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Serpulidae (Annelida, Polychaeta) Collected around Cape Shionomisaki, Kii Peninsula

By

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今島　実*: 紀伊半島の潮岬周辺海域から得られたカンザシゴカイ類（多毛環虫類）

A benthic survey was carried out around Cape Shionomisaki, Kii Peninsula, in July, 1978 by the National Science Museum, Tokyo, for the Natural History Research Project of the Japanese Islands.

Cape Shionomisaki is situated at the most southern tip of Honshu, the main island of Japan. Meanders of the Kuroshio current hit Cape Shionomisaki directly in all seasons. The mean sea-surface temperature of the area usually is 27°C.

Although many polychaetes have been obtained in this survey by hand in the intertidal region and by dredging in depths from 12 to 75 m, this report deals with species of the Serpulidae, except Spirorbinae, only. Thirty-five species in 15 genera are recognized. The material includes one new genus, a new species of the genera *Serpula, Filogranula* and *Paraprotis*. The genus *Filogranula* has been reported from Japanese waters previously. *Serpula vittata* known from Australia, *Metavermilia nates* from the Western Indian Ocean, and *Janita fimbriata* from the Mediterranean Sea and the Atlantic Ocean are reported for the first time from Japan.

Thanks are due to Mr. Takeshi TATSUKI and other staff members of the Kushimoto Marine Park at Sabiura, for their understanding and cooperation in undertaking the present survey. The author wishes to express his thanks to Dr. H.A. TEN HOVE of the Laboratory for Zoological Ecology and Taxonomy, Utrecht, the Netherlands for critically reading the manuscript and for valuable suggestions with regard to the taxonomic problems.

The bulk of the collection, including type-specimens, has been deposited in the National Science Museum, Tokyo; a small part is in the collection of TEN HOVE, Utrecht, nrs tHU 378–380.

List of species represented:

Serpula vittata AUGENER, 1914
Serpula vermicularis LINNAEUS, 1767
Serpula cf. *kaempferi* (KINBERG, 1867)
Serpula japonica sp. nov.
Semiserpula longituba gen. nov., sp. nov.
Hydroides fusca IMAJIMA, 1976
Hydroides tambalagamensis PILLAI, 1961
Hydroides exaltata (MARENZELLER, 1884)
Hydroides tuberculata IMAJIMA, 1976
Hydroides albiceps (GRUBE, 1870)
Hydroides fusicola MÖRCH, 1863
Hydroides dirampha MÖRCH, 1863
Hydroides ezoensis OKUDA, 1934
Hydroides elegans (HASWELL, 1883)

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Hydroides multispinosa MARENZELLER, 1884
Vermiliopsis infundibulum/glandigera-group
Vermiliopsis labiata (COSTA, 1861)
Pseudovermilia pacifica IMAJIMA, 1978
Semivermilia elliptica IMAJIMA, 1978
Metavermilia ovata IMAJIMA, 1978
Metavermilia spicata IMAJIMA, 1977
Metavermilia inflata IMAJIMA, 1977
Metavermilia acanthophora (AUGENER, 1914)
Metavermilia nates ZIBPOWIUS, 1971
Filogranula exilis sp. nov.
Janita fimbriata (DELLE CHIAJE, 1822)
Spirobranchus latiscapus (MARENZELLER, 1884)
Spirobranchus giganteus corniculatus (GRUBE, 1862)
Spirobranchus cf. *polytrema* (PHILIPPI, 1884)
Spirobranchus tetraceros (SCHMARDA, 1861)
Pomatoleios kraussii (BAIRD, 1865)
Placostegus tridentatus (FABRICIUS, 1780)
Ditrupa arietina (O.F. MÜLLER, 1776)
Paraprotis pulchra sp. nov.
Josephella marenzelleri CAULLERY & MESNIL, 1896

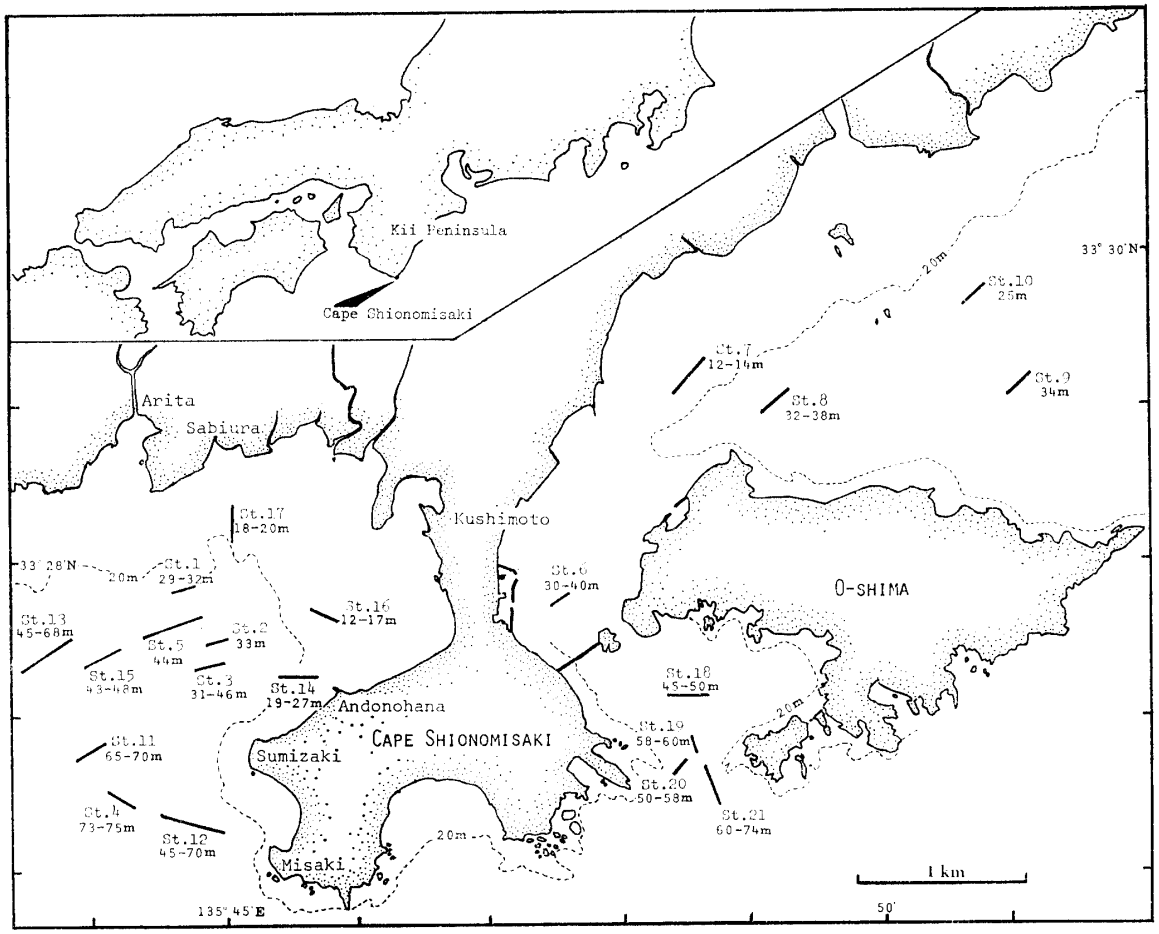

Fig. 1. Map of Cape Shionomisaki and its vicinity, showing the position and depth of the stations of the survey.

Genus **Serpula** LINNAEUS, 1758

Serpula vittata AUGENER, 1914

(Fig. 2, a–o)

Serpula vittata AUGENER, 1914, pp. 137–139, fig. 17, pl. 1, fig. 18–19.
Serpula concharum: UCHIDA, 1978, p. 21 (not LANGERHANS, 1880).

MATERIAL EXAMINED. Sabiura (75 specimens), Sumizaki, Shionomisaki (65), intertidally

on rocks.

DESCRIPTION. A large specimen is about 33 mm in length, including operculum, and about 2 mm in width in the thorax; it consists of 130 segments.

The branchiae have 19 to 21 gill-radioles on either side, which end in slender, pinnule-free tips. The proximal parts of the gill-radioles are connected by a branchial membrane for 1/3 to 1/4 of their whole length; they are arranged in two semicircles.

The opercular peduncle is sub-cylindrical and arises from the left or right branchial lobe, just below and between the first and second normal filament (Fig. a); a rudimentary operculum is situated at the opposite side. The opercular funnel is shallowly cupped to nearly flat distally, and has 18 to 20 blunt marginal teeth. The grooves between the teeth reach nearly to the center of the funnel. There is a constriction between the basal part of the funnel and the peduncle (Figs. b, c).

The collar has one ventral and two latero-dorsal lobes, which are continuous with the thoracic membranes, ending at the posterior margin of the last thoracic segment.

The thorax has 7 segments, 6 of which are uncinigerous. The collar setae are of two types; fine capillaries (Fig. d) and bayonet-shaped setae with 2 to 4 large conical teeth and a variable number of small teeth at the base of the blade (Figs. e–h). The remaining thoracic setae are limbate capillaries (Fig. i); the thoracic uncini have 5 sharply pointed teeth in one row, of which the most anterior is the largest (Fig. j). The anterior abdominal uncini are smaller than those of the thorax, and have 4 teeth in one row (Fig. k); posteriorly the number of teeth increases to 6 visible in profile, in one to four rows (Fig. 1). The abdominal setae are trumpet-shaped distally, with about 40 minute teeth in lateral view (Fig. m); they are replaced by long capillary setae in the posterior segments.

The tube is white, thick-walled and irregularly coiled (Fig. n). It is sub-trapezoidal in cross-section, with 4 longitudinal ridges and many transverse wrinkles (Fig. o).

REMARKS. The material described here corresponds with the original description of *S. vittata* from Shark Bay, Western Australia, in the number of opercular radii and gill-radioles of branchiae, this is the main reason to use this name. Apparently, however, there is a slight difference in operculum, since AUGENER describes a navel-like centre, which is not present in our material. The colouration of the tube is white in Japan, with brown spots in Australia; since within one population of other *Serpula* species pink and white tubes may occur together (TEN HOVE, unpublished), in itself this is no reason to create a new species. A further difference might be found in the form of the collar setae, not figured by AUGENER, but of which he states that they are shaped like in *Hydroides multispinosa* (AUGENER's misidentification for *H. elegans*); they thus should have a denticulate zone proximally of the conical teeth, and such a denticulate zone is not evident in our material, though accessory teeth are present. *S. vittata* has been recorded from New Britain, with a questionmark, by AUGENER (1927: 148), and from Queensland by STRAUGHAN (1967: 30); the diagnoses given, however, are too short for a reliable identification, and these records have been left out of the list of synonyms (based upon a pers. communication by TEN HOVE).

UCHIDA (1978: 21) used the name *Serpula concharum* LANGERHANS, 1880 for this species.

