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# Polychaeta of the 'DIVA-Artabria I' project (cruise 2002) in the continental shelf and upper slope off Galicia (NW Spain)

Julio PARAPAR[1] and Juan MOREIRA[2]

(1) *Departamento de Bioloxía Animal, Bioloxía Vexetal e Ecoloxía, Facultade de Ciencias, Universidade da Coruña, Alejandro de la Sota 1, E-15008 A Coruña, Spain. E-mail: jparapar@udc.es*

(2) *Estación de Bioloxía Mariña da Graña, Universidade de Santiago de Compostela, Rúa da Ribeira 1, A Graña, E-15590 Ferrol, Spain. E-mail: juan.moreira@usc.es*

**Abstract:** The present paper reports on the Polychaeta collected during the 2002 cruise of the 'DIVA-Artabria I' project in the shelf and upper slope off Golfo Ártabro (Galicia, NW Spain). Eighteen samples were taken at 9 stations covering a depth range from 150 to 1,140 m. Three different sampling gears were used: Agassiz trawl, Naturalist dredge and Epibenthic sledge. A total of 5,598 specimens belonging to 43 polychaete families and 171 species were collected. The polychaete assemblage differed between the shelf and the upper slope: the polychaete fauna from the shelf was composed of infaunal taxa such as ampharetids, opheliids, paraonids and spionids and the upper slope was characterized by mobile epibenthic taxa such as syllids, hesionids, and phyllodocids. The acrocirrid *Macrochaeta polyonyx* Eliason, 1962 is reported for the first time for the Iberian Peninsula, and new morphological data are provided for the ampharetid *Auchenoplax crinita* Ehlers, 1887 and the terebellid *Euthelepus setubalensis* McIntosh, 1885.

**Résumé :** *Polychètes du projet 'DIVA-Artabria I' (campagne 2002) sur le talus et le plateau continental au large de la Galice (Espagne).* Ce travail a pour but d'étudier les Polychètes récoltés pendant la campagne 2002 du projet 'DIVA-Artabria I' sur le plateau continental et le talus du Golfo Ártabro (Galice, NW Espagne). Dix-huit échantillons ont été prélevés à 9 stations à une profondeur de 150 à 1140 m. Trois appareils d'échantillonnage différents ont été utilisés: une drague Agassiz, une drague de Naturaliste et un traîneau épibenthique. En tout, 5598 spécimens appartenant à 43 familles et 171 espèces de polychètes ont été récoltés. L'assemblage de polychètes du plateau continental diffère de celui du talus : la faune de polychètes du plateau est composée de taxa de l'endofaune tels les ampharétidés, les ophélidés, les paraonidés et les spionidés, alors que le talus est caractérisé par des taxa épibenthiques mobiles tels les syllidés, les hésionidés et les phyllodocidés. L'acrocirride *Macrochaeta polyonyx* Eliason, 1962 est cité pour la première fois dans la péninsule ibérique. De nouvelles données morphologiques sont apportées sur l'ampharetidé *Auchenoplax crinita* Ehlers, 1887 et le térébellidé *Euthelepus setubalensis* McIntosh, 1885.

*Keywords*: Polychaeta ● Atlantic Ocean ● Continental shelf ● Continental slope ● Distribution ● DIVA-Artabria I ● Galicia ● Iberian Peninsula

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## Introduction

The NW Iberian Continental Margin along the coast of Galicia is characterized by a narrow shelf which is connected to the North Atlantic Abyssal Plain by a steep slope intersected by a series of canyons. The region is subject to seasonal coastal organic enrichment via upwelling events from the deep North Atlantic waters. These upwellings intrude into the Galician coastal embayments known as 'rias' and contribute to a high primary production that supports an intensive raft culture, particularly of the edible mussel, *Mytilus galloprovincialis* Lamarck, 1819, in the southern rias (Tenore et al., 1982). Likewise, large outflows of waters enriched in nutrients from the southern rias, particularly the Ría de Arousa, occur along the western Galician coast (López-Jamar et al., 1992; Tenore et al., 1995).

The composition and distribution of benthic assemblages in the intertidal zone and shallow waters of continental shelf of the rias of Galicia is well-documented (e.g. López-Jamar, 1978; Viéitez, 1981; Mora et al., 1982; López-Jamar & Mejuto, 1985; Junoy & Viéitez, 1990). Because of this wealth of information, the diversity and ecology of polychaetous annelids from coastal areas is well-known. However, polychaete faunas from continental shelf and slope have been less studied. The first studies focused on polychaete fauna of the continental shelf and continental slope off Galicia were carried out as part of oceanographic cruises with a wider geographic range such as those of the ship 'Challenger' between 1872 and 1876, and the ships 'Hirondelle', 'Hirondelle II', and 'Princess Alice' in the first half of the 20th century (Fauvel, 1914, 1916 & 1932), and 'Thalassa' in the second half of the 20th century (Amoureux, 1972 & 1974) (Fig. 1, Table 1). Later, several surveys on benthic ecology were done by the Instituto Español de Oceanografía off the northern rias ('Rías Altas') by López-Jamar & González (1987) and off the southern rias ('Rías Baixas') by Tenore et al. (1982) and López-Jamar et al. (1992). In recent years, cruises were initiated in the framework of the OMEX II project devoted to the study of natural biological processes in ocean margins related to coastal upwellings and their effects on the benthic fauna (Flach et al., 2002; Lavaleye et al., 2002), as well as the ECOPREST project related to the effects of the 'Prestige' oil spill on the benthic fauna of the continental shelf (Serrano et al., 2006).

In 2002 the Marine Biological Station of A Graña (Universidade de Santiago de Compostela, Spain) started the 'DIVA-Artabria I' project as a survey of the benthic fauna of the Galician shelf and slope off Golfo Ártabro (NW Spain; Fig. 1) in order to obtain baseline data about

**Table 1.** List of main oceanographic cruises (R.V. in low case) and projects (capitals) done in the Galician continental shelf and slope showing the publications devoted to polychaete taxonomy or those of benthic ecology with references to polychaetes. Gears: AT, Agassiz trawl; OT, otter trawl; BC, box corer; BD, boillot dredge; BT, beam trawl; RD, Rallier dredge; EB, Epibenthic sledge; ND, Naturalist dredge. The number of species in papers by Fauvel only refers to those collected from the Galician coast. (*) the only polychaete species collected was the pelagic *Tomopteris apsteini*. (**) only three families reported as such. (***) polychaetes were identified at a higher taxonomic level (i.e. class).

**Tableau 1.** Liste des principales campagnes océanographiques (N/O en petits caractères) et projets (lettres capitales) réalisés sur le plateau continental et le talus de la Galice, avec indication des publications concernant la taxonomie des polychètes et des publications sur l'écologie benthique faisant référence aux polychètes. Appareils d'échantillonnage: AT, drague Agassiz; OT, drague Otter; BC, box corer; BD, drague boillot; BT, drague beam; RD, drague Rallier; EB, traîneau épibenthique; ND, drague de Naturaliste. Le nombre d'espèces consigné dans les publications de Fauvel est limité aux citations sur les côtes de la Galice. (*) la seule espèce de polychète récoltée est l'espèce pélagique *Tomopteris apsteini*. (**) seulement trois familles citées, en tant que telles. (***) polychètes identifiés uniquement au niveau de classe.

| R.V. / Project | Year | Number of Stations | Depth range (m) | Sampling gears | Number of species | Source |
|---|---|---|---|---|---|---|
| Hirondelle & Princesse Alice | 1885-1910 | 29 | 123-5,000 | - | 24 | Fauvel (1914) |
| Hirondelle II | 1911-1915 | 1 | 0-3,500 | - | 1* | Fauvel (1932) |
| Thalassa | 1967-1968 | 48 | 200-1,000 | BD, RD | 127 | Amoureux (1972) |
| Thalassa | 1972 | 10 | 200-1,400 | BD | 17 | Amoureux (1974) |
| SARS | 1981 | 13 | 100-240 | BC | 29 | Tenore et al. (1984) |
| FOG | 1984 | 20 | 48-142 | BC | 96 | Lopez-Jamar & González (1987) |
| FOG | 1984-1986 | 79 | 48-1,000 | BC | 180 | Lopez-Jamar et al. (1992) |
| OMEX II | 1997-1998 | 12 | 175-4,950 | BC | n.d.*** | Flach et al. (2002) |
| OMEX II | 1997 | 7 | 180-4,910 | AT | n.d.*** | Lavaleye et al. (2002) |
| ECOPREST | 2002-2004 | 23 | 70-300 | OT, BT, BC, EB | 3** | Serrano et al. (2006) |
| DIVA-ARTABRIA I | 2002 | 9 | 200-1,000 | ND, AT, EB | 171 | This work |

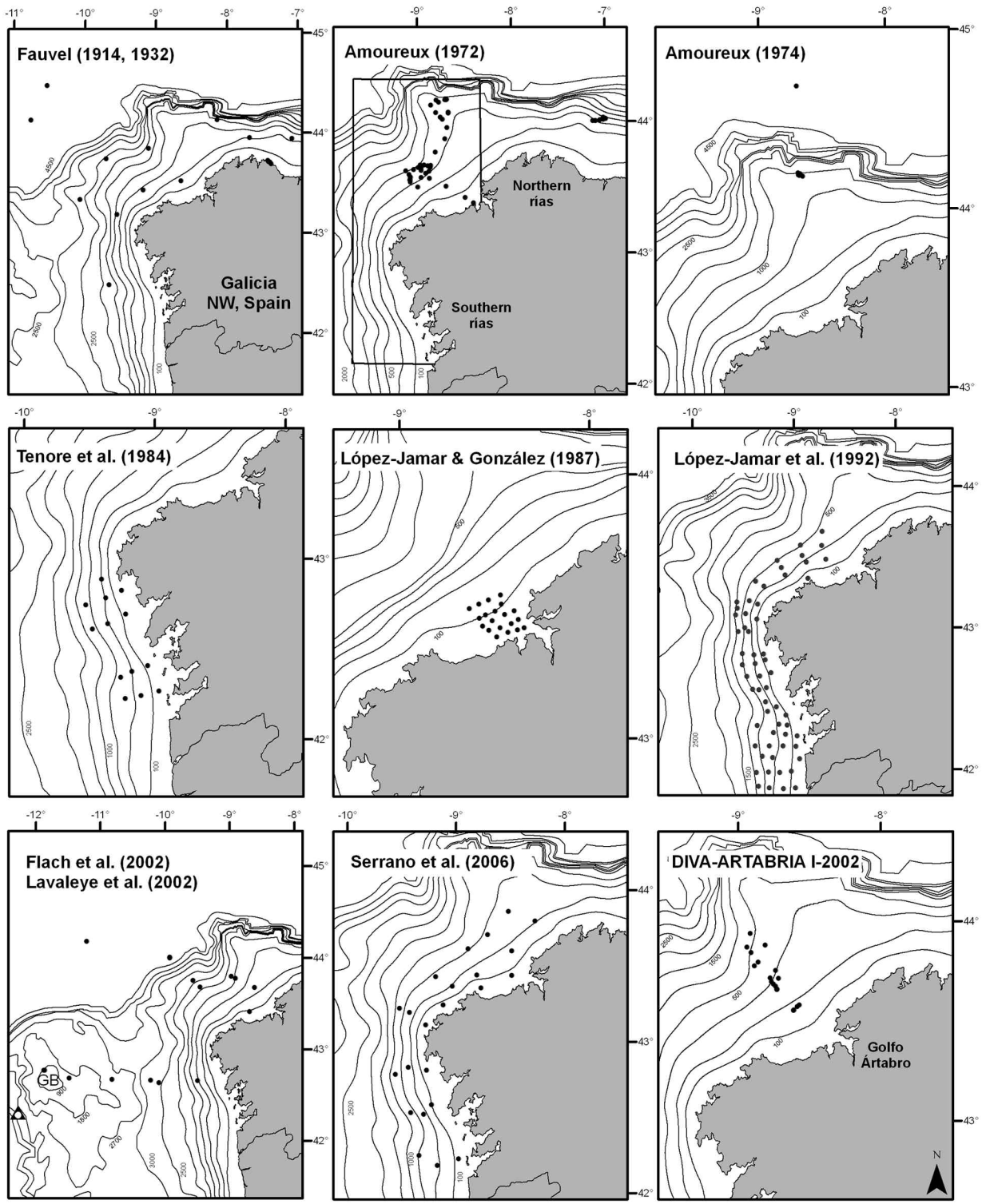


**Figure 1.** Main oceanographic cruises and projects on benthic ecology done in the NW Iberian margin, showing the position of the sampling stations. In Amoureux (1972), the frame delimits the area surveyed by the 1968 cruise of the 'Thalassa'. In Flach et al. (2002) and Lavaleye et al. (2002), a triangle marks the position of the 'Prestige' wreck near to the Galician Bank (GB).

