

Dorvilleidae (Polychaeta) from the Capbreton Canyon (Bay of Biscay, NE Atlantic) with the description of *Pettiboneia sanmartini* sp. nov.

Florencio AGUIRREZABALAGA & Argiloa CEBERIO
S.C. INSUB, C/ Zemoría 12, Apdo 3223, 20013 Donostia-San Sebastián, Spain,
E-mail: tepagelf@sc.ehu.es

Abstract: Three species of dorvilleid polychaetes are reported from bathyal depths of the Capbreton Canyon, Bay of Biscay. *Pettiboneia sanmartini* sp. nov. is described, *Schistomeringos* cf. *anocolata* is reported for the first time from the Eastern Atlantic and *Protodorvillea kefersteini*, reported for the first time from the bathyal étage.

Résumé : *Dorvilleidae (Polychaeta) du Canyon de Capbreton (Golfe de Gascogne, Atlantique NE) et description de Pettiboneia sanmartini sp. nov.*. Trois espèces de polychètes dorvilleidés sont signalées de l'étage bathyal du Canyon de Capbreton, Golfe de Gascogne. Une espèce nouvelle, *Pettiboneia sanmartini*, est décrite, *Schistomeringos* cf. *anocolata* est signalée pour la première fois dans l'Atlantique orientale, et *Protodorvillea kefersteini* pour la première fois dans l'étage bathyal.

Keywords: Polychaeta, Dorvilleidae, Pettiboneia, New species, Bay of Biscay.

Introduction

During 1987 to 1990, four oceanographic cruises were conducted in a French-Spanish research project directed by Dr. J.C. Sorbe (CNRS, LOB), aboard the R/V "Côte d'Aquitaine". These studies of bathyal macrofauna communities yielded eight specimens of dorvilleid polychaetes, comprising three species: *Pettiboneia sanmartini* sp. nov., described below, *Schistomeringos* cf.

anocolata (Hartman, 1965), a species only reported until now from the western Atlantic, and *Protodorvillea kefersteini* (Mc Intosh, 1869), collected for the first time from the bathyal étage.

Material and methods

The specimens were collected at five stations situated between 492 m and 1113 m depth (see coordinates in Table 1). Two different types of gear were used: a Sanders-Hessler epibenthic dredge (DI) with a mesh size of 0.5 mm and a Flusha box-corer (KF), which sample was sieved with a mesh of 0.5 mm. Specimens were preserved in a 10%

formaldehyde-seawater solution. The types and representative specimens were deposited in the following institutions: Museo Nacional de Ciencias Naturales, Madrid (MNCN); Muséum National d'Histoire Naturelle, Paris (MNHN); Sociedad Cultural de Investigación Submarina (INSUB).

Systematics

Family DORVILLEIDAE Chamberlin, 1919

Genus *Pettiboneia* Orensanz, 1973

Pettiboneia sanmartini sp. nov

Fig. 1-3

Material examined

Atlantic Ocean, Bay of Biscay, Capbreton Canyon (coordinates in Table 1). CB 89/KF-58: holotype (MNCN 16.01/8853); CB 88/DI-12: one paratype (MNCN 16.01/8854); CB 88/DI-13: 2 paratypes (MNHN Poly type 1326) (INSUB POL-159).

Description

All specimens complete, with 29-30 chaetigers. Holotype: 2.1 mm long, 0.3 mm wide (at chaetiger 10, excluding parapodia), 30 chaetigers.

Prostomium triangular, slightly wider than long, with distal part rounded (Fig. 1A). Two dorsal, smooth antennae, half as long as prostomium width. Pair of biarticulate palps, longer than antennae, with thick, ciliated palpophores and thinner, smooth palpostyles, similar in shape to antennae but shorter. Pair of ciliary bands in front of antennae.

Two peristomial apodous and achaetous segments. First segment shorter, often telescoped below the second, longer and wider one. Each ring with a ciliary band in posterior margin.

Cirriform aciculate notopodia present from chaetiger 2 through chaetigers 21-27. Notopodia shorter (or subequal) than neuropodia (Fig. 1A,B). Neuropodium comprising an acicular lobe and a retractable inferior chaetal lobe (Fig. 2A). Ventral cirrus filiform, subdistally inserted (Fig. 2A).

