

Distribution of benthic polychaetous annelids in the Adriatic Sea with zoogeographic considerations

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SUMMARY

Purpose of this paper is to estimate the biodiversity of the benthic Polychaeta along the Adriatic Sea and to discuss their biogeographical distribution. It is shown that from this sea 580 species, belonging to 57 families, have been so far reported: 401 from the northern Adriatic, 373 from the Central Adriatic, 332 from the southern Adriatic. The dominant biogeographical group is constituted by the Atlantic-Mediterranean species, but well represented are also the cosmopolitan and the endemic ones. The same pattern is present in all the latitudinal sectors of Adriatic, with little differences in the frequencies of the various categories.

INTRODUCTION

Differently from the biogeography of terrestrial animals that is known long since, the studies on the distribution of marine fauna and the definition of zoogeographical areas for the marine species are still insufficient. In fact for long it has been a widespread belief, because of the continuity of the water, that marine organisms were cosmopolitan. Many famous polychaetologists, (Fauvel, 1923, 1927; Rullier, 1958; Day, 1967) had the same conviction. Holthe, 1978, in his study on the zoogeography of the Terebellomorpha of the Northern European waters, showed that despite of the tendency towards widespread geographical distribution and eurybathy within this class of Annelids, Polychaeta can contribute to the understanding of marine zoogeography. Recently some scientists have been engaged in clarifying the problem of the wide distribution of this taxon that, according to Fauchald, 1984, might depend on its ancient origin, estimated going back to the Precambrian. The "cosmopolitan" species in many cases are complexes of species with different geographic distribution (Williams, 1984; Hartley, 1984; Dauvin and Thiebaut, 1994) or "sibling" species

(Grassle and Grassle, 1976; Petersen, 1984). Other authors have studied different aspects of the distribution of this taxonomic group (Bilyard and Carey, 1980; San Martin, 1984 a,b, Pocklington and Tremblay, 1987; Lardicci et al., 1990; Gambi et al., 1990; Arvanitidis et al., 2002).

Even though at this point it is clear that also the marine animals are distributed on the basis of environmental conditions, geological events, anthropic actions and many basins (e.g., Mediterranean or Atlantic) have been well studied, the biogeography of single or local seas, such as the Adriatic Sea, is not yet sufficiently known.

The Adriatic Sea is one of the six areas (the others being Western Mediterranean, Central Basin, Aegean Sea, Levantine Basin and Black Sea) of the Mediterranean Region (Por, 1989); its position, in the centre of Mediterranean, is very significant, and its environmental features are peculiar. The Adriatic Sea is about 800 Km long and 90-200 Km wide. The northern part is very different from the rest of the basin, being characterized by low salinity, that can reach 18‰, low winter temperature and shallow waters, that in the Gulf of Venice do not exceed 30 m; depth is greater in the central basin (220 m in the Pomo Pit) and in the southern part (1200 m south of Lagosta) and so is the salinity, that there reaches 38‰. The Adriatic Sea receives the Levantine Intermediate Stream, deriving from a branch of superficial Algerian stream, and from it the Adriatic Deep Waters take origin.

Many studies on the benthic Adriatic biocoenoses (Vatova, 1947, 1949; Gamulin-Brida, 1967, 1974; Gamulin-Brida and Karaman, 1968), or on Polychaeta of particular zones (e.g., Venice and Trieste Gulf, delta of Po river (Vatova, 1940; Bellan, 1969; Orel and Mennea, 1969) have been carried out but no study have concerned so far the benthic Polychaeta of the whole Adriatic. Therefore a detailed knowledge of the biodiversity and distribution of the benthic Polychaeta found respectively in the northern, central and southern Adriatic Sea, based on the results of my personal researches, conducted through several years, and on literature data (starting from Marenzeller, 1901), might be useful and this is the aim of the present research.

RESULTS

By the consultation of more than 140 papers and through author's researches (Cantone and Di Pietro, 2002), it came out that the Polychaeta biodiversity of the Adriatic Sea amounts to 580 species (53 more than reported for this sea by Arvanitidis et al., 2002) belonging to 57 families (Tab. I).

The richer families are, in decreasing order of abundance: Syllidae (with 93 species), Sabellidae (41), Spionidae (34), Phyllodocidae (30), Serpulidae (25), Paraonidae (25), Nereididae and Terebellidae (23); these eight families include more than 51% of the whole polychetological population.

Tab. I - Adriatic Polychaete fauna. N: Northern Adriatic Sea; C: Central Adriatic Sea; S: Southern Adriatic Sea. AA: ampho-Atlantic; AM: Atlantic-Mediterranean; Bi: bipolar; Bo: boreal; C: circumtropical; Co: cosmopolitan; E: endemic; IP: Indo-Pacific; O: other.

	N	C	S	Category
ORBINIIDAE				
<i>Naineris laevigata</i> (Grube, 1885)	*	*	*	C
<i>Orbinia cuvieri</i> (Audouin & Milne-Edwards, 1833)	*	*		Co
<i>Phylo foetida</i> (Claparède, 1870)	*	*	*	IP
<i>Phylo grubei</i> Mc Intosh, 1910	*	*		AM
<i>Phylo kuppferi</i> (Ehlers, 1874)		*		Co
<i>Phylo ligustica</i> (Orlandi, 1896)			*	AM
<i>Phylo norvegicus</i> (M. Sars, 1872)	*	*		Co
<i>Protoaricia oerstedii</i> (Claparède, 1864)			*	IP
<i>Scalaricia typica</i> Eisig, 1914	*	*	*	E
<i>Scoloplos armiger</i> (O.F. Müller, 1776)	*	*		Co
APISTOBRANCHIDAE				
<i>Apistobranchnus tullbergi</i> (Theel, 1879)		*		Bo
SPIONIDAE				
<i>Aonides oxycephala</i> (M. Sars, 1862)	*	*	*	Co
<i>Aonides paucibranchiata</i> Southern, 1914		*		Bi
<i>Boccardia polybranchia</i> (Haswell, 1885)	*			Co
<i>Dipolydora armata</i> (Langerhans, 1880)	*			C
<i>Dipolydora coeca</i> (Oersted, 1843)	*	*		Co
<i>Dipolydora flava</i> (Claparède, 1870)	*			Co
<i>Dipolydora quadrilobata</i> (Jacobi, 1883)	*			Bo
<i>Laonice cirrata</i> (M. Sars, 1851)	*	*	*	Co
<i>Malacoceros fuliginosus</i> (Claparède, 1870)	*	*	*	AM
<i>Malacoceros girardi</i> Quatrefages, 1843	*		*	Bo
<i>Malacoceros vulgaris</i> (Johnston, 1827)	*			Bi
<i>Microspio mecznikowianus</i> (Claparède, 1869)	*	*		AM
<i>Paraprionospio pinnata</i> (Ehlers, 1901)		*		Co
<i>Polydora ciliata</i> (Johnston, 1838)	*	*	*	Co
<i>Polydora hoplura</i> Claparède, 1870	*			Co
<i>Prionospio banyulensis</i> Laubier, 1966		*		AM
<i>Prionospio caspersi</i> Laubier, 1962	*	*		Co
<i>Prionospio cirrifera</i> Wiren, 1883	*	*	*	O
<i>Prionospio ehlersi</i> Fauvel, 1928		*	*	O
<i>Prionospio malmgreni</i> Claparède, 1870	*	*		C
<i>Prionospio steenstrupi</i> Malmgren, 1867		*		Co
<i>Pseudopolydora antennata</i> (Claparède, 1870)		*		Co
<i>Pygospio elegans</i> Claparède, 1863	*		*	Bo
<i>Scolelepis cantabra</i> (Rioja, 1918)	*		*	Bo
<i>Scolelepis foliosa</i> (Audouin & Milne-Edwards, 1833)			*	Bo

	N	C	S	Category
<i>Scolelepis squamata</i> (O.F. Müller, 1789)		*		Co
<i>Scolelepis tridentata</i> (Southern, 1914)	*	*		AA
<i>Spio decoratus</i> Bobretzky, 1870	*	*	*	C
<i>Spio filicornis</i> (O.F. Müller, 1776)	*	*		Co
<i>Spio multioculata</i> (Rioja, 1918)	*	*		AM
<i>Spiophanes bombyx</i> Claparède, 1870	*	*		Bi
<i>Spiophanes kroyeri kroyeri</i> Grube, 1860	*	*	*	Co
<i>Spiophanes kroyeri reysi</i> Laubier, 1964	*	*	*	E
<i>Sresblospio shrubsolii</i> (Buchanan, 1890)	*			E
MAGELONIDAE				
<i>Magelona alleni</i> Wilson, 1958	*	*	*	AM
<i>Magelona equilamellae</i> Harmelin, 1964	*			E
<i>Magelona filiformis</i> Wilson, 1959	*		*	AM
<i>Magelona minuta</i> Eliason, 1962			*	AM
<i>Magelona papillicornis</i> O.F. Müller, 1858	*	*		C
<i>Magelona rosea</i> Moore, 1907	*			AM
POECILOCHAETIDAE				
<i>Poecilochaetus fauchaldi</i> Pilato & Cantone, 1976	*	*	*	E
<i>Poecilochaetus serpens</i> Allen, 1904	*	*	*	C
LONGOSOMATIDAE				
<i>Heterospio mediterranea</i> Laubier, Picard & Ramos, 1972		*		E
CHAETOPTERIDAE				
<i>Chaetopterus variopedatus</i> Renier, 1804	*	*	*	Co
<i>Mesochaetopterus sagittarius</i> (Claparède, 1870)	*	*		Co
<i>Phyllochaetopterus gracilis</i> Grube, 1863	*			AM
<i>Spiochaetopterus costarum</i> (Claparède, 1868)	*	*	*	AM
<i>Spiochaetopterus typicus</i> M. Sars, 1856	*			Bo
PARAONIDAE				
<i>Aedicira mediterranea</i> Laubier & Ramos, 1974		*	*	E
<i>Aricidea assimilis</i> Tebble, 1959	*	*		Co
<i>Aricidea capensis bansei</i> Laubier & Ramos, 1974	*	*		AM
<i>Aricidea catherinae</i> Laubier, 1967	*	*	*	Bi
<i>Aricidea cerruti</i> Laubier, 1966		*	*	Co
<i>Aricidea claudiae</i> Laubier, 1967	*	*		AM
<i>Aricidea fragilis mediterranea</i> Laubier & Ramos, 1974	*	*	*	E
<i>Aricidea mariannae</i> Laubier, 1966		*		E
<i>Aricidea monicae</i> Laubier, 1967		*		O
<i>Aricidea pseudannae</i> Katzmann & Laubier, 1975		*		E
<i>Aricidea quadrilobata</i> Webster & Benedict, 1887		*		Co