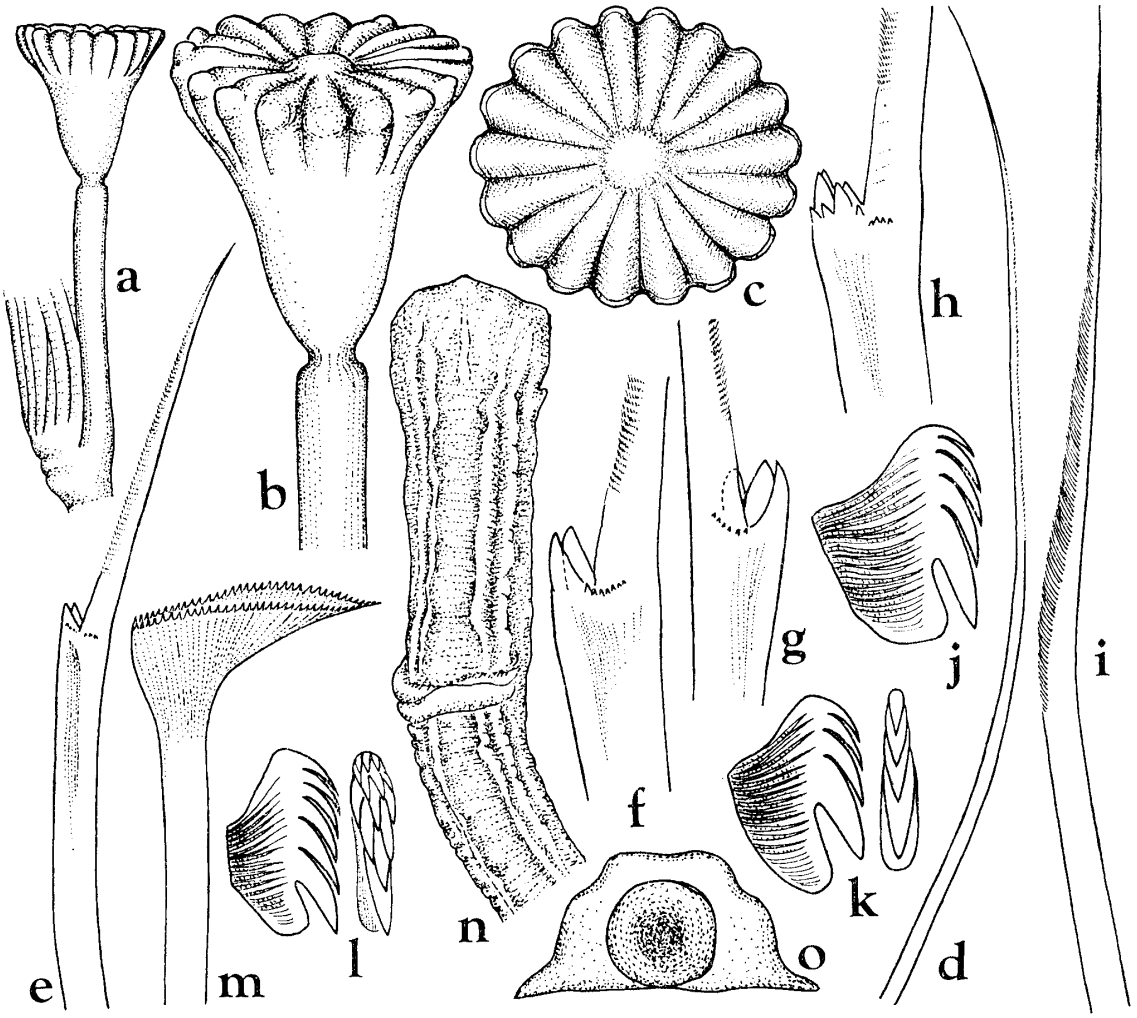

Fig. 2. *Serpula vittata* AUGENER. a, part of right branchia, showing operculum, in dorsal view, ×9; b, c, opercula, lateral and frontal view, ×19; d, capillary collar seta, ×115; e, bayonet-shaped collar seta, ×115; f, g, h, parts of bayonet-shaped setae, showing teeth at base of blade, ×200; i, thoracic seta, ×220; j, thoracic uncinus, ×885; k, anterior abdominal uncinus, in side and frontal views, ×885; l, posterior abdominal uncinus, in side and frontal views, ×885; m, abdominal seta, ×885; n, tube, ×5; o, cross-section of median part of tube, ×8.

However, the real *S. concharum* has rather few (up to 15) gill-radioles on either side, and is a smaller species. For a more extensive discussion see IMAJIMA 1978: 52.

The species is new to the Japanese fauna.

DISTRIBUTION. Shark Bay, Western Australia; southern Japan (intertidally).

Serpula vermicularis LINNAEUS, 1767

Serpula vermicularis: IMAJIMA, 1976 a, p. 141 [for synonymy]; 1977, p. 92.

MATERIAL EXAMINED. Off Sabiura, dredge sta. 2 (2).

DISTRIBUTION. Cosmopolitan.

Serpula cf. **kaempferi** (KINBERG, 1867)

Serpula cf. *kaempferi*: IMAJIMA, 1978, pp. 50–52, fig. 2, a–u [for synonymy].

MATERIAL EXAMINED. Off Shionomisaki, dredge sta. 4 (2), sta. 12 (8).

DISTRIBUTION. Bangka Strait, North Celebes; southern Japan (30–94 m depth).

Serpula japonica sp. nov.

(Fig. 3, a–v)

MATERIAL EXAMINED. Off Shionomisaki, dredge sta. 4 (holotype and 1 paratype), sta. 12 (1).

DESCRIPTION. The holotype is about 12 mm in length, including operculum, and about 0.4 mm in width in the thorax; it has 97 segments.

The branchiae have 8 gill-radioles on either side, which end in slender, pinnule-free filaments. They are not connected by a branchial membrane.

The opercular peduncle is sub-cylindrical and arises from the right branchial lobe, just below the first filament; a rudimentary operculum is situated at the opposite side. The opercular funnel is bilaterally symmetrical (dorsal side rather straight, ventral side bulging), with 24 blunt marginal teeth (Figs. a,b). The operculum of the paratype is smaller than that of the holotype and has 21 marginal teeth (Figs. c,d). The grooves between the teeth reach nearly to the center of the funnel; the distal depression reaching slightly deeper than halfway the length of the funnel. There is a constriction between the basal part of the funnel and the peduncle. The collar has a ventral elongated triangular lobe, with a notch on both sides, and two latero-dorsal lobes which are continuous with the thoracic membranes, ending just posterior to the fifth uncinigerous segment (Fig. e).

The thorax has 7 segments, of which 6 are uncinigerous. The collar setae are of two types; slender, limbate capillaries (Fig. f) and bayonet-shaped setae, with 2 to 4 large and a variable number of small teeth at the base of the blade (Figs. f–l). The remaining thoracic setae are thick (Fig. m) and slender (Fig. n) limbate capillaries; the thoracic uncini have 6 sharply pointed teeth in one row, of which the most anterior is the largest (Fig. o). The anterior abdominal uncini are about 2/3 as large as those of the thorax, with 5 teeth in one row (Fig. p); the posterior uncini are saw-shaped, with 2 to 4 rows of minute teeth, about 7 to 9 teeth are visible in profile (Figs. q,r). Abdominal setae are trumpet-shaped distally, with about 20 very slender teeth in lateral view (Fig. s); they are replaced by long capillary setae in the posterior segments.

The tube is white and calcareous; it is sinistrally wound on itself and forms a coil of about 13–14 turns (Figs. t–v).

REMARKS. As stated before (IMAJIMA, 1978: 52), the genus is badly in need of revision. In the literature figures of opercula of about 25～30 species are given, most of these show a radial symmetry. There are two species with a zygomorf operculum: *S. lobiancoi* RIOJA, 1917 and *S. magna* STRAUGHAN, 1967. The latter, with its up to 90 opercular radii, is a much larger species than *S. japonica*. As for *S. lobiancoi*, this species agrees with *S. japonica*

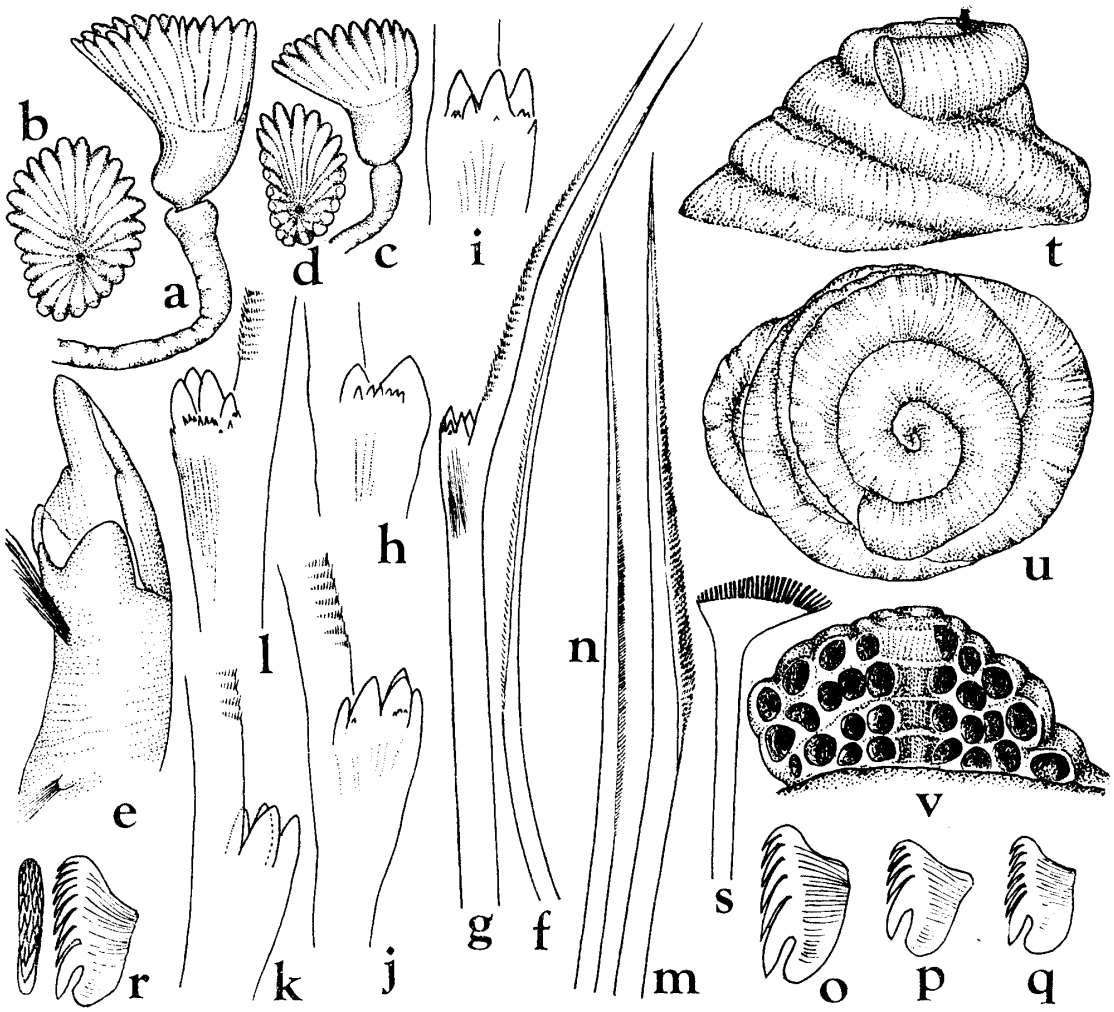

Fig. 3. *Serpula japonica* sp. nov. a, operculum of holotype, in lateral view, ×38; b, the same in frontal view, ×38; c, operculum of paratype, in lateral view, ×38; d, the same in frontal view, ×38; e, anterior end of worm, showing collar, ×38; f, limbate collar seta, ×200; g, bayonet-shaped collar seta, ×220; h–l, parts of bayonet-shaped setae, showing teeth at base of blade, in various views, ×885; m, n, thoracic setae, ×397; o, thoracic uncinus, ×885; p, anterior abdominal uncinus, ×885; q, posterior abdominal uncinus, in side view, ×885; r, posterior abdominal uncinus, in side and frontal views, ×885; s, abdominal seta, ×885; t, u, tube of holotype, ×8; v, cross-section of tube of paratype, ×8

