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Check-list of Cnidaria and Ctenophora from the coasts of Turkey

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Abstract: This paper presents the actual status of species diversity of the phyla Cnidaria and Ctenophora along the Turkish coasts of the Black Sea, the Sea of Marmara, the Aegean Sea, and the Levantine Sea. A total of 195 cnidarian species belonging to 5 classes (Hydrozoa, Cubozoa, Scyphozoa, Staurozoa, and Anthozoa) have been determined in these regions. Eight anthozoan species (*Arachnanthus oligopodus*, *Bunodactis rubripunctata*, *Bunodeopsis strumosa*, *Corynactis viridis*, *Halcampoides purpureus*, *Sagartiogeton lacerates*, *Sagartiogeton undatus*, and *Pachycerianthus multiplicatus*) are reported for the first time as elements of the Turkish marine fauna in the present study. The highest number of cnidarian species (121 species) was reported from the Aegean Sea, while the lowest (17 species) was reported from the Black Sea. The hot spot areas for cnidarian diversity are the Prince Islands, İstanbul Strait, İzmir Bay, and Datça Peninsula, where relatively intensive scientific efforts have been carried out. Regarding ctenophores, 7 species are distributed along the Turkish coasts, 5 of which were reported from the Black Sea. A total of 16 alien cnidarian and 2 ctenophore species were determined in the regions. Two species (*Sagartiogeton laceratus* and *Pachycerianthus multiplicatus*) are new alien species for the Mediterranean Sea and could have been introduced to the northern part of the Sea of Marmara and İskenderun Bay, areas from which these species are recorded, by ships from the North-East Atlantic.

Key words: Species diversity, cnidarian, ctenophore, alien species, protected species, Mediterranean Sea, Black Sea

1. Introduction

Cnidaria is a diverse phylum containing 10,211 species worldwide and 752 species in the Mediterranean Sea, inhabiting exclusively aquatic and mostly marine environments (Coll et al., 2010; Appeltans et al., 2012). Many cnidarians are distributed in shallow waters as they are in a symbiotic relationship with endosymbiotic algae for food and calcification (Pearse and Muscatine, 1971; Muscatine and Porter, 1977). They form reefs in tropical waters, constituting a highly productive ecosystem (Hatcher, 1997). Blooms of jellyfish suddenly appearing in the anthropogenically deteriorated areas are known to be an indication of greatly altered ecosystem function (Parsons and Lalli, 2002; Purcell et al., 2007). They have also direct effects on human enterprise, particularly obscuring tourism by stinging swimmers (Öztürk and İşinibilir, 2010; Çinar et al., 2011), fishing and aquaculture by clogging nets and feeding zooplankton and ichthyoplankton (Richardson et al., 2009; Dong et al., 2010), and power plants by clogging seawater-intake pipes (Galil, 2007).

The jellyfish bloom along the coast of Turkey was first reported by Antipa (1892) in İzmir Bay for *Drymonema dalmatinum* (cited as *D. cordelio*). Afterwards, blooms of alien (*Rhopilema nomadica*) and native (*Aurelia aurita*, *Chrysaora hysoscella*, and *Rhizostoma pulmo*) jellyfish have been frequently observed along the coasts of Turkey (Balık, 1972; Bingel et al., 1991; Mutlu et al., 1994; Alparslan, 2001; Çinar et al., 2011). More recently, blooms of *Liriope tetraphylla*, a hydromedusa species, caused a temporal regime shift from a crustacean- to a jellyfish-controlled system in the Sea of Marmara (Yilmaz, 2014).

The naturalist and diplomat Luigi Ferdinando Marsili, who provided the first scientific understanding of the dynamics of the exchange currents through the Turkish Straits System, was the first to observe and draw a coral species (probably *Savalia savaglia*) in the Sea of Marmara in 1691 (Özsoy and Pinardi, 2010). Scientifically, the first reports of anthozoan species were given by Forbes (1844), who said: "The only corals met with of any size were *Cladocora caespitosa* and *Porites daedalea*. The former is extremely abundant near water-mark on the coast of Asia Minor, where it forms elegant cauliflower-like patches of bright orange, from the hue of the animals, adhering to the rocks". The species *Porites daedalea* was then considered

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as a misidentification of *Madracis pharensis* by Zibrowius (1980). Colombo (1885) and Ostroumoff (1896) listed 5 and 15 anthozoan species in the Çanakkale Strait and Sea of Marmara, respectively. Demir (1952) identified 14 species among the material collected from the İstanbul Strait and Prince Islands. Tixier-Durivault (1961) described a new species (*Parerythropodium bosphorense*) in the İstanbul Strait. This group of animals was first specifically studied by Coşar (1974), who reported 11 species in İzmir Bay. More recently, Topçu and Öztürk (2013) identified 9 octocoral species from Balıkçı Island (Sea of Marmara). Other records of anthozoan species were given in some general ecological works (i.e. Çinar et al., 2006b) or a species atlas (i.e. Gökalp, 2011).

The phylum Ctenophora, also known as comb jellies, is mainly characterized by bearing 8 rows of comb-like bands of cilia used for swimming. This phylum includes almost 190 species worldwide and 30 species in the Mediterranean Sea (Coll et al., 2010; Appeltans et al., 2012). The first record of ctenophores from the Turkish coast was given by Demir (1952), who reported *Pleurobrachia rhodopis* around the İstanbul Strait and Prince Islands. This species was later found off Trabzon (Demir, 1954). The well-known ctenophore species in the region is *Mnemiopsis leidyi*, which was unintentionally introduced to the Black Sea from the northwestern Atlantic by ballast water of ships (Vinogradov et al., 1989). This zooplanktonic predator reached an enormous biomass level (>1 kg m^{-2}) in some areas in the summer of 1989, which was estimated to be greater than that of all other zooplankton combined, leading to a sharp decrease in anchovy production in the region (Kideys and Niermann, 1994; Kideys, 2002). After the arrival of the other alien species *Beroe ovata*, which feeds on other ctenophores, the sharpest drop was estimated for biomass and density of *Mnemiopsis leidyi* in 1999 compared with late summer data during the previous 10 years (Shiganova et al., 2001).

The present study gives a check-list of cnidarian and ctenophore species reported from the coasts of Turkey and presents some anthozoan species new to the Turkish marine fauna. Finally, the hot spot diversity areas for these major taxonomic groups are presented.

2. Materials and methods

The check-list was prepared by compiling all existing scientific papers about Cnidaria and Ctenophora species along the coasts of Turkey. In addition, new records of anthozoan species, which were identified in recent research projects but have not been cited in any papers, are presented here. The stations where new records of species were found are indicated in Figure 1. The station numbers are superscripted over "PS" in the Table. The first reports of all species and their depth and habitat distributions are given in the Table. Notes regarding the recorded species names cited in the literature considering the Turkish marina fauna are also provided in the Table.

In order to assess the diversity hot spots for the taxonomic groups considered in this study and to identify the areas where different degrees of research efforts — a major factor apart from environmental characteristics regulating diversity patterns — have been performed to date (gap analysis), the coasts of Turkey were divided into grids with squares of 15 × 15 km. All data of species distribution were entered into an Excel file and then imported and digitized with ArcGIS 9.3 software.

3. Results and discussion

According to previous data and new data presented in this paper, the phylum Cnidaria along the coasts of Turkey is represented by 195 species belonging to 5 classes (Hydrozoa, Cubozoa, Scyphozoa, Staurozoa, and Anthozoa) and 76 families. The phylum Ctenophora along the coasts of Turkey is represented by 7 species belonging to 2 classes (Nuda and Tentaculata) and 4

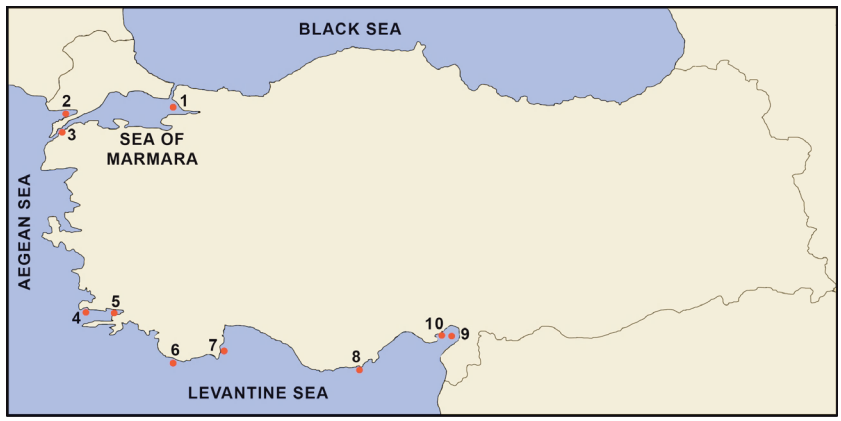

Figure 1. Map of the stations where new records of anthozoan species were found.

