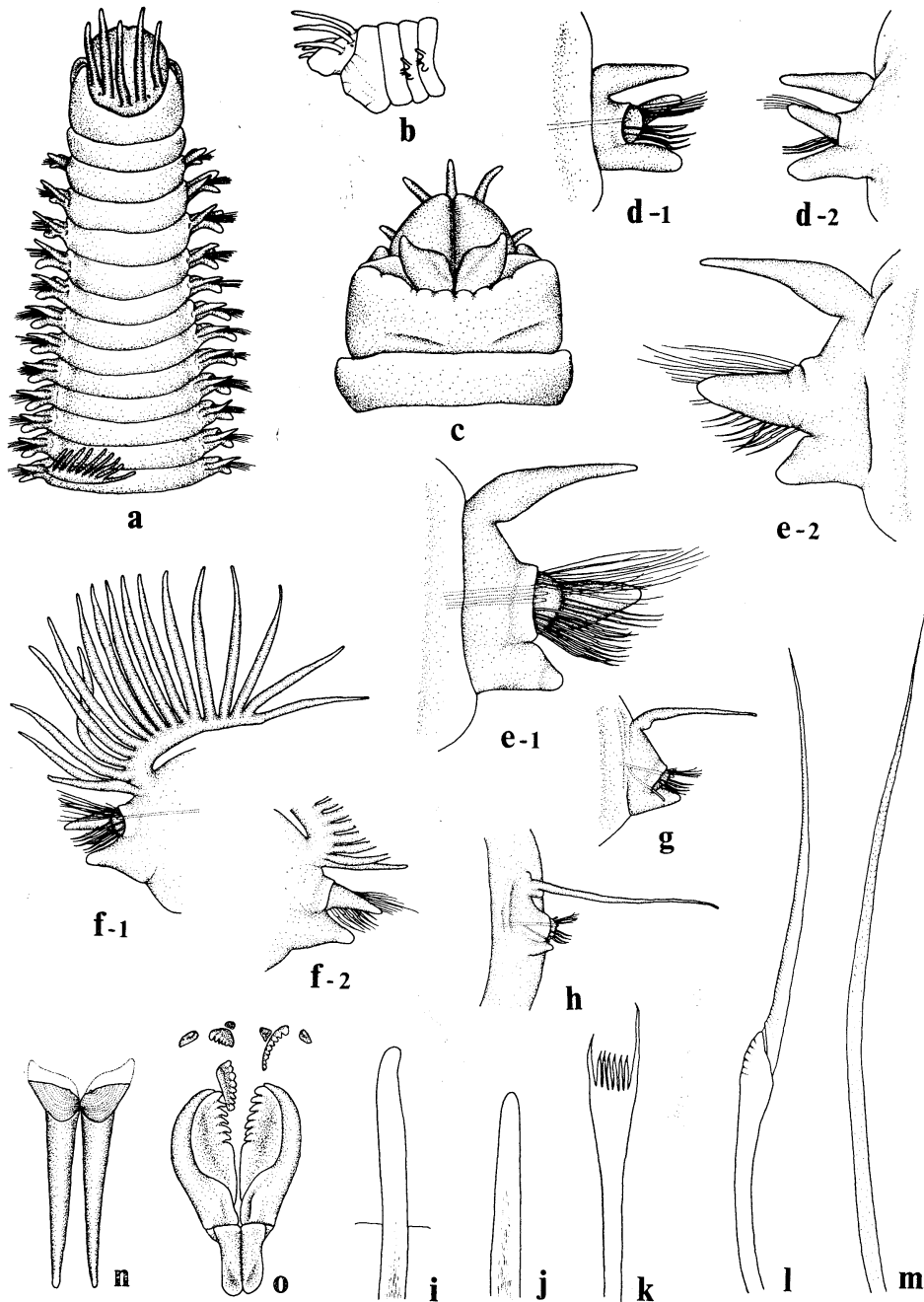


Fig. 5. *Marphysa disjuncta* HARTMAN, 1961. a, Anterior end, in dorsal view, $\times 25$ (E 60). b, The same, in lateral view, $\times 15$. c, Buccal region, in ventral view, $\times 40$. d-1, First parapodium, in anterior view, $\times 80$. d-2, The same, in posterior view, $\times 80$. e-1, Parapodium 8, in anterior view, $\times 80$. e-2, The same, in posterior view, $\times 80$. f-1, Parapodium 21, in anterior view, $\times 40$. f-2, The same, in posterior view, $\times 40$. g, Parapodium 46, in anterior view, $\times 40$. h, Parapodium 77, in posterior view, $\times 40$ (E 61). i, Subacicular hook, $\times 400$ (E 60). j, Aciculum, $\times 400$. k, Comb seta, $\times 800$. l, Compound seta, $\times 800$. m, Capillary seta, $\times 800$. n, Mandibles, in ventral view, $\times 40$. o, Maxillae, in dorsal view, $\times 40$.

preserved specimens.

