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Lists of Species

Polychaeta (Annelida) from the continental shelf off Aveiro (NW Portugal): Species composition and community structure

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Abstract: The present study provides a checklist of the polychaete fauna collected on the continental shelf off Aveiro (NW Portugal), within an area located between latitudes 40°30'N and 40°50'N and longitudes 8°40'W and 9°20'W, and a depth range of 8 to 185 m. The list includes 136 species, belonging to 37 families, from which 19 are new records for the Portuguese coast (*Isolda pulchella*, *Mesochaetopterus sagittarius*, *Aphelochaeta multibranchis*, *Chaetozone* cf. *vivipara*, *Diplocirrus hirsutus*, *Goniadella gracilis*, *Gyptis mediterranea*, *Lumbrinerides crassicephala*, *Eumida bahusiensis*, *Eumida ockelmanni*, *Nereiphylla paretti*, *Phyllodoce rosea*, *Glyphohesione klatti*, *Malmgreniella arenicolae*, *Prionospio aluta*, *Pseudopolydora paucibranchisata*, *Pseudopolydora pulchra*, *Scolelepis mesnili*, *Polycirrus* cf. *medusa*). The shelf off Aveiro presents a well-defined pattern of sediment distribution, with finer sand on the inner (8–22 m depth) and the outer (94–184 m depth) parts of the shelf and coarser sediments on the mid-shelf. The distribution of polychaete assemblages follows closely the aforementioned sedimentary pattern, showing different specific composition and structure in each of the three areas. Depth was also found to play an important role in the distribution of some polychaete species.

Introduction

Marine soft-bottom communities support a high diversity of species with different ecological characteristics. Many studies have been published on benthic communities of the Northeastern Atlantic continental shelves (Heip and Craeymeersh 1995; Hoey *et al.* 2004; Mackie *et al.* 1997; Martínez and Adarraga 2001; Parapar and Moreira 2009; among others) and the Mediterranean (Ballesteros 2006; Cebrián and Ballesteros 2004; Çinar 2005; Martin *et al.* 2000; Mohamed 1993; Sardá *et al.* 2012; Somaschini *et al*. 1998; among others). Nevertheless, little is known about the benthic communities of the Portuguese continental coast, especially at higher depths. There are only two studies on polychaete fauna from the Portuguese continental slope (including the slope off Aveiro) at depths below 200 m (Amoureux 1974; 1987). A few other works are published for Portuguese coastal waters, the majority referring to near shore zones (Almaça 1960; Amoureux and Calvário 1981; Dexter 1988; 1990; França *et al.* 2009; Guerra-García *et al.* 2011; Moreira *et al.* 1993; Sousa-Reis *et al.* 1982), and others to South and Southwest of Portugal (Bellan 1960; Gil and Sardá 1999; Hartmann-Schröder 1977; 1979; 1981; Monteiro-Marques 1979; 1987; Pérès, 1959). The western Portuguese continental shelf is of particular interest due to the combined influence of the North Atlantic and Mediterranean currents, providing conditions to the occurrence of fauna characteristic from both regions (Sousa-Reis *et al.* 1982). Polychaetes (Annelida, Polychaeta) represent a very important part of the marine macrobenthic fauna, being often the most abundant and specious group. It is, therefore, crucial to improve the knowledge on polychaete fauna composition and distribution in this area. During the summers of 1994 and 1995, two oceanographic surveys were carried out with the aim of studying these communities and their relation to some environmental parameters on the shelf off Aveiro. These surveys resulted from a collaboration between the universities of Aveiro and Bordeaux and were supported by a Portuguese-French oceanological program (JNICT, French embassy) and by the French CIRMAT (Comite Inter-Regional Manche-Atlantique) and CNRS (Centre National de la Research Scientifique). The present work provides information on the species composition, distribution and ecology of benthic polychaetes of shelf depths, increasing our knowledge on the biodiversity of the Portuguese coastal waters. The data was analyzed on the basis of species composition and density and interpreted according to habitat features, namely sediment type and depth.