Supraacicular chaetae of anteriormost chaetigers formed by 1-3 long, thin capillary chaetae with inner margin serrate (Fig. 2C) and 1-2 geniculate chaetae (Fig. 3A-C). From chaetiger 5 geniculate chaetae replaced by 1-3 furcate chaetae with subequal, slender and parallel tines (Figs. 2B, 3D). Distal part of furcate chaetae shaft serrated below shorter tine. 3-4 subacicular heterogomph falcigerous chaetae with finely serrated blade. Blades showing dorso-ventral gradation, dorsal blade very much longer, ventral blade shortest (Fig. 2D-F).

Mandibles L-shaped, with short handle and long cutting edge (Fig. 3E). Teeth of the cutting edge all rounded and in three rows: inferior with 2-3 teeth, main row with 10 teeth, superior row with 2-3 teeth.

Maxillae consisting of two rows of free denticles and some (5-6) additional rows on each side (Fig. 3F,G). Denticles of row I large, delicate, rounded plates covered with small spines. Denticles of row II, rectangular plates with main fang and coarsely serrated cutting edge (Fig. 3F).

Pygidium wider than long, with two pairs of subterminal cirri; dorsal pair longest (Fig. 1B).

Remarks

The members of the genus *Pettiboneia* Orensanz, 1973, are small dorvilleids distributed throughout the world's oceans. Before 1990 only five species were considered to belong to this genus. Blake & Hilbig (1990) determined that two species of *Protodorvillea* described by Armstrong & Jumars (1978) belonged to the genus *Pettiboneia*,

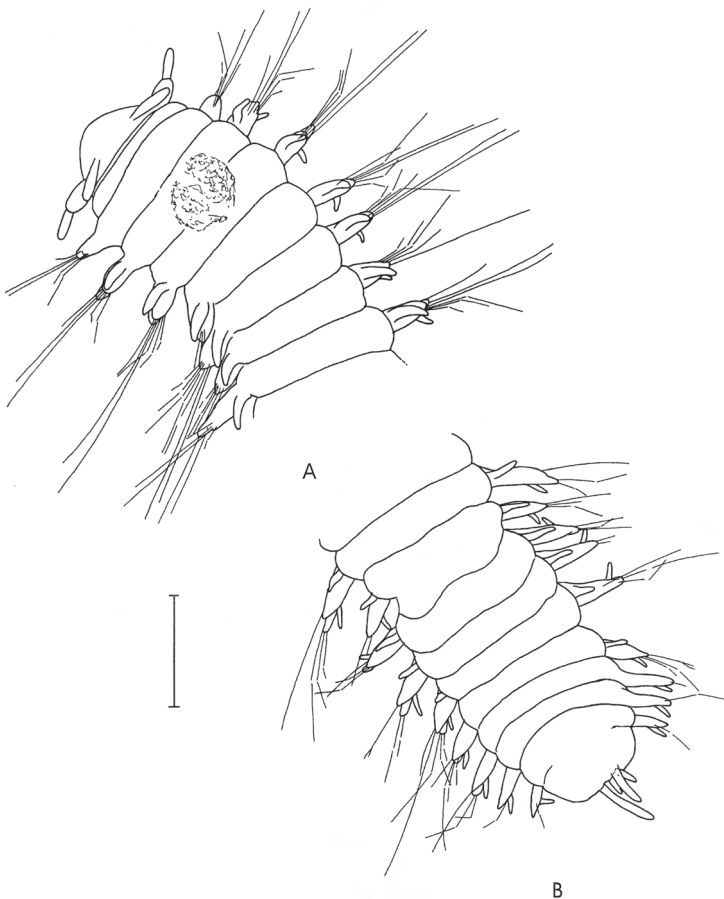


Figure 1. *Pettiboneia sanmartini* sp. nov., holotype. A. anterior end, dorsal view. B. posterior end, dorsal view. Scale bar: 200 μ m.

Figure 1. *Pettiboneia sanmartini* sp. nov., holotype. A. région antérieure, vue dorsale. B. région postérieure, vue dorsale. Échelle : 200 μ m.

Table 1. Main characteristics of sampling stations in the Capbreton Canyon with dorvilleid specimens.

