

A Faunistic Study on the Freshwater Cladocera (Crustacea) Species in Turkish Thrace (Edirne, Tekirdağ, Kırklareli)

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Abstract: A total of 47 different localities including lakes, ponds, streams, rivers and other bodies of water were surveyed between 1996 and 1998 in order to determine the Cladoceran (Crustacea) fauna of the Turkish Thrace region.

Thirty-nine species of Cladocera were collected, out of which, 10 are new of the Thrace region of Turkey. The distribution of the species are given according to their localities and province.

Key Words: Crustacea, Cladocera, Freshwater, Thrace, Fauna.

Trakya Bölgesi (Edirne, Tekirdağ, Kırklareli) Tatlısu Cladocera (Crustacea) Türleri Üzerine Faunistik Bir Araştırma

Özet: Trakya bölgesi (Edirne, Tekirdağ, Kırklareli) Cladocera (Crustacea) faunasının ortaya çıkarılması amacıyla 1996-1998 yılları arasında göl, gölet, akarsu ve çeşitli su birikintileri olmak üzere 47 lokaliteden toplanan örnekler incelenmiştir. Bunun sonucunda Cladocera ordosuna ait, 10'u Trakya bölgesi için yeni kayıt olmak üzere toplam 39 tür bulunmuştur. Bulunan bu türlerin lokalitelere ve illere göre dağılımları verilmiştir.

Anahtar Sözcükler: Crustacea, Cladocera, Tatlısu, Trakya, Fauna.

Introduction

The Cladocera species, which make up an important proportion of zooplanktonic organisms, are found in almost all kind of aquatic habitats such as rivers, lakes, ponds, streams and other bodies of water. These organisms are known as essential components of the food chain for the freshwater ecosystem, because they are the most important grazers of phytoplankton, and thus herbaceous material is diverted to animal material through these zooplanktons. For this reason, these species are indicators of productivity of the water systems where they are found.

Although there are several studies on the Cladocera of Turkey, the number of taxonomical and ecological works is very limited (1-6). Geldiay (7), Margaritora and Cattarelli (8), Geldiay and Taaren (9), Demirhindi (10), Tanyolaç and Karabatak (11), Tokat (12), Akdağ (13), Margaritora and Stella (14), Fiers (15) Ortak and Kırgız (16) Güher and Kırgız (17), Ustaoglu (18, 19) Ustaoglu and Balık (20) and Güher (21) have also studied the Cladocera group with other zooplanktonic (Copepoda, Rotifera) groups.

In Turkish Thrace, the previous studies on Cladocera involve Istanbul (Eyüp) (1), Edirne province (6,17) Gala Lake (10,16), Babaeski (15), and several lakes in İğneada (21).

As indicated above, in Turkish Thrace, the Cladocera has generally been surveyed in Edirne province but there are no detailed studies in the other areas (Tekirdağ and Kırklareli). The present study was carried out to determine the Cladocera fauna of the Thrace region of Turkey, which involves several rivers in the Meriç-Ergene Basin and many lakes, ponds, streams etc.

Materials and Methods

The samples were collected from 47 localities (Figure 1) in Turkish Thrace (except Istanbul and Çanakkale provinces) between 1996 and 1998. The sampling dates and localities are given in numerical order in Table 1.

The most attention for choosing the sampling localities was paid to the areas that were not included in previous studies but cover the region (6, 10, 16, 17, 21).

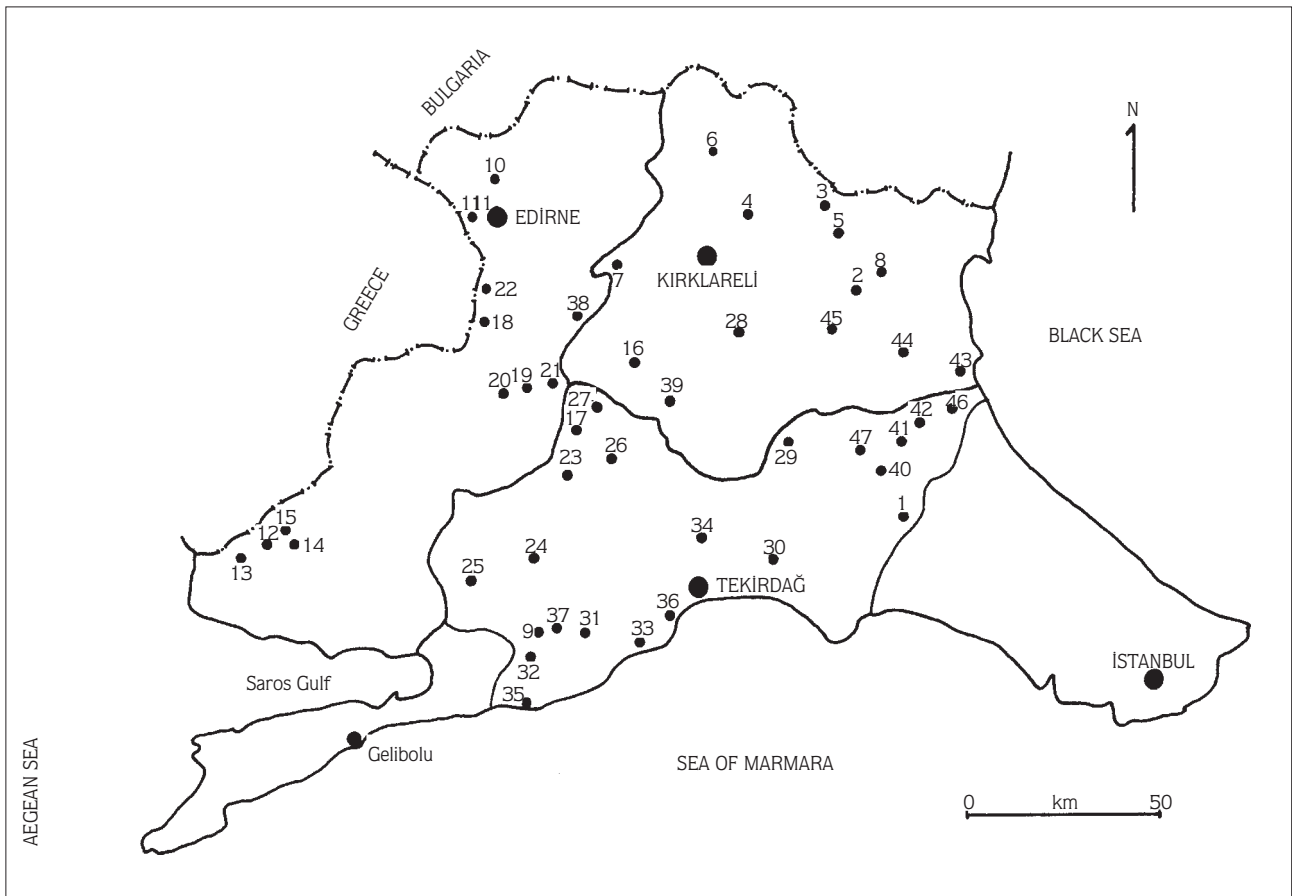


Fig. 1. Sampling localities in the study area (in numerical order).

Material was collected with several plankton nets (cell diameter of 55 µm) fixed in 70 % alcohol and examined under a binocular stereo microscope at x20 magnification. The identification methods for the materials were obtained from Lilljebord (22), Goulden (23), Scourfield and Harding (24), Flössner (25), Smirnov (26), Negrea (27), Margaritora (28), Korinek (29), and Pennak (30).

The species that were identified during the present study are given according to localities and their distributions are shown according to provinces.

Results

A total of 39 species of cladocera were determined. Twenty-nine species were recorded in Edirne province, 27 species in Tekirdağ province and 18 species in Kırklareli province (Table 2). The species and their localities are as follows:

Family: Daphniidae (Straus, 1820)

Genus: *Daphnia* (O. F. Müller, 1785)

Species: *Daphnia longispina*, O. F. Müller; 1785

Material: 13, 14, 15, 17, 24, 25,

Species: *Daphnia obtusa* Kurtz, 1874;

Material: 46

Species: *Daphnia pulex* Leydig, 1860;

Material: 11, 35, 43

Species: *Daphnia similis* Claus, 1876;

Material: 9, 19.

Species: *Daphnia atkinsoni* Baird, 1859;

Material: 13.

Genus: *Simocephalus* Schoedler, 1858

Species: *Simocephalus vetulus* (O. F. Müller, 1776);

Locality Number	Locality Name	Sampling Date
1	Çerkezköy/Tekirdağ (stream)	28.2.1996
2	Velika/Kırklareli (stream)	16.7.1996
3	Şükrüpaşa-Dupnisa Cavern/Kırklareli (stream)	18.10.1996
4	Dereköy/Kırklareli (pond)	18.10.1996
5	Dupnisa Cavern/Kırklareli (spring)	18.10.1996
6	Kofçaz/Kırklareli (stream)	2.11.1996
7	Azizbaba-Ürenli/Kırklareli (stream)	2.11.1996
8	Demirköy/Kırklareli (stream)	2.11.1996
9	Çınarlıdere/Tekirdağ (stream)	5.4.1997
10	Tunca River near Avarız Village/Edirne	9.5.1997
11	Meriç River, Söğütlük/Edirne	29.5.1997
12	Pamuklu Lake/Edirne	21.7.1997
13	Gala Lake / Edirne	21.7.1997-23.7.1997
14	Karpuzlu Village / Edirne (pond)	23.7.1997
15	Karpuzlu / Edirne (spring)	23.7.1997
16	Babaeski / Kırklareli (stream)	3.10.1997
17	Çerkezmüsellim / Tekirdağ (pond)	3.10.1997
18	Saçılmüsellim Village / Edirne (trough)	3.10.1997
19	Bayramlı Village / Edirne (pond)	3.10.1997
20	Malkoç / Edirne (pond)	3.10.1997
21	Muhacirkadı / Edirne (pond)	3.10.1997
22	Doyran / Edirne (pond)	3.10.1997
23.	Örenköy / Tekirdağ (stream)	4.10.1997
24	Karademir / Tekirdağ (dam)	4.10.1997
25	Kadıköy / Tekirdağ (dam)	4.10.1997
26	Hayrabolu / Tekirdağ (trough)	4.10.1997
27	Hedeyli Village / Tekirdağ (trough)	5.10.1997
28	Osmançık köyü / Kırklareli (spring)	5.10.1997
29	Pınarbaşı Village / Tekirdağ (trough)	5.10.1997
30	Yeniceköy / Tekirdağ (trough)	5.10.1997
31	Tatarlı Village / Tekirdağ (trough)	5.10.1997
32	Isaklı Village / Tekirdağ (trough)	5.10.1997
33	Yeniköy / Tekirdağ (trough)	5.10.1997
34	Yeşilsirt Village / Tekirdağ (pond)	5.10.1997
35	Şarköy / Tekirdağ (pond)	5.10.1997
36	Barbaros / Tekirdağ (pond)	5.10.1997
37	Sağlamtaş Village / Tekirdağ (trough)	5.10.1997
38	Necatiye / Edirne (pond)	4.5.1998-4.8.1998
39	Sarıcalı / Kırklareli (pond)	4.8.1998
40	Büyükoncalı Village/Tekirdağ (stream)	4.8.1998
41	Saray / Tekirdağ (ditch)	5.8.1998
42	Güngörmez / Tekirdağ (stream)	5.8.1998
43	Kıyıköy / Kırklareli (stream)	5.8.1998
44	Kömürköy / Kırklareli (stream)	5.8.1998
45	Soğucak / Kırklareli (stream)	5.8.1998
46	Bahçeköy / Tekirdağ (stream)	5.8.1998
47	Kurtdere / Tekirdağ (stream)	5.8.1998

Table 1. Sampling localities and their identification numbers according to sampling dates (types of water sources are indicated in parentheses).

- Material: 1, 4, 7, 12, 13, 16, 23, 26, 34.
Species: *Simocephalus expinosus* (Koch, 1841);
Material: 1, 10, 13, 15, 18, 26, 34, 41, 46.
Species: *Simocephalus serrulatus* (Koch, 1841);
Material: 47.
Genus: *Ceriodaphnia* Dana, 1853
Species: *Ceriodaphnia quadrangula* (O. F. Müller, 1785);
Material: 7, 11, 23, 24, 25, 35, 46.
Species: *Ceriodaphnia reticulata* (Jurine, 1820);
Material: 5, 13, 15, 17, 20, 23.
Genus: *Scapholeberis* Schoedler, 1858
Species: *Scapholeberis mucronata* (O. F. Müller, 1785);
Material: 43.
Species: *Scapholeberis kingi* Sars, 1903;
Materials: 12, 13, 15, 38, 41, 42, 43.
Species: *Scapholeberis aurita* (Fischer, 1849);
Material: 13.
Family: Moinidae Goulden, 1968
Genus: *Moina* Baird, 1850
Species: *Moina brachiata* (Jurine, 1820);
Material: 13, 15, 17, 18, 27, 28, 33, 34
Species: *Maina micrura* Kurz, 1874;
Material: 12, 13, 21, 35
Species: *Moina salina* Daday, 1888;
Material: 17, 38,
Species: *Moina macrocopa* (Straus, 1820);
Material: 42.
Family: Macrothricidae, Norman & Brady, 1867.
Genus: *Ilyocryptus* Sars, 1862
Species: *Ilyocryptus sordidus* (Lievin, 1848);
Material: 1, 10, 40, 45.
Species: *Ilyocryptus agilis* Kurz, 1878;
Material: 1, 4, 20, 44.
Genus: *Echinisca* Lievin, 1848
Species: *Echinisca rosea* Lievin, 1848;
Material: 13.
Genus: *Macrothrix* Baird, 1843
Species: *Macrothrix laticornis* (Fischer, 1848);
Material: 20, 23.
Species: *Macrothrix hirsuticornis* Norman & Brady, 1867;
Material: 16.
Family: Bosminidae (Baird, 1845)
Genus: *Bosmina* Baird, 1845
Species: *Bosmina longirostris* (O. F. Müller, 1785);
Material: 4, 11, 14, 17, 24, 25, 31, 34, 35, 36, 38, 39.
Family: Chydoridae Stebbing, 1902
Genus: *Pleuroxus* Baird, 1843
Species: *Pleuroxus aduncus* (Jurine, 1820);
Material: 12, 13, 23, 41.
Species: *Pleuroxus laevis* Sars, 1862.
Material: 6, 43.
Genus: *Alonella* Sars, 1862
Species: *Alonella excisa* (Fischer, 1854);
Material: 21, 31.
Genus: *Disparalona* Fryer, 1968
Species: *Disparalona rostrata* (Koch, 1841);
Material: 24, 25, 38.
Genus: *Chydorus* Leach, 1816
Species: *Chydorus sphaericus* (O. F. Müller, 1776);
Material: 1, 4, 13, 14, 22, 23, 24, 25, 26, 30, 31, 32, 33, 34, 35.
Genus: *Dunhevedia* King, 1853
Species: *Dunhevedia crassa* King, 1853;
Material: 12, 13, 15, 20.
Genus: *Alona* Baird, 1843
Species: *Alona quadrangularis* (O. F. Müller, 1785);
Material: 1, 3, 4, 6, 8, 20, 31, 46.
Species: *Alona guttata* Sars, 1862;
Material: 4
Species: *Alona costata* Sars, 1862;
Material: 15, 20.
Species: *Alona rectangula* Sars, 1862;
Material: 4, 13, 29, 32, 37.
Genus: *Leydigia* Kurz, 1875.

	EDİRNE	TEKİRDAĞ	KIRKLARELİ
<i>Daphnia longispina</i>	x	x	
<i>Daphnia optusa</i>		x	
<i>Daphnia pulex</i>	x	x	x
<i>Daphnia similis</i>	x	x	
<i>Daphnia atkinsoni</i>	x		
<i>Simocephalus vetulus</i>	x	x	x
<i>Simocephalus expinosus</i>	x	x	
<i>Simocephalus serrulatus</i>		x	
<i>Ceriodaphnia quadrangula</i>	x	x	x
<i>Ceriodaphnia reticulata</i>	x	x	x
<i>Scapholeberis mucronata</i>			x
<i>Scapholeberis kingi</i>	x	x	x
<i>Scapholeberis aurita</i>	x		
<i>Moina brachiata</i>		x	x
<i>Moina micrura</i>	x	x	
<i>Moina salina</i>		x	x
<i>Moina macrocopa</i>		x	
<i>Ilyocryptus sordidus</i>	x	x	x
<i>Ilyocryptus agilis</i>	x	x	x
<i>Echinisea rosea</i>	x		
<i>Macrothrix laticornis</i>	x	x	
<i>Macrothrix hirsuricornis</i>			x
<i>Bosmina longirostris</i>	x	x	x
<i>Pleuroxus aduncus</i>	x	x	
<i>Pleuroxus laevis</i>			x
<i>Alonella excisa</i>	x	x	
<i>Disparalona rostrata</i>		x	x
<i>Cydorus sphaericus</i>	x	x	x
<i>Dunhevedia crassa</i>	x		
<i>Alona quadrangularis</i>	x	x	x
<i>Alona guttata</i>			x
<i>Alona costata</i>	x		
<i>Alona rectangula</i>	x	x	x
<i>Leydigia leydigi</i>	x	x	x
<i>Leydigia acanthoercooides</i>	x		
<i>Tretocephala ambigua</i>	x		
<i>Oxyurella tenuicaudis</i>	x		
<i>Diaphanosoma orghidani</i>		x	
<i>Diaphanosoma brachyurum</i>	x	x	
Total of species	29	27	18

Table 2. Distribution of the species according to provinces.

Species: *Leydigia leydigi* (Schoedler, 1863);

Material: 4, 20, 46.

Species: *Leydigia acanthoercooides* (Fischer, 1854);

Material: 13.

Genus: *Tretocephala* Frey, 1965

Species: *Tretocephala ambigua* (Lilljeborg, 1900);

Material: 18.

Genus: *Oxyurella* Dybowski & Grochowski, 1894

Species: *Oxyurella tenuicaudis* (Sars, 1862);

Material: 22.

Family: Sididae (Baird, 1850)

Genus: *Diaphanosoma* Fischer, 1850

Species: *Diaphanosoma birgei* Korinek, 1981;

Material: 24, 25, 35.

Species: *Diaphanosoma orghidani* Negrea, 1982;

Material: 17, 35.

Species: *Diaphanosoma brachyurum* (Lievin, 1848);

Material: 14, 15, 34.

Discussion

A total of 39 species of Cladocera belonging to 6 families were determined. Families and the number of species are as follows: Daphniidae 13, Moiniidae 4, Macrotrichidae 5, Bosminidae 1, Chydoridae 14, Sididae 2. Of these, 27 species are new records for Tekirdağ, 6 for Edirne and 5 for Kırklareli. *Simocephalus serrulatus* (Koch, 1841), *Moina salina* Daday, 1888, *Moina*

macrocopa (Straus, 1820), *Echinisca rosea* Lievin, 1848, *Disparalona rostrata* (Koch, 1841), *Dunhevedia crassa* King, 1853, *Leydigia acanthoercooides* (Fischer, 1854), *Tertocephala ambigua* (Lilljeborg, 1900), *Oxyurella tenuicaudis* (Sars, 1862), and *Diaphanosoma orghidani* Negrea, 1982 species are new records for Turkish Thrace.

In the studies hitherto involving Turkey, a total of 80 Cladocera species have been recorded (5). In Turkish Thrace, which makes up approximately 3% of Turkey, the number of recorded species along with this study is 60. This number is small for all of Turkey because the number of studies performed on the Cladocera group in Turkey is limited. However, the number of species in Turkish Thrace is high, compared with the number in Turkey since the Thrace Region has suitable wetland habitats for these species. The Tunca and Meriç Rivers, which originate from Bulgaria and the Arda River, which originates from Greece, form a wide wetland area in the Thrace region where they end in the Aegean Sea. This may be a fundamental reason for the richness of cladocera species in this area.

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