

Ephemeroptera, Odonata, Plecoptera (Insecta) Fauna of Ankara Stream (Turkey)

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ABSTRACT

1. Thirteen species from Ephemeroptera, 14 species from Odonata and four species from Plecoptera were recorded Ankara Stream between April 1991 and November 1991.
2. The saprobic value of *Electrogena necatii* Kazancı, 1987 (type locality was Ankara, Çamkoru) was given for the first time as betamesosaprobic and alphamesosaprobic according to results of this study.
3. Plecoptera species accounted for a small proportion of the aquatic insects community due to organic pollution slight, moderate and high levels at the collecting sites.

KEY WORDS: Ankara Stream, Aquatic insects, Ephemeroptera, fauna, Odonata, Plecoptera, Turkey.

Ankara Çayı'nın Ephemeroptera, Plecoptera ve Odonata (Insecta) Faunası

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ÖZ

1. Ankara Çayı'nda Nisan 1991 ve Kasım 1991 tarihleri arasında toplanan örnekler kullanılarak 13 Ephemeroptera, 14 Odonata ve dört Plecoptera türü saptanmıştır.
2. *Electrogena necatii* Kazancı, 1987'nin (tip lokalitesi Ankara, Çankoru'dur) saprobik değerinin ilk defa bu çalışmadaki sonuçlara göre betamezosaprobik ve alfamezosaprobik düzeyde olduğu saptanmıştır.
3. Plecoptera türleri sucul böcek komünitesinin, toplama lokalitelerinin kalite yönünden betamezosaprobik ve alfamezosaprobik düzeyde olması nedeni ile küçük bir bölümünü oluşturmuştur.

ANAHTAR KELİMELEER: Ankara Çayı, Ephemeroptera, fauna, Odonata, Plecoptera, sucul böcekler, Türkiye.

INTRODUCTION

Aquatic insects are the subject to anthropogenic disturbance and also natural changes in their habitats. The distribution of aquatic insects are related to many factors such as water quality, elevation, latitude, current velocity, discharge, riparian vegetation, substrat structure (Resh and Rosenberg 1993).

Among aquatic insects, Ephemeroptera, Odonata and Plecoptera are important components of aquatic insect assemblages in low and medium order stony streams. Ephemeroptera and Plecoptera are sensitive orders to habitat destruction and considered to good indicators of environmental quality (Resh and Rosenberg 1993).

Ephemeroptera, Odonata, Plecoptera fauna of Ankara and surrounding regions was studied by Kazancı (1981) for the first time. The complete faunal list of Ephemeroptera species of Turkey and their saprobic values were given by Kazancı (2001a, b). Ephemeroptera fauna of Turkey includes 124 species.

In the present study, Ephemeroptera, Odonata and Plecoptera fauna of Ankara Stream was given in species level.

METHODS

The Ankara Stream has a total catchment area of 7,140 km² and a length of 140 km. Despite its importance for the city of Ankara, the stream is affected by industrial and domestic pollution.

In this study, sampling was carried out monthly along the Ankara Stream and its tributaries between April 1991 and November 1991. Ephemeroptera, Odonata and Plecoptera samples were collected by kicking method for 15 minutes with a handnet (1 mm mesh size; frame, 20 cm high and 30 cm wide) with other benthic macroinvertebrates. The samples were preserved in 80% alcohol. Taxa were determined to species level by Nilgün Kazancı.

RESULTS AND DISCUSSION

Thirteen species from Ephemeroptera, 14 species from Odonata and four species from Plecoptera were recorded in first and second order streams (Ankara Stream and its tributaries) during study period. The collecting sites in Ankara Stream were slightly and moderately polluted.

Order Ephemeroptera

Family Baetidae

Genus Baetis Leach 1815

B. buceratus Eaton 1870

Ankara: İmrahor, 01.04.1991, 134 larvae; Ankara: Kışlacık Village, 04.04.1991, 27 larvae; Ankara: Bayındır Dam Inlet, 10.05.1991, 6 larvae; Ankara: Pazar, 20.05.1991, 64 larvae; Ankara: Zir Stream, 10.07.1991, 12 larvae; Ankara: Hatip Stream, 18.07.1991, 20 larvae.

B. fuscatus Linne 1761

Ankara: Eymir, 19.06.1991, 115 larvae; Ankara: Bayındır Dam Outlet, 18.07.1991, 3 larvae; Ankara: Akdoğan, 28.08.1991, 8 larvae.

