

## HESIONIDAE (ANNELIDA, POLICHAETA) FROM JAPAN. I.

by

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Since Marenzeller's (1879) new species' description of *Hesione reticulata* from Japan, 13 species of Hesionids belonging to 9 genera have been hitherto reported by several authors. But 10 species out of them were firstly recorded by Hessle (1925). He also recorded *H. reticulata* in the paper as *H. splendida* Savigny, 1818. Afterwards, Okuda (1936) recorded *Podarke pugettensis* Johnson, 1901, and Westheide (1977a) recorded *Hesionides arenaria* Friedrich, 1937. Therefore, only two species have been added as Japanese Hesionid fauna since Hessle's report (1925). The author has published a list of polychaete species collected in the Kii region (Uchida, 1988), and only a single Hesionid (*Ophiodromus berrisfoldi* Day, 1967) out of 9 species has firstly reported in it.

Hesionids are rather common in tropical and subtropical waters, and it is also the case in Japan. The species diversity of hesionids is high in southern warm waters, and they distributed along the Kuroshio Current, but limited number of hesionids including interstitial minute species have been recorded north to the Boso Peninsula, where the Kuroshio flows away to the Central North Pacific.

In the present account 17 genera and more than 50 species will be described. Japanese Hesionids with less than 7 pairs of tentacular cirri are described here as Part I of the report. The Hesionids with 8 pairs of tentacular cirri will be reported as Part II.

### **Genus *Micropodarke* Okuda, 1938, char. emend.**

Body rather long. With six pairs of tentacular cirri. Proboscis without a pair of chitinous ventrolateral ridges or jaws. With proboscial papillae. With a pair of bi-articulated palpi. With two antennae. Parapodia sub-biramous, with notopodial acicula, but without notosetae. Each neuropodial presetal lobe sub-divided into two lobes by a median depression. Neurosetae all compound and the shaft of them with a bifid tip.

#### ***Micropodarke dubia* (Hessle, 1925)**

(ミクロオトヒメ)

(Figs. 1-2: Pl. 1, fig. 1)

*Kefersteinia dubia* Hessle, 1925, p. 32, Fig. 11.

*Micropodarke Amemiyai* Okuda, 1938, p. 89, Fig. 10.

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- *dubia* Imajima & Hartman, 1964, p. 83.  
 ————— ——— Okuda & Imajima, 1965, p. 502, Figs. 1–5.  
 ? ————— ——— Banse & Hobson, 1968, p. 13, Figs. 3i, j.  
 ————— ——— Uchida, 1988, p. 78.

#### MATERIAL EXAMINED.

Kushimoto, Arita, lobster gill net, 7 February, 1979, late K. Ikazaki, collector, 1 specimen; Kada, Wakayama, Wakayama Prefecture, lower tidal zone, 4 June, 1985, 4 specimens; the same locality, 14 September, 1985, 11 specimens; Kuroshima Is. (Ryukyu Islands, Yaeyama Group), off Nishinohama Beach, 15 m deep, SCUBA diving, 12 Sept. 1986, K. Nomura, collector, 1 specimen; Kushimoto, Fukuro, intertidal zone, 12 April, 1990, 3 specimens; Kushimoto, Ohshima Is., Kashino, 15 m deep, SCUBA diving, 10 May, 1990, Sh. Ui, collector, 1 specimen; Kada, Wakayama, tidal zone, 3 June, 1996, 11 specimens; Kuroshima Is., around the Island, 5–8 m deep, SCUBA diving, 15–17 Dec. 1997, 17 specimens; the same locality, SCUBA diving, 17–20 April, 1998, 91 specimens; Kushimoto, Arita, intertidal zone, 27 April, 1998, 1 specimen; Tsubaki, Shirahama, Wakayama Prefecture, 7m, SCUBA diving, 12 April, 1999, 1 specimen; the same locality, SCUBA diving, 3–11m, 6 Oct. 1999, 2 specimens; the same locality, SCUBA diving, 15m, 30 Mar. 2000, 1 specimen, the same locality, SCUBA diving, 8m, 11 Oct. 2000, 1 specimen, the same locality, SCUBA diving, 12m, 12 Oct. 2000, 1 specimen.

#### DESCRIPTION.

Body colorless except for pale gray faint markings in sidebody between each parapodium (Pl. 1, Fig. 1), but the preserved specimens colorless all over. Body 3–9 mm long with 24–50 setigers in complete specimens, but it seems to be up to *ca.* 15 mm long with *ca.* 70 setigers. Body width 250  $\mu$ m–1 mm excluding parapodia, and 700  $\mu$ m–2 mm including parapodia. The longest fragment 16 mm long with 59 setigers behind the anterior tentacular segments.

Prostomium sub-rectangular, wider than long, with a depression in posterior margin (Fig. 1, A). With two antennae, two bi-articulated palpi, and two pairs of eyes. The antennae inserted in frontal margin of prostomium, rather slender, non-articulated, and almost as long as the length of prostomium. Palpi situated just ventral to the antennae, and somewhat shorter than the latter. An articulation occurred about a half of the entire length. Orangish red eyes situated in the posterior half of prostomium. The anterior pair wide, and larger than the posterior pair. Without a facial tubercle.

Proboscis without teeth or jaws, but with a circle of 20 papillae. Each papilla subconical with a ciliated tip. Proboscial margin not ciliated (Fig. 1, F).

Tentacular cirri, dorsal cirri, and anal cirri articulated (Fig. 1, A–E). Each article long cylindrical in form.

Each of anterior three segments with two pairs of tentacular cirri (Fig. 1, A–B). Tentacular cirri of segment II situated ventrally than those of segments I and III (Fig. 1, B). Dorsal tentacular cirri of segment III the longest. Dorsal tentacular cirri of segment I and ventral tentacular cirri of segment III almost as long as a half of the longest cirri. Dorsal and ventral tentacular cirri of segment II the shortest, and almost as long as a half of dorsal tentacular cirri of segment I. Ventral tentacular cirri of segment I somewhat longer

than tentacular cirri of segment II (Fig. 1, A-B). Each of three pairs of ventral tentacular cirrophores with 3-4 slender acicula, but dorsal tentacular cirrophores without acicula.

Dorsal cirri of the following setigers somewhat shorter than the longest tentacular cirri (Fig. 1, B), and those in posterior segments short (Fig. 1, C). A pair of anal cirri stout, but the length of them unknown, because all the specimens incomplete in anal cirri (Fig. 1, C).

Parapodia of the first setiger enough large, slightly smaller than the following parapodia (Fig. 1, A-B, Fig. 2, A-B). The last three setigers with parapodia of gradually diminished, and with an achaetous parapodium on each side between the last setiger and pygidium (Fig. 1, C).

Each parapodium (Fig. 1, D-E) with an articulated long notocirrus and a non-articulated neurocirrus. Presetal lobe divided into two lobes. Postsetal lobe with entire rounded margin. Anterior parapodia essentially same as those in middle region (Fig. 2, A-B). In posterior parapodium, superior presetal lobe inconspicuous, and inferior presetal lobe rather longer than postsetal lobe (Fig. 2, C).

A single aciculum in each neuropodium (Fig. 1, D, Fig. 2, A-C). Neuroaciculum gradually tapered to a dully pointed tip (Fig. 2, E). A notoaciculum present in each parapodium, accompanied with an additional needle-like slender one (Fig. 2, C-D). Main notoaciculum same as that in neuropodia in form, but thinner (Fig. 2, D). In the anterior-

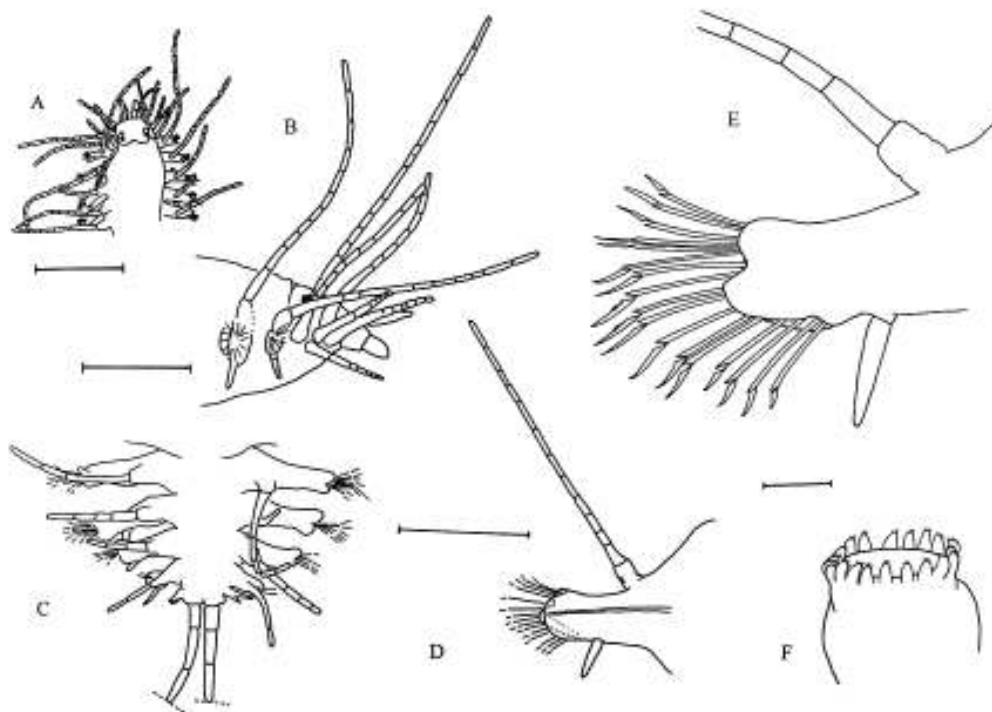


Fig. 1. *Micropodarke dubia*

A, anterior part, dorsal view (scale: 1 mm); B, the same, side view, showing the arrangement of tentacular cirri (scale: 0.5 mm); C, posterior part, dorsal view, all of two anal cirri broken (scale: 0.5 mm); D, left 31st parapodium, posterior view (scale: same as C); E, right 35th parapodium, anterior view (scale: 0.1 mm); F, distal part of proboscis, with 20 papillae on margin (scale: same as E).

most parapodia, two notoacacula almost the same thickness each other (Fig. 2, A–B). Each of noto- and neuroaciculum with an axial hollow (or a perforation) in a distal half (Fig. 2, D–E).

Without notosetae in all parapodia.

Neurosetae all compound. Median parapodia with *ca.* 20 setae (*ca.* 12 in smaller specimens, *ca.* 25 in larger specimens). Three or four (rarely five) setae in median portion in each parapodium with long teeth on their basal part of blades (Fig. 2, G, K). Each of the other neurosetae (Fig. 2, F, H–J) with fine serration on blade, and with a slender spinous subterminal tooth (or a guard). Setae with longer blades situated in median portion (Fig. 2, F). Inferior-more (Fig. 2, I) or superior-more (Fig. 2, H) setae with shorter blades. Shalt of all neurosetae with a bifid apex. The two teeth arranged in parallel side by side. Therefore, it is difficult to define by side view of setae, but easily observable in oblique view (Fig. 2, J–K).

The first three setigers and the last three setigers without special neurosetae. Each parapodidium of 4th setiger and last to the 4th setiger with a single special seta, and parapodia of 5th setiger and last several setigers with two special setae in each setal

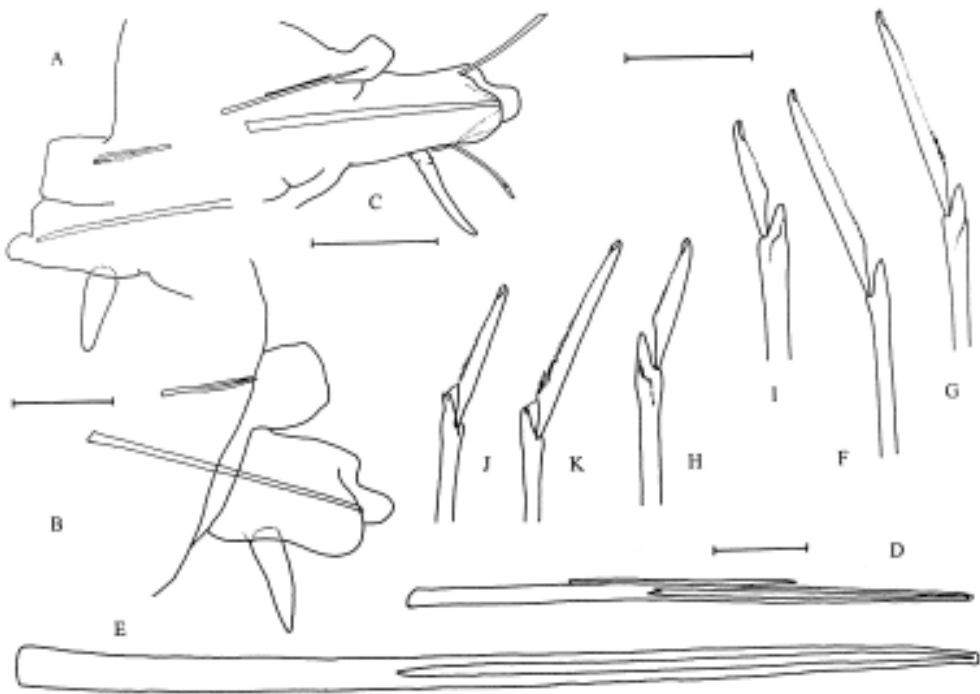


Fig. 2. *Micropodarke dubia*

A, right first parapodium, anterior view (scale: 0.1 mm); B, right second parapodium, posterior view (scale: same as A); C, right parapodium of last 8th setiger, showing only superior-most and inferior-most setae, posterior view (scale: 0.1 mm); D, a pair of noto-acicula in median parapodium (scale: 50  $\mu$ m); E, neuro-aciculum in median parapodium (scale: same as D); F, compound falciger just superior to the special seta in right 35th parapodium (scale for F–K: 50  $\mu$ m); G, the special falciger in the same parapodium; H, superior-most falciger in the same parapodium; I, inferior falciger in the same parapodium; J, superior falciger; in somewhat oblique view in right 22nd parapodium; K, the special seta in oblique view in the same parapodium.

fascicle. Parapodia except for those setigers with three or four (rarely five) special setae in each setal fascicle.

#### REMARKS.

The specimens agree well with the descriptions by Hessle (1925) and Okuda (1938), except for several points as follows.

Hessle (1925) described "Das Endglied der Palpen ist ebenso lang, oder einwenig länger als der Basalglied." In his figure (Fig. 11, a), although, the palpi are articulated near the half of the entire length, which is the same as Okuda's description and the present materials. He also described, "Die Dorsalcirren sind mit einem langen Basalstück versehen und sind gegliedert." (pp. 32-33) (cf. his Fig. 11, b). The cirrophores of notocirri are, however, not so long (Fig. 1, D-E, and also Okuda's Fig. 10, b). Hessle surely mistook the proximal-most article of cirrostyle for a part of cirrophore (compare the form of his cirrophore in his Fig. 11, b with that in Fig. 1, D of the present author). The articulation of dorsal cirrus in Hessle's figure is also finer than those of Okuda's and present materials.

A supernumerary eye in the left side of prostomium in Okuda (1938) is a simple variety, as mentioned by Imajima & Hartman (1964).

According to the descriptions, the number of proboscis papillae is *ca.* 20 in Hessle (1925), and 21 in Okuda (1938). All the specimens of proboscis protruded in the present materials (Kada, 2 spec.; Kushimoto-Arita, 1 spec.; Kushimoto-Fukuro, 1 spec.; Kuroshima Is., 1 spec.) have 20 papillae on proboscis. Okuda's material (he got only a single specimen in his disposal) seems to be in a range of variety.

"The parapodium is uniramous" in Okuda (1938) should surely be read that the parapodia without notosetae. He never checked not only notoacacula but neuroacacula in parapodia.

*M. dubia* by Banse & Hobson (1968) has about 25 proboscis papillae, instead of 20. It seems to be the reasonable difference from the Japanese specimens. American specimens have, moreover, weakly developed superior presetal lobes in median parapodia. Fig. 3, i of Banse & Hobson (1968) resembles very much to the posterior ones in Japanese materials (see Fig. 2, C). They described "The anterior lips (= two presetal lobes) of the first parapodia are almost bilobed as described by Okuda (1938)." Okuda's description and also his figure (Fig. 10, b), though, are on the median parapodia (His upside down figure is from the 34th parapodium). Therefore, there is a doubt that the American specimens belongs to the Japanese species. They described that the parapodium has 1 or 2 notoacacula, and their figure of a median parapodium (Fig. 3, i) has two neuroacacula. Parapodium in Japanese specimens has a single neuroaciculum.

*Megalia assimilis* Pryde, 1914 is very similar to the present species. *M. assimilis* has the compound setae with the blade of basal serration of long teeth, and with shaft of bifid apex (Pryde, 1914, Pl. 11, fig. 2). Almost all parts of his description agree with the present materials. *Megalia assimilis* is surely a member of the genus *Micropodarke*, if the tentacular cirri are correctly six pairs. Paired eyes on each side, however, "are situated near each other towards the middle region." in *M. assimilis*, same as those of *Kefersteinia cirrata* (Keferstein, 1863). Two pairs of eyes are situated the posterior half of prostomium in *M. dubia*. Each of 6 pairs of tentacular cirrophores has a single aciculum in *M. assimilis*, but each of only ventral tentacular cirrophores has 3-4 acicula in *M. dubia*. Each

parapodium of *M. assimilis* also has "two fairly stout" acicula. *M. assimilis* agrees fairly well with *Kefersteinia cirrata*, except for the number of tentacular cirri.

The account of the number of neuroacicula is two by Banse & Hobson (1968), and Pryde (1914). The stout neuroaciculum has an axial hollow (or an axial perforation) in a distal half of length in Japanese specimens (Fig. 2, E), and is easily misjudged as two acicula, on account of the transparent nature of acicula, and overlapped setal bundle. The specimens from America and North Sea may, therefore, have a single aciculum in each neuropodium.

The genus *Micropodarke* would be close to *Nereimyra* Blainville, 1828, *Syllidia* Quatrefages, 1865, *Neopodarke* Hartman, 1965, and *Synsyllidia*, n. Gen. The former two genera have horny jaws or horny ridges in proboscis. On the definition from *Synsyllidia* is mentioned elsewhere (pp. 33 & 35). *Neopodarke* is devoid of notoacicula.

Following is the key to species of the genus *Micropodarke*.

1. Two pairs of eyes located in the middle part of prostomium  
..... *M. assimilis* (Pryde, 1914), n. comb.
1. Two pairs of eyes located in the posterior half of prostomium ..... 2
2. Superior lobe of parapodial presetal lobe rather small in median parapodia. Postsetal lobe shorter than presetal lobe in median parapodia ..... *M. dubia* sensu Banse & Hobson 1968
2. Superior lobe of parapodial presetal lobe almost as large as inferior lobe in median parapodia. Postsetal lobe almost as long as presetal lobe in median parapodia  
..... *M. dubia* (Hessle, 1925)

### **Genus *Synsyllidia* nov.**

TYPE SPECIES: *Synsyllidia alternata*, n. sp.

Gender: feminine.

#### DIAGNOSIS.

Prostomium rectangular, with two antennae, paired bi-articulated palpi, and two pairs of eyes. Without facial tubercle. Proboscis with a circle of papillae, but without jaws. Three tentacular segments achaetous and apodous. Six pairs of tentacular cirri with distinct ceratophores. Parapodia sub-biramous. Notopodia represented by dorsal cirri and acicula. Neuropodia subconical, without extra lobes, but with ventral cirri. A neuropodial aciculum extended to the ventral margin of parapodium a little inferior to a parapodial apex. Neurosetae of two kinds, heterogomph falcigers and acicular simple setae. Compound setae with hooked apex and fine serration. Each parapodium with a single simple seta and several compound setae. Some anterior segments without simple setae. Pygidium unknown.

#### ETYMOLOGY.

The genus is named from the genus *Syllidia* Quatrefages, 1865, which resembles to the new genus.

## REMARKS.

Seven hitherto known genera have six pairs of tentacular cirri and proboscial papillae in the family: *Microphthalmus* Mecznikov, 1865, *Micropodarke* Okuda, 1938; *Neopodarke* Hartman, 1965a; *Heteropodarke* Hartmann-Schröder, 1962b; *Parahesion* Pettibone, 1956; *Nereimyra* Blainville, 1828; and *Syllidia* Quatrefages, 1865.

The latter two genera, however, have horny jaws or horny ridges in proboscis. The palpi in *Microphthalmus*, *Heteropodarke*, and *Parahesion* are not bi-articulated. *Neopodarke* has complete uniramous parapodia, without notopodial acicula. *Micropodarke* is somewhat related to *Synsyllidia*, n. Gen. Both genera have two antennae, two bi-articulated palpi, six pairs of articulated tentacular cirri, and sub-biramous parapodia. *Synsyllidia*, n. Gen. has simple subconical parapodia, and acicular setae. *Micripodarke*, however, has conspicuous parapodial lobes, and is devoid of acicular setae.

***Synsyllidia alternata*, Gen. et sp. nov.**

(Fig. 3)

## MATERIAL EXAMINED.

Kushimoto (Kii Peninsula), Arita, lobster gill-net, 7 February 1979, 1 specimen (holotype).

## DESCRIPTION.

Body colorless, semi-transparent, 1.5 mm long (excl. protruded proboscis) with 10 setigers. Holotype without posterior part of body (Fig. 3, A). Body width 220  $\mu\text{m}$  excluding parapodia, 600  $\mu\text{m}$  including parapodia, and 900  $\mu\text{m}$  including setal fascicles.

Prostomium sub-rectangular, with a pair of antennae, a pair of bi-articulated palpi, and two pairs of eyes (Fig. 3, B). Lateral antennae as long as length of prostomium. Without median antenna. Palpi inserted closely and ventro-laterally to antennae, and shorter than the latter (Fig. 3, B-C). Their distal articles bullet-shaped, and their proximal articles wrinkled midway. Two pairs of eyes reddish, and in trapezoidal arrangement. Anterior pair larger than posterior pair. Without a facial tubercle.

Proboscis without teeth or jaws, but with a circle of papillae on distal margin (Fig. 3, B-C). 10 large papillae and 9 small ones arranged alternately. Small papillae situated in mid-dorso-ventrally. Without small papilla in the space between left ventral-most large papilla and next large one. Mid-dorsal papilla and next small papilla of left side smaller than the others. Each papilla pear-shaped, distally somewhat bending inwards, and with apical tuft of cilia (Fig. 3, B). Proboscial margin sparsely ciliated.

Each of anterior three segments with two pairs of tentacular cirri (Fig. 3, A-C). All tentacular cirri missing except for dorsal cirrus of segment I and ventral cirrus of segment III in right side, and ventral cirri of segments II-III. Cirrostyle of right dorsal cirrus of segment I stout and non-articulated. Three ventral cirrostyles remained slender and articulated. Ventral cirri of segment II longer than those of segment III.

Parapodia of segment IV (setiger I) somewhat smaller. Following parapodia gradually developed to setiger V. Posterior part from setiger XI missing, and posterior end regenerating, with a pair of spherical projections (Fig. 3, A).

All dorsal cirri missing or partly so.

Parapodia rather long comparing with body width. Each parapodium sub-biramous, with two dorsal acicula and a single ventral aciculum (Fig. 3, D-G). Dorsal cirri long and articulated. Two notoacicula in cirrophore of dorsal cirrus, one much slender than another (Fig. 6, F). Ventral cirrus simple subulate form, inserted midway of ventral margin of parapodium. Neuropodial setal cone simple conical, never divided into pre- and postsetal lobes (Fig. 3, D-E). A single neuroaciculum in neuropodial cone. Its apex extending to the margin of neuropodial cone of a little inferior to podial apex (Fig. 3, G).

Each parapodium with 18-20 compound setae, but anterior parapodia with more or less few setae (11-17 setae in setigers II-IV). Setiger I with seven compound setae. A single simple seta in each parapodium from setiger VI (Fig. 3, D-E, G). Simple seta inserted dorsal margin of parapodium (Fig. 3, G). Compound setae with hooked apex and fine serration in proximal half of blade (Fig. 3, H-J). Median setae with longer blade than superior or inferior setae. Serration of setae with longer blade somewhat stronger than the others. Simple seta weakly bent and with a weakly hooked but blunt apex (Fig. 3, G, K).

#### ETYMOLOGY.

Named for the alternate arrangement of large and small papillae on proboscis.