Tableau 1. Principales caractéristiques des stations du canyon du Capbreton échantillonnées, contenant des spécimens de dorvilleidés.

Station	Date	Position at the beginning and the end of the tow on the sea floor	Depth (m)	Time of dragging
DI 12	6/07/88	43°38,57' N - 2°17,93' W	1012	20'
		43°38,33' N - 2°18,11' W	1113	
DI 13	6/07/88	43°38,36' N - 2°18,03' W	1040	15'
		43°38,08' N - 2°18,14' W	1007	
DI 26	8/07/88	43°42,89' N - 2°18,71' W	984	25'
		43°43,25' N - 2°18,80' W	1029	
DI 33	10/07/88	43°50,32' N - 2°10,90' W	495	15'
		43°49,78' N - 2°11,12' W	492	
		Position	Depth(m)	
KF 58	14/09/89	43°35,26' N - 1°55,28' W	1002	

DI - Sanders-Hessler dredge

KF - Flusha box-corer

P. pugettensis and *P. dibranchiata*, increasing the number of known species to seven; Hilbig & Ruff (1990) described two new species, *P. brevipalpa* and *P. bathyalis*, and presented a key to the nine known species of the genus; Orensanz (1990) described a new species, *P. hartmanae*. Finally, Carrasco & Palma (2000) have described a new species, *Pettiboneia wui*, so that, with *Pettiboneia sanmartini* sp. nov., the total number of known species of *Pettiboneia* is at present twelve (Table 2).

Pettiboneia sanmartini sp. nov. is very close to *Pettiboneia bathyalis* Hilbig & Ruff, 1990. Both species have geniculate chaetae and not furcate chaetae in the anteriormost chaetigers, a character that Hilbig & Ruff (1990) stated for *P. bathyalis*, and that distinguishes the two species from all congeners. Both species are also similar in the shape of prostomium (antennae and palps included), mandibles and maxillae. The main difference between them is the number of chaetigers with notopodia, a distinction that appears to be a real feature rather than an artifact (Hilbig & Ruff, 1990): *P. bathyalis* has notopodia from chaetiger 2 to chaetigers 7-9 whereas *P. sanmartini* sp. nov. has notopodia from chaetigers 2 to 21-27. Furthermore, these species differ in the shape of the furcate chaetae and the length of the blade of the superior subacicular falcigerous chaetae.

Distribution

Capbreton Canyon, Bay of Biscay, 1002-1113 m depth, soft sediment. This is the first record of the genus *Pettiboneia* in the eastern Atlantic. *Pettiboneia sanmartini* sp. nov. inhabits the bathyal étage, as *P. dibranchiata* and *P. bathyalis* (Armstrong & Jumars, 1978; Hilbig & Ruff, 1990).

Etymology: this species is named in honour of the Spanish polychaetologist Dr. Guillermo San Martín, for his support and friendship over the years.



Figure 2. *Pettiboneia sanmartini* sp. nov., paratypes: parapodium and chaetae of chaetiger 11. A. paratype DI-12; B-F paratype DI-13. A. parapodium (chaetiger 11). B. furcate supraacicular chaeta. C. capillary supraacicular chaeta. D. subacicular falciger chaeta, superior position. E. subacicular falciger chaeta, middle position. F. subacicular falciger chaeta, inferior position. Scale bar: A: 100 μ m. B-F: 40 μ m.

Figure 2. *Pettiboneia sanmartini* sp. nov., paratypes: parapode et soies du sétigère 11. A. paratype DI-12; B-F paratype DI-13. A. parapode (sétigère 11). B. soie fourchée supraciculaire. C. soie capillaire supraciculaire. D. soie composée à serpe, position supérieure. E. soie composée à serpe, position intermédiaire. F. soie composée à serpe, position inférieure. Échelle : A : 100 μ m. B-F : 40 μ m.

