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Contributions to the Limoniidae (Insecta, Diptera) fauna from inner western Anatolia

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Abstract: The study was carried out between 2009 and 2011 in the inner part of western Anatolia (Afyonkarahisar, Kütahya, and Uşak), and 18 species were recorded for the first time for the Turkish Limoniidae fauna. The taxa are *Ellipteroides* (s.str.) *lateralis* (Macquart, 1835), *Eriocnopa diuturna* (Walker, 1848), *E. interposita* Stary, 1976, *Gonempeda flava* (Schummel, 1829), *Gonomyia* (s.str.) *recta* Tonnoir, 1920, *G. (Paralipophleps) bifida* Tonnoir, 1920, *Hoplolabis (Parilisia) longior* Stary, 2006, *Idiocera* (s.str.) *alexanderiana* (Lackschewitz, 1940), *Ilisia inermis* Mendl, 1979, *Molophilus* (s.str.) *appendiculatus* (Staeger, 1840), *M.* (s.str.) *niger* Goetghebuer, 1920, *Tasiocera (Dasymolophilus) murina* (Meigen, 1818), *Euphylidorea phaeostigma* (Schummel, 1829), *Pilaria scutellata* (Staeger, 1840), *Dicranomyia* (s.str.) *didyma* (Meigen, 1804), *D. (Idiopyga) danica* Kuntze, 1919, *Helioides* (s.str.) *calviensis* Edwards, 1928, and *Rhipidia* (s.str.) *uniseriata uniseriata* (Schiner, 1864). The distribution maps of the 18 new records from the research area are given.

Key words: Limoniidae, Diptera, Turkey, inner west Anatolia, new record

Introduction

Many characters of adult Limoniidae resemble those of Tipulidae, while they are generally smaller than Tipulidae. The larvae of most of them usually live in various aquatic and semi-aquatic environments during their development period. Thus, they move to pupate on the margins of aquatic and semi-aquatic environments or dryer places (Savchenko et al., 1992).

Limoniidae is the largest family of the Diptera; it currently contains 10,874 described species worldwide. In the Palaearctic region, mainly from the eastern part, 1620 species are known (Oosterbroek, 2012).

As a result of the previous studies on the Turkish fauna of Limoniidae in some regions of Turkey, such as the eastern Black Sea region (Koç et al., 2005; Stary and Oosterbroek, 2008; Oosterbroek, 2009), the inner part of western Anatolia (Özgül and Koç, 2010), and the other areas (Koç, 2004, 2008; Koç et al., 2005; Özgül et al., 2006; Parvu and Popescu-Mirceni, 2006), a total of 96 limoniid species have been determined from Turkey to date.

Material and methods

Specimens were collected from the provinces of Afyonkarahisar, Kütahya, and Uşak, located in the inner part of western Anatolia, between 2009 and

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2011. The areas include many lakes and wetland areas (Acıgöl, Eber Lake, Akşehir Lake, Karamık Sazlığı etc.), Başkomutan National Park, Akdağ and Yirmialtı Ağustos Natural Parks; Habitat Protection Areas (Dandindere, Kasalıc, and Vakıf Piny), and Natural Monuments (Kermes oak woodland and Mızıkçam).

The adults were collected from aquatic and semi-aquatic habitats by sweep net (40 cm Ø), and were preserved either in 70% mixture of alcohol and glycerin (3:1) solution or by pinning and drying. Genitalia preparations were performed according to Dienska (1987). The species were identified by following especially the works by Dienska (1987), Savchenko (1989), Reusch and Oosterbroek (1997), Lackschewitz and Pagast (1940–1942), and Podenas et al. (2006). Some problems in identification of species were solved and identified taxa were checked by Jaroslav Starý. All specimens are deposited in the collection of the Zoological Laboratory of the Department of Biology, Muğla Sıtkı Koçman University, Muğla, Turkey.

Results

Subfamily Chioneinae

1. *Ellipteroides* (s.str.) *lateralis* (Macquart, 1835)

Erioptera lateralis Macquart, 1835; Hist. nat. Ins., Dipt. 2: 653.

Material examined: Afyonkarahisar, Başmakçı, Akpınar (37°51'N/29°59'E) 847 m, 26.05.2011, 1 ♂, 1 ♀; (37°50'N / 29°59'E), 848 m 28.05.2009, 7 ♂♂, 1 ♀; Kütahya, Tavşanlı, Cevizdere (39°38'N/29°18'E) 900 m, 15.07.2010, 2 ♀♀ (Figure 1).

Palaearctic distribution: Albania, Andorra, Austria, Belgium, Bulgaria, Czech Republic, Denmark, France, Germany, Great Britain, Greece, Hungary, Ireland, Israel, Italy, Lebanon, Lithuania, Malta, Netherlands, Morocco, Poland, Slovakia, Spain, Switzerland (Oosterbroek, 2012).

2. *Eriocnopa diuturna* (Walker, 1848)

Limnobia diuturna Walker, 1848; List Dipt. Colln Br. Mus. 1: 5.

Material examined: Uşak, Eşme, Yeniköy (38°16'N/29°02'E), 645 m, 19.04.2010, 5 ♂♂, 2 ♀♀ (Figure 1).

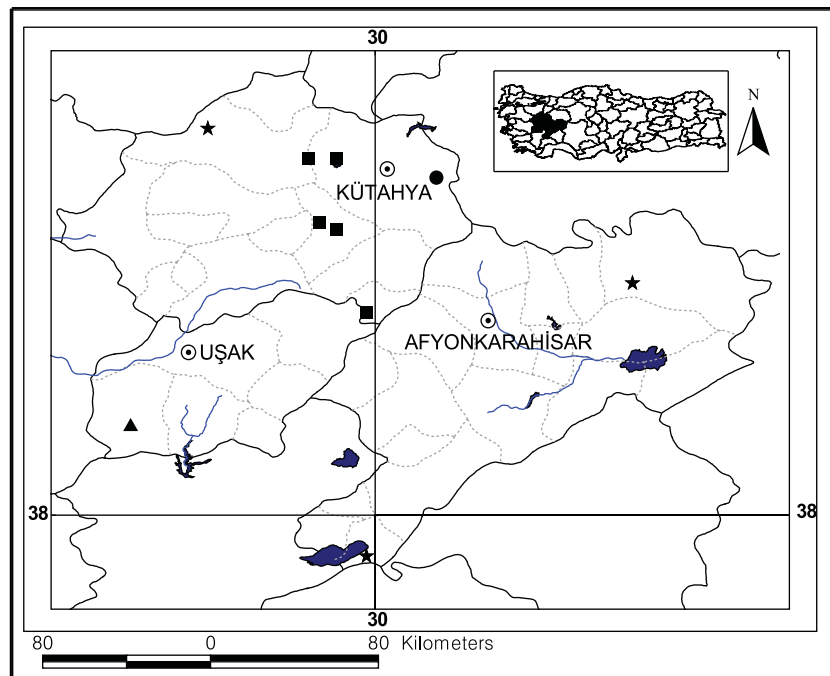


Figure 1. Distribution of the new records from inner western Anatolia.

[*Ellipteroides* (s.str.) *lateralis* (★), *Eriocnopa diuturna* (▲), *Eriocnopa interposita* (■), *Gonempeda flava* (●)].

Palaearctic distribution: Austria, Bulgaria, Czech Republic, Estonia, Finland, France, Germany, Great Britain, Ireland, Italy, Latvia, Lithuania, Norway, Poland, Russia, Slovakia, Spain, Sweden, Switzerland, Ukraine (Oosterbroek, 2012).

3. *Erioconopa interposita* Stary, 1976

Material examined: Kütahya, Çavdarhisar road (39°14'N/29°47'E) 1085 m, 05.10.2011, 1 ♂; Yoncalı (39°30'N/29°51'E), 1015 m, 26.04.2009, 5 ♂♂, 2 ♀♀; Seyitömer, Köprüören (39°30'N/29°44'E), 1026 m, 26.04.2009, 9 ♂♂, 3 ♀♀; Aslanapa, Terziler (39°12'N/29°51'E) 1053 m, 26.04.2011, 7 ♂♂; Dumlupınar (38°51'N/29°59'E), 1245 m, 19.04.2010, 7 ♂♂, 7 ♀♀ (Figure 1).

Palaearctic distribution: Slovakia, Ukraine (Oosterbroek, 2012).

4. *Gonempeda flava* (Schummel, 1829)

Limnobia flava Schummel, 1829: Beitr. Ent., Breslau 1: 148.

Material examined: Kütahya, Yumaklı (39°25'N/30°17'E) 1330, 18.07.2011, 1 ♂, 2 ♀♀ (Figure 1).

Palaearctic distribution: Austria, Belgium, Bulgaria, Czech Republic, Denmark, Estonia, Finland, France, Germany, Great Britain, Hungary, Ireland, Lithuania, Netherlands, Poland, Romania, Russia, Slovakia, Sweden, Switzerland, Ukraine (Oosterbroek, 2012).

5. *Gonomyia* (s.str.) *bifida* Tonnoir, 1920

Material examined: Afyonkarahisar, Şuhut, Akpınar (38°22'N/30°40'E), 1158 m, 19.06.2011, 1 ♂ (Figure 2).

Palaearctic distribution: Austria, Belgium, Czech Republic, Estonia, Finland, France, Germany, Great Britain, Hungary, Ireland, Italy, Latvia, Lithuania, Norway, Serbia, Slovakia, Sweden, Switzerland, Ukraine, Russia, Azerbaijan (Oosterbroek, 2012).

6. *Gonomyia* (s.str.) *recta* Tonnoir, 1920

Material examined: Kütahya, Yumaklı (39°25'N/30°17'E), 1330 m, 18.07.2011, 1 ♂ (Figure 2).

Palaearctic distribution: Austria, Belgium, Bulgaria, Czech Republic, Denmark, France, Germany, Great Britain, Italy, Lithuania, Macedonia, Netherlands, Romania, Slovakia, Sweden, Switzerland, Ukraine (Oosterbroek, 2012).

7. *Hoplolabis* (*Parilisia*) *longior* Stary, 2006

Material examined: Kütahya, Gediz, Gölcük (38°53'N/29°17'E) 649 m, 14.07.2010, 8 ♂♂, 11 ♀♀; Şaphane, Tereköy (38°54'N/29°06'E), 1016 m, 15.07.2011, 1 ♂; Tavşanlı, Akçaşehir (39°26'N/29°37'E), 875 m, 21.04.2010, 5 ♂♂. Uşak, Güre, Kula road (38°39'N/29°05'E) 527 m, 01.07.2010, 4 ♂♂, 1 ♀; Sivaslı, Uşak road, Banaz bridge (38°33'N/29°37'E) 796 m, 30.06.2010, 1 ♂; Ulubey, Avgan stream (38°24'N/29°26'E), 610 m, 19.04.2010, 3 ♂♂ (Figure 2).

Palaearctic distribution: Bulgaria, Greece, Rodos, Syria (Oosterbroek, 2012).

8. *Idiocera* (s.str.) *alexanderiana* (Lackschewitz, 1940)

Gonomyia alexanderiana Lackschewitz, 1940; Annln naturh. Mus. Wien 50: 53.

Material examined: Kütahya, Gediz, Murat Mountain (38°57'N/29°29'E), 785 m, 25.08.2009, 1 ♂; Tavşanlı, Harmancık road (39°38'N/29°17'E), 902 m, 24.07.2009, 3 ♂♂, 3 ♀♀ (Figure 2).

Palaearctic distribution: Albania, France, Italy, Romania (Oosterbroek, 2012).

9. *Ilisia inermis* Mendl, 1979

Material examined: Afyonkarahisar, Çay, Devederesi, Acılı (38°28'N/30°50'E), 1024 m, 11.05.2010, 2 ♂♂. Uşak, Banaz, Kocahisar, Küçükler dam (38°52'N/29°37'E), 1278 m, 25.08.2009, 1 ♂ (Figure 2).

Palaearctic distribution: Greece, Israel, Slovakia, Syria (Oosterbroek, 2012).

10. *Molophilus* (s.str.) *appendiculatus* (Staeger, 1840)

Erioptera appendiculatus Staeger, 1840: Naturh. Tidsskr. 3: 55.

Material examined: Kütahya, Domaniç, (39°52'N/29°38'E), 1276 m, 17.07.2011, 8 ♂♂, 1 ♀; Kocayayla (39°52'N/29°39'E), 1400 m, 17.07.2011, 2 ♂♂ (Figure 3).

Palaearctic distribution: Austria, Belgium, Bulgaria, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Great Britain, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Montenegro, Netherlands, Norway, Poland, Romania, Russia,

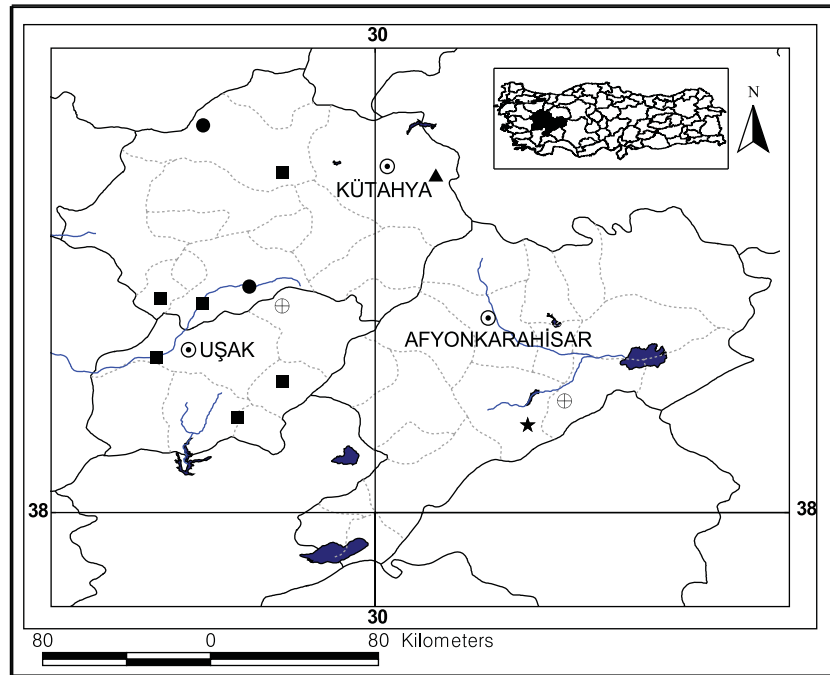


Figure 2. Distribution of the new records from inner western Anatolia.

[*Gonomyia* (s.str.) *bifida* (▲), *Gonomyia* (s.str.) *recta* (★), *Hoplolabis* (*Parilisia*) *longior* (■), *Idiocera* (s.str.) *alexanderiana* (●), *Ilisia inermis* (◇)].

Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Ukraine (Oosterbroek, 2012).

11. *Molophilus* (s.str.) *niger* Goetghebuer, 1920

Material examined: Uşak, Banaz, Büyükturak (38°46'N/29°49'E), 955 m, 01.05.2009, 2 ♂♂, 1 ♀ (Figure 3).

Palaearctic distribution: Austria, Belgium, Czech Republic, France, Germany, Great Britain, Macedonia, Poland, Romania, Slovakia, Switzerland, Ukraine (Oosterbroek, 2012).

12. *Tasiocera* (*Dasymolophilus*) *murina* (Meigen, 1818)

Erioptera murina Meigen, 1818: Syst. Besch. 1: 113.

Material examined: Kütahya, Domaniç, Kocayayla (39°52'N/29°39'E), 1400 m, 17.07.2011, 7 ♂♂, 4 ♀♀ (Figure 3).

Palaearctic distribution: Austria, Azerbaijan, Belgium, Bulgaria, Czech Republic, Denmark, Estonia, Finland, France, Georgia, Germany, Great Britain, Hungary, Ireland, Italy, Lithuania, Netherlands, Norway, Poland, Romania, Russia, Slovakia, Spain,

Sweden, Switzerland, Ukraine (Oosterbroek, 2012).

Subfamily Limnophilinae

13. *Euphyllidorea phaeostigma* (Schummel, 1829)

Limnobia phaeostigma Schummel, 1829: Beitr. Ent., Breslau 1: 165.

Material examined: Afyonkarahisar, Sandıklı, Çiğiltepe (38°41'N/30°18'E) 1312 m, 21.06.2011, 2 ♂♂, 2 ♀♀ (Figure 3).

Palaearctic distribution: Austria, Belgium, Czech Republic, Denmark, Estonia, Finland, France, Germany, Great Britain, Hungary, Italy, Latvia, Lithuania, Netherlands, Norway, Poland, Romania, Russia, Slovakia, Slovenia, Sweden, Switzerland, Ukraine (Oosterbroek, 2012).

14. *Pilaria scutellata* (Staeger, 1840)

Limnophila scutellata Staeger, 1840; Naturh. Tidsskr. 3: 34.

Material examined: Afyonkarahisar, Başmakçı, Akpınar 3 km (37°50'N/29°59'E), 850 m 11.05.2010, 1 ♂; 847 m, 26.05.2011, 2 ♂♂; Çay, (38°23'N/30°45'E), 993 m, 26.05.2011, 1 ♂; Çayır

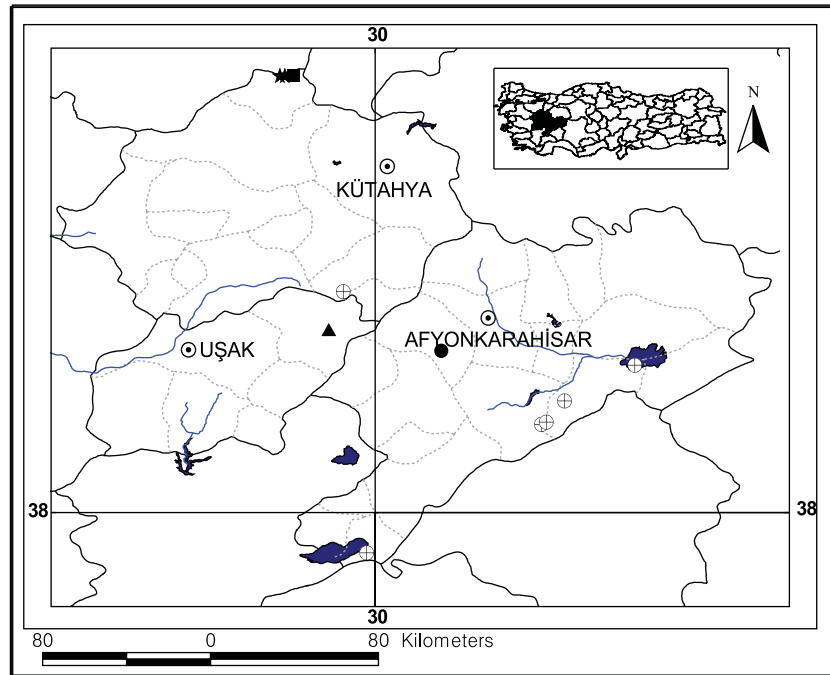


Figure 3. Distribution of the new records from inner western Anatolia.

[*Molophilus* (s.str.) *appendiculatus* (★), *Molophilus* (s.str.) *niger* (▲), *Tasiocera* (*Dasymolophilus*) *murina* (■), *Euphyllidorea phaeostigma* (●), *Pilaria scutellata* (◇)].

yazı, Genali (38°22'N/30°44'E), 1016 m, 11.05.2010, 10 ♂♂, 3 ♀♀; Devederesi, Acılı (38°28'N/30°50'E), 1024 m, 11.05.2010, 1 ♂, 1 ♀; Sultandağı, Eber (38°37'N/31°08'E) 971 m, 25.05.2011, 1 ♂. Kütahya, Dumlupınar, Yüglük (38°56'N/29°53'E), 1273 m, 29.05.2009, 1 ♂ (Figure 3).

Palaearctic distribution: Austria, Belgium, Czech Republic, Denmark, Estonia, Finland, France, Germany, Great Britain, Greece, Hungary, Iran, Kyrgyzstan, Latvia, Lithuania, Macedonia, Netherlands, Romania, Slovakia, Sweden, Switzerland, Tajikistan (Oosterbroek, 2012).

Subfamily Limoniinae

15. *Dicranomyia* (s.str.) *didyma* (Meigen, 1804)

Limonia didyma Meigen, 1804: Klass. Beschr. 1: 55.

Material examined: Afyonkarahisar, Emirdağ, Gedikevi, Bağlıca road (39°09'N/31°05'E) 1022 m, 24.05.2011, 6 ♂♂, 3 ♀♀. Uşak, Karahallı, Clandras Waterfall (38°24'N/29°29' E), 680 m, 19.04.2010, 1 ♂ (Figure 4).

Palaearctic distribution: Afghanistan, Albania, Armenia, Austria, Azerbaijan, Belgium, Bosnia-Herzegovina, Bulgaria, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Georgia, Germany, Great Britain, Hungary, Iceland, Ireland, Iran, Italy, Latvia, Lithuania, Macedonia, Montenegro, Morocco, Netherlands, Norway, Poland, Portugal, Romania, Russia, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Ukraine (Oosterbroek, 2012).

16. *Dicranomyia* (*Idiopyga*) *danica* Kuntze, 1919

Material examined: Afyonkarahisar, Çay, Armutlu (38°24'N/30°50'E) 1006 m, 26.05.2011, 1 ♂; Çayıryazı, Genali (38°22'N/30°44'E), 1016 m, 11.05.2010, 6 ♂♂, 2 ♀♀ (Figure 4).

Palaearctic distribution: Austria, Czech Republic, Denmark, Finland, Germany, Great Britain, Hungary, Ireland, Lithuania, Netherlands, Poland, Slovakia, Sweden, Russia, Kyrgyzstan (Oosterbroek, 2012).

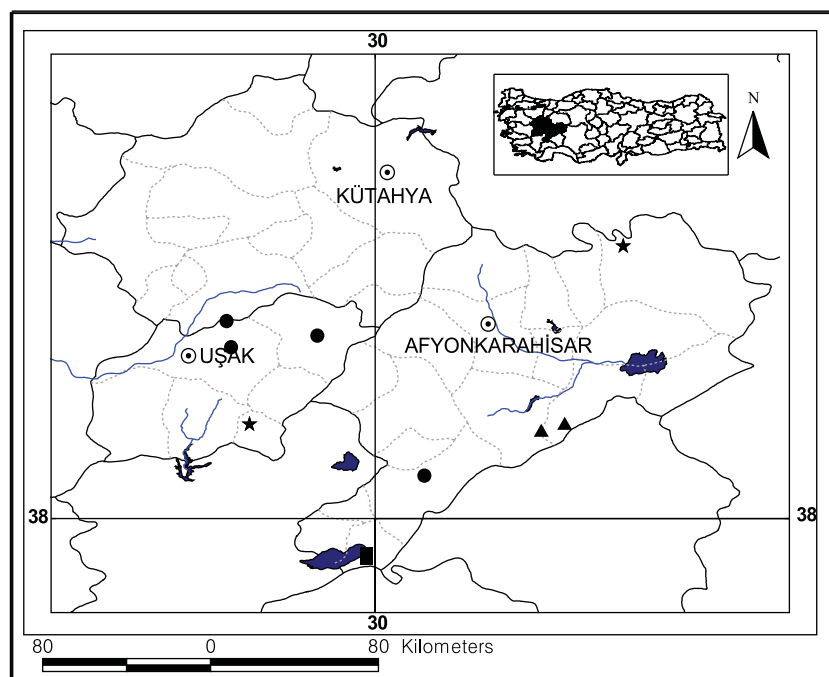


Figure 4. Distribution of the new records from inner western Anatolia.

[*Dicranomyia* (s.str.) *didyma* (★), *Dicranomyia* (*Idiopyga*) *danica* (▲), *Helius* (s.str.) *calviensis* (■), *Rhipidia* (s.str.) *uniseriata uniseriata* (●)].

17. *Helius* (s.str.) *calviensis* Edwards, 1928

Material examined: Afyonkarahisar, Başmakçı, Akpınar (37°50'N/29°59'E), 850 m 11.05.2010, 2 ♂♂, 1 ♀; 848 m 28.05.2009, 1 ♂; 26.05.2011, 4 ♂♂, 4 ♀♀; (37°50'N/29°58'E), 852 m, 28.05.2009, 3 ♂♂ (Figure 4).

Palaearctic distribution: Algeria, Bulgaria, France, Italy, Spain, Tunisia (Oosterbroek, 2012).

18. *Rhipidia* (s.str.) *uniseriata uniseriata* Schiner, 1864

Material examined: Afyonkarahisar, Dinar, Cumhuriyet (38°11'N/30°14'E), 1020 m, 28.05.2009, 1 ♂; Uşak, Sorkun (38°43'N/29°24'E) 975 m, 01.07.2010, 1 ♂; Eskigüney, Dikence (38°50'N/29°23'E) 1057 m, 01.07.2010, 1 ♂; Banaz, Hatiplar (38°46'N/29°46'E) 958 m, 30.06.2010, 1 ♂ (Figure 4).

Palaearctic distribution: Austria, Belgium, Bulgaria, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Georgia, Germany, Great Britain, Hungary, Lithuania, Moldavia, Mongolia, Netherlands, Poland,

Romania, Russia, Slovakia, Slovenia, Sweden, Switzerland, Ukraine (Oosterbroek, 2012).

Discussion

In this paper, 18 species and subspecies of Limoniidae are recorded from Turkey for the first time. With the additions in this paper, the number of species of Limoniidae in Turkey has increased to 114. Twelve of these species belong to the subfamily Chioneinae, 2 of them to Limnophilinae, and 4 of them to Limoniinae. Five of the new records are from both the West Palaearctic and East Palaearctic; 13 of the new records are only from the West Palaearctic.

Pilaria scutellata is widely distributed in the Palaearctic region. The Euro-Siberian subregion distributed *Erioconopa interposita* and the Euro-Siberian and Irano-Turanian subregion distributed *Dicranomyia* (*Idiopyga*) *danica* have been also recorded in the Mediterranean and Euro-Siberian subregions in this study. The rest of species found in this study are distributed in the Mediterranean and European subregions.

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