Materials and Methods

Study site

The continental shelf off Aveiro is located at the NW Portuguese continental margin. The shelf-width ranges between 50.2 km (in the northern part of the study area) and 38 km (near Aveiro Canyon) and the shelf-break lies at a mean depth of about 160 m. The bathymetrical contours are generally subparallel to the coastline, having a NNE-SSW orientation. The sediment cover of the shelf is dominated by sand arranged in deposits of different origins and characteristics. The near-shore deposits are formed by siliciclastic fine to very fine sand mostly supplied by southward alongshore drift from northern river born material. The mid-shelf deposits are formed by siliciclastic coarse sand and gravel originated by past littoral reworking of terrestrial deposits. These two areas (inner- and mid-shelf) have high energetic conditions at the bottom, promoting sediment remobilization and transport. At the

100 m isobath the occurrence of oceanic thermal fronts benefit the deposition of finer sediments enriched in organic matter, which enhance the productivity of benthic fauna in this area (Martins *et al.* 2012). The subsequent outer-shelf and shelf-break deposits are formed by very fine and median sand rich in particles of biogenic origin (molluscan fragments, foraminifera tests) (Abrantes *et al.* 1994). Mud (silt and clay) content is generally low over the whole study area and increases seawards.

Data collection

The sampling took place during two oceanographic surveys carried out in July/August of 1994/95 onboard R/V "Côte d'Aquitaine" (CNRS-CIRMAT). A total of 31 sites were sampled along four transects perpendicular to the coast and covering an area between latitudes 40º30'N and 40º50'N and longitudes 8º40'W and 9º20'W, within a depth range of 8 to 185 m (Figure 1). The macrofauna was sampled with a Smith-McIntyre grab (0.1 m^2) and three replicates were taken per site. Samples were fixed in 10% neutral formalin stained with rose Bengal, and later washed and the macrofauna transferred to 70% ethanol. After taxonomical identification and counting, the specimens were deposited in the Biological Research Collection of Marine Invertebrates of Universidade de Aveiro (DBUA), Portugal. Total organic matter content of surface sediments was determined by loss of weight on ignition at 450ºC for 5 hours, using 1 g of dried sediment taken from each sample before fixation. For sedimentological studies an extra sample was collected at each site using a Reineck box corer, from which the upper 2 cm layer was analyzed. Sediment type was determined according to the Wentworth scale (Buchanan and Kain 1971).

Data analysis

The biological data was submitted to Non-parametric multivariate analyses using the PRIMER package (Carr *et al.* 1993). Following the prearrangement of the abundance data into samples / species matrix, the similarity between all pairwise combinations of samples was calculated using the Bray-Curtis similarity coefficient after fourth-root transformation of the data. Hierarchical agglomerative clustering, using group-average linking, and non-metric MDS (Multi-Dimensional Scaling) ordination based on the Bray-Curtis similarity matrix were used to obtain graphical presentation of the faunal similarity changes in space. Diversity was evaluated by species richness and Shannon-Wiener index (H') (log base 2), while equitability was accessed by Pielou evenness index (J').

Results and Discussion

A total of 136 species and 10,353 individuals were collected in this study. Table 1 presents a list of the species recorded, from which 19 are new records for the Portuguese coast (see species marked with a * in Table 1). For each species, the total number of individuals, habitat conditions in the study area (depth range, sediment type and organic matter content) and deposit number in the DBUA collection are given.

The classification and ordination analyses of the 31 sampled sites clustered three main groups at a similarity level higher than 30% (Figure 2). The three groups of sites occupy well-defined positions on the shelf off Aveiro corresponding to inner- (depth range from 8 to 22 m), mid- (depth range from 31 to 79 m) and outer-shelf (depth range from 94 to 184 m) (Figure 1). The mid-shelf group stands out from the others for its higher values of species richness and abundance, and for presenting coarser sediments (Table 2). The other two groups are much similar in faunal composition and are both characterized by finer sediment, although outer-shelf sites have higher organic matter content. The outer-shelf group also presents higher values of diversity and equitability. The distribution of the polychaete fauna along the shelf off Aveiro seems to be mainly related to sediment type and depth (Figure 3). Many species present a strong association with fine sediments, being very abundant on the inner-

