

## *Archinome rosacea* (BLAKE, 1985)

**Size:** Up to 13 mm long, 5.8 mm wide.

**Morphology:** Body short, fusiform, roughly trapezoidal in cross-section, with 18 segments. Prostomium with paired dorsal and inconspicuous median antenna. Caruncle fused through chaetiger 2, cantilevered to posterior margin of chaetiger 3 and anterior margin of chaetiger 4 (sometimes to chaetiger 5). Paired palps similar in shape, just slightly longer than paired prostomial antennae. Peristomium glandular, ciliated; chordate shape divided into two lobes by a long, deep midventral groove, extending through anterior lip of mouth into pharynx. Mouth ventral, opening at junction of chaetigers 1-2. Chaetae simple, calcareous and bifurcate. Long prongs of bifurcate chaetae nearly straight, smooth to distally serrated with around three in-

conspicuous denticles confined to tips. Largest notochaetae slightly less robust than largest neurochaetae. Ratio of long to short prongs of bifurcate notochaetae ranging from 5.3-10.7: 1; neurochaetae from 2.1-4.7: 1; notoacicalae from 20.5-22: 5: 1; and neuroacicalae around 36: 1. Branchiae present from chaetiger 3, palmate. Pygidium opening on dorsum of last two chaetigers; cirrus digitiform, recurved anterodorsally.

**Biology:** Ubiquitous; associated with tube worms and in mussel beds. Carnivore and scavenger with dietary preferences for polychaetes, crustaceans; also some molluscs.

**Distribution:** Galapagos Spreading Center, Rose Garden, Northern East Pacific Rise.



1: Specimens from East Pacific Rise: 13°N; by P. Briand © Ifremer.



2: Branchiae; by Kudenov.



5: Bifurcate chaetae with short prongs; by Kudenov.



3: Prostomium and caruncle, dorsal view; by Kudenov.



4: Branchiae (SEM) © Ifremer.

### References:

- BLAKE J.A. (1985) Bull. Biol. Soc. Wash. **6**: 67-101.  
 KUDENOV J.D. (1991) Ophelia Supplement **5**: 111-120.  
 KUDENOV J.D. (1993) Antarc. Res. Ser. **58**: 93-50.  
 WARD M.E., JENKINS C.D. & C.L. VAN DOVER (2003) Can. J. Zool. **81**(4): 582-590.

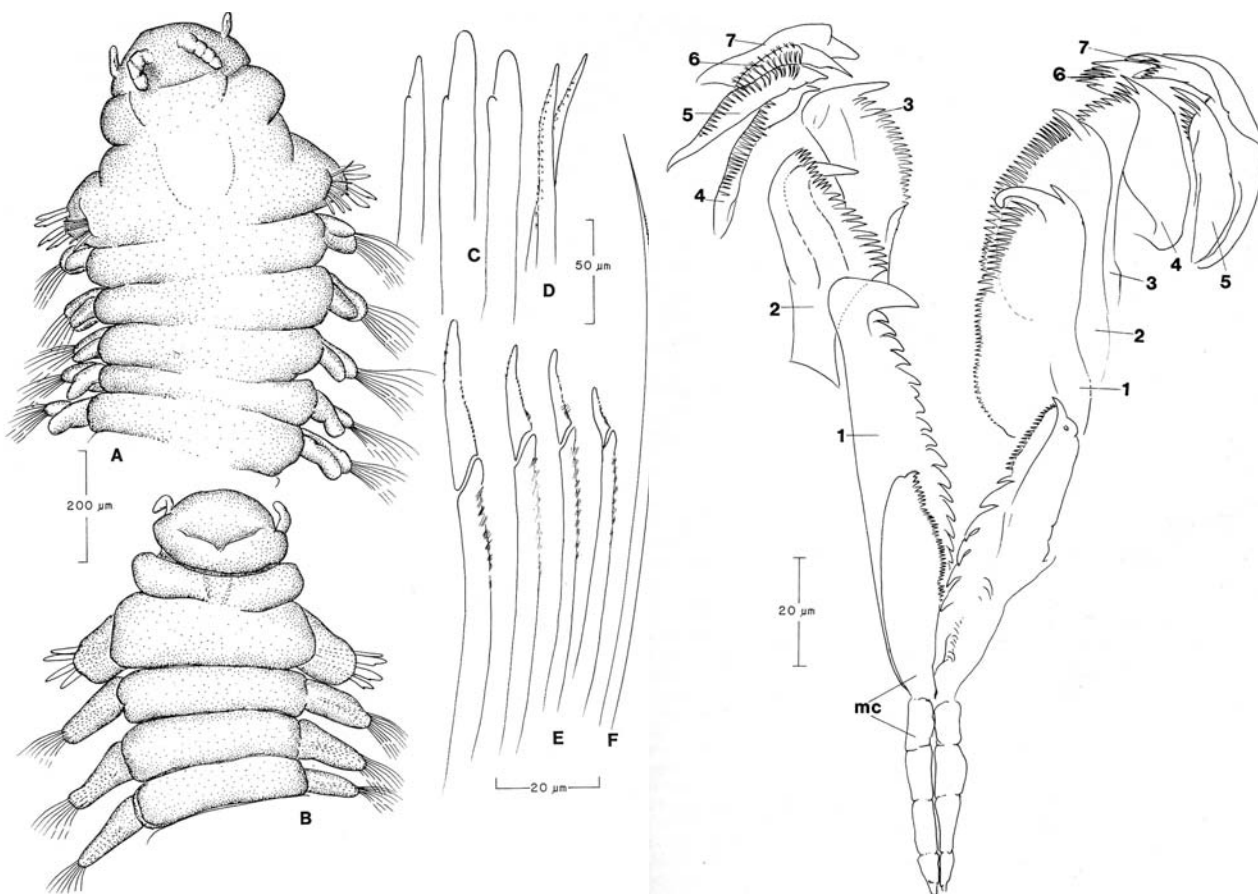
## *Exallopus jumarsi* BLAKE, 1985

**Size:** Small, about 3 mm long, 0.6 mm wide for 26 segments.

**Morphology:** Prostomium wider than long, rounded along anterior margin; with two annulated dorsal antennae and two short, smooth lateral palps. Chaetiger 1 modified, without dorsal and ventral cirri, but bearing two types of heavy modified simple chaetae: (1) upper group of 4-5 narrow, finely denticulate chaetae; (2) lower group of four large spines with lateral accessory tooth. Following segments with thick dorsal cirri, no ventral cirri, with simple serrated chaetae and compound fal-cigers. Jaw apparatus with seven pairs of maxillae, all with larger terminal or subterminal tooth and numerous small denticles.

**Biology:** From fine sediments among hydrothermal mounds. Densities of 2667 individuals m<sup>-2</sup> were recorded from mats of *Beggiatoa* sp.

**Distribution:** Guaymas Basin.



1A: Anterior end, dorsal view; B: Same, ventral view; C: Heavy modified chaetae from chaetiger 1; E: Group of composite fal-cigers from anterior chaetiger; F: Normal simple chaetae from anterior chaetiger; from BLAKE (1985).

2: Maxillary apparatus, showing maxillary carriers and individual plates. Labels on maxillary apparatus indicate maxillary carriers (MC) and maxillae (1-7); from BLAKE (1985).

### References:

- BLAKE J.A. (1985) Bull. Biol. Soc. Wash. **8**: 67-101.  
 DESBRUYÈRES D., GAILL F., LAUBIER L. & Y. FOUQUET (1985) Bull. Biol. Soc. Wash. **6**: 103-116.  
 PETRECCA R.F. & J.F. GRASSLE (1989) in G.R. MC MURRAY (Ed.) Proc. Gorda Ridge Symp. May 11-13, 1987, Springer: 279-283.

## *Ophryotrocha akessoni* BLAKE, 1985

**Size:** Up to 8.5 mm long, 1.1 mm wide, for 55 segments.

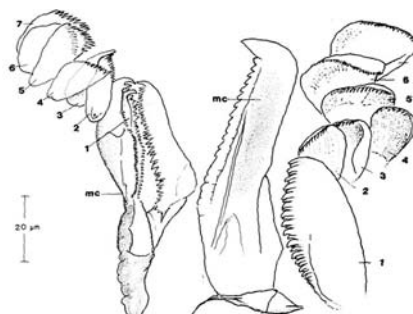
**Morphology:** A small, compact species. Color in alcohol light tan. Prostomium broadly rounded anteriorly with two smooth antennae and two similar palps. Segments 1-2 achaetous, followed by similar appearing chaetigers. Each segment with single ciliary band encircling body. Pygidium with two anal cirri. Each chaetiger with long dorsal cirrus and short, stubby ventral cirrus. Chaetae include dorsal group of simple serrated chaetae, ventral group of composite falcigers, and 1-2 ventralmost simple chaetae. Maxillary apparatus with seven pairs of maxillae, each with numerous short teeth; maxillary carriers large, forcep-like in adults.

**Biology:** An abundant, opportunistic epifaunal species occurring with siboglinids, mussels, and clams. In the Guaymas Basin, *O. akessoni* dominated in sediments saturated with petroleum hydrocarbons. Densities of 3,222 individuals per m<sup>2</sup> were recorded from mats of *Beggiatoa* sp. in the Guaymas Basin.

**Distribution:** Widespread at the East Pacific Rise: 21°N, 13°N, 9°N, Galapagos Spreading Center and Guaymas Basin.



1: Specimen in vivo, apical view © Ifremer



2: Maxillary apparatus: left juvenile, right adult; by courtesy of J. Blake.



3: Anterior part, lateral view (SEM) © Ifremer



4: Composite falciger (SEM) © Ifremer

### References:

- BLAKE J.A. (1985) Bull. Biol. Soc. Wash. **8**: 67-101.  
DESBRUYÈRES D., GAILL F., LAUBIER L. & Y. FOUQUET (1985) Bull. Biol. Soc. Wash. **8**: 103-116.  
GRASSLE J.F. (1988) Adv. Mar. Biol. **23**: 301-366.  
PETRECCA R.F. & J.F. GRASSLE. (1989) Proc. Gorda Ridge Symp.: 279-283.



*Ophryotrocha globopalpata* BLAKE & HILBIG, 1990

**Size:** Up to 7 mm long, 1.0 mm wide, with 40+ segments.

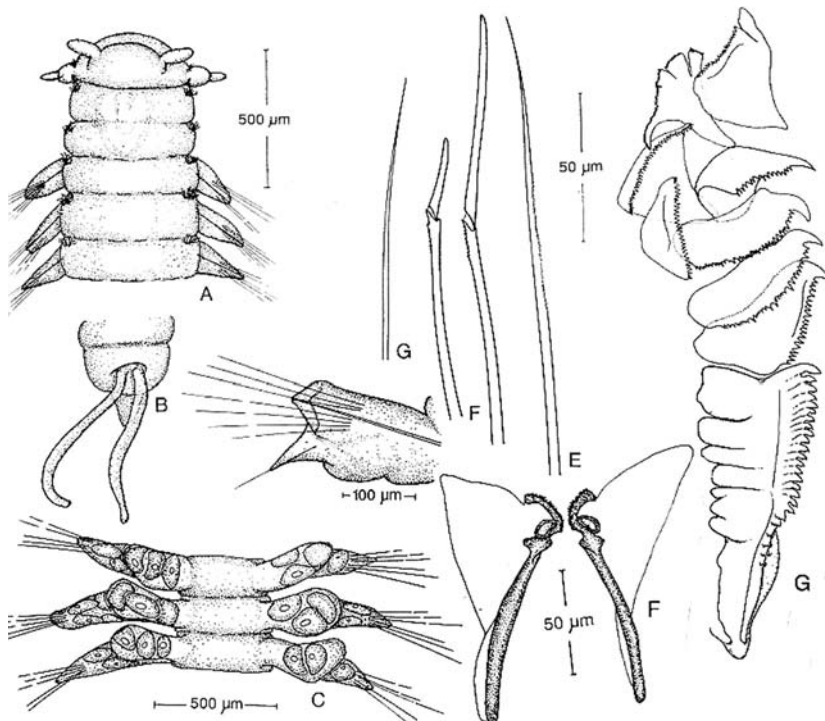
**Color:** In alcohol opaque white.

**Morphology:** Body wide, dorsoventrally compressed, blunt anteriorly, tapering towards pygidium; with long, prominent parapodia. Prostomium rounded, twice as wide as long; with two long, antennae; with two biarticulate palps bearing wide, globular palpophores and slender palpostyles; eyes absent. Peristomium with two achaetous rings about as long as following chaetigers. Parapodia uniramous, with triangular acicular lobe, low prechaetal lobe and retractable ventral chaetal lobe; dorsal and ventral cirri absent. Chaetae of three kinds: (1) supraacicular fascicle of long, flat capillaries with fine subdistal serration; (2) subacicular fascicle of heterogomph falcigers with distally serrated shaft and smooth, narrow, distally blunt blades; (3) inferiormost smooth capillary. Pygidium rounded with two long

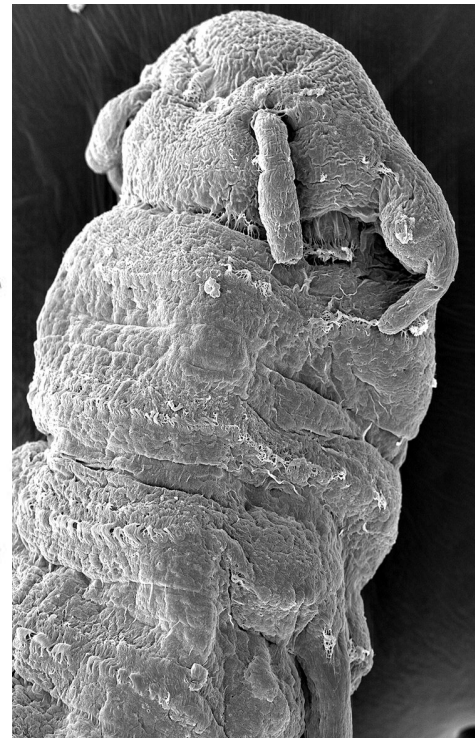
dorsolateral anal cirri. Mandibles elongate, rodlike, with short, rounded, serrated cutting edge and large, unsclerotized lateral wings giving mandible triangular outline. Maxillae with P-type forceps and eight pairs of free denticles with numerous small teeth along cutting edge.

**Biology:** An epifaunal species associated with smokers and active vents. Mature females with about 6-8 eggs in each parapodium and sometimes 3-4 additional ones in large ventral pouches formed from ventral body wall; egg diameters from 64-120  $\mu\text{m}$ , those in pouches larger (mean = 102  $\mu\text{m}$ ) than those in the parapodium (mean = 81  $\mu\text{m}$ ). Mature males with sperm from chaetiger 3 or 4 to end of body, visible in parapodia and under dorsal body wall.

**Distribution:** Juan de Fuca Ridge.



1A: Anterior end dorsal view; B: Posterior end, dorsal view; C: Middle segments of ovigerous female with ventral pouches, ventral view; D: Parapodium anterior view; E: Supraacicular chaetae; F: Subacicular falcigers; G: Ventralmost capillary; from BLAKE & HILBIG (1990).



1: Dorsolateral view of the anterior part (SEM) © Ifremer.

#### References:

- BLAKE J.A. & B. HILBIG (1990) Pac. Sci. **44**: 219-253.  
 TUNNICLIFFE V. (1988) Proc. R. Soc. Lond. B **233**: 347-366.



*Ophryotrocha platycephale* BLAKE, 1985

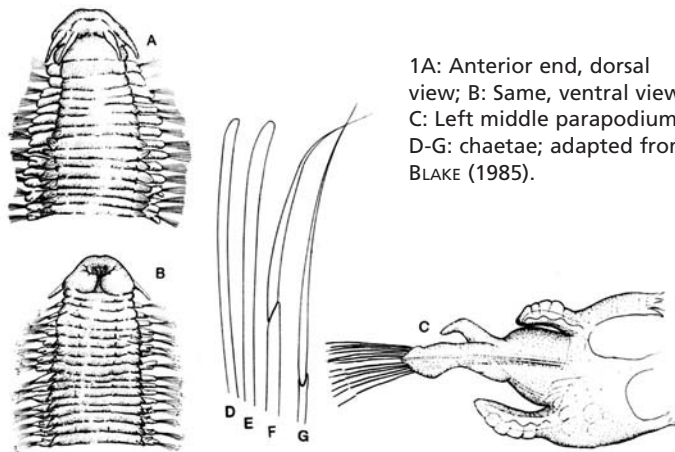
**Size:** Up to 40 mm long, 2.5 mm wide, with more than 150 segments.

**Morphology:** Body dorsoventrally compressed throughout, thickest anteriorly; posterior segments appearing ragged from projecting parapodia. Color in life and alcohol opaque white. Prostomium flattened, wider than long, with cirriform, distally tapering antennae and palps, both of similar length; eyes absent. Peristomium with single achaetous ring. Uniramous parapodia projecting far away from body, with pre- and postchaetal lobes short and rounded anteriorly, becoming elongate by about chaetiger 15. Dorsal cirri from chaetiger 17-19, becoming long, digitiform, bifid in posterior chaetigers. Ventral cirri short, retractile from chaetiger 3 to end of body. Dorsal branchiae from chaetiger 14; ventral branchiae from chaetiger 2; ventral branchiae longer than dorsal ones. Large parapodial glands present between dorsal cirrus and dorsal parapodial base. Chaetae include dorsal fascicle of simple spines and ventral fascicle of compound spinigers. Maxillae with large P-type forceps and seven pairs of free denticles.

**Remarks:** (1) The illustration of the parapodium in the original description of *O. platycephale* (BLAKE 1985: Fig. 14C) was shown upside down and misinterpreted. This error was later noted by BLAKE & HILBIG (1990) and corrected by SOLÍS WEISS & HILBIG (1992). The original figure has been corrected here. (2) A closely related morphotype of *O. platycephale* is present in the same samples from the Guaymas basin hydrothermal mounds. It differs externally from *O. platycephale* having a peristomium with two achaetous rings and a globose dorsal cirrus (see Fig. 2-6). Its mandibles differ also from *O. platycephale* being more spindly and curved. Its specific status remains to be discussed (likely morphological variants or different stages of *O. platycephale*).

**Biology:** Living specimens of *O. platycephale* were observed swimming among a colony of the ampharetid *Amphisamytha galapagensis*. The general habitat was of a seep site warmed by percolating hot water, but away from chimneys.

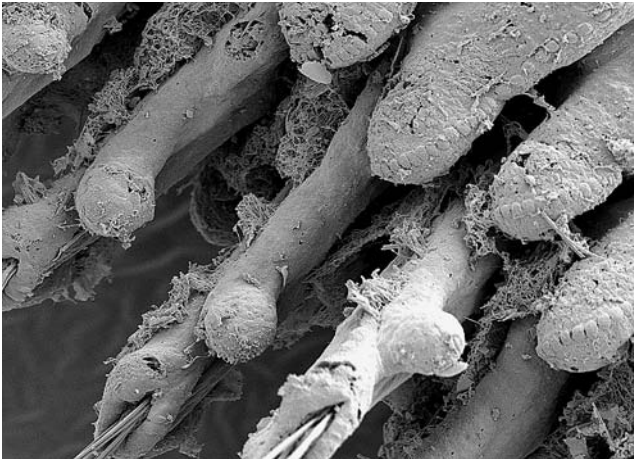
**Distribution:** Guaymas Basin hydrothermal mounds.



1A: Anterior end, dorsal view; B: Same, ventral view; C: Left middle parapodium; D-G: chaetae; adapted from BLAKE (1985).



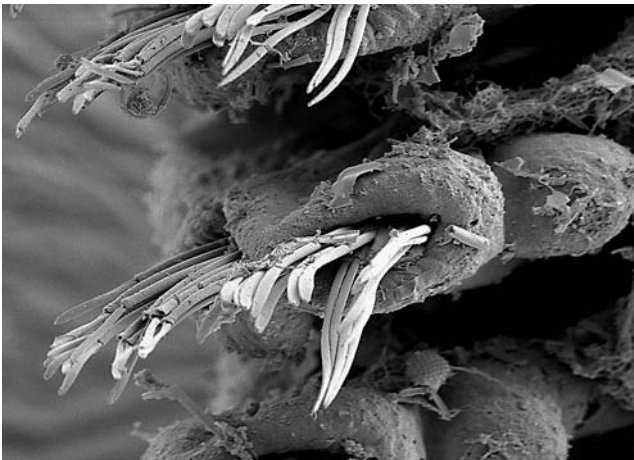
2: Prostomium, dorso-lateral view (SEM) © Ifremer.



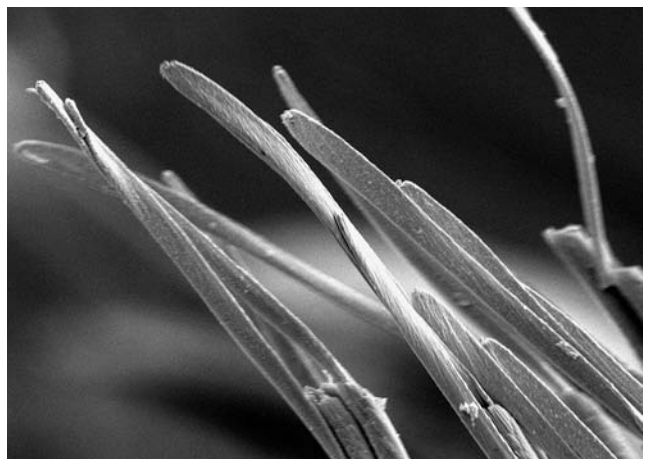
3: Medial parapodia, dorso-lateral view showing branchia and globular dorsal cirri (SEM) © Ifremer.



5: Anterior parapodia, dorso-lateral view showing the two chaetal fascicles (SEM) © Ifremer.



4: Medial parapodia, dorso-lateral view showing the two chaetal fascicles (SEM) © Ifremer



6: Composite blunt-tipped chaetae (SEM) © Ifremer.

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#### References:

- BLAKE J.A. (1985) *Bull. Biol. Soc. Wash.* **6**: 67-101.  
BLAKE J.A. & B. HILBIG (1990) *Pac. Sci.* **44**: 219-253.  
SOLÍS WEISS V. & B. HILBIG (1992) *Bull. South Calif. Acad. Sci.* **91**: 92-96.

*Parougia wolffi* BLAKE & HILBIG, 1990

**Size:** Up to 11.5 mm long, 1.0 mm wide, with about 55 segments.

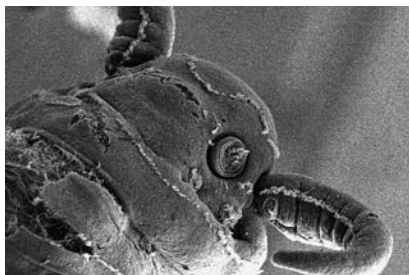
**Color:** In alcohol opaque yellowish-white.

**Morphology:** Body long, cylindrical, with projecting parapodia, tapering within last 5-10 segments towards pygidium. Segmental ciliation absent (present on specimens observed by DD). Prostomium rounded anteriorly, triangular to pear-shaped, with large, flattened palps, longer than greatest prostomial width; antennae unknown. Peristomium with two rings, as long as following chaetigers. Parapodia in chaetiger 1 uniramous, following chaetigers subbiramous; neuropodium with low, square prechaetal lobe and longer, conical postchaetal lobe; notopodium with conspicuous acicula in long basal part and short, conical distal article; ventral cirri short, cirriform. Chaetae of

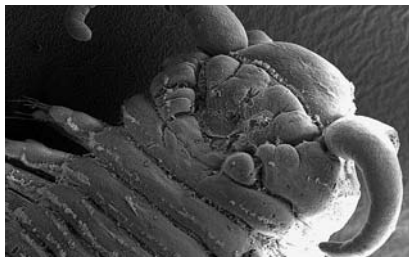
supraacicular fascicle simple, with subdistal serrations and furcate tip (seldom observed by D. DESBRUYERE); capillaries absent. Subacicular fascicle with 10-15 compound falcigers with subdistally serrated shaft and bifid, distally hooded blade. Pygidium small, with terminal anus surrounded by heavily ciliated, rounded papillae. Mandibles triangular, with heavily sclerotized handle and transparent lateral wings; cutting edge with outer hook-shaped tooth and about five large, rounded and five smaller, irregular teeth. Maxillae with superior basal plates and 30-35 superior and inferior free denticles; maxillary carriers and inferior basal plates absent.

**Biology:** Collected from active vents.

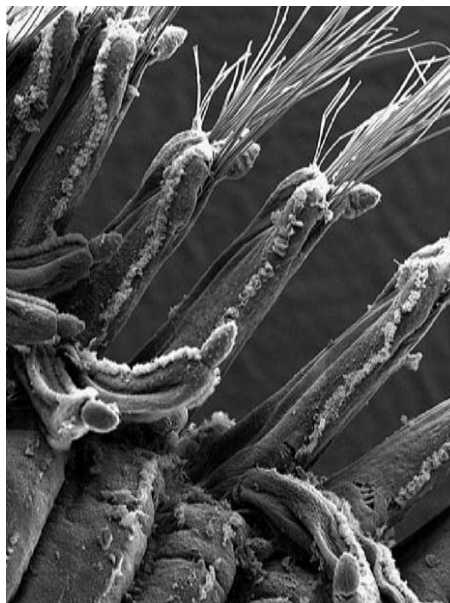
**Distribution:** Juan de Fuca Ridge.



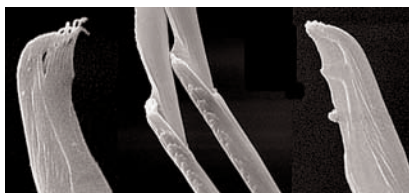
1: Prostomium, dorso-lateral view (SEM)  
© Ifremer.



2: Anterior part, ventral view (SEM)  
© Ifremer.



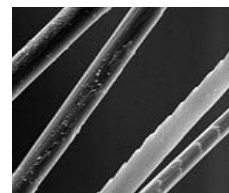
4: Middle parapodia, dorsal view (SEM)  
© Ifremer.



3: Three compound falcigers of the subacicular fascicle with subdistally serrated shaft and bifid, distally hooked blade (SEM) © Ifremer.



5: Simple chaetae of the supraacicular fascicle with a furcate tip (SEM) © Ifremer.



6: Simple chaetae of the supraacicular fascicle with subdistal serrations (SEM) © Ifremer.

#### Reference:

BLAKE J.A. & B. HILBIG (1990) Pac. Sci. **44**: 219-253.



*Eunice pulvinopalpata* FAUCHALD, 1982

**Size:** A large species, 450 mm long, 12 mm wide, for more than 350 chaetigers.

**Morphology:** A large, robust eunicid. Prostomium short, transverse, with pair of large palps along anterior edge; with five weakly articulated antennae. Peristomium with two achaetous rings, with separation between the two indistinct; a pair of peristomial cirri on second ring. Branchiae from chaetiger 3-4 to end of body; branchiae mostly pectinate, with multiple filaments. Parapodia all similar, with rounded acicular lobe bearing

three protruding dark brown or black aciculae; with long dorsal cirrus and short, thick ventral cirrus. Chaetae include bidentate compound hooded hooks, limbate capillaries, pectinate chaetae, bidentate subacicular hooks, and acicula.

**Biology:** Found on smoker walls in rusted areas; probably a carnivore.

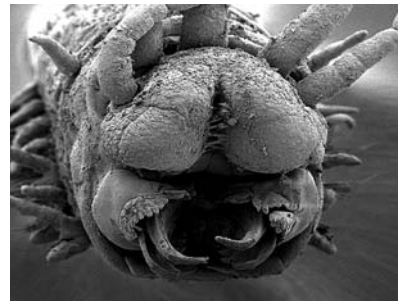
**Distribution:** East Pacific Rise: 21°N and 13°N.



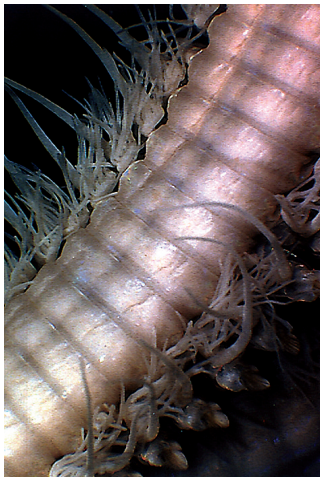
1: Anterior part, dorsal view; by P. Briand © Ifremer.



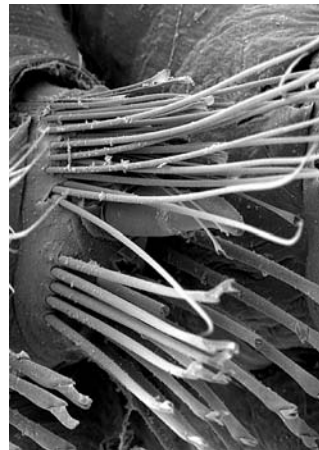
3: Anterior part, ventral view; by P. Briand © Ifremer.



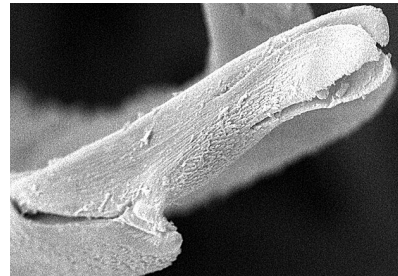
5: Anterior part of the proboscis (SEM) © Ifremer.



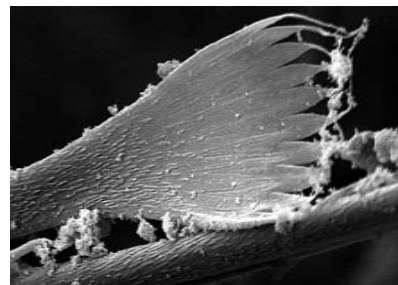
2: Midpart, dorsal view; by P. Briand © Ifremer.



4: Parapodium, SEM view showing one of the dark brown acicula © Ifremer.



6: Bidentate compound hooded hooks (SEM) © Ifremer.



7: Pectinate chaeta (SEM) © Ifremer.

References:

- DESBRUYÈRES D., GAILL F., LAUBIER L. & Y. FOUQUET (1985) Bull. Biol. Soc. Wash. **8**: 103-116.  
FAUCHALD K. (1982) Proc. Biol. Soc. Wash. **95**: 871-877.

## *Thraumastos dieteri* WATSON, 2001

**Size:** > 10 mm maximum size (type truncated).

**Morphology:** Anterior mid-body rectangular, long tapered anteriorly, numerous segments. Pale gold coloured palae fans (brown areas present). Prostomium small quadrate compressed between anterior segments. Subulate median antennae, with short ceratophore, inserted medially on anterior edge of the prostomium, dorsally to two similar sized lateral antennae. Prostomial cirri with filiform tips. Two ovoid palps inserting on

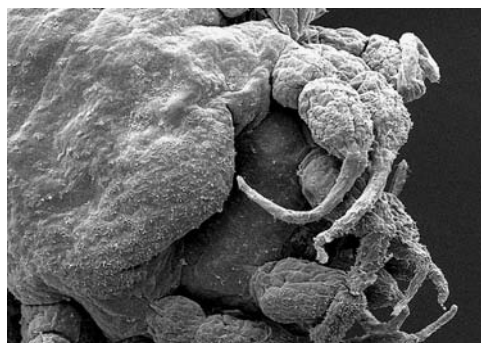
the ventral edge of the prostomium. Mid-body notopodia with lateral and main paleal fascicles. Neuropodia with subacicular fascicle of heterogomph falcigerous neurochaetae. Glandular pads present.

**Biology:** Common in washings of *Bathymodiolus brevior*.

**Distribution:** North Fiji and Lau Basins and cold seep south of Lihir Papua New Guinea.



1: Habitus in vivo © Ifremer



4: Prostomium, ventral view (SEM) © Ifremer.



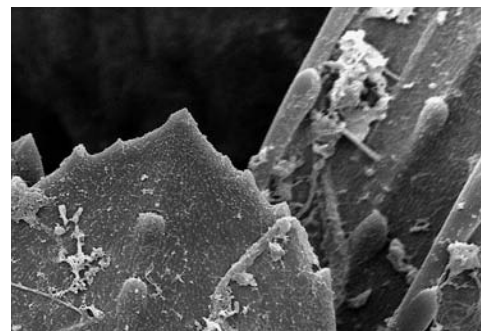
2: Prostomium, dorsal view (SEM) © Ifremer.



5: Neuropodial spinigerous falciger (SEM) © Ifremer.



3: Notopodial fan, middle body (SEM) © Ifremer.



6: Detail of two median paleae (SEM) © Ifremer.

### References:

- DESBRUYÈRES D., ALAYSE-DANET A.M., OHTA S. & the Scientific Parties of Biolau and Starmer Cruises (1994) Mar. Geol. **116**: 227-242.  
WATSON C. (2001) The Beagle, Records of the Museums and Art Galleries of the Northern Territory **17**: 57-66.



## *Glycera branchiopoda* MOORE, 1911

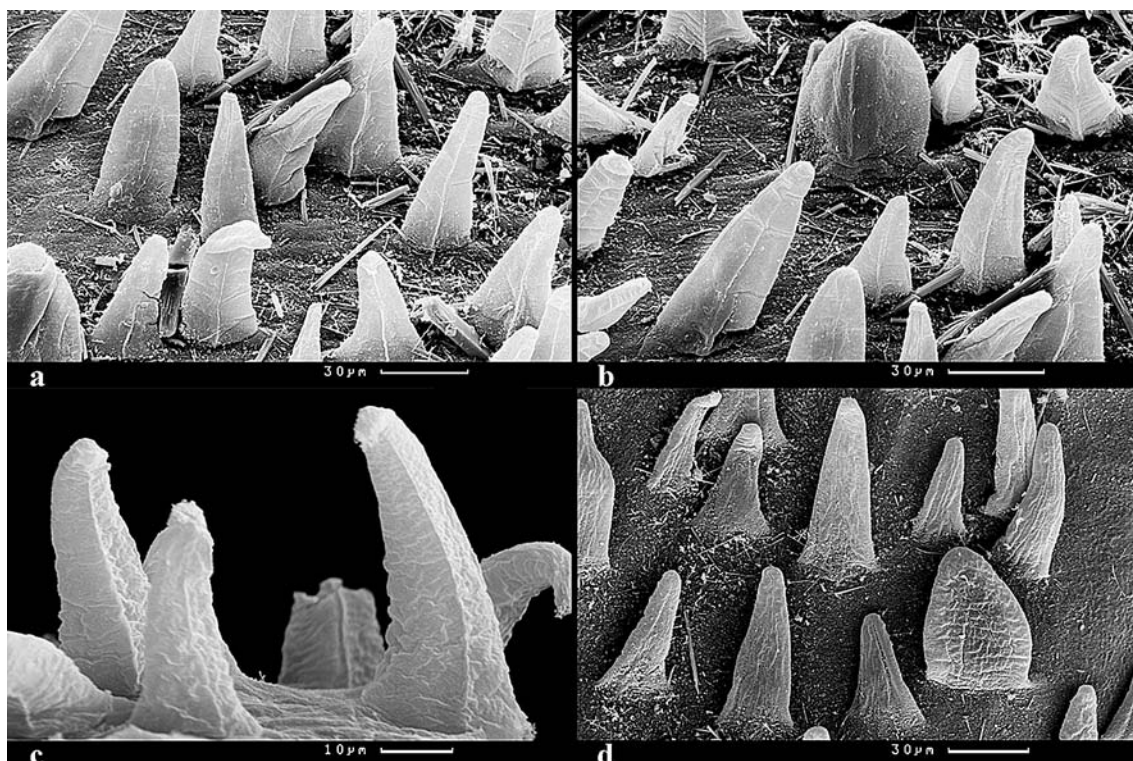
**Synonym:** *Glycera profundis* CHAMBERLIN, 1919.

**Size:** Body up to 90 mm with up to 137 segments.

**Morphology:** Conical prostomium long with 8-9 rings. Proboscis with two types of papillae: (1) numerous tall thin, with straight, median longitudinal ridge and very small papillae surrounding core; (2) isolated shorter broader oval to globular papillae without ridge. Aileron with pointed triangular base. First two parapodia uniramous; following parapodia biramous. Two slender triangular to digitiform praechaetal lobe. One shorter, rounded, sometimes blunt triangular postchaetal lobe. Dorsal cirri distinctly visible from 3<sup>rd</sup> parapodium, oval to globular. Posterior parapodial lobes prolonged. Branchiae absent.

**Biology:** Burrows in soft sediments; not endemic. Glycerids, sometimes called bloodworms, are long-bodied active burrowing predatory worms, which lives in soft sediments.

**Distribution:** Pacific coast of North America, Central American Trench; off central Oregon and Gulf of California deep basins including Guaymas Basin hydrothermal mounds. Depth range 10-2562 m.



1A-D: Proboscis papillae, main and additional types (A-C posterior; D anterior view, USNM 17304; C SMF 9391); from BOGGEMANN (2002, page 97, fig. 26) with the editor's kind permission.

### References:

- BLAKE J.A. (1985) Bull. Biol. Soci. Wash. **8**: 67-101.  
BOGGEMANN M. (2002) Abh. Senckenb. Naturforsch. Ges. **555**: 1-249.  
FAUCHALD K. (1972) Allan Hancock Monography in Mar. Biol. **7**: 1-573.



## *Glycera tessellata* GRUBE, 1863

**Size:** Up to 76 mm long with 181 segments.

**Morphology:** Proboscis papillae mainly digitiform with straight, median, longitudinal ridge; aileron with deeply incised bases; parapodia of mid-body with two short rounded postchaetal lobes; branchiae absent. Mid-body segments bianulate. Conical prostomium consisting of about 8-9 rings. Proboscis with two types of papillae: (1) numerous digitiform papillae with straight, median, longitudinal ridge; (2) isolated, shorter and broader conical papillae with more or less distinctly straight, median longitudinal ridges. First two parapodia uniramous; following parapodia biramous. Two slender triangular

to digitiform prechaetal lobes; neuropodial lobe usually slightly longer and wider than notopodial lobe. Dorsal cirrus from third parapodium, conical to oval; inserted on body wall far above parapodial base. Branchiae absent.

**Biology:** Glycerids are considered to be carnivorous worms.

**Distribution:** Northwestern and northeastern Atlantic, Gulf of Mexico, Caribbean Sea, Mediterranean Sea, Red Sea, south coast of Africa, Indo-Pacific, northwestern Pacific; 2000-4066 m; Mid-Atlantic Ridge: Lucky Strike.



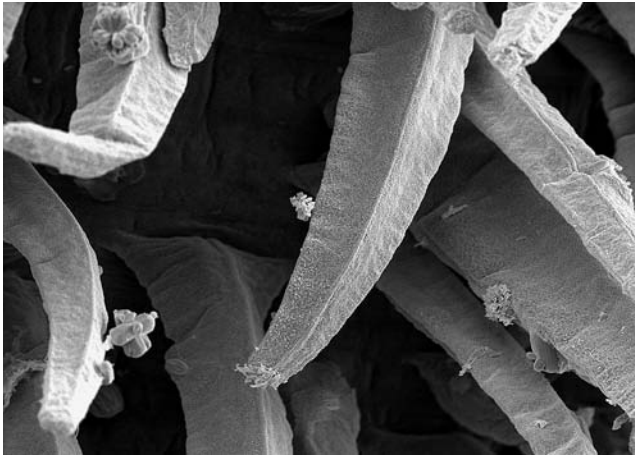
1: Top left, proboscis and anterior part in a living specimen; by P. Briand © Ifremer.



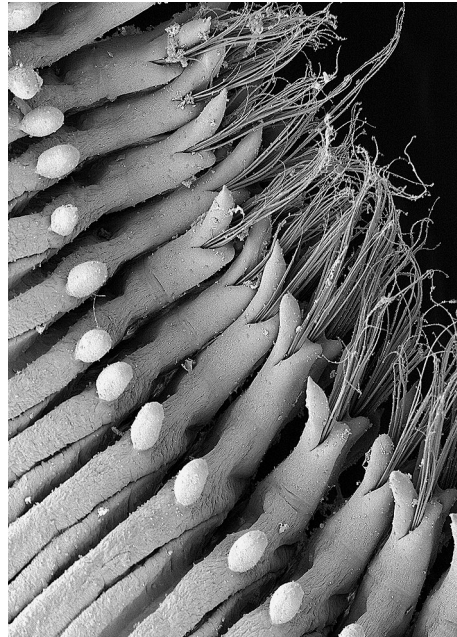
2: Same part, lateral view (SEM) © Ifremer.



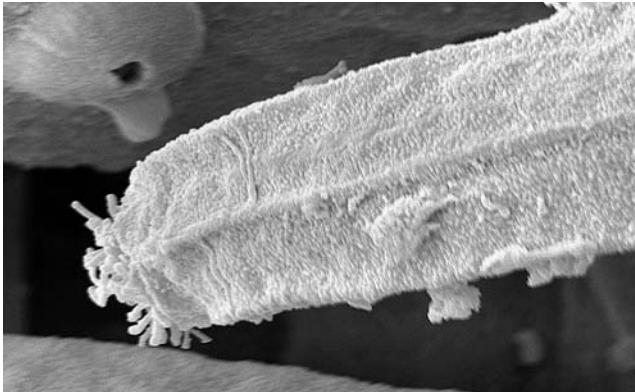
3: Proboscis papillae (SEM) © Ifremer.



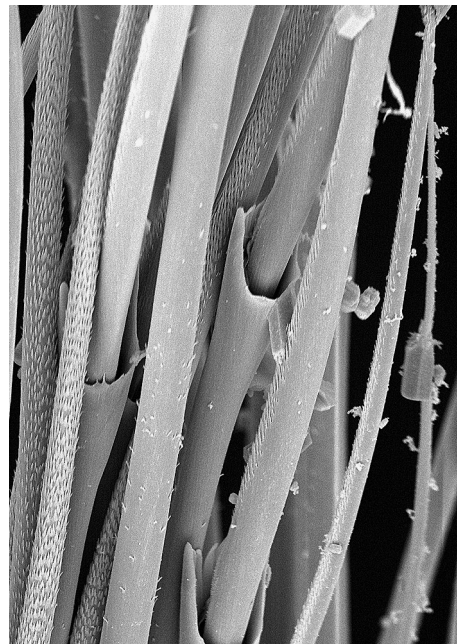
4: Proboscis papillae (SEM) © Ifremer.



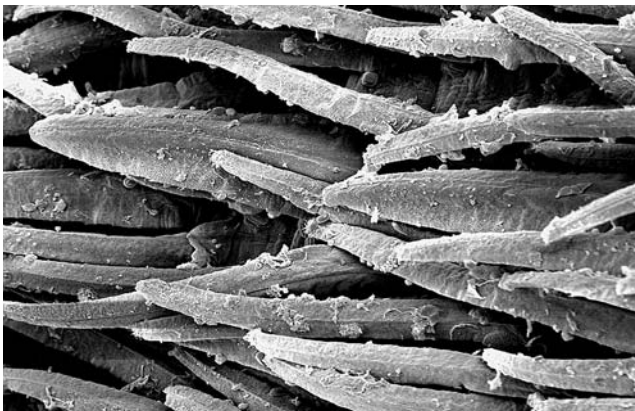
5: Median parapodia, dorsal view (SEM) © Ifremer.



6: Distal part of main papillae (SEM) © Ifremer.



8: Notochaetae, median parapodia (SEM) © Ifremer.



7: Main and additional type of proboscis papillae (SEM) © Ifremer.

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#### Reference:

BÖGGEMANN M. (2002) Abhandl. Senckenberg. Naturforsch. Ges. Frankfurt **555**: 1-249.



*Amphiduroopsis axialensis* (BLAKE & HILBIG, 1990)

**Size:** All known specimens incomplete, anterior end fragments up to 8 mm long for 21 segments.

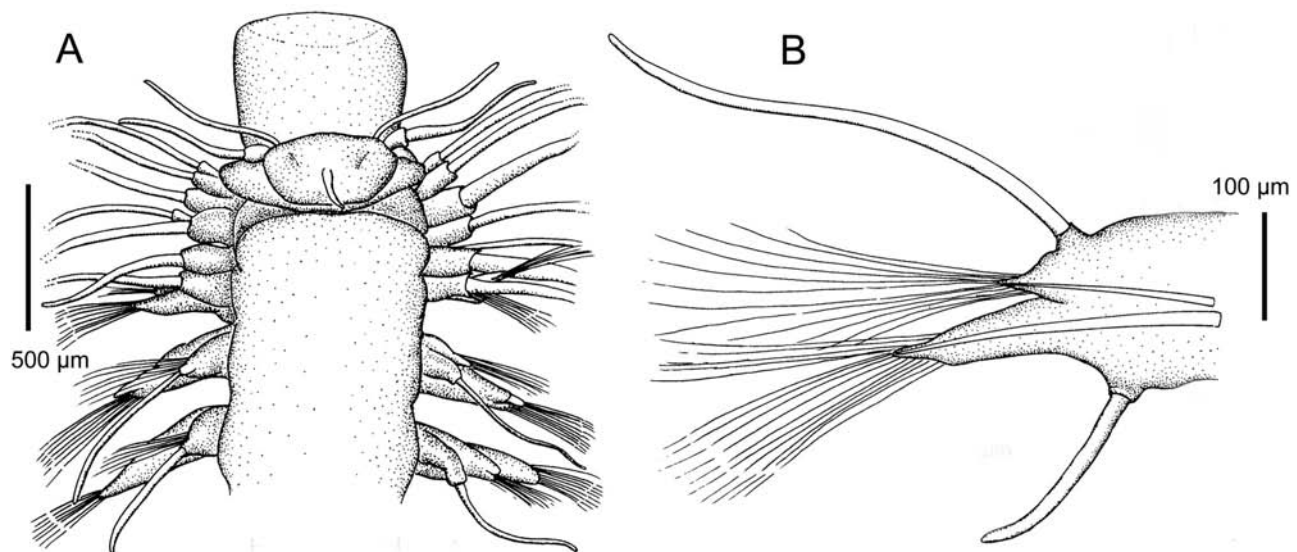
**Color:** Preserved animals yellow-white, pigmentation absent or with dark brown-black pigmentation on lips, laterally on prostomium, palpophores and nuchal organs, distally on proboscis, and on venter.

**Morphology:** Prostomium rounded rectangular, wider than long, posteriorly with small median incision. Palpophores very short, palpostyles of equal width or with slightly enlarged rounded tips. Paired antennae as long as palps, tapered. Both palpostyles and paired antennae very long and slender. Median antenna much shorter than paired antennae, with tapering tip, inserted medio-dorsally on prostomium. Eyes absent. Proboscis smooth and unarmed, ending anteriorly in ring of cilia but without papillae. Dorsal cirri and cirrophores on segment 1–5 larger than on following segments, ventral cirri on segment 1–4 larger and longer than on following segments, with distinct cir-

rophores. Neuropodial lobes and neurochaetae present from segment 5, notopodial lobes and notochaetae from segment 6. Notopodial lobes conical, pointed. Notochaetae include many fine capillaries with two rows of small teeth, three to four ventrally situated curved chaetae with distal serration on ventral side, and two (rarely one) medially situated stout emerging acicular chaetae. Neuropodial lobes conical, much larger than notopodial lobes. Neurochaetae all compound. Ventral cirri distally inserted on neuropodium.

**Remarks:** The new record from East Pacific Rise: 9°N is based on a single specimen from the expedition Hope'99 (Nautilite dive 1372, 2500 m, 09°46'17"N, 104°21'70"W); although not in good condition it agrees well with *A. axialensis*.

**Distribution:** Juan de Fuca Ridge: Axial Seamount and Middle Valley; East Pacific Rise: 9°N (new record; see Remarks).



1A: Anterior end, dorsal view, pharynx extended; B: Parapodium from middle segment, anterior view; by courtesy of J. Blake.

## References:

- BLAKE J.A. & B. HILBIG (1990) Pac. Sci. **44**: 219-253.  
 PLEIJEL F. (2001) Ophelia **54**: 15-27.