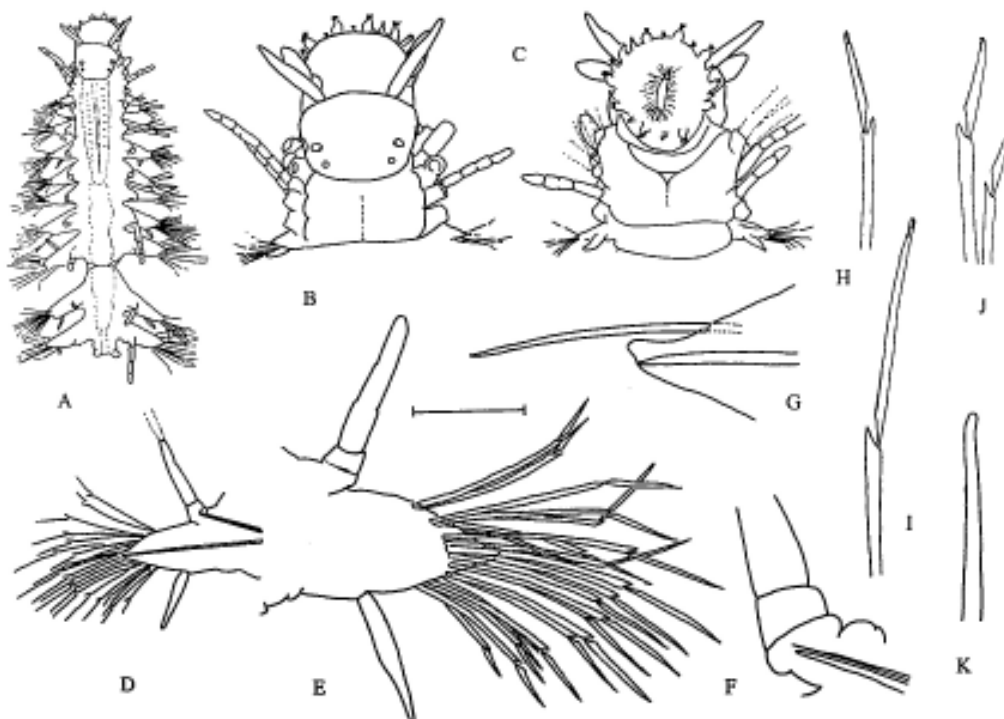


Fig. 3. *Synsyllidia alternata*, n. Gen., n. sp.

A, anterior part, dorsal view; B, prostomium; C, proboscis, ventral view; D, right 9th parapodium, anterior view; E, the same, posterior view; F, notopodial cirrophore in the same parapodium, with noto-acicula; G, neuropodial aciculum and a simple seta in the same parapodium; H, superior-most compound falciger; I, median falciger; J, inferior-most two falcigers; K, tip of simple seta. Scale, A:0.5 mm, B-D: 200  $\mu$ m, E: 100  $\mu$ m, F-J: 50  $\mu$ m, K: 20  $\mu$ m.



## REMARKS.

Bi-articulated palpi are almost same length as, or somewhat longer than antennae, and proximal articles of palpi not wrinkled according to my rough sketch of the specimen in living condition. It seems, therefore, that the wrinkles of proximal articles of palpi are an effect of fixation.

The unusual form of dorsal tentacular cirrus of right side in segment I is due to regeneration. The left dorsal cirrus on segment I was already missing when I observed it in living condition. Therefore, the true length of dorsal tentacular cirri on segment I are unknown. The other tentacular cirri were, however, roughly figured before fixation. According to the figure, ventral tentacular cirri on segment I are as long as those on segment II, and dorsal tentacular cirri are the longest of all, and more than twice as long as their ventral partners. The dorsal tentacular cirri of segment III are 1.5 times as long as the ventral cirri of segment II. Dorsal cirri of segment IV and V (setigers I-II) are much longer than the dorsal tentacular cirri on segment III, but are shorter than those on segment II. All the cirri mentioned above are articulated into many articles.

*Synsyllidia alternata*, n. sp. is related to *Micropodarke dubia* (Hessle, 1925). The two species have six pairs of tentacular cirri, papillated proboscis without ventral ridges or jaws, a pair of antennae, a pair of bi-articulated palpi, and sub-biramous parapodia. The new species, however, has simple conical parapodial cones, instead of complicated lobes of parapodia in *M. dubia*. Moreover, *M. dubia* lacks acicular simple setae.

*Synsyllidia alternata*, n. sp. rather similar to the species of *Syllidia* Quatrefages, 1865. There are five species hitherto referred to *Syllidia* (Hartman, 1959, 1965b): *S. armata* Quatrefages, 1865 (type species); *S. inermis* (Ehlers, 1912); *S. assimilis* (Pryde, 1914); *S. capensis* (McIntosh, 1925); and *S. liniata* Hartmann-Schröder, 1962b.

The genus *Syllidia* Quatrefages, 1865 characterized by a pair of lateral horny jaws and a median stylet in proboscis, together with a circle of papillae (Grube, 1880, p. 222; Gravier, 1900, p. 172; Chamberlin, 1919, p. 185; Day, 1967, p. 226; Hartmann-Schröder, 1971, p. 126). *S. armata* (type species) and *S. liniata* have jaws, but *S. inermis* is avoid of jaws, and proboscis are unknown in *S. assimilis* and *S. capensis*.

*S. inermis* with a pair of bi-articulated large palpi, but with a pair of short antennae together with a facial tubercle. These are the striking points of the new species discriminating from imperfectly known *S. inermis*.

Outside of the presence of jaws, *Syllidia* (type species and *S. liniata*) has the parapodial postsetal lobes of low rounded lamellae. The new species, however, has simple conical neuropodial cones, without postsetal lobes.

Imperfectly known *S. assimilis* from the North Sea has stronger serration of blade of compound setae, and distal apex of shaft is bifid in several compound setae of long blade. Moreover, acicular simple setae are wanted in *S. assimilis*. Form of serration in compound setae and that of apical bifurcation of setal shaft show the species closely related to *Micropodarke* (see the preceding species).

Imperfectly known *S. capensis* from South Africa has parapodia of remarkable resemblance to the species of *Nereimyra* Blainville, 1828. Considering the form of parapodium together with the presence of a small tuft of notopodial setae, *Magalia capensis* McIntosh, 1925 may be a species of *Nereimyra*.

[*Syllidia*] *inermis* (Ehlers, 1912) from the Antarctic Sea closely related to the new species. Both species have no jaws in proboscises, and no extra lobes (superior and inferior lobes characterizing the species of *Nereimyra*) in parapodia. According to the original description, [*S.*] *inermis* has six pairs of tentacular cirri, which are arranged three pairs in segment I, two pairs in segment II, and a single pair in segment III. However, the arrangement described by Ehlers (1912) is doubtful. In the new species, six pairs of cirrophores of tentacular cirri look like the manner (see Fig. 6, B). This is due to the oblique shift of tentacular cirri on segment II to antero-dorsally. The shift results in the dorsal tentacular cirrophores of segment II (D2) carrying on the dorsal tentacular cirrophores of segment I (D1), and ventral tentacular cirrophores of segment II (V2) carrying on the ventral tentacular cirrophores of segment III (V3). Therefore, six pairs of tentacular cirri are arranged as if D2–D1–V1 dorsoventrally on segment I, V2–V3 on segment II, and D3 on segment III. [*S.*] *inermis* has, however, no acicular simple setae, and has 12 papillae of a same size on its proboscis.

[*Nereimyra*] *longicirrata* Knox & Cameron, 1971 has the parapodia without any lobes characterizing the species of *Nereimyra*. The form of proboscis is unknown. Therefore, the generic status of the species is uncertain. [*N.*] *longicirrata* has simple conical neuropodial cones resembling to the new species. The Australian species, however, is devoid of acicular simple setae.

Neuropodial acicular simple setae are rare in Hesionidae. Only two hitherto-known species have those setae: *Orseis brevis* Hartmann-Schröder, 1959, and *Hesiospina similis* (Hessle, 1925). But the former has only two pairs of tentacular cirri, and the latter has eight pairs of tentacular cirri, instead of six pairs. Many species of *Microphthalmus* have simple neurosetae. The new species, however, has distinct cirrophores of tentacular cirri and dorsal cirri.

The alternate arrangement of large and small proboscical papillae is very curious. *Syllidia armata* Quatrefages, 1865 is the only a single known species with the type of proboscis. *S. armata*, however, has horny jaws in proboscis.

### **Genus *Ophiodromus* Sars, 1861**

Syn. *Podarke* Ehlers, 1864, p. 199.

*Irma* Grube, 1878, p. 107.

? *Parasyllidia* Pettibone, 1961, p. 173.

Body rather stout, with rather few segments. With a pair of bi-articulated long palpi, and three antennae. Proboscis without a pair of chitinous ventral ridges, chitinous jaws, or marginal papillae, but with fine ciliation. Without facial tubercle. With six pairs of tentacular cirri. Cirrophores of dorsal tentacular cirri of segment II tend to shift toward dorsal side of dorsal tentacular cirrophores of segment I. Parapodia biramous or sub-biramous, with noto-acilula, and with or without notosetae. Neuropodium with one or two acicula, a more or less indistinct postsetal lobe, and a long presetal lobe. Notosetae, if present, simple capillary or forked. Forked seta with two arms in different length. Neurosetae all compound falcigers.

## REMARKS.

The species of the genus *Ophiodromus* belong to one of the most difficult groups to identify in the family. The setal morphology is not useful, because of the same form of them in all the species in the genus.

Simple capillary setae and forked setae are found in notopodia in the genus. It is said that some species have only simple capillary notosetae, and others have forked notosetae. The notosetae are, however, very fine, and forked setae are easily mistakenly recognized as simple capillary setae according to the direction of observation. Rioja (1923) found forked setae in *O. flexuosus* (delle Chiaje, 1825), which was regarded as the species with only capillary notosetae (Fauvel, 1923). The other case is *O. pugettensis* (Johnson, 1901). Forked notosetae in the species were shown by Berkeley & Berkeley (1948) (Okuda (1936) found forked setae in *O. pugettensis*, but his species is seems to be another species; see p. 55). Devoid of forked setae in several species characterized by the presence of only capillary notosetae (*O. agilis* (Ehlers, 1864), *O. spinosus* (Ehlers, 1908), *O. pugettensis spinapandens* Storch & Niggemann, 1967) are, therefore, quite questionable, perhaps except for *O. pelagica* [sic] Rioja, 1923. It is difficult to consider that Rioja, who defined the possession of forked setae in *O. flexuosus*, failed in finding of the same setae in his *O. pelagicus*.

The form of prostomium is almost same in every species, together with that of proboscis, and tentacular cirri (*O. comatus* (Ehlers, 1913) and *O. tigrinus* Rullier, 1972 may be not the genus, see below). Many morphological characters of anterior part of the body are not good factors for identification. Prostomium is also different in from in the condition of proboscis of specimen. Prostomium of the specimen of protruded proboscis is wider and much shorter than those with non-protruded proboscis. Among them, the form and relative size of median antenna may be useful.

The form of parapodia is, therefore, the most important character for identification of the species, especially in the comparisons of species depending on the descriptions. In the morphology of parapodia, the form of notopodial cirrophores, the forms of presetal and postsetal lobes of neuropodia, and the position of insertion of neurocirri are seemed to be useful. The number of acicula is not specifically stable in both rami of median segments. *O. parapallidus*, n. sp., for example, has two neuro-acicula in several median parapodia, but has a single aciculum in other parapodia. Smaller individual also has a single neuro-aciculum in each parapodium. The fact is also the same in the case of *O. pugettensis* (Johnson, 1901). Each aciculum, however, has an axial perforation, and it is easily miscounted a single aciculum as a couple of parallel ones (see p. 55), without dissection of parapodia, or enucleation of acicula.

The notopodial cirrophores in some species (*O. berrisfordi* Day, 1967, and *O. bunbuku*, n. sp., for example) are thick and long cylindrical in form. Those in other species (*O. pallidus* (Claparede, 1864) and *O. angolaensis* (Hartmann-Schröder, 1974), for example) are very short. And notopodial cirrophore has a clear constriction in many species (*O. berrisfordi* Day, 1967, and *O. pugettensis* (Johnson, 1901), for example). In *O. bunbuku*, n. sp., the cirrophores have, however, no constrictions. The position of the constrictions are constant in one and the same species. Constrictions are shifted distally in *O. fauveli*, n. sp., but those are shifted proximally in *O. brevipodius*, n. sp. The position of

constrictions is related to the position of acicular papillae, where the tips of acicula penetrated.

Presetal lobe in neuropodia seems to be specifically quite stable in form. Very inconspicuous (*O. minutus* (Hartmann-Schröder, 1959), for example), narrow triangular (*O. berrisfordi* Day, 1967, and *C. constrictus*, n. sp. for example), cylindrical with a round tip (*O. bunbuku*, n. sp., for example), wide triangular with dull tip (*O. pugettensis* (Johnson, 1901) for example), wide triangular with pointed tip (*O. agilis* (Ehlers, 1864) and *O. parapallidus*, n. sp. for example), and long triangular (*O. fauveri*, n. sp. and *O. okudai*, n. sp. for example) are present.

Postsetal lobe in neuropodia is also specifically stable in form. Long triangular (*O. fauveri*, n. sp. and *O. parapallidus*, n. sp., for example), rounded (*O. agilis* (Ehlers, 1864), *O. pugettensis* (Johnson, 1901), and *O. brevipodius*, n. sp., for example), and almost truncated (*O. berrisfordi* Day, 1967, *O. bunbuku*, n. sp., and *O. constrictus*, n. sp., for example) are present.

The position of insertion of neurocirri is also specific. Neurocirri are inserted at ventro-lateral corner of parapodia in some species such as *O. brevipodius*, n. sp., but those are inserted more inside of ventral edge of parapodia in other species such as *O. bunbuku*, n. sp.

Presence of long blade neurosetae is also specific. During the survey of several species of *Ophiodromus*, it is found that some species with sub-acicular long blade neurosetae together with short blade setae, but other species without such sub-acicular setae, and furthermore, found that the species with long blade sub-acicular neurosetae, also have very long blade neurosetae in their supra-acicular position.

Some species with pale colored bands on the dorsum of some segments. The bands are brightly white with blue-green tint in living condition. Degree of development of the white bands shows variety by individuals, but the positioning of the bands in anterior part of the body (until Segment XXXV (?), cf. Okuda, 1936, p. 414) very stable in the same species, and the presence of the white bands is also specifically stable.

*Parasyllidia* Pettibone, 1961 is very similar to *Ophiodromus*. The difference is only presence or absence of median antenna. *Parasyllidia humesi*, the type species, was described based on the type series of over 200 individuals of specimens collected from the mantle cavity of a species of bivalve molluscs. The median antenna of *Ophiodromus* species is occasionally missing while collection or treatment of fixed condition. However, it is difficult to consider that all the type specimens of over 200 individuals lost their median antennae before Pettibone's check. Whatever *P. humesi* is devoid of a median antenna, the species is too much similar to *O. berrisfordi* Day, 1967.

The other species hitherto referred to *Parasyllidia* [*P. blacki* (Knox, 1960)] may be the specimens of the genus *Ophiodromus* of their median antennae thrown off (see p. 43).

*Nereimyra longicirrata* Knox & Cameron, 1971 may be the members of the genus *Ophiodromus*. *Gyptis vittata* Webster & Benedict, 1887 is also in the same condition. (cf. the key to the species of the genus *Ophiodromus*, p. 65)

On the other hand, *Podarke comata* Ehlers, 1913 may be a species of the genus *Gyptis*. The description shows the species with papillae on its proboscis. *Ophiodromus tigrinus* Rullier, 1972 may also belong to another genus. The species has not 6 pairs of

tentacular cirri, but 3 pairs of them.

***Ophiodromus angustifrons* (Grube, 1878)**

(Fig. 4)

- Irma angustifrons* Grube, 1878, p. 108, Taf. 6, Fig. 7, Taf. 15, Fig. 12.  
 ————, Grube, 1880, p. 223.  
*Podarke angustifrons*, Hartman, 1959, p. 191.  
 ? ———— *latifrons*, Fauvel, 1939, p. 288.  
 ? ———— ————, (partim) Fauvel, 1953, p. 110, Fig. 51, d-f.  
 non *Irma angustifrons*, Augener, 1913, p. 189.  
 nec ————, Hoagland, 1920, p.604. (*fid.* Pettibone, 1970)  
 ———— (?) ————, Hartman, 1954, p.633. (?= *Gyptis* sp.)  
*Podarke angustifrons*, Fauvel, 1918, p. 333.  
 ————, Fauvel, 1919, p.371.  
 ————, Augener, 1923, p.40.  
 ———— (*Irma*) ————, Horst, 1924, p.191.  
 ————, Fauvel, 1932, p.63, Text-fig. 11.  
 ————, Uschakov and Wu, 1962, p.60, Pl. 1, Fig. A-D.  
 ————, Parulekar, 1972, p.736.  
 ————, Amoureux, Rullier and Fishelson, 1978, p.79.  
*Ophiodromus angustifrons*, Day, 1967, p. 224.

MATERIAL EXAMINED.

Iriomote Island, off Komi, Yaeyama Group, Okinawa Prefecture, 10m, SCUBA diving, Mar. 25, 1986, K. Nomura, collector, 1 specimen.

DESCRIPTION.

Body uniformly pale brown, with 36 setigers, 10.5 mm long, 2.5 mm wide including setal fascicles, 1.8 mm wide including parapodia, and 0.8 mm wide excluding parapodia.

Prostomium elliptical, wider than long, with three antennae, paired palpi, and two pairs of eyes (Fig. 4, A-B). A pair of lateral antennae missing, inserted from the latero-frontal margin of prostomium (Fig. 4, B). A fusiform median antenna short, 1/4 of length of the prostomium, inserted from the frontal margin of it. Palpi bi-articulated, inserted nearby lateral antennae, and as long as the prostomium (Fig. 4, B). Articulation of palpi at the site of proximal 1/3. Two pairs of eyes located lateral corners. Anterior pair of eyes larger a little than posterior pair (Fig. 4, B). Each of anterior three segments with two pairs of tentacular cirri. All dorsal tentacular cirri missing, but right side ventral tentacular cirrus on Segment II, and left ventral cirrus on Segment III still remain. They are almost in same length, and also as long as the length of the prostomium. Anal cirri missing.

Parapodium uniramous. Each parapodium with a dorsal cirrus, a neuropodial cone, and a ventral cirrus (Fig. 4, C). Notopodial part of the median parapodium with a cirrophore and a cirrostyle. Notopodial cirrophore rather long, spread out to the same level of outer margin of neuropodial postsetal lobe. Notopodial cirrophore with an inconspicuous constriction at the distal 1/3. At the constriction, the diameter of the cirrophore decrease to 2/3, and distal 1/3 of cirrophore being somewhat thicker than its cirrostyle. Reduction of the diameter at the constriction rather gradually, without a remarkable ring of fold (Fig. 4,

D). Notopodial cirrostyles rather short. Each notopodium with a single aciculum. The tip of aciculum approached to the surface of the cirrophore near the constriction. Without notosetae. Each median neuropodium with a single aciculum. Neuropodial presetal lobe with a long triangular projection (Fig. 4, C-D). Neuropodial postsetal lobe low and rounded and not conspicuous (Fig. 4, D). With *ca.* 16 supra-acicular and *ca.* 18 sub-acicular setae in median neuropodia. Neurocirri long subulate in form, inserted from somewhat to the ventro-lateral corner of parapodia (Fig. 4, C-D).

Neuroseta with rather long terminal piece of narrow blade (Fig. 4, F-J). Serration of blade very fine and almost smooth. Superior sub-acicular setae with long blade (Fig. 4, D, J).

#### REMARKS.

The elliptical prostomium, rather large eyes, rather long notopodial cirrophore, with gradually reduced constriction, rather short notopodial cirrostyle, long neuropodial presetal lobe, and insertion of neurocirrus far apart from the latero-ventral corner of the neuropodium, are all resemble to the figures of original description (Grube, 1878, Taf. VI, figs. 7, 7a, Taf. XV, fig. 12). The locality of the present material, furthermore, is the Yaeyama, southern-most part of Japan, and true coral reef region, and closely near the type

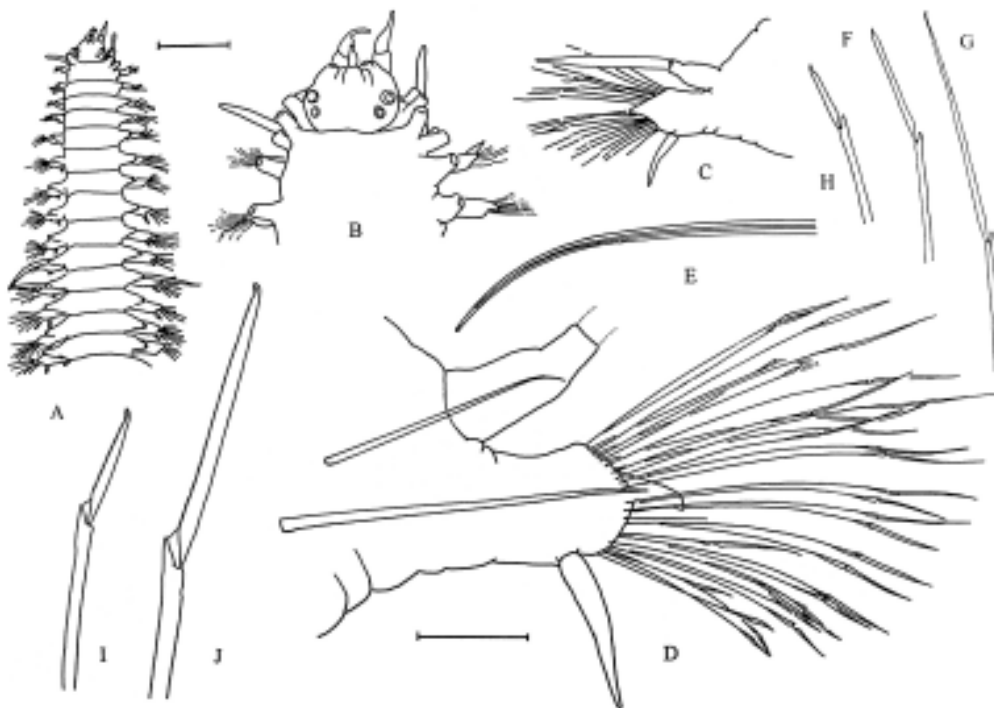


Fig. 4. *Ophiodromus angustifrons*

A, anterior part, dorsal view (scale by A: 1 mm); B, prostomium; C, right 15th parapodium, anterior view; D, right 20th parapodium, posterior view; E, notopodial aciculum; F, median supra-acicular neuropodial falciger in right 15th parapodium; G, inferior-most supra-acicular falciger in the same parapodium; H, inferior-most sub-acicular falciger in the same parapodium; I, inferior sub-acicula falciger; J, superior sub-acicular falciger. Scale by D, B-C: 500  $\mu$ m, D and F-H: 200  $\mu$ m, E and I-J: 50  $\mu$ m.

locality of *O. angustifrons*, the Philippines.

This species has been confused very much. Original description clearly shows that the species without notosetae and without white dorsal bands. Augener (1913 & 1923) and Fauvel (1918 & 1919) described *Irma angustifrons* Grube, or *Podarke angustifrons* Grube, as the species with notosetae. Moreover, Augener (1913) treated *O. latifrons* (Grube, 1878) as a junior synonym of *O. angustifrons*. *O. latifrons* was described as a very large species of 77 mm long. The size is surely not the usual value of the species in *Ophiodromus*, and the consideration should be needed for the genus of this species. Furthermore, Fauvel (1919) described the species as that with white bands. The species hitherto reported in many times, but almost materials described as the species with notosetae, and some of them also with white bands on dorsum. The characters should be belong to other species of *Ophiodromus* (see below).

The form of prostomium, which is the essential definition of difference of *O. angustifrons* and *O. latifrons* by original designation. But the difference may due to different conditions of proboscis between the two type specimens. The prostomium of protruded proboscis being wider than that of non-protruded proboscis, as mentioned by Fauvel (1932).

### ***Ophiodromus berrisfordi* Day, 1967**

(Fig. 5, Pl. I, fig. 2)

*Ophiodromus berrisfordi* Day, 1967, p. 224.

? *Parasyllidia humesi* Pettibone, 1961, p. 173, Fig. 4.

non *Ophiodromus berrisfordi*, Uchida, 1988, p. 78 (see next species).

nec \_\_\_\_\_, Uchida, 1992, p. 321, Pl. 63, Fig. 8 (see next species).

#### MATERIAL EXAMINED.

Sabiura, Kushimoto, Wakayama Prefecture, 10m, SCUBA diving, Mar. 5, 1995, K. Nomura, collector, 2 specimens, commensal with an Ophiuroid; Yoshimi, Shimonoseki, Yamaguchi Prefecture, 3m, SCUBA diving, Nov. 9, 1997, K. Nomura, collector, 1 specimen.

#### DESCRIPTION.

Body uniformly brownish orange, but posterior part paler. All cirri colorless. Eyes dark red. The bigger specimen from Sabiura with 56 setigers, 24 mm long, 4.8 mm wide including setal fascicles, 3.2 mm wide including parapodia, and 1.6 mm wide excluding parapodia, and anal cirri 2 mm long. All the figures in Fig. 5, except for Fig. 5-B are drawn from this specimen. The smaller one with 51 setigers, 4.0 mm, 2.8 mm, and 1.3 mm wide respectively, and anal cirri 3.2 mm. The specimen from Yoshii lost posterior part, with anterior 27 setigers, 4.0 mm, 2.5 mm, and 1.0 mm wide respectively.