The five occipital antennae are almost equal in length or the outer pair somewhat shorter. All of them are smooth, slender and get beyond the anterior margin of prostomium (Fig. 5, a). Two small, oval eyes are situated at the outer bases of the inner lateral antennae. The two peristomial rings are equally long dorsally, but the first one is projected forward on both lateral sides (Fig. 5, b). The prostomium is very slightly incised in front and the incision connects to a ventral groove extending to the posterior part of the prostomium (Fig. 5, c). The calcified points of the mandibles are projected from the mouth.

Parapodia are uniramous; the postsetal lobes are remarkable. The first parapodium has a long cone-shaped dorsal cirrus and a cylindrical ventral one. The setal lobe with distally rounded end is supported by one aciculum (Fig. 5, d-1). The digitiform postsetal lobe projects from the parapodium; it is about as high as the dorsal or ventral cirrus (Fig. 5, d-2). Later prebranchial parapodia are larger than the first parapodia and have shorter ventral cirri; each setal lobe has three embedded acicula and the postsetal lobe is tapered (Fig. 5, e). Each branchial parapodium has a conical ventral cirrus, a long dorsal cirrus similar in shape to a branchial filament, a conical postsetal lobe and a rounded setal lobe with one aciculum embedded (Fig. 5, f). The postbranchial parapodium decreases in size, having a long thread-like dorsal cirrus, a conical ventral cirrus and a subacicular hook. The postsetal lobe is lower than the setal lobe in the postbranchial region. Dorsal cirri have knob-like papillae on their ventral bases (Fig. 5, g) and become longer and slenderer with well-developed papillae in more posterior parapodia (Fig. 5, h). Branchiae which extend over the dorsum of each branchial segment start on setigers 12-14; the first branchia has seven to 12 filaments. The number of branchial filaments increases to about 20 at the middle of the branchial region, then decreases to four to ten at the last branchia. The last branchia is on about setiger 25.

Dark subacicular hooks are first present from setigers 27-32, which are the second or third

segment after the last branchial one. They occur singly in each parapodium. Their tips are slightly curved without dentition (Fig. 5, i). Acicula are dark with bluntly tapered ends; their number varies with the body region as described above. The tip projects from the setal lobe in the postbranchial region (Fig. 5, j). Comb setae with asymmetrical lateral extensions and about six inner teeth (Fig. 5, k) occur from near setiger 8 to the posterior ends of fragments. The number is less than five in a fascicles. Compound spinigerous setae have indistinctly serrated blades (Fig. 5, l) and number maximally 30 in a parapodium in the prebranchial region; they become more sparse posteriorly, e.g. six to seven at setiger 45. Simple setae are long and slender with short spines (Fig. 5, m), number six or seven on the first parapodium, increase to more than 20 in a branchial parapodium and decrease to five to seven in a postbranchial parapodium.

The mandibles are anteriorly well calcified on the cutting edges which are sculptured by 15-16 lines. The shafts are slender (Fig. 5, n). The maxillary supports are almost rectangular. The maxillary formula is Mx. I=1+1, Mx. II=(6-7)+(7-9), Mx. III=8+0, Mx. IV=(4-5)+7, Mx. V=1+1 (Fig. 5, o).

This species is described here as new to Japan.

Distribution: Southern California; Kagoshima Bay, Japan.

Discussion: *Marphysa disjuncta* was originally described with about 15 pairs of branchia by HARTMAN (1961). The specimens collected from Kagoshima Bay has 13-14 pairs of branchiae. FAUCHALD (1970) remarked that *M. disjuncta* is distinguished from *M. kinbergi* with 20 pairs of branchiae. *M. bellii* has also about 15 pairs of branchiae; however, *M. bellii* differs from *M. disjuncta* in that the former has both compound falcigers and spinigers but the latter has only compound spinigers. The specimens described here are only anterior fragments with 48-85 setigers, so it is not clear if these specimens had compound falcigers in the posterior lost part of the body. The three specimens are here considered as *M. disjuncta* in that they have subacicular hooks from about setiger 30 instead of from setiger 39 as in *M. bellii*.

Marphysa sanguinea (MONTAGU, 1815)

(Fig. 6, a-q)

Marphysa sanguinea: FAUVEL, 1923, pp. 408-410, fig. 161, a-h; FAUVEL, 1936, pp. 69-70; OKUDA, 1937, pp. 286-287, fig. 31, a-e; OKUDA, 1938, p. 96; HARTMAN, 1944, pp. 127-128, pl. 8, figs. 179-183; OKUDA and YAMADA, 1954, p. 188; HARTMAN, 1961, p. 84; PETTIBONE, 1963, pp. 236-238, fig. 62, a-k; IMAJIMA and HARTMAN, 1964, pp. 259-260; IMAJIMA, 1967, p. 432; DAY, 1967, p. 396, fig. 17, 5, u-y; IMAJIMA, 1968, p. 32, fig. g; FAUCHALD, 1970, pp. 64-66.

Marphysa iwamushi: IZUKA, 1912, pp. 141-143, pls. 1, fig. 8 and 14, figs. 11-16.