Table. Species list of the phyla Cnidaria and Ctenophora from the coasts of Turkey *: Alien species; BS: Black Sea; SM: Sea of Marmara; AS: Aegean Sea; LS: Levantine Sea; DR: depth range (I: 0–10 m; II: 11–50 m; III: 51–100 m; IV: 101–200 m; V: 201–400 m; VI: 401–600 m; VII: >600 m); H: habitat (Hs: hard substratum – including algae, sponge, mussels, etc.; Ss: soft substratum – including all phanerogams; P: pelagic); PS: present study (superscripted numbers indicate station numbers as shown in Figure 1).

Group/Species	BS	SM	AS	LS	DR	H	Remarks
Phylum: Cnidaria							
Class: Hydrozoa							
Subclass: Trachylinae							
Family: Geryoniidae							
Geryonia proboscidalis (Forsskål, 1775)	-	-	70	1		P	
Liriope tetraphylla (Chamisso & Eysenhardt, 1821)	-	55	-	-		P	
Family: Rhopalonematidae							
Rhopalonema velatum Gegenbaur, 1857	-	-	13	-		P	
Aglaura hemistoma Péron & Lesueur, 1810	-	5	61	16	II, III	P	
Family: Olindiidae							
Olindias phosphorica (Delle Chiaje, 1841)	-	-	58	-	I	P	
Family: Aeginidae							
Solmundella bitentaculata (Quoy & Gaimard, 1833)	-	55	-	-		P	
Subclass: Hydroidolina							
Family: Forskaliidae							
Forskalia contorta (Milne-Edwards, 1841)	-	-	-	1		P	
Family: Abylidae							
Abylopsis tetragona (Otto, 1823)	-	-	1	1		P	
Family: Diphyidae							
Muggiaea kochii (Will, 1844)	-	5	-	-	I–VI	Hs	
Lensia conoidea (Keferstein & Ehlers, 1860)	10	-	40	-	II	P	
Lensia subtiloides (Lens & Van Riemsdijk, 1908)	-	-	16	16		P	
Eudoxoides spiralis (Bigelow, 1911)	-	-	13	16		P	
Family: Cladonematidae							
Cladonema radiatum Dujardin, 1843	-	4	-	-	II	Hs	
Family: Pennariidae							
Pennaria disticha Goldfuss, 1820	-	-	-	20	I	Hs	
Family: Porpitidae							
Porpita porpita (Linnaeus, 1758)	-	-	-	1		P	=*Porpita glandifera*
Family: Cladocorynidae							
Cladocoryne floccosa Rotch, 1871	-	-	19	-	I	Hs	
Family: Corynidae							
Sarsia tubulosa (M. Sars, 1835)	-	8	-	-	I	Hs	=*Sarsia sarsii* =*Syncoryne sarsii*
**Coryne eximia* Allman, 1859	-	8	-	-	I	Hs	
Coryne muscoides (Linnaeus, 1761)	-	-	19	-	I	Hs	

Table 1. (Continued).

Family: Tubulariidae							
Tubularia indivisa Linnaeus, 1758	-	4	-	-	II	Hs, Ss	
Ectopleura crocea (Agassiz, 1862)	-	-	15	-	I	Hs	=*Tubularia mesembryanthemum*
Ectopleura larynx (Ellis & Solander, 1786)	-	8	19	-	I	Hs	
Family: Cordylophoridae							
**Cordylophora caspia* (Pallas, 1771)	-	-	52	-	I	Hs	
Family: Bougainvilliidae							
Bougainvillia muscus (Allman, 1863)	14	2	19	20	I–III	Hs	=*Eudendrium ramosum* Van Beneden, 1844 =*Bougainvillia fructicosa*
Rhizorhagium arenosum (Alder, 1862)	-	8	-	-	I	Hs	
Garveia grisea (Motz-Kossowska, 1905)	-	-	20	-		Hs	
Garveia nutans Wright, 1859	14	-	-	-		Hs	
Dicoryne conferta (Alder, 1856)	-	24	-	-	I	Hs	
Family: Hydractiniidae							
Hydractinia carnea (M. Sars, 1846)	-	8	-	-	I	Hs	
Hydractinia echinata (Fleming, 1828)	-	5	-	-	I, II	Hs	
Podocoryna carnea M. Sars, 1846	-	5	-	-	II	Hs	
Stylactaria fucicola (M. Sars, 1857)	-	-	20	-		Hs	
Family: Eudendriidae							
Eudendrium armstongi Stechow, 1909	-	5	-	-	II	Hs	=*Eudendrium ramosum* Armstrong, 1879
Eudendrium capillare Alder, 1856	-	8	19	-	I–III	Hs	
Eudendrium glomeratum Picard, 1952	-	-	20	-		Hs	
**Eudendrium merulum* Watson, 1985	-	39	39	-	I	Hs	
Eudendrium racemosum (Cavolini, 1785)	-	-	20	-	I, II	Hs	
Eudendrium rameum (Pallas, 1766)	-	8	-	-	II	Hs	
Eudendrium simplex Pieper, 1884	-	-	20	-		Hs	=*Eudendrium motzkossowskae*
Family: Pandeidae							
Leuckartiara octona (Fleming, 1823)	-	8	-	-	I–III	Hs	=*Perigonimus repens*
Neoturris pileata (Forsskål, 1775)	-	55	-	-		P	
Family: Halopteridiidae							
Halopteris catharina (Johnston, 1833)	-	-	20	-	I, II	Hs	
Halopteris diaphana (Heller, 1868)	-	-	20	-		Hs	
Antennella secundaria (Gmelin, 1791)	-	5	20	-	II, III	?Hs	
Family: Plumulariidae							
Plumularia obliqua (Johnston, 1847)	-	-	24	-	I	Hs	
Plumularia setacea (Linnaeus, 1758)	-	-	20	-		Hs	
Plumularia syriaca Billard, 1931	-	24	-	6	II, III	Hs	
Nemertesia antennina (Linnaeus, 1758)	-	2	24	-	I–IV	Hs	=*Nemertesia pentasticha*
Nemertesia ramosa (Lamarck, 1816)	-	2	-	-	III	Hs	

Table 1. (Continued).

Nemertesia tetrasticha Meneghini, 1845	-	5	-	-	III	Hs	=*Plumularia disticha*
Family: Aglaopheniidae							
Aglaophenia dichotoma Kirchenpauer, 1872	-	11	-	-	II	Hs	
Aglaophenia elongata Meneghini, 1845	-	5	20	-	II, III	Hs	
Aglaophenia octodonta Heller, 1868	-	11	20	-	II	Hs	
Aglaophenia picardi Svoboda, 1979	28	-	-	-	II	Hs	
Aglaophenia pluma (Linnaeus, 1758)	14	4	19	-	I, II	Hs	=*Plumularia cristata*
**Macrorhynchia philippina* Kirchenpauer, 1872	-	-	-	51	I	Hs	
Lytocarpia myriophyllum (Linnaeus, 1758)	-	24	24	-	II–IV	Hs	
Family: Kirchenpaueriidae							
Kirchenpaueria halecioides (Alder, 1859)	-	8	24	-	I	Hs	
Kirchenpaueria pinnata (Linnaeus, 1758)	-	-	19	6	I	Hs	=*Kirchenpaueria echinulata*
Family: Haleciidae							
Halecium beanii (Johnston, 1838)	-	24	24	-	I–III	Hs	
Halecium halecinum (Linnaeus, 1758)	-	11	24	-	I–IV	Hs	=*Halecium halecium*
Halecium labrosum Alder, 1859	-	37	-	-	III	Hs	
Halecium lankesterii (Bourne, 1890)	-	-	20	-		Hs	=*Halecium lankesteri*
Halecium pusillum Sars, 1856	-	-	19	-	I	Hs	
Halecium mediterraneum Weismann, 1883	-	-	20	-		Hs	
Halecium nanum Alder, 1859	-	-	20	-		Hs	
Hydrodendron mirabile (Hincks, 1866)	-	-	19	-	I	Hs	=*Ophiodissa mirabilis*
Family: Sertulariidae							
Sertularia distans (Lamouroux, 1816)	-	-	24	-	II	Hs	=*Sertularella fusiformis*
**Sertularia marginata* (Kirchenpauer, 1864)	-	-	20	-		Hs	
Sertularia perpusilla Stechow, 1919	-	-	20	-		Hs	
Sertularella crassicaulis (Heller, 1868)	-	4	-	-	II–IV	Hs	
Sertularella ellisii (Deshayes & Milne Edwards, 1836)	-	4	19	-	I, II	Hs	
Sertularella mediterranea Hartlaub, 1901	-	-	19	6	I	Hs	
Sertularella polyzonias (Linnaeus, 1758)	7	5	20	-	I–III	Hs	
Sertularella simplex (Hutton, 1873)	-	-	24	-	I	Hs	=*Sertularella fusiformis*
Salacia desmoides (Torrey, 1902)	-	-	20	-		Hs	
Dynamena disticha (Bosc, 1802)	-	-	20	20		Hs	
Amphisbetia operculata (Linnaeus, 1758)	-	-	24	-	I	Hs	=*Dynamena operculata*
Family: Aequoreidae							
**Aequorea globosa* Eschscholtz, 1829	-	-	-	65	II	P	
Aequorea forskalea Péron & Lesueur, 1810	-	-	-	71	I, II	P	
Family: Phialellidae							
Phialella quadrata (Forbes, 1848)	-	8	-	-	I	Hs	=*Campanulina repens*
Family: Campanulariidae							

Table 1. (Continued).