	N	C	S	Category
<i>Aricidea simonae</i> Laubier & Ramos, 1974		*	*	AM
<i>Aricidea suecica meridionalis</i> Laubier & Ramos, 1974		*		E
<i>Aricidea wassi</i> Pettibone, 1965		*		Co
<i>Cirrophorus branchiatus</i> Ehlers, 1908		*	*	Co
<i>Cirrophorus furcatus</i> (Hartman, 1957)		*		Bo
<i>Levinsenia gracilis</i> (Tauber, 1879)	*	*	*	Co
<i>Levinsenia oculata</i> (Hartman, 1957)	*			O
<i>Paradoneis armata</i> Tauber, 1879		*	*	AM
<i>Paradoneis drachi</i> Laubier & Ramos, 1974		*	*	E
<i>Paradoneis fulgens</i> (Levinsen, 1883)		*	*	AA
<i>Paradoneis lyra</i> (Southern, 1914)	*	*	*	AM
<i>Paraonides myriamae</i> Katzmann & Laubier, 1975		*		E
<i>Paraonides neapolitana</i> (Cerruti, 1909)		*	*	E
<i>Paraonis tenera</i> Grube, 1878	*	*	*	E
CIRRATULIDAE				
<i>Aphelochaeta filiformis</i> (Keferstein, 1862)	*	*	*	
<i>Aphelochaeta marioni</i> (Saint-Joseph, 1894)	*	*	*	Co
<i>Caulleriella bioculata</i> (Keferstein, 1862)	*	*		Bi
<i>Caulleriella alata</i> (Southern, 1914)	*		*	Co
<i>Caulleriella killariensis</i> (Southern, 1914)		*		AA
<i>Chaetozone caput-esocis</i> (Saint-Joseph, 1894)	*	*	*	AM
<i>Chaetozone setosa</i> Malmgren, 1867	*	*	*	Co
<i>Cirratulus cirratus</i> (O.F. Müller, 1776)	*	*	*	Co
<i>Cirriformia tentaculata</i> (Montagu, 1808)	*	*	*	C
<i>Dodecaceria concharum</i> Oersted, 1843	*			AM
<i>Monticellina dorsobranchialis</i> (Kirkegaard, 1959)	*	*	*	AM
<i>Tharyx multibranchis</i> (Grube, 1863)	*	*		AM
<i>Timarete filigera</i> (Delle Chiaje, 1808)	*			Co
CTENODRILIDAE				
<i>Ctenodrilus serratus</i> (Schmidt, 1857)	*			AM
<i>Raphidrilus nemasoma</i> Monticelli, 1910	*			AM
COSSURIDAE				
<i>Cossura soyeri</i> Laubier, 1962	*	*		AM
CAPITELLIDAE				
<i>Capitella capitata</i> (Fabricius, 1780)	*	*	*	Co
<i>Capitella minima</i> Langerhans, 1880		*		AM
<i>Dasybranchus caducus</i> (Grube, 1846)	*	*		C
<i>Dasybranchus gajolae</i> Eisig, 1887	*			AM
<i>Heteromastus filiformis</i> (Claparède, 1864)	*	*	*	Co
<i>Mastobranchnus trinchesei</i> Eisig, 1887	*			IP

	N	C	S	Category
<i>Mediomastus capensis</i> Day, 1961	*		*	AM
<i>Mediomastus fragilis</i> Rasmussen, 1973		*		AM
<i>Neopseudocapitella brasiliensis</i> Rullier & Amoureux, 1979	*			AM
<i>Notomastus aberrans</i> Day, 1963		*	*	O
<i>Notomastus latericeus</i> M. Sars, 1851	*	*	*	Co
<i>Notomastus lineatus</i> Claparède, 1868	*			O
<i>Notomastus profundus</i> Eisig, 1887	*	*		O
<i>Pseudoleiocapitella fauveli</i> Harmelin, 1964	*	*	*	E
ARENICOLIDAE				
<i>Abarenicola claparedii</i> (Levinsen, 1884)	*		*	E
<i>Arenicola marina</i> (Linnaeus, 1758)	*			Bo
<i>Branchiomaldane vincenti</i> Langerhans, 1881			*	O
MALDANIDAE				
<i>Chirimia biceps</i> (M. Sars, 1861)		*	*	Bo
<i>Chymenura chlypeata</i> (Saint-Joseph, 1894)	*	*	*	AM
<i>Chymenura tricirrata</i> (Bellan & Reys, 1967)	*	*		AM
<i>Euchymene collaris</i> (Claparède, 1868)	*	*	*	E
<i>Euchymene lumbricoides</i> (Quatrefages, 1865)	*	*	*	C
<i>Euchymene oerstedii</i> (Claparède, 1863)	*	*	*	Co
<i>Euchymene palermitana</i> (Grube, 1840)	*	*	*	E
<i>Euchymene robusta</i> (Arwidsson, 1906)	*			AM
<i>Maldane glebifex</i> Grube, 1860	*	*	*	C
<i>Maldane sarsi</i> Malmgren, 1865	*	*	*	Co
<i>Metasychis gotoi</i> (Izuka, 1902)	*	*		IP
<i>Micromaldane ornithochaeta</i> Mesnil, 1897			*	Bi
<i>Nicomache personata</i> Johnson, 1901			*	Bo
<i>Petaloproctus terricola</i> Quatrefages, 1865	*		*	AM
<i>Praxillella gracilis</i> (M. Sars, 1861)	*	*	*	Co
<i>Praxillella affinis</i> (M. Sars 1872)	*	*		AM
<i>Praxillella lophoseta</i> (Orlandi, 1898)	*	*		E
<i>Praxillella praetermissa</i> (Malmgren, 1865)		*	*	Bo
<i>Rhodine gracilior</i> Tauber, 1879		*	*	IP
OPHELIIDAE				
<i>Armandia cirrhosa</i> Philippi, 1865	*	*	*	AM
<i>Armandia polyophtabna</i> Kukenthal, 1887	*	*		AM
<i>Ophelia bicornis</i> Savigny, 1818	*			AM
<i>Ophelia translucens</i> (Katzmann, 1973)		*		E
<i>Ophelina abranchiata</i> Stop-Bowitz, 1948		*		AA
<i>Ophelina cylindricaudata</i> (Hansen, 1878)		*		Bi
<i>Ophelina modesta</i> (Stop-Bowitz, 1958)		*		AM
<i>Ophelina norvegica</i> (Stop-Bowitz, 1945)		*		AM