**Figure 1.** Principales campagnes océanographiques et projets en écologie benthique réalisées sur la côte nord occidentale ibérique, avec indication des stations d'échantillonnage. Dans Amoureux (1972), le cadre délimite l'aire étudiée lors de la campagne de 1968 du 'Thalassa'. Dans Flach et al. (2002) et Lavaleye et al. (2002), le triangle marque la position des épaves maritimes du 'Prestige', proches du banc de la Galice (GB).

diversity, composition and distribution of benthic assemblages. These data will be useful for monitoring potential changes in the composition of benthic fauna due to environmental changes such as climate change or oil spills; the later are common in both Galician coastal waters (e.g., the oil tankers 'Polycommander' in 1974 in the Ría de Vigo, 'Monte Urquiola' in 1976 and 'Aegean Sea' in 1992 in the Ría da Coruña) and off littoral areas as the above mentioned 'Prestige', which sank in November 2002 at 3,500 m depth in the 'Galician Bank' (Fig. 1).

In September 2002, the first 'DIVA-Artabria I' cruise was done. One additional cruise was later done in the same area in 2003, whose material will be examined in the future. The present paper reports on the Polychaeta collected during the 2002 expedition. It is the starting point for a detailed taxonomic study of the polychaete fauna off the Golfo Ártabro in which the main goals will be: (1) recording the benthic polychaete diversity in relation to abiotic factors and different sampling gears, and comparing it with similar data from previous studies (see above), (2) extending our knowledge about deep-water species of the Galician waters through a detailed inventory of the polychaete fauna to add up to the catalogue of 487 species compiled by Parapar et al. (1996) for the Galician littoral, (3) collecting new specimens for the 'Fauna Ibérica' project whose main task is to update the taxonomic knowledge of the Iberian species and of which two volumes are so far devoted to polychaetes (San Martín, 2003; Viéitez et al., 2004). From the polychaete material collected during the 'DIVA-Artabria I' 2002 cruise, two new species were already described (Moreira & Parapar, 2007a & b) and four new species of Paraonidae and Syllidae will be described elsewhere. In this paper, a list of polychaete taxa from the 2002 cruise is presented, additional morphological observations complemented with SEM studies are provided for three poorly-known species and a preliminary analysis of the composition of the polychaete assemblage according to depth, substratum and gear used is done.

## Materials and Methods

The study area surveyed by the 2002 cruise of 'DIVA-Artabria I' includes the shelf and upper slope off Golfo Ártabro, located at the Galician Continental Margin (NW Spain; Fig. 1). In September 2002, benthic samples were collected at nine stations with the 'R/V *Mytilus'* of the Instituto de Investigaciones Marinas (Vigo, Spain). The sampling stations were located along a transect starting at depths of 150 m in the continental shelf (station 1) and crossing the continental slope in NW direction to depths of about 1,000 m (St. 9). Sampling positions and dates, water depth, sampling gear used and substratum type are reported in Table 2. Three different sampling gears were deployed depending on the nature of the substratum: Agassiz Trawl, Naturalist

**Table 2.** Abiotic and faunistic characteristics of the stations sampled during the 'DIVA-Artabria I' project, 2002 cruise. Latitude and longitude correspond to the coordinates at the beginning of the sampling. E, Epibenthic sledge; N, Naturalist dredge; A, Agassiz trawl.

**Tableau 2.** Caractéristiques abiotiques et faunistiques des stations échantillonnées au cours de la campagne 2002 du projet 'DIVA-Artabria I'. La latitude et la longitude correspondent aux coordonnées du début de chaque échantillonnage. E, traîneau épibenthique ; N, drague de Naturaliste ; A, drague Agassiz.

| Station | Sample | Sampling date | Depth (m) | Latitude (N) | Longitude (W) | Substratum | No individuals | No families | No species |
|---|---|---|---|---|---|---|---|---|---|
| 1 | N-150 | 08/09/02 | 150-153 | 43º33.960' | 08º36.709' | sand | 20 | 8 | 10 |
| | A-150 | 08/09/02 | 151-155 | 43º34.937' | 08º35.386' | sandy mud | 15 | 10 | 11 |
| | E-150 | 08/09/02 | 153-151 | 43º35.451' | 08º34.432' | sandy mud | 872 | 23 | 38 |
| 2 | N-200 | 14/09/02 | 204-209 | 43º40.165' | 08º43.697' | muddy sand | 31 | 10 | 12 |
| | A-200 | 08/09/02 | 202-209 | 43º40.036' | 08º43.789' | muddy sand | 10 | 4 | 4 |
| | E-200 | 08/09/02 | 207-212 | 43º40.192' | 08º43.760' | muddy sand | 237 | 15 | 24 |
| 3 | E-250 | 14/09/02 | 256-258 | 43º41.113' | 08º44.297' | muddy sand | 314 | 22 | 28 |
| 4 | N-300 | 13/09/02 | 307-311 | 43º43.444' | 08º43.121' | muddy sand | 21 | 4 | 5 |
| | E-300 | 13/09/02 | 298-303 | 43º41.689' | 08º45.195' | muddy sand | 301 | 19 | 33 |
| 5 | E-350 | 13/09/02 | 347-243 | 43º42.427' | 08º45.921' | muddy sand | 194 | 17 | 22 |
| 6 | N-400 | 13/09/02 | 400-411 | 43º43.571' | 08º46.508' | muddy sand | 1 | 1 | 1 |
| | E-400 | 13/09/02 | 390-381 | 43º45.892' | 08º44.301' | muddy sand | 704 | 22 | 36 |
| 7 | N-600 | 11/09/02 | 579-688 | 43º48.340' | 08º51.485' | nodules and stones | 39 | 13 | 22 |
| | A-600 | 11/09/02 | 629-631 | 43º53.457' | 08º48.461' | nodules and stones | 383 | 20 | 45 |
| 8 | N-800 | 11/09/02 | 827-819 | 43º51.265' | 08º54.480' | stones | 251 | 17 | 36 |
| | A-800 | 11/09/02 | 770-842 | 43º47.188' | 08º53.053' | nodules and stones | 690 | 20 | 51 |
| 9 | N-1000 | 09/09/02 | 988-920 | 43º52.823' | 08º56.151' | stones and dead corals | 112 | 12 | 24 |
| | A-1000 | 08/09/02 | 1,091-1,132 | 43º57.030' | 08º54.795' | stones and dead corals | 1403 | 25 | 56 |

dredge and Epibenthic sledge. The Agassiz trawl (AT) was provided with a 30 cm high and 105 cm wide opening, and a cod end 1.0 cm in mesh size. The Naturalist dredge (NDR) was provided with a 25 cm high and 75 cm wide opening, and a cod end 1.0 cm in mesh size. The Epibenthic sledge (EBS) was provided with a supra- and an epinet (20 cm high and 55 cm wide, 500 µm mesh size), both equipped with a cod end of 500 µm, that allow quantitative sampling of the motile fauna in two water layers: 15-35 cm and 45-65 cm above the sea bottom. Both nets were considered as one sample following Brenke (2005) and other recent papers (e.g. Ellingsen et al., 2007; Kaiser et al., 2007). NDR was used at stations 1, 2, 4, 6-9 and AT at stations 1, 2, 7-9. EBS was only used at stations located at depths between 150 and 400 m (soft bottoms). Trawling was carried out for 60 minutes for EBS and 30 minutes for NDR and AT at a speed of 1.5 knots after the gear reached the bottom.

Samples were sieved on board with a column of sieves of 10, 2.0, 1.0 and 0.5 mm mesh size. Samples were fixed in 4% seawater formaldehyde. Preserved samples were sorted to major taxa (Polychaeta, Echinodermata, Bivalvia, Amphipoda, etc) under a stereomicroscope and transferred to 70% ethanol. Polychaetes were identified at the lowest taxonomic level possible and counted per station. Specimens of three poorly-known species used for scanning electron microscopy (SEM) were dehydrated via a graded ethanol series, critical-point dried using $CO_2$, covered with gold in a BAL-TEC SCD 004 sputter coater and examined and photographed under a JEOL JSM-6400 scanning electron microscope at the Servicios de Apoio á Investigación (SAIN), Universidade da Coruña, Spain. Selected voucher specimens have been deposited in the Museo Nacional de Ciencias Naturales of Madrid, Spain (MNCN).

Faunistic attributes were analysed separately for all types of gear. Similarities among samples were determined based on presence-absence data of polychaete species through the Sorensen similarity index. The resemblance matrix of similarity between each sample was classified into groups by hierarchical agglomerative cluster analysis. Clusters of samples determined as statistically significant by profile test SIMPROF ($p < 0.05$) were considered as having a similar polychaete composition. Non-metric multi-dimensional scaling (nMDS) analysis was used to plot the similarities between samples. All multivariate analyses were done with the PRIMER 6 software package (Clarke & Gorley, 2006).

## Results

*Polychaete species richness*

A total of 5,598 individuals belonging to 43 families and 171 species were collected (Annex). Samples from shallow stations (150-400 m) collected with NDR and AT yielded fewer specimens than those with the EBS (Fig. 2). EBS samples (150-400 m) and AT samples from 600-1000 m were the most speciose (22-56 species). Syllids were the most diverse family in number of species (36) followed by

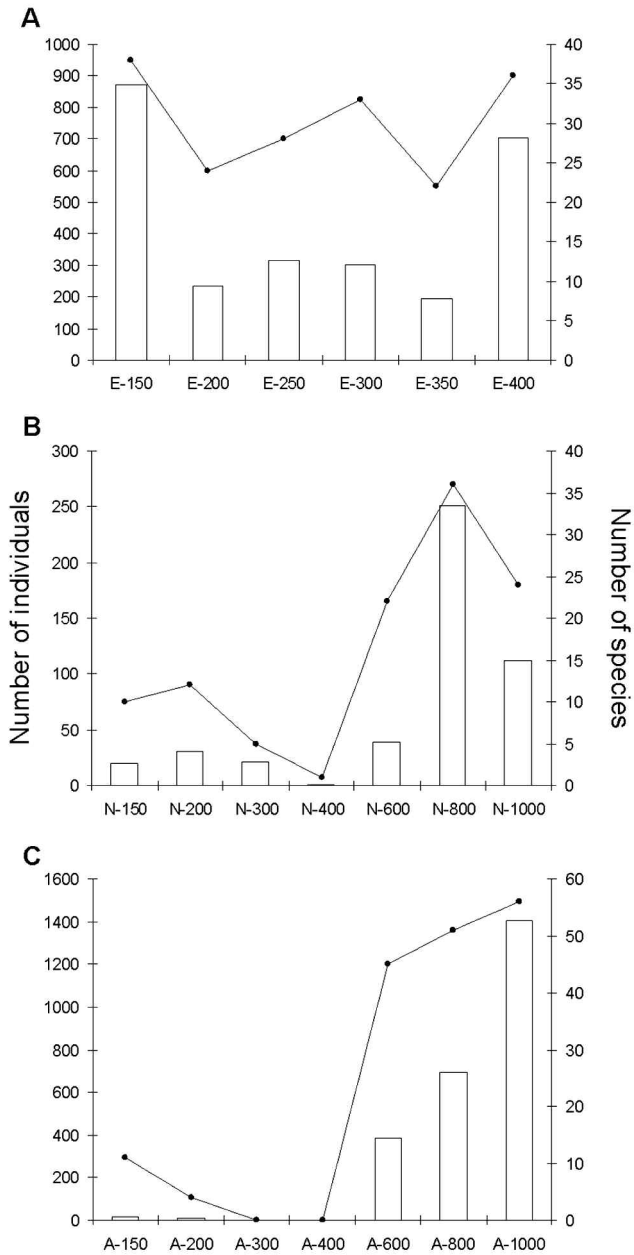


**Figure 2.** Number of species (line) and total number of individuals (bars) of polychaetes in samples collected by means of each sampling gear. **A.** Epibenthic sledge. **B.** Naturalist dredge. **C.** Agassiz trawl.