in its coiled smooth tube and in its collar setae. Differences between both species can be found in: tube, white in *S. japonica,* pink in *S. lobiancoi*; number of opercular radii, 24 in former, 12–15 in latter species; length of thoracic membranes, up to 5th setiger in *S. japonica,* to 2nd in *S. lobiancoi* (based upon a personal communication by TEN HOVE).

TYPE-SERIES. Holotype, NSMT-Pol. H 144; 1 paratype, NSMT-Pol. P 145.

DISTRIBUTION. Southern Japan (73–75 m depth).

Genus **Semiserpula,** gen. nov.

TYPE-SPECIES: *Semiserpula longituba,* sp. nov., designed herein. Gender: feminine.

Body slender, with 7 (exceptionally up to 9) thoracic segments. Branchiae with up to 15 gill-radioles in pectiniform to semi-circular arrangement. Opercular peduncle cylindrical; operculum funnel-shaped with up to 60 marginal radii. Thoracic membranes long, sometimes united ventrally on anterior abdominal segments. Capillary collar setae of two types; bayonet-shaped setae with conical teeth absent. Thoracic uncini rasp-shaped with relatively few tooth (7–10), with a simple anterior-most tooth; abdominal uncini saw- to rasp-shaped. Abdominal setae plectrum-like with minute denticles in one row, or flatly trumpet-shaped distally; posteriorly they are replaced by capillary setae with minute teeth distally. The tube very gradually increasing in size or subequal in width throughout its whole length.

DISCUSSION. As is indicated in the name, *Semiserpula* resembles *Serpula* LINNAEUS, 1758 in many respects notably the funnel-shaped operculum and the form of the uncini. In its general setation pattern it also resembles *Pseudoserpula* STRAUGHAN, 1967, this genus however is based upon the absence of an operculum only. Since this is a quite normal phenomenon in for instance *Serpula massiliensis* ZIBROWIUS (1968: 103) and *Hydroides spongicola* BENEDICT (TEN HOVE, unpublished data), it apparently is not realistic to maintain the genus *Pseudoserpula,* it is a synonym of *Serpula* only. Discrimination between genera in Serpulidae generally is done upon differences in setae, mainly collar setae, and or operculum. For instance, the overall setation pattern of *Pomatoceros* PHILIPPI, 1844 and *Spirobranchus* BLAINVILLE, 1818, as well as the shape of their respective opercula and peduncles are very similar. Nevertheless most authors accept both genera as valid, based upon the simple limbate collar setae in the first genus, the more or less bayonet-shaped collar setae (with proximal hairy zone) in the latter. On this analogy it certainly is justifiable to create a new genus *Semiserpula* for species with the overall appearance of *Serpula,* but without bayonet setae.

It has never been suggested even to create a new genus for instance *Hydroides elegans* and *H. multispinosa,* although they have collar setae quite different from the usual bayonet setae with conical teeth. On the analogy of similar cases in *Serpula,* ZIBROWIUS (1968: 95) argued quite rightly that the genus *Paraserpula* SOUTHWARD, 1963 is only a synonym of *Serpula.* Although AMOUREUX's (1976:1056–1058) observation that his species *Serpula israelitica* should have a special status, owing to the schematically figured collar setae, is quite correct, he thus chose the wrong name (*Paraserpula*) to indicate this. His species belongs in *Semiserpula.*

Two more species belong here, by their non-descript simple capillary or limbate collar setae: a worm from Brazil, mentioned by ZIBROWIUS (1917:4) as *Serpula* sp. (C); and *Ditrupa crenata,* EHLERS, 1908 already placed in *Serpula* by ZIBROWIUS (1968: 95, 1971: 4) from Zanzibar and New Zealand (new record, unpublished data TEN HOVE). It is very well possible that in the future, when better techniques for the study of setae have been developed and a more reliable survey of those can be given, *Semiserpula* will prove to be a subgenus of *Serpula* only (discussion based upon a personal communication by TEN HOVE).

Semiserpula longituba sp. nov.

(Fig. 4, a–q)

MATERIAL EXAMINED. Kushimoto Harbour, dredge sta. 6 (holotype).

DESCRIPTION. The holotype is, including the operculum, 29 mm in length, and about 0.8 mm in width in the thorax; it consists of 76 segments.

The branchiae are about 4 mm in length; there are 9 gill-radioles on the right side and 10 on the left, in a pectiniform arrangement. The radioles are not connected by a branchial membrane, and have a slender, pinnule-free tip distally.

The opercular peduncle is cylindrical and arises from the right branchial lobe; a rudimentary operculum is situated at the opposite side (Fig. a). The opercular funnel is elongated, the distal depression reaching down for about one-thirds of the funnel; it has 32 marginal radii with blunt distal tips, the grooves between the teeth extending for about two-thirds of internal as well as external surface of funnel (Figs. b,c). There is a constriction between the basal part of the funnel and the operculum. The collar has one ventral and

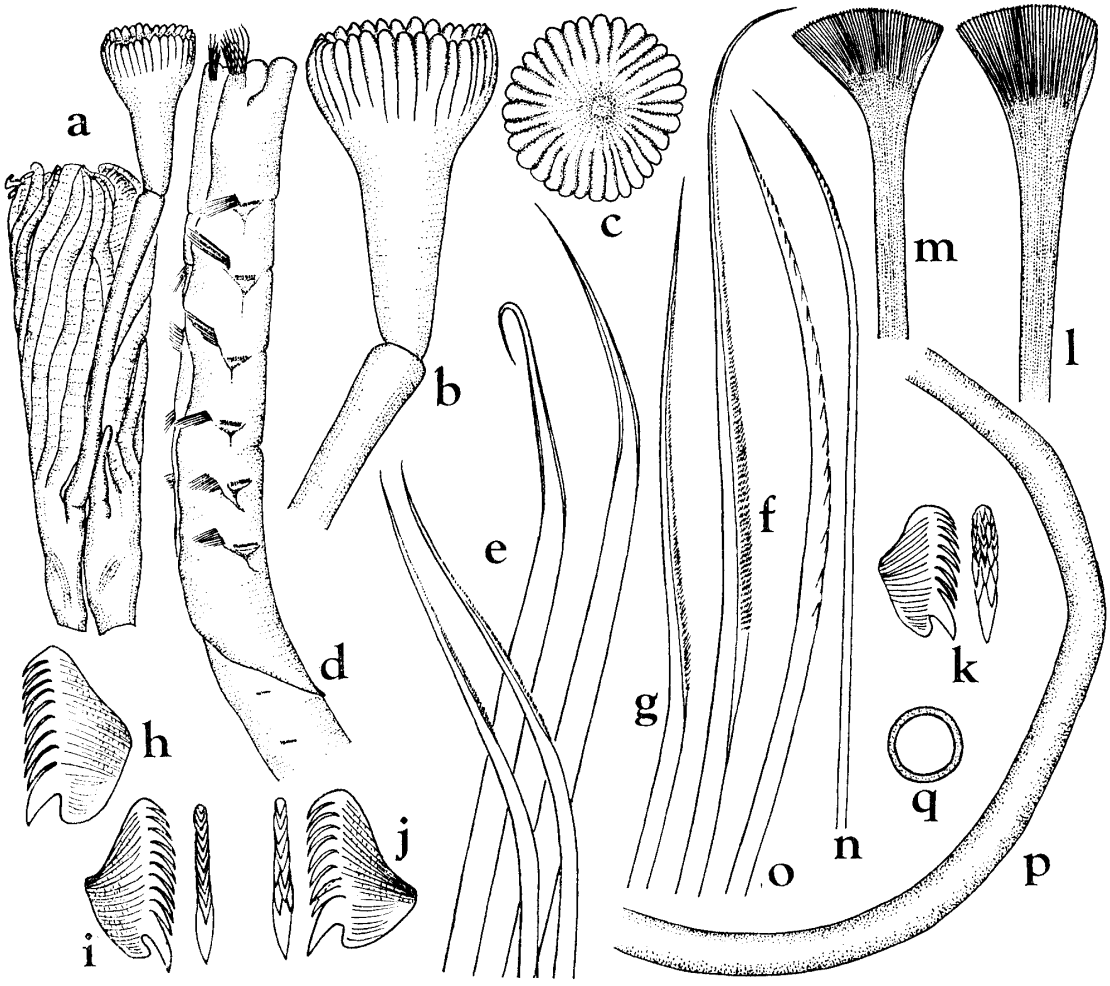

Fig. 4. *Semiserpula longituba* gen. nov., sp. nov. a, branchiae, in dorsal view, ×13; b, c, opercula, in lateral and frontal views, ×30; d, anterior end of worm, in lateral view, ×13; e, part of collar fascicle, showing two types of setae, ×110; f, g, thoracic limbate setae, ×205; h, thoracic uncinus, in side view, ×825; i, j, anterior abdominal uncini, in side and frontal views, ×825; k, posterior abdominal uncinus, in side and frontal views, ×825; 1, anterior abdominal seta, ×825; m, posterior abdominal seta, ×825; n, posterior capillary seta, ×205; o, distal end of posterior capillary seta, ×825; p, part of tube, ×4; q, cross-section of tube, ×9.

two latero-dorsal lobes, which are continuous with the thoracic membranes. The thoracic membranes are wide, covering the dorsal thorax, and are united ventrally on the anterior abdominal segments (Fig. d).

