

The jumping plant-lice (Hemiptera: Psyllodea) of Turkey: a checklist and new records

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Abstract: A checklist is provided for the Turkish Psyllodea comprising 99 species, of which 1 is doubtful (*Livia crefeldensis*) and 6 are recorded for the first time from Turkey (*Rhodochlanis bicolor*, *Euphyllura pakistanica*, *Camarotoscena lauta*, *Syntomoza unicolor*, *Baeopelma colorata*, and *Spanioneura persica*). A key is provided for the 3 *Spanioneura* species associated with *Prunus dulcis*. *Spanioneura pechai* (Klimaszewski and Lodos) **stat. rev.** is removed from synonymy with *S. turkiana*.

Key words: Palearctic, psyllids, taxonomy, distribution, *Spanioneura*

1. Introduction

Psyllids or jumping plant-lice are phloem-feeding insects that superficially resemble small cicadas. They are generally very host-specific, in particular as larvae. It is therefore not surprising that some can become pests on cultivated plants (Burckhardt, 1994). Of major economic importance are those vectoring *Liberibacter* and *Phytoplasma* species, the causal agents of serious plant diseases on citrus, pear, apple, plum, potato, and tomato (Hodkinson, 2009). Several psyllid species originating from Australia have been introduced into other continents where they can cause severe damage in eucalypt plantations by feeding and by secreting honeydew and wax (Queiroz et al., 2012). Others, such as the olive psyllids (*Euphyllura* spp.), were considered for a long time economically insignificant, but are gaining importance now in the Mediterranean and Middle East due to the recent intensification of olive cultivation in this region (Asadi et al., 2011; Tüfekli and Ulusoy, 2011a). Along with the increased interest in these psyllids comes a demand for identification keys, illustrated species descriptions, and faunal checklists (e.g., Asadi et al., 2009; Burckhardt and Lauterer, 2009).

The psyllid fauna of the eastern Mediterranean and Middle East is only incompletely known. Turkey is no exception in this respect. The last overview is 20 years old (Burckhardt and Önuçar, 1993), listing 85 species. An additional 8 species were added subsequently by Güçlü and Burckhardt (1996), Aytar (2007), and Özgen et al. (2012b), bringing the number to 93 species, and biological studies have been made on some pest species (e.g., Tüfekli

and Ulusoy, 2011a, 2011b). The present checklist brings together the published records on Turkish psyllids and adds information from several small lots of material that we have identified over the last few years.

2. Materials and methods

Material was examined from the collections of the Naturhistorisches Museum, Basel (NHMB); the Department of Zoology, Silesian University, Katowice (SU); and the Upper Silesian Museum, Bytom (USMB). The specimens were conserved either dry or in 70% ethanol.

The classification follows that of Burckhardt and Ouvrard (2012).

3. Results and discussion

Previously, 93 species of jumping plant-lice were recorded from Turkey, 1 of which is doubtful (*Livia crefeldensis*). Here we add the following 6 species, which are recorded for the first time from Turkey: *Rhodochlanis bicolor*, *Euphyllura pakistanica*, *Camarotoscena lauta*, *Syntomoza unicolor*, *Psylla colorata*, and *Spanioneura persica*. We also list additional localities for 33 previously recorded species. Specimens of another 3 species were examined but could not be identified due to insufficient material.

The fact that only a single species, *Colposcena bidentata*, is endemic to Turkey, whereas most species are widely distributed in the Mediterranean region, the Middle East, or the Palearctic region, suggests that the Turkish psyllid fauna is currently insufficiently known. This is supported

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by the relatively small number of species developing on herbaceous plants, which seem to be underrepresented in the checklist.

Checklist

Aphalaridae: Aphalarinae

Aphalara grandicula (Gegechkori, 1981)

Reported from Gümüşhane, Kars (Burckhardt, 1988), Konya, Meram, Nevşehir (Burckhardt and Önuçar, 1993), southeastern Anatolia (Özgen et al., 2012b).