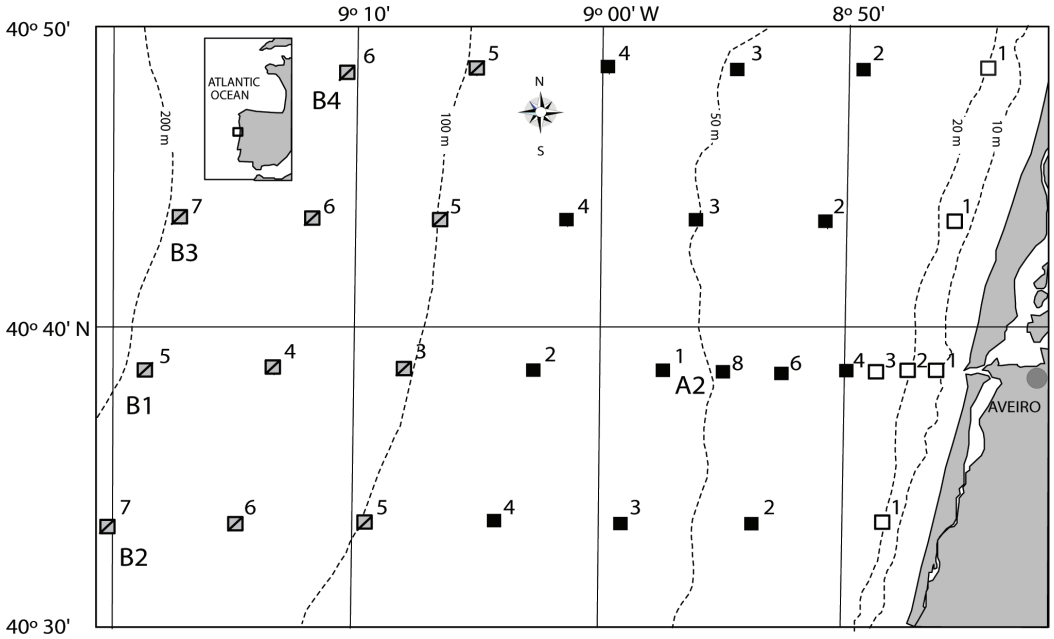

Figure 1. Map of the study area on the NW Portuguese continental shelf off Aveiro with location of sampling sites. Site symbols correspond to the three clusters resulting from the classification analysis.

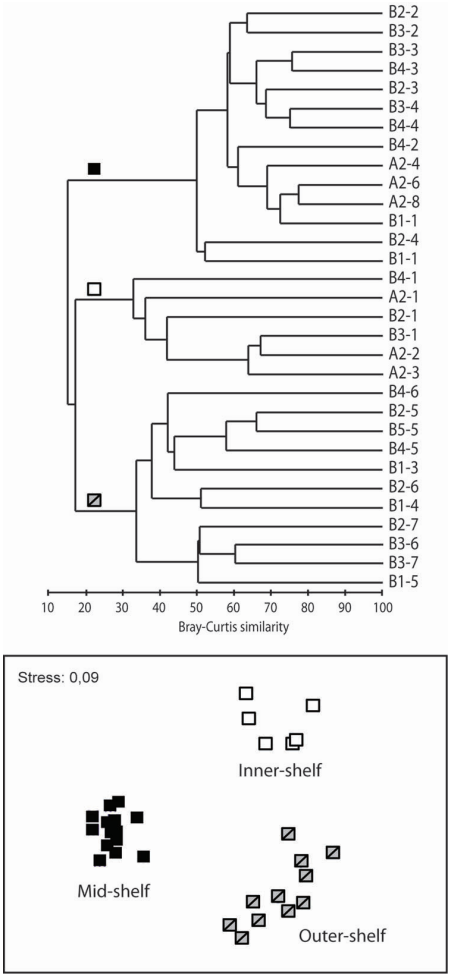

Figure 2. Classification and ordination analysis of the 31 sampled sites based on polychaete abundance data.

shelf, scarce or absent on the mid-shelf and occurring again on the outer-shelf, while other species have their distribution mainly restricted to the mid-shelf, where sediment is coarser. On the other hand, the distribution of some other species seems to be mostly determined by depth, independently of sediment type. Depth and sediment type have been pointed out by most authors as important factors affecting the distribution of marine macrobenthic communities (Hoey *et al.* 2004; Mackie *et al.* 1997; Martínez and Adarraga 2001; Parapar and Moreira 2009; Snelgrove 1998).

The comparison of the fauna collected in this area with that of the North Sea (Eleftheriou and Basford 1989; Heip and Craeymeersh 1995; Hoey *et al.* 2004; Künitzer et al. 1992), denoted a large proportion of species in common with our study area. Furthermore, there was a similar relationship between the species distribution and the sediment type and depth in both areas. The same was observed in the coasts of France and Galicia (NW Spain) (Amoureux 1985; Martínez and Adarraga 2001; Parapar and Moreira 2009). Species like *Psammathe fusca*, *Laonice bahusiensis*, *Magelona filiformis*, *Paradiopatra hispanica*, *Diplocirrus stopbowitzi* and *Aphelochaeta multibranchis* (among others), which are common in the shelf off Aveiro, are also frequent and abundant in those northern regions. Likewise, species such as *Parapionosyllis cabezli* and *Opisthodonta morena*, for example, occur mostly in the Mediterranean (Bellan 1962; 1964; 1965; Çinar 2005; Guille 1970) and are also common in the shelf off Aveiro. These findings suggest that the studied area is located in a transition zone where species characteristic of both septentrional and meridional areas can be found.

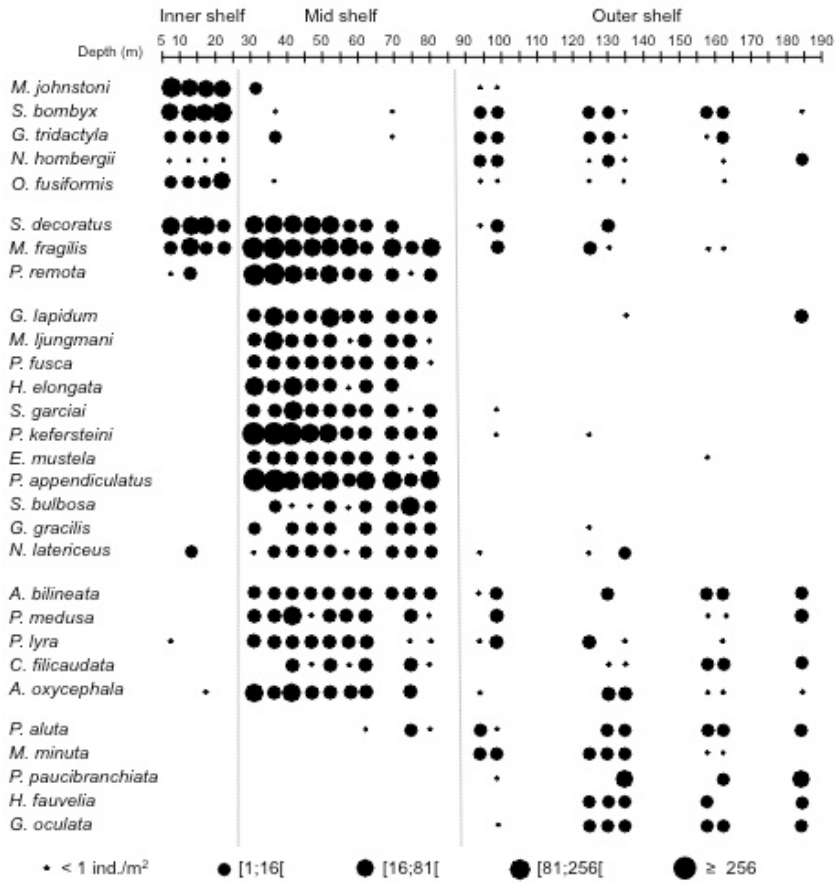

Figure 3. Depth distribution of the most abundant species. Dots size reflects the abundance values.

Table 1. List of species collected on the continental shelf off Aveiro. N, number of individuals; O.M., organic matter content; DBUA, deposit number on the DBUA collection; *, first record for Portugal. Sediment types: VFS, very fine sand; FS, fine sand; MS, median sand; CS, coarse sand; VCS, very coarse sand; G, gravel. The species *Oxydromus agilis* and *O. pallidus* (placed together in the table) require live organisms to be accurately distinguished.

LIST OF SPECIES	N	DEPTH RANGE (M)	SEDIMENT TYPE	O.M. (%)	DBUA
AMPHARETIDAE Malmgren, 1866					
Ampharete finmarchica (M. Sars, 1865)	9	68.9-184.2	FS, MS	0.85-4.21	00142
Amphicteis gunneri (M. Sars, 1835)	1	162.8	MS	3.06	00183
Anobothrus gracilis (Malmgren, 1866)	5	129.5-157.7	FS, MS	2.53-2.57	00143
Isolda pulchella F. Müller, 1858*	16	157.7-162.8	MS	2.57-3.06	00145
Sosane sulcata Malmgren, 1866	4	134.9-184.2	FS, MS	2.14-2.83	00144
AMPHINOMIDAE Savigny *in* Lamarck, 1818					
Chloeia venusta Quatrefages, 1866	15	35.2-184.2	MS, CS	0.58-2.83	00027
CAPITELLIDAE Grube, 1862					
Mediomastus fragilis E. Rasmussen, 1973	1052	8.9-162.8	FS, MS, CS, G	0.33-4.21	00126
Notomastus latericeus M. Sars, 1851	146	12.7-134.9	MS, CS, VCS, G	0.33-2.14	00127
Notomastus profundus Eisig, 1887	8	131.5-184.2	FS, MS	2.57-4.21	00128
CHAETOPTERIDAE Malmgren 1867					
Mesochaetopterus sagittarius (Claparède, 1870)*	25	15.6-184.2	MS, VCS, G	0.36-4.21	-
CIRRATULIDAE Ryckholt, 1851					
Aphelochaeta marioni (Saint-Joseph, 1894)	34	39.3-184.2	FS, MS, VCS, G	0.36-4.21	-
Aphelochaeta multibranchis (Grube, 1863)*	16	96.3-184.2	FS, MS	0.98-2.83	-
Caulleriella alata (Southern, 1914)	5	39.3-76.8	CS, G	0.57-1.46	-
Caulleriella bioculata (Keferstein, 1862)	34	30.8-76.8	CS, G	0.33-1.46	-
Chaetozone setosa Malmgren, 1867	37	48.3-162.8	FS, MS	0.76-4.21	-
Chaetozone cf. *vivipara* Christie, 1984*	4	129.5-131.5	FS	2.53-4.21	-
Cirriformia tentaculata (Montagu, 1808)	5	31.8-157.7	CS, VCS, G	0.33-0.90	-
DORVILLEIDAE Chamberlin, 1919					
Protodorvillea kefersteini (McIntosh, 1869)	1075	30.8-124.2	CS, VCS, G	0.33-1.46	00052
Schistomeringos neglecta (Fauvel, 1923)	4	59.1-76.8	VCS	0.70-1.29	00053
EUNICIDAE Berthold, 1827					
Eunice vittata (Delle Chiaje, 1829)	10	35.2-157.7	MS, CS, VCS	0.58-2.57	00051
Marphysa bellii (Audouin and Milne Edwards, 1833)	12	31.8-57.3	CS, VCS, G	0.33-1.46	00050
FLABELLIGERIDAE Saint-Joseph, 1894					
Diplocirrus hirsutus (Hansen, 1878)*	2	21.9	VFS	0.90	-
Diplocirrus stopbowitzi Darbyshire and Mackie, 2009	17	48.2-79.0	VCS, G	0.70-1.29	01148
Pherusa monilifera (Delle Chiaje, 1841)	9	13.5-40.9	FS, VCS	0.36-0.74	-
GLYCERIDAE Grube, 1850					
Glycera fallax Quatrefages, 1850	27	30.8-184.2	MS, CS, VCS, G	0.36-3.06	00068
Glycera lapidum Quatrefages, 1866	330	30.8-184.2	CS, VCS, G	0.33-2.83	00070
Glycera tridactyla Schmarda, 1861	119	12.7-162.8	VFS, FS, MS	0.36-4.21	00071
GONIADIDAE Kinberg, 1866					
Glycinde nordmanni (Malmgren, 1866)	33	34.9-184.2	MS, VCS	0.36-2.83	00185
Goniada emerita Audouin and Milne Edwards, 1833	2	21.9-34.9	VFS, CS	0.42-0.90	00186
Goniada maculata Ørsted, 1843	16	57.3-162.8	FS, MS	0.76-4.21	00187
Goniadella galaica (Rioja, 1923)	63	15.6-79.0	CS, VCS, G	0.36-1.46	00188
Goniadella gracilis (Verrill, 1874)*	84	30.8-124.2	VCS, G	0.43-2.14	-
HESIONIDAE Grube, 1850					
Gyptis mediterranea Pleijel, 1993*	1	124.8	-	-	00100
Oxidromus agilis (Ehlers, 1864) / *Oxidromus pallidus* Claparède, 1864	25	35.2-76.8	CS, VCS	0.58-1.29	00101
Psamathe fusca Johnston 1836	96	12.7-97.5	CS, VCS, G	0.33-1.46	00102
LUMBRINERIDAE Schmarda, 1861					
Lumbrinerides amoureuxi Miura, 1980	19	30.8-76.8	MS, CS, VCS, G	0.33-2.14	00039
Lumbrinerides crassicephala Hartman, 1965*	9	124,6-162,8	FS, MS, G	2.14-4.21	01323
Lumbrineris futilis Kinberg, 1865	5	46.1-184.2	FS, CS, G	0.33-2.83	01322
Lumbrineris lusitanica Martins, Carrera-Parra, Quintino and Rodrigues, 2012	31	57.3-184.1	FS, MS, CS, VCS, G	0.78-4.21	00040
Scoletoma cf. *magnidentata* (Winsnes, 1981)	1	39.3	G	0.57	-
MAGELONIDAE Cunningham and Ramage, 1888					
Magelona alleni Wilson, 1958	5	13.5-124.2	FS	0.74-1.35	00083
Magelona filiformis Wilson, 1959	40	12.7-162.8	VFS, FS	0.36-3.06	00082
Magelona johnstoni Fiege, Licher and Mackie 2000	230	8.9-93.9	VFS, FS	0.36-1.03	00084
Magelona minuta Eliason, 1962	76	93.9-162.8	FS, MS	0.76-4.21	00081
MALDANIDAE Malmgren, 1867					
Leiochone leiopygos (Grube, 1860)	32	46.1-184.2	MS, CS, VCS, G	0.33-4.21	00129
Maldane glebifex Grube, 1860	2	129.5-157.7	MS, VCS	0.36-2.57	00130
NEPHTYIDAE Grube, 1850					

Table 1. ***Continued.***

LIST OF SPECIES	N	DEPTH RANGE (M)	SEDIMENT TYPE	O.M. (%)	DBUA
Aglaophamus agilis (Langerhans, 1880)	25	12.7-131.5	FS, CS, VCS	0.42-4.21	00062
Nephtys assimilis Ørsted, 1843	24	8.9-100.5	VFS, FS, CS, VCS	0.36-1.35	00060
Nephtys cirrosa Ehlers, 1868	18	8.9-34.9	FS, CS	0.42-0.83	00061
Nephtys hombergii Savigny *in* Lamarck, 1818	29	8.9-184.9	VFS, FS	0.76-3.06	00059
NEREIDIDAE Blainville, 1818					
Eunereis longissima (Johnston, 1840)	14	35.2-124.2	CS, G	0.36-0.98	00022
OENONIDAE Kinberg, 1865					
Notocirrus scoticus McIntosh, 1869	1	59.1	VCS	0.70	-
ONUPHIDAE Kinberg, 1865					
Aponuphis bilineata (Baird, 1869)	245	30.8-184.2	MS, CS, VCS, G	0.33-4.21	00043
Aponuphis fauveli (Rioja, 1918)	24	129.5-184.2	FS, MS	2.14-4.21	00077
Diopatra neapolitana Delle Chiaje, 1841	9	12.7-93.9	VFS, FS	0.74-0.99	-
Hyalinoecia tubicola (O.F. Müller, 1776)	1	162.8	MS	3.06	-
Paradiopatra hispanica (Amoureux, 1972)	19	134.9-184.2	FS, MS, G	2.14-3.06	00044
Rhamphobrachium (Spinigerium) brevibrachiatum (Ehlers, 1874)	1	184.2	FS	2.83	00045
OPHELIIDAE Malmgren, 1867					
Ophelia neglecta Schneider, 1892	5	15.6-68.9	CS	0.85	-
Ophelina cylindricaudata (Hansen, 1878)	3	129.5-157.7	FS, MS	2.53-4.21	00085
ORBINIIDAE Hartman, 1942					
Orbinia latreillii (Audouin and Milne Edwards, 1833)	2	12.7-13.8	FS	0.99-1.03	00091
Orbinia sertulata (Savigny, 1822)	3	12.7-131.5	FS	0.99-4.21	00090
OWENIIDAE Rioja, 1917					
Galathowenia oculata (Zachs, 1923)	49	100.5-184.2	FS, MS	1.35-4.21	00078
Owenia fusiformis Delle Chiaje, 1844	39	12.7-162.8	FS, MS	0.36-2.14	00004
PARAONIDAE Cerruti, 1909					
Aricidea (Acmira) catherinae Laubier, 1967	21	97.5-130.1	FS, MS	0.76-2.53	00582
Aricidea (Acmira) cerrutii Laubier, 1966	2	76.8-157.7	MS	1.29-2.57	00197
Aricidea (Acmira) laubieri Hartley, 1981	10	93.9-134.9	FS, MS	0.76-2.53	00581
Aricidea (*Acmira*) *simonae* Laubier and Ramos, 1974	2	93.9-100.5	FS	0.76-1.35	00196
Aricidea (*Allia*) *roberti* Hartley, 1984	5	76.5-96.3	FS	0.76-1.29	00580
Aricidea (Aricidea) pseudoarticulata Hobson, 1972	23	76.8- 97.5	FS, MS	0.76-3.06	00199
Aricidea (Aricidea) wassi Pettibone, 1965	6	93.9-184.2	FS	0.76-2.83	00195
Levinsenia gracilis (Tauber, 1879)	1	96.3	FS	-	00583
Paradoneis lyra (Southern, 1914)	118	8.9-162.8	MS, CS, VCS, G	0.36-2.57	00198
PECTINARIIDAE Quatrefages, 1866					
Amphictene auricoma (O.F. Müller, 1776)	1	13.8	FS	1.03	-
Lagis koreni Malmgren, 1866	6	13.5-96.3	FS, VFS	0.74-0.90	-
PHYLLODOCIDAE Ørsted, 1843					
Eteone picta Quatrefages, 1866	2	13.5-15.6	FS	0.74	-
Eulalia mustela Pleijel, 1987	109	30.8-157.7	CS, VCS, G	0.36-2.57	00113
Eumida bahusiensis Bergström, 1914*	73	12.7-97.5	FS, CS	0.36-1.29	00110
Eumida ockelmanni Eibye-Jacobsen, 1987*	6	35.2-71.7	VCS, G	0.58-0.90	00109
Hesionura elongata (Southern, 1914)	189	30.8-71.7	CS, VCS, G	0.33-1.46	00111
Nereiphylla paretti Blainville, 1828*	4	35.2-157.7	MS, VCS	0.58-2.57	00119
Paranaitis kosteriensis (Malmgren, 1867)	15	35.2-157.7	MS, VCS	0.36-2.57	00118
Phyllodoce lineata (Claparède, 1870)	9	21.9-184.2	FS, MS	0.76-3.06	00120
Phyllodoce longipes Kinberg, 1866	1	12.7	VFS	0.99	-
Phyllodoce rosea (McIntosh, 1877)*	3	12.7-21.9	VFS	0.90-0.99	-
Pseudomystides limbata (Saint-Joseph, 1888)	19	30.8-162.8	MS, CS, VCS, G	0.33-3.06	00112
PILARGIDAE Saint-Joseph, 1899					
Ancistrosyllis groenlandica McIntosh, 1878	1	124.2	FS	-	00098
Glyphohesione klatti Friedrich, 1950*	1	124.4	-	-	00099
PISIONIDAE Ehlers, 1901					
Pisione remota (Southern, 1914)	1153	8.9-79.0 m	CS, VCS, G	0.33-1.46	00001
POECILOCHAETIDAE Hannerz, 1956					
Poecilochaetus serpens Allen, 1905	6	131.5	G	4.21	00387
POLYGORDIIDAE Czerniavsky, 1881					
Polygordius appendiculatus Fraipont, 1887	1251	30.8-79.0	CS, VCS, G	0.36-1.46	00079
POLYNOIDAE Malmgren, 1867					
Harmothoe antilopes McIntosh, 1876	2	96.3-124.2	FS, MS	-	00035
Harmothoe glabra (Malmgren, 1865)	9	30.8-129.5	FS, CS, VCS, G	0.43-2.53	00036
Malmgreniella arenicolae (Saint-Joseph, 1888)*	16	40.9-162.8	MS, CS, VCS	0.36-3.06	00037
Malmgreniella ljungmani (Malmgreni, 1867)	167	30.8-79.0	CS, VCS, G	0.33-1.46	00038

Table 1. ***Continued.***

LIST OF SPECIES	N	DEPTH RANGE (M)	SEDIMENT TYPE	O.M. (%)	DBUA
SABELLIDAE Latreille, 1825					
Paradialychone filicaudata (Southern, 1914)	99	39.3-184.2	MS, CS, VCS, G	0.33-4.21	00663/4
SCALIBREGMATIDAE Malmgren, 1867					
Scalibregma inflatum Rathke, 1843	15	76.8-184.2	FS, MS	1.29-3.06	00002
SERPULIDAE Rafinesque, 1815					
Ditrupa arietina (O.F. Müller, 1776)	1	157.7	MS	2.57	00072
Hydroides norvegicus Gunnerus, 1768	22	40.9-93.9	CS, VCS, G	0.36-0.85	00073
Serpula concharum Langerhans, 1880	14	34.9-157.7	MS, CS, VCS	0.36-2.57	00075
Spirobranchus triqueter (Linnaeus, 1758)	42	35.2	VCS	0.58	00074
SIGALIONIDAE Malmgren, 1867					
Sigalion squamosus Delle Chiaje, 1830	1	100.5	FS	1.35	-
Sthenelais limicola (Ehlers, 1864)	12	76.8-131.5	FS	0.76-4.21	00030
SPIONIDAE Grube, 1850					
Aonides oxycephala (M. Sars, 1862)	278	30.8-184.2	MS, CS, VCS, G	0.33-3.06	00156
Laonice bahusiensis Söderström, 1920	44	57.3-157.7	MS, CS, VCS, G	0.70-2.57	00175
Prionospio aluta Maciolek, 1985*	67	59.1-184.2	FS, CS	0.70-4.21	00157
Prionospio caspersi Laubier, 1962	2	157.7-184.2	FS, MS	2.57-2.83	
Prionospio fallax Söderström, 1920	30	68.9-134.9	FS, MS	0.76-2.53	00158
Pseudopolydora paucibranchiata (Okuda, 1937)*	238	97.5-184.2	FS, MS	0.98-3.06	00163
Pseudopolydora pulchra (Carazzi, 1895)*	2	34.9-46.1	CS	0.33-0.42	00164
Scolelepis mesnili (Bellan and Lagardère, 1971)*	3	8.9-15.6	FS	0.83	-
Scolelepis cf. *tridentata* (Southern, 1914)	5	12.7-131.5	FS, CS	0.85-4.21	-
Spio decoratus Bobretzky, 1870	548	8.9-131.5	FS, CS	0.33-4.21	00176
Spiophanes afer Meißner, 2005	12	96.3-184.2	FS	1.35-4.21	00173
Spiophanes bombyx (Claparède, 1870)	212	8.9-184.2	VFS, FS, MS	0.98-4.21	00174
SYLLIDAE Grube, 1850					
Dioplosyllis cirrosa Gidholm, 1962	2	48.2	CS	0.7	00009
Eurysyllis tuberculata Ehlers, 1864	6	31.8-71.7	CS, VCS	0.58-0.85	00012
Exogone (Exogone) naidina Ørsted, 1845	2	48.2	CS	0.7	00011
Myrianida brachycephala (Marenzeller, 1874)	2	31.8-71.7	VCS	0.58-0.80	00006/8
Odontosyllis ctenostoma Claparède, 1868	1	79.0	G	0.80	-
Opisthodonta morena Langerhans, 1879	26	46.4-76.8	CS, VCS	0.33-1.33	00014
Palposyllis prosostoma Hartmann-Schröder, 1977	35	30.8-71.7	CS, G	0.33-1.46	00029
Paraehlersia ferrugina (Langerhans, 1881)	48	30.8-76.8	CS, G	0.33-1.46	00013
Parapionosyllis cabezali Parapar, San Martín and Moreira, 2000	52	28.8-71.7	CS, G	0.44-1.46	00180
Sphaerosyllis bulbosa Southern, 1914	146	31.8-79.0	CS, G	0.33-1.46	00017
Sphaerosyllis hystrix Claparède, 1863	15	40.9-76.8	CS, VCS	0.36-1.29	00016
Sphaerosyllis taylori Perkins, 1981	11	31.8-71.7	VCS	0.36-1.29	00093
Streptodonta pterochaeta (Southern, 1914)	35	40.9-76.8	CS, G	0.33-1.46	00015
Syllis garciai (Campoy, 1982)	231	30.8-93.9	CS, VCS, G	0.33-1.46	00028
Syllis licheri Ravara, San Martín and Moreira *in* San Martin, 2003	31	46.1-100.5	MS, G	0.33-1.35	00589
Syllis parapari San Martín and López, 2000	20	31.8-100.5	CS, VCS	0.36-1.35	00429
Syllis pontxioi San Martín and López, 2000	213	30.8-79.0	CS, G	0.33-1.46	00019
Trypanosyllis coeliaca Claparède, 1868	39	30.8-76.8	CS, G	0.39-1.46	00020
TEREBELLIDAE Grube, 1850					
Lanice conchilega (Pallas, 1766)	16	12.7-162.8	FS, MS, CS, VCS	0.33-3.06	-
Loimia medusa (Savigny, 1822)	1	59.1	VCS	0.70	00153
Pista malmgreni Saphronova and Jirkov *in* Jirkov, Leontovich and Saphronova, 2001	36	35.2-79.0	CS, VCS, G	0.33-1.46	00154
Polycirrus cf. *medusa* Grube, 1850*	211	39.4-184.2	MS, CS, VCS, G	0.33-3.06	-
TRICHOBRANCHIDAE Malmgren, 1866					
Terebellides stroemii Sars, 1835	2	124.2-184.2	FS	2.83	00155

Table 2. Mean values of species richness (S), number of individuals (N), diversity (H'), equitability (J'), organic matter content (O.M.) and sediment type (VFS, very fine sand; FS, fine sand; MS, median sand; CS, coarse sand; VCS, very coarse sand; G, gravel) for each group of sites resultant from classification analysis.

	S	N	H'	J'	O.M. (%)	Sed. type
Inner-shelf	14.7	57.8	2.69	0.703	0.898	VFS, FS
Mid-shelf	**39.4**	**193.8**	3.89	0.736	0.730	CS, VCS, G
Outer-shelf	28.9	41.2	**4.03**	**0.828**	**2.270**	FS, MS

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