The thorax has 7 segments, 6 of which are uncinigerous. The collar setae are of two types: slender, limbate capillaries (8), and thick, geniculate setae (6) with narrow wings distally (Fig. e). The subsequent thoracic setae are limbate capillaries of two sizes (Figs. f, g); the thoracic uncini are subtriangular, with 10 teeth in one row; the mostanterior tooth is simple and larger than the remaining ones (Fig. h). The anterior abdominal uncini are similar to those of the thorax, with 9–11 teeth visible in profile, in one to two rows (Figs. i,j). The posterior abdominal uncini are smaller than those of the anterior abdomen, with 2 to 4 rows of minute teeth, with 9 teeth visible in profile (Fig. k). Abdominal setae apparently are plectrum-like with many minute denticles in one row distally; those of the anterior abdominal fascicles are slightly thicker than the posterior ones (Figs. l,m); there are 3 to 5 setae per fascicle. Posteriorly they are replaced by long capillary setae with 2 rows of teeth distally (Figs. n,o).

The tube is white and subequal throughout the whole length; its surface is smooth. It is circular in cross-section (Figs. p,q).

REMARKS. *Semiserpula longituba* can be discerned from *S. crenata* and *S. israelitica* by the number of marginal radii being 32 in the first species, 17–22 in the second (TEN HOVE, pers. comm.) and 40–60 in the last species.

HOLOTYPE. NSMT-Pol. H 146.

DISTRIBUTION. Southern Japan (30–40 m depth).

Genus **Hydroides** GUNNERUS, 1768

Hydroides fusca IMAJIMA, 1976

Hydroides fusca IMAJIMA, 1976 a, pp. 130–131, fig. 6, a–i [for synonymy]; 1978, p. 53.

MATERIAL EXAMINED. Area around Shionomisaki, dredge sta. 2 (3), sta. 4 (33), sta. 5 (2), sta. 6 (2), sta. 11 (7), sta. 12 (10), sta. 13 (6), sta. 14 (3), sta. 15 (5), sta. 20 (4), on shell.

DISTRIBUTION. Southern Japan (Tanega-shima, Kagoshima Bay, Tsushima Strait, Ogasawara Islands, Shionomisaki; 23–115 m depth).

Hydroides tambalagamensis PILLAI, 1961

Hydroides tambalagamensis: IMAJIMA, 1976 a, pp. 123–126, fig. 2, a–j [for synonymy]; 1976 b, pp. 231–232.

MATERIAL EXAMINED. Sabiura, underside of coral (1).

DISTRIBUTION. Sri Lanka; Sumatra; Australia; southern Japan (Amami-Oshima, Tanega-shima, Kushimoto; 1–30 m depth).

Hydroides exaltata (MARENZELLER, 1884)

Hydroides exaltata: IMAJIMA, 1976 a, pp. 127–128, fig. 4, a–j [for synonymy]; 1977, p. 94; AMOUREUX, RULLIER & EISHELSON, 1978, p. 146, fig. 13.

MATERIAL EXAMINED. Sabiura (9), near Andonohana (8), Sumizaki (1), Shionomisaki, underside of coral.

DISTRIBUTION. Southern Japan (Amami-Oshima to Enoshima, Ogasawara Islands; up to 30 m depth); Solomon Islands; Sumatra; W. and E. Australia; Sri Lanka; Arabian Gulf; Red Sea.

Hydroides tuberculata IMAJIMA, 1976

Hydroides tuberculata IMAJIMA, 1976 a, pp. 132–133, fig. 7, a–j [for synonymy]; 1978, p. 53.

MATERIAL EXAMINED. Sabiura, intertidally on rocks (2). Around Shionomisaki, dredge sta. 2 (2), sta. 8 (1), sta. 12 (1).

DISTRIBUTION. Southern Japan (Amami-Oshima to Shionomisaki; 10–80 m depth); Australia.

Hydroides albiceps (GRUBE, 1870)

Hydroides albiceps: IMAJIMA, 1976 a, pp. 133–135, fig. 8, a–v [for synonymy]; 1978, pp. 53–54.
Hydroides exaltatus vesiculosus: AMOUREUX, RULLIER & FISHELSON, 1978, pp. 146–147, fig. 14, H.v.; UCHIDA, 1978, pp. 26–27, pls. 7,8.

MATERIAL EXAMINED. Sabiura (102), near Andonohana (46), Sumizaki (29), Shionomisaki, underside of coral. Area around Shionomisaki, dredge sta. 4 (6), sta. 8 (11), sta. 12 (16), sta. 19 (2).

DISTRIBUTION. Red Sea; Australia; Japan (Kabira Bay, Ishigaki-jima to Uotsu, Toyama Pref., up to 60 m depth).

Hydroides fusicola MÖRCH, 1863

Hydroides fusicola: IMAJIMA, 1976 b, pp. 235–236, fig. 1, a–k [for synonymy]; 1978, p. 53.
Hydroides uncinata: UCHIDA, 1978, pp. 25–26.

MATERIAL EXAMINED. Sabiura (52), near Andonohana (18), Shionomisaki, intertidally on rocks.

DISTRIBUTION. Japan (Ogasawara Islands to Hokkaido, up to 207 m depth); South Kuril (up to 30 m depth).

Hydroides dirampha MÖRCH, 1863

Hydroides dirampha: IMAJIMA, 1978, pp. 54–56, fig. 3, a–i [for synonymy].

MATERIAL EXAMINED. Kushimoto Harbour, attached to rope, together with tubes of

Hydroides elegans (2).

DISTRIBUTION. Italy; circum (sub-)tropical, in littoral depths; southern Japan (O-shima, Izu Islands).

Hydroides ezoensis OKUDA, 1934

Hydroides ezoensis: IMAJIMA, 1976 b, pp. 236–237, fig. 2, a–o [for synonymy]; 1978, p. 54; ZIBROWIUS, 1978, pp. 141–145, fig. 1; UCHIDA, 1978, p. 25.

MATERIAL EXAMINED. Sabiura (7), near Andonohana (53), Sumizaki (2), Shionomisaki, intertidally on rock. Kushimoto Harbour, attached to rope, together with tubes of *Hydroides elegans* (2).

DISTRIBUTION. Japan (Amakusa, Kyushu to Hokkaido; up to 30 m depth); Peter the Great Bay, USSR.

Hydroides elegans (HASWELL, 1883)

Hydroides elegans: IMAJIMA, 1976 b, pp. 237–238, fig. 3, a–n [for synonymy]; 1978, p. 54.

MATERIAL EXAMINED. Around Shionomisaki, dredge sta. 1 (7), sta. 2 (21), sta. 3 (8), sta. 4 (11), sta. 6 (184), sta. 8 (1), sta. 11 (11), sta. 12 (3), sta. 13 (32), sta. 14 (186), sta. 17 (4), sta. 20 (1), on shell and gravel.

Distribution. Southern Japan (Kagoshima Bay to Nii-jima, Izu Islands; 22–92 m depth); Australia; W. Europe and Mediterranean Sea; Sri Lanka; Hawaiian Islands; Philippines; Caribbean Sea.

Hydroides multispinosa MARENZELLER, 1884

Hydroides multispinosa: IMAJIMA, 1976 b, pp. 238–240, fig. 4, a–k [for synonymy]; 1978, p. 54.

MATERIAL EXAMINED. Around Shionomisaki, dredge sta. 1 (7), sta. 2 (21), sta. 3 (8), sta. 4 (11), sta. 6 (184), sta. 8 (1), sta. 11 (11), sta. 12 (3), sta. 13 (32), sta. 14 (186), sta. 17 (4), sta. 20 (1), on shell and gravel.

DISTRIBUTION. Southern Japan (Kagoshima Bay to Nii-jima, Izu Islands; 22–92 m depth).

Genus **Vermiliopsis** SAINT-JOSEPH, 1894

Vermiliopsis infundibulum/glandigera-group

Vermiliopsis infundibulum/glandigera-group: IMAJIMA, 1976 a, pp. 139–141, fig. 11, a–o [for synonymy]; 1978, p. 57.

Vermiliopsis infundibulum: UCHIDA, 1978, pp. 30–31.

MATERIAL EXAMINED. Sabiura (24), near Andonohana (3), Sumizaki (21), intertidally on rock. Around Shionomisaki, dredge sta. 2 (1), sta. 4 (31), sta. 12 (72), sta. 17 (1), sta. 19 (5).

DISTRIBUTION. Circum (sub-) tropical; Japan (Tanega-shima, O-shima, Izu Islands, Ogasawara Islands; up to 92 m depth).

Vermiliopsis labiata (COSTA, 1861)

Vermiliopsis labiata: IMAJIMA, 1977, pp. 95–97, fig. 4 [for synonymy]; 1978, p. 57.

MATERIAL EXAMINED. Around Shionomisaki, dredge sta. 2 (1), sta. 12 (16), sta. 19 (1).

DISTRIBUTION. Mediterranean Sea; Gulf of Guinea; southern Japan (Ogasawara Islands, off Shionomisaki; 36–70 m depth).

Genus **Pseudovermilia** BUSH, 1907

Pseudovermilia pacifica IMAJIMA, 1978

Pseudovermilia pacifica IMAJIMA, 1978, pp. 57–59, fig. 4, a–n.

MATERIAL EXAMINED. Off Sumizaki, Shionomisaki, dredge sta. 4 (6), sta. 12 (3).

DISTRIBUTION. Southern Japan (O-shima, Izu Islands, off Shionomisaki; 30–75 m depth).

Genus **Semivermilia** TEN HOVE, 1975

Semivermilia elliptica IMAJIMA, 1978

Semivermilia elliptica IMAJIMA, 1978, pp. 59–61, fig. 5, a–q.

MATERIAL EXAMINED. Off Sumizaki, Shionomisaki, dredge sta. 4 (26), sta. 11 (1), sta. 12 (95).

DISTRIBUTION. Southern Japan (off Nii-jima and O-shima, Izu Islands, off Shionomisaki; 30–85 m depth).

Genus **Metavermilia** BUSH, 1904

Metavermilia ovata IMAJIMA, 1978

Metavermilia ovata IMAJIMA, 1978, pp. 62–64, fig. 6, a–n.

MATERIAL EXAMINED. Sabiura (3), intertidally on rock. Around Shionomisaki, dredge sta. 12 (2), sta. 19 (3).

DISTRIBUTION. Southern Japan (off Nii-jima and O-shima, Izu Islands, off Shionomisaki; 23–94 m depth).

Metavermilia spicata IMAJIMA, 1977

Metavermilia spicata IMAJIMA, 1977, pp. 97–99, fig. 5; 1978, p. 62.

MATERIAL EXAMINED. Around Shionomisaki, dredge sta. 12 (13), sta. 19 (3), on gravel.

DISTRIBUTION. Southern Japan (Ogasawara Islands, off Nii-jima and O-shima; 30–94 m depth).