Prostomium elliptical, a little wider than long, with three antennae, paired palpi, and two pairs of eyes (Fig. 5, A-B). A pair of lateral antennae missing, inserted from the latero-frontal margin of prostomium (Fig. 5, B). A fusiform median antenna short, 1/4 of length of the prostomium, inserted from the frontal margin of it. A pair of lateral antennae

1.7 times as long as prostomium. Palpi bi-articulated, inserted nearby lateral antennae, and a little longer than the prostomium (Fig. 5, B). Articulation of palpi at the site of less than proximal 1/4. Two pairs of eyes located lateral corners. Anterior pair of eyes larger a little than posterior pair (Fig. 5, B). Each of anterior three segments with two pairs of tentacular cirri. All dorsal tentacular cirri almost in the same length, and ventral tentacular cirri somewhat shorter than dorsal ones. Anal cirri long and slender.

Parapodium uniramous. Each parapodium with a dorsal cirrus, a neuropodial cone, and a ventral cirrus (Fig. 5, C-D). Notopodial part of the median parapodium with a cirrophore and a cirrostyle. Notopodial cirrophore long, spread out over the level of outer margin of neuropodial postsetal lobe. Notopodial cirrophore with a conspicuous constriction near the distal end. At the constriction, the diameter of the cirrophore markedly decrease, and distal part of cirrophore being somewhat thicker than or almost same thickness as its cirrostyle. Notopodial cirrostyles rather short. Each notopodium with 1-3 acicula. The tips of acicula penetrate to the surface of the cirrophore near the constriction, where an

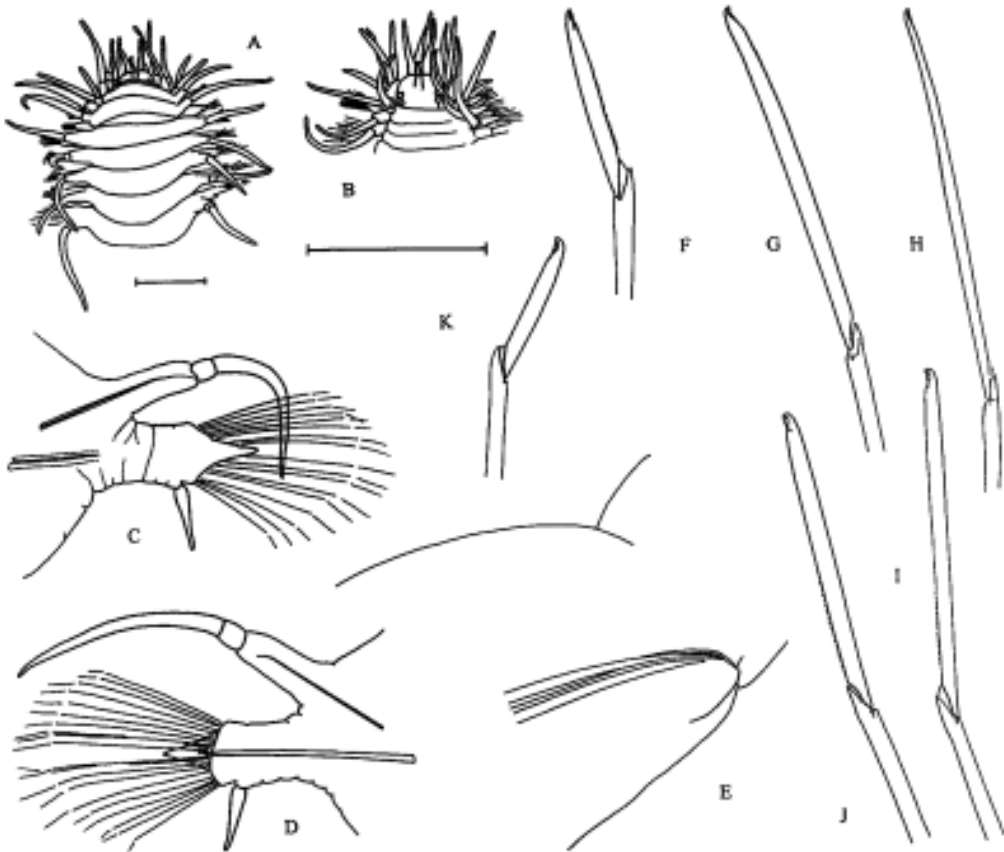


Fig. 5. *Ophiodromus berrisfordi*

A, anterior part, dorsal view (scale by A: 1 mm); B, prostomium; C, left 21st parapodium (with dorsal cirrus of short type), anterior view; D, left 22nd parapodium (with dorsal cirrus of long type), posterior view; E, notocirrus constriction of left 34th parapodium, showing 3 noto-acicula; F-H, supra-acicular neurosetae of 22nd parapodium; F, superior-most; G, median; H, inferior; I-K, sub-acicular neurosetae of left 21st parapodium; I, superior-most; J, median; K, inferior-most. Scale by B, B: 1.7 mm, C-D: 1 mm, E-K: 100  $\mu$ m.



inconspicuous mound formed (Fig. 5, E). Without notosetae. Each median neuropodium with a single or 2 acicula. The tip of a single aciculum penetrate to the presetal lobe of neuropodium. Neuropodial presetal lobe with a long triangular projection (Fig. 5, C-D). Neuropodial postsetal lobe low and not conspicuous (Fig. 5, D). With *ca.* 35 supra-acicular and *ca.* 45 sub-acicular setae in median neuropodia. Neurocirri long subulate in form, rather small and slender comparing with other species of the genus. Neurocirri inserted far inside from the ventro-lateral corner of parapodia, with rather clear cirrophores (Fig. 5, C-D).

Neuroseta with rather long terminal piece of narrow blade (Fig. 5, F-K). Serration of blade very fine. Superior sub-acicular setae with long blade (Fig. 5, I), and shown that this species belongs to the group of long type neurosetae.

#### REMARKS.

The species with characteristic long notopodial cirrophores. The species somewhat resembles to *O. angustifrons* (p. 39), but *O. angustifrons* with short palpi, and without conspicuous constriction on notopodial cirrophores. The species also somewhat resembles to *O. constrictus*, n. sp. (p. 48), but *O. constrictus* with rather short notopodial cirrophores, and also devoid of long blade setae in sub-acicular group of neuropodia (short setae type). The species also resembles to *O. fauveli*, n. sp., but without notosetae and also without color bands.

The present materials coincide very well with the species mentioned above. Small median antennae, the site of articulation of palpi, short notocirri, long notopodial cirrophores, remarkable constriction on notopodial cirrophores, long triangular presetal lobe of parapodia, remarkable cirrophores of neurocirri projecting from the distal parapodial ventral line, and plural number of notopodial acicula. These factors are common to the description (incl. figures) of *O. berrisfordi* and present materials. The type locality, the Atlantic coast of South West Africa, is rather far from our localities (northeastern edge of the Indo-West Pacific region), but I regard my materials as the same species from the Atlantic southern Africa.

*Parasyllidia humesi* Pettibone, 1961 is very similar to this species. The body size and the locality are also near. The collector, Dr. A. G. Humes is the copepod taxonomist of commensal Cyclopoid, associated with many groups of Invertebrates. His method for collecting copepods is, unfortunately, rather rude for the delicate Hesionids. It is probable that the almost specimens lost their fragile median antennae during the treatment for copepods.

Other species with long notopodial cirrophores is *Nereimyia blacki* Knox, 1960, but the species with many notosetae, spread from the constriction of notopodial cirrophore. *N. blacki* is surely a member of the genus *Ophiodromus*. The 2 type specimens of *Ophiodromus blacki* (Knox, 1960), n. comb., undoubtedly lost their easily detachable median antennae, during collection or treatment after collection.

#### ***Ophiodromus brevipodius*, sp. nov.**

(Fig. 6)

## MATERIAL EXAMINED.

Kushimoto, off Shionomisaki Cape, Wakayama Prefecture, ca. 200 m, dredge, Jan. 21, 1990, S. Nagai, collector, 1 specimen (Holotype, mature female).

Other material (?): Sabiura, Kushimoto, Wakayama Prefecture, 5m, SCUBA diving, Aug. 16, 1996, H. Misaki, collector, 1 specimen.

## DESCRIPTION.

Preserved specimen in 10 % formalin colorless except for pale brown eyes. Body 15 mm long with 50 segments. Body width 1 mm excluding parapodia, 1.8 mm including parapodia, and 2.5 mm including setal fascicles. Prostomium hemi-circular or sub-hexagonal, somewhat wider than long, with three antennae, paired palpi, and two pairs of eyes (Fig. 6, A). A pair of lateral antennae 1.5 times as long as the length of prostomium, inserted frontal margin of prostomium (Fig. 6, A). A fusiform median antenna as long as a quarter of lateral antennae, inserted frontal margin of prostomium. Palpi bi-articulated, inserted latero-ventrally to lateral antennae (Fig. 6, A), and as long as the latter. Two pairs of circular eyes pale brown in color, located lateral corners. Anterior pair larger than posterior pair (Fig. 6, A). Each of anterior three segments with two pairs of tentacular cirri. Dorsal tentacular cirri on segments I-III almost in same length (Fig. 6, A).

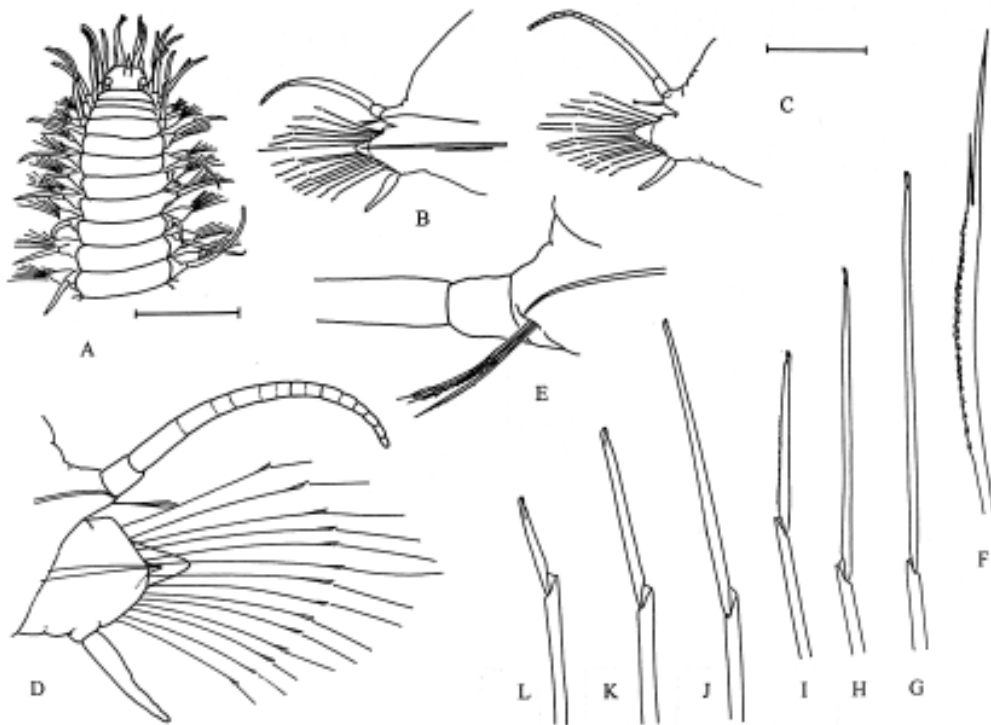


Fig. 6. *Ophiodromus brevipodius*, n. sp.

A, anterior part, dorsal view (scale by A: 1 mm); B, right 21st parapodium (with dorsal cirrus of short type), anterior view; C, right 22nd parapodium (with dorsal cirrus of long type) anterior view; D, right 21st parapodium, posterior view; E, Notopodial part of the same, anterior view; F, notoseta; G-I, supra-acicular neurosetae; G, inferior; H, median; I, superior; J-L, sub-acicular neurosetae; J, superior; K, median; L, inferior. Scale by C, B-C: 0.5 mm, D: 200  $\mu$ m, E: 100  $\mu$ m; F: 20  $\mu$ m; G-L: 50  $\mu$ m.

Ventral tentacular cirri on those segments somewhat shorter.

Parapodia in 4th segment (first setiger) rather small. Parapodia gradually developed posteriorly, and full grown in 8th setiger (Fig. 6, A). Parapodium sub-biramous. Each parapodium with a dorsal cirrus, a neuropodial cone, and a ventral cirrus (Fig. 6, B-D). Notopodial part of the median parapodium with a cirrophore and a pseudo-articulated cirrostyle. The articulation of cirrostyle rather clearly in distal part (Fig. 6, D). The difference of length of cirrostyle between parapodia with long cirri and those with short cirri rather small (Fig. 6, B-C).

Notopodial cirrophore with a remarkable constriction at midway of its length. Distal part of cirrophore cylindrical in form. Notopodium with a single aciculum. The tip of it stretched at just proximad of the constriction (Fig. 6, D) forming an inconspicuous acicular cone (Fig. 6, E). A small fascicle of notosetae inserted by the acicular cone. Notosetae 3-4 in number in each fascicle. Neuropodia very stout, comparing with notopodial cirrophores, or neuropodia of other species. Each median neuropodium with a single aciculum, or together with an additional slender one (Fig. 6, B-D). Neuropodial presetal lobe triangular, and postsetal lobe rounded (Fig. 6, B-D), with *ca.* 28 supra-acicular and *ca.* 36 sub-acicular setae in median body region. A neurocirrus fusiform, inserted ventro-lateral corner of parapodium (Fig. 6, D).

Notosetae all forked. Forked notosetae with sub-apical spine less than a half length of apical spine, and rather wide blade with long serrated zone (Fig. 6, F). Neuroseta long type, with terminal piece of narrow blade (Fig. 6, G-L). Serration of blade very fine, but those in superior supra-acicular several setae rather coarse (Fig. 6, I). Tip of shaft of compound setae simple pointed.

#### REMARKS.

Among the species of *Ophiodromus* with sub-biramous parapodia, and normal long notocirri, there are two hitherto known species with short parapodia, resembles to the new species; *O. pallidus* (Claparède, 1864) and *O. guanicus* (Hoagland, 1919).

A joint of articulation of palpa of *O. pallidus* proximally than the new species and *O. guanicus* (cf. Pruvot and Racovitza, 1895, pl. 18). Palpi of *O. pallidus* are, furthermore, shorter than the lateral antennae, beside those are almost the same length in the new species and *O. guanicus*. Eyes of *O. pallidus* smaller than the new species, especially in the case of posterior pair.

The new species approaches to *O. guanicus*. The parapodia of the new species (Fig. 6, D) much resembles to that of *O. guanicus* (Hoagland, 1919, Pl. 29, Fig. 2). The constriction of notopodial cirrophore situated distally in *O. guanicus*, but those are much more proximally in the new species. Lateral antennae and palpi of *O. granicus* are shorter than those of new species, and joint of palpa is situated at midway of whole length in *O. guanicus*. That of new species, however, situated more proximal part of palpi.

*O. limicola* (Willey, 1905) somewhat resembles to the new species. But considering from the position of distal point of noto-aciculum in the original figure (Willey, 1905, Pl. 3, Fig. 74), the situation of constriction of the cirrophore should be located more distal comparing with that of new species, and short blade type of neurosetae with shorter blade than the new species.

***Ophiodromus bunbuku*, sp. nov.**

(ブンブクオトヒメ)

(Fig. 7, Pl. 1, fig. 3)

*Ophiodromus berrisfordi*, Uchida, 1988, p. 78 (not Day, 1967).*Ophiodromus berrisfordi*, Uchida, 1992, p. 321, pl. 63, Fig. 8 (not Day, 1967).

## MATERIAL EXAMINED.

Holotype: Takegashima Marin Park Area No. 2, Tokushima Prefecture, Shikoku, 5 m deep, commensal with a Spatangoid, *Brissus latecarinatus* (Leske, 1778), Feb. 19, 1988, H. Misaki, collector.

Paratypes: Kushimoto, Kamiura, lower part of intertidal zone, associated with *Brissus latecarinatus*, June, 2, 1977, 1 specimen (Paratype No. 1); Kushimoto, Sabiura, 3m, SCUBA diving, associated with *Brissus latecarinatus*, Mar. 21, 1982, Sh. Ui, collector, 1 specimen (Paratype No. 2); Takegashima Marin Park Area No. 2 (same record as Holotype), Feb. 19, 1988, H. Misaki, collector, 2 specimens (Paratypes Nos. 3 & 4); Kushimoto, Ohshima, Myogashima Islet, 25m, SCUBA diving, associated with *Brissus latecarinatus*, April, 17, 1992, K. Nomura, collector, 3 specimens (Paratypes Nos. 5-7).

Other materials: Okinoshima, Tateyama, Chiba Prefecture, SCUBA diving, associated with *Brissus agassizii* Döderlein, 1885, July, 7, 1995, I. Soyama, collector, 1 specimen; Tsuruga Bay, Fukui Prefecture, the Sea of Japan, 5m, SCUBA diving, associated with *Brissus agassizii*, May, 17, 1999, I. Soyama, collector, 1 specimen.

## DESCRIPTION.

Holotype: Body uniformly dark brown in color (Pl. 1, Fig. 3). With 46 setigers, lost the posterior end. 16 mm long, 3.3 mm wide including parapodia, and 1.4 mm wide excluding parapodia. Complete paratypes 36-74 setigers, of 11-27 mm long, and of 2.0-4.5 mm wide including, and 1.2-2.0 mm wide excluding parapodia.

Prostomium hemi-circular or sub-hexagonal, wider than long, with three antennae, paired palpi, and two pairs of eyes (Fig. 7, A-B). A pair of lateral antennae as long as the length of prostomium, inserted frontal margin of prostomium (Fig. 7, A-B). A spherical median antenna very short, inserted frontal margin of prostomium (Fig. 7, A-B). Palpi bi-articulated, inserted latero-ventrally to lateral antennae (Fig. 7, A-B), and as long as the latter. Articulation of palpi at the site of proximal 1/3. Two pairs of eyes orange in color, located lateral corners. Anterior pair of eyes larger than posterior pair, and somewhat elliptical in form (Fig. 7, A-B). Each of anterior three segments with two pairs of tentacular cirri. Dorsal tentacular cirri on segments I-III almost in same length (Fig. 7, A-B). Ventral tentacular cirri on those segments somewhat shorter. Pygidium with a pair of long anal cirri (Fig. 7, D).

Parapodium sub-biramous. Each parapodium with a dorsal cirrus, a neuropodial cone, and a ventral cirrus (Fig. 7, E-F). Notopodial part of the median parapodium with a cirrophore and a pseudo-articulated cirrostyle. The articulation of cirrostyle rather clearly in distal part (Fig. 7, E).

Notopodial cirrophore very long, without constriction. Each notopodium with two

acicula. The tip of them buried in the cirrophore. The perforation of noto-acicula thin (Fig. 7, G). Without notosetae. Each median neuropodium with a single aciculum. Neuropodial presetal lobe with papilla-form spherical projection on the center of distal margin (Fig. 7, E-F). Neuropodial postsetal lobe not conspicuous, formed a low edge, almost truncated margin (Fig. 7, F). With *ca.* 10 supra-acicular and *ca.* 15 sub-acicular setae in median neuropodia. Neurocirri long cylinder, inserted somewhat inside to ventro-lateral corner of parapodia (Fig. 7, E-F).

Neurosetae with rather short terminal piece of narrow blade (Fig. 7, H-N). Serration of blade very fine. 2 supra-acicular setae with long blade, other supra-acicular setae short blade type (Fig. 7, H-J). 2 sub-acicular setae also with long blade, and others with short blade, but supra-acicular setae of longer type with longer blade than those in sub-acicular group (Figs. 7, H-I, L-M). Tip of shaft of compound setae simple pointed.

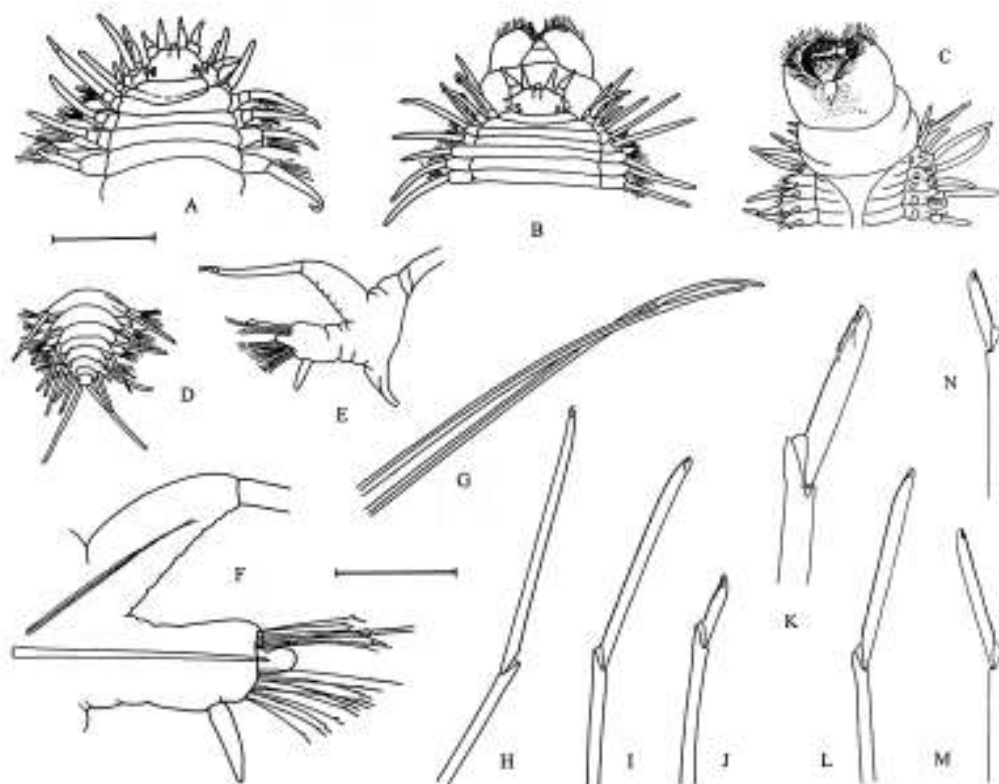


Fig. 7. *Ophiodromus bunbuku*, n. sp.

A, anterior part, with proboscis not protruded, dorsal view; B, the same, with proboscis protruded, dorsal view (from Holotype); C, the same, with proboscis protruded, ventral view; D, posterior part, dorsal view; E, right 24th parapodium, anterior view (from Holotype); F, the same, posterior view (from Holotype); G, noto-acicula of left 32nd parapodium (from the specimen of figure C); H-I, two (= all) longer blade type compound falcigers in supra-acicular region; J-K, short blade type falciger and enlarged figure in supra-acicular region; L-M, two (= all) longer type falcigers in sub-acicular region; N, short type falciger in sub-acicular region.

Scale by A, A and E: 1 mm, B-D: 1.5 mm; Scale by F, F: 500  $\mu$ m, G and K: 50  $\mu$ m; H-J and L-N: 100  $\mu$ m.

## REMARKS.

The species of *Ophiodromus* with long cirrophores of notopodia are *O. angustifrons* (Grube, 1878), *O. latifrons* (Grube, 1878), *O. berrisfordi* Day, 1967, and *Nereimyra blacki* Knox, 1960. But the only species with very short median antenna is *O. berrisfordi*. *N. blacki* may be a member of the genus, with the median antenna broken off. *N. blacki* with rather many notosetae, and a remarkable constriction on the notopodial cirrophore. The new species without notosetae on all parapodia, and without constrictions on all notopodial cirrophores. The new species surely near *O. berrisfordi* from South West Africa. However, *O. berrisfordi* with minute papilliform median antenna, instead of minute spherical one, with a conspicuous constriction on the distal part of cirrophore of notopodium, instead of devoid of constrictions, and with long triangular presetal lobe of neuropodium, instead of nipple-like spherical projection of presetal lobe (cf. p. 41).

Spherical minute median antenna resembles to *Podarke angustifrons* by Takahashi (1941) from Palao Islands, but his Hesionid has a short notopodial cirrophore and has "very small furcate dorsal bristles" (p. 184).

## ETYMOLOGY.

Named from the Japanese names of commensal hosts, the Spatangoid, *Brissus latecarinatus* and *B. agassizii*. The former called "minami-oh-bunbuku", and the latter called "oh-bunbuku" in Japanese.

***Ophiodromus constrictus*, sp. nov.**

(Fig. 8, Pl. 1, fig. 4)

## MATERIAL EXAMINED.

Holotype: Sabiura, Kushimoto, Wakayama Prefecture, 12m, SCUBA diving, Sept. 22, 1992, K. Nomura, collector.

Paratype: the same locality, 10m, SCUBA diving, Sept. 23, 1994, K. Nomura, collector, 1 specimen.

## DESCRIPTION.

Body uniformly dark brown, with a central paler area on prostomium (Pl. 1, Fig. 4).

Holotype with 50 setigers, 17 mm long, 3.5 mm wide including setal fascicles, 2.5 mm wide including parapodia, and 1.25 mm wide excluding parapodia. Paratype without posterior part, with 44 setigers, 21 mm long, 5 mm wide including setal fascicles, 3.2 mm wide including parapodia, and 1.6 mm wide excluding parapodia.