B. lutheri Müller-Liebenau 1967

Ankara: Before Karagöl, 04.04.1991, 40 larvae; Ankara: Kışlacık Village, 04.04.1991, 55 larvae; Ankara: Bayındır Dam Inlet, 19.06.1991, 925 larvae; Ankara: Hatip Stream, 19.06.1991, 21 larvae; Ankara: Hatip Stream, 18.07.1991, 2 larvae.

B. rhodani Pictet 1844

Ankara: Çavındır, 04.04.1991, 123 larvae; Ankara: Kışlacık Village, 04.04.1991, 8 larvae; Ankara: Bayındır Dam Inlet, 10.05.1991, 1 larva; Ankara: Kışlacık Village, 10.06.1991, 3 larvae.

Family Heptageniidae

Genus *Epeorus* Eaton 1881

E. sylvicola Pictet 1865

Ankara: Kışlacık Village, 04.04.1991, 1 larva.

Genus *Ecdyonurus* Eaton 1865

E. venosus Fabricius 1775

Ankara: Kışlacık Village, 04.04.1991, 2 larvae; Ankara: Kışlacık Village, 10.06.1991, 2 larvae.

Genus *Electrogena* Zurwerra, Tomka 1985

E. necatii Kazancı 1987

Ankara: Hatip Stream, 18.07.1991, 1 larva.

Family Ephemerellidae

Genus *Ephemerella* Walsh 1862

E. ignita Poda 1761

Ankara: Bayındır Dam Inlet, 19.06.1991, 18 larvae; Ankara: Kışlacık Village, 10.07.1991, 2 larvae; Ankara: Akdoğan, 12.07.1991, 1 larva; Ankara: Hatip Stream, 18.07.1991, 2 larvae.

E. major Klapalek 1905.

Ankara: Kışlacık Village, 10.07.1991, 6 larvae; Ankara: Kışlacık Village, 10.06.1991, 65 larvae; Ankara: Kışlacık Village, 10.07.1991, 6 larvae.

Family Caenidae

Genus *Caenis* Stephens 1835

C. luctuosa Burmeister 1839

Ankara: İmrahor, 01.04.1991, 16 larvae; Ankara: Before Karagöl, 04.04.1991, 2 larvae; Ankara: Kışlacık Village, 04.04.1991, 24 larvae; Ankara: Pazar , 20.05.1991, 36 larvae; Ankara: Pazar Kavşağı, 20.05.1991, 26 larvae; Ankara: Akdoğan, 20.05.1991, 194 larvae; Ankara: Akdoğan, 09.06.1991, 440 larvae; Ankara: İmrahor, 09.06.1991, 1 larva; Ankara: Kışlacık, 10.06.1991, 15 larvae; Ankara: Eymir, 19.06.1991, 4 larvae; Ankara: Bayındır Dam Inlet, 19.06.1991, 2 larvae; Ankara: Zir Stream, 10.07.1991, 1 larva; Ankara: Kışlacık Village, 10.07.1991, 4 larvae; Ankara: Akdoğan, 12.07.1991, 10 larvae; Ankara: Eymir Outlet, 18.07.1991, 5 larvae; Ankara: Eymir Outlet, 18.07.1991, 5 larvae; Ankara: Akdoğan, 27.08.1991, 12 larvae.

Family Leptophlebiidae

Genus *Choroterpes* Eaton 1881

C. picteti Eaton 1871

Ankara: Kışlacık Village, 10.07.1991, 1 larva.

Family Ephemeridae

Genus *Ephemera* Linne 1758

E. danica Müller 1764

Ankara: Before Karagöl, 04.04.1991, 18 larvae.

Family Potamanthidae

Genus *Potamanthus* Pictet 1843

P. luteus Linne 1767

Ankara: Kışlacık Village, 10.07.1991, 1 larva.

Order Plecoptera

Family Taeniopterygidae

Genus *Brachyptera* Newport 1851

Brachyptera sp. 1

Ankara: Kışlacık Village, 24.03.1992, 1 larva.

Brachyptera sp. 2

Ankara: Kışlacık Village, 24.03.1992, 1 larva.

Family Leuctridae

Genus *Leuctra* Stephens 1836

L. hippopus Kempny 1899

Ankara: Kışlacık Village, 24.03.1992, 8 larvae.

Family Perlidae

Genus *Perla* Geoffroy 1762

P. marginata Panzer 1799

Ankara: Kışlacık Village, 04.04.1991, 1 larva; Ankara: Kışlacık Village, 21.04.1992, 2 larvae; Ankara: Kışlacık Village, 10.06.1991, 1 larva.