Collection

A	B	C	D	E	F	G	H	I	J
E 67	May 6, 1973 Kominato	11.5	32-1		93-1	265		10.9	C S
E 68	"	11.5	28-1		64-1	271		10.3	C S
E 69	"	12.5	26-1		97-1	251		11.1	C S
E 70	"	10.5	25-1		47-1	189		8.5	C S
E 71	"	11.0	27-2		46-1			10.0	C S
E 72	"	9.8	24-1		56-1			9.9	A F
E 73	"	12.0	30-2		-			11.0	A F
E 74	"	12.0	27-1		-			12.0	C S
E 75	"	15.0	25-1		-			11.5	A F
E 76	"				-	626			C S
E 77	May 4, 1973 Kominato	28.5	47-1		-			16.0	A F
E 78	"	13.0	46-1		43-1			10.0	C S
E 79	"	16.5	50-1		-			14.0	A F
E 80	"	13.0	35-1		-			11.0	A F
E 81	"	13.5	31-1		-			13.0	A F
E 82	"	13.5	31-1		-			11.0	A F
E 83	"	-	-	-	-	-	-	-	P F
E 84	Nov. 5, 1975 Kominato	16.0	29-1		-			10.0	C S
E 85	Nov. 19, 1975 Kominato	13.5	32-1		-			15.0	C S
E 86	"	13.5	31-1		-			11.0	C S
E 87	"	13.0	36-1		-			12.0	C S
E 88	"	13.0	31-1		-			13.0	C S
E 89	"	14.0	34-1		-			12.0	C S
E 90	"	-	-	-	-	-	-	-	P F
E 91	"	19.5	47-1		-	872	8	18.0	C S

Description: Many specimens were collected from rocky areas in the intertidal zone. The largest specimen (E 91) measures 805 mm long by 18.0 mm wide including parapodia (at about setiger 50) and has 872 setigers. The cross-section of each segment is nearly circular in the anterior several segments, and becomes gradually flattened and wider in the remaining part of the body.

The color of the dorsum is reddish brown with metallic iridescence.

The prostomium is bilobed in front. There are five occipital antennae; the median and longest one is twice as long as the prostomium. The first peristomial ring is broad and more

than twice as long as the second one (Fig. 6, a).

Anterior parapodia have well-developed postsetal lobes with almost conical dorsal and ventral cirri. The ventral cirri are provided with proximal pads in branchial parapodia, where the postsetal lobes become low and the setal lobes high. In the first parapodia (Fig. 6, b-c), the postsetal lobes are elongated and cylindrical. The postsetal lobe is higher than the setal lobe in parapodium 5 (Fig. 6, d). Branchiae start from parapodia 30-50 as a single filament or as rudimentary knobs (Fig. 6, e). The first occurrence of the branchiae varies with the size of the specimen. The number of branchial filaments gradually increases to the middle part