Prostomium hemi-circular or sub-hexagonal, wider than long, with three antennae, paired palpi, and two pairs of eyes (Fig. 8, A). A pair of lateral antennae longer than the length of prostomium, inserted frontal margin of prostomium (Fig. 8, A). A fusiform median antenna short, one fourth of length of the laterals, inserted frontal margin of prostomium. Palpi bi-articulated, inserted nearby lateral antennae (Fig. 8, A), and as long as the latter. Articulation of palpi at the site of proximal 1/3 to 1/4. Two pairs of eyes whitish in color, located lateral corners. Anterior pair of eyes larger than posterior pair, and

somewhat elliptical in form (Fig. 8, A). Each of anterior three segments with two pairs of tentacular cirri. Dorsal tentacular cirri on segments I-III almost in same length, but tentacular cirri on segment II the longest (Fig. 8, A). Ventral tentacular cirri on those segments about a half as long as the dorsal partners. Pygidium with a pair of long anal cirri (Fig. 8, B).

Parapodium sub-biramous. Each parapodium with a dorsal cirrus, a neuropodial cone, and a ventral cirrus (Fig. 8, C-D, F). Notopodial part of the median parapodium with a cirrophore and a cirrostyle. Notopodial cirrophore rather long, spread out to the same level of outer margin of neuropodial postsetal lobe. Notopodial cirrophore with a strong constriction at the distal 1/4 (Fig. 8, C-F). At the constriction, the diameter of the cirrophore decrease a half, and distal 1/4 of cirrophore being almost same thickness as its cirrostyle. Therefore, the constriction recognized as if the conjunction between cirrophore and cirrostyle (Fig. 8, D). Notopodial cirrostyles rather long. Each notopodium with a single or a pair of acicula (Fig. 8, C-D, F). The tip of an aciculum approached to the surface of the cirrophore near the constriction. Without notosetae. Each median neuropodium with a single aciculum (Fig. 8, C-F). Neuropodial presetal lobe with a long triangular projection on the center of distal margin. Neuropodial postsetal lobe low and

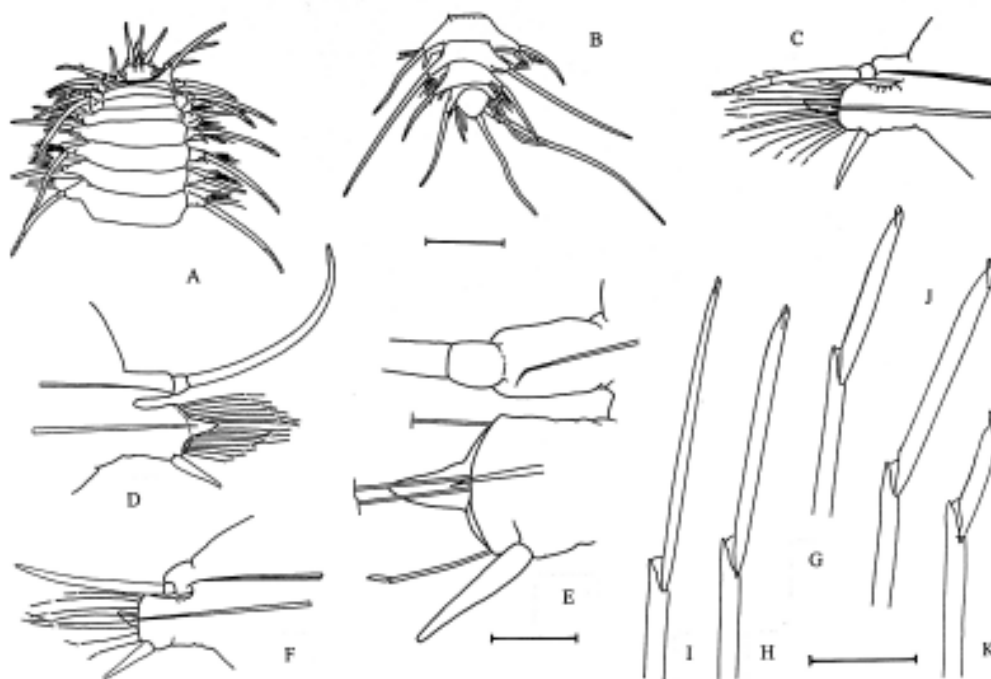


Fig. 8. *Ophiodromus constrictus*, n. sp.

A, anterior part, dorsal view; B, posterior part, dorsal view; C, left 17th parapodium, with notocirrus of short type, anterior view; D, left 22nd parapodium, with notocirrus of long type, anterior view; E, the same, posterior view; F, left 23rd parapodium, with notocirrus of short type, posterior view; G, superior supra-acicular neuropodial compound falciger; H, median supra-acicular falciger; I, inferior supra-acicular falciger; J, median sub-acicular falciger; K, inferior-most sub-acicular falciger. Scale by B, A-B: 1 mm; Scale by E, C-D and F: 0.5 mm; E: 200  $\mu$ m; Scale by H, G-K: 50  $\mu$ m.

rounded (Fig. 8, C-F). With *ca.* 20 supra-acicular and *ca.* 25 sub-acicular setae in median neuropodia. Neurocirri long subulate, inserted ventro-lateral corner of parapodia (Fig. 8, C-F).

Neurosetae in usual form (Fig. 8, G-K). Serration of blade very fine and almost overlooked, except for the setae in superior-most supra-acicula or inferior-most sub-acicular portions (Fig. 8, G). Inferior-most 2 supra-acicular setae with long and narrow blade (Fig. 8, I). Distal part of shaft of compound seta with an inconspicuous undulation on its inside surface (Fig. 8, G-K).

#### REMARKS.

*O. constrictus*, n. sp. closely related to *O. angustifrons*, but can be easily separated from the latter by the strong constriction on notopodial cirrophores, together with the insertion site of neuropodial cirri. Furthermore, *O. constrictus*, n. sp. with neurosetae of rather short blade, and without long blade neurosetae in sub-acicular position, but *O. angustifrons* is a species with long neurosetal blades, and also with long-blade setae in sub-acicular position. *O. constrictus*, n. sp. is somewhat similar to *O. berrisfordi*, but the new species with long notocirri with articulations.

#### ***Ophiodromus fauveli*, sp. nov.**

(Fig. 9, Pl. 1, fig. 5)

*Podarke angustifrons*, Fauvel, 1918, p. 333. (not Grube, 1878)

—————, Fauvel, 1919, p.371. (not Grube, 1878)

—————, Fauvel, 1932, p.63, Text-fig. 11. (not Grube, 1878)

—————, Fauvel, 1953, p.109, Fig. 52. (not Grube, 1878)

*Ophiodromus angustifrons*, Uchida, 1988, p.78. (not Grube, 1878)

—————, Uchida, 1992, p.321, pl. 63, Fig. 7. (not Grube, 1878)

#### MATERIAL EXAMINED.

Holotype: Kushimoto, Izumo, Wakayama Prefecture, Oct. 26, 1976, lobster gill-net, H. Misaki, collector.

Paratypes: Kushimoto, Arita, Nov. 30, 1976, lobster gill-net, H. Misaki, collector, 1 specimen; the same locality, Dec. 1, 1976, the same method, H. Misaki & M. Suzuki, collector, 1 specimen; Kushimoto, Shionomisaki, Naminoura, Dec. 17, 1976, the same method, H. Misaki, collector, 1 specimen; Kushimoto, Shionomisaki, Shobadani, Mar. 16, 1985, the same method, K. Nomura, collector, 1 specimen; Kushimoto, Sabiura, Aquarium tank, April, 9, 1985, 1 specimen; the same locality, April, 18, 1985, 1 specimen; Kushimoto, Shionomisaki, Oct. 31, 1989, lobster gill-net, K. Nomura, collector, 1 specimen; the same locality, Feb. 11, 1991, the same method, the same collector, 1 specimen; Minabe, Sakai, Wakayama Prefecture, Jan. 11, 1992, lobster gill-net, F. Iwase, collector, 1 specimen; the same locality, Feb. 14, 1992, the same method, the same collector, 3 specimens; Kushimoto, off Arita, 20m, SCUBA diving, Mar. 13, 1992, K. Nomura, collector, 2 specimens.

Other materials: Nachikatsuura, Urugami Bay, Wakayama Prefecture, Sep. 15, 1980, Wakayama Prefectural Fisheries Laboratory, collector, 10 specimens; Kushimoto, off



Hashikui, 15m, SCUBA diving, Sept. 23, 1989, 1 specimen (?); Kushimoto, fish culture field, 8m, SCUBA diving, Sept. 26, 1989, 1 specimen (?); Kushimoto, Shionomisaki, Andonohana, 15m, SCUBA diving, Mar. 9, 1993, K. Nomura, collector, 1 specimen; Ohtsuki, Kashiwajima, Kohchi Prefecture, 20m, SCUBA diving, April, 22, 1993, K. Nomura, collector, 1 specimen; Kushimoto, Oshima, Myogajima Islet, 30m, SCUBA diving, July, 13, 1993, K. Nomura, collector, 1 specimen (?); Muroto, off Narashi River, Kohchi Prefecture, SCUBA diving, Dec. 12, 1993, F. Iwase, collector, 2 specimen; Kushimoto, Oshima, Kanayamashita, 10m, SCUBA diving, Dec. 15, 1993, K. Nomura, collector, 3 specimens; Kushimoto, Shionomisaki, Andonohana, 12m, SCUBA diving, Jan. 14, 1994, K. Nomura, collector, 3 specimens; Kushimoto, Arita Bay, 3m, SCUBA diving, Jan. 15, 1994, K. Nomura, collector, 1 specimen; Kushimoto, Sabiura, 10m, SCUBA diving, Jan. 16, 1994, K. Nomura, collector, 1 specimen; Kushimoto, Shionomisaki, Andonohana, 16m, SCUBA diving, Jan. 25, 1994, K. Nomura, collector, 1 specimen; Kushimoto, Shionomisaki, Feb. 7, 1994, lobster gill-net, K. Nomura, collector, 1 specimen; the same locality, Mar. 22, 1994, the same method, the same collector, 1 specimen; Kushimoto, Shionomisaki, Andonohana, 15m, SCUBA diving, Oct. 17, 1994, K. Nomura, collector, 1 specimen; Kushimoto, Oshima, Myogajima Islet, 3m, SCUBA diving, Oct. 17, 1994, K. Nomura, collector, 1 specimen; the same locality, 5m, the same method, Oct. 18, 1994, the same collector, 3 specimens; Kushimoto, Tago, Sohshima Islet, 15m, SCUBA diving, Aug. 7, 1995, K. Nomura, collector, 1 specimen; Shirahama, Seto, Bansho Cape, Wakayama Prefecture, intertidal zone, Sept. 9, 1995, 1 specimen; Kushimoto, Shionomisaki, off Sumisaki, 25m, SCUBA diving, April, 3, 1996, K. Nomura, collector, 1 specimen.

#### DESCRIPTION.

Holotype with 41 setigers, 12 mm long, 3.0 mm wide including setal fascicles, 2.25 mm wide including parapodia, and 1.0 mm wide excluding parapodia. Other specimens with 31–48 setigers, 5.5–14 mm long, 1.5–4.0 mm wide including setal fascicles, 1.0–2.5 mm wide including parapodia, and 0.5–1.3 mm wide excluding parapodia.

Dorsum of the body brown, with clear white bands on the segments II, VIII, XII, XVII, XXI, XXV, XXIX, XXXIII, XXXV, XXXIX, XLIII. The bands not so clear in the fixed specimens, but brightly white in life, with bluish green iridescence, and very remarkably recognizable (Fig. 9, A; Pl. 1, Fig. 5). The positioning of the bands on segments stable in all examined specimens.

Prostomium hexagonal, wider than long, with three antennae, paired palpi, and two pairs of eyes (Fig. 9, B). A pair of lateral antennae 1.5 times as long as the length of prostomium (Fig. 9, B). A fusiform median antenna very short, less than 1/4 of lateral antennae, inserted frontal margin of prostomium (Fig. 9, A–B). Palpi bi-articulated, inserted just latero-ventrally to lateral antennae (Fig. 9, B), and as long as the latter. Articulation of palpi at the site of proximal 1/3. Two pairs of circular eyes dark red in color, located lateral corners. Anterior pair of eyes larger than posterior pair (Fig. 9, A–B). Each of anterior three segments with two pairs of tentacular cirri. Dorsal tentacular cirri on segments I–III almost in same length (Fig. 9, B). Ventral tentacular cirri on segment I somewhat shorter, but those on segments II–III being about 1/2 of dorsal ones. Pygidium with a pair of rather short anal cirri (Fig. 9, C).

Parapodium biramous. Each parapodium with a dorsal cirrus, a neuropodial cone, and

a ventral cirrus (Fig. 9, D-E). Notopodial part of the median parapodium with a cirrophore and a cirrostyle. Notopodial cirrophore not so long, with a constriction near distal end (Fig. 9, E). Each notopodium with a single aciculum, and the tip of aciculum reached to ventral side of the constriction (Fig. 9, E). A small bundle of notosetae beside the aciculum tip. Notosetae firstly appeared from 3rd to 6th setiger, and 1-10 setae in each fascicle. Each median neuropodium with a single aciculum (Fig. 9, D-E). Neuropodial presetal lobe as a triangular sheet, and its proximal part extended to parapodial full width. The distal part of the presetal lobe rather narrow, and with dully pointed apex (Fig. 9, D-E). Neuropodial postsetal lobe formed semi-circular or wide triangular edge (Fig. 9, D-E). With *ca.* 18 supra-acicular and *ca.* 25 sub-acicular setae in median neuropodia. Neurocirri long subulate, inserted ventro-lateral corner of parapodia, but shifted distally comparing with other species of the genus (Fig. 9, D-E).

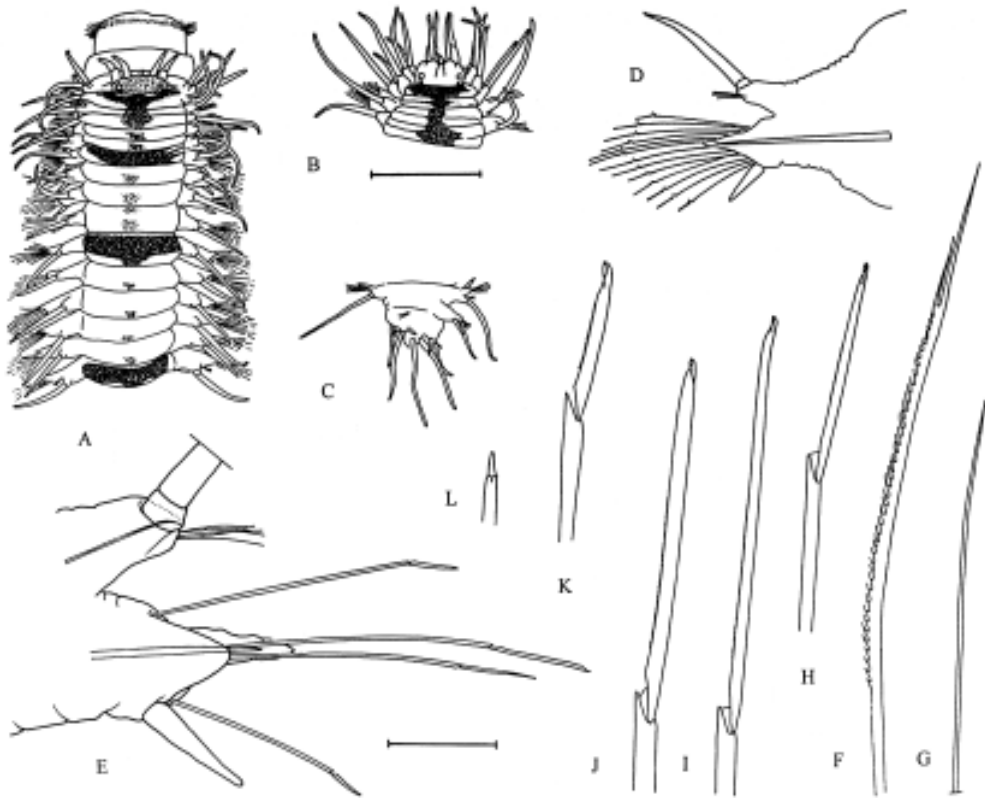


Fig. 9. *Ophiodromus fauveli*, n. sp.

A, anterior part, with proboscis protruded, dorsal view, white markings shown as dotted areas; B, the same, with proboscis not protruded, dorsal view (from Holotype); C, posterior part, ventral view (from Holotype); D, right 23rd parapodium, anterior view; E, the same, posterior view; F, notoseta; G, simple capillary notoseta in right 33rd parapodium, parapodial epidermis shown as proximal line; H, superior supra-acicular compound falciger; I, inferior supra-acicular falciger; J, superior sub-acicular falciger; K, inferior sub-acicular falciger; L, tip of shaft of compound seta. Scale by B, A: 1.25 mm; B-C: 1 mm; Scale by E, D: 0.5 mm; E: 200  $\mu$ m; F: 20  $\mu$ m, G-L: 50  $\mu$ m.

Notosetae forked form (Fig. 9, F), but the last 2-3 setigers with a single capillary seta (Fig. 9, G) in each notopodium together with several normal forked setae in some individuals. Neuroseta with normal form of the genus (Fig. 9, H-K). Tip of shaft of compound setae simple pointed (Fig. 9, L).

#### REMARKS.

The characteristic points of the new species are white bands on dorsum, and rather many notosetae. Furthermore, neuropodial pre- and post-setal lobes are both wide triangular form. *Podarke angustifrons* reported by Fauvel (1918, 1919, 1932, 1953) from the Indian Ocean, with white bands are surely this species.

Color photo-figure of the new species as *Ophiodromus angustifrons* in Uchida (1992, pl. 63, Fig. 7.) is a paratype from Kushimoto, Shionomisaki, Oct. 31, 1989.

Other species with bluish white bands on dorsum together with diminished notopodia is only *Podarke pugettensis spinapandens* Storch and Niggemann, 1967 (= *O. spinapandens* (Storch et Niggemann, 1967), n. comb.). But this *Clypeaster*-associated hesionid with broad white zone of dorsum in first eight setigers. The new species (and also *O. okudai*, n. sp.) without white bands on 6th-7th setiger. European *O. flexuosus* (delle Chiaje, 1825) has also white bands (see Claparède, 1870, Pl. 12, Fig. 1.), but the species has well developed notopodia and many notosetae (*Ibid.* Pl. 12, Fig. 1B.)

The new species is collected in shallow waters of rocky shores in southern part of Japan, but never collected in coral reef area.

#### ETYMOLOGY.

Named dedicated to the famous French taxonomist of Polychaeta, late Prof. Pierre Fauvel. The new species was firstly reported from the Indian Ocean by him as *O. angustifrons*.

#### *Ophiodromus longifundus*, sp. nov.

(Fig. 10)

#### MATERIAL EXAMINED.

Holotype: Kuroshima, off Nishinohama, 10m, Yaeyama Group, Okinawa Prefecture, June, 18, 1987, SCUBA diving: mature male.

Other material: (?) Kushimoto, off Tago-Sohshima Islet, 10m, July, 8, 1995, SCUBA diving, K. Nomura, collector, 1 specimen.

#### DESCRIPTION.

A single specimen (holotype) without the posterior end, with 35 setigers, but 35th setiger may be closely near the pygidium. 10 mm long, 2.3 mm wide including setal fascicles, 1.6 mm wide including parapodia, and 0.9 mm wide excluding parapodia.

Dorsum of the body pale brown, central part of prostomium orange in color, eyes dark red.

Prostomium hemi-circular, almost as long as wide, with three antennae, paired palpi, and two pairs of eyes (Fig. 10, A). A pair of lateral antennae a little longer than the length

of prostomium (Fig. 10, A). A fusiform median antenna lost during treatment after fixation (see Fig. 10, A), but short, about 1/4 of the length of prostomium, inserted frontal margin, judging from the sketch of living state. Palpi bi-articulated, inserted just latero-ventrally to lateral antennae (Fig. 10, A), and as long as or a little longer than the latter. Articulation of palpi at the site of proximal 2/5 or a little more distal. Two pairs of circular eyes dark red in color, located latero-caudal. Anterior pair of eyes larger than posterior pair (Fig. 10, A). Each of anterior three segments with two pairs of tentacular cirri. Dorsal tentacular cirri on segments I-III almost in same length. Ventral tentacular cirri a little shorter than the dorsal partners. All the appendages slender, comparing with those in other species of the genus. *Pygidium* unknown.

Parapodium biramous or sub-biramous. Each parapodium with a dorsal cirrus, a neuropodial cone, and a ventral cirrus (Fig. 10, B-D). Notopodial part of the median parapodium with a cirrophore and a cirrostyle. Notopodial cirrophore cylindrical, not so long but slender, with an inconspicuous constriction on the midway (Fig. 10, B-D). Each notopodium with a single aciculum, and the tip of aciculum reached to ventral side of the constriction. Some notopodia with a single notoseta beside the aciculum tip (Fig. 10, D). Each median neuropodium with a single aciculum (Fig. 10, B-D). Neuropodial presetal



Fig. 10. *Ophiodromus longifundus*, n. sp.

A, anterior part, dorsal view; B, right 23rd parapodium (with notocirrus of short type), notocirrus missing, posterior view; C, right 20th parapodium (with notocirrus of long type), notocirrus and all supra-acicular setae missing, anterior view; D, right 33rd parapodium, noto- and neurocirri and all neurosetae missing, posterior view; E, neuropodial aciculum; F, notoseta; G, superior supra-acicular compound falciger; H, inferior supra-acicular falciger; I, superior sub-acicular falciger; J, middle sub-acicular falciger; K, inferior-most sub-acicular falciger. Scale by A, A: 0.5 mm; Scale by F, B: 0.5 mm; C: 200  $\mu$ m; D-E: 100  $\mu$ m; F: 20  $\mu$ m, G-K: 50  $\mu$ m.

lobe as triangular sheet of parapodial full width (Fig. 10, B-C). The distal part of the presetal lobe rather narrow, and with dully pointed apex. Neuropodial postsetal lobe formed wide triangular edge (Fig. 10, D). Neuropodial aciculum very thick with a central hollow, and easily misconceived as two acicula (Fig. 10, E). With *ca.* 20 supra-acicular and *ca.* 30 sub-acicular setae in median neuropodia. Neurocirri long subulate, inserted ventral edge of parapodia rather inside of the ventro-lateral corner (Fig. 10, C).

Notosetae forked form (Fig. 10, F), and neuroseta with normal form of the genus (Fig. 10, G-K). Tip of shaft of compound setae simple pointed (Fig. 10, G). The length of blades rather long comparing with other species of the genus.

#### REMARKS.

The new species has several very curious points as follows. The constrictions on palpi shifted distally, notopodial cirrophores slender, with the constrictions near the middle of their length. The position of insertion of neurocirri also unique. Furthermore, neuropodial acicula stout very much. No other species of the genus with the palpal constrictions near the middle as those in the new species.

#### ETYMOLOGY.

Named from the long proximal part of palpi.

#### *Ophiodromus okudai*, sp. nov.

(モグリオトヒメ)

(Fig. 11)

*Podarke pugettensis*, Okuda, 1936, p. 413, Fig. 4. (not Johnson, 1901)

*Ophiodromus angustifrons*, Uchida and Ui, 1991, p.89. (not Grube, 1878)

*Ophiodromus* sp. oku. Uchida and Ui, 1992, pp. 79 & 86.

————— ———— Uchida and Ui, 1993, p. 84.

————— ———— Uchida and Ui, 1994, pp. 31 & 32.

————— ———— Uchida and Ui, 1994, p. 34.

? *Porarke angustifrons*, Parulekar, 1972, p.736. (not Grube, 1878)

#### MATERIAL EXAMINED.

Holotype: House ten Vos, Ohmura Bay, Nagasaki Prefecture, 3.4m, Ekman-Birge mud sampler, April, 15, 1991, 1 specimen.

Paratypes: Nagasaki Holland Village, Ohmura Bay, Nagasaki Prefecture, 4.4m, Ekman-Birge mud sampler, Oct. 24, 1991, 1 specimen; House ten Vos, 5.7m, the same method, April, 23, 1992, 1 specimen; Nagasaki Holland Village, 7.0m, the same method, May, 24, 1993, 1 specimen; the same locality, 6.7m, the same method, Oct. 27, 1993, 1 specimen; the same locality, 5.6m, the same method, April, 26, 1994, 1 specimen; the same locality, 7.8m, the same method, April, 26, 1994, 1 specimen; the same locality, 7.2m, the same method, April, 22, 1998, 1 specimen.

## DESCRIPTION.

Holotype with 30 setigers, 10.5 mm long, 3.0 mm wide including setal fascicles, 2.5 mm wide including parapodia, and 1.1 mm wide excluding parapodia. The holotype full grown to 27 setiger, afterwards regenerated. Paratypes 2.7–7.0 mm wide including setal fascicles, 2.0–5.5 mm wide including parapodia, and 0.9–3.0 mm wide excluding parapodia. Only two specimens complete with pygidia, with 74 and 65 segments, of 16.3 mm and 41 mm long respectively.