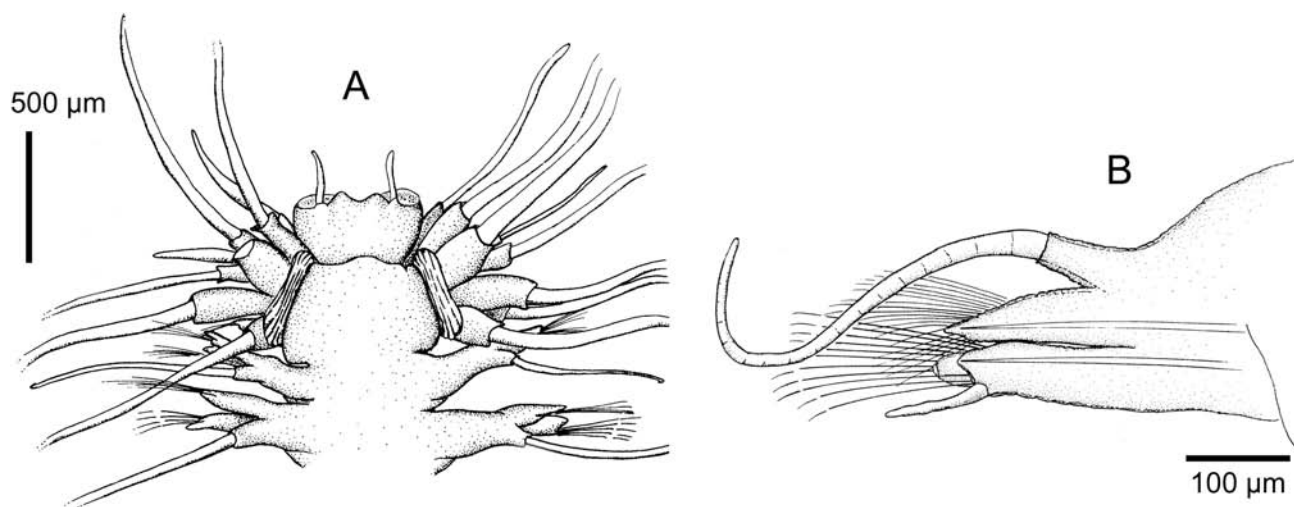
*Hesiodeira glabra* BLAKE & HILBIG, 1990

**Size:** No complete specimens known. Anterior end of 21 segments 5.6 mm long.

**Morphology:** Body shape cylindrical with flattened venter. Prostomium rounded rectangular, wider than long, with anterior median incision (Fig. 1A). Palpophores prominent, annulated, palpostyles tapered with pointed tips. Paired antennae cylindrical with short pointed tips, median antenna small, pointed, inserted dorsally on prostomium (not visible on Fig. 1A). Eyes absent. Proboscis unknown. Dorsal cirri and cirrophores on segment 1–5 and ventral cirri and cirrophores on

segment 1–3 larger than on following segments. Dorsal cirri connected by several muscle bands. Ventral cirri on segment 4 very small. Neuropodial lobes and neurochaetae from segment 5, notopodial lobes and notochaetae from segment 6. Notochaetae include capillaries with two rows of teeth and a few furcate chaetae. Neurochaetae all compounds, with indented tips. Ventral cirri inserted distally on neuropodium.

**Distribution:** Juan de Fuca Ridge: Axial Seamount.



1A: Anterior end, dorsal view; B: Right parapodium from middle segment, anterior view; by courtesy of J. Blake.

**References:**

- BLAKE J.A. & B. HILBIG (1990) *Pac. Sci.* **44**: 219-253.  
PLEIJEL F. (1998) *Zool. Scr.* **27**: 89-163.

## *Hesiolyra bergi* BLAKE, 1985 “caterpillar worm“

**Size:** Up to 80 mm for 100 segments.

**Morphology:** Body anteriorly truncate and posteriorly tapered, dorso-ventrally flattened. Prostomium rounded rectangular, slightly wider than long. Palpophores short, stout; palpostyles much longer and thinner than palpophores, cylindrical with rounded tips. Paired antenna similar to palpostyles; median antenna absent. Eyes absent. Outside of everted proboscis with pointed papillae, increasing in size distally. Terminal ring of proboscis with large number of pointed papillae. Inside of proboscis with large number of denticles in band on ventral side; dorsal and ventral teeth present, dorsal much larger. Dorsal cirri and cirrophores on segment 1–5 and ventral cirri and cirrophores on segment 1–4 larger and longer than on following segments. Neuropodial lobes and neurochaetae from segment 5, notopodial lobes and notochaetae from segment 6. Notochaetae surrounded by large pre- and postchaetal lamellae, smaller lamellae also surrounding neurochaetae. Notochaetae of four kinds: one-two serrated flattened (difficult to detect),

large number of lyriform, tapered spinulose, and subdistally enlarged (and often twisted) spinulose. Neurochaetae all compound, dark to black in color (possibly due to some inclusions?), with unidentate tips. Ventral cirri inserted medially on neuropodium, with distinct cirrophores.

**Biology:** On smoker walls, often visiting tubes of *Alvinella pompejana*. Can occur in large numbers. Epibiotic filamentous bacteria on parapodia and chaetae. Egg diameter about 125  $\mu\text{m}$ .

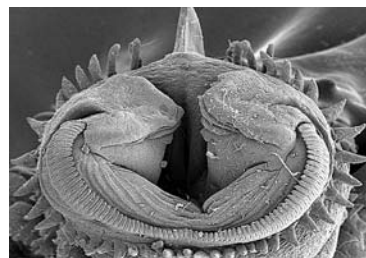
**Distribution:** East Pacific Rise: 9°N and 21°N, and a closely related species on Mid-Atlantic Ridge: at the Azores Triple Junction (expeditions Diva 1 and 2, Marvel) and 22°N (Microsmoke). Newly collected specimens from Mid-Atlantic Ridge agree well with *H. bergi*. Whether they should be referred to a new species or not cannot be stated at present; they are currently best referred to as “*Hesiolyra* sp.”.



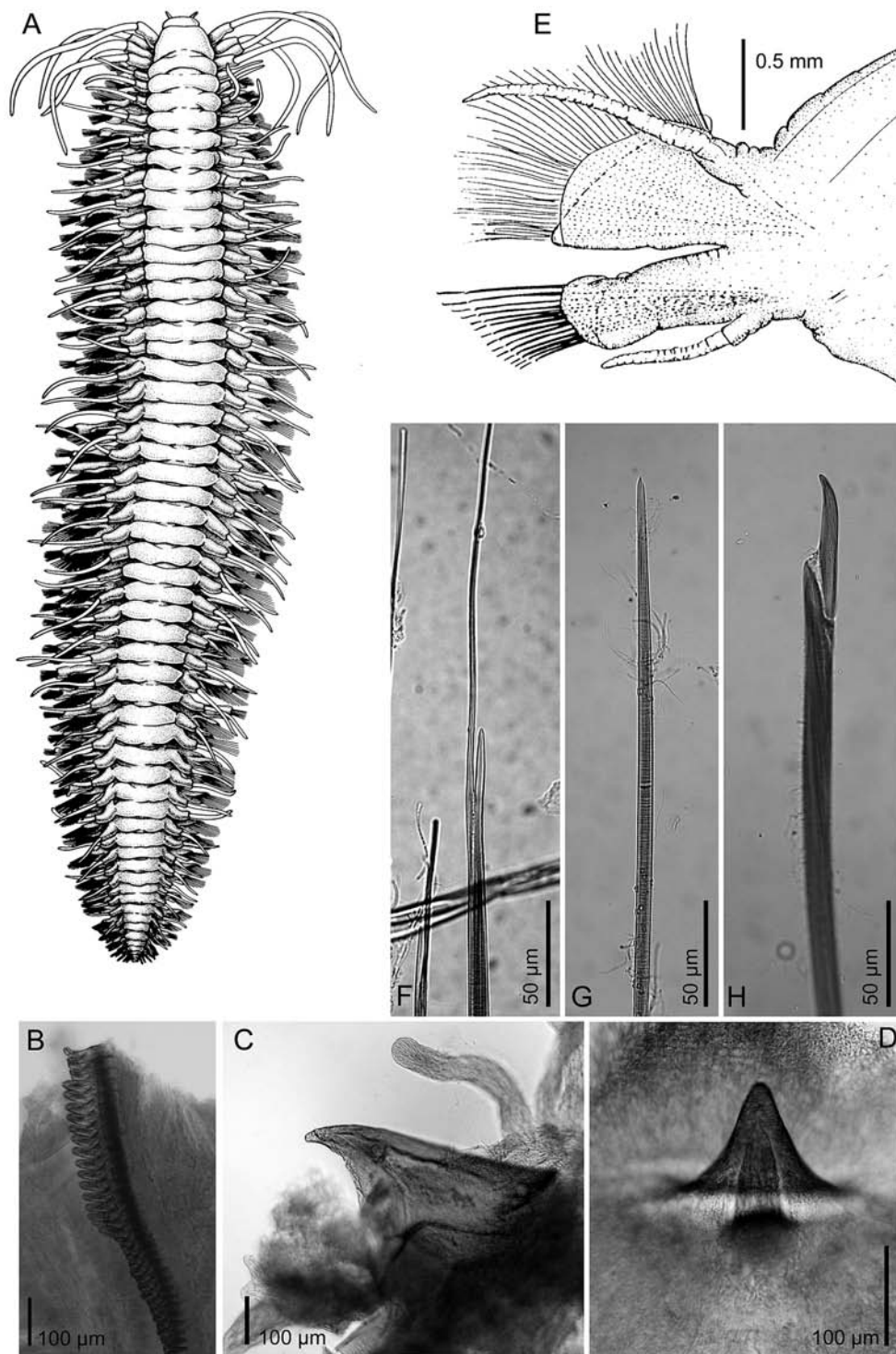
1: Habitus in vivo; by P. Briand © Ifremer.



2: Population on a smoker wall, visiting *Alvinella*'s tubes (East Pacific Rise 13°N, 2630 m). Phare cruise © Ifremer.



3: Proboscis, frontal view (SEM) © Ifremer.



4A: Habitus; by V. Martin © Ifremer; B-D: Denticles of the proboscis; E: Left parapodium of segment 13; by courtesy of J. Blake; F: Lyriform notochaeta; G: Tapered spinulose notochaeta; H: Compound neurochaeta (B-D & F-H © F. Pleijel).

#### References:

- BLAKE J.A. (1985) *Bull. Biol. Soc. Wash.* **6**: 67–101.  
DIXON D.R., DIXON, L. R. J., SHILLITO, B. & J.P. GWYNN (2002) *Cah. Biol. mar.* **43**: 333–336.  
PLEIJEL F. (1998) *Zool. Scr.* **27**: 89–163.  
SHILLITO B., JOLLIVET D., SARRADIN P.M., RODIER P., LALLIER F., DESBRUYÈRES D. & F. GAILL (2001) *Mar. Ecol. Progr. Ser.* **216**: 141–149.



*Hesiospina vestimentifera* BLAKE, 1985

**Size:** Up to 36 mm long for 45 segments.

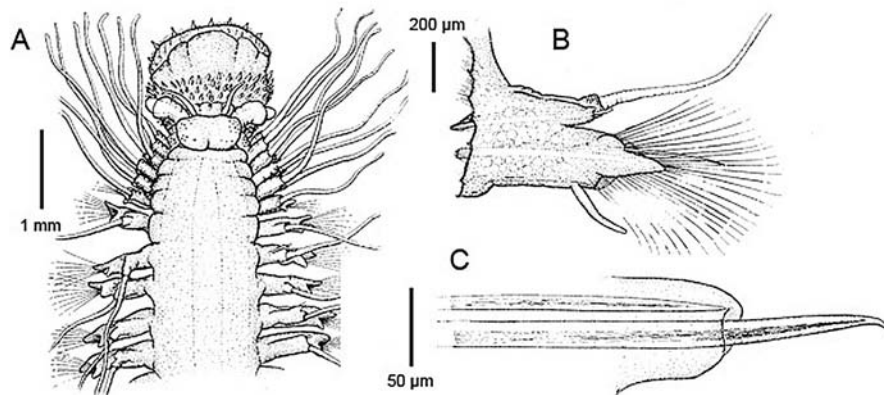
**Color:** Live specimens yellowish transparent, with yellow-orange gut, dorsal and parapodial blood vessels red. Preserved specimens yellowish.

**Morphology:** Body anteriorly truncate and posteriorly tapered. Prostomium rounded trapezoid, anteriorly wider (Fig. 5A). Palpophores long; palpostyles much shorter than palpophores, varying in shape from ovoid to elongated, tips rounded. Paired antenna thin, evenly tapering to rounded tips, slightly shorter or of same length as palps. Median antenna absent. Eyes absent. Everted proboscis basally with papillae appearing in c. 10–15 poorly defined rows, with three to five conical, pointed papillae in each row. Papillae increasing in size distally. Anterior end of proboscis with 10 conical papillae. Dorsal and ventral pair of jaw plates inside terminal ring of papillae, both pairs with two basally jointed lamellae, dorsal pair anteriorly rounded, ventral pair pointed (PLEIJEL, 2004, fig. 10A, B). Dorsal cirri and cir-

rophores on segment 1–5 larger than on following segments, ventral cirri on segment 1–4 larger and longer than on following segments, with distinct cirrophores. Neuropodial lobes and neuropodia from segment 5, notopodial lobes and notochaetae (except hooks; see below) absent from all segments. Notopodia from segment 8–9 to last segments with single stout, straight to slightly curved protruding hook, emerging on frontal side of cirrophore. Neuropodial lobes elongated triangular. Neurochaetae of two kinds: one to two stout, bent acicular chaetae, usually shorter than shafts of compounds, and c. 50 compounds with unidentate tips. Ventral cirri inserted subdistally on neuropodium, without distinct cirrophores.

**Biology:** Commonly associated with the siboglinid *Riftia*. Egg size 100–120 µm in diameter.

**Distribution:** Explorer Ridge, Juan de Fuca Ridge, Galapagos Spreading Center, and East Pacific Rise.



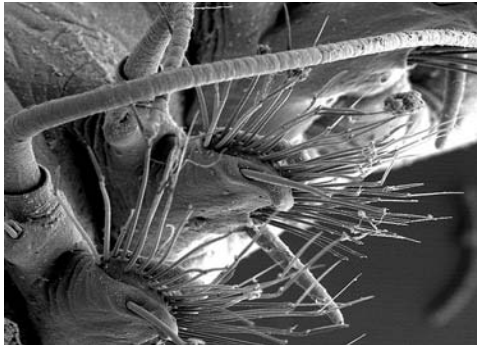
1A: Anterior end, dorsal view with proboscis everted; B: Middle left parapodium, anterior view; C: Notopodium, showing aciculum and protruding acicular spine; by courtesy of J. Blake.



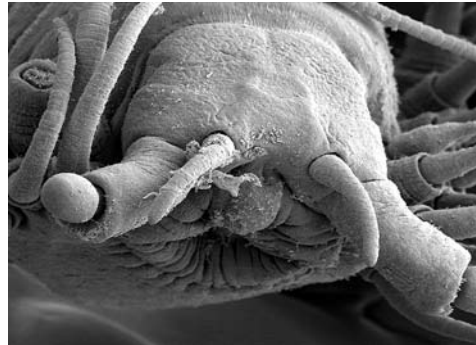
2: Habitus, dorsal view; by P. Briand © Ifremer.



3: Anterior part in vivo; by P. Briand © Ifremer.



4: Parapodia, dorso-lateral view © Ifremer.



3: Prostomium, frontal view © Ifremer.

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## References:

- BLAKE J.A. (1985) *Bull. Biol. Soc. Wash.* **8**: 67-101.  
BLAKE J.A. & B. HILBIG (1990) *Pac. Sci.* **44**: 219-253.  
DESBRUYÈRES D., GAILL F., LALLIER L. & Y. FAUQUET (1985) *Bull. Biol. Soc. Wash.* **8**: 103-116.  
PLEIJEL F. (2004) *J. nat. Hist.* **38**: 2547-2566.  
TUNNICLIFFE V. (1988) *Proc. R. Soc. London B* **233**: 347-366.

## *Nereimyra alvinae* BLAKE, 1985

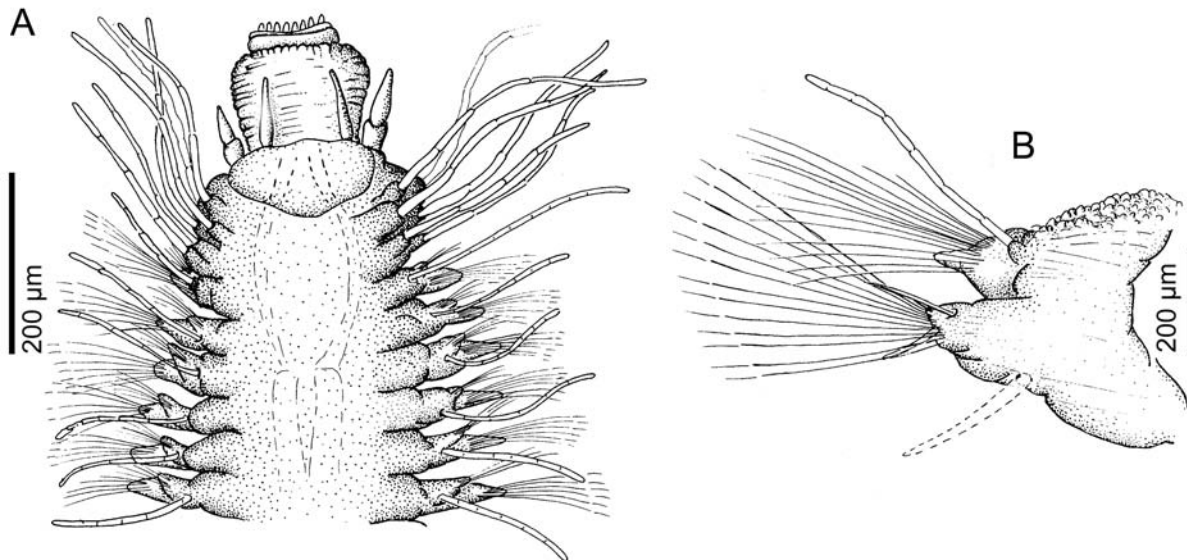
**Size:** Length of largest observed anterior fragment 3 mm for 20 segments.

**Morphology:** Prostomium wider than long. Palpophores cylindrical, palpostyles thinner, basally inflated with tapering tips. Paired antennae thinner and longer than palpostyles, median antenna absent. Eyes absent. Everted proboscis smooth, anterior end with ring of papillae, jaws absent. Dorsal cirri and cirrophores on segment 1–3 (possible 1–4) longer than on following segments, ventral cirri (and cirrophores?) on segment 1–3 larger than on following segments. Noto- and neuropodial lobes and noto- and neurochaetae from segment 4. Notochaetae all capillaries, neurochaetae unidentate capillaries and compounds. Ventral cirri inserted subdistally on neuropodium.

**Biology:** Associated with mussels at the Galapagos Rift and sorted from sediment in box cores from the Guaymas Basin.

**Remarks:** Poorly known and requires redescription (the type material is in bad condition and the above description is based on the original one); the affinities with other members of *Nereimyra* is uncertain.

**Distribution:** Galapagos Spreading Center, Guaymas Basin.



1A: Anterior end, dorsal view with proboscis everted; B: Middle parapodium, posterior view; by courtesy of J. Blake.

### Reference:

BLAKE J.A. (1985) Bull. Biol. Soc. Wash. **8**: 67-101.



## *Sirsoe grasslei* (BLAKE, 1985)

**Synonym:** *Orseis grasslei* BLAKE, 1985.

**Size:** Length 8–9 mm for 32 segments (holotype).

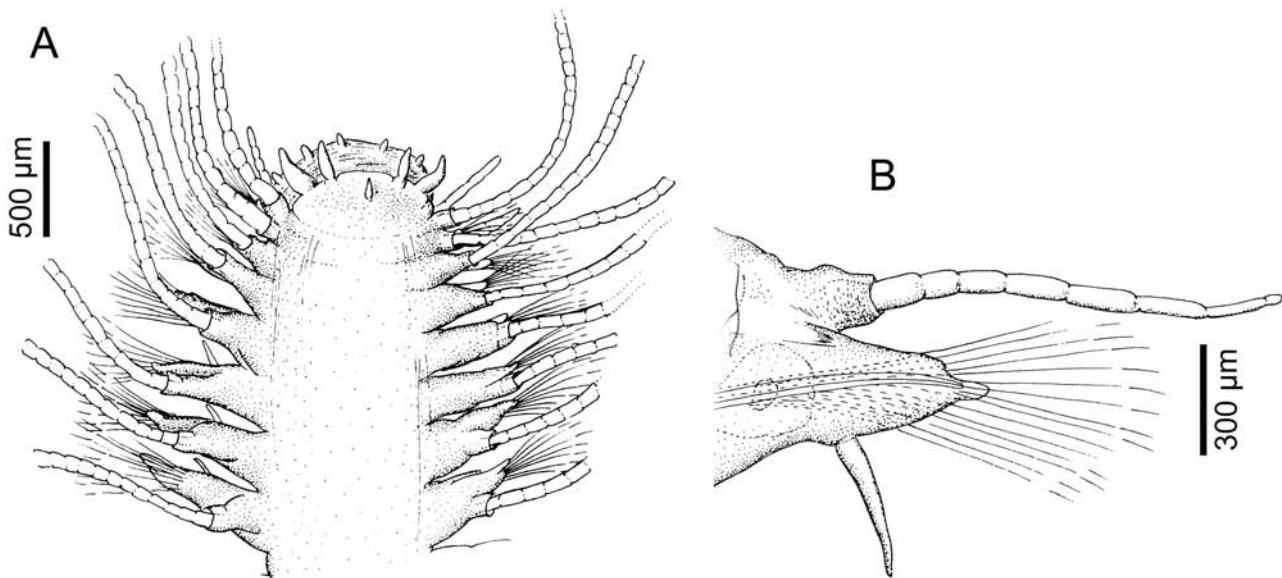
**Morphology:** Body shape anteriorly truncate and posteriorly tapered. Prostomium rounded rectangular, slightly wider than long. Palpophores short and large, palpostyles much longer, evenly tapered and pointed. Paired antennae similar to palpostyles but slightly smaller, median antenna similar to paired ones but much smaller, inserted on dorsal, posterior part of prostomium. Eyes absent. Everted proboscis smooth, unarmed, anterior end with ring of 10 small pointed papillae. Dorsal cirri of segment 1–2 or 1–3 (uncertain) larger than on following segments, ventral cirri on segment 1–2 larger than on following

segments and with developed cirrophores (also on segment 3). Notopodial lobes and notochaetae absent from all segments. Neuropodial lobes and neurochaetae present from segment 2. Neurochaetae all unidentate compounds. Ventral cirri subdistally inserted on neuropodium.

**Remarks:** Poorly known, requires redescription.

**Biology:** Densities of 2,844 individuals per m<sup>2</sup> have been recorded from mats of *Beggiatoa* (PETRECCA & GRASSLE 1989). Eggs large, about 250 µm in diameter.

**Distribution:** Guaymas Basin.



1A: Anterior end, dorsal view, proboscis everted; B: Right parapodium from chaetiger 6, anterior view; by courtesy of J. Blake.

### References:

- BLAKE J.A. (1985) Bull. Biol. Soc. Wash. **8**: 67-101.  
PETRECCA R.F. & J.F. GRASSLE (1989) Proc. Gorda Ridge Symp.: 279-283.  
PLEIJEL F. (1998) Zool. Scr. **27**: 89-163.

*Theyomytilidicola tridentatus* MIURA & HASHIMOTO, 1996

**Size:** Up to 20 mm in length. Up to 2.3 mm in width.

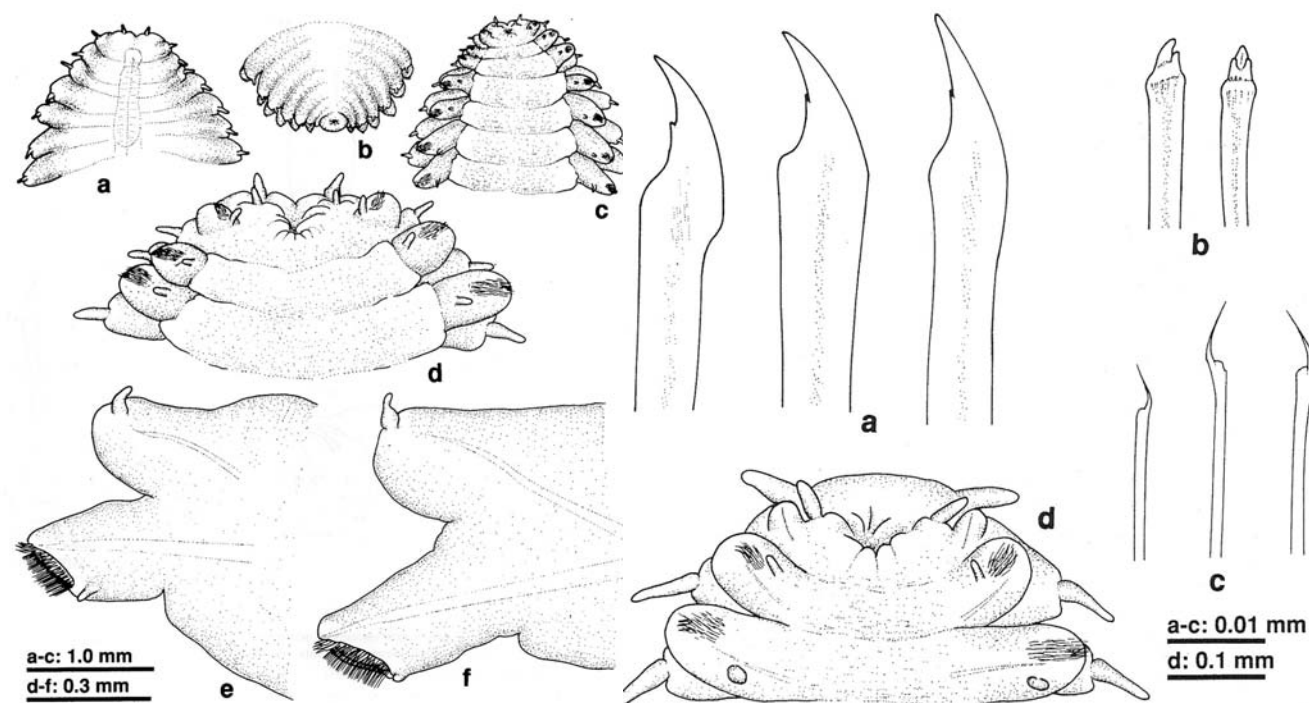
**Color:** Preserved specimens pale.

**Morphology:** Body flattened ventrally and arched dorsally, with 106 segments. Prostomium short with a pair of short cirriform antennae, without eyes. Second or tentacular segment completely fused to prostomium, lacking dorsal cirri and neurochaetae, defined by ventral cirri. Parapodia subbiramous throughout the body, with very short dorsal and ventral cirri. Notopodia slightly inflated, supported by single stout acicula. Neuropodia supported by a single stout neuroacicula, projecting from the parapodial base, slightly elongated on middle and posterior segments. Ventral cirri on ventro-posterior side of neuropodia, decreasing in size on middle and posterior parapodia. Neuropodial hooks on dorsal side of chaetal lobes, stout, slightly inflated subdistally, with minute projection on cutting

edge of the main fang; occurring up to five on each parapodium. Additional neurochaetae two kinds; tridentate chaetae on outer base of chaetal lobes, simple slender than neuropodial hooks, shorter than other chaetae, with blunt main tooth on one side of distal tip and two shorter blunt teeth on opposite side, occurring 10-20 per parapodium; minute slender chaetae on inner side of chaetal lobe, enlarged subdistally, with single distal mucronate spin, longer and more numerous than tridentate chaetae. Pygidium rounded, without anal cirri.

**Biology:** Living in the mantle cavity of the deep-sea mussel *Bathymodiolus adulosus*. Foregut with well muscularized part; stomodeum may be eversible. The species is thought to be parasitic.

**Distribution:** Okinawa Trough.



1A: Anterior end, dorsal view; B: Posterior end, dorsal view; C: Anterior end, ventral view; D: Same enlarged; E: Parapodium of the 12<sup>th</sup> segment (or parapodium 11); F: Parapodium 40, anterior view; from MIURA & HASHIMOTO (1996).

2A: Neuropodial hooks; B: Tridentate chaetae; C: Minute mucronate chaetae; D: Anterior end of a juvenile; from MIURA & HASHIMOTO (1996).

**Reference:**

MIURA T. & J. HASHIMOTO (1996) Publ. Seto Mar. Biol. Lab. **37**(3/6): 257-274.

*Mytilidiphila enseiensis* MIURA & HASHIMOTO, 1993

**Size:** Up to 28 mm in length. Up to 1.5 mm in width.

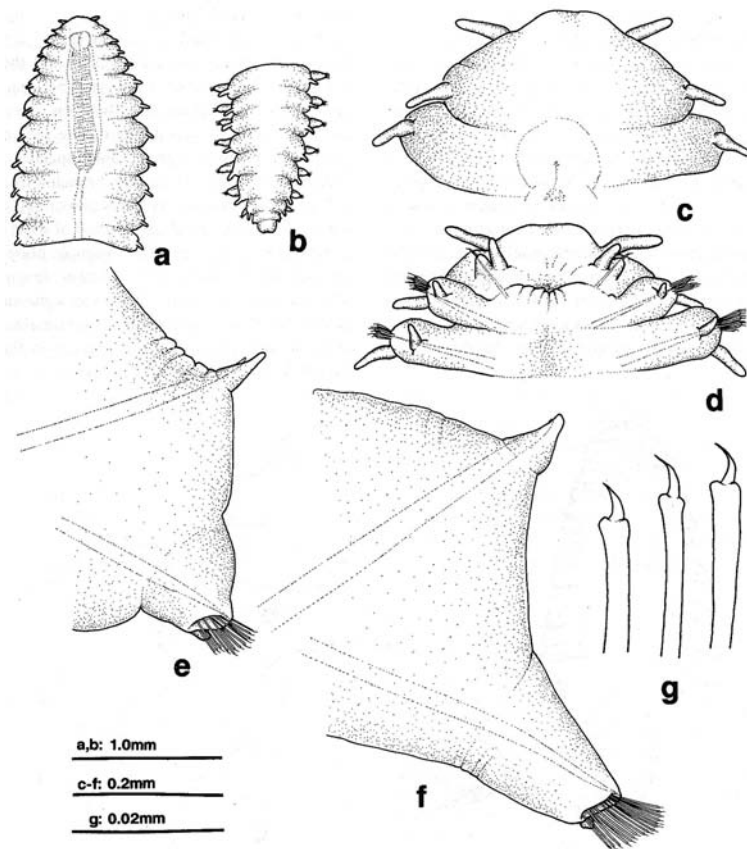
**Color:** Preserved specimens pale.

**Morphology:** Body long, vermiform, flattened ventrally and arched dorsally, with up to 164 segments; first segment tentacular, chaetigerous. Prostomium short with a pair of short cirri-form antennae, without eyes. Second segment well fused with prostomium, defined by embedded acicula and ventral cirri as well as projected simple hooks. Notopodia very short, with dorsal cirri and stout acicula. Neuropodia cylindrical, with very

short ventral cirri and stout acicula; ventral hooks simple, thin, occurring more than 35 as maximal number of posterior parapodia. Pygidium simple, without anal cirri.

**Biology:** Living in the mantle cavity of a burrowing deep-sea mussel (*Adula?*). Foregut with well muscularized part; stomodeum may be eversible. The species is thought to be parasitic.

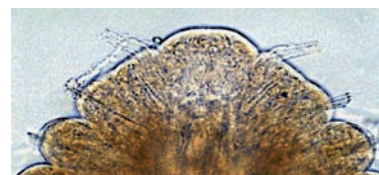
**Distribution:** Okinawa Trough.



1A: Anterior end, dorsal view; B: Posterior end, dorsal view; C: Anterior end enlarged, dorsal view; D: Same, ventral view; E: Parapodium of the 11<sup>th</sup> segment, anterior view; F: Parapodium of the 27<sup>th</sup> segment, anterior view; G: Hooks; from MIURA & HASHIMOTO (1993).



2: Anterior part in dorsal view; by T. Miura.



3: Details of the prostomium; by T. Miura.

**References:**

- HASHIMOTO J., OHTA S., FUJIKURA K. & T. MIURA (1995) Deep-Sea Res. **42**: 577-598.  
 MIURA T. & J. HASHIMOTO (1993) Zool. Soc. **10**: 169-174.



*Mytilidiphila okinawaensis* MIURA & HASHIMOTO, 1993

**Size:** Up to 15 mm in length. Up to 1.4 mm in width.

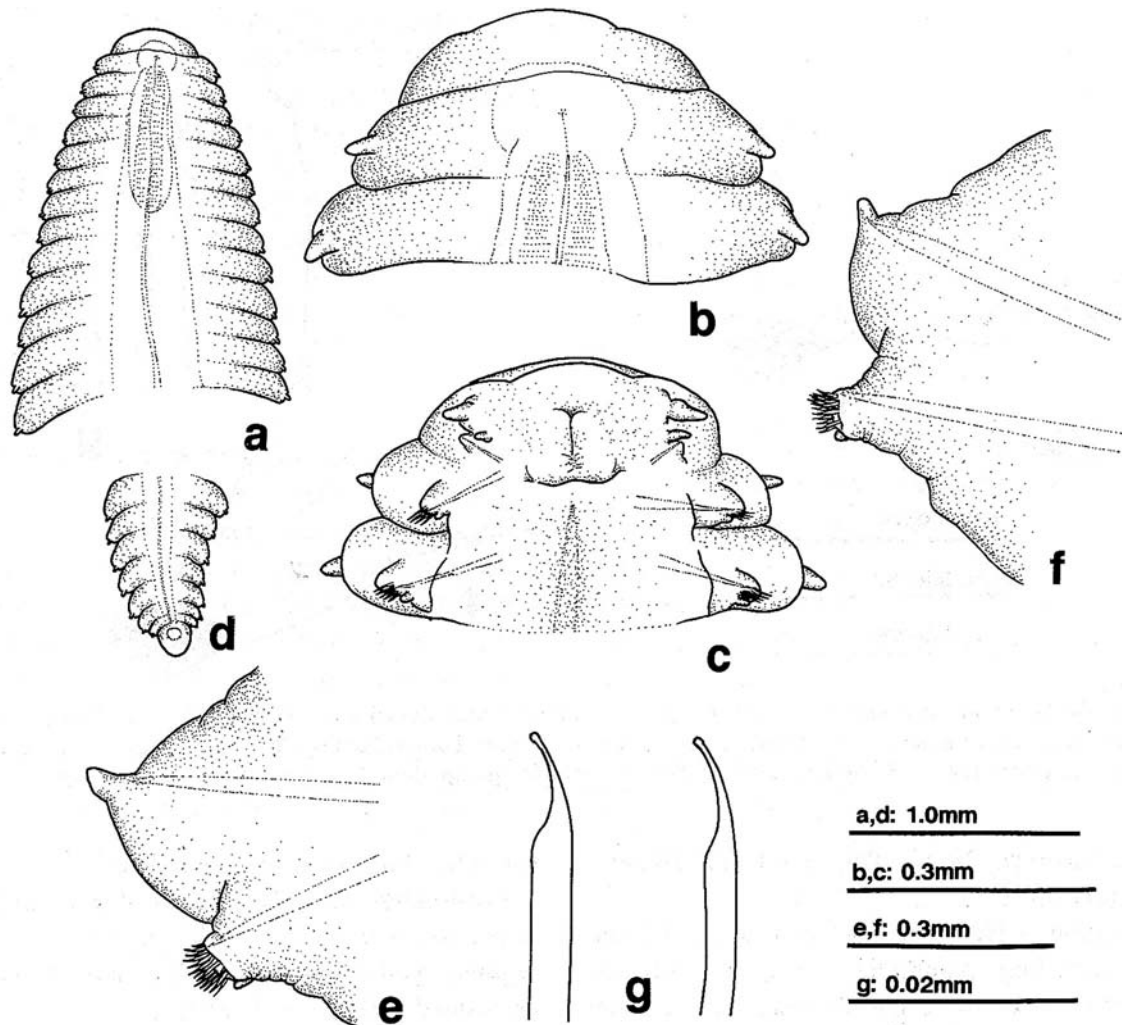
**Color:** Preserved specimens pale.

**Morphology:** Body long, vermiform, flattened ventrally and arched dorsally, with about 100 segments; first segment tentacular, achaetous. Prostomium short with ventrally a pair of cirri-form antennae, without eyes. Second or tentacular segment well fused with prostomium, achaetous, defined by embedded acicula and ventral cirri. Notopodia very short, with dorsal cirri and stout acicula. Neuropodia short cylindrical, with very

short ventral cirri and stout acicula; ventral hooks simple, thin, occurring more than 30 as maximal number on posterior parapodia. Pygidium rounded, without anal cirri.

**Biology:** Living in the mantle cavity of a deep-sea mussel *Bathymodiolus japonicus*. Foregut with well muscularized part; stomodeum may be eversible. The species is thought to be parasitic.

**Distribution:** Okinawa Trough.



1A: anterior end, dorsal view; B: Same enlarged, dorsal view; C: Same, ventral view; D: Posterior end, dorsal view; E: Parapodium of the 11<sup>th</sup> segment (or parapodium 10) anterior view; F: Parapodium of the 36<sup>th</sup> segment (or parapodium 35), anterior view; G: Hooks; from MIURA & HASHIMOTO (1993).

**References:**

HASHIMOTO J., OHTA S., FUJIKURA K. & T. MIURA (1995) Deep-Sea Res. **42**: 577-598.  
 MIURA T. & J. HASHIMOTO (1993) Zool. Soc. **10**: 169-174.

Annelida, Polychaeta, Phyllodocida, Nautiliniellidae

*Shinkai longipedata* MIURA & OHTA, 1991

**Size:** Up to 200 mm in length. Up to 6.0 mm in width.

**Color:** In alcohol light greenish brown; parapodia darker than trunk (small individuals pale or colorless).

**Morphology:** Body long, vermiform, flattened ventrally and arched dorsally, with about 242 segments (excluding preanal achaetous segments); first segment tentacular, chaetigerous. Prostomium with a pair of antennae. Notopodia elongated, with short dorsal cirri and thin acicula. Neuropodia globular, with very short ventral cirri and stout acicula; ventral hooks

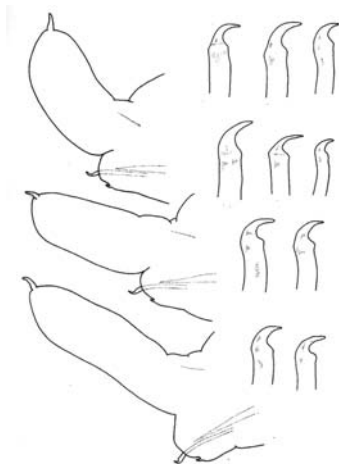
simple, stout, 2-10 as maximal number on anterior parapodia or occurring singly on succeeding parapodia.

**Biology:** Living in the mantle of a giant clam species of the genus *Calyptogena*. Foregut with well muscularized part; stomodaeum may be eversible. The species is thought to be parasitic.

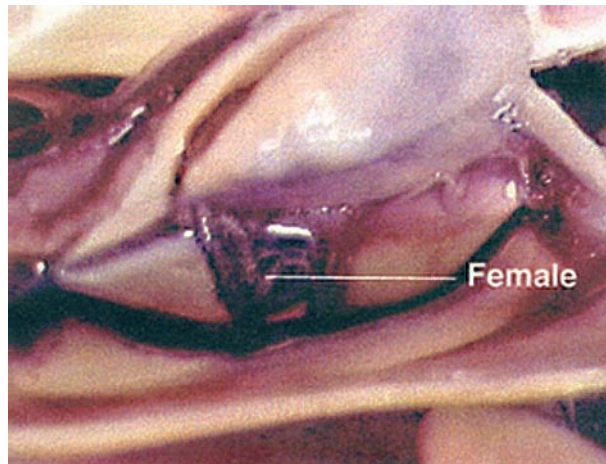
**Distribution:** Okinawa Trough.



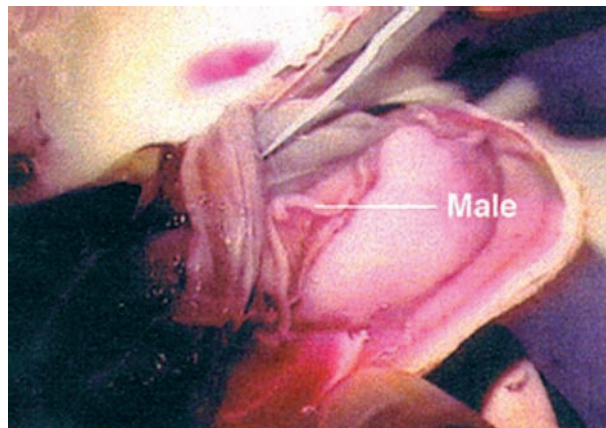
1: Ventral view of the anterior part.



2: Variations in parapodia and chaetae.



3: Female as found in the clams' mantle cavity; by courtesy of T. Miura.



4: Male as found in the clams' mantle cavity; by courtesy of T. Miura.

**References:**

- MIURA T. & J. HASHIMOTO (1996) Publ. Seto Mar. Biol. Lab. **37**(3/6): 257-274.  
MIURA T. & S. OHTA (1991) Zool. Soc. **8**: 383-387.

*Shinkai semilonga* MIURA & HASHIMOTO, 1996

**Size:** Up to 100 mm in length. Up to 3.9 mm in width.

**Color:** The female is deep purplish brown on parapodia and the male whitish.

**Morphology:** Body long, vermiform, flattened ventrally and arched dorsally, with about 267 segments (excluding preanal achaetous segments). Prostomium short, with a pair of short antennae, without eyes. Tentacular segment well fused with prostomium, with dorsal cirri and ventral cirri, neuroacicula, and numerous neuropodial hooks. Foregut with strongly muscularized part. Pygidium rounded, without anal cirri.

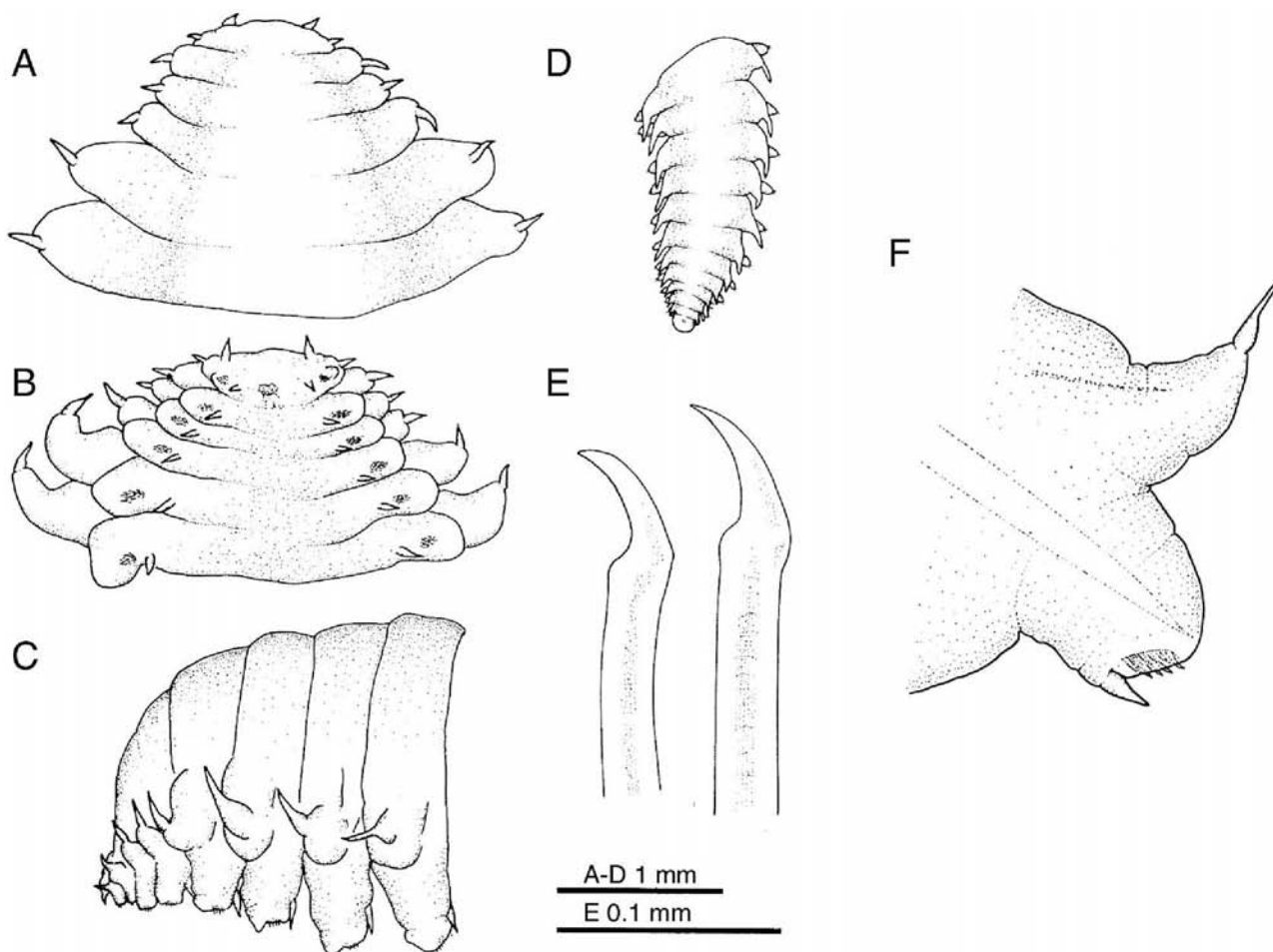
Parapodia subbiramous, with dorsal and ventral cirri. Notopodia slightly elongated, supported by single, very thin notoacicula; dorsal cirri short, on distal end of notopodia. Neuropodia well developed, supported by single stout neuroacicula; ventral cirri on ventro-posterior side of neuropodia, shorter than dorsal cirri.

Neuropodial hooks simple, stout, slightly curved on distal end; number of hooks per parapodium, about 15 on parapodia 1-3, more than 25 on parapodia 4-6 as maximum, then decreasing to reach about ten on parapodium 10, 5-8 on parapodia 50-200.

**Remark:** A closely related species has been sampled at Manus Back-Arc Basin: Desmos Cauldron (Shinkai 2K # 916). It differs from *S. semilonga* by the shape of the neuropodial hooks, which have a tridentate apical end.

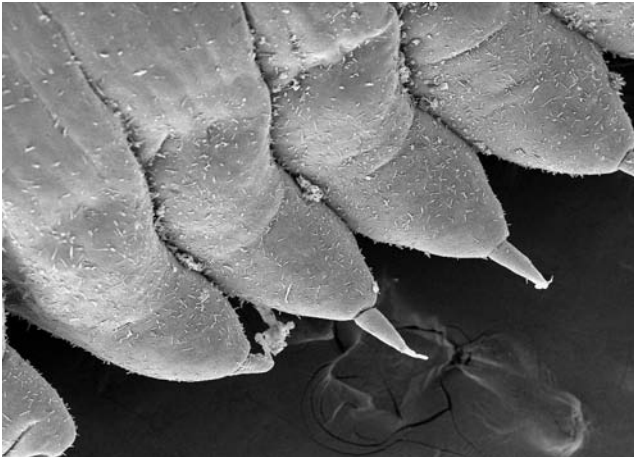
**Biology:** Living in the valve cavity of a giant clam *Calyptogena solidissima*. The species is thought to be parasitic.

**Distribution:** Okinawa Trough: Minami-Ensei Knoll.

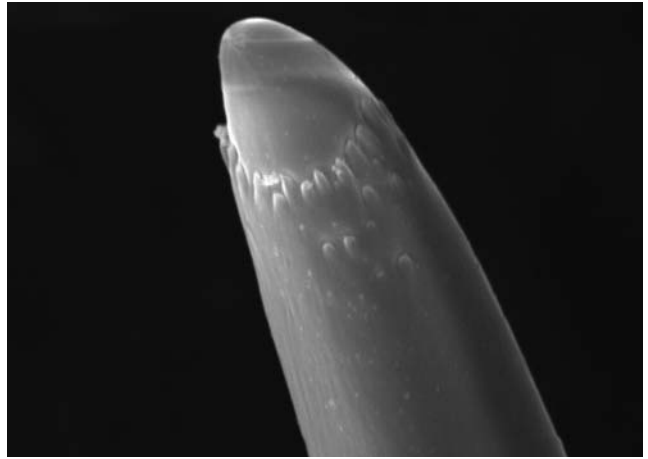


1A: Anterior end, dorsal view; B: Same, ventral view; C: Same, lateral view; D: Posterior end, dorsal view; E: Neuropodial hooks from parapodia 51 (right) and 200 (left); F: Parapodium; from MIURA & HASHIMOTO (1996).