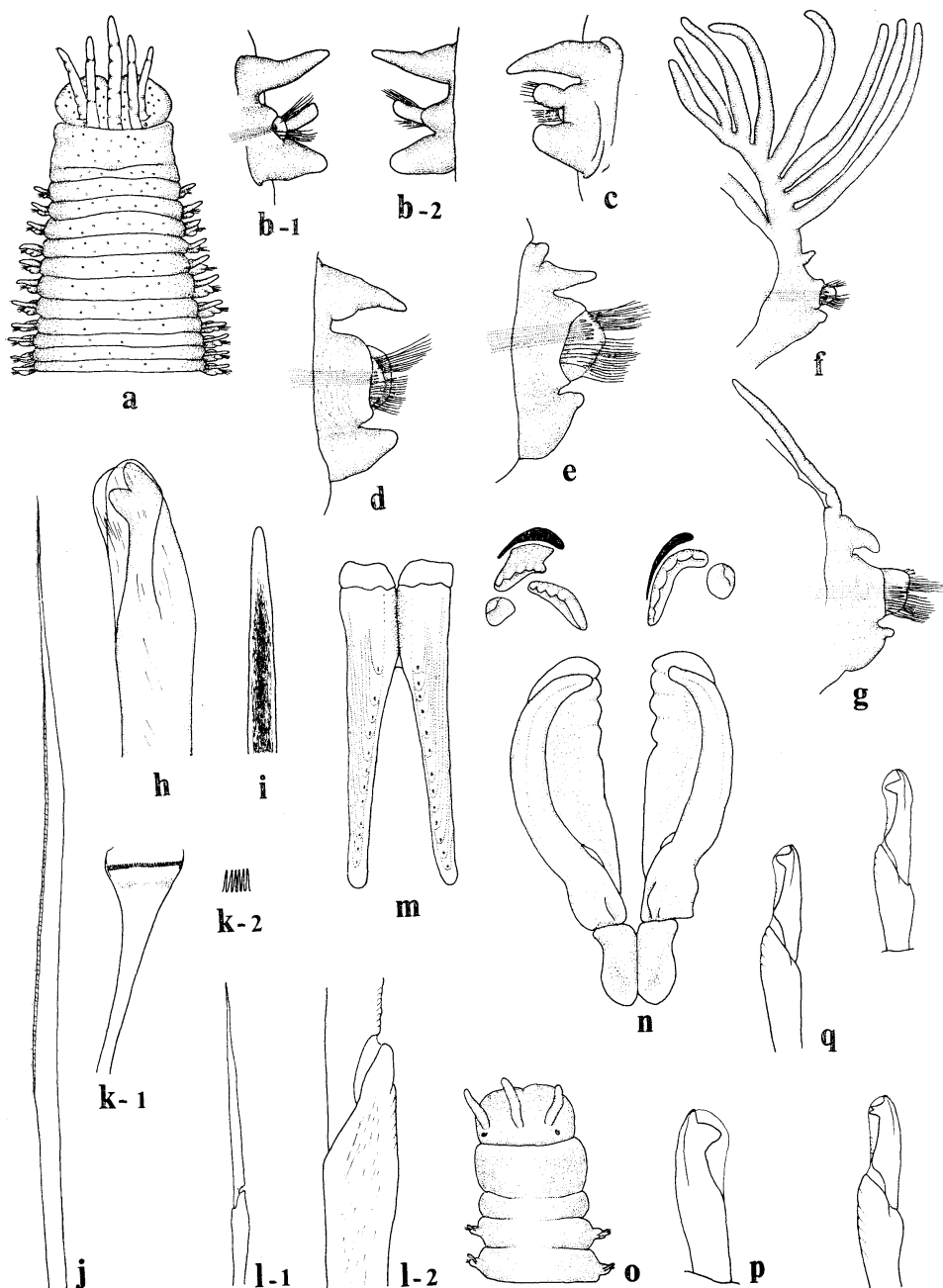


Fig. 6. *Marphysa sanguinea* (MONTAGU, 1815). a, Anterior end, in dorsal view, $\times 6$. b-1, First parapodium, in anterior view, $\times 15$ (E 76). b-2, The same, in posterior view, $\times 15$. c, First parapodium, in posterior view, $\times 15$ (E 91). d, Parapodium 5, in anterior view, $\times 15$. e, Parapodium 47, in anterior view, $\times 15$. f, Parapodium 210, in anterior view, $\times 10$. g, Parapodium 800, in anterior view, $\times 10$. h, Subacicular hook, $\times 400$. i, Aciculum, $\times 100$. j, Capillary seta, $\times 200$. k-1, Comb seta, $\times 100$. k-2, The same, enlarged of part, $\times 1200$. l-1, Compound spiniger, $\times 100$. l-2, The same, enlarged of part, $\times 400$. m, Mandibles, in dorsal view, $\times 15$. n, Maxillae, in dorsal view, $\times 15$. o, Anterior end of young worm, in dorsal view, $\times 30$. p, Subacicular hook of young worm, $\times 400$. q, Compound falcigers of young worm, $\times 400$.

of the body, then it decreases slowly to the posterior end. For example, in specimen E 91, the branchial filaments occur one on parapodium 47, two on p. 51, five on p. 70, seven on p. 90, six on p. 110, eight on p. 170, seven on p. 190, six on p. 350, five on p. 450, four on p. 550, three on p. 700, one on p. 800, and is absent on p. 850. Thus the maximal number of filaments is eight (Fig. 6, f).

Subacicular hooks are bidentate and hooded (Fig. 6, h). In fully grown specimens (of more than 13 mm of head length), they are completely absent and in specimens with 10 mm head length, they start after parapodium 45, but the occurrence is scattered. The smallest specimen, measured 9.8 mm in head length, has subacicular hooks from parapodium 56 to the posterior end of the fragment. The color of the hook is yellow or amber basally and always transparent near the tip. The hook is slender and lighter in color than the aciculum. The apical tooth is swollen compared to the second one. The aciculum is black and stout with bluntly tapered end (Fig. 6, i). They number two to eight in a parapodium. The number is three in the first parapodium, increases to eight in parapodium 90 and decreases to two in far posterior parapodia (on specimen E 91). The number of acicula is lower in small specimens. The simple setae are long, slender and limbate (Fig. 6, j). Each comb seta has more than 30 inner teeth and asymmetrical extensions on the cutting edge (Fig. 6, k-1). The inner teeth are pointed (Fig. 6, k-2). In subacicular positions, there are many compound spinigers. Their blades are serrated on one side (Fig. 6, l).

The mandibles are black and have calcified anterior cutting edges (Fig. 6, m). The maxillary carriers are almost rectangular with rounded, concave end pieces. The maxillary formula is Mx. I=1+1, Mx. II=(3-4)+(3-4), Mx. III=(4-6)+0, Mx. IV=(3-4)+(3-7), Mx. V=1+1 (Fig. 6, n).

The pygidium has two long dorsal and two very short ventral cirri.

Young specimens

In addition to the specimens collected, about 50 young specimens donated by Akita-ken Oga Aquarium were examined. These specimens had been reared in containers.

They range from 10-30 mm in length and 1.0-3.0 mm in width. The number of setigers are 39-91. Four individuals with three prostomial antennae measure 11.5-21.0 mm long by 1.1-1.6 mm wide for 32-62 setigers (Fig. 6, o). Subacicular hooks always present in young worms are bidentate and hooded (Fig. 6, p). The two teeth are somewhat sharper than in adult worms. The hooks start from setigers 15-20, depending on the development of branchiae. Branchiae are present as single or bifurcate filaments and are restricted to the middle body. They start from setigers 13-15. A few caudal parapodia have compound falcigerous setae. These are hooded, bidentate or sometimes tridentate (Fig. 6, q).