Dorsum of the body pale brown, with clear white bands on the segments II, VIII, XII, XVII, XXI, XXVII, XXXI, XXXV, XXXIX, XLIII, XLVII, LI, LIII, LVII (specimen on April, 22, 1998, with 65 segments). The positioning of the bands on segments stable in all examined specimens, except for the posterior part of the body, as mentioned by Okuda (1936, p. 414). The specimen on Oct. 27, 1993 (with 74 segments), with a band on segment LII, together with those on LI and LIII, and also with the bands on the segments LIX, LXIII, LXV, LXVII, LXVIII, LXIX, and LXXI, after the segment LVII. The variety of bands on posterior part may be corresponding with individuality of the degree of development of white bands.

Prostomium hexagonal, wider than long, with three antennae, paired palpi, and two pairs of eyes (Fig. 11, A). A pair of lateral antennae almost as long as the length of prostomium (Fig. 11, A). A fusiform median antenna very short, less than 1/3 of lateral antennae, inserted frontal margin of prostomium. Palpi bi-articulated, inserted just latero-ventrally to lateral antennae (Fig. 11, A), and as long as the latter, or shorter a little. Articulation of palpi at the site of proximal 1/3. Two pairs of circular eyes dark red in color, located lateral corners. Anterior pair of eyes larger than posterior pair (Fig. 11, A). Each of anterior three segments with two pairs of tentacular cirri. Dorsal tentacular cirri on segments I–III almost in same length (Fig. 11, A). Ventral tentacular cirri on segments I–III somewhat shorter than their dorsal partners. All the specimens lost their anal cirri.

Parapodium biramous. Each parapodium with a dorsal cirrus, a neuropodial cone, and a ventral cirrus (Fig. 11, B–F). Notopodial part of the median parapodium with a cirrophore and a long cirrostyle. Notopodial cirrophore not so long, with a constriction near distal end. Each notopodium with a single or two acicula, and the tip of an aciculum reached to ventral side of the constriction (Fig. 11, B–E). A small bundle of 1–3 notosetae beside the aciculum tip (Fig. 11, D, F). Each median neuropodium with a single or two acicula. Neuropodial presetal lobe with a long triangular projection (Fig. 11, B–E). The distal end of the presetal lobe slender as if the distal part of cirrus, and reached sideway to the same position as the tip of neurocirrus. Neuropodial postsetal lobe formed semi-circular edge (Fig. 11, D–E). With *ca.* 23 supra-acicular and *ca.* 25 sub-acicular setae in median neuropodia. Neurocirri long subulate, inserted ventro-lateral corner of neuropodia (Fig. 11, C–D).

Notosetae forked form of usual type (Fig. 11, G). Neurosetae almost same form as other species of the genus (Fig. 11, H–K), but the tip of shaft bifurcate (Fig. 11, L).

## REMARKS.

The new species has white bands on dorsum, same as *O. spinapandens* (Storch et Niggemann, 1967), n. comb. and *O. fauveri*, n. sp. *O. spinapandens* with broad white dorsum to 8th setiger (= segment XI), but *O. okudai*, n. sp. same as *O. fauveri*, n. sp.,

without white dorsum on first to 4th setigers and 6th, and 7th. *O. okudai*, n. sp. resembles to *O. fauveli*, n. sp. The positioning of the white bands just same to the segment XXI, but afterwards, the white bands on the segments XXVII, XXXI, XXXV, XXXIX, XLIII in *O. okudai*, and on the segments XXV, XXIX, XXXIII, XXXV, XXXIX, XLIII in *O. fauveli*. The tip of shaft of neurosetae pointed in *O. fauveli*, but with bifurcate tip in *O. okudai*. Distinction from the European *O. flexuosus* (delle Chiaje, 1825) is the same as that of *O. fauveli*, n. sp.

The arrangement of white bands of Okuda's description of *Podarke pugettensis* (Okuda, 1936, p.414) is just same as those in these specimens. And other factors, especially the bifurcate tip of shaft of neurosetae of his description fitted well with my



Fig. 11. *Ophiodromus okudai*, n. sp.

A, anterior part, dorsal view, white markings shown as dotted areas; B, right 17th parapodium (with notocirrus of short type), posterior view, neurocirrus artificially twisted inward; C, right 26th parapodium (with notocirrus of long type), anterior view; D, the same, posterior view; E, right 6th parapodium, notocirrus missing, posterior view; F, notopodial part of the right 15th parapodium, posterior view; G, notoseta; H, short type sub-acicular compound falciger; I, long type sub-acicular falciger; J, the same, apical part; K, short type sub-acicular falciger in inferior portion; L, tip of shaft of long type sub-acicular falciger. Scale by A, A: 1 mm; Scale by C, B-C: 0.5 mm; D-E: 200  $\mu$ m; F: 100  $\mu$ m; Scale by G, G: 20  $\mu$ m; H, J-L: 50  $\mu$ m; I: 100  $\mu$ m.

materials. In the description, Okuda (1936) reported his materials from the burrows of an apodus holothurian, *Protankyra bidentata* (Woodward et Barrett, 1858).

The 8 occasions of the new species at muddy bottom in Ohmura Bay, by the Ekman-Birge mud sampler. In 4 occasions out of total 8, *Protankyra bidentata* is also recorded together with the new species, and the holothurian is a rather common member of the fauna of the sampling area. Therefore, it may be probable that my materials live together with the holothurian, that Okuda (1936) recorded as associate animals of his *Podarke pugettensis*. The locality of Okuda's *Ophiodromus* and those of my materials also west coast of Kyushu, Japan.

Pareulekar (1972) recorded *Podarke angustifrons* associated with the holothurian from the Arabian coast of India. His specimen has white bands, and may be identical with the new species. The original figure of parapodium of *Cirrosyllid didymocera* Schmarda, 1861 (p. 77, Fig. a) with a long cirriform presetal lobe, and rather resembles to the parapodia of the new species, but has no white bands on dorsum. *Iruma limicola* Willey, 1905 with somewhat similar parapodium to the new species according to the original description (Pl. 3, Fig. 74). However, the exact form of notopodial cirrophores uncertain, *I. limicola* is a member of *incertae sedis* in the genus. No mentions was given on the dorsal white bands of this Ceylon species.

#### ETYMOLOGY.

Named dedicated to the Japanese Polychaetologist, late Prof. Shiro Okuda. The new species was firstly reported from burrows of an apodous holothurian from Japan by him as *Podarke pugettensis*, together with the exact arrangement of dorsal white bands.

#### ***Ophiodromus parapallidus*, sp. nov.**

(Figs. 12–13, Pl. 1, fig. 6)

#### MATERIAL EXAMINED.

Holotype: Kushimoto, Izumo, Wakayama Prefecture, Oct. 18, 1976, lobster gill-net, M. Suzuki, collector.

Paratypes: Kushimoto, Sabiura, July, 1, 1973, 1 specimen; Kushimoto, Izumo, Oct. 18, 1976, lobster gill-net, M. Suzuki, collector, 2 specimens; Kushimoto, Arita, Nov. 30, 1976, the same method, H. Misaki, collector, 1 specimen; Kushimoto, Arita, Dec. 1, 1976, the same method, H. Misaki & M. Suzuki, collector, 4 specimen; Kushimoto, Izumo, Dec. 14, 1976, the same method, H. Misaki, collector, 1 specimen; the same locality, Dec. 15, 1976, the same method, H. Misaki, collector, 1 specimen; Kushimoto, Dec. 17, 1976, the same method, H. Misaki, collector, 2 specimens; Kushimoto, Arita, 30m, Feb. 7, 1979, the same method, K. Ikazaki, collector, 4 specimen; Kushimoto, Shionomisaki, Feb. 7, 1979, the same method, H. Misaki, collector, 1 specimen; Kushimoto, Shionomisaki, 40m, Feb. 7, 1979, the same method, K. Ikazaki, collector, 2 specimens; Gokasho Bay, Hazama-ura, Mie Prefecture, Aug. 16, 1979, 1 specimen; Kushimoto, Arita, Feb. 23, 1980, lobster gill-net, M. Suzuki, collector, 1 specimen; Kushimoto, Oshima, Myougajima Islet, 20m, July, 16, 1980, SCUBA diving, M. Suzuki, K. Ikazaki & Sh. Ui, collector, 1 specimen; Kushimoto, Sabiura, aquarium tank, Dec. 20, 1980, H. Misaki, collector, 1 specimen; Sabiura, aquarium



tank, Mar. 1, 1982, 1 specimen; Kushimoto, Fukuro, intertidal zone, Mar. 20, 1983, 1 specimen; Iriomote Island, off Nakamagawa River, Okinawa Prefecture, 3m, June, 5, 1984, SCUBA diving, K. Nomura, collector, 1 specimen; Kuroshima Island, Nakamoto, in moat, 3m, June, 15, 1984, SCUBA diving, K. Nomura, collector, 4 specimens; Sabiura, 10m, July, 4, 1984, SCUBA diving, K. Nomura, collector, 1 specimen; Shingu, Miwazaki, Wakayama Prefecture, 1 specimen; Kushimoto, Mar. 22, 1985, lobster gill-net, K. Nomura, collector, 1 specimen; Sabiura, aquarium tank, April, 18, 1985, K. Nomura, collector, 1 specimen; Kuroshima Island, off Iko, 2m, Aug. 29, 1986, SCUBA diving, K. Nomura, collector, 1 specimen; Kuroshima Island, off Nishinohama Beach, 15m, Sept. 12, 1986, SCUBA diving, K. Nomura, collector, 1 specimen; Kushimoto, Shionomisaki, Shobadani, Oct. 21, 1989, lobster gill-net, K. Nomura, collector, 1 specimen; Koza, Tsuga, Wakayama Prefecture, April, 20, 1990, lobster gill-net, H. Misaki, collector, 2 specimens; Kuroshima Island, Nakamoto, moat, 2m, June, 13, 1991, 1 specimen; Kuroshima Island, Fuki, moat, June, 21, 1991, 1 specimen; Minabe, Wakayama Prefecture, Dec. 28, 1991, lobster gill-net, F. Iwase, collector, 2 specimens; the same locality, Jan. 11, 1992, the same method, F. Iwase, collector, 2 specimens; Kushimoto, Shionomisaki, Shobadani, Jan. 15, 1992, lobster gill-net, K. Nomura, collector, 1 specimen; Minabe, Feb. 4, 1992, lobster gill-net, F. Iwase, collector, 4 specimens; Kushimoto, Shionomisaki, Shobadani, Mar. 31, 1992, lobster gill-net, K. Nomura, collector, 2 specimens; Kushimoto, Oshima, Myougajima Islet, 25m, April, 17, 1992, SCUBA diving, K. Nomura, collector, 2 specimens; Sabiura, aquarium tank, May, 15, 1992, 1 specimen; Akajima Island, Kerama Islands, Ryukyu Islands, in the harbor, 5m, July, 5, 1992, SCUBA diving, K. Nomura, collector, 1 specimen; Kushimoto, Sabiura, 5m, Sept. 19, 1992, SCUBA diving, K. Nomura, collector, 3 specimens.

Other materials: Iriomote Island, Amitori, 0.9–23m, with coral debris, June 28–Oct. 27, 1985, staff of Tokai University, collector, 135 specimens; Sabiura, aquarium tank, May, 15, 1992, K. Nomura, collector, 1 specimen; Minabe, Jan. 9, 1993, lobster gill-net, F. Iwase, collector, 1 specimen; Sabiura, 6m, July, 17, 1993, SCUBA diving, K. Nomura, collector, 2 specimens; the same locality, 10m, Jan. 5, 1994, the same method, K. Nomura, collector, 4 specimens; the same locality, 10m, Jan. 9, 1994, the same method, K. Nomura, collector, 1 specimen; Kushimoto, Shionomisaki, Andonohana, 12m, Jan. 14, 1994, the same method, K. Nomura, collector, 8 specimens; Sabiura, 10m, Jan. 16, 1994, SCUBA diving, K. Nomura, collector, 5 specimens; Kushimoto, Oshima, Myougajima Islet, 20m, Feb. 18, 1994, SCUBA diving, K. Nomura, collector, 1 specimen; Kushimoto, Shionomisaki, Mar. 20, 1994, lobster gill-net, K. Nomura, collector, 1 specimen; the same locality, Mar. 22, 1994, the same method, the same collector, 1 specimen; (?) Sabiura, aquarium tank, July, 27, 1994, H. Misaki, collector, 1 specimen (damaged); (?) Shirahama, Sakata, Wakayama Prefecture, July, 1994, plankton net, Sh. Kubota, collector, 1 specimen; Kushimoto, Shionomisaki, Andonohana, 15m, Sept. 2, 1994, SCUBA diving, K. Nomura, collector, 3 specimens; Kushimoto, Shionomisaki, off Sumisaki, 15m, SCUBA diving, Sept. 6, 1994, K. Nomura, collector, 1 specimen; Sabiura, 3m, Sept. 23, 1994, the same method, K. Nomura, collector, 2 specimens; Kushimoto, Oshima, Myougajima Islet, 3m, Oct. 17, 1994, the same method, K. Nomura, collector, 1 specimen; Sabiura, Nov. 1, 1994, the same method, H. Misaki, collector, 4 specimens; Minabe, Feb. 3, 1995, lobster gill-net, F. Iwase, collector, 1 specimen; Sabiura, lower intertidal zone, April, 18, 1995, 1 specimen; Kushimoto, Shionomisaki, Andonohana, 12m, Aug. 30, 1995, SCUBA diving, K. Nomura,

collector, 1 specimen; Sabiura, 5m, Nov. 5, 1995, the same method, H. Misaki, collector, 1 specimen; Kushimoto, Shionomisaki, off Sumisaki, 25m, SCUBA diving, April, 3, 1996, K. Nomura, collector, 4 specimens; (?)Tateyama, Banda, 6m, Chiba Prefecture, May, 18, 1996, SCUBA diving, K. Nomura, collector, 1 specimen; (?)Kushimoto, Shionomisaki, Andonohana, 10m, June, 18, 1997, SCUBA diving, K. Nomura, collector, 2 specimens (damaged).

#### DESCRIPTION.

Holotype without posterior part, with 35 setigers, 5 mm long, 2.5 mm wide including setal fascicles, 1.8 mm wide including parapodia, and 0.9 mm wide excluding parapodia. Paratypes with anal segment, with 30–54 segments, 2.75–15.0 mm long. Anterior wide part of paratypes 1.25–3.5 mm wide including setal fascicles, 0.75–2.5 mm wide including parapodia, and 0.3–1.15 mm wide excluding parapodia.

Dorsum of the body brown, with three pale brown transverse bands on the dorsum of each segment (Pl. 1, Fig. 6). Prostomium uniformly brown, or with paler area on postero-lateral corners around posterior eyes, and a pair of incisions of frontal margin beside the insertion of median antenna.

Prostomium hemi-circular, somewhat wider than long, with three antennae, paired palpi, and two pairs of eyes (Fig. 12, A). A pair of lateral antennae a little longer than the length of prostomium (Fig. 12, A). A fusiform median antenna short, 1/3 to 1/4 of the

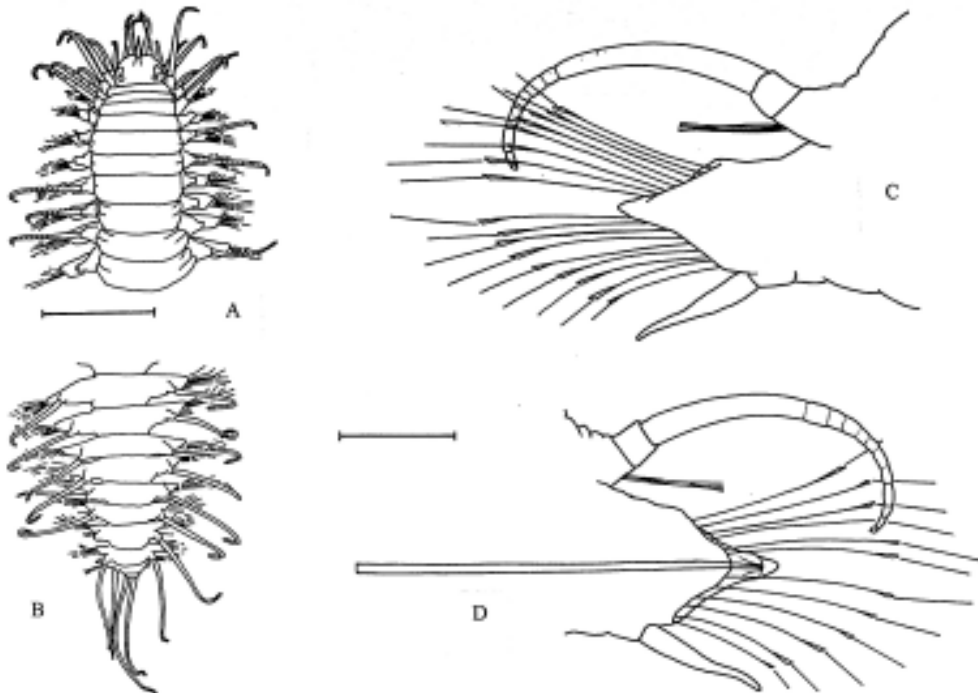


Fig. 12. *Ophiodromus parapallidus*, n. sp.

A, anterior part, dorsal view; B, posterior part, dorsal view; C, right 19th parapodium (with notocirrus of short type), anterior view; D, the same, posterior view. Scale: left, A-B: 1 mm; right, C-D: 200  $\mu$ m.

length of lateral antennae, inserted frontal margin. Median antenna long in larger specimens, but shorter in small specimens. Palpi bi-articulated, inserted just latero-ventrally to lateral antennae (Fig. 12, A), and as long as the latter. Articulation of palpi at the site of proximal 1/3 or a little more proximal. Two pairs of circular eyes dark red in color, located latero-caudad. Anterior pair of eyes larger than posterior pair (Fig. 12, A). Each of anterior three segments with two pairs of tentacular cirri. Dorsal tentacular cirri on segments I-III almost in same length or those of segment II longer (Fig. 12, A). Ventral tentacular cirri rather much shorter than the dorsal partners. Pygidium with a pair of long slender anal cirri (Fig. 12, B).

Parapodium biramous. Each parapodium with a dorsal cirrus, a neuropodial cone, and a ventral cirrus (Fig. 12, C-D, Fig. 13, A). Notopodial part of the median parapodium with a cirrophore and a cirrostyle. Notopodial cirrophore cylindrical with a considerable length, with a conspicuous constriction at distal 1/3 of whole length. The diameter of notopodial cirrophore distal to the constriction almost the same as that of proximal part (Fig. 12, C-D, Fig. 13, A-B). Notocirrus with faint articulation on its distal part (Fig. 12, C-D). Each notopodium with a single or a couple of acicula, and the tip of one aciculum reached to ventral side of the constriction (Fig. 13, B). A small tuft of 1-4 notosetae beside the

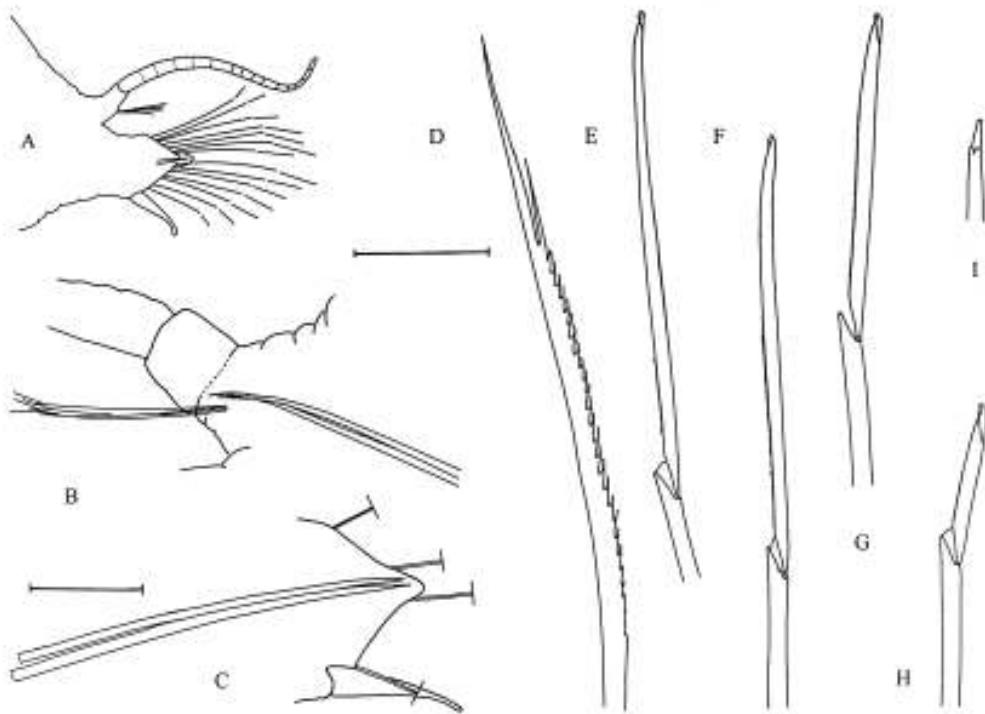


Fig. 13. *Ophiodromus parapallidus*, n. sp.

A, right 22nd parapodium (with notocirrus of long type), posterior view; B, the same, notopodial part, anterior view; C, the same, neuropodial part, posterior view, superior-most and inferior-most supra- and sub-acicular setae are shown only in their proximal parts; D, notoseta; E, superior supra-acicular neuropodial falciger; F, superior sub-acicular falciger; G, middle sub-acicular falciger; H, inferior-most sub-acicular falciger; I, tip of shaft of compound falciger. Scale by D, A: 0.5 mm; D: 20  $\mu$ m; E-I: 50  $\mu$ m; Scale by C, B: 100  $\mu$ m; C: 200  $\mu$ m.

aciculum tip beginning from 3rd–5th setiger (Fig. 12, C–D, Fig. 13, A). Each median neuropodium with a single or two acicula (Fig. 12, D, Fig. 13, B–C). Neuropodial presetal lobe as triangular sheet of parapodial full width (Fig. 12, C–D, Fig. 13, A, C). The distal part of the presetal lobe rather narrow, and with dully pointed apex. Neuropodial postsetal lobe formed a wide triangular edge (Fig. 12, D, Fig. 13, A). With *ca.* 20 supra-acicular and *ca.* 30 sub-acicular setae in median neuropodia. Neurocirri long subulate, inserted near the ventro-lateral corner (Fig. 12, C–D, Fig. 13, A).

Notosetae forked form with sub-apical spine less than a half length of apical spine, and rather wide blade with long serrated zone (Fig. 13, D). Neurosetae with normal form of the genus (Fig. 13, E–H). Tip of shaft of compound setae simple pointed (Fig. 13, I).

#### REMARKS.

*O. parapallidus*, n. sp. is characterized by notopodial cirrophores of medium length, with a constriction on cirrophore, situated rather proximally, and the diameter never reduced on distal part from the constriction. The form of presetal lobe, and a reasonable numbers of notosetae are also specific characters of the new species. *O. parapallidus*, n. sp. allied to *O. pallidus* (Claparède, 1864) especially on the detailed description by Pruvot and Racovitza (1895). The exact figures of parapodia by Zunarelli-Vandini (1971) show the species with no remarkable constriction on notopodial cirrophore. Furthermore, notosetae of each bundle is one to three in the Atlantic species, and our new species with *ca.* 4 notosetae in each bundle. *O. parapallidus*, n. sp. allied to *O. brevipodus*, n. sp., but the latter with stout parapodia and rounded short post-setal lobes. *O. parapallidus*, n. sp. also allied to *O. agilis* (Ehlers, 1864), but the Mediterranean species with only a single notoseta in each parapodium, and the notoseta is recognized as simple capillary.

#### ETYMOLOGY.

Named from the allied species *O. pallidus* (Claparède, 1864).

### ***Ophiodromus pugettensis* (Johnson, 1901)**

(Fig. 14)

- Podarke pugettensis* Johnson, 1901, p. 397, Pl. 3, figs. 23–25.  
 ————, Berkeley and Berkeley, 1948, p. 56, Figs. 83–84.  
 ————, Uschakov, 1955, p. 198, Fig. 59 (figs. after Johnson, 1901).  
 ? ————, Bailey–Brock and Hartman, 1987, p. 264, Fig. 3.II.35, a–c  
 (figs. after Johnson, 1901).  
 ? *Ophiodromus pugettensis*, Hessle, 1925, p. 20.  
 ————, Uchida and Ui, 1994, p. 31.  
 ————, Uchida and Ui, 1995, p. 38.  
*Podarke furcata* Hartmann-Schröder, 1962b, 116, Taf. 5, Abb. 27–29.  
 non *Podarke pugettensis*, Moore, 1909, p. 336.  
 nec ————, Okuda, 1936, p. 413, Fig. 4. (= *O. okudai*, n. sp.)