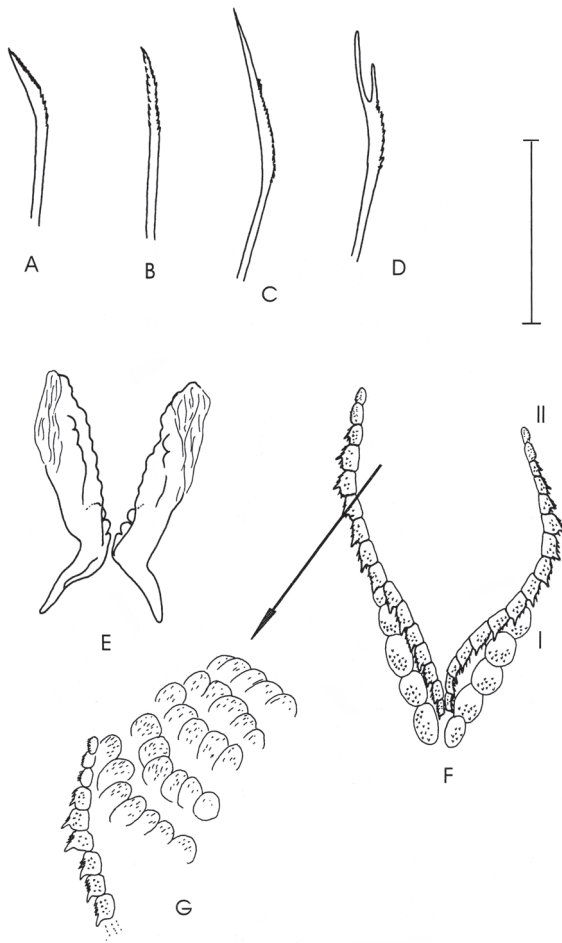


Figure 3. *Pettiboneia sanmartini* sp. nov., paratype DI-12. A. geniculate supraacicular chaeta, chaetiger 1. B. geniculate supraacicular chaeta, chaetiger 3, frontal view. C. geniculate supraacicular chaeta, chaetiger 4. D. furcate supraacicular chaeta, chaetiger 5. E. mandibles. F. maxillae (I and II, rows of plates). G. end of row II of maxillae with additional rows of plates. Scale bar: A-D, F,G: 40 μ m; E: 100 μ m.

Figure 3. *Pettiboneia sanmartini* sp. nov., paratype DI-12. A. soie geniculée supraciculaire du sétigère 1. B. soie geniculée supraciculaire du sétigère 3, vue frontale. C. soie geniculée supraciculaire du sétigère 4. D. soie fourchue supraciculaire du sétigère 5. E. mâchoire. F. appareil maxillaire (I et II, rangs de plaques). G. extrémité du rang II de l'appareil maxillaire avec rangs additionnels de plaques.

Échelle : A-D, F,G : 40 μ m ; E : 100 μ m.

Genus *Protodorvillea* Pettibone, 1961

Protodorvillea kefersteini (Mc Intosh, 1869)

Staurocephalus kefersteini Fauvel, 1923: 444, fig. 177 m-n; *Protodorvillea kefersteini* Orensanz, 1973: 335, pl. IV: 1-6; Perkins, 1979: 456, fig. 17 g-m; Wolf, 1984: 44-12, fig. 44.8 a-m; Hartmann-Schröder, 1996: 276, fig. 123 a-g; Núñez, Pascual & Brito, 1996: 142, fig. 2.

Material examined

Atlantic Ocean, Bay of Biscay, Capbreton Canyon (coordinates in Table 1). CB 88/DI-12: 2 specimens (INSUB POL-175); CB 88/DI-26: 1 specimen (INSUB POL-176).

Description

Prostomium conical with distal part rounded. Two short and ovoid antennae. Eyes not seen. Peristomium formed by two apodous and achaetous segments.

Parapodia uniramous. Dorsal and ventral cirri, short and ovoid, from first chaetiger backwards.

Supraacicular chaetae of two types: furcate chaetae with subequal, smooth tines and 1-2 finely serrated capillary chaetae. Subacicular chaetae are composite heterogomph falcigers, having finely serrated blades with bidentate tips and with the secondary tooth well marked. Blades of composite chaetae showing dorsoventral decreasing gradation, 1-2 dorsal blades much longer, as figured by Wolf (1984). Cultriform chaetae absent as in the New England specimens (Perkins, 1979).

Morphology of mandibles and maxillae typical of the species (Orensanz, 1973; Wolf, 1984; Núñez et al., 1996)

Distribution

North Pacific; West Atlantic from Massachusetts to Florida, Gulf of Mexico, Argentina; East Atlantic from Scotland to South Africa; Antarctic. The species lives mainly in shallow waters, from intertidal to 120 m depth. The specimens of Capbreton increase the range of bathymetric distribution of the species to the bathyal étage (984 - 1113 m depth)

Genus *Schistomeringos* Jumars, 1974

Dorvillea and *Schistomeringos* are two similar genera which differ only by the presence of furcate chaetae in the genus *Schistomeringos*. Wolf (1986) combined both genera under the genus name *Dorvillea* and divided it into two subgenera *Dorvillea* and *Schistomeringos*. Later on, Orensanz (1990) preferred to retain them as separate genera when careful comparative studies of maxillary elements became available. Eiby-Jacobsen & Kristensen (1994), described a new genus and species of Dorvilleidae, *Neotenotrocha sterreri*, and gave a phylogenetic analysis of the families Dorvilleidae, Iphitimidae and Dinophilidae. Based on this analysis, they proposed a key to the genera of Dorvilleidae emended, where the genera *Dorvillea* and *Schistomeringos* are considered as two genera which differ by the absence or presence of furcate chaetae.

Schistomeringos cf. *anoculata* (Hartman, 1965)

Fig. 4-6

Dorvillea rudolphi anoculata Hartman, 1965: 124-125, Pl. 22
Stauronereis anoculatus Orensanz, 1973: 333, Pl. III: 1-4

Table 2. Locality and morphological data of the twelve species of the genus *Pettiboneia*.
Tableau 2. Données sur les localités et les caractères morphologiques des douze espèces du genre *Pettiboneia*.

<i>Species</i>	<i>Type locality depth</i>	<i>Antennae length</i>	<i>Eyes</i>	<i>Achaetous peristomial rings</i>	<i>Notopodia from----to</i>	<i>Geniculate supraacicular chaetae in anterior chaetigers</i>	<i>Furcate chaetae tines</i>	<i>Branchiae on anterior neuropodia</i>	<i>Anal cirri</i>
<i>P. sanmatiensis</i> Orensanz 1973	Gulf of S. Matias- Argentina 15 m	Shorter than length of palps	1 pair of black eyes	2, distinct	2 ---- 10/14	Absent	Asymmetrical, smooth or slightly serrated	Absent	2 pairs, dorsal longer
<i>P. urciensis</i> Campoy & San Martín, 1980	Mediterranean Spain. 0.1 - 2 m	Shorter than length of palps	1 pair of small eyes	2, distinct	2 ---- 10/12	Absent	Asymmetrical, serrated	Absent	2 pairs, dorsal longer
<i>P. blakei</i> Wolf, 1987	Florida 22 - 43 m	1/2 length of palps	1 pair of large eyes	2, distinct	2 ---- 12/24	Absent	Slightly asymmetrical, spinose	Absent	2 pairs, filiform, dorsal longer
<i>P. pugetensis</i> (Armstrong & Jumars, 1978)	Puget Sound Washington intertidal to 12 m	1/2 length of palps	1 pair of faint eyes	2, fused dorsally	3 ---- 10/14	Absent	Asymmetrical, serrated intertidal to 12 m	Absent	2 pairs
<i>P. harmanae</i> Orensanz 1990	Antarctic Peninsula. 38 m	Shorter than length of palps	Absent	2, distinct	1/2 ---- 6/8	Absent	Very asymmetrical, spinulate	Absent	1 pair, small, papillate
<i>P. brevipalpa</i> Hilbig & Ruff, 1990	Alaska 140 - 380 m	2 length of palps	Absent	2, distinct, subequal	2 ---- 8/11	Absent	Asymmetrical, serrated	Absent	2 pairs
<i>P. wui</i> Carrasco & Palma, 2000	Antofagasia Chile. 40 m	Shorter than length of palps	Absent	1	2 ---- 12/13	Absent	Asymmetrical, spinulate	Absent	2 pairs, short, papillate
<i>P. australiensis</i> Westheide & Nordheim, 1985	Great Barrier Reef Australia. 0.5 m	1/2 length of palps	Absent	2, distinct	2 ---- 17/19	Absent	Symmetrical, smooth	Absent	Unknown
<i>P. bathyalis</i> Hilbig & Ruff, 1990	New England 800 - 2500 m	Shorter than length of palps	Absent	2, distinct unequal	2 ---- 7/9	Present	Asymmetrical, serrated	Absent	2 pairs
<i>P. sanmartini</i> , new species	Bay of Biscay 1002 - 1113 m	Shorter than length of palps	Absent	2, distinct	2 ---- 21/27	Present	Asymmetrical, serrated	Absent	2 pairs, dorsal longer
<i>P. ditbranchiata</i> (Armstrong & Jumars, 1978)	Sta Catalina Basin California. bathyal	Shorter than length of palps	Absent	2, distinct unequal	2 ---- 13/17	Absent	Asymmetrical, serrated	Present, from set.1 - 13/17	2 pairs, dorsal longer
<i>P. duofurca</i> Wolf, 1987	Florida to Texas 9.3 - 118 m	2/3 length of palps	1 pair of small eyes, when present	2, distinct	2 ---- 8/9	Absent	Two types, slightly asymmetrical	Present, from set.3 - 5/8 or absent	2 pairs, dorsal very long

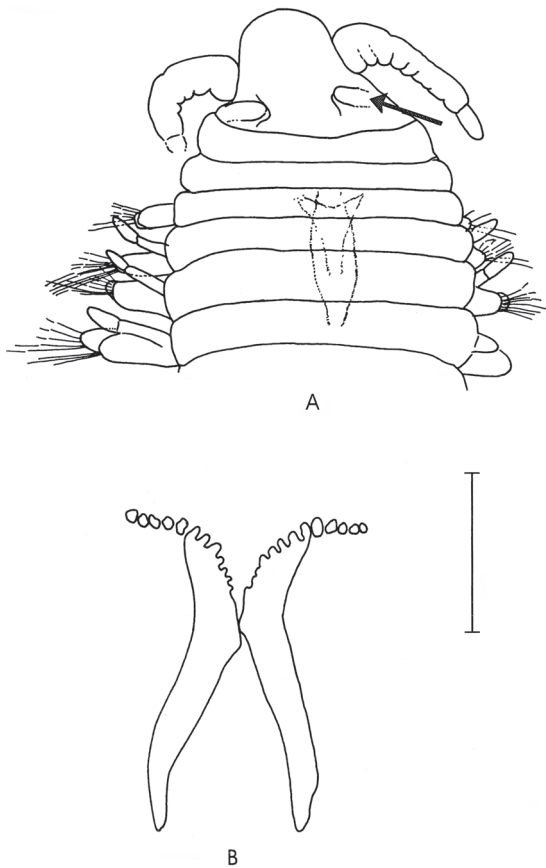


Figure 4. *Schistomeringos* cf. *anoculata*. A. anterior end, dorsal view (arrow points on basis of the missing antenna). B. mandibles. Scale bar: A: 400 μ m; B: 200 μ m.

Figure 4. *Schistomeringos* cf. *anoculata*. A. région antérieure vue dorsale (la flèche indique la base de l'antenne manquante). B. mâchoire.

Échelle : A : 400 μ m ; B : 200 μ m.

Material examined

Atlantic Ocean, Bay of Biscay, Capbreton Canyon (coordinates in Table 1). CB 88/DI-33: 1 specimen (INSUB POL-177).

Description

One incomplete specimen with 16 chaetigers, 2.57 mm long and 0.66 mm wide.

Prostomium truncate conical. Eyes absent. In the posterior part of prostomium two dorsal antennae, broken on the specimen examined, and one pair of ventral palps with a long palpophore and a short oval palpostyle (Fig. 4A).

Peristomium composed of two apodous and achaetous segments. First chaetiger without dorsal cirrus (Fig. 4A). From chaetiger 2 backwards, each parapodium has a dorsal cirrus comprising a long cirrophore, with an inner notoacicula, and a distal, shorter cirrostyle (Fig. 5A). Ventral cirri elongate, digitiform (Fig. 5A).