Distribution: Mediterranean Sea; Atlantic, Indian and Pacific oceans, cosmopolitan in warm waters; Japan.

Discussion: It has been suggested by FAUCHALD (1970) that the distribution of branchiae and the appearance of subacicular hooks are variable in this species. PETTIBONE (1963) reviewed what the biology of *Marphysa sanguinea* is. She also mentioned that the young worms may have compound falcigers and less than five antennae. The adult worms are frequently used as bait in Japan and known under the name of 'Iwa-mushi' or 'Iwa-isome'. These names mean rocky eunicid worms. These terms are considered to indicate the biological habitat of this species. In winter night, at ebb tide, the worms can be observed extending their anterior bodies from the tubes and feeding on seaweeds or little animals.

Genus *Lysidice* SAVIGNY, 1818

Lysidice ninetta AUDOIN and MILNE EDWARDS, 1833

(Fig. 7, a-n)

Lysidice ninetta: FAUVEL, 1923, pp. 411-412, fig. 162, a-g; MONRO, 1933, pp. 70-71; HARTMAN, 1944, p. 125; HARTMAN, 1948, p. 83; DAY, 1967, p. 403, fig. 17, 8, g-i; FAUCHALD, 1970, pp. 52-53;

NONATO and LUNA, 1970, pp. 84-85.

Lysidice ninetta collaris: WU *et al.*, 1975, p. 84.

Lysidice collaris: CROSSLAND, 1904, pp. 143-144; IZUKA, 1912, pp. 133-135, pl. 14, figs. 9-10; MONRO, 1933, pp. 69-70; MONRO, 1937, p. 290; OKUDA, 1937, pp. 288-289, fig. 34, a-e; OKUDA, 1938, p. 96; HARTMAN, 1948, pp. 83-84; DAY, 1967, pp. 402-403, fig. 17, 8, a-f; IMAJIMA, 1967, p. 432; IMAJIMA, 1968, p. 31.

		Collection									
A	B	C	D	E	F	G	H	I	J		
E 92	May 4, 1973 Kominato	6.0	-	-	26-1	86	-	5.5	AF		
E 93	"	6.5	-	-	20-1		-	5.7	AF		
E 94	"	6.5	-	-	27-1		-	5.5	AF		
E 95	May 31, 1975 Kominato	2.1	-	-			-	1.3	AF		
E 96	"	3.8	-	-	21-1		-	3.1	AF		
E 97	Jun. 12, 1975 Oga	5.3	-	-	21-1	75	-	3.0	CS		
E 98	"	5.3	-	-	22-1		-	3.2	AF		
E 99	"	4.3	-	-	20-1		-	3.4	CS		
E 100	"	5.1	-	-	22-1		-	4.0	AF		
E 101	"	2.1	-	-	18-1		-	1.8	AF		
E 102	Jun. 13, 1975 Oga	3.2	-	-	21-1		-	2.2	CS		
E 103	Oct. 4, 1975 Kominato	5.0	-	-	19-1		-	2.8	AF		
E 104	"	4.4	-	-	21-1		-	4.0	AF		
E 105	"	3.5	-	-	21-1		-	1.8	AF		
E 106	"	3.7	-	-	26-1		-	1.7	AF		
E 107	Oct. 5, 1975 Kominato	3.0	-	-	22-1		-	1.7	CS		
E 108	"	1.0	-	-			-	0.8	AF		
E 109	"	1.3	-	-			-	0.8	CS		
E 110	"	1.1	-	-			-	0.8	CS		
E 111	"	1.1	-	-			-	0.8	CS		
E 112	"	2.2	-	-	22-1	40	-	2.0	AF		
E 113	"	3.0	-	-	23-1	51	-	2.5	AF		
E 146	Feb. 19, 1976 Kominato	6.5	-	-	21-1		-	6.0	AF		
E 147	"	4.0	-	-	20-1		-	3.8	CS		
E 148	"	5.5	-	-	20-1		-	5.5	CS		
E 149	Feb. 14, 1976 Kominato	3.1	-	-	18-1		-	1.7	CS		
E 150	Feb. 17, 1976 Kominato	3.0	-	-	18-1		-	3.5	CS		
E 160	Apr. 16, 1976 Ishigaki	4.5	-	-	19-1		-	4.0	AF		
E 161	"	3.3	-	-	17-1		-	3.2	AF		
E 162	"	4.6	-	-	17-1		-	3.8	AF		
E 163	"	3.9	-	-	16-1		-	3.0	CS		
E 164	"	2.9	-	-	19-1		-	2.5	AF		
E 165	"	3.4	-	-	17-1		-	3.1	AF		
E 168	"	-	-	-	-	-	-	-	PF		
E 183	Apr. 17, 1976 Ishigaki	3.5	-	-	18-1		-	3.5	AF		
E 184	"	3.7	-	-	19-1		-	3.3	AF		
E 185	"	6.5	-	-	18-1		-	4.2	AF		
E 186	"	2.1	-	-	20-1		-	3.0	CS		
E 187	"	3.5	-	-	19-1		-	3.6	CS		
E 188	"	3.0	-	-	20-1		-	3.0	CS		

Description: Many specimens were collected from intertidal or subtidal rocky areas. These specimens include a wide range of sizes; the

smallest young worm measures 1.0 mm in head length and 0.8 mm in width. On the other hand, the largest one measures 6.5 mm in head

length and 5.7 mm in body width. Most of the specimens examined were incomplete. Even when complete, the specimens usually divided into some pieces due to the fragile nature of the body of this species.