Material examined: 1 ♀, Ergani, Pınarkaya, 38°35'N, 31°4'E, 02.11.2007, *Morus alba* (leg. İ. Özgen and C. Gözüaçık) (dry mounted, NHMB).

Aphalara maculipennis Löw, 1886

Reported from Erzurum (Güçlü and Burckhardt, 1996).

Colposcencia aliena (Löw, 1881)

Reported from Kars (Burckhardt, 1988).

Material examined: 1 ♂, Hadim, 36°59'N, 32°27'E, 04.07.1980 (dry mounted, SU); 1 ♀, Ilgin, Çaycuma, 41°26'N, 32°4'E, 16.07.1979 (dry mounted, SU); 1 ♀, Ilgin, Kahramanmaraş, 37°35'N, 36°56'E, 21.07.1984 (dry mounted, SU).

Colposcencia bidentata Burckhardt, 1988

Reported from Artvin (Burckhardt, 1988).

Material examined: 1 ♂, 2 ♀, Akşehir, 38°21'N, 31°24'E, 06.07.1980 (dry mounted, SU).

Colposcencia osmanica Vondráček, 1953

Reported from Ankara (Vondráček, 1953), Artvin, Kars (Burckhardt, 1988), Kırıkkale (Burckhardt and Önuçar, 1993).

Material examined: 1 ♀, 3 forewings, Alanya, 36°33'N, 32°0'E, 09.04.1981 (dry mounted, SU); 1 ♀, Ilgin, Çankırı, 40°36'N, 33°36'E, 03.08.1979 (dry mounted, SU); 1 ♀, Ilgin, Kırıkkale, 36°29'N, 36°21'E, 11.07.1984 (dry mounted, SU).

Craspedolepta armazhi Gegechkori, 1973

Reported from Kars (Burckhardt, 1988).

Craspedolepta bulgarica Klimaszewski, 1961

Reported from Ankara (Klimaszewski and Lodos, 1980, as *Cerna asetipennis*), Artvin (Burckhardt, 1988), Konya, Erzincan, Kırıkkale (Burckhardt and Önuçar, 1993).

Craspedolepta innoxia (Foerster, 1848)

Reported from İzmir (Burckhardt and Önuçar, 1993).

Craspedolepta malachitica (Dahlbom, 1851)

Reported from Kars (Burckhardt and Önuçar, 1993), Erzurum (Güçlü and Burckhardt, 1996).

Craspedolepta nebulosa (Zetterstedt, 1828)

Reported from Erzurum (Güçlü and Burckhardt, 1996).

Craspedolepta omissa Wagner, 1944

Reported from Hakkari (Klimaszewski and Lodos, 1979, as *Cerna omissa*).

Craspedolepta pontica Dobreanu and Manolache, 1962

Reported from Artvin, Kars (Burckhardt, 1988), Erzurum (Güçlü and Burckhardt, 1996).

Craspedolepta setosa (Wagner, 1947)

Reported from Ankara (Vondráček, 1953, as *Xanioptera setosa*).

Craspedolepta sp.

Material examined: 2 ♂, 2 ♀, Kop, 40°2'N, 40°25'E, 14.07.1982 (dry mounted, SU).

Comment: The material at hand resembles *C. malachitica* in the dotted forewing and, in particular, in the straight female proctiger. It differs from *C. malachitica* in the slightly smaller and less conspicuous dark dots on the forewing, and the sexually dimorphic pattern of surface spinules, forming cells in males and covering membrane evenly in females.

Crastina myricariae Loginova, 1964

Reported from Van (Klimaszewski and Lodos, 1979), Erzurum (Güçlü and Burckhardt, 1996).

Crastina sp.

Material examined: 1 ♂, Gümüşhane, 40°26'N, 39°30'E, 13.07.1982, *Astragalus* (dry mounted, SU).

Comment: The single ♂ resembles *C. dimorpha* in the terminalia and forewing shape and venation but lacks a forewing pattern. More material is necessary for identification.

Rhodochlanis bicolor (Scott, 1880)

Material examined: 1 ♂, 1 ♀, Bayat, 40°38'N, 34°15'E, 06.08.1979 (dry mounted, SU).

