

New records of aquatic Empididae (Insecta, Diptera) from Turkey

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ABSTRACT

1. Seven species of aquatic dance flies (Hemerodromiinae, Clinocerinae) were recorded from Bolu, Turkey.
2. All species are new to the fauna of Turkey: *Wiedemannia fallaciosa* (Loew 1873), *Wiedemannia zetterstedti* (Fallén 1826), *Wiedemannia vaillanti* (Joost, 1981), *Wiedemannia lamellata* (Loew 1869), *Chelifera stigmatica* (Schiner 1862), *Hemerodromia raptoria* Meigen 1830, *Hemerodromia oratoria* (Fallén 1816).

KEY WORDS: Abant Nature Park, aquatic Empididae, Bolu, faunistics, new records, Turkey, Yedigöller National Park.

Türkiye'den sucul Empididae (Insecta, Diptera) yeni kayıtları

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ÖZ

1. Türkiye'nin Bolu İli sınırları içerisindeki Yedigöller Milli Parkı ve Abant Tabiat Parkı'ndan yedi sucul Empididae türü (Hemerodromiinae, Clinocerinae) kaydedilmiştir.
2. *Wiedemannia fallaciosa* (Loew 1873), *Wiedemannia zetterstedti* (Fallén 1826), *Wiedemannia vaillanti* (Joost 1981), *Wiedemannia lamellata* (Loew 1869), *Chelifera stigmatica* (Schiner 1862), *Hemerodromia raptoria* Meigen 1830, *Hemerodromia oratoria* (Fallén 1816) türleri Türkiye faunası için yeni kayıtlardır.

ANAHTAR KELİMELER: Abant Tabiat Parkı, Bolu, fauna, sucul Empididae, Türkiye, Yedigöller Milli Parkı, yeni kayıtlar.

INTRODUCTION

The study area, Bolu is situated at Western Black Sea Region of Turkey. Yedigöller National Park and Abant Nature Park are situated on the north of Turkey and south-west part of Bolu. Both region have been selected as a protected area by Ministry of Forestry. In consequence of being protected areas, these regions have a rich biodiversity owing to undegradated habitats.

The Empididae family comprised several subfamilies Oreogetoninae, Empidinae, Hemerodromiinae, Clinocerinae, Ceratomerinae and Brachystomatinae (Chvála 1983). Sinclair and Cumming, 2006 have proposed a classification based on the most recent data only with Empidinae, Hemerodromiinae, Clinocerinae. The Empididae exhibit a large diversity in wing venation and genitalic structure. The family is recognized with normally branches, prosternum enlarged forming precoxal bridge, laterotergite ususally with setae, male terminalia often with clasping-like cerci or hypandrium laterally flattened or keel-like, female terminalia usually telescopic with simple cerci (Sinclair and Cumming 2006). The adults are from 1 to about 15 mm long. Generally adults are predatory mostly on small Diptera. They live as larvae and pupae in aquatic habitats. In temperate regions, aquatic Empididae are abundant in spring and early summer, and many species occur in humid, hilly or mountainous environments (Chvála 1983, Wagner 1997).

The subfamily Hemerodromiinae and Clinocerinae are aquatic in their immature stages in Palearctic regions. The adults of Hemerodromiinae and Clinocerinae are related with streams and rivers. The adults of Clinocerinae are generally small to medium sized, usually greyish or brownish flies, with long slender legs and narrow wings (anal angle not developed). The adults of Hemerodromiinae are small to medium sized, usually yellowish or brownish flies with predatory front legs, has enlarged or swollen femora (Chvála 1983, Wagner 1997).

Wagner (1981), Joost (1982), Horvat (1990), Horvat (1993), Horvat (1995a), Horvat (1995b) and Ivković and Horvat (2007a, 2007b) have recorded aquatic Empididae for Balkan peninsula and Joost (1981) has recorded aquatic Empididae for Caucasian region. Nonetheless there is no record for aquatic Empididae (Hemerodromiinae and Clinocerinae) in Turkey. This study is the first record on aquatic Empididae fauna for Turkey. This study included seven new records of Empididae species: *Wiedemannia fallaciosa* (Loew 1873), *Wiedemannia zetterstedti* (Fallén 1826), *Wiedemannia vaillanti* (Joost 1981), *Wiedemannia lamellata* (Loew 1869), *Chelifera stigmatica* (Schiner 1862), *Hemerodromia raptoria* Meigen 1830, *Hemerodromia oratoria* (Fallén 1816) from Bolu, Turkey.

MATERIAL AND METHODS

Aquatic empidids were collected from 10 study sites on July, 2008. The six of sites are springs situated in Yedigöller National Park and four of sites are rivers situated in Abant Nature Park in Bolu. Yedigöller National Park ($40^{\circ}56' N$ $31^{\circ}44' E$) is situated on the north part in the forest area and Abant Nature Park ($40^{\circ}37' N$ $31^{\circ}15' E$) on the south-west part of Bolu. The highest peak is 1488 m in Yedigöller National Park and 1794 m in Abant Nature Park, the lowest peak is 465 m in Yedigöller National Park and 1328 m in Abant Nature Park.

Adult flies were collected with an aspirator and by using a sweeping net on low vegetation on the sides of streamlets, springs or waterfalls. Samples were preserved in 80% ethanol. Genitalia of male flies were dissected for determination. The abdomens with the genitalia were boiled in potassium hydroxide and then transferred into acetic acid. Finally the genitalia and their structures were replaced on a lamel with glycerin and determined using Nikon TMS-F and Prior S2026 inverted microscopes. Chvála and Wagner (1989), Collin (1961), Engel (1938-1946), Wagner (1995), Wagner (1997), Niesiolowski (1988) and Vaillant (1978) were used for identification and nomenclature.

RESULTS

A total of 94 specimens (35 ♂, 59 ♀) were collected and seven species were determined.

FAUNISTICS

Subfamily CLINOCERINAE

Genus *Wiedemannia* Zetterstedt 1838

Subgenus *Philolutra* Mik 1881

Wiedemannia (Philolutra) fallaciosa (Loew 1873)

Material examined: Bolu: Yedigöller National Park site 5, 06.07.2008, 1 ♂ 1 ♀, Bolu: Abant Nature Park site 9, 1418 m, N $40^{\circ}38'$ E $31^{\circ}17'$, 07.07.2008, 12 ♂ 12 ♀, leg. Öz.

Subgenus *Pseudowiedemania* Engel 1918

Wiedemania (Pseudowiedemania) lamellata (Loew 1869)

Material examined: Bolu: Abant Nature Park site 8, 1273 m, N 40°40' E 31°26', 07.07.2008, 1 ♂ 1 ♀, leg. Öz.

Subgenus *Eucelidia* Mik 1881

Wiedemania (Eucelidia) zetterstedti (Fallen 1826)

Material examined: Bolu: Yedigöller National Park site 5, 06.07.2008, 2 ♂ 3 ♀, Bolu: Yedigöller National Park site 6, 06.07.2008, 1 ♂ 7 ♀, Bolu: Yedigöller National Park site 1, 05.07.2008, 5 ♂ 5 ♀, Bolu: Yedigöller National Park site 3, 05.07.2008, 1 ♂ 3 ♀, Bolu: Abant Nature Park site 8, 1273 m, N 40° 40' E 31 26', 07.07.2008, 6 ♂ 6 ♀, leg. Öz.

Wiedemania (Philolutra) vaillanti Joost 1981

Material examined: Bolu: Yedigöller National Park site 4, 05.07.2008, 2 ♂, leg. Öz.

Additional records:

Wiedemania sp. -1

Material examined: Bolu: Yedigöller National Park site 2, 05.07.2008, 2 ♀, leg. Öz.

Wiedemania sp. -2

Material examined: Bolu: Yedigöller National Park site 2, 05.07.2008, 3 ♀, leg. Öz.

Wiedemania sp. -3

Material examined: Bolu: Yedigöller National Park site 2, 05.07.2008, 1 ♀, Bolu: Yedigöller National Park site 7, 07.07.2008, 1 ♀, leg. Öz.

Wiedemania sp. -4

Material examined: Bolu: Yedigöller National Park site 7, 07.07.2008, 1 ♀, leg. Öz.

Subfamily HEMERODROMIINAE

Genus *Chelifera* Macquart 1835

Chelifera stigmatica (Schiner 1862)

Material examined: Bolu: Abant Nature Park site 9, 1418 m, N 40°38' E 31°17', 07.07.2008, 1 ♂, leg. Öz.

Genus *Hemerodromia* Meigen 1822

Hemerodromia oratoria (Fallén 1816)

Material examined: Bolu: Abant Nature Park site 10, 1467 m, N 40°38' E 31°17',
06.07.2008, 2 ♂ 8 ♀, leg. Öz.

Hemerodromia raptoria Meigen 1830

Material examined: Bolu: Abant Nature Park site 9, 1418 m, N 40°38' E 31°17', 07.07.2008,
1 ♂ 2 ♀, leg. Öz.

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REFERENCES

- Chvála, M. and Wagner, R., 1989. Empididae. Pages 6: 312-318 in Soos, A. and Papp, L. (eds.), Catalogue of Palaearctic Diptera, Akadémiai Kiadó and Elsevier Science publ., Budapest-Amsterdam.
- Chvála, M., 1983. The Empidoidea (Diptera) of Fennoscandia and Denmark, Scandinavian Science Press, Copenhagen, 1-275.
- Collin, J. E., 1961. British Flies: Empididae: Hemerodrominae, Part III., Cambridge University Press. 681-767.
- Engel, E. O., 1938-1946. 28. Empididae. Pages 4,4: 1-399 in Linder, E. (ed.), Die Fliegen der palaearktischen Region, Bd. E. Schweizerbart'sche Verlagsbuchhandlung (Erwin Nagele), Stuttgart.
- Horvat, B., 1990. Aquatic Dance Flies of the Subfamily Hemerodrominae (Diptera: Empididae) in Yugoslavia, Scopolis 20: 1-27.
- Horvat, B., 1993. Aquatic Empididae Fauna (Diptera) in Bosnia and Herzegovina, Scopolia 28: 1-25.
- Horvat, B., 1995a. Checklist of the aquatic Empididae recorded from Slovenia, with the description of new species (Diptera), Acta Entomologica Slovenica 3,1: 25-35.
- Horvat, B., 1995b. Aquatic Empididae Fauna (Diptera) in Macedonia, Acta Museum Macedonia Sci. Nat. 19,6-159: 147-170.
- Ivković, M. and Horvat, B., 2007a. *Hemerodromia raptoria* (Meigen) A Newly Recorded Species of Aquatic Dance Flies (Diptera, Empididae) in Croatia and Its Distribution on Balkan Peninsula, Nat. Croat., 16,1: 79-82.

- Ivković, M. and Horvat, B., 2007b. Aquatic Dance flies (Diptera, Empididae: Clinocerinae, Hemerodromiinae) of the River Cetina, Nat. Croat., 16,3: 171-179.
- Joost, W., 1981. Beitrag zur Kenntnis der Hemerodromiinae des Kaukasus (I), Reichenbachia Museum für Tierkunde in Dresden, 19,31: 184-191.
- Joost, W., 1982. Beitrag zur Kenntnis der Hemerodromiinae (Diptera, Empididae) Bulgariens, Ent. Nachr. Ber. 29: 277-278
- Niesiolowski, S., 1988. *Wiedemannia escheri* (Zetterstedt, 1838) and *W. hirtiloba* (Speiser, 1924), New synonyms of *W. zetterstedti* (Fallén, 1826), Aquatic Insects 10,3: 185-187.
- Sinclair, B. J. and Cumming, J., 2006. The morphology, higher-level phylogeny and classification of the Empidoidea (Diptera), Zootaxa, 1180: 1-172.
- Vaillant, F., 1978. Empididae. Pages 465-469 in Illies, J. (eds): Limnofauna Europaea, 2. Aufl., Gustav Fischer Verlag, Stuttgart, and Swets and Zeitlinger.
- Wagner, R., 1981. Über einige Hemerodromiinae vom Balkan und aus der Agais, Spixiana 4,3: 297-304.
- Wagner, R., 1995. Empididen aus dem Mitteleuropa (Diptera, Empididae: Hemerodromiinae und Clinocerinae), Acta Entomologica Slovenica 3,1: 5-23.
- Wagner, R., 1997. Diptera Empididae, Dance Flies. Pages 333-344 in Nilsson, A. (eds.), Aquatic Insects of North Europe, Stenstrup.