Metavermilia inflata IMAJIMA, 1977

Metavermilia inflata IMAJIMA, 1977, pp. 99–100, fig. 6, a–j; 1978, p. 62.

MATERIAL EXAMINED. Off Sumizaki, Shionomisaki, dredge sta. 11 (4), sta. 12 (2).

DISTRIBUTION. Southern Japan (Ogasawara Islands, off Nii-jima, Izu Islands; 65–94 m depth).

Metavermilia acanthophora (AUGENER, 1914)

Metavermilia acanthophora: TEN HOVE, 1975, pp. 57–59 [discussion]; IMAJIMA, 1976a, pp. 138–139, fig. 10, a–k [for synonymy]; 1978, pp. 61–62.

MATERIAL EXAMINED. Off Sumizaki, Shionomisaki, dredge sta. 12 (2).

DISTRIBUTION. Southern Japan (Tanegashima, Ogasawara Islands, off Nii-jima and O-shima; 30–75 m depth); Western and eastern Australia.

Metavermilia nates ZIBROWIUS, 1971

(Fig. 5, a–m)

Mevermilia nates (sic!) ZIBROWIUS, 1971, pp. 1380–1382, fig. 4a–n.

MATERIAL EXAMINED. Off Sumizaki, Shionomisaki, dredge sta. 12 (1).

DESCRIPTION. The specimen measures 7.5 mm in length, including the branchiae, and about 0.5 mm in width in the thorax; it consists of 56 segments.

The gill-radioles of the branchiae are arranged in semicircles: 7 on the right side and 8 on the left. They are not connected by a branchial membrane. The distal tips of the gill-radioles are short and elliptical (Fig. a). The second radiole on the left side is transformed into a large flat, ribbon-like opercular stalk; it is irregularly annulated and wingless.

The operculum is differentiated into two distinct parts: a proximal soft globular part and a distal, yellow-brown horny part. The latter is composed of 7 similar and parallel tiers; these tiers have entire margins except middorsally, where the margin is depressed and notched, especially in lower ones. The terminal tier does not have a spine (Figs. b,c).

The collar has one ventral lobe and two latero-dorsal ones. The latter are continuous with the thoracic membranes, which end just posterior to the fifth uncinigerous segment. The thoracic membranes are wide, covering the dorsal thorax.

The thorax has 7 segments, of which 6 are uncinigerous. The small fascicles of collar setae contain only a few limbate capillaries of two sizes (Figs. d,e). The following thoracic bundles have limbate capillaries (Fig. f) and "sickle" or "*Apomatus*"-setae with a denticulate blade and a short, limbate proximal zone (Fig. g). Thoracic uncini are sub-rectangular and have a single row of 8 teeth, the anteriormost tooth is simple and larger than the remaining

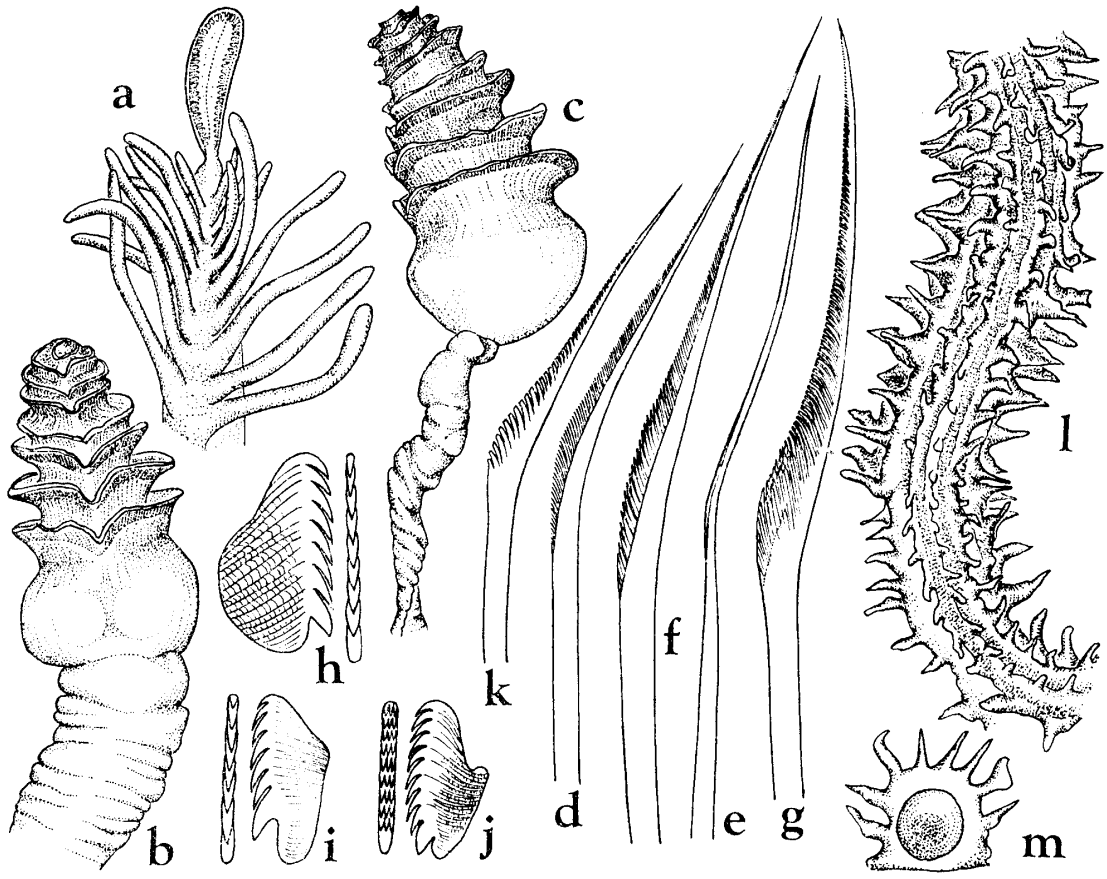

Fig. 5. *Metavermilia nates* ZIBROWIUS. a, distal end of gill-radioles, ×55; b, c, opercula, in dorsal and lateral views, ×40; d, e, collar setae, ×370; f, thoracic limbata seta, ×370; g, thoracic sickle seta, ×370; h, thoracic uncinus, in side and frontal views, ×825; i, anterior abdominal uncinus, in side and frontal views, ×825; j, posterior abdominal uncinus, in side and frontal views, ×825; k, geniculate abdominal seta, ×825; l, tube, ×13; m, cross-section of tube, ×13.

ones (Fig. h). Anterior abdominal uncini are sub-triangular and have 7 teeth in a single row (Fig. i); posteriorly they are replaced by rasp-shaped ones, with 3 rows of minute teeth, with 10 teeth visible in profile (Fig. j). Abdominal setae are geniculate, with a coarsely denticulate edge (Fig. k). The two geniculate setae per fascicle are replaced by long capillary setae in the posterior segments.

The tube is white, and about 1 mm in diameter near the mouth; it is circular in cross-section. It has 8 irregularly sinuous longitudinal ridges with slender to concave foliaceous tubercles; most of the tubercles in the three rows on the upper face are slender, finger-like (Figs. l,m).

REMARKS. This third specimen known of the species enables us to complete ZIBROWIUS's description with details of thoracic membranes and collar setae, the latter pointting confirmation of the generic attribution as done by ZIBROWIUS (being away on an expedition the printer's error in the proofs did not come to his attention, hence *Mevermilia*).

The species is new to the Japanese fauna.

DISTRIBUTION. Western Indian Ocean (Europe Island, Tanzania); southern Japan; in

45–70 m depth.

Genus **Filogranula** Langerhans, 1884

Filogranula exilis sp. nov.

(Fig. 6, a–l)

Material Examined. Off Sabiura, dredge sta. 1 (holotype and 1 paratype), on shell.

Description. The holotype is, including operculum, 5 mm in length, and about 0.2 mm in width in the thorax; it consists of 34 segments.

The branchiae have 4 gill-radioles on either side, in a short pectiniform arrangement,

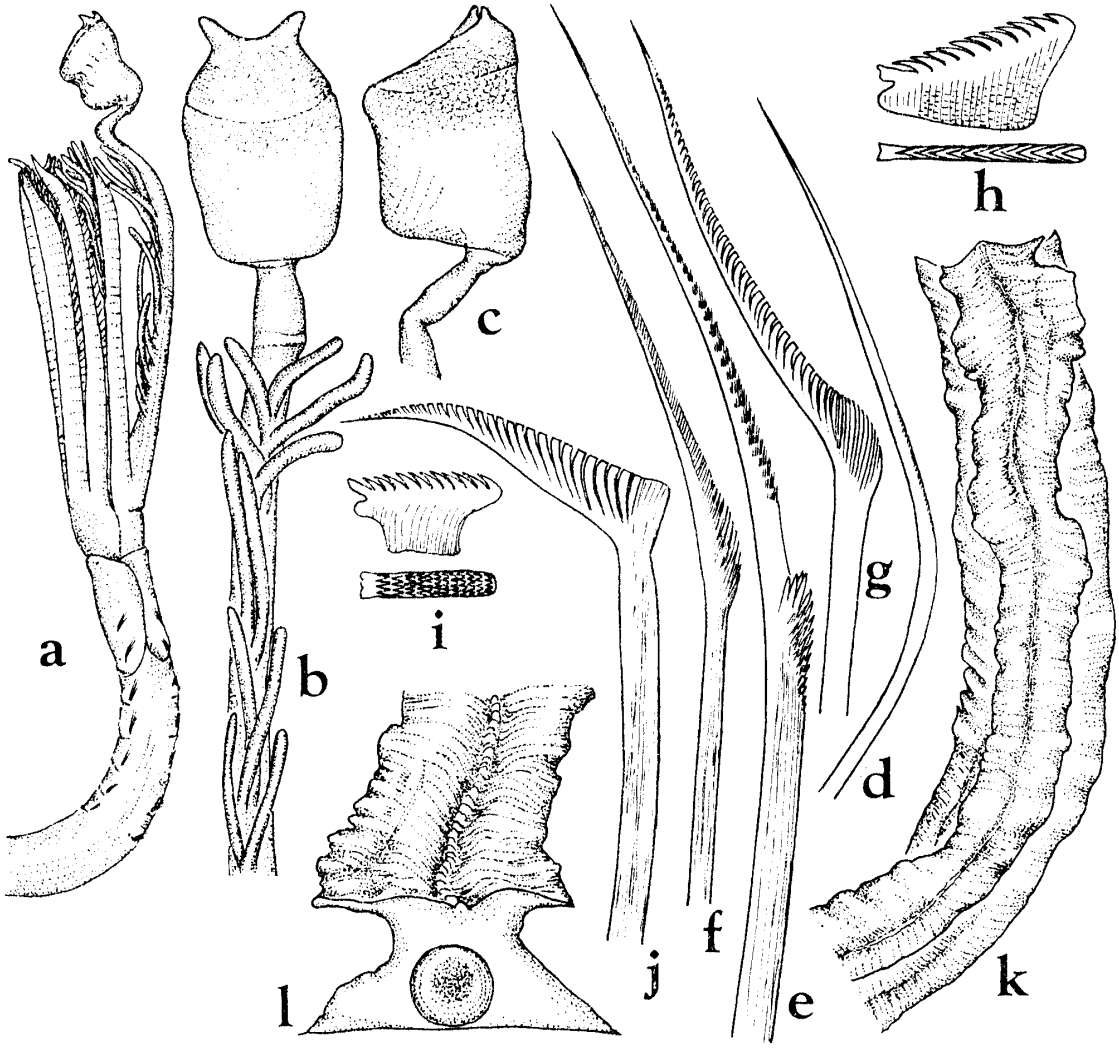

Fig. 6. *Filogranula exilis* sp. nov. a, anterior end, in dorsal view, ×40; b, c, opercula, ventral (b) and lateral (c) views, ×94; d, e, collar setae, ×940; f, g, thoracic dorsal setae, ×940; h, thoracic uncinus, ×940; i, abdominal uncinus, ×940; j, abdominal seta, ×940; k, tube, from above, ×23; l, cross-section of tube, ×40.

and not connected by a branchial membrane; the radioles have pinnule-free distal tips. The second gill-radiole of the right branchial lobe carries an operculum distally (Fig. a). The operculum consists of a proximal soft, globular part, and a horny terminal cap with two distal horns (Figs. b,c).

