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Inventory and the biogeographical affinities of Annelida Polychaeta in the Algerian coastline (Western Mediterranean)

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Abstract

From collected data analyzed to produce an inventory of all polychaetes in Algerian waters, the diversity of this group was estimated as 534 species. The largest families are Syllidae (66 species), Spionidae (37 species) and Terebellidae (27 species). The presence of those listed species along the Algerian coast was compared with their occurrence in nine other areas of the Mediterranean Sea, in the Black Sea and in four other more distant seas around the world. Comparisons are also made with respect to the biogeographical origin for each species. The polychaete fauna of the Algerian coast is among the richest of the Mediterranean Sea and comparable to the diversity reported for the French Mediterranean continental shelf and that in the Aegean Sea, but higher than that found in the nearby coastlines of Morocco and Tunisia. Most of the species found have an Atlantic origin and are present in the western Mediterranean Sea. This current inventory includes eight non-indigenous polychaete species found in the Algerian waters.

Keywords: Biogeography; inventory; non-native species; benthos.

Introduction

Establishing an inventory of marine species remains a challenging task despite the availability of numerous records (especially via the Internet), and the existing data already provided by taxonomists and ecologists. Coll *et al.* (2010) carried out the first complete inventory of marine species in the Mediterranean Sea at the end of the 2010s.

The entire Mediterranean region, with its smaller distinct areas, has long been recognized as rich in terms of marine biodiversity (Coll *et al.*, 2010, 2012; Altobelli *et al.*, 2017). In their review for the Mediterranean Sea, Coll *et al.* (2010) reported 16,848 different marine species, including 10,902 invertebrates. Moreover, these authors stressed that these numbers were probably still an underestimate and needed to be supplemented to include additional species found in some southern areas of the sea as well as those living in the deeper regions of the eastern basin. This gap in their records mostly concerns the coasts of North Africa, mainly relating to Libya and Algeria. Such an apparent lack of available information is probably due to the numerous data included in early

publications written in French and the large amount of grey literature including PhD theses that are often not accessible via the web.

The annelid polychaetes are amongst the most diversified of invertebrates and several publications report inventories for this group at the local, national and regional scale, including the coastlines along Morocco and Tunisia in the southern part of the western basin of the Mediterranean Sea.

Some inventories for polychaetes cover the entire Mediterranean Sea (Arvanitidis *et al.*, 2002; Castelli *et al.*, 2008; Coll *et al.*, 2010), while others are limited to certain areas: Moroccan waters (both the Atlantic and Mediterranean coasts) (Gillet, 2017), the Mediterranean coast of France (Laubier & Paris, 1962; Dauvin *et al.*, 2006), Italian waters (Castelli *et al.*, 1995, 2008), the Adriatic Sea (Musco, 2012; Mikac, 2015), the Tunisian coasts (Ayari *et al.*, 2009; Zaâbi *et al.*, 2012, Mosbahi *et al.*, 2017), the Aegean Sea (Ergen, 1976; Simbora & Nicolaidou, 1994, 2001; Arvanitidis, 2000; Ergen *et al.*, 2002, 2006; Faulwetter *et al.*, 2017), the Levantine Sea (Laubier, 1966; Ben-Eliahu, 1995; Çinar & Ergen, 2003; Çinar, 2005, 2007, 2009; Çinar *et al.*, 2003, 2014;

Mutlu *et al.*, 2010; Faulwetter *et al.*, 2017; Dorgham *et al.*, 2013, 2014), the Turkish coastline (Çinar *et al.*, 2014) and the Black Sea (Arvaniditis *et al.*, 2002; Şahin & Çinar, 2012). However, no complete inventory is available for the 1200km of Algerian coastline. The first studies of polychaetes in Algerian waters took place at the turn of the 20th century. Viguier (1886 to 1920) and Gravier & Dantan (1928) described several new species of polychaetes in the Bay of Algiers, including the genus *Alciop*e Viguier, 1886, the genus *Frennia* Viguier, 1912 (*F. dubia* Viguier, 1912, *F. propinqua* Viguier, 1920), the genus *Iospilus* Viguier, 1886 (*I. phalacroides* Viguier, 1886), the genus *Maupasia* Viguier, 1886 (*M. coeca* Viguier, 1886), the genus *Paratospilus* Viguier, 1911 (*P. affinis* Viguier, 1911), and the species *Nereis icosiensis* Gravier & Dantan, 1928. Most of the polychaetes found during this period were reported by Fauvel (1923, 1927a, 1927b) in the French publication 'Faune de France, polychètes errantes et sédentaires'. Fauvel (1927b) wrote:

'A l'exception des Mémoires de Viguier sur le plancton de la Baie d'Alger et de quelques mentions par Marenzeller (1888) on ne trouve que de bien rares indications disséminées dans d'autres travaux. Jamais à notre connaissance la Faune des Polychètes des Côtes d'Algérie n'a encore été l'objet de recherches suivies et cela est regrettable car cette étude fournirait sûrement bien des observations intéressantes' translated as 'Other than the memoirs of Viguier on the plankton in the Bay of Algiers and some references by Marenzeller (1888), it is very rare to find anything disseminated in other studies. To the best of our knowledge, polychaete fauna off the coast of Algeria has never been the subject of research, which is regrettable, as such a study would surely provide some interesting observations'.

Marcel (1962) studied the annual cycle of *Perinereis cultrifera*. In studies on the phanerogam meadows on the Algerian coastline near Bou Ismail, Le Gall (1969) identified 72 polychaetes species, whereas Falconetti (1970) listed 64 polychaete species from the maërl beds in the same bay. Separately, some data was acquired for the waters in the harbour of Algiers (Bakalem & Romano, 1983, 1988; Rebzani-Zahaf *et al.*, 1988; Rebzani-Zahaf, 1990, 1992). Populations of some nereids in shallow hard substrates from the eastern part of the Algerian coast were investigated by Rouabah & Scaps (2003) and also by Daas *et al.* (2010). In other work, Younsi *et al.* (2010) recorded the polychaetes of economic interest and Meghlaoui *et al.* (2015a,b) investigated the effects of local pollution on polychaetes. More recently Bakalem (2008) and Grimes (2010) studied the communities of soft bottom of all Algerian gulfs, bays and harbours, in reported work that includes inventories of polychaetes.

Despite this level of scientific interest, there has still been no complete inventory of all polychaetes found in Algerian waters. A total of 26 polychaete species were initially listed in the two monographs entitled 'Faune de France' (Fauvel, 1923, 1927a), whilst a further 69 species were later added by Gravier & Dantan (1928). Many further species have since been identified during the PhD research of Bakalem (2008) (444 species) and then by Grimes (2010) (506 species). All these previous documents from an essential basis for the current listing of polychaetes of the Algerian coast; other even more recent publications, (including as yet unpublished data and personal communications), have been used to supplement the complete inventory reported here.

The main objectives of this current study were:

- to present a current list of all polychaetes species

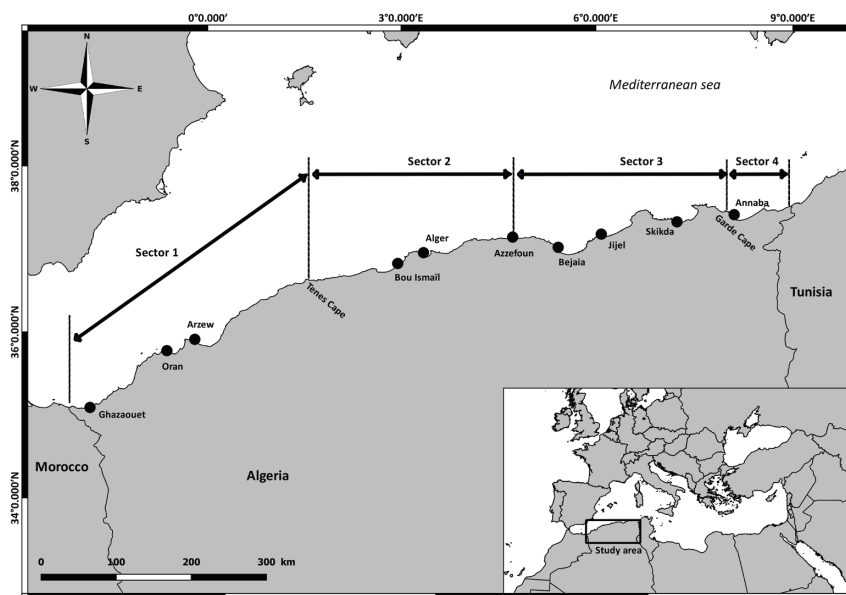


Fig. 1: Map of the Algerian coast with identification of the four study sectors with cited locations.

- recorded along the whole Algerian coastline;
- to attribute geographical affinities for each of the Algerian polychaete species;
- to compare the inventory of polychaete in the coastal waters off Algeria with similar studies compiled for other areas of the Mediterranean Sea.

Materials and Methods

General characteristics of the Algerian coastal zone

The Algerian coastline (Fig. 1) covers a variety of different habitats, ranging from rocky shorelines (sometimes with high cliffs), to sandy beaches and dunes found in many of the bays. The Algerian continental shelf is narrow, in contrast with those found in the north-western basin of the Mediterranean Sea, and especially the Gulf of Lion and the northern part of the Adriatic Sea. The distribution of soft sediments shows an increasing gradient (in terms of silt content) with sea depth; the seabed composition was characterized by a succession of fine sand, muddy sand, sandy mud and pure mud such as observed in the coastal seabed in the bay of Algiers and the bay of Bou Ismail (Bakalem, 2008; Bakalem *et al.*, 2020). Coarse sand and gravel make up the seabed near rocky shores, especially in the vicinity of the headlands bordering the bays (Grimes *et al.*, 2016). The shallow waters are also characterized by some specific habitats such as “seagrass zones” including *Posidonia oceanica* meadows and coralligenous formations both types having a high natural heritage value. The composition of the fauna in these habitats is characterized by a high diversity, and such areas are protected in many countries bordering the Mediterranean Sea against a range of environmental threats (Coll *et al.*, 2010, 2012; Altobelli *et al.*, 2017).

The circulation of the sea currents along the Algerian coast is mainly influenced by North Atlantic surface waters, which penetrate into the Mediterranean Sea through the Strait of Gibraltar. As they continue to progress eastward, the Atlantic waters gradually mix into the Mediterranean waters with its higher salinity. This movement is highlighted by the progressive impoverishment of Atlantic species travelling from the western to the eastern part of the Algerian coast (Dauvin *et al.*, 2013).

Data sources

The current study covers all the polychaetes that have been recorded along the Algerian coast, which runs 1200km from the Morocco to Tunisia. The study has been largely restricted to the continental shelf since there was little opportunity to access the continental slope or the offshore bathyal zones (Fig. 1). Zooplankton sampling in Algiers Bay (sector 2 in Fig. 1) enabled the collection of pelagic polychaetes and the subsequent description of several new species (Viguier, 1886, 1911, 1912, 1920; Gravier & Dantan, 1928). More recent studies have fo-

cused mainly on the soft-bottom communities found in the bays and gulfs of the Algerian continental shelf (Vaissière & Fredj, 1963; Le Gall, 1969; Falconetti, 1970; Bakalem, 2008; Grimes, 2010).

These results show a progressive change in the physico-chemical marine water characteristics along the Algerian coast from the entrance of the Atlantic current in the West and its attenuation moving to the eastern part of the coast. Since the end of the 1970, the studies of Bakalem (2008), Grimes (2010) and Dauvin *et al.* (2013) on the soft-bottom macrobenthic communities of the Algerian shallow habitats from west to east have enabled the identification of four main sectors along the coast (see Dauvin *et al.*, 2013). This classification takes into account numerous characteristics based on: 1) the hydrology and local marine currents (Furnestin & Allain, 1962a,b,c; Benzohra & Millot, 1990; Millot, 1987, 1988; Millot *et al.*, 1990), 2) the hydrology, nutrients and phytoplankton (Bernard, 1952, 1956, 1958), and 3) biological data including ichthyology and macrobenthos (Le Danois, 1925; Maurin, 1962; Vaissière & Fredj, 1963; Bakalem, 2008; Grimes, 2010).

Sector 1 is located in the West before the Almeria-Oran front with hydrological characteristics similar than those of the Atlantic waters (Fig. 1). Sectors 3 and 4 correspond to Mediterranean hydrological water characteristics while the sector 2 corresponds to an intermediate situation between the western sector 1 and the eastern sectors.

Data reported here follows the model set out by Dauvin *et al.* (2013), where the presence of polychaetes is reported for the four sectors, which enables the identification of changes in diversity along the Algerian coast from west to east. Sector 1 comprises the western part of the Algerian coast from the Moroccan border to Cap Tenes, including the bays of Ghazaouet, Oran and Arzew. Sector 2 is the central part of the coastline from Cap Tenes to Azeffoun, including the bays of Bou Ismail and Algiers. Sector 3 is defined as the eastern part of Algerian coast from Azeffoun to the Cap de Garde including the Bejaia, Jijel and Skikda bays. Finally, Sector 4 corresponds to the most eastern Algerian coast from Cap de Garde to the Tunisian border, including the bays of Annaba and El Kala (Fig. 1). The coastlines of Sectors 1 and 2 are similar in length (300-350 km), whilst the coastline of Sector 3 is longer (400 km) and that of Sector 4 shorter (150 km).

Nomenclature and polychaete classification

The nomenclature and classification of polychaetes have been the subject of several successive studies (Fauchald & Rouse, 1997; Rouse & Fauchald, 1997; Hansson, 1998; Rouse & Gonzalo, 2016; Weigert & Bleidorn, 2016). The present work adopts the most recent form of the classification system for families based on polychaete phylogeny (Weigert & Bleidorn, 2016).

The individual species were classified by family, and these are listed alphabetically in Table 1. The species are validated following the nomenclature and classification given by the World Register of Marine Species (WoRMS)

Table 1. List of the Polychaetes recorded along the Algerian coast. The species are classified following the alphabetical order of the families. Year of collection: 1886, 1911, 1912, 1920: Viguière; 1923, 1927: Fauvel; 1928, Gravier & Dantan; 1963: Vaisiere & Fredj; 1969: Le Gall; 1970: Falconetti; 2008: Bakalem; 2010: Grimes. S1: Sector 1...

Status: Qs: Questionable species; Sc: species complex; NIS: Non-Indigenous Species.

G: geographical origin, for legend see Figure 5; 1, 2,... geographical areas, for legend see Figure 6.

Species	Authority	Year of re-cord	Status	G	S1	S2	S3	S4	1	2	3	4	5	6	7	8	9	10	11	12	13	
Acroetiidae	<i>Eupanthalis kinbergi</i> <i>Panthalis oerstedii</i> <i>Polyodontes maxillosus</i>	1970 McIntosh, 1876 Kinberg, 1856 (Ranzani, 1817)		eamr em eamip	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Acroirridae	<i>Acrocirrus frontifilis</i> <i>Macrochaeta clavicornis</i>	2008 (Grube, 1860) (M. Sars, 1835)		eam eam	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Alciopiidae	<i>Naiades canrainii</i> <i>Rhynchonereella capitata</i> <i>Rhynchonereella peterii</i> <i>Torrea candida</i> <i>Lianadis longissima</i>	1886 Delle Chiaie, 1828 1886 Greeff, 1876 1886 (Langerhans, 1880) 1886 (Delle Chiaie, 1841) 1886 (Levinsen, 1885)		empip amp eam empip empip	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Ampharetidae	<i>Alkmarraria romijni</i> <i>Amage adpersa</i> <i>Amage gallasi</i> <i>Ampharete grubei</i> <i>Ampharete octocirrata</i> <i>Amphitecis gunneri</i> <i>Anobolhus gracilis</i> <i>Melinnia palmata</i>	2010 Horst, 1919 (Grube, 1863) Marion, 1875 2008 Malmgren, 1865 2008 (Sars, 1835) 2008 (M. Sars, 1835) 2008 (Malmgren, 1866) Grube, 1870	Qs	eam eam an c c eam c c	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
Amphinomidae	<i>Arenicola marina</i> <i>Chloeta venusta</i> <i>Hermidice carunculata</i>	2008 McIntosh, 1885 1923 Audouin & Milne Edwards, 1830	Qs	c eam eamr	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Aphroditidae	<i>Hipponeoe gaudichaudi</i> <i>Notopygos megalops</i> <i>Aphrodita aculeata</i> <i>Laemonice lysitrix</i> <i>Pontogenia chrysocoma</i>	2008 McIntosh, 1885 Linnaeus, 1758 (Savigny in Lamarck, 1818) 1963 (Baird, 1865) 1970 (Linnaeus, 1758)	Qs	eamr eamr mp c eam	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Arenicolidae	<i>Arenicolides branchialis</i> <i>Arenicolides grubii</i> <i>Branchiomaldane vincentii</i>	2008 1833 Claparède, 1868 Langerhans, 1881 [as vincentii]		eam c eam	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Bonelliidae	<i>Macruellieria gigas</i> <i>Capitella capitata</i> <i>Capitella giardi</i> <i>Capitella minima</i> <i>Dasybranchus caducus</i> <i>Dasybranchus gajotiae</i> <i>Heteromastus filiformis</i> <i>Mastobranchus trinchessii</i>	2008 (Müller M., 1852) 2008 (Fabricius, 1780) 2010 (Mesnil, 1897) 2008 Langerhans, 1880 2008 (Grube, 1846) 1969 Eisig, 1887 2008 (Claparède, 1864) Eisig, 1887	Qs&Sc	em c em eamip c em c	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
Capitellidae	<i>Notomastus aberans</i> <i>Notomastus latericeus</i> <i>Notomastus lineatus</i> <i>Notomastus profundus</i> <i>Peresiella cymenoides</i> <i>Pseudocapitella incerta</i> <i>Pseudoleiocapitella fauveli</i>	2010 Day, 1957 Sars, 1851 Claparède, 1869 (Eisig, 1887) Harmelin, 1968 Fauvel, 1913 Harmelin, 1964	NIS	mpip c em eam em em c	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	

Continued

Table 1 continued

Species	Authority	Year Of re- cord	Status	G	S1	S2	S3	S4	I	2	3	4	5	6	7	8	9	10	11	12	13
<i>Chaetopterus variopedatus</i>	(Renier, 1804)	1970		c	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Mesochaetopterus sagittarius</i>	(Claparède, 1870)	2008		c	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Phyllochaetopterus gracilis</i>	Grube, 1863	2008		em	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Phyllochaetopterus socialis</i>	Claparède, 1869	2008		emip	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Spiochaetopterus costarum</i>	(Claparède, 1869)	2008	Sc	emr	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Spiochaetopterus solitarius</i>	(Rioja, 1917)	2008		em	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Spiochaetopterus typicus</i>	M. Sars, 1856	2008		emip	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Chrysopetelidae																					
<i>Chrysopetulum debile</i>	(Grube, 1855)	2008		c	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Aphelocheilidae																					
<i>Aphelocheila filiformis</i>	(Keferstein, 1862)	1927		em	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Aphelocheila marioni</i>	(Saint-Joseph, 1894)	1969		c	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Aphelocheila multibranchis</i>	(Grube, 1863)	1970		eam	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Caulleriella alata</i>	(Southern, 1914)	1969		eamip	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Caulleriella bioculata</i>	(Keferstein, 1862)	2008		eamip	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Chaetozone caputesocis</i>	(Saint-Joseph, 1894)	1928		em	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Chaetozone setosa</i>	Malmgren, 1867	1927	Qs&Sc	eam	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Chaetozone zelandica</i>	McIntosh, 1911	2008		em	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Cirratulus cirratus</i>	(O. F. Müller, 1776)	2008	Sc	em	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Cirriformia tentaculata</i>	(Montagu, 1808)	1969		eamip	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Dodecaceria concharum</i>	Orsted, 1843	1969	Qs	eamip	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Kirkegaardia heterochaeta</i>	(Laubier, 1961)	2008		em	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Protocirriperis chrysoerma</i>	(Claparède, 1868)	1928	Qs&Sc	emr	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Raphidrilus nemasona</i>	Monticelli, 1910	2008		c	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Tharix killarriensis</i>	(Southern, 1914)	2008		em	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Timareie filigera</i>	(Delle Chiaie, 1828)	2010	Sc	e	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Dorvilleidae																					
<i>Dorvillea atlantica</i>	(McIntosh, 1885)	2010		em	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Dorvillea rubrovittata</i>	(Grube, 1855)	1928		eam	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Ophryotrocha puerilis</i>	Claparède & Mecznikow, 1869	1886	Sc	em	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Parophryotrocha isocheata</i>	(Eliason, 1962)	2008		em	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Protodurvillea atlantica</i>	(McIntosh, 1885)	1928	Qs	eam	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Protodurvillea kefersteini</i>	(McIntosh, 1869)	2008		eamr	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Schistomerings neglecta</i>	(Fauvel, 1923)	1969		eam	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Schistomerings rudolphi</i>	(Delle Chiaie, 1828)	2008		eam	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Eunicidae																					
<i>Eunice floridana</i>	(Pourtales, 1867)	2010		em	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Eunice norvegica</i>	(Linnaeus, 1767)	2008	Qs	eam	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Eunice oerstedii</i>	Stimpson, 1853	2008		c	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Eunice pennata</i>	(Müller, 1776)	1928		eam	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Eunice roussaei</i>	Quatrefores, 1866	2008		eam	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Eunice schizobranchia</i>	Claparède, 1870	2010	Qs	e	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Eunice vittata</i>	(Delle Chiaie, 1828)	1970		c	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Leodiceidae																					
<i>Leodice harassii</i>	(Audouin & Milne Edwards, 1833)	1969		eam	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Leodiceidae																					
<i>Leodice torquata</i>	(Quatrefores, 1866)	2008		emr	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Lysididae																					
<i>Lysidice ninetta</i>	Audouin & H Milne Edwards, 1833	1928	Sc	c	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Lysidice unicornis</i>	(Grube, 1840)	1928		c	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Marphysa sanguinea</i>	(Montagu, 1813)	1969	Sc	c	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Palata siciliensis</i>	(Grube, 1840)	1928		emr	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Paucibranchia bellii</i>	(Audouin & Milne Edwards, 1833)	2008		emr	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Paucibranchia fallax</i>	(Marion & Bobretzky, 1875)	1928		emr	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+