Campanularia hincksii Alder, 1856	-	-	20	-		Hs	=*Orthopyxis alta*
Clytia gracilis (Sars, 1850)	-	8	24	-	I, II	Hs	
Clytia hemisphaerica (Linnaeus, 1767)	-	4	19	20	I, II	Hs	=*Clytia johnstoni*
**Clytia linearis* (Thorneley, 1900)	-	-	20	-		Hs	=*Clytia gravieri*
Clytia paulensis (Vanhöffen, 1910)	-	-	20	-		Hs	
Obelia bidentata Clark, 1875	-	8	24	-	I–III	Hs	=*Obelia biscuspidata*
Obelia dichotoma (Linnaeus, 1758)	-	8	36	6	I, II	Hs	
Obelia geniculata (Linnaeus, 1758)	-	-	19	-	I	Hs	
Obelia longissima (Pallas, 1766)	-	24	-	-	I	Hs	=*Obelia flabellata*
Orthopyxis everta (Clark, 1876)	-	-	20	-		Hs	=*Orthopyxis crenata*
Orthopyxis integra (MacGillivray, 1842)	-	24	20	-	I, II	Hs	=*Orthopyxis caliculata*
Hartlaubella gelatinosa (Pallas, 1766)	14	8	-	-	I, II	Hs	
Gonothyraea loveni (Allman, 1859)		8	-	-	I, II	Hs	=*Gonothyraea hyalina*
Laomedea angulata Hincks, 1861	14	8	24	-	I, II	Hs, Ss	
Laomedea calceolifera (Hincks, 1871)	-	38	20	-	I	Hs	
Laomedea exigua M. Sars, 1857	-	24	24	-	I, II	Hs	
Laomedea flexuosa Alder, 1857	-	5	24	-	I–III	Hs	
Family: Lafoeidae							
Lafoea dumosa (Fleming, 1820)	-	8	20	-	I–IV	Hs	=*Lafoea gracillima* =*Scandia pocillum*
Filellum serpens (Hassall, 1848)	-	24	-	-	II	Hs	
**Filellum serratum* (Clarke, 1879)	-	24	20	-	II	Hs	
Acryptolaria conferta (Allman, 1877)	-	24	-	-	IV	Hs	
Family: Hebellidae							
Hebella scandens (Bale, 1888)	-	-	20	-		Hs	
Anthohebella parasitica (Ciamician, 1880)	-	5	20	-	III	Hs	
Family: Tiarannidae							
Modeeria rotunda (Quoy & Gaimard, 1827)	-	24	-	-	II–IV	Hs	=*Stegopoma fastigiata*
Family: Laodiceidae							
Laodicea undulata (Forbes & Goodsir, 1853)	-	-	20	-		Hs	
Class: Cubozoa	-	-	-	-			
Family: Carybdeidae							
Carybdea marsupialis (Linnaeus, 1758)	-	-	18	-	?	P	
Class: Scyphozoa							
Subclass: Discomedusae							
Family: Ulmaridae							
Aurelia aurita (Linnaeus, 1758)	9	8	13	60	I, II	P	
Family: Pelagiidae							
Chrysaora hysoscella (Linnaeus, 1767)	-	45	13	27	I, II	P	
Pelagia noctiluca (Forsskål, 1775)	-	-	13	60	I, II	P	

Table 1. (Continued).

Family: Cyaneidae							
Drymonema dalmatinum Haeckel, 1880	-	-	3	-	I, II	P	
Family: Cassiopeidae							
**Cassiopea andromeda* (Forsskål, 1775)	-	-	60	44	I	Ss, P	
Family: Cepheidae							
Cotylorhiza tuberculata (Macri, 1778)	-	-	2	-	I, II	P	
Family: Mastigiidae							
**Phyllorhiza punctata* Lendenfeld, 1884	-	-	69	57	I	P	
Family: Rhizostomatidae							
Rhizostoma pulmo (Macri, 1778)	35	53	1	27	I, II	P	
**Rhopilema nomadica* Galil, Spanier & Ferguson, 1990	-	-	66	33	I, II	P	
Family: Periphyllidae							
Nausithoe punctata Kölliker, 1853	-	-	59	-	II	Hs	
Periphylla periphylla (Péron & Lesueur, 1810)	-	5	-	-	I, II	P	
Family: Paraphyllinidae							
Paraphyllina ransoni Russell, 1956	-	55	-	-	I, II	P	
Class: Staurozoa							
Family: Kishinouyeidae							
Lucernariopsis campanulata (Lamouroux, 1815)	47	8	-	-	I	?Hs	
Class: Anthozoa							
Subclass: Hexacorallia							
Family: Actiniidae							
Actinia cari Delle Chiaje, 1822	-	-	17	54	I–III	Hs	
Actinia equina (Linnaeus, 1758)	41	8	15	48	I	Hs	
Anemonia viridis (Forskål, 1775)	-	8	15	48	I, II	Hs	=*Anemonia sulcata*
Aulactinia verrucosa (Pennant, 1777)	-	-	17	PS[6]	I	Hs	
Bunodactis rubripunctata (Grube, 1840)	-	-	PS[4]	-	I	Hs	
Condylactis aurantiaca (Delle Chiaje, 1825)	-	60	59	PS[10]	I, II	Ss	
Family: Actinostolidae							
Paranthus rugosus Andrès, 1880	-	-	50	-	I	Hs	
Family: Aiptasiidae							
Aiptasia diaphana (Rapp, 1829)	-	-	17	PS[6]	I	Hs	
Aiptasia mutabilis (Gravenhorst, 1831)	-	60	56	PS[6]	I, II	Hs	
Aiptasiogeton pellucidus (Hollard, 1848)	-	PS[1]	50	-	I	Hs	=*Aiptasiogeton comatus*
Family: Aliciidae							
Alicia mirabilis Johnson, 1861	-	-	59	60	I, II	Hs	
Family: Arachnactidae							
Arachnanthus oligopodus (Cerfontaine, 1891)	-	-	-	PS[6]	II	Ss	
Family: Boloceroididae							

Table 1. (Continued).

Bunodeopsis strumosa Andrès, 1881	-	PS[3]	PS[2]	PS[6]	I	Hs	
Family: Cerianthidae							
Cerianthus lloydii (Gosse, 1859)	-	59	-	-	I	Ss	Questionable
Cerianthus membranaceus (Spallanzani, 1784)	-	5	30	48	I–V	Ss	
Pachycerianthus solitarius (Rapp, 1829)	23	8	PS[5]	PS[6]	II	Ss	
**Pachycerianthus multiplicatus* Carlgren, 1912	-	-	-	PS[10]	I	Ss	
Family: Corallimorphidae							
Corynactis viridis Allman, 1846	-	PS[1]	-	-	II	Hs	
Family: Diadumenidae							
**Diadumene lineata* (Verrill, 1869)	-	-	43	-	I	Hs	
**Diadumene cincta* Stephenson, 1925	-	59	-	-	I	Hs	Questionable
Family: Edwardsiidae							
Edwardsia claparedii (Panceri, 1869)	23	-	50	67	I–III	Ss	
Family: Halcampoididae							
Halcampoides purpureus (Studer, 1879)	-	-	-	PS[6]	I, II	Ss	
Family: Hormathiidae							
Adamsia palliata (Fabricius, 1779)	-	-	17	PS[6,8]	I, II	Hs	
Calliactis parasitica (Couch, 1842)	-	-	15	60	I, II	Hs	
Family: Epizoanthidae							
Epizoanthus couchii Johnston in Couch, 1844	-	59	-	-	II	Hs	
Family: Isophellidae							
Telmatactis cricoides (Duchassaing, 1850)	-	-	60	32	I	Hs	
Telmatactis forskalii (Ehrenberg, 1834)	-	-	19	PS[6]	I	Hs	=*Phellia limicola*
Family: Haloclavidae				-			
Peachia cylindrica (Reid, 1848)	14	46	17	-	I, II	Ss	=*Peachia hastata*
Family: Sagartiidae							
Actinothoe clavata (Ilmoni, 1830)	23	-	-	-	III	Ss	
Cereus pedunculatus (Pennant, 1777)	-	59	17	-	I, II	Ss	
Sagartia elegans (Dalyell, 1848)	-	60	17	-	II	Hs	=*Sagartia rhododactylos*
**Sagartiogeton laceratus* (Dalyell, 1848)	-	PS[1]	-	-	II	Hs	
Sagartiogeton undatus (Müller, 1778)	-	PS[1]	-	-	II	Hs	
Sagartiogeton viduatus (Müller, 1776)	-	5	-	-	II	Ss	
Family: Schizopathidae							
Parantipathes larix (Esper, 1788)	-	5	-	-	V–VII	Ss	=*Anthipathes larix*
Family: Parazoanthidae							
Parazoanthus axinellae (Schmidt, 1862)	-	5	48	48	II	Hs	
Savalia savaglia (Bertoloni, 1819)	-	25	PS[2]	-	II, III	Hs	=*Gerardia savaglia*
Family: Dendrophyllidae							
Balanophyllia (*Balanophyllia*) *europaea* (Risso, 1826)	-	5	21	60	I–III	Hs, Ss	=*Balanophyllia italica*

Table 1. (Continued).

Dendrophyllia ramea (Linnaeus, 1758)	-	5	-	-	II	Ss	
Leptopsammia pruvoti Lacaze-Duthiers, 1897	-	-	59	60	II	Hs	
Family: Caryophyllidae							
Caryophyllia (*Caryophyllia*) *cyathus* (Ellis & Solander, 1786)	-	2	-	-	II, III	Hs	
Caryophyllia (*Caryophyllia*) *inornata* (Duncan, 1878)	-	-	21	60	I, II	Hs	
Caryophyllia (*Caryophyllia*) *smithii* Stokes & Broderip, 1828	-	5	48	48	II, III	Hs, Ss	=*Caryophyllia clava*
Coenocyathus anthophyllites Milne Edwards & Haime, 1848-		5	-	-	II	Ss	
Desmophyllum dianthus (Esper, 1794)	-	64	-	-	VII	Hs	
Hoplangia durotrix Gosse, 1860	-	-	59	-	I	Hs	
Paracyathus pulchellus (Philippi, 1842)	-	8	-	-	II	Hs	
Phyllangia mouchezii (Lacaze-Duthiers, 1897)	-	-	22	22	II	Hs	
Polycyathus muellerae (Abel, 1959)	-	-	21	PS[7]	I	Hs	
Family: Faviidae							
Cladocora caespitosa (Linnaeus, 1767)	-	62	1	48	I, II	Hs	
Family: Oculinidae							
**Oculina patagonica* De Angelis, 1908	-	-	-	51	I	Hs	
Family: Pocilloporidae							
Madracis pharensis (Heller, 1868)	-	-	1	21	II	Hs	=*Porites daedalea*
Subclass: Octocorallia							
Family: Funiculinidae							
Funiculina quadrangularis (Pallas, 1766)	-	5	-	-	II–IV	Ss	
Family: Alcyoniidae							
Alcyonium acaule Marion, 1878	-	72	60	-	II	Hs	
Alcyonium coralloides (Pallas, 1766)	-	4	PS[2]	-	II, III	Hs, Ss	
Alcyonium palmatum Pallas, 1766	-	2	15	-	II–V	Ss	
Parerythropodium bosphorense Tixier-Durivault, 1961	-	12	-	-	II	Ss	
Family: Clavulariidae							
Clavularia crassa (Milne Edwards, 1848)	-	8	-	-	I	Hs	
Sarcodictyon roseum (Philippi, 1842)	-	4	-	-	III	Ss	=*Rhizoxenia rosea*
Family: Plexauridae							
Bebryce mollis Philippi, 1842	-	5	-	-	III	Ss	
Paramuricea clavata (Risso, 1826)	-	25	48	-	II	Hs	
Paramuricea macrospina (Koch, 1882)	-	5	-	-	II, III	Hs, Ss	=*Muricea macrospina*
Spinimuricea klavereni (Carpine & Grasshoff, 1975)	-	5	-	-	II, III	Hs, Ss	=*Muricea echinata*
Family: Gorgoniidae							
Eunicella cavolini (Koch, 1887)	-	48	48	-	II	Hs	
Eunicella singularis (Esper, 1791)	-	48	48	-	II	Hs	
Eunicella verrucosa (Pallas, 1766)	-	8	-	-	II, III	Hs	
Family: Veretillidae							

Table 1. (Continued).

Veretillum cynomorium (Pallas, 1766)	-	4	15	-	II–IV	Ss	
Family: Paralyconiidae							
Paralcyonium spinulosum Delle Chiaje, 1822	-	68	-	-	II	Hs	
Family: Pennatulidae							
Pennatula phosphorea Linnaeus, 1758	-	2	-	67	II, III	Ss	
Pennatula rubra (Ellis, 1761)	-	49	-	54	II, III	Ss	
Pteroeides griseum (Linnaeus, 1767)	-	8	-	PS[8]	?	Ss	
Pteroeides spinosum (Ellis, 1764)	-	2	-	PS[9]	II	Ss	
Family: Virgulariidae							
Virgularia mirabilis (Müller, 1776)	7	46	-	-	II, III	Ss	
Family: Cornulariidae							
Cornularia cornucopiae (Pallas, 1766)	-	46	-	-	II	Hs	
Family: Kophoblemnidae							
Kophobelemnon stelliferum (Müller, 1776)	-	8	-	-	II	Ss	=*Cophobelemnon leuckarti*
Phylum: Ctenophora							
Class: Nuda							
Family: Beroidae							
**Beroe ovata* Bruguière, 1789	42	34	-	-	I, II	P	
Class: Tentaculata							
Subclass: Cyclocoela							
Family: Bolinopsidae							
Bolinopsis vitrea (L. Agassiz, 1860)	63	-	13	PS	I–III	P	
Bolinopsis infundibulum (O.F. Müller, 1776)	-	-	60	-	II	P	
**Mnemiopsis leidyi* A. Agassiz, 1865	35	26	31	29	I, II	P	
Family: Cestidae							
Cestum veneris Lesueur, 1813	-	-	-	60	I	P	
Subclass: Typhlocoela							
Family: Pleurobrachiidae							
Pleurobrachia pileus (O. F. Müller, 1776)	35	34	-	-	I, II	P	
Pleurobrachia rhodopis Chun, 1879	9	8	13	-	I	P	

1. Forbes, 1844; 2. Colombo, 1885; 3. Antipa, 1892; 4. Ostroumoff, 1894; 5. Ostroumoff, 1896; 6. Billard, 1931; 7. Jakubova, 1948; 8. Demir, 1952; 9. Demir, 1954; 10. Einarsson and Gürtürk, 1959; 11. Tortonese, 1959; 12. Tixier-Durivault, 1961; 13. Ergen, 1967; 14. Băcescu et al., 1971; 15. Geldiay and Kocataş, 1972; 16. Gökalp, 1972; 17. Coşar, 1974; 18. Geldiay and Balık, 1977; 19. Kocataş, 1978; 20. Marinopoulos, 1979; 21. Zibrowius, 1979a; 22. Zibrowius, 1980; 23. Kiseleva, 1981; 24. Ünsal, 1981; 25. Öztürk and Bourguet, 1990; 26. Artüz, 1991; 27. Bingel et al., 1991; 28. Svoboda and Cornelius, 1991; 29. Uysal and Mutlu, 1993; 30. Ergen et al., 1994; 31. Kideys and Niermann, 1994; 32. Hartog, 1995; 33. Kideys and Gücü, 1995; 34. Shiganova et al., 1995; 35. Shiganova et al., 1998; 36. Koçak et al., 1999; 37. Albayrak and Balkıs, 2000; 38. Koçak and Küçüksezgin, 2000; 39. Marques et al., 2000; 40. Tarkan, 2000; 41. Bat et al., 2001; 42. Kideys and Romanova, 2001; 43. Sarı et al., 2001; 44. Bilecenoğlu, 2002; 45. İnanmaz et al., 2002; 46. Uysal et al., 2002; 47. Gönlügür Demirci, 2004; 48. Öztürk et al., 2004; 49. Topaloğlu et al., 2004; 50. Çinar et al., 2006b; 51. Çinar et al., 2006a; 52. Çinar et al., 2008; 53. Mavili, 2008; 54. Mutlu and Ergev, 2008; 55. Işinibilir et al., 2010; 56. Aslan Cihangir et al., 2011; 57. Çevik et al., 2011; 58. Eleftheriou et al., 2011; 59. Gökalp, 2011; 60. Gözcelioğlu, 2011; 61. Mavili, 2011; 62. Özalp and Alparslan, 2011; 63. Öztürk et al., 2011; 64. Taviani et al., 2011; 65. Turan et al., 2011; 66. Gülşahin and Tarkan, 2011a; 67. Çinar et al., 2012; 68. Evirgen and Ekşiyan, 2012; 69. Gülşahin and Tarkan, 2012; 70. Gülşahin et al., 2013; 71. Gürlek et al., 2013; 72. Topçu and Öztürk, 2013.

families (Table; Figure 2). Seven anthozoan species (*Arachnanthus oligopodus*, *Bunodactis rubripunctata*, *Bunodeopsis strumosa*, *Corynactis viridis*, *Halcampoides purpureus*, *Sagartiogeton lacerates*, and *Sagartiogeton undatus*) constitute new records for the Turkish marine fauna. A brief description and distribution of these species is presented below.

Arachnanthus oligopodus (Cerfontaine, 1891)

(Figure 2A)

Notes: Column up to 80 mm (usually up to 25 mm) long. Thin, not sclerotised, granular tube-living relatively loose in substrata; often u-shaped; tearing easily. Up to 20 marginal or labial tentacles each in a pseudocycle; marginal tentacles short; usually brown-grey banded, but uniformly brown or transparent; siphonoglyph very wide (Figure 2A). Active at night, rolls its tentacles immediately if touched (Hofrichter, 2003).

Distribution: This species was encountered on sand at 26 m depth at station 6 (2 specimens), and in a *Cymodocea nodosa* bed at 16 m depth at station 7 (1 specimen). It is a species endemic to the Mediterranean (Vafidis, 2010).

Bunodactis rubripunctata (Grube, 1840)

(Figure 2B)

Notes: Basal disc almost 35 mm; column 40 mm high, 30 mm base; mouth disc 45 mm. Column brownish red or green mottling with fine red, irregular; 48 vertical rows of red dotted verrucae; significant fosse; short capitulum. Limbus lighter than wall sheet, clearly notched; margin with 96 alternating small and large, composite (pseudo) acrorhagi. Ninety-six tentacles slightly longer than oral disc diameter; hyaline brown grey, light grey, reddish grey with yellowish longitudinal stripes on surface, conical (Figure 2B). Inner mouth brown field greenish or reddish, peripheral half golden yellow, olive green border, mesenteric insertion red. Two distinct siphonoglyphs (Hofrichter, 2003).

Distribution: This species was only found on hard substrate (1 specimen) at 1.5 m depth at station 4 (Poyraz Limanı-Karaada). It is an Atlanto-Mediterranean species (Vafidis, 2010).

Bunodeopsis strumosa Andrès, 1881

(Figure 2C)

Notes: Basal disc almost 4 mm in diameter; column up to 6 mm high, column brownish green with large golden yellow, with bubble-like protuberances. Oral disc small; 26 conical tentacles, almost 4 times longer than oral disc diameter; mottling with brownish stripes (Figure 2C). No significant siphonoglyphs.

Distribution: This species was found on *Posidonia oceanica* and *Cymodocea nodosa* leaves (many specimens) at 2–3 m depth at stations 2, 3, and 6. It is a species endemic to the Mediterranean Sea (Vafidis, 2010).

Corynactis viridis Allman, 1846

(Figure 2D)

Notes: Column usually short and squat, usually overlapped by oral disc. Tentacles short to moderate, arranged in radial rows increasing in size towards the margin; each with a spherical knob (acrosphere) at tip (Figure 2D). Disc about 10 mm diameter; span of tentacles to 25 mm. Colours varied, with disc, tentacles, and often acrospheres in contrasting colours.

Distribution: Two colonies of this species (each >100 individuals) were found on rocky wall at 28–30 m depths at station 1 (Yassıada and Sivriada). Both colonies observed were colourless, without zooxanthellae. It is an Atlanto-Mediterranean species and was previously reported from the western Mediterranean Sea, Adriatic Sea, and Aegean Sea (Vafidis, 2010).

Halcampoides purpureus (Studer, 1879)

(Figure 2E)

Notes: Column elongated, not divided into distinct regions, its aboral end rounded and provided with cinclides; periderm is absent. Disc small, with a slight hypostome; tentacles very long, even in contraction being much longer than the disc diameter, in extension tapering to fine points (Figure 2E). Length of column when not buried up to 100 mm. Disc and tentacles translucent grey-brown or pinkish, disc with reddish lines on mesenteric insertions and often with small white spots on the exocoels, close to the mouth (Manuel, 1988).

Distribution: This species was observed on sand at 5–12 m depth (6 specimens) at station 6. It is distributed in the East Atlantic Ocean and Mediterranean Sea (Vafidis, 2010).

Sagartiogeton laceratus (Dalyell, 1848)

(Figure 2F)

Notes: Base broad and closely adherent, its outline usually ragged due to basal laceration; column tall and pillar-like extension, 30 mm high, 15 mm base diameter; disc twice diameter of column; tentacles long, arranged irregularly, owing to habitual pedal laceration, up to about 200. Column buff, dull orange or reddish brown, pale cream stripes running upwards from limbus to about middle; disc translucent cream or greyish, mesenteric insertions being indicated by fine orange lines; flanked by a pair of opaque cream ones, lining of actinopharynx orange (Figure 2F); acontia not readily emitted (Manuel, 1988).

Distribution: This species was found on rocky substrate at 26–35 m depth at station 1 (many specimens). It is distributed along the north-eastern Atlantic coasts from Sweden to Portugal (Manuel, 1988). This species has not been recorded in the Mediterranean Sea before and its presence in the Sea of Marmara could be attributed to transport by ships.

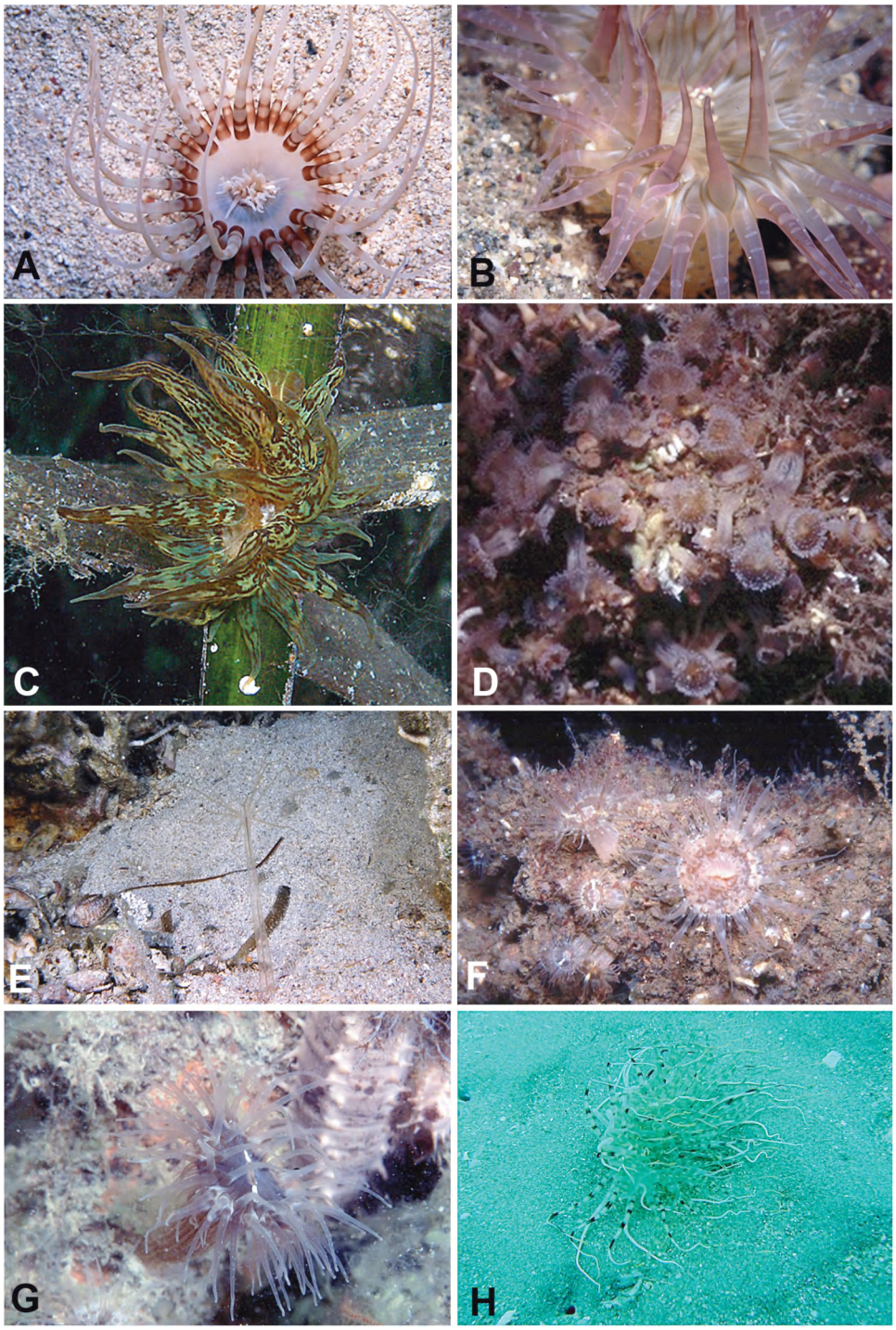

Figure 2. A) *Arachnanthus oligopodus* at 26 m depth at station 6, **B)** *Bunodactis rubripunctata* at 1.5 m depth at station 4, **C)** *Bunodeopsis strumosa* at 2 m depth at station 2, **D)** *Corynactis viridis* at 28 m depth at station 1, **E)** *Halcampoides purpureus* at 12 m depth at station 6, **F)** *Sagartiogeton lacerates* at 30 m depth at station 1, **G)** *Sagartiogeton undatus* at 30 m depth at station 1, **H)** *Pachycerianthus multiplicatus* at 8 m depth at station 10 (only C and H photographed by ME Çinar, the others by B Yokeş).

Sagartiogeton undatus (Müller, 1778)
(Figure 2G)

Notes: Column up to 120 mm high and 20 mm in diameter, becoming very low in contraction. Oral disc wider than column, with an unusually wide mouth; tentacles up to 200, long. Column grey or buff, with regular vertical stripes of brown flecks of variable intensity; acontia not readily emitted (Figure 2G). Disc and tentacles translucent grey or buff, with a pattern of dark markings and cream spots; often with irregular dark radial wedges; tentacles with 2 dark longitudinal stripes (Manuel, 1988).

Distribution: Many specimens of this species were observed on rocky substrate at 25–35 m depths at station 1. It is an Atlanto-Mediterranean species (Vafidis, 2010).

Pachycerianthus multiplicatus Carlgren, 1912
(Figure 2H)

Notes: Marginal tentacles arranged in 4 pseudocycles, numbering almost 120; diameter of tentacles ca. 150 mm. Marginal tentacles pale yellowish to white at tips, banded with brown; labial tentacles pale yellowish (Figure 2H). Tips of marginal tentacles slender, bending towards direction of prevailing current.

Distribution: This species was found only on sandy mud bottom (3 specimens) at 8 m depth at station 10 (Yumurtalık). It is known from the coasts of the United Kingdom and Scandinavia (Manuel, 1988). This is the first time this species is being reported from the Mediterranean Sea. This species could have been introduced to the area (near the Baku–Tbilisi–Ceyhan Oil Terminal) by ballast waters of ships.

Three anthozoan species were excluded from the list: 1) *Phellia elongata* (Delle Chiaje, 1825) was reported on alga *Ellisolandia elongata* (cited as *Corallina mediterranea*) in İzmir Bay by Kocataş (1978), but this species was considered *nomen dubium* by van der Land and den Hartog (2001); 2) based on the specimens collected at 4 stations (depth range: 73–496 m) in the Sea of Marmara, Ostroumoff (1896) presented *Palythoe conchilega* as a new species together with a small note, but as the species was not adequately described or figured, it is considered here as *nomen nudum*; 3) Demir (1952) identified the species *Gorgonia flabellum* Linnaeus, 1758 (cited as *Rhipidigorgia flabellum*) among the Sea of Marmara material deposited at the Fisheries Institution in İstanbul. It is in fact a western Atlantic (Antilles) species (Bayer, 1953) and its report from the Sea of Marmara is probably a misidentification since the species has no other records from the Turkish coasts or the whole Mediterranean Sea. Finally, 2 anthozoan species, namely *Cerianthus lloydii* and *Diadumene cincta*, are regarded as questionable as no morphologic/anatomic characters specific to these species were provided by Gökalp (2011).

The total number of Cnidaria and Ctenophora species along the coasts of Turkey was estimated to be 202 species, of which 195 species belonged to Cnidaria and 7 species to Ctenophora (Figure 3). The highest number of cnidarian species was determined in the Aegean Sea (121 species) and the Sea of Marmara (115 species), with the lowest (17 species) in the Black Sea. Unlike cnidarians, the highest number of ctenophore species (5 species) was encountered in the Black Sea, with the lowest (3 species) in the Levantine Sea.

Among the classes of Cnidaria and Ctenophora, Hydrozoa ranked first in terms of the number of species (106 species), followed by Anthozoa (75 species) and Scyphozoa (12 species) (Figure 3). Scyphozoa included 10 species in the Aegean Sea, 7 species in the Levantine Sea, and 2 species (*Aurelia aurita* and *Rhizostoma pulmo*) in the Black Sea. The Sea of Marmara possessed roughly half the number of hydrozoan species (57 species) and the majority of anthozoans (52 species) known to occur along the coasts of Turkey. This sea also contained 24 anthozoan species (e.g., *Corynactis viridis*, *Sagartiogeton* spp., *Dendrophyllia ramea*, *Desmophyllum dianthus*, *Parerythropodium bosphorense*, *Spinimuricea klavereni*, and *Paramuricea macrospina*) that have not been reported from any other seas surrounding Turkey. Only 1 Cubozoa (*Carybdea marsupialis*) and 1 Staurozoa (*Lucernariopsis campanulata*) species were reported along the coasts of Turkey (Demir, 1952; Geldiay and Balık, 1977; Gönlügür Demirci, 2004). The number of ctenophore species varied between 3 (Levantine Sea) and 5 (Black Sea) in the region.

The numbers of cnidarian and ctenophore species along the coasts of Turkey are shown in Figure 4. The hot spot areas for the cnidarian species are the Prince Islands, İstanbul Straits, İzmir Bay, and Datça Peninsula (Figure 4A). Only 9 grid squares (15 × 15 km) have more than 18 cnidarian species in the region. Cnidarians along the Black Sea coast of Turkey have been poorly studied to date, with the presence of 2 jellyfish (*Aurelia aurita* and *Rhizostoma pulmo*), 8 hydrozoan, and 6 anthozoan species, most of which were reported from the pre-Bosphorus area (i.e. Jakubova, 1948; Kiseleva, 1981). The diversity and population densities of ctenophores have been relatively well studied in the Black Sea and the Sea of Marmara. Every grid in these seas has at least one ctenophore species (Figure 4B). The less studied regions in terms of the ctenophore diversity are the Aegean Sea and Levantine Sea, where the limited data regarding this group are only available from Fethiye Bay, İzmir Bay, and Gökçeada.

The numbers of hydrozoan species attained the highest levels (max. 32 species) in areas such as the Datça Peninsula, Prince Islands, and İstanbul Strait, where relatively strong scientific efforts have been made, particularly thanks to Marinopoulos (1979) and Ünsal

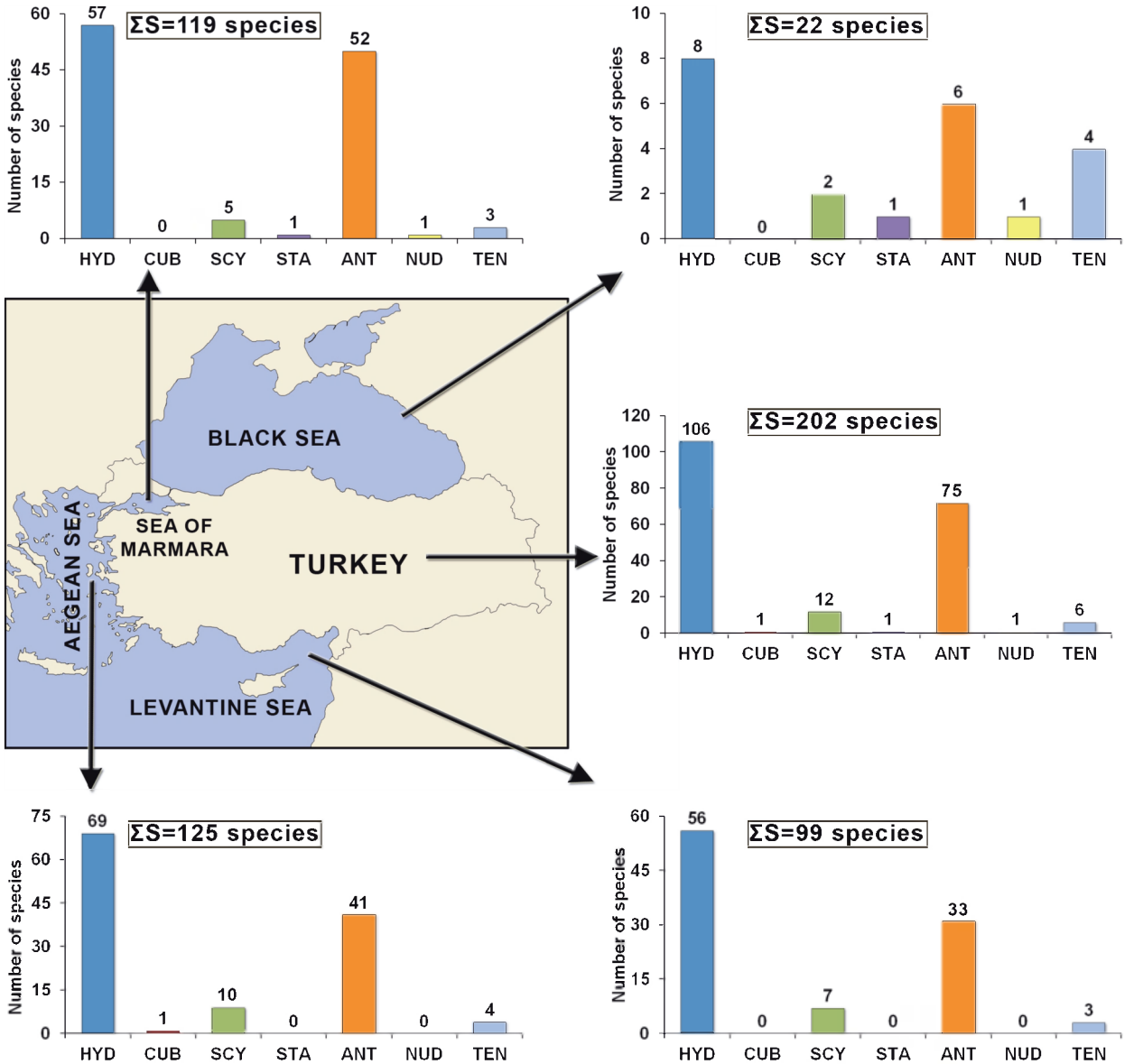

Figure 3. The number of species of the phyla Cnidaria and Ctenophora along the coasts of Turkey. HYD: Hydrozoa, CUB: Cubozoa, SCY: Scyphozoa, STA: Staurozoa, ANT: Anthozoa, NUD: Nuda, TEN: Tentaculata. ΣS indicates the total number of species of two phyla.

(1981) (Figure 5A). Only 3 grid squares in the Aegean Sea and 5 grid squares in the Sea of Marmara have more than 10 species. Only grid squares located near the Black Sea entrance of the İstanbul Strait possessed the hydrozoan species (totally 8 species) in the Black Sea, where almost 26 species are known (Zaitsev and Mamaev, 1997). There are also some sporadic data on hydrozoan fauna along the Levantine coast of Turkey. The scyphozoan species were relatively well studied in İzmir Bay (Ergen, 1967; Balık, 1972) and around Gökçeada (Öztürk and Topaloğlu, 2011), where more than 4 species were reported (Figure 5B). *Aurelia aurita* is a common species along the coast of the Black Sea (Kideys and Romanova, 2001), *Cotylorhiza tuberculata* in Gökova Bay (Gülşahin and Tarkan, 2011b), and *Rhopilema nomadica* in Mersin Bay and İskenderun Bay (Avşar, 1999). The highest number of anthozoan species (>12 species) was found around the Prince Islands and Kaş, where relatively intensive research has been performed (Figure 5C). Some species seem to have a narrow geographic distribution (i.e. confined to a specific area). For instance, the alien invasive coral species *Oculina patagonica* was only encountered in Akkuyu (Çinar et al.,

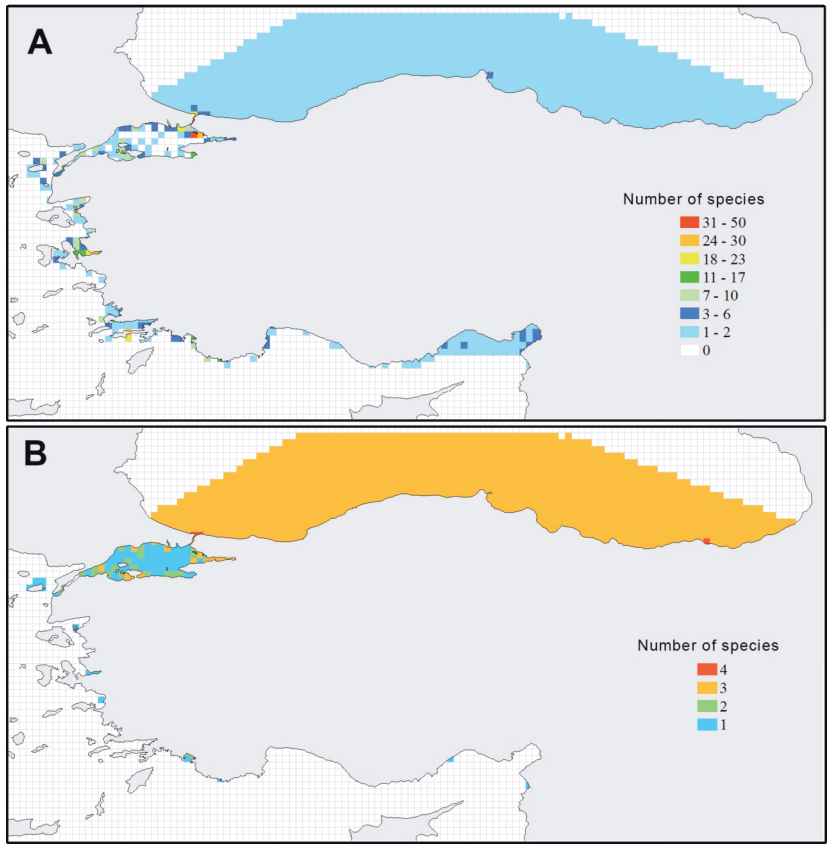

Figure 4. The distribution of the number of cnidarian **(A)** and ctenophore **(B)** species along the coasts of Turkey. Each grid square has dimensions of 15 × 15 km.

2006a), *Desmophyllum dianthus* in deep water (Çınarcık Basin) of the Sea of Marmara (Taviani et al., 2011), and *Parerythropodium bosphorense* in the İstanbul Strait (Tixier-Durivault, 1961). Data regarding the anthozoan fauna of the Black Sea of Turkey are only available from the pre-Bosphorus region and Sinop Peninsula.

Only 34 species were found in the pelagic domain and the remaining in benthic assemblages. The majority of the species (139) were encountered on hard substrata and 33 species were from soft substrata. Seven species occurred on both hard and soft substrata. A total of 155 species were reported from 0–50 m depths and only 5 species (*Alcyonium palmatum*, *Desmophyllum dianthus*, *Parantipathes larix*, *Cerianthus membranaceus*, and *Muggiaea kochii*) inhabited depths of about 200 m or downwards.

The alien Cnidaria and Ctenophora species inhabiting the coasts of Turkey were evaluated by Çinar et al. (2011), who listed 8 species (2 Hydrozoa, 3 Scyphozoa, 1 Anthozoa, and 2 Ctenophora species) in the region. The number of alien species (18) presented in this study is more than the double that. There are 3 reasons for this increase: 1) 5 alien hydrozoan (*Coryne eximia*, *Eudendrium merulum*, *Sertularia marginata*, *Clytia linearis*, and *Filellum serratum*) and 1 anthozoan (*Diadumene lineata*) species escaped the attention of Çinar et al. (2011); 2) 2 species (*Aequorea globosa* and *Diadumene cincta*) were recently identified in the area (Gökalp, 2011; Turan et al., 2011); and, finally, 3) 2 species (*Sagartiogeton laceratus* and *Pachycerianthus multiplicatus*) are newly reported as components of the Turkish marine fauna in the present study. The xenodiversity (i.e. alien diversity) regarding the phylum Cnidaria is 16 species (8 hydrozoan, 3 scyphozoan, 5 anthozoan); for the phylum Ctenophora, it is 2 species. The majority of alien species should be considered as Lessepsian migrants. The presence of the cnidarian species *Diadumene* spp., *S. laceratus*, *P. multiplicatus*, and *Oculina patagonica* and the ctenophores (*Mnemiopsis leidyi* and *Beroe ovata*) along the Turkish coasts should probably be attributed to introduction by shipping. Finally, *Cordylophora caspia* has been considered as a cryptogenic species (Zenetos et al., 2010). The distribution of the number of alien species along the coast of Turkey is shown in Figure 6. Two alien ctenophore species (*Mnemiopsis*

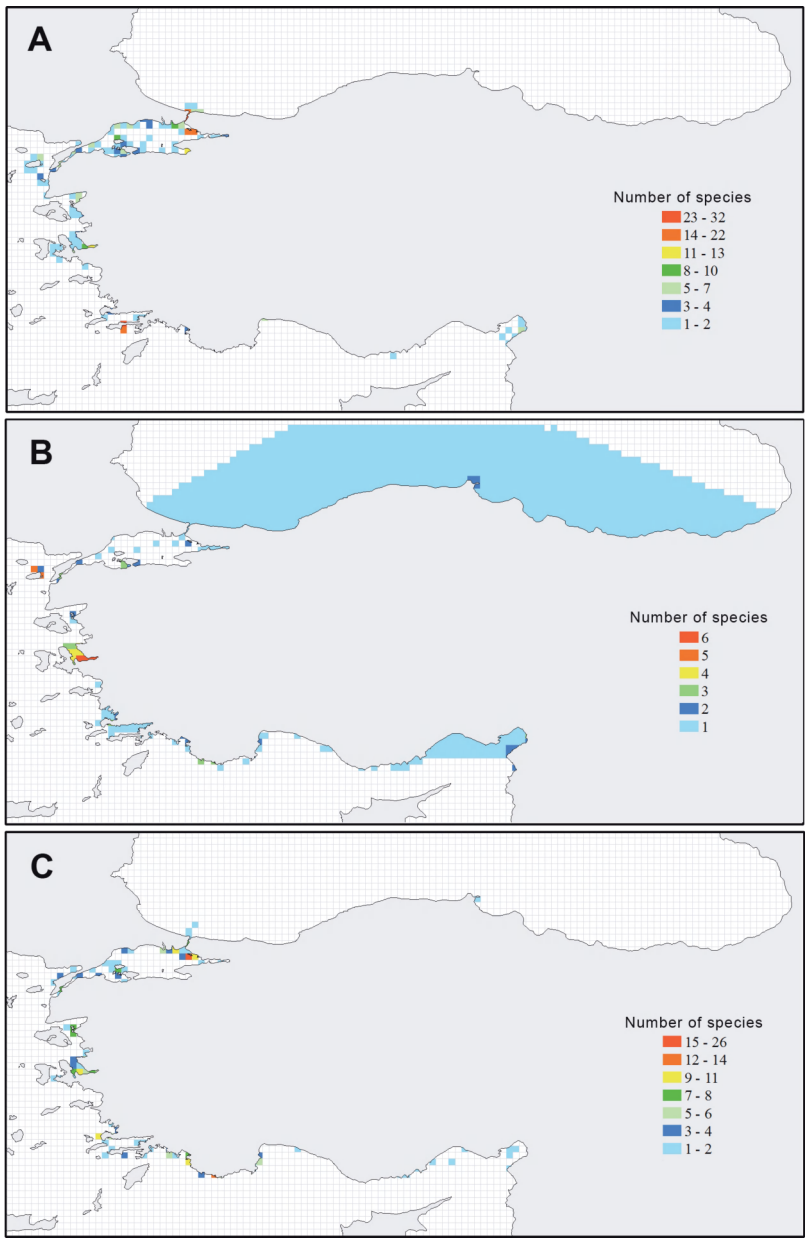

Figure 5. The distribution of the number of species for the major Cnidaria classes along the coasts of Turkey: **A)** Hydrozoa, **B)** Scyphozoa, and **C)** Anthozoa. Each grid square has dimensions of 15 × 15 km.

leidyi and *Beroe ovata*) are very common in the Black Sea and the Sea of Marmara. Five grid squares in the Sea of Marmara and 3 in the Levantine Sea (İskenderun Bay) have maximally 3 alien species, whereas only 2 grid squares have 2 alien species in the Aegean Sea. The alien jellyfish species (*Cassiopea andromeda*, *Phyllorhiza punctata*, and *Rhopilema nomadica*) occurred only along the Aegean and Levantine coasts of Turkey.

In the IUCN Red List, the gorgonian *Eunicella verrucosa* is classified as Vulnerable, *Madracis pharensis* as Least Concern, and *Balanophyllia europaea* and *Cladocora caespitosa* as Data Deficient (IUCN, 2014). *Oculina patagonica*, which is an invasive alien species in the Mediterranean Sea, might have been erroneously included in the list with wrong information (i.e. endemic species for the Mediterranean Sea). According to the Barcelona and Bern Conventions, *Savalia savaglia* is recognised as an endangered or threatened species. In the national legislation (Official Notice for Regulating Commercial Fisheries of Water Resources, No. 2012/65), fisheries of

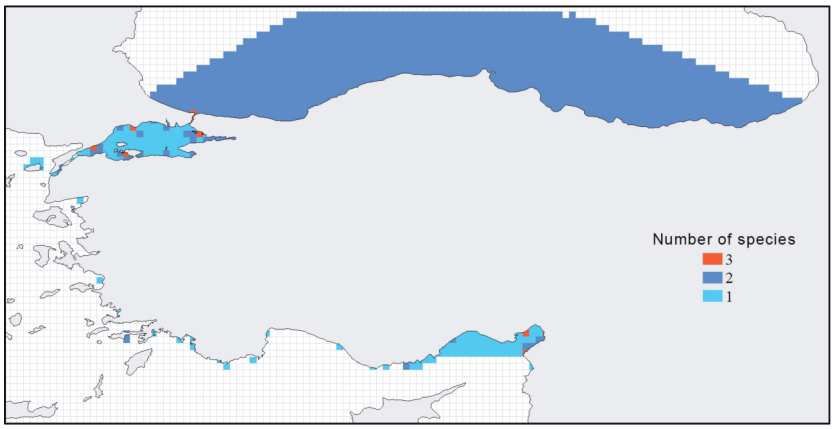

Figure 6. The distribution of the number of alien cnidarian and ctenophore species along the coasts of Turkey. Each grid square has dimensions of 15 × 15 km.

Corallium rubrum and *Savalia savaglia* are prohibited along the coasts of Turkey. *Savalia savaglia* is known to occur in the Sea of Marmara (Öztürk and Bourguet, 1990) and the North Aegean Sea (present study), but no report has been made about the occurrence of *C. rubrum* along the Turkish coast. Therefore, the presence of this species in the list lacks scientific basis. However, the presence of this species in the Aegean Sea is known since the classical work of Forbes (1844), who reported it as "very numerous minute specimens occurring of *Corallium rubrum*, for instance, but none being met with of sufficient size as to render them of value in commerce". This species was then encountered near Meis (Kastellorizon) Island at 128–274 m depth (Zibrowius, 1979b) and in the North Aegean Sea (Chintiroglou et al., 1989) including Midilli Island at 50–91 m depths (Vafidis et al., 1994).

The species reports of Cnidaria and Ctenophora sharply increased after the 1940s in all seas except for the Black Sea, where a relatively gradual increase was observed in the course of time (Figure 7). The authors that made the major contributions to the understanding of the cnidarian diversity in the region were Ostroumoff (1896) with 23 new records, Demir (1952) with 26 new records, Marinopoulos (1979) with 25 new records, and Ünsal (1981) with 13 new records. In the last 14 years, new species records have been given by different authors with almost equal contributions.

This paper compiled all existing species data regarding Cnidaria and Ctenophora along the coasts of Turkey and provides a database for future studies. The paper also indicates the urgent need of precise taxonomic studies to be focused on certain classes of these phyla (i.e. Anthozoa) that have not been adequately studied in the area yet. The

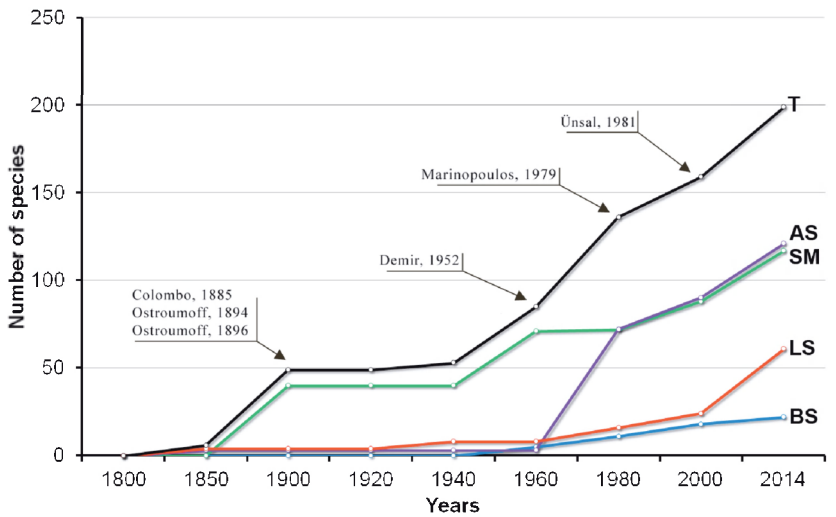

Figure 7. Changes over time in the number of new records of Cnidaria and Ctenophora along the coasts of Turkey (T: Turkey, AS: Aegean Sea, SM: Sea of Marmara, LS: Levantine Sea, BS: Black Sea).

lack of faunistic data in many marine areas of Turkey (including deep seas) and the requisite of expanding faunistic studies from some specific areas (e.g., İzmir Bay) where marine stations are located towards other unexplored areas of the Turkish coasts are also emphasised.

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