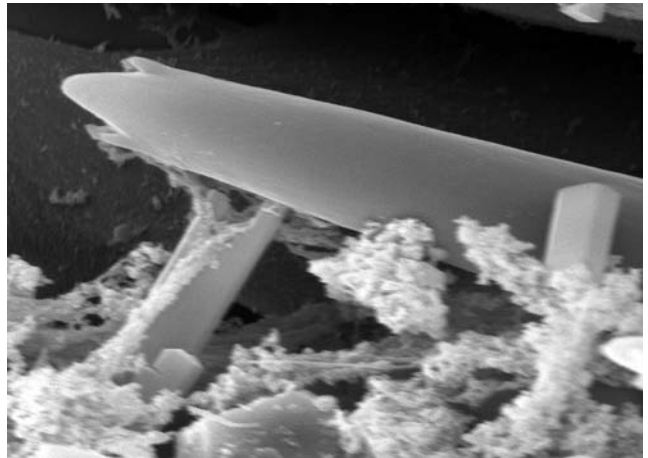
2: *Shinkaia* sp., middle segments dorsal view (SEM); Manus Basin © Ifremer.



3: *Shinkaia* sp., distal view of posterior hooks (SEM); Manus Basin © Ifremer.



4: *Shinkaia* sp., tridentate hooks from anterior parapodia (SEM); Manus Basin © Ifremer.



5: *Shinkaia* sp., tridentate hooks from anterior parapodia (SEM); Manus Basin © Ifremer.

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**Reference:**

MIURA T. & J. HASHIMOTO (1996) Publ. Seto Mar. Biol. Lab. **37**(3/6): 257-274.

## *Nereis piscesae* BLAKE & HILBIG, 1990

**Size:** A large, robust species, some fragments up to 5 cm long; largest complete specimens 75 mm long, 7 mm wide, for 100 segments.

**Morphology:** Prostomium triangular, narrowing anteriorly to rounded tip bearing two short antennae; eyes absent, but two pairs of sunken depressions representing positions of missing eyes present; palps thickened, fleshy, each bearing two finger-like palpostyles. Peristomium enlarged, inflated, surrounding prostomial structures; four pairs of tentacular cirri. Jaws golden, pointed, each with 78 teeth. Paragnaths all conical, arranged as follows: I – two large cones in vertical row; II – 12 large cones in nearly circular arc; III – 21-22 small and large cones in cluster; IV – 19-20 small and large in three distinct clusters arranged in three transverse rows; V – 0; VI – 46 large pointed cones; VII – two small cones; VIII – two groups of two small cones. Parapodia of middle and posterior segments with upper notopodial ligule becoming enlarged and flattened, with distinct dorsal curvature and tapering triangular tip, with thickened glandular border, bearing thin dorsal cirrus; lower notopodial ligule tapering, not enlarged; neuropodial ligule thickened

basally, tapering distally; ventral cirrus narrow, cirriform. Notopodial acicular lobes small in both anterior and posterior segments. Neuropodial acicular lobes conical throughout. Four types of chaetae present. Anterior notochaetae all homogomph spinigers replaced from segments 30-35 by 1-2 heavy homogomph falcigers with elongated blades bearing 6-8 blunt denticles [not seen in specimens from type locality studied by D. Desbruyères, probably worn falcigers]; upper neurochaetae including heterogomph spinigers and heterogomph falcigers; lower neurosetae include homogomph spinigers and heterogomph falcigers; blades of all spinigers with thin denticles on cutting edge; falcigers with thin, pointed denticles; shafts of all chaetae smooth; internally ornamented with dark brown to black camerations.

**Biology:** An epifaunal species associated with siboglinids. The species is probably an omnivore, feeding on filamentous bacteria.

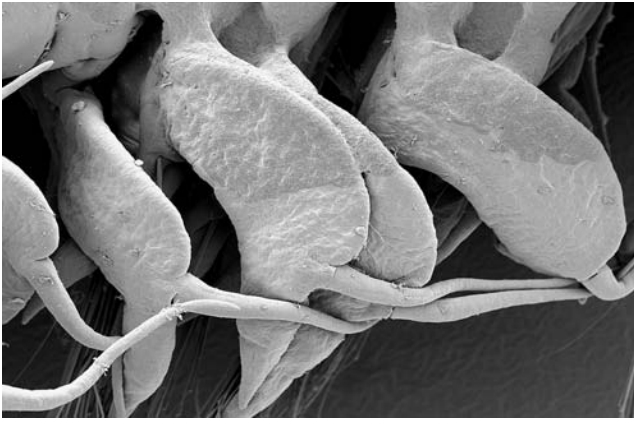
**Distribution:** Juan de Fuca Ridge.



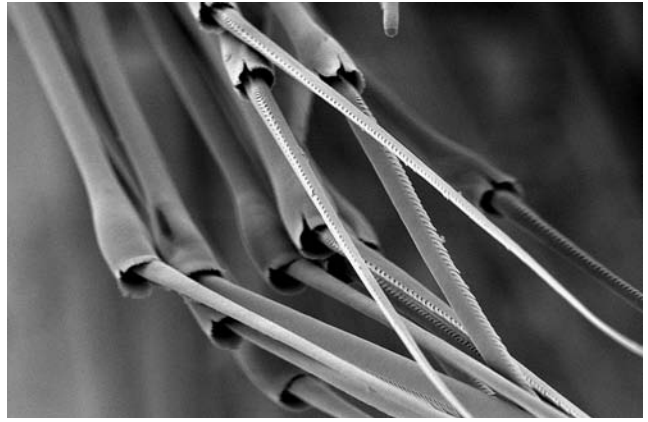
1: Anterior end, ventral view (SEM) © Ifremer.



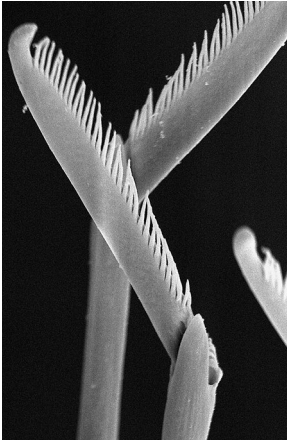
2: Anterior end, lateral view (SEM) © Ifremer.



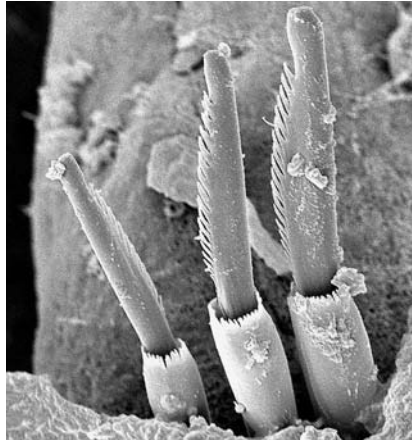
3: Enlarged notopodial ligule of middle segments (SEM)  
© Ifremer.



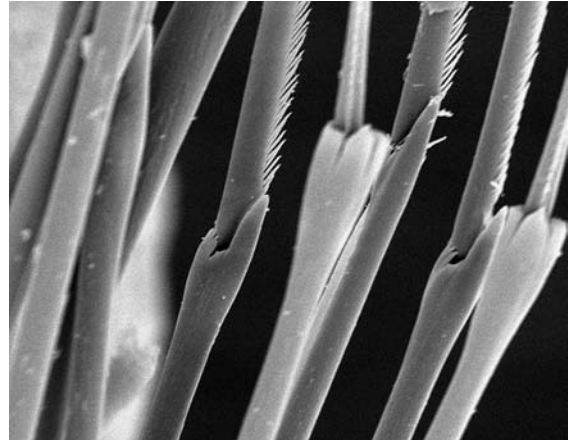
4: Anterior notochaetae homogomph spinigers (SEM)  
© Ifremer.



5: Heterogomph falcigers of upper neurochaetae (SEM)  
© Ifremer.



6: Heavy homogomph falciger of posterior notopods (SEM)  
© Ifremer.



7: Lower neurochaetae of posterior segments including heterogomph falcigers and homogomph spinigers (SEM) © Ifremer.

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#### Reference:

BLAKE J.A. & B. HILBIG (1990) *Pac. Sci.* **44**: 219-253.



*Nereis sandersi* BLAKE, 1985

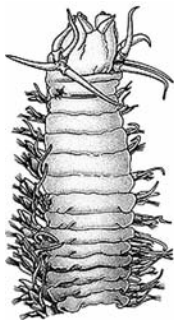
**Size:** Largest specimen 95 mm.

**Morphology:** Parapodia elongated in posterior segments, providing ragged appearance to worm. Body terminated in two long anal cirri, each with basal swelling. Jaws black to golden, with 10-12 blunt teeth. Paragnaths all conical, arranged as follows: I – 4-6 in vertical cluster; II – about 30 small cones in an arc; III, IV – 85-100 small cones in dense field; V – 0; VI 4-5 dark large, curved cones in cluster; VII – two irregular rows of about 10 cones each; VIII – 1-2 large colored cones and 3-4 cones. Parapodia of segments 1-2 uniramous, following parapodia biramous with two black acicula. Four types of chaetae pres-

ent: anterior chaetae homogomph spinigers replaced by 4-6 heavily homogomph falcigers. Lower neurochaetae include homogomph spinigers and heterogomph falcigers; blades of all spinigers with thin denticles on cutting edge.

**Biology:** On smoker's walls, dwelling inside active/inactive deposits. Some nereids are carnivorous, others are grazers of bacterial mats.

**Distribution:** Galapagos Spreading Center, Northern East Pacific Rise, Guaymas Basin.



1: Anterior part; by V. Martin © Ifremer.



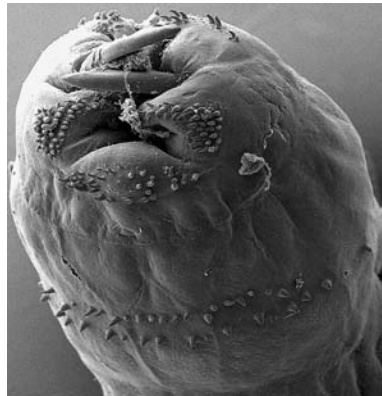
2: Anterior part in vivo © Ifremer.



3: Prostomium, frontal view (SEM) © Ifremer.



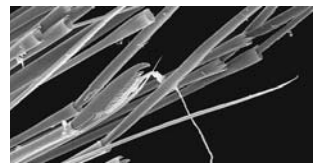
4: Specimen on a smoker wall (EPR 13°N); cruise Phare © Ifremer.



5: Everted proboscis showing jaws and paragnaths (SEM) © Ifremer.



6: Posterior parapodia elongated in vivo © Ifremer.



7: Homogomph falcigers (SEM) © Ifremer.

**Reference:**

BLAKE J.A. (1985) Bull. Biol. Soc. Wash. **6**: 67-101.

## *Eulalia papillosa* (BLAKE, 1985)

**Size:** Up 13 mm long, 0.8 mm wide, for 75 segments.

**Color:** In alcohol opaque white with brown pigment granules on antennae, cirri, and body surface.

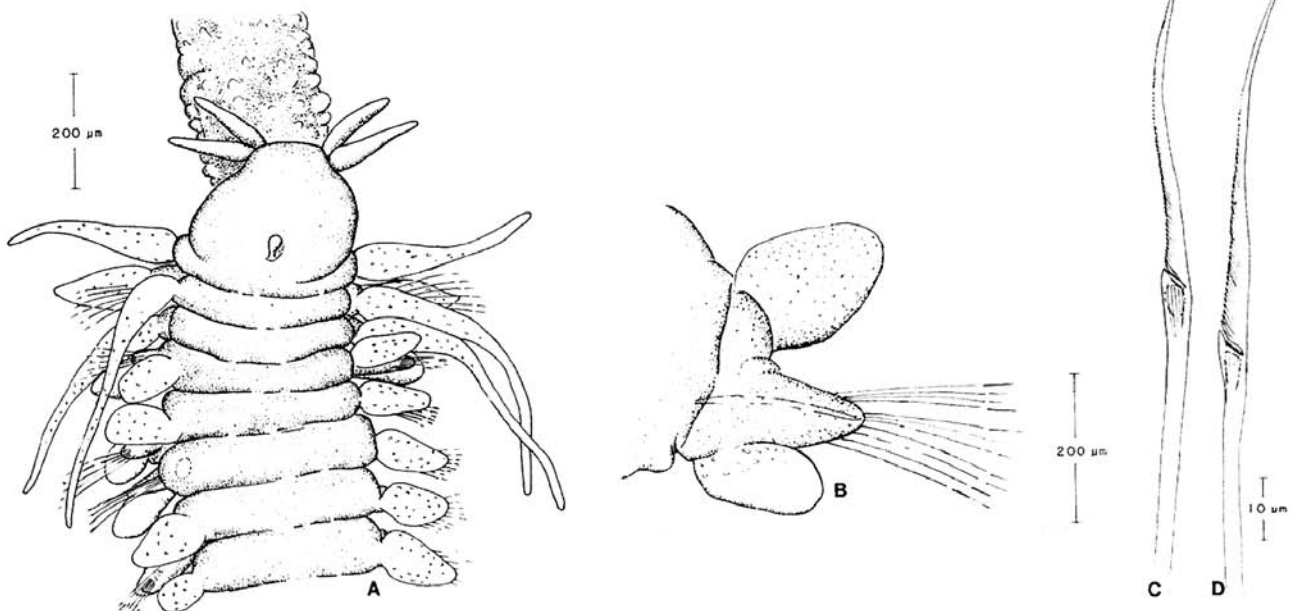
**Morphology:** Prostomium pear-shaped, slightly wider than long with four frontal antennae; with short, clavate median antenna on posterior one-fourth. With four pairs of tentacular cirri on three segments with following formula:  $1 + S^{1/1} + S^{1/n}$ ; ventral tentacular cirrus of segment 2 short, broad, pointed; other three tentacular cirri long, tapering, cirriform. Dorsal cirri from segment 4 longer than wide, oval-shaped; ventral cirri asymmetrical, not pointed, shorter than podial lobe. Parapodia uniramous with single internal aciculum and 10-12 compound spinigers,

each with shaft bearing single medial tooth and fine lateral denticles, blade with finely serrated cutting edge. Pygidium with two long broad flattened cirri.

**Remarks:** *E. papillosa* was originally described as a species of *Protomystides*. However, the median antenna was misinterpreted as a papilla and when correctly interpreted, the species agrees with the definition of *Eulalia*.

**Biology:** An epifaunal species associated with *Riftia* and *Calypptogena*. The species probably feeds on small epifaunal invertebrates.

**Distribution:** East Pacific Rise at 21°N.



1A: Anterior end, dorsal view with pharynx everted; B: Left parapodium from posterior region, anterior view; C-D: Composite chaetae; from BLAKE (1985).

### Reference:

BLAKE J.A. (1985) Bull. Biol. Soc. Wash. **8**: 67-101.

## *Galapagomystides aristata* BLAKE, 1985

**Size:** Up to 20 mm long, 1.2 mm wide, with about 90 segments.

**Morphology:** Color dark brown to light tan, with dark brown spots on prostomium, antennae, tentacular cirri, and dorsal ventral cirri. Prostomium wider than long bearing four long, cirriform frontal antennae shifted ventrolaterally. Proboscis narrow, smooth. Segment 1 dorsally fused to prostomium, free ventrally; segments 2-3 distinct dorsally and ventrally. Three pairs of long, cirriform tentacular cirri with following formula:  $1 + S^1/1 + S^0/n$ . Segment 3 without dorsal cirrus. Dorsal cirri from segment 4 long, thickened, fleshy, tapering distally. Ventral cirri small, oval subequal to podial lobe. Parapodia uniramous

bearing 4-8 heavy compound chaetae with heavy shaft and thin, aristate-like narrow blade. Pygidium with pair of long, thick cirri.

**Biology:** An epifaunal species associated with siboglinid tubes and mussels. The species is probably a scavenger, or a possible predator on small invertebrates. This worm was proposed to be an hematophagous.

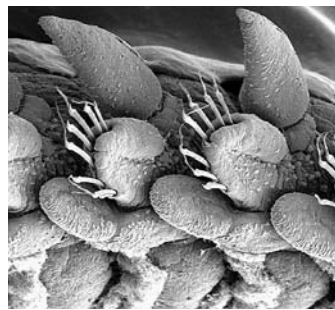
**Distribution:** Galapagos Spreading Center; East Pacific Rise: 13°N, 9°N; common species.



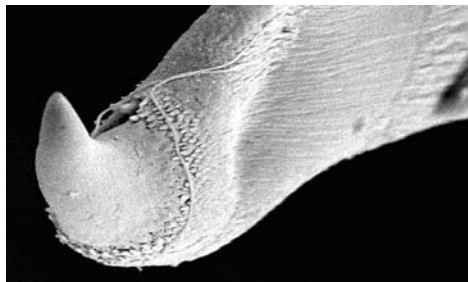
1: Habitus in vivo (dorsal); by P. Briand © Ifremer.



2: Ventral view (SEM) © Ifremer.



3: Middle parapodia, right side (SEM) © Ifremer.



4: Shaft of a composite chaetae (SEM) © Ifremer.



5: Aristate-like composite chaetae (SEM) © Ifremer.

### References:

- BLAKE J.A. (1985) Bull. Biol. Soc. Wash. **8**: 67-101.  
DESBRUYÈRES D., GAILL F., LALLIER L. & Y. FAUQUET (1985) Bull. Biol. Soc. Wash. **8**: 103-116.  
JENKINS C.D., WARD M.E., TURNIPSEED M., OSTERBERG J. & C. VAN DOVER (2002) Invertebr. Biol. **121**: 243-254.



*Protomystides verenae* BLAKE & HILBIG, 1990

**Size:** Up to 27 mm long, 2.1 mm wide, for 75 segments.

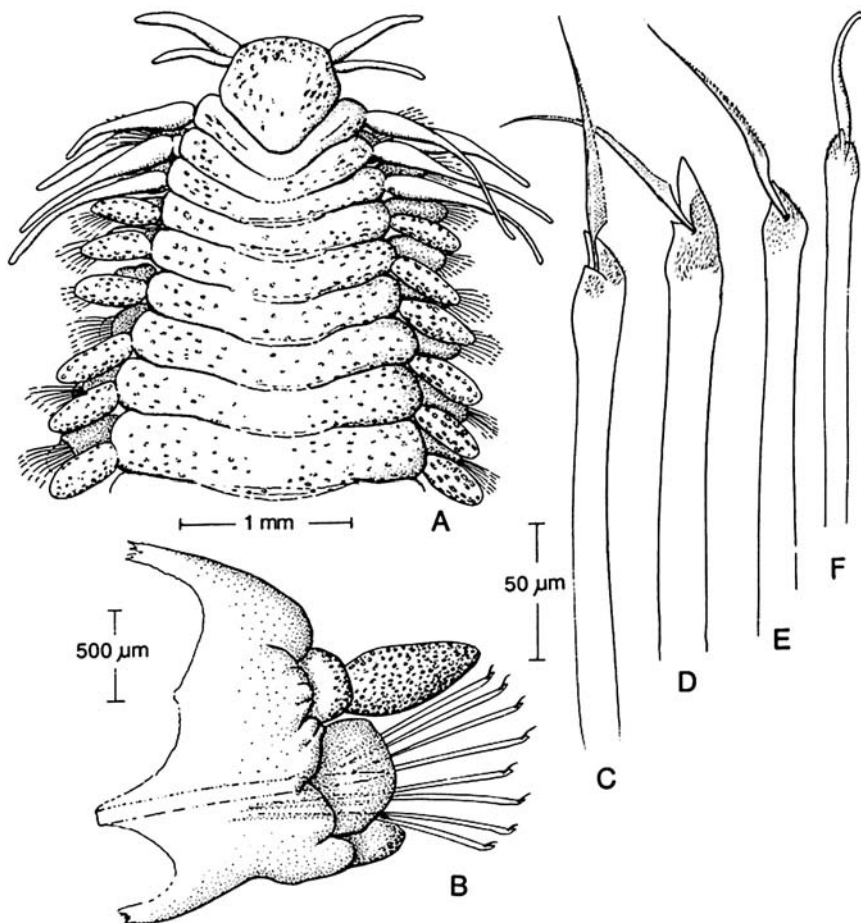
**Color:** Body dark brown to light tan with dark spots on prostomium, all cirri, and body segments.

**Morphology:** Prostomium trapezoidal, broadly rounded anteriorly, as wide as long, V-shaped posteriorly; with four long, cirri-form antennae, ventral pair shifted ventrolaterally. Anterior segments free from one another and prostomium. With three pairs of long, tapering, cirriform tentacular cirri with following formula:  $1 + S^1_1 + S^1_1$ . Dorsal cirri from segment 4, each short, oval, thickened, about 2-3 times as long as wide. Dorsal cirri of anterior segments long, extending well beyond podial lobe; those of middle segments smaller, shifted to higher location on body wall; ventral cirri shorter than ventral cirri throughout;

both dorsal and ventral cirri with dense concentrations of brown pigment spots. Parapodia uniramous bearing single acicula and fascicle of 8-12 compound spinigers of two types: (1) large, heavy, brown in color, (2) small, thin, non-colored; both with shaft bearing large, pointed terminal tooth and subapical notch from which thin blade emerges; tip of shaft with fine teeth along one edge. Pygidium bearing two long, cirriform anal cirri.

**Biology:** The species is likely an epifaunal associate of vestimentiferans and other larger invertebrates found at vent sites. The species is probably predatory on small invertebrates.

**Distribution:** Explorer Ridge and Juan de Fuca Ridge.



1A: Anterior end in dorsal view; B: Right middle parapodium; C-F: Composite chaetae; from BLAKE & HILBIG (1988).



2: Habitus; scale bar 1 mm; by courtesy of V. Tunnicliffe.

#### References:

- BLAKE J.A. & B. HILBIG, (1990) *Pac. Sci.* **44**: 219-253.  
 TUNNICLIFFE V. (1988) *Proc. R. Soc. Lond. B* **233**: 347-366.

*Bathykurila guaymasensis* PETTIBONE, 1989

**Size:** Up to 8 mm in length.

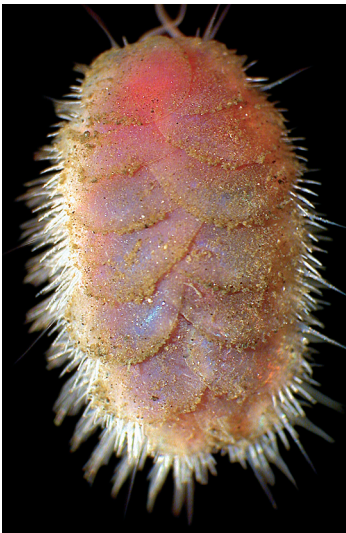
**Color:** Pinkish red.

**Morphology:** Body fusiform, flattened, with 15 segments (first achaetous). Elytra seven pairs on segments 2, 4, 5, 7, 9, 11, and 13, large, oval, covering dorsum, delicate, with larger conical to rounded tubercles variable in size on posterior and lateral borders with smaller ones scattered on surface. Prostomium oval, deeply bilobed with triangular anterior continuations bearing small frontal filaments. First or tentacular fused to prostomium, not visible dorsally; tentaculophores lateral to prostomium, each with prominent acicular lobe on inner side, without chaetae, and pair of subulate tentacular cirri, shorter than palps; upper lip large bilobed. Notopodia rounded basally with

projecting acicular lobes on lower side. Neuropodia with conical projecting prechaetal acicular lobe and shorter, rounded postchaetal lobe. Notochaetae numerous, short to longer forming radiating bundles stouter than neurochaetae, with row of widely spaced teeth along one side and blunt tips. Neurochaetae very numerous forming fan-shaped bundles; neurochaetae with two rows of long spines. Pair of long ventral papillae present in males on segment 11, sometimes extending far beyond posterior end. Posterior two segments smaller, enclosed in elytragerous segment 13. Pygidium long with pair of slender short anal cirri.

**Biology:** Found also on whale carcasses.

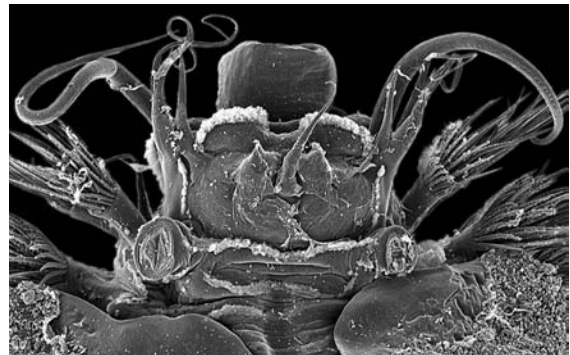
**Distribution:** Guaymas Basin.



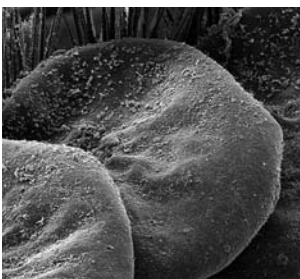
1: Dorsal view in vivo; by courtesy of A. Glover.



2: Ventral view in vivo; by courtesy of A. Glover.



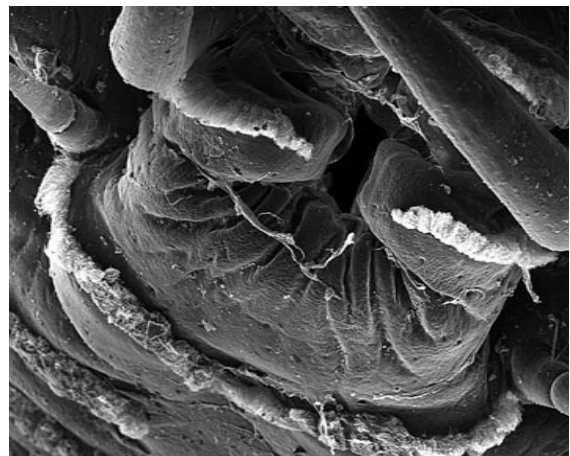
3: Prostomium, dorsal view (SEM); by courtesy of A. Glover.



4: Elytra (SEM); by courtesy of A. Glover.



5: Distal part of sexual male ventral papillae; (SEM); by courtesy of A. Glover.



6: Anterior end, ventral view (SEM); by courtesy of A. Glover.

**Reference:**

PETTIBONE M. (1989) Proc. Biol. Soc. Wash. **102**(1): 154-168.



*Branchinotogluma hessleri* PETTIBONE, 1985

**Synonym:** *Opisthotrochopodus alvinus* PETTIBONE, 1985.

**Size:** Up to 16 mm.

**Morphology:** Segments 21. Body flattened, tapering slightly anteriorly and posteriorly, with parapodia longer than body width. Dorsum with transverse ciliated bands. Elytra 10 pairs. Elytra covering dorsum, round to oval with branched “veins”. Dorsal cirri with short cylindrical cirrophores and long tapered smooth styles extending beyond tips of chaetae. Groups of arborescent branchiae attached on the lateral sides of elytraphores and dorsal tubercles. Branchiae beginning on segment 3 as two small groups and becoming larger posteriorly. Prostomium bilobed, oval anterior lobes triangular with delicate frontal filaments. Median antenna with bulbous ceratophore. Palp stout, tapering, smooth. First segment with two tentacular cirri. Notopodium with hood or bract encircling small bundle of chaetae. Everted pharynx with three dorsal and two ventral papillae, two pairs of prominent jaws with minute denticles on the inner border. Notopodia with short conical acicular lobes and on elytrigerous segments, with prominent bracts enclosing notochaetae dorsally and posteriorly. Notochaetae acicular much stouter than neurochaetae, smooth or with 1-2 rows of short spines. Neurochaetae slender, very numerous, forming fan-shaped bundles. Few upper neurochaetae with more prominent spines, with tip flattened and finely spinous. Tips slightly hooked, with finely spinous hood.

In females pygidium consisting of small squarish, to rounded lobes wedged between bases of posteriorly-directed parapodia of

posterior two segments, with pair of anal cirri. Six pairs of small rounded segmental lamellae near ventral bases of neuropodia of segments 11-16.

In males (described as *Opisthotrochopodus alvinus*), segment 12 with a greatly extended papilla, parapodia of posterior four segments modified and directed posteriorly differing from one another. Parapodia of chaetigerous segment 18 smaller than preceding and following parapodia. Notopodium represented as a small acicular lobe with a bundle of short smooth acicular chaetae and delicate rounded flattened lamella. Neuropodium without neurochaetae. Modified parapodia of segment 19 without chaetae with small elytraphore and elongate-oval elytron. Parapodium 20 greatly modified. Notopodium represented by achaetous elongated cylindrical acicular lobe with distal style of dorsal cirrus. Neuropodium forming large cylindrical acicular lobe with projecting conical acicular process and enclosing circle of chaetae of several types. Segment 21 with right and left parapodia closely approximated medially and directed posteriorly. Notopodium consisting of expanded thin lamella and thickened acicular lobes without notochaetae. Neuropodium also with expanded thin lamella and thickened acicular lobes with a small bundle of needle-like neurochaetae. Pygidium consisting of small ovale lobe without anal cirri.

**Biology:** Found in *Riftia* and *Calyptogena* washes.

**Distribution:** East Pacific: from Guaymas Basin to East Pacific Rise 9°N, Galapagos Spreading Center.

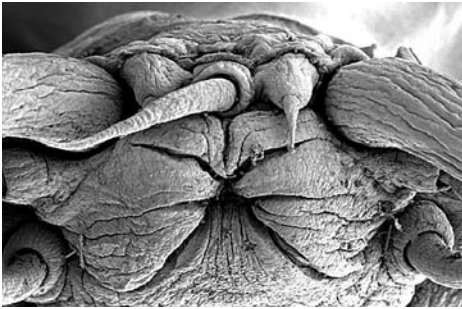


1: Habitus in vivo; by P. Briand © Ifremer.

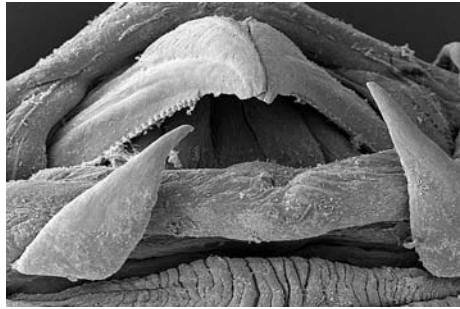


2: In vivo, ventral view of a male specimen; by P. Briand © Ifremer.

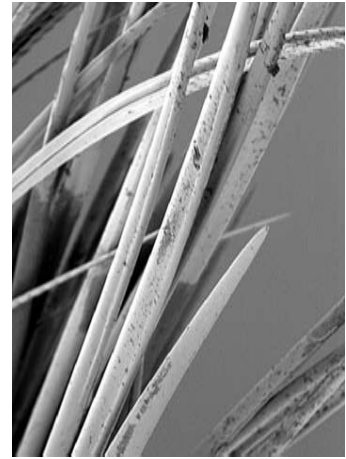




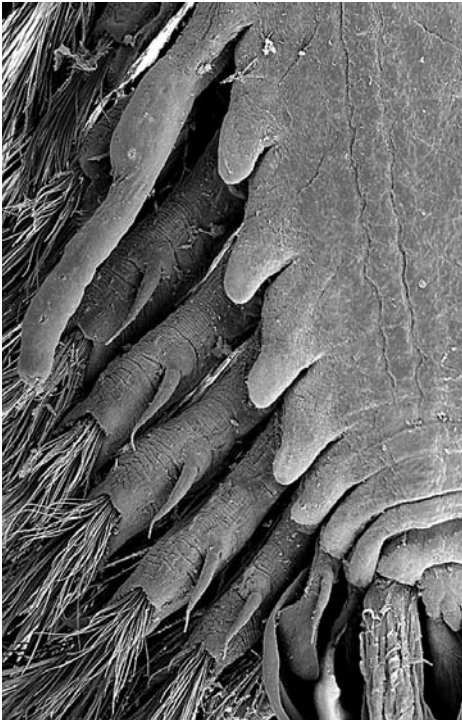
3: Prostomium, apical view (SEM)  
© Ifremer.



4: Jaws and proboscis papillae, apical view (SEM) © Ifremer.



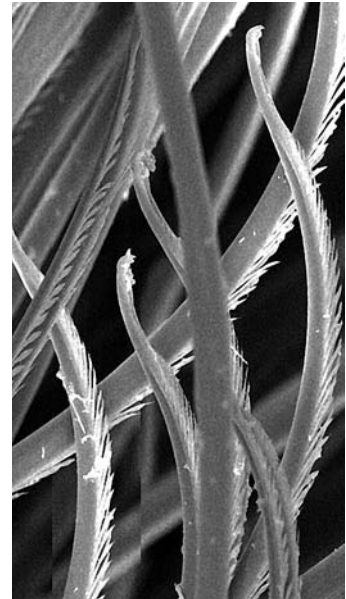
5: Notochaetae (SEM) © Ifremer.



6: Ventral view of the posterior part of a male specimen showing the elongated papilla of the segment 12 (SEM) © Ifremer.



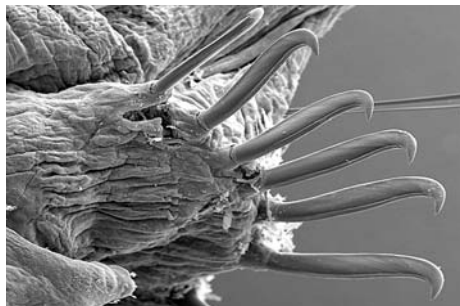
7: Modified segments 18-21, ventral view (SEM) © Ifremer.



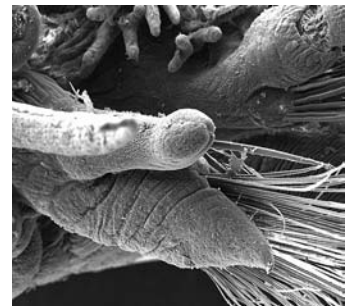
8: Upper neurochaetae (SEM) © Ifremer.



9: Parapodium (SEM)  
© Ifremer.



10: Hooked neurochaetae from chaetiger 20 (SEM) © Ifremer.



11: Bract second segment (SEM) © Ifremer.

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#### Reference:

PETTIBONE M.H. (1985) Proc. Biol. Soc. Wash. **98**: 447-469.

## *Branchinotogluma marianus* (PETTIBONE, 1989)

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**Synonym:** *Opisthotrochopodus marianus* PETTIBONE, 1989.

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**Size:** Up to 6 mm in length. Up to 3 mm in width.

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**Morphology:** Body flattened, with 21 segments (first achaetous). Dorsum with transverse ciliated bands. Elytra 10 pairs on segments 2, 4, 5, 7, 9, 11, 13, 15, 17 and 19. Elytra covering the dorsum, except for posterior modified segments (elytra very small on segments 17 and 19). Branchiae delicate, arborescent, on lateral bases of elytriphores and dorsal tubercles and dorsal bases of notopodia, beginning on segment 3 as two small groups, becoming larger and continuing to segment 15 as a small group. Muscular pharynx encircled distally by four pairs of papillae, dorsal with two medial ones larger and lateral ones smaller, ventral with four small papillae; two pairs of curved reddish jaws occupying most of opening, without denticles on inner border. Parapodia 2-16 biramous with notopodia shorter than neuropodia. Notopodia long, conical with notochaetae short smooth, or longer with faint spinuous rows. Larger neuropodia with prechaetal lobe long, subconical, with projecting acicular process, postchaetal lobe shorter rounded. Neurochaetae with slightly hooked tips. Elongated ventral papillae on segment 12 extending posteriorly to segment 15. six pairs of short, flat ventral lamellae on segments 13-18. Parapodia from

segment 15 more or less modified. Parapodia 16 and following parapodia without branchiae. Parapodium 17 with a neuropodium shorter than ventral cirrus. Parapodium 18 with small notopodial acicular lobe fused to cirrophore, conical neuropodium shorter than ventral cirrus. Parapodium 19 with a small elytron, inflated oval notopodium; neuropodium with small bundle of long capillary neurochaetae. Parapodium 20 directed posteriorly, with small notopodial acicular lobe fused to cirrophore of dorsal cirrus. Notochaetae long, wider subdistally spinuous, tapering to capillary tips. Parapodium 21 directed posteriorly, with notopodial acicular lobe fused to cirrophore of the dorsal cirrus, without notochaetae; neuropodial conical acicular lobe with slender capillary neurochaetae and a large oval lateral lamella.

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**Remark:** A closely related species was sampled in North Fiji Back-Arc Basin. It differs from PETTIBONE's (1989) original description by the shape of the muscular pharynx which is encircled by four double large papillae instead of four pairs of papillae, with two dorsomedial ones larger.

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**Biology:** Female unknown.

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**Distribution:** Mariana Back-Arc Basin.

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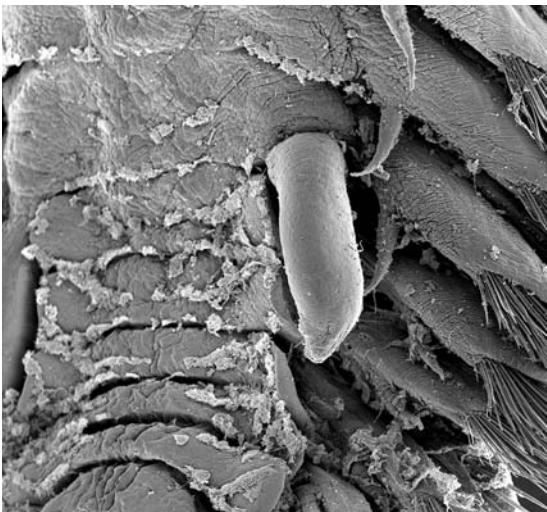




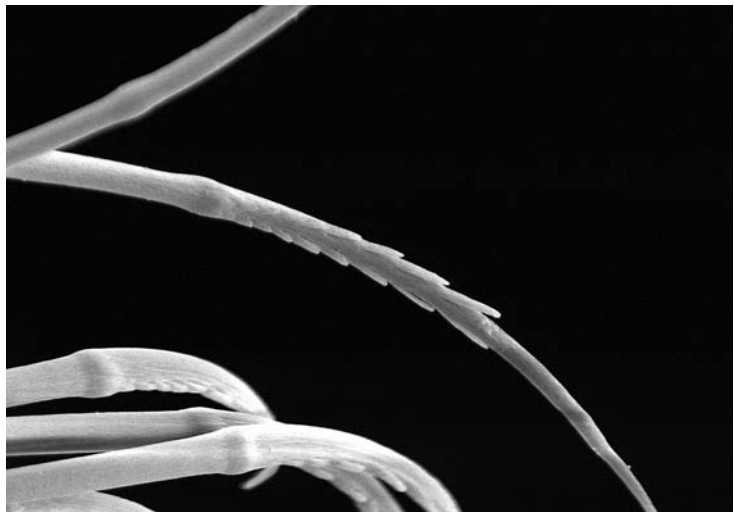
1: Muscular pharynx in distal view (SEM)  
© Ifremer.



2: Posterior chaetigers (ventral view) showing the transformed lateral lamella of the 21<sup>st</sup> segment (SEM) © Ifremer.



3: Ventral papillae of the 12<sup>th</sup> segment (SEM) © Ifremer.



4: Long notochaetae of the 20<sup>th</sup> segment, wider subdistally spinuous and tapering to capillary tips © Ifremer.

1-4: *Branchinotogluma* aff. *marianus* from North Fiji Back-Arc Basin; cruise Starmer.

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#### Reference:

PETTIBONE M.H. (1989) Proc. Biol. Soc. Wash. **102**(1): 137-153.



*Branchinotogluma sandersi* PETTIBONE, 1985

**Synonym:** *B. grasslei* PETTIBONE, 1985.

**Size:** Up to 60 mm in length.

**Color:** Pink to light red in living specimens. Golden-colored chaetae.

**Morphology:** Body rectangular flattened, tapering slightly anteriorly and posteriorly. Dorsum with transverse ciliated bands. Elytra 10 pairs, large covering dorsum, round to oval, stiff, opaque. Each segment from 4<sup>th</sup> chaetiger with two groups of delicate arborescent compact branchiae, with terminal filaments. A single group of branchiae on 3<sup>rd</sup> segment. Prostomium bilobed, anterior lobes cylindrical with a terminal filament. Median antenna with a short style. Palps stout tapered smooth. Tentaculophores with two pairs of tentacular cirri, dorsal ones as long as palps. Muscular pharynx showing five papillae around opening (3 dorsal and two ventral). Jaws denticled in their inner border.

In males, parapodia of segments 2-18 biramous. Notopodia conical with projecting acicular processes, without bracts except on segment 2. Neuropodia with long conical prechaetal acicular lobes, postchaetal lobes rounded and shorter. Notochaetae

short and acicular, superior neurochaetae with two rows of prominent spines and a slightly hooked tip, lower neurochaetae with flattened spinous hooked hood. Parapodia of the posterior three segments modified directed posteriorly and enclosed in parapodia of segment 18, all with ventral cirri but branchiae lacking. Parapodia of elytrigerous segment 19 biramous with rami similar in length; notopodia with thickened dorsal bract. Parapodia of segment 20 much smaller and enclosed in parapodia of segment 19. Notopodial acicular lobe fused to cirrophore of dorsal cirrus. Notochaetae few, short, stout, curved with two rows of distal spines. Upper neurochaetae with scattered long spines and rounded tips. Segment 21 similar to 20<sup>th</sup> but lacking notochaetae. Four pairs of segmental ventral papillae on segment 12-15. Three pairs of rounded ventral lamellae on segments 16-18.

In females (described as *B. grasslei*) segments 19-21 not transformed. With or without five pairs of small squarish segmental ventral papillae near ventral bases of neuropodia 11-15.

**Distribution:** Galapagos Spreading Center, East Pacific Rise: 21°N to 17°S, Guaymas Basin.



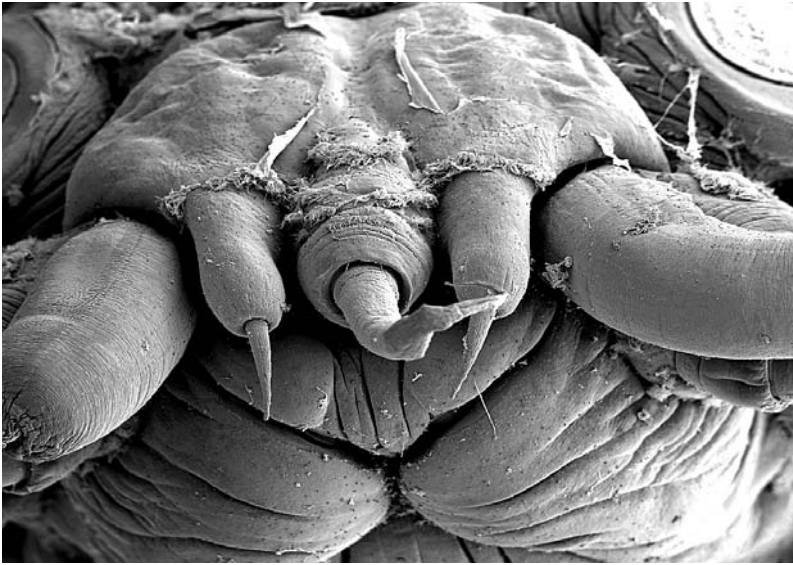
1: Dorsal view; by P. Briand © Ifremer.



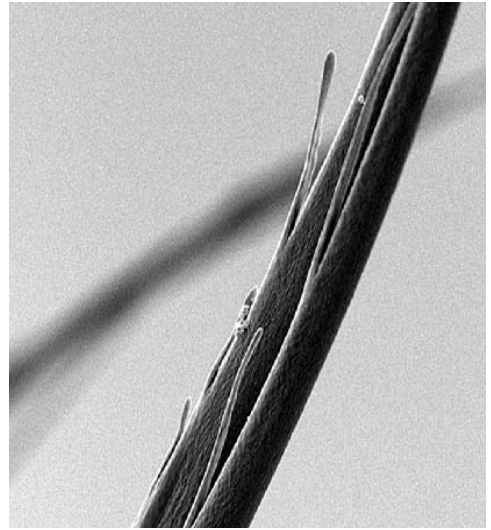
2: Ventral view of the posterior segments, female; by P. Briand © Ifremer.

**Reference:**

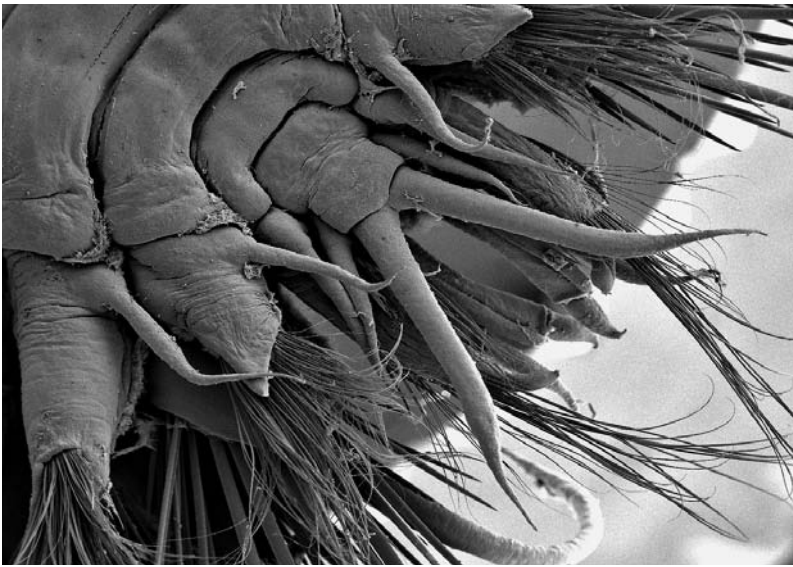
PETTIBONE M.H. (1985) Proc. Biol. Soc. Wash. **98**: 447-469.



3: Frontal view of the prostomial part (SEM) © Ifremer.



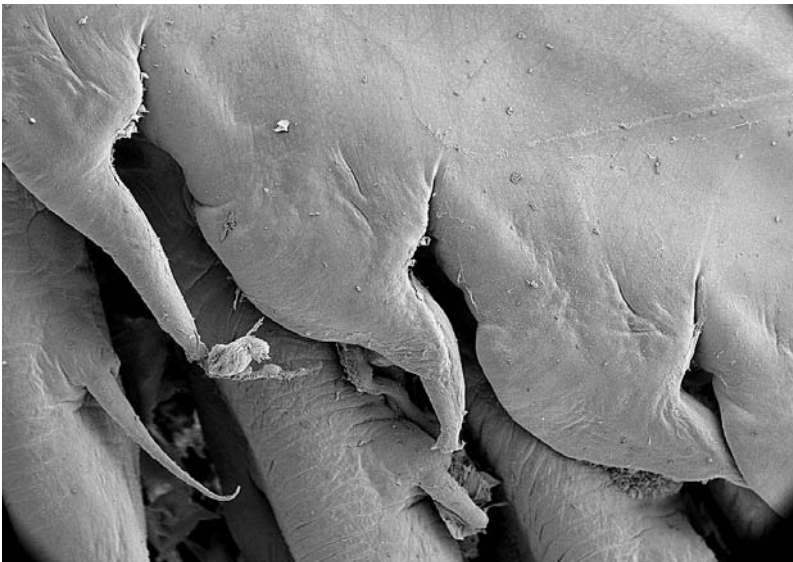
6: Upper neurochaetae of the 20<sup>th</sup> segment, male (SEM) © Ifremer.



4: Ventral view of the posterior segments, male (SEM) © Ifremer.



7: Notopodial bract on segment 2 (SEM) © Ifremer.



5: Ventral view of the segmental papillae, male (SEM) © Ifremer.



8: Subacicular neurochaeta (SEM) © Ifremer.



*Branchinotogluma segonzaci* (MIURA & DESBRUYÈRES, 1995)

**Size:** Up to 49 mm in length. Up to 19 mm in width.

**Morphology:** Body flattened, with 21 segments (first achaetous). Elytra 10 pairs on segments 2, 4, 5, 7, 9, 11, 13, 15, 17 and 19. Branchiae arborescent, separated into two groups on segments 3-19, or on segments 3-21 on half specimens. Muscular pharynx encircled distally by four pairs of small papillae, subequal in size, bearing lateral lamellar expansions with four distal papillae, and numerous small papillae forming proximal band. Two pairs of jaws without denticulation on the inner border. Dorsal cirri on non-elytrigerous segments with short cylindrical cirrophores, and short styles with rounded tips, extending to tips of neurochaetae. Notopodia subconical, with projecting acicular lobe. Neuropodia subconical, deeply notched on upper part. On males, pair of segmental papillae at the most extending to the base of ventral cirrus on segment 12; five pairs of

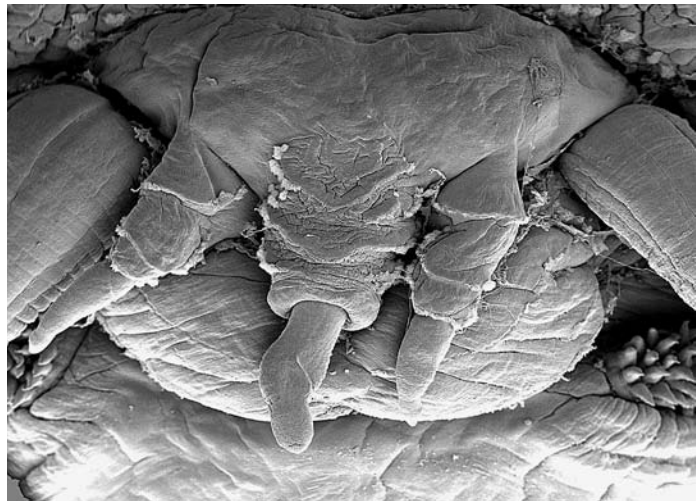
squarish ventral lamellae on following segments 13-17; lacking both papillae on female specimens. On males, parapodium of segment 20 modified with reduced notopodium and elongated neuropodium, lacking notochaetae. Notopodial acicular lobe fused to cirrophore with ventral lamellar expansion and embedded notoacacula. Neuropodium with lamellar expansion folding small bundle of chaetae. Parapodium of segment 21 strongly modified on males, lacking chaetae. Notopodial acicular lobe fused to cirrophore of the short conical dorsal cirrus, ventral lamellar expansion enlarged.

**Biology:** Free living polynoids, found on whitish parts of active chimney walls. Active predators of shrimps and bacterial mat grazers.

**Distribution:** North Fiji, Lau and Manus Back-Arc Basins.

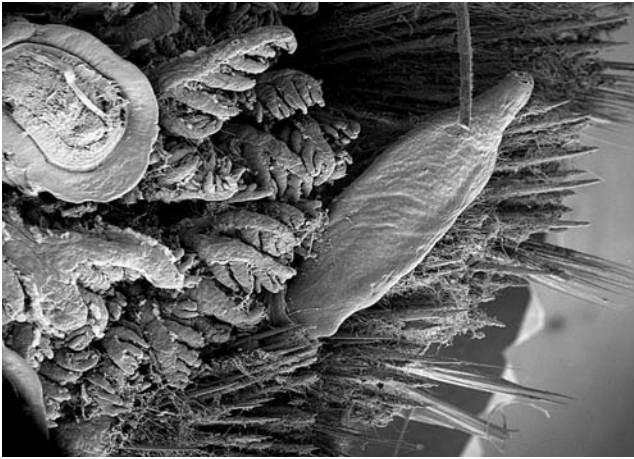


1: Specimen on active smoker walls; cruise TUIM07, Lau Basin; by courtesy of C.R. Fisher.



2: Prostomium in dorsal view (SEM). Notice the proximal band of papillae on the pharynx © Ifremer.





3: Second left parapodia in dorsal view, with the typical dorsal cirrus (SEM) © Ifremer.



4: Ventral view of the left side of the 12th and 13th segments in male showing the ventral papilla and the first flat semioval ventral lamella (SEM) © Ifremer.



5: Upper part of the pharynx with two dorsal rounded papillae (SEM) © Ifremer.



6: Lower part of the pharynx showing two small papillae (SEM) © Ifremer.



7: Ventral view of the posterior end in male (SEM) © Ifremer.



8: Ventral view of the posterior end in female (SEM) © Ifremer.

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#### Reference:

MIURA T. & D. DESBRUYÈRES (1995) Proc. Biol. Soc. Wash. **108**: 583-595.

*Branchinotogluma trifurcus* (MIURA & DESBRUYÈRES, 1995)

**Size:** Small species up to 15 mm in length and 7 mm in width.

**Color:** Bright red in vivo. Preserved specimens pale.

**Morphology:** Body short with 21 segments, including the tentacular segment. Elytra 10 pairs, large imbricated, oval smooth. Dorsal cirri with very long cirriform styles and tapered tips. Branchiae arborescent in two groups, present on segments 3-21 (females) or 3-20 (males). Prostomium bilobed. Anterior lobes prominent, without frontal filaments. Tentacular segment achaetous not distinct dorsally. Muscular pharynx encircled by four large papillae, subequal in size; two pairs of jaws with denticulations on inner border. Notopodia long, conical, with several notochaetae; neuropodia long, conical, deeply notched on upper part.

In males, ventral segmental papillae on segment 12, as long as segment; five pairs of flat semioval ventral segmental lamellae

present on segments 13-17. Segments 18-21 modified with reduced parapodia. Segment 18 with very long dorsal cirri. Segment 19 with achaetous notopodia bearing broad dorsal lamellar expansion. Segment 20 modified strongly, with long achaetous notopodia bearing bifurcate distal end, dorsal digitiform expansion and ventral fringed lamella, club-shaped neuropodia fringed by trifurcate neurochaetae. Segment 21 reduced in size achaetous, with uniramous parapodia, notopodia digitiform with very short cirri and basal lamellar expansion. Anal cirri short.

Females lack posterior modified parapodia and ventral lamellae, but bear ventral papillae on segment 11.

**Biology:** Very often found in washings of *Ifremeria nautili*; no evidence of commensalisms.

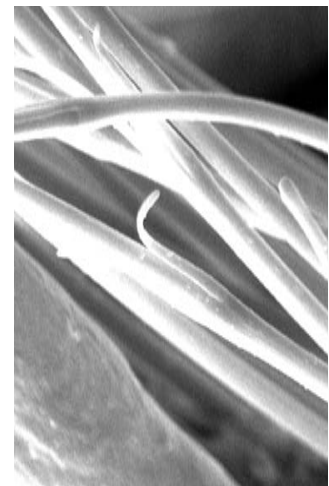
**Distribution:** North Fiji and Lau Back-Arc Basins.



1: Living specimens dorsal and ventral view; by courtesy of F. Pleijel.



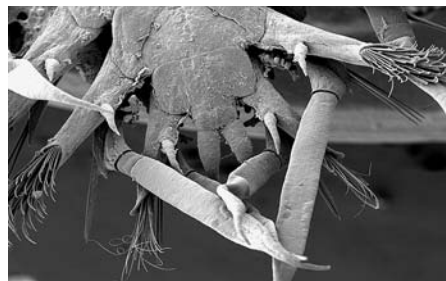
2: Ventral papillae on segment 11, female (SEM) © Ifremer.



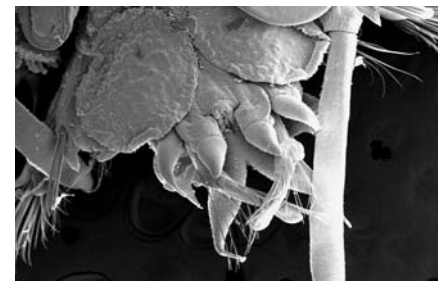
3: Trifurcate neurochaetae from segment 20, male (SEM) © Ifremer.



4: Anterior part in dorso-anterior view (SEM) © Ifremer.



5: Ventral view of the posterior part, female (SEM) © Ifremer.



6: Dorsal view of the posterior part, male (SEM) showing the transformed segments © Ifremer.

**Reference:**

MIURA T. & D. DESBRUYÈRES (1995) Proc. Biol. Soc. Wash. **108**: 583-595.



## *Branchinotogluma tunnicliffae* (PETTIBONE, 1988)

**Synonym:** *Opisthotrochopodus tunnicliffae* PETTIBONE, 1988, *Branchinotogluma grasslei* sensu PETTIBONE, 1988 (specimens from Northeast Pacific).

**Size:** Up to 31 mm.

**Morphology:** Segment 21, elytra 10 pairs. Body flattened ventrally, arched dorsally, with parapodia longer than body width. Elytra large, overlapping covering dorsum. Elytra smooth, stiff, somewhat vaulted around place of attachment to elytophores. Elytophores large, projecting posteriorly, with arborescent branchiae attached on lateral sides. Dorsal tubercles elongate, projecting posteriorly with arborescent branchiae on distal part. Prostomium bilobed, anterior lobes subtriangular, with long frontal filaments; median antenna with bulbous ceratophore in anterior notch, subulate style with long slender tip, shorter than tentacular cirri; palp stout, tapered, smooth. Tentaculophores lateral to prostomium, without chaetae, each with pair of tentacular cirri, dorsal tentacular cirrus longer than palp, ventral one shorter. Second segment forming posterior lip of the mouth, bearing biramous parapodia and first pair of elytophores. Notopodia with hood or bract on anterodorsal side encircling small bundle of notochaetae and conical acicular lobe; ventral buccal cirri similar to tentacular cirri longer than following ventral cirri. Muscular pharynx showing five papillae around opening (3 dorsal and 2 ventral); two pairs of jaws minutely denticulated.

In females (described as *Branchinotogluma grasslei*): Biramous parapodia on segments 3-21 similar with smaller notopodium

on anterodorsal side of a large neuropodium. Pygidium consisting of small squarish lobe with pair of anal cirri.

In males (described as *Opisthotrochopodus*): Biramous parapodia on segments 3-17 similar with smaller notopodium on anterodorsal side of a large neuropodium. Notochaetae stouter than neurochaetae acicular with two rows of spines. Neurochaetae long, slender with slightly hooked tips. Cirriferous parapodium of segment 18 much smaller, with long dorsal cirrus projecting posteriorly and single arborescent branchiae. Segment 19 with smaller elytophores approaching medially, with small parapodia hidden from view dorsally, notopodia with delicate lamella on dorsal side, notochaetae stout acicular with two rows of spines. Segment 20 with parapodia greatly modified. Neuropodia enlarged, inflated with projecting conical acicular lobe with neurochaetae projecting from wide opening and ventral cirrus attached near the base. Neurochaetae consisting of four stout acicular harpoon chaetae and long slender chaetae. Neuropodia inflated and extended according to the specimens (even according to the side of the same specimen). Segment 21 with elongated cirriferous fused medially and to the notopodial lobe. Ventral segmental papillae long tapering on segment 12, shorter and thicker with slender distal part on segments 13-15 reduced to a rounded lamellae on 16 and 17.

**Distribution:** Explorer Ridge; Juan de Fuca Ridge: Endeavour segment; Axial Seamount and Southern Juan de Fuca Ridge.

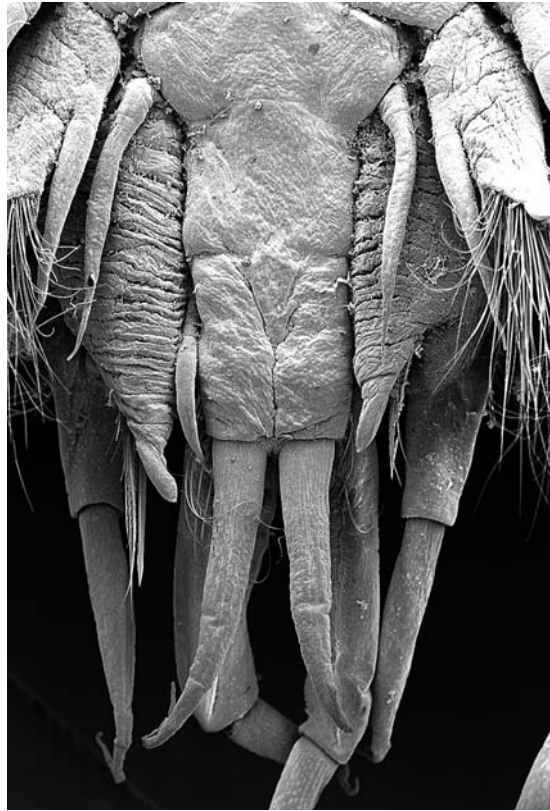


1: In situ; by courtesy of S.K. Juniper.

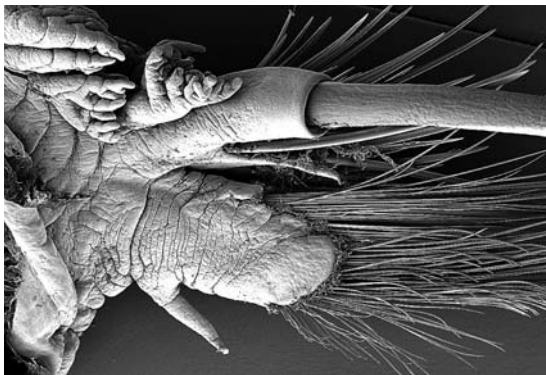




2: Proboscis, left anterior view showing the jaws (SEM) © Ifremer.



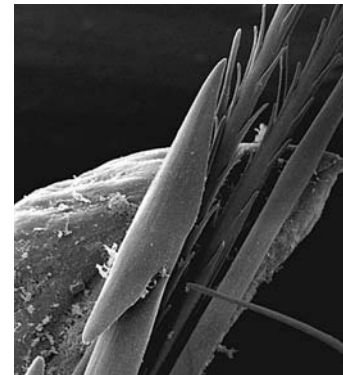
3: Posterior part, male (SEM) © Ifremer.



4: Parapodium (SEM) © Ifremer.



5: Neurochaetae (SEM) © Ifremer.



6: Stout acicular harpoon chaetae of the 20<sup>th</sup> segment (SEM) © Ifremer.

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**Reference:**

PETTIBONE M.H. (1988) Proc. Biol. Soc. Wash. **101**: 192-208.

*Branchiplicatus cupreus* PETTIBONE, 1985

**Size:** 50 mm in length, 15 mm in width.

**Morphology:** Segments 31-35. Prostomium truncate. No eyes, no lateral antenna. Elytra 12 pairs on segments 2, 4, 5, 7, 9, 11, 13, 15, 17, 19, 21 and 23. Up to 12 posterior segments without elytra. Elytra large covering dorsum excepted for posterior segments. Elytra stiff, smooth, opaque, with « veins » Posterior border of elytra with variable number of small rounded tubercles. Elytra surface with minute sensory papillae. Branchiae begin on segment 3 of unique type, formed of flattened elongated sacs, deeply folded and convoluted attached by broad bases to lateral sides of elythrochlores and dorsal tubercles and

to dorsal sides of notopodia and dorsal cirrophores. Parapodia biramous. Notopodia shorter than neuropodia. Notochaetae numerous forming radiating bundles short to long. Notochaetae much stouter than neurochaetae, acicular, smooth with double rows of spines near distal bare tips. Neurochaetae very numerous, slender, forming fan-shaped bundles. Subacicular neurochaetae more slender, with shorter spines and slightly hooked bare tips.

**Biology:** From *Riftia* and *Calypptogena* washings.

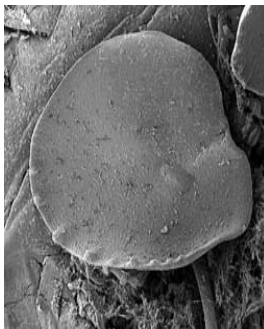
**Distribution:** East Pacific Rise: 9°N to 21°N; Guaymas Basin.



1: Dorsal view; by P. Briand © Ifremer.



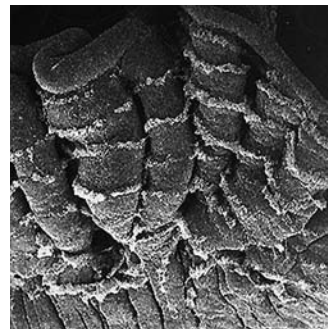
2: Prostomium (SEM) © Ifremer.



3: Elytron (SEM)  
© Ifremer.



4: Close up of the surface of the elytron (SEM) © Ifremer.



5: Folded branchiae (SEM)  
© Ifremer.

**Reference:**

PETTIBONE M.H. (1985) Proc. Biol. Soc. Wash. **98**: 150-157.



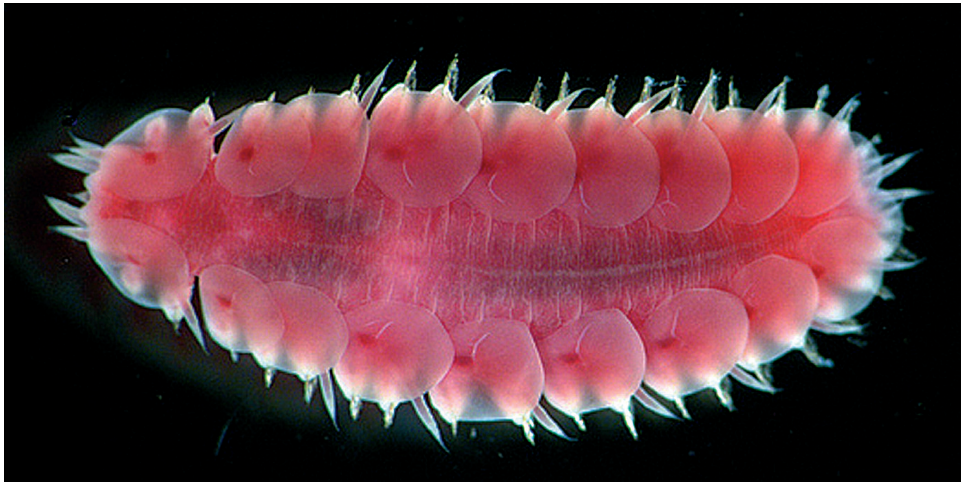
*Branchipolynoe pettibonae* MIURA & HASHIMOTO, 1991

**Size:** Up to 43 mm in length. Up to 19 mm in width.

**Morphology:** Body flattened, with 21 segments (first achaetous). Elytra 10 pairs on segments 2, 4, 5, 7, 9, 11, 13, 15, 17 and 19. Branchiae well developed, arborescent on segment 3-21; separated into upper larger and lower smaller groups. Notopodia very small, digitiform, with a few notochaetae. Neuropodia large, long, with slightly bilobed acicular lobe and rounded postchaetal lobe. Ventral segmental papillae long; two pairs on segments 11 and 12.

**Biology:** Living in the mantle cavity of the deep-sea vent mollusks (*Bathymodiolus platyfrons*, *B. japonicus*, *B. brevior*, *B. elongatus*).

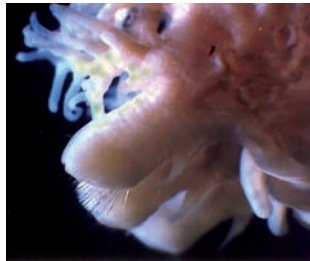
**Distribution:** Izu Ogasawara Arc, Okinawa Trough, North Fiji and Lau Back Arc Basins.



1: Habitus © Greg Rouse (TUIM06).



2: Anterior part, ventral view from a specimen of Hine Hina, Lau Bassin © Briand/Ifremer.



3: Parapodium, 11<sup>th</sup> segment, right side, anterior view © Briand/Ifremer.



4: 11<sup>th</sup> and 12<sup>th</sup> segments, ventral view © Briand/Ifremer.

References:

- COSEL R. & B. MÉTIVIER (1994) *Veliger* **37**: 374-392.  
DESBRUYÈRES D., ALAYSE-DANET A.M., OHTA S. & the Scientific Parties of Biolau and Starmer Cruises (1994) *Mar. Geol.* **116**: 227-242.  
HASHIMOTO J., OHTA S., FUJIKURA K. & T. MIURA (1995) *Deep-Sea Res. I* **42**: 577-598.  
MIURA T. & J. HASHIMOTO (1991) *Proc. Biol. Soc. Wash.* **104**: 166-174.



*Branchipolynoe seepensis* PETTIBONE, 1986

**Size:** Up to 31 mm in length and 13 mm in width.

**Morphology:** Body short, spindle-shaped, tapered anteriorly and posteriorly, flattened ventrally and arched dorsally. 21 segments with 10 pairs of elytra attached on segments 2, 4, 5, 7, 9, 11, 13, 15, 17 and 19. Elytra moderately large, oval, covering lateral thirds of body on larger specimens and nearly covering body of juveniles. Branchiae well developed, arborescent. Prostomium oval, bilobed, with rounded anterior lobes lacking frontal filaments. Median antenna lacking distinct ceratophore. Palp rather short, thick, smooth and tapered. Thick muscular pharynx, five pairs of small delicate oval papillae around opening and two pairs of small jaws lacking denticulate base. Lower neurochaetae slender and having hooked tips with some longer lateral denticles.

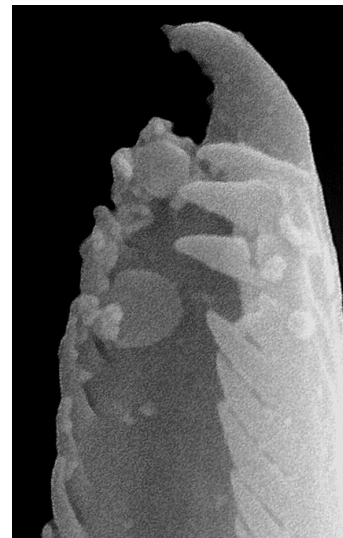
**Remark:** According to CHEVALDONNÉ et al. (1998) *B. seepensis* from the Gulf of Mexico and *B. seepensis* from Mid-Atlantic Ridge appear to have recently diverged and must be considered as two isolated phylogenetic species, although no morphological differences have been found on large series of specimens.

**Biology:** Commensal within the mantle cavity of mussels. Two individuals (male and female) are frequently observed within a single mussel. Sexual dimorphism with females larger than males; females having two pairs of ventral papillae on segments 11 and 12. Sex ratio 0.5-0.7: 1. Females contain mature sperm and there is evidence of internal fertilization. Inferred mode of development lecithotrophic or direct. Asynchronous gametogenesis, rapid oogenesis.

**Distribution:** Hypersaline seeps at the base of Florida Escarpment, 26°02'24"N and 84°54'48"W; Mid-Atlantic Ridge: Lucky Strike.



1: Proboscis, frontal view (SEM) © Ifremer.



2: Tip of upper neurochaetae (SEM) © Ifremer.



3: Habitus, dorsal view; by A. Fifis © Ifremer.



4: Habitus, ventral view; by A. Fifis © Ifremer.

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#### References:

- CHEVALDONNÉ P., JOLLIVET D., FELDMAN R. A., DESBRUYÈRES, d. & LUTZ R. A. & R. C. VRIJENHOEK (1998) *Cah. Biol. Mar.* **39**: 347-350.
- DESBRUYÈRES D., ALAYSE A.M., ANTOINE E., BARBIER G., BARRIGA F., BISCOITO M., BRIAND P., BRULPORT J.P., COMTET T., CORNEC L., CRASSOUS P., DANDO P., FABRI M.C., FELBECK H., LALLIER F., FIALA-MÉDIONI A., CONÇALVES J., MÉNARD F., KERDONCUFF J., PATCHING J., SALDANHA L. & P.M. SARRADIN (1994) *InterRidge News* **3**(2): 18-19.
- HOUREZ S. & C. JOUIN-TOULMOND (1998) *Zoomorphology* **118**: 225-233.
- HOUREZ S., LALLIER F.H., GREEN B.N. & A. TOULMOND (1999) *Proteins* **34**: 427-434.
- JOLLIVET D., COMTET T., CHEVALDONNÉ P., HOUREZ S. DESBRUYÈRES D. & D. DIXON (1998) *Cah. Biol. Mar.* **39**: 359-362.
- PETTIBONE M.H. (1986) *Proc. Biol. Soc. Wash.* **99**(3): 444-451.
- VAN DOVER C.L., TRASK J., GROSS J. & A. KNOWLTON (1999) *Mar. Ecol. Progr. Ser.* **181**: 201-214.

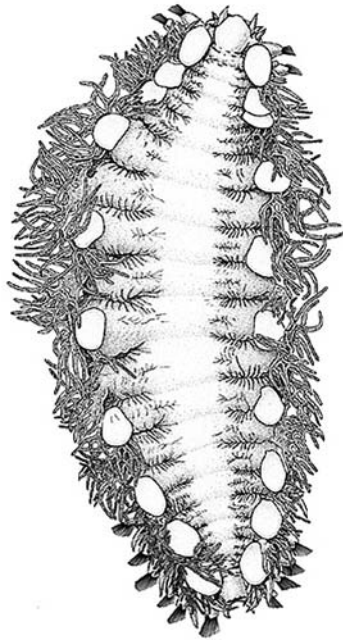
*Branchipolynoe symmytilida* PETTIBONE, 1984

**Size:** Up to 50 mm.

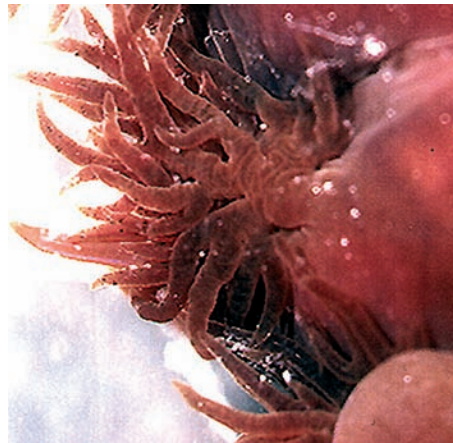
**Morphology:** Scale worm dwelling commensal of *Bathymodiolus thermophilus*; body flattened, segments 21 first achaetous. Elytra and elytraphores 10 paires on segments 2, 4, 5, 7, 9, 11, 13, 15, 17 and 19. Branchiae well developed, arborescent on all parapodia from segment 2. Notopodia small, with few short acicular notochaetae. Neuropodia short truncate, without projecting acicular lobes; with very numerous neurochaetae including upper stout, slightly hooked ones and very slender ones. Adults with very small elytra. 0/2 pairs of ventral papillae on segments 11 and 12.

**Biology:** All worms were collected from mussels and were found occupying the anterior and ventral parts of the mantle cavity. A study of the digestive contents led to hypothesize a nutrition based on mussel gills and pseudofaeces.

**Distribution:** Galapagos Spreading Center, East Pacific Rise (not collected at 21°N and Guaymas Basin).



1: Habitus; by V. Martin © Ifremer.



2: Gill in vivo; by P. Briand © Ifremer.



3: Ventral view showing the two pairs of papillae; by P. Briand © Ifremer.

**References:**

- DESBRUYÈRES D., GAILL F., LAUBIER L. & Y. FOUQUET (1985) Bull. Biol. Soc. Wash. **6**: 103-116.  
HOURDEZ S., LALLIER F., MARTIN-JEZEQUEL V. WEBER R.E. & A. TOULMOND (1999) Proteins **34**: 427-434.  
PETTIBONE M.H. (1984) Proc. Biol. Soc. Wash. **97**: 226-239.



## *Iphionella risensis* PETTIBONE, 1986

**Size:** Up to 11 mm in length, width 6 mm including chaetae.

**Color:** Reddish.

**Morphology:** Body ovate greatly flattened. Thirteen pairs of elytra, 28 segments. The elytra are reniform, their surface covered by polygonal areas enclosing small areolae. Prostomium bilobed forming to separate rounded lobes, with anterolateral bulbous extensions fused to the facial tubercle. Antennae and eyes lacking. Long cylindrical tentaculophores emerge lateral to the prostomium and palps each with a stout aciculum. Short papillate dorsal and ventral tentacular cirri. Small oval medial nodules are found on segments 4 and 5, variable in number and position among studied specimens. Very numerous notochaetae

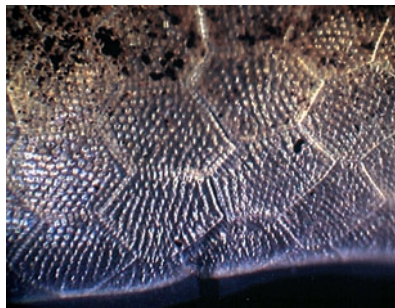
are straw-colored and bipinnate feathered, with a slender axis and lateral spines. The upper group of neurochaetae are similar to notochaetae. The rest of neurochaetae are stouter, with close-set spinous rows on the basal enlarged part.

**Biology:** Uncommon, in mussels and clams washings. More common among stalked cirripeds.

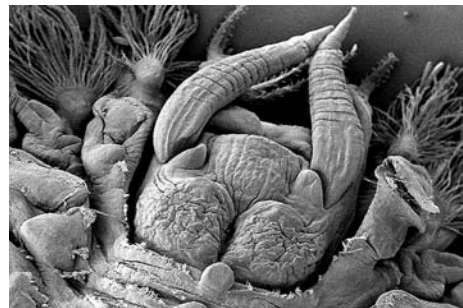
**Distribution:** East Pacific Rise: 21°N, 9°N. A posteriorly incomplete, unique specimen was sampled at Mid-Atlantic Ridge: Lucky Strike and could correspond to *I. risensis* or a closely related species.



1: Habitus in vivo © Ifremer.



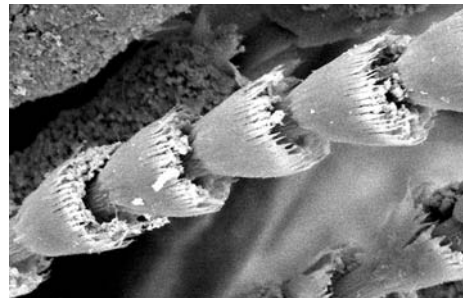
2: Surface of elytron in vivo © Ifremer.



3: Prostomium, dorsal view (SEM) © Ifremer.



4: Surface of elytron (SEM) © Ifremer.



5: Notochaetae (SEM) © Ifremer.

### References:

- PETTIBONE M.H. (1986) *Smithson. Contr. Zool.* **428**: 1-43.  
VAN DOVER C.L. (2002) *Mar. Ecol. Progr. Ser.* **230**: 137-158.

*Lepidonotopodium atalantae* DESBRUYÈRES & HOURDEZ, 2000

**Size:** Up to 9 mm in length for 23 segments.

**Color:** Red to pinkish, notopodial chaetae are straw colored, neuropodial chaetae are light brown.

**Morphology:** The body is short, suboval in outline, flattened dorsoventrally, slightly tapered and rounded anteriorly and posteriorly. The 11 pairs of elytra are located on segments 2, 4, 5, 7, 9, 11, 13, 15, 17, 19 and 21. They cover the dorsum. The elytra are subreniform, overlapping with 6-12 macrotubercles raised on the posterior border. The elytral surface appears smooth but is covered with numerous globular or clavate micropapillae. The surface of both elythrochlores and dorsal tubercles have bands or tufts of cilia. The prostomium is bilobed, the anterior lobes subtriangular with a frontal filament, lateral antennae are absent. The tentacular segment is not visible dorsally. The tentaculophores of this segment are lateral to the prostomium and lack chaetae. The facial tubercle is lacking. Seven

pairs of unequal bulbous papillae encircle the opening of the extended pharynx. The three dorsal papillae are pear-shaped, longer than the other ones. The two pairs of hooked jaws are minutely serrated with numerous teeth. The notopodium is subconical with acicular lobes and is enclosed anterodorsally by flaring bracts. The neuropodium is deeply cleft in the upper and lower part. The notochaetae are numerous forming thick radiating bundles. The notochaetae have two rows of spines and bare tips. The neurochaetae are numerous; they have two rows of numerous spines and bare tips. On one third of the specimens (males), there are four ventral pairs of elongated papillae on segments 11-14, extending to the tip of neurochaetae. There is a pair of very long ventral anal cirri.

**Distribution:** East Pacific Rise: 13°N to 17°S.



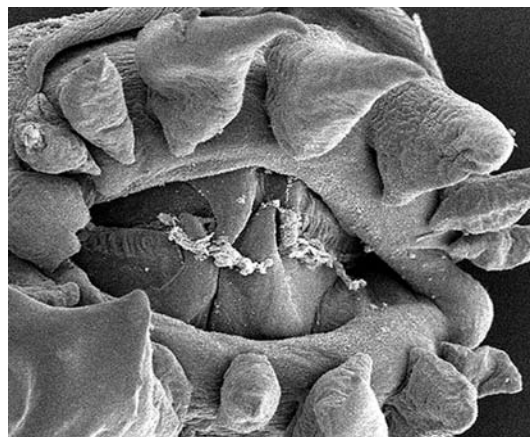
1: Habitus in vivo © Ifremer.



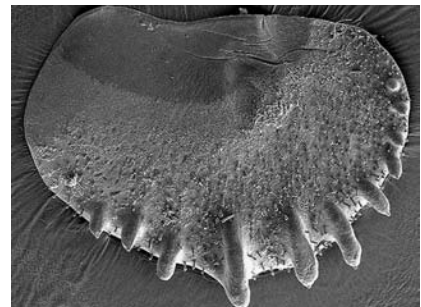
2: Ventral view in vivo of the segments 11-14 showing the sexual elongated papillae © Ifremer.



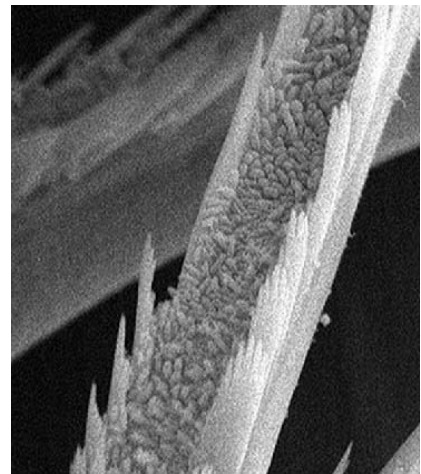
3: Anterior part in dorsal view (SEM) © Ifremer.



4: Frontal view of the distal part of the proboscis (SEM) © Ifremer.



5: Elytron from the middle part of the body (SEM) © Ifremer.



6: Distal part of a neuropodial chaeta (SEM) © Ifremer.

**Reference:**

DESBRUYÈRES D. & S. HOURDEZ (2000) Cah. Biol. Mar. **41**: 47-54.



*Lepidonotopodium fimbriatum* PETTIBONE, 1983

**Size:** Maximum observed 35 mm in length, 18 mm in width.

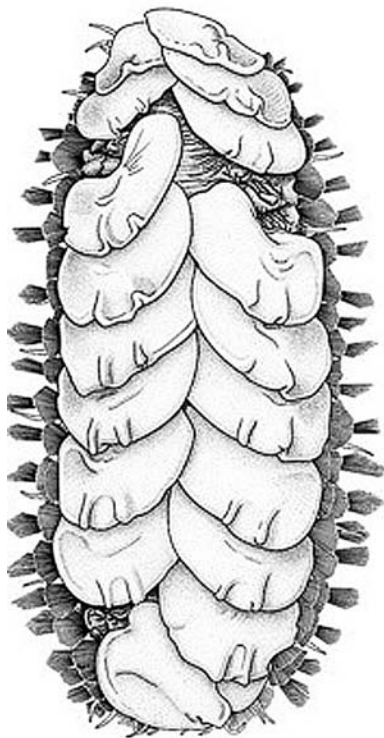
**Color:** Living specimens pinkish or rustish to whitish in color, neurochaetae brown to black.

**Morphology:** Body stout, short, rectangular in outline, flattened ventrally, strongly arched dorsally, and slightly tapered and rounded anteriorly and posteriorly. The elytra are thick; leathery, imbricated, covering the dorsum. There are 11 pairs of elytra attached on segments 2, 4, 5, 7, 9, 11, 13, 15, 17, 19 and 21. Except for the first and the last pairs, each elytron has two raised smooth macrotubercles on the posterior one-third. The elytra appears smooth but is covered with numerous round

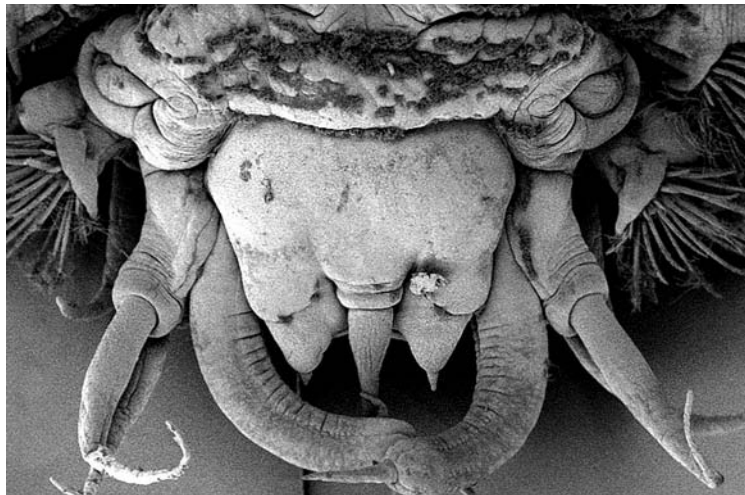
microtubercles. The prostomium is bilobed, the anterior lobes subtriangular, each with a small frontal filament. The biramous parapodia have a shorter notopodia located on the anterodorsal sides of the longer neuropodia. The distal margins of the notopodial acicular lobes, notopodial bracts, and neuropodial lobes are fimbriated with slender papillae.

**Biology:** Mainly observed abundant on smoker walls. Likely a carnivorous species (amphipods observed crushed by the jaws).

**Distribution:** East Pacific Rise: 21°N to 9°N.



1: Habitus; by V. Martin © Ifremer.



2: Prostomium, dorsal view © Ifremer.



3: Specimen on a smoker wall; East Pacific Rise: 13°N, 2630 m. Cruise Phare © Ifremer.

**Reference:**

PETTIBONE M.H. (1983) Proc. Biol. Soc. Wash. **96**(3): 392-399.



*Lepidonotopodium jouinae* DESBRUYÈRES & HOURDEZ, 2000

**Size:** Maximum observed 14 mm in length and width 7 mm.

**Color:** Light brown after preservation.

**Morphology:** Body short, suboval in outline, flattened dorsoventrally, slightly tapered and rounded anteriorly and posteriorly. The elytra are opaque, oval to subreniform, imbricate, covering the dorsum. There are 11 pairs of elytra attached on segments 2, 4, 5, 7, 9, 11, 13, 15, 17, 19 and 21. The elytra appears smooth to the naked eye. Under SEM, the elytral surface in the non-overlapping region appears covered with numerous globular or clavate micropapillae. The prostomium is bilobed, the anterior lobes subtriangular, each with a small frontal filament. Six pairs of unequal pear-shaped papillae and two median papillae encircle the opening of the extended pharynx. The two pairs of dorsal and ventral jaws are minutely serrated with

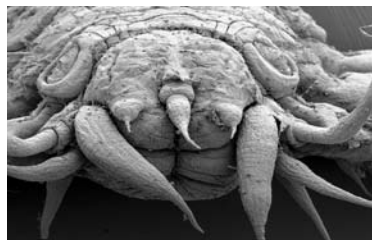
numerous teeth. The biramous parapodia have a shorter notopodia located on the anterodorsal sides of the longer neuropodia. The notopodium is enclosed by a flaring bract. The neuropodium is deeply cleft on the upper and lower parts. The notochaetae are stouter than neurochaetae. They have two rows of alternating teeth. The dorsal neurochaetae have one row of spines and straight tips. The ventral ones have two rows of numerous spines. 0/5 pairs of elongated papillae on segments 11-15.

**Biology:** Mainly observed in washings of mussels. Likely a carnivorous/omnivorous species.

**Distribution:** Mid-Atlantic Ridge: Azores Triple Junction, Menez Gwen, and Lucky Strike.



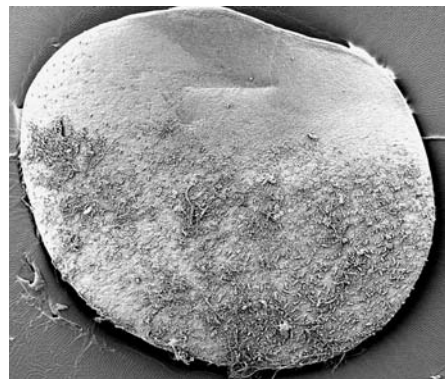
1: Habitus (preserved specimen) © Ifremer.



3: Prostomium, fronto-dorsal view (SEM) © Ifremer.



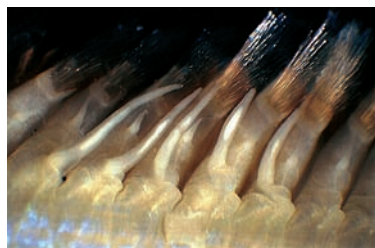
4: Proboscis everted showing four pairs of jaws with numerous teeth (SEM) © Ifremer.



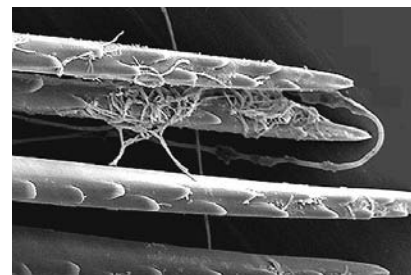
6: Anterior elytron (SEM) © Ifremer.



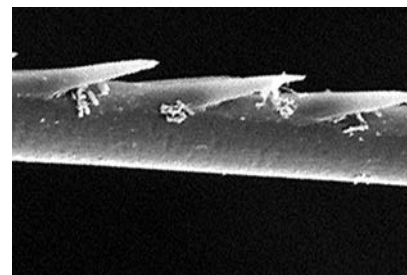
7: Clavate micropapilla at the surface of elytron (SEM) © Ifremer.



2: Segments 11-15, ventral view © Ifremer.



5: Upper neurochaetae (SEM) © Ifremer.



8: Notochaetae (SEM) © Ifremer.

**Reference:**

DESBRUYÈRES D. & S. HOURDEZ (2000) Cah. Biol. Mar. **41**: 399-405.

*Lepidonotopodium piscisae* PETTIBONE, 1988

**Size:** Maximum observed 29 mm in length, 13 mm in width.

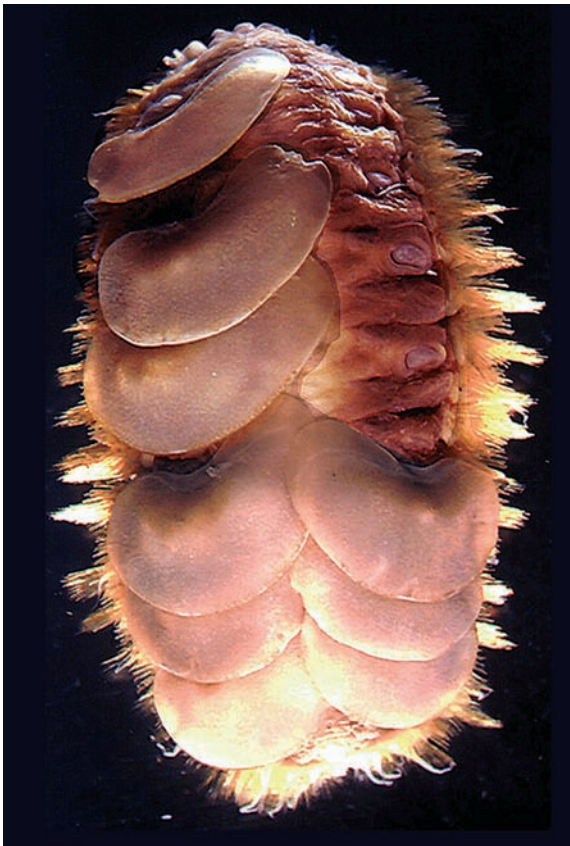
**Color:** Living specimens brownish to tan in color, elytra covered with bacterial filaments giving them a white color.

**Morphology:** Body sturdy, elongated oval, rounded anteriorly and posteriorly, flattened ventrally, arched dorsally. The elytra are large, overlapping, covering the dorsum, thick, stiff, opaque. There are 11 pairs of elytra attached on segments 2, 4, 5, 7, 9, 11, 13, 15, 17, 19 and 21. Elytral surface thickly covered with opaque rounded to conical microtubercles, especially thick on somewhat transverse areas in the middle of elytra and along borders with scattered globular and filiform micropapillae. The prostomium is bilobed, the anterior lobes prominent, each with a long frontal filament. The biramous parapodia have a shorter notopodia located on the anterodorsal sides of the longer neuropodia. Neuropodium diagonally truncate, with shallow notch

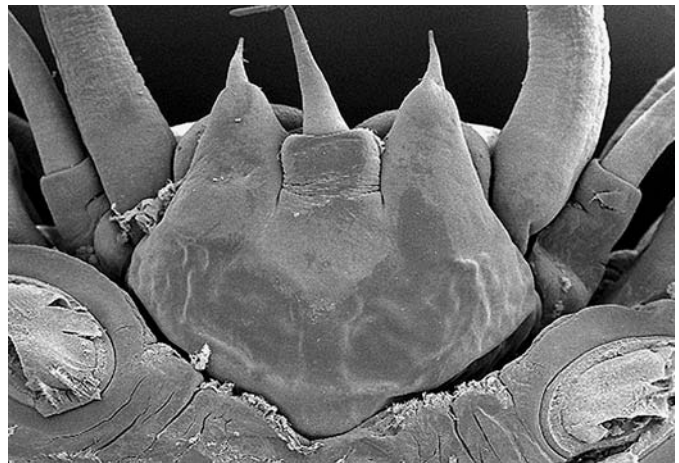
on posterior lower side and deep notch on posterior upper side. Notochaetae with two rows of spines and blunt tapered and “hairy” tips. Very numerous neurochaetae with slightly hooked tips and fine spiny rows on cutting edge. On some specimens, neuropodia of segment 13 differing by the presence of only 1-2 stout, reddish sabre like chaetae. 0/5 elongate papillae on segments 11-15.

**Biology:** Widely dispersed species, but low in abundance. Observed at the periphery of vents, crawling on the rocks, active sulphide and vestimentiferan tubes, grazing on the bacterial mats and protozoans. Trophic generalist or/and carnivorous.

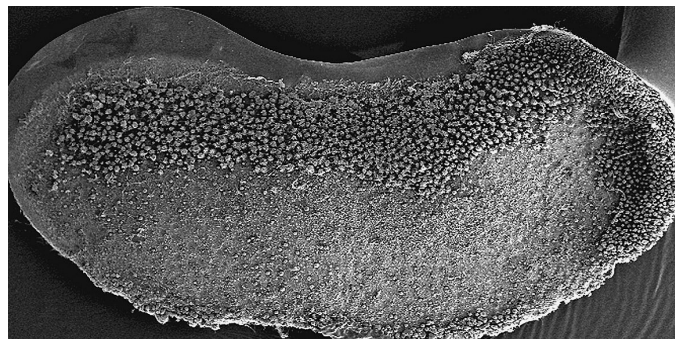
**Distribution:** Explorer Ridge; Juan de Fuca Ridge: Endeavour segment, Axial Seamount and Southern Juan de Fuca Ridge; Gorda Ridge.



1: Habitus in vivo © Ifremer.

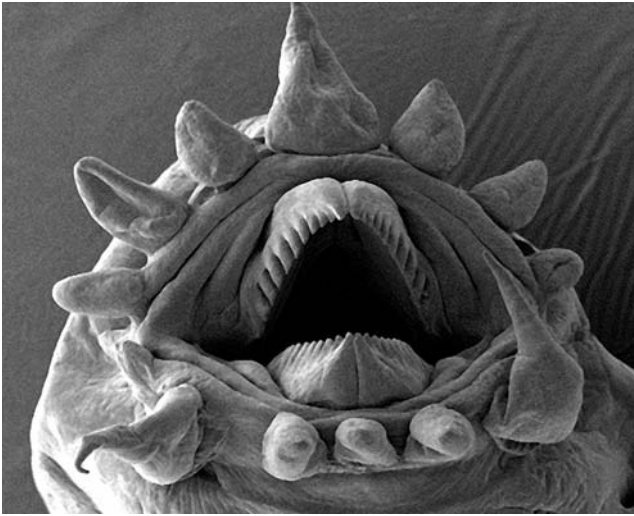


2: Prostomium, dorsal (SEM) © Ifremer.

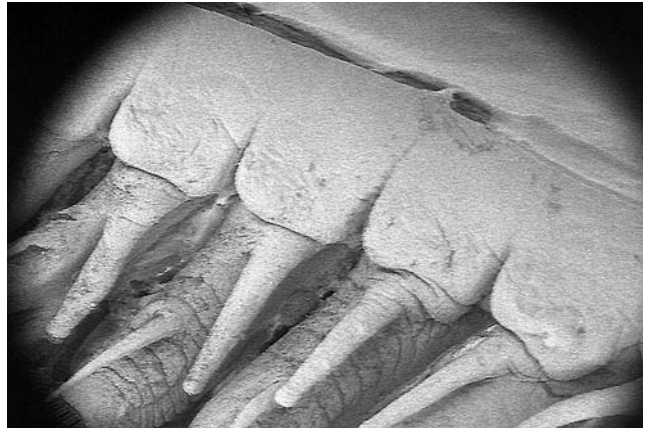


3: Elytron (SEM) © Ifremer.