The color of dorsum is reddish brown with numerous white dots. Colorless transverse bands appear only on setiger 2 or both setigers 2 and 3.

The prostomium is bilobed in front and twice as long as the first setiger (Fig. 7, a). There are three occipital antennae, subequal in length and projecting slightly from the anterior margin

of the prostomium. Two eyes situated outside the paired tentacles are usually reniform but sometimes oval (Fig. 7, b). The first peristomial ring is broader than the second.

Parapodia are uniramous and lack branchiae. The dorsal cirri are long and cylindrical in the first few parapodia (Fig. 7, c) or short and conical in posterior parapodia (Fig. 7, d). The ventral cirri are also long in anterior parapodia and short with proximal pad in posterior ones. The postsetal lobe is higher than the presetal or setal lobe.

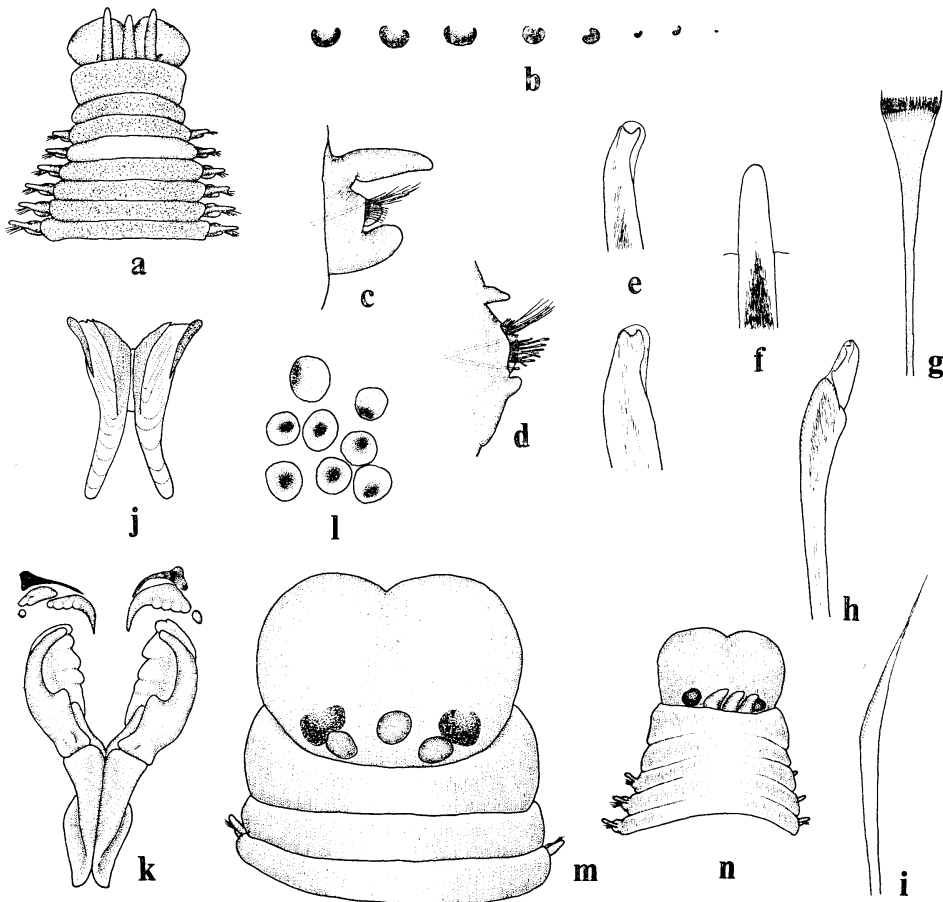


Fig. 7. *Lysidice ninetta* AUDOIN and MILNE EDWARDS, 1833. a, Anterior end, in dorsal view, $\times 10$ (E 93). b, The left eyes of several specimens, $\times 50$ (from left to right, E 92, 93, 94, 97, 104, 107, 110). c, First parapodium, in anterior view, $\times 60$ (E 92). d, Parapodium 45, in anterior view, $\times 50$. e, Subacicular hooks, $\times 400$ (E 188, 92). f, Aciculum, $\times 250$. g, Comb seta, $\times 500$. h, Compound seta, $\times 400$. i, Capillary seta, $\times 400$. j, Mandibles, in dorsal view, $\times 15$. k, Maxillae, in dorsal view, $\times 25$. l, Eggs, $\times 80$. m, Anterior end of epitokous female, in dorsal view, $\times 80$ (E 133). n, Anterior end of epitokous male, in dorsal view, $\times 50$ (E 112).