	N	C	S	Category
<i>Polyophthalmus pictus</i> (Dujardin, 1839)	*	*	*	C
<i>Tachytrypane jeffreysii</i> Mc Intosh, 1878		*		AM
SCALIBREGMATIDAE				
<i>Asclerocheilus intermedius</i> (Saint-Joseph, 1894)		*	*	AM
<i>Polyphysia crassa</i> (Oersted, 1843)		*		Bo
<i>Scalibregma inflatum</i> Rathke, 1843	*	*		Co
<i>Sclerocheilus minutus</i> Grube, 1863	*	*	*	AM
PHYLLODOCIDAE				
<i>Eteone foliosa</i> Quatrefages, 1866	*			O
<i>Eteone longa</i> (Fabricius, 1780)	*		*	Bo
<i>Eteone picta</i> Quatrefages, 1865	*	*	*	AA
<i>Eteone siphonodonta</i> (Delle Chiaje, 1822)	*		*	AM
<i>Eulalia bilineata</i> (Johnston, 1840)	*			Bi
<i>Eulalia tripunctata</i> Mc Intosh, 1874		*		AM
<i>Eulalia venustissima</i> Banse, 1959	*			E
<i>Eulalia viridis</i> (Linnaeus, 1767)	*	*	*	C
<i>Eumida punctifera</i> (Grube, 1860)	*	*		AA
<i>Eumida sanguinea</i> (Oersted, 1843)	*	*	*	Co
<i>Genetyllis nana</i> (Saint-Joseph, 1906)	*	*		E
<i>Lugia pterophora</i> (Ehlers, 1864)	*			AM
<i>Mystides bidentata</i> Langerhans, 1880			*	AM
<i>Mystides borealis</i> Theel, 1879		*		Bo
<i>Nereiphylla paretii</i> Blainville, 1828	*			AM
<i>Nereiphylla pusilla</i> (Claparède, 1868)	*	*		E
<i>Nereiphylla rubiginosa</i> (Saint-Joseph, 1888)	*	*	*	AM
<i>Notophyllium foliosum</i> (M. Sars, 1835)	*			Bo
<i>Paranaitis kosteriensis</i> (Malmgren, 1867)	*			AM
<i>Phyllodoce madeirensis</i> (Langerhans, 1880)	*	*	*	Co
<i>Phyllodoce albovittata</i> Grube, 1860	*			E
<i>Phyllodoce groenlandica</i> Oersted, 1843	*			Bo
<i>Phyllodoce laminosa</i> Savigny, 1818	*	*		AM
<i>Phyllodoce lineata</i> (Claparède, 1870)	*	*	*	AM
<i>Phyllodoce macrophthalma</i> Schmarida, 1861	*	*		AM
<i>Phyllodoce mucosa</i> (Oersted, 1843)	*	*	*	AM
<i>Phyllodoce rosea</i> (Mc Intosh, 1877)		*	*	AM
<i>Phyllodoce vittata</i> Ehlers, 1864		*		E
<i>Pseudomystides limbata</i> (Saint-Joseph, 1888)	*	*		AM
<i>Pterocirrus macroceros</i> (Grube, 1860)	*		*	Co
GLYCERIDAE				
<i>Glycera alba</i> (O.F. Müller, 1776)	*	*	*	Co
<i>Glycera capitata</i> Oersted, 1843	*	*	*	Co
<i>Glycera gigantea</i> Quatrefages, 1865	*	*	*	Co

	N	C	S	Category
<i>Glycera lapidum</i> Quatrefages, 1865	*	*		AM
<i>Glycera rouxii</i> Audouin & Milne-Edwards, 1833	*	*	*	Co
<i>Glycera tessellata</i> Grube, 1863	*	*	*	Co
<i>Glycera tridactyla</i> Schmarada, 1861	*	*	*	C
<i>Glycera unicornis</i> Savigny, 1818	*	*	*	C
GONIADIDAE				
<i>Glycinde nordmanni</i> (Malmgren, 1866)	*	*	*	Bo
<i>Goniada emerita</i> Audouin & Milne Edwards, 1833	*	*	*	Co
<i>Goniada maculata</i> Oersted, 1843	*	*		Co
<i>Goniada norvegica</i> Oersted, 1844	*	*	*	AA
SPHAERODORIDAE				
<i>Clavodorum adriaticum</i> (Katzmann, 1973)		*		E
<i>Sphaerodoridium claparedi</i> (Greef, 1866)		*		Bo
<i>Sphaerodoropsis baltica</i> (Reimers, 1933)		*		Bo
<i>Sphaerodoridium longiparapodium</i> Katzmann, 1973		*		E
<i>Sphaerodoropsis minuta</i> (Webster & Benedict, 1887)		*		Bo
<i>Sphaerodoropsis philippi</i> (Fauvel, 1911)		*		AM
<i>Sphaerodoropsis flavum</i> Oersted, 1843		*	*	Bi
<i>Sphaerodorum gracilis</i> (Rathke, 1843)		*		Bo
HESIONIDAE				
<i>Gyptis propinqua</i> Marion & Bobretzky, 1875		*	*	AM
<i>Gyptis rosea</i> Malmgren, 1874	*	*		Co
<i>Hesione splendida</i> Savigny, 1818	*		*	Co
<i>Hesiospina similis</i> (Hessle, 1925)		*		O
<i>Keferstenia cirrata</i> (Keferstein, 1862)	*	*	*	Co
<i>Leocrates atlanticus</i> (Mc Intosh, 1885)	*			AM
<i>Leocrates chinensis</i> Kinberg, 1866	*	*	*	Co
<i>Microphthalmus aberrans</i> (Webster & Benedict, 1887)		*		AA
<i>Microphthalmus similis</i> Bobretzky, 1870	*			E
<i>Nereimyra punctata</i> (O.F.Müller, 1776)		*		Bo
<i>Ophiiodromus agilis</i> (Ehlers, 1864)	*		*	AM
<i>Ophiiodromus flexuosus</i> (Delle Chiaje, 1825)	*	*	*	AA
<i>Ophiiodromus pallidus</i> (Claparède, 1864)	*		*	AM
<i>Orseis pulla</i> Ehlers, 1864	*			E
<i>Podarkeopsis arenicola</i> (La Greca, 1946)			*	O
<i>Podarkeopsis capensis</i> (Day, 1963)		*		AM
<i>Syllidia armata</i> Quatrefages, 1865	*	*		Co
PILARGIIDAE				
<i>Ancistrotyllis cingulata</i> (Koeschel, 1893)	*			E
<i>Ancistrotyllis groenlandica</i> Mc Intosh, 1879	*	*		Co

	N	C	S	Category
<i>Glyphobesione klatti</i> Friedrich, 1950		*		AM
<i>Litocorsa stremma</i> Pearson, 1970	*			AM
<i>Oropis chardyi</i> Katzman, Laubier & Ramos, 1974		*		E
<i>Pilargis verrucosa</i> (Saint-Joseph, 1899)	*	*		AM
<i>Sigambra tentaculata</i> (Treadwell, 1941)	*	*	*	Bo
<i>Synelmis albini</i> (Langerhans, 1881)	*			Co
<i>Synelmis dineti</i> Katzman, Laubier & Ramos, 1974		*		E
SYLLIDAE				
<i>Amblyosyllis formosa</i> (Claparède, 1864)	*			Co
<i>Amblyosyllis madeirensis</i> Langerhans, 1879			*	AA
<i>Autolytus benazzi</i> Cognetti, 1953	*		*	AM
<i>Autolytus brachycephalus</i> (Marenzeller, 1874)		*	*	AM
<i>Autolytus convolutus</i> Cognetti, 1953			*	Co
<i>Autolytus edwardsi</i> Saint-Joseph, 1887	*			AM
<i>Autolytus prolifer</i> (O.F. Müller, 1788)	*	*	*	Co
<i>Autolytus quindecimdentatus</i> Langerhans, 1844		*	*	AM
<i>Autolytus rubropunctatus</i> (Grube, 1860)	*			AA
<i>Branchiosyllis exilis</i> (Gravier, 1900)	*		*	IP
<i>Brania arminii</i> (Langerhans, 1881)			*	AM
<i>Ehlersia cornuta</i> (Rathke, 1843)	*	*		Co
<i>Ehlersia ferrugina</i> (Langerhans, 1881)		*	*	Co
<i>Eurysyllis tuberculata</i> Ehlers, 1864	*	*	*	Co
<i>Eusyllis assimilis</i> Marenzeller, 1875	*		*	AM
<i>Eusyllis blomstrandii</i> Malmgren, 1867	*	*	*	Co
<i>Eusyllis lamelligera</i> Marion & Bobretzky, 1875	*		*	Co
<i>Exogone brevipes</i> Claparède, 1864	*			AM
<i>Exogone dispar</i> Webster, 1879		*	*	Co
<i>Exogone fauveli</i> Cognetti, 1961		*		E
<i>Exogone gambiae</i> Lanera, Sordino & San Martin, 1994			*	E
<i>Exogone hebes</i> (Webster & Benedict, 1889)	*			AA
<i>Exogone meridionalis</i> Cognetti, 1955			*	E
<i>Exogone naidina</i> Oersted, 1845	*	*	*	Co
<i>Exogone rostrata</i> Naville, 1933			*	E
<i>Exogone verugera</i> (Claparède, 1868)	*	*		Co
<i>Grubeosyllis clavata</i> (Claparède, 1863)	*		*	Co
<i>Grubeosyllis pusilla</i> (Dujardin, 1839)	*	*	*	AM
<i>Grubeosyllis limbata</i> (Claparède, 1868)	*	*	*	Co
<i>Grubeosyllis vicitezi</i> (San Martin, 1984)			*	E
<i>Haplosyllis spongicola</i> (Grube, 1855)	*	*	*	Co
<i>Myrianida pinnigera</i> (Montagu, 1808)	*			Co
<i>Odontosyllis ctenostoma</i> Claparède, 1868	*	*	*	AM
<i>Odontosyllis fulgurans</i> (Audouin & Milne-Edwards, 1934)		*	*	Co
<i>Odontosyllis gibba</i> Claparède, 1863	*	*	*	AM

