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Macrozoobenthic Diversity of the Daradanelles

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Abstract: A study was undertaken between 2007-2009 in the Dardanelles. Monthly sampling was carried out in 5 stations up to 10 m of water depths by using dredge. The samples were fixed and preserved in 5% formalin prepared in marine water. Morever, anatomical and morphological characteristics of identified species were shown with photographs. The specimens were examined the macroscopic and then microscopic under the light of binocular microscope. According to the results, total of 21 species belonging to 7 Order, 5 Kalssis was found in the Dardanelles.

Key words: Diversity, mollusca, crustacea, decapoda, bivalvia, echinodermata, stelleroidae, gastropoda, taxonomy, morphology, dardanelles

INTRODUCTION

In the present study, we investigated the macrozoobenthic diversity, tacsonomical charecteristic and bioecology of these species according to location in Dardanelles, which is passage between seas of Aegean and Marmara and has extremelly specific hydrodynamic structure. So, 5 stations chosen for sampling in Dardanelles are as follows: Cardak, Sevketiye, Kemer, Bolayir and Gelibolu. Sampling was done in monthly intervals using dredge were brought to the laboratories in either 0.5-1 L glass jars or 1 L plastic bags containing ice (to preserve the freshness of samples). Samples were dispersed according to their sex, fixed in glass jars containing 5% formaldehyte and the information about the specimen was recorded on the labels, which were stuck on glass jars. Besides, anotomical and morphological charecteristics of the speciments were recorded with the pictures taken from tese speciments (Fig. 1). Macroscopic and microscopic features of specimens were studied and according to the definitions of Zariquiey (1968), Ingle (1980), Holthuis (1987), Kocatas (1971), Noel (1992) and Balkis (1994) and with the help of previous studies done by Ninni (1923), Demir (1952), Monod (1956), Kocatas and Mater (1967), Kocatas (1981), Muller (1986) and Koukouras *et al*. (1992) the species were identified.

Cardak location: This stony-muddy ground is intensively inhabited by sea-urchins in depths between 0-1 m and a crowded population of black musselles, a sporadic population of oyster and sea urchins inhabit the depths

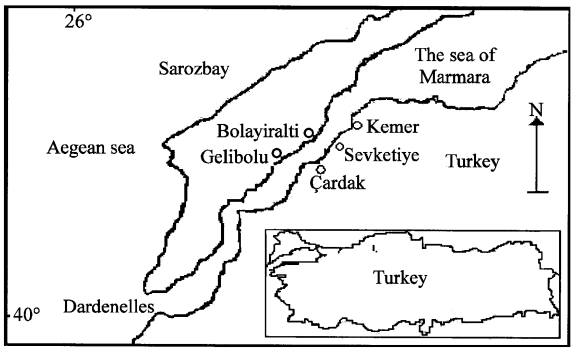

Fig. 1: The map of the study area

between 3-5 m whereas, a layer of musseles and oysters covers the depths between 9-10 m. The specimens of this ground consist of *Donax trunculus*, *Donax variabilis*, *Chamelia gallina*, *Spisulasubtruncata*, *Bittium reticulatum*, *Tapes phillippinarum*, *Mytilus galloprovincialis*, *Rudicardium tubercilatum*, *Cardium edule*, *Astropecten spinulosus*, *Paracenthorus lividus*, *Carcinus aestuarii*, *Liocarcinus depurator*, *Maja crispata*, *Pisa tetraodon*, *Dromia personata*, *Ilia nucleus*, *Xantho poressa Cyclope nerita*, *Raphana thomasian*, *Aconthocardia aculeata*.

Sevketiye location: In general, bottom of this region is stony and muddy. However, algea and sea urchins among these cover the sea shore of this region. In addition, black mussels lay among the rocks in this region. Posidonias dominate in the region. The species inhabit, this region are *Donax variabilis*,

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Chamelia gallina, *Spisula subtruncata*, *Bittium reticulatum*, *mytilus galloprovincialis*, *Astropecten spinulosus*, *Paracenthorus lividus*, *Carcinus aestuarii*, *Liocarcinus depurator*, *Maja crispata*, *Pisa tetraodon*, *Dromia personata*, *Ilia nucleus*, *Xantho poressa Cyclope nerita*, *Raphana thomasiana*, *Cardium edule*, *Rudicardium tubercilatum*, *Aconthocardia aculeate*, *Modiolus barbatus*.

Kemer location: Stony and muddy bottom of this region also contains algea and 0-1 m depth extends for quite a long distance. Species found in this region are *Chamelia gallina*, *Aconthocardia aculeate*, *Spisula subtruncata*, *Bittium reticulatum*, *Cyclope nerita*, *Raphana thomasiana*, *Paracenthorus lividus*, *Donax variabilis* and *Donax trunculus*.

Bolayir location: Bottom of this stony-muddy region is covered with posidonias inhabit the area between sea shore and 5 m depth, which contains small rocks. The species inhabits this region are *Chamelia gallina*, *Spisula subtruncata*, *Bittium reticulatum*, *Astropecten spinulosus*, *Paracenthorus lividus*, *Carcinus aestuarii*, *Liocarcinus depurator*, *Maja crispata*, *Pisa tetraodon*, *Dromia personata*, *Ilia nucleus*, *Xantho poressa Cyclope nerita*, *Raphana thomasiana*, *Rudicardium tubercilatum*, *Donax trunculus*, *Donax variabilis*, *Aconthocardia aculeate*, *Tapes phillippinarum*, *Paracontratus lividus*.

Gelibolu location: This is stony-rocky region with some algea and posidonia the depths between 0.5 and 9-10 m rocks extends perpendiculary to the sea in the Northern part of the region. The area between 0-4 m depth, which starts from sea shore and reaches to 9-10 m open sea is covered with stones. The location is inhabitated by the following species; *Donax trunculus*, *Donax variabilis*, *Chamelia gallina*, *Spisula subtruncata*, *Bittium reticulatum*, *Tapes phillippinarum*, *mytilus galloprovincialis*, *Rudicardium tubercilatum*, *Cardium edule*, *Astropecten spinulosus*, *Paracenthorus lividus*, *Carcinus aestuarii*, *Liocarcinus depurator*, *Maja crispata*, *Pisa tetraodon*, *Dromia personata*, *Ilia nucleus*, *Xantho poressa*, *Aconthocardia aculeate*, *Cyclope nerita*, *Raphana thomasiana*.

MATERIALS AND METHODS

Nineteen species of Brachyura sampled from the research field are classified according to Alvarez nomenclature as:

Klassis	=	CRUSTACEA
Subklassis	=	MALACOSTRACA
Order	=	DECAPODA (Latreille, 1803)
Süperseksiyon	=	REPTENTIA
Seksiyon	=	BRACHYURA (Latreille, 1803)
Section	=	BRACHYRHYNCHA (Borradaile, 1903)
Familya	=	PORTUNIDAE (Rafineesque, 1815)
Genus	=	Liocarcinus (Stimpson, 1870)
		Liocarcinus depurator (Linnaeus, 1758)
Genus	=	Carcinus (Leach, 1814)
		Carcinus aestuarii (Nordo, 1847)
Familya	=	XANTHIDAE (Mac Leay, 1838)
Genus	=	Eriphia (Latreille, 1817)
		Eriphia verrucosa (Forskal, 1775)
Genus	=	Xantho (Leach, 1814)
		Xantho poressa (Olivi, 1792)
Section	=	DROMIACEA (De Haan, 1833)
Familya	=	DROMIIDAE (De Haan, 1833)
Genus	=	Dromia (Weber, 1795)
		Dromia personata (Linnaeus, 1758)
Genus	=	Ilia (Leach, 1817)
		Ilia nucleus (Linnaeus, 1758)
Section	=	OXYRHYNCHA (Latreille, 1803)
Familya	=	MAJIDAE (Samouelle, 1819)
Genus	=	Macropodia (Leach, 1814)
		Macropodia longirostris (Fabricius, 1775)
Genus	=	Maja (Lamarck, 1801)
		Maja crispata (Risso, 1827)
Genus	=	Pisa Leach, 1814
		Pisa tetraodon (Pennant, 1777)
Klassis	=	BIVALVIA
Order	=	FILIBRANCHIATA
Family	=	MYTILIDAE (Rafinesque, 1815)
		Mytilus galloprovincialis (Lamarck, 1822)
		Modiolus barbatus (Lamarck, 1799)
Order	=	VENEROIDA
Family	=	VENERIDAE (Rafinesque, 1815)
		Tapes decussatus (Linnaeus, 1758)
		Tapes philippinarum Adams and Reeve, 1850
		Chamelia gallina (Linnaeus, 1758)
Family	=	CARDIIDAE (Lamarck, 1809)
		Cardium edule (Linnaeus, 1758)
		Rudicardium tuberculatum
Family	=	MACTRIDAE
		Spisula subruncata (Da Costa, 1778)
Family	=	DONACIDAE (Felming, 1828)
		Donax turunculus (Linnaeus, 1758)
		Donax variabilis (Say, 1822)
Klassis	=	GASTROPODA
Order	=	CAENOGASTROPODA
Family	=	CERITHIIDAE (Fleming, 1822)
		Bittium reticulatum (Da Costa, 1778)
Family	=	NASSARIIDAE
		Cyclope nerita (Linnaeus, 1758)
Klassis	=	ECHINOIDEA
Subklassis	=	EUECHINOIDEA
Order	=	ECHINOIDA
Familya	=	ECHINIDAE
		Paracentrotus lividus (Lam.1816)
Klassis	=	STELLEROIDAE
Subklassis	=	ASTEROIDEA
Order	=	PAXILLOSIDA
Familya	=	ASTROPECTINIDAE
		Astropecten spinulosus (Philippi, 1837)

RESULTS AND DISCUSSION

When the studies done to identify brachyura species in Mediterranean Sea, Aegean Sea, Marmara Sea and

Black Sea during the last years it has been noticed that most of the studies carried out in Aegean Sea and Mediterranean Sea. The first record of decapod in Aegean Sea was reported by Holthuis and Gottlieb (1958). According to this report, 59 brachyura species out of 124 Decapod species consist of the decapod fauna of Aegean Sea. Nineteen species identified during the course of this study were in the list of 59 brachyura reported by Holthuis and Gottlieb (1958). It has been noticed that the number of species identified during the course of the present study consist of 32.2% of the number of species identified by Holthuis and Gotltlieb (1958). A study done with the French research ship Calypso between 1955-1960 on decapod species of Aegean sea revealed 44 Brachyura species. Six species out of 19 species identified during the present study matches with the 6 of 44 species reported by the study done with French research ship Calypso.

The structure and the distrubution of bivalves on the shelf of straits and Sea of Marmara is poorly known (Demir, 1952). Whereas, many various investigations were conducted on bivalves adjected seas by Geldiay and Uysal (1971) and Geldiay and Kocatas (1988).

There are very limited number of reported studies done on faunas of Dardanelles and Sea of Marmara. The studies done by Muller (1986) and Ostroumoff (1893) reported 24 species in the Sea of Marmara. Muller (1986) reported 45 species belonging to 11 families in the Sea of Marmara and system of straits and he compared the previous reports using the scientific terms. The 19 species identified by us are covered in the list of 45 species prepared by Muller (1983).

Demir (1952) defined 25 crab species belonging to 13 families along with their taxonomic compositions, morphology and location where, they were caught Demir's (1952) list of species contains 17 of the species identified by the present study. Different 2 species are *Macropipus holsatus*, *Calappa granulata*.

The species of crab identified with this study consist of 68% of the species reported and described 56 species of bivalves with their systematic composition and morphologies in his book named Adalar Sahillerinin Omurgasiz Dip Hayvanlari (Invertebrata Bentic Animals of Cost of The Islands and Straits).

CONCLUSION

Twenty eight species were identified belonging to 14 families in the shore of the Dardanelles. However, further studies need to be conducted in suitable climatic conditions and in described 56 species of bivalves with their systematic composition and morphologies in his book named Adalar Sahillerinin Omurgasiz dip hayvanlari (Invertebrata Bentic Animals of Cost of The Islands and Straits). In longer research periods, in order to explore the unidentified species of the area by Demir (1952).

Holthus (1987) reported 15 crab species in Turkish seas. Fifteen of those from Mediterranean and Aegean seas, 9 from Sea of Marmara and 5 from Black sea were identified. Five species out of 9 species identified from Sea of Marmara are the same species, we report with the present study.

Kocatas (1981) investigated the Decapod crustacea of the costs of Seas surrounding Turkey and reported 7 species from Black sea, 9 species from Sea of Marmara, 64 species from Aegean Sea and 41 species from Mediterranean 81 species in total. All the species identified with this study were in the list of species from Aegean Sea and consisted of 29.5% of the species identified this sea by Kocatas (1981). Seven species out of 9 identified by Kocatas (1981) from Sea of Marmara match with the list of Species determined by the present study. Kocatas (1981) identified 7 species in Black Sea.

Balkis (1994) reported 21 species of crabs belonging to 8 families in the Sea of Marmara. Fifteen out of 19 species identified from the stations covered in the present study were in the list of 21 species detrmined by Balkis (1994). The different species identified during the present study were *Ilia nucleus*, *Calappa granulata*, *Parthenope angulifrons*, *Pisa tetradon*. The species, *Xantho pilipes* is anew record for the sea of Marmara.

Palaz *et al*. (1998) reported 8 species of crabs belonging to 8 genus of 5 families. The species detrmined by their study. According to the the study results; 21 species was determined belonging to 7 order and 5 Kalssis in the Dardanelles.

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