**Figure 2.** Nombre d'espèces (ligne) et nombre d'individus (barre) de polychètes présents dans les échantillons prélevés avec les différents appareils d'échantillonnage. **A.** Traîneau épibenthique. **B.** Drague de Naturaliste. **C.** Drague Agassiz.

paraonids (12). Families such as Acrocirridae, Ampharetidae, Nephtyidae, Opheliidae, Sigalionidae, and Sphaerodoridae were mainly found at shallow depths (150-400 m), mostly in EBS samples. Eunicidae, Euphrosinidae, Pholoididae, Phyllodocidae and Syllidae were well- represented in NDR-AT samples from 600-1000 m. Some polychaete families (e.g. Hesionidae, Glyceridae, Polynoidae) were present at all depths but some species were only found at a certain bathymetric range. For example, within the Hesionidae, *Gyptis mediterranea* Pleijel, 1993 was only found in EBS samples between 150 and 350 m depth while *Leocrates atlanticus* (McIntosh, 1885) and *Nereimyra punctata* (Müller, 1776) were found in samples collected at deeper bottoms (600-1000 m) by means of NDR and AT.

*Multivariate analyses*

CLUSTER and SIMPROF analyses based on presence-absence data revealed four main groups of samples (Fig. 3): (1) EBS samples (150-400 m) from sandy-mud and muddy-sand soft-bottoms, (2) NDR-AT samples from shallower stations (150-200 m), (3) NDR samples from 300-400 m, and (4) most of NDR-AT samples from deeper stations (600-1000 m) with stony substratum. NDR and AT samples from shallower depths (150-400 m) showed low similarities among them and to the other samples (Figs 3 & 4). Polychaete fauna from the groups of samples from the shelf (groups 1-3; 150-400 m) was characterized by the presence of infaunal taxa such as the glycerids *Glycera alba* (Müller, 1776) and *G. lapidum* Quatrefages, 1865, the nephtyid *Nephtys hystricis* McIntosh, 1900, and several species of opheliids, paraonids and spionids. The slope assemblage (group 4; 600-1000 m) was mostly composed of mobile epibenthic taxa (the hesionids *L. atlanticus* and *N. punctata*, most of the species of phyllodocids and syllids), several eunicids including those inhabiting corals such as *Eunice floridana* (Pourtalès, 1867) and *E. oerstedi* Stimpson, 1854, and serpulids.

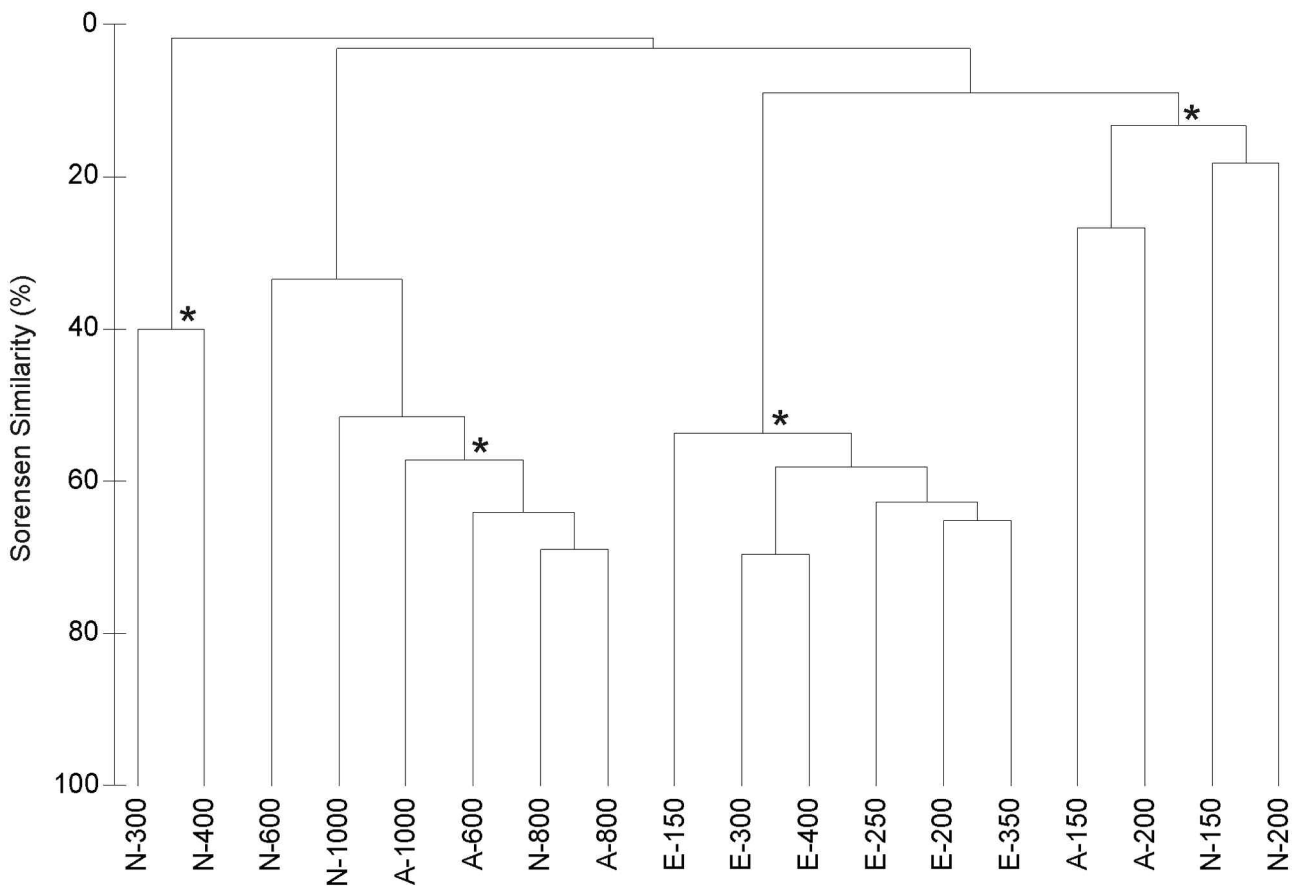


**Figure 3.** Similarity dendrogram of classification of samples collected by means of each sampling gear. (*) groups of samples statistically significant according to SIMPROF test ($p < 0.05$). E, Epibenthic sledge; N, Naturalist dredge; A, Agassiz trawl.

**Figure 3.** Dendrogramme de similarité de classification des échantillons prélevés au moyen des différents appareils d'échantillonnage. (*) groupes d'échantillons statistiquement significatifs selon le test SIMPROF ($p < 0,05$). E, Traîneau épibenthique; N, Drague de Naturaliste; A, Drague Agassiz.

*Taxonomy and faunistics*

Among the species collected, some taxonomical remarks on three poorly-known species are presented below.

***Macrochaeta polyonyx*** Eliason, 1962
(Figs 5 & 6)

*Macrochaeta polyonyx*. Eliason, 1962: 269, fig. 18. Kirkegaard, 1996: 169, fig. 86.

*Material examined*

DIVA-Artabria I, 2002 cruise. Station 150 (15 spec.), St. 200 (22), St. 250 (10), St. 300 (5), St. 350 (4), St. 400 (14). MNCN, Madrid (16.01/11367-11373).

*Description*

Clavate body shape (Fig. 5A) with anterior chaetigers wider than long, becoming longer than wide in posterior segments. Two pairs of branchiae present, a pair of nephridial pores in the shape of short papillae near second pair of branchiae (Fig. 5C). Epithelium densely covered with papillae of conical shape both on dorsal (Fig. 5B) and ventral (Fig. 5D) body surface. Notochaetae from the first chaetiger, numbering 1-2 per parapodium, surface with rows of spines resulting in a serrated appearance (Fig. 6D). Neurochaetae as compound falcigers numbering up to 8 per parapodium in anterior chaetigers (Fig. 5F) to 3-5 in posterior ones (Fig. 6A). Both shaft and blade provided with minute spinulation (Fig. 6E). Cutting edges of blades of thoracic neurochaetae directed posteriorly (Fig. 5D), those of abdominal chaetae irregularly orientated (Fig. 6A). Pygidium conical in shape, bearing short papillae (Fig. 6B).

*Remarks*

Three external characters observed under SEM and not reported to date are: 1) a row of papillae located ventrally

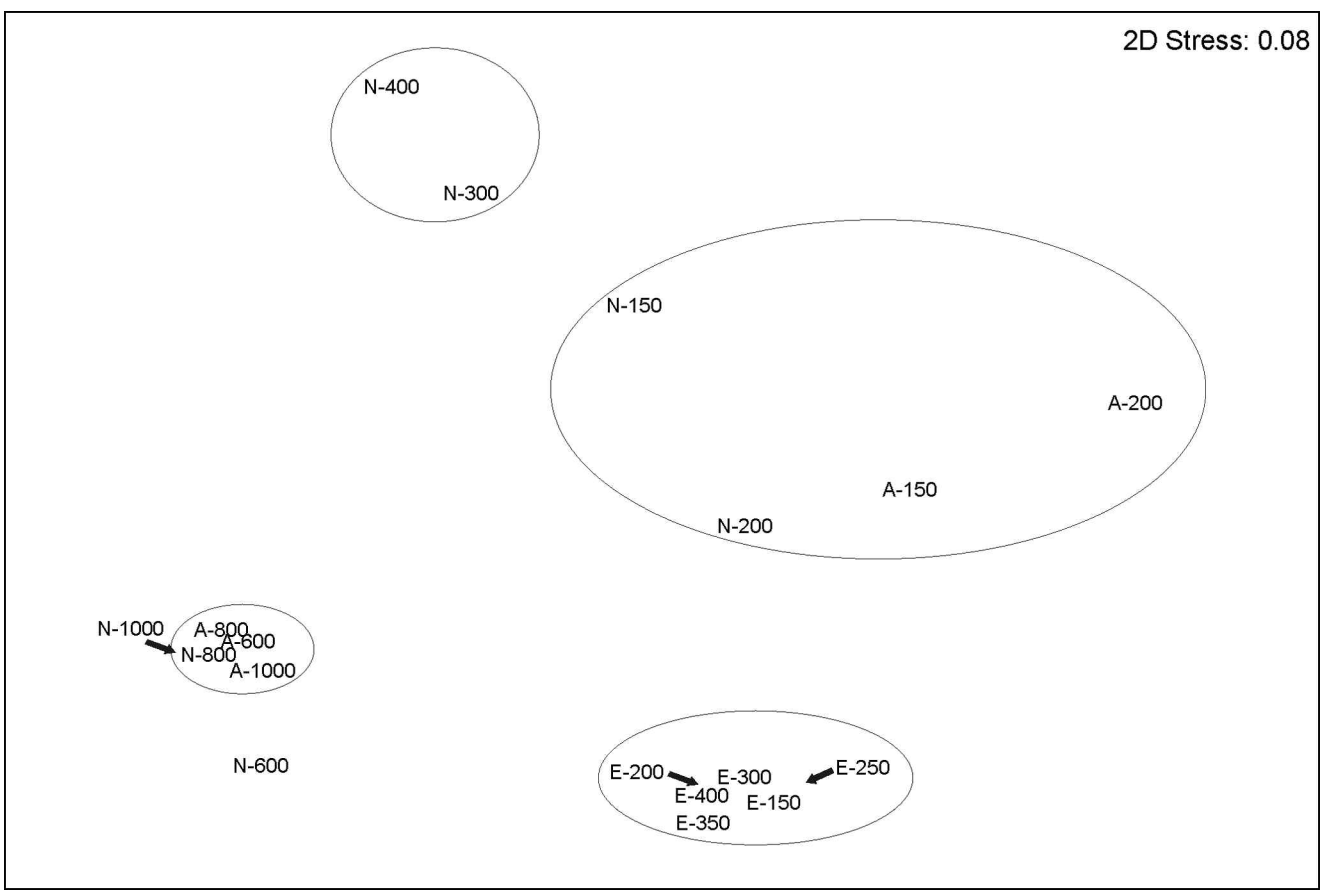


**Figure 4.** Non-metric multidimensional scaling (nMDS) ordination of samples collected by means of each sampling device. Groups of samples statistically significant according to SIMPROF test ($p < 0.05$) are indicated. E, Epibenthic sledge; N, Naturalist dredge; A, Agassiz trawl.

**Figure 4.** Ordination nMDS des échantillons prélevés au moyen des différents appareils d'échantillonnage. Groupes d'échantillons statistiquement significatifs selon le test SIMPROF ($p < 0,05$). E, Traîneau épibenthique ; N, Drague de Naturaliste ; A, Drague Agassiz.