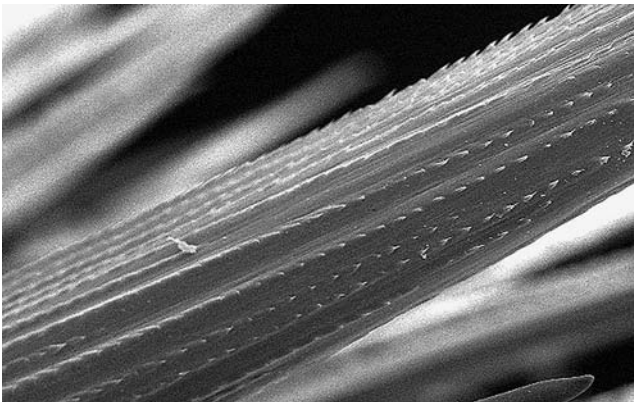




4: Proboscis and jaws (SEM) © Ifremer.



5: Elongated ventral papillae on segments 11-15 (SEM)  
© Ifremer.



6: Sabre-like supra acicular neurochaetae on segment 13  
(SEM) © Ifremer.



7: Elytron surface (SEM) © Ifremer.

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#### References:

- PETTIBONE M.H. (1988) *Proc. Biol. Soc. Wash.* **101**: 192-208.  
SARRAZIN J. & S.K. JUNIPER (1991) *Mar. Ecol. Progr. Ser.* **185**: 1-19.  
SARRAZIN J., JUNIPER S.K., MASSOTH G. & P. LEGENDRE (1999) *Mar. Ecol. Progr. Ser.* **190**: 89-112.  
TSURUMI M. & V. TUNNICLIFFE (2003) *Deep-Sea Res.* **50**: 611-629.  
TSURUMI M., DE GRAAF R.C. & V. TUNNICLIFFE (2003) *J. Mar. Biol. Assoc. U.K.* **83**: 469-477.



*Lepidonotopodium riftense* PETTIBONE, 1984

**Size:** Maximum observed 13 mm in length and 7 mm in width.

**Color:** No color in preservative.

**Morphology:** Body short, suboval in outline, flattened dorsoventrally, slightly tapered and rounded anteriorly and posteriorly. The elytra are oval to subreniform, imbricate, covering the dorsum. There are 11 pairs of elytra attached on segments 2, 4, 5, 7, 9, 11, 13, 15, 17, 19 and 21. The elytra appear smooth with branching “veins” emanating from the place of attachment to the elytophores. Near the posterior and lateral borders of the elytra, scattered micropapillae with short tapered or cylindrical bases. On some specimens from the EPR, the elytra

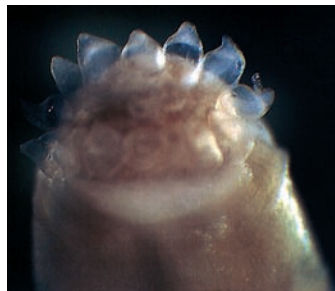
have a variable number of oval projections near the posterior border. The prostomium is bilobed, the anterior lobes subtriangular, each with a small frontal filament. The biramous parapodia have a shorter notopodia located on the anterodorsal sides of the longer neuropodia. The neuropodium is diagonally truncated and deeply cleft on the upper part. 0/2 pairs of elongated papillae on segments 11-12.

**Biology:** Mainly observed in washings of mussels, clams and tube worms. Likely a carnivorous/omnivorous species.

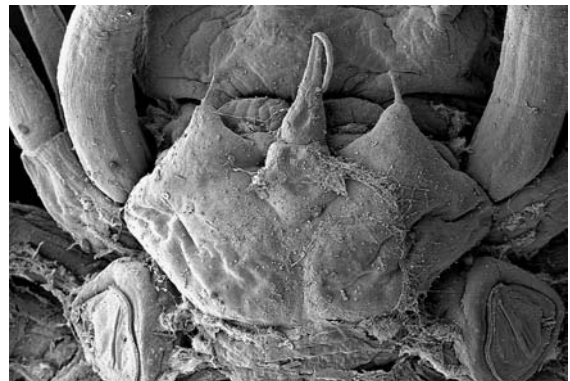
**Distribution:** East Pacific Rise: 21°N to 9°N and Galapagos Spreading Center.



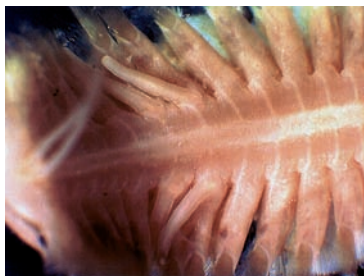
1: Habitus (preserved specimen) © Ifremer.



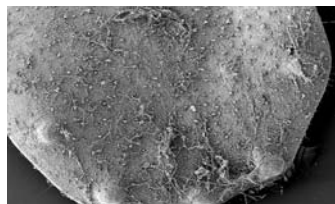
3: Opening of the pharynx encircled by nine pairs of bulbous papillae © Ifremer.



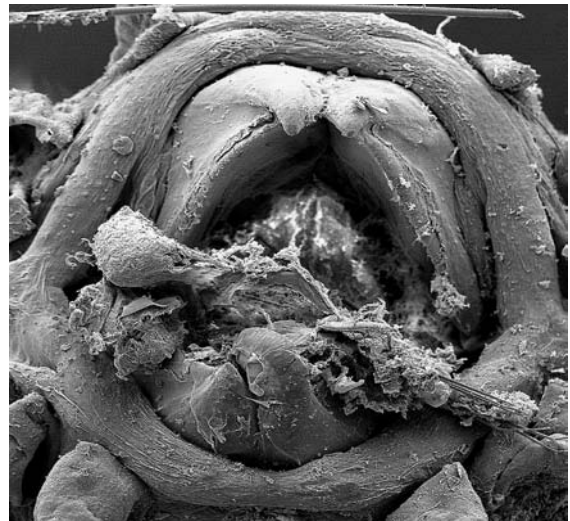
6: Prostomium, dorsal view (SEM) © Ifremer.



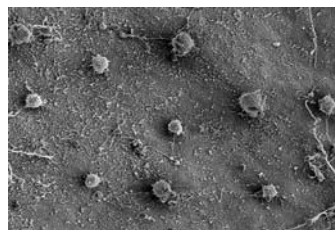
2: Ventral view (preserved specimen) showing the two pairs of elongated papillae on segments 11-12 attached basally on the ventroposterior sides of the neuropodia. © Briand/Ifremer.



4: Oval projections of the posterior border of one elytron (SEM) © Ifremer.



7: Two pairs of dorsal and ventral jaws minutely serrated with numerous teeth (SEM) © Ifremer.



5: Globular micropapillae at the surface of elytron (SEM) © Ifremer.

References:

PETTIBONE M.H. (1984) Proc. Biol. Soc. Wash. **97**: 849-863.  
 VAN DOVER C.L. (2002) Mar. Ecol. Progr. Ser. **230**: 137-158.

*Lepidonotopodium williamsae* PETTIBONE, 1984

**Size:** 26 mm in length, 19 mm in width. Largest up to 36 mm in length.

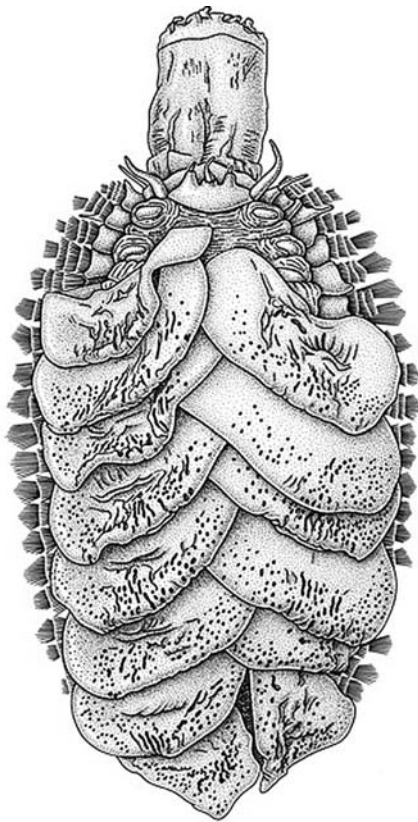
**Color:** Brownish to tan.

**Morphology:** Body short, stout, rectangular in outline, 24-26 segments. 11 pairs of elytra attached eccentrically. The elytra are large, imbricate, covering the dorsum. They are thick, stiff opaque; their dorsal surface is nearly covered with rounded to conical microtubercules (inner anterior part) and rounded elevations at the distal posterior part. The prostomium is bilobed, the anterior lobes prominent, each with a frontal filament; lateral antennae are absent. The palps are cylindrical, smooth. The eyes are lacking. The biramous parapodia have shorter no-

topodia located on the anterodorsal sides of longer neuropodia. The notopodia are subconical with projecting acicular lobes hidden by the numerous notochaetae and enclosed dorsally by well developed large flaring bracts. The distal margins of the notopodial acicular lobes, notopodial bracts and neuropodial lobes are fimbriate with slender papillae. 0/2 elongated papillae ventral on segments 11-12.

**Biology:** Ubiquitous at vents.

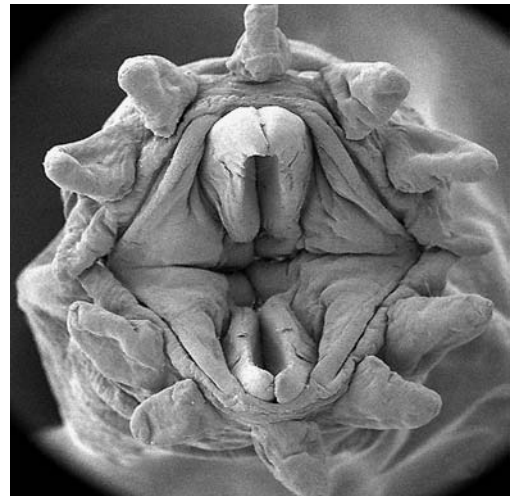
**Distribution:** Galapagos Spreading Center; East Pacific Rise: 21°N to 9°N.



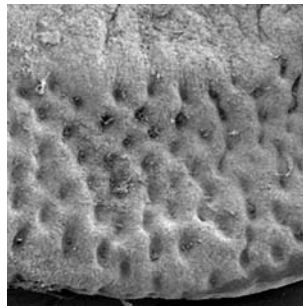
1: Habitus; by V. Martin © Ifremer.



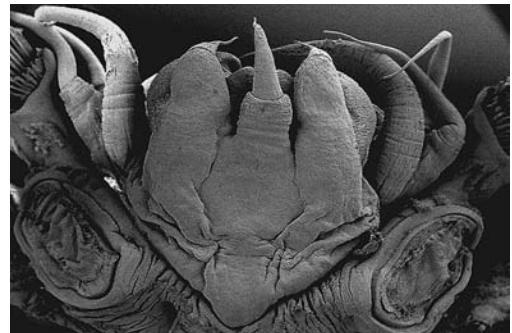
2: Habitus, in vivo © Ifremer.



3: Proboscis, frontal view (SEM) © Ifremer.



4: Elytron, posterior border (SEM) © Ifremer



5: Prostomium, dorsal view (SEM) © Ifremer.

**References:**

- DESBRUYÈRES D. & S. HOURDEZ (2000) Cah. Biol. Mar. **41**: 47-54.  
PETTIBONE M.H. (1984) Proc. Biol. Soc. Wash. **97**: 849-863.



*Levensteiniella iris* HOURDEZ & DESBRUYÈRES, 2003

**Size:** Maximum observed 21 mm in length for 25 segments.

**Color:** Living specimens translucent or greenish with gold colored chaetae. Elytra and chaetae often coated with mineral deposits.

**Morphology:** Body short, tapering anteriorly and posteriorly. There are 11 pairs of elytra (they are deciduous). Elytra overlap anteriorly and posteriorly, and cover the mid-dorsal line. Short dorsal cirri on the non-elytra bearing segments. Elytra are translucent, smooth, oval, and bear posterior, raised, irregularly-spaced macrotubercles. The elytral surface appears smooth or slightly covered of small scattered bumps. The cirri are as long as the parapodia, tapering to tips. The prostomium is bilobed, with cephalic peaks and frontal filaments as long as 1/3 of the prostomium length. Lateral antennae are absent and the median antenna is approximately as long as the prostomium, tapers close the tip and bears a terminal filament. The median antenna is inserted in the anterior notch of the prostomium and has a short, spherical ceratophore. Palps are short and thick, approximately 1.5 times the length of the prostomium, and bear terminal filaments. When dissected, the pharynx opening revealed seven pairs of papillae, all similar in size. There are two pairs of jaws which do not bear any teeth but the tip is slightly

curved and appears as a parrot beak. The parapodia are biramous. Notopodia are shorter in length to the neuropodia and located on their anterior-dorsal side. Notopodia are cylindrical in shape, with the bundle of notochaetae radiating on the dorsal side, close to the tip. The acicular lobe forms a pointed, scoop-like ligule located underneath the notochaetae. The neuropodia are not cleft in the upper and lower part, but the acicular lobe forms a pointed, scoop-like ligule on the dorsal-anterior side. Notochaetae are stouter than the neurochaetae. Notochaetae are short, curved on one side, with rows of teeth appearing as scales on the curved side. They taper to blunt tips. The neurochaetae are numerous, forming a fan-shaped bundle and bear two lateral rows of spines on one side. They are unidentate and slightly hooked. Ventral cirri are short and tapered, located at the base of the neuropodia. The pygidium is small, rounded, bearing a pair of anal cirri. All the ventral papillae are inconspicuous, except of segment 11 where they are very developed in some of the specimens.

**Biology:** Among *Bathymodiolus azoricus* beds.

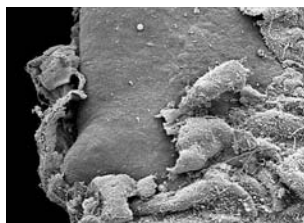
**Distribution:** Mid-Atlantic Ridge: Rainbow, Lucky Strike (uncommon species).



1: Habitus, dorsal view © Ifremer.



2: Prostomium, dorsal view (SEM) © Ifremer.



3: Posterior part of elytron (SEM) © Ifremer.



4: Acicular lobe of notochaetae (SEM) © Ifremer.



5: Ventral pair papillae 11<sup>th</sup> segment © Ifremer.

#### Reference:

HOURDEZ S. & D. DESBRUYÈRES (2003) Cah. Biol. Mar. **44**: 13-21.



*Levensteiniella plicata* HOURDEZ & DESBRUYÈRES, 2000

**Size:** Maximum size observed 57 mm in length, width 21 mm including chaetae.

**Color:** Pinkish in vivo, light brown when preserved. Chaetae are straw colored.

**Morphology:** Body long suboval, flattened dorso-ventrally. 11 pairs of elytra. The elytra are smooth, thick and with a prominent longitudinal fold. They leave uncovered the middle part of the body and the posterior end. The tapering tip of the dorsal cirrus does not extend beyond the neurochaetae. The prostomium is trapezoid, deeply bilobed with frontal terminal filaments on the cephalic peaks. The ceratophore of the median antennae is short, cylindrical, and inserted in the anterior notch. The style is shorter than the palps, which are stout, shorts and with a terminal articulated filament. The proboscis

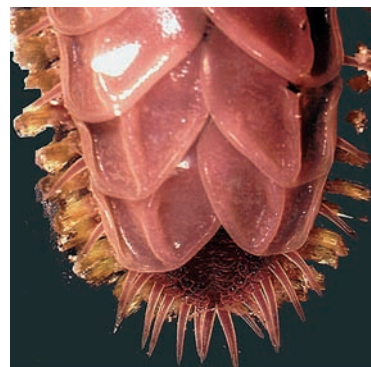
has two pairs of straight jaws with up to 20 teeth. Both rami of the parapodia well developed; the notopodia shorter than the neuropodia are rounded and the acicula project from acicular lobes. The notochaetae are numerous, stouter than neurochaetae. They are straight, flattened, tapering to blunt tips and with scales on one side. The neurochaetae are slender, numerous, forming a fan-shaped bundle. They have two longitudinal rows of spines on one side and their tip is bare and straight. 0/2 elongated papillae on 11 and 12.

**Biology:** Living among mussel beds of *Bathymodiolus thermophilus*.

**Distribution:** East Pacific Rise: 9°N.



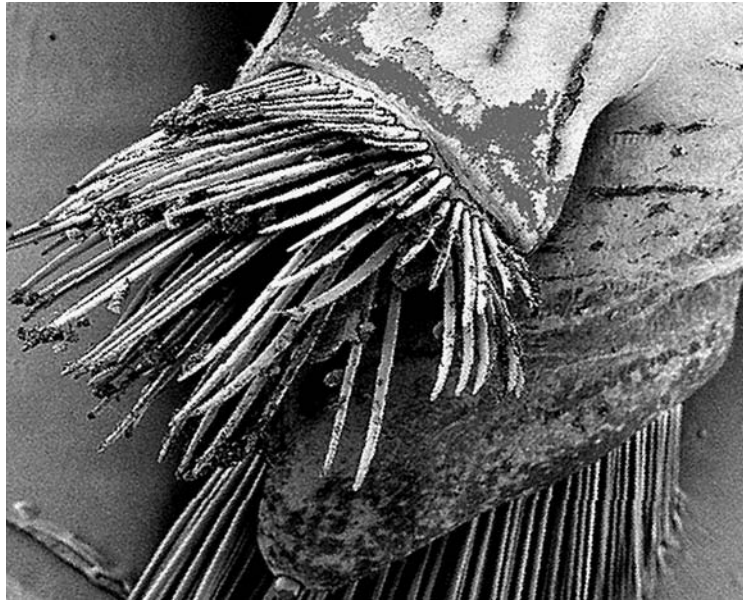
1: Habitus © Ifremer.



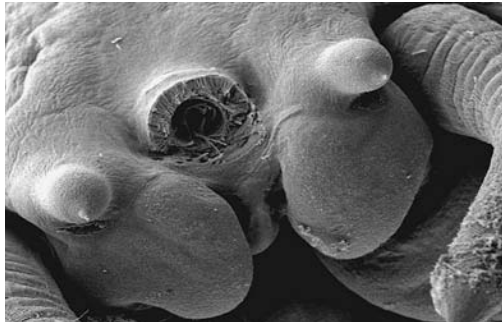
2: Posterior part © Ifremer.



3: Parapodia, dorsal view © Ifremer.



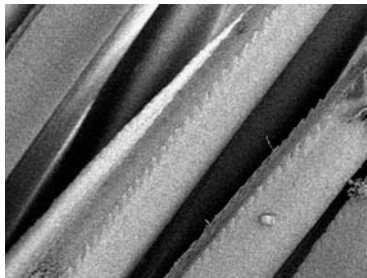
4: Right parapodium, anterodorsal view (SEM) © Ifremer.



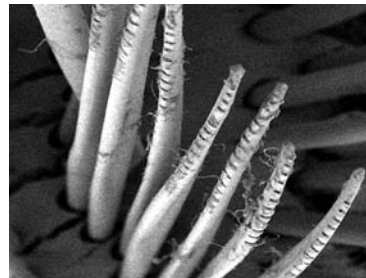
5: Prostomium, frontal view; median antenna removed (SEM) © Ifremer.



6: Elongated ventral papillae 11 and 12 segments © Ifremer.



7: Notochaetae (SEM) © Ifremer.



8: Neurochaetae (SEM) © Ifremer.

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#### References:

- HOURDEZ S. & D. DESBRUYÈRES (2000) Cah. Biol. Mar. **41**: 97-102.  
VAN DOVER C.L. (2002) Mar. Ecol. Progr. Ser. **230**: 137-158.



## *Thermiphione fijiensis* MIURA, 1994

**Size:** Up to 20 mm in length and 10 mm in width.

**Morphology:** Body flattened, with 30 or 31 segments. Elytra 14 pairs on segments 2, 4, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 26 and 27; elytra on segment 2 oval, with fringes of short papillae covered with filamentous bacteria; other elytra elongated subreniform, lateral borders with fringes of short papillae; elytral surface covered with hexagonal or polygonal areas with secondary areolae. Prostomium partially fused to tentacular segment, and withdrawn in anterior segments. Prostomium bilobed forming separate rounded lobes with anterolateral extensions. Tentacular segment with long cylindrical tentaculophores lateral to prostomium; each with a single aciculum. Nodular papillae arising from dorsum of anterior segments; more than 20 papillae on anterior segments; arranged in two or more rows before segment

14, thereafter in single row, absent posterior to segment 20. Elytrophores bulbous, transversely elongated; places of attachment with latero-posterior extensions. Dorsal tubercles on cirriferous segments bulbous, prominent, transversally elongated, continuous with enlarged cirrophores of dorsal cirri. Dorsal and ventral cirri with short clavate papillae. Branchiae absent. Notopodia subconical, with projecting acicular lobes hidden by numerous notochaetae. Neuropodia large truncate. Hooked neurochaetae occurring on segment 3.

**Biology:** Free living scale-worm. Epibiotic filamentous bacteria on parapodia.

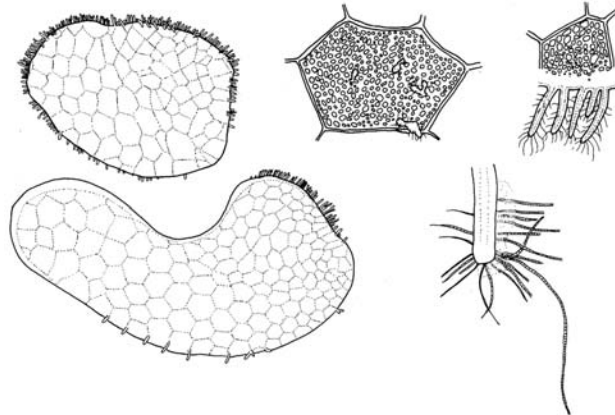
**Distribution:** North Fiji and Lau Back-Arc Basins.



1: Dorsal view; by P. Briand © Ifremer.



2: Anterior end, dorsal view  
elytra removed;  
from MIURA (1994).



3: Anterior  
(segment 2) and  
median (segment  
5) elytra with details of the hexagonal areas and marginal papillae;  
from MIURA (1994).

### Reference:

MIURA T. (1994) Proc. Biol. Soc. Wash. **107**: 532-543.



*Thermiphione tufari* HARTMANN-SCHRÖDER, 1992

**Size:** Up to 30 mm in length, width 7.5 mm including chaetae.

**Color:** Reddish.

**Morphology:** Body ovate greatly flattened. Fourteen pairs of elytra (...23, 26, 27), 29-32 segments. The elytra are reniform, their surface are covered by polygonal areas with secondary areolae; elytrae ciliated at the outer and posterior borders. Prostomium bilobed forming two separate rounded lobes, with anterolateral bulbous extensions fused to the facial tubercle. Antennae and eyes lacking. Long cylindrical tentaculophores emerge lateral to the prostomium and palps each with an aciculum as well as one or two chaetae. Short papillae on dorsal and ventral tentacular cirri. Small oval medial nodules are

found on segments 4 (1), 5 (2) and two following segments (2) but variable in number according to specimens. Segment 3 not visible dorsally. Elytrophores bulbous, transversally elongated. Dorsal tubercles on cirriferous segments transversally elongated and striated. Dorsal and ventral cirri with short clavate papillae. Notochaetae forming radiating bundles of dense tufts, shorter than neurochaetae. Hooked neurochaetae first present from chaetiger 4.

**Biology:** Rare, found at the periphery of active vents, with stalked barnacles.

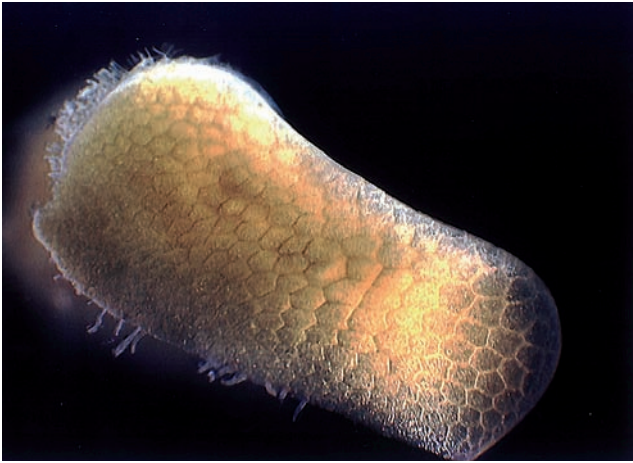
**Distribution:** East Pacific Rise: 7°S to 21°S.



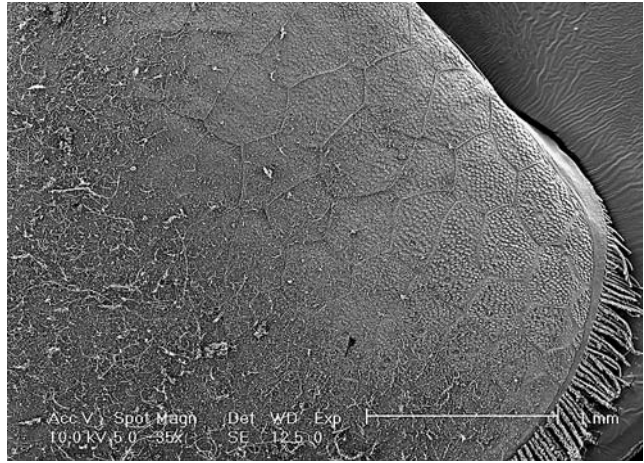
1: Anterior part, dorsal view © Ifremer.



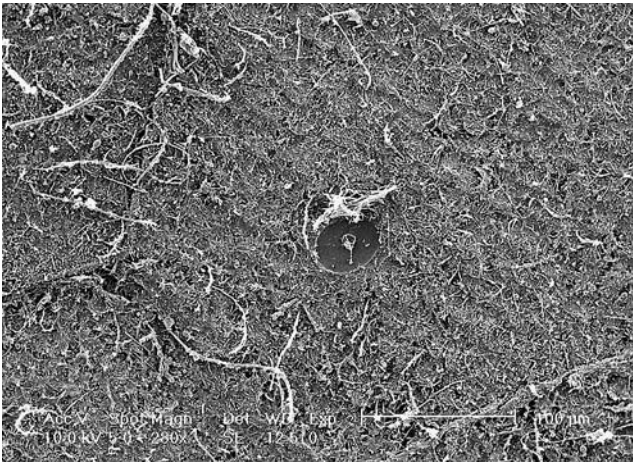
2: Proboscis, frontal view (preserved specimen) © Ifremer.



3: Median elytron © Ifremer.



4: Elytra with ciliated border (SEM) © Ifremer.



5: Polygonal area with a central areola (SEM) © Ifremer.



6: Medial parapodia, dorsal view (SEM) © Ifremer.



7: Notochaetae (SEM) © Ifremer.



8: Ventral cirrus (SEM) © Ifremer.

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#### Reference:

HARTMANN-SCHRÖDER G. (1992) *Helgol. Meeresunters.* **46**: 389-403.



## *Thermopolynoe branchiata* MIURA, 1994

**Size:** Up to 53 mm in length. Up to 20 mm in width.

**Morphology:** Body flattened, with 27 segments (first achaetous). Elytra 11 pairs on segments 2, 4, 5, 7, 9, 11, 13, 15, 17, 19 and 21, large, covering dorsum, stiff, rough with numerous brownish papillae. Branchiae well developed, arborescent on segment 3-26; separated into two groups on anterior and posterior sides of notopodia on segment 3 and on some less developed posterior segments; forming single large branchial areas encircling central parts of notopodia on other fully developed parapodia. Prostomium bilobed. Anterior lobes prominent, cylindrical, with small frontal filaments. Mouth opening situated between segments 1 and 2. Muscular pharynx encircled by

seven pairs of bulbous papillae. Dorsal and ventral pairs of jaws fused medially each with up to 15 teeth on basal sides. Notopodia subconical with projecting acicular lobes and large flaring bracts. Neuropodia diagonally truncate, deeply notched on upper part; distal margins fimbriated with slender papillae covered with numerous filamentous bacteria. Ventral segmental papillae long; three pairs present on segments 12, 13 and 14 and lacking in half of the specimens.

**Biology:** Free living. Found in washings of *Ifremeria* and mussels. Epibiotic bacteria on parapodia.

**Distribution:** North Fiji, Lau Basin, and Manus Back-Arc Basins.



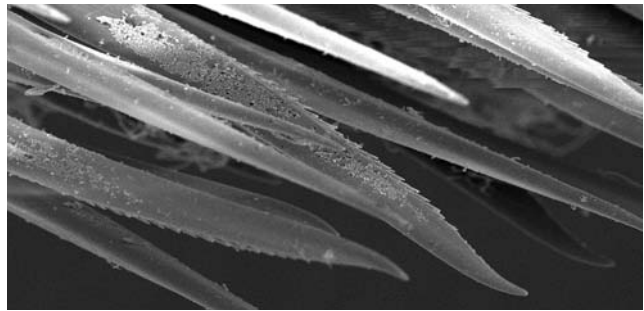
1: Habitus in vivo; by courtesy of C. Rouse (cruise TUIM06).



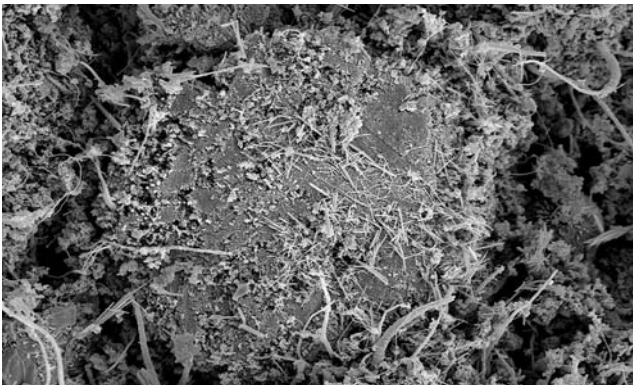
4: Prostomium and buccal region, frontal view (SEM) © Ifremer.



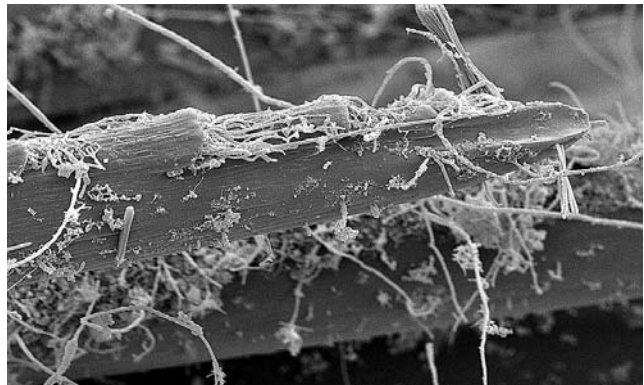
2: Elytron surface (SEM) © Ifremer.



5: Inferior neurochaetae (SEM) © Ifremer.

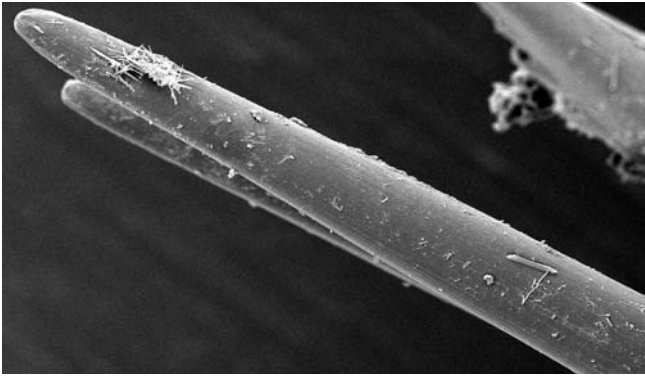


3: Elytron surface detail (SEM) © Ifremer.

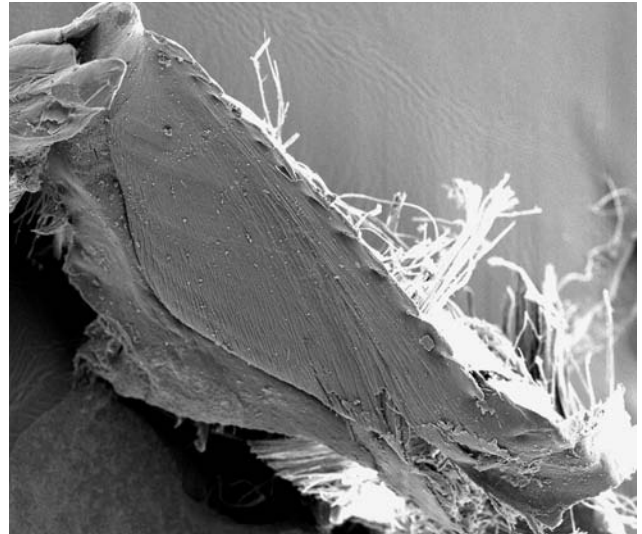


6: Superior notochaetae (SEM) © Ifremer.





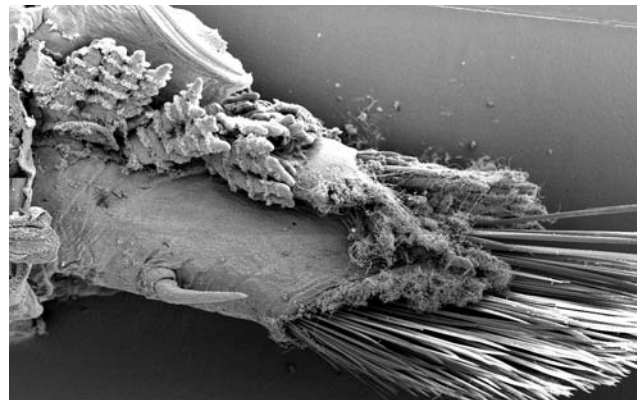
7: Middle notochaetae (SEM) © Ifremer.



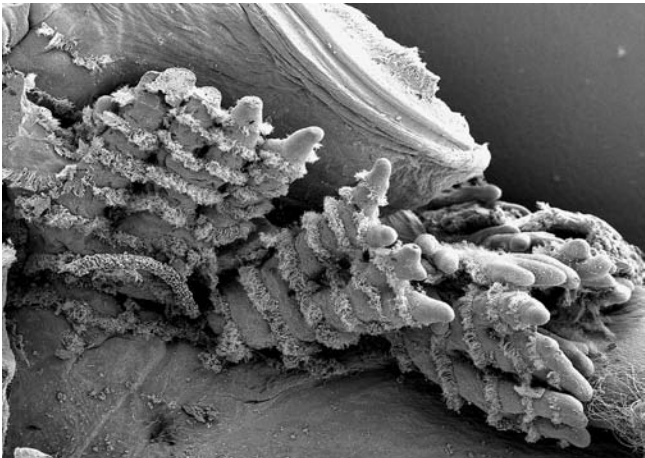
10: Jaw (dissection) (SEM) © Ifremer.



8: Flaring bracts first chaetigers, frontal view (SEM) © Ifremer.



11: Median elytriphorous chaetiger (SEM) © Ifremer.



9: Arborescent branchiae forming large branchial areas (SEM) © Ifremer.



12: Median cirriphorous chaetiger (SEM) © Ifremer.

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**Reference:**

MIURA T. (1994) Proc. Biol. Soc. Wash. **107**: 532-543.

*Vampiropolynoe embleyi* MARCUS & HOURDEZ, 2002

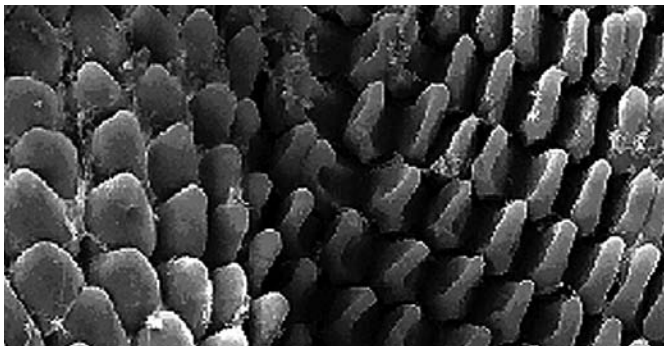
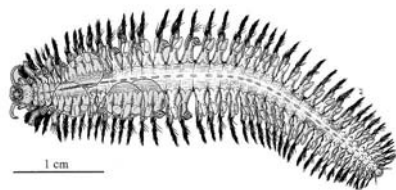
**Size:** Up to 52 mm.

**Morphology:** Scale worm found on bacterial mats; body flattened, segments 43-45 first achaetous. Elytra (smooth) and elytriphores 10 paires on segments 2, 4, 5, 7, 9, 11, 13, 15, 17 and 19. Dorsal tubercles developed as gills on cirriferous segments starting on segment 6. Prostomium bilobed, strong sharp acicular lobes on segment 1. Notochaetae stouter than neurochaetae. No jaws, keratinized teeth inside the pharynx. Mouth opening with papillae. No elongated ventral papillae.

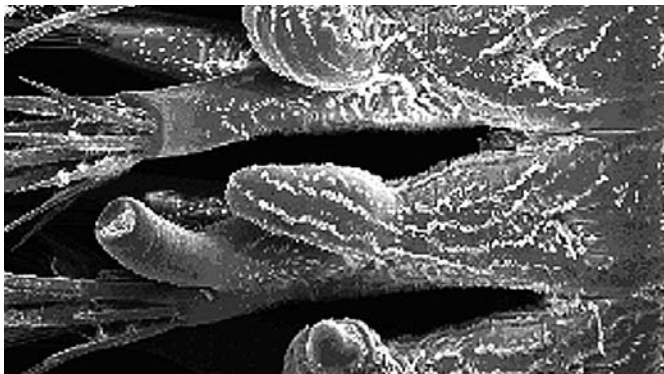
**Biology:** All worms were collected from bare basalt on vent peripheries, after the 1998 eruption of Axial Volcano. The species is thought to feed on bacterial mats and may be a pioneer species.

**Distribution:** Juan de Fuca Ridge: Axial Volcano.

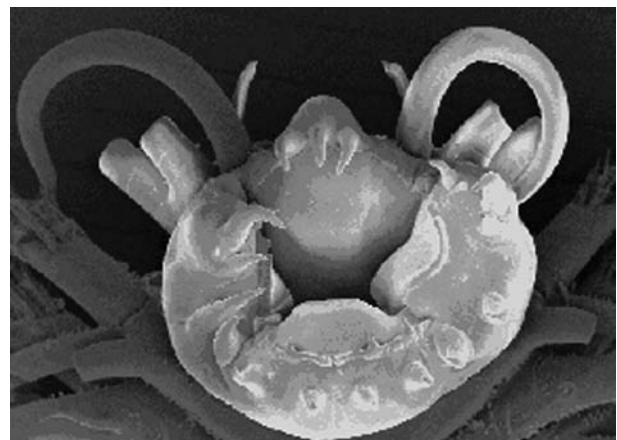
1: Paratype, dorsal view of the whole specimen; from MARCUS & HOURDEZ (2002).



2: Keratinized teeth at the junction between the mouth opening and the pharynx (SEM); by courtesy of J. Marcus and S. Hourdez.



3: Dorsal view of the segments 11-14 (SEM); by courtesy of J. Marcus and S. Hourdez.



4: Ventral view of a partially everted pharynx showing upper, lateral and ventral lips with their papillae and ridges (SEM); by courtesy of J. Marcus and S. Hourdez.



5: Dorsale view of the anterior part of the worm, showing the strong aciculae protruding from the first segment (SEM); by courtesy of J. Marcus & S. Hourdez.

**Reference:**

MARCUS J. & S. HOURDEZ (2002) Proc. Biol. Soc. Wash. **111**(2): 341-349.



*Sphaerosyllis ridgiensis* BLAKE & HILBIG, 1990

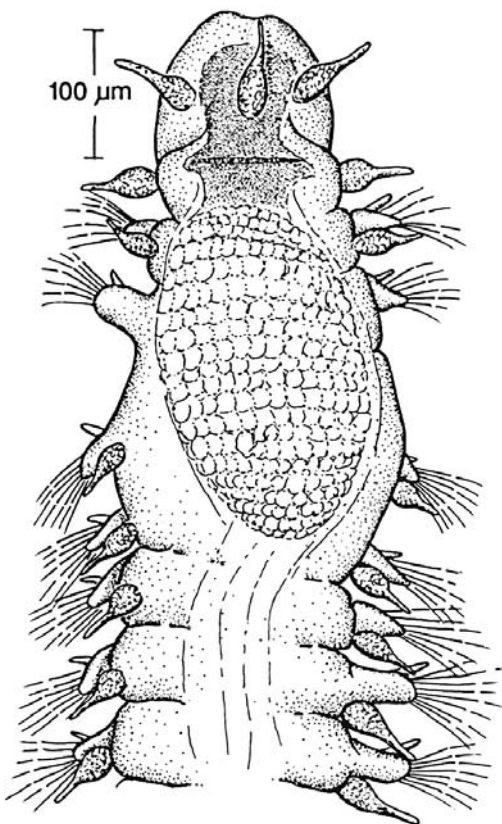
**Size:** Small species, holotype 3.1 mm long for 23 chaetigerous segments, 1 mm wide.

**Morphology:** Prostomium weakly notched on anterior margin, about as long as wide, clearly fused with tentacular segment; medial antenna inserted at point of folded merger of tentacular segment with prostomium; lateral antennae inserted nearly in line with medial antenna; antennae glandular, with bulbous bases and narrow tapering tips. Eyes lacking. Tentacular cirri present laterally on tentacular segment similar to antennae; parapodia similar throughout body, conical with single imbedded aciculum lacking papillae; dorsal cirri glandular, with bulbous bases and narrow tapering tips; without dorsal cirri on

chaetiger 2; ventral cirri long, cirriform. Chaetae including single, long dorsalmost simple chaetae with bidentate tips and 8-10 compound falcigers with bidentate tips and conspicuous serrations on blade. Pharynx red in color, occupying tentacular segment, and bearing single middorsal tooth sometimes emerging from oral opening; proventriculus occupying chaetigers 1-4, tan colored, with about 20 rows of muscle cells.

**Biology:** Unknown. The syllids are known to be suctorial-feeders.

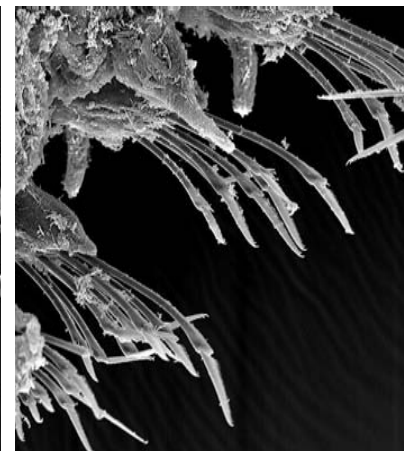
**Distribution:** Explorer Ridge, Juan de Fuca Ridge.



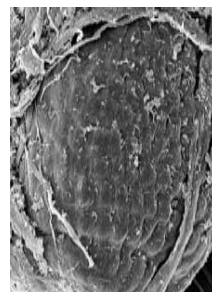
1: Habitus, dorsal view; by courtesy of J. Blake.



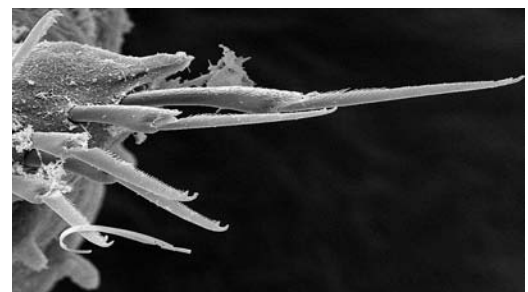
2: Anterior part, ventral view (SEM) © Ifremer.



3: Median parapodium, dorsal view (SEM) © Ifremer.



4: Proventriculus (SEM) © Ifremer.



5: Compound falcigers with bidentate tips (SEM) © Ifremer.

References:

- BLAKE J.A. & B. HILBIG (1990) Pac. Sci. **44**: 219-253.  
 TUNNICLIFFE V. (1988) Proc. R. Soc. London B **233**: 347-366.



*Laminatubus alvini* TEN HOVE & ZIBROWIUS, 1986

**Size:** Tube, until 100 mm long, 5.3 mm wide.

**Morphology:** The tube is thick-walled, smooth, subtriangular in cross-section. It has a wide flattened area of attachment; the lateral parts are solids, not with the alveolar structure as in. A crest-like, sometimes undulating medial keel is the only ornamentation present. The wall of the tube comprises two distinct layers. The operculum is radially or slightly bilaterally symmetrical. It consist of a bulbous proximal part, which may be somewhat conical, and a rounded to inverted saucer-like distal cap.

Branchial crown about 1/2 of the animal. Branchial radioles in a short spirale. Collar with capillaries and special chaetae, five pairs of subsequent bundles. Abdomen with up to 109 segments.

**Biology:** At the border of active vent fields. Filter feeding organisms (mixotrophic?).

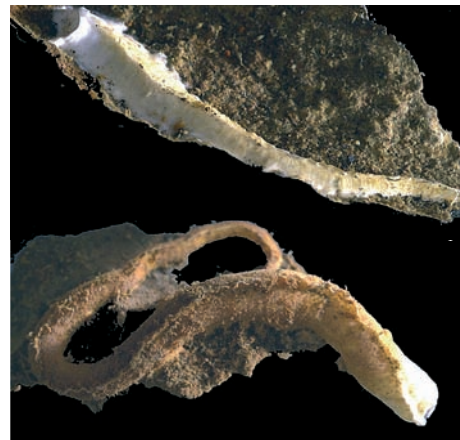
**Distribution:** Galapagos Spreading Center; East Pacific Rise: 21°N to 23°S.



1: Habitus operculum missing; by V. Martin © Ifremer.



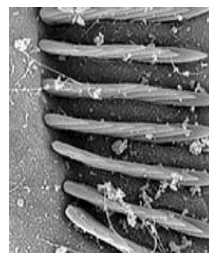
2: Habitus in vivo; by P. Briand © Ifremer.



3: Tubes of specimens from East Pacific Rise 13°N © Ifremer.



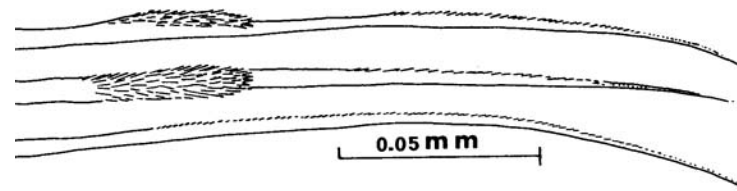
4: Geniculated chaeta from anterior abdomen (SEM) © Ifremer.



5: Thoracic uncini (SEM) © Ifremer.



6: Population in situ from East Pacific Rise 13°N; cruise Phare © Ifremer.



7: Two special collar chaetae and one capillary chaeta below; from TENHOVE & ZIBROWIUS (1986).

**References:**

- DESBRUYÈRES D., GAILL F., LAUBIER L. & Y. FOUQUET (1985) Biol. Soc. Wash. Bull. **6**: 103-116.  
 TEN HOVE H.A. & H. ZIBROWIUS (1986) Zool. Scripta **15**(1): 21-31.

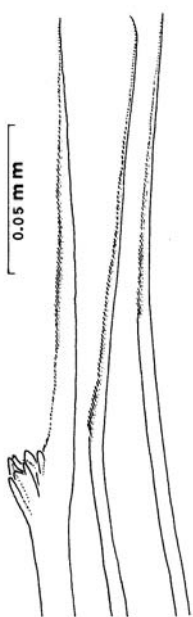
*Protis hydrothermica* TEN HOVE & ZIBROWIUS, 1986

**Size:** Tube, up to 70 mm long, 3.8 mm wide, the thickness of the wall is ca 0.2 mm; length of the body 47 mm, width of the thorax up to 2 mm.

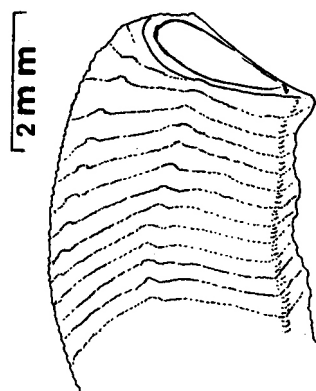
**Morphology:** The tube is semicircular in cross-section, adhering relatively flatly to the substrate. If a flattened area of attachment is present, it is very small. The tube is rather indistinctive, somewhat rugged. Very careful illumination reveals that, in addition to the faint medial ridge, there may be a pair of shallow grooves or ridges laterally, making the cross-section of the tube slightly trapezoidal. Free anterior tube parts have

not been observed. The wall of the tube is homogenous, and does not consist of two distinct layers. The surface is lusterless. Older tube parts are frequently encrusted by yellowish-brown deposits. No operculum.

**Distribution:** Galapagos Spreading Center; East Pacific Rise: 21°N, 13°N, 17°S; Pacific-Antarctic Ridge: 38°S.



1 left to right: Special collar chaeta, capillary collar chaeta and capillary chaeta; from TEN HOVE & ZIBROWIUS (1986).