The collar is divided into a medio-ventral flap, and paired rounded latero-dorsal lobes. The latter are continuous with the thoracic membranes, which end just posterior to the first row of uncini (Fig. a).

The thorax has 7 segments, 6 of which are uncinigerous. The collar setae are of two types: limbate capillaries (Fig. d) and bayonet-shaped setae with a well defined apical hairy zone, five small teeth and a subapical (more proximal) denticulate zone (Fig. e). The subsequent thoracic setae are limbate setae (Fig. f) and "sickle" or "*Apomatus*"-setae with a denticulate blade and a slightly limbate proximal zone (Fig. g). The thoracic uncini are subtriangular, with 12 teeth in one row; the most anterior tooth is gouged (Fig. h). The abdominal uncini are rasp-like and about two-thirds as large as the thoracic ones, with 12 teeth visible in profile, including the anterior gouged one; they have 4 to 5 rows of teeth (Fig. i). The abdominal setae are geniculate, with a coarsely denticulate edge (Fig. j); they are replaced by long capillary setae in the posterior segments.

The tube is white; it is shaped like a rail in cross-section, with a small median longitudinal ridge (Figs. k,l).

REMARKS. *Filogranula exilis* is characterized by its peculiar opercular structure and its tube, which is clearly distinct from that of the hitherto described species, viz.: *Filogranula gracilis* LANGERHANS, 1884, *F. calyculata* (O.G. COSTA, 1861), *F. annulata* (O.G. COSTA, 1861), *F. stellata* (SOUTHWARD, 1963) (compare ZIBROWIUS, 1968: 137–147 under *Omphalopoma*, 1972: 120–121 and 1973: 56–58).

This is the first record of the genus from Japan.

TYPE-SERIES. Holotype, NSMT-Pol. H 147; 1 paratype, NSMT-Pol. P 148.

DISTRIBUTION. Southern Japan (29–32 m depth).

Genus **Janita** SAINT-JOSEPH, 1894

Janita fimbriata (DELLE CHIAJE, 1822)

(Fig. 7, a–o)

Omphalopomopsis fimbriata: ZIBROWIUS, 1968, pp. 149–151, pl. 6, fig. 13–21 [synonymy].
Janita fimbriata: ZIBROWIUS, 1972, p. 122; 1973, pp. 59–61.

MATERIAL EXAMINED. Around Shionomisaki, dredge sta. 4 (2), sta. 12 (19), sta. 19 (3).

DESCRIPTION. The largest specimen measures 19 mm in length including branchiae, and 1.0 mm in width in the thorax; it consists of 95 segments.

The branchiae have 9–11 on the right and 10–12 gill-radioles on the left side, in a pectiniform arrangement. The radioles are not connected by a branchial membrane, and have a

slender, pinnule-free tip distally.

The opercular peduncle is inserted to the right or to the left at the base of the branchial stem; just below and between first and second normal radiole; it is slightly compressed dorso-ventrally, faintly wrinkled. The corresponding radiole at the opposite side is about half the size of a normal one, and also placed slightly out of rank. The operculum is bell-shaped, ending in simple concave distal plate, being rather thick and brown, without calcareous deposit; its base is surrounded by three fleshy processes, one triangular and two rounded ones

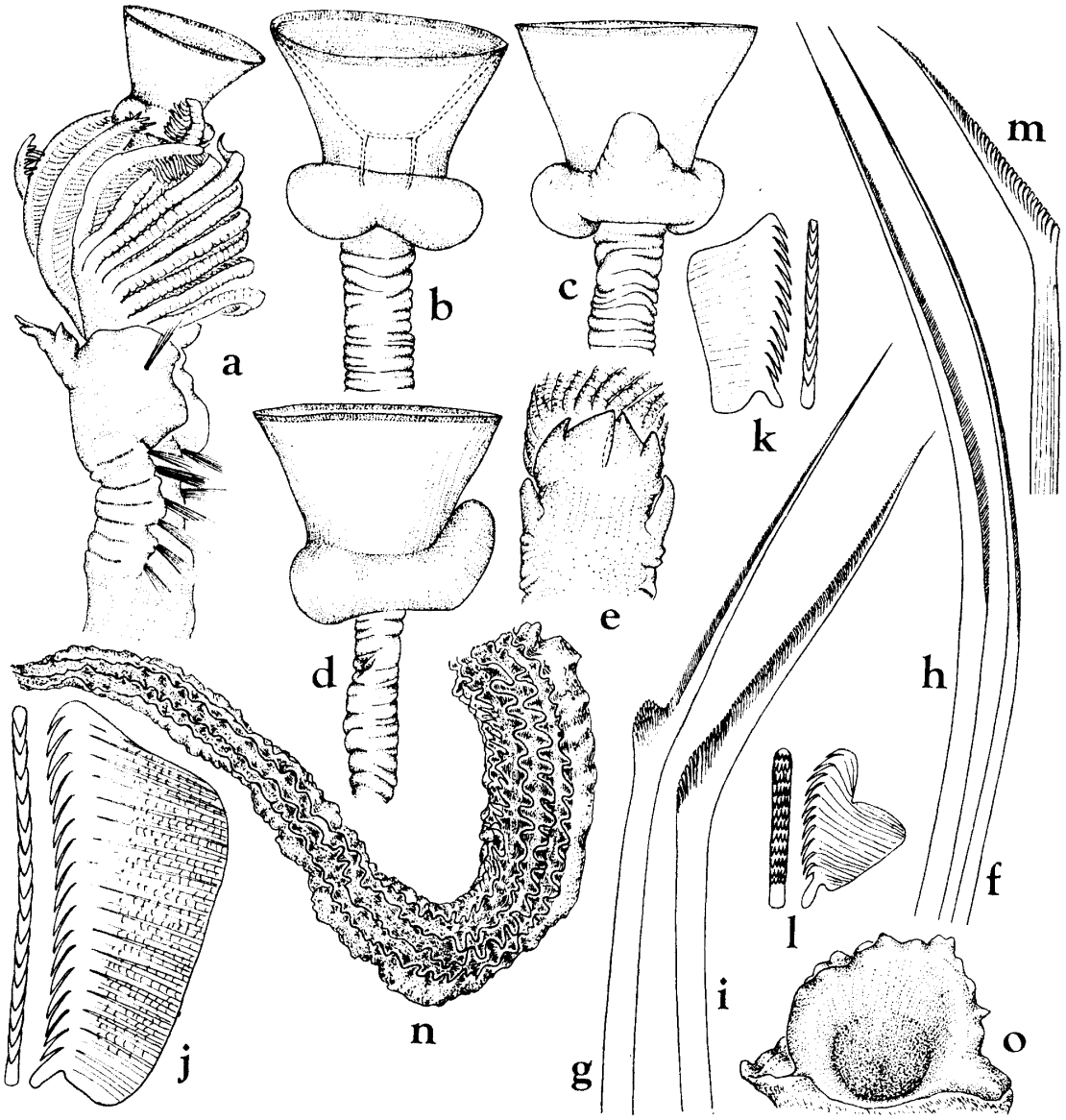

Fig. 7. *Janita fimbriata* (DELLE CHIAJE). a, anterior end of worm, in lateral view, ×20; b, c, d, opercula in dorsal (b), ventral (c) and lateral (d) views, ×33; e, anterior thorax, showing ventral collar lobe ×20; f, capillary collar seta, ×190; g, bayonet-shaped collar seta, ×190; h, thoracic limbate capillary seta, ×190; i, thoracic sickle seta, ×190; j, thoracic uncinus, in side and frontal views, ×770; k, anterior abdominal uncinus, in side and frontal views, ×770; l, posterior abdominal uncinus, in side and frontal views, ×770; m, abdominal seta, ×400; n, tube, ×4; o, orifice of tube, ×8.

(Figs. a–d). The concave distal plate has a horny "talon" into the fleshy operculum part.

The collar is divided into three regions: a medio-ventral flap and paired rounded latero-dorsal lobes. The former is divided in four lobes by a deep median and two shallow incisions; the latter are continuous with the short thoracic membranes, which end at the first row of uncini (Figs. a,e).

The thorax has 7 segments, 6 of which are uncinigerous. The bundles of collar setae contain slender capillary setae (Fig. f) and bayonet-shaped setae with stout hair-like processes at the base of the blade not unlike those in *Spirobranchus* (Fig. g). The subsequent thoracic bundles have capillary setae resembling those of the collar (Fig. h) and "*Apomatus*"-setae with a denticulate blade and a slightly limbate proximal zone (Fig. i). The thoracic uncini are sub-rectangular and have a single row of 16 to 17 teeth, the anteriormost tooth is gouged (Fig. j). Anterior abdominal uncini are about half as large as the thoracic ones and have a single row of 11 teeth (Fig. k). Posterior abdominal uncini are rasp-like, with 13 teeth visible in profile, including the anterior gouged one; they have 3 to 5 rows of teeth (Fig. 1). The abdominal setae are geniculate, with a coarsely denticulate edge (Fig. m). Posteriorly they are replaced by slightly longer capillary setae.

The tube is white; it is sub-circular in cross-section, with 5 longitudinal, winding ridges (Fig. n). The orifice is widened out into a simple funnel-shaped peristome (Fig. o).