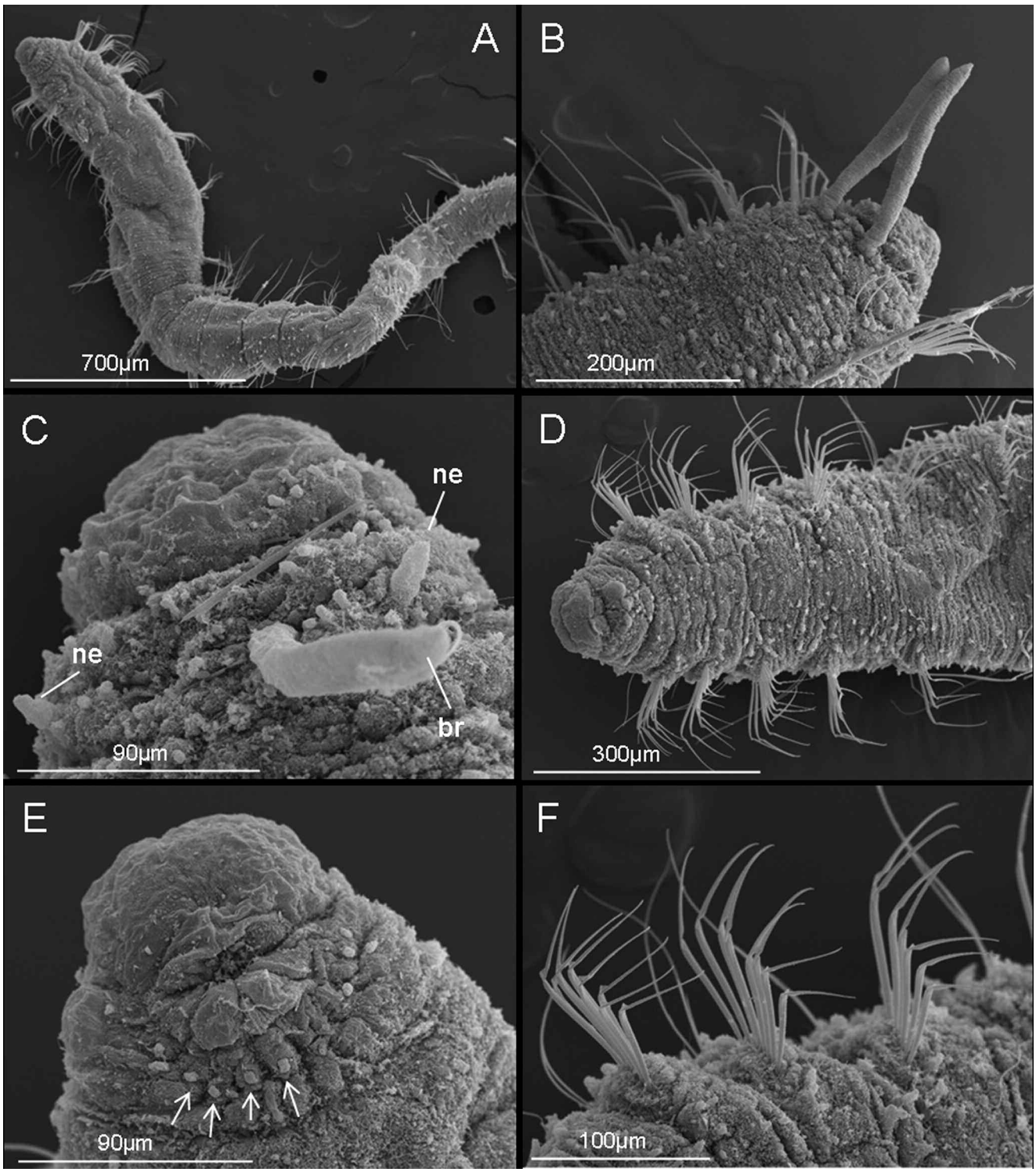


**Figure 5.** *Macrochaeta polyonyx*. **A.** General ventral view. **B.** Anterior region, dorsal view (first pair of branchiae missing). **C.** Head region, dorsal view. **D.** Anterior region, ventral view. **E.** Head region, ventral view, arrows marking position of some oral papillae. **F.** Chaetigers 1-3, ventral view. br = branchia; ne = nephridial papilla. Scale: A = 700 µm; B = 200 µm; C = 90 µm; D = 300 µm; E = 90 µm; F = 100 µm (MNCN 16.01/11373).

**Figure 5.** *Macrochaeta polyonyx*. **A.** Vue ventrale générale. **B.** Région antérieure en vue dorsale (la première paire de branchies manque). **C.** Partie antérieure en vue dorsale. **D.** Région antérieure en vue ventrale. **E.** Partie antérieure en vue ventrale, les flèches marquent l'emplacement de quelques papilles orales. **F.** Sétigères 1-3 en vue ventrale. br = branchie ; ne = papille néphridienne. Échelle : A = 700 µm ; B = 200 µm ; C = 90 µm ; D = 300 µm ; E = 90 µm ; F = 100 µm (MNCN 16.01/11373).

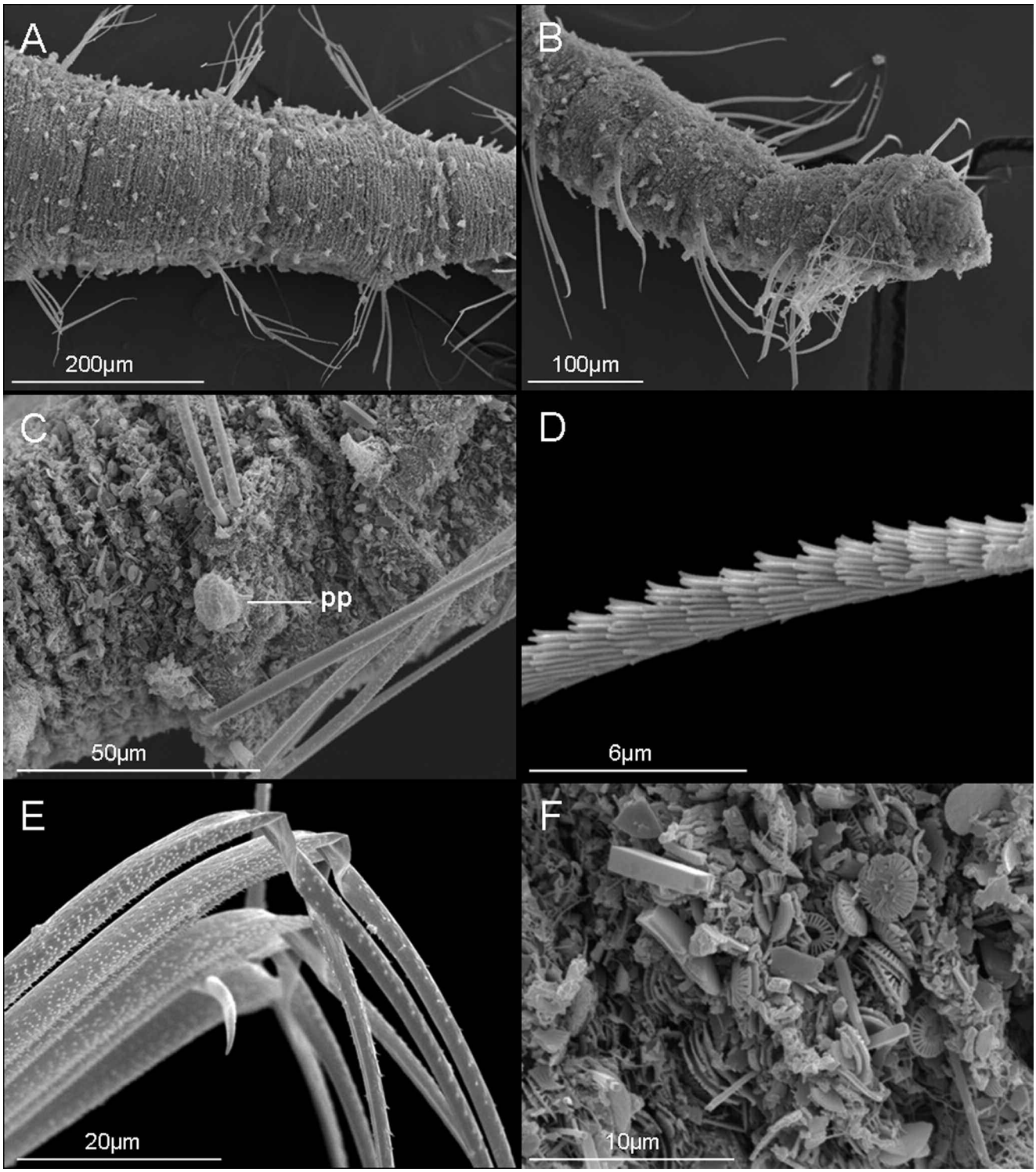


**Figure 6.** *Macrochaeta polyonyx*. **A.** Middle region, dorsal view. **B.** Posterior region, dorsal view. **C.** Mid-body parapodium. **D.** Notochaeta. **E.** Neurochaetae. **F.** Cocolithophore plates covering. pp = parapodial papilla. Scale: A = 200 µm; B = 100 µm; C = 50 µm; D = 6 µm; E = 20 µm; F = 10 µm (MNCN 16.01/11373).

**Figure 6.** *Macrochaeta polyonyx*. **A.** Région moyenne en vue dorsale. **B.** Région postérieure en vue dorsale. **C.** Parapode de la région moyenne. **D.** Soie dorsale. **E.** Soies ventrales. **F.** Recouvrement de plaques de Cocolitophores. pp = papille parapodiale. Échelle : A = 200 µm ; B = 100 µm ; C = 50 µm ; D = 6 µm ; E = 20 µm ; F = 10 µm (NMCM 16.01/11373).

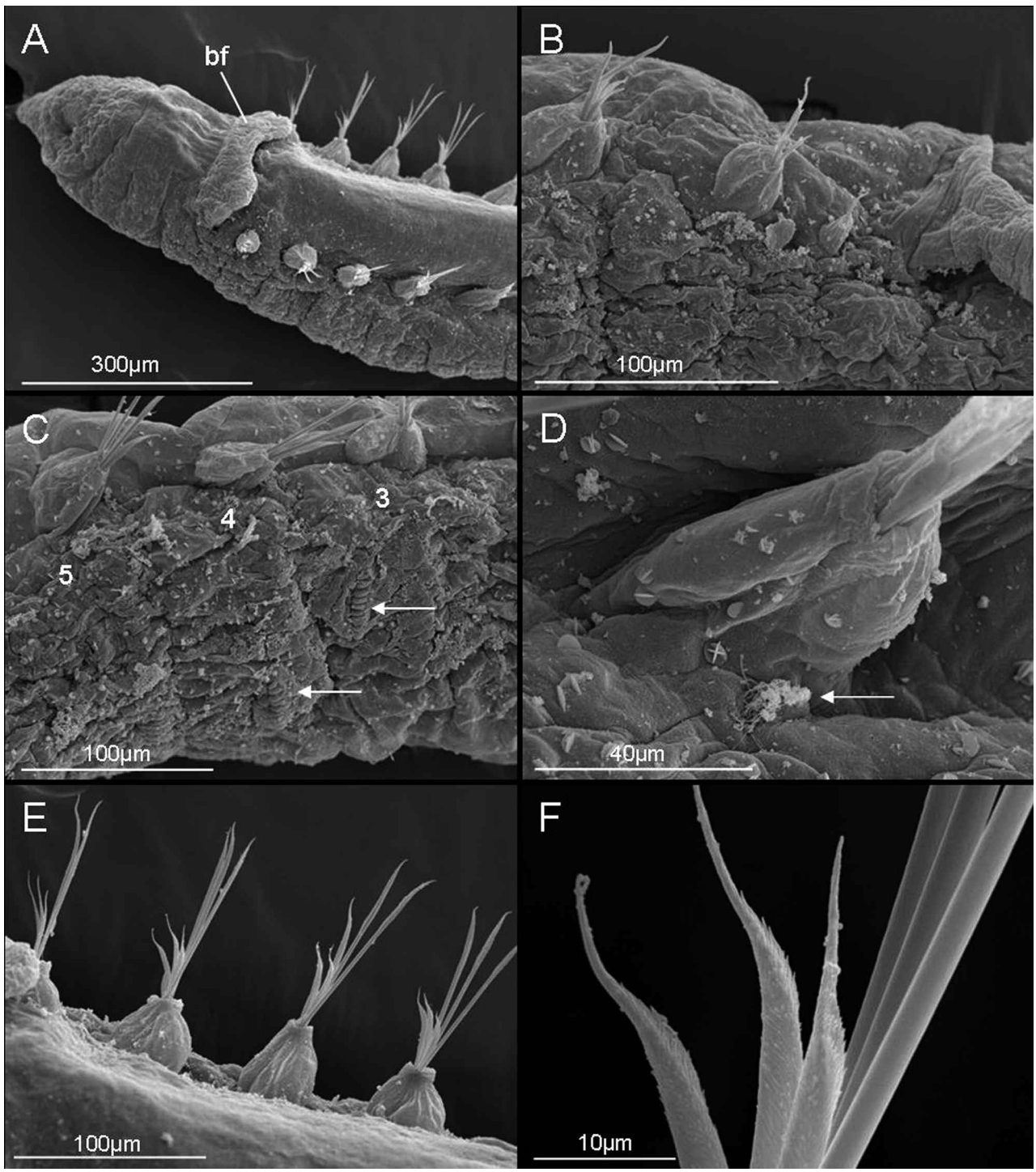


**Figure 7**. *Auchenoplax crinita*. **A.** Anterior region, dorsal view. **B.** Chaetigers 1-3, latero-ventral view. **C.** Chaetigers 3-5, latero-ventral view, arrows marking position of 1st and 2nd neuropods. **D.** Chaetiger 6 notopod, arrow marking position of ciliated tuft. **E.** Chaetigers 2-5 notopodia, dorsal view, showing two types of chaetae. **F.** Detail of distal end of short serrated notochaetae. bf = branchial fold. Scale: A = 300 µm; B = 100 µm; C = 100 µm; D = 40 µm; E = 100 µm; F = 10 µm (MNCN 16.01/11379).