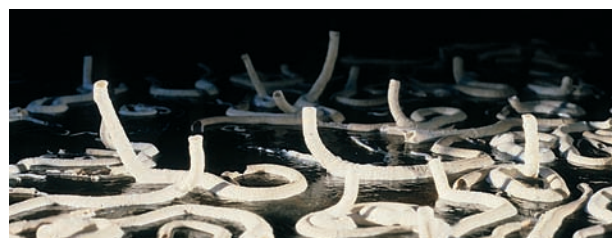
2: Anterior part of tube; from TEN HOVE & ZIBROWIUS (1986).



3: Tube of specimen on the capitulum of stalked banacle *Vulcanolepas* sp., from East Pacific Rise: 17°S; cruise Biospeedo; by P. Briand © Ifremer.



4: Specimen removed from tube; East Pacific Rise: 13°N; by D. Desbruyères © Ifremer.



5: Colony of tubes on an artificial substrate left several months on the vent site Parigo, East Pacific Rise: 13°N; cruise Hydronaut; by P. Briand © Ifremer.

**Reference:**

TEN HOVE H.A. & H. ZIBROWIUS (1986) Zool. Scr. **15**(1): 21-3.

H. ZIBROWIUS & M. SEGONZAC

Denisia 18 (2006): 254

*Alaysia spiralis* SOUTHWARD, 1991 “small spiral tube-worm“

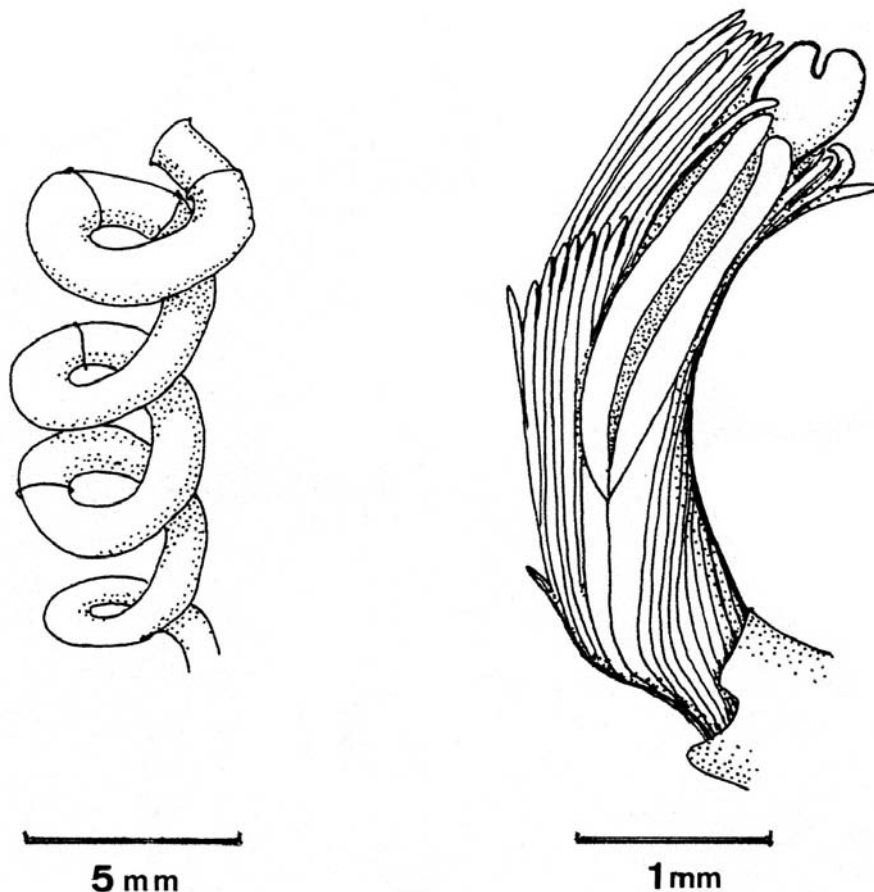
**Size:** Tube length max. 300 mm; diameter 0.7-1.0 mm.

**Color:** White/grey, semi-transparent.

**Morphology:** Anterior part of the tube coiled like a corkscrew, rising from a sinuous basal region. Surface smooth, with narrow flanges at irregular intervals. The top of the obturaculum is cup-shaped, with a thin colorless lining, on a stalk which is triangular in cross section, having a dorsal groove and lateral flaps. Branchial filaments are parallel to the obturaculum, forming lamellae, composed of two types: one pair of sheath lamellae, composed of filaments without pinnules, surrounds the inner lamellae made of pinnulate filaments.

**Biology:** Tubes are fixed to rocks close to mussel beds in areas of diffuse venting; temperature about 7°C. Endosymbiotic bacteria present, probably sulphur-oxidisers.

**Distribution:** Valu Fa Ridge in the Lau Back-Arc Basin.



1 left: Anterior region of larger tube; right: Outer lamellae, inner filaments and obturaculum, dorsal view; from SOUTHWARD (1991).

**References:**

- DESBRUYÈRES D., ALAYSE-DANET A.M., OHTA S. & the Scientific Parties of Biolau and Starmer Cruises (1994) Mar. Geol. **116**: 227-242.  
HALANYCH K.M. (2005) Hydrobiologia **535/536**: 297-307.  
KOJIMA S., OHTA S., YAMAMOTO T., YAMAGUCHI T., MIURA T., FUJIWARA T. & J. HASHIMOTO (2003) Mar. Biol. **142**: 625-635.  
SOUTHWARD E.C. (1991) J. Nat. Hist. **25**: 859-881.



*Arcovestia ivanovi* SOUTHWARD & GALKIN, 1997

**Size:** The sinuous tubes are up to 200 mm long, the anterior part is up to 3 mm in diameter.

**Color:** The semi transparent tube wall is light-tan to olive-green (grey in preserved specimens).

**Morphology:** The tube has an anterior funnel followed by a series of collars (flanges) diminishing in size toward the posterior end. The tube surface is slightly ridged, but its general appearance is shiny and smooth. The plume is made of slender filaments that surround a slender obturaculum with a spoon-shaped top. The obturaculum stalk has a sharp ventral ridge, extending from the base to the apex and a dorsal groove sepa-

rates prominent lateral ridges. The branchial filaments are grouped in numerous paired lamellae, parallel to the obturaculum. The collar at the anterior end of the vestimental region is long, covering the base of the branchial lamellae. The lateral vestimental folds meet at the dorsal mid line, enclosing the dorsal vestimental space, and join posteriorly to form an entire ventral fold. The branchial plume including the obturaculum is slightly longer than the vestimental region. A pair of genital grooves runs from the posterior end of the vestimental region to the base of the anterior collar in mature males.

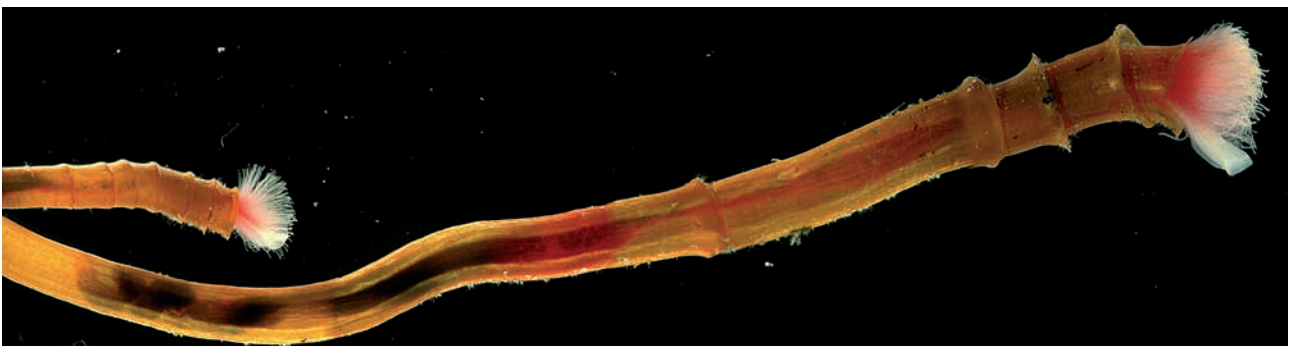
**Distribution:** Manus and Lau Back-Arc Basins.



1: Co-dominant species at the DESMOS site (Manus Back-Arc Basin) are galatheids (*Munidopsis lauensis*), vestimentiferans (*Arcovestia ivanovi*) and zoarcids (*Pyrolycus manusanus*); by courtesy of J. Hashimoto © JAMSTEC.



2: Anterior end of the tube, obturaculum and plume; specimen from Lau Back-Arc Basin; cruise TUIM 06; by courtesy of Greg Rouse.



3: Habitus of two animals in their tube. Specimens from Lau Basin; cruise TUIM 06; by courtesy of Greg Rouse.

**References:**

- SOUTHWARD E.C. & S.V. GALKIN (1997) J. Nat. Hist. **31**: 43-45.  
KOJIMA S., OHTA S., YAMAMOTO T., MIURA T., FUJIWARA Y., FUJIKURA K. & J. HASHIMOTO (2002) Mar. Biol. **141**: 57-64.

*Lamelibrachia barhami* WEBB, 1969

**Size:** Tube length max. ca. 1500 mm; anterior diameter 7-12 mm.

**Color:** Grey/white, opaque.

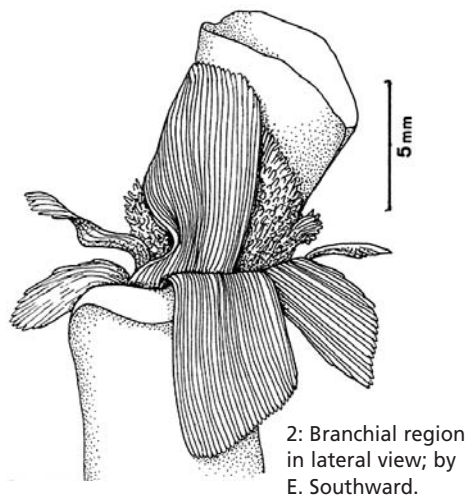
**Morphology:** Tube rigid, thick walled, sinuous, tapering to <1 mm at posterior end; short external flanges anteriorly, eroded and indistinct over much of the tube. Top of obturaculum cup-shaped, smooth interior surface, stalk elliptical in section. Obturaculum short (max. 12 mm), about 1/3 length of vestimental region. Branchial filaments are parallel to the obturaculum, forming lamellae of two types: pale outer sheath lamellae (2-5 pairs) made of adherent filaments without pinnules and red inner lamellae of pinnulate filaments.

**Biology:** Sprawling tangles of tubes lie on muddy surface, with posterior ends burried in sediment or under rocks. Cold seep animals live at ambient sea temperature; Middle Valley animals at fringes of diffuse venting regions with sulphide seepage but no apparent temperature anomaly. Use internal symbiotic sulphide-oxidizing bacteria.

**Distribution:** Subduction zone cold seeps on the North America continental margin and a sedimented hydrothermal region at Middle Valley on the Juan de Fuca Ridge.



1: Population on the bottom at Middle valley on the Juan de Fuca Ridge; by courtesy of V. Tunnicliffe.



3: Population on the bottom at Middle valley on the Juan de Fuca Ridge; by courtesy of V. Tunnicliffe.



4: Anterior region in vivo; by courtesy of V. Tunnicliffe.

References:

- JONES M.L. (1985) Bull. Biol. Soc. Wash. **6**:117-158.  
JUNIPER S.K., TUNNICLIFFE V. & E.C. SOUTHWARD (1992) Can. J. Zool. **70**: 1792-1809.  
SOUTHWARD E.C., TUNNICLIFFE V., BLACK M.B., DIXON D.R. & L.R.J. DIXON (1996) J. Geol. Soc., Spec. Publ. **118**: 211-224.  
SUESS E., CARSON B., RITGER S.D., MOORE J.C., JONES M.L., KULM L.D. & G.R. COCHRANE (1985) Bull. Biol. Soc. Wash. **6**: 475-484.  
WEBB M. (1969) Bull. Mar. Sci. **19**: 18-47.



*Lamellibrachia columna* SOUTHWARD, 1991

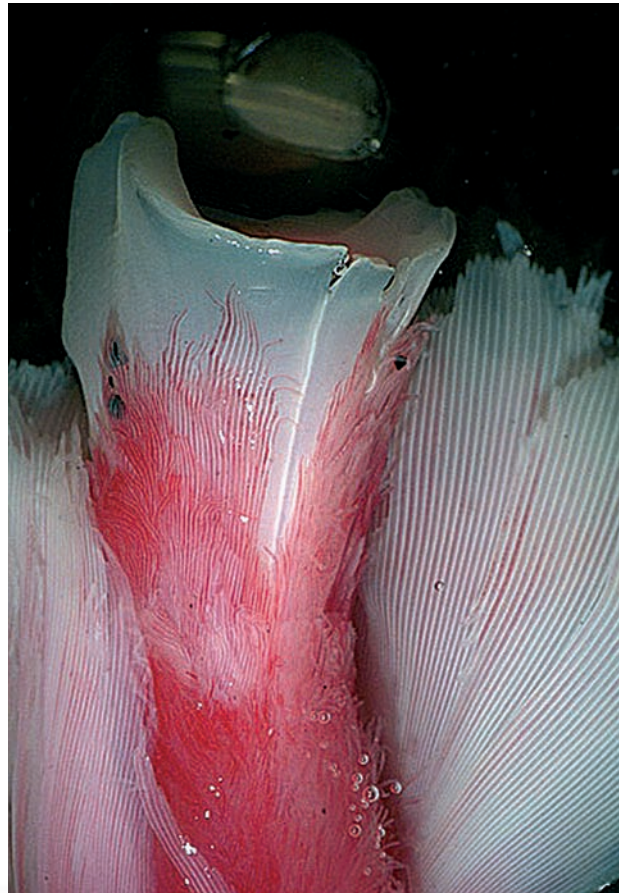
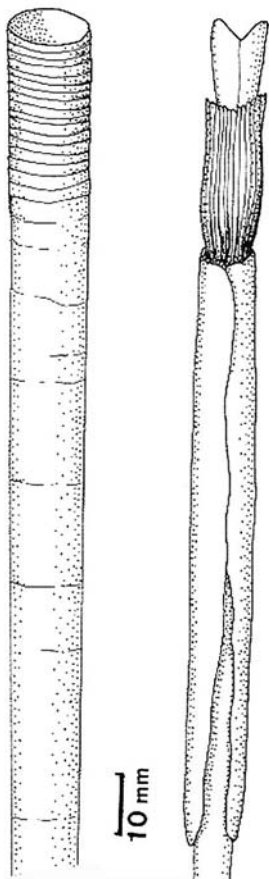
**Size:** Tube length max. 820 mm; anterior diameter 14-20 mm.

**Color:** Tube white/grey, opaque.

**Morphology:** Tubes smooth surfaced, straight, thick walled, rigid, tapering to sinuous posterior region 10 to <5 mm diameter. The white obturaculum (15-42 mm long) has a funnel-shaped top, with thin anterior rim and smooth inner surface, on a slender stalk elliptical in section. Branchial filaments are parallel to the obturaculum forming lamellae of two types: pale outer sheath lamellae (8-16 pairs) made of adherent filaments without pinnules and red inner lamellae composed of pinnulate filaments.

**Biology:** The tubes are attached within rock crevices, and project vertically, near sources of diffuse venting, but probably there is no temperature anomaly in the surrounding water; internal bacteria present probably sulphide oxidizers.

**Distribution:** Valu Fa Ridge in the Lau Back-Arc Basin.



1: Left, anterior end of the tube and anterior end of the animal, dorsal view; from SOUTHWARD (1991).

2: Anterior end of the animal showing obturaculum and branchial filaments; cruise TUIM 06; by courtesy of G. Rouse.

3: A tube projecting vertically, Valu Fa Ridge; cruise Biolau © Ifremer.

**References:**

DESBRUYÈRES D., ALAYSE-DANET A.M., OHTA S. & the Scientific Parties of Biolau and Starmer Cruises (1994) Mar. Geol. **116**: 227-242.  
SOUTHWARD E.C. (1991) J. Nat. Hist. **25**: 859-881.



*Lamellibrachia satsuma* MIURA, TSUKAHARA & HASHIMOTO, 1997

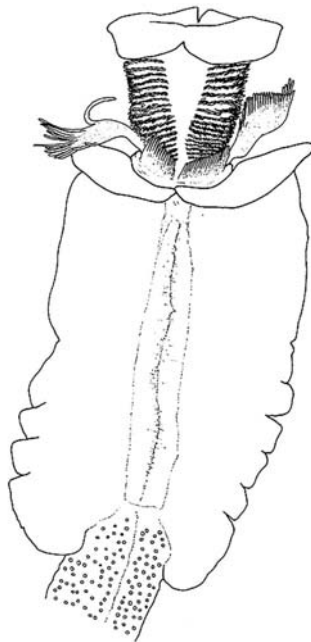
**Size:** Tube length max. 1400 mm; anterior diameter max. 9 mm.

**Color:** Tube grey/white.

**Morphology:** Tube rigid, thick walled, tapering to less than 1 mm at posterior end; short external flanges anteriorly, eroded and indistinct in posterior half; sinuous but anterior parts more straight than posterior: Obturaculum cup- or funnel- shape, with smooth interior surface; stalk elliptical in transverse section, with up to 19 pairs of branchial lamellae hidden by up to four pairs of peripheral lamellar sheets. Vestimentum of ale with paired ciliated grooves, diverging at anterior ends. Vestimental cuticular plaques 35-63 mm in diameter, trophosomal ones 51-82 mm.

**Biology:** This tubeworm species lives in shallow water at depths of 82-110 m in Kagoshima Bay and of about 300 m in Nankai Trough. The worms make a cluster on sediment bottom. Most of clusters are less than 5 m in length with about 1 m height, but reaches more than 10 m in length and 3 m in height. Ambient temperature is constant at about 16°C throughout the year. Internal bacteria present, sulfide oxidizers, may chiefly use biogenic hydrogen sulfide rather than volcanic gas.

**Distribution:** West Pacific: Kagoshima Bay; Nankai Trough.



1: Anterior end, ventral view, body fixed after removal from the tube; by T. Miura.



2: Uncini of the opisthosome (SEM); by T. Miura.



3: Living specimens; by T. Miura.



4: A clump of vestimentiferan tube worms, 82 m deep, Kagoshima Bay; by T. Miura © Jamstec.

References:

- MIURA T., TSUKAHARA J. & J. HASHIMOTO (1997) Proc. Biol. Soc. Wash. **110**: 447-456.  
MIURA T., NEDACHI M. & J. HASHIMOTO (2002) J. Mar. Biol. Ass. U. K. **82**: 537-540.

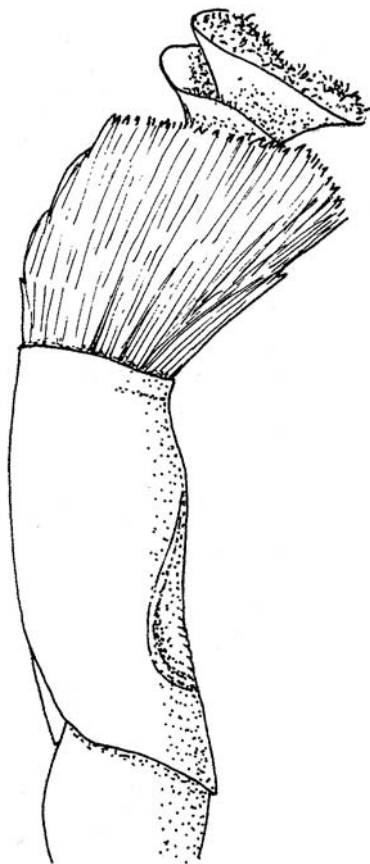
## *Oasisia alvinae* JONES, 1985

**Size:** Tube length max. 123 mm; anterior diameter 1.5-2.5 mm.

**Morphology:** Tube transparent, tapering, flexible, with widely spaced flanges. Top of obturaculum with conspicuous central axial rod carrying 2-3 translucent white saucer-like structures (small specimens found at East Pacific Rise 9°N having 5-6 saucers); broad dorsal groove. Branchial filaments in concentric lamellae, most filaments pinnulate, a few without pinnules on dorsal end of basal lamellae. Paired excretory pores opening dorsally at the base of obturaculum. Anterodorsal wings of vestimentum become sheath at base of obturaculum, continuing ventrally, free from obturaculum and vestimentum proper. Opisthosome with as many as 37 segments.

**Biology:** Found on sites of diffuse venting; occurs with *Tevnia jerichonana*; endosymbiotic sulfide oxidizing bacteria.

**Distribution:** East Pacific Rise: 21°N to 9°N.



1: Right lateral view of the anterior region; by E. Southward.



2 left: Tube; right: Habitus; from East Pacific Rise: 13°N; cruise Biocyarise; by P. Briand © Ifremer.

### References:

- HUNT H.L., METAXAS A., JENNINGS R.M., HALANYCH K.M. & L.S. MULLINEAUX (2004) Deep-Sea Res. I **51**: 225-234.  
JONES, M.L. (1985) Bull. Biol. Soc. Wash. **6**: 117-158.  
JONES M.L. (1988) Oceanol. Acta, Spec. **8**: 69-82.



## *Ridgeia piscesae* JONES, 1985

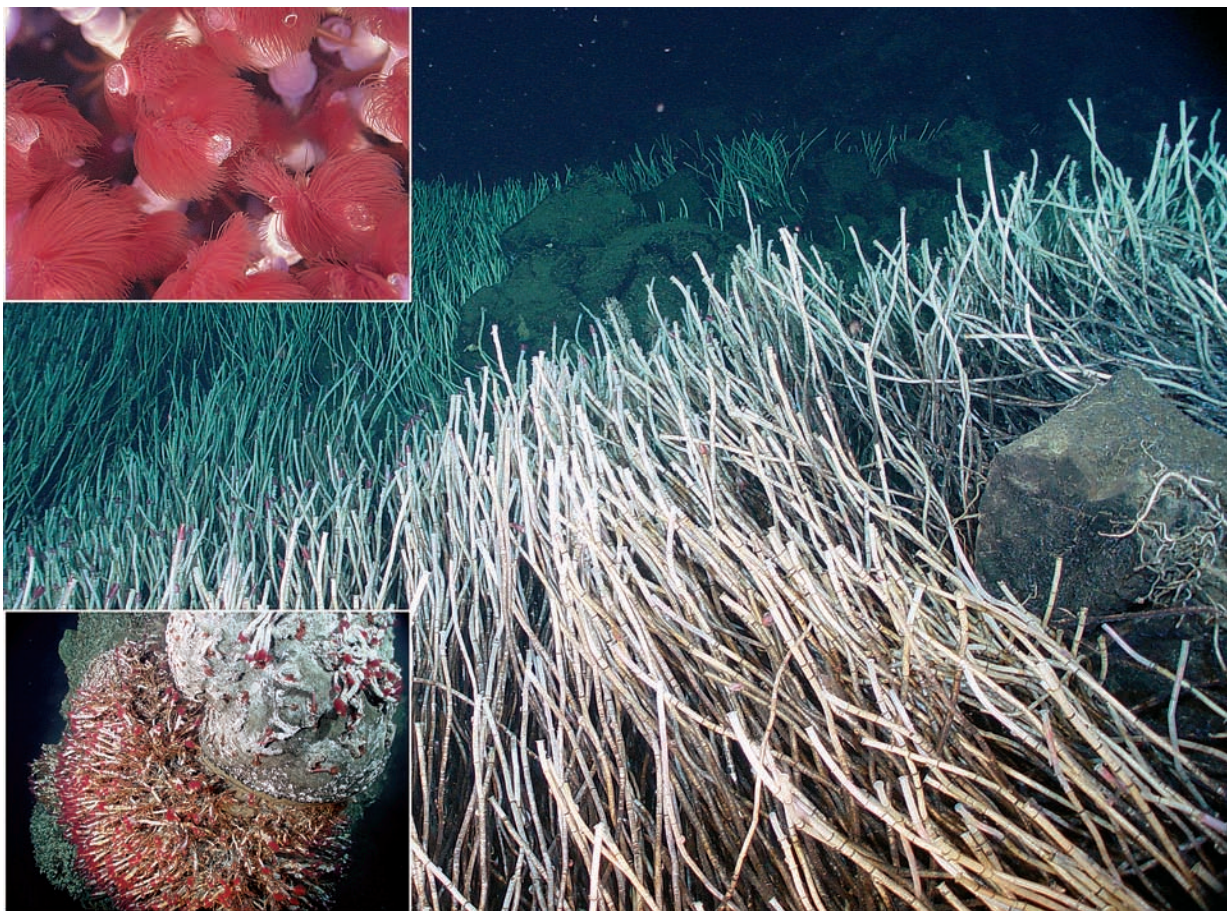
**Size:** Tube length max. 1900 mm; anterior diameter 2-13 mm.

**Morphology:** Tube very variable, straight or sinuous, stiff or soft, tapering to 1mm posterior end; anterior funnel and external flanges present. Color white, grey, gold, brown; commonly translucent. Top of obturaculum carries 1-15 brown saucers on a central axial rod; if these are shed, traces of the axial structure remain. Red branchial filaments in concentric lamellae parallel to the obturaculum; most bear pinnules, but there are a few thin, smooth filaments at the ends of each row.

**Remark:** *R. piscesae* was amended by SOUTHWARD et al. (1995) to include *R. phaeophiale* JONES 1985

**Biology:** Grows gregariously in clusters at sites of diffuse or warm venting, temperature range 5-60°C (?). Uses internal symbiotic sulphide-oxidizing bacteria. This species can even grow and survive in areas of low diffuse vent flow with very low plume level exposure to sulfide.

**Distribution:** Explorer Ridge, Juan de Fuca Ridge, Gorda Ridge.



1: Population in situ (Endeavour segment); by courtesy of S.K. Juniper.

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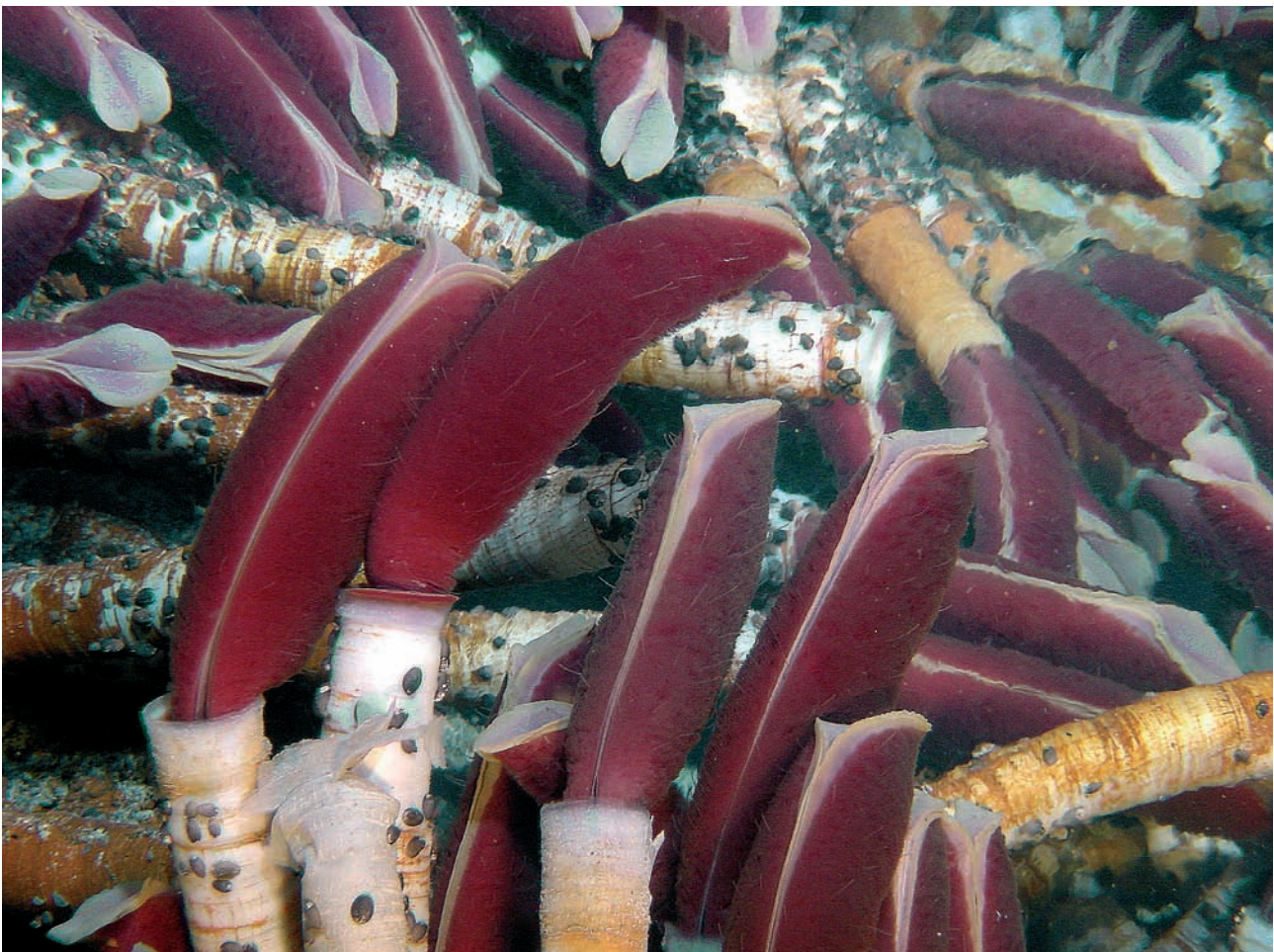
*Riftia pachyptila* JONES, 1981 “giant tube worm“

**Size:** Individual tubes up to 1.5 m.

**Morphology:** Four body regions (1) anterior tentacular plume on obturaculum; winged vestimentum; trunk; segmented posterior opisthosome. Plume red, with tentacular lamellae perpendicular to axis; paired halves of apical split end forming operculum upon withdrawal into tube. Vestimentum with dorsolateral flaps overlapping one another ventrally. Opisthosome with variable number of segments, ending in rounded posterior tip. Anterior segments completely encircled with paired single rows of chaetae, becoming incomplete posteriorly. Tube white, smooth, flexible, extremely sturdy, essentially cylindrical, basally blind ending. Tube made of a chitin-protein system.

**Biology:** Forms clusters on rocks in zone of diffuse venting. Feeds only on internal symbiotic sulfide oxidizing bacteria.

**Distribution:** Galapagos Spreading Center, East Pacific Rise (including Guaymas Basin).



1: Population in situ from East Pacific Rise: 13°N; cruise Phare © Ifremer.





2: Specimen, total view (left) and detail of anterior body regions, dorsal view (middle), ventral view (right) at East Pacific Rise: 9°N; by M. Bright.

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## *Siphonobrachia lauensis* SOUTHWARD, 1991

**Size:** Tube length max. 290 mm; anterior diameter 0.8-1.2 mm.

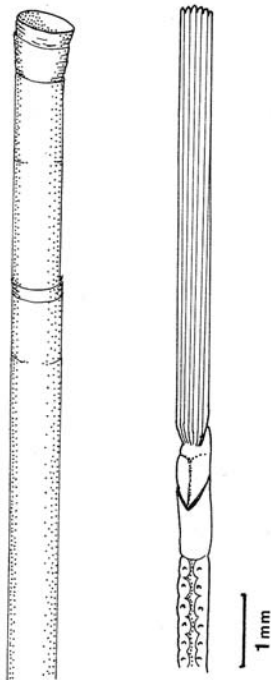
**Color:** Tube, transparent yellow anteriorly, then orange brown darkening to opaque brown posteriorly.

**Morphology:** The tube is straight and stiff, with a funnel at the top and external collars at irregular intervals, tapering to < 0.7 mm posteriorly. No obturaculum. Tentacles (10-21) stuck together side by side to form a hollow cylinder 5-18 mm long. Dark V-shaped bridle on dorsal side of forepart of body, fol-

lowed by two rows of dark crescentic plaques on the anterior trunk papillae.

**Biology:** The tubes are partly buried in sediment, projecting vertically, between rocks covered with oxides and bacterial mats. Temperature "not elevated". Internal bacteria present, probably sulphur-oxidizers.

**Distribution:** Lau Back-Arc Basin: Valu Fa Ridge.



1 left: Anterior end of the tube; right: Anterior end of animal; by E. Southward.



2: Tubes in hydrothermal sediment, close to bacterial mats. Stalked barnacles and galatheids in background. Biolau cruise © Ifremer.

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SOUTHWARD E.C. (1991) J. Nat. Hist. **25**: 859-881.



## *Tevnia jerichonana* JONES, 1985 "Jericho worm"

**Size:** Tube length max. 350 mm; anterior diameter 3-8 mm.

**Morphology:** Tube sinuous, rigid, tapering to <1 mm posteriorly; closely spaced external flanges. Color white or gold/brown, opaque. Top of obturaculum has yellow/brown crust and small axial lamina; obturaculum is short (length < 2 x diameter); conspicuous dorsal groove. Short red branchial filaments in concentric lamellae parallel to operaculum, most bear pinnules, but a few without pinnules at dorsal ends of rows.

**Biology:** Uses internal symbiotic sulphide-oxidizing bacteria. Forms cluster on rocks in zone of diffuse venting, temperature 5-30°C; an early colonizer of new vent sites.

**Distribution:** East Pacific Rise: 13°N to 21°S.



2: Plume;  
by courtesy of P. Baston.

1: Population in situ from East Pacific Rise: 13°N; cruise Hydronaut © Ifremer.  
Upper left: Anterior region; drawing by E. Southward. Box: Tubes.

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## *Nicomache arwidssoni* BLAKE, 1985 “bamboo worm“

**Size:** A large species, up to 84 mm long, 3 mm wide for 21 chaetigers.

**Morphology:** Color in alcohol light to dark brown, with gold pigment on anterior end and dark, rusty pigment posteriorly; some EPR specimens with glandular areas appearing dark green or black. Prostomium broadly rounded anteriorly, merging posteriorly with arched cephalic keel; cephalic plate lacking, nuchal grooves curved. Segments longer than wide, flaring anteriorly, but not forming collars. Notochaetae capillaries; long filamentous capillary notochaetae absent. Neurochaetae of

chaetigers 1-3 with 1-2 blunt-tipped spines; rostrate chaetae from chaetiger 4 increasing to 9-10 per fascicle middle segments; hooks with four apical teeth and tuft of bristles below main fang. Anus surrounded by funnel bearing about 25 papillae.

**Biology:** An epifaunal species, found in association with mussels, clams, siboglinids, and other associations. Maldanids are known as bulk-ingestors of particles.

**Distribution:** Galapagos Spreading Center; East Pacific Rise: 13°N, 21°N; Mariana Back-Arc Basin (questionable).



1: Habitus, dorsal view; by V. Martin © Ifremer.



2: Prostomium, lateral view (preserved specimen) © Ifremer.



3: Funnel with papillae surrounding anus © Ifremer.



4: Tube © Ifremer.



5: Hooks with tufts of bristles (SEM) © Ifremer.

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- BLAKE J.A. (1985) Bull. Biol. Soc. Wash. **6**: 67-101.  
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VAN DOVER C.L. (2002) Mar. Ecol. Prog. Ser. **230**: 137-158.



*Nicomache venticola* BLAKE & HILBIG, 1990

**Size:** A large species, up to 130 mm long, 2.5 mm wide, for 27-32 segments.

**Color:** In alcohol greenish gray or light brown, with dark pigmented areas sometimes apparent on neuropodia.

**Morphology:** Prostomium rounded on anterior margin, continuing posteriorly as arched cephalic keel; cephalic plate lacking; nuchal grooves curved. Anterior segments except first one or 2, longer than wide, flared anteriorly, overlapping preceding segments but not forming collars. Few posterior segments crowded, with swollen parapodial lobes. Parapodia biramous. Notochaetae simple capillaries with smooth shafts and clear narrow sheaths; long filamentous capillary notochaetae absent. Neuropodia of chaetigers 1-3 with 4-6 heavy straight acicular

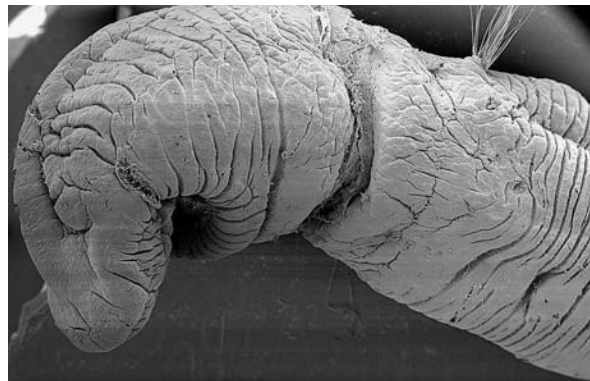
spines. Following neuropodia with 6-8 rostrate hooks in single rows, increasing to 9-10 in middle segments; hoods with main fang surmounted by 2-3 teeth and with numerous fibrils below main fang; unworn hooks with distinct tuft of fibrils emerging below main fang; worn spines lacking tuft of fibrils; rostrate hooks with prominent manubrium on shaft. Anus terminal, surrounded by irregular funnel bearing about 22 papillae.

**Biology:** An epifaunal species, collected from washings of larger biota.

**Distribution:** Juan de Fuca Ridge: Axial Seamount, Southern Juan de Fuca Ridge; Explorer Ridge; Guaymas Basin.



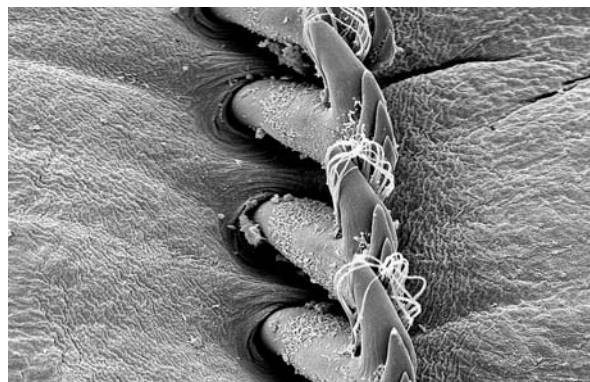
1: Specimen in vivo; by courtesy of V. Tunnicliffe.



2: Prostomium, lateral view showing arched cephalic keels (SEM) © Ifremer.



3: Neuropodium of chaetiger III with four acicular spines (SEM) © Ifremer.



4: Rostrate hooks of middle segments, with main fang surmounted by 2-3 teeth and with numerous fibrils below main fang (SEM) © Ifremer.

**Reference:**

BLAKE J.A. & B. HILBIG (1990) Pac. Sci. **44**: 219-253.

*Leitoscoloplos pachybranchiatus* BLAKE & HILBIG, 1990

**Size:** Small species, up to 9.0 mm long and 0.64 mm wide for 54 chaetigers.

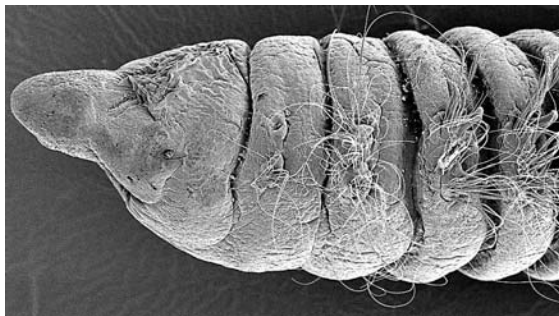
**Color:** In alcohol tan.

**Morphology:** Prostomium conical, smoothly rounded along anterior margin, with small nuchal organs on lateral boundary of prostomium and peristomium. Peristomium with one or two achaetous rings depending on size and state of preservation; both rings apparent in smaller specimens, vaguely apparent in larger specimens. Thorax with nine similar chaetigers. Notopodia with thin, cirriform postchaetal lobes; neuropodia, with short triangular shaped postchaetal lobes, developing thickened base in abdominal region; neuropodial lobe of abdominal segments becoming thicker, blunted, then developing weak bilobed appearance in far abdominal segments. Notochaetae camerated capillaries; furcate chaetae absent. Thoracic neu-

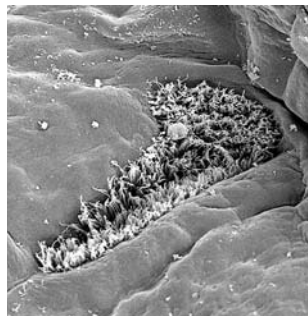
rochaetae camerated capillaries; abdominal neurochaetae including 2-3 capillaries and 1-2 thin acicular spines. Branchiae from chaetiger 13-15; each thick in cross section, appearing glandular; anterior and posterior abdominal branchiae short, stubby in appearance, with broad base and narrow apex; branchiae from middle abdominal segments, longer, but still with broad base. Pygidial segment broadly rounded, with two lateral cirri.

**Biology:** Exact habitat unknown, collected near an active vent. The species probably burrows into mud and is likely a deposit feeder. Two large eggs measuring approximately 100 µm in diameter were observed in one specimen. They were enclosed in a chamber that was located on the dorsum between chaetigers 6 and 7.

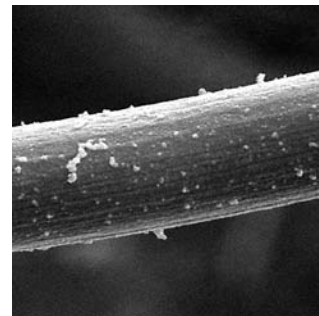
**Distribution:** Juan de Fuca Ridge.



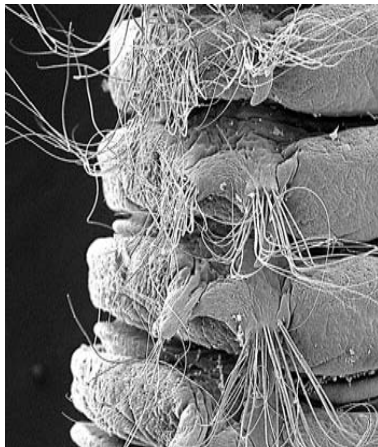
1: Prostomium, lateral view (SEM)  
© Ifremer.



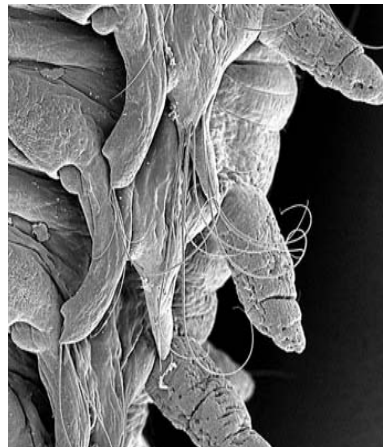
2: Nuchal organ (SEM)  
© Ifremer.



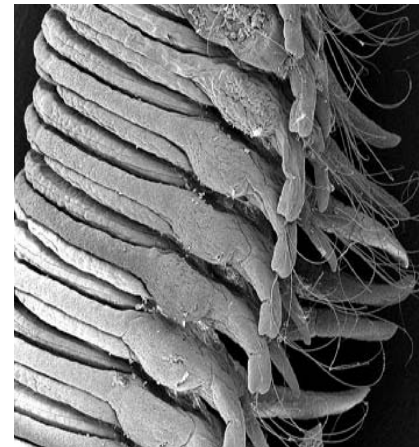
3: Camerated capillaries (SEM)  
© Ifremer.



4: Lateral view showing transition between thoracic and abdominal regions (SEM) © Ifremer.



5: Lateral view showing abdominal paramodia with thick glandular branchiae (SEM) © Ifremer.



6: Far abdominal segments, lateral view (SEM) © Ifremer.

**Reference:**

BLAKE J.A. & B. HILBIG (1990) Pac. Sci. **44**: 219-253.



## *Orbiniella aciculata* BLAKE, 1985

**Size:** Small, probably no more than 4 mm long, 0.6 mm wide, for 25 segments.

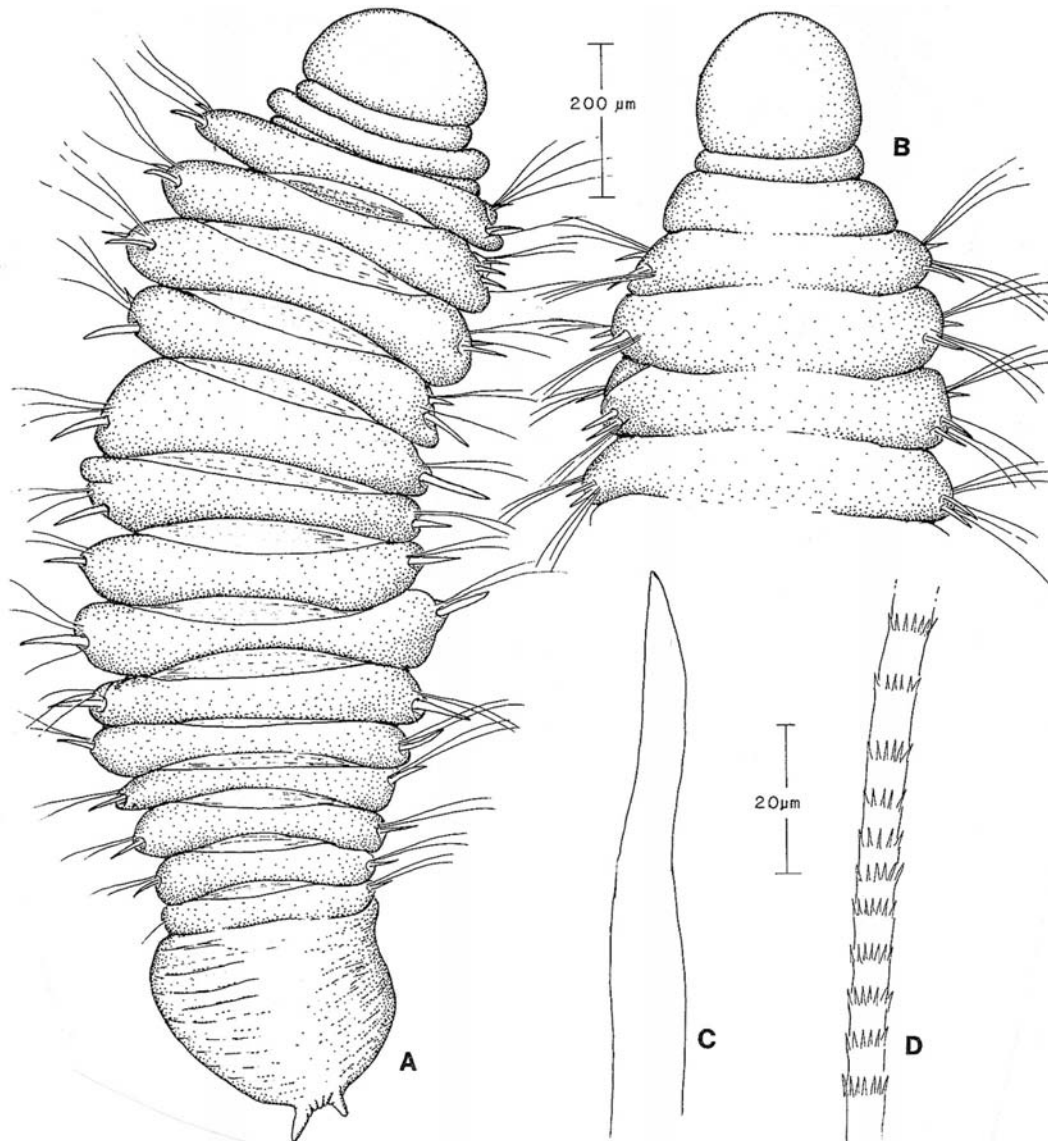
**Color:** In alcohol opaque white.

**Morphology:** Body small, wide, not divided into thorax and abdomen. Prostomium broadly rounded along anterior margin; eyes and nuchal organs absent. Peristomium consisting of two achaetous rings with first narrower than second. Noto- and

neurochaetae include 1-4 acicular spines and 2-10 long barbed capillaries; number of chaetae size dependent, smaller specimens with fewest chaetae. Pygidium with two short cirri.

**Biology:** Infaunal, in mud; exact habitat unknown, may not be a true vent species; a deposit feeder.

**Distribution:** Galapagos Spreading Center hydrothermal vent fields.



1A: Dorsal view; B: Anterior end, dorsal view; C: Acicular spine from notopodium; D: Basal part of capillary notochaetae; from BLAKE (1985).

### Reference:

BLAKE J.A. (1985) Bull. Biol. Soc. Wash. **8**: 67-101.