Order Odonata

Sub Order Anisoptera Selys 1854

Family Aeschnidae

Genus *Aeschna* Fabricius 1775

A. juncea Linnaeus 1758

Ankara: Bayındır Dam Outlet, 25.11.1990, 1 larva.

Family Gomphidae

Genus *Onychogomphus* Selys 1854

O. forcipatus Linnaeus 1758

Ankara: Akdoğan, 20.05.1001, 1 larva; Ankara: Pazar, 12.06.1991, 1 larva; Ankara: Pazar Kavşağı, 18.06.1991, 4 larvae; Ankara: Eymir Outlet, 19.06.1991, 1 larva; Ankara: 22.10.1991

Genus *Ophiogomphus* Selys 1854

O. serpentinus Charpentier 1825

Ankara: Akdoğan, 12.07.1991, 1 larva.

Family Libellulidae

Genus *Orthetrum* Newman 1833

O. albistylum Selys 1848

Ankara: Bayındır Dam Outlet, 22.10.1991, 10 larvae.

O. brunneum Fonscolombe 1837

Ankara: Pazar Kavşağı, 12.06.1991, 1 larva; Ankara: Eymir Outlet, 19.06.1991, 1 larva.

O. cancellatum Linnaeus 1758

Ankara: 01.04.1991, 1 larva; Ankara: Eymir Outlet, 18.07.1991, 1 larva.

Genus *Sympetrum* Newman 1833

S. vulgatum Linnaeus 1758

Ankara: Bayındır Dam Outlet, 18.07.1991, 7 larvae; Ankara: Bayındır Dam Outlet, 18.07.1991, 5 larvae.

Sub Order Zygoptera Selys 1854

Family Calopterygidae

Genus *Calopteryx* Leach 1815

C. splendens Haris 1782

Ankara: İmrahor, 01.04.1991; Ankara: Akdoğan, 09.04.1991; Ankara: Pazar Kavşağı, 09.04.1991, 1 larva; Ankara: Pazar Kavşağı, 12.06.1991.

Family Coenagrionidae

Genus *Coenagrion* Kirby 1890

C. mercuriale Charpentier 1840

Ankara: Bayındır Dam Outlet, 18.07.1991, 1 larva.

C. ornatum Selys 1850

Ankara: Zir Stream, 08.04.1991, 1 larva.

Genus *Enallagma* Charpentier 1840

E. cyathigerum Charpentier 1840

Ankara: Bayındır Dam Stream, 25.11.1990, 1 larva.

Family Lestidae

Genus *Lestes* Leach 1815

L. viridis Vander Linden 1825

Ankara: 01.04.1991, 2 larvae.

Genus *Sympecma* Burmeister 1839

S. fusca Vander Linden 1820

Ankara: Eymir, 18.07.1991, 5 larvae.

Family Platycnemididae

Genus *Platycnemis* Charpentier 1840

P. pennipes Pallas 1771

Ankara: Tuğla Ocağı Önü, 01.04.1991; Ankara: 01.04.1991; Ankara: Zir Stream, 08.04.1991; Ankara: Akdoğan, 09.04.1991, 1 larva; Ankara: Pazar Kavşağı, 12.06.1991, 30 larvae; Ankara: Eymir, 19.06.1991, 2 larvae; Ankara: Zir Stream, 10.07.1991; Ankara: Akdoğan, 27.08.1991.

Benthic macroinvertebrates are the most valuable biological indicators due to: high diversity and abundance, reflecting local conditions, large size, low mobility, long life cycles, in providing a wide range of responses to different environmental pollution agents; easy identification at high taxonomic (such as family) resolution by non-specialists; well standardized and low-cost methodologies; and temporal and spatial stability, reflecting changes in ecosystem processes. Within the benthic macroinvertebrates Ephemeroptera, Odonata and Plecoptera stand out as ideal due to their sensitivity about environmental quality. Aquatic insects and other benthic invertebrates are the most widely used organisms in freshwater biomonitoring of human impacts (Rosenberg and Resh 1993).

Plecoptera accounted for a small proportion of the aquatic insects community only at up-stream sites of Ankara Stream due to moderate and heavy organic pollution at down-stream sites (Girgin and Kazancı 1994).

The saprobic values of identified Ephemeroptera species were oligosaprobic, betamesosaprobic and alphamesosaprobic. The saprobic value of *Electrogena necatii* Kazancı 1987 (Kazancı 1987, 1990) was betamesosaprobic and alphamesosaprobic according to results of this study. This species was recorded in Hatip Stream with betamesosaprobic and alphamesosaprobic water quality (Girgin and Kazancı 1994) while type locality of *Electrogena necatii* Kazancı 1987 was Çankoru.

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