	N	C	S	Category
<i>Parapionosyllis brevicirra</i> Day, 1954			*	O
<i>Parapionosyllis elegans</i> (Pierantoni, 1903)			*	AM
<i>Parapionosyllis minuta</i> (Pierantoni, 1903)			*	AM
<i>Pionosyllis lamelligera</i> Saint-Joseph, 1856			*	AA
<i>Pionosyllis morenoae</i> San Martin, 1984			*	AM
<i>Pionosyllis pulligera</i> Krohn, 1852	*			Co
<i>Pionosyllis serrata</i> Southern, 1914	*			AM
<i>Procerastea halleziana</i> Malaquin, 1893		*	*	AM
<i>Procerastea nematodes</i> Langerhans, 1884	*			AM
<i>Procerea aurantiaca</i> Claparède, 1868	*			AA
<i>Procerea picta</i> Ehlers, 1864	*			C
<i>Pseudosyllis brevipennis</i> Grube, 1863	*	*	*	AM
<i>Sphaerosyllis austriaca</i> Banse, 1959			*	E
<i>Sphaerosyllis bulbosa</i> Southern, 1914			*	AM
<i>Sphaerosyllis claparedii</i> Ehlers, 1864	*			AM
<i>Sphaerosyllis cryptica</i> (Ben Eliahu, 1977)			*	C
<i>Sphaerosyllis erinaceus</i> Claparède, 1863	*			Co
<i>Sphaerosyllis glandulata</i> Perkins, 1981			*	AM
<i>Sphaerosyllis gravinae</i> Somaschini & San Martin 1994			*	E
<i>Sphaerosyllis hystrix</i> Claparède, 1863	*	*	*	Co
<i>Sphaerosyllis pirifera</i> Claparède, 1868			*	Co
<i>Sphaerosyllis taylori</i> Perkins, 1981			*	AM
<i>Sphaerosyllis tetralix</i> Eliason, 1920		*		AM
<i>Sphaerosyllis thomasi</i> San Martin, 1984			*	E
<i>Sphaerosyllis xarifae</i> Hartmann-Schroeder, 1960			*	O
<i>Syllides bansei</i> Perkins, 1981			*	AM
<i>Syllides edentula</i> Claparède, 1868	*			AM
<i>Syllides fulvus</i> (Marion & Bobretzy, 1875)	*	*	*	C
<i>Syllis amica</i> Quatrefages, 1865	*	*	*	AM
<i>Syllis armillaris</i> (O.F. Müller, 1771)	*	*	*	Co
<i>Syllis beneliabuae</i> Campoy & Alquezar, 1982		*	*	AM
<i>Syllis bouvieri</i> Gravier, 1900			*	AM
<i>Syllis caeca</i> (Katzmann, 1973)		*		E
<i>Syllis columbretensis</i> Campoy, 1982		*	*	E
<i>Syllis corallicola</i> Verrill, 1900			*	AM
<i>Syllis ferrani</i> Alos & San Martin, 1987			*	E
<i>Syllis garciai</i> Campoy, 1982			*	AM
<i>Syllis gerundensis</i> (Alos & Campoy, 1981)			*	E
<i>Syllis gracilis</i> Grube, 1840	*	*	*	Co
<i>Syllis hyalina</i> Grube, 1863	*	*	*	Co
<i>Syllis jorgei</i> San Martin & Lopez, 2000			*	AM
<i>Syllis krohni</i> Ehlers, 1864	*		*	AM
<i>Syllis luquei</i> San Martin, 1984			*	E
<i>Syllis lutea</i> (Hartmann-Schroeder, 1962)			*	C
<i>Syllis nigricirris</i> Grube, 1863	*		*	E

	N	C	S	Category
<i>Syllis pontxioi</i> San Martin & Lopez, 2000			*	AM
<i>Syllis prolifera</i> (Krohn, 1852)	*	*	*	Co
<i>Syllis pulvinata</i> (Langerhans, 1881)			*	AM
<i>Syllis rosea</i> Langerhans, 1879		*	*	C
<i>Syllis truncata cryptica</i> Ben-Eliahu, 1977			*	AM
<i>Syllis variegata</i> Grube, 1860	*	*	*	Co
<i>Syllis vittata</i> Grube, 1840	*		*	Co
<i>Syllis westheidei</i> San Martin, 1984			*	O
<i>Trypanosyllis aeolis</i> Langerhans, 1879			*	AM
<i>Trypanosyllis coeliaca</i> Claparède, 1868	*	*	*	C
<i>Trypanosyllis gigantea</i> Mc Intosh, 1885	*			Co
<i>Trypanosyllis zebra</i> Grube, 1860	*	*	*	Co
<i>Xenosyllis scabra</i> (Ehlers, 1864)			*	AM
NEREIDIDAE				
<i>Ceratonereis costae</i> (Grube, 1840)	*	*	*	Co
<i>Ceratonereis hircinicola</i> (Eisig, 1870)	*	*	*	Co
<i>Eunereis longissima</i> (Johnston, 1840)	*		*	AM
<i>Micronereis variegata</i> Claparède, 1863	*	*		AM
<i>Namanereis quadraticeps</i> (Blanchard, 1849)	*			Co
<i>Neanthes caudata</i> (Delle Chiaje, 1828)	*		*	C
<i>Neanthes diversicolor</i> (O.F. Müller, 1776)	*		*	Bo
<i>Neanthes flavipes</i> Ehlers, 1868	*		*	E
<i>Neanthes fucata</i> (Savigny, 1818)		*	*	AA
<i>Neanthes kerguelensis</i> (Mc Intosh, 1885)	*	*	*	Co
<i>Neanthes mossambica</i> Day, 1957		*	*	AM
<i>Neanthes succinea</i> (Frey & Leuckart, 1847)	*	*	*	C
<i>Nereis falsa</i> Quatrefages, 1865		*		O
<i>Neanthes irrorata</i> (Malmgren, 1868)		*	*	AM
<i>Nereis lamellosa</i> Ehlers, 1868	*			AM
<i>Nereis pelagica</i> Linnaeus, 1761	*			Co
<i>Nereis rava</i> Ehlers, 1868	*	*	*	AM
<i>Nereis zonata</i> Malmgren, 1868	*	*	*	Co
<i>Perinereis cultrifera</i> (Grube, 1840)	*	*	*	C
<i>Perinereis rullieri</i> Pilato, 1974	*			E
<i>Platynereis coccinea</i> (Delle Chiaje, 1841)	*			AM
<i>Platynereis dumerilii</i> (Audouin & Milne-Edwards, 1833)	*	*	*	C
<i>Websterinereis glauca</i> (Claparède, 1870)	*	*	*	AA
NEPHTYIDAE				
<i>Aglaophanus agilis</i> (Langerhans, 1880)		*		AM
<i>Inermonephtys inermis</i> (Ehlers, 1887)	*	*		C
<i>Micronephtys mariae</i> San Martin, 1982		*		Bi
<i>Micronephtys sphaerocirrata</i> (Wesenberg-Lund, 1949)	*	*		IP
<i>Micronephtys stammeri</i> (Augener, 1932)	*	*	*	E

	N	C	S	Category
<i>Nephtys ciliata</i> (O.F. Müller, 1776)		*		Bo
<i>Nephtys cirrosa</i> Ehlers, 1868	*	*		AM
<i>Nephtys hystrix</i> Mc Intosh, 1900	*	*	*	AM
<i>Nephtys hombergi</i> Savigny, 1818	*	*	*	Co
<i>Nephtys incisa</i> Malmgren, 1865	*	*		AM
<i>Nephtys paradoxa</i> Malmgren, 1874		*		Bo
PARALACYDONIIDAE				
<i>Paralacydonia paradoxa</i> Fauvel, 1913	*	*	*	C
APHRODITIDAE				
<i>Aphrodita aculeata</i> Linnaeus, 1761	*	*	*	AM
<i>Laetmonice hystrix</i> (Savigny, 1820)	*	*	*	Co
<i>Pontogenia chrysocoma</i> (Baird, 1865)	*	*	*	AM
POLYNOIDAE				
<i>Acholoe astericola</i> (Delle Chiaje, 1841)	*			AM
<i>Harmothoe antilopes</i> Mc Intosh, 1876	*	*	*	Bi
<i>Harmothoe areolata</i> , Grube, 1860	*	*	*	AM
<i>Harmothoe extenuata</i> (Grube, 1840)	*	*	*	Bi
<i>Harmothoe fraser-thomsoni</i> Mc Intosh, 1897	*			AM
<i>Harmothoe imbricata</i> (Linnaeus, 1767)	*		*	AM
<i>Harmothoe impar</i> Johnston, 1839	*	*		AA
<i>Harmothoe reticulata</i> (Claparède, 1870)		*	*	AM
<i>Harmothoe spinifera</i> Ehlers, 1864	*	*	*	AM
<i>Lepidasthenia elegans</i> (Grube, 1840)	*			IP
<i>Lepidonotus clava</i> Montagu, 1808	*			C
<i>Lepidonotus squamatus</i> (Linnaeus, 1767)			*	AM
<i>Malmgreniella castanea</i> (Mc Intosh, 1876)	*	*		AM
<i>Malmgreniella darbouxi</i> Pettibone, 1993		*		E
<i>Malmgreniella glabra</i> (Malmgren, 1865)	*			AA
<i>Malmgreniella ljungmani</i> (Malmgren, 1867)		*		AM
<i>Malmgreniella lunulata</i> (Delle Chiaje, 1841)	*	*	*	Co
<i>Polynoe scolopendrina</i> Savigny, 1822	*			AM
<i>Subadyte pellucida</i> (Ehlers, 1864)	*	*	*	Co
ACOETIDAE				
<i>Eupanthalis kinbergi</i> Mc Intosh, 1876		*		E
<i>Panthalis oerstedii</i> Kinberg, 1855	*	*		AM
<i>Polyodontes maxillosus</i> Ranzani, 1817	*	*		AM
PHOLOIDAE				
<i>Pholoe sinophthalmica</i> Claparède, 1868			*	E
<i>Pholoides dorsipapillatus</i> Marenzeller, 1893			*	O