*Orbiniella hobsonae* BLAKE & HILBIG, 1990

**Size:** Small, threadlike, up to 4.5 mm long, 0.2 mm wide, for 25 chaetigers.

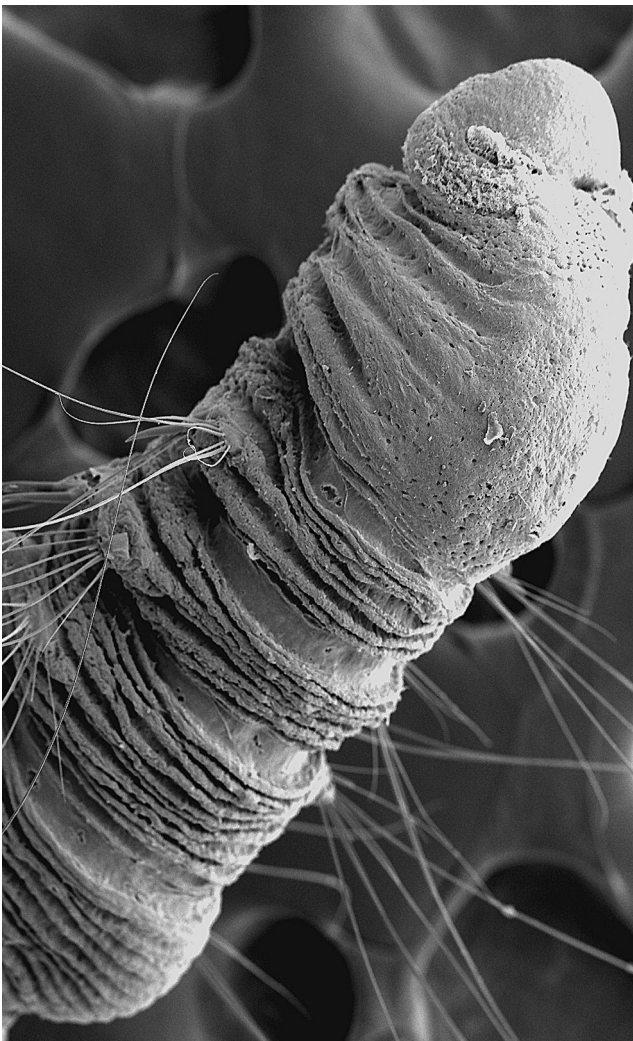
**Color:** In alcohol opaque white.

**Morphology:** Prostomium nearly circular in outline, rounded along anterior margin, with pair of lateral nuchal organs. First achaetous peristomial ring reduced, compressed between prostomium and larger second ring. All chaetigers similar, without apparent abdominal or thoracic regions. Chaetigers 1-4 generally narrower, shorter, more compressed; middle chaetigers larger, more elongate; posterior chaetigers becoming compressed

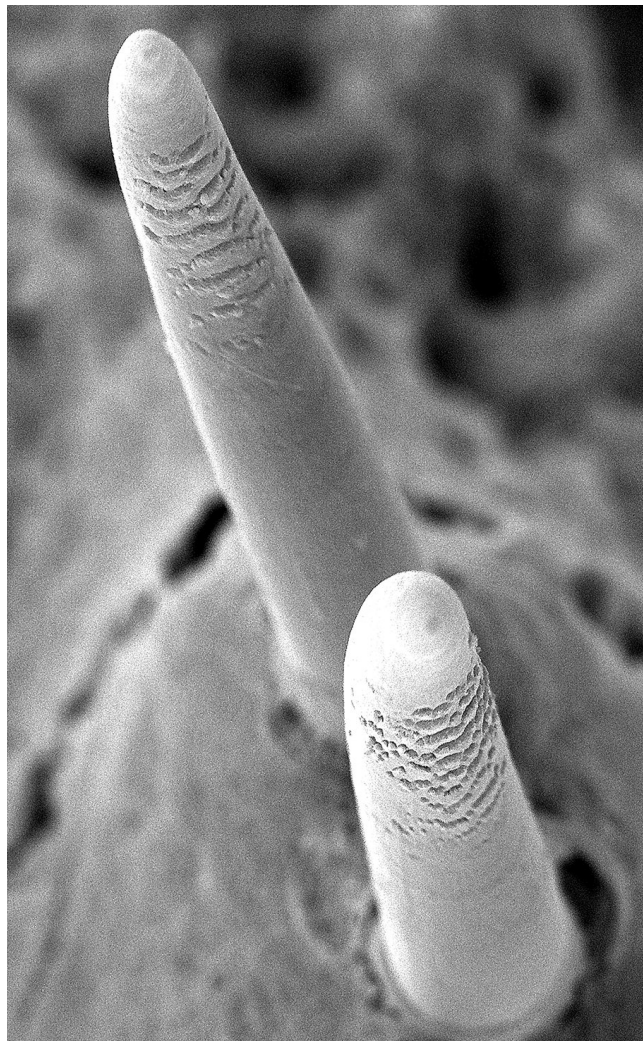
again. Pygidium simple, without lobes or cirri. Parapodia reduced, without distinct podial or postchaetal lobes; branchiae lacking. Chaetae include 1-2 barbed acicular spines and 2-5 bristled capillaries in both noto- and neuropodia; bristles of capillaries arranged in uniform transverse rows.

**Biology:** Unknown, but probably living in crevices containing pockets of soft sediments; a deposit feeder.

**Distribution:** Juan de Fuca Ridge.



1: Anterior end, dorsolateral view (SEM) © Ifremer.



2: Barbed acicular spines (SEM) © Ifremer.

**References:**

- BLAKE J.A. & B. HILBIG (1990) *Pac. Sci.* **44**: 219-253.  
TUNNICLIFFE V. (1988) *Proc. R. Soc. Lond. B* **233**: 347-366.



*Scoloplos ehlersi* BLAKE, 1985

**Size:** Up to 10 mm long, 0.5 mm wide, for 50+ segments.

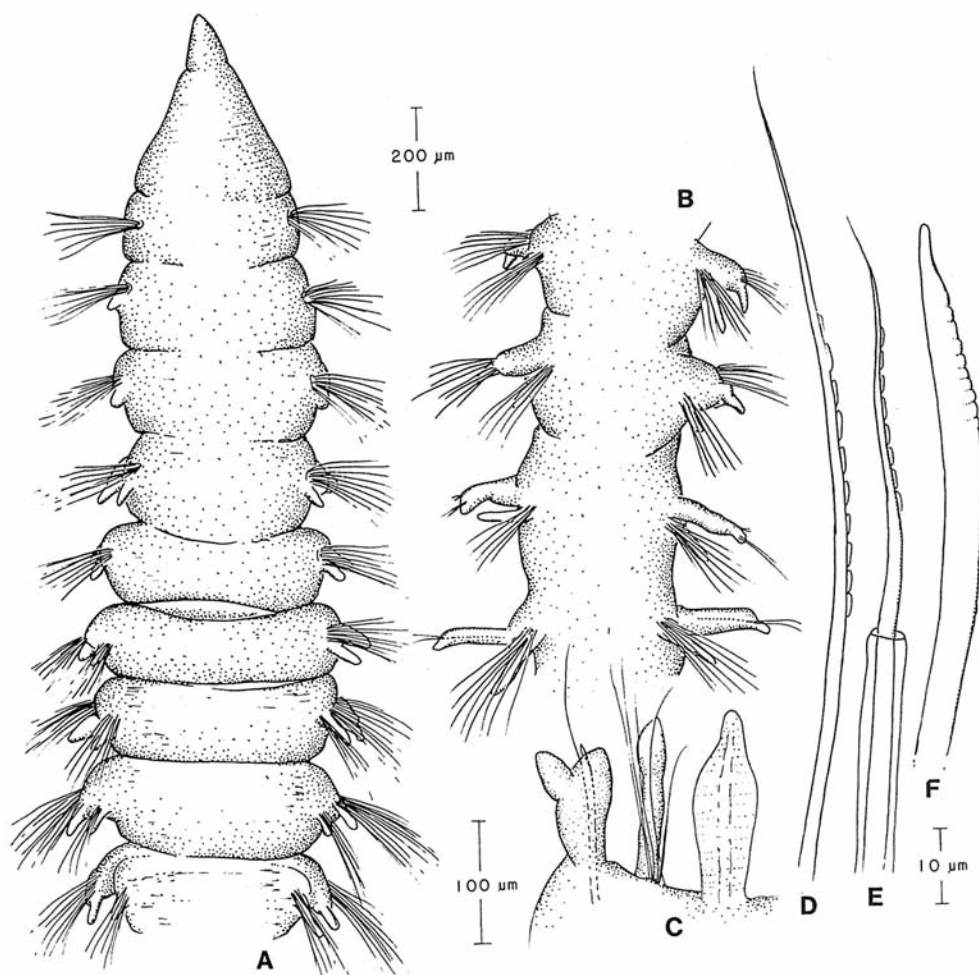
**Color:** In alcohol opaque white, with golden flocculent material observed in gut.

**Morphology:** Body elongate, cylindrical in cross section; anterior nine chaetigers swollen. Thorax consisting of 11 chaetigers; transition to abdomen abrupt, denoted by appearance of elongate neuropodial cirrus and disappearance of thoracic neuropodial uncini. Prostomium elongate, pointed anteriorly; eyes and nuchal organs absent. Parapodia of chaetigers 1-3 without postchaetal lamellae; from chaetiger 4, notopodia with fingerlike postchaetal lamellae, becoming longer over fol-

lowing segments; abdominal neuropodia elongate, flattened, with ventral lobe in middle chaetigers. Branchiae from chaetiger 21, continuing to posterior end [late occurrence of branchiae unusual]. Thoracic notopodia with fascicles containing numerous camerated capillaries; neuropodia with dense fascicles of capillaries and short, ribbed spines.

**Biology:** Infaunal, in mud; may not be a true vent species; a deposit feeder.

**Distribution:** Galapagos Spreading Center, hydrothermal vent fields.



1A: Anterior end dorsal view; B: Chaetigers 10-13, dorsal view; C: Left parapodium from abdominal segment, posterior view; D: Thoracic capillary notochaetae; E: Abdominal flail chaetae; F: Thoracic acicular neurochaetae; from BLAKE (1985).

#### References:

- BLAKE J.A. (1985) Bull. Biol. Soc. Wash. **8**: 67-101.  
 VAN DOVER C.L. (2002) Mar. Ecol. Progr. Ser. **230**: 137-158.

## *Spiochaetopterus* Sars, 1853

**Size:** Unknown, only fragmented specimens.

**Color:** Dark tan in alcohol with ventral white glandular shield extending from segment 5-8.

**Morphology:** Body long, slender, soft; tubes ringed, horny. Prostomium small, and enfolded by the truncate buccal segment which bears long grooved palps but no tentacular cirri. Fourth chaetiger with a fan of lanceolate chaetae, a large and long spine with a truncated top, slightly cordate and a small aristate spine. Middle region (very damaged) with numerous segments (>15), with two rami, all similar with a bilobed Y-shaped inner part and a small unilobed foliaceous outer part. The neuropodia are unilobed on B1 and bilobed on following segments. The no-

topodia of the posterior region are erected, slightly inflated posteriorly.

**Remarks:** Likely two different species of *Spiochaetopterus* are present at Mid-Atlantic Ridge vent fields. The poor conservation state of the collections does not allow a specific identification; however, the shape of the specialized chaetae is unique.

**Biology:** All chaetopterids have highly modified body regions that enable them to strain water through mucous bags. All chaetopterids secrete the tube from glands located on the ventral side of the anterior body region.

**Distribution:** Mid-Atlantic Ridge: TAG and Rainbow.



1: Chaetopterid on the bottom at TAG; cruise Exomar © Ifremer.



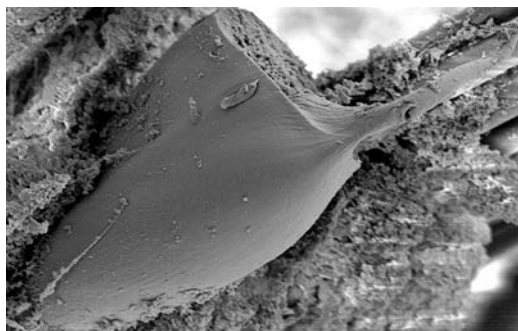
2: View of the extremity and the middle part of the tube, by P. Briand © Ifremer.



3: Lateral view, anterior part of a specimen collected at the Rainbow vent field; by P. Briand © Ifremer.



4: Dorsal view of the posterior part of a specimen collected at the Rainbow vent field; by P. Briand © Ifremer.



5: Short and thick aristate chaeta from segment four (SEM) © Ifremer.



4: Long and thick slightly cordate spine from chaetiger four (SEM) © Ifremer.

### References:

- BHAUD M. (1998) *Sarsia* **83**: 243-263.  
BHAUD M. (2001) *J. Mar. Biol. Ass. U. K.* **81**: 225-234.  
BHAUD M. (2003) *Sci. Mar.* **67**(1): 99-105.



*Laonice athecata* SIGVALDADÓTTIR & DESBRUYÈRES, 2003

**Size:** Up to 51 mm long.

**Color:** Greenish in vivo, white when preserved in ethanol.

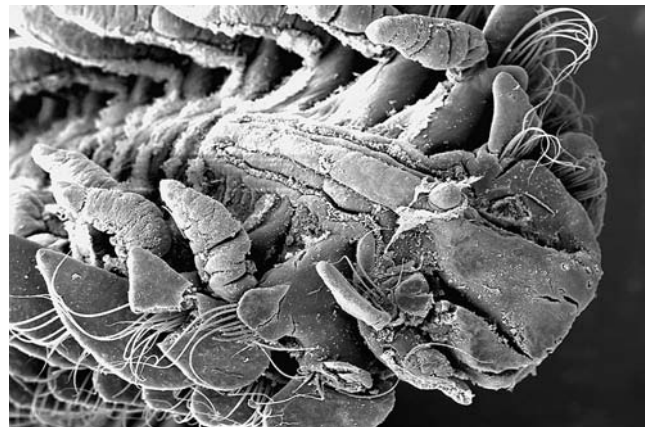
**Morphology:** Prostomium broadly triangular with straight anterior margin, laterally tapering backwards into a caruncle reaching to posterior margin of chaetiger four. Small occipital antennae on level of chaetiger one. Eyes absent. Nuchal organ arranged in two rows enclosing caruncle. Peristomium surrounding prostomium almost completely, laterally forming prominent lateral wings, partly fused with chaetiger one. Postchaetal notopodial lamellae of chaetiger one reduced, triangular, with dorsal projection. Lamellae on following chaetigers large, foliate, with a dorsal protrusion, extending almost over dorsum. Lamellae successively becoming smaller, on posteriormost chaetigers ventrally round with dorsal tip. Prechaetal lamellae small. Neuropodial lamellae on chaetiger

one reduced, round ventrally, with dorsal projection. On subsequent chaetigers lamella larger, dorsally and ventrally evenly projected. On posterior chaetigers lamella becoming smaller and less projecting. Interparapodial pouches missing. Branchiae from chaetiger two, present on about 30 chaetigers. Branchiae smooth, little longer than notopodial lamellae, heavily ciliated laterally. Chaetae of anterior chaetigers arranged in simple row, not particularly long, becoming longer and reduced in number on posterior chaetigers. Neuropodial hooded hooks from chaetiger 30-32. Hooks with one pair of teeth over main fang which is slightly grooved longitudinally. Notopodial hooks absent. Sabre chaeta from chaetiger 20-23. Chaetae long, thin, with a curved delicate tip. Pygidium with 6-8 short cirri.

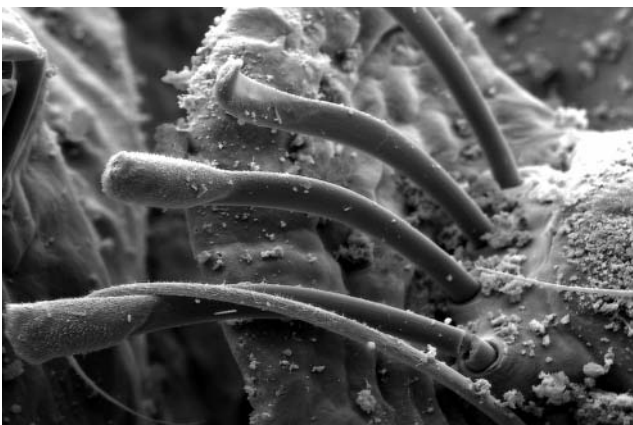
**Distribution:** Mid-Atlantic Ridge: Lucky Strike and Logatchev.



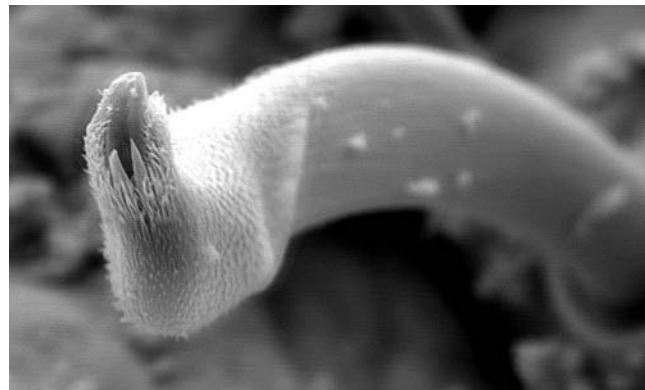
1: Anterior part (preserved specimen) © Briand/Ifremer.



2: Anterior part (SEM) © Ifremer.



3: Neuropodial lamella with hooded hooks, and sabre chaeta (SEM) © Ifremer.



4: Hooded hook showing pair of teeth over main fang (SEM) © Ifremer.

**Reference:**

SIGVALDADÓTTIR E. & D. DESBRUYÈRES (2003) Cah. Biol. Mar. **44**: 219-225.

*Laubieriellus grasslei* MACIOLEK, 1981

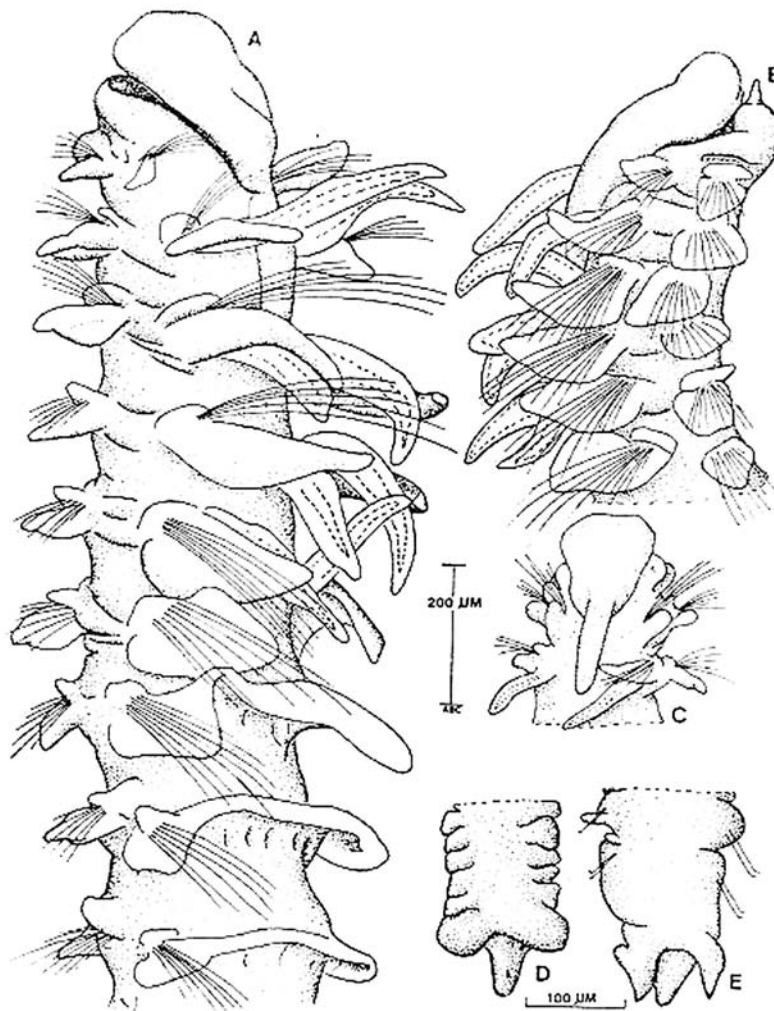
**Size:** Small, up to 11.5 mm long, 0.75 mm wide, with about 45 segments.

**Morphology:** Prostomium rounded anteriorly, continuing posteriorly as caruncle to chaetiger 2-3 (A-C). Peristomium separated from chaetiger 1, without lateral wings. Branchiae smooth, apinnate, four pairs, from chaetiger 2. Neuropodia of anterior segments connected by ventral crests from chaetiger 2; dorsal crests present on several postbranchial chaetigers (A). Notochaetae all capillaries; neurochaetae include capillaries and multidentate hooded hooks from chaetiger 10; ventral

sabre chaetae from chaetiger 10-11. Pygidium with two short, rounded lobes and one long cirrus (D: E).

**Biology:** A cryptic species, found among mussels, from experimental fouling panels, and present with other invertebrates washed from various collections. The species is likely a surface deposit feeder that forms temporary tubes.

**Distribution:** Galapagos Spreading Center, hydrothermal vent fields.



1A: Anterior end, dorsolateral view; B: Anterior end, lateral view; C: Anterior end, dorsal view; D, E: Pygidium, ventral view; from MACIOLEK (1981).

**Reference:**

MACIOLEK N.J. (1981) Proc. Biol. Soc. Wash. **94**: 826-837.



*Lindaspio dibranchiata* BLAKE & MACIOLEK, 1992

**Size:** A large species, holotype 31 mm long, 4 mm wide, with 165 segments.

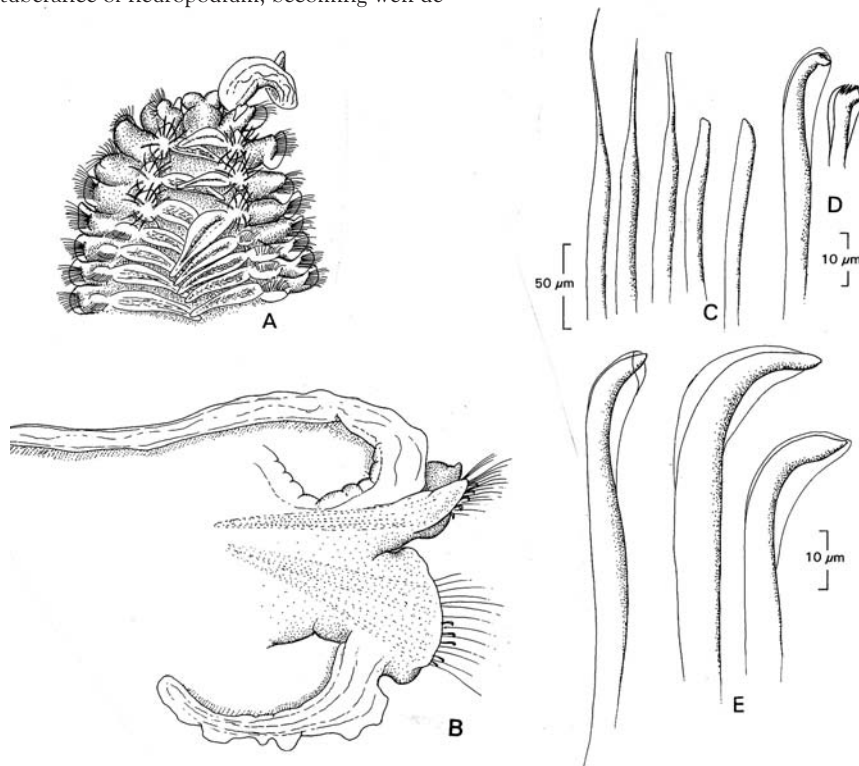
**Color:** Brown in alcohol.

**Morphology:** Anterior end broad, widest between chaetigers 12-20, dorsoventrally flattened throughout. Body terminating in conical pygidial cone, lacking appendages. Prostomium bifid anteriorly, with two thick rounded lobes, extending posteriorly as short, mounded caruncle to chaetiger 1. Palps short, thick. Chaetiger 1 reduced, lacking notochaetae; following segments with well-developed noto- and neuropodia bearing elaborate pre- and postchaetal lamellae encompassing chaetal fascicles. Notopodia of middle and posterior chaetigers with anterior and posterior lamellae, but these shorter, more triangular and only partly encompassing chaetae. Dorsal branchiae present from chaetiger 2, each anterior branchia thickened, extending across dorsal midline; after chaetiger 20, becoming very thin, continuing to posterior end. Ventral branchiae from about chaetiger 20 as swollen protuberance of neuropodium, becoming well de-

veloped by chaetiger 30 and fully developed by chaetiger 40; ventral branchiae broader than dorsal branchiae, not meeting at ventral midline, continuing to posterior end. Notochaetae of chaetigers 2-4 modified into unique rosette of 9-10 heavy spines; subsequent notochaetae consisting of capillaries until about chaetiger 40 where 3-5 unidentate hooded hooks begin; hooks sharply curved with closely adhering hood. Neurochaetae of chaetigers 1-5 capillaries; with distinct fascicles of 15-20 heavy spines and thin capillaries from chaetigers 6-28; spines replaced by multidentate hooded hooks by about chaetiger 45; neuropodial spines distinctly tapered distally, when worn, appearing acicular; neuropodial hooks thinner, more delicate than notopodial hooks.

**Biology:** A large benthic infaunal species, probably a surface deposit feeder.

**Distribution:** Guaymas Basin, Southern Trough, in sediments of hydrothermal mounds.



1A: Anterior end, dorsal view; B: Posterior parapodium, anterior view; C: Modified neuropodial spines from anterior chaetiger; D: Neuropodial hooded hooks; E: Notopodial hooded hooks; from BLAKE & MACIOLEK (1992).

**Reference:**

BLAKE J.A. & N.J. MACIOLEK (1992) Proc. Biol. Soc. Wash. **105** (4): 723-732.

*Lindaspio southwardorum* BLAKE & MACIOLEK, 1992

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**Size:** A large species, recorded up to about 160 mm long, 6-7 mm wide, for more than 340 segments.

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**Color:** In life pinkish white with pale violet streak down dorsum; in alcohol light brown.

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**Morphology:** Anterior half of body dorsoventrally flattened, with dorsum becoming rounded posteriorly. Pygidium not observed. Prostomium narrow, pear-shaped, flaring anteriorly, forming two broadly swollen lobes, continuing posteriorly as narrow, folded caruncle to anterior margin of chaetiger 2. Palps short, thick. Chaetiger 1 reduced, lacking notochaetae. Notopodia of chaetigers 2-4 modified, dorsally elevated, with pre- and postchaetal lamellae forming cup enclosing cluster of modified spines; notopodia from chaetiger 5 and neuropodia from chaetiger 2 with well-developed, elaborate pre- and postchaetal lamellae enclosing chaetal fascicles; notopodial lamellae eventually becoming more elongate, somewhat triangular; neuropodial lamellae remaining broadly rounded throughout. Dorsal branchiae first present from chaetiger 2, each relatively short for first 45-50 chaetigers, extending only half of distance to midline, thereafter branchiae becoming thinner, longer, extending to midline. Ventral branchiae from about chaetiger 55 as extensions of postsetal lamellae, remaining relatively short, until about chaetiger 100-125, then becoming longer, more

cylindrical; in far posterior segments, nearly reaching ventral midline, but never as long as dorsal branchiae. Notochaetae of chaetigers 2-4 modified into cluster of about 20 heavy spines; subsequent notochaetae numerous, thin capillaries; 5-8 hooded hooks from chaetiger 75; capillaries become heavier and more limbate in far posterior segments; individual notopodial hooks strongly curved, with pointed main fang surmounted by several minute teeth. Anterior neurochaetae include row of 25-30 heavy spines, thin companion capillaries, and ventral bundle of thin capillaries; neuropodial spines each with smooth shaft that tapers abruptly, then continues as fine, pointed tip with fine serrations or bristles sometimes visible along edge; spines present until about chaetiger 40, then replaced by thin capillaries; neuropodial hooded hooks from about chaetiger 75; each hook smaller, more delicate than notopodial hook; each hook with several minute teeth above main fang.

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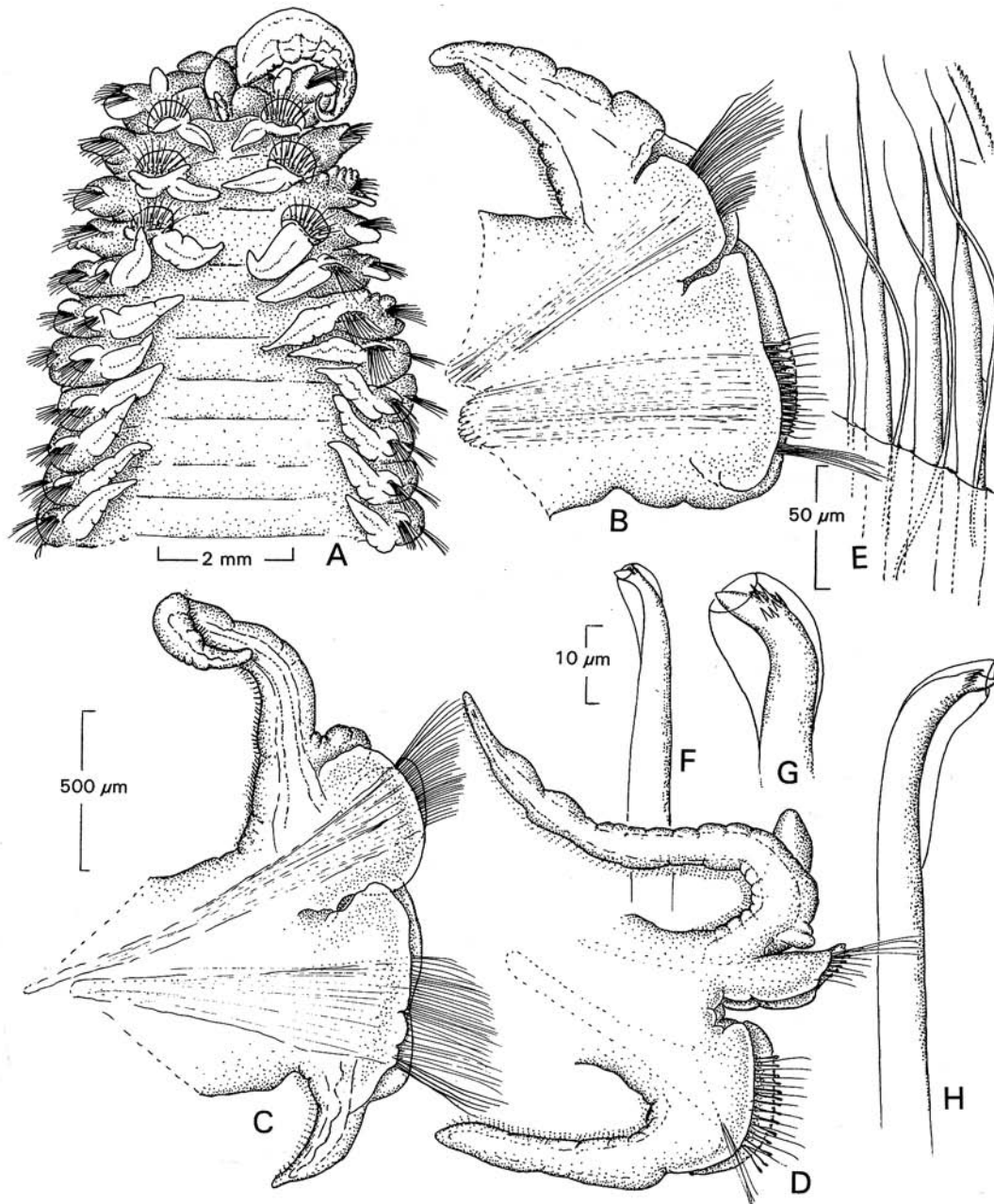
**Biology:** A benthic infaunal species living in sediments near hydrothermal vents; the species is likely a surface deposit feeder.

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**Distribution:** Juan de Fuca Ridge: Middle Valley Segment, in sediment from high heat areas.

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1A: Anterior end, dorsal view; B: Anterior parapodium anterior view; C: Middle parapodium, anterior view; D: Posterior parapodium, anterior view; E: Modified anterior neurochetae and accompanying capillaries; F-G: Notopodial hooked hooks; H: Neuropodial hooked hooks; from BLAKE & MACIOLEK (1992).

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Reference:

BLAKE J.A. & N.J. MACIOLEK (1992) Proc. Biol. Soc. Wash. **105**(4): 723-732.

*Prionospio sandersi* MACIOLEK, 1981

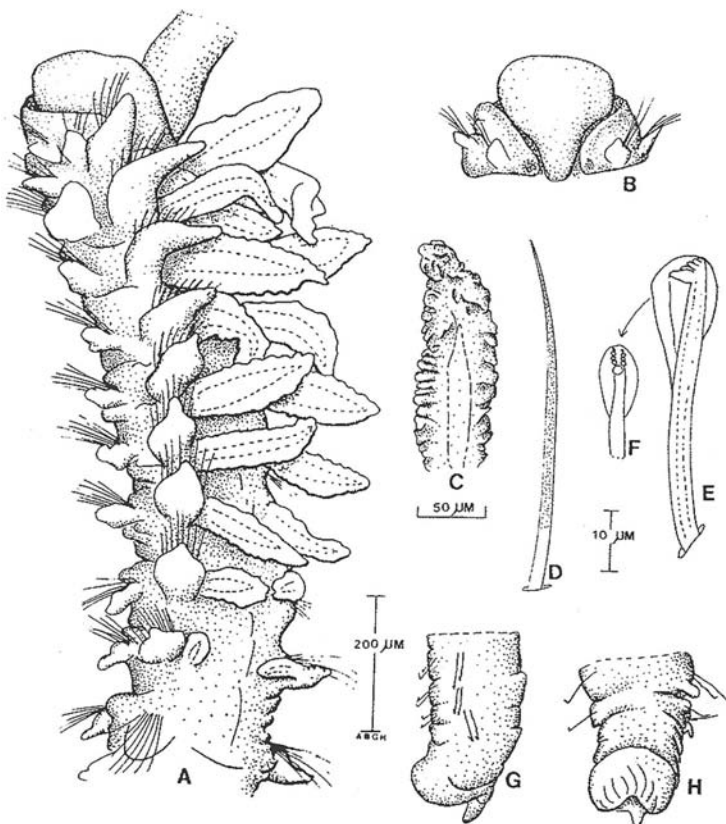
**Size:** Small, up to 3.2 mm long, 0.5 mm wide, with about 35 segments.

**Morphology:** Prostomium broadly rounded anteriorly, ending posteriorly at chaetiger 1. Peristomium encompassing prostomium laterally and ventrally, not developing lateral wings; fused dorsally to chaetiger 1. Branchiae from chaetiger 2, nine pairs; each gill broad, robust, appearing wrinkled, but lacking pinules; branchiae longest anteriorly, becoming shorter, stubby posteriorly. Dorsal crests absent. Anterior chaetae capillaries; multidentate hooded hooks from chaetiger 15 in neuropodia, chaetiger 29 in notopodia; ventral sabre chaetae from chaetiger 14. Pygidium cup-shaped, with deeply rounded ventral edge and small dorsal elongation.

**Remark:** A closely related form of *Prionospio* sp. has been commonly sampled on the Northern East Pacific Rise at 13°N and 9°N. It differs from *Prionospio sandersi* by the number of branchiae (12-14 pairs instead nine pairs) by the occurrence of the sabre chaetae on neuropodia from chaetiger 15 instead of 14 and the occurrence of the multidentate hooks on neuropodia from chaetiger 17 instead 15 and in notopodia from chaetiger 23 instead of 29.

**Biology:** The known specimens were collected from washings of *Riftia pachyptila* and might no be a fully developed. The species is likely a surface deposit feeder, scavenging particles with its short palps.

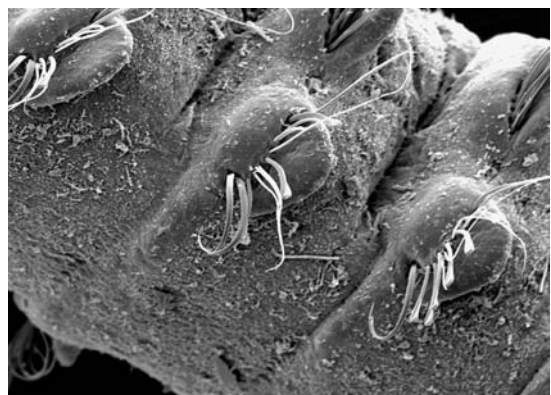
**Distribution:** Galapagos Spreading Center, hydrothermal vent fields.



1: Drawings from MACIOLEK (1981). A: Anterior end, dorsolateral view; B: Prostomium, dorsal view; C: Branchia, dorsal view, showing details of the wringled surface; D: Ventral sabre chaetae; E, F: Hooded hook; G: Pygidium, lateral view; H: Pygidium, ventral view.



2: Living specimen from East Pacific Rise: 13°N; by P. Briand © Ifremer.



3: Two neuropodia of the middle part of the body in lateral view showing sabre chaetae and multidentate hooks (SEM); East Pacific Rise: 13°N © Ifremer.





4: A microphotograph mosaic, lateral view (SEM); East Pacific Rise: 13°N  
© Ifremer.



5: A microphotograph mosaic, dorsal view (SEM); East Pacific Rise: 13°N  
© Ifremer.

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**Reference:**

MACIOLEK N.J. (1981) Proc. Biol. Soc. Wash. **94**: 826-837.

*Prionospio unilamellata* SIGVALDADÓTTIR & DESBRUYÈRES, 2003

**Size:** Up to 17 mm long and 0.9 mm width for 114 chaetigers.

**Morphology:** Prostomium broadly triangular, widest at anterior margin, narrowing into a raising caruncle, reaching to posterior delineation of first chaetiger. Anterior margin sometimes with 3-4 ciliated tubercles. Peristomium partly surrounding prostomium, forming a low collar, not fused to chaetiger one. Pair of indistinct ciliated nuchal organs situated on each side of caruncle. Postchaetal notopodial lamella of chaetiger one reduced, dorsally pointed, free from prechaetal lamella. On chaetigers 2 to 16-17, a single large notopodial lamella is enclosing chaetae. Postchaetal lamellae on postbranchial segments becoming smaller, separated from prechaetal lamellae, round in form. On anterior chaetigers, postchaetal lamellae with dorsal tip. On posteriormost chaetigers lamellae dorsally pointed. Prechaetal lamellae small on postbranchial chaetigers. Dorsal crests absent. Neuropodial postchaetal lamellae reduced on first chaetiger, elliptical in shape. Lamellae largest on branchial chaetigers, successively becoming smaller. On chaetigers 2-3 lamellae ventrally round, dorsally with a tip, on subsequent chaetigers becoming more round. On posteriormost

chaetigers lamellae leaflike, dorsally pointed. Prechaetal lamellae separated from postchaetal lamellae. Branchiae from chaetiger two, 15-16 in number. Anterior branchiae slightly longer than notopodial lamellae, on subsequent chaetigers successively longer and more slender. Branchiae apinate with dense lateral ciliation. Interparapodial pouches missing. Small, papilla-like, structures can sometimes be observed laterally between neuropodia. These structures start on 2-3 posteriormost, or posterior to, branchial segments and occur on 7-8 segments. Chaetae on anterior chaetigers slender, arranged in dense double rows. Neuropodial hooded hooks from chaetiger 19-27. Introduction of hooks moving backwards with increasing size. Hooks with 4-6 secondary teeth over main fang. Notopodial hooks from chaetiger 25-46. Notopodial hooks with longer shaft than neuropodial hooks. Sabre chaeta from chaetiger 12-20, one or two per rami. Sabre chaeta distally granulated. Pygidium with long median cirrus and two rounded lateral flaps.

**Distribution:** Mid-Atlantic Ridge: Lucky Strike, Rainbow and Snake Pit.



1: Habitus (preserved specimen) © Ifremer. Box: Distal part of notopodial hooded hook (SEM) © Ifremer.



2: Anterior part (SEM) © Ifremer.

#### Reference:

SIGVALDADÓTTIR E. & D. DESBRUYÈRES (2003) Cah. Biol. Mar. **44**: 219-225.



*Xandaros acanthodes* MACIOLEK, 1981

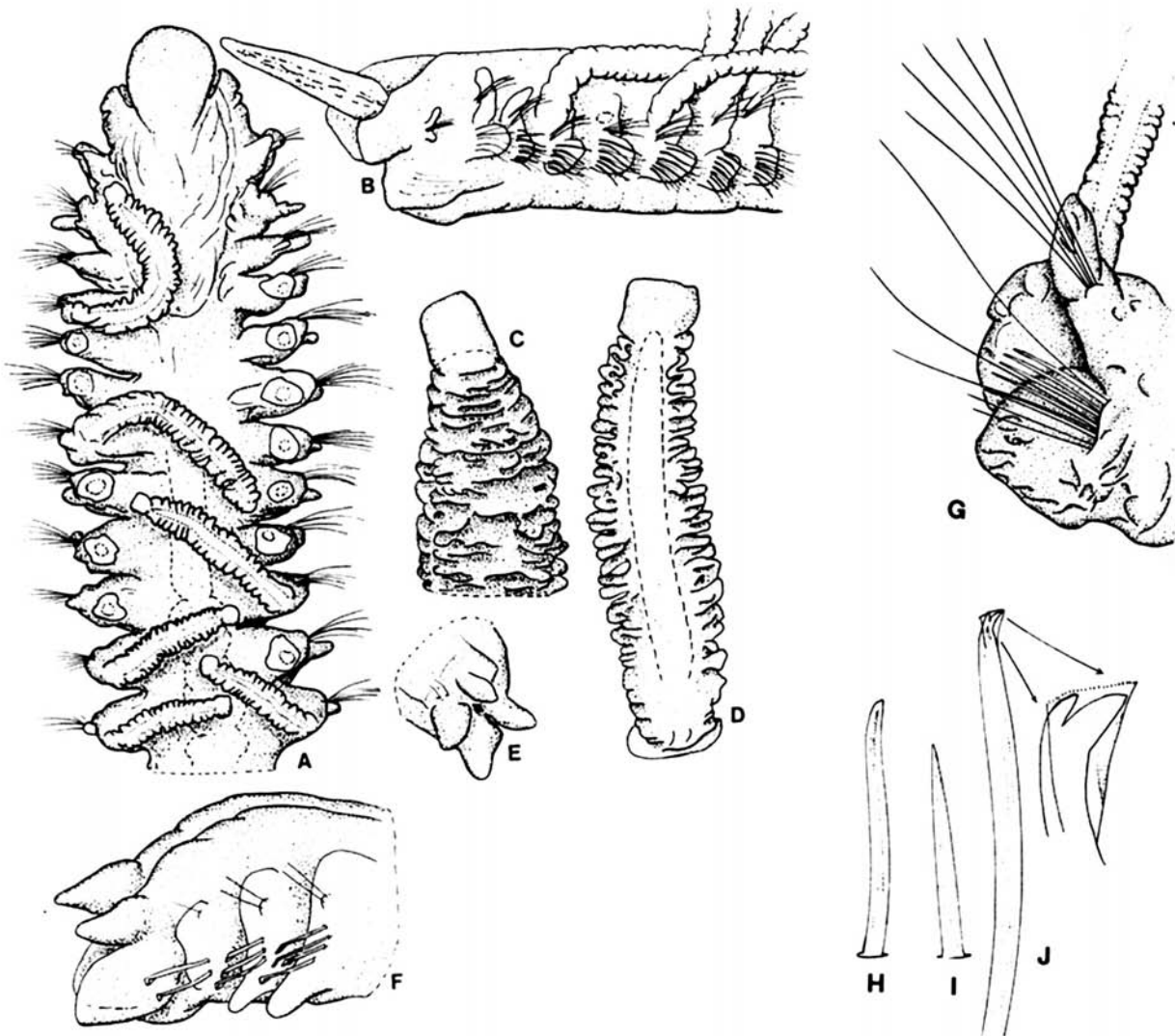
**Size:** A small species, 6 mm long, 0.3 mm wide, with about 55 segments.

**Morphology:** A unique spionid. Prostomium rounded anteriorly, without posterior keel or caruncle. Peristomium well developed, but not producing lateral wings. Notochaetae absent on chaetiger 1. Branchiae from chaetiger 4, continuing to chaetiger 10-13; each gill elongate, cylindrical, wrinkled, lacking distinct pinnules. Notochaetae capillaries; neurochaetae include capillaries on chaetigers 1-2, replaced with unhooded acicular spines on chaetigers 3-10, these in turn becoming thinner,

straighter, then replaced by bidentate hooks with half hoods from chaetiger 16 continuing to posterior end; spines and hooded hooks accompanied by 4-5 large and 2-3 thin capillaries throughout; ventral sabre chaetae absent. Pygidium with two dorsal and two larger ventral lobes.

**Biology:** Epifaunal, collected among siboglinids and mussels. The species is likely a surface deposit feeder.

**Distribution:** Galapagos Spreading Center, hydrothermal vent fields.



1A: Anterior end, dorsal view, palps and several branchiae removed; B: Anterior end, lateral view; C: Distal tip of branchia in lateral view; D: Entire branchia dorsal view; E: Pygidium and last three chaetigers, lateral view; from MACIOLEK (1981).

**Reference:**

MACIOLEK N.J. (1981) Proc. Biol. Soc. Wash. **94**: 826-837.

*Alvinella caudata* DESBRUYÈRES & LAUBIER, 1986

**Size:** Up to 140 mm.

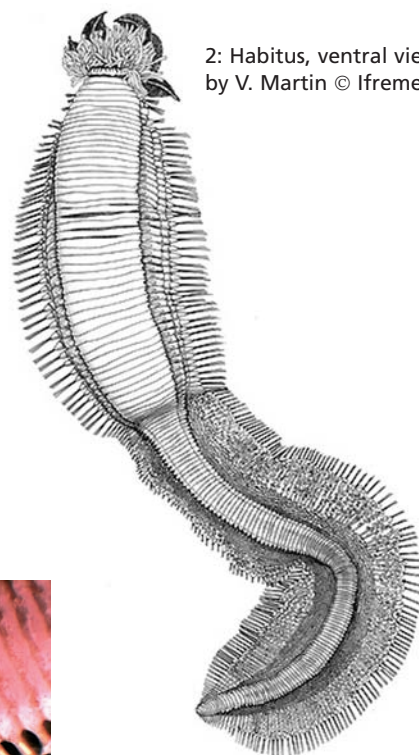
**Morphology:** Four pairs of lamellate gills; two transformed chaetigerous segments bearing stout spines; body in two parts, the posterior one with enlarged notopods bearing distal digitations; bacterial epibiosis.

**Biology:** Dwelling inside organic tubes in active chimney walls. Temperature ranging from 10-50°C. Seldom observed in situ. Feeding on free bacteria, associated with filamentous bacteria epibiosis. Gut functional; retractile buccal tentacles; gonochoric, sexual dimorphism.

**Distribution:** East Pacific Rise: 21°N to 17°S (not observed in Guaymas Basin and Galapagos Spreading Center).



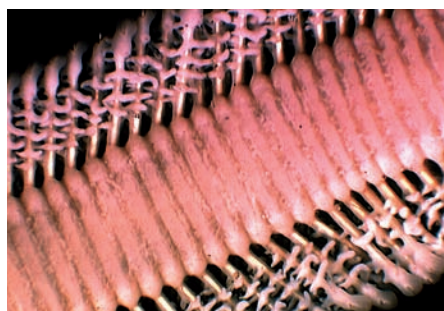
1: Population in situ (East Pacific Rise: 13°N, 2630 m); Phare cruise © Ifremer.



2: Habitus, ventral view; by V. Martin © Ifremer.



3: "Caudal" part in dorsal view; by P. Briand © Ifremer.



4: "Caudal" part in ventral view; by P. Briand © Ifremer.

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- ALAYSE-DANET A.M., DESBRUYÈRES D. & F. GAILL (1987) *Symbiosis* **4**: 51-62.  
CHEVALDONNÉ P. & D. JOLLIVET (1993) *Mar. Ecol. Prog. Ser.* **95**: 251-262.  
DESBRUYÈRES D. & L. LAUBIER (1980) *Oceanol. Acta* **3**: 267-274.  
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## *Alvinella pompejana* DESBRUYÈRES & LAUBIER, 1980 “Pompei worm“

**Size:** Up to 150 mm.

**Morphology:** Tube dwelling polychaetes with four pairs of lamellate branchiae; two transformed chaetigerous segments; body tapering posteriorly, no obvious abdominal part; bacterial epibiosis on the dorsum. Retractable buccal tentacles and two specialized sexual ones.