#### MATERIAL EXAMINED.

Akou, Maruyama, intertidal zone, Hyogo Prefecture, April, 27, 1990, 2 specimens;  
 Kushimoto, Oshima, Myougajima Islet, 4m, May, 5, 1991, SCUBA diving, F. Iwase,

collector, 1 specimen; (?) Kushimoto, Arita, 5–10m, SCUBA diving, K. Nomura, collector, 1 specimen; (?) Nagasaki Holland Village, Ohmura Bay, Nagasaki Prefecture, 5.6m, Ekman-Birge's sampler, April, 26, 1994, 2 specimens; Nagasaki, House ten Vos, 3.1m, the same method, May, 19, 1995, 1 specimen; the same locality, 16.8m, the same method, May, 19, 1995, 1 specimen.

#### DESCRIPTION.

Body uniformly brown. The only two complete specimens with 39 and 48 setigers. The smaller one (from Kushimoto, Oshima) 8.5 mm long, with 2.25 mm wide including setal fascicles, 1.6 mm wide including parapodia, and 0.75 mm wide excluding parapodia, and with three achaetous segments between the last setiger and anal segment. The larger one (from Akou, the Inland Sea of Japan) 10.0 mm long, with 2.5 mm wide including setal fascicles, 2.0 mm wide including parapodia, and 0.8 mm wide excluding parapodia, and with no achaetous segments between the last setiger and anal segment.

Prostomium hemi-circular or sub-hexagonal, wider than long, with three antennae, paired palpi, and two pairs of eyes (Fig. 14, B). A pair of lateral antennae a little longer than the length of prostomium (Fig. 14, B). A fusiform median antenna short, 2/5 to 1/3 of the length of lateral antennae, inserted frontal margin. Palpi bi-articulated, inserted just

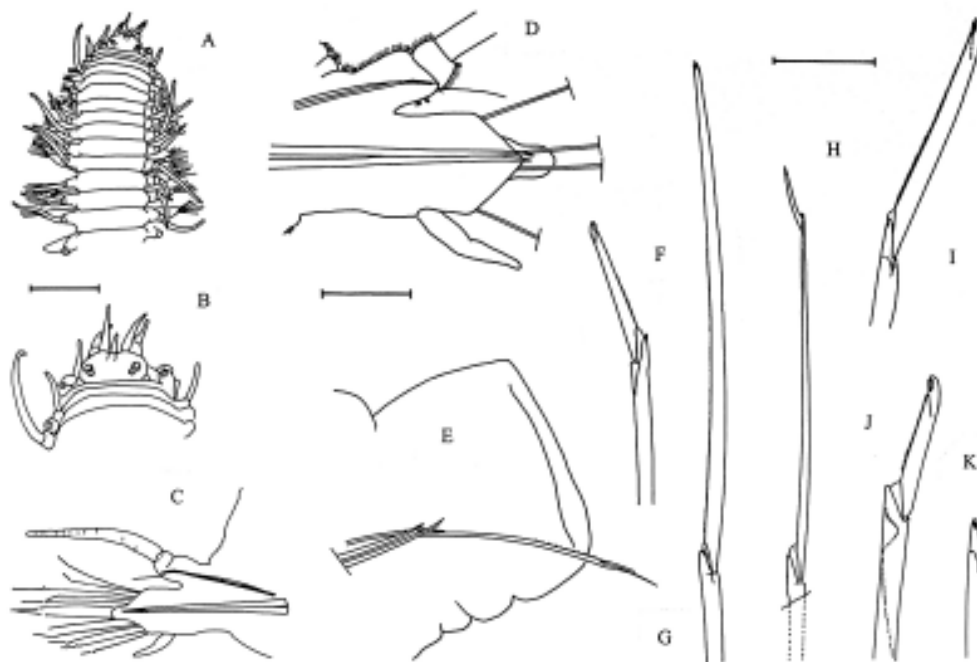


Fig. 14. *Ophiodromus pugettensis*

A, anterior part, dorsal view; B, prostomium; C, right 23rd parapodium, anterior view; D, the same, posterior view, superior-most and inferior-most supra- and sub-acicular setae are shown only in their proximal parts; E, notopodial cirrophore of the same, showing noto-acicula and notoseta, back view; F, superior-most supra-acicular neuropodial compound falciger; G, inferior supra-acicular falciger; H, the same, with the long hood; I, superior sub-acicular falciger; J, inferior sub-acicular falciger; K, tip of shaft of compound falciger. Scale by A, A: 1 mm; B: 0.5 mm; Scale by D, D: 200  $\mu$ m; E: 50  $\mu$ m; Scale by G, C: 0.5 mm; F-K: 50  $\mu$ m.

latero-ventrally to lateral antennae (Fig. 14, B), and as long as the latter. Articulation of palpi at the site of proximal 1/3 or a little more proximal. Two pairs of circular eyes located latero-caudad, but shifted dorsally comparing with other species of the genus. Anterior pair of eyes larger than posterior pair (Fig. 14, B). Each of anterior three segments with two pairs of tentacular cirri. Dorsal tentacular cirri on segments I-III almost in same length. Ventral tentacular cirri shorter than their dorsal partners. Pygidium lost anal cirri.

Parapodium biramous. Each parapodium with a dorsal cirrus, a neuropodial cone, and a ventral cirrus (Fig. 14, C). Notopodial part of the median parapodium with a cirrophore and a cirrostyle. Notopodial cirrophore cylindrical with a considerable length, with a conspicuous constriction at distal 1/3 of whole length. The diameter of notopodial cirrophore somewhat reduced in distal part from the constriction. Notopodial cirrophores rather well ciliated (Fig. 14, D). Notocirrus with faint articulation on its distal half (Fig. 14, C). Each notopodium of median part of the body with a couple of acicula, and the tip of one aciculum reached to ventral side of the constriction (Fig. 14, D-E). Several posterior notopodia with a single aciculum in each of their cirrophore, and in the anterior part of the body from setigers I-II, each notopodium with 4 or 5 acicula. A small tuft of 1-7 notoseta beside the aciculum tip. Each median neuropodium with a single or two acicula (Fig. 14, C-D). Neuropodial presetal lobe formed a short cylindrical projection with round tip (Fig. 14, C-D). Neuropodial postsetal lobe formed wide triangular edge (Fig. 14, D). With each 16-17 setae in supra-acicular and sub-acicular position in median neuropodia. Neurocirri long subulate or almost cylindrical, inserted far ventral from the ventro-lateral corner (Fig. 14, D).

Notosetae forked form (Fig. 14, E), and neurosetae with normal form of the genus (Fig. 14, F-J). Tip of shaft of compound setae simple pointed, but with a shallow excavation near the tip (Fig. 14, K). Sub-acicular neurosetae show the species belongs to short setae group. The supra-acicular one or two setae of inferior position in developing stage with a long hood (Fig. 14, H).

#### REMARKS.

*O. pugettensis* is characterized by notopodial cirrophores of medium length, with a constriction on cirrophore, situated rather proximally, and the diameter reduced on distal part from the constriction. The form of presetal lobe are also specific characters of the species.

*Podarke furcata* Hartmann-Schröder may be the same species. The separate or diffused condition of Segments I and II should be depend on the protruded condition of proboscis. The form of distal part of neuropodial presetal lobe sometimes with round head or sometimes with rather dully pointed apex. Membranaceous hood by Hartmann-Schröder (1962, Taf. 5, Abb. 29a) are same as my specimens (Fig. 14, H).

It is impossible that Japanese record by Hessle (1925) is surely the species or not, for the incomplete or rather almost no description was given. *O. pugettensis* collected in the sheltered muddy areas in the case of west coast of U.S. (Hartman, 1968) and my specimens.

Following is the key to the Japanese species of the genus *Ophiodromus*.

**Key to species of Japanese *Ophiodromus***

1. Parapodia biramous with well developed notopodial cone and with many notosetae.  
*O. spinosus* (Ehlers, 1908)  
*O. flexuosus* (delle Chiaje, 1825)  
*etc.* (not Japanese fauna)
1. Parapodia not typical biramous, without notopodial cone and many notosetae. .... 2
2. Notocirri short  
*Gyptis vittata* Webster et Benedict, 1887  
(= a species of *Ophiodromus*)  
(*O. vittatus* preoccupied by Sars, 1861)  
*O. tigrinus* Rullier, 1972  
(may be not a species of *Ophiodromus*)  
(not Japanese fauna)
2. Notocirri long spread over the distal tip of their neuropodia. .... 3
3. Parapodia short: Joint of articulation of palpi near midway: Palpi as long as lateral antennae: A constriction of notopodial cirrophore not situated near its distal part.  
*O. brevipodus*, n. sp.
3. Parapodia long, projecting enough from lateral side of the body. .... 4
4. Notopodial cirrophores long cylinder, spread sideway to or near the distal part of postsetal lobes of neuropodia: With or without notosetae. .... 5
4. Notopodial cirrophores short, never reached sideway to or near the distal part of postsetal lobes of neuropodia: Presetal lobe of neuropodia conspicuous: Median antenna much shorter than lateral antennae. .... 8
5. Without a remarkable constriction in each notopodial cirrophore, or with a constriction but at where the diameter of the cirrophore never reduced: Median antenna minute, spherical in form: Notopodial cirrophore with two acicula: Neuropodial presetal lobe cylindrical with spherical apex.  
*O. bunbuku*, n. sp.
5. With a constriction in each notopodial cirrophore, where the diameter of the cirrophore reduced drastically: With triangular presetal lobes. .... 6
6. A constriction of notopodial cirrophore situated near the distal end: Notopodial cirrophore spread over the tip of neuropodial postsetal lobe: Median antenna slender and minute: With two pairs of eyes: Notopodial cirrophore with 1-3. acicula.  
*O. berrisfordi* Day, 1967
6. A constriction of notopodial cirrophore situated at distally 1/3 of whole length: Notopodial cirrophore spread near the tip of neuropodial postsetal lobe. .... 7
7. Notopodial cirrophores with constrictions of gradually reduced in thickness: Inside of conjunctural part of setal shaft in compound setae straight in side view.  
*O. angustifrons* (Grube, 1878)
7. Notopodial cirrophores with remarkable constrictions of suddenly reduced in thickness at the constrictions: Inside of conjunctural part of setal shaft in compound setae undulate in side view.  
*O. constrictus*, n. sp.
8. Without a remarkable constriction in each notopodial cirrophore, or with a constriction

- but at where the diameter of the cirrophore never reduced: Neuropodial presetal lobe triangular. .... 9
8. With a remarkable constriction in each notopodial cirrophore, where the diameter of the cirrophore reduced drastically. .... 10
9. Notopodial cirrophores long: A single notoaciculum stretched into a midway of notopodial cirrophore. *O. longifundus*, n. sp.
9. Notopodial cirrophores short: Noto- and neuropodial cirrostyles not very long  
Neuropodial postsetal lobes with triangular projecting margin. *O. parapallidus*, n. sp.
10. Without color bands on dorsum: With few forked notosetae.  
*O. pugettensis* (Johnson, 1901)
10. With white bands on dorsum of the Segments II, VIII, XII, XVII, and XXI. .... 11
11. White band on Segment XXVII next to the Segment XXI: Shaft of compound setae bifid tip. *O. okudai*, n. sp.
11. White band on Segments XXV and XXIX next to the Segment XXI: Shaft of compound setae pointed. *O. fauveli*, n. sp.

#### Genus *Heteropodarke* Hartmann-Schröder, 1962

"Body small, with rather few segments: Prostomium roundish, never incised: 4 eyes: a single median and 2 lateral antennae; two non-articulated palpi: tentacular cirri variable in number by specimens, 2-6 pairs, on 0-2 clear segments: Parapodia uniramous, with 1-2 slender acicula in cirrophore of notocirrus; Notocirri more or less clearly articulated; Neurocirri rather long and articulated too; Neurosetae compound, its blade short, falciger, with uni-dentate apex: In several anterior and middle segments, parapodia with other sort of stout deformed setae: Proboscis with papillae on distal margin, but without jaws." (Hartmann-Schröder, 1962b, pp. 117-118) No additions should be needed.

#### *Heteropodarke kiiensis*, sp. nov.

(Fig. 15)

#### MATERIAL EXAMINED.

Nachi-Katsuura, Nachi Bay, 9.4m, sandy bottom, Sept. 27, 1988, SCUBA diving, 1 specimen (holotype).

#### DESCRIPTION.

Body colorless, 6 mm long with 42 setigers excluding lost posterior part, with 450 µm wide including parapodia, and 270 µm wide excluding parapodia.

Prostomium almost rounded, as long as wide, with a median antenna, a pair of lateral antennae and a pair of palpi. Median antenna subulate, as long as the length of prostomium, inserted at the center of frontal margin. A pair of weak undulations on both sides of inserted part of the prostomium. Lateral antennae same from, but somewhat longer than the



median antenna (Fig. 15, A-B). A pair of palpi almost same form and length as lateral antennae, and without bi-articulation, inserted sideway rather far from the insertion of lateral antennae (Fig. 15, B). With two pairs of minute red eyes of all in the same size, anterior pair situated near the widest corners of prostomium (Fig. 15, B). Proboscis protruded, but not stretched from the mouth opening, surrounded by 10 triangular papillae (Fig. 15, C-D)

Each of the first three segments with two pairs of tentacular cirri (Fig. 15, A-B). The length of the dorsal tentacular cirri on the first segment unknown, for the holotype lost both of them. Those of the second segment about twice as long as lateral antennae, and those of the third segment a little shorter than those of the second segment. Ventral tentacular cirri on Segment II and III are about a half as long as their dorsal partner, and

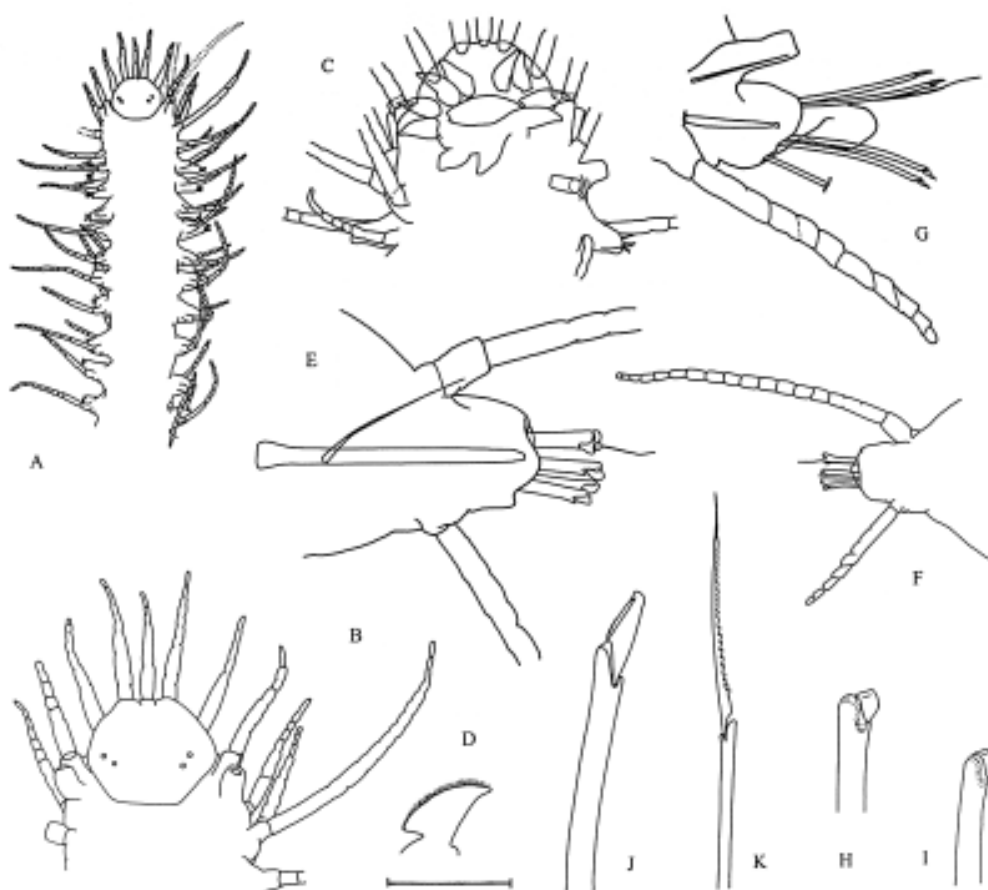


Fig. 15. *Heteropodarke kiiensis*, n. sp.

A, anterior part, dorsal view; B, prostomium; C, proboscis, ventral view; D, a papilla of proboscis, side view; E, left 27th parapodium, anterior view; F, the same, posterior view; G, right 38th parapodium, posterior view, neuropodial aciculum and inferior-most setae broken; H, neuroseta of median position in left 27th parapodium; I, inferior-most neuroseta in the same parapodium; J, neuroseta in right 38th parapodium; K, spiniger in the same parapodium. Scale, A:0.5 mm, B-C, F: 200  $\mu$ m, D-E, G: 100  $\mu$ m, H-I: 50  $\mu$ m, J-K: 20  $\mu$ m.

ventral tentacular cirri on Segment I almost as long as those in Segment II and III (Fig. 15, A-B).

Setae present from the fourth segment (Fig. 15, A, C). Dorsal cirri of the first setiger prominent (Fig. 15, A, C). Dorsal cirri arranged long and short type alternately, and the first setiger with those of short type (Fig. 15, A). Caudal region unknown. All the cirri rather slender and articulated including palpi, and body segmentation never clear.

Parapodia sub-biramous, and all are almost in same form. Each parapodium with a long dorsal cirrus and a short ventral cirrus. Notopodial cone never developed, without notosetae (Fig. 15, E-G). Basal part of notocirrus with a single notoaciculum. Anterior to median neuropodia short cylinder, with inconspicuous presetal lobe of low mound, and with a stout aciculum (Fig. 15, E). Posterior neuropodia with long stout presetal lobe, and a single aciculum of round tip (Fig. 15, G). Parapodial notocirri and neurocirri with their cirrophores, and articulated cirrostyles (Fig. 15, F).

Each of neuropodia with 2 falciger and a single spiniger in supra-acicular position, and 3 falcigers in sub-acicular position (Fig. 15, E-G). Spiniger firstly appeared in 3rd or 4th setiger, and with slender blade of serration on free edge (Fig. 15, K). Falciger in anterior and middle parapodia (6th-32nd setigers) with the distal part of depressed form, their blade round conical in form (Fig. 15, H-I), and those in far anterior (1st-5th setigers) and posterior parapodia (from 33rd setiger) with rather long blade of plump tip (Fig. 15, J).

#### REMARKS.

The new species very well coincides with the original description of *H. heteromorpha* Hartmann-Schröder, 1962, collected from Peru, in all the factors except for the following points.

Stout modified neurosetae present from 4th or 5th setiger, and continued to 6th-16th setigers in *H. heteromorpha*, but 6th-32nd setigers in the new species. Non-modified neuropodial falcigers with sharply pointed apex in *H. heteromorpha*, but rounded apex in the new species. Modified neuropodial falcigers with markedly bifid apex in the Peruvian species, but never clearly bifid at apex in the Japanese new species. The neuropodial spinigers absent in the Peruvian species, but the *H. kiiensis*, n. sp. with a single spiniger in each parapodium of all the segments.

#### ETYMOLOGY.

Named from the Kii Peninsula. Nachi Bay, the type locality of the new species, is located near the southern-most part of the peninsula.

### **Genus *Uncopodarke* nov.**

TYPE SPECIES: *Uncopodarke intermedia* n. sp.

Gender: feminine.

#### DIAGNOSIS.

Prostomium sub-conical, with a pair of antennae, a pair of palpi, and a pair of eyes.

Palpi minute (or sometimes absent ?), inserted ventrally. Without a facial tubercle. With six pairs of tentacular cirri on the first three anterior segments. Segment IV (first setiger) uniramous, with compound claw setae together with normal falcigers in neuropodia. Parapodia of all setigers except setiger I, biramous, with noto- and neurocirri. Each notopodium reduced with a single aciculum and accompanied pectinate setae. Neuropodium with a stout aciculum, a slender aciculum, and compound falcigers. Pygidium with a pair of anal cirri, together with an anal lamella. Antennae, palpi, tentacular cirri, dorsal cirri, ventral cirri, and anal cirri without cirrophores.

#### ETYMOLOGY.

The genus is named for the presence of claw setae in the first setiger.

#### REMARKS.

All the characters mentioned in the diagnosis are belonged to *Microphthalmus* (see p. 73), except for the presence of claw compound setae in the first setiger, and without a median antenna.

*Uncopodarke*, n. Gen. is also closely related to *Struwela* Hartmann-Schröder, 1959. The two genera have a pair of antennae, a pair of eyes, and compound claw setae in an anterior segment. Prostomium and compound falcigers in the two genera, furthermore, are in the same form.

*Struwela* has no palpi, and has only four pairs of tentacular cirri. *Uncopodarke*, n. Gen., however, has a pair of palpi (sometimes without palpi ?) and six pairs of tentacular cirri. Compound claw setae of *Struwela* are very long, situated in segment II (the second tentacular segment). Those of *Uncopodarke*, n. Gen. are short, situated in segment IV (next segment to the third tentacular segment). Pygidium in *Struwela* has a pair of anal flaps, but that in *Uncopodarke*, n. Gen. has a pair of anal cirri and an anal lamella. Finally, parapodium in *Struwela* is uniramous, without noto-acicula nor notosetae, and is devoid of neurocirri. Parapodium in *Uncopodarke* is biramous, with a noto-aciculum and pectinate notosetae, and also has a neurocirrus.

Hartmann-Schröder (1959) has never described on the condition of joining of dorsal cirri from the body. Judging from her figures (Abb. 41, 44 and 46), tentacular cirri and notocirri in *Struwela* are more or less clearly jointed to the body at their inserted points. All the appendages (antennae, palpi, tentacular cirri, dorsal cirri, ventral cirri, and anal cirri) of *Uncopodarke*, however, have not any trace of conjunctions from the body, just same as those in *Microphthalmus* and *Hesionides*.

The apical form of compound setae of the two species are similar each other. The apical tooth is spine like, and much smaller than the sub-apical tooth, and the peculiar form of incision between sub-apical tooth and distal part of edge. The morphology of the setae resembles to those in the family Syllidae, such as in *Opisthodontia morena* Langerhans, 1879, and several species of *Pionosyllis*, but we cannot find such compound setae in Hesionidae. It is general tendency in the family Hesionidae that a uniform morphology of apical structure of compound setae is proposed among the species in the same genera. The typical examples are the case in *Hesione* and *Ophiodromus*, and it is indeed the chief cause for the difficulty of species identifications in the family.

The new genus is markedly closely related to not only *Struwela*, but *Microphthalmus*.

Hartmann-Schröder (1971) defined two subfamilies, Hesioninae and Microphthalminae, in the family Hesionidae. *Struwela* and *Uncopodarke* are, however, completely connected the two subfamilies, by the reasons mentioned above. It seems, therefore, to be better that the subdivision of the family are not applied.

*Uncopodarke intermedia*, Gen. et sp. nov.

(Figs. 16–17)

MATERIAL EXAMINED.

Nachi-Katsuura Town (Kii Peninsula), Nachi Bay, 2 m deep, sandy bottom, 27 Sept. 1988 (holotype); *ditto*, 8 m deep, sandy bottom, 27 Sept. 1988 (paratype).

DESCRIPTION.

Body colorless, 3.6 mm long with 31 setigers in the holotype, 5 mm long with 48 setigers in the paratype. Body width (excl. parapodia) anteriorly 260  $\mu\text{m}$ , middle 280  $\mu\text{m}$ , and posteriorly 160  $\mu\text{m}$  in the holotype. Those in the paratype, 300  $\mu\text{m}$ , 370  $\mu\text{m}$ , and 200  $\mu\text{m}$  respectively. Body depressed dorso-ventrally, *ca.* 150  $\mu\text{m}$  thick.

Prostomium sub-conical, wider than long, with a pair of lateral antennae and a pair of minute palpi. Median antenna wanted. Lateral antennae subulate in form, somewhat shorter than prostomium (Fig. 16, A–C). A pair of palpi (only in holotype) as minute papillae, inserted latero-ventrally to lateral antennae, and not observable in dorsal view (Fig. 16, A). A pair of minute eyes situated near the widest corners of prostomium (Fig. 16, A). Proboscis not protruded in both specimens.

Each of the first three segments with two pairs of tentacular cirri, same as the species of *Microphthalmus* (Fig. 16, A–B). All three pairs of dorsal tentacular cirri markedly longer than their own ventral partners. Dorsal tentacular cirri of segments II and III longest, and almost same length each other, and much longer than those of segment I. Among ventral tentacular cirri, those of segment II longest. Ventral tentacular cirri of segment II as long as a half of the dorsal ones. Ventral tentacular cirri of segment III shortest.

Setae present from the fourth segment (Fig. 16, A–B). Dorsal cirri of the first setiger not prominent (Figs. 16, A–B, F–G). Dorsal cirri gradually long towards posterior setigers, and enough long in the fifth setiger (segment 8), but much shorter than dorsal tentacular cirri (Fig. 16, A). Posterior end with a pair of anal cirri and a fan-shaped anal lamella (Fig. 16, D–E). Anal cirri short, extending to the posterior margin of anal lamella. Anal lamella with an entire margin, without a mid-posterial incision nor marginal fringes.