REMARKS. In the past there has been a considerable confusion about the generic attribution of this species, generally it has been attributed to *Omphalopomopsis*. ZIBROWISU (1972: 122; 1973: 58–59) points out that a distinction between *Janita* and *Omphalopomopsis* is justified upon the very different opercula: *O. langerhansi* MARENZELLER (1885: 219–220, from off Enoshima and Oshima) has a simple globular operculum with a shallowly concave calcareous endplate; *J. fimbriata* has a more complex operculum with a deeply cupped horny endplate, which has a horny stalk (talon) into the fleshy operculumpart.

A superficial comparison with Mediterranean material showed no significant differences, with the possible exception of the tube, which appears to be slightly less ornamented in the Mediterranean (communication by TEN HOVE).

DISTRIBUTION. Mediterranean Sea; Atlantic Ocean: Brasil, Spain to Gulf of Guinea; Indian Ocean; Malagasy; southern Japan (45–75 m depth).

Genus **Spirobranchus** BLAINVILLE, 1818

Spirobranchus latiscapus (MARENZELLER, 1884)

Pomatostegus latiscapus MARENZELLER, 1884, pp. 218–219, pl. 4, fig. 5.
Spirobranchus latiscapus: IMAJIMA, 1978, p. 56 [for partial synonymy]; Uchida, 1978, p. 32.

MATERIAL EXAMINED. Around Shionomisaki, dredge sta. 4 (141), sta. 6 (6), sta. 11 (8), sta. 12 (131), sta. 13 (59), sta. 14 (1), sta. 20 (2).

DISTRIBUTION. Southern Japan (Tanega-shima, Ogasawara Islands, off Nii-jima and O-shima, Kushimoto; up to 180 m depth); Sulu Sea; New Zealand; Hawaiian Islands.

Spirobranchus giganteus corniculatus (GRUBE, 1862)

Spirobranchus giganteus corniculatus: TEN HOVE, 1970, pp. 24–32 [for synonymy]; IMAJIMA, 1976 a, pp. 136–137, fig. 9, a–p; 1977, p. 106; 1978, pp. 56–57.
Spirobranchus giganteus: WU, SHEN & CHEN, 1975, pp. 93,95,98; UCHIDA, 1978, pp. 31–32.

MATERIAL EXAMINED. Sabiura (78), Sumizaki (64), Shionomisaki, intertidally on coral.

DISTRIBUTION. Indian Ocean; Malaysian Archi.; Philippines; southern Pacific Islands; N. Eastern Australia; southern Japan (up to 30 m depth).

Spirobranchus cf. **polytrema** (PHILIPPI, 1844)

Spirobranchus cf. *polytrema*: IMAJIMA, 1977, pp. 102–106, fig. 9 [for synonymy]; 1978, p. 56.

MATERIAL EXAMINED. Sumizaki (1), near Andonohana (1), Shionomisaki, Type A. Around Shionomisaki, dredge sta. 4 (3), sta. 12 (2), sta. 19 (1), Type B.

DISTRIBUTION. Mediterranean Sea; Indo-West Pacific; Sri Lanka; Australia; southern Japan (Ogasawara Islands, off O-shima, Izu Islands; in 23–75 m depth).

Spirobranchus tetraceros (SCHMARDA, 1861)

(Fig. 8, a–k)

Spirobranchus giganteus: IMAJIMA & HARTMAN, 1964, p. 373; UCHIDA, 1978, pp. 31–32.
Spirobranchus tetraceros: TEN HOVE, 1970, pp. 3–14, figs. 1–27 [for synonymy].

MATERIAL EXAMINED. Sabiura, intertidally on coral (1). Around Shionomisaki, dredge sta. 8 (1), sta. 12 (2).

DESCRIPTION. The largest specimen measures 12 mm in length, including the branchiae, and about 2 mm in width in the thorax; it consists of 72 segments.

The branchiae are placed at each side in a circle. The gill-radioles number 17 pairs; they are connected by a webbed membrane for 1/2 to 2/3 of their length; there are processes between the filaments. The collar has one ventral lobe and two latero-dorsal ones. The latter are continuous with the thoracic membranes, which are united ventrally on the anterior abdominal segments.

The peduncle is inserted at the left side, it is somewhat flattened, with a pair of lateral wings; the wings have a fringed edge, bearing 4 to 5 short processes. The operculum is a circular, concave calcareous disc, with three groups of dichotomously branched spines distally: one group medio-ventrally and two groups latero-dorsally (Figs. a,b).

The thorax has 7 segments, 6 of which are uncinigerous. The collar setae are of two types: bayonet-shaped setae covered with papillate to pilose processes along the distal portions of their shafts (Fig. c), and capillary setae with minutely serrated blades (Fig. d). The remaining thoracic setae are limbate capillaries of two sizes (Figs. e,f); the thoracic uncini have 10 to 11 teeth, the mostanterior tooth is gouge-shaped (Fig. g). The abdominal setae are compressed trumpet-shaped with serrate edges, terminating in a long delicate point (Fig. h); they number 4 at each side per segment and continue to the posterior end. The abdominal

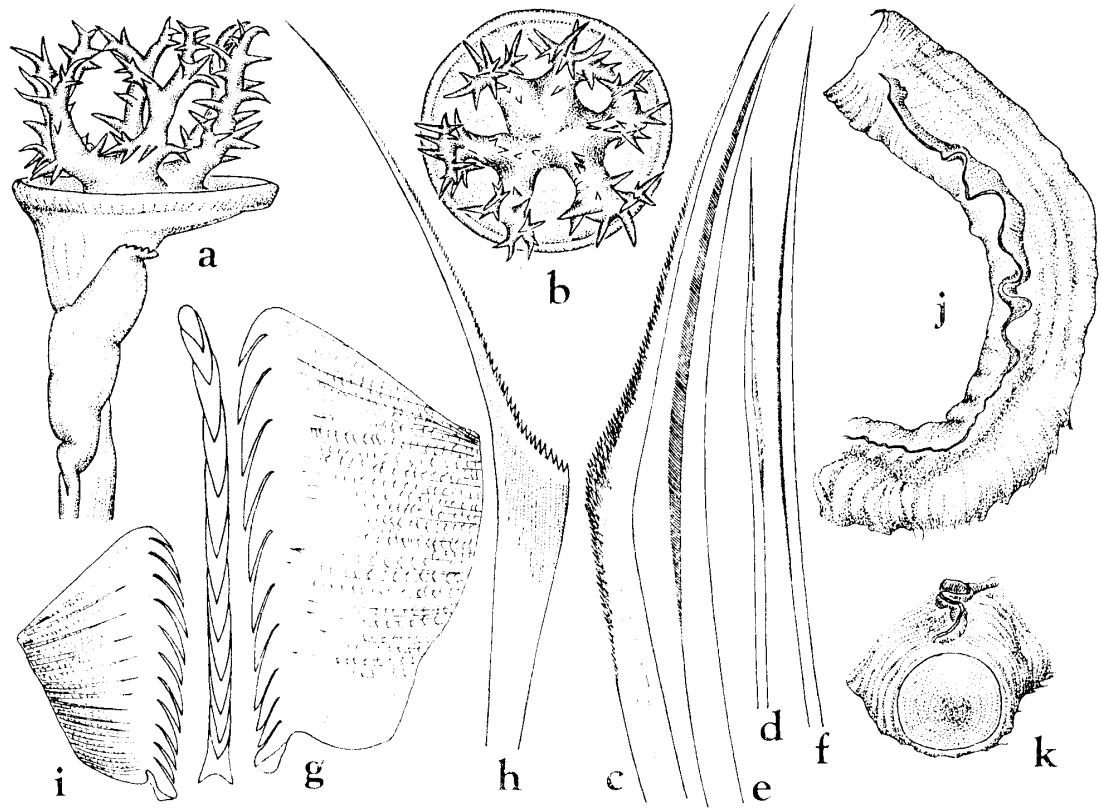

Fig. 8. *Spirobranchus tetraceros* (SCHMARDA). a, operculum, in right lateral view, ×17; b, the same from above, ×17; c, bayonet-shaped collar seta, ×320; d, capillary collar seta ×180; e, f, thoracic setae, ×180; g, thoracic uncinus, in side and frontal views, ×700; h, abdominal seta, ×700; i, abdominal uncinus, in side view, ×700; j, tube, ×5; k, orifice of tube, ×5.

uncini are sub-triangular, smaller than the thoracic ones, and have 11 teeth, with one anterior gouge (Fig. i).

The tube is pinkish; it is semi-circular in cross-section. There is a roughly serrated median ridge (Figs. j,k).

REMARKS. *Spirobranchus giganteus* reported by IMAJIMA and HARTMAN, 1964, and UCHIDA, 1978 from Japan is referred to this species.

DISTRIBUTION. Caribbean Sea; tropical pacific coast of America; Malaysian Archipel; Indian Ocean; Natal; Sydney; Japan (up to 70 m depth).

Genus **Pomatoleios** PIXELL, 1913

Pomatoleios kraussii (BAIRD, 1865)

Pomatoleios kraussii: IMAJIMA, 1976 a, pp. 135–136 [for synonymy]; 1977, pp. 100–101; 1978, p. 56; UCHIDA, 1978, p. 33.

MATERIAL EXAMINED. Sabiura (78), near Andonohana (81), Shionomisaki, intertidally on rock.

DISTRIBUTION. Tropical Indo-Pacific (intertidally).

Genus **Placostegus** PHILIPPI, 1844

Placostegus tridentatus (FABRICIUS, 1780)

Placostegus tridentatus: IMAJIMA, 1978, pp. 67–69, fig. 9, a–l [for partial synonymy].

MATERIAL EXAMINED. Around Shionomisaki, dredge sta. 4 (1), sta. 12 (26), sta. 19 (6).

DISTRIBUTION. Norway; Atlantic and Mediterranean Sea; southern Japan (off O-shima, Izu Islands, Kushimoto; in 30–75 m depth).

Genus **Ditrupa** BERKELEY, 1835

Ditrupa arietina (O.F. MÜLLER, 1776)

Ditrupa arietina: IMAJIMA, 1978, p. 69 [for partial synonymy].

MATERIAL EXAMINED. Around Shionomisaki, dredge sta. 1 (2), sta. 2 (3), sta. 3 (1), sta. 4 (45), sta. 11 (7), sta. 12 (2), sta. 13 (3), sta. 14 (2), sta. 15 (1).

DISTRIBUTION. Western Europe; Mediterranean Sea; Red Sea; Indian Ocean; Philippine Islands; Japan (19–85 m depth).

Genus **Paraprotis** UCHIDA, 1978

Paraprotis pulchra sp. nov.

(Fig. 9, a–o)

MATERIAL EXAMINED. Around Shionomisaki, dredge sta. 3 (holotype and 27 paratypes), sta. 4 (many), sta. 11 (7), sta. 12 (54), sta. 14 (11), sta. 19 (7), sta. 20 (5).

DESCRIPTION. The holotype is, including branchiae, 21 mm in length, and about 1.5 mm in width in the thorax; it consists of 54 segments.

The branchiae are whitish. They have on either side 30 gill-radioles, which are arranged in a stalked spire of one whorl and are connected by a branchial membrane (Fig. a); they end in slender, pinnule-free tips (Fig. b). The paratypes have 29–32 gill-radioles on either side. The holotype does not have an operculum, however, some of the other specimens have a thin, globular operculum, carried on the second gill-radiole on the right or left side; they are variable in size, 0.3 to 1.4 mm in diameter (Figs. c,d,e).

The collar has an unpaired medio-ventral lobe and two latero-dorsal ones; the latter are continuous with the wide thoracic membranes, which are united ventrally on the first abdominal segment (Fig. f).

The thorax has 7 segments, 6 of which are uncinigerous. The small fascicles of collar setae contain only a few, slender limbate capillary setae of two sizes (Figs. g,h). The subsequent thoracic setae are all limbate capillaries (Figs. i,j); other types of setae are absent. Thoracic uncini are saw-shaped, with 6–7 teeth; the most anterior tooth is simple and larger than the remaining ones (Fig. k). The posterior abdominal uncini are rasp-shaped with one to three rows of minute teeth, with 9 teeth visible in profile (Fig. 1). Abdominal setae

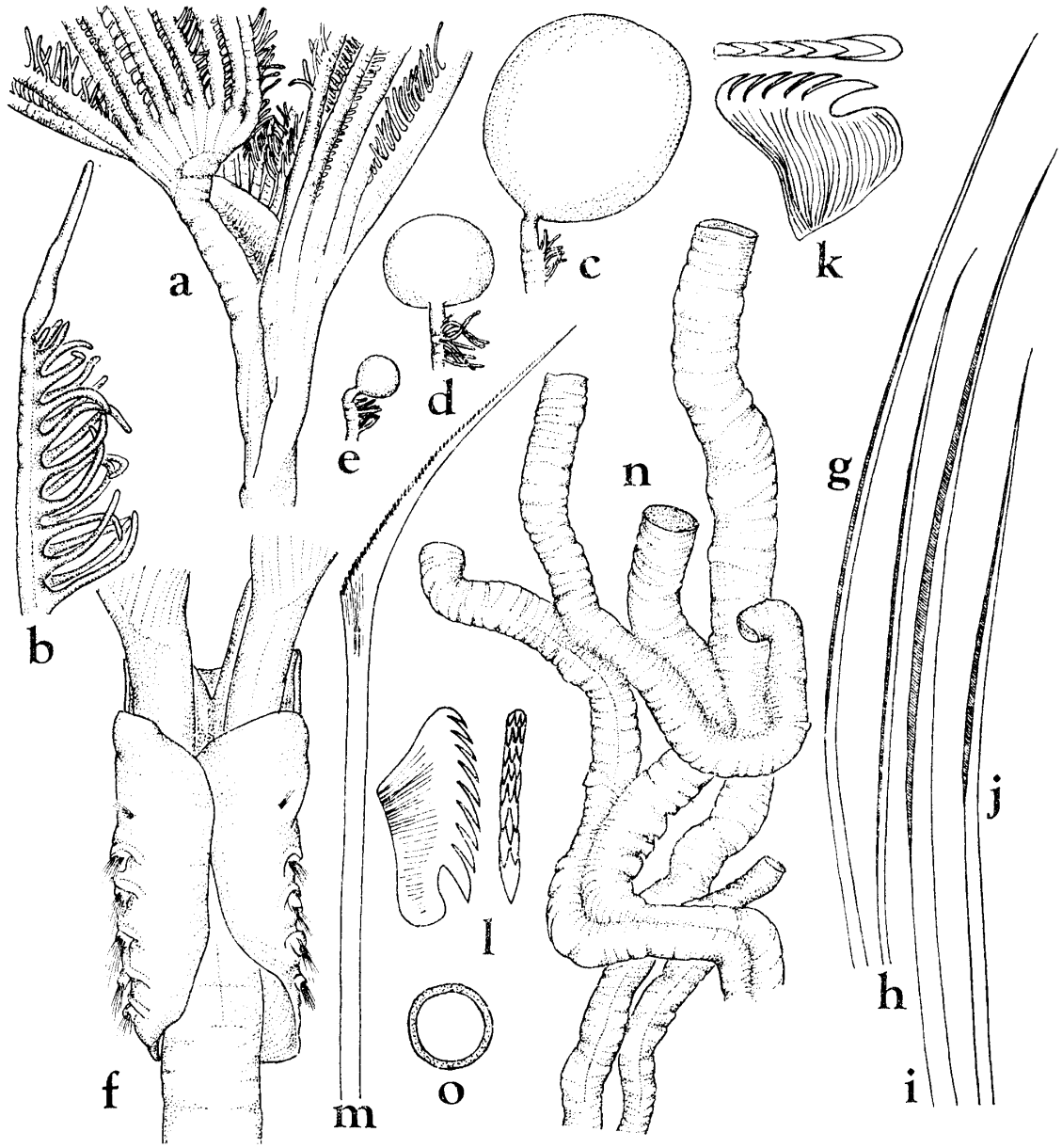

Fig. 9. *Paraprotis pulchra* sp. nov. a, basal part of left branchial lobe, ×16; b, distal part of gill-radiole, ×48; c, d, e, distal part of same, various views, ×16; f, thorax, in dorsal view, ×14; g, h, collar setae, ×220; i, j, thoracic limbate capillaries, ×220; k, thoracic uncinus, in side and frontal views, ×885; l, posterior abdominal uncinus, in side and frontal views, ×885; m, abdominal seta, ×610; n, tube, ×3; o, cross-section of tube, ×5.

are long and geniculate, terminating in a long fine point, with serrations arranged in a double row (Fig. m). The most posterior abdominal setae are longer than the anterior ones, but still geniculate.

The tube is white, opaque and irregularly coiled with faint transverse growth markings; it tends to grow away from the substratum. Where two tubes meet, the border between them may become very indistinct, the tubewalls apparently fusing together (Fig. n). It is circular in cross-section (Fig. o).

REMARKS. The following facts justify attribution of the material to the genus *Paraprotis* UCHIDA, 1978: the operculum is generally absent (present in some specimens); collar setae and thoracic setae are limbate capillaries only; thoracic and abdominal uncini have a simple anterior tooth; abdominal setae are geniculate, with serrations on the free margins.

Paraprotis pulchra can be easily distinguished from *P. dendrova* UCHIDA, 1978, from Sabiura, Kushimoto, by the body size and the number of gill-radioles of branchiae. Moreover, some specimens of *P. pulchra* have a globular operculum.

TYPE-SERIES. Holotype, NSMT-Pol. H 149; 27 paratypes, NSMT-Pol. P 150.

DISTRIBUTION. Southern Japan (19–75 m depth).

Genus **Josephella** CAULLERY & MESNIL, 1896

Josephella marenzelleri CAULLERY & MESNIL, 1896

Josephella marenzelleri: ZIBROWIUS, 1968, pp. 172–174, pl. 9, fig. 14–22; Uchida, 1978, pp. 34–36, pl. 11, figs. A–K, tab. 4.

MATERIAL EXAMINED. Sumizaki, near Andonohana, intertidally on rock. Around Shionomisaki, dredge sta. 4, sta. 12, sta. 19, sta. 20, on other serpulid tubes and shells.

DISTRIBUTION. Atlantic (Brasil, The Channel to Madeira); Mediterranean Sea; Gulf of Akaba; Queensland; Japan (up to 75 m depth).

Zoogeography

Cape Shionomisaki, Kii Peninsula is always influenced by the Kuroshio current. The mean sea-surface temperature is usually 27°C. Of the 35 recorded species of the Serpulidae, except Spirorbinae, 10 have a wide Indo-Pacific distribution, another 13 species have a nearly world-wide or circum-tropical one. The remaining 12 species have a distribution limited to Japan, as far as known yet.

要　　約

「南アルプスと紀伊半島を中心とする地域の自然史科学的総合研究」の初年度として，1978年7月に紀伊半島の南端に位置する潮岬周辺海域で海産無脊椎動物相の調査を行った．潮岬の西側のアンドノ鼻付近と住崎海岸ならびに有田町の錆浦付近の海岸で磯採集を行い，また潮岬を中心とした東西両海域で海底の状態が許す限りドレッヂ採集を行った．その結果，各動物群にわたる多くの種類が得られたが，ここでは多毛環虫類のウズマキゴカイ亜科を除いたカンザシゴカイ科（Serpulidae）の種類が研究された．

研究の結果，15属，35種が認められ，そのなかに1新属新種 *Semiserpula longituba*，3新種，*Serpula japonica*, *Filogranula exilis*, *Paraprotis pulchra* が含まれる．*Filogranula* 属は現在まで日本から知られていなかった．また，*Serpula vittata*, *Metavermilia nates*, *Janita fimbriata* の3種は日本から初めて報告された．

報告された35種類のうち，*Serpula vittata*, *Serpula* cf. *kaempferi*, *Hydroides tambalagamensis*, *Hydroides exaltata*, *Hydroides tuberculata*, *Hydroides albiceps*, *Metavermilia acanthophora*, *Spirobranchus latiscapus*, *Spirobranchus giganteus corniculatus*, *Pomatoleios kraussii* の10種がインド・太平洋域に広く分布しており，*Serpula vermicularis*, *Hydroides dirampha*, *Hydroides elegans*, *Hydroides ezoensis*, *Vermiliopsis infundibulum*/

glandigera-group, *Vermiliopsis labiata, Metavermilia nates, Janita fimbriata, Spirobranchus* cf. *polytrema, Spirobranchus tetraceros, Placostegus tridentatus, Ditrupa arietina, Josephella marenzelleri* の13種は地中海，大西洋を含む広い海域に分布している．そして，*Hydroides fusca, Hydroides fusicola, Hydroides multispinosa, Pseudovermilia pacifica, Semivermilia elliptica, Metavermilia ovata, Metavermilia spicata, Metavermilia inflata* の8種に4新種を加えた12種が現在のところ日本固有種であり，これは全種数の約⅓にあたる．

日本産の *Hydroides* 属には IMAJIMA (1976, 1978) によって13種類報告されているが，潮岬付近の海域からは *Hydroides externispina, H. minax, H. longispinosa* の3種を除いた10種が得られている．しかし，これらの3種はいずれも潮岬より南方海域で得られており，海流の状態からこの海域における今後の調査で採集される可能性が充分たかい．

現在までに黒潮海域でなされた自然史科学的総合研究で，カンザシゴカイ科（ウズマキゴカイ亜科を除く）の種類は種子島から13種，伊豆大島・新島から25種，黒潮反流域の小笠原諸島の父島では18種報告されており，これらに比較して潮岬の35種は最も種数が多い．しかし，各海域での採集条件や採集量は必ずしも等しくなく，また，いずれもただ1回だけの調査であるからここに現れた種数だけでその海域を特徴づけることは無理と思われるが，黒潮が直接ぶつかっているこの海域で種数が多いことは充分うなずけるところである．

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