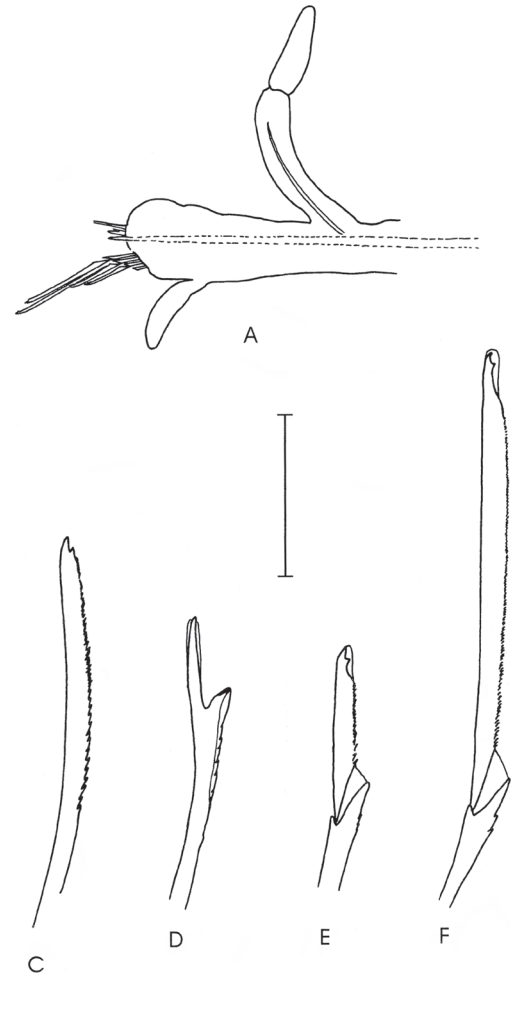


Figure 5. *Schistomeringos* cf. *anoculata*. A. parapodium, chaetiger 16. B. capillary supraacicular chaeta, chaetiger 13. C. cultriform chaeta, chaetiger 6. D. furcate chaeta, chaetiger 14. E. subacicular compound chaeta, inferiormost position, chaetiger 7. F. subacicular compound chaeta, superiormost position, chaetiger 7.

Scale bar: A: 200 μ m. B-F: 40 μ m.

Figure 5. *Schistomeringos* cf. *anoculata*. A. parapode du sétigère 16. B. soie capillaire supraaciculaire du sétigère 13. C. soie cultriforme du sétigère 6. D. soie fourchue du sétigère 14. E. soie composée à serpe, subaciculaire, en position inférieure, du sétigère 7. F. soie composée à serpe, subaciculaire, en position supérieure, du sétigère 7.

Échelle : A : 200 μ m. B-F : 40 μ m.

Supraacicular chaetae of the nine anteriormost chaetigers of two types: 3-4 long, very fine, serrated simple chaetae (Fig. 5B); 2-4 cultriform simple chaetae (Fig. 5C), shorter and stronger, with bidentate tip and serrated margin. From chaetiger 10 to chaetiger 12, cultriform chaetae gradually replaced by 2-3 furcate simple chaetae with very unequal tines and subdistal margin denticulate (Fig. 5D). From chaetiger 12 backwards cultriform chaetae totally absent.



Figure 6. *Schistomeringos* cf. *anoculata*. Maxillae
Scale bar: 200 μ m.

Figure 6. *Schistomeringos* cf. *anoculata*. Maxilles
Échelle : 200 μ m.

All subacicular chaetae are composite heterogomph falcigers, having shafts subdistally hooded (Fig. 5E, F). Blades, distally bidentate and hooded, with spinulate inner margin. Each fascicle with 2-3 falcigers with very long blade (Fig. 5F).

The mandibles consist of two elongate pieces, distally denticulate with some free teeth on each side (Fig. 4B). Maxillae carriers and four rows of teeth well developed and four rows more, incompletely developed (Fig. 6).

Remarks

The specimen agrees well with the description of Orensanz (1973), but the missing antennae leads us to leave the species pending until new specimens are collected from the same area.

Distribution

A predominantly bathyal species, *Schistomeringos anoculata* has been collected in the West Atlantic from New England (U.S.A.) to the mouth of de la Plata river (Hartman,

1965, Orensanz, 1973). The specimen of the Bay of Biscay would constitute the first record from the East Atlantic.

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