**Figure 7.** *Auchenoplax crinita*. **A.** Région antérieure en vue dorsale. **B.** Sétigères 1-3 en vue latéro-ventrale. **C.** Sétigères 3-5, vue latéro-ventrale, les flèches marquent l'emplacement des 1er et 2ème neuropodes. **D.** Notopode du 6ème sétigère, la flèche marque l'emplacement de la touffe ciliée. **E.** Notopodes des sétigères 2-5 en vue dorsale, montrant deux types de soies. **F.** Détail de la partie distale des soies dorsales courtes denticulées. bf = plissement branchial. Échelle : A = 300 µm ; B = 100 µm ; C = 100 µm ; D = 40 µm ; E = 100 µm ; F = 10 µm (MNCN 16.01/11379).

behind the mouth (Fig. 5E), 2) a big papilla present in all chaetigers and located between parapodial rami (Fig. 6C) and 3) the body surface is densely covered with Cocolithophores plates (Phylum: Haptophyta) (Fig. 6F).

Four species of *Macrochaeta* Grube, 1850 are hitherto reported from the north-east coast of the Atlantic Ocean (Hartmann-Schröder, 1996; Hansson, 1998): *M. clavicornis* (Sars, 1835), *M. helgolandica* Friedrich, 1937, *M. polyonyx,* and *M. bansei* Hartmann-Schröder, 1974. *Macrochaeta polyonyx* is distinguished from all congeneric species by the presence of only two pairs of branchiae instead of four, and by the highest number (8-10 vs. 1-2) of neurochaetae in anterior chaetigers (Eliason, 1962; Banse, 1969; Westheide, 1981).

The species was originally described from the Skagerrak coast (off Arendal) and later reported from the British (Hartley, 1981) and Danish coasts (Kirkegaard, 1996). This finding on the Galician shelf (150-400 m) is the first record of the species in the Iberian Peninsula region and represents its most southern report.

### ***Auchenoplax crinita*** Ehlers, 1887
(Fig. 7)

*Auchenoplax crinita.* Ehlers, 1887: 209, pl. 44, figs. 10-16. Fauvel, 1936: 95. Laubier, 1966: 438, fig. 1. Hartman, 1965: 216, fig. 47. Imajima, 1997: 210, fig. 13.

*Material examined*

DIVA-Artabria I, 2002 cruise. Station 200 (7 spec.), St. 250 (7), St. 300 (4), St. 350 (4), St. 400 (6). MNCN, Madrid (16.01/11374-11379).

*Description*

Body linear, depressing and tapering posteriorly to a rounded pygidium. Prostomium pentagonal with pointed anterior end and broadest at its midlength, with two small embedded black eyespots at greatest width (Fig. 7A). Paleae absent. First segment forming lower lip, and continuing laterally and dorsally as a complete ring. Two pairs of branchiae located on a characteristic dorsal, elevated, transverse fold (Fig. 7A); the two of a pair are close together but widely separated from those of opposite side. Fourteen thoracic chaetigers. First notopodial pairs smallest (Fig. 7B); following notopodia increasing in size, with largest in mid-thoracic segments. Two types of distally pointed notosetae (Fig. 7E). Uncinal tori beginning on chaetiger 3; second pair displaced mid-ventrally (Fig. 7C). Uncini in single series.

*Remarks*

Examination under SEM revealed ciliated pits associated with notopodial lobes (Fig. 7D) and two types of notochaetae; long, smoothly tipped, capillary chaetae, and shorter, finely serrated capillaries (Fig. 7E & F).

Species originally described from the Gulf of Mexico. Laubier (1966), who first reported this species in the Mediterranean Sea, gathered all previous reports from both sides of the Atlantic Ocean from Fauvel (1936), Kirkegaard (1959) and Hartman (1965). Subsequent records in the Atlantic Ocean were off Beaufort, North Carolina (Day, 1973), off New Jersey (Gaston, 1987), the Ivory Coast (Intes & Le Loeuff, 1984), and the Tyrrhenian Sea (Cocito et al., 1990). In the Pacific Ocean the species was reported off South Vietnam (Gallardo, 1968), at the Japanese coast (Imajima, 1997), and off the Natuna Islands, South China Sea (Al-Hakim & Glasby, 2004). The species was previously reported in the Iberian Peninsula region by Gil & Sardá (1999) and Martínez & Adarraga (2001) from the shelf of Portugal and Guipúzcoa (Bay of Biscay) respectively, being this last report the most northerly record of the species in the eastern part of the Atlantic Ocean. Other species of this genus are *Auchenoplax rullieri* Holthe, 1986 from New Caledonia, *Auchenoplax mesos* Hutchings, 1977 from Australia, and *Auchenoplax andamana* Holthe, 2002 from the Andaman Sea (Holthe, 2002).

### ***Euthelepus setubalensis*** McIntosh, 1885
(Figs 8-9)

*Euthelepus setubalensis.* McIntosh, 1885: 465, pl. 50, fig. 4; pl. 28A, fig. 13. Fauvel, 1927: 275, fig. 96 o. Hutchings & Glasby, 1986: 109, fig. 1 e-h.

*Material examined*

DIVA-Artabria I, 2002 cruise. Station 800 (22 spec.), St. 1000 (1). MNCN, Madrid (16.01/11380-11383).

*Description*

Body small, robust, tapering posteriorly. Oral tentacles long, with a longitudinal ciliated groove (Figs. 8A & 9B); a transverse ciliated band in the limit between prostomium and peristomium (Fig. 8B-C). Thorax composed of 30-31 pairs of notochaetal bundles starting in the same segment as the second pair of branchiae (segment 3). About 70 uncinigers present; first unciniger in fifth segment (third chaetiger, Fig. 8D). Lateral lobes on segments 2-4, poorly developed in some specimens (Fig. 8A) but always well developed in large specimens (Fig. 9A). Branchiae very long and thick on base, present as one pair of simple filaments in segments 2-4. Filaments in segments 2 and 4 displaced toward middorsum, while more laterally positioned in segment 3, dorsal to notochaetae (Figs 8A & 9A). Notochaetae smooth, winged capillaries with scale covering (Fig. 9D); first two pairs of notopodia with smaller lobes (Fig. 8D); subsequent pairs with dome-

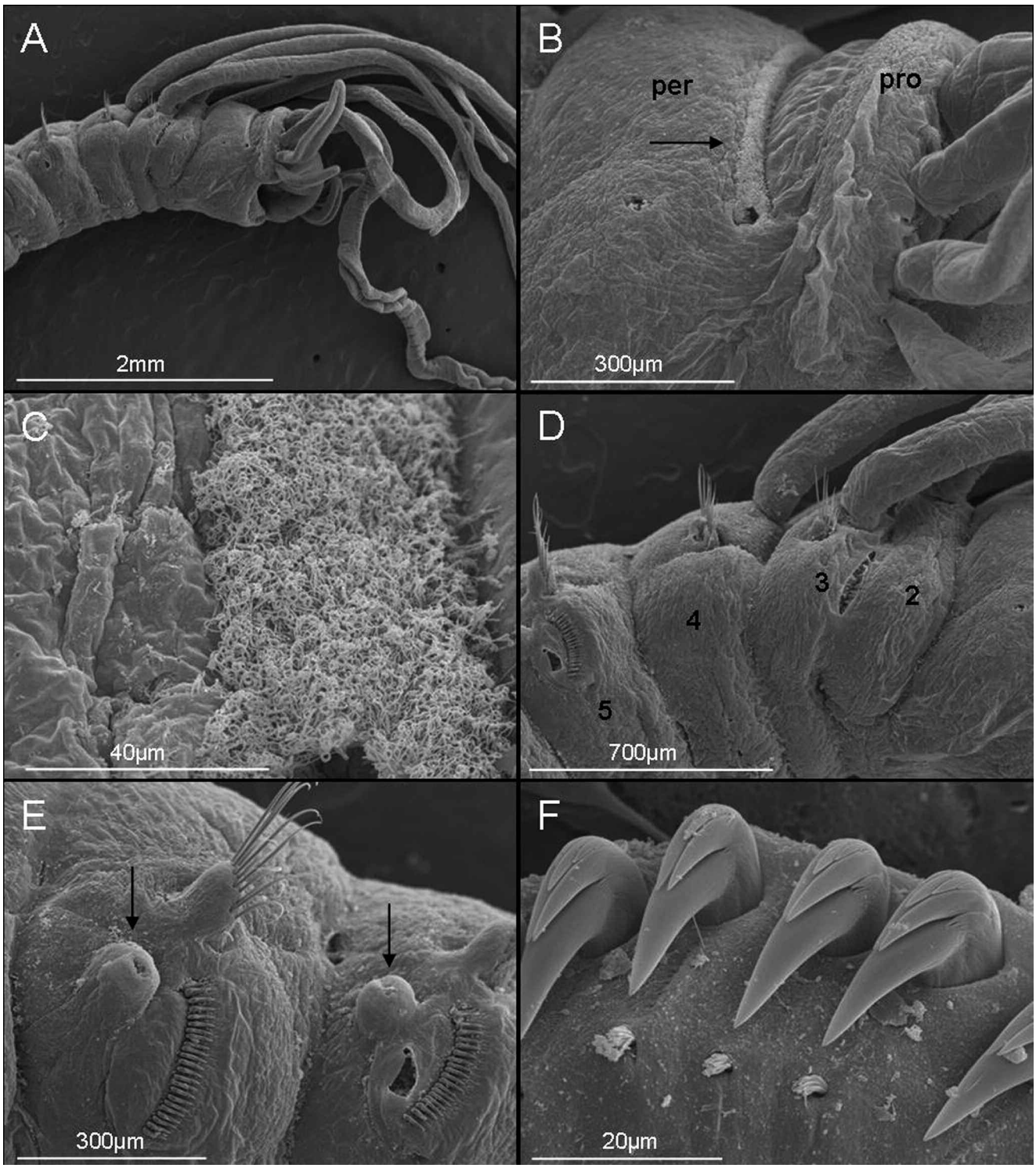


**Figure 8.** *Euthelepus setubalensis*. **A.** Anterior region, ventro-lateral view. **B.** Prostomium and peristomium; arrow marking position of ciliated band. **C.** Detail of ciliated band, located between prostomium and peristomium. **D.** Segments 2-5. **E.** Segments 5-6, arrows showing position of nephridial papillae. **F.** Abdominal uncini. pro = prostomium; per = peristomium. Scale: A = 2 mm; B = 300 µm; C = 40 µm; D = 700 µm; E = 300 µm; F = 20 µm (MNCN 16.01/11382).