**Remark:** HURTADO et al. (2004) found a very significant mitochondrial divergence between north and south EPR populations, leading to hypothesize the presence of a southern cryptic

species, although no significant morphological differences have been detected.

**Biology:** Dwelling inside organic tubes in active chimney walls. Temperature ranging from 10-80°C (debated?). Feeding on free bacteria, associated with filamentous bacteria epibiosis. Functional gut, retractile buccal tentacles, gonochoric, sexual dimorphism.

**Distribution:** East Pacific Rise: 21°N to 23°S (not observed in Guaymas Basin and Galapagos Spreading Center).



1: Population in situ; East Pacific Rise: 13°N; Cruise Phare © Ifremer.



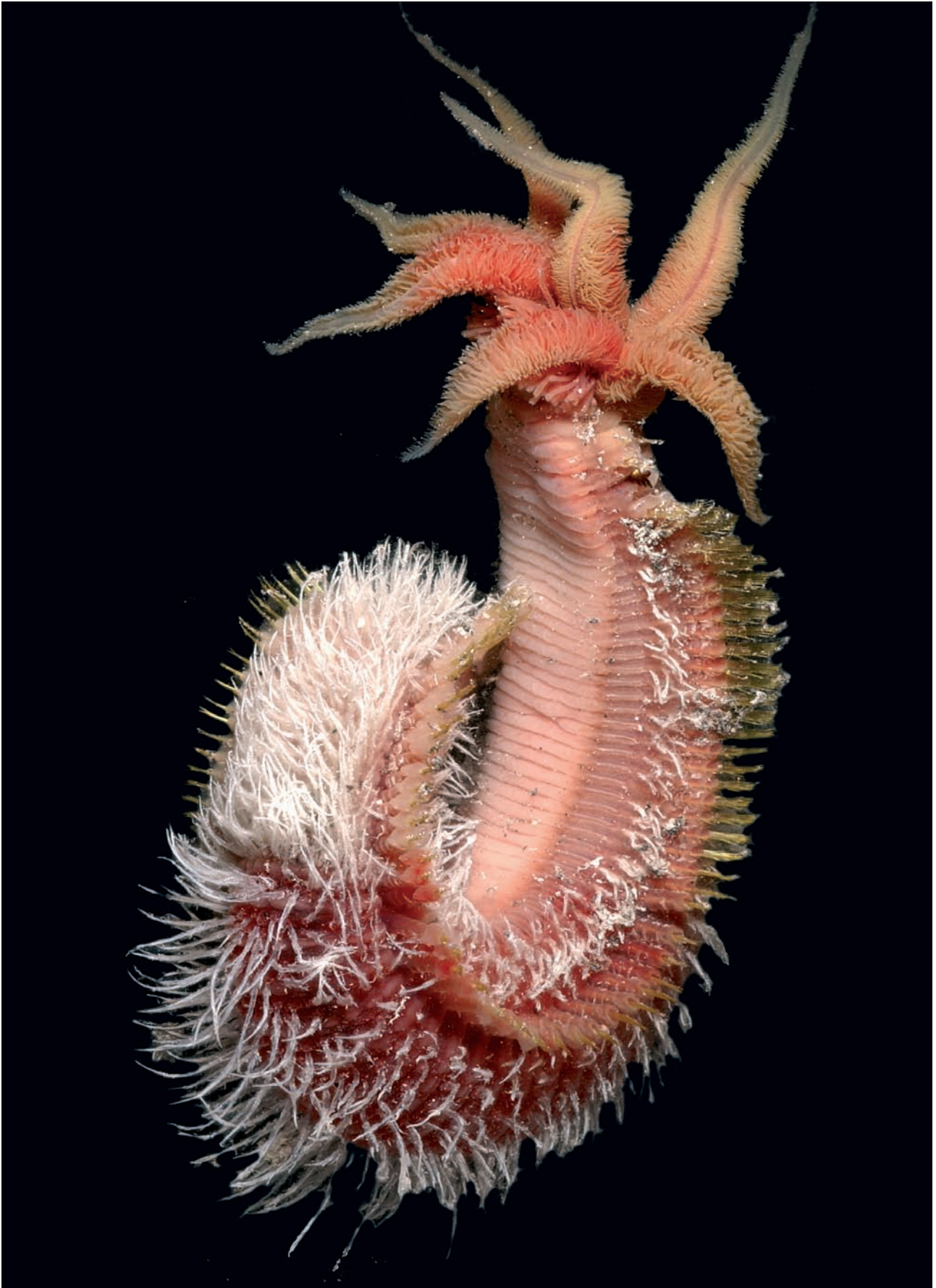
2: Cluster of filamentous bacteria from dorsal part of the worm (SEM)  
© Ifremer.



3: Transformed notosetae on two anterior segments  
© Ifremer.

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CHEVALDONNÉ P., JOLLIVET D., VANGRIESHEIM A. & D. DESBRUYÈRES (1997) *Limnol. Oceanogr.* **42**: 67-80.  
CHEVALDONNÉ P., FISHER C.R., CHILDRESS J.J., DESBRUYÈRES D., JOLLIVET D., ZAL F. & A. TOULMOND (2000) *Mar. Ecol. Prog. Ser.* **208**: 293-295.  
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DESBRUYÈRES D., CHEVALDONNÉ P., ALAYSE A.M., JOLLIVET D., LALLIER F.H., JOUIN-TOULMOND C., ZAL F., SARADIN P.M., COSSON R., CAPRAIS J.C., ARNDT C., O'BRIEN J., GUEZENNEC J., HOURDES S., RISO R., GAILL F., LAUBIER L. & A. TOULMOND (1998) *Deep-Sea Res. II* **45**: 383-422.  
GAILL F., DESBRUYÈRES D. & D. PRIEUR (1987) *Microb. Ecol.* **13**: 129-139.  
HURTADO L.A., LUTZ R.A. & R.C. VRIJENHOEK (2004) *Mol. Ecol.* **13**: 2603-2615.  
JOLLIVET D., DIXON L.R.J., DESBRUYÈRES D. & D.R. DIXON (1998) *J. Mar. Biol. Ass. U. K.* **78**: 113-130.  
LUTHER III G. W., ROZAN T.F., TAILLEFERT M., NUZZO D.B., DI MEIO C., SHANK T.M., LUTZ R.A. & S.C. CARY (2001) *Nature* **410**: 813-816.



4: Specimen in vivo; by Dugornay © Ifremer.



*Paralvinella (Miralvinella) bactericola* DESBRUYÈRES & LAUBIER, 1991

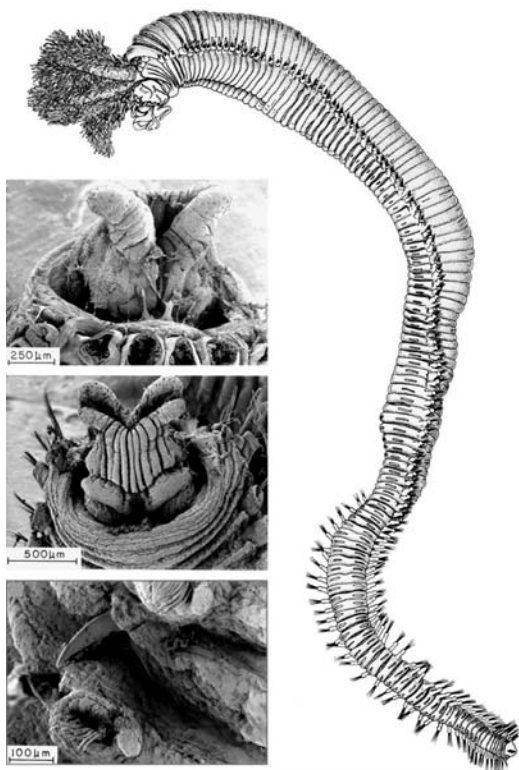
**Size:** Up to 42 mm for 130 segments.

**Morphology:** Alvinellid worm with four pairs of pinnate branchiae. Animals brownish in colour after preservation. Prostomium reduced, with a dorsal lobe, having a dorsal incision and two well developed lateral expansions. Dorsal part of the dorsal cavity with several rows of smooth oral tentacles with a ciliated groove, surrounding dorsal organ dorsally. Dorsal organ with a deep median hollow ending ventrally in two stout lobes from which arise two large, long and strong pointed tentacles (male), each with a deep longitudinal groove without any ciliation. Tentacles are often rolled in a spiral. Notopodia of 7<sup>th</sup> chaetigerous segment modified with 4-6 stout and slightly curved acicular hooks instead of capillary chaetae. Notopodia of chaetigers 8-32 with digitiform lobes. Capillary notochaetae

covered with minute spines. Uncinigerous neuropodial tori present from chaetiger 35-37 to the end of the body. Uncinigerous tori increasing slightly in length posteriorly. Uncini breviacicular, stout as in other alvinellids, arranged in a single vertical row and oriented with the teeth pointing backwards. Pygidium rounded without appendages.

**Biology:** The animal seems to live freely in the sediment without conspicuous tubes. On living animals, the tentacles extend far over the bacterial mats and move gently in the moiré water, while the tips of the branchiae reach the surface of the sediment.

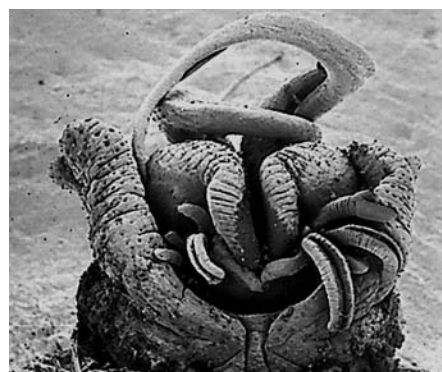
**Distribution:** Guaymas basin.



1: Habitus, lateral view of a male specimen by V. Martin © Ifremer. Upper box, prostomium, dorsal view; center, buccal segment ventral view; bottom, chaetigers 7 and 8, showing digitiform lobes (SEM) © Ifremer.



2: Anterior end, ventro-lateral view (preserved specimen) © Ifremer.



3: Buccal part of a male specimen showing the sexual grooved tentacles and dorsal view (SEM) © Ifremer.

**Reference:**

DESBRUYÈRES D. & L. LAUBIER (1991) *Ophelia* Suppl. 5: 31-45.

*Paralvinella (Miralvinella) dela* DETINOVA, 1988

**Size:** Up to 110 mm (170 chaetigerous segments).

**Color:** Dark red when preserved.

**Morphology:** Alvinellid worm with four pairs of pinnate branchiae. Prostomium very reduced, similar to that of *P. bactericola* with a median lobe having a median incision and two very well developed and bilobed lateral expansions. Numerous grooved buccal tentacles inserted on two lateral pads. As in *P. grasslei*, a median hemispherical body is observed ventrally in the buccal cavity, bordered by two lateral pads. Two long pointed and grooved peribuccal tentacles are present in males, each with a deep longitudinal groove devoid of ciliation. Four stout

and slightly curved acicular spines in the 7<sup>th</sup> chaetiger. Uncinigerous neuropodial tori from chaetiger 48-52 to the end of the body. No notopodial or anal cirrus.

**Remarks:** The species is a sister species of *P. bactericola* from Guaymas basin and *P. hessleri* from Western Pacific Back-Arc Basins which were grouped in the subgenus *Miralvinella*.

**Biology:** This worm is usually found in tube worm clusters.

**Distribution:** Juan de Fuca Ridge: Axial Seamount, sites Ashes and Casm.



1: Female specimen from Axial Seamount, frontal view  
© Ifremer.



2: Living specimens in: "A Bestiary of the Endeavour Hot Vents"; by courtesy of V. Tunnicliffe.

**References:**

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DETINOVA N.N. (1988) Zool. Zh. **67**: 858-864.  
DETINOVA N.N. (1989) Trans. Shirshov Instit. Oceanol. **123**: 71-80.



*Paralvinella (Miralvinella) hessleri* DESBRUYÈRES & LAUBIER, 1989

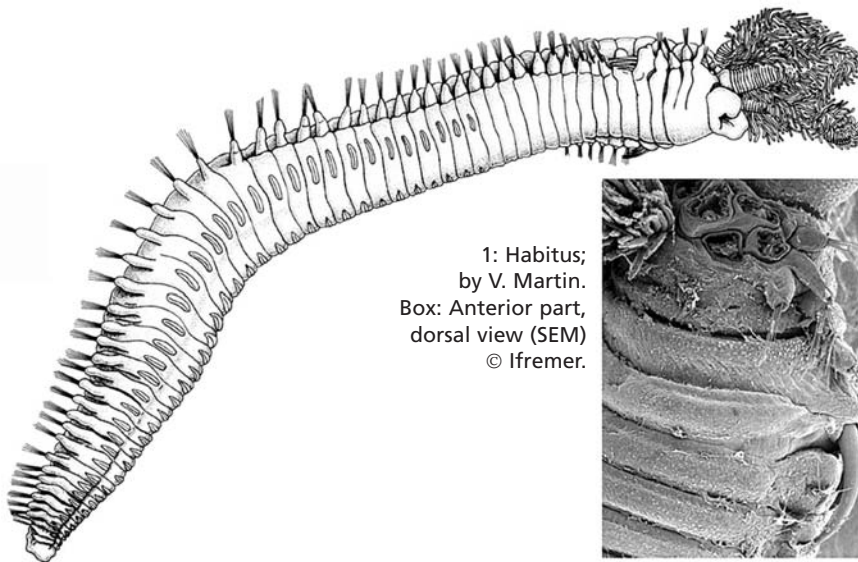
**Size:** Up to 22 mm.

**Morphology:** Alvinellid worm with four pairs of pinnate branchiae. Up to 61 segments. Prostomium medially reduced with a median incision and two well developed lateral lobes ventrally enclosing peristomium. Male buccal apparatus comprising a ventral globular bulky organ, two lateral strong and pointed tentacles bearing a deep groove without ciliation, and many grooved and ciliated smaller tentacles inserted in two groups on a quadrilobed upper lip. First two segments (II and III) achaetous and fused to the first three chaetigerous. The first 15-20 chaetigerous segments with notopodia only. First three notopodia smaller than others and dorsally elevated. Chaetiger 4 with a median dorsal expansion which protrude forward. Notopodia from 4 to 13-17 (7 excepted) cylindrical with a dorsal

digitiform lobe bearing two groups of capillary chaetae, one with short and the other with long. Chaetigerous segment 7 strongly modifies lacking cylindrical notopodia but bearing on each side 4-5 strongly modified acicular hooks directed posteriorly. Segment 8 with cylindrical notopodium and very strong digitiform lobe directed forward. Uncinigerous neuropodial tori on each segment from segment 15-20 to the end of the body.

**Biology:** All specimens found in tubes on rocks directly exposed to venting water whose temperature was recorded up to 25°C. Tubes whitish and corneous in aspect, amoeba like in shape with long anchor filaments. Tube walls thick and multi-layered. Inner surface bearing important bacterial mats.

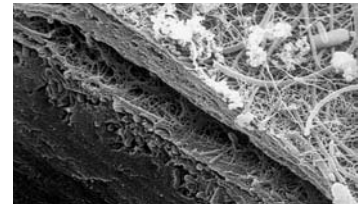
**Distribution:** Mariana and Manus Back-Arc Basins.



1: Habitus;  
by V. Martin.  
Box: Anterior part,  
dorsal view (SEM)  
© Ifremer.



2: Male buccal apparatus (SEM)  
© Ifremer.



3: Cross cut of a tube wall, showing epibiotic bacteria on the inner part (SEM) © Ifremer.

**Reference:**

DESBRUYÈRES D. & L. LAUBIER (1989) Proc. Biol. Soc. Wash. **102**: 761-767.

*Paralvinella (Nautalvinella) pandorae* DESBRUYÈRES & LAUBIER, 1986

**Size:** Up to 20 mm.

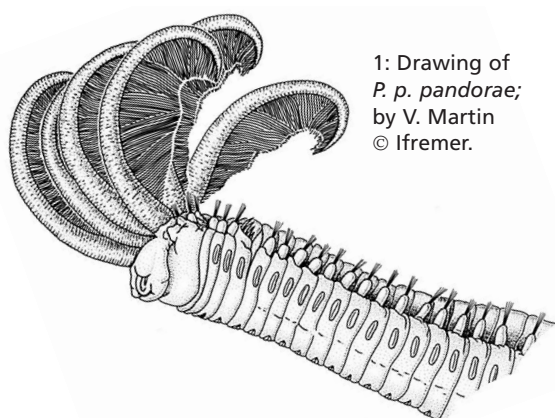
**Color:** Light brown to pinkish in ethanol.

**Morphology:** Body tapering posteriorly comprising about 60 chaetigerous segments. Seventh chaetigerous segment with notopodial chaetae deeply modified forming stout hooks directed backward. Prostomium reduced. Buccal apparatus retractile made of a median groove with a pointed end. Numerous buccal tentacles grooved and smooth inserted in two groups. The first three chaetigerous segments bearing only notopodia with chaetae. The branchial region comprises the first achaetous segment plus the three following chaetigerous segments. Four pairs of pinnate gills with lanceolated secondary filaments in

two adjacent lines. Uncinigerous tori from fifth chaetigerous segment (*P. p. p.*) or sixth chaetigerous segment (*P.p.i.*). No digitiform lobes.

**Biology:** Associated with early colonizer siboglinids (e.g. *Oasisia*, *Tevnia*). Continuous or semi-continuous recruitment (single mode size-frequency distribution). MCHUGH (1989) hypothesized a brooding of larvae by adults.

**Distribution:** *P. p. pandorae* is found on North East Pacific: Juan de Fuca Ridge; *P. p. irlandei* is found at the East Pacific Rise: 21°N to 20°S.



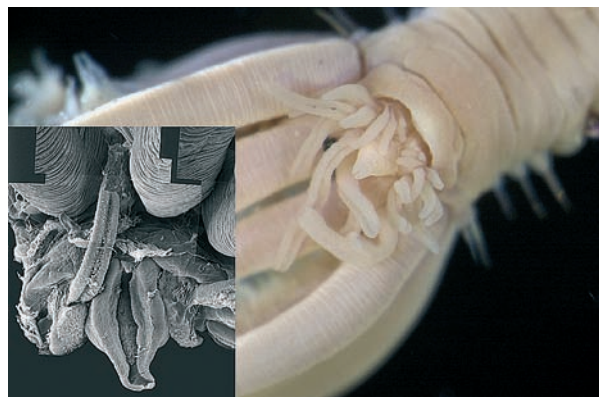
1: Drawing of *P. p. pandorae*; by V. Martin © Ifremer.



2: *P. p. irlandei* (East Pacific Rise: 13°N), dorsolateral view; Box: Gill (SEM) © Briand/Ifremer.



3: *P. p. irlandei* (East Pacific Rise: 13°N), latero-ventral view; the arrow is pointing at the first uncinigerous torus in the sixth chaetigerous segment © Briand/Ifremer.



4: *P. p. irlandei* (East Pacific Rise: 13°N), ventral view; Box: Median groove (SEM) © Ifremer.

**References:**

- DESBRUYÈRES D. & L. LAUBIER (1986) Can. J. Zool. **64**: 2227-2245.  
LEVESQUE C., JUNIPER K. & J. MARCUS (2003) Mar. Ecol. Progr. Ser. **246**: 173-182.  
MCHUGH D. (1987) M. Sc., University of Victoria.  
MCHUGH D. (1995) Invertebr. Biol. **114**: 161-168.  
MCHUGH D. (1989) Mar. Biol. **103**: 95-106.



*Paralvinella (Nautalvinella) unidentata* DESBRUYÈRES & LAUBIER, 1993

**Size:** 4.8-11 mm in length for 77-88 chaetigerous segments.

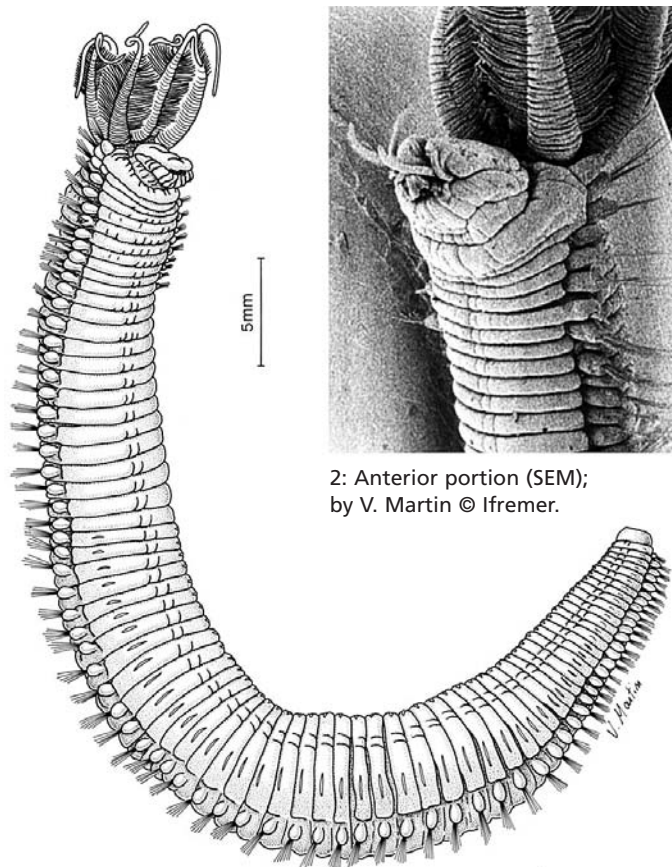
**Color:** Pale grey-pinkish in ethanol.

**Morphology:** Prostomium well developed, with oviform shield shape, clearly separated from buccal segment, with anterior median incision on two third of the length. Buccal apparatus with many grooved buccal tentacles. Paired sexual tentacles or ventral organ not observed in the type series. First 25-30 chaetigerous segments with notopodia only. Branchiae four pairs all similar arranged as funnel-like structure, with strong basal stem bearing small secondary filaments and a thin terminal tip devoid of secondary filaments as long as the basal stem. Secondary filaments inserted along stem on two opposite areas; each leaf-shaped, strongly flattened with median ciliated area and pointed tip. Notopodia (from chaetiger 1 to the end of the body - ex-

cepted 7<sup>th</sup>) cylindrical bearing two groups of capillary chaetae. Notopodia without digitiform lobes. Chaetiger 7 strongly modified bearing two to three straight short acicular notopodial chaetae on each side. Uncinigerous neuropodia from 26-29 chaetiger; uncini numerous (20-50 per torus) in single rows, with teeth directed anteriorly. Uncini with only a single main tooth, lacking a secondary tooth. Pygidium rounded with five conspicuous rounded papillae.

**Biology:** In anhydrite close to vent opening and on rocks under *Alviniconcha* beds in active areas. Tubes horny with apical digitations.

**Distribution:** North Fiji Back-Arc Basin; Lau Back-Arc Basin: Vaï Lili vent field.



2: Anterior portion (SEM);  
by V. Martin © Ifremer.

1: Habitus; by V. Martin © Ifremer.

**References:**

DESBRUYÈRES D. & L. LAUBIER (1993) Proc. Biol. Soc. Wash. **106**: 225-236.

DESBRUYÈRES D., ALAYSE-DANET A. M., OHTA S. & the Scientific Parties of Biolau and Starmer Cruises (1994) Mar. Geol. **116**: 227-242.



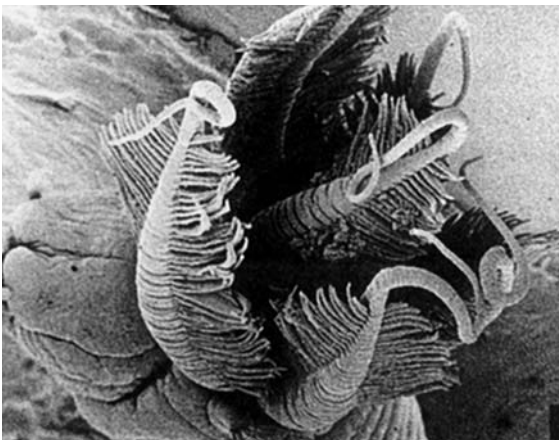
3: in vivo; by courtesy of Greg Rouse.



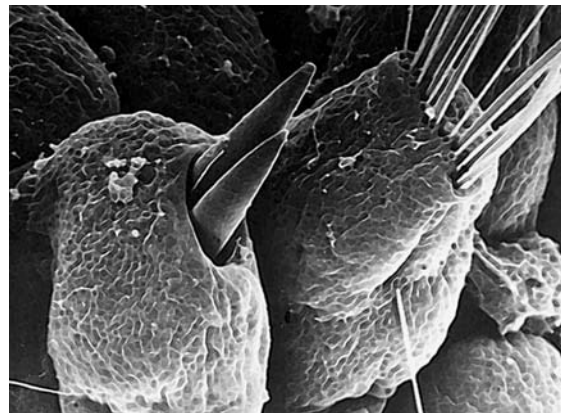
4: Anterior part of a preserved specimen showing the funnel-like structure of gills. Photo by P. Briand © Ifremer.



5: Tubes of *P. unidentata* on a sulphide spire © Ifremer.



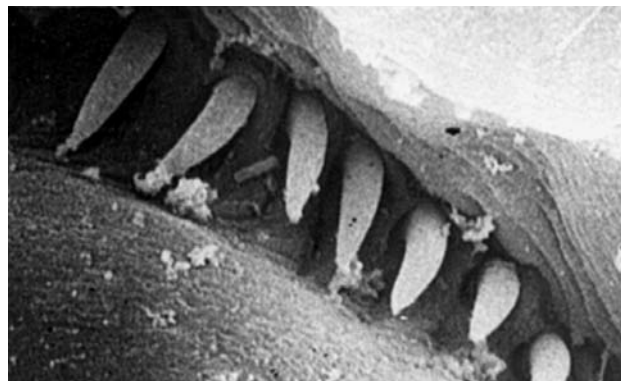
6: Funnel like structure of gills (SEM) © Ifremer.



7: 7<sup>th</sup> and 8<sup>th</sup> parapods, left side of the body (SEM) © Ifremer.



8: Prostomium (SEM) © Ifremer.



9: Uncinigerous torus (SEM) © Ifremer.



*Paralvinella (Paralvinella) fijiensis* DESBRUYÈRES & LAUBIER, 1993

**Size:** Up to 25 mm long.

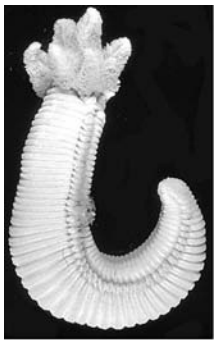
**Color:** In vivo reddish and yellow gills.

**Morphology:** Body maggot-shaped in large specimens (50-65 cs). Prostomium reduced medially, with two anterior lobes. Buccal apparatus comprising numerous exsertile grooved tentacles and two paired sexual tentacles in males ending with three unequally developed rounded lobes. Notopodia of chaetigerous segments one and two reduced. Branchiae four pairs, all similar, with a strong basal stem and secondary filaments abundant inserted on two opposite areas. Notopodia from about 9 cs to 30 cs

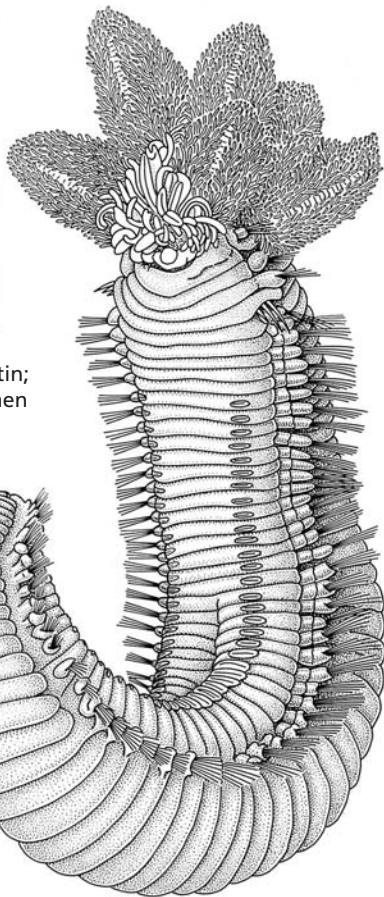
bearing dorsal and ventral rounded lobes. Chaetigerous segment 7 bearing three to four stout transformed chaetae. Uncinigerous neuropodial tori present from 12-19 to the end of the body. Each uncinus with a main tooth surmounted by smaller secondary tooth. Pygidium blunt.

**Biology:** Most specimens were collected on active edifice walls. Tubes are cylindrical and isolated.

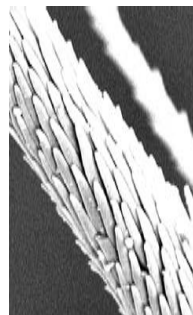
**Distribution:** North Fiji and Lau Back-Arc Basins.



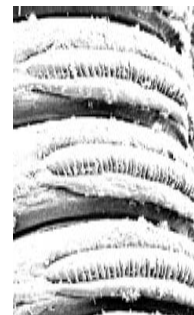
1: Habitus; by V. Martin; box preserved specimen © Ifremer.



2: Habitus in vivo; Lau Basin, cruise TUIM06; by courtesy of F. Pleijel.



3: Notopodial chaeta (SEM) © Ifremer.



4: Posterior uncinigerous tori (SEM) © Ifremer.



5: Sexual trilobed tentacles (SEM) © Ifremer.

**Reference:**

DESBRUYÈRES D. & L. LAUBIER (1993) Proc. Biol. Soc. Wash. **106**: 225-236.

*Paralvinella (Paralvinella) grasslei* DESBRUYÈRES & LAUBIER, 1982

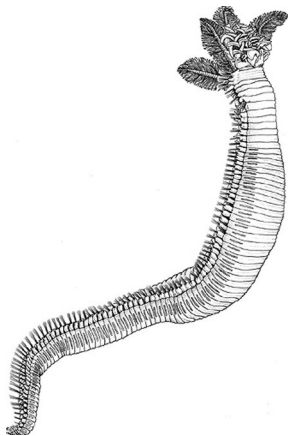
**Size:** Up to 80 mm.

**Color:** Brownish when preserved, reddish in vivo.

**Morphology:** Alvinellid worm with four pairs of pinnate branchiae. One transformed notopod wearing stout acicular spines. Uncinigerous segment from 13-17<sup>th</sup> chaetigerous segment to the posterior part. Chaetigerous segments up to 110. Gonochoric species; males with two robust ventral peribuccal tentacles ending in three rounded lobes. No bacterial epibiosis. Mucous tubes inconspicuous.

**Biology:** Worm dwelling both in warm part of active chimneys where mineral load is low and on *Riftia* tubes. Deposit feeder feeding mainly on bacterial mats.

**Distribution:** East Pacific Rise, Guaymas Basin, Galapagos Spreading Center.



1: Habitus; by V. Martin © Ifremer.



2: Population in situ on a white smoker (East Pacific Rise: 13°N); cruise Phare © Ifremer.



3: Anterior part © Ifremer.

**References:**

- DESBRUYÈRES D. & L. LAUBIER (1982) Proc. Biol. Soc. Wash. **95**: 484-494.  
DESBRUYÈRES D., GAILL F., LAUBIER L. & Y. FOUQUET (1985) Bull. Biol. Soc. Wash. **6**: 103-116.  
DESBRUYÈRES D. & L. LAUBIER (1986) Can. J. Zool. **64**: 2227-2245.  
ZAL F., DESBRUYÈRES D. & JOUIN-TOULMOND C. (1994) C R. Acad. Sci. Paris, Sciences de la Vie / Life Sciences **317**: 42-48.  
ZAL F., JOLLIVET D., CHEVALDONNÉ P. & D. DESBRUYÈRES (1995) Mar. Biol. **122**: 637-648.



*Paralvinella (Paralvinella) palmiformis* DESBRUYÈRES & LAUBIER, 1986

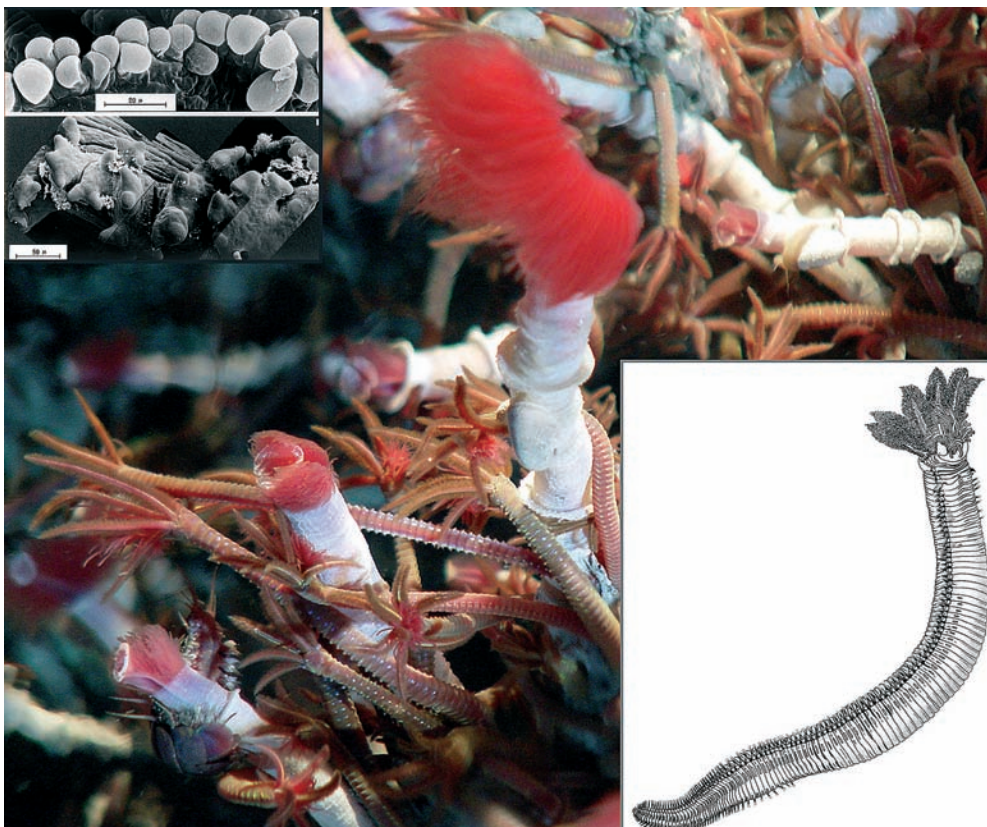
**Size:** Up to 80 mm.

**Color:** Red or pinkish after preservation in ethanol.

**Morphology:** Body gradually tapering. Holotype with 118 segments, paratypes 100-118. Prostomium medially reduced. Ventrally on the peristomium of males, two blind cavities. Buccal apparatus comprising large number of smooth and grooved buccal tentacles and in males two robust peribuccal tentacles ending in three rounded lobes bordered by composite papillae. The first 20-31 chaetigerous segments with notopodia only. Chaetigerous segment 7 strongly modified.

**Biology:** Most commonly found with its caudal end coiled around the distal portion of siboglinid tubes or on the surface of sulfide mineral deposits covered in a sheath of inorganic particulates accumulated by mucus secretion. Deposit feeder.

**Distribution:** Gorda Ridge, Explorer Ridge, Juan de Fuca Ridge.



1: Endeavour segment, *P. palmiformis* associated with *Ridgeia piscesae*; by courtesy of S.K. Juniper. Bottom right: Habitus; by V. Martin © Ifremer. Top left: Comparison between the edges of peribuccal tentacles (SEM) in *P. grasslei* (upper) and *P. palmiformis* (lower) © Ifremer.

**References:**

- ALAIN K. OLAGNON M., DESBRUYÈRES D., PAGÉ A., BARBIER G., JUNIPER S.K., QUÉRELLOU J. & M.A. CAMBON-BONAVITA (2002) FEMS Microbiol. Ecol. **42**: 463-476.  
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TAGHON G.L. (1988) Comp. Biochem. Physiol. **91B**: 593-596.  
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TUNNICLIFFE V. & S.K. JUNIPER (1990) Progr. Oceanogr. **24**: 1-13.

Annelida, Polychaeta, Terebellida, Alvinellidae

*Paralvinella (Paralvinella) sulfincola* DESBRUYÈRES & LAUBIER, 1993 “sulfide worm“

**Size:** Up to 80 mm.

**Color:** Bright red in life and chocolate brown with brown chaetae after preservation in formalin.

**Morphology:** 54-68 chaetigerous segments. Body regular, tapering abruptly in terminal 10 segments. Buccal apparatus comprising small grooved and ciliated tentacles, one pair of large basal tubercles and in males two large lateral tentacles and terminating in a curved margin. First 24-30 chaetigerous segments with notopodia only. Four pairs of branchiae present, all similar strong, abruptly attenuated. Branchial stem relatively short, with a large number of slender filaments arising in two opposite ranks and bearing ciliated longitudinal line. First 22 notopodia

(excepted 7) bearing a dorsal digitiform lobe. Chaetigerous 7 strongly modified with 4-5 very large stout notopodial hooks directed posteriorly. Tubes cylindrical translucent and thin.

**Biology:** Temperatures of 20-80°C have been measured on surfaces colonized by sulfide worms and its most likely that the worms regularly experience temperatures within the lower part of this range. All the collections containing this species are coming from active sulfide edifices where the animal occupies a distinct microhabitat.

**Distribution:** Explorer Ridge, Juan de Fuca Ridge, Gorda Ridge.



1: Anterior part (preserved specimen)  
© Ifremer.



2: Population in situ (Endeavour segment); by courtesy of S.K. Juniper.



3: Population in situ (Endeavour segment); by courtesy of S.K. Juniper.

References:

- JUNIPER S.K. (1994) Paper presented at the 4th International Polychaete Conference, Angers, France.  
SARRAZIN J. & S.K. JUNIPER (1998) Cah. Biol. Mar. **39**: 255-258.  
SARRAZIN J. & S.K. JUNIPER (1999) Mar. Ecol. Progr. Ser. **185**: 1-19.  
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*Amathys lutzi* DESBRUYÈRES & LAUBIER, 1996

**Size:** 1.25-15.7 mm in length, 2.1-6 mm in width.

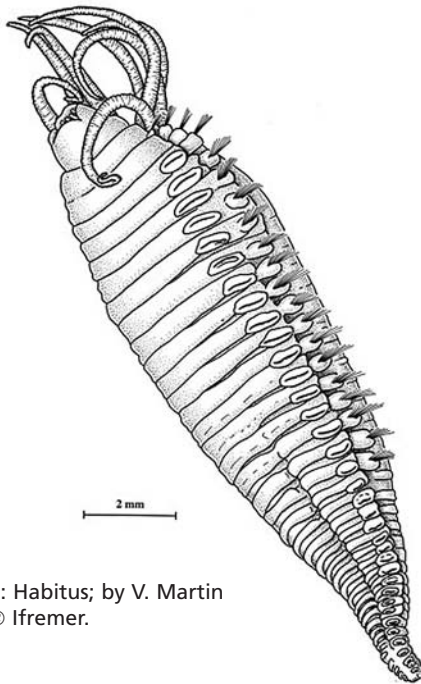
**Color:** No color pattern observed on preserved material.

**Morphology:** 38 chaetigerous segments of which 20 thoracic and 18 abdominal; 17 thoracic uncinigerous segments. Prostomium lacking glandular ridge or eyes; no pallae. Buccal tentacles smooth, grooved and inserted on a buccal membrane. Four pairs of branchiae, all smooth and similar, regularly attenuated. Thoracic parapodia without cirri. Each thoracic uncinus with a single row of four teeth, abdominal uncini with the same

shape as thoracic ones. Abdominal notopodia absent. Pygidium terminal without circle of papillae or anal cirri. Mucus lined tubes covered with rusty colored mineral particles, mussel periostracum pieces and fragments of byssal threads; sometimes, tube simple covered with gray mud.

**Biology:** Sorted from mussel washings, or found in tubes attached to mussel shell hinges and to sulfide or basaltic rocks.

**Distribution:** Mid-Atlantic Ridge: Lucky-Strike, Broken Spur, Snake Pit.



1: Habitus; by V. Martin © Ifremer.



2: Anterior part, lateral view; by P. Briand © Ifremer.



3: Tube from Mid-Atlantic Ridge: Rainbow; by P. Briand © Ifremer.



4: Prostomium, frontal view; by P. Briand © Ifremer.



5: Thoracic uncini (SEM) © Ifremer.

**References:**

- COLAÇO A., DEHAIRS F. & D. DESBRUYÈRES (2002) Deep-Sea Res. **49**: 395-412.  
DESBRUYÈRES D. & L. LAUBIER (1996) Proc. Biol. Soc. Wash. **109**: 248-255.

Annelida, Polychaeta, Terebellida, Ampharetidae, Ampharetinae

*Amphisamytha galapagensis* ZOTTOLI, 1983

**Size:** Maximum size in Guaymas individuals 18 mm, smaller elsewhere.

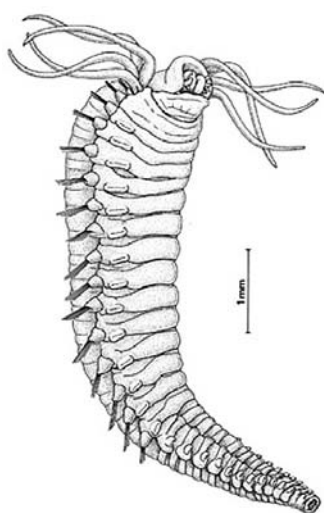
**Color:** Whitish or grey when preserved. Pinkish to green in vivo.

**Morphology:** Ampharetinae with four pairs of smooth gills, no pallae, first three chaetigerous segments reduced, uncini from fourth chaetigerous segment continuing posteriorly on 14 thoracic segments. Uncini avicular with one row of teeth. Buccal tentacles smooth, inserted on a "buccal membrane", 12-15

abdominal segment. Tube mucus-lined covered with small chips of volcanic glass or mud.

**Biology:** Ubiquitous, often found in other invertebrate shells or carapaces. Deposit feeder.

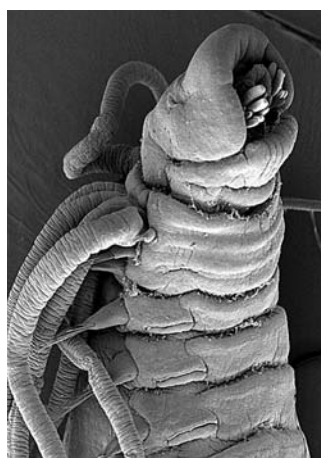
**Distribution:** Galapagos Spreading Center, East Pacific Rise, Guaymas Basin, North East Pacific, Lau Back-Arc Basin, North Fiji Back-Arc Basin, Manus Back-Arc Basin, Okinawa Trough, Mariana Back-Arc Basin. Likely a group of cryptic species (see CHEVALDONNÉ et al. 2002).



1: Habitus; by V. Martin © Ifremer.



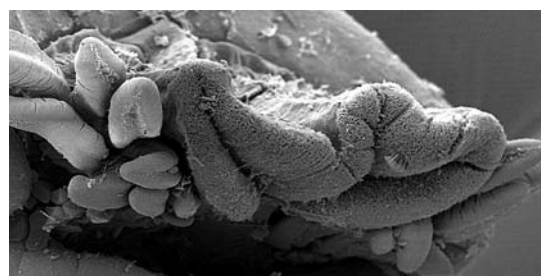
2: Specimen in vivo © Briand/Ifremer.



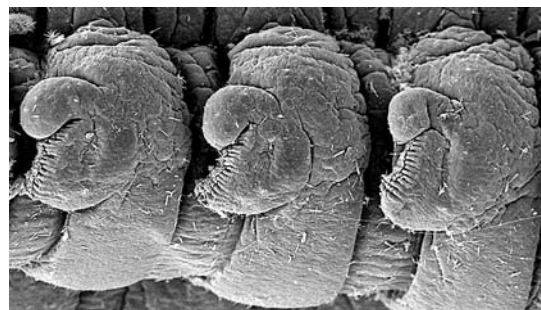
3: Anterior part, lateral view (SEM) © Ifremer.



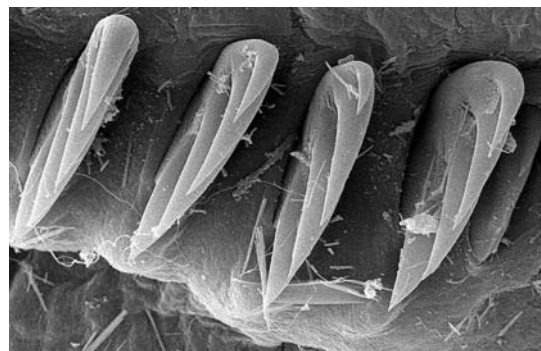
4: Posterior end (SEM) © Ifremer.



5: Buccal membrane and tentacles (SEM) © Ifremer.



6: Abdominal segments, lateral view (SEM) © Ifremer.



7: Thoracic uncini (SEM) © Ifremer.

References:

- CHEVALDONNÉ P., JOLLIVET D., DESBRUYÈRES D., LUTZ R.A. & R.C. VRIJENHOEK (2002) Cah. Biol. Mar. **43**: 367-370.  
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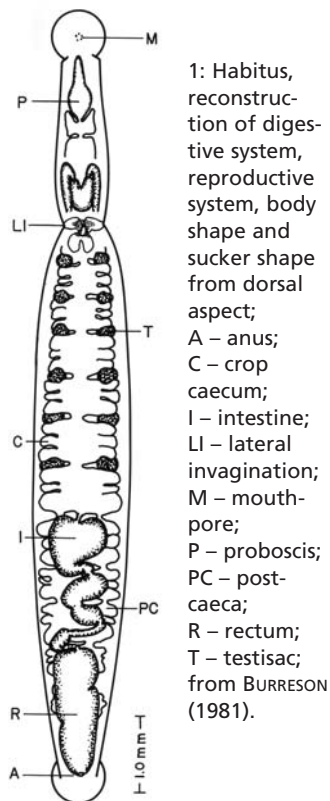
*Bathybdella sawyeri* BURRESON, 1981

**Size:** Maximal 13 mm.

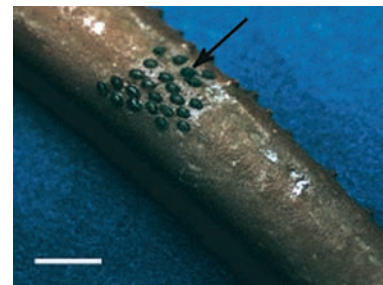
**Morphology:** The morphology of most specimens corresponds with the original described morphology of *B. sawyeri*, with suckers of approximately equal size, but all specimens collected from *Cyanagraea praedator* have unusually large oral suckers that were distinctly larger than the caudal sucker. However, based on the internal morphology using serial sections, also the specimens from *C. praedator* could be identified as *Bathybdella sawyeri*. The leech is unpigmented and lacks eyespots and ocelli, but often appears red in color because of the blood in the gut. The body is smooth and lacks papillae, tubercles or lateral pulsatile vesicles. Internally *B. sawyeri* is characterized by six pairs of testisacs and a very unusual reproductive system that includes paired lateral invaginations in segment 12 connected via vector tissue to a large bilobed spermatheca.

**Biology:** Found free-living in washings of bivalves vesicomid *Calyptogena magnifica* and mytilid *Bathymodiolus thermophilus*, bythograeid crabs *Bythograea thermydron* and *Cyanagraea praedator*, tubeworm *Riftia pachyptila*, and bythitid fish. Little is known on the biology of *Bathybdella sawyeri*. No specimens were collected from fish hosts, but the presence of nucleated red blood cells in the gut suggest that this leech feeds on the blood of fishes, as do all other members of the family Piscicolidae. The high abundance of leeches found among vent invertebrates suggests that the leech leaves the fish host after each blood meal and seeks refuge among various invertebrates until digestion is complete and the leech is ready to feed again. Although cocoons (egg cases) have not been found, *B. sawyeri* undoubtedly deposits cocoons on available hard substrate including shells or carapaces of invertebrates.

**Distribution:** Galapagos Spreading Center; Southern East Pacific Rise: 14°S, 17°S.



2: Specimen taken onboard, after collection from Southern East Pacific Rise: 17°S, Oasis site; cruise Biospeedo; by S. Hourdez © CNRS.



3: Leech cocoons of *Johanssonia arctica* on the walking leg of the Tanner crab, *Chionoecetes bairdi*, off the coast of Oregon (USA); scale bar 6 mm; by E. Burreson © VIMS.



4: Leech cocoons of *Myzobdella lugubris* on the carapace of the blue crab, *Callinectes sapidus*, in Chesapeake Bay, Virginia (USA); scale bar 6 mm; by E. Burreson © VIMS.

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