Dark subacicular hooks are bidentate and hooded. Both teeth are directed upward along the stem. In the large specimen, the hooks lack hood and their teeth become dull (Fig. 7, e). Subacicular hooks start from setigers 16-25 in these specimens. Acicula are darker and stouter than the subacicular hooks; they appear singly in a parapodium and have bluntly tapered tips (Fig. 7, f). Each comb seta has nearly symmetrical lateral extensions and more than ten inner spines (Fig. 7, g). Compound setae, situated in subacicular positions, are bidentate and hooded (Fig. 7, h). The cutting edge of the hood and the distal part of the stem are serrated. Both teeth of the blade are directed laterally. Simple setae are broad and serrated on the middle portion (Fig. 7, i).

The mandibles are H-shaped with two black horny plates on their outside. They sometimes are calcified on the cutting edge (Fig. 7, j). The maxillary carriers are long and relatively narrow. The maxillary formula is Mx. I=1+1, Mx. II=(3-4)+(3-4), Mx. III=(3-4)+0, Mx. IV=(1-3)+(2-4), Mx. V=1+1 (Fig. 7, k).

The pygidium has two long dorsal and two short ventral cirri.

Epitokous specimen

Two epitokous specimens were collected from the bases of seaweed at Kominato. Specimen E 133 is a female with purplish eggs within the body. When the worm was captured, it released the eggs from the dorsal part of the parapodia. The eggs have large yolk granules and purple pigments at their vegetal pole (Fig. 7, l). Thus the adult females are colored purplish posterior to setiger 25. The anterior body is beige colored in epitokous females, without the distinct bands of the atokous stage. The prostomial antennae are very short and conical. Outside the paired antennae, there are two enlarged oval eyes (Fig. 7, m).

In the male specimen (E 112), the anterior body is beige without bands and the posterior body is pink by the mixture of red blood and white male products. The eyes are also rounded and enlarged (Fig. 7, n).

Distribution: Red Sea; Mediterranean Sea; Atlantic, Indian and Pacific Oceans; Japan.

Discussion: *Lysidice collaris* was considered

synonymous with *L. ninetta* by FAUCHALD (1970), who did not consider the character used to differentiate the two species, *i. e.* the shape of eye as significant. FAUCHALD (1970) mentioned that the shape of eye is related to the start of the subacicular hooks and that the latter depends on the size of the specimen. The specimens examined here did not present a clear relationship between the two diagnostic characters and the size of the specimen; however, these two characters may be related to the physiological condition of this species. In the epitokous stage the eyes become enlarged and the outline becomes obscured. The dilatation of the eyes causes the shape to become oval or circular. The anterior or central part of eye, however, remains somewhat lighter in color.

The three antennae are considerably shorter in epitokous stage than in atokous stage. This was mentioned of *L. ninetta* by MONRO (1933, p. 71). *L. collaris* may be considered as an atokous stage of *L. ninetta*. The present author considers that the two named species are synonymous.

4. Literature cited

- CROSSLAND, C., 1904: The Polychaeta of the Maldivic Archipelago from the collections made by J. Stanley GARDINER in 1899. Proc. Zool. Soc. London, 1904: 270-286, 2 pls., 5 figs.
- DAY, J. H., 1962: Polychaeta from several localities in the Western Indian Ocean. Proc. Zool. Soc. London, 139: 624-656, 5 figs.
- DAY, J. H., 1967: A monograph of the Polychaeta of Southern Africa. Part 1. Errantia. British Mus. (Nat. Hist.), London. xxxix+458 pp., 17 pls., 1 map.
- FAUCHALD, K., 1969: A revision of six species of the *Flavus-Bidentatus* group of *Eunice* (Eunicidae: Polychaeta). Smithsonian. Contrib. Zool., 6: 1-15, 6 figs.
- FAUCHALD, K., 1970: Polychaetous annelids of the families Eunicidae, Lumbrineridae, Iphitimidae, Arabellidae, and Dorvilleidae from Western Mexico. Allan Hancock Monogr. Mar. Biol., 5: 1-335, 27 pls.
- FAUVEL, P., 1923: Polychètes errantes. Faune de France, 5: 1-448, 181 figs.
- FAUVEL, P., 1936: Annélides polychètes du Japon. Mem. Coll. Sci., Kyoto Univ., ser. B, 12: 41-92, 1 fig.