Comment: New record for Turkey.

Aphalaridae: Rhinocolinae

Agonosцена cisti (Puton, 1882)

Reported from İzmir (Lodos and Önuçar, 1985; Burckhardt and Önuçar, 1993), and from Turkey without further indications (Burckhardt and Lauterer, 1989).

Agonosцена pistaciae Burckhardt and Lauterer, 1989

Reported from İzmir (Klimaszewski and Lodos, 1977, 1979, as *A. succinata* [sic]; Önuçar, 1983, as *A. succinata*), İçel, Gaziantep, Kahramanmaraş, Urfa (Çelik, 1981, as *A. succinata*), Adana, Gaziantep (Burckhardt and Lauterer, 1989), İzmir (Burckhardt and Önuçar, 1993), Siirt (Özgen et al., 2012a), southeastern Anatolia (Özgen et al., 2012b).

Material examined: 1 ♀, 2 larvae, Siirt, Aydınlar, 37°56'N, 42°0'E, 01.08.2009, *Pistacia vera* (leg. İ. Özgen and C. Gözüaçık) (dry mounted, NHMB).

Agonosцена targionii (Lichtenstein, 1874)

Reported from İzmir, Gaziantep (Lodos and Önuçar, 1985), Aydın (Burckhardt and Önuçar, 1993).

Lisronia varicicosta (Hodkinson and Hollis, 1981)

Reported from İzmir, Aydın (Burckhardt and Önuçar, 1993).

Megagonoscena viridis (Baeva, 1963)

Reported from Gaziantep (Klimaszewski and Lodos 1979, as *Agonoscena viridis*), İçel, Gaziantep, Kahramanmaraş, Urfa (Çelik, 1981, as *A. viridis*), İçel, Adana, Gaziantep, Kahramanmaraş, Adıyaman, Urfa, Mardin, Diyarbakır, and Siirt (Lodos and Önuçar, 1985, as *A. viridis*), and from Turkey without further indications (Burckhardt and Lauterer, 1989).

***Rhinocola aceris* (Linnaeus, 1758)**

Reported from Tunceli (Burckhardt, 1988; Burckhardt and Lauterer, 1989), Çankırı, Ankara (Burckhardt and Önuçar, 1993).

Aphalaridae: Spondyliaspidae

***Blastosylla occidentalis* Taylor, 1985**

Reported from Mersin (Aytar, 2007).

Calophyidae

***Calophya rhois* (Löw, 1877)**

Reported from Artvin (Burckhardt, 1988).

Homotomidae

***Homotoma ficus* (Linnaeus, 1767)**

Reported from İzmir (Klimaszewski and Lodos, 1977, 1979; Önuçar, 1983, as *H. viridis*), Artvin (Burckhardt, 1988, as *H. viridis*), İzmir, Adana (Burckhardt and Önuçar, 1993), Bursa (Gencer et al., 2007), southeastern Anatolia (Özgen et al., 2012b).

Material examined: 8 ♂, 13 ♀, İçel, surroundings of Aydınlar, 25 km NW Erdemli, 36°48'N, 34°10'E, 09–12.06.2000, *Cedrus* sp., cedar forest (dry mounted, USMB); 1 ♂, İçel, Göktepe Dağı, 1.5 km S of Aydınlar, 36°45'N, 34°08'E, 1395 m, 19.07.2004, in light, cedar forest (dry mounted, USMB); 2 ♂, 2 ♀, İçel, surroundings of Aydınlar, 36°41'N, 34°10'E, 1000 m, 28–30.05.2001, oak forest (dry mounted, USMB); 1 ♀, İçel, 3 km S of Aydınlar, 36°44'N, 34°08'E, 28–30.05.2001, cedar forest (dry mounted, USMB); 1 ♀, İçel, Göktepe Dağı, 1.5 km S of Aydınlar, 36°45'N, 34°08'E, 1395 m, 20.07.2004, in light, cedar forest (dry mounted, USMB); 1 ♂, 5 ♀, İçel, Aydınlar, surroundings of Avgadı, 25 km N of Erdemli, 36°48'N, 34°10'E, 1380 m, 10.06.2000, cedar forest (preserved in 70% ethanol, USMB); 4 ♀, İçel, 3 km S Aydınlar, 36°44'N, 34°08'E, 1400 m, 28.05.2001, *Abies* sp. (preserved in 70% ethanol, USMB); 1 ♂, Adıyaman, Çemberlitaş, 37°48'N, 38°20'E, 03.11.2007, *Ficus carica* (leg. İ. Özgen and C. Gözüaçık) (dry mounted, NHMB); 2 ♀, Ergani, 38°16'N, 39°46'E, 06.06.2007, 01.10.2008, *Prunus dulcis*, *Rosa canina* (leg. İ. Özgen and C. Gözüaçık) (dry mounted, NHMB); 1 ♂, Ergani, Diyarbakır, 38°16'N, 39°46'E, 01.06.2007, *Ficus carica* (leg. İ. Özgen and C. Gözüaçık) (dry mounted, NHMB); 8 ♂, 11 ♀, Ergani, Pınarkaya, 38°14'N, 39°41'E, 06.06.2007, 21.06.2007, 27.06.2007, 26.07.2007, 06.09.2007, 20.09.2007, 04.10.2007, 19.10.2007, 02.11.2007, *Ficus carica*, *Morus alba*, *Prunus armeniaca*, *Punica granatum*, *Pyrus communis*, *Quercus* sp. (leg. İ. Özgen and C. Gözüaçık) (dry mounted, NHMB).

Liviidae: Euphyllurinae

***Diaphorina putonii* (Löw, 1878)**

Reported from Ankara (Vondráček, 1953, as *D. putoni* [sic]), Urfa (Klimaszewski and Lodos, 1979, as *D. putoni* [sic]).

***Euphyllura phillyreae* Foerster, 1848**

Reported from Asia Minor (Klimaszewski, 1973), İzmir (Klimaszewski and Lodos, 1977, 1979; Önuçar, 1983, as *E. phillyreae* and *E. olivina*; Burckhardt and Önuçar, 1993), Erzurum (Güçlü and Burckhardt, 1996).

Material examined: 101 ♂, 99 ♀, 1 adult without abdomen, Balıkesir, 39°33'N, 27°44'E, 11.08.2004, 25.08.2004, 08.09.2004, 07.09.2005, 05.10.2005, 27.10.2005, *Olea europaea* (leg. B. Hepdurgun) (dry mounted, NHMB).

***Euphyllura pakistanica* Loginova, 1973**

Material examined: 2 ♀, Antalya, 36°53'N, 30°42'E, 07.07.1983 (dry mounted, SU).

Comment: New record for Turkey.

***Euphyllura straminea* Loginova, 1973**

Reported from İzmir (Önuçar and Ulu, 1991), Adana, Mersin (Tüfekli and Ulusoy, 2011a, 2011b), southeastern Anatolia (Özgen et al., 2012b).

Material examined: 5 ♂, 3 ♀, Adıyaman, Çemberlitaş, 37°48'N, 38°20'E, 23.08.2007, 20.10.2007, 03.11.2007, *Olea europaea*, *Crataegus oxyacantha*, *Ficus carica* (leg. İ. Özgen and C. Gözüaçık) (dry mounted, NHMB).

***Psyllopsis fraxinicola* (Foerster, 1848)**

Reported from Hakkari (Klimaszewski and Lodos, 1977, 1979), Eskişehir (Burckhardt and Önuçar, 1993), Erzurum (Güçlü and Burckhardt, 1996).

Material examined: 2 ♂, 2 ♀, Sarımsaklı Br., 38°45'N, 35°28'E, 12.08.1979, *Fraxinus* sp. (dry mounted, SU); 1 ♂, 1 ♀, Erzurum, Şimşir, 39°53'N, 41°16'E, 15.07.1982 (dry mounted, SU).

***Psyllopsis machinosus* Loginova, 1963**

Reported from Tunceli (Burckhardt, 1988).

***Psyllopsis securicola* Loginova, 1963**

Reported from Kars (Burckhardt, 1988).

Material examined: 2 ♂, 5 ♀, Ankara, 39°55'N, 32°51'E, 05.06.2003, *Fraxinus* sp. (leg. S. Bayram) (dry mounted, NHMB).

Liviidae: Liviinae

***Aphorma lichenoides* (Puton, 1898)**

Reported from İzmir (Klimaszewski and Lodos, 1980, as *Aphorma renova*), İzmir (Burckhardt and Önuçar, 1993).

***Camaratoscena fulgidipennis* Loginova, 1975**

Reported from Kahramanmaraş (Loginova, 1975).

***Camaratoscena hoberlandti* Vondráček, 1952**

Reported from Adana (Vondráček, 1953, as *Paurocephala* (*Camaratoscena*) *hoberlandti*), Van (Klimaszewski and Lodos, 1979, as *C. hoberlandti* [sic]).

Camaratoscena lauta Loginova, 1975

Material examined: 4 ♂, 4 ♀, Ankara, 39°55'N, 32°51'E, 29.10.2001, *Populus alba* (leg. S. Bayram) (dry mounted, NHMB).

Comment: New record for Turkey.

Camaratoscena speciosa (Flor, 1861)

Reported from İzmir (Klimaszewski and Lodos, 1977, 1979; Önuçar, 1983), Ankara, Konya (Burckhardt and Önuçar, 1993).

Camaratoscena subrubescens (Flor, 1861)

Reported from İzmir (Klimaszewski and Lodos, 1977; Önuçar, 1983, as *Camaratoscena unicolor*; Klimaszewski and Lodos, 1979; Önuçar, 1983).

Material examined: 2 ♀, Karaman, 37°10'N, 33°13'E, 02.07.1980 (dry mounted, SU).

Livia crefeldensis Mink, 1855

Reported from Ankara (as *Diraphia crefeldensis*) (Vondráček, 1953).

Comment: This record is doubtful as it may concern the closely related *L. mediterranea* (Burckhardt and Önuçar, 1993).

Livia junci (Schrank, 1798)

Reported from Ankara (Vondráček, 1953, as *L. juncorum*), Erzurum (Güçlü and Burckhardt, 1996, as *L. juncorum*).

Livia mediterranea Loginova, 1974

Reported from Erzurum (Güçlü and Burckhardt, 1996).

Syntomoza unicolor (Loginova and Parfentiev, 1958)

Material examined: 2 ♀, 4 forewings, Kavak, Silifke, 36°43'N, 33°48'E, 27.05.1984 (dry mounted, SU).

Comment: New record for Turkey.

Psyllidae: Psyllinae***Arytainilla cytisi*** (Puton, 1876)

Reported from İzmir (Klimaszewski and Lodos, 1979; Önuçar, 1983, as *Arytaina cytisi*), İzmir, Aydın (Burckhardt and Önuçar, 1993).

Baeopelma colorata (Löw, 1888)

Material examined: 2 ♂, 9 ♀, İçel, Göktepe Dağı, 1.5 km S of Aydınlar, 36°45'N, 34°08'E, 1395 m, 19.07.2004, in light, cedar forest (dry mounted, USMB); 1 ♀, İçel, Göktepe Dağı, 1.5 km S of Aydınlar, 36°45'N, 34°08'E, 1395 m, 20.07.2004, in light, cedar forest (dry mounted, USMB); 1 ♀, İçel, Aydınlar, N of Erdemli, 36°45'N, 34°08'E, 1390 m, 09–11.06.2005, cedar forest (dry mounted, USMB); 1 ♀, 2 forewings, Silifke, Kayın, 36°22'N, 33°55'E, 29.05.1984 (dry mounted, SU).

Comment: New record for Turkey.

Baeopelma foersteri (Flor, 1861)

Reported from İzmir (Klimaszewski and Lodos, 1979; Önuçar, 1983, as *Psylla foersteri*), Tunceli, Artvin (Burckhardt, 1988).

Material examined: 2 ♂, 1 ♀, Andırın, 37°34'N, 36°21'E, 1200 m, 20.07.1984, *Alnus* sp. (dry mounted, SU); 1 ♂, 1

♀, Giresun, Şebinkarahisar, 40°17'N, 38°25'E, 12.07.1978 (dry mounted, SU); 2 ♀, Denizli, Bozdağ, 38°5'N, 29°49'E, 1600 m, 30.07.1976, *Alnus* sp. (dry mounted, SU); 3 ♀, Muğla, Köyceğiz, 36°58'N, 28°41'E, 18.05.1980, *Platanus orientalis* (dry mounted, SU); 1 forewing, Artvin, Borçka, 41°21'N, 41°40'E, 8.07.1978 (dry mounted, SU).

Cacopsylla affinis (Löw, 1880)

Reported from İstanbul, Bursa, Muğla (Burckhardt and Önuçar, 1993).

Material examined: 1 ♀, Eskişehir, 39°46'N, 30°31'E, 08.07.1979 (dry mounted, SU).

Comment: The single female from Eskişehir is only provisionally assigned to *C. affinis*, as males are required to separate it from the morphologically similar *C. melanoneura* (Foerster, 1848).

Cacopsylla albipes (Flor, 1861)

Reported from Gümüşhane (Burckhardt, 1988).

Cacopsylla bidens (Šulc, 1907)

Reported from southeastern Anatolia (Özgen et al., 2012b).

Material examined: 2 ♂, 4 ♀, Adıyaman, Çemberlitaş, 37°48'N, 38°20'E, 01.05.2007, 14.07.2007, *Crataegus oxyacantha*, tree (leg. İ. Özgen and C. Gözüaıcık) (dry mounted, NHMB).

Cacopsylla breviantennata (Flor, 1861)

Reported from Gümüşhane (Burckhardt, 1988).

Cacopsylla fasciata (Löw, 1881)

Reported from Kars (Burckhardt, 1988).

Cacopsylla incerta (Bajeva, 1972)

Reported from Kars (Burckhardt, 1988).

Cacopsylla mali (Schmidberger, 1836)

Reported from Kars (Burckhardt, 1988), Erzurum (Güçlü and Burckhardt, 1996).

Cacopsylla mariannae (Baeva, 1966)

Reported from İzmir (Önuçar and Ulu, 1991), İstanbul, Muğla, Kayseri, Van (Burckhardt and Önuçar, 1993), Erzurum (Güçlü and Burckhardt, 1996), southeastern Anatolia (Özgen et al., 2012b).

Material examined: 1 ♂, İçel, Göktepe Dağı, 1.5 km S of Aydınlar, 36°45'N, 34°08'E, 1395 m, 19.07.2004, in light, cedar forest (dry mounted, USMB); 1 ♀, Akşehir, 38°21'N, 31°24'E, 06.07.1980, *Salix* sp. (dry mounted, SU); 1 ♂, Adıyaman, Çemberlitaş, 37°48'N, 38°20'E, 01.05.2007, *Hippophae rhamnoides* (leg. İ. Özgen and C. Gözüaıcık) (dry mounted, NHMB); 2 ♀, Ergani, Pınarkaya, 38°14'N, 39°41'E, 25.05.2007, 27.06.2007, various trees (leg. İ. Özgen and C. Gözüaıcık) (dry mounted, NHMB).

Cacopsylla moscovita (Andrianova, 1948)

Reported from Tunceli (Burckhardt, 1988).

Cacopsylla myrthi (Puton, 1876)

Reported from Ankara (Vondráček, 1953, as *Psylla myrti* [sic]), Manisa, Erzincan (Klimaszewski and Lodos, 1979, as *C. myrti* [sic]), İzmir (Klimaszewski and Lodos,

1979; Önuçar, 1983, as *C. alaterni*), İzmir (Burckhardt and Önuçar, 1993).

Material examined: 1 ♀, 1 ♂, İçel, Göktepe Dağı, 1.5 km S of Aydınlar, 36°45'N, 34°08'E, 1395 m, 20.07.2004, in light, cedar forest (dry mounted, USMB); 1 ♂, İçel, Göktepe Dağı, 1.5 km S of Aydınlar, 36°45'N, 34°08'E, 1395 m, 19.07.2004, in light, cedar forest (dry mounted, USMB); 1 ♀, İçel, Aydınlar, surroundings of Avgadı, 25 km N of Erdemli, 36°48'N, 34°10'E, 1380 m, 09.06.2000, *Cedrus* sp., cedar forest (preserved in 70% ethanol, USMB).

***Cacopsylla notata* (Flor, 1861)**

Reported from İzmir (Klimaszewski and Lodos, 1977, 1979; Önuçar, 1983, as *C. pyricola*), İzmir (Burckhardt and Önuçar, 1993), and from Turkey without further indications (Burckhardt and Hodkinson, 1986).

***Cacopsylla peregrina* (Foerster, 1848)**

Reported from Erzincan (Burckhardt and Önuçar, 1993), Erzurum (Güçlü and Burckhardt, 1996).

Material examined: 1 ♂, Kırklareli, Yenice, 16 km NE Pınarhisar, 41°44'N, 27°38'E, 04–05.06.2000 (dry mounted, USMB); 3 ♂, 5 ♀, Kırklareli, surroundings of Yenice, 16 km NE Pınarhisar, 41°44'N, 27°38'E, 04.06.2000, *Crataegus* sp. (preserved in 70% ethanol, USMB); 3 ♂, 1 ♀ Aşkale, 39°55'N, 40°41'E, 17.07.1982, *Crataegus* sp. (dry mounted, DZSU); 2 ♀ Akseki, 37°2'N, 31°47'E, 12.06.1981, *Crataegus* sp. (dry mounted, DZSU).

***Cacopsylla permixta* Burckhardt and Hodkinson, 1986**

Reported from Konya, Adana (Burckhardt and Hodkinson 1986), Gümüşhane (Burckhardt, 1988), Mardin (Burckhardt and Önuçar, 1993), southeastern Anatolia (Özgen et al., 2012b).

Material examined: 2 ♂, 1 ♀, Adıyaman, Çemberlitaş, 37°48'N, 38°20'E, 01.05.2007, 03.11.2007, *Crataegus oxyacantha*, tree (leg. İ. Özgen and C. Gözüaçıık) (dry mounted, NHMB).

***Cacopsylla picta* (Foerster, 1848)**

Reported from İçel, Adana, Gaziantep, Hakkari (Klimaszewski and Lodos, 1977, 1979, as *Cacopsylla costalis*), Adana (Burckhardt and Önuçar, 1993, as *Cacopsylla costalis*).

***Cacopsylla pruni* (Scopoli, 1763)**

Reported from Erzurum (Güçlü and Burckhardt, 1996), Adana, Bursa, Mersin, Yalova (Ulubaş Serçe et al., 2011).

Material examined: 2 ♂, İçel, Göktepe Dağı, 1.5 km S of Aydınlar, 36°45'N, 34°08'E, 1395 m, 20.07.2004, *Medicago sativa*, cedar forest (dry mounted, USMB).

***Cacopsylla pulchella* (Löw, 1877)**

Reported from İzmir (Klimaszewski and Lodos, 1977, 1979; Önuçar, 1983), Aydın (Burckhardt and Önuçar, 1993).

Material examined: 1 ♂, 3 ♀, İçel, 25 km NW of Erdemli, surroundings of Aydınlar, 36°48'N, 34°10'E, 09–

12.06.2000, *Abies* sp., cedar forest (dry mounted, USMB); 1 ♂, İçel, Göktepe Dağı, 1.5 km S of Aydınlar, 36°45'N, 34°08'E, 1395 m, 19.07.2004, in light, cedar forest (dry mounted, USMB); 1 ♂, İçel, Göktepe Dağı, 1.5 km S of Aydınlar, 36°45'N, 34°08'E, 1395 m, 19–23.07.2004, in light, cedar forest (dry mounted, USMB); 1 ♂, İçel, Göktepe Dağı, 1.5 km S of Aydınlar, 36°45'N, 34°08'E, 1395 m, 20.07.2004, in light, cedar forest (dry mounted, USMB); 1 ♂, 1 ♀, İçel, Aydınlar, surroundings of Avgadı, 25 km N of Erdemli, 36°48'N, 34°10'E, 1380 m, 10.06.2000, cedar forest (preserved in 70% ethanol, USMB); 1 ♀, İçel, 3 km S of Aydınlar, 36°44'N, 34°08'E, 1400 m, 28.05.2001, *Abies* sp. (preserved in 70% ethanol, USMB).

***Cacopsylla pyri* (Linnaeus, 1758)**

Reported from İzmir (Klimaszewski and Lodos, 1979; Önuçar, 1983), Ankara, Erzincan (Burckhardt and Önuçar, 1993), Erzurum (Güçlü and Burckhardt, 1996), Bursa (Ulubaş Serçe et al. 2006), and Turkey without further indications (Burckhardt and Hodkinson, 1986).

Material examined: 2 ♀, 1 forewing, Karaman, 37°10'N, 33°13'E, 02.07.1980 (dry mounted, SU); 2 ♂, 1 ♀, Erzincan, 39°45'N, 39°30'E, 03.09.1979, *Malus* sp. (dry mounted, SU); 1 ♀, Cumaouasi, Armut, 37°43'N, 29°53'E, 28.04.1976 (dry mounted, SU); 1 ♂, Konya, 1 km S of Hadim, 36°59'N, 32°28'E, 1527 m, 17.07.2004 (dry mounted, USMB).

***Cacopsylla pyrisuga* (Foerster, 1848)**

Reported from İzmir (Burckhardt and Önuçar, 1993), and from Turkey without further indications (Burckhardt and Hodkinson, 1986).

Material examined: 1 ♀, Andırın, 37°34'N, 36°21'E, 1200 m, 20.07.1984, *Cedrus* sp. (dry mounted, SU); 1 ♀, Ankara, Karagöl, 40°21'N, 31°55'E, 03.05.1979 (Ahlat) (dry mounted, SU); 1 ♀, Kumluca, 36°21'N, 30°17'E, 20.06.1981, *Malus domestica* (dry mounted, SU).

***Cacopsylla rhamnicola* (Scott, 1876)**

Reported from Artvin, Kars (Burckhardt, 1988).

***Cacopsylla saliceti* (Foerster, 1848)**

Reported from Kars (Burckhardt, 1988).

***Cacopsylla zetterstedti* (Thomson, 1877)**

Reported from Erzincan (Burckhardt and Önuçar, 1993).

***Cacopsylla* sp.**

Reported from Erzurum, Nevşehir (Burckhardt and Önuçar, 1993, as *C. cf. hippophaes*).

Material examined: 3 ♀, Bayburt, Söğüt, 40°15'N, 40°13'E, 14.07.1982 (dry mounted, SU); 2 ♀, Aşkale, 39°55'N, 40°41'E, 14.07.1982, *Elaeagnus* sp. (dry mounted, SU); 1 ♀, 1 forewing, Pınarbaşı, 38°43'N, 36°23'E, 18.08.1979, *Salix* sp. (dry mounted, SU).

Comment: The material at hand is probably conspecific with that mentioned by Burckhardt and Önuçar (1993) under *C. cf. hippophaes*. Males are required for identification.

Cyamophila astragalicola (Gegechkori, 1977)

Reported from Erzurum (Güçlü and Burckhardt, 1996).

Cyamophila glycyrrhizae (Becker, 1864)

Reported from Ankara (Vondráček, 1953, as *Psylla glycyrrhizae*); Bitlis, Iğdır, Muş, Siirt, Van (Klimaszewski and Lodos, 1977, as *Cacopsylla glycