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The Amphipod (Crustacea) Species at the Coasts of Bozcaada Island (NE Aegean Sea)

Bozcaada (KD Ege Denizi) Kıyıları Amphipod (Crustacea) Türleri

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Abstract

This study was carried out to determine amphipod species of Bozcaada Island (NE Aegean Sea) and some ecological features within their habitat. Samples were collected from 32 stations during 2000- 2001 years, situated at the depth of 0.5-35 m by dredge, drift net, bottom trawl and scoop net. As a result of this research, 46 amphipod species belonging to 16 families were determined. *Microdeutopus similis* Myers, 1977 was reported for the first time from the entire Turkish Seas. Moreover, *Apherusa mediterranea* Chevreux, 1911 was a new record for the Aegean Sea coasts of Turkey.

Key Words: Amphipod, Bozcaada Island, Aegean Sea

Introduction

Bozcaada Island (lat 39˚ 47′ 30″-39˚ 50′ 90″ N and long 25˚ 57′ 80″- 26˚ 05′ 00″ E), which has an area of 42 km^2 and is nearly 5 km away from the mainland coast, is located in the lower part of the Aegean Sea and is between the Dardanelles Straits and Bababurnu.

In the Aegean Sea, there are three different water masses, namely surface water, an intermediate layer and deep water. The surface water is influenced by the Black Sea brackish water in the north and in the west along the coast of Greece. The salinity of this water is 26-35 psu. Intermediate water, characterised by a salinity maximum, is not distinguished on the shelf areas of the central and northern Aegean Sea, as a result of a vertical mixing process. The deep water mass of the Aegean Sea extends from a depth of approximately 300 m down to the bottom with a salinity of 38.8 psu (Yüce, 1995).

Amphipod crustaceans are peracarid crustaceans, typically ranging in size from 2 to 50 mm, although a few may be larger. Amphipods are common in aquatic ecosystems throughout many parts of the world, inhabiting marine, brackish, and freshwater environments. A few species also live in terrestrial ecosystems. In the sea amphipods can be found burrowing in sandy and muddy sediments, living in tubes on hard surfaces, dwelling among macroalgae and sessile invertebrates, and as part of the plankton. The order Amphipoda, which contains nearly 7,000 described species. The fauna of Mediterranean benthic amphipods consist of 451 species (Bellan-Santini *et al*., 1998).

Before this study, Geldiay *et al.,* (1970), Kocataş (1976), Kocataş *et al*., (2001, 2001), Katağan *et al.,* (2001), studied in the Aegean Sea coast of Turkey for amphipod species. Kocataş and Katağan (1978) reported 181 amphipod species in their study which was in the Aegean Sea of Turkish coast.

The purpose of this study was to determine the amphipod species living at the coasts of Bozcaada Island and to investigate some of their ecological properties.

Materials and Methods

The samples were collected from different 32 stations during 2000 and 2001 (Figure 1). These samples were collected at depths of 0.5-35 m using a dredge, drift net, bottom trawl and scoop net. The material was rinsed in wine sieves. The amphipod species were separated and then

fixed and preserved in 5% formaldehyde prepared in seawater. These species have been conserved in the Hydrobiological Museum of the Department of Biology, Faculty of Science, İstanbul University.

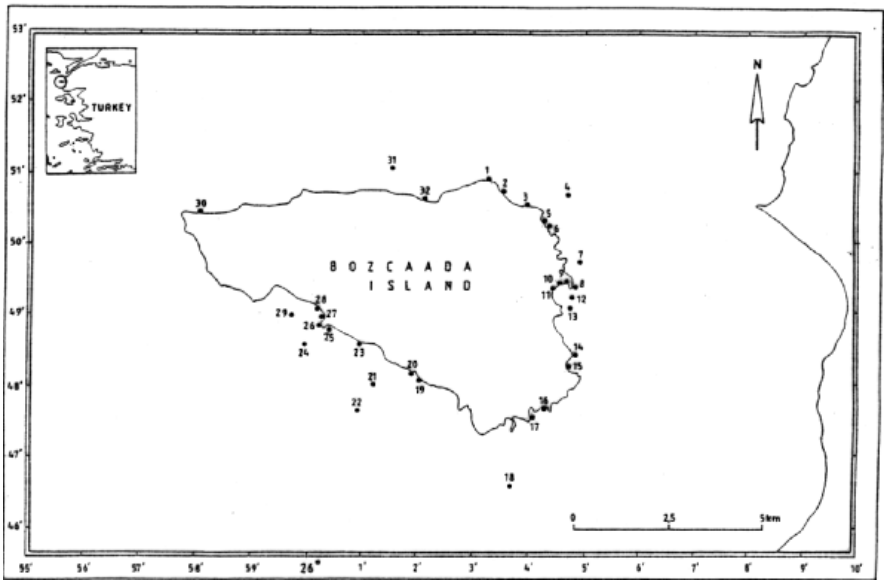


Figure 1- Map of the investigated area

The temperature was measured with the reversing thermometer of the Nansen bottle, the salinity by the Mohr-Knudsen method (Ivanoff, 1972); and the dissolved oxygen (DO) by the Winkler method (Winkler, 1888), (Table 1).

The identification of the specimens was carried out with the help of Bellan-Santini *et al.*, (1982, 1989, 1993).

Table 1- Some information on the sampled stations.
DN: drift net; DR: dredge; BTR: bottom trawl; SN: scoop net.

Station number	Date	Depth (m)	Tool	Temperature (°C)	Salinity (psu)	Dissolved oxygen (mg^{-1})
1	27.08.2000	0.5	SN	24.0	33.2	6.9
2	25.11.2000	0.5	SN	17.3	36.6	10.3
3	17.02.2001	0.5	SN	13.9	36.9	7.8
4	24.05.2000	20	DR	14.7	37.4	11.9
5	19.02.2001	0.5	SN	13.9	37.5	7.5
6	18.02.2001	5	DN	13.7	37.7	7.2
7	26.05.2000	9	DR	16.3	35.3	9.4
8	27.05.2000	0.5	SN	19.5	32.0	5.4
9	30.08.2000	0.5	SN	25.1	33.7	7.9
10	19.02.2001	0.5	SN	13.8	37.4	7.5
11	22.11.2000	0.5	SN	16.7	30.4	10.6
12	18.02.2001	5	DR	12.8	37.7	7.4
13	18.02.2001	8	DR	13.4	37.3	7.8
14	22.11.2000	0.5	SN	17.8	32.5	11.4
15	27.05.2000	0.5	SN	20.2	33.8	5.9
16	30.08.2000	0.5	SN	23.0	33.7	5.4
17	27.05.2000	0,5	SN	20.0	33.5	6.0
18	23.05.2000	35	DN	14.7	38.2	7.7
19	27.05.2000	0.5	SN	18.0	34.0	8.6
20	30.08.2000	0.5	SN	22.5	34.0	7.6
21	24.11.2000	25	DN	16.8	37.5	8.2
22	18.02.2001	30	BTR	14.1	38.4	7.4
23	19.02.2001	0.5	SN	13.7	37.6	7.8
24	18.02.2001	5	DR	13.6	37.6	7.3
25	22.11.2000	0.5	SN	18.7	34.9	11.2
26	18.02.2001	0.5	SN	13.7	37.6	7.8
27	25.05.2000	0.5	SN	20.0	33.5	8.8
28	19.02.2001	0.5	SN	13.7	37.5	7.7
29	24.11.2000	8	DR	16.8	36.7	8.8
30	31.08.2000	0.5	SN	22.4	32.1	7.5
31	24.11.2000	5	DR	17.1	36.9	8.7
32	25.05.2000	0.5	SN	21.0	32.2	11.0

Result

As a result of this study, totally 46 amphipod species belonging to 16 families were determined. Of these, *Apherusa mediterranea* Chevreux, 1911 is reported from the Aegean Sea coasts of Turkey for the first time, and *Microdeutopus similis* Myers, 1977 is new record for Turkish waters. In addition, 21 species are also a new record for Bozcaada Island. These 46 species have been given below as a table (Table 2).

Table 2- List of each identified Amphipod species from Bozcaada Island

* The new records for Bozcaada Island
♦ The new record for Turkish coast of the Aegean Sea
The new record for Turkish coast

Species	**Depth (m)**	**Habitat**	**Station n°**
CAPRELLIDAE			
Caprella acanthifera Leach, 1814	0.5	Photophilic algae	3, 15, 16, 17
****Caprella grandimana*** Mayer, 1882	0.5	Photophilic algae	1, 19, 26
****Caprella hirsuta*** Mayer, 1890	0.5	Photophilic algae	2
****Caprella rapax*** Mayer,1890	0.5	sand	1, 2, 9, 11, 19, 20, 26
Phtisica marina Slabber, 1749	20	*Posidonia* meadow	4
AMPHILOCHIDAE			
Amphilochus neapolitanus Della Valle, 1893	0.5	Photophilic algae	26
AMPITHOIDAE			
****Ampithoe ferox*** (Chevreux, 1902)	0.5	Photophilic algae	19

Ampithoe ramondi Audouin, 1826	0.5-35	Photophilic algae	1, 2, 8, 9, 16, 17, 18, 19, 20, 21, 25, 26, 27, 30, 31
****Ampithoe riedli*** **(**Krapp-Schickel, 1968)	0.5	Photophilic algae	16, 19, 20
Cymadusa crassicornis (A. Costa, 1857)	0.5	Photophilic algae	1, 15, 19, 30
AORIDAE			
****Autonoe spiniventris*** (Della Valle, 1893)	0.5	sand	19
Microdeutopus chelifer (Bate, 1862)	0.5	Photophilic algae	8, 15
****Microdeutopus gryllotalpa*** Costa, 1853	0.5	Photophilic algae	1
Microdeutopus obtusatus Myers, 1973	0.5	Photophilic algae	9, 16, 19
#Microdeutopus similis Myers, 1977	0.5	Photophilic algae	9
****Microdeutopus stationis*** Della Valle, 1893	0.5-20	sand and *Posidonia* meadow	4, 9
DEXAMINIDAE			
Dexamine spiniventris (Costa, 1853)	0.5-20	Photophilic algae	1, 4, 8, 9, 15, 16, 19, 20, 24, 25, 26, 27, 30
Dexamine spinosa *(*Montagu, 1813)	0.5-20	Photophilic algae	4, 8, 9, 16, 19, 26, 31
EUSIRIDAE			
♦Apherusa mediterranea Chevreux, 1911	0.5	rock	30
GAMMARIDAE			
****Echinogammarus olivii*** (Milne Edwards, 1830)	0.5	Photophilic algae and under stones	2, 10, 19, 26
****Gammarus aequicauda*** (Martyinov, 1931)	8	*Posidonia* meadow	13

HYALIDAE			
Hyale camptonyx (Heller, 1866)	0.5-35	Photophilic algae	1, 2, 8, 10, 11, 14, 15, 17, 18, 19, 20, 26, 30
Hyale crassipes (Heller, 1866)	0.5	under stones	2, 3, 25
Hyale perieri (Lucas, 1849)	0.5	Photophilic algae	19, 26
Hyale pontica Rathke, 1837	0.5	Photophilic algae	8, 20
Hyale schmidti (Heller, 1866)	0.5	Photophilic algae	1, 2, 8, 9, 15, 17, 19, 20, 25, 26, 27, 30
Parhyale aquilina (Costa, 1857)	0.5	Photophilic algae	1, 3, 5, 9, 10, 11, 23, 26, 30
Parhyale plumicornis (Heller, 1866)	0.5	Photophilic algae	23, 28
ISCHYROCERIDAE			
Ericthonius brasiliensis (Dana, 1855)	0.5	Photophilic algae	9, 30
Jassa marmorata (Holmes, 1903)	0.5	Photophilic algae	2
LEUCOTHOIDAE			
Leucothoe spinicarpa (Abildgaard, 1789)	0.5-8	Photophilic algae	9, 19, 29
LYSIANASSIDAE			
Lysianassa caesarea Ruffo, 1987	0.5	Photophilic algae	19
Lysianassa costae (Milne-Edwards, 1830)	0.5-20	Photophilic algae	4, 8, 9, 16, 19, 26
MELITIDAE			
Elasmopus brasiliensis (Dana, 1855)	0.5-35	rock	1, 2, 8, 9, 15, 16, 18, 19, 20, 25, 26, 27, 30, 32

Elasmopus pocillimanus (Bate, 1862)	0.5-5	Photophilic algae	8, 9, 15, 16, 19, 20, 24, 25, 26
****Elasmopus rapax*** Costa, 1853	0.5	Photophilic algae and muddy bottoms	16, 19
Gammarella fucicola (Leach, 1814)	0.5-8	Photophilic algae and *Posidonia* meadow	9, 13, 23, 32
Maera grossimana (Montagu, 1808)	0.5	Photophilic algae	1, 9
Maera inaequipes (Costa, 1857)	0.5-5	Photophilic algae and *Posidonia* meadow	9, 16, 24
****Melita hergensis*** Reid, 1939	0.5	under rock	30
Melita palmata (Montagu, 1804)	0.5-9	Photophilic algae and under stones	1, 2, 3, 7, 8, 9, 10, 11, 14, 23, 25, 27, 30, 32
PHLIANTIDAE			
Pereionotus testudo (Montagu, 1808)	0.5	Photophilic algae	9, 15, 16, 19, 20
PODOCERIDAE			
Podocerus variegatus Leach, 1814	0.5	Photophilic algae	16, 20, 25
STENOTHOIDAE			
Stenothoe monoculoides (Montagu, 1815)	0.5	Photophilic algae	8, 9, 19, 30
****Stenothoe tergestina*** Nebeski, 1881	0.5	Photophilic algae	8, 19, 20, 26, 30
TALITRIDAE			
Orchestia stephenseni Cecchini, 1928	0.5	under stones	1

Discussion

In this study, 46 amphipod species belonging to 16 families were determined. *Microdeutopus similis* Myers, 1977 was reported for the first time from the entire Turkish Seas. Moreover, *Apherusa mediterranea* Chevreux, 1911 was a new record for the Aegean Sea coasts of Turkey. In addition, 21 new amphipod species were added to the amphipod fauna of Bozcaada Island.

Kocataş and Katağan (1978) reported 50 amphipod species from Bozcaada Island. However 25 species could not be found in our study. These species are *Iphimedia* spp.*; Ampelisca* spp.*; Autonoe viduarum* (Myers, 1974); *Leptocheirus pectinatus* (Norman, 1869); *Microdeutopus anomalus* (Rathke, 1843); *Apherusa chiereghinii* Giordani-Soika, 1950; *Apherusa cf. vexatrix* Krapp-Schickel, 1979; *Colomastix pusilla* Grube, 1861; *Guernea coalita* (Norman, 1868); *Tritaeta gibbosa* (Bate, 1862); *Eusiroides dellavallei* Chevreux, 1899; *Eusirus longipes* Boeck, 1861; *Cheirocratus* sp.*; Echinogammarus foxi* (Schellenberg, 1928); *Melita coroninii* Heller, 1866; *Urothoe spp.; Liljeborgia dellavallei* Stebbing, 1906; *Acidostoma laticorne* O. Sars, 1879; *Lysianassa longicornis* (Lucas, 1849); *Lysianassa pilicornis* (Heller, 1866); *Orchomene humilis* (A.Costa, 1853); *Perioculodes aequimanus* (Krossman, 1880); *Harpinia dellavallei* Chevreux, 1910; *Metaphoxus fultoni* (Scott, 1890); *Orchestia montagui* Audouin, 1826. Moreover, *Jassa dentex* which was found by Kocataş and Katağan (1978) was accepted as *Jassa marmorata* in this study. Thus, total number of determined amphipod species was increased to 71.

Up to date, carcinological studies conducted on Turkish coasts established the presence of 202 benthic amphipods (Kocataş *et al*., 2002).

In this study *Ampithoe ramondi* was the most frequent species. This species was followed by *Elasmopus brasiliensis* and *Melita palmata* whereas thirteen species were found only once in this area. Moreover, these 46 amphipod species were obtained over various habitats. Most of the species were found only in substrates with a biocenosis of photophilic algae (Table 3).

Table 3- Numerical distribution of the identified species over various habitats.

Habitat	Number of Species
Photofilic algae	31
Photofilic algae and under stones	2
Photofilic algae and muddy bottom	1
Photofilic algae and *Posidonia* meadow	2
Posidonia meadow	2
Posidonia meadow and sandy	1
Sandy	2
Rocky – under stones	5

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Özet

Bu araştırma, Bozcaada'nın amphipod türlerinin ve bu türlerin bulundukları habitatların bazı ekolojik özelliklerinin belirlenmesi amacıyla yapıldı. Örnekler 2000-2001 yıllarında 0,5-35 m arasındaki derinliklerde bulunan 32 istasyondan drej, fanyalı ağ, dip trolü ve el kepçesi ile toplandı. Bu çalışmanın bir sonucu olarak, 16 familyaya ait 46 amphipod türü saptandı. *Microdeutopus similis* Myers, 1977 Türk Denizleri için yeni kayıttır. Ayrıca, *Apherusa mediterranea* Chevreux, 1911) türü de Ege Denizi'nin Türk kıyıları için yeni kayıttır.

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