

Checklist of Bryozoa on the coasts of Turkey

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Abstract: The phylum Bryozoa includes a total of 185 species reported from the Turkish coasts of the Levantine Sea, the Aegean Sea, the Sea of Marmara, and the Black Sea. The class Gymnolaemata is represented by 159 species, followed by the class Stenolaemata (26 species). While the Aegean Sea had the highest species richness (139 species), the lowest bryozoan diversity (8 species) was reported from the Black Sea coast of Turkey. Only 2 alien species, *Celleporaria brunnea* and *Rhynchozoon larreyi*, were recorded from the Turkish coasts.

Key words: Bryozoa, checklist, Turkish coasts

1. Introduction

Bryozoans predominantly occur in marine habitats. They are sessile and colonial animals and cover an important part of the hard substrate in coastal environments. The phylum Bryozoa has 2 classes and 3 orders in the sea. The class Stenolaemata includes the order Cyclostomatida and the class Gymnolaemata has 2 orders, Ctenostomatida and Cheilostomatida. The noncalcified bryozoans are placed in the order Ctenostomatida, whereas the calcified species are placed in the orders Cheilostomatida and Cyclostomatida.

The species richness of bryozoans in the Mediterranean Sea is closely related with environmental components of the studied localities. The lack of recruitment of propagules, homothermy at 13 °C, high salinity, and oligotrophy might be considered as limiting factors for deep-water bryozoan species richness noted below 200 m in the Mediterranean (Harmelin and d'Hondt, 1993). Bryozoan communities are mainly influenced by habitat and substratum types (Lombardi et al., 2008; Ben Ismail et al., 2012). Amini et al. (2004) found relationships between the bryozoan associations and water depth, water energy, sedimentation rate, and substrate type.

The marine biota of the Mediterranean is composed of species belonging to several biogeographic categories (Bianchi and Morri, 2000). Bryozoan fauna in the Mediterranean Sea possess different biogeographic distributions, expanding to the Pacific Ocean, Atlantic Ocean, Indian Ocean, and Red Sea, while some of them are endemic for the Mediterranean. Among surveyed biocoenosis, coralligenous habitats harbored the largest

diversity of bryozoans, which is followed by semicave biocoenosis, seagrass meadows (particularly *Posidonia oceanica*), and photophilic algal biocoenosis (Novosel, 2005). In a *Posidonia oceanica* meadow, the scale of leaf variability showed significant variation for encrusting and erect bryozoans, while geographic area differences were found to be important for encrusting bryozoans (Pardi et al., 2006).

Bryozoan diversity in the Mediterranean comprises approximately 10% of 5000 extant bryozoan species recorded worldwide. In the Mediterranean Sea, Red Sea migrants were recorded in the Levantine Sea, while the Atlantic-originated species are found especially in the Alboran Sea (Harmelin and d'Hondt, 1993; Bianchi and Morri, 2000). Moreover, 31 out of the 986 alien species introduced to the Mediterranean Sea are bryozoan species. The number of nonindigenous bryozoan species was significantly greater in the eastern Mediterranean Sea and 22 species were introduced to the area by different pathways, such as shipping and the Suez Canal. However, 7 species that were found in both western and central parts of the Mediterranean might have been introduced through fouling (Zenetos et al., 2012).

The first knowledge on marine bryozoan fauna of the Turkish seas was given by Forbes (1844). In that study, 8 depth ranges extending from 3.66 to 213.36 m were distinguished according to their characteristics of the sea floor. In the community, as described by Forbes (1844), *Cellaria ceremoides* and *Myriapora truncata* were determined as the characteristic species of region IV

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(27–64 m) and V (64–100 m), respectively. The taxonomic validity of the former species is currently uncertain. The cyclostome genera, such as *Idmonea* and *Alecto*, were recorded from the deepest region (VIII) and extended to 421 m. Colombo (1885) identified *Flustra truncata*, *Retepora cellulosa*, and *Flustra carbacea* in the dredged material samples collected from the Dardanelles. In the Sea of Marmara and the Bosphorus, bryozoan species were identified with other faunal components by Ostroumoff (1894). In another study conducted by Ostroumoff (1896), plankton and benthic samples were taken from more than 60 stations during the ‘Selanik’ expedition to the Sea of Marmara and Bosphorus, and 49 bryozoan species were determined from different depths and biotopes. Marion (1898) reported 3 bryozoan species, *Retepora cellulosa*, *Myrionozoum truncatum*, and *Porella cervicornis*, obtained in the dredged material collected to the north of the Sultan Castle at a depth of 65 m. Description and ecological peculiarities of bryozoan species appearing in faunal assemblages collected from the Bosphorus and near the Prince Islands in the Sea of Marmara were given for the first time by Demir (1952–1954). The preliminary study conducted by Geldiay and Kocataş (1972) on benthic organisms of İzmir Bay included 3 bryozoan species, namely *Retepora cellulosa*, *Membranipora membranacea*, and *Amathia* sp., which were abundantly found in Uzunada, Tuzla, and Güzelbahçe, respectively.

The description and illustration of the bryozoan species collected in the Aegean Sea, Black Sea, and Sea of Marmara was done by Ünsal (1975) and Ünsal and d’Hondt (1978–1979). In addition to species given as a new record from Turkish coast, *Cleidochasmidra canakkalense* Ünsal and d’Hondt was described as a new species (Ünsal and d’Hondt, 1978–1979). Balkıs (1992) studied macrobenthic species around Marmara Island and *Cryptosula pallasiana* was noted as a common species, whereas *Aetea truncata*, *Scrupocellaria* sp., and *Crisia* sp. were rare species. In 1992, the ‘Akdeniz Campaign’ was realized to increase knowledge of the eastern Mediterranean fauna. Samples for qualitative study were collected by SCUBA divers in a *P. oceanica* meadow near Yenikaş at the 18–25 m depth range. Additionally, the knowledge of geographic distributions of 32 bryozoan species were given. Previously unrecorded species *Aetea lepadiformis*, *Pentapora ottomulleriana*, *Fenestrulina joannae*, and *Microporella umbracula* and one new Indo-Pacific species, *Schedocleidochasma porcellaniformis*, were noted for the eastern Mediterranean Sea (Nicoletti et al., 1995). After a period of time, *S. porcellaniformis* was renamed as *Plesiocleidochasma mediterraneum* (Chimenz Gusso and Soule, 2003). During the same expedition, a new species, *Retevirgula akdenizae* (type locality: Datça) was also described (Chimenz et al., 1997). Both spatial and

temporal aspects of fouling communities developed on panels were analyzed in terms of physicochemical variables in different marinas located on the Aegean coast (Koçak et al., 1999; Koçak, 2008). The settlement of bryozoan species was investigated considering environmental changes in the marinas. In the inner part of İzmir Bay, morphological, ecological, and zoogeographical characteristics of an alien bryozoan species, *Celleporaria brunnea*, were discussed by Koçak (2007).

The aim of this study is to elucidate recent taxonomic and biogeographic knowledge of bryozoan species recorded from the Turkish coasts.

2. Materials and methods

For preparing the actual checklist of the Turkish bryozoans, all relevant faunal investigations were considered. Species-specific data obtained from these works were used to construct a distributional map (in a grid system, 15 × 15 km in dimension) of the bryozoan species along the coasts of Turkey. In the checklist, the valid names of the species are given according to the World Register of Marine Species (WoRMS, <http://www.marinespecies.org>) and Integrated Taxonomic Information System (ITIS, <http://www.itis.gov>) and some monographs and papers (Harmelin, 1976; d’Hondt, 1983; Hayward and Ryland, 1985, 1998, 1999; Hayward and McKinney, 2002; Novosel et al., 2005).

3. Results and discussion

The bryozoan fauna of the Turkish coasts includes a total of 185 species. The class Gymnolaemata includes 159 species, of which 140 species belong to the order Cheilostomatida and 19 species to the order Ctenostomatida. Moreover, the class Stenolaemata comprises 26 species. The status of the Turkish marine fauna was previously given by Kocataş et al. (2000), who reported 2683 invertebrate species, of which 151 species belonged to Bryozoa. They found the highest number of bryozoan species (131) from the Aegean Sea. In the present study, the total number of bryozoans obtained from the Aegean Sea has reached 139 species. The Sea of Marmara, the Levantine Sea, and the Black Sea have 89, 66, and 8 bryozoan species, respectively. The highest number of species belonging to orders Cheilostomatida, Ctenostomatida, and Cyclostomatida was reported from the Aegean Sea. The total number of species and their distributions among orders show that the highest species richness was followed by the Sea of Marmara and Levantine Sea. However, in the Black Sea, only Cheilostomatida species were recorded (Figure 1).

The localities with hard substrates had the highest species richness (63 species), while the soft substrates were characterized by 23 species. Furthermore, 19 species were found on both hard and soft substrates. The majority of bryozoan species were determined at 0–100 m depths.

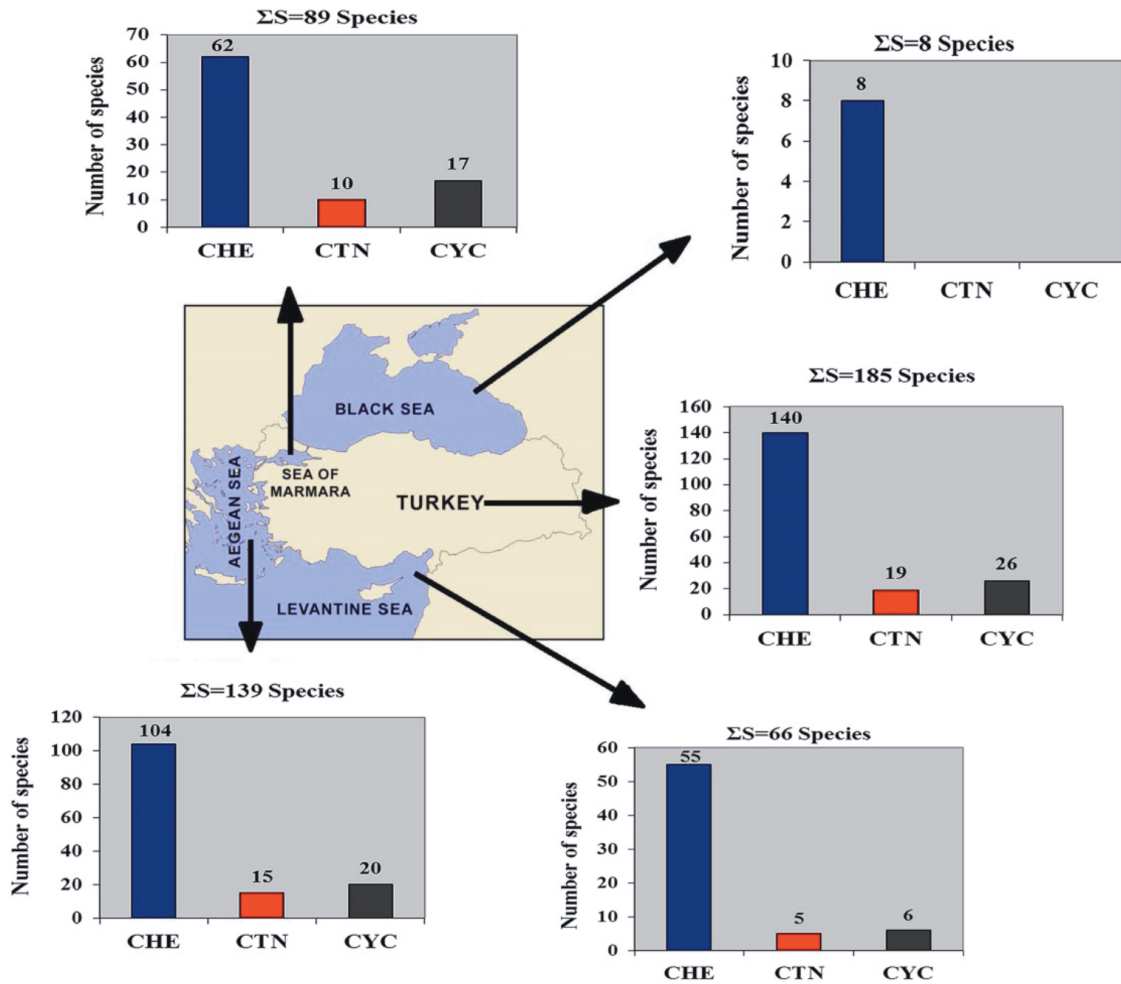


Figure 1. The number of bryozoan species recorded along the Turkish coasts (CHE: Cheilostomatida, CTN: Ctenostomatida, CYC: Cyclostomatida).

Among them, 34 species at 0–50 m, 33 species at 11–50 m, and 40 species at 51–100 m depth ranges were determined. In addition, the distribution of 26 species was limited to 11–100 m depths. Eight species (*Escharoides megarostris*, *Diporula verrucosa*, *Jaculina parallelata*, *Turbicellepora coronopus*, *Stephanollona armata*, *Cellaria salicornioides*, *Securiflustra securifrons*, and *Pherusella tubulosa*) were recorded at depths of approximately greater than 100 m. Only a single species, *Triticella flava*, was reported from depths deeper than 600 m (Table).

The species richness of Bryozoa along the Turkish coasts is represented in Figure 2. According to the data, the highest number of bryozoan species was determined on the coast of the Aegean Sea, where Cheilostomatida contains the majority of the species. The western part of Gökçeada (45 species), Bozcaada (37 species), Gökova (20 species), and Bodrum-Turgutreis (19 species) can be indicated as hot-spot areas on the Aegean coast. However, limited data were available about bryozoan species along

the Levantine Sea. The number of species was found to be higher at Yenikaş (21 species) and Mersin Bay (20 species) with the contributions of various studies. In the Sea of Marmara, 20 species were recorded from the northern part of Marmara Island. Either environmental conditions or the poverty of the studies may be effective on the lowest species diversity (8 species) recorded from the Black Sea. A total of 185 species was found along the Turkish coasts and this number can be increased with further research.

The bryozoan species recorded from the Turkish coasts are listed in the Table. *Lepralia foraminifera* (Heller, 1867) and *Membranipora rostrata* Heller, 1867 are indicated as doubtful species as they were determined only once in the Sea of Marmara. *Lepralia foraminifera* was found at the 73–77 m depth range on sandy mud sediments with shell fragments (Ostroumoff, 1896). In addition, the taxonomic status of *Retepora cellulosa* Johnston, which was reported from the Dardanelles and the Sea of Marmara at 41 and 80 m depths (Forbes, 1844; Colombo, 1885; Ostroumoff,

Table. Checklist of marine bryozoans of Turkey. 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).

| Taxon | BS | SM | AS | LS | DR | H |
|--|----|----|----|----|---------|--------|
| Phylum: Bryozoa | | | | | | |
| Class: Gymnolaemata | | | | | | |
| Order: Cheilostomatida | | | | | | |
| Family: Aeteidae | | | | | | |
| <i>Aetea anguina</i> (Linnaeus, 1758) | | 3 | | | I, II | Hs, Ss |
| <i>Aetea lepadiformis</i> Waters, 1906 | | | | 13 | II | Ss |
| <i>Aetea sica</i> (Couch, 1844) | | 6 | 9 | 9 | I, II | Hs |
| <i>Aetea truncata</i> (Landsborough, 1852) | | 6 | 9 | 9 | I, II | Hs, Ss |
| Family: Electridae | | | | | | |
| <i>Conopeum reticulum</i> (Linnaeus, 1767) | | 3 | | | II | ? |
| <i>Conopeum seurati</i> (Canu, 1928) | | 9 | | | I | ? |
| <i>Einhornia crustulenta</i> (Pallas, 1766) | 9 | 18 | | | I, II | Hs |
| <i>Electra monostachys</i> (Busk, 1854) | 9 | 18 | 9 | | I, II | Hs |
| <i>Electra pilosa</i> (Linnaeus, 1767) | 9 | 6 | 9 | 9 | I–III | Hs, Ss |
| <i>Electra posidoniae</i> Gautier, 1954 | 9 | 9 | 9 | 9 | I, II | Ss |
| <i>Electra repiachowi</i> Ostroumoff, 1896 | | | 10 | | ? | Ss |
| Family: Calloporidae | | | | | | |
| <i>Aplousina gigantea</i> Canu & Bassler, 1927 | 8 | 8 | | | I | Hs |
| <i>Callopora dumerilii</i> (Audouin, 1826) | | 6 | 9 | | III | Hs |
| <i>Copidozoum planum</i> (Hincks, 1880) | | | | 13 | II | Ss |
| <i>Copidozoum tenuirostre</i> (Hincks, 1880) | | 9 | 9 | | II, III | Ss |
| <i>Retevirgula akdenizae</i> Chimenz, Nicoletti & Lippi Boncambi, 1997 | | | | 14 | I | Hs |
| Family: Candidae | | | | | | |
| <i>Caberea boryi</i> (Audouin, 1826) | | 4 | 9 | 9 | I–III | Hs |
| <i>Cradoscrupocellaria bertholletii</i> (Audouin, 1826) | | 3 | 9 | 8 | I, II | Hs |
| <i>Cradoscrupocellaria reptans</i> (Linnaeus, 1758) | | 6 | 9 | | I–III | Hs |
| <i>Scrupocaberea maderensis</i> (Busk, 1860) | | 4 | | | III | Hs |
| <i>Scrupocellaria delilii</i> (Audouin, 1826) | | | 9 | | III | ? |
| <i>Scrupocellaria scrupea</i> Busk, 1852 | | 4 | 9 | | I–III | Hs |
| <i>Scrupocellaria scruposa</i> (Linnaeus, 1758) | | 3 | 9 | 9 | I–III | Hs |
| Family: Epistomiidae | | | | | | |
| <i>Synnotum aegyptiacum</i> (Audouin, 1826) | | | 9 | | II | ? |
| Family: Bugulidae | | | | | | |
| <i>Bugula flabellata</i> (Thompson, in Gray, 1848) | | 4 | 9 | | I–III | Hs |
| <i>Bugula gracilis</i> Busk, 1858 | | | 9 | | II | ? |
| <i>Bugula neritina</i> (Linnaeus, 1758) | | | 8 | 8 | I | Hs |
| <i>Bugula plumosa</i> (Pallas, 1766) | 8 | 6 | 9 | 9 | I–III | Hs |
| <i>Bugula simplex</i> Hincks, 1886 | | 9 | | | II | ? |
| <i>Bugula stolonifera</i> (Ryland, 1960) | | | 8 | 9 | I, II | Hs, Ss |
| Family: Beaniidae | | | | | | |
| <i>Beania hirtissima</i> (Heller, 1867) | | | 9 | | I–III | Ss |

Table. (Continued).

| | | | | | |
|---|---|----|----|---------|----------|
| <i>Beania hirtissima cylindrica</i> (Hincks, 1886) | 9 | | | I | ? |
| <i>Beania magellanica</i> (Busk, 1852) | 9 | | | III | ? |
| <i>Beania mirabilis</i> Johnston, 1840 | 9 | 13 | | I-III | Ss |
| <i>Beania robusta</i> (Hincks, 1881) | 9 | | | II | ? |
| Family: Microporidae | | | | | |
| <i>Calpensia nobilis</i> (Esper, 1796) | 9 | 9 | 9 | I-III | Hs |
| <i>Mollia circumcincta</i> (Heller, 1867) | 4 | 9 | | I-III | Hs |
| <i>Mollia patellaria</i> (Moll, 1803) | | 9 | | II, III | ? |
| Family: Membraniporidae | | | | | |
| <i>Membranipora membranacea</i> (Linnaeus, 1767) | | 7 | | I, II | Hs |
| Family: Cribrilinidae | | | | | |
| <i>Collarina balzaci</i> (Audouin, 1826) | | 9 | | I, II | ? |
| <i>Corbulipora tubulifera</i> (Hincks, 1881) | 4 | | | III | Hs |
| <i>Membraniporella nitida</i> (Johnston, 1838) | | 9 | 9 | II, III | ? |
| <i>Puellina gattyae</i> (Landsborough, 1852) | 9 | 9 | | I, II | ? |
| <i>Puellina (Cribrilaria) innominata</i> (Couch, 1844) | | | 13 | II | Ss |
| <i>Puellina (Cribrilaria) radiata</i> (Moll, 1803) | | 9 | 9 | I-III | ? |
| Family: Tendridae | | | | | |
| <i>Tendra zostericola</i> Nordman, 1839 | 3 | | | II | Hs, Ss |
| Family: Hippothoidae | | | | | |
| <i>Hippothoa flagellum</i> (Manzoni, 1870) | 9 | 9 | 9 | II | ? |
| Family: Chorizoporidae | | | | | |
| <i>Chorizopora brongiartii</i> (Audouin, 1826) | 9 | 9 | 13 | I, II | Ss |
| Family: Savignyellidae | | | | | |
| <i>Savignyella lafontii</i> (Audouin, 1826) | 3 | 9 | | I-III | Hs |
| Family: Umbonulidae | | | | | |
| <i>Umbonula oviceolata</i> Hastings, 1944 | | 9 | | I, II | ? |
| Family: Lacernidae | | | | | |
| <i>Arthropoma ceciliai</i> (Audouin, 1826) | 4 | 9 | | II, III | Hs |
| Family: Exochellidae | | | | | |
| <i>Escharoides megarostris</i> (Canu & Bassler, 1928) | | 9 | | IV | ? |
| Family: Schizoporellidae | | | | | |
| <i>Schizobrachiella sanguinea</i> (Norman, 1868) | | 9 | | I-III | Hs, Ss |
| <i>Schizoporella dunkeri</i> (Reuss, 1848) | 9 | 9 | | I, II | ? |
| <i>Schizoporella errata</i> (Waters, 1878) | | 20 | 9 | I | Hs |
| <i>Schizoporella magnifica</i> (Hincks, 1886) | 4 | 9 | | I-III | Hs, Ss |
| <i>Schizoporella unicornis</i> (Johnston in Wood, 1844) | 4 | | | I-III | Hs |
| Family: Margarettidae | | | | | |
| <i>Margaretta buski</i> Harmer, 1957 | | 9 | | I-III | ? |
| <i>Margaretta cereoides</i> (Ellis & Solander, 1786) | | 1 | | III | ? |
| Family: Bitectiporidae | | | | | |
| <i>Hippoporina pertusa</i> (Esper, 1796) | | 10 | | III | ? |
| <i>Schizomavella auriculata</i> (Hassal, 1842) | 9 | 9 | | II | ? |
| <i>Schizomavella hastata</i> (Hincks, 1862) | | 9 | | I, II | ? |
| <i>Schizomavella linearis</i> (Hassall, 1841) | 9 | 6 | 9 | 9 | I-III Hs |

Table. (Continued).

| | | | | | |
|--|---|----|----|---------|--------|
| <i>Pentapora fascialis</i> (Pallas, 1766) | 4 | | | III | Hs |
| <i>Pentapora ottomulleriana</i> (Moll, 1803) | | | 13 | II | Ss |
| Family: Escharinidae | | | | | |
| <i>Escharina dutertrei</i> (Audouin, 1826) | 9 | | | II | ? |
| <i>Escharina hyndmanni</i> (Johnston, 1847) | | | 9 | III | ? |
| <i>Escharina johnstoni</i> (Quelch, 1884) | | | 9 | III | ? |
| <i>Escharina vulgaris</i> (Moll, 1803) | 9 | 9 | 13 | I-III | Ss |
| <i>Phaeostachys spinifera</i> (Johnston, 1847) | 4 | 9 | 8 | III | Hs |
| <i>Stomacrustula sinuosa</i> (Busk, 1860) | | 9 | | III | ? |
| Family: Microporellidae | | | | | |
| <i>Diporula verrucosa</i> , (Peach, 1868) | 4 | 9 | 9 | I-IV | Hs |
| <i>Haplopoma impressum</i> (Audouin, 1826) | | | 13 | II | Ss |
| <i>Fenestrulina joannae</i> (Calvet, 1991) | | 23 | 13 | II | Ss |
| <i>Fenestrulina malusii</i> (Audouin, 1826) | 9 | 9 | | II, III | Hs |
| <i>Microporella ciliata</i> (Pallas, 1766) | 6 | 9 | | II, III | Hs |
| <i>Microporella impressa</i> (Audouin, 1826) | | 9 | | I-III | ? |
| <i>Microporella marsupiata</i> (Busk, 1860) | | 10 | | III | ? |
| <i>Microporella umbracula</i> (Audouin, 1826) | | | 13 | II | Ss |
| Family: Adeonidae | | | | | |
| <i>Adeonella lichenoides</i> (Lamarck, 1816). | 4 | | | III | Hs |
| <i>Adeonella pallasii</i> (Heller, 1867) | | 9 | 9 | II, III | ? |
| <i>Reptadeonella violacea</i> (Johnston, 1847) | 6 | 9 | 13 | I, II | Hs, Ss |
| Family: Exechonellidae | | | | | |
| <i>Anarthropora monodon</i> (Busk, 1868) | | 9 | | III | ? |
| Family: Exochellidae | | | | | |
| <i>Escharoides coccinea</i> (Abildgaard, 1806) | 9 | 9 | 10 | I-III | ? |
| Family: Jaculinidae | | | | | |
| <i>Jaculina parallelata</i> (Waters, 1894) | | 9 | | IV | ? |
| Family: Smittinidae | | | | | |
| <i>Parasmittina raigii</i> (Audouin, 1826) | | 9 | | II | ? |
| <i>Parasmittina rouvillei</i> (Calvet, 1902) | | 9 | | II | ? |
| <i>Parasmittina trispinosa</i> (Johnston, 1838) | | 9 | | II | ? |
| <i>Prenantia cheilostoma</i> (Manzoni, 1869) | | 9 | | II | ? |
| <i>Smittina cervicornis</i> (Pallas, 1766) | 5 | 9 | | II, III | Hs |
| <i>Smittina landsborovii</i> (Johnston, 1847) | 9 | | 9 | II, III | ? |
| <i>Smittoidea marmorea</i> (Hincks, 1877) | 9 | | | I | ? |
| <i>Smittoidea reticulata</i> (Mac Gillivray, 1842) | 3 | 9 | | I-III | ? |
| Family: Celleporidae | | | | | |
| <i>Buskea billardi</i> (Calvet, 1906) | | 10 | | III | ? |
| <i>Buskea nitida</i> Heller, 1867 | | 10 | | III | ? |
| <i>Cellepora birostrata</i> Canu & Bassler, 1928 | | 9 | | III | ? |
| <i>Cellepora posidoniae</i> (Hayward, 1975) | | 10 | | I | ? |
| <i>Cellepora pumicosa</i> (Pallas, 1766) | 4 | 9 | 9 | I-III | Hs, Ss |
| <i>Celleporina caminata</i> (Waters, 1879) | 4 | | 13 | II | Hs, Ss |

Table. (Continued).

| | | | | | | |
|--|----|----|----|---|---------|--------|
| <i>Celleporina costata</i> (MacGillivray, 1869) | 4 | | | | III | Hs |
| <i>Celleporina mangnevellana</i> (Lamouroux, 1816) | | 10 | | | I | ? |
| <i>Celleporaria brunnea</i> (Hincks, 1884) | | 19 | | | I | Hs |
| <i>Omalosecosa ramulosa</i> (Linnaeus, 1767) | | | 9 | | III | ? |
| <i>Palmicellaria cf. aviculifera</i> Canu & Bassler, 1928 | | 10 | | | III | ? |
| <i>Palmicellaria elegans</i> Alder, 1864 | | 9 | | | III | ? |
| <i>Turbicellepora coronopus</i> (Wood, 1844) | | 9 | 9 | | III, IV | Hs |
| Family: Bryocryptellidae | | | | | | |
| <i>Porella concinna</i> (Busk, 1854) | 4 | | | | III | Hs |
| Family: Phoceanidae | | | | | | |
| <i>Phoceana tubulifera</i> (Heller, 1867) | 9 | 9 | 9 | | II, III | ? |
| Family: Phidoloporidae | | | | | | |
| <i>Dentiporella sardonica</i> (Waters, 1879) | | 9 | | | II | ? |
| <i>Plesioleidochasma mediterraneum</i> Chimenz Gusso & Soule, 2003 | | | 13 | | II | Ss |
| <i>Reteporella beaniana</i> (King, 1846) | 18 | 9 | | | II | Hs |
| <i>Reteporella couchii</i> (Hincks, 1878) | 18 | | 9 | | II, III | Hs |
| <i>Reteporella sudbourniensis</i> Gautier, 1962 | | 9 | | | I, II | ? |
| <i>Rhynchozoon larreyi</i> (Audouin, 1826) | | 10 | | | II | Ss |
| <i>Schizotheca fissa</i> (Busk, 1856) | 4 | 9 | | | II, III | Hs |
| <i>Stephanollona armata</i> (Hincks, 1862) | | 9 | | | III, IV | ? |
| <i>Triphyllozoon hirsutum</i> (Busk, 1884) | | 10 | | | III | ? |
| Family: Watersiporidae | | | | | | |
| <i>Watersipora complanata</i> (Norman, 1864) | | 20 | | | I | Hs |
| <i>Watersipora subovoidea</i> (d'Orbigny, 1852) | | 9 | 9 | | I-III | Hs |
| Hippaliosinidae | | | | | | |
| <i>Hippaliosina depressa</i> (Busk, 1854) | 18 | 9 | 9 | | I-III | Hs, Ss |
| Family: Hippoporidridae | | | | | | |
| <i>Hippoporella hippopus</i> (Smitt, 1868) | | 9 | | | III | ? |
| Family: Cryptosulidae | | | | | | |
| <i>Cryptosula pallasiana</i> (Moll, 1803) | 8 | 3 | 8 | 8 | I-III | Hs, Ss |
| Family: Cheiloporinidae | | | | | | |
| <i>Hagiosynodos kirchenpaueri</i> (Heller, 1867) | | 9 | 9 | | III | ? |
| <i>Hagiosynodos latus</i> (Busk, 1856) | | 9 | | | III | ? |
| Family: Romancheinidae | | | | | | |
| <i>Neolagenipora collaris</i> (Norman, 1867) | | | 9 | | III | ? |
| Family: Myriaporidae | | | | | | |
| <i>Myriapora truncata</i> (Pallas, 1766) | 5 | 1 | 9 | | II, III | ? |
| Family: Scrupariidae | | | | | | |
| <i>Scruparia ambigua</i> (d'Orbigny, 1841) | | 10 | | | | Hs |
| Family: Cleidochasmatidae | | | | | | |
| <i>Cleidochasmidra canakkalense</i> Unsal & d'Hondt, 1979 | | 10 | | | I-III | ? |
| Family: Cellariidae | | | | | | |
| <i>Cellaria fistulosa</i> (Linnaeus, 1758) | 3 | | | | II, III | Hs |
| <i>Cellaria salicornioides</i> Lamouroux, 1816 | 6 | 9 | 9 | | II-IV | Hs |
| Family: Scrupariidae | | | | | | |

Table. (Continued).

| | | | | |
|---|----|----|---------|----------------|
| <i>Scruparia chelata</i> (Linnaeus, 1758) | 3 | | II | Hs |
| Family: Monoporellidae | | | | |
| <i>Monoporella bouchardii</i> (Audouin & Savigny, 1826) | 23 | 13 | II | Ss |
| Family: Trypostegidae | | | | |
| <i>Trypostega venusta</i> (Norman, 1864) | | 13 | I | Hs |
| Family: Flustridae | | | | |
| <i>Chartella papyrea</i> (Pallas, 1766) | 9 | | II, III | ? |
| <i>Securiflustra securifrons</i> (Pallas, 1786) | 2 | | I–IV | Hs |
| Family: Chlidoniidae | | | | |
| <i>Chlidonia pyriformis</i> (Bertolini, 1810) | 9 | 13 | I–III | Ss |
| Family: Onychocellidae | | | | |
| <i>Onychocella antiqua</i> (Busk, 1858) | | 9 | III | ? |
| <i>Onychocella marioni</i> (Jullien, 1881) | | 9 | III | ? |
| <i>Onychocella vibraculifera</i> Neviani, 1895 | 9 | 9 | II, III | Ss |
| Family: Setosellidae | | | | |
| <i>Setosella vulnerata</i> (Busk, 1860) | 9 | | III | ? |
| Order: Ctenostomatida | | | | |
| Family: Alcyonidiidae | | | | |
| <i>Alcyonidium gelatinosum</i> (Linnaeus, 1767) | 9 | | II | ? |
| <i>Alcyonidium mamillatum</i> Alder, 1857 | 6 | | II, III | Hs |
| <i>Alcyonidium polyoum</i> (Hassal, 1841) | 18 | 9 | II, III | Hs |
| Family: Pherusellidae | | | | |
| <i>Pherusella tubulosa</i> (Ellis & Solander, 1786) | 9 | 13 | II–IV | Ss |
| Family: Nolellidae | | | | |
| <i>Nolella dilatata</i> (Hincks, 1860) | 10 | 13 | II, III | Ss |
| <i>Nolella gigantea</i> (Busk, 1856) | 9 | | II | Ss |
| Family: Vesiculariidae | | | | |
| <i>Amathia lendigera</i> (Linnaeus, 1758) | 9 | | I | ? |
| <i>Amathia pruvoti</i> Calvet, 1911 | 9 | 9 | 10 | I–III ? |
| <i>Amathia semiconvoluta</i> Lamouroux, 1824 | 9 | 9 | II | ? |
| <i>Amathia vidovici</i> (Heller, 1867) | | | 10 | III ? |
| <i>Bowerbankia citrina</i> (Hincks, 1877) | 9 | 9 | II, III | ? |
| <i>Bowerbankia gracilis</i> Leidy, 1855 | | 20 | I–III | Hs, Ss |
| <i>Bowerbankia imbricata</i> (Adams, 1798) | 4 | | II | Hs |
| Family: Mimosellidae | | | | |
| <i>Bantariella verticillata</i> (Heller, 1867) | 4 | 23 | II, III | Hs, Ss |
| <i>Mimosella gracilis</i> Hincks, 1851 | 4 | 9 | I–III | Hs, Ss |
| Family: Walkeriidae | | | | |
| <i>Walkeria uva</i> (Linnaeus, 1758) | 4 | 9 | 13 | II, III Hs, Ss |
| Family: Buskiidae | | | | |
| <i>Buskia nitens</i> (Alder, 1857) | | 21 | I | Hs |
| <i>Buskia socialis</i> (Hincks, 1887) | | 21 | I | Hs |
| Family: Triticellidae | | | | |

Table. (Continued).

| | | | | | |
|--|----|----|---|---------|--------|
| <i>Triticella flava</i> Dalyell, 1848 | 4 | | | VII | Hs |
| Class: Stenolaemata | | | | | |
| Order: Cyclostomatida | | | | | |
| Family: Crisiidae | | | | | |
| <i>Crisidia cornuta</i> (Linnaeus, 1758) | 4 | 9 | 9 | I–III | Hs |
| <i>Crisia denticulata</i> (Lamarck, 1816) | 9 | 9 | 9 | I–III | ? |
| <i>Crisia eburnea</i> , (Linnaeus, 1758) | 4 | 9 | 9 | II, III | Hs |
| <i>Crisia fistulosa</i> (Heller, 1867) | 4 | | | III | Hs |
| Family: Horneridae | | | | | |
| <i>Hornera lichenoides</i> (Linnaeus, 1758) | | 9 | | I–III | ? |
| Family: Lichenoporidae | | | | | |
| <i>Lichenpora verrucaria</i> (Fabricius, 1780) | 9 | 9 | | I, II | ? |
| <i>Patinella radiata</i> (Audouin, 1826) | 4 | 9 | | I–III | Hs, Ss |
| <i>Disporella hispida</i> (Fleming, 1828) | 4 | | | II | Hs |
| Family: Annectocymidae | | | | | |
| <i>Annectocyma major</i> (Johnston, 1847) | 4 | 10 | | II, III | Hs, Ss |
| <i>Entalophoroecia deflexa</i> | 4 | 9 | | III | ? |
| Family: Entalophoridae | | | | | |
| <i>Mecynoecia proboscidea</i> (Milne-Edwards, 1838) | 4 | | | III | Hs |
| <i>Mecynoecia delicatula</i> (Busk, 1875) | 4 | | | III | Hs |
| Family: Frondiporidae | | | | | |
| <i>Frondipora gracilis</i> Canu & Bassler, 1930 | | 9 | 9 | I–III | ? |
| <i>Frondipora verrucosa</i> (Lamouroux, 1821) | 4 | | | II, III | Hs |
| Family: Diastoporidae | | | | | |
| <i>Cardioecia watersi</i> (O'Donoghue & de Watteville, 1939) | | 10 | | III | ? |
| <i>Diplosolen obelia</i> (Johnston, 1838) | 9 | 9 | 9 | I–III | Ss |
| Family: Plagioeciidae | | | | | |
| <i>Plagioecia patina</i> (Lamarck, 1816) | 4 | 9 | | II, III | Hs |
| <i>Plagioecia sarniensis</i> (Norman, 1864) | | 9 | | III | ? |
| Family: Tubuliporidae | | | | | |
| <i>Idmidronea atlantica</i> (Forbes in Johnston, 1847) | | 9 | | III | ? |
| <i>Idmidronea bidenkapi</i> (Kluge, 1955) | 18 | | | II | Hs |
| <i>Platonea stoechas</i> Harmelin, 1976 | 4 | 10 | | I–III | Hs, Ss |
| <i>Tubulipora biserialis</i> Canu & Bassler, 1925 | | 9 | | I | ? |
| <i>Tubulipora flabellaris</i> (O. Fabricius, 1780) | | 9 | | I–III | ? |
| <i>Tubulipora liliacea</i> (Pallas, 1766) | 4 | 9 | 9 | I–III | Hs |
| <i>Tubulipora ziczac</i> Harmelin, 1976 | | 10 | | | ? |
| Family: Terviidae | | | | | |
| <i>Tervia irregularis</i> (Meneghini, 1844) | 4 | 10 | | III | Hs |

1: Forbes (1844); 2: Colombo (1885); 3: Ostroumoff (1894); 4: Ostroumoff (1896); 5: Marion (1898); 6: Demir (1952–1954); 7: Geldiay and Kocataş (1972); 8: Pınar (1974); 9: Ünsal (1975); 10: Ünsal and d'Hondt (1978–1979); 11: Balkıs (1992); 12: Ergen and Çınar (1994); 13: Nicoletti et al. (1995); 14: Chimenz et al. (1997); 15: Koçak et al. (1999); 16: Chimenz-Gusso and Soule (2003); 17: Çınar et al. (2005); 18: Aslan Cihangir (2007); 19: Koçak (2007); 20: Koçak (2008); 21: Çınar et al. (2008); 22: Çınar et al. (2011); 23: Kocak and Aydın-Onen (2014).

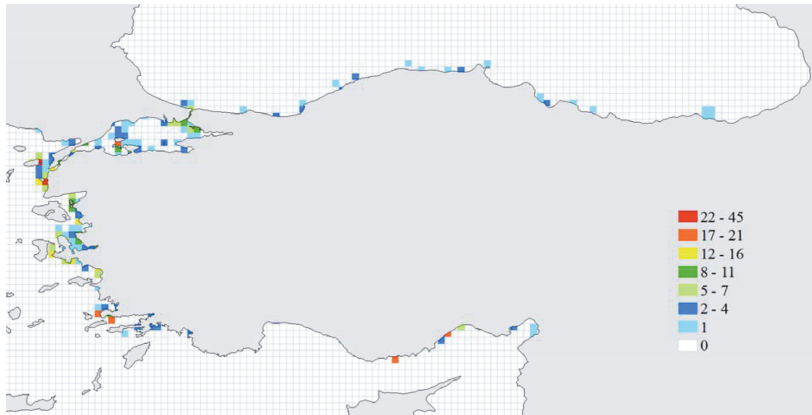


Figure 2. Distribution of bryozoan species along the Turkish coast.

1896; Marion, 1898), seems to be unclear nowadays. Although the valid name of *Retepora cellulosa* Smitt, 1867 was given as *Reteporella grimaldii* (Jullien, 1903) in the checklist prepared for Adriatic Sea (Novosel and Požar-Domac, 2001), it is difficult to determine the systematic position of *Retepora cellulosa* Johnston. Among bryozoan species recorded in the Dardanelles, *Lagenipora tubulifera* Hincks, recently named as *Corbulipora tubulifera* (Hincks, 1881), was noted once at 75 m depth from a gravelly sand habitat with *Lithothamnion* fragments (Ostroumoff, 1896). However, the geographical distribution of this species was restricted to only Australasia (Bock and Cook, 2001).

Adeonella polystomella, which was reported by Ünsal (1975), most probably belongs to *Adeonella pallasii*, which is common in the eastern Adriatic and the Aegean Sea. Moreover, it was also recorded from Naples by Hincks (1866) (Hayward and McKinney, 2002).

Cellaria cereoioides recorded by Forbes (1844) and *Margaretta buski* determined by Ünsal (1975) probably belong to the same species, namely *Margaretta cereoioides*. While the distribution of *M. buski* was restricted in the Gulf of Mexico, *M. cereoioides* was recorded in the Atlantic, the Mediterranean, Europe, and North Africa. It was found on *Posidonia oceanica* rhizomes collected from Cyprus coastal waters (Koçak et al., 2002) and it is probably considered as an endemic species (Hayward and McKinney, 2002).

Recently Vieira et al. (2013) used some morphological features to erect a new genus, *Cradoscrupocellaria*, and described 18 new species. Furthermore, the new genus includes 9 species previously assigned to *Scrupocellaria*. *Cradoscrupocellaria reptans* was assigned to a new genus (Vieira et al., 2013). Morphologically, it is possible to distinguish 2 groups of *Cradoscrupocellaria* based on the scutal shape, including a group with scutum stout with truncate tips, comprising 8 species from the British coast, the North Sea, the Mediterranean, and eastern Australia. Among them only 4 species (*C. aegyptiana*,

C. ellisi, *C. gautieri*, *C. macrorhyncha*) were recorded from the Mediterranean and the Aegean Sea. Although *Scrupocellaria reptans* was recorded by Ünsal (1975) and Demir (1952–1954) from the Turkish coast and by Bedini et al. (2014) from a coralligenous habitat in the northwestern Mediterranean Sea, it actually has a more restricted distribution and was recorded in the North Atlantic (British Isles) (Vieira et al., 2013). Thus, it may be a misidentified species.

Fouling and boring organisms in Amasra, Akbaş, Mersin, İzmir Harbor, and the Bay of Beykoz were investigated by Pınar (1974). Among 8 bryozoan species, *Aplousina gigantea* Canu & Bassler, 1927 was recorded for the first time from the Amasra Harbor and the Beykoz Gulf. However, the distribution of this species is restricted in the Gulf of Mexico (Canu and Bassler, 1928).

According to Hayward and Ryland (1999), *Pentapora fascialis* (Pallas) and *Pentapora foliacea* (Ellis & Solander) were merged into a single species as *P. fascialis*. Therefore, in this checklist, the specimens from Marmara Island (Turkey) identified as *Lepralia foliacea* by Ostroumoff (1876) are assigned to *P. fascialis*.

Monoporella bouchardii is a common bryozoan species in Lebanon, the Greek islands Turkey, and Egypt (Harmelin, 2014). It was found in cavities of rocky bottoms, on *Posidonia* rhizomes, and on leaves in Turkey (Nicoletti et al., 1995; Kocak and Aydin-Onen, 2014). In these studies, specimens collected from Yenikaş and Engeceli Bay (İzmir) was assigned to *M. nodulifera*. The reexamination of the material collected from different regions has confirmed that these species are *M. bouchardii* (Harmelin, 2014). This species has a thermophilic tendency so it has not been recorded from the western Mediterranean Sea (Harmelin, 2014).

Idmonea bidenkapi Kluge 1955, recorded from Bozcaada Island (Aegean Sea) by Aslan-Cihangir (2007), is a North Atlantic (WoRMS, <http://www.marinespecies>).

org) and Arctic (Bryozoa Home Page, <http://www.bryozoa.net/annual/taxa1955.html>) species. Therefore, the actual presence of the species in the Turkish seas is doubtful.

In the checklist, some species need revisionary work. While the name of *Retepora cellulosa* encompasses several species of *Reteporella*, one of the most common species in the Mediterranean is *R. grimaldii*. Thus, a total of 4 bryozoan species [*Lepralia foraminifera* (Heller, 1867), *Membranipora rostrata* (Heller, 1867), *Polytrema corallinum* Risso, and *Retepora cellulosa* Johnston] have been excluded from the list.

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- The most recent studies for the alien species of the Mediterranean Sea (Zenetos et al., 2010, 2012) indicated that the highest number of nonindigenous bryozoan species reached 22 in the eastern Mediterranean Sea; however, only 2 species, *Celleporaria brunnea* and *Rhynchozoon larreyi*, were recorded from the Turkish coasts.

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