	N	C	S	Category
SIGALIONIDAE				
<i>Claparedepelogenia inclusa</i> (Claparède, 1868)	*		*	AM
<i>Fimbriosthenelais minor</i> (Pruvot & Racovitza, 1895)	*	*		E
<i>Labioleanira yhleni</i> (Malmgren, 1867)	*	*	*	AM
<i>Neoleanira tetragona</i> (Oersted, 1845)	*			AM
<i>Pelogenia arenosa</i> (Delle Chiaje, 1841)	*		*	AM
<i>Sigalion mathildae</i> Audouin & Milne-Edwards, 1832	*	*		IP
<i>Sigalion squamatum</i> Delle Chiaje, 1830	*	*		AM
<i>Stbenelais boa</i> (Johnston, 1839)	*	*	*	Co
<i>Stbenelais ctenolepis</i> (Claparède, 1868)	*			E
<i>Stbenelais limicola</i> (Ehlers, 1864)	*	*	*	Bi
<i>Thalenessa dendrolepis</i> (Claparède, 1868)	*	*	*	AM
EULEPETHIDAE				
<i>Pareulepis geayi</i> (Fauvel, 1918)	*	*		E
CHRYSOPETALIDAE				
<i>Bhawania reysi</i> Katzmann, Laubier & Ramos, 1974		*		E
<i>Chrysopetalum debile</i> (Grube, 1855)	*	*	*	IP
PISIONIDAE				
<i>Pisione remota</i> (Southern, 1914)		*		Co
AMPHINOMIDAE				
<i>Chloeia venusta</i> Quatrefages, 1865		*		O
<i>Hermodice carunculata</i> (Pallas, 1766)		*		C
EUPHROSYNIDAE				
<i>Euphrosine foliosa</i> Audouin & Milne-Edwards, 1833	*	*	*	Co
<i>Euphrosine myrtilosa</i> Savigny, 1818		*		C
SPINTHERIDAE				
<i>Spinther arcticus</i> (M. Sars, 1851)	*			Bo
ONUPHIDAE				
<i>Aponuphis bilineata</i> (Baird, 1870)	*	*	*	AM
<i>Aponuphis brementi</i> (Fauvel, 1916)	*	*	*	E
<i>Aponuphis fauveli</i> (Rioja, 1918)	*	*	*	AM
<i>Aponuphis willisiei</i> Cantone & Bellan, 1994	*	*		E
<i>Diopatra neapolitana</i> Delle Chiaje, 1841	*	*		C
<i>Hyalinoecia tubicola</i> (O.F. Müller, 1776)	*	*	*	Co
<i>Nothria conchylega</i> (M. Sars, 1835)	*	*	*	Co
<i>Omuphis eremita</i> Audouin & Milne-Edwards, 1833		*		C
<i>Paradiopatra lepta</i> (Chamberlin, 1919)	*	*		O
<i>Rhamphobrachium brevibranchiatum</i> (Ehlers, 1875)	*	*	*	O

	N	C	S	Category
EUNICIDAE				
<i>Eumice aphroditois</i> (Pallas, 1788)	*		*	IP
<i>Eumice barassi</i> Audouin & Milne-Edwards, 1834	*	*	*	AM
<i>Eumice pennata</i> (O.F. Müller, 1778)	*	*	*	Co
<i>Eumice schizobranchia</i> Claparède, 1870	*		*	E
<i>Eumice torquata</i> Quatrefages, 1865	*	*	*	O
<i>Eumice vittata</i> (Delle Chiaje, 1828)	*	*	*	C
<i>Lysibranchia paucibranchiata</i> Cantone, 1983		*		E
<i>Lysidice ninetta</i> Audouin & Milne-Edwards, 1833	*	*	*	C
<i>Marphysa bellii</i> (Audouin & Milne-Edwards, 1833)	*	*	*	C
<i>Marphysa fallax</i> Marion & Bobretzky, 1875	*		*	AM
<i>Marphysa kinbergi</i> Mc Intosh, 1910	*	*		AM
<i>Marphysa sanguinea</i> (Cantone, 1983)	*	*	*	C
<i>Nematonereis unicornis</i> Schmarda, 1861	*	*	*	C
<i>Palola siciliensis</i> (Grube, 1840)	*	*	*	Co
LUMBRINERIDAE				
<i>Lumbricalus adriatica</i> (Fauvel, 1940)	*			AM
<i>Lumbrinerides acuta</i> (Verrill, 1875)			*	AM
<i>Lumbrineriopsis paradoxa</i> (Saint-Joseph, 1888)	*	*	*	AM
<i>Lumbrineris latreilli</i> Audouin & Milne-Edwards, 1834	*	*	*	Co
<i>Lumbrineris coccinea</i> (Renier, 1804)	*	*	*	Co
<i>Lumbrineris gracilis</i> (Ehlers, 1868)	*	*	*	AM
<i>Lumbrineris nonatoi</i> Ramos, 1976		*		E
<i>Ninoe armoricana</i> Glemarec, 1968	*	*	*	AM
<i>Ninoe kinbergi</i> (Ehlers, 1887)	*	*		E
<i>Scoletoma emandibulata mabiri</i> (Ramos, 1976)		*	*	E
<i>Scoletoma fragilis</i> (O.F. Müller, 1776)	*	*	*	Bo
<i>Scoletoma funchalensis</i> (Kinberg, 1865)	*	*	*	AM
<i>Scoletoma impatiens</i> (Claparède, 1868)	*	*	*	C
<i>Scoletoma rovigniensis</i> (Fauvel, 1940)	*	*		E
<i>Scoletoma tetraura</i> (Schmarda, 1861)		*	*	Co
ARABELLIDAE				
<i>Arabella coeca</i> Fauvel, 1940	*	*		E
<i>Arabella geniculata</i> (Claparède, 1868)	*	*	*	E
<i>Arabella iricolor</i> (Montagu, 1804)	*	*	*	Co
<i>Drilonereis filum</i> (Claparède, 1868)	*	*	*	C
<i>Oligognatus bonelliae</i> Spengel, 1882	*			E
OENONIDAE				
<i>Halla parthenopeia</i> (Delle Chiaje, 1828)			*	E
DORVILLEIDAE				
<i>Dorvillea atlantica</i> (Mc Intosh, 1875)	*		*	AM

	N	C	S	Category
<i>Dorvillea rubrovittata</i> (Grube, 1855)	*	*	*	C
<i>Ophryotroca puerilis</i> Claparède & Metschnikow, 1869	*			O
<i>Protodorvillea kefersteini</i> (Mc Intosh, 1869)	*	*		Bi
<i>Schistomeringos neglectus</i> (Fauvel, 1923)	*	*	*	AM
<i>Schistomeringos rudolphi</i> (Delle Chiaje, 1828)	*	*	*	C
STERNASPIDIDAE				
<i>Sternaspis scutata</i> (Renier, 1807)	*	*	*	Co
OWENIIDAE				
<i>Myriochele oculata</i> Zachs, 1923	*	*		Co
<i>Owenia fusiformis</i> Delle Chiaje, 1841	*	*	*	Co
FLABELLIGERIDAE				
<i>Brada villosa</i> (Rathke, 1843)	*	*	*	Co
<i>Diplocirrus glaucus</i> Malmgren, 1867	*	*	*	Bi
<i>Flabelligera affinis</i> M. Sars, 1829	*	*		C
<i>Flabelligera diplochaitus</i> (M. Sars, 1829)	*			E
<i>Pherusa monilifera</i> (Delle Chiaje, 1841)	*		*	AM
<i>Pherusa plumosa</i> (O.F. Müller, 1776)	*	*		AM
<i>Piromis eruca</i> (Claparède, 1870)	*	*		C
ACROCIRRIDAE				
<i>Acrocirrus frontifilis</i> (Grube, 1860)	*	*		C
<i>Macrochaeta clavicornis</i> (M. Sars, 1835)		*		AM
FAUVELIOPSIDAE				
<i>Fauveliopsis adriatica</i> Katzmann & Laubier, 1974		*		E
<i>Fauveliopsis fauchaldi</i> Katzmann & Laubier, 1974		*		E
PECTINARIIDAE				
<i>Pectinaria auricoma</i> (O.F. Müller, 1776)	*	*	*	AM
<i>Pectinaria belgica</i> (Pallas, 1776)	*	*		Bo
<i>Pectinaria koreni</i> (Malmgren, 1866)	*	*	*	AM
<i>Petta pusilla</i> Malmgren, 1865	*	*		AM
AMPHARETIDAE				
<i>Amage adpersa</i> (Grube, 1863)	*	*	*	AM
<i>Ampharete acutifrons</i> (Grube, 1860)	*	*	*	Co
<i>Amphicteis gunneri</i> (M. Sars, 1835)	*	*		Bo
<i>Anobothrus gracilis</i> (Malmgren, 1866)		*		Bo
<i>Auchenoplax crinita</i> Ehlers, 1887		*		AM
<i>Lysippe labiata</i> Malmgren, 1866	*	*		Bo
<i>Melinna cristata</i> (M. Sars, 1851)	*			AA

	N	C	S	Category
<i>Melinna monoceroides</i> Fauvel, 1936		*		AM
<i>Melinna palmata</i> Grube, 1870	*	*	*	AM
<i>Sabellides octocirrata</i> (M. Sars, 1835)	*	*	*	Bi
<i>Sosane sulcata</i> Malmgren, 1866	*		*	AM
TRICHOBRANCHIIDAE				
<i>Octobranchus lingulatus</i> (Grube, 1863)	*			AM
<i>Terebellides stroemi</i> M. Sars, 1835	*	*	*	AA
<i>Trichobranchus glacialis</i> Malmgren, 1866		*		Bi
TEREBELLIDAE				
<i>Amaeana trilobata</i> (M. Sars, 1863)	*	*		Bi
<i>Amphitrite cirrata</i> O.F. Müller, 1771	*	*	*	Co
<i>Amphitrite rubra</i> (Risso, 1828)	*	*	*	Co
<i>Amphitrite variabilis</i> (Risso, 1826)	*			E
<i>Amphitritides gracilis</i> (Grube, 1860)	*	*	*	AM
<i>Axionice maculata</i> (Dalyell, 1853)		*		AA
<i>Eupolyminia nebulosa</i> (Montagu, 1818)	*	*	*	Co
<i>Eupolyminia nesidensis</i> (Delle Chiaje, 1828)	*	*	*	AM
<i>Lanice conchylega</i> (Pallas, 1766)	*	*		AM
<i>Lysilla loveni</i> Malmgren, 1865	*			Bi
<i>Nicolea venustula</i> (Montagu, 1818)	*			Co
<i>Nicolea zostericola</i> (Oersted, 1844)	*			Bi
<i>Pista cretacea</i> (Grube, 1860)			*	AM
<i>Pista cristata</i> (O.F. Müller, 1776)	*		*	Bi
<i>Polycirrus aurantiacus</i> Grube, 1860	*	*	*	AM
<i>Polycirrus haematodes</i> (Claparède, 1864)	*			AM
<i>Polycirrus tenuisetis</i> Langerhans, 1880		*		AM
<i>Proclea graffi</i> Langerhans, 1884		*		Bo
<i>Streblosoma bairdi</i> (Malmgren, 1866)	*		*	Bo
<i>Terebella lapidaria</i> Linnaeus, 1767	*		*	C
<i>Thelepus cincinatus</i> (Fabricius, 1780)	*		*	Co
<i>Thelepus setosus</i> (Quatrefages, 1865)	*			Co
<i>Thelepus triserialis</i> (Grube, 1855)			*	C
SABELLARIIDAE				
<i>Sabellaria alcocki</i> Gravier, 1906	*			Co
<i>Sabellaria spinulosa</i> Leuckart, 1849		*	*	AM
SABELLIDAE				
<i>Amphicorina armandi</i> (Claparède, 1864)	*		*	IP
<i>Amphicorina eimeri</i> (Langerhans, 1880)			*	AM
<i>Amphicorina persinosa</i> (Ben Eliahu, 1975)			*	O
<i>Amphiglena mediterranea</i> (Leydig, 1851)	*	*	*	Co

	N	C	S	Category
<i>Bispira mariae</i> Lo Bianco, 1893	*	*		E
<i>Bispira viola</i> (Grube, 1863)		*		E
<i>Branchiomma bombyx</i> (Dalyell, 1853)	*	*	*	AM
<i>Branchiomma lucullanum</i> (Dalle Chiaje, 1828)	*	*	*	AM
<i>Branchiomma moebii</i> (Knight-Jones, 1994)	*			E
<i>Chone acustica</i> (Claparède, 1870)	*	*	*	AM
<i>Chone arenicola</i> Langerhans, 1880			*	AM
<i>Chone collaris</i> Langerhans, 1880	*	*	*	O
<i>Chone dunerii</i> Malmgren, 1867	*	*	*	Co
<i>Chone filicaudata</i> Southern, 1914	*		*	AM
<i>Demonax tommasi</i> Giangrande, 1994			*	E
<i>Demonax brachybona</i> (Claparède, 1870)	*	*	*	AM
<i>Demonax langerhansii</i> Knight-Jones, 1983			*	AM
<i>Demonax tenuicollaris</i> Grube, 1870			*	E
<i>Desdemona ornata</i> Banse, 1957			*	Co
<i>Euchone rosea</i> Langerhans, 1884	*		*	AM
<i>Euchone rubrocincta</i> (M. Sars, 1861)	*	*		AA
<i>Fabricia stellaris adriatica</i> Banse, 1956	*			E
<i>Fabricia stellaris stellaris</i> (O.F. Müller, 1774)	*	*		AM
<i>Fabriciola tonerella</i> Banse, 1956			*	E
<i>Hypsicomus stichophthalmos</i> (Grube, 1863)	*	*	*	AM
<i>Jasmineira candela</i> (Grube, 1863)	*		*	AM
<i>Jasmineira caudata</i> Langerhans, 1880	*	*		AM
<i>Jasmineira elegans</i> Saint-Joseph, 1884			*	AM
<i>Laonome sabnacidis</i> Claparède, 1868	*	*		E
<i>Megalomma vesiculosum</i> (Cantone, 1983)	*	*		C
<i>Myxicola aesthetica</i> (Claparède, 1870)	*			AM
<i>Myxicola infundibulum</i> (Renier, 1804)	*			Bi
<i>Perkinsiana rubra</i> (Langerhans, 1880)		*		AM
<i>Perkinsiana socialis</i> (Langerhans, 1884)		*		AM
<i>Pseudofabricia aberrans</i> Cantone, 1972			*	E
<i>Pseudofabriciella analis</i> Fitzhugh, Giangrande & Simbora, 1993			*	E
<i>Pseudopotamilla ceresinae</i> Grube, 1870		*		E
<i>Pseudopotamilla veniformis</i> (Bruguiere, 1789)	*	*	*	Co
<i>Sabella discifera</i> Grube, 1874	*	*	*	AM
<i>Sabella pavonina</i> Savigny, 1822	*		*	AM
<i>Sabella spallanzani</i> (Gmelin, 1791)	*	*	*	AM
SERPULIDAE				
<i>Apomatus cf. ampulliferus</i> , Philippi 1844		*		AM
<i>Ditrupa arietina</i> (O.F. Müller, 1776)	*		*	C
<i>Ficopomatus enigmaticus</i> (Fauvel, 1923)	*	*	*	AM
<i>Filoglypta implexa</i> Berkeley, 1827	*		*	Co
<i>Filoglypta calyculata</i> (O.G. Costa, 1861)			*	AM

	N	C	S	Category
<i>Hydroides dianthus</i> (O.G. Costa, 1861)	*	*	*	AM
<i>Hydroides elegans</i> (Haswell, 1883)	*	*	*	C
<i>Hydroides helmatus</i> (Iroso, 1921)	*			E
<i>Hydroides niger</i> Zibrowius, 1971	*		*	E
<i>Hydroides norvegicus</i> Gunnerus, 1768	*	*	*	AM
<i>Hydroides pseudouncinatus</i> Zibrowius, 1968	*	*	*	E
<i>Hydroides stoichadon</i> Zibrowius, 1971			*	E
<i>Metavermilina multicristata</i> (Philippi, 1844)	*		*	AM
<i>Placostegus crystallinus</i> Zibrowius, 1968			*	AM
<i>Placostegus tridentatus</i> (Fabricius, 1779)			*	AA
<i>Pomatoceros lamarckii</i> (Quatrefages, 1865)	*			AM
<i>Pomatoceros triqueter</i> (Linnaeus, 1767)	*	*	*	AM
<i>Protula tubularia</i> (Montagu, 1803)	*	*	*	Co
<i>Serpula concharum</i> Langerhans, 1880	*	*		O
<i>Serpula lobiancoi</i> Rioja, 1917	*		*	AM
<i>Serpula vermicularis</i> Linnaeus, 1767	*	*	*	Co
<i>Spirobranchus polytrema</i> (Philippi, 1844)		*	*	Co
<i>Vermiliopsis infundibulum</i> (Philippi, 1844)	*	*	*	Co
<i>Vermiliopsis labiata</i> (O.G. Costa, 1861)	*	*	*	Co
<i>Vermiliopsis striaticeps</i> (Grube, 1862)	*	*	*	AM
SPIRORBIDAE				
<i>Janua pagenstecheri</i> (Quatrefages, 1865)	*			Co
<i>Neodexiospira pseudocorrugata</i> (Bush, 1904)	*			Co
<i>Pileolaria militaris</i> Claparède, 1870	*		*	Co
<i>Simplaria pseudomilitaris</i> (Thiriot-Quiévreux, 1965)	*		*	Co
POLYGORDIIDAE				
<i>Polygordius triestinus</i> Woltereck, 1906	*			E

In the north Adriatic (401 species belonging to 49 families) the eight richest families are: Syllidae (45 species), Spionidae and Sabellidae (26), Phyllodocidae (25), Nereididae and Serpulidae (19), Terebellidae (18).

In the Central Adriatic (373 species belonging to 50 families) the richest families are: Syllidae (34 species), Paraonidae (24), Spionidae (23), Sabellidae (21), Phyllodocidae (17), Maldanidae (15), Nereididae and Serpulidae (14).

