

## The Ostracoda (Crustacea) Fauna of Lakes Erikli, Hamam, Mert, Pedina and Saka (İğneada, Kırklareli, Turkey)

Selçuk ALTINSAÇLI

Department of Biology, Faculty of Science, University of İstanbul, 34459 Vezneciler, İstanbul - TURKEY

Received: 21.04.2000

**Abstract:** This study was performed at Lakes Erikli, Hamam, Mert, Pedina and Saka (İğneada, Kırklareli) in 1999. Materials collected seasonally from the 20 stations were evaluated. The 24 species (*Candona neglecta*, *Fabaeformiscandona fabaeformis*, *Pseudocandona compressa*, *Pseudocandona hartwigi*, *Pseudocandona marchica*, *Candonopsis kingslei*, *Cypria ophthalmica*, *Physocyprina kraepelini*, *Ilyocypris bispinosa*, *Ilyocypris monstifica*, *Cypris bispinosa*, *Eucypris inflata*, *Eucypris virens*, *Psychrodromus olivaceus*, *Heterocypris incongruens*, *Heterocypris salina*, *Cyprinotus inaequalis*, *Cypridopsis vidua*, *Limnocythere inopinata*, *Limnocythere stationis*, *Cyprideis torosa*, *Callistocythere diffusa*, *Pontocythere bacescoi* and *Urocythereis margaritifera*) belonging to 18 genera were recorded. Three of them (*Pseudocandona hartwigi*, *Ilyocypris monstifica* and *Limnocythere stationis*) are new records for the Ostracoda fauna of Turkey.

**Key Words:** Inland waters, Ostracoda, Crustacea, Fauna, Taxonomy, Turkey

### Erikli, Hamam, Mert, Pedina ve Saka Göllerinin (İğneada, Kırklareli, Türkiye) Ostrakod (Crustacea) Faunası

**Özet:** Bu çalışma, Erikli, Hamam, Mert (Kocagöl), Pedina ve Saka göllerinde 1999 yılında gerçekleştirilmiştir. 20 istasyondan mevsimsel olarak toplanan materyaller değerlendirilmiştir. 18 cinsine ait 24 tür (*Candona neglecta*, *Fabaeformiscandona fabaeformis*, *Pseudocandona compressa*, *Pseudocandona hartwigi*, *Pseudocandona marchica*, *Candonopsis kingslei*, *Cypria ophthalmica*, *Physocyprina kraepelini*, *Ilyocypris bispinosa*, *Ilyocypris monstifica*, *Cypris bispinosa*, *Eucypris inflata*, *Eucypris virens*, *Psychrodromus olivaceus*, *Heterocypris incongruens*, *Heterocypris salina*, *Cyprinotus inaequalis*, *Cypridopsis vidua*, *Limnocythere inopinata*, *Limnocythere stationis*, *Cyprideis torosa*, *Callistocythere diffusa*, *Pontocythere bacescoi* ve *Urocythereis margaritifera*) kaydedilmiştir. Bunlardan üçü (*Pseudocandona hartwigi*, *Ilyocypris monstifica* ve *Limnocythere stationis*) Türkiye Ostracoda faunası için yeni kayıttır.

**Anahtar Sözcükler:** İç sular, Ostracoda, Crustacea, Fauna, Taksonomi ve Türkiye

### Introduction

This study was carried out to determine the Ostracoda fauna of lakes Erikli, Hamam, Mert, Pedina and Saka. This region contains important wetlands and forests (1). Therefore, biological diversity is expected to be high (1). It is assumed that the presence or absence of ostracod species is closely related to physical and chemical variables.

The first studies on the Ostracoda fauna of Anatolia were performed by Schäfer (2) and Hartmann (3). Later, other studies were performed by Gülen (4, 5, 6, 7, 8, 9), Altınışaçlı (10, 11), Altınışaçlı and Kubanç (12), Külköylüoğlu et al. (13, 14), Altınışaçlı and Yılmam (15) and Külköylüoğlu (16), which aimed to compile lists of the freshwater Ostracoda fauna of Anatolia (Asia Minor) and Thrace.

In this study, the biogeography of freshwater ostracod species living in the lakes were analysed. The data provide additional information for the biogeography of this group in Anatolia and the adjacent areas.

### Study Area

According to Yarar and Magnin (1), there exists a complex of seasonally flooded forests, swamps, freshwater lakes and sand dune habitats on the Black Sea coast near the Turkish–Bulgarian border (41°52' N 27°57'E). The area is bordered in the south and west by the Turkish Istranca mountains (peak 1035 metres). Water from the mountains flows via a number of streams to the Black Sea (the most prominent being the Çavuşdere (or Deringeçit stream) and Bulanıkdere) and accumulates behind the dunes, where it feeds the flooded forests, which are mostly below sea level. Five small lakes

with a rich and diverse aquatic flora are found within the area. The northernmost, Lake Erikli (41°52'55"N-27°59'11"E, 43 ha), just north of İğneada, is a coastal lagoon with no outlet to the sea during summer. Lake Saka (41°49'45"N- 27°59'00"E, 25 ha) is a freshwater lake located immediately after the sand dunes in the south. Lake Mert (41° 52' 09"N -27° 57'57"E, 266 ha), just south of İğneada, is in fact a small delta of Çavuşdere stream. Lake Hamam (41°49' 32"N- 27°57' 19"E, 19 ha) and Lake Pedina (41°49' 56" N- 27°55' 30"E, 10 ha) are situated further inland. The ca. 10 km-long pristine dunes and beach are an important feature of the IBA (Important Bird Area) and are of high botanical importance, with a range of south-west Black Sea characteristics. In this study, four sampling stations were chosen in Lakes Mert, Erikli, and Pedina, five in Lake Hamam and three in Lake Saka. The sampling stations are shown in the Figure.

**Stations**

The sampling stations and their substrates are shown in Table 1.

Table 1. The names of sampling stations and their substrates.

Station Number	Sampling Station Name	Substrate
1	North lakeshore of Lake Erikli	Sand
2	North-eastern lakeshore of Lake Erikli	Sand
3	West lakeshore of Lake Erikli	Sand+Mud
4	South-eastern lakeshore of Lake Erikli	Sand+Mud
5	West lakeshore of Lake Mert	Mud
6	North lakeshore of Lake Mert	Sand
7	East lakeshore of Lake Mert	Sand
8	North-western lakeshore of Lake Mert	Mud
9	South lakeshore of Lake Pedina	Mud
10	West lakeshore of Lake Pedina	Mud
11	North lakeshore of Lake Pedina	Mud
12	South-eastern lakeshore of Lake Pedina	Mud
12	East lakeshore of Lake Hamam	Mud
13	East lakeshore of Lake Hamam	Mud
14	North lakeshore of Lake Hamam	Mud
15	South-eastern lakeshore of Lake Hamam	Mud
16	South lakeshore of Lake Hamam	Mud
17	North-western lakeshore of Lake Hamam	Mud
18	East lakeshore of Lake Saka	Sand
19	North lakeshore of Lake Saka	Sand
20	West lakeshore of Lake Saka	Mud

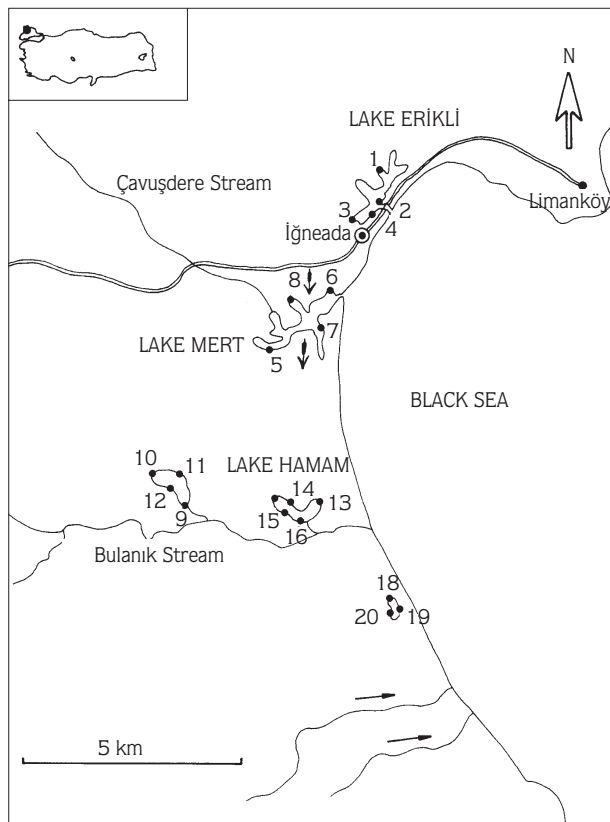


Figure Lakes and sampling stations .

**Materials and Methods**

In this study, samples were collected from 20 stations in the summer (July 12), autumn (September 6), winter (February 22) and spring (May 10) 1999. Freshwater ostracods live in stagnant and shallow water. Therefore, the materials were collected from lakes. In order to collect living forms from the mud, the Ekman grab (Hydrobios, 20X20X40 cm) was used. Ostracods were collected from shallow waters (< 1m depth) with a Müller plankton net, and immediately fixed in 4% formaldehyde. In the laboratory, the samples were washed under running water, filtered through three standard-sized sieves (of 2:1:0.25mm mesh size) and stored in 70% ethanol. Then the samples were conserved in 70% ethanol and glycerine (in a 1:1 ratio). Species identification was based on the soft body parts and valves. Samples were analysed in the laboratory between 1 and 35 days after collection. Water samples were taken at each station for laboratory analyses of salinity, dissolved oxygen and biological oxygen demand (BOD). Salinity values were measured using the Mohr-Knudsen method (17), while dissolved oxygen and BOD values were determined using the Winkler method (18). Other

variables (pH, temperature, conductivity, depth) were measured in situ. Water transparency was measured using a Secchi disc. Major ion (calcium, magnesium, chloride, water hardness) and nutrient (total phosphate, nitrite and nitrate) concentrations were measured following standard methods (19). All samples were stored in the Zoology Museum of the Biology Department, University of Istanbul, Turkey.

### Findings and Taxonomy

A total of 24 species were identified from 5 lakes.

Subphylum: Crustacea Pennant, 1777

Class: Ostracoda Latreille, 1806

Subclass : Podocopa G.W. Müller, 1894

Order: Podocopida Sars, 1866

Family: Candonidae Kaufmann, 1900

Superfamily: Cypridoidea Baird, 1845

Family: Candonidae Kaufmann, 1900

Subfamily: Candoninae Kaufmann, 1900

Genus: *Candona* Baird, 1845

*Candona neglecta* Sars 1887

**Material:** Station 3: 10.05.1999, 2 ♀♀; 12.07.1999, 2 ♀♀ and 1 ♂; 06.09.1999, 2 ♀♀ and 1 ♂; 22.02.1999, 3 ♀♀; Station 4: 10.05.1999, 2 ♀♀ and 1 ♂; 12.07.1999, 3 ♀♀ and 1 ♂; 06.09.1999, 2 ♀♀ and 1 ♂; 22.02.1999, 2 ♀♀ and 1 ♂; Station 6: 10.05.1999, 3 ♀♀ and 1 ♂; 12.07.1999, 2 ♀♀; 06.09.1999, 2 ♀♀; 22.02.1999, 1 ♀; Station 11: 10.05.1999, 4 ♀♀ and 1 ♂; 12.07.1999, 3 ♀♀ and 2 ♂; 06.09.1999, 4 ♀♀ 2 ♂♂; 22.02.1999, 3 ♀♀ and 2 ♂♂; Station 12: 10.05.1999, 3 ♀♀ and 2 ♂; 12.07.1999, 4 ♀♀ and 2 ♂; 06.09.1999, 3 ♀♀; 22.02.1999, 3 ♀♀ and 2 ♂♂; Station 14: 10.05.1999, 3 ♀♀ and 1 ♂; 12.07.1999, 2 ♀♀; 06.09.1999, 1 ♂; 22.02.1999, 1 ♀; Station 15: 10.05.1999, 2 ♀♀ and 1 ♂; 12.07.1999, 2 ♀♀; 06.09.1999, 2 ♀♀ and 1 ♂; 22.02.1999, 1 ♀; Station 18: 10.05.1999, 2 ♀♀ and 1 ♂; 12.07.1999, 2 ♀♀; 06.09.1999, 1 ♀ and 1 ♂; 22.02.1999, 1 ♀.

**Previous Records from Turkey:** Gaziantep (3); Kütahya (5, 8); Bilecik, İzmir, Aydın, Bolu, Zonguldak (7, 8, 10); Zonguldak, Afyon (8); Adana (9); Sinop (20); Lake İznik and Lake Sapanca (11), Lake Terkos (15).

**General Distribution:** Europe, North Africa, Central Asia and Near East.

**Genus:** *Fabaeformiscandona* (Krstic, 1972) Danielopol, 1973.

*Fabaeformiscandona fabaeformis* (Fischer, 1851) Danielopol, 1973.

**Material:** Station 9: 10.05.1999, 3 ♀♀ and 1 ♂; 12.07.1999, 3 ♀♀ and 1 ♂; Station 10: 10.05.1999, 2 ♀♀; 12.07.1999, 2 ♀♀ and 1 ♂; Station 13: 10.05.1999, 1 ♂; 12.07.1999, 1 ♀ and 1 ♂; Station 15: 10.05.1999, 2 ♀♀ and 1 ♂.

**Previous Records from Turkey:** Lake Sapanca (11)

**Genus:** *Pseudocandona* Kaufmann, 1900

*Pseudocandona compressa* (Koch, 1838) Danielopol, 1973

**Material:** Station 9: 10.05.1999, 3 ♀♀ and 1 ♂; 12.07.1999, 3 ♀♀ and 1 ♂; 06.09.1999, 3 ♀♀; Station 10: 10.05.1999, 2 ♀♀ and 1 ♂; 12.07.1999, 2 ♀♀ and 1 ♂; Station 13: 10.05.1999, 3 ♀♀ and 2 ♂♂; 12.07.1999, 3 ♀♀ and 2 ♂♂; 06.09.1999, 2 ♀♀ and 1 ♂; 22.02.1999, 1 ♀ and 1 ♂.

**Previous Records from Turkey:** Lake Terkos (15).

**General Distribution:** Europe, Siberia and North America.

*Pseudocandona hartwigi* (Müller, 1900) Wouters, 1989.

**Material:** Station 1: 10.05.1999, 3 ♀♀; 12.07.1999, 2 ♀♀; Station 3: 10.05.1999, 4 ♀♀; 12.07.1999, 2 ♀♀; Station 13: 10.05.1999, 2 ♀♀; 12.07.1999, 3 ♀♀; 06.09.1999, 2 ♀♀; 22.02.1999, 2 ♀♀; Station 16: 10.05.1999, 2 ♀♀; 12.07.1999, 2 ♀♀.

**Previous Records from Turkey:** New record for Ostracoda fauna of Turkey

**General Distribution:** Europe.

*Pseudocandona marchica* (Hartwig, 1899) Carbonnel, 1969.

**Material:** Station 1: 10.05.1999, 3 ♀♀ and 2 ♂♂; 12.07.1999, 4 ♀♀ and 2 ♂♂; 06.09.1999, 2 ♀♀ and 1 ♂; 22.02.1999, 2 ♀♀ and 2 ♂♂; Station 3: 10.05.1999, 2 ♀♀ and 3 ♂♂; 12.07.1999, 4 ♀♀; Station 5: 10.05.1999, 2 ♀♀ and 1 ♂; 12.07.1999, 3 ♀♀ and 1 ♂; 06.09.1999, 1 ♀; 22.02.1999, 2 ♀♀; Station 8: 10.05.1999, 2 ♀♀ and 2 ♂♂; 12.07.1999, 3 ♀♀ and 2 ♂♂; 06.09.1999, 2 ♀♀;

22.02.1999, 2 ♀♀ and 3 ♂♂; Station 13: 10.05.1999, 1 ♀ and 1 ♂; 12.07.1999, 3 ♀♀ and 2 ♂♂; 06.09.1999, 2 ♀♀ and 2 ♂♂; 22.02.1999, 2 ♀♀; Station 15: 10.05.1999, 3 ♀♀ and 2 ♂♂; 12.07.1999, 3 ♀♀; 06.09.1999, 1 ♀ and 1 ♂; 22.02.1999, 2 ♀♀ and 2 ♂♂.

**Previous Records from Turkey:** Lake İznik (11) and Lake Terkos (15).

**General Distribution:** Recorded all over Europe.

**Genus:** *Candonopsis* Vavra, 1891

*Candonopsis kingsleii* (Brady & Robertson, 1870) Vavra, 1891

**Material:** Station 5: 10.05.1999, 3 ♀♀ and 2 ♂♂; 12.07.1999, 3 ♀♀ and 2 ♂♂; Station 8: 10.05.1999, 2 ♀♀ and 2 ♂♂; Station 5: 12.07.1999, 2 ♀♀ and 1 ♂; Station 9: 10.05.1999, 2 ♀♀ and 1 ♂; 12.07.1999, 1 ♀; Station 10: 10.05.1999, 2 ♀♀ and 1 ♂; 12.07.1999, 2 ♀♀; Station 13: 10.05.1999, 2 ♀♀ and 1 ♂; 12.07.1999, 2 ♀♀ and 1 ♂.

**Previous Records from Turkey:** Antakya (7, 8, 9), and Lake İznik and Lake Sapanca (11).

**General Distribution:** Europe, Siberia, Black Sea, Sea of Azov and North America

**Subfamily:** Cyclocypridinae Kaufmann, 1900

**Genus:** *Cypria* (Zenker, 1854) Brady & Norman, 1889

*Cypria ophthalmica* (Jurine, 1820) Brady & Norman, 1889

**Material:** Station 1, 10.05.1999, 3 ♀♀; 12.07.1999, 4 ♀♀ and 1 ♂; 06.09.1999, 2 ♀♀; 22.02.1999, 3 ♀♀.

**Previous Records from Turkey:** İstanbul (7, 8, 14, 16); Lake Sapanca and Lake İznik (11); Lake Terkos (15).

**General distribution:** Cosmopolitan, except Australia

**Genus:** *Physocypria* (Vavra, 1897) G.W. Müller, 1912

*Physocypria kraepelini* G.W. Müller, 1903

**Material:** Station 1: 10.05.1999, 2 ♀♀; 12.07.1999, 3 ♀♀; Station 3: 10.05.1999, 3 ♀♀; 12.07.1999, 2 ♀♀; Station 9: 10.05.1999, 3 ♀♀; 12.07.1999, 4 ♀♀; 06.09.1999, 2 ♀♀; 22.02.1999, 3 ♀♀; Station 10: 10.05.1999, 3 ♀♀; 12.07.1999, 2 ♀♀; 06.09.1999, 3 ♀♀; 22.02.1999, 2 ♀♀; Station 11: 10.05.1999, 2 ♀♀; 12.07.1999, 3 ♀♀; Station 12: 10.05.1999, 3 ♀♀;

12.07.1999, 2 ♀♀; Station 13: 10.05.1999, 5 ♀♀ and 2 ♀♀, 12.07.1999, 3 ♀♀ and 2 ♂♂; Station 15, 10.05.1999, 3 ♀♀ and 1 ♂; 12.07.1999, 1 ♂ and 3 ♀♀;

**Previous Records from Turkey:** Eskişehir (5); Balıkesir, Bursa, Bolu, and Zonguldak (7, 8); Eskişehir, Muğla (8); Lake İznik (11); İstanbul (14, 16) and Lake Terkos (15).

**General Distribution:** Recorded all over Europe.

**Family:** Ilyocyprididae Kaufmann, 1900

**Genus:** *Ilyocypris* Brady & Norman 1889

*Ilyocypris biplicata* (Koch, 1838) Brady & Norman, 1889.

**Material:** Station 5: 10.05.1999, 3 ♀♀; 12.07.1999, 3 ♀♀; 06.09.1999, 2 ♀♀; 22.02.1999, 1 ♀; Station 8: 10.05.1999, 4 ♀♀; 12.07.1999, 3 ♀♀; 06.09.1999, 2 ♀♀; 22.02.1999, 3 ♀♀; Station 9: 10.05.1999, 3 ♀♀; 12.07.1999, 3 ♀♀; 06.09.1999, 2 ♀♀; 22.02.1999, 3 ♀♀; Station 10: 10.05.1999, 6 ♀♀; 12.07.1999, 4 ♀♀; 06.09.1999, 3 ♀♀; 22.02.1999, 2 ♀♀; Station 11: 10.05.1999, 4 ♀♀; 12.07.1999, 7 ♀♀; 06.09.1999, 2 ♀♀; 22.02.1999, 3 ♀♀; Station 12: 10.05.1999, 3 ♀♀; 12.07.1999, 2 ♀♀; 06.09.1999, 1 ♀; 22.02.1999, 2 ♀♀; Station 13: 10.05.1999, 3 ♀♀; 12.07.1999, 4 ♀♀; 06.09.1999, 2 ♀♀; 22.02.1999, 3 ♀♀; Station 14, 10.05.1999, 2 ♀♀; 12.07.1999, 3 ♀♀; 06.09.1999, 2 ♀♀; 22.02.1999, 1 ♀; Station 17: 10.05.1999, 3 ♀♀; 12.07.1999, 4 ♀♀; 06.09.1999, 2 ♀♀; 22.02.1999, 1 ♀.

**Previous Records from Turkey:** Bursa, Bilecik (7, 8); İzmir (10); Sinop (20); İstanbul (13, 14); Lake İznik and Lake Sapanca (11); Lake Terkos (15).

**General Distribution:** Europe, North Africa, North America and Near East.

*Ilyocypris monstifrica* (Norman, 1862) McKenzie, 1970

**Material:** Station 5: 10.05.1999, 2 ♀♀; 12.07.1999, 3 ♀♀; 06.09.1999, 2 ♀♀; 22.02.1999, 1 ♀.

**Previous Records from Turkey:** New record for Ostracoda fauna of Turkey.

**General Distribution:** Europe

**Family:** Cyprididae Baird, 1845

**Subfamily:** Cypridinae Baird, 1845

**Genus:** *Cypris* O.F. Müller, 1776

*Cypris bispinosa* Lucas, 1849

**Material:** Station 5, 10.05.1999, 5 ♀♀; 12.07.1999, 3 ♀♀; 06.09.1999, 3 ♀♀; 22.02.1999, 7 ♀♀.

**Previous records from Turkey:** Muğla (7) and Lake Sapanca (11)

**General distribution:** Holarctic, Near East, North Africa and North America.

**Subfamily:** Eucypridinae Bronstein, 1947

**Genus:** *Eucypris* (Vavra, 1891) Daday, 1900

*Eucypris inflata* (Sars, 1903) Bronstein, 1925

**Material:** Station 6: 10.05.1999, 12 ♀♀; 12.07.1999, 5 ♀♀; 06.09.1999, 2 ♀♀; 22.02.1999, 4 ♀♀; Station 7: 10.05.1999, 5 ♀♀; 12.07.1999, 4 ♀♀; 06.09.1999, 2 ♀♀; 22.02.1999, 2 ♀♀; Station 18: 10.05.1999, 7 ♀♀; 12.07.1999, 3 ♀♀; 06.09.1999, 2 ♀♀; 22.02.1999, 4 ♀♀; Station 19: 10.05.1999, 2 ♀♀; 12.07.1999, 2 ♀♀; 06.09.1999, 3 ♀♀; 22.02.1999, 2 ♀♀; Station 20: 10.05.1999, 2 ♀♀; 12.07.1999, 3 ♀♀; 06.09.1999, 2 ♀♀; 22.02.1999, 2 ♀♀.

**Previous Records from Turkey:** Antalya, Mersin (7); Mersin (8); İzmir (10); İstanbul (15).

**General Distribution:** Black Sea, Europe, Northern Africa, Central Asia, Black Sea, Caspian Sea and Sea of Azov.

*Eucypris virens* (Jurine, 1820) Daday, 1900

**Material:** Station 5: 10.05.1999, 3 ♀♀; 12.07.1999, 4 ♀♀; 06.09.1999, 3 ♀♀, Station 8: 10.05.1999, 3 ♀♀; 12.07.1999, 2 ♀♀; 06.09.1999, 2 ♀♀; 22.02.1999, 3 ♀♀; Station 13: 10.05.1999, 3 ♀♀; 12.07.1999, 2 ♀♀; 06.09.1999, 2 ♀♀; 22.02.1999, 3 ♀♀; Station 15: 10.05.1999, 4 ♀♀; 12.07.1999, 3 ♀♀; 06.09.1999, 2 ♀♀; 22.02.1999, 2 ♀♀.

**Previous Records from Turkey:** İzmir (4, 5); Kütahya (5); İstanbul (7, 13, 14, 16), Aydın, Muğla, Antalya, Manisa, Afyon, Zonguldak (7, 13, 14); Mersin, Adana, Antakya (9); Sinop (20); Lake İznik and Lake Sapanca (11).

**General Distribution:** Europe, Algeria, Island of Azores, North America, Middle Asia, Near East and Northern Africa.

**Subfamily:** Herpetocypridinae Kaufmann, 1900

**Genus:** *Psychrodromus* Danielopol & Mc Kenzie, 1977

*Psychrodromus olivaceus* (Brady & Norman, 1889) Danielopol & Mc Kenzie, 1977

**Material:** Station 8: 10.05.1999, 6 ♀♀; 12.07.1999, 4 ♀♀; 06.09.1999, 2 ♀♀.

**Previous Records from Turkey:** Kocaeli, Zonguldak (3); Kütahya (5); Bursa (7); Afyon (8); İzmir (10); İstanbul (13); Lake İznik and Lake Sapanca (11).

**General Distribution:** Europe.

**Subfamily:** Cyprinotinae Bronstein, 1947

**Genus:** *Heterocypris* Claus, 1892

*Heterocypris incongruens* (Ramdohr, 1808) Claus, 1892

**Material:** Station 8: 10.05.1999, 10 ♀♀; 12.07.1999, 12 ♀♀; 06.09.1999, 10 ♀♀; 22.02.1999, 10 ♀♀; Station 10: 10.05.1999, 14 ♀♀; 12.07.1999, 12 ♀♀; 06.09.1999, 10 ♀♀; 22.02.1999, 10 ♀♀; Station 12: 10.05.1999, 12 ♀♀; 12.07.1999, 10 ♀♀; 06.09.1999, 10 ♀♀; 22.02.1999, 8 ♀♀; Station 15: 10.05.1999, 12 ♀♀; 12.07.1999, 11 ♀♀; 06.09.1999, 4 ♀♀; 22.02.1999, 6 ♀♀;

**Previous Records from Turkey:** Antakya (3); Eskişehir (5); İzmir (5, 10); Antalya, Aydın, Muğla, Kastamonu, Afyon, Isparta, Zonguldak (7); Denizli (7, 8) Mersin, Adana (9); Balıkesir (12); Lake İznik and Lake Sapanca (11); İstanbul (13, 14, 16); Lake Terkos (15); Sinop (21).

**General Distribution:** Cosmopolitan.

*Heterocypris salina* (Brady, 1886) Klie, 1932

**Material:** Station 1: 10.05.1999, 2 ♀♀; 12.07.1999, 3 ♀♀; 06.09.1999, 2 ♀♀; 22.02.1999, 2 ♀♀; Station 2: 10.05.1999, 2 ♀♀; 12.07.1999, 4 ♀♀; 06.09.1999, 2 ♀♀; 22.02.1999, 3 ♀♀; Station 3: 10.05.1999, 4 ♀♀; 12.07.1999, 4 ♀♀; 06.09.1999, 2 ♀♀; 22.02.1999, 2 ♀♀; Station 5: 10.05.1999, 4 ♀♀; 12.07.1999, 3 ♀♀; 06.09.1999, 3 ♀♀; 22.02.1999, 3 ♀♀; Station 6: 10.05.1999, 4 ♀♀; 12.07.1999, 3 ♀♀; 06.09.1999, 3 ♀♀; 22.02.1999, 2 ♀♀; Station 7: 10.05.1999, 4 ♀♀; 12.07.1999, 3 ♀♀; 06.09.1999, 3 ♀♀; 22.02.1999, 2 ♀♀; Station 18: 10.05.1999, 5 ♀♀; 12.07.1999, 3 ♀♀; 06.09.1999, 3 ♀♀; 22.02.1999, 1 ♀; Station 19: 10.05.1999, 5 ♀♀; 12.07.1999, 4 ♀♀; 06.09.1999, 2 ♀♀; 22.02.1999, 3 ♀♀; Station 20: 10.05.1999, 7 ♀♀; 12.07.1999, 8 ♀♀; 06.09.1999, 3 ♀♀; 22.02.1999, 2 ♀♀.

**Previous Records from Turkey:** Burdur, Denizli, Aydın, Muğla, İzmir, (7, 10); Lake İznik (11); Sinop (20); İstanbul (13, 14); İstanbul and Rize (21).

**General Distribution:** Holarctic, Northern Africa and Sea of Azov.

**Genus:** *Cyprinotus* Brady, 1866

*Cyprinotus inaequalis* Bronstein, 1928

**Material:** Station 13, 10.05.1999, 2 ♀♀; 12.07.1999, 2 ♀♀; 06.09.1999, 2 ♀♀; 22.02.1999, 3 ♀♀.

**Previous Records from Turkey:** Antakya (3); Kütahya (5); Eskişehir, Bilecik, Bursa, Antalya, Aydın, Bolu and Zonguldak (7); Antakya (9); İzmir (10); Balıkesir (12); Sinop (20); Lake İznik and Lake Sapanca (11); Ordu (21).

**General Distribution:** Europe and Near East.

**Subfamily:** Cypridopsinae Kaufmann, 1900

**Genus:** *Cypridopsis* Brady, 1867

*Cypridopsis vidua* (Müller, 1776) Brady, 1867.

**Material:** Station 1, 10.05.1999, 12 ♀♀; 12.07.1999, 5 ♀♀; 06.09.1999, 2 ♀♀; 22.02.1999, 4 ♀♀; Station 2: 10.05.1999, 4 ♀♀; 12.07.1999, 6 ♀♀; 06.09.1999, 4 ♀♀; 22.02.1999, 6 ♀♀; Station 3: 10.05.1999, 3 ♀♀; 12.07.1999, 4 ♀♀; 06.09.1999, 3 ♀♀; 22.02.1999, 2 ♀♀; Station 4: 10.05.1999, 3 ♀♀; 12.07.1999, 4 ♀♀; 06.09.1999, 2 ♀♀; 22.02.1999, 2 ♀♀; Station 5: 10.05.1999, 3 ♀♀; 12.07.1999, 4 ♀♀; 06.09.1999, 5 ♀♀; 22.02.1999, 2 ♀♀; Station 7: 10.05.1999, 3 ♀♀; 12.07.1999, 3 ♀♀; 06.09.1999, 2 ♀♀; 22.02.1999, 2 ♀♀; Station 8: 10.05.1999, 3 ♀♀; 12.07.1999, 4 ♀♀; 06.09.1999, 2 ♀♀; 22.02.1999, 2 ♀♀; Station 11: 10.05.1999, 8 ♀♀; 12.07.1999, 3 ♀♀; 06.09.1999, 4 ♀♀; 22.02.1999, 8 ♀♀; Station 12: 10.05.1999, 7 ♀♀; 12.07.1999, 8 ♀♀; 06.09.1999, 7 ♀♀; 22.02.1999, 8 ♀♀; Station 14: 10.05.1999, 3 ♀♀; 12.07.1999, 4 ♀♀; 06.09.1999, 2 ♀♀; 22.02.1999, 2 ♀♀; Station 16: 10.05.1999, 12 ♀♀; 12.07.1999, 7 ♀♀; 06.09.1999, 4 ♀♀; 22.02.1999, 3 ♀♀; Station 18: 10.05.1999, 8 ♀♀; 12.07.1999, 7 ♀♀; 06.09.1999, 4 ♀♀; 22.02.1999, 2 ♀♀.

**Previous Records from Turkey:** Eskişehir (5); Gökçeada Island, Bolu, Zonguldak, Kırklareli (7); Lake İznik and Lake Sapanca (11); Balıkesir (12); İstanbul (7, 14); Lake Terkos (15); Ordu (21).

**General Distribution:** Cosmopolitan.

**Superfamily:** Cytheroidea Baird, 1850

**Family:** Limnocytheridae Sars, 1925

**Subfamily:** Limnocytherinae Sars, 1925

**Genus:** *Limnocythere* Brady, 1867

*Limnocythere inopinata* (Baird, 1843) Brady, 1867

**Material:** Station 1: 10.05.1999, 3 ♀♀; 12.07.1999, 2 ♀♀; 06.09.1999, 1 ♀.

**Previous Records from Turkey:** Lake Van (7); Lake İznik (11) and İstanbul (14).

**General Distribution:** Holarctic and Northern Africa (fossil).

*Limnocythere stationis* Vavra, 1891

**Material:** Station 3: 10.05.1999, 2 ♀♀; 12.07.1999, 2 ♀♀.

**Previous Records from Turkey:** New record for Ostracoda fauna of Turkey.

**Known Distribution:** Palaeartic.

**Family:** Cytherideidae Sars, 1925

**Subfamily:** Cytherideinae Sars, 1925

**Genus:** *Cyprideis* Jones, 1857

*Cyprideis torosa* (Jones, 1850) Jones, 1857

**Material:** Station 1: 10.05.1999, 3 ♀♀ and 2 ♂♂; 12.07.1999, 10 ♀♀ and 3 ♂♂; 06.09.1999, 3 ♀♀ and 2 ♂♂; 22.02.1999, 10 ♀♀ and 4 ♂♂; Station 2: 10.05.1999, 7 ♀♀ and 3 ♂♂; 12.07.1999, 10 ♀♀ and 2 ♂♂; 06.09.1999, 3 ♀♀ and 2 ♂♂; 22.02.1999, 3 ♀♀ and 2 ♂♂; Station 4: 10.05.1999, 3 ♀♀ and 1 ♂; 12.07.1999, 4 ♀♀ and 2 ♂♂; 06.09.1999, 5 ♀♀ and 3 ♂♂; 22.02.1999, 7 ♀♀ and 2 ♂♂; Station 6: 10.05.1999, 4 ♀♀ and 3 ♂♂; 12.07.1999, 5 ♀♀ and 4 ♂♂; 06.09.1999, 2 ♀♀ and 1 ♂; 22.02.1999, 3 ♀♀ and 1 ♂; Station 7: 10.05.1999, 4 ♀♀ and 3 ♂♂; 12.07.1999, 4 ♀♀ and 3 ♂♂; Station 7, 06.09.1999, 5 ♀♀ and 3 ♂♂; 22.02.1999, 2 ♀♀ and 1 ♂.

**Previous Records from Turkey:** İzmir (8, 10); Balıkesir (12, 22); Sea of Marmara (23); Sinop (20); Lake Terkos (15); Muğla (24); İstanbul (11, 14, 25);

**General Distribution:** Palaeartic and Central Africa.

**Family:** Leptocytheridae Hanai, 1957

**Genus:** *Callistocythere* Ruggieri, 1953

*Callistocythere diffusa* (Müller, 1894) Morkhoven, 1963

**Material:** Station 2: 10.05.1999, 2 ♀♀ and 2 ♂♂; 12.07.1999, 2 ♀♀ and 2 ♂♂; 06.09.1999, 5 ♀♀ and 3 ♂♂; 22.02.1999, 2 ♀♀ and 1 ♂; Station 6: 10.05.1999, 3 ♀♀ and 1 ♂; 12.07.1999, 2 ♀♀; 06.09.1999, 2 ♂♂; 22.02.1999, 1 ♂.

**Previous Records from Turkey:** Adapazarı coasts of Black Sea (21).

**General Distribution:** Black Sea, Azov Sea, Adriatic Sea, Mediterranean Sea and Atlantic Ocean.

**Family:** Cushmanideidae Puri, 1973

**Genus:** *Pontocythere* Dubowsky, 1939

*Pontocythere bacescoi* (Caraion, 1960) Caraion, 1967

**Material:** Station 2: 10.05.1999, 2 ♀♀ and 2 ♂♂; 12.07.1999, 2 ♀♀ and 2 ♂♂; 06.09.1999, 3 ♀♀ and 3 ♂♂; 22.02.1999, 2 ♀♀ and 2 ♂♂.

**Previous Records from Turkey:** İstanbul, Sinop, Samsun, Giresun and Rize (21).

**General Distribution:** Black Sea and Sea of Azov.

**Family:** Hemicytheridae Puri, 1953

**Subfamily:** Urocytheridinae Ruggieri, 1950

**Genus:** *Urocythereis* Attersuch, 1977

*Urocythereis margaritifera* (Müller, 1894) Ruggieri, 1950

**Material:** Station 2: 10.05.1999, 2 ♀♀ and 1 ♂; 12.07.1999, 2 ♀♀ and 1 ♂; 06.09.1999, 2 ♀♀ and 2 ♂♂; 22.02.1999, 1 ♀ and 1 ♂.

**Previous Records from Turkey:** Sea of Marmara (23) and Aegean Sea (24).

**General Distribution:** Mediterranean Sea and Aegean Sea.

Average values of major parameters pertaining to the lakes are shown in Tables 2, 3, 4, 5 and 6. Seasonal distributions of ostracod species are shown in Table 7. Ostracod species and their sampling stations are shown in Table 8.

## Discussion and Results

In this study, the materials were gathered from five lakes located in the İğneada district of Kırklareli province, of which two are lagoons and three are freshwater lakes. The study was conducted to determine both the ostracod species present and the physical and chemical parameters of the lakes. The seasonal distribution of the ostracod species was determined. Also, the ecological parameters were used to explain the absence and presence of ostracod species in those lakes (Altınışaçlı 2000 unpublished).

Lake Mert is a lagoon connected to the sea. A channel with a sandy substrate connects it to the Black Sea. Salinity measurements were made and on the basis of these results two distinct zones were identified. The vegetation present reflects the differences in salinity. Freshwater species of plants were found in the freshwater zone (zone 2) of the lake. Where salinities

Table 2. Physical and chemical parameters of Lake Erikli.

Parameters	SPRING	SUMMER	AUTUMN	WINTER	AVERAGE
Water Temperature (°C)	19	20	16	6	15.5
Salinity (‰)	2.5	5.8	6.3	4.25	4.71
Biological Oxygen Demand (mg l <sup>-1</sup> )	2.1	4.3	1.9	1.2	2.37
Air Temperature (°C)	22	25	18	10	18.75
Dissolved Oxygen (mg l <sup>-1</sup> )	5.6	8.5	7.99	9	7.77
pH	7.6	8.2	8.7	6.8	7.82
Conductivity (µS/cm)	216.8	520.5	1512.3	212	615.4
Calcium (mg l <sup>-1</sup> )	70.12	79.25	74.4	49.7	68.36
Magnesium (mg l <sup>-1</sup> )	30.12	45.25	152.2	39.7	60.06
Chloride (mg l <sup>-1</sup> )	392	430.3	3002	729.7	1138.5
French Hardness (10 mg l <sup>-1</sup> CaCO <sub>3</sub> )	33.3	68.5	100.2	37.3	59.82
Total Phosphate (µg l <sup>-1</sup> )	0.0002	0.3	0.0042	0.0032	0.076
Nitrite (mg l <sup>-1</sup> )	0.010	0.013	0.001	0.0006	0.006
Nitrate (mg l <sup>-1</sup> )	0.018	0.020	0.054	0.0003	0.023
Water transparency (cm)	46	70	49	80	61.25
Depth (cm)	115	80	58	128	95.25

Table 3. Physical and chemical parameters of Lake Hamam.

Parameters	SPRING	SUMMER	AUTUMN	WINTER	AVERAGE
Water Temperature (°C)	19	20	16	6	15.5
Salinity (‰)	0.22	0.37	0.33	0.25	0.29
Biological Oxygen Demand (mg l <sup>-1</sup> )	3.1	3.38	1.63	1.56	2.41
Air Temperature (°C)	22	25	18	10	18.75
Dissolved Oxygen (mg l <sup>-1</sup> )	9.6	8.5	8.2	11.24	9.38
pH	6.45	7.76	8.13	6.91	7.31
Conductivity (µS/cm)	56.8	51.5	51.3	84.5	61.02
Calcium (mg l <sup>-1</sup> )	7.12	11.25	12.3	11.2	10.46
Magnesium (mg l <sup>-1</sup> )	3.1	5.25	12.2	3.7	6.06
Chloride (mg l <sup>-1</sup> )	17.1	18.3	23	22.7	20.275
French Hardness (10 mg l <sup>-1</sup> CaCO <sub>3</sub> )	5.3	6.5	14.2	7.3	8.325
Total Phosphate (µg l <sup>-1</sup> )	0.005	0.005	0.004	0.004	0.004
Nitrite (mg l <sup>-1</sup> )	0.008	0.009	0.007	0.006	0.007
Nitrate (mg l <sup>-1</sup> )	0.12	0.21	0.16	0.13	0.155
Water transparency (cm)	58	55.5	46.7	83.5	60.925
Depth (cm)	243.5	187	158	185	193.37

Table 4. Physical and chemical parameters of Lake Mert.

Parameters	SPRING	SUMMER	AUTUMN	WINTER	AVERAGE
Water Temperature (°C)	19	20	16	6	15.5
Salinity (‰)	2.5	6.2	6.5	3.25	4.61
Biological Oxygen Demand (mg l <sup>-1</sup> )	2.1	4.1	2.8	1.3	2.57
Air Temperature (°C)	22	25	18	10	18.75
Dissolved Oxygen (mg l <sup>-1</sup> )	5.4	7.9	7.4	10	7.67
pH	6.9	8.2	8.3	6.8	7.55
Conductivity (µS/cm)	280.8	1120.5	1912.3	812	1031.4
Calcium (mg l <sup>-1</sup> )	56.2	124.5	190.6	69.7	110.25
Magnesium (mg l <sup>-1</sup> )	72.12	899.2	456.6	139.7	391.90
Chloride (mg l <sup>-1</sup> )	1290.5	5430.3	11022	2729.7	5118.12
French Hardness (10 mg l <sup>-1</sup> CaCO <sub>3</sub> )	48.3	212.5	270.2	79.3	152.57
Total Phosphate (µg l <sup>-1</sup> )	0.003	0.3	0.42	0.006	0.1822
Nitrite (mg l <sup>-1</sup> )	0.010	0.013	0.001	0.006	0.03
Nitrate (mg l <sup>-1</sup> )	0.018	0.084	0.054	0.0003	0.04657
Water transparency (cm)	61	74	54.4	78	66.8
Depth (cm)	118	90	56	101	91.25

Table 5. Physical and chemical parameters of Lake Pedina.

Parameters	SPRING	SUMMER	AUTUMN	WINTER	AVERAGE
Water Temperature (°C)	19	20	16	6	15.5
Salinity (‰)	0.16	0.20	0.22	0.15	0.18
Biological Oxygen Demand (mg l <sup>-1</sup> )	3.4	3.54	1.63	1.56	2.53
Air Temperature (°C)	22	25	18	10	18.75
Dissolved Oxygen (mg l <sup>-1</sup> )	9.2	8.5	8.2	12.24	9.53
pH	7.35	7.2	7.5	7.94	7.49
Conductivity (µS/cm)	54.8	55.5	78.3	56.5	61.27
Calcium (mg l <sup>-1</sup> )	7.20	10.25	11.3	10.15	9.72
Magnesium (mg l <sup>-1</sup> )	3.3	4.85	10.2	2.9	5.312
Chloride (mg l <sup>-1</sup> )	16.8	17.5	21	23.7	21.55
French Hardness (10 mg l <sup>-1</sup> CaCO <sub>3</sub> )	5.1	6.2	13.2	6.3	7.7
Total Phosphate (µg l <sup>-1</sup> )	0.003	0.004	0.005	0.003	0.003
Nitrite (mg l <sup>-1</sup> )	0.008	0.009	0.007	0.006	0.007
Nitrate (mg l <sup>-1</sup> )	0.13	0.22	0.15	0.12	0.155
Water transparency (cm)	57	54.5	45.7	84.5	60.4
Depth (cm)	242.5	186	155	188	192.8



Table 6. Physical and chemical parameters of Lake Saka.

Parameters	SPRING	SUMMER	AUTUMN	WINTER	AVERAGE
Water Temperature (°C)	19	20	16	6	15.5
Salinity (‰)	0.22	0.23	0.33	0.25	0.25
Biological Oxygen Demand (mg l <sup>-1</sup> )	2.9	3.18	1.54	1.54	2.29
Air Temperature (°C)	22	25	18	10	18.75
Dissolved (mg l <sup>-1</sup> )	7.6	8.5	8.9	10.24	8.11
pH	7.22	7.76	7.13	7.91	7.5
Conductivity (µS/cm)	52.8	58.5	59.3	60.5	57.77
Calcium (mg l <sup>-1</sup> )	7.12	11.25	12.3	11.2	68.36
Magnesium (mg l <sup>-1</sup> )	3.1	5.25	12.2	3.7	60.06
Chloride (mg l <sup>-1</sup> )	17.1	18.3	23	22.7	1138.5
French Hardness (10 mg l <sup>-1</sup> CaCO <sub>3</sub> )	5.1	5.5	12.2	8.3	7.7
Total Phosphate (µg l <sup>-1</sup> )	0.005	0.005	0.004	0.004	0.076
Nitrite (mg l <sup>-1</sup> )	0.008	0.009	0.007	0.006	0.006
Nitrate (mg l <sup>-1</sup> )	0.12	0.20	0.15	0.12	0.147
Water transparency (cm)	67	80.2	56.7	83.5	71.85
Depth (cm)	130	120	140	145	133.7

Table 7. The ostracod species recorded by season.

SPECIES	SPRING	SUMMER	AUTUMN	WINTER
<i>Candona neglecta</i>	E, H, M, P, S	E, H, M, P, S	E, H, M, P, S	E, H, M, P, S
<i>Fabaeformiscandona fabaeformis</i>	H, P	H, P		
<i>Pseudocandona compressa</i>	H, P	H, P	H, P	
<i>Pseudocandona hartwigi</i>	E, H	E, H	E, H	
<i>Pseudocandona marchica</i>	E, H, M, P	E, H, M, P	E, H, M, P	E, H, M, P
<i>Candonopsis kingsleii</i>	M, P	M, P	M, P	M, P
<i>Cypria ophtalmica</i>	E	E	E	E
<i>Physocypria kraepelini</i>	E, H, P	E, H, P	P	P
<i>Ilyocypris biplicata</i>	H, M, P	H, M, P	H, M, P	H, M, P
<i>Ilyocypris monstifrica</i>	M	M	M	M
<i>Cypris bispinosa</i>	M	M	M	M
<i>Eucypris inflata</i>	M, S	M, S	M, S	M, S
<i>Eucypris virens</i>	H, M	M	H, M	H, M
<i>Psychrodromus olivaceus</i>	M	M	M	
<i>Heterocypris incongruens</i>	H, M, P	H, M, P	H, M, P	H, M, P
<i>Heterocypris salina</i>	E, M, S	E, M, S	E, M, S	E, M, S
<i>Cyprinotus inaequivalvis</i>	H	H	H	H
<i>Cypridopsis vidua</i>	E, M, P, S	E, M, P, S	E, M, P, S	E, M, P, S
<i>Limnocythere inopinata</i>	E	E	E	
<i>Limnocythere stationis</i>	E	E		
<i>Cyprideis torosa</i>	E, M	E, M	E, M	E, M
<i>Callistocythere diffusa</i>	E, M	E, M	E, M	E, M
<i>Pontocythere bacescoi</i>	E	E	E	E
<i>Urocythereis margaritifera</i>	E	E	E	E

E: Lake Erikli, H: Lake Hamam, M: Lake Mert P: Lake Pedina, S: Lake Saka.

Table 8. The ostracod species recorded in the sampling stations.

Species	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
<i>Candona neglecta</i>			+	+		+					+	+		+	+					+
<i>Fabaeformiscandona fabaeformis</i>									+	+			+		+					
<i>Pseudocandona compressa</i>									+	+			+							
<i>Pseudocandona hartwigi</i>	+		+										+			+				
<i>Pseudocandona marchica</i>	+		+		+			+					+		+					
<i>Candonopsis kingsleii</i>					+				+	+			+							
<i>Cyprina ophtalmica</i>	+																			
<i>Physocyprina kraepelini</i>	+		+						+	+	+	+	+		+					
<i>Ilyocypris biplicata</i>					+			+	+	+	+	+	+	+						+
<i>Ilyocypris monstrifica</i>					+															
<i>Cypris bispinosa</i>					+															
<i>Eucypris inflata</i>						+	+													+
<i>Eucypris virens</i>					+			+					+		+					
<i>Psychrodromus olivaceus</i>								+												
<i>Heterocypris incongruens</i>								+		+		+			+					
<i>Heterocypris salina</i>	+	+	+		+	+	+													+
<i>Cyprinotus inaequalis</i>													+							
<i>Cypridopsis vidua</i>	+	+	+	+	+		+	+			+	+		+		+				+
<i>Limnocythere inopinata</i>	+																			
<i>Limnocythere stationis</i>			+																	
<i>Cyprideis torosa</i>	+	+		+		+	+													
<i>Callistocythere diffusa</i>		+				+														
<i>Pontocythere bacescoi</i>		+																		
<i>Urocythereis margaritifera</i>		+																		

were higher halophytic plants were thriving (zone 1). Salinity was measured in summer (6.2‰), spring (2.5‰), autumn (6.5‰) and winter (3.2‰) in the lake. Three factors affect the salinity of Lake Mert. Firstly, brackish water from the Black Sea enters Lake Mert during the winter period and salinity increases in the first zone of the lake.

Secondly, during summer and autumn, when evaporation rates are at a maximum, Lake Mert's connection with the Black Sea is broken and the salt concentration of zone 1 increases, because of evaporation. Finally, rain water feeds the lake in spring and winter. Therefore, salinity (< 1‰) is less in some parts of the second zone of the lake.

The concentrations of phosphate, nitrite and nitrate recorded in Lake Mert indicate high quality water (class I). The amount of total phosphate measured in the lake was < 5 µg l<sup>-1</sup>. Therefore, Lake Mert displays the properties of an ultra-oligotrophic lake.

The low values of BOD measured in the lake also indicate that the lake waters are of a very high, class I quality (Table 4). The waters of the lake had French hardness values > 54. This is very hard water (Table 4). The amount of dissolved oxygen in the lake was highest during winter and autumn. Average pH values in the lake varied from 6.9 to 8.3.

*Candona neglecta*, *Pseudocandona marchica*, *Candonopsis kingsleii*, *Ilyocypris biplicata*, *Ilyocypris monstrifica*, *Cypris bispinosa*, *Eucypris inflata*, *Eucypris virens*, *Psychrodromus olivaceus*, *Heterocypris incongruens*, *Heterocypris salina* and *Cypridopsis vidua* were found in zone 2 with mud substrata, where salinity was lowest.

*Cyprideis torosa*, *Callistocythere diffusa*, *Cypridopsis vidua*, *Heterocypris salina* and *Eucypris inflata* were found in the zone 1 with sandy substrata, where salinity was highest. Therefore, all species found in this zone of the lake were halobiont species. *C. vidua* was found living on the water plants in zone 1 and *H. salina* and *E. inflata* were found on the lake floor among the detritus.

Lake Erikli is also a lagoon connected to the Black Sea. This lake, like Lake Mert, has a sandy substrate in the channel connecting it to the Black Sea. The existence of two zones different in terms of physical and chemical characteristics, as in Lake Mert, is very interesting ecologically. The first zone, with a sandy substrate and slightly salty waters, is under the effect of the brackish waters from the Black Sea. The second zone, with a muddy substrate and fresh water (although sometimes brackish), is fed by streams and rain. The zones in which the salinity decreases are covered by marshes.

*Candona neglecta*, *Pseudocandona hartwigi*, *Pseudocandona marchica*, *Cypria ophtalmica*, *Physocypria kraepelini*, *Heterocypris salina*, *Cypridopsis vidua*, *Limnocythere inopinata* and *Limnocythere stationis* were found in the second zone with mud substrata where salinity was lowest.

*Cyprideis torosa*, *Callistocythere diffusa*, *Pontocythere bacescoi*, *Urocythereis margaritifera*, *Cypridopsis vidua* and *Heterocypris salina* were found in the first zone with sand substrata, where salinity was highest. All the species found in this zone of the lake are halobiont species. *Cypridopsis vidua* was found on the water plants and *H. salina* on the bottom amongst the detritus.

The conductivity of the water increased in zone 1 during the periods when the waters from Black Sea entered Lake Erikli, and in zone 2 during summer and autumn when evaporation increased. The total phosphate, nitrite and nitrate values measured in Lake Erikli indicated that the lake water quality is very high. The amount of total phosphate measured in the lake was  $< 5 \mu\text{g l}^{-1}$ , and so Lake Erikli displays the properties of an ultra-oligotrophic lake.

The low values of BOD recorded in the lake indicated that the lake water is of a very high quality (Table 2). Since the lake water has French hardness values higher than 54 it can be classified among the lakes with the highest water hardness. The lake water is characterised as hard since the French hardness of water is 33.3 during spring, and 37.3 during winter. The amount of dissolved oxygen in the lake peaks during winter and autumn. The average pH values in the lake varied between 7.6 and 7.8.

Lakes Mert and Erikli are both lagoonal and have similar ostracod communities since they have similar

ecological conditions. Güher (26) has studied the Rotifera, Cladocera and Copepoda fauna in lakes Mert and Erikli, and has shown that these two lakes have similar fauna since they have similar ecological conditions.

Lakes Hamam, Pedina and Saka are freshwater lakes not connected to the Black Sea. These lakes are solely fed by streams and rain, and share similar ecological conditions. In particular, lakes Hamam and Pedina are the most similar.

The greatest part of the substrate of lakes Hamam and Pedina is mud, a smaller part is sand. Phosphate, nitrite and nitrate levels in lakes Hamam and Pedina indicate that water quality is high in these lakes. Such measurements indicate that no agricultural fertilisers or domestic waste are discharged into these lakes. Since the amount of phosphate measured in the lakes is less than  $< 5 \mu\text{g l}^{-1}$ , all three lakes display ultra-oligotrophic properties.

The low values of biological oxygen demand (BOD) recorded in all three lakes (Tables 3, 5 and 6) indicate that the lake water is of a high quality. Since Lake Hamam has French hardness values of 5.3 - 7.3 (Table 3), it is classified as a soft water lake.

Since Lake Pedina has French hardness values of 5.1-13.2 (Table 5), it too is classified as a soft water lake. Since the waters of Lake Saka have values French hardness of 5.1-12.2 (Table 6), it is classified as a soft water lake. The amount of dissolved oxygen in Lake Pedina peaks during winter and autumn. Average pH values 6.45-8.13 in Lake Hamam, 7.2-7.94 in Lake Pedina and 7.13-7.91 in Lake Saka.

*C. neglecta*, *F. fabaeformis*, *P. compressa*, *P. hartwigi*, *P. marchica*, *P. kraepelini*, *I. biplicata*, *E. virens*, *P. olivaceus*, *H. incongruens* and *C. inaequalvis* were found in Lake Hamam.

*C. neglecta*, *F. fabaeformis*, *P. compressa*, *P. marchica*, *C. kingsleii*, *P. kraepelini*, *I. biplicata*, *H. incongruens* and *C. vidua* were found in Lake Pedina. *C. neglecta*, *H. salina*, *E. inflata* and *C. vidua* were found in Lake Saka.

Among the species found during this study, *P. hartwigi*, *I. monstrifica* and *L. stationis* are new records for the Ostracoda fauna of Turkey.

Studies of the origins of the ostracod species found in Turkey show that the of majority the fauna consists of Palaearctic, Holarctic, Circum-Mediterranean and

Pontocaspian (Paratethys relict) species. A minority of the species are of Near East origin.

*C. neglecta*, *P. marchica*, *C. kingsleii*, *C. ophtalmica*, *P. kraepelini*, *I. biplicata*, *I. monstrefica*, *C. bispinosa*, *E. inflata*, *E. virens*, *H. incongruens*, *H. salina*, *C. inaequalvis*, *C. vidua*, *C. torosa*, *C. diffusa*, *P. bacescoi* and *U. margaritifera* were found during all seasons (yearly forms).

Of these species, *F. fabaeformis* and *L. stationis* were found during spring and summer. *P. compressa*, *P. hartwigi* and *L. inopinata* were found during spring, summer and autumn. However, *P. compressa* is a eurytherm species whereas *L. inopinata* is both a eurythermic and a halobiont species. Therefore, it is possible that these species may be found during winter as well.

*C. bispinosa*, *E. inflata*, *E. virens*, *H. incongruens*, *H. salina*, *C. vidua*, *C. torosa*, *C. diffusa*, *P. bacescoi* and *U. margaritifera* can be found in all seasons because they are both eurythermic and halobiont species.

*C. neglecta*, *P. marchica*, *C. kingsleii*, *C. ophtalmica*, *P. kraepelini*, *I. biplicata*, *I. monstrefica*, *P. olivaceus* and *C. inaequalvis* were found in all lakes and in low salinity waters since they are eurythermic. A great majority of the ostracod species found in the lakes were found in the muddy substrata since they are epigeic (i.e. *F. fabaeformis* and *P. olivaceus*). All species of Ostracoda are new records for this locality.

### Acknowledgements

Our thanks go to biologist Songül Altınışağı for help during the field study, and also to Sandra Ryan for the help with the English translation.

### References

1. Yarar, M. & Magnin, G., Türkiye'nin Önemli Kuş Alanları, Doğal Hayatı Koruma Derneği Yayınları, İstanbul, 1997. ISBN: 975-96081-6-2, 314, 1997.
2. Schäfer, H. W., Über Süßwasser-Ostracoden aus der Türkei., Hydrobiologi. İstanbul Seri B. 1: 7-32, 1954.
3. Hartmann, G. Asiatische Ostracoden, Systematische und Zoogeographische Untersuchungen.- Internationale Revue der Gesamten Hydrobiologie, Systematische Beihefte, 3: 1-155, 1964.
4. Gülen, D., Animals Encountered in the Hot-springs of North Anatolia., Med. Terap. Hidroklimatoloji Yıllığı:16-17. 1975.
5. Gülen, D., Contribution to the Knowledge of the Freshwater Ostracoda Fauna of Turkey.- İst. Üniv. Fen Fak. Mec. Seri B. 42: 101-106, 1977.
6. Gülen, D., Türkiye İçin Yeni Notodromas (Ostracoda) Türleri. Tübitak VII. Bilim Kongresi Tebliğleri: 561-564, 1982.
7. Gülen, D., The Species and Distribution of the Group of Podocopa (Ostracoda- Crustacea) in Freshwaters of Western Anatolia- İst. Üniv. Fen Fak. Mec. Seri B. 50: 65-82, 1985 a.
8. Gülen, D., Bisexual Ostracoda (Crustacea) Populations in Anatolia. Üniv. Fen Fak. Mec. Seri B.50: 81-86,1985b.
9. Gülen, D., Türkiye Tatlısu Ostrakod Faunasına Katkılar II./ Contribution to the Taxonomy of the Freshwater Ostracoda Fauna of Turkey. Su Ürünleri Dergisi (Journal of Aquatic Products), 2, 1, S: 199-102,1988.
10. Altınışağı, S., Bergama (İzmir) Yöresi Ostrakod (Crustacea) Faunası ve Mevsimsel Dağılımı, Yüksek Lisans Tezi İstanbul Univ. Fen Bilimleri Enstitüsü, 1988.
11. Altınışağı, S., Sapanca ve İznik Göllerinin Ostrakod (Crustacea) Faunası ve Zoocoğrafik Dağılımı, Doktora Tezi İstanbul Univ. Fen Bilimleri Enstitüsü, 1993.
12. Altınışağı, S., & Kubanç, C. Ayvalık Yöresi Ostrakod (Crustacea) Faunası. X. Ulusal Biyoloji Kongresi Tebliğleri, Erzurum: 55-62, 1990.
13. Külköylüoğlu, O., Altınışağı, S. & Kubanç, C., Küçükçekmece Gölünün (İstanbul) Ostrakod (Crustacea) Faunası ve Mevsimsel Dağılımı. Doğa- Tr. J. of Zoology 17, 19-27, 1993.
14. Külköylüoğlu, O., Altınışağı, S., Kılıç, M. & Kubanç, C., (1995): Büyükçekmece Gölünün (İstanbul) Ostracoda (Crustacea) Faunası ve Mevsimsel Dağılımı. Doğa- Tr. Journal of Zoology 19: 249-256, 1995
15. Altınışağı, S. & Yılmam, S., Terkos Gölü (Durusu Gölü) Ostrakod (Crustacea) Faunası Tr. Journal of Zoology 19: 207-212, 1995.
16. Külköylüoğlu, O., Freshwater Ostracoda (Crustacea) and Their Quarterly occurrence in Şamlar Lake (İstanbul-Turkey), Limnologica 28 (2): 229- 235, 1998.
17. Ivanoff, A., Introduction a l'oceanographie. Tome I. Paris. Librarie Vuibert. 208 pp.,1972.
18. Winkler, L. W., The determination of dissolved oxygen in water. Berlin Deut. Chem. Ges., 21: 2843-2855, 1888
19. APHA, Standart Methods for the examination of water and wastewater. 15<sup>th</sup> Edition. 1980.
20. Kaleli, A., Orta Karadeniz Sahil Ostrakod (Crustacea) Faunası ve Zoocoğrafik Yayılışı İst. Üniv. Deniz Bilimleri ve İşletmeciliği Enstitüsünde Yüksek Lisans Tezi (M.Sc. thesis): 1-40, 1993.

21. Kılıç, M. Karadeniz Kıyıları Ostrakod (Crustacea) Faunası, İstanbul Üniversitesi Fen Bilimleri Enstitüsünde Doktora Tezi (Ph.D. Thesis) İstanbul Üniversitesi, Fen Fakültesi, 1997.
22. Kubanç, C. & Altınışaılı, S., Ayvalık-Bergama Lagün Ostrakod Faunası, X. Ulusal Biyoloji Kongresi Teblięleri, Erzurum: 37-46, 1990.
23. Kubanç, C. Marmara Denizi Ostrakod (Crustacea) Faunası. Yüksek Lisans Tezi. İstanbul Üniversitesi Fen Bilimleri Enstitüsü, 1989.
24. Kubanç, C., Ege Denizi Ostrakod (Crustacea) Faunası. Doktora Tezi, İstanbul Üniversitesi Fen Bilimleri Enstitüsü, 1995.
25. Kılıç, M., İstanbul Boęazı Karadeniz Girişı Ostrakod (Crustacea) Faunası ve Zoocoęrafyası, İstanbul Üniversitesi Fen Bilimleri Enstitüsünde Yüksek Lisans Tezi (MSc.) İstanbul Üniversitesi, Fen Fakültesi, 1992.
26. Güher, H., Mert Erikli, Hamam, Pedina Gölllerinin (İęneada/Kırklareli) Zooplanktonik Organizmaları (Rotifera, Cladocera, Copepoda) ve Mevsimsel Daęılımları, Trakya Üniversitesi Fen Bilimleri Enstitüsünde Doktora Tezi (Ph.D. thesis), 1996.