**Figure 8.** *Euthelepus setubalensis*. **A.** Région antérieure en vue ventro-latérale. **B.** Prostomium et péristomium; la flèche marque l'emplacement de la bande ciliée. **C.** Détail de la bande ciliée, placée entre le prostomium et le péristomium. **D.** Segments 2-5. **E.** Segments 5-6, les flèches montrent l'emplacement de la papille néphridienne. **F.** Uncini abdominaux. pro = prostomium ; per = péristomium. Échelle : A = 2 mm ; B = 300 µm ; C = 40 µm ; D = 700 µm ; E = 300 µm ; F = 20 µm (MNCN 16.01/11382).

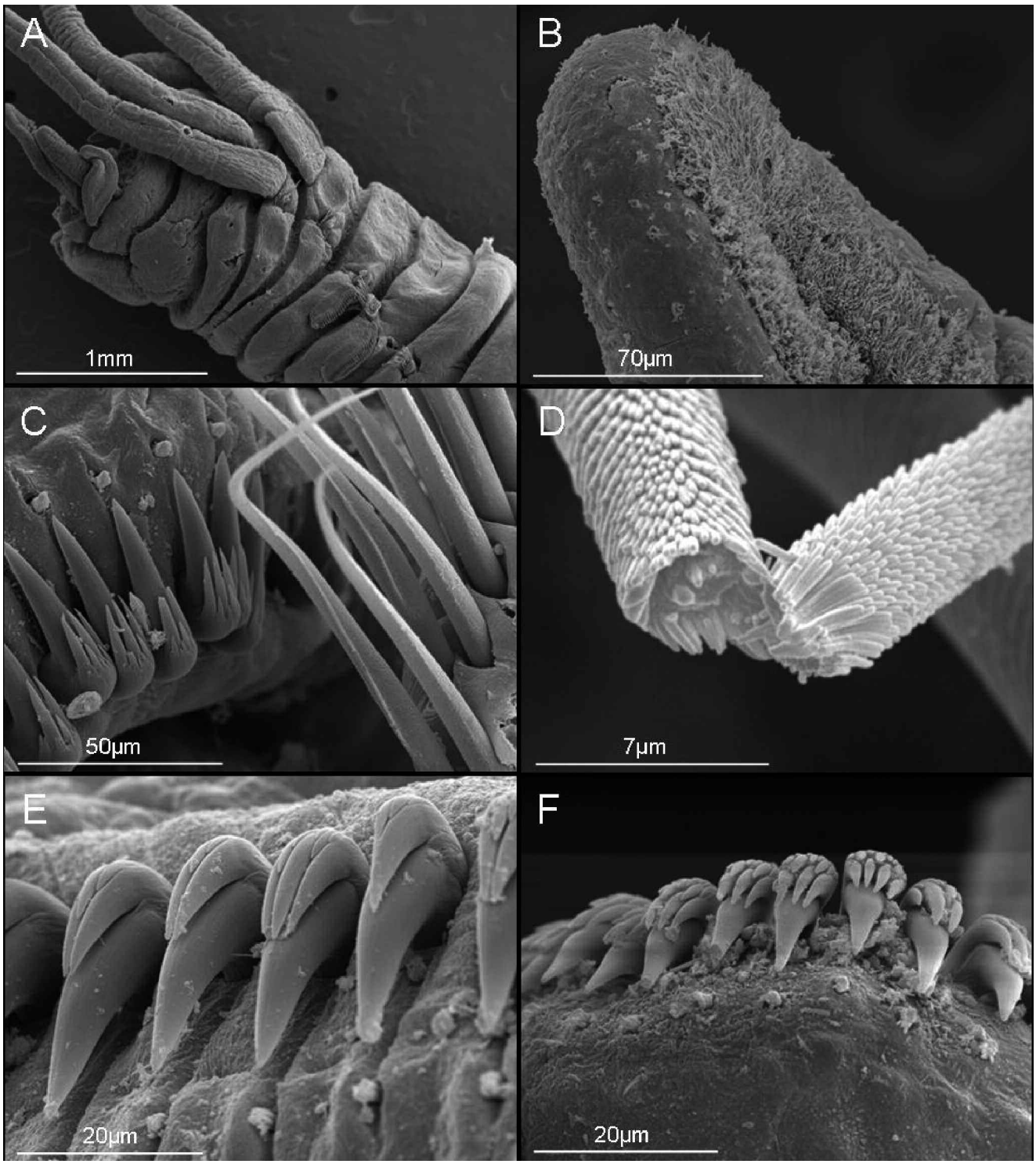


**Figure 9.** *Euthelepus setubalensis*. **A.** Anterior region, dorso-lateral view. **B.** Tip of buccal tentacle. **C.** Segment 5 uncini and segment 6 notochaetae. **D.** Notochaetae scale cover. **E.** Uncini from chaetiger 22. **F.** Uncini from chaetiger 60. Scale: A = 1 mm; B = 70 µm; C = 50 µm; D = 7 µm; E = 20 µm; F = 20 µm (MNCN 16.01/11383).

**Figure 9.** *Euthelepus setubalensis*. **A.** Région antérieure en vue dorso-latérale. **B.** Extrémité du tentacule buccal. **C.** Uncini du segment 5 et soies dorsales du segment 6. **D.** Recouvrement en écailles des soies dorsales. **E.** Uncini du sétigère 22. **F.** Uncini du sétigère 60. Échelle : A = 1 mm ; B = 70 µm ; C = 50 µm ; D = 7 µm ; E = 20 µm ; F = 20 µm (MNCN 16.01/11383).

shaped lobes (Fig. 8E). No serrated notochaetae. Avicular uncini present from segment 5 (Fig. 8D-E) with variable elongated teeth (Figs 8F & 9C, E-F). Nephridial papillae small, globular, present on posterior edge of segments 5-7 in line with top of uncinal row (Fig. 8E).

*Remarks*

Twenty-three specimens of the thelepodid terebellid *Euthelepus setubalensis* McIntosh, 1885 were found in this study between 800 and 1000 m depth. This species, originally described off Setubal (Portugal) at 859.5 m depth (470 fathoms) from only one incomplete specimen, was characterized by the presence of three pairs of cirriform branchiae located in three contiguous segments (segments 2-4) and notopodia starting on segment 3 bearing only smooth notochaetae. The study of complete specimens from the 'DIVA-Artabria I' 2002 cruise enables to complement the previous descriptions and drawings by McIntosh (1885), Fauvel (1927) and Hutchings & Glasby (1986).

The known geographical distribution of this species is restricted to the Atlantic coast of the Iberian Peninsula and British Islands (McIntosh, 1885; Amoureux, 1972 & 1982). Apart from *E. setubalensis*, the type species of the genus, only three species are hitherto recognized as valid: *E. kinsemboensis* Augener, 1918 from Angola, Ile des Pins and New Caledonia, *E. serratus* Hutchings & Glasby, 1986 and *E. marchibar* Hutchings, 1997, both from Australia. Recently, Hutchings (1997) revised, redefined and emended the genus and Garraffoni (2007) studied the phylogenetic relationships of *Euthelepus* by means of parsimony analysis.

## Discussion

Results from the 'DIVA-Artabria I' 2002 cruise show that there is a large number of polychaete species on the continental shelf and upper slope off Golfo Ártabro. This stands out in contrast to results from other cruises done in nearby areas, which reported, in general, a smaller number of taxa (e.g., Amoureux, 1972 & 1974; Tenore et al., 1984; López-Jamar & González, 1987). López-Jamar et al. (1992) reported a similar number of taxa (180) although this study spanned a larger period of time (1984-1986) and covered also shallower areas (40-150 m) than those studied in this paper. The greater diversity observed in the 'DIVA-Artabria I' 2002 cruise may partly be explained because of the use of different types of sampling gears in order to complement the results of each other, which, as stated by Hilbig (2004), enables to obtain a better representation of the fauna when sampling different types of bottoms. Thus, the Epibenthic sledge (EBS) enables to collect those epibenthic mobile species, such as scale worms (Hilbig, 2004), which are not so efficiently collected with other gears. Nevertheless, not all sampling devices could be used at each station because of the existence of different types of substratum on the area prospected. In contrast to the continental shelf, presence of nodules and stones in the substratum of the upper slope prevented the use of EBS and sampling was thus done by means of Naturalist dredge (NDR) and Agassiz trawl (AT). This is a common procedure in similar studies, in which only one sample is taken as it happened here (Narayanaswamy et al., 2005). On the other hand, discrepancies between our results and those from other works may be also related to other variables such as differences in period of sampling, sorting and current knowledge of the taxonomic status of some taxa (Gillet & Dauvin, 2000); the latter could result in the underestimation of some taxa in previous works.

Analyses showed the existence of several groups of samples, corresponding three of these groups to the shelf (150-400 m) and one group to the upper slope (600-1000 m); this suggests differences in faunal composition between the two areas. In fact, previous works reported differences in benthic assemblages among the shelf, slope and abyssal depths on NE Atlantic (Flach & de Bruin, 1999) and in other seas as well (Stora et al., 1999; Hilbig et al., 2006). However, one must be careful when comparing samples taken with gears which differ, for example, in mesh size; this might result in differences in faunal composition among samples that can be due to the very nature of those gears. In our case, this can be detected in the samples from EBS and AT-NDR collected at the shelf; although those samples were collected in similar sediments and within the same bathymetric range, samples from different gears were plotted in different positions in the nMDS ordination. Thus, when sampling those bottoms, EBS would collect and retain more specimens because of its finer mesh (500 µm); on the contrary, sediment collected by means of NDR and AT (both provided with a greater mesh) would get washed during retrieval, losing fauna as well. In fact, NDR and AT collected a much smaller number of individuals than EBS at those sediments. On the other hand, we think that differences in polychaete composition between EBS samples from the shelf (150-400 m) and those of NDR-AT from the upper slope (600-1000 m; Figs 3 & 4) are not related to the gears themselves but to the type of substratum. In fact, there are major differences in the composition and nature of substratum between shelf and slope. As stated above, the EBS was not used at the upper slope because of the stony nature of the bottom; the EBS is unable to collect the stones and corals present there and therefore most of the associated fauna to those structures would not be collected as well. This could, however, be accomplished with both AT and NDR. Otherwise, using

EBS instead of NDR and AT at the upper slope would have resulted in the underestimation of most of the polychaete fauna present at those bottoms.

The composition of benthic assemblages in general and of polychaetes, in particular, has traditionally been related to hydrodynamism and substratum nature, among other abiotic factors (e.g. Gray, 1974; Hutchings, 1998). In our case, the shelf bottom is composed of soft sediments (sand-mud) while at the upper slope the substratum is characterized by the presence of stones, corals and nodules. Our results suggest that distribution of polychaete assemblages in the studied area corresponds to that of the type of substratum. Thus, the polychaete fauna at the shelf is mainly composed of typically infaunal families such as ampharetids, opheliids, nephtyids, paraonids and spionids; the taxa present on the stony substratum at the upper slope were mobile epibenthic species, eunicids inhabiting corals such as *Eunice floridana* and *E. oerstedi*, and serpulids. Those differences in substratum type between shelf and slope resulting, in turn, in different polychaete assemblages might be related to the prevalent hydrodynamism at the slope. In fact, Lavaleye et al. (2002) pointed out the existence of a high-energy environment on the slope in this area, which creates a non-depositional environment thus preventing the establishment of soft sediments and therefore of a polychaete fauna similar to that present on the soft bottoms at the shelf.

Furthermore, in the Galician Continental Margin (GCM) as a whole, differences in structure of polychaete assemblages along a depth gradient may be also partly explained by life-history strategies and food supply such as those due to upwellings and intrusion of continental waters rich in nutrients as were previously noted by López-Jamar et al. (1992), Flach & de Bruin (1999), and Flach et al. (2002). At the upper slope of the GCM including that of the Golfo Ártabro, pulses in supply of organic matter may create a less predictable environment than the continental shelf and therefore resulting in greater competition for food thus allowing more variety in trophic strategies, which, in turn, increases the diversity of polychaete species present at these bottoms (Flach & de Bruin, 1999).

In conclusion, polychaete assemblages off the Golfo Ártabro are speciose and show differences in composition according to depth and nature of substratum. These data will also be helpful for future monitoring studies of the polychaete assemblages at the shelf and upper slope of the GCM. In addition, this area is subjected to intense maritime traffic including that of oil tankers and to several oil spills that have occurred in the last decades including that of the 'Prestige' in 2002; data about composition and distribution of benthic assemblages are needed when studying the scope of oil spills.