Parapodia of the first setiger (segment 4) uniramous, without prominent dorsal cirri, nor notopodial acicula nor setae, but with ventral cirri (Fig. 16, F–G). All the parapodia, except for in the first setiger, almost in same form. Each parapodium with a long dorsal cirrus and a short ventral cirrus. Notopodial cone not prominent, with a small fascicle of diminished setae situated on the inferior bases of notocirrus (Fig. 17, A, C, G). Each neuropodial cone well developed, consisting of a long presetal lobe and a small conical postsetal lobe. Presetal lobe cylindrical with more or less truncated distal end, and thrust with a fine aciculum to distal part near the tip. A stout aciculum extending to the tip of a

presetal lobe (Fig. 17, A, C).

The first setiger without notopodia. Each notopodial fascicle from the second setiger with a (or rarely and an additional one of) pectinate seta accompanied with a slender acicular simple seta (Fig. 17, A, C-D, G). Neuropodium in the first setiger with 2-4 stout compound hooks together with 2-3 compound setae of usual form, and two acicula (Fig. 16, F-G). Each of the other neuropodia with 5-7 compound setae, and two acicula (Fig. 17, A-C). A superior-most short-blade seta, two long-blade supra-acicular setae, and 2-4 short-blade sub-acicular setae in a neuropodium. The last 1-3 setigers with one or two slender simple neurosetae in each parapodium (Fig. 17, H). One or two posterior-most segments anterior to pygidium achaetous (Fig. 16, D-E).

Notopodial pectinate seta with a rather short recurved blade serrated into *ca.* 10 teeth

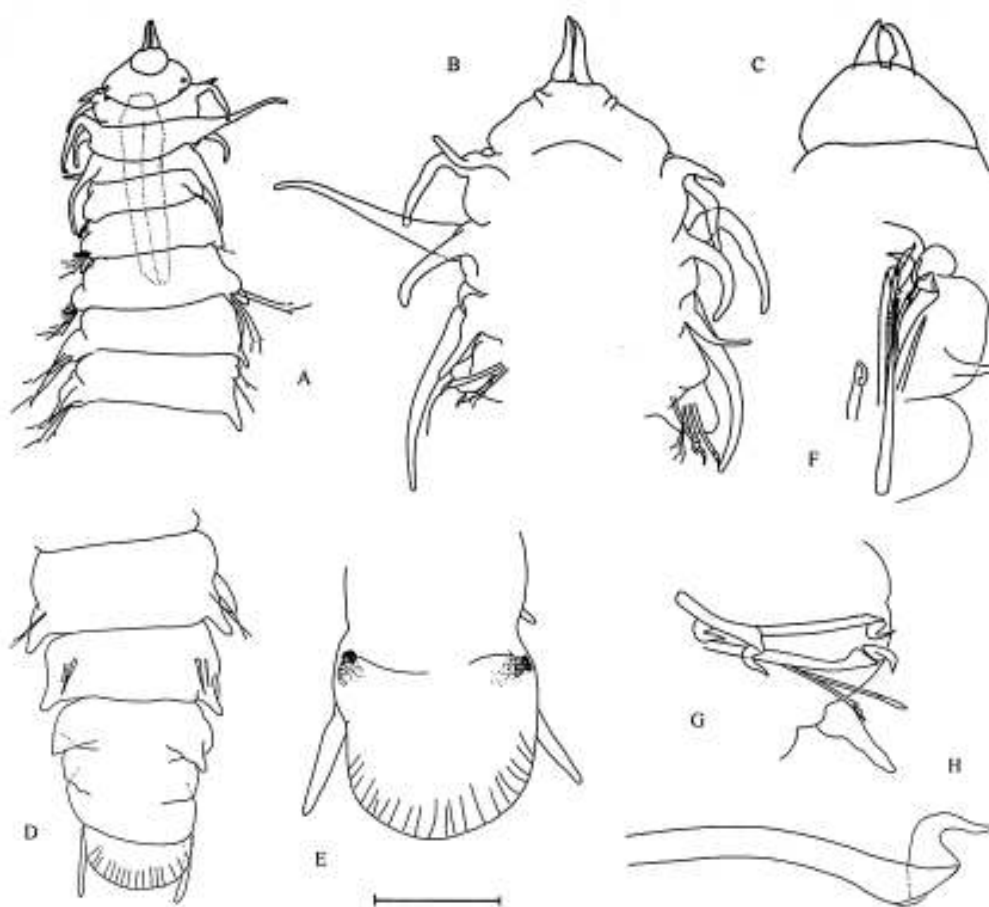


Fig. 16. *Uncopodarke intermedia*, n. Gen., n. sp.

A, anterior part, holotype, dorsal view; B, same, holotype, ventral view; C, prostomium and antennae, paratype, dorsal view; D, posterior end, holotype, dorsal view; E, pygidium, paratype, ventral view; F, right first parapodium, holotype, ventral view; G, same, holotype, posterior view, neuropodial aciculum omitted; H, compound claw seta from right first parapodium. Scale, A: 200  $\mu$ m, B-D: 100  $\mu$ m, E-G: 50  $\mu$ m, H: 20  $\mu$ m.

(Fig. 17, D). Accompanied acicular seta with a slender fine tip (Fig. 17, D). Compound hooks or claw setae in neuropodia of the first setiger usually folded at the joint (Fig. 16, H). Hooks stout, more than twice as thick as accompanied compound setae. Non-folded form of the hook is shown as an outer one in Fig. 16, F. Form of hooks similar to those in the species of the genus *Branchiosyllis* (Sylliidae). Neuropodia in the second setiger with only compound setae of normal form (Fig. 17, A). All compound neurosetae similar each other except for the length of blade (Fig. 17, E-F). Distal part of blade with a hooked main tooth, together with a minute spinous tooth above it. Free margin of blade very finely serrated or almost smooth. Proximal stout aciculum long with a blunt tip (Fig. 17, C). Distal slender aciculum short with a fine tip (Fig. 17, A-C). Simple seta in posterior neuropodia slender with a merely hooked fine tip (Fig. 17, I).

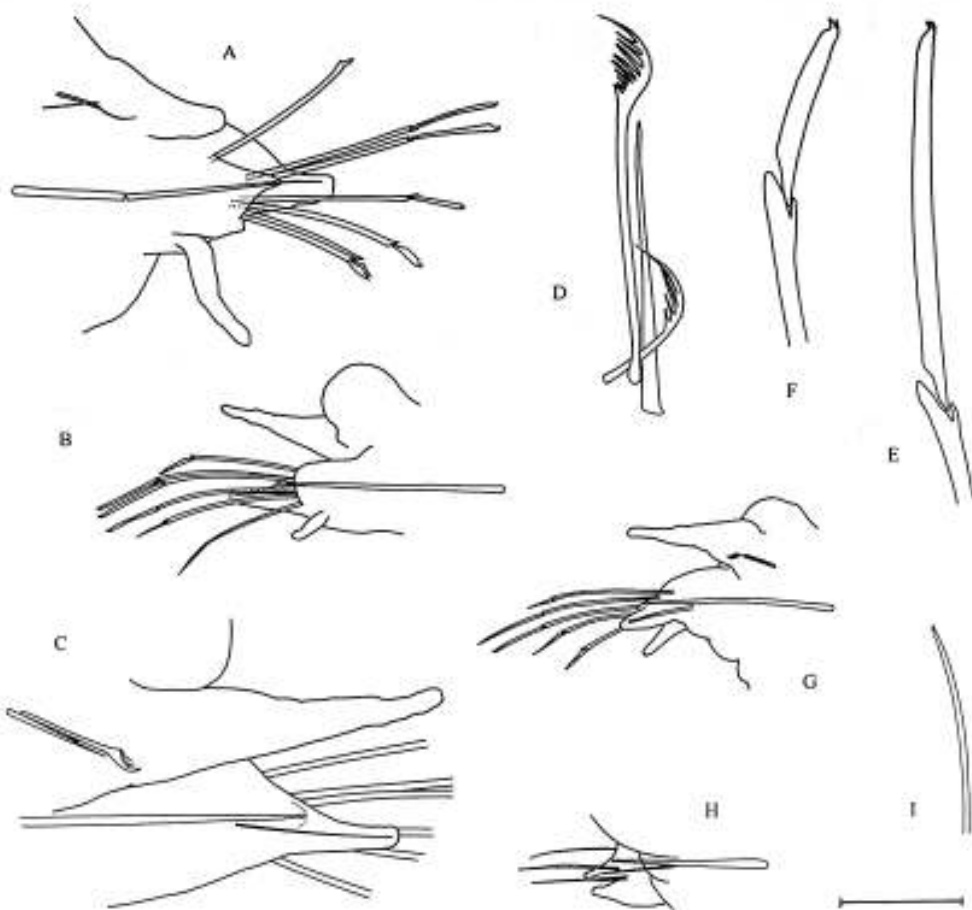


Fig. 17. *Uncopodarke intermedia*, n. Gen., n. sp.

A, right 2nd parapodium, anterior view; B, left 8th parapodium, posterior view; C, same, anterior view; D, notosetae in left 8th notopodium; E-F, neuropodial compound setae; G, right 39th parapodium, anterior view; H, neuropodium of the left last setiger; I, simple seta from the last setiger. Scale, A, C, and H: 50  $\mu$ m, B and G: 100  $\mu$ m, D-F and I: 20  $\mu$ m.

## REMARKS.

*Microphthalmus ancistrosylliiformis* Hartmann-Schröder, 1962 has acicular stout setae in 2nd-4th setigers, but the acicular setae are notopodial, and are not compound (Hartmann-Schröder, 1962a, figs. 45-46). *M. aciculata* Hartmann-Schröder, 1962 has acicular setae in almost every setiger, but those setae are also notopodial (Hartmann-Schröder, 1962b, figs. 36-37). These two species without notopodial pectinate setae.

Outside the presence of neuropodial hooks in the first setiger, *Uncopodarke intermedia*, n. sp. resembles to *Microphthalmus westheidei* Hartmann-Schröder, 1982, in the forms of anal lamella, of notopodial pectinate setae, and of parapodial notocirri, together with the presence of simple neurosetae in posterior-most few setigers, and the presence of notopodial acicular simple setae. Noto- and neurocirri of *M. westheidei*, however, is much longer than the new species. Furthermore, serration of compound neurosetae in *M. westheidei* is stronger than those in the new species. Anal lamella of the Australian species has a weak central incision, but that of new species entire. All of two specimens without median antenna. Anterior margin of two specimens much resembles each other in dorsal view. Two lateral antennae only are visible (Fig. 16, A, C). A pair of palpi present as two small papillae in holotype (Fig. 16, B), but paratype lacks such papillae. *Microphthalmus riojai* Reish, 1968 has much reduced palpi (see Reish, 1968, fig. 4-a), but the palpi of the Mexican species are long enough visible in dorsal view.

Anyway, *Uncopodarke intermedia*, n. sp. is markedly distinguishable from all the species of the genus *Microphthalmus* by the presence of neuropodial compound claw setae in setiger I.

*Uncopodarke intermedia*, n. sp. is different from *Struwela noodti* Hartmann-Schröder, 1959 by the less development of compound claw setae in the anterior segment. Other more essential differences of these two species are already discussed in remarks of the new genus (p. 69).

## ETYMOLOGY.

Named from the intermediate natures of the new species between *Hesionides-Microphthalmus* group and *Struwela*.

**Genus *Microphthalmus* Meczников, 1865**

Body minute, and rather short, with few segments. With six pairs of tentacular cirri. Proboscis without a pair of chitinous ventral ridges nor jaws. With proboscial papillae. With a pair of non-articulated palpi. With three antennae (except *M. riojai* Reish, 1968). Parapodia biramous, with notosetae of simple capillary, or pectinate, or both types. Neuropodia with compound falcigers accompanied with or without simple setae. Pygidium with anal lamellae together with a pair of anal cirri. Antennae, palpi and cirri without cirrophores.

***Microphthalmus itoi* sp. nov.**

(Fig. 18)

#### MATERIAL EXAMINED.

Akkeshi, Tsukushigoi Beach, Hokkaido, intertidal sand layer, July, 1971, the late Tatsunori Ito, collector, 1 specimen (holotype).

#### DESCRIPTION.

Body dark gray, 7.7 mm long, with 61 setigers. Body width (excl. parapodia) 320  $\mu$ m in the anterior region, 360  $\mu$ m in the middle, and 300  $\mu$ m in the posterior region.

Prostomium hemi-spherical, wider than long, with a single median antenna, a pair of lateral antennae and a pair of palpi. Median antenna inserted dorso-hinter margin of prostomium, subulate, and a little longer than the length of the prostomium. Lateral antennae same form as median antenna, inserted at the anterior margin of the prostomium, and 2/3 length of median antenna. A pair of palpi as the same form and length of lateral antennae, but somewhat slender, inserted latero-ventrally to lateral antennae (Fig. 18, A).

Eyes cannot be found. It may be due to the body color (gray color of the whole body may be artifact for the preservation in cooler in living state together with other interstitial organisms and some amount of sand, until sorting. The color of the animal in natural state may be colorless transparent) and/or long preservation (Fig. 18, A). Proboscis, protruded in the holotype, with 10 conical papillae of the same size at the distal margin (Fig. 18, A).

Each of the first three segments with a pair of tentacular cirri on each side. In anterior pairs, the ventral tentacular cirri almost as long as the dorsal ones. In the second pairs, dorsal ones longer than the ventral ones, and than the anterior pairs also. In the third pairs, dorsal ones almost as long as the dorsal ones in the second segment. Ventral tentacular cirri in the third segment much shorter than the other tentacular cirri (Fig. 18, A).

Setae present from the fourth segment. Dorsal cirri in the first and the second setigers shorter than dorsal tentacular cirri, and than the dorsal cirri in the following segments (Fig. 18, A). Dorsal cirri of the third setiger and the following segments almost as long as dorsal tentacular cirri in the second and the third segments, but those in the posterior region gradually diminished to the third to last setiger, and suddenly diminished to the last setiger (Fig. 18, B).

Posterior end with a pair of anal cirri and a fan-shaped anal lamella (Fig. 18, B). Two anal cirri incomplete in holotype. Anal lamella fringed with 37 more or less regularly split papillae (Fig. 18, B). Almost all papillae with the tip entire, but only two papillae with the tip of weak bifurcation.

Parapodia biramous from the first setiger till almost last setiger, with reduced notopodia and well developed neuropodia. Noto- and neuropodia well separated by wide branching. Notopodial cirrus simple subulate, with a small conical notopodial projection on its base. A single notoaciculum penetrate through the conical projection. Neuropodium with a long conical podial cone and a slender neurocirrus inserted ventro-posterior margin of midway of neuropodial cone (Fig. 18, C). Neurocirri faintly undulated or faintly articulated. Neuropodium with two acicula, one is stout of dully round tip, another is slender with sharply pointed tip (Fig. 18, D). Pointed aciculum penetrates longer presetal lobe of neuropodium.

Each notopodial fascicle with a single pectinate seta accompanied with 15-20 simple capillary setae (Fig. 18, C-D). Each neuropodium with 5 sorts of setae, namely two



(rarely one) serrated compound, 2 or 3 superior simple, 1-4 long blade, 2-3 short blade, and two or three inferior simple setae, arranged from the dorsal side to ventral (Fig. 18, C-D). Notopodial simple setae almost straight, without serration (Fig. 18, E).

Noto- and neuroacicula all slender (Fig. 18, G). Pectinate notosetae situated inferior-most in the notosetal fascicles, sigmoid in form, without spur, and with many fine serration along rather long part of blade to the apex (Fig. 18, F). Neuropodial superior serrated compound setae with rounded tip and serration, with several large tooth on the basal part of blade, and with a long projection on each joint part of setal shaft (Fig. 18, H). Neuropodial superior simple setae somewhat resembles to notopodial simple setae, but geniculated scarcely, and with minute serration near the geniculated part (Fig. 18, I). Long



Fig. 18. *Microphthalmus itoi*, n. sp.

A, anterior part, dorsal view; B, posterior part, dorsal view; C, right 9th parapodium, posterior view; D, right 53rd parapodium, anterior view; E, notopodial simple seta; F, notopodial pectinate seta; G, Notopodial aciculum from 9th setiger; H, neuropodial superior-most serrated seta; I, neuropodial superior simple seta; J, long type neuropodial compound seta; K, short type neuropodial compound seta; L, neuropodial inferior simple seta. Scale, A: 200  $\mu$ m, B-D: 100  $\mu$ m, E-L: 20  $\mu$ m.

and short blade setae with bidentate tip and fine serration on free margin of blade (Fig. 18, J-K). Inferior simple setae with stout apex of clearly bifid tip (Fig. 18, L).

#### REMARKS.

*Microphthalmus itoi*, n. sp. with fringed anal lamella, with neuropodial simple and compound setae, with pectinate notosetae, and more than 10 simple setae in a single notopodium. The new species is allied to *M. fragilis* Bobretzky, 1870, and *M. urofimbriata* Alikunhi, 1943, for the characters mentioned above. *M. urofimbriata* with pectinate notosetae of bow-shaped (Alikunhi, 1948, fig. 3, b), but the new species with pectinate notosetae of simple geniculate, same as *M. fragilis*.

*M. fragilis* differs, however, in having more complex fringe of anal lamella (see Greca, 1950, fig. 7, d), and compact fringe on free margin of neuropodial compound setae (see Greca, 1950, fig. 6). Moreover, *M. fragilis* without strongly serrated pectinate compound neurosetae.

*M. indefatigatus* Westheide 1974 is the only previously known species with neuropodial compound setae of both type of apex, entire and bifid (Westheide, 1974, fig. 7, J-L), same as *M. itoi*, n. sp. However, *M. indefatigatus* with long notocirri, short pectinate notosetae, and fewer notopodial simple setae.

#### ETYMOLOGY.

Named from the late Dr. Tatsunori Itô, the collector of the holotype during his survey of interstitial fauna in Hokkaido.

### **Genus *Parahesiocaeca* nov.**

TYPE-SPECIES: *Parahesiocaeca japonica*, n. sp.

Gender: feminine.

#### DIAGNOSIS.

Prostomium rectangular, with three antennae, paired biarticulated palpi, and two pairs of eyes. Without a facial tubercle. Proboscis with a circle of papillae, but without jaws. Proboscical papillae all in the same size, and with ciliated apex. Proboscical distal margin smooth, excepting for the papillae. Two tentacular segments achaetous and apodous. Four pairs of tentacular cirri with distinct ceratophores. Parapodia sub-biramous throughout. Notopodia represented by dorsal cirri and acicula. Neuropodia with longer presetal lobes, shorter postsetal lobes, and short ventral cirri. A neuropodial aciculum in a presetal lobe. Neurosetae all heterogomph falcigers, with hooked apex, and fine serration. Pygidium with paired anal cirri, but without anal lamellae. Tentacular cirri and dorsal cirri articulated.

#### ETYMOLOGY.

The genus is named from the genus *Hesiocaeca* Hartman, 1965a, which resembles to the new genus.

#### REMARKS.

Four hitherto known genera have four pairs of tentacular cirri in the family: *Struwela* Hartmann-Schröder, 1959; *Heteropodarke* Hartmann-Schröder, 1962b; *Hesiocaeca* Hartman, 1965; and *Bonuania* Pillai, 1965. *Struwela* has strongly hooked modified setae in anterior segments. *Struwela* is, moreover, devoid of a median antenna and palpi. *Heteropodarke* has variable number of tentacular cirri including four pairs, but it has stout compound setae (see p. 66). *Bonuania* has a minute median antenna, but is devoid of lateral antennae (according to the original designation, Pillai, 1965), or antennae are all missing in the type materials, but with a facial tubercle. In either case, the new genus differs from *Bonuania*. *Hesiocaeca* is near to the new genus. Both genera have three antennae and paired palpi. The new genus is, however, devoid of a facial tubercle in front of prostomium.

***Parahesiocaeca japonica*, Gen. et sp. nov.**

(Fig. 19)

MATERIAL EXAMINED.

Kushimoto (Kii Peninsula), Arita, lobster gill net, ca 30 m deep, Feb. 7, 1979, K. Ikazaki, collector (holotype and two paratypes).

DESCRIPTION.

Body colorless, 1.75 mm long with 20 setigers (holotype). Body width 200  $\mu$ m excluding parapodia, 450  $\mu$ m including parapodia, and 700  $\mu$ m including setal fascicles. Two paratypes of anterior fragments 1.2 mm long with 15 setigers, and 1.25 mm long with 10 setigers (Fig. 19, A) respectively. The paratypes also 200  $\mu$ m wide (excl. parapodia).

Prostomium subrectangular, wider than long, with three antennae, paired palpi, and two pairs of eyes (Fig. 19, B). A pair of lateral antennae almost as long as the length of prostomium, inserted frontal margin of prostomium (Fig. 19, B-C). A median antenna as long as a half of lateral antennae, and inserted near frontal margin of prostomium, but somewhat caudad to lateral antennae (Fig. 19, A-B). Palpi bi-articulated, inserted latero-ventrally to lateral antennae (Fig. 19, B-C), and as long as the latter. Two pair of eyes orange in color, located near lateral depressions. Anterior pair larger (Fig. 19, B). An inconspicuous depression on posterior margin of prostomium. Without a facial tubercle (Fig. 19, A-B).

Proboscis of one of paratype (Paratype I) protruded. Proboscis without teeth or jaws, but with a circle of 18 papillae located just outside of anterior margin. Each papilla subconical with a tuft of cilia on top (Fig. 19, B-D). Proboscial margin smooth, without cilia.

Each of anterior two segments with two pairs of tentacular cirri (Fig. 19, A-C, E). Dorsal cirri of segment II longest. Dorsal cirri of segment I somewhat longer than a half of those of segment II. Ventral cirri of segments I and II almost same in length, and as long as a half of dorsal cirri of segment I (Fig. 19, A-C). Holotype, the only one perfect specimen, with 20 pairs of parapodia. Left last parapodium of holotype with a seta, but achaetous in right side (Fig. 19, F). Pygidium with a pair of anal cirri similar to tentacular cirri and parapodial dorsal cirri (Fig. 19, F). Parapodia of setiger I small with few setae, but with conspicuous dorsal and ventral cirri almost as long as the following setigers (Fig.

19, A-C, E). Parapodia gradually developed toward posterior segments, and fully developed in setiger V (Fig. 19, A). Parapodia rather long comparing with body width. Second to the last parapodia somewhat small than the anteriors, with non-articulated short dorsal cirri (Fig. 19, F). Last parapodia small without conspicuous dorsal cirri.

Parapodia sub-biramous throughout. Each parapodium with a long dorsal cirrus, a neuropodial cone, and a ventral cirrus (Fig. 19, G). Two slender acicula in a dorsal

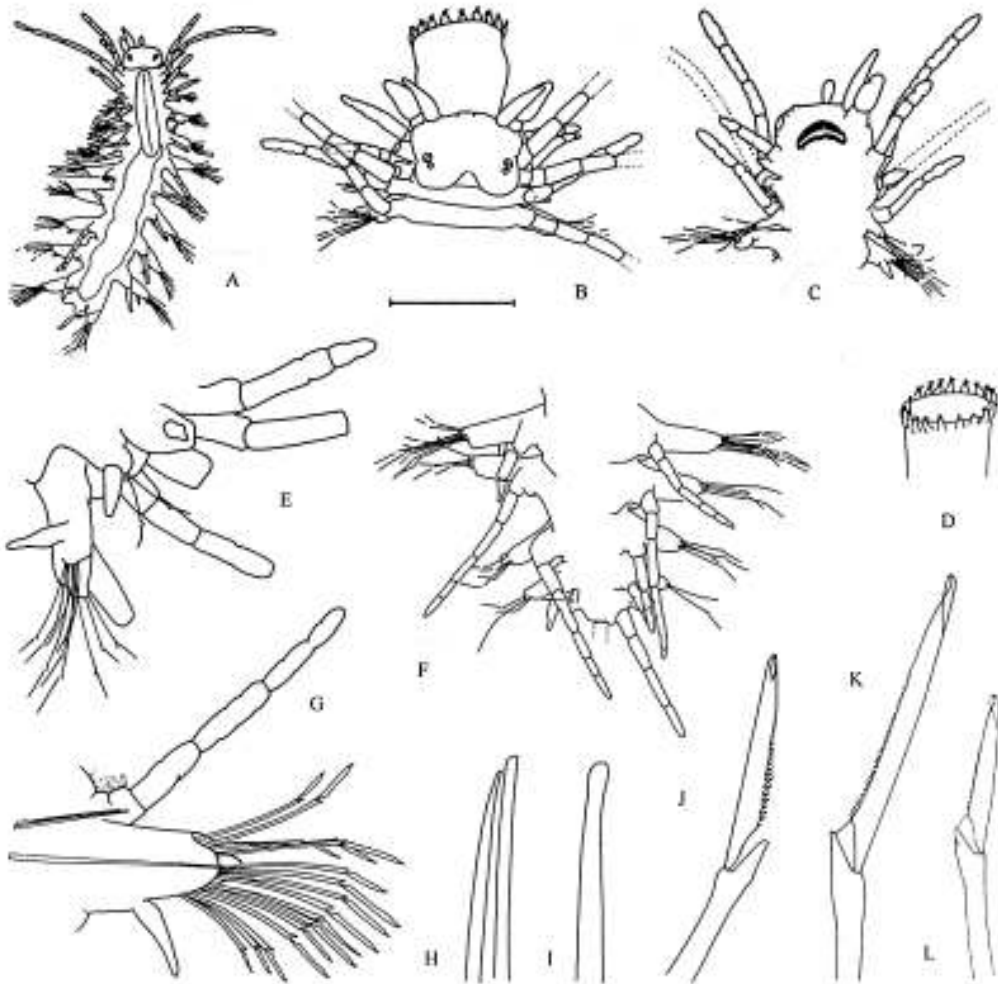


Fig. 19. *Parahesiocaeca japonica*, n. Gen., n. sp.