Continued

Table 1 continued

	Species	Authority	Year Of re- cord	Status	G	S1	S2	S3	S4	I	2	3	4	5	6	7	8	9	10	11	12	13	
Euphosini- dae	<i>Euphosine armadillo</i>	Sars, 1851	2008	canr		+				+				+						+			
	<i>Euphosine foliosa</i>	Audouin & H Milne Edwards, 1833	1928	eamip		+				+				+						+			
	<i>Euphosine myrtosa</i>	Savigny in Lamarck, 1818	2010	eamip		+				+				+						+			
Fabriciidae	<i>Fabricia stellaris</i>	(Müller, 1774)	2008	Qs	eam					+				+						+			
	<i>Manayunkia aestuarina</i>	(Bourne, 1883)	1969	Qs	en					+				+						+			
	<i>Pseudofabricia filamentosa</i>	(Day, 1963)	2008		nrip					+				+						+			
Flabellig- ridae	<i>Diplocirrus glaucus</i>	(Malmgren, 1867)	2008		eam					+				+						+			
	<i>Flabelligera affinis</i>	M. Sars, 1829	1928	Sc	eamip					+				+						+			
	<i>Flabelligera diplochaitus</i>	(Otto, 1820)	2010		en					+				+						+			
	<i>Pherusa monilifera</i>	(Delle Chiaje, 1841)	2008		en					+				+						+			
	<i>Pherusa plumosa</i>	(Müller, 1776)	1970	Qs	en					+				+						+			
	<i>Piromis erica</i>	(Claparède, 1869)	1970		en					+				+						+			
	<i>Therochaeta flabellata</i>	(Sars in Sars, 1872)	2008		en					+				+						+			
Glyceridae	<i>Glycera alba</i>	(O.F. Müller, 1776)	1969		c					+				+						+			
	<i>Glycera capitata</i>	Örsted, 1843	2008		eam					+				+						+			
	<i>Glycera fallax</i>	Quatrefages, 1850	1970		en					+				+						+			
	<i>Glycera lapidum</i>	Quatrefages, 1866	1928		eam					+				+						+			
	<i>Glycera tessellata</i>	Grube, 1863	1928		c					+				+						+			
	<i>Glycera tridactyla</i>	Schmarda, 1861	1928		c					+				+						+			
Goniadiidae	<i>Glycinde unicornis</i>	Lamarck, 1818	2008		eamip					+				+						+			
	<i>Glycinde nordmanni</i>	(Malmgren, 1866)	2008		eam					+				+						+			
	<i>Goniada emerita</i>	Audouin & H Milne Edwards, 1833	1969		enrip					+				+						+			
	<i>Goniada maculata</i>	Örsted, 1843	2008		eamip					+				+						+			
	<i>Goniada norvegica</i>	Örsted, 1845	2008		en					+				+						+			
	<i>Gypis propinqua</i>	Marion & Bobretzky, 1875	2008		eamip					+				+						+			
	<i>Hesione splendida</i>	Lamarck, 1818	2008		c					+				+						+			
	<i>Leocrates claparèdi</i>	(Costa in Claparède, 1868)	2008		c					+				+						+			
	<i>Nereimyra punctata</i>	(Müller, 1788)	2010	Qs	en					+				+						+			
	<i>Oxydromus agilis</i>	(Ehlers, 1864)	1928	Qs	en					+				+						+			
Iospilidae	<i>Oxydromus flexuosus</i>	(Delle Chiaje, 1827)	1928		eam					+				+						+			
	<i>Oxydromus pallidus</i>	Claparède, 1864	2010		eam					+				+						+			
	<i>Psamathe fusca</i>	Johnston, 1836	2008		c					+				+						+			
	<i>Syllidia armata</i>	Quatrefages, 1866	1928		eamip					+				+						+			
	<i>Iospilus phalacroides</i>	Viguer, 1886	1886		an					+				+						+			
	<i>Paratospilus affinis</i>	Viguer, 1911	1920		e					+				+						+			
	<i>Phalacrophorus pictus</i>	Greiff, 1879	1886		eam					+				+						+			
	<i>Lacydoniidae</i>	Marion & Bobretzky, 1875	2008	Qs	en					+				+						+			
	Lopador- rhynchidae	<i>Lopadorhynchus krohnii</i>	(Claparède, 1870)	1886		en					+				+						+		
		<i>Maupasia coeca</i>	Viguer, 1886	1923		en					+				+						+		
<i>Pedinosoma curtum</i>		Reibisch, 1895	2010		en					+				+						+			
<i>Pelagobia longicirrata</i>	Greiff, 1879	1886		en					+				+						+				

Continued

Table 1 continued

Species	Authority	Year Of re- cord	Status	G	S1	S2	S3	S4	I	2	3	4	5	6	7	8	9	10	11	12	13
<i>Hiligneri gracilis</i>	(Ehlers, 1868)	1969		em	+	+	+	+				+	+	+	+	+					
<i>Lumbrineris acuta</i>	(Verrill, 1875)	2008	Qs	em	+	+	+	+	+	+		+	+	+	+	+					
<i>Lumbrinerionis paradoxax</i>	(Saint-Joseph, 1888)	1970		em	+	+	+	+				+	+	+	+	+					+
<i>Lumbrineris coccinea</i>	(Renier, 1804)	1970		c	+	+	+	+				+	+	+	+	+					+
<i>Lumbrineris inflata</i>	(Moore, 1911)	2008		eamip	+	+	+	+	+	+		+	+	+	+	+					+
<i>Lumbrineris labrofrimbriata</i>	Saint-Joseph, 1888	2008		em	+	+	+	+				+	+	+	+	+					+
<i>Lumbrineris latreilli</i>	Audouin & Milne Edwards, 1834	2008		c	+	+	+	+	+	+		+	+	+	+	+					+
<i>Lumbrineris nonatoi</i>	Ramos, 1976	2008		em	+	+	+	+	+	+		+	+	+	+	+					+
<i>Lumbrineris perkinsi</i>	Carrera-Parra, 2001	2008	NIS	em	+	+	+	+	+	+		+	+	+	+	+					+
<i>Scoletoma emanatibulata mabiti</i>	(Ramos, 1976)	2008		em	+	+	+	+	+	+		+	+	+	+	+					+
<i>Scoletoma fragilis</i>	(O.F. Müller, 1776)	1923	Sc	eam	+	+	+	+	+	+		+	+	+	+	+					+
<i>Scoletoma funchalensis</i>	(Kinberg, 1865)	2008		eam	+	+	+	+	+	+		+	+	+	+	+					+
<i>Scoletoma impatiens</i>	(Claparède, 1868)	1969		emr	+	+	+	+	+	+		+	+	+	+	+					+
<i>Magelona alleni</i>	Wilson, 1958	2008		eam	+	+	+	+	+	+		+	+	+	+	+					+
<i>Magelona filiformis</i>	Wilson, 1959	2008		em	+	+	+	+	+	+		+	+	+	+	+					+
<i>Magelona minuta</i>	Eliason, 1962	2008		em	+	+	+	+	+	+		+	+	+	+	+					+
<i>Magelona mirabilis</i>	(Johnston, 1865)	2008		em	+	+	+	+	+	+		+	+	+	+	+					+
<i>Magelona wilsoni</i>	Glémarec, 1966	2008		em	+	+	+	+	+	+		+	+	+	+	+					+
<i>Axiolhella constricta</i>	(Claparède, 1868)	2008		c	+	+	+	+	+	+		+	+	+	+	+					+
<i>Axiolhella rubrocincta</i>	(Johnson, 1901)	2008	Qs&Sc	c	+	+	+	+	+	+		+	+	+	+	+					+
<i>Chirimia biceps</i>	(M. Sars, 1861)	2008		em	+	+	+	+	+	+		+	+	+	+	+					+
<i>Euchymene collaris</i>	(Claparède, 1869)	2008		emr	+	+	+	+	+	+		+	+	+	+	+					+
<i>Euchymene lombricoides</i>	(Quatrefages, 1866)	1970		em	+	+	+	+	+	+		+	+	+	+	+					+
<i>Euchymene oerstedii</i>	(Claparède, 1863)	2008		eamip	+	+	+	+	+	+		+	+	+	+	+					+
<i>Euchymene palermiana</i>	(Grube, 1840)	1970		em	+	+	+	+	+	+		+	+	+	+	+					+
<i>Heterochymene robusta</i>	Arwidsson, 1906	2008		em	+	+	+	+	+	+		+	+	+	+	+					+
<i>Johnstonia clymenoides</i>	Quatrefages, 1866	2008		eam	+	+	+	+	+	+		+	+	+	+	+					+
<i>Leiochone leiopygos</i>	(Grube, 1860)	2008		em	+	+	+	+	+	+		+	+	+	+	+					+
<i>Leiochone tricirrata</i>	Bellan & Reys, 1967	2008		em	+	+	+	+	+	+		+	+	+	+	+					+
<i>Macrochymene santanderensis</i>	(Rioja, 1917)	2008		em	+	+	+	+	+	+		+	+	+	+	+					+
<i>Maldane gtebifex</i>	Grube, 1860	2008		em	+	+	+	+	+	+		+	+	+	+	+					+
<i>Maldane sarsi</i>	Malmgren, 1865	2008		eamip	+	+	+	+	+	+		+	+	+	+	+					+
<i>Metasychis gotoi</i>	(Izuka, 1902)	2008		emip	+	+	+	+	+	+		+	+	+	+	+					+
<i>Micromaidane ornithochaeta</i>	Mesnil, 1897	2008		em	+	+	+	+	+	+		+	+	+	+	+					+
<i>Nicomache lumbricalis</i>	(Fabricius, 1780)	2008		eamip	+	+	+	+	+	+		+	+	+	+	+					+
<i>Petaloproctus terricolus</i>	Quatrefages, 1866	1969	Qs	em	+	+	+	+	+	+		+	+	+	+	+					+
<i>Praxillella affinis</i>	(M. Sars in G.O. Sars, 1872)	2008		eamip	+	+	+	+	+	+		+	+	+	+	+					+
<i>Praxillella gracilis</i>	(M. Sars, 1861)	2008		emip	+	+	+	+	+	+		+	+	+	+	+					+
<i>Praxillella lophoseta</i>	(Orlandi, 1898)	2008		em	+	+	+	+	+	+		+	+	+	+	+					+
<i>Praxillella praetermissa</i>	(Malmgren, 1865)	2008	Sc	c	+	+	+	+	+	+		+	+	+	+	+					+
<i>Aglaophamus agilis</i>	(Langehans, 1880)	2008		em	+	+	+	+	+	+		+	+	+	+	+					+
<i>Inermonephthys inermis</i>	(Ehlers, 1887)	2008	Qs	c	+	+	+	+	+	+		+	+	+	+	+					+
<i>Nephtys caeca</i>	(Fabricius, 1780)	2008		c	+	+	+	+	+	+		+	+	+	+	+					+
<i>Nephtys ciliata</i>	(Müller, 1788)	2010	Qs	c	+	+	+	+	+	+		+	+	+	+	+					+
<i>Nephtys cirrosa</i>	Ehlers, 1868	2008		eam	+	+	+	+	+	+		+	+	+	+	+					+
<i>Nephtys hombergii</i>	Savigny in Lamarck, 1818	1969		eam	+	+	+	+	+	+		+	+	+	+	+					+
<i>Nephtys hystrix</i>	McIntosh, 1900	1923		eam	+	+	+	+	+	+		+	+	+	+	+					+
<i>Nephtys incisa</i>	Malmgren, 1865	2008		eam	+	+	+	+	+	+		+	+	+	+	+					+
<i>Nephtys paradoxax</i>	Malm, 1874	2008		c	+	+	+	+	+	+		+	+	+	+	+					+

Continued

Table 1 continued

Species	Authority	Year Of re- cord	Status	G	S1	S2	S3	S4	I	2	3	4	5	6	7	8	9	10	11	12	13
<i>Alitta succinea</i>	(Leuckart, 1847)	2008		camp	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Ceratonereis (Compositella) costae</i>	(Grube, 1840)	1970		c	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Ceratonereis (Compositella) hirci-nicola</i>	(Eisig, 1870)	2008		amp	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Eunereis longissima</i>	(Johnston, 1840)	1928		eam	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Hediste diversicolor</i>	(O.F. Müller, 1776)	2008	Sc	em	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Micronereis variegata</i>	(Claparède, 1863)	2008		eam	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Neanthes acuminata</i>	(Ehlers, 1868)	1969	Sc	c	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Neanthes ficata</i>	(Savigny, 1822)	2008		eam	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Neanthes nubila</i>	(Savigny, 1822)	1928		em	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Nereis funchalensis</i>	(Langehans, 1880)	1928		eamr	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Nereis rava</i>	(Ehlers, 1868)	1928		eam	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Nereis splendida</i>	(Grube, 1840)	1928		eam	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Nereis zonata</i>	(Malmgren, 1867)	1928		c	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Perinereis cultrifera</i>	(Grube, 1840)	1928		c	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Perinereis macropus</i>	(Claparède, 1870)	1928		eam	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Perinereis oliverae</i>	(Horst, 1889)	2008		eam	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Perinereis tenuiseta</i>	(Fauvel, 1915)	1928		c	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Platynereis coccinea</i>	(Delle Chiaje, 1822)	2008		eam	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Platynereis dumerilii</i>	(Audouin & Milne Edwards, 1833)	1928		eamrp	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Websterinereis glauca</i>	(Claparède, 1870)	1928		eamr	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Arabella geniculata</i>	(Claparède, 1868)	2008		em	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Arabella iricolor</i>	(Montagu, 1804)	1969	Sc	c	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Drilonereis filum</i>	(Claparède, 1868)	1969		emr	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Halia parthenopeia</i>	(Delle Chiaje, 1828)	2008		emp	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Notocirrus scolecus</i>	(McIntosh, 1869)	2008		em	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Aponuphis bilineata</i>	(Bard, 1870)	1970	Sc	em	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Aponuphis brementi</i>	(Fauvel, 1916)	2008	Sc	eam	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Diopatra neapolitana</i>	(Delle Chiaje, 1841)	1969		em	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Hyalinoecia tubicola</i>	(O.F. Müller, 1776)	1963		em	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Nothria conchylega</i>	(Sars, 1835)	2008	Sc	em	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Onuphis eremita</i>	(Audouin & Milne Edwards, 1833)	1969	Sc	emr	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Paradiopatra quadricuspis</i>	(M. Sars in G.O. Sars, 1872)	1969	Qs	em	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Rhamphobranchium (Spinigerium) brevibrachiatum</i>	(Ehlers, 1875)	2008		em	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Armandia cirrhosa</i>	(Filippi, 1861)	1928		emr	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Armandia polyophthalma</i>	(Kükenthal, 1887)	1969		em	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Ophelia amoureaei</i>	(Bellan & Costa, 1987)	2008		c	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Ophelia barquii</i>	(Fauvel, 1927)	2008		c	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Ophelia bicornis</i>	(Savigny, 1822)	2010	Sc	em	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Ophelia neglecta</i>	(Schneider, 1892)	2008		em	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Ophelia radiata</i>	(Delle Chiaje, 1828)	2008		em	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Ophelia roscoffensis</i>	(Augener, 1910)	1970		em	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Ophelina acuminata</i>	(Orsted, 1843)	2008	Sc	em	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Polyophthalmus pictus</i>	(Dujardin, 1839)	1928		eamrp	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+