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**Annex.** Number of individuals of the polychaete species found in each sample at each depth. Families arranged in alphabetical order.
**Annexe.** Nombre d'individus des espèces de polychètes récoltés à chaque prélèvement et à chaque profondeur. Familles rangées par ordre alphabétique.

| Taxon | EBS 150 | EBS 200 | EBS 250 | EBS 300 | EBS 350 | EBS 400 | DRN 150 | DRN 200 | DRN 300 | DRN 400 | DRN 600 | DRN 800 | DRN 1000 | AT 150 | AT 200 | AT 600 | AT 800 | AT 1000 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ACOETIDAE | | | | | | | | | | | | | | | | | | |
| *Eupanthalis kinbergi* McIntosh, 1876 | | | | | | | | | 5 | | | | | | | | | |
| *Laetmonice filicornis* Kinberg, 1856 | | | | | | | | | | | | | | | | | | 1 |
| ACROCIRRIDAE | | | | | | | | | | | | | | | | | | |
| *Macrochaeta polyonyx* Eliason, 1962 | 15 | 22 | 10 | 5 | 4 | 14 | | | | | | | | | | | | |
| AMPHARETIDAE | | | | | | | | | | | | | | | | | | |
| *Auchenoplax crinita* Ehlers, 1887 | | 7 | 7 | 4 | 4 | 6 | | | | | | | | | | | | |
| *Ampharete* cf. *lindstroemi* Malmgren, 1867 | 66 | 39 | 44 | 30 | 27 | 51 | | 2 | | | | | | | | | | |
| *Ampharete* sp. | | | | | | | | | | | 1 | | | | | | | 1 |
| *Amphicteis gunneri* (Sars, 1835) | | | | | | | | 2 | | | | | | 1 | 7 | | | |
| *Eclysippe vanelli* (Fauvel, 1936) | 1 | 17 | 27 | 29 | 35 | 23 | | | | | | | | | | | | |
| *Lysippides fragilis* Wollenbaek, 1912 | | | | | | | | | | | | 1 | | | | 1 | | |
| *Melinna* sp. | | | | 1 | | | | | | | | | | | | | | |
| *Sosane sulcata* Malmgren, 1866 | | 2 | 1 | | 1 | | | | | | | | | | | | | |
| Ampharetidae gen. sp. | | | | | | | | | | | | | | | | | 1 | |
| Ampharetidae undet. | | | | | | | | | | | | | | | | | | 4 |
| AMPHINOMIDAE | | | | | | | | | | | | | | | | | | |
| *Chloeia venusta* Quatrefages, 1866 | | | | | | | | 11 | | | | | | | 1 | | | |
| *Eurythoe* sp. | | | | | | | | | | | | | | | | | | 2 |
| APHRODITIDAE | | | | | | | | | | | | | | | | | | |
| *Aphrodite* sp. | | | | | | | | | | | | | | | 1 | | | |
| *Panthalis oerstedi* Kinberg, 1855 | | | | | | | | | 1 | | | | | | | | | |
| CALAMYZIDAE | | | | | | | | | | | | | | | | | | |
| *Calamyzas amphictenicola* Arwidsson, 1932 | | | | | | | | | | | | | | 2 | 1 | | | |
| CAPITELLIDAE | | | | | | | | | | | | | | | | | | |
| *Notomastus latericeus* Sars, 1851 | | | | | | | | | | | | 4 | 1 | | | 2 | 5 | 17 |
| CHAETOPTERIDAE | | | | | | | | | | | | | | | | | | |
| *Spiochaetopterus* sp. | | | | | | | 5 | | 13 | 1 | | | | | | 1 | | |
| CHRYSOPETALIDAE | | | | | | | | | | | | | | | | | | |
| Chrysopetalidae gen. sp. | | | 1 | | | 1 | | | | | | | | | | | | |
| CIRRATULIDAE | | | | | | | | | | | | | | | | | | |
| *Aphelochaeta* sp. | | | | | | | | | | | | 21 | 10 | | | 5 | 2 | 27 |
| *Chaetozone setosa* Malmgren, 1867 | | | | 1 | | 5 | | | | | | | | | | | | |
| *Dodecaceria concharum* Oersted, 1843 | | | | | | | | | | | | | 3 | | | | 1 | 13 |
| Cirratulidae undet. | | | 1 | 1 | | | | | | | | | | | | | | |
| CTENODRILIDAE | | | | | | | | | | | | | | | | | | |
| *?Zeppelinia* sp. | | | | | | | | | | | | 2 | | | | | | |
| DORVILLEIDAE | | | | | | | | | | | | | | | | | | |
| *Staurocephalus* sp. | | | | | | | | | | | | | 1 | | | | | |
| EUNICIDAE | | | | | | | | | | | | | | | | | | |
| *Eunice* sp. 1 | 1 | | | | | | | | | | | | | | | | | |
| *Eunice* sp. 2 | | | | | | | | | | | 1 | | | | | | | |
| *Eunice floridana* (Pourtalès, 1867) | | | | | | | | | | | | | 4 | | | | | 34 |

| Taxon | EBS 150 | EBS 200 | EBS 250 | EBS 300 | EBS 350 | EBS 400 | DRN 150 | DRN 200 | DRN 300 | DRN 400 | DRN 600 | DRN 800 | DRN 1000 | AT 150 | AT 200 | AT 600 | AT 800 | AT 1000 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *Eunice oerstedi* Stimpson, 1854 | | | | | | | | | | | | | | | | | 6 | 4 |
| *Eunice vittata* (Delle Chiaje, 1828) | | | | | | | | | | | 1 | 1 | | | | 15 | | |
| *Lysidice ninetta* Audouin & Milne-Edwards, 1833 | | | | | | | | | | | 2 | 14 | 18 | | | 19 | 27 | 99 |
| EUPHROSINIDAE | | | | | | | | | | | | | | | | | | |
| *Euphrosine armadillo* Sars, 1851 | | | | | | | | | | | | 4 | | | | 3 | 2 | 2 |
| *Euphrosine* cf. *foliosa* Audouin & Milne-Edwards, 1833 | | | | | | | | | | | | | | | | | | 5 |
| *Euphrosine myrtosa* Savigny in Lamarck, 1818 | | | | | | | | | | | | 7 | | | | 4 | 2 | 5 |
| FLABELLIGERIDAE | | | | | | | | | | | | | | | | | | |
| *Diplocirrus glaucus* (Malmgren, 1867) | 25 | | | 1 | | | | | | | | | | | | | | |
| *Pherusa* sp. | | | | | | | | | | | | | | | | | | 1 |
| GONIADIDAE | | | | | | | | | | | | | | | | | | |
| *Goniada norvegica* Oersted, 1845 | | | | | | | | | 1 | | | | | | | 1 | | |
| GLYCERIDAE | | | | | | | | | | | | | | | | | | |
| *Glycera alba* (Müller, 1776) | 72 | 19 | 21 | 12 | 2 | | | | | | | | | 1 | | | | |
| *Glycera lapidum* Quatrefages, 1865 | | | | 12 | 5 | 23 | | | | | | | | | | | | |
| *Glycera tesselata* Grube, 1863 | | | | | | | | | | | | | | | | | 1 | 52 |
| *Glycerella magellanica* (McIntosh, 1865) | | | | | | | | | | | | | | | | | 8 | 1 |
| HESIONIDAE | | | | | | | | | | | | | | | | | | |
| *Gyptis* cf. *rosea* Marion, 1875 | | | | | | 6 | | | | | | | | | | | | |
| *Gyptis mediterranea* Pleijel, 1993 | 10 | 4 | 3 | | 5 | | | | | | | | | | | | | |
| *Leocrates atlanticus* (McIntosh, 1885) | | | | | | | | | | | | 5 | | | | 3 | 89 | 137 |
| *Nereimyra punctata* (Müller, 1776) | | | | | | | | | | | 1 | | 2 | | | 2 | 3 | 13 |
| *Ophiodromus flexuosus* (Delle Chiaje, 1825) | | | | 1 | | | | | | | | | | | | | | |
| *Podarkeopsis capensis* (Day, 1963) | 2 | | | 1 | | | | | | | | | | | | | | |
| LUMBRINERIDAE | | | | | | | | | | | | | | | | | | |
| *Lumbrineris gracilis* (Ehlers, 1868) | 71 | 4 | | | | | 1 | 2 | | | 3 | 4 | | | | 3 | 11 | 41 |
| *Lumbrineris tetraura* (Schmarda, 1861) | 4 | | 2 | 2 | | 5 | | | | | | | | 1 | | | | |
| MAGELONIDAE | | | | | | | | | | | | | | | | | | |
| *Magelona filiformis* Wilson, 1959 | 7 | | 2 | | 1 | 8 | | | | | | | | | | | | |
| MALDANIDAE | | | | | | | | | | | | | | | | | | |
| *Leiochone* sp. | | | | | | | | | | | | 3 | 1 | | | | 4 | 3 |
| *Lumbriclymene cylindricaudata* Sars, 1872 | | | | | | | | | | | | 2 | | | | | | |
| *Maldane* cf. *sarsi* Malmgren, 1865 | | | | 1 | | 2 | | | | | | | | | | | | |
| *Nicomache* aff. *trispinata* (Arwidsson, 1907) | | | | | | | | | | | 1 | 5 | | | | 23 | 4 | |
| *Praxillella* sp. | | | | | | | | | | | | | | | | 1 | | |
| Maldanidae gen. sp. 1 | | 1 | | | | | | | | | | | | | | | | |
| Maldanidae gen. sp. 2 | | | 2 | 2 | | | | | | | | | | | | | | |
| Maldanidae gen. sp. 3 | | | | | | | | | | | 1 | | | | | 1 | | |
| Maldanidae gen. sp. 4 | | | | | | | | | | | | 15 | 6 | | | 2 | 20 | 24 |
| Maldanidae undet. | 1 | | | | | | | 1 | | | | | | | | | | |
| NEPHTYIDAE | | | | | | | | | | | | | | | | | | |
| *Nephtys hombergi* Savigny, 1818 | | | | | | | | 2 | | | | | | | | | | |
| *Nephtys hystricis* McIntosh, 1900 | 37 | 2 | 7 | 10 | 10 | 45 | | | | | | | | | | | | |
| NEREIDIDAE | | | | | | | | | | | | | | | | | | 9 |
| *Neanthes* aff. *agulhana* (Day, 1963) | | | | | 1 | 1 | | | | | 1 | | | | | 2 | 2 | |
| Nereididae undet. | | | | | | | | | | | | | | 1 | | | | |

| Taxon | EBS 150 | EBS 200 | EBS 250 | EBS 300 | EBS 350 | EBS 400 | DRN 150 | DRN 200 | DRN 300 | DRN 400 | DRN 600 | DRN 800 | DRN 1000 | AT 150 | AT 200 | AT 600 | AT 800 | AT 1000 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OENONIDAE | | | | | | | | | | | | | | | | | | |
| *Drilonereis filum* (Claparede, 1870) | | | | | | | 1 | | | | | | | | | | | |
| ONUPHIDAE | | | | | | | | | | | | | | | | | | |
| *Hyalinoecia fauveli* Rioja, 1914 | | | | | | | | 2 | | | | | | | | | | |
| *Onuphis* sp. | 5 | 13 | 3 | 1 | 3 | 2 | | | | | 1 | | | | | | | |
| OPHELIIDAE | | | | | | | | | | | | | | | | | | |
| *Ophelina abranchiata* (Støp-Bowitz, 1948) | 51 | 14 | 50 | 52 | 25 | 256 | | 1 | | | | | | | | | | |
| *Ophelina* cf. *breviata* Nowakowski, 1959 | 1 | | | | | | | | | | | | | | | | | |
| *Ophelina cylindricaudata* (Hansen, 1878) | 40 | 2 | | 2 | 3 | 39 | | | | | | | | | | | | |
| *Ophelina modesta* Støp-Bowitz, 1958 | 25 | 6 | | | | | | | | | | | | | | | | |
| OWENIIDAE | | | | | | | | | | | | | | | | | | |
| *Galathowenia oculata* (Zaks, 1923) | 2 | | 2 | 7 | 4 | 1 | | 5 | | | | | | | | 1 | | 1 |
| *Owenia* sp. | | | | | | | | 1 | | | | | | | | | | |
| PARAONIDAE | | | | | | | | | | | | | | | | | | |
| *Aricidea abyssalis* Laubier & Ramos, 1974 | | | | | | | | | | | | | | | | | | 9 |
| *Aricidea* cf. fragilis *mediterranea* Laubier & Ramos, 1974 | | | | | | | | | | | | | | | | | | 8 |
| *Aricidea monicae* Laubier, 1967 | | | 4 | 3 | | 6 | | | | | | | | | | | | |
| *Aricidea quadrilobata* Webster & Benedict, 1887 | | | | 1 | | 5 | | | | | | | | | | | | |
| *Aricidea* sp. | | | | | | 2 | | | | | | | | | | | | |
| *Levinsenia flava* Strelzov, 1973 | | | 1 | 4 | | 9 | | | 1 | | | | | | | | | |
| *Levinsenia gracilis* (Tauber, 1879) | | | | 1 | | | | | | | | | | | | | | |
| *Levinsenia* cf. *oculata* (Hartman, 1957) | | | | 2 | 1 | 7 | | | | | | | | | | | | 1 |
| *Paradoneis ilvana* Castelli, 1965 | | | 1 | | | | | | | | | | | | | | | |
| *Paradoneis* cf. *ilvana* Castelli, 1965 | | | | | | 4 | | | | | | | | | | | | |
| *Paradoneis* cf. *lyra* Southern, 1914 | | | | | | 2 | | | | | | | | | | | 1 | |
| *Paraonides myriamae* Katzmann & Laubier, 1975 | | | | | | 1 | | | | | | | | | | | | |
| PECTINARIIDAE | | | | | | | | | | | | | | | | | | |
| *Pectinaria* sp. | | | | | | | 1 | | | | | | | | | | | |
| Pectinariidae undet. | | | | | | | | | | | | | | | | | | 4 |
| PHOLOIDIDAE | | | | | | | | | | | | | | | | | | |
| *Pholoe* sp. | | | | | | | | | | | | 3 | | | | 2 | 22 | 144 |
| PHYLLODOCIDAE | | | | | | | | | | | | | | | | | | |
| *Eulalia* sp. 1 | | | | | | | | | | | | | | 1 | | | | |
| *Eulalia* sp. 2 | | | | | | | | | | | | 10 | 5 | | | 15 | 4 | 7 |
| *Eulalia* sp. 3 | | | | | | | | | | | | 3 | 1 | | | 6 | 1 | 16 |
| *Eumida* sp. | | | | | | | | | | | 1 | | | | | | | |
| *Phyllodoce groenlandica* Oersted, 1843 | | | | | | | | | | | | 16 | 22 | | | 44 | 45 | 157 |
| *Pseudomystides limbata* (Saint-Joseph, 1888) | 1 | | | | | | | | | | | | | | | | | |
| *Pterocirrus* sp. | | | | | | | | | | | | 3 | | | | | 1 | |
| PILARGIDAE | | | | | | | | | | | | | | | | | | |
| *Ancistrosyllis groenlandica* McIntosh, 1879 | | | 1 | | | | | | | | | | | | | | | |
| *Litocorsa stremma* Pearson, 1970 | | | | | | | | 1 | | | | | | | | | | |

| Taxon | EBS 150 | EBS 200 | EBS 250 | EBS 300 | EBS 350 | EBS 400 | DRN 150 | DRN 200 | DRN 300 | DRN 400 | DRN 600 | DRN 800 | DRN 1000 | AT 150 | AT 200 | AT 600 | AT 800 | AT 1000 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *Pseudexogone dineti* (Katzmann, Laubier & Ramos, 1974) | | | | | | | 1 | | | | | | | 1 | | | | |
| *Synelmis urgorrii* Moreira & Parapar, 2007 | | | | | | | | | | | | 4 | 2 | | | | 1 | 60 |
| POLYNOIDAE | | | | | | | | | | | | | | | | | | |
| *Harmothoe* sp.1 | | | | | | | 4 | | | | | | | | | | | |
| *Harmothoe* sp. 2 | | | | | | | | | | | | 1 | | | | 4 | 5 | 12 |
| *Lepidasthenia* cf. *argus* Hodgson, 1900 | | | | | | | 2 | 1 | | | | | | | | | | |
| Polynoidae undet. | 7 | 33 | 24 | 24 | 17 | 29 | | | | | | | | | | | | |
| SCALIBREGMATIDAE | | | | | | | | | | | | | | | | | | |
| *Asclerocheilus* sp. | | | | | | | | | | | 1 | | | | | | | |
| SABELLIDAE | | | | | | | | | | | | | | | | | | |
| *Euchone rosea* Langerhans, 1884 | 1 | 2 | 12 | 1 | | 3 | | | | | | | | | | | | |
| *Jasmineira* sp. | | | | | | | | | | | 1 | | 1 | | | 5 | 10 | 16 |
| *Oridia armandi* (Claparède, 1864) | 6 | 5 | | 2 | 1 | 4 | | | | | | | | | | | | |
| SERPULIDAE | | | | | | | | | | | | | | | | | | |
| *Apomatus* sp. | | | | | | | | | | | | 1 | | | | | | |
| *Hydroides norvegica* Gunnerus, 1768 | | | | | | | 1 | | | | | | | 1 | | | | |
| *Vermiliopsis monodiscus* Zibrowius, 1968 | | | | | | | | | | | | 4 | | | | | 5 | |
| *Vermiliopsis* cf. *striaceps* (Grube,1862) | | | | | 1 | | | | | | | 8 | | | | 7 | 15 | |
| Serpulidae gen. sp. | | | | | | | | | | | | | | | | | | 1 |
| SIGALIONIDAE | | | | | | | | | | | | | | | | | | |
| *Leanira yhleni* Malmgren, 1867 | 9 | | 31 | 14 | 4 | 7 | | | | | | | | | | | | |
| *Sthenelais limicola* (Ehlers, 1864) | 1 | | | | | | | | | | | | | | | | | |
| *Sthenelais zetlandica* McIntosh, 1876 | | | 2 | | | | | | | | | | | | | | | |
| SPHAERODORIDAE | | | | | | | | | | | | | | | | | | |
| *Sphaerodoridium fauchaldi* Hartmann-Schröder, 1993 | | 32 | | | | | | | | | | | | | | | | |
| *Sphaerodoropsis artabrensis* Moreira & Parapar, 2007 | | 6 | 7 | 3 | | | | | | | | | | | | | | |
| SPIONIDAE | | | | | | | | | | | | | | | | | | |
| *Polydora* aff. *ciliata* (Johnston, 1838) | | | | | | | | | | | | | 4 | | | 4 | 4 | 3 |
| *Polydora* sp. | | | | | | | 2 | | | | | | | 1 | | | | |
| *Prionospio* sp. | 245 | 13 | 40 | 62 | 39 | 131 | | | | | | | | 1 | | | | |
| *Pseudopolydora* sp. | 1 | | | | | | | | | | | | | | | | | |
| *Spiophanes bombyx* Claparède, 1870 | 1 | | | | | | | | | | | | | | | | | |
| *Spiophanes kroyeri* Grube, 1860 | | | | | | | | | | | | 1 | | | | 2 | 3 | 3 |
| Spionidae gen. sp. 1 | | | | | | | | | | | | | | | | | | 1 |
| Spionidae gen. sp. 2 | | 1 | | 2 | | 1 | | | | | | | | | | | | |
| STERNASPIDAE | | | | | | | | | | | | | | | | | | |
| *Sternaspis* sp. | 2 | | | | | | | | | | | | | | | | | |
| SYLLIDAE | | | | | | | | | | | | | | | | | | |
| *Amblyosyllis* sp. | | | | | | | | | | | | | | | | | 1 | |
| *Epigamia labordai* (San Martín & López, 2002) | | | | | | | | | | | 1 | 1 | 1 | | | 2 | 7 | 2 |
| *Eurysyllis* n. sp | | | | | | | | | | | | | | | | | 7 | 12 |
| *Eurysyllis tuberculata* Ehlers, 1864 | | | | | | | | | | | | 1 | 1 | | | | 1 | 1 |

| Taxon | EBS 150 | EBS 200 | EBS 250 | EBS 300 | EBS 350 | EBS 400 | DRN 150 | DRN 200 | DRN 300 | DRN 400 | DRN 600 | DRN 800 | DRN 1000 | AT 150 | AT 200 | AT 600 | AT 800 | AT 1000 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *Eusyllis lamelligera* Marion & Bobretzky, 1875 | | | | | | | | | | | | | | | | | 1 | |
| *Exogone naidina* Oersted, 1845 | | | | | | | | | | | | | | | | 1 | 3 | |
| *Exogone veruguera* (Claparede, 1868) | | | | | | 1 | | | | | | | | | | | | 313 |
| *Haplosyllis spongicola* (Grube, 1855) | | | | | | | | | | | 5 | 45 | 5 | | | 97 | 178 | |
| *Myrianida brachycephala* (Marenzeller, 1874) | | | | | | | | | | | | | | 4 | | | 2 | |
| *Myrianida edwarsi* (Saint Joseph, 1887) | | | | | | | | | | | | | | | | 2 | | |
| *Myrianida prolifera* (Müller, 1778) | | | | | | | | | | | 4 | 2 | | | | | 2 | |
| *Myrianida* sp. 1 | | | | | | | | | | | | | | | | | | 1 |
| *Myrianida* sp. 2 | | | | | | | | | | | | | | | | | 2 | |
| *Myrianida* sp. 3 | | | | | | | | | | | | | | | | 1 | | |
| *Parexogone caribensis* San Martín, 1991 | | | | | | 1 | | | | | | | | | | 1 | | 1 |
| *Paraexogone wolfi* San Martín, 1991 | | | | | | | | | | | | | | | | | | 1 |
| *Pionosyllis enigmatica* (Wesenberg-Lund, 1950) | | | | | | | | | | | | | | | | | 1 | |
| *Pionosyllis lamelligera* Saint-Joseph, 1887 | | | | | | | | | | | 1 | | 2 | | | 2 | 4 | 6 |
| *Pionosyllis serratisetosa* López, et al. 1997 | | | | | | | | | | | | | | | | | 1 | 6 |
| *Proceraea aurantica* Claparede, 1868 | | | | | | | | | | | | | | | | 1 | | |
| *Proceraea* sp. | | | | | | | | | | | | | | | | 1 | | |
| *Prosphaerosyllis tetralix* (Eliason, 1920) | 64 | 15 | 1 | 1 | 1 | 1 | 2 | | | | | | | | | | | |
| *Prosphaerosyllis* n. sp. | | 2 | | | | | | | | | | | | | | | | |
| *Prosphaerosyllis* sp. 2 | 2 | | | | | | | | | | | | | | | | | |
| *Sphaerosyllis parabulbosa* San Martín & López, 2000 | | 7 | 2 | | | | | | | | | | | | | | | |
| *Sphaerosyllis pirifera* Claparede, 1868 | | | | | | | | | | | 1 | 1 | | | | 8 | 7 | 53 |
| *Spaherosyllis taylori* Perkins, 1981 | 1 | | | | | | | | | | | | | | | | | |
| *Syllis alternata* Moore, 1908 | | | | | | | | | | 5 | | | | 2 | 6 | 9 | | |
| *Syllis hyalina* Grube, 1863 | | | | | | | | | | | 2 | 39 | 10 | | | 63 | 101 | 11 |
| *Syllis parapari* San Martín y López, 2000 | | | | | | | 1 | | | | | | | | | | | |
| *Syllis* n. sp. | | | | | | | | | | | | 1 | | | | 1 | | 9 |
| *Syllis* sp. 2 | | | | | | | | | | | 2 | | | | | | | |
| *Syllis* sp. 3 | | | | | | | | | | | | | | | | 1 | | |
| *Syllis* sp. 4 | | | | | | | | | | | | | | | | | 1 | |
| *Syllis* sp. 5 | | | | | | | | | | | | | | | | | | 1 |
| *Trypanosyllis coeliaca* Claparede, 1868 | | | | | | | | | | | | | | | | 2 | 5 | 7 |
| TEREBELLIDAE | | | | | | | | | | | | | | | | | | |
| *Euthelepus setubalensis* McIntosh, 1885 | | | | | | | | | | | | 4 | 1 | | | | 18 | |
| *Pista cristata* (Müller, 1776) | 2 | | | | | 1 | | | | | | | | | | | | |
| *Polycirrus* sp. | | | | | | | | | | | | 4 | 4 | | | 3 | 19 | 9 |
| *Thelepus cincinnatus* (Fabricius, 1780) | 1 | | | | | | | | | | | | | 1 | | | | 2 |
| Terebellidae gen. sp. | | | | | | | | | | | | 6 | 6 | | | 8 | 18 | |
| Terebellidae undet. | | | | | | | | | | | 6 | | | | | 9 | | 21 |
| TRICHOBRANCHIDAE | | | | | | | | | | | | | | | | | | |
| *Terebellides* sp. | 47 | 5 | 11 | 9 | | | | | | | | | | | | | | |