- GRAY, J. E., 1847: An account of *Palola*, a sea worm caten in the Navigator Islands. Proc. Zool. Soc. London, **15**: 17-18.
- HARTMAN, O., 1944: Polychaetous annelids. Part 5, Eunicea. Allan Hancock Pac. Exped., **10**: 1-181, 18 pls.
- HARTMAN, O., 1948: The marine annelids erected by KINBERG, with notes on some other types in the Swedish State Museum. Ark. Zool., Stockholm, **42a**: 1-137, 18 pls.
- HARTMAN, O., 1961: Polychaetous annelids from California. Allan Hancock Found. Pac. Exped., **25**: 1-226, 34 pls.
- HAUENSCHILD, C., A. FISCHER and D.K. HOFMANN, 1969: Untersuchungen am pazifischen Pololowurm *Eunice viridis* (Polychaeta) in Samoa. Helgol. wiss. Meeresunters., **18**: 254-295.
- HOFMANN, D.K., 1974: Maturation, epitoky and regeneration in the polychaete *Eunice siciliensis* under field and laboratory conditions. Mar. Biol., **25**: 149-161.
- IMAJIMA, M., 1967: Errant polychaetous annelids from Tsukumo Bay and vicinity of Noto Peninsula, Japan. Bull. Nat. Sci. Mus., Tokyo, **10**: 403-441, 12 figs.
- IMAJIMA, M., 1968: Polychaetous annelids from Hayama, Miura Peninsula. Sci. Rep. Yokosuka City Mus., **14**: 20-41, 6 pls. (In Japanese).
- IMAJIMA, M., and O. HARTMAN, 1964: The polychaetous annelids of Japan. Part 2. Allan Hancock Found. Publ. Occas. Pap., **26**: 239-452, 3 pls.
- IZUKA, A., 1912: The errantiate Polychaeta of Japan. J. Coll. Sci., Tokyo Univ., **30**: 1-262, 24 pls.
- MCINTOSH, W.C., 1885: Report on the Annelida Polychaeta collected by H.M.S. Challenger during the years 1873-76. Rep. Sci. Res. Challenger (Zool.), **12**: 1-554, 94 pls.
- MIURA, T., 1977: Euniceid polychaetous annelids from Japan—I. La mer, **15**: 1-20, 9 figs.
- MONRO, C., 1933: The Polychaeta Sedentaria collected by Dr. C. CROSSLAND at Colon, in the Panama region, and the Galapagos Islands during the expedition of the S. Y. St. George. Proc. Zool. Soc. London, 1933: 1039-1092, 31 figs.
- MONRO, C., 1937: Polychaeta. The John Murray Expedition, 1933-1934, Sci. Rep., **4**: 243-321, 28 figs.
- MOORE, J.P., 1903: Polychaeta from the coastal slope of Japan and from Kamchatka and Bering Sea. Proc. Acad. Nat. Sci. Phila., **55**: 401-490, 5 pls.
- NONATO, E.F. and J.A.C. LUNA, 1970: Annelídeos poliquetas do nordeste do Brasil. I-Poliquetas bentônicos da Costa de Alagoas e Sergipe. Bolm Inst. oceanogr. S Paulo, **19**: 57-130.
- OKUDA, S., 1937: Polychaetous annelids from the Palau Islands and adjacent waters, the South Sea Islands. Bull. Biogeogr. Soc. Japan, **7**: 257-315, 59 figs.
- OKUDA, S., 1938: Polychaetous annelids from the vicinity of the Mitsui Institute of Marine Biology. Jap. J. Zool., **8**: 75-105, 15 figs.
- OKUDA, S., and M. YAMADA, 1954: Polychaetous annelids from Matsushima Bay. J. Fac. Sci., Hokkaido Univ., ser. 4, **12**: 175-199, 10 figs.
- PETTIBONE, M.H., 1963: Marine polychaete worms of the New England region. 1. Aphroditidae through Trochochaetidae. Bull. U.S. Nat. Mus., **227**: 1-356, 83 figs.
- TREADWELL, A.L., 1921: Leodicidae of the West Indian Region. Pap. Tortugas Lab., Carnegie Inst., **15**: 1-131, 9 pls.
- WU, B., S. SHEN and M. CHEN, 1975: Preliminary report of Polychaetous annelids from Xisha Islands, Guangdong Province, China. Stud. Mar. Sin., **10**: 65-104, 10 figs. (In Chinese with English abstract).

日本産イソメ科多毛環虫類—II

三 浦 知 之

要旨：第1報 (MIURA, 1977) に続き、日本各地から採集されたイソメ科多毛環虫類について分類学的研究の結果を報告する。

本報ではイソメ科の4属 *Eunice*, *Palola*, *Marphysa*, *Lysidice* に属する7種が扱かれ、日本未記録の2種 *E. (Nigidion) cariboea*, *M. disjuncta* と1新種 *E. spinea* sp. nov. が記載された。

E. vittata は浅海底に比較的普通に見られ、3歯黄色の足刺状剛毛と体前部にだけ発達した鰓を持っている。*E. spinea* は鹿児島湾の20~200 mの海底から採集されたもので、長複剛毛を持つ数少ない *Eunice* 属の1種である。足刺状剛毛は2歯黒色で、最高3分枝する鰓が第9節に始まる。*E. (Nigidion) cariboea* は汎世界種で2歯黒色の足刺状剛毛と体後部にだけ鰓がみられる。*Palola* 属は足刺状剛毛と櫛状剛毛を欠く点で *Eunice* 属とは区別され、*P. siciliensis* は中でもよく知られた種で、体後部にだけ鰓がある。*Marphysa* 属は囀口部に感触鬚がなく、前感触手が5本ある。*M. disjuncta* は従来南カリフォルニア沖から知られていたが、鹿児島湾にも生息することが確認された。長複剛毛と体前部に対する鰓がある。*M. sanguinea* は世界的に分布する普通種で、長複剛毛と体前部から後端近くまで分布する鰓がある。*Lysidice* 属は前感触手が3本で鰓がない。*L. ninetta* は以前は *L. collaris* として知られていた種で、わが国沿岸に極めて普通である。