Continued

Table 1 continued

Species	Authority	Year Of re- cord	Status	G	S1	S2	S3	S4	I	2	3	4	5	6	7	8	9	10	11	12	13
<i>Naineris laevigata</i>	(Grube, 1855)	1969	c	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Orbinia lazevilli</i>	(Audouin & H Milne Edwards, 1833)	2008	em	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Orbinia sertulata</i>	(Savigny, 1822)	2008	emip	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Phylo foetida</i>	(Claparède, 1868)	1969	emip	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Phylo foetida ligustica</i>	(Orlandi, 1896)	1977	em	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Phylo grubbei</i>	(McIntosh, 1910)	2008	em	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Phylo norvegicus</i>	(M. Sars in G.O. Sars, 1872)	2008	c	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Protoarctica oerstedii</i>	(Claparède, 1864)	2008	em	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Scoloplos (Leodamas) chevalieri</i>	(Fauvel, 1902)	2008	amr	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Scoloplos armiger</i>	(Müller, 1776)	1969	em	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Scoloplos typicus</i>	(Eisig, 1914)	2008	em	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Galathea oculata</i>	(Zachs, 1923)	2008	em	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Myriochele heeri</i>	Malmgren, 1867	2008	em	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Owenia fissiformis</i>	Delle Chiaje, 1844	1969	c	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Paralacydonia paradoxo</i>	Fauvel, 1913	2008	emip	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Aricidea (Amira) assimilis</i>	Tebble, 1959	2008	amip	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Aricidea (Amira) catherinae</i>	Laubier, 1967	2008	emip	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Aricidea (Amira) cerruti</i>	Laubier, 1966	2008	emr	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Aricidea (Amira) lopezi</i>	Berkeley & Berkeley, 1956	2008	an	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Aricidea (Amira) simonae</i>	Laubier & Ramos, 1974	2008	em	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Aricidea (Aricidea) capensis</i>	Laubier & Ramos, 1974	2008	em	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Aricidea (Aricidea) capensis</i>	Laubier & Ramos, 1974	2008	em	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Aricidea (Aricidea) fragilis</i>	Webster, 1879	2008	amip	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Aricidea (Aricidea) pseudoariculata</i>	Hobson, 1972	2008	emip	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Aricidea (Strelzovia) claudiae</i>	Laubier, 1967	2008	em	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Aricidea (Strelzovia) mediterranea</i>	(Laubier & Ramos, 1974)	2008	em	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Aricidea (Strelzovia) pseudannae</i>	Katzmann & Laubier, 1975	2008	c	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Aricidea (Strelzovia) suecica meridionalis</i>	Laubier & Ramos, 1974	2008	em	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Aricidea annae</i>	Laubier, 1967	2008	em	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Aricidea neosuecica</i>	Hartman, 1965	2010	eam	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Cirrophorus branchiatus</i>	Ehlers, 1908	2008	emip	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Levinsonia gracilis</i>	(Lauber, 1879)	2008	c	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Paradoneis armata</i>	Glémarec, 1966	2008	emr	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Paradoneis harpagonea</i>	(Storch, 1967)	2008	emr	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Paradoneis lyra</i>	(Southern, 1914)	1969	eam	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Paraonides neapolitana</i>	(Cerruti, 1909)	2008	em	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Paraonides fulgens</i>	(Levinson, 1884)	2008	em	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Paraonius paucibranchiata</i>	Cerruti, 1909	2008	c	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Paraonius tenera</i>	Grube, 1873	2008	c	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Amphictene auritoma</i>	(O.F. Müller, 1776)	1969	em	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Lagis koreni</i>	Malmgren, 1866	2008	eam	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Pectinaria belgica</i>	(Pallas, 1766)	2008	eam	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Petta pusilla</i>	Malmgren, 1866	1970	eam	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Pholoe inornata</i>	Johnston, 1839	2008	em	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+

Continued

Table 1 continued

Species	Authority	Year of record	Status	G	S1	S2	S3	S4	I	2	3	4	5	6	7	8	9	10	11	12	13
<i>Eulalia bilineata</i>	(Johnston, 1840)	2008	Qs	eam	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Eulalia pusilla</i>	Ørstedt, 1843	2008	em	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Eulalia viridis</i>	(Linnaeus, 1767)	2008	Sc	emr	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Eumida punctifera</i>	(Grube, 1860)	2008	em	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Eumida sanguinea</i>	(Ørstedt, 1843)	1928	Sc	emip	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Hyperleone foliosa</i>	(Quatrefages, 1865)	2008	eam	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Lugia pterophora</i>	(Ehlers, 1864)	1970	em	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Mysta picta</i>	(Quatrefages, 1866)	1969	em	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Mysta sibpodonta</i>	(Delle Chiaje, 1830)	1969	eam	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Mystides borealis</i>	Théel, 1879	2008	em	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Nereiphylla parenti</i>	Blainville, 1828	2010	em	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Nereiphylla pusilla</i>	(Claparède, 1870)	1970	eam	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Phyllocladidae	(Sars, 1835)	2008	em	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Notoplyllum foliosum</i>	(Malmgren, 1867)	2008	em	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Paramatis kosteriensis</i>	Ørstedt, 1842	2008	em	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Phyllocladus groenlandica</i>	(Claparède, 1870)	2008	eam	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Phyllocladus lineata</i>	(Claparède, 1870)	2008	eam	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Phyllocladus maculata</i>	(Linnaeus, 1767)	1928	emip	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Phyllocladus madeirensis</i>	Langerhans, 1880	1969	em	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Phyllocladus mucosa</i>	Ørstedt, 1843	1970	eam	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Pseudomystides limbata</i>	(Saint-Joseph, 1888)	1970	em	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Pterocirrus limbatus</i>	(Claparède, 1868)	2008	em	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Pterocirrus macroceros</i>	(Grube, 1860)	1928	em	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Ancistrostylis groenlandica</i>	McIntosh, 1878	2008	eam	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Ancistrostylis hamata</i>	(Hartman, 1960)	2008	nip	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Ptilargis verrucosa</i>	Saint-Joseph, 1899	2008	eam	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Sisambra tentaculata</i>	(Treadwell, 1941)	2008	em	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Poecilochaetidae	Claparède in Ehlers, 1875	2008	em	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Poecilochaetus fulgoris</i>	Claparède in Ehlers, 1875	2008	em	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Poecilochaetus serpens</i>	Allen, 1904	1928	eamip	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Polygordiiidae	Frapont, 1887	2008	em	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Polygordius appendiculatus</i>	Schneider, 1868	2008	em	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Polygordius lacteus</i>	Schneider, 1868	2008	em	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Achloae squamosa</i>	(Delle Chiaje, 1827)	2008	eam	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Dreschia pelagica</i>	Michaelsen, 1892	2010	nip	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Eunoe nodosa</i>	(M. Sars, 1861)	2008	eamip	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Frennia dubia</i>	Viguier, 1912	1912	c	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Frennia propinqua</i>	Viguier, 1920	1920	c	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Galyana cirrhosa</i>	(Pallas, 1766)	2008	eamip	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Harmothoe antilopes</i>	McIntosh, 1876	1970	eam	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Harmothoe areolata</i>	(Grube, 1860)	2008	eam	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Harmothoe extenuata</i>	(Grube, 1840)	1970	emip	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Harmothoe fraserthomsoni</i>	(Johnston, 1839)	2008	em	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Harmothoe impar</i>	(McIntosh, 1876)	2008	em	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Harmothoe johnstoni</i>	(Grube, 1863)	2008	em	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Harmothoe longisetis</i>	(Grube, 1863)	1928	em	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Harmothoe spinifera</i>	(Ehlers, 1864)	1969	eam	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Lepidasthenia elegans</i>	(Grube, 1840)	2008	emip	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Lepidasthenia maculata</i>	Potts, 1910	2008	emip	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Lepidonotus clava</i>	(Montagu, 1808)	1970	emip	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Lepidonotus squamatus</i>	(Linnaeus, 1758)	1969	emip	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Malmgrenia castanea</i>	McIntosh, 1876	2008	emr	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Malmgrenia ljungmani</i>	(Malmgren, 1867)	1970	eam	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Malmgrenia lunulata</i>	(Delle Chiaje, 1830)	1969	eam	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Polynoe scolopendrina</i>	Savigny, 1822	1970	eamr	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Subadyte pellucida</i>	(Ehlers, 1864)	1970	emip	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+

Continued

Table 1 continued

Species	Authority	Year Of re- cord	Status	G	S1	S2	S3	S4	I	2	3	4	5	6	7	8	9	10	11	12	13	
Pontodoridae	<i>Pontodora pelagica</i>	Greiff, 1879	en	+																		
Protodrilidae	<i>Megadrilus purpureus</i>	(Schneider, 1868)	en	+																		
	<i>Lygdamis muratus</i>	(Allen, 1904)	en	+																		
Sabellaridae	<i>Phaetostemma cidariophilum</i>	Marenzeller, 1895	en	+																		
	<i>Sabellaria abveolata</i>	(Linnaeus, 1767)	en	+																		
	<i>Sabellaria spinulosa</i>	(Leuckart, 1849)	eam	+																		
	<i>Acromegalomma vesiculosum</i>	(Montagu, 1813)	en	+																		
	<i>Anphigena mediterranea</i>	(Leydig, 1851)	e	+																		
	<i>Bispira volutacornis</i>	(Montagu, 1804)	en	+																		
	<i>Branchiomma bombyx</i>	(Dalyell, 1853)	c	+																		
	<i>Diabychone dumerficia</i>	(Tovar-Hernandez, Lucciano, Giangrande, 2007)	en	+																		
	<i>Diabychone acustica</i>	(Claparède, 1869)	e	+																		
	<i>Diabychone collaris</i>	(Langerhans, 1881)	en	+																		
	<i>Euchone rosea</i>	(Langerhans, 1884)	en	+																		
	<i>Euchone rubrocineta</i>	(Sars, 1862)	en	+																		
	<i>Euratella salmacidis</i>	(Claparède, 1869)	en	+																		
Sabellidae	<i>Hypsiconus stichophthalmos</i>	(Grube, 1863)	en	+																		
	<i>Jasminetra candida</i>	(Grube, 1863)	en	+																		
	<i>Jasminetra caudata</i>	(Langerhans, 1880)	en	+																		
	<i>Jasminetra elegans</i>	(Saint-Joseph, 1894)	eam	+																		
	<i>Laonome kroyeri</i>	(Malmgren, 1866)	en	+																		
	<i>Myxicola aesthetica</i>	(Claparède, 1870)	en	+																		
	<i>Myxicola infundibulum</i>	(Claparède, 1870)	en	+																		
	<i>Notaulax phaeotaenia</i>	(Schmarda, 1861)	eam	+																		
	<i>Amphicorina armandi</i>	(Claparède, 1864)	enmp	+																		
	<i>Pseudopotamilla reniformis</i>	(Bruguère, 1789)	enmp	+																		
	<i>Sabella discifera</i>	(Grube, 1874)	enmp	+																		
	<i>Sabella pavonina</i>	(Savigny, 1822)	en	+																		
	<i>Sabella spallanzanii</i>	(Gmelin, 1791)	enmp	+																		
Scalibregmatidae	<i>Asclerocheilus intermedius</i>	(Saint-Joseph, 1894)	en	+																		
	<i>Scalibregma inflatum</i>	(Rathke, 1843)	enmp	+																		
	<i>Sclerocheilus minutus</i>	(Grube, 1863)	en	+																		

Continued

Table 1 continued

Species	Authority	Year of record	Status	G	S1	S2	S3	S4	I	2	3	4	5	6	7	8	9	10	11	12	13	
<i>Apomatus similis</i>	Marion & Bobretzky, 1875	2008		eam																		
<i>Dirupa arctina</i>	(O. F. Müller, 1776)	2008		eam																		
<i>Ficopomatus enigmaticus</i>	(Fauvel, 1923)	2010	NIS	eamip																		
<i>Hydroides dianthus</i>	(Verrill, 1873)	2008		eamip																		
<i>Hydroides abrampha</i>	Möreh, 1863	2008	NIS	c																		
<i>Hydroides elegans</i>	(Haswell, 1883)	2008	NIS	c																		
<i>Hydroides norvegica</i>	Gunnerus, 1768	2008		eam																		
<i>Hydroides pseudoucinata</i>	Zibrowius, 1968 [original]	2008		eam																		
<i>Metavermilia multiristata</i>	(Philippi, 1844)	1927		em																		
<i>Placostegus tridentatus</i>	(Fabricius, 1779)	2008		eam																		
<i>Pronula intestinum</i>	(Lamarck, 1818)	2010		emip																		
<i>Pronula tubularia</i>	(Montagu, 1803)	2010		c																		
Serpulidae																						
<i>Salinacina dysteri</i>	(Huxley, 1855)	2008		emr																		
<i>Salinacina incrustans</i>	Claparède, 1870	2008		eam																		
<i>Semivermilia agglutinata</i>	(Marenzeller, 1893)	1927		emr																		
<i>Semivermilia crenata</i>	(O. G. Costa, 1861)	2008		eam																		
<i>Serpula concharum</i>	Langerhans, 1880	2010		eamr																		
<i>Serpula lobiancoi</i>	Rioja, 1917	2008		emr																		
<i>Serpula vermicularis</i>	Linnaeus, 1767	1928		c																		
<i>Spiraserpula massiliensis</i>	Linnaeus, 1968	2008		eam																		
<i>Spirobranchus lamarki</i>	(Zibrowius, 1866)	2008		eam																		
<i>Spirobranchus triqueter</i>	(Quatrefages, 1866)	2008		eam																		
<i>Vermilopsis infundibulum</i>	(Linnaeus, 1758)	2008		eamr																		
<i>Vermilopsis labiata</i>	(Philippi, 1844)	2008		c																		
<i>Vermilopsis labiata</i>	(O. G. Costa, 1861)	2008		eamip																		
<i>Vermilopsis striaticeps</i>	(Grube, 1862)	2008		eam																		
<i>Claparedepelogenia inclusa</i>	(Claparède, 1868)	1923		eam																		
<i>Euthalenexa oculata</i>	(Peters, 1854)	1970		em																		
<i>Fimbrosiethelais minor</i>	(Pruvot & Racovitz, 1895)	1970		eam																		
<i>Labioleantira ylleni</i>	(Malmgren, 1867)	2008		em																		
<i>Leanira hysiricis</i>	Ehlers, 1874	2008		em																		
<i>Neoleanira tetragona</i>	(Ørsted, 1845)	2008	Qs	eam																		
<i>Pelogenia arenosa</i>	(Delle Chiaje, 1830)	1969		eam																		
<i>Pholooides dorsipapillatus</i>	(Marenzeller, 1893)	2008		em																		
<i>Pisione remota</i>	(Southern, 1914)	1970		em																		
<i>Sigalion mathildae</i>	Audouin & Milne Edwards in Cuvier, 1830	2008		emr																		
<i>Sigalion squamosus</i>	Delle Chiaje, 1830	1970		eam																		
<i>Sihenelais boa</i>	(Johnston, 1833)	1969		emrip																		
<i>Sihenelais limicola</i>	(Ehlers, 1864)	1970		em																		
<i>Ephesella abyssorum</i>	(Hansen, 1878)	2008		em																		
Sphaerodoridae																						
<i>Sphaerodoridium claparedii</i>	(Greeff, 1866)	2010		em																		
<i>Sphaerodoridium minutum</i>	(Webster & Benedict, 1887)	2008		em																		
<i>Sphaerodorum gracilis</i>	(Reath, 1843)	2008	Qs	em																		
Spintheridae																						
<i>Spinther arcticus</i>	(M. Sars, 1851)	2008		em																		

Continued

Table 1 continued

Species	Authority	Year Of re- cord	Status	G	S1	S2	S3	S4	I	2	3	4	5	6	7	8	9	10	11	12	13	
<i>Anoides oxycephala</i>	(Sars, 1862)	1969		emp	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Anoides paucibranchiata</i>	Southern, 1914	2008		em	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Aurospio banyulensis</i>	(Laubier, 1966)	2008		em	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Boccardia polybranchia</i>	(Haswell, 1885)	2008		c	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Boccardiella ligierica</i>	(Ferrière, 1898)	2010		em	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Dipolydora armata</i>	(Langerhans, 1880)	2008		eamip	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Dipolydora caeca</i>	(Ørsted, 1843)	2008		em	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Dipolydora flava</i>	(Claparède, 1870)	2008		c	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Dipolydora giardi</i>	(Mesnil, 1893)	2008		em	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Dipolydora quadrilobata</i>	(Jacobi, 1883)	2010		emp	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Laonice cirrata</i>	(M. Sars, 1851)	1927	Qs&Sc	em	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Malacoceros fuliginosus</i>	(Claparède, 1868)	1969	Sc	eam	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Malacoceros girardi</i>	Quatrefages, 1843	1969		em	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Malacoceros tetracerus</i>	(Schmarda, 1861)	2008		em	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Microspio mecznikowianus</i>	(Claparède, 1869)	1969		em	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Parapriospio pimata</i>	(Ehlers, 1901)	2008		em	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Polydora ciliata</i>	(Johnston, 1838)	2008	Sc	c	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Polydora hoplura</i>	(Claparède, 1868)	2008		eamip	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Priospio caspersi</i>	(Laubier, 1962)	2008		c	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Priospio cirrifera</i>	(Wirén, 1883)	1928	Qs	emr	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Priospio decipiens</i>	(Söderström, 1920)	2010	Qs	em	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Priospio ehlersi</i>	(Fauvel, 1928)	2008		eamip	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Priospio fallax</i>	(Claparède, 1869)	2008		eam	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Priospio steenstrupi</i>	(Malmgren, 1867)	2008	Qs	em	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Pseudopolydora antennata</i>	(Claparède, 1869)	1969		eamip	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Pygospio elegans</i>	(Claparède, 1863)	2008	Sc	em	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Scolecopsis (Parascolecopsis) tridentata</i>	(Southern, 1914)	2008		em	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Scolecopsis (Scolecopsis) cantabra</i>	(Rioja, 1918)	2008		em	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Scolecopsis (Scolecopsis) foliosa</i>	(Audouin & Milne Edwards, 1833)	2008		em	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Scolecopsis (Scolecopsis) squamata</i>	(O.F. Muller, 1806)	1969		eamip	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Scolecopsis bomieri</i>	(Mesnil, 1896)	2008		em	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Spio decorata</i>	(Bobretzky, 1870)	1969		em	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Spio multioculata</i>	(Rioja, 1918)	2008		em	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Spiophanes bombyx</i>	(Claparède, 1870)	2008	Sc	c	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Spiophanes kroyeri</i>	(Grube, 1860)	2008	Qs	emr	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Spiophanes reyssi</i>	(Laubier, 1964)	2008		em	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Spreblaspio shrubsohlii</i>	(Buchanan, 1890)	2010		em	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Sternaspidae																						
<i>Sternaspis scutata</i>	(Ranzani, 1817)	2008		em	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Amblyosyllis formosa</i>	(Claparède, 1863)	1886		eam	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Anoplosyllis eadentula</i>	(Claparède, 1868)	2010	Qs	em	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Branchiosyllis exilis</i>	(Gravier, 1900)	2008	Sc	mip	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Brania pusilla</i>	(Dujardin, 1851)	2008		eamip	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Epigamia alexandri</i>	(Malmgren, 1867)	2008	Qs	em	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Euryosyllis tuberculata</i>	(Ehlers, 1864)	1928		emr	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Eusyllis assimilis</i>	(Marenzeller, 1875)	2008		eam	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Eusyllis blomstrandii</i>	(Malmgren, 1867)	1928		eamr	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Eusyllis lamelligera</i>	(Marion & Bobretzky, 1875)	2008		eam	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Exogone (Paraxogone) cognettii</i>	(Castelli, Badalamenti & Lardici, 1987)	2010		em	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
<i>Exogone (Sylline) brevipes</i>	(Claparède, 1864)	2010		eamip	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+

Table 1 continued

Species	Authority	Year Of re- cord	Status	G	S1	S2	S3	S4	I	2	3	4	5	6	7	8	9	10	11	12	13	
<i>Exogone naidina</i>	Ørsted, 1845	1886		eam	+				+										+			
<i>Exogone verigera</i>	(Claparède, 1868)	2008		eam	+				+										+			+
<i>Haplosyllis spongicola</i>	(Grube, 1855)	1928	Sc	emp	+				+										+			
<i>Myrionida brachycephala</i>	(Marenzeller, 1874)	2008		em	+				+										+			
<i>Myrionida inermis</i>	(Saint Joseph, 1887)	2010	Qs	em	+				+										+			
<i>Myrionida pinnigera</i>	(Montagu, 1808)	1886		em	+				+										+			
<i>Myrionida prolifera</i>	(O.F. Müller, 1788)	1886		enr	+				+										+			
<i>Nudisyllis divaricata</i>	(Kieferstein, 1862)	1928		eam	+				+										+			
<i>Nudisyllis pulligera</i>	(Krohn, 1852)	1928		eam	+				+										+			
<i>Odontosyllis stenostoma</i>	(Claparède, 1868)	1928		eam	+				+										+			
<i>Odontosyllis dugesiana</i>	(Claparède, 1864)	1928		em	+				+										+			
<i>Odontosyllis fulgurans</i>	(Audouin & Milne Edwards, 1833)	2010		c	+				+										+			
<i>Odontosyllis gibba</i>	(Claparède, 1863)	1928		em	+				+										+			
<i>Papposyllis prosostoma</i>	Hartmann-Schröder, 1977	2010		em	+				+										+			
<i>Paraehiersta ferrugina</i>	(Langerhans, 1881)	2010		c	+				+										+			
<i>Parapionosyllis brevicirra</i>	Day, 1954	2008		em	+				+										+			
<i>Parapionosyllis elegans</i>	(Pierantoni, 1903)	2010	Qs	em	+				+										+			
<i>Parexogone hebes</i>	(Webster & Benedict, 1884)	2008		eam	+				+										+			
<i>Procerata aurantata</i>	(Claparède, 1868)	2008		em	+				+										+			
<i>Procerata picta</i>	Ehlers, 1864	1928		emp	+				+										+			
<i>Proceratea halieziana</i>	(Malaquin, 1893)	2008		em	+				+										+			
<i>Prosphaerosyllis tetralix</i>	(Eliason, 1920)	2008		em	+				+										+			
<i>Salvatoria clavata</i>	(Claparède, 1863)	1928		eamip	+				+										+			
<i>Salvatoria eurtimica</i>	(Sardá, 1984)	2008		eam	+				+										+			
<i>Salvatoria limbata</i>	(Claparède, 1868)	1886		enr	+				+										+			
<i>Salvatoria tenuicirrata</i>	(Claparède, 1864)	1886	Qs	enr	+				+										+			
<i>Sphaerosyllis bulbosa</i>	(Southern, 1914)	2008		em	+				+										+			
<i>Sphaerosyllis hystrix</i>	(Claparède, 1863)	1886		eam	+				+										+			
<i>Sphaerosyllis ovigera</i>	(Langerhans, 1879)	2008	Qs	eam	+				+										+			
<i>Sphaerosyllis papilifera</i>	(Naville, 1933)	2008		c	+				+										+			
<i>Sphaerosyllis pirifera</i>	(Claparède, 1868)	1886		em	+				+										+			
<i>Streptosyllis bidentata</i>	(Southern, 1914)	2010	Qs	eam	+				+										+			
<i>Streptosyllis varians</i>	(Webster & Benedict, 1887)	2010		em	+				+										+			
<i>Streptosyllis websteri</i>	(Southern, 1914)	2008		eamip	+				+										+			
<i>Syllis alternata</i>	(Moore, 1908)	2008	Sc	em	+				+										+			
<i>Syllis amica</i>	(Quatrefoiges, 1866)	1928		c	+				+										+			
<i>Syllis armillaris</i>	(O.F. Müller, 1776)	1970		c	+				+										+			
<i>Syllis columbretensis</i>	(Campoy, 1982)	2008	Qs	em	+				+										+			
<i>Syllis cornuta</i>	(Rathke, 1843)	1928		emp	+				+										+			
<i>Syllis garciai</i>	(Campoy, 1982)	2008		eam	+				+										+			
<i>Syllis ge-lachi</i>	(Hartmann-Schröder, 1960)	2008		eamr	+				+										+			
<i>Syllis gracilis</i>	(Grube, 1840)	1928	Sc	c	+				+										+			
<i>Syllis hyalina</i>	(Grube, 1863)	2008		c	+				+										+			
<i>Syllis krohni</i>	(Ehlers, 1864)	1928		eamip	+				+										+			
<i>Syllis prolifera</i>	(Krohn, 1852)	1928		eamip	+				+										+			
<i>Syllis puvinata</i>	(Langerhans, 1881)	2008		eamr	+				+										+			
<i>Syllis rosea</i>	(Langerhans, 1879)	2008		eamr	+				+										+			
<i>Syllis torquata</i>	(Marion & Bobretzky, 1875)	2008		em	+				+										+			
<i>Syllis variegata</i>	(Grube, 1860)	2008		c	+				+										+			
<i>Syllis vitata</i>	(Grube, 1840)	1928		eam	+				+										+			

Continued

(www.marinespecies.org; accessed on 25 January 2019). Comments are added for any questionable species present in either Algerian and Mediterranean waters. Uncertainty arose mainly for species complexes belonging to the Cirratulidae and Spionidae families.

In the current study, an abundant literature was consulted before attributing a status to each Algerian polychaete species (Çinar, 2003, 2005, 2009, 2013; Çinar & Ergen, 2003; Çinar *et al.*, 2003, 2014; Zenetos *et al.*, 2005, 2010, 2011, 2012, 2017; Gravili *et al.*, 2010; Gil, 2011; Occhipinti-Ambrogi *et al.*, 2011; Evagelopoulos *et al.*, 2015; Corriero *et al.*, 2016; Galil *et al.*, 2016; Ouni-Ben Amor *et al.*, 2016; Faulwetter *et al.*, 2017; López & Richter, 2017).

To specify the status of a species found in Algerian waters, it was classified into one of three groups as proposed by Zenetos *et al.* (2011) and used by Faulwetter *et al.* (2017): Non-Indigenous Species (NIS), Questionable Species (Qs) and Species Complexes.

“Questionable species” are defined as either those reported as found in Algerian waters but whose presence still needs to be confirmed, or those, which have an unresolved taxonomic status. In this study, if records of any species are in doubt, they are not automatically classified as NIS if they have never been previously reported as NIS anywhere else in the Mediterranean. On the other hand, species already reported as NIS from other studies in the Mediterranean Sea but which still retain a questionable status, are listed as “NIS Questionable” to highlight this unresolved matter in the case of further assessments.

Species complexes correspond to those species known to form a complex of cryptic (morphologically indistinguishable but genetically different) or pseudo-cryptic (morphologically very similar) species (Nygren & Pleijel, 2011). The term ‘Species complex’ indicates that the name has been applied to a species as defined above.

Geographical patterns of polychaetes from the Algerian coasts

The distribution of the 534 polychaete species found in Algerian waters is categorised taking into account the distinct geographical areas of the Mediterranean and related maritime regions as proposed by Coll *et al.* (2010) and modified by Bakalem *et al.* (2020). These are, 1: African Atlantic Coast (from Cap Spartel to Cap Blanc); 2: North-Eastern Atlantic European waters; 3: Alboran Sea; 4: North-Western Mediterranean; 5: Algeria South-Western Mediterranean; 6: Ionian Sea; 7: Tunisian shelf and Libya; 8: Adriatic Sea; 9: Aegean Sea; 10: Black Sea; 11: Levantine Sea; 12: Red Sea and 13: Indo-Pacific oceans.

Each polychaete species found on the Algerian coast, is classified as one of fifteen groups reflecting their geographical origin (Bakalem *et al.*, 2020): eam (Mediterranean, European and African Atlantic species); em (Mediterranean and European Atlantic species); am (Mediterranean and African Atlantic coast species); e (endemic species); c (cosmopolitan species); emr (Mediterranean, European Atlantic and Red Sea species); emip (Mediterranean, European Atlantic and Indo-Pacific species); amr (African Atlantic, Mediterranean and Red Sea species); amip (African Atlantic, Mediterranean and Indo-Pacific species); mip (Mediterranean and Indo-Pacific species); emrip (European Atlantic, Mediterranean, Red Sea and Indo-Pacific species); eamrip (European and African Atlantic, Mediterranean, Red Sea and Indo-Pacific species); eamr (European and African Atlantic, Mediterranean and Indo-Pacific species); eamr (European and African Atlantic, Mediterranean and Red Sea species) and mrip (Mediterranean, Red Sea and Indo-Pacific species).

Hierarchical Cluster Analysis (HCA) based on Sorensen’s coefficient for the presence/absence of the species found in each of the four sectors of the Algerian coast and in the 13 geographical areas was carried out along with the construction of a dendrogram using the group average algorithm generated from the PRIMER V6 software (Clarke & Gorley, 2006).

Results

List of species

Studies on the presence of polychaetes along the Algerian coasts have been sporadic. Viguiet (1886, 1911, 1912, 1920) and later, Gravier & Dantan (1928), all collected pelagic species from the Bay of Algiers, whilst Fauvel (1923, 1927a,b) focused on benthic species in the waters surrounding Algiers and Annaba. These focused studies only found a small number of polychaete families and species: between 8 and 18 families covering 25 to 69 species. More recently, Le Gall (1969) and Falconetti (1970) studied the Phanerogam meadows and maërl community respectively, (located in the Bay of Bou Ismail), and reported between them a total of 27 families and 72 species.

Results

List of species

The present inventory of polychaete species is mainly compiled from data collected in three successive periods: the first was from 1886 to 1928, (leading to 28 families and 96 species), the second from 1963 to 1970, (leading to 44 families and 196 species), and finally from 1975 to 2010, (leading to the final list with 58 families and 534 species). During these three periods, the number of recorded species increased from 96 to 534. The PhD theses of Bakalem (2008) and Grimes (2010), which together, covered most of the soft-bottom habitats in the gulfs, bays and harbours along the Algerian coasts, listed the greatest numbers of polychaetes with 54 and 51 families and 444 and 506 species, respectively. It is noteworthy that there were no studies reporting new polychaetes between 1928 and 1963, and none have taken place since 2011.

The Syllidae (66 species representing 12% of the total diversity) is the most diversified family, followed by the Spionidae (37 species, 7%), the Terebellidae (27 species, 5%), the Serpulidae (25 species, 4.5%), the Polynoidae (24 species, 4.5%), the Sabellidae (23 species, 4%) and the Paraonidae (23 species, 4%).

Ten families (each with more than 20 species) account

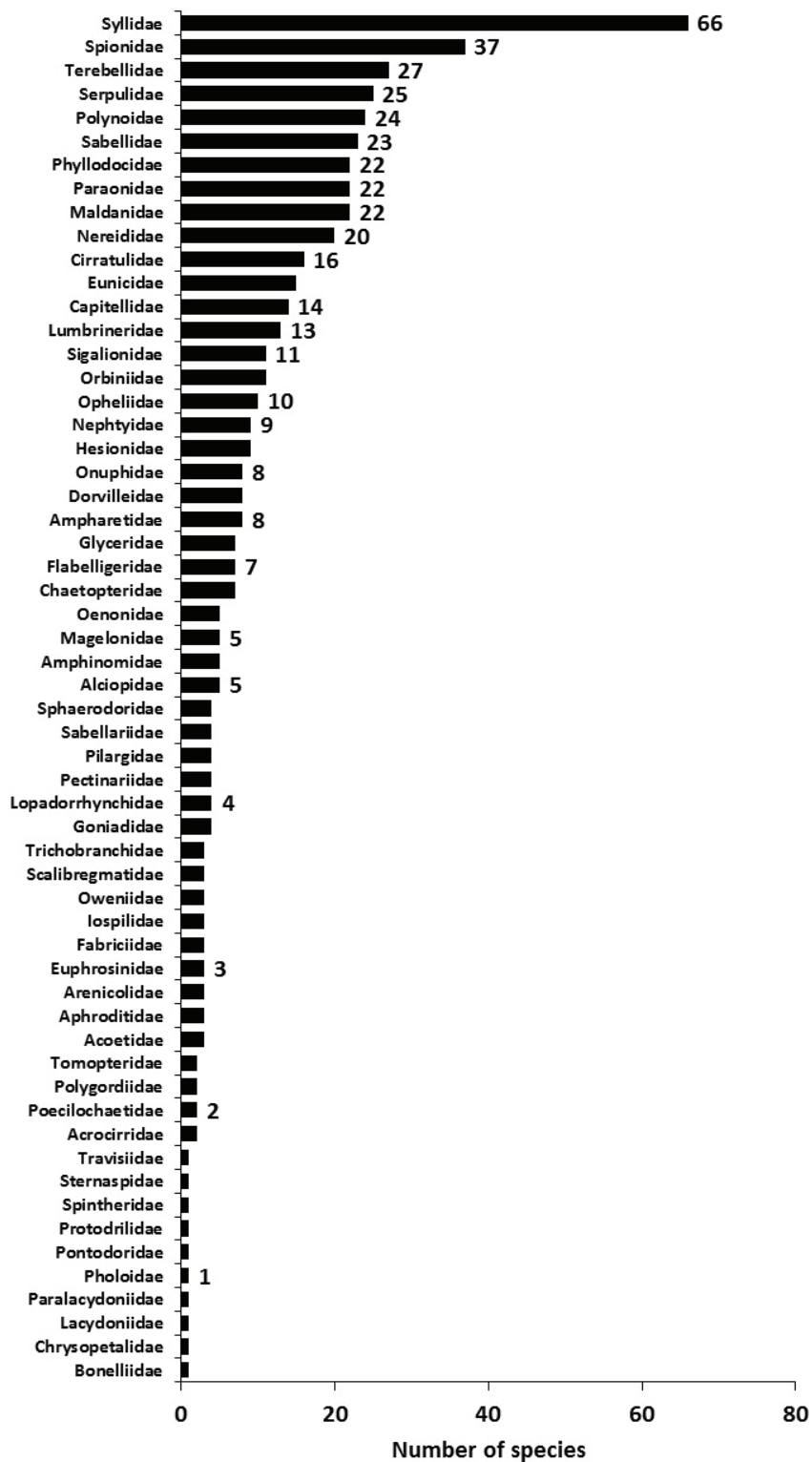


Fig. 2: Number of polychaete species per family classified by decreasing number of species.

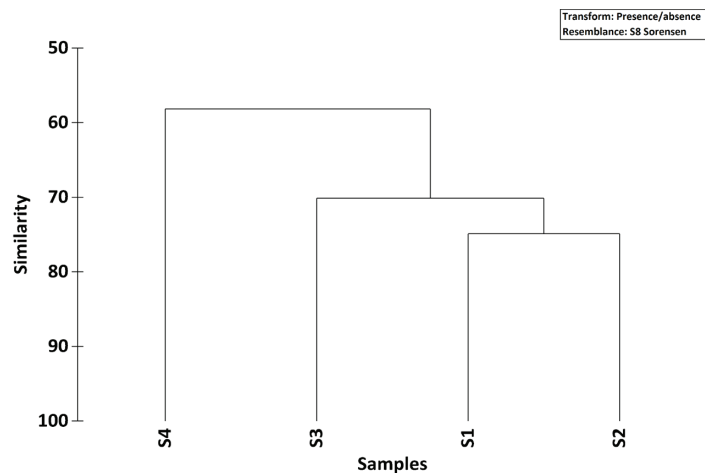


Fig. 3: Results of cluster analysis (Sørensen similarity) on the presence and absence of species, in the four defined sectors (S1 to S4 see Fig. 1) along the Algerian coast.

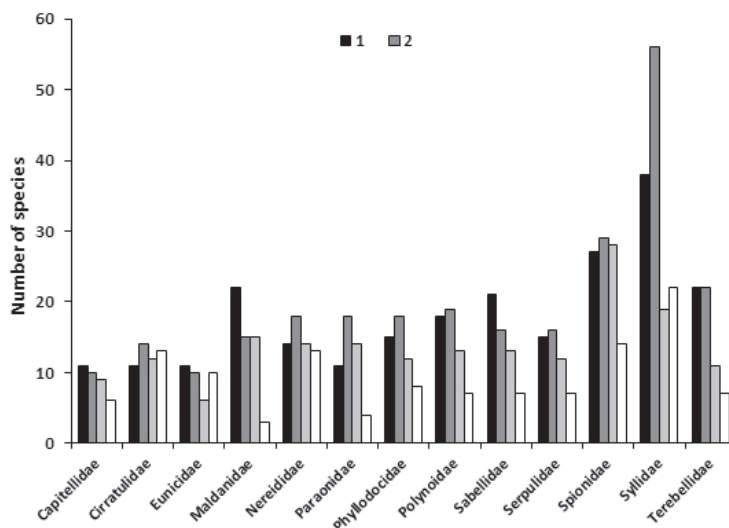


Fig. 4: Number of species present of the ten most diversified families in the four defined sectors (see Fig. 1) along the Algerian coast.

for 55% of polychaetes diversity (Fig. 2); seven families are contain between 10 and 20 species, whilst most of the remaining families (41) have fewer than 10 species; moreover, ten families are only represented by a single species (Fig. 2).

Out of the 534 species reported, 22 are planktonic, including five families with a strictly pelagic life style: Alciopidae (5 species), Lopadorhynchidae (4), Iosipilidae (3), Tomopteridae (2) and Pontodoridae (1). Five species, two of *Ancistrosyllis* (Pilargidae), two of Polynoidae and one Nereididae belonging to families of benthic polychaetes are all pelagic.

The previously defined geographical sector 2 was found to be the richest in terms of polychaete diversity with 56 families and 430 species (representing 81% of the total recorded species). Sector 1 with 48 families (371

species, 69%) supported the second largest diversity. The eastern sectors were relatively poorer in terms of diversity with 49 families (300 species, 56%) in sector 3 and 40 families (195 species, 37%) in sector 4. Figure 3 compares the similarities between the four sectors; sector 4 is very different from the three other sectors, whilst sectors 1 and 2 (in the western and central parts, which display the richest diversity), also show the greatest similarity. Families are represented by a similar number of species in all except sector 3 where the family of Syllidae is more diversified (Fig. 4).

Questionable species (Qs) and species complexes

Among the 534 species recorded along the Algerian coast, 45 correspond to the status “questionable species” and 38 are considered nowadays to be species complexes, these numbers respectively 8 and 6.5% of the total richness amongst the polychaete (Table 1). Further data will be required to confirm their presence in Algerian waters. It should be noted that most of these species have already been previously reported in other polychaete inventories (e.g., Faulwetter *et al.*, 2017).

The following taxa are classified as both questionable species and species complex: *Axiothella rubrocincta* (Johnson, 1901), *Capitella capitata* (Fabricius, 1780), *Chaetozone setosa* Malmgren, 1867, *Laonice cirrata* (M. Sars, 1851), *Lepidonotus squamatus* (Linnaeus, 1758), *Phyllodoce groenlandica* Örsted, 1842, *Protocirrinis chrysoderma*, (Claparède, 1868), and *Terebellides stroemii* Sars, 1835.

Ampharete acutifrons (Grube, 1860) may have been confused with *Ampharete lindstroemi* Hessle, 1917 in the Mediterranean Sea (Mikac, 2015) and in samples found in Algerian waters. It forms a species complex in its North Atlantic and Pacific distributions (Faulwetter *et al.*, 2017). *Ampharete grubei* Malmgren, 1865 is often reported as *A. acutifrons*, which is also present in Greek waters (Faulwetter *et al.*, 2017).

The specimens reported as *Chaetozone setosa* Malmgren, 1867 in the Mediterranean Sea and along the Algerian coast, corresponds to several possible species such as *Chaetozone gibber* Woodham & Chambers,

1994, *Chaetozone corona* Berkeley & Berkeley, 1941 or *Chaetozone carpenteri* McIntosh, 1911: it probably does not exist in the Mediterranean Sea (Çinar & Ergen, 2007; Faulwetter *et al.*, 2017).

Specimens of polychaetes from the Mediterranean previously named as *Terebellides stroemii* almost certainly belong to different species including *Terebellides gracilis* (Malm, 1874) and *Terebellides mediterranea* Parapar, Mikac and Fiege, 2013 (Faulwetter *et al.*, 2017).

Non-Indigenous Species (NIS)

Out of the 534 species reported along the Algerian coast, eight have the status NIS in the Mediterranean Sea: *Aricidea (Aricidea) fragilis* (Webster, 1879), *Ficopomatus enigmaticus* (Fauvel, 1923), *Hydroides dirampha* Mörch, 1863 and *H. elegans* (Haswell, 1883), *Lumbrineris perkinsi* Carrera-Parra, 2001, *Metasychis gotoi* (Izuka, 1902), *Notomastus aberans* Day, 1957 and *Pista unibranchia* Day, 1963.

Seven species found along the Algerian coast were reported in the list compiled by Zenetos *et al.* (2017). They were *Ficopomatus enigmaticus* (Fauvel, 1923), *Hydroides dirampha* Mörch, 1863 and *H. elegans* (Haswell, 1883), *Lumbrineris perkinsi* Carrera-Parra, 2001, *Metasychis gotoi* (Izuka, 1902), *Pista unibranchia* Day, 1963, and *Notomastus aberans* Day, 1957. *Aricidea (Aricidea) fragilis* (Webster, 1879) was a typically west-Atlantic species. It was present in the Adriatic and Tyrrhenian seas and in the Strait of Sicily (Langeneck *et al.*, 2018). The

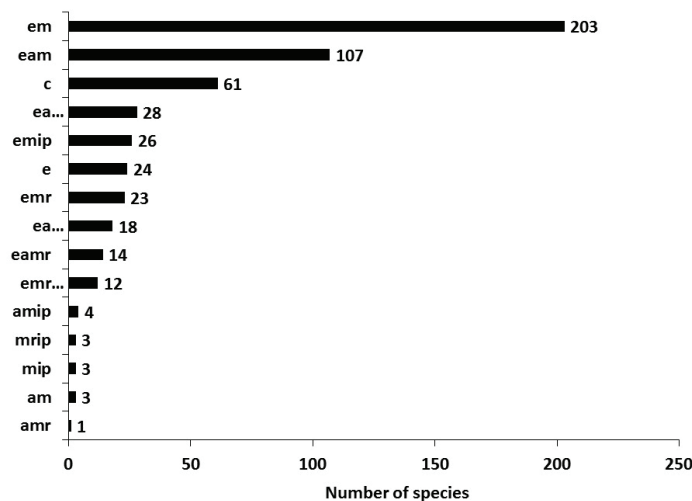


Fig. 5: Number of species present in the different geographical groups. Legend: amr: African Atlantic, Mediterranean and Red Sea species, amip: African Atlantic, Mediterranean and Indo-Pacific species, mip: Mediterranean and Indo-Pacific species, mrip: Mediterranean, Red Sea and Indo-Pacific species, am: Mediterranean and African Atlantic species, emrip: European Atlantic, Mediterranean, Red Sea and Indo-Pacific species, eamr: European Atlantic, African Atlantic, Mediterranean and Red Sea species, eamrip: European Atlantic, African Atlantic, Mediterranean, Red Sea and Indo-Pacific species, emr: European Atlantic, Mediterranean and Red Sea species, eamip: European Atlantic, African Atlantic, Mediterranean and Indo-Pacific species, emip: European Atlantic, Mediterranean and Indo-Pacific species, e: endemic species, c: cosmopolitan species, eam: European Atlantic, Mediterranean and African Atlantic species, em: European Atlantic and Mediterranean species.

status of NIS is also given for this species present along the Algerian coast.

Geographical patterns of Polychaetes of the Algerian coasts

Most of the Polychaetes found in Algerian waters have an Atlantic-Mediterranean origin (315 species, 50% of the total number recorded). 203 species (38%) are common to the Mediterranean Sea and the North-Eastern Atlantic coast, whereas 107 species (20%) are common to the Mediterranean Sea, the North-Eastern Atlantic and African Atlantic coast and only three species share a Mediterranean and African Atlantic distribution (Fig. 5). The cosmopolitan species (61) and endemic species (24) make up 11.5 and 5% of all species respectively. 122 species (23% of the total) show a wide distribution across the North-Eastern Atlantic Ocean, the Mediterranean and Red Seas as well as being found in the Indo-Pacific region. Only six species (1%) share a Mediterranean, Red Sea and Indo-Pacific distribution.

A total of 492 species from the European Atlantic Ocean and 507 from the North-Western Mediterranean Sea were reported as found along the Algerian coast; these species make up 92 and 95% respectively of the total inventory. The Aegean and Adriatic Seas have a high number of polychaete species in common with the Algerian coasts, respectively 488 (91%) and 462 (86%) species, whereas a significant number are in common with the Ionian Sea (406 species and 76%), the Levantine Sea (348 species, 66%) and with the Tunisian shelf extending to Libya (305 species, 57%). By contrast, the Alboran Sea (180 species, 34%) and the Black Sea (189 species, 35%) both share a relatively low number common of species with the Algerian coast. The number of species shared between the Algerian coast and the Red Sea (110 species, 21%) and the Indo-Pacific (151 species, 28%) was low.

The geographical distributions of the 534 species recorded from the Algerian coast (Table 1) are compared with their presence in 12 other geographical areas. Differences were analysed using the Sorensen coefficient (Fig. 6). The dendrogram showing the Sorensen similarity between the 13 geographical areas suggests the division of these areas into two main groups. The first group comprises only two areas, the Red Sea (labelled 12 in Fig. 6) and the Indo-Pacific region (13) whereas the second group encompasses all the 11 other areas. Within this second group, the Alboran Sea (3), the Black Sea (10) and the African Atlantic coast (1) show the lowest level of similarities with the other areas in the same group. However, the remaining eight areas display a high level of similarity and form an distinct pattern with the Tunisian shelf and Libya (7), Levantine Sea (11), Ionian Sea (6), Adriatic Sea (8), North-Eastern Atlantic European (2), Algeria (South-Western Mediterranean) (5), North-Western Mediterranean (4) and Aegean Sea (9). The highest similarities (>90%) are found between the North-Eastern Atlantic European waters (2) and the Algerian south-western Mediterranean (5) and also between the North-Western Mediterranean (4) and the Aegean Sea (9) (Fig. 6).

Discussion

The estimated total number of polychaete species varies depending on the author (Arvanitidis *et al.*, 2002; Coll *et al.*, 2010); the most recent census of polychaete species for the Mediterranean Sea is that of Faulwetter *et al.* (2017) who recorded 1,105 species. With 534 species, the polychaetes of the Algerian coasts represent 48% of the polychaete fauna found in the Mediterranean Sea and this diversity is appreciable in comparison with those noted in other areas of the Mediterranean Sea (Table 2).

However, the inventory of Faulwetter *et al.* (2017) do

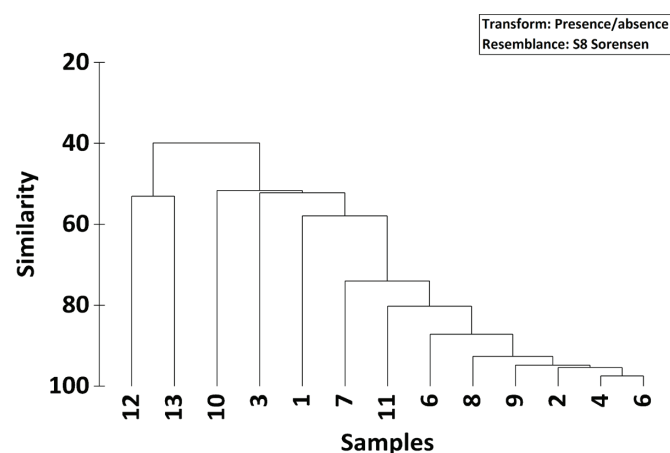


Fig. 6: Results of cluster analysis (Sørensen similarity) on the species presence and absence in 13 geographical regions. 1: African Atlantic Coast (from Cap Spartel to Cap Blanc); 2: North-Eastern Atlantic European waters; 3: Alboran Sea; 4: North-Western Mediterranean; 5: Algerian South-Western Mediterranean; 6: Ionian Sea; 7: Tunisian Shelf and Libya coastline; 8: Adriatic Sea; 9: Aegean Sea; 10: Black Sea; 11: Levantine Sea; 12: Red Sea and 13: Indo-Pacific Oceans.

Table 2. Comparison of inventories of polychaetes species found in different areas of the Mediterranean Sea.

Author (s)	Areas	Species	Comments
Arvanitidis <i>et al.</i> , 2002	Mediterranean and Black seas	1,036	All species recorded including questionable species
Coll <i>et al.</i> , 2010	Mediterranean Sea	1,122	Few data in the southern part of the Mediterranean Sea
Faulwetter <i>et al.</i> , 2017	Mediterranean Sea	1,105	Number standardised to currently accepted names in 2017
Gillet, 2017	Morocco (Atlantic and Mediterranean)	321	Continental shelf species
Dauvin <i>et al.</i> , 2006	Mediterranean French continental shelf	623	Continental shelf species
	Gulf of Lions	641	Continental and bathyal species
	Gulf of Lions	487	Continental shelf species
	Provence-Alpes-Côte d'Azur coast	516	Continental shelf species
	Corsica	256	Continental shelf species, few data around Corsica
Castelli <i>et al.</i> , 2008	Italian waters	876	Including questionable species
Mikac, 2015	Adriatic Sea	764	Including questionable species
Ayari <i>et al.</i> , 2009	Tunisia	289	Few data for the southern part of the Tunisia
Zaâbi <i>et al.</i> , 2012	Cap Bon Peninsula, Tunisia	212	North-east coast of Tunisia
Zaâbi <i>et al.</i> , 2012	Tunisia	375	New cumulative number
Fersi <i>et al.</i> , in preparation	Tunisia	443	Indicative total number
Arvanitidis, 2000	Aegean Sea	592	0-1000 m, except Turkish coast
Simboura & Nicolaidou, 2001	Greek waters	753	Census from 1891 to 2000
Arvanitidis <i>et al.</i> , 2002	Western Basin of the Mediterranean	884	All species recorded including questionable species
	Central Basin of the Mediterranean	528	All species recorded including questionable species
	Levantine Basin of the Mediterranean	451	All species recorded including questionable species
	Aegean Sea	493	All species recorded including questionable species
Faulwetter <i>et al.</i> , 2017	Greek waters	836	Including 142 questionable species
Çınar <i>et al.</i> , 2014	Mediterranean coasts of Turkey	705	Including questionable species
Çınar, 2005	Cyprus waters	456	All species recorded including questionable species
Şahin & Çınar, 2012	Black Sea	238	New cumulative number
Dorgham <i>et al.</i> , 2013	Egyptian Mediterranean waters	283	Including questionable species
This study	Algerian waters	534	Species mainly found on the continental shelf

not include 45 of the 534 Algerian species. Moreover, this value of 534 species may also be under-estimated due to: 1) the low level of study and sampling in the eastern part of the Algerian coast (sectors 3 and 4); 2) the few studies of exceptional habitats (including the phanerogams, shallow and deep hard substratum as well as coralligenous formations and the bathyal benthic zone), and 3) the absence of molecular analyses applied to those questionable species and species complexes, those Non-Native species and those species classified as “cosmopolitan”.

The richness of polychaete species along the coast of Algeria is comparable to that reported for the continental shelf of the French Mediterranean coast (Dauvin *et al.*, 2006) and also to that for the Greek part of the Aegean Sea (Arvanitidis, 2000) (Table 2). This richness is higher

than that found in bordering countries such as Morocco, with 321 species listed including the Atlantic coast of Morocco (Gillet, 2017), and Tunisia with 443 species (Ayari *et al.*, 2009; Zaâbi *et al.*, 2012). It is also higher than that observed for the Black Sea (Şahin & Çınar, 2012). Nevertheless, an even greater diversity of polychaetes have been found for Greek waters (Faulwetter *et al.*, 2017), along the Italian coast (Castelli *et al.*, 2008), in Turkish waters (Çınar *et al.*, 2014), and in the Adriatic Sea (Mikac, 2015).

In the coasts of Algeria, the families of Syllidae, Spionidae, Polynoidae, Phyllodocidae, Terebellidae, Serpuliidae and Sabellidae, account for most of the diversity, as is the case in along the French Continental shelf (Dauvin *et al.*, 2006), the Greek coasts (Faulwetter *et al.*, 2017), the

Turkish coasts (Çinar *et al.*, 2014), and Adriatic coastline (Mikac, 2015); however, in these areas, there is also the significant presence of the family Maldanidae.

The percentage of questionable species and species complexes remains high in the case of studies along the Algerian coastline (15%), but this number is lower than that given by Faulwetter *et al.* (2017) for such types of species present in Greek waters (23%).

Arvanitidis *et al.* (2002) reviewed 1,036 species of polychaetes for the Mediterranean Sea, including 41% that are considered as cosmopolitan, 29% as Atlantic-Mediterranean and 19% as endemic polychaetes. By comparison, the Mediterranean, European and African Atlantic species are dominant along the Algerian coastal waters accounting for 60%. The European Atlantic-Mediterranean species (38%) and the cosmopolitan species (12%) are the dominant groups on the Algerian coasts. The number of endemic species for Algeria is low (24 species, making up just 5% of the recorded species and indeed, lower than the values reported for other areas of the Mediterranean Sea such as the French Mediterranean coast (Dauvin *et al.*, 2006), the Greek coasts (Simboura & Nicolaidou, 2001) and the Aegean Sea (Arvanitidis *et al.*, 2002).

The close similarity between the Algerian polychaetes and those found in both the European and African coasts of the Atlantic Ocean reflects the influence of the Atlantic waters along the Moroccan coasts extending towards Tunisia in the south of the Mediterranean Sea, which is inevitably related to the connexion via the Strait of Gibraltar (Fig. 6). This same observation has previously been highlighted for all the macrobenthic species of the Algerian coasts (Dauvin *et al.*, 2013). Moreover, the polychaete fauna in Algerian waters is similar to those of the North-Western basin of the Mediterranean Sea off Spain, France and Italy (Fig. 6). Furthermore, Algerian polychaete fauna displays a great similarity to that of the Aegean Sea (both Greek and Turkish coasts), suggesting a high level of similarity of Polychaete fauna at the scale of the Mediterranean Sea. The Black Sea, due its particular physico-chemical characteristics shows little similarity in terms of polychaete fauna with the different areas of the Mediterranean Sea.

Faulwetter *et al.* (2017) pointed out that the regional lists of species inevitably reflect the research and sampling effort. He added that their reliability depends on the presence of zoological experts who are competent in the identification of polychaetes, noting that some groups or species of polychaetes can be very difficult to identify (Dauvin, 2005). The richness and geographic origin of a species in a given area can be estimated by making comparisons. Faulwetter *et al.* (2017) stressed that each inventory carried out on Polychaetes has given rise to a relatively large number of species reported in the same region. Faulwetter *et al.* (2017) go on to explain that this may be partly due by the actual geographic distribution of species and partly due to the incorrect identification of some species.

Comprehensive revisions and updated identification keys are lacking for many of the taxa studied in the Medi-

terranean yet protocols established a century ago, such as those of Fauvel (1923, 1927a), are still commonly used in many laboratories as the main tools for species identification. It is unfortunate that the level of research on Mediterranean Polychaete Fauna performed in the 1990s was not maintained to the present day. The taxonomic effort remains to be implemented and will be a challenge for polychaete experts around the world. On the other hand, British Synopses, Fauna Iberica and other publications on the taxonomy and phylogeny of polychaetes remain very useful tools for the identification of the Mediterranean polychaetes. Furthermore, molecular analysis needs to be developed to resolve the problems of cryptic and sibling polychaete species, not only for the Mediterranean Sea but also for the wider area of the North-Eastern Atlantic Ocean. The World Register of Marine Species (WoRMS) has become an indispensable tool, not only for naming existing species and problems of synonymy, but also for describing their actual geographical distribution.

The Mediterranean Sea is recognised as a rich area for biodiversity. It is also impacted on by a range of damaging factors such as habitat loss and degradation, climate change, pollution and the invasion of NIS (Coll *et al.*, 2010, 2012; Altobelli *et al.*, 2017). A regular evaluation of the marine biodiversity of target groups (such as the polychaetes) in certain target areas (such as the wide range of soft-bottom habitats in the Bay of Bou Ismail) is strongly recommended. Such monitoring activity can reveal the long-term changes in biodiversity under the increased influence of climatic and human pressures in Algerian coastal environments.

The analyses by Arvanitidis *et al.* (2002) show differences in the Mediterranean Sea between the western basin, where the polychaete studies are satisfactory, and the eastern basin where the knowledge of polychaetes remains insufficient. Furthermore, Spanish, French and Italian inventories cover the northern coasts of the western basin, whereas there is relatively sparse data for the southern coast (North Africa) of this same basin. For the central part of the Mediterranean Sea, these inventories take into account the Ionian Sea (Italy and Greece). Finally, for the eastern basin, the inventories carried out concern mostly the Aegean Sea (Ergen, 1976; Simboura, 1987; Arvanitidis, 1994, 2000), the Levantine Sea, mainly the coasts of Cyprus and Israel (Ben-Eliahu, 1972, 1991, 1995; Ben-Eliahu & Fiege, 1995, 1996; Russo, 1997), the Egyptian coasts (Abd-Elnaby, 1999; Selim, 1978, 1996) and Turkish waters (Ergen & Çinar, 1997). The data relating to these areas remain sporadic.

Since the beginning of new millennium there has been a considerable research effort on polychaetes with a great deal of effort targeted at those areas with a low level of data: Algeria (Bakalem, 2008; Grimes, 2010), Tunisia (Ayari *et al.*, 2009; Zaâbi *et al.*, 2012; Ayari *et al.*, in preparation), Greece (see Faulwetter, 2017), Turkey (see Çinar *et al.*, 2014), Cyprus (Çinar, 2005), and Egypt (Abd-Elnaby, 2008, 2009; Dorgham *et al.*, 2013, 2014). These very recent results have shown that the diversity of polychaete fauna is relatively homogenous at the scale of the whole Mediterranean Sea and that the differences between the

West and East (as noted by Arvanitidis *et al.*, 2002) may only be due to the lack of information and thus not correctly reflect the real situation. Future research using molecular analysis will be crucial to assess the representability of questionable species and species complex, which are numerous amongst the polychaete species reported.

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