A, paratype II, dorsal view; B, prostomium of paratype I, dorsal view, median antenna and left dorsal tentacular cirrus on the second segment lost; C, anterior part of paratype II, ventral view; D, proboscis of paratype I, ventral view; E, left side of anterior part (two pairs of tentacular cirri and 1st and 2nd setigers), holotype, ventral view, dorsal and ventral tentacular cirri on second segment missing; F, posterior part, holotype, dorsal view, last to 5th parapodia with rather many setae (9) on both sides, but next segment with only 4 setae in each parapodium, and the last segment with a single compound seta on left, but achaetous on right, left anal cirrus missing; G, right 7th parapodium, posterior view; H, notopodial acicula; I, neuropodial aciculum; J, supra-acicular seta; K, superior sub-acicular seta; L, inferior sub-acicular seta. Scale, A:0.5 mm, B-D and F: 200  $\mu$ m, E and G: 100  $\mu$ m, H-L: 20  $\mu$ m.

cirrophore. Dorsal cirrostyle articulated, and each article indistinctly annulated. Dorsal cirrus extending beyond the tip of setal fascicle. Ventral cirrus short, spindle-shaped, inserted halfway on ventral ridge of parapodium. Parapodial cone with a longer presetal lobe and a shorter postsetal one. Presetal lobe subpyriform, with a rather truncated distal part. Postsetal lobe semicyclic. An aciculum imbedded in parapodial cone, and its tip extending near distal part of presetal lobe. Several compound setae rashed out between pre- and postsetal lobes, somewhat in fan arrangement (Fig. 19, G). Parapodia in setiger I with 1-4 setae (Fig. 19, B-C, E). Those in setiger II with *ca.* 10 setae (Fig. 19, E). Following parapodia with 10-17 setae (Fig. 19, G). Number of setae diminished at 4th to last setiger in holotype (Fig. 19, F). A ciliary band surrounding parapodium at the position of cirrophores of two cirri.

Noto- and neuroacicula with slender apex, but with rather dull tip (Fig. 19, H-I). Setae all heterogomph compound type, and all fundamentally identical in form (Fig. 19, J-L), but superior and inferior setae with shorter blades than those in middle position. Free edge of each blade with serration. Serration diminished toward apex, and superior setae with somewhat stronger serration than the others.

#### ETYMOLOGY.

Named from Japan, the type locality.

#### REMARKS.

See remarks of the genus (p. 76).

Antennae, tentacular cirri and parapodial dorsal cirri deciduous, same as other species of Hesionidae. Holotype and one of paratype lost their median antenna. Another paratype lost lateral antenna and palpus on right side (Fig. 19, A, C). Paratype of fig. 19, A lost dorsal tentacular cirri on segment II during my observation (compare Figs. 19, A and 19, C). Ventral cirri of setiger I remains only in holotype (see Fig. 19, E).

Scars of tentacular cirri and parapodial dorsal cirri are rather easily recognized by the presence of cirrophores. Those of antennae and parapodial ventral cirri are, however, difficult to define, for the absence of their remarkable cirrophores. *Bonuania parva* Pillai, 1965 is regarded as a species with a peculiar short conical median antenna, but without lateral antennae. If it is the truth, the new genus differs from *Bonuania* by the presence of lateral antennae.

But, it is more likely that *B. parva* lost two or three antennae together with all tentacular cirri. Form of so-called median antenna of the species (see Pillai, 1965, fig. 4, I-J) is similar to a facial tubercle of *Hesiocaeca bermudensis* Hartman, 1965, or those of species of *Leocrates* and *Leocratides*. If *Bonuania parva* has a facial tubercle, it is rather close to *Hesiocaeca*, but not to *Parahesiocaece*, n. Gen. The new genus has no facial tubercle.

#### **Genus *Hesionides* Friedrich, 1937**

Body minute, rather short with few segments. With three pairs of tentacular cirri. Proboscis without a pair of chitinous ventral ridges nor jaws. With proboscial papillae.

With a pair of non-articulated palpi. With three antennae. Parapodia biramous, with notosetae of serrated margin. Neurosetae compound falcigers. Pygidium with anal lamellae together with a pair of anal cirri. Antennae, palpi and cirri without cirrophores.

***Hesionides arenaria* Friedrich, 1937 (?)**

(スナオトヒメゴカイ)

(Fig. 20)

- Hesionides arenaria* Friedrich, 1937, p.343, Abb. 1-4.  
 ——— *arenarius* [sic] Westheide & Ax, 1964, p. 196, Abb. 1-13.  
 ——— [sic] Rao & Ganapati, 1967, p. 11, (Fig. 1, 4-6).  
 ——— *arenaria* Westheide, 1967, p. 127.  
 ——— ——— Hartmann-Schröder, 1971, p. 134, Abb. 44.  
 ——— ——— Hartmann-Schröder, 1974a, p. 111, Taf. 6, Fig. 52-55.  
 ——— ——— Hartmann-Schröder, 1974b, p. 42, Abb. 12-15.  
 ——— ——— Hartmann-Schröder, 1977a, p. 55, Abb. 13-14.  
 ——— ——— Marinov, 1977, p. 80, Tab. VIII, 1, a-d.  
 ——— ——— Westheide & Rao, 1977, p. 276, Fig. 1, A-D.  
 ——— ——— Westheide, 1977a, p. 295, Fig. 1-A.

MATERIAL EXAMINED.

Ishikari Beach, Hokkaido, intertidal sand layer, 28 August 1969; 7 specimens.

DESCRIPTION.

Body small, consisting of 5-21 setigerous segments, 400-1300  $\mu\text{m}$  long and 70-140  $\mu\text{m}$  wide, in somewhat artificially depressed condition. Prostomium with three antennae and a pair of palpi. All but a median antenna somewhat moniliform (Fig. 20, A-B). Pygidium with a pair of well separated anal lamellae together with a pair of long anal cirri (Fig. 20, C-D). Anal lamellae two short stump-shaped, with semicircular margin. Each notopodium with an aciculum and two serrated setae. Notopodial acicula slender with fine tip (Fig. 20, E). Longer notoseta with 6-7 teeth and somewhat slender tip (Fig. 20, F). The dental part *ca.* 10  $\mu\text{m}$  long. Shorter notoseta with fewer serration (Fig. 20, G). Neuropodia with *ca.* five compound setae. Each of them with a conspicuous bifid tip (Fig. 20, H-I).

REMARKS.

7 specimens (see above) are examined, all of which have been mounted in water soluble mounting agent under cover glasses. Four specimens out of 7 lost their posterior segments, but the other three specimens have anal lamellae of just same form each other. The anal lamellar appendix in the materials are separate type, same as *H. minima* Westheide & Rao 1977, *H. peculiaris* Westheide & Rao 1977, and *H. riegerorum* Westheide 1979. Remarkable bifurcation of neurosetal apex and the serration of notosetae show the specimens closely related to *H. minima*. However, maximum number of setigers, maximum body length, and length of dental part and number of teeth of longer notosetae are different from those of *H. minima* (see Westheide 1979, table 1).

The species was found by the late Dr. Tatsunori Ito, in intertidal sand layer at Ishikari Beach, Hokkaido. Several specimens were checked by me several years ago, and I

found them a species of the genus *Hesionides* (Ito, 1970). Afterwards, he sent (some) specimen(s) to Westheide, and Westheide identified it (or them) as *H. arenaria* (see Westheide, 1977a).

Body length, number of setigers, forms of parapodial acicula and setae, and form of anal cirri of the specimens are same as those of *H. arenaria*. Notopodial setae are somewhat slender, but the length of dental part and number of teeth are almost same as *H. arenaria* (see Westheide & Rao, 1977). Body width is somewhat stouter, but it may be due to the depression among glasses.

The remarkable difference is in the form of anal lamellae. *H. arenaria* has two fan-shaped anal lamellae, but the present specimens has two short stump-shaped ones well separated each other. *H. arenaria* has somewhat different form of anal lamellae on its regenerating periods (Westheide, 1967, fig. 5). But anal lamellae of the present specimens are same as neither of them. Moreover, all the anal lamellae of the specimens examined are in the same form. Therefore, the form of anal lamellae of the specimens is not those of regenerating stage, but in normal stage. The possibility is the shrink of anal lamellae by mounting agent. However, the other parts of worms such as antennae and tentacular cirri are seen not to shrink. The other possibility is that the specimen(s) send to Westheide lacks the posterior part. Therefore, I identified them temporarily as the species mentioned above until further specimens are collected.

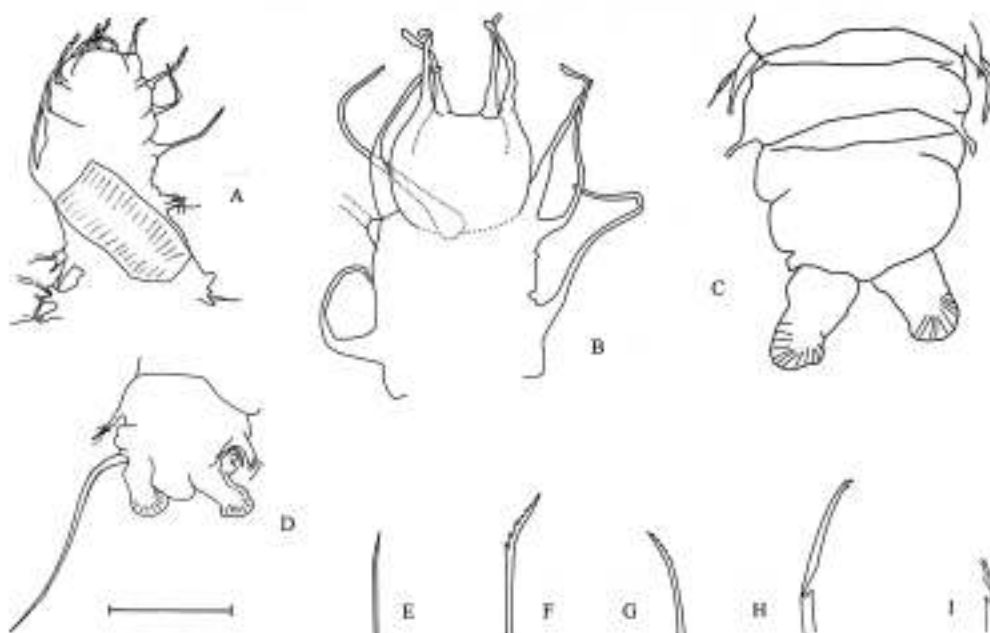


Fig. 20. *Hesionides arenaria*

A, anterior part, dorsal view, median antenna missing; B, prostomium, ventral view, right dorsal tentacular cirrus on 1st segment missing; C, pygidium, dorsal view, anal cirri missing; D, pygidium, dorsal view, right anal cirrus missing; E, notopodial aciculum; F, longer notoseta; G, shorter notoseta; H, neuroseta with long blade; I, neuroseta with short blade. Scale, A: 200  $\mu$ m, B and D: 50  $\mu$ m, C: 100  $\mu$ m, E-I: 20  $\mu$ m.

## DISTRIBUTION.

*Hesionides arenaria arenaria* Friedrich 1937, and *H. arenaria pacifica* Westheide 1974, see Westheide, 1977a, Fig. 1A. After that the species has been recorded from Morocco and Australia.

**Genus *Ichthyohesione* nov.**

TYPE SPECIES: *Ichthyohesione gorgasiae*, n. sp.

Gender: feminine.

## DIAGNOSIS.

Body small, depressed dorso-ventrally, rather short with few segments. Prostomium completely fused to peristomium. With two pairs of tentacular cirri on the first segment. Mouth opening at distal margin of prostomium. Proboscis protruded from the mouth, sucker-shaped, with sucking face directed dorsally. Without proboscial papillae on margin, but inner surface of the proboscis densely ciliated. With two minute antennae. Without palpi. Parapodia biramous, and with ventral lamellae. Notosetae with serrated edge. Neurosetae compound falcigers.

## ETYMOLOGY.

The genus is named for the possible habit associated with garden eel.

## REMARKS.

Two pairs of tentacular cirri is not so common in the family. Only a single genus, *Orseis* Ehlers, 1864, has only two pairs of tentacular cirri. *Orseis* with three antennae, and two non-articulated palpi, and the parapodia uniramous without notosetae. The new genus with small two antennae, but without palpi, and the parapodia biramous with notosetae. Furthermore, proboscis of *Orseis* with a circle of papillae just same as other papillated Hesionid genera.

The variety of two pairs of tentacular cirri is known in *Heteropodarke heteromorpha* Hartmann-Schröder, 1962. But *Heteropodarke* with non-articulated palpi and three non-articulated antennae, together with the normal papillated proboscis (see p. 66).

***Ichthyohesione gorgasiae*, Gen. et sp. nov.**

(Figs. 21-22)

## MATERIAL EXAMINED.

1 specimen (Holotype) collected from the sea water in the vinyl plastic bag used for bring the garden eel, *Gorgasia taiwanensis* Shao, 1990, from the collecting site to the laboratory. Nov. 17, 1995. A single individual of *Gorgasia taiwanensis* was collected at 40 m deep sandy bottom off Sabiura, Kushimoto, Wakayama, middle Japan.

## DESCRIPTION.



Body dark violet brown, 10.0 mm long with 64 setigers. Body 1.1 mm wide including setal bundles, 0.9 mm wide including parapodia, and 0.5 mm excluding parapodia. Body depressed dorso-ventrally, ca. 200  $\mu$ m thick.

Prostomium perfectly fused to peristomium, and the border is not recognized (Fig. 21, A-C). Anterior end of the body truncated with a median incision, and a pair of minute antennae. Anterior margin of prostomium covered by proboscis, when proboscis is protruded (Fig. 21, A). A pair of club-shaped small antennae on the anterior margin (Fig. 21, B-C). Two pairs of tentacular cirri inserted from the antero-lateral corner of the body.

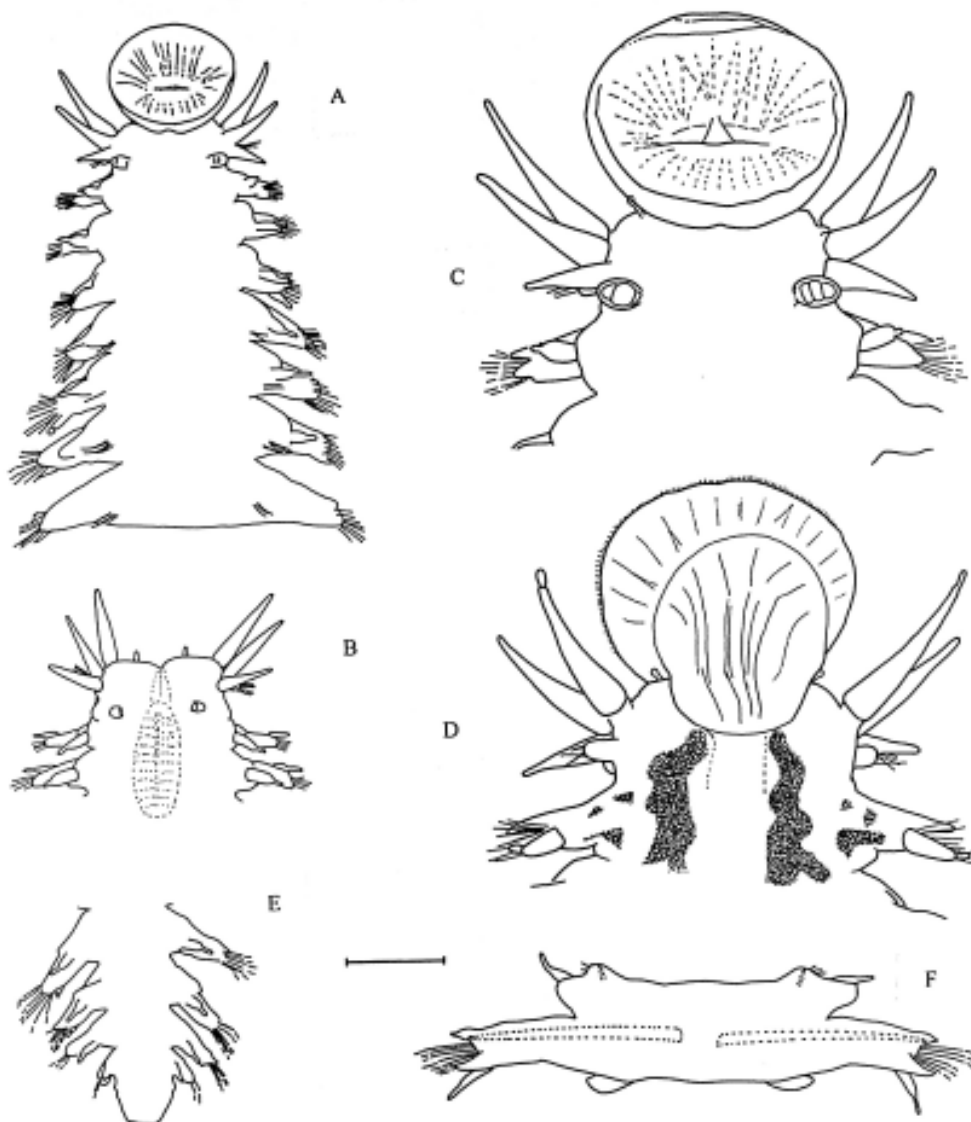


Fig. 21. *Ichthyohesion gorgasiae*, n. Gen., n. sp.

A, anterior part, dorsal view; B, same, from a rough sketch in living condition, dorsal view, proboscis not protruded; C, prostomium and tentacular cirri, dorsal view; D, same, ventral view, dark violet pigment inside the body shown as dotting; E, posterior part, dorsal view; F, 21st setiger, anterior view. Scale, A-B and E-F: 200  $\mu$ m, C-D: 100  $\mu$ m, H-L: 20  $\mu$ m.

Ventral ones longer a little. Proboscis protruded from the center of anterior part of the body, expanded as a sucker. The expanded face directed dorsally, without papillae on the margin, but with many minute cilia on the inside surface of the proboscis. A pair of elliptical projections of uncertain nature on both sides just behind dorsal cirri of the first setiger. First parapodia smaller than the followings, with long subulate notocirri, being same form as the tentacular cirri, but short. Parapodial projections of fist setiger simple, without presetal lobes nor neurocirri (Fig. 21, D). Pygidium simple, without anal cirri (Fig. 21, E).

Parapodium rather long, with a ventral lamella on its ventral base (Fig. 21, F, Fig. 22, A-B). Notopodium situated on the dorsal base of neuropodium, and with a notocirrus, an aciculum, and notosetae. Anterior parapodia from 1st to 4th setiger without notosetae. Notosetae appeared from 5th setiger onward (Fig. 21, A). Neuropodium projecting sideway with a neurocirrus, an aciculum, and many neurosetae. Noto- and neurocirri spindle-form. Notopodial aciculum stretched to a low mound (Fig. 22, A). Two longer notosetae insert to anterior base of the mound, and ca. 10 notosetae spread from the posterior base of the mound. Neuropodium with a presetal- and a postsetal lobe. A papilla on distal top of the postsetal lobe. A single neuropodial aciculum stretched to the base of the postsetal lobe (Fig. 22, D). Notoacicula with round tip, and neuroacicula with slender tip (Fig. 22, C-D). Each median parapodium with ca. 12 notosetae and ca. 20 neurosetae. Notosetae short and capillary, with hair-like serration on the free edge (Fig. 22, E). Neurosetae compound falcigers, with weakly hooked pointed tip. All neurosetae situated in sub-acicular position, and no supra-acicular neurosetae. A small spine behind the hooked main apical teeth, and

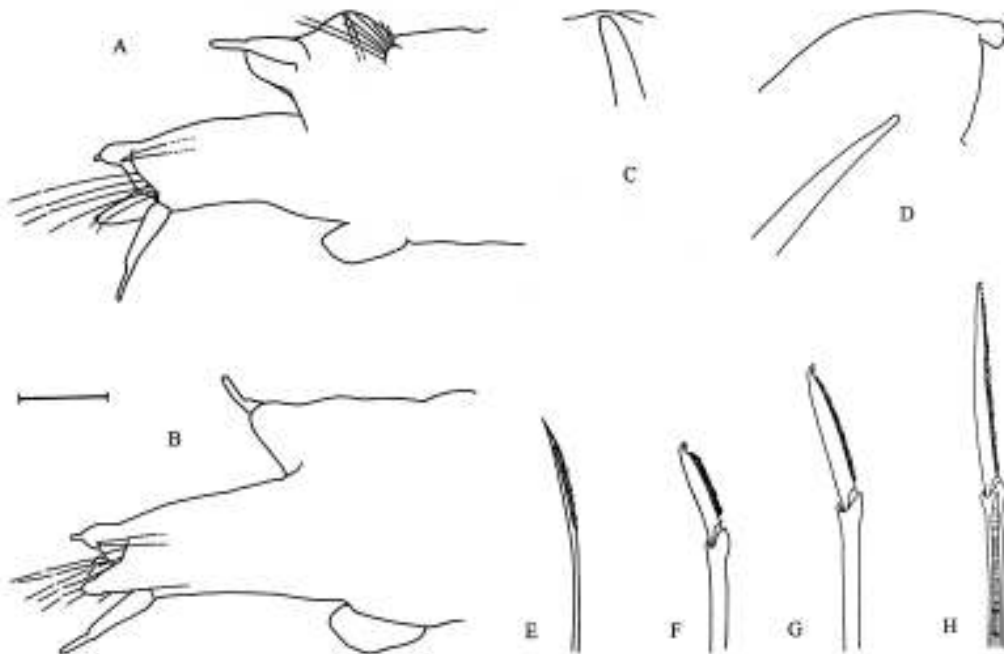


Fig. 22. *Ichthyohesione gorgasiae*, n. Gen., n. sp.

A, left 29th parapodium, posterior view; B, left 28th parapodium, anterior view; C, tip of notopodial aciculum; D, tip of neuropodial postsetal lobe and tip of aciculum; E, notoseta; F, inferior-most neuroseta; G, median neuroseta; H, superior-most neuroseta. Scale, A-B: 100 µm, C-H: 20 µm.

hairy serration on the free edge (Fig. 22, F-H). Neurosetae in superior portion with rather long blade (Fig. 22, H).

Spherical projections of unknown nature in anterior dorsum are orange in color. All other part of the body colorless, with patchwork of dark violet brown. The dark color is due to the pigment substance inside the body.

#### REMARKS.

*Orseis* is the only Hesionid genus with two pairs of tentacular cirri, and several species have been known as the species of *Orseis*. But all species hitherto nominated in the genus *Orseis* with uniramous parapodia, and no species has any relations to the new form.

*Ichtyotomus sanguinarius* Eisig, 1906 is the only species hitherto known as the parasite on fish. But, *I. sanguinarius* is the member of Ord. Eunicea, with horny jaws in the proboscis. But the shape of truncate anterior part of prostomium, and form of parapodia resemble the new form. Those forms may related functionally to the parasitic life on fishes. The Mediterranean form with semi-biramous parapodia, with only noto-acicula in notopodia, and form of neurosetae also different from the Japanese species. Both species also found from the fishes of the same family, Congridae.

The whole posture is somewhat similar to endoparasitic *Calamyzas* (Arwidsson, 1932). The presence of pigmentation and posterior end without anal cirri in both form, but Arwidsson's worm has the setae indicating the relation to the family Sylliidae.

The form of neurosetae indicates the species belong to or near by the family Hesionidae. Spherical projections on anterior dorsum may be stalked eyes, judging from the different coloration. It may be supported by my observation in living condition. They are shown as eyes in my rough sketch drawn from observation in living material.

#### ETYMOLOGY.

Named from the genus of the host fish which the new species may be parasitic on.

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**Explanations of plate 1**

Fig. 1. *Micropodarke dubia* (Hessle).

Fig. 2. *Ophiodromus berrisfordi* Day.

Fig. 3. *Ophiodromus bunbuku*, n. sp.

Fig. 4. *Ophiodromus constrictus*, n. sp.

Fig. 5. *Ophiodromus fauveli*, n. sp.

Fig. 6. *Ophiodromus parapallidus*, n. sp.



Fig. 1 *Micropodarke dubia* (Hessle)



Fig. 2 *Ophiodromus berrisfordi* Day



Fig. 3 *Ophiodromus bunbuku* n. sp.



Fig. 4 *Ophiodromus constrictus* n. sp.



Fig. 5 *Ophiodromus fauveli* n. sp.



Fig. 6 *Ophiodromus parapallidus* n. sp.