

# Cladocera and Copepoda (Crustacea) Fauna of Lake Terkos (Durusu)

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**Abstract:** Field studies were conducted by taking samples vertically and horizontally during a specific period of each month between April 2000 and March 2001 in Lake Terkos. A total of 28 species belonging to six families of Cladocera and 13 species from seven families of Copepoda are identified. Their known geographical distribution in Turkey have been given according to provinces.

**Key Words:** Lake Terkos, Cladocera, Copepoda, Fauna

## Terkos Gölü (Durusu) Cladocera ve Copepoda (Crustacea) Faunası

**Özet:** Bu çalışma Terkos Gölü'nde Nisan 2000-Mart 2001 tarihleri arasında gerçekleştirilmiştir. Aylık dönemler halinde vertikal ve horizontal olarak toplanan örnekler değerlendirilmiş ve Cladocera'nın 6 familyasına bağlı 28 tür, Copepoda'dan 7 familyaya bağlı 13 tür tespit edilmiştir. Bulunan türlerle ilgili olarak Türkiye'de bilinen dağılımları il temelinde verilmiştir.

**Anahtar Sözcükler:** Terkos gölü, Cladocera, Copepoda, Fauna

## Introduction

Cladocera and Copepoda species in zooplanktonic groups, which are the first link in the food chain in freshwater ecosystems, are present in all kinds of freshwater systems. They are the main food source of fish in their infant period in freshwater reservoirs. For this reason, the amount of these organisms in the unit water mass is vital for fry in reservoirs.

Wetlands host many organisms and they are considered vital territories for many species. However, over the last few decades, wetlands have become seriously threatened because of pollution caused by developing industry. As a result, species living in these areas either migrate or become extinct. Thus, it is clear that some urgent precautions have to be taken to protect the wetlands. There are many studies on this subject in the literature (1-26).

Lake Terkos is an important wetland as well as being a drinking water reservoir of Istanbul. This study was carried out to determine the Cladocera and Copepoda fauna considering there might be some different species since Terkos was a lagoon connected to the Black Sea until its disconnection in 1881.

### Description of the Research Area

Lake Terkos is situated at lat 40° 19' N long 28° 32'

W 50 km from Istanbul. Lake Terkos was a lagoon until its disconnection from the Black Sea in 1881. In order to supply water to Istanbul the lake was disconnected completely by installing regulators at the point where the lake meets the Black Sea. Owing to the insufficient rainfall, the water level has decreased in recent years. Therefore saline deposits are sometimes allowed into the lake by unlocking the regulators. The lake can approach a length of 14 km and a width of 6 km. The total area is 25 km<sup>2</sup> and the deepest point is 11 m. The lake is fed by Sivasköy, Istranca and Çiftlikköy streams (Figure 1). Some streams in the mountains discharging into the Black Sea are also pumped into the lake by the regulators.

Some water vegetation (i.e. *Phragmites australis* L., *Trapa natans* L., *Nymphaea* sp.) can be seen, especially where the streams flow into the lake.

### Materials and Methods

This study was performed at the Lake Terkos (Durusu) at monthly periods between April 2000 and March 2001. Plankton samples were collected horizontally and vertically with several plankton nets (mesh size 55 µm), and in the areas where water vegetation is dense small plankton nets were used. Collected samples were fixed in 70% alcohols.

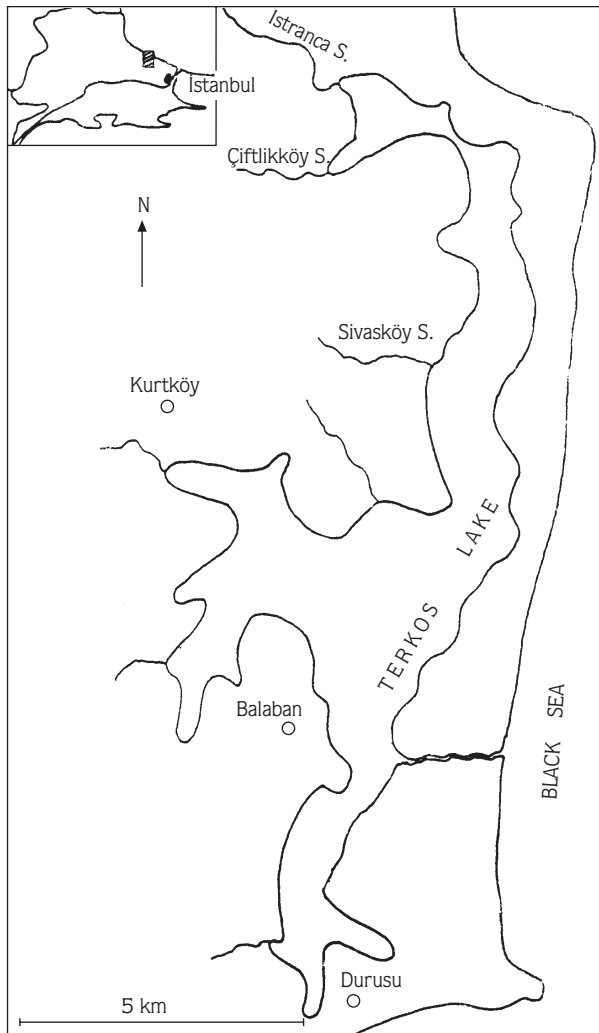


Figure 1. The location of Lake Terkos.

Relevant literature (27-36) was used for the identification of the species. Negrea (31) and Dussart (34,35) were followed for the classification of the species. Geographical distributions of the species in Turkey are added.

## Results

A total of 28 species of Cladocera belonging to six families and 13 species of Copepoda belonging to seven families were determined in Lake Terkos.

Order: Cladocera Latreille, 1829

Family: Daphniidae Straus, 1820

Genus: *Ceriodaphnia* Dana, 1853

*Ceriodaphnia reticulata* (Jurine, 1820)

Distribution in Turkey: Kayseri, Elazığ (15), İzmir (10), Manisa (12), Konya, Nevşehir, Ankara (16), Kırklareli, Konya, Burdur, Bolu, Afyon (18), Edirne, Tekirdağ, Kırklareli (26).

*Ceriodaphnia quadrangula* (O.F.Müller, 1785)

Distribution in Turkey: Manisa (12), Aydın, Muğla (11), Burdur (13), Trabzon, Afyon, Ankara, Rize, Diyarbakır, Denizli, Kayseri (18), Edirne, Tekirdağ, Kırklareli (26).

Genus: *Daphnia* Müller, 1785

*Daphnia pulex* Leydig, 1860

Distribution in Turkey: Ankara (2), Adıyaman, İçel (16), Manisa (12), Ankara (18), Edirne, Tekirdağ, Kırklareli (26).

*Daphnia hyalina* Leydig, 1860

Distribution in Turkey: Bolu (9), Muğla, Kars (18), İzmir (22).

*Daphnia curvirostris* Eylmann, 1887

Distribution in Turkey: Afyon, Edirne, Ankara, Muğla (18).

Genus: *Simocephalus* Schödler, 1858

*Simocephalus vetulus* (O.F.Müller, 1776)

Distribution in Turkey: Ankara (2), Uşak, Niğde, Kayseri, Bingöl, Elazığ (15), Trabzon, Afyon, Samsun, Bolu, Kayseri, Ordu, Kırşehir, Rize (18), Edirne, Kırklareli, Tekirdağ (26).

*Simocephalus serrulatus* (Koch, 1841)

Distribution in Turkey: Tekirdağ (26).

Genus: *Scapholeberis* Schödler, 1858

*Scapholeberis mucronata* (O.F.Müller, 1785)

Distribution in Turkey: Balıkesir (11), Manisa (12), Bolu (18), Kırklareli (26).

*Scapholeberis kingi* Sars, 1903

Distribution in Turkey: Ankara, Adıyaman (16), Kırşehir, Kayseri, Afyon, Konya (18), Edirne, Kırklareli, Tekirdağ (26).

Family: Bosminidae Baird, 1846

Genus: *Bosmina* Baird, 1846

*Bosmina longirostris* (O.F.Müller, 1785)

Distribution in Turkey: İzmir (21), Manisa (12), Bolu (9), Sakarya, Bursa (1), Aydın, Muğla, Bursa, Balıkesir (11), Eskişehir, Antalya, Adana, Urfa (16), Samsun, Konya, Afyon, Kayseri, Amasya, Adana, Ankara, Denizli, Burdur, Aksaray, İstanbul (18), Edirne, Kırklareli, Tekirdağ (26).

**Family: Macrothricidae Norman & Brady, 1867**

Genus: *Ilyocryptus* Sars, 1872

*Ilyocryptus sordidus* (Lievin, 1848)

Distribution in Turkey: Antalya (16), Konya (18), Tekirdağ, Kırklareli (26).

*Ilyocryptus agilis* Kurz, 1878

Distribution in Turkey: Edirne, Kırklareli, Tekirdağ (26).

Genus: *Lathonura* Lilljeborg, 1853

*Lathonura rectirostris* (O.F.Müller, 1785)

Distribution in Turkey: Adapazarı (20).

Genus: *Macrothrix* Baird, 1843

*Macrothrix laticornis* (Fischer, 1848)

Distribution in Turkey: Bursa (11), Adıyaman, Konya (16), Samsun, Ankara, Burdur, Bolu (18), Edirne, Tekirdağ (26).

**Family: Chydoridae Stebbing, 1902**

Genus: *Acroperus* Baird, 1843

*Acroperus harpae* (Baird, 1834)

Distribution in Turkey: Bolu, Kars, Afyon, Konya (18), Kırklareli (25).

Genus: *Alona* Baird, 1843

*Alona quadrangularis* (O.F.Müller, 1785)

Distribution in Turkey: Edirne, Tekirdağ, Kırklareli (26).

*Alona rectangula* Sars, 1862

Distribution in Turkey: İzmir (21), Konya (16), Çorum, Niğde, Malatya, Muş (15), Balıkesir, Muğla (11), Konya, Kayseri, Afyon, Kırşehir, Ankara, Aksaray, Samsun, Kars, Trabzon (18), Edirne, Kırklareli, Tekirdağ (26).

*Alona guttata* Sars, 1862

Distribution in Turkey: Aksaray, Afyon, Burdur (18), Edirne, Kırklareli (26).

*Alona costata* Sars, 1862

Distribution in Turkey: Bolu (18), Kırklareli (25), Edirne (26).

*Alona protzi* Hartwig, 1900

Distribution in Turkey: Isparta (16).

Genus: *Biapertura* Smirnov, 1971

*Biapertura affinis* (Leydig, 1860)

Distribution in Turkey: Manisa (12), Ankara (2), Bolu (9), Konya, Kars, Burdur, Rize (18), Kırklareli (25).

Genus: *Cydorus* Leach, 1816

*Cydorus sphaericus* (O.F.Müller, 1776)

Distribution in Turkey: Manisa, Niğde, Uşak, Nevşehir, Malatya, Elazığ, Bingöl, Muş (15), İzmir (21), Manisa, Muğla, Bursa, Balıkesir (12), Bolu (9), İçel, Antalya, Konya (16), Kayseri, Afyon, Rize, Bolu, Kırşehir, Ankara, İstanbul (18), Edirne, Kırklareli, Tekirdağ (26).

*Cydorus latus* Sars, 1862

Distribution in Turkey: Elazığ (16), Samsun (18).

Genus: *Graptoleberis* Sars, 1862

*Graptoleberis testudinaria* (Fischer, 1848)

Distribution in Turkey: Bolu, Konya, Afyon, Kars (18), Kırklareli (25).

Genus: *Leydigia* Kurz, 1875

*Leydigia acanthocercoides* (Fischer, 1854)

Distribution in Turkey: Samsun, Konya (18), Edirne (26).

Genus: *Pleuroxus* Baird, 1843

*Pleuroxus aduncus* (Jurine, 1820)

Distribution in Turkey: Elazığ (15), Konya, Antalya (16), Afyon, Kayseri (18), Edirne, Tekirdağ (26), Kırklareli (25).

**Family: Sididae Baird, 1850**

Genus: *Diaphanosoma* Fischer, 1850

*Diaphanosoma brachyurum* (Lievin, 1848)

Distribution in Turkey: Bursa, İstanbul, Balıkesir, Ankara (1), İzmir (10), Muğla, Bursa, Balıkesir, Burdur (11), Manisa (12), Amasya, Afyon, Bolu (18), Edirne, Kırklareli, Tekirdağ (26).

**Family: Leptodoridae Lilljeborg, 1861**

Genus: *Leptodora* Lilljeborg, 1861

*Leptodora kindti* (Focke, 1844)

Distribution in Turkey: Bursa, Balıkesir, Edirne (11), Kars (18).

Subclass: Copepoda

Order: Calanoida

**Family: Temoridae G.O.Sars, 1903**

Genus: *Eurytemora* Giesbrecht, 1881

*Eurytemora velox* (Lilljeborg, 1853)

Distribution in Turkey: Samsun (19), İstanbul (1), Kırklareli (25).

**Family: Pseudodiaptomidae G.O. Sars, 1903**

Genus: *Calanipeda* Kritschagin, 1873

*Calanipeda aguedulcis* Kritschagin, 1873

Distribution in Turkey: Samsun (19), İstanbul (1), Burdur, Balıkesir, Aydın, Edirne, Muğla (11), Kırklareli (25).

Order: Harpacticoida

**Family: Ameiridae Monard, 1927; Lang, 1936**

Genus: *Nitocra* Boeck, 1864

*Nitocra hibernica* (G.S. Brady, 1880)

Distribution in Turkey: Isparta (4), Balıkesir, Bursa (8).

**Family: Canthocamptidae Sars, 1906**

Genus: *Canthocamptus* Westwood, 1836

*Canthocamptus staphylinus* (Jurine, 1820)

Distribution in Turkey: İzmir (21), İstanbul, Çankırı (4).

Genus: *Attheyella* Brady, 1880

*Attheyella trispinosa* (Brady, 1880)

Distribution in Turkey: Afyon (17).

**Family: Laophontidae T. Scott, 1904**

Genus: *Onychocamptus* Daday, 1903

*Onychocamptus mohammed* (Blanchard and Richard, 1891)

Distribution in Turkey: Bursa (8), Kırklareli (25).

Order: Cyclopoida

**Family: Eucyclopinae Kiefer, 1927**

Genus: *Macrocylops* Claus, 1893

*Macrocylops albidus* (Jurine, 1820)

Distribution in Turkey: Afyon (17), Burdur, Adana (3), İstanbul, Kahramanmaraş (4), İzmir (22), Kırklareli (25).

Genus: *Eucyclops* Claus, 1893

*Eucyclops serrulatus* (Fischer, 1851)

Distribution in Turkey: Bolu (9), Kayseri, Elazığ, Muş (15), Ankara, Burdur, Nevşehir (16), İstanbul, Balıkesir (1), Çankırı (4), Gaziantep, Niğde, Kahramanmaraş, Malatya (7), Kırklareli (25), İzmir (22).

*Eucyclops macrurus* (G.O. Sars, 1863)

Distribution in Turkey: Afyon (17)

**Family: Cyclopinae Kiefer, 1927**

Genus: *Cyclops* O.F. Müller, 1776

*Cyclops vicinus* Uljanin, 1875

Distribution in Turkey: Samsun (19), İzmir (21), Edirne (24), Balıkesir (11).

Genus: *Acanthocyclops* Kiefer, 1927

*Acanthocyclops robustus* (G.O. Sars, 1863)

Distribution in Turkey: Samsun (19), İstanbul (4), Edirne (24), Kırklareli (25).

Subgenus: *Megacyclops* Kiefer, 1927

*Acanthocyclops (Megacyclops) viridis* (Jurine, 1820)

Distribution in Turkey: Afyon (17), Bolu (9), Kayseri, Niğde, Muş (15), Ankara, Nevşehir (16), İstanbul, Çankırı, Van (4), Adana, Hatay, Gaziantep, Kahramanmaraş (7), Kırklareli (25).

Genus: *Mesocyclops* G.O. Sars, 1914

*Mesocyclops leuckarti* (Claus, 1857)

Distribution in Turkey: Afyon (17), Burdur, Antalya, Adana, Adıyaman (16), Balıkesir (4), Kırklareli (25).

**Discussion**

The results demonstrated the existence of 28 Cladocera and 13 Copepoda species in Lake Terkos. The highest number of species in Cladocera was found in the family Chydoridae and this is followed by the families

Daphniidae and Macrothricidae respectively. Only one species was found in the families Leptodoridae, Sididae and Bosminidae. The Copepoda group is represented by seven species in the order Cyclopoida, by four species in the order Harpacticoida, and by two species in the order Calanoida.

During dry periods, in order to keep the water at the necessary level, sometimes saline water is allowed into the lake by unlocking the regulators, which makes the water in Lake Terkos somewhat salty. The water of various streams in Istranca Mountains is kept in

reservoirs and pumped into the lake. This causes other species in the streams to be transferred to the lake and therefore resulting in increases in biological variety.

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