In the south Adriatic (332 species belonging to 45 families) the most abundant families are: Syllidae with 73 species, Sabellidae (27), Serpulidae (21), Nereididae (16), Maldanidae (14), Spionidae and Paraonidae (13), Phyllodocidae, Eunicidae and Terebellidae (12).

It appears clearly by these data that because of the different ecological conditions (depth, salinity, type of bottoms, fluvial flowing) the specific composition of Polychaeta

Tab. II - Specific richness of the Adriatic Basins. N: Northern Adriatic Sea; C: Central Adriatic Sea; S: Southern Adriatic Sea.

	TOTAL SPECIES	N	C	S
ORBINIIDAE	10	7	8	5
APISTOBRANCHIDAE	1		1	
SPIONIDAE	34	26	23	13
MAGELONIDAE	6	5	2	3
POECILOCHAETIDAE	2	2	2	2
LONGOSOMATIDAE	1		1	
CHAETOPTERIDAE	5	5	3	2
PARAONIDAE	25	9	24	13
CIRRATULIDAE	13	12	10	8
CTENODRILIDAE	2	2		
COSSURIDAE	1	1	1	
CAPITELLIDAE	14	11	9	6
ARENICOLIDAE	3	2		2
MALDANIDAE	19	14	15	14
OPHELIIDAE	10	4	9	2
SCALIBREGMATIDAE	4	2	4	2
PHYLLODOCIDAE	30	25	17	12
GLYCERIDAE	8	8	8	7
GONIADIDAE	4	4	4	3
SPHAERODORIDAE	8		8	1
HESIONIDAE	17	11	10	8
PILARGIIDAE	9	6	6	1
SYLLIDAE	93	45	34	73
NEREIDIDAE	23	19	14	16
NEPHTYIDAE	11	7	11	3
PARALACYDONIIDAE	1	1	1	1
APHRODITIDAE	3	3	3	3
POLYNOIDAE	19	15	11	9
ACOETIDAE	3	2	3	
PHOLOIDAE	2			2
SIGALIONIDAE	11	11	7	6
EULEPETHIDAE	1	1	1	
CHRYSOPETALIDAE	2	1	2	1
PISIONIDAE	1		1	
AMPHINOMIDAE	2		2	
EUPHROSYNIDAE	2	1	2	1
SPINTHERIDAE	1	1		
ONUPHIDAE	10	9	10	6
EUNICIDAE	14	13	11	12
LUMBRINERIDAE	15	11	13	11
ARABELLIDAE	5	5	4	3
OENONIDAE	1			1
DORVILLEIDAE	6	6	4	4
STERNASPIDIDAE	1	1	1	1
OWENIIDAE	2	2	2	1
FLABELLIGERIDAE	7	7	5	3
ACROCIRRIDAE	2	1	2	
FAUVELIOPSIDAE	2		2	
PECTINARIIDAE	4	4	4	2
AMPHARETIDAE	11	8	9	5
TRICHOBRANCHIIDAE	3	2	2	1
TEREBELLIDAE	23	18	11	12
SABELLARIIDAE	2	1	1	1
SABELLIDAE	41	26	21	27
SERPULIDAE	25	19	14	21
SPIROBIDAE	4	4		2
POLYGORDIIDAE	1	1		
Number of families	57	49	50	45
Number of species	580	401	373	332

population, is different in every Adriatic sector (Tab. II). Moreover, these results do not agree with those concerning the whole benthos that shows an impoverished fauna in the northern basin and a much richer fauna in the Central Adriatic.

The Polychaeta species, according to their distribution, were assigned to the following zoogeographical categories derived from the literature: (1) *Endemic*: species distributed only in the Mediterranean Sea; (2) *Atlantic-Mediterranean*: species distributed in the eastern Atlantic and in the Mediterranean; (3) *Amphi-Atlantic*: species distributed in both side of the Atlantic and in the Mediterranean; (4) *Indo-Pacific*: species distributed in the Indian and Pacific Oceans and in the Mediterranean; (5) *Cosmopolitan*: species widely spread in the Atlantic, Pacific and Indian Oceans; (6) *Boreal*: species distributed in the Arctic, boreal Atlantic and Pacific Oceans; (7) *Bipolar*: species arctic to boreal and Antarctic till austral regions. (8) *Circumtropical*: species distributed in the warm temperate and tropical areas; (9). *Other*: species with an insufficiently known geographical distribution.

Out of 580 species found in the Adriatic Sea, 196 were characterized as Atlantic-Mediterranean, 127 as Cosmopolitan, 89 as Endemic (24 of them are endemic of the Adriatic Sea), 49 as Circumtropical, 35 as Boreal, 25 as Bipolar, 23 as Amphi-Atlantic, 12 as Indo-Pacific and 24 as Other (Fig. 1). These first data classify all the species on the basis of their geographic distribution, independently from their bathymetry, abundance or type of bottom; therefore they do not necessarily give information on their ecological requirements.

Summarizing, most species of the Adriatic benthic Polychaeta are Atlantic-Mediterranean, followed by those cosmopolitan and endemic; well represented are the warmer elements (Circumtropical and Indo-Pacific) while lower is the influence of colder ones (Boreal); scarce the other categories.

The comparison of the distribution of the various zoogeographical categories in the different Adriatic sectors does not show remarkable differences but little variation in their percentage (Tab. III): in the northern basin (Fig. 2) there are more cosmopolitan and Indo-Pacific species; in the southern (Fig. 4) the Atlantic

Tab. III - Biogeography of the Adriatic Polychaeta. N: Northern Adriatic Sea; C: Central Adriatic Sea; S: Southern Adriatic Sea.

CATEGORY	Adriatic	N	C	S
Amphi-Atlantic (AA)	23	14	15	10
Atlantic-Mediterranean (AM)	196	134	113	117
Bipolar (Bi)	25	16	15	9
Boreal (Bo)	35	18	21	13
Circumtropical (C)	50	43	40	35
Cosmopolitan (Co)	127	112	100	89
Other (O)	24	11	13	13
Indo-Pacific (IP)	11	9	6	6
Endemic (E)	89	44	50	40
Number of species	580	401	373	332

Mediterranean and the others are predominant; in the Central basin (Fig. 3) all the other categories are more abundant, especially the Adriatic endemic species (*Aricidea mariannae* Katzmann and Laubier, 1975, *Aricidea pseudannae* Katzmann and Laubier, 1975, *Paraonides myriamae* Katzmann and Laubier, 1975, *Paraonis tenera* Grube, 1878, *Ophelia translucens* (Katzmann, 1973), *Clavodorum adriaticum* Katzmann, 1973, *Sphaerodoridium longiparapodium* Katzmann, 1973, *Otopsis chardyi* Katzmann, Laubier and Ramos, 1974, *Pareulepis geayi* (Fauvel, 1918), *Bhawania reyssi* Katzmann, Laubier and Ramos, 1974, *Scoletoma rovignensis* (Fauvel, 1940), *Arabella coeca* Fauvel, 1940, *Fauveliopsis adriatica* Katzmann and Laubier, 1974, *Fauveliopsis fauchaldi* Katzmann and Laubier, 1974, *Pseudopotamilla ceresinae* Grube, 1870).

DISCUSSION

The dominance of Atlantic-Mediterranean species was reported by Ekman (1953) and Gamulin-Brida (1974) for the Adriatic benthos, but Arvanitidis et al. (2002), for the Polychaeta of this sea report the cosmopolitan species as dominant, followed by the Atlantic-Mediterranean, the ampho-Atlantic, the endemic and the Indo-Pacific. It should be noted that these Authors consider only these five categories, instead of nine.

The abundance of endemics has been reported both for the Mediterranean (17%) and the Adriatic Polychaete fauna by Arvanitidis et al. (2002). It should be noted that several of the 89 endemic species have been reported till now exclusively from the Adriatic and that recently *Otopsis chardyi* Katzmann, Laubier and Ramos, 1974, *Synelmis dineti* Katzmann, Laubier and Ramos, 1974, *Bhawania reyssi* Katzmann, Laubier and Ramos, 1974, *Scoletoma rovignensis* (Fauvel, 1940), *Malmgreniella darbouxi* Pettibone, 1993 and *Branchiomma moebii* (Knight-Jones, 1994) have been found also in Aegean Sea (Arvanitidis, 2000). The presence of these species in both seas shows a strong affinity of the Adriatic Sea to the Eastern Mediterranean.

The dominance of the Atlantic-Mediterranean species confirms the Atlantic origin of the Adriatic population; the high number of cosmopolitan species is not surprising since in all the Mediterranean areas this category is dominant (Arvanitidis et al., 2002).

The Mediterranean Sea, together with the Atlantic Ocean, derives from the old Tethys and until the Miocene it communicated with the present Indian Ocean. The ancient Mediterranean population, in consequence of the high temperature, was tropical; therefore some Indo-Pacific taxa might derive from that warm fauna. About 5-6 million years ago, during the "Messinian crisis" the Mediterranean Sea dried up nearly totally; later, during Pliocene, marine waters and organisms entered this sea from the Atlantic through the Strait of Gibraltar.

During the Quaternary there was immigration of deep and cold waters from Lusitanian province into the Mediterranean Sea during the glacial periods and of shallow and warm waters from Senegalese province during the interglacial ones.

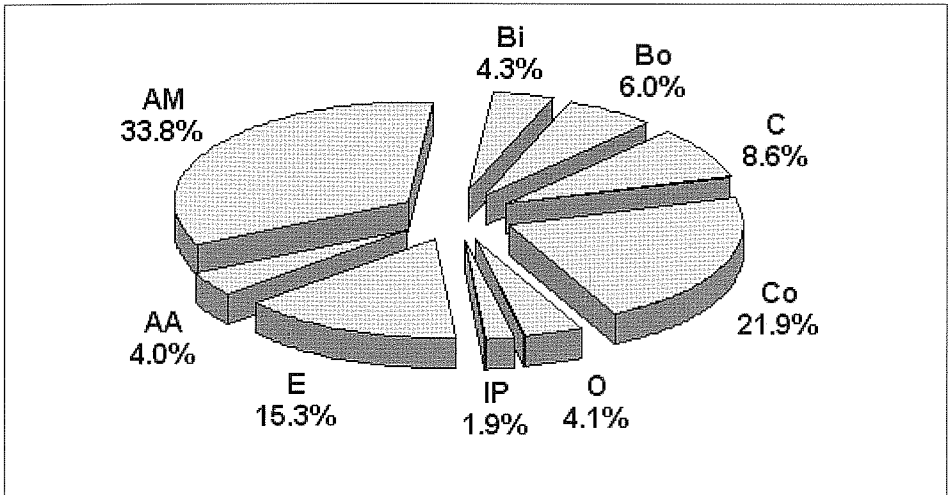


Fig. 1 - Distribution of Polychaete species in the Adriatic Sea. AA: amphi - Atlantic; AM: Atlantic - Mediterranean; Bi: bipolar; Bo: boreal; C: circumtropical; Co: cosmopolitan; E: endemic; IP: Indo - Pacific; O: other.

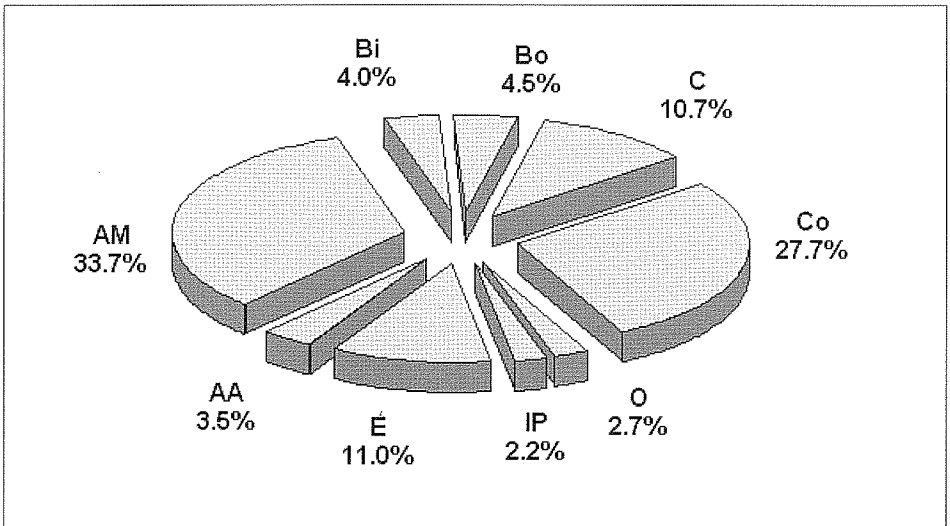


Fig. 2 - Distribution of Polychaete species in the Northern Adriatic Sea. AA: amphi - Atlantic; AM: Atlantic - Mediterranean; Bi: bipolar; Bo: boreal; C: circumtropical; Co: cosmopolitan; E: endemic; IP: Indo - Pacific; O: other.

Recently a new problem merited particular attention: the aperture of the Suez Canal in 1869 permitted the penetration into the Mediterranean Sea of warm species, belonging to different taxonomic groups, from the Red Sea and Indo-Pacific Regions (lessepsian migration). The Polychaetes *Branchiosyllis exilis* (Gravier, 1900), *Metasychis gotoi* (Izuka, 1902) and *Rhodine gracilior* Tauber, 1879, examples of this lessepsian migration, are present in the Adriatic Sea.

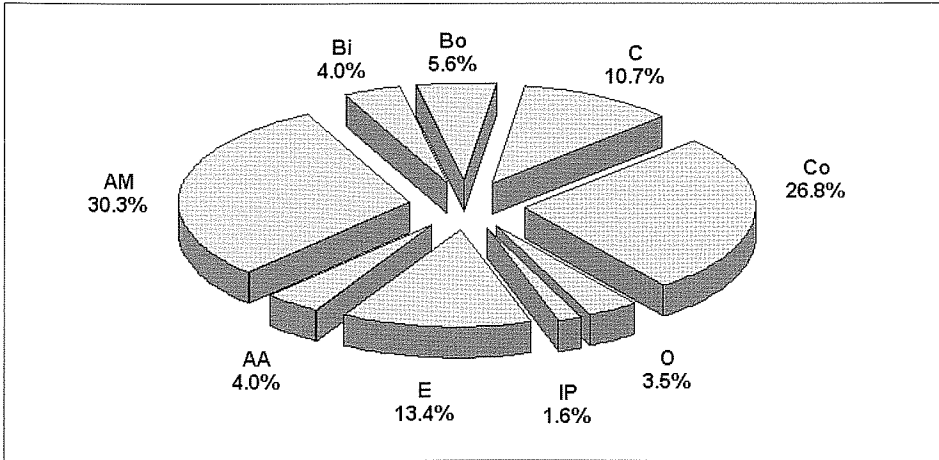


Fig. 3 - Distribution of Polychaete species in the Central Adriatic Sea. AA: amphi – Atlantic; AM: Atlantic – Mediterranean; Bi: bipolar; Bo: boreal; C: circumtropical; Co: cosmopolitan; E: endemic; IP: Indo – Pacific; O: other.

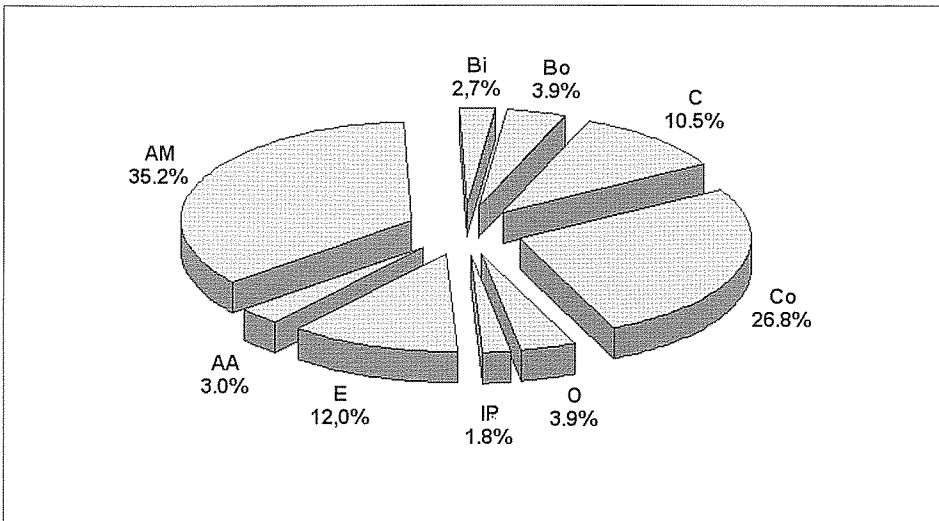


Fig. 4 - Distribution of Polychaete species in the Southern Adriatic Sea. AA: amphi – Atlantic; AM: Atlantic – Mediterranean; Bi: bipolar; Bo: boreal; C: circumtropical; Co: cosmopolitan; E: endemic; IP: Indo – Pacific; O: other.

All these geological and anthropic events might explain the present polychetological population.

I think that these data may be useful as database for future studies; some of them are going to be changed when the exact zoogeographical position of the species, whose distribution is matter of debates, will be cleared and when the problem of other “cosmopolitan” species will be solved.

CONCLUSION

Up to 1999 1036 species of benthic Polychaetes have been reported from the Mediterranean Sea (Arvanitidis et al., 2002); as shown by the present study, 580 species, corresponding to 51% of the total Mediterranean species, have been reported from the Adriatic Sea; this sea is hence the third richest area of the Mediterranean Region, after western Mediterranean (884 species), and Aegean Sea (593) and followed by Central Basin (Ionian Sea and Sea of Sidra) (528), Levantine Basin (451) and Black Sea (310).

The number of species appears to be decreasing from north to south (401, 373, 332), but the last basin is still much less studied than the other two.

These first data on the benthic Adriatic Polychaeta confirm the Atlantic origin of the Mediterranean (and Adriatic) Sea; the presence of species in the Adriatic and Aegean Sea shows an affinity of the first sea with the eastern Mediterranean basin; the data beside show a high number of cosmopolitan and endemic species and a moderate influence of warmer and colder elements. The present distribution can be explained by the complex geological Mediterranean history, but it is subjected to be changed with the improvement of the studies aimed to the zoogeography, that till now have been only marginal.

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