

Ephemeroptera (Insecta) Fauna of Turkey: Records from Eastern Anatolia (Turkey)

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ABSTRACT

1. Thirty one taxa of Ephemeroptera are recorded from Eastern Anatolia (Turkey). While the 30 species belong to Palearctic Region and one species (*Baetis pseudogemellus* Soldan 1977) belongs to Afrotropical Region and is known from Sudan.
2. The ten species are new records for Turkey. These are *Baetis bisri* Thomas and Dia 1983, *Baetis lutheri georgiensis* Zimmermann 1981, *Baetis pseudogemellus* Soldan 1977, *Baetis vardarensis caucasicus* Zimmermann, 1981, *Iron fuscus* Sinitshenkova 1976, *Iron magnus* Braasch 1978, *Epeiron amseli* Demoulin 1964, *Ecdyonurus aurantiacus* (Burmeister 1839), *Ecdyonurus submontanus* Landa 1969 and *Heptagenia perflava* Brodsky 1930.
3. One endemic species is recorded, *Electrogena anatolica* (Kazancı and Braasch 1986).
4. *Ecdyonurus venosus* (Fabricius 1775) and *Potamanthus luteus* (Linnaeus 1767) are given from Eastern Anatolia for the first time.
5. Fauna of Turkey contains 134 Ephemeroptera species and Fauna of Eastern Anatolia contains 85 species according to results of this study.
6. The collecting sites belong to Kızılırmak, Çoruh, Kura, Aras, Fırat, Dicle River Basins and Streams in Eastern Black Sea Region.

KEY WORDS: Ephemeroptera, Eastern Anatolia, Turkey, fauna, new records.

Türkiye Ephemeroptera (Insecta) Faunası: Doğu Anadolu (Türkiye)'dan kayıtlar

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ÖZ

1. Ephemeroptera'dan 31 taksa Doğu Anadolu (Türkiye)'dan kaydedilmiştir. Otuz bir tür Palearktik Bölge'ye aitken bir tür (*Baetis pseudogemellus* Soldan 1977) Afrotropikal Bölge'ye aittir ve Sudan'dan bilinmektedir.
2. On tür, Türkiye için yeni kayıttır. Bu türler *Baetis bisri* Thomas ve Dia 1983, *Baetis lutheri georgiensis* Zimmermann 1981, *Baetis pseudogemellus* Soldan 1977, *Baetis vardarensis caucasicus* Zimmermann, 1981, *Iron fuscus* Sinitshenkova 1976, *Iron magnus* Braasch 1978, *Epeiron amseli* Demoulin 1964, *Ecdyonurus aurantiacus* (Burmeister 1839), *Ecdyonurus submontanus* Landa 1969 ve *Heptagenia perflava* Brodsky 1930.
3. Bir endemik tür kaydedilmiştir, *Electrogena anatolica* (Kazancı and Braasch 1986).
4. *Ecdyonurus venosus* (Fabricius 1775) ve *Potamanthus luteus* (Linnaeus 1767) Doğu Anadolu'dan ilk defa kaydedilmiştir.
5. Bu çalışmanın sonuçlarına göre, Türkiye Faunası 134 tür içerir ve Doğu Anadolu Faunası 85 tür içerir.
6. Toplama yapılan istasyonlar Kızılırmak, Çoruh, Kura, Aras, Fırat, Dicle Nehirlerinin havzalarında ve Doğu Karadeniz Bölgesi'ndeki çaylarda bulunmaktadır.

ANAHTAR KELİMELER: Doğu Anadolu, Ephemeroptera, fauna, Türkiye, yeni kayıt.

INTRODUCTION

Ephemeroptera is an important component and abundant in benthic macroinvertebrate communities in running water ecosystems. Ephemeroptera taxa richness commonly used as an indicator of habitat quality of running waters (Rosenberg and Resh 1993). The faunal structure of Ephemeroptera should be enlighten in order to their accurate usage in biomonitoring of running water ecosystems in Turkey.

Ephemeroptera Fauna of Turkey includes 124 species (Kazancı and Türkmen 2008). Seventy three species were known from Eastern Turkey (Kazancı 2001). The faunal composition of Ephemeroptera of Eastern Turkey were revealed by Verrier (1955), Puthz (1972), Braasch (1981), Berker (1981), Kazancı (1981, 1984, 1985, 1986a, 1986b, 1990, 1991, 1992, 2001a, 2001b), Kazancı and Braasch (1986), Sowa, Soldán and Kazancı (1986), Kazancı and Braasch (1988), Kazancı and Thomas (1989).

In this study, thirty one species of Ephemeroptera were given from Eastern Anatolia and ten species were new records for Fauna of Turkey.

MATERIAL AND METHODS

Sampling was carried out from Kızılırmak, Çoruh, Kura, Aras, Fırat, Dicle River Basins and streams in Eastern Black Sea Region between 1981 and 1987. Imagos of Ephemeroptera were collected from surroundings of running waters by a steel framed net with the bag made from textile. Larvae were collected from running waters by hand and standard pond-net. Samples were kept in 80% ethyl alcohol. Taxa were determined to species level. All material collected by the author.

RESULTS AND DISCUSSION

Ephemeroptera Fauna of Eastern Anatolia indicates significant high species richness according to results of this study. While Fauna of Turkey contains 134 Ephemeroptera species and Fauna of Eastern Anatolia contains 85 species (63.4% of Fauna of Turkey) with new records given in this study.

This richness were correlated with high quality and diversity of habitats which affects distribution of Ephemeroptera with other aquatic insects. The results of aquatic biodiversity studies related to biomonitoring of water quality will be accurate depending on the level of knowledge of Ephemeroptera Fauna of Turkey.

Thirty one species of Ephemeroptera were found at the studied localities. Thirty one species represents approximately 23.1% of Ephemeroptera Fauna of Turkey. Ten species are recorded for the first time in Turkey. These are *Baetis bisri* Thomas and Dia 1983, *Baetis lutheri georgiensis* Zimmermann 1981, *Baetis pseudogemellus* Soldan 1977, *Baetis vardarensis caucasicus* Zimmermann, 1981, *Iron fuscus* Sinitshenkova 1976, *Iron magnus* Braasch 1978, *Epeiron amseli* Demoulin 1964, *Ecdyonurus aurantiacus* (Burmeister 1839), *Ecdyonurus submontanus* Landa 1969 and *Heptagenia perflava* Brodsky 1930. *Ecdyonurus venosus* (Fabricius 1775) and *Potamanthus luteus* (Linnaeus 1767) are given from Eastern Turkey for the first time.

The collecting sites belong to Kızılırmak, Çoruh, Kura, Aras, Fırat, Dicle River Basins and streams in Eastern Black Sea Region.

The 30 species belong to Palearctic Region and one species (*Baetis pseudogemellus* Soldan 1977) is known from Sudan in Afrotropical Region.

Fauna of different regions of Turkey comprises elements of Palearctic, Afrotropical, Oriental Zoogeographic Regions due to transitional position between these zoogeographical regions. The fauna of Taurus Mountains in south eastern Turkey has similarities with Afrotropical Region (Kosswig 1955). Hakkari and Şırnak Provinces are the eastern extension of the Taurus Mountain Chain where collecting site of *Baetis pseudogemellus* is settled in this area. Therefore records of *Baetis pseudogemellus* Soldan 1977 can be expected in this region.

Species list

Baetis alpinus (Pictet 1843)

Çankırı-Eldivan Road, Acısu Stream, Kızılırmak River Basin, 4. 7. 1984, 3 larvae; Hakkari-Van Province Border, Dicle River Basin 27. 7. 1984, 1750m, 2♂; Erzincan: Arapgir- Kemaliye Road, Çit Village, Miran Stream, Fırat River Basin, 1000m, 8. 7. 1986, 30 ♂.

Baetis bisri Thomas and Dia 1983

Hakkari: Dicle River Basin, 1500 m, 10. 7. 1986, 3 larvae.

New record for Turkey!

Baetis buceratus Eaton 1870

Adıyaman: Belveren Village, Büyükdere Stream, Fırat River Basin, 800m, 21. 5. 1983, 2 larvae; Erzurum-Pasinler Road, Hamam Stream, Aras River Basin, 1800m, 20. 7. 1984, 2 ♂; Kars: Karakurt Town, Aras River, 13. 7. 1986, 1550m, 3 larvae.

Baetis lutheri species-group

Adıyaman:Nemrut Mountain: Tütenocak Village, Fırat River Basin, 800m, 22. 5. 1983, 5 larvae.

Baetis lutheri georgiensis Zimmermann 1981

Artvin: Narlık Village, Çoruh River basin, 350m, 4 larvae; Erzincan: Kemaliye, Fırat River Basin, 1100m, 10. 7. 1986, 2 larvae; Tunceli: Ovacık, Fırat River Basin, 1350m, 12. 7. 1986, 4 larvae.

New record for Turkey!

Baetis pseudogemellus Soldan 1977

Siirt- Şırnak Road, Resor Bridge, Dicle River Basin, 1000m, 22. 7. 1984, 3 larvae.

New record for Turkey!

Baetis rhodani species-group

Çankırı-Eldivan Road, Acısu Stream, Kızılırmak River Basin, 4. 7. 1984, 4 larvae.

Baetis tricolor Tshernova, 1928

Erzincan: Arapgir-Kemaliye Road, Çit Village, Miran Stream, Fırat River Basin, 1000m, 08.07.1986, 1 ♂; Tunceli: Pülümür Town, a tributary of Pülümür Stream, Fırat River Basin, 1500m, 13. 7. 1986, 2 larvae.

Baetis vardarensis caucasicus Zimmermann, 1981

Trabzon: Maçka, 25. 7. 1985, 3larvae.

New record for Turkey!

Oligoneuriella tskhomelidzei Sowa and Zosidse 1973

Van: Başkale Town, Dicle River Basin, 27. 7. 1984, 3 larvae; Kars: Karakurt, Aras River, 1550m, 13. 7. 1986, 10 larvae.

Cinygma caucasica Tshernova 1938

Erzurum: Narman Town: Örentaş Village, Çoruh River Basin, 2100m, 30. 5. 1983, 4 larvae; Hakkari-Van Province Border, Dicle River Basin, 1750m, 23. 7. 1984, 10 larvae; Tercan-Erzurum Road, Ceyhun Stream, Fırat River Basin, 1920m, 27. 7. 1987, 7 larvae; Tunceli: Ovacık Town, Fırat River Basin, 1350m, 12. 7. 1986, 30 larvae; Hakkari: Şemdinli Town, Dicle River Basin, 1500m, 26. 7. 1984, 3 larvae; Erzincan: Arapgir-Kemaliye Road, Çit Village, Miran Stream, Fırat River Basin, 1000m, 8. 7. 1986, 1 larvae.

Epeorus zaitzevi Tshernova 1981

Erzurum: Hınıs, Fırat River Basin, 1750m, 20. 7. 1984, 2 larvae; Şırnak: Uludere Town, Dicle River Basin, 1500m, 22. 7. 1984, 1♂; Şırnak: Beytüşşebap Town, Aşağıdere Village, Dicle River Basin 1100m, 23. 7. 1984, 2♂; Hakkari: Güzelköy, Dicle River Basin, 1850m, 24. 7. 1984, 2♂; Kars: Posof Town, Kura River Basin, 1600m, 15. 7. 1986, 2♂, 2♀; Tunceli: Ovacık Town, Fırat River Basin, 1350m, 12. 7. 1986, 30, 1♂.

Iron fuscus Sinitshenkova 1976

Erzincan-Erzurum Road, Değirmendere Stream, 1150m, 27. 5. 1983, 10 larvae.
New record for Turkey!

Iron magnus Braasch 1978

Rize: Ovit Mountain, Kazan Depression, Çoruh River Basin, 2300m, 8. 8. 1983, 8 larvae.
New record for Turkey!

Iron nigripilosus Sinitshenkova 1976

Şırnak: Beytüşşebap Town, Dicle River Basin 1200m, 23. 7.1984, 11 larvae; Erzincan: Kemaliye Town, Fırat River Basin, 3. 8. 1987, 900m, 8 larvae, 1♂.

Epeiron amseli Demoulin 1964

Muş: Varto Town, Toplak Stream, Fırat River Basin, 1200m, 21. 7. 1984, 2♂; Hakkari: Uludere, Uzungöçit Village, Dicle River Basin, 2000m, 26. 7. 1984, 2♂.
New record for Turkey!

Rhithrogena caucasica Braasch 1979

Bingöl: Karlıova, Alabalık Village, Fırat River Basin, 1850m, 30. 7. 1982, 6♂.

Rhithrogena iranica Braasch 1983

Van: Başkale Town, Dicle River Basin, 1750m, 27. 7. 1984, 2 ♂.

Rhithrogena iridina kownackii 1976

Kars: Sarıkamış-Erzurum Road, Kars Stream, Aras River Basin, 1850 m, 2. 6. 1983, 2 ♂;

Erzincan: Kızıldağ Pass, Fırat River Basin, 1850 m, 14. 7. 1984, 1 ♂, 1 ♀.

Rhithrogena znojkoii (Tshernova 1938)

Erzincan: Arapgir-Kemaliye Road, Çit Village, Miran Stream, Fırat River Basin, 1000m, 8. 7. 1986, 2 ♂, 4 ♀; Hakkari-Van Province Border, Dicle River Basin, 27. 7. 1984, 1750m, 1 ♂; Şırnak: Beytüşşebap Town, Aşağıdere Village, 1100m, Dicle River Basin, 23. 7. 1984, 2 larvae, 2 ♂.

Ecdyonurus aurantiacus (Burmeister 1839)

Erzurum: Pasinler Town, Aras River Basin, 1800m, 20. 7. 1984, 2 ♂.

New record for Turkey!

Ecdyonurus dispar (Curtis 1834)

Hakkari: Güzel Village, Katramaz Stream, Dicle River Basin, 1850m, 24. 7. 1984, 1 ♂;

Hakkari: Şemdinli Town, Dicle River Basin, 1500m, 26. 7. 1984, 2 ♂, 1 ♀.

Ecdyonurus submontanus Landa 1969

Ardahan: Damal Town, Kura River Basin, 2000m, 15. 7. 1986, 2 ♂, 2 ♀.

New record for Turkey!

Ecdyonurus venosus (Fabricius 1775)

Erzincan: Arapgir-Kemaliye Road, Çit Village, Miran Stream, Fırat River Basin, 1000m, 8. 7. 1986, 4 ♂, 4 ♀.

Electrogena anatolica (Kazancı and Braasch 1986)

Kars: Gülyüzü Village, Aras River Basin, 2000m, 13. 7. 1986, 2 ♂.

Electrogena resslii (Braasch 1981)

Erzincan: Çağlayan, Fırat River Basin, 1400m, 26. 7. 1982, 2 ♂; Erzurum: Horasan, Yeşildere Village, Aras River Basin, 1400m, 27. 7. 1981, 3 ♂; Tunceli: Pülümür, Fırat River Basin, 1500m, 27. 7. 1982, 2 ♂; Muş: Karlıova-Varto Road, Onpınar Village, Fırat River Basin, 1800m, 1. 8. 1982, 2 ♂.

Heptagenia coerulans Rostoc 1877

Hakkari: Şine Mountain, Zap River, Dicle River Basin, 1050m, 23. 7. 1984, 1 larvae, 2 ♂.

Heptagenia perflava Brodsky 1930

Siirt-Eruh Road, Zarova River, Dicle River Basin, 1000m, 20. 7. 1981, 2 ♂.

New record for Turkey!

Torleya major (Klapalek 1905)

Erzincan: Arapgir- Kemaliye Road, Çit Village, Miran Stream, Fırat River Basin, 1000m, 08.07.1986, 2 ♂; Ardahan: Damal Town, Kura River Basin, 2000m, 15.07.1986, 1 ♂.

Ephemera vulgata Linnaeus 1758

Hakkari: Güzelköy, Katramaz Stream, Dicle River Basin, 1850m, 24.7 1984, 11♂, 15♀;
Kars: Karakurt Town, Aras River, 1550m, 13.07.1986, 2 larvae.

Potamanthus luteus (Linnaeus 1767)

Kars: Karakurt Town, Aras River, 1550m, 13.07.1986, 3 larvae; Tercan-Erzurum Road, Ceyhun Stream, Fırat River Basin 1920m, 27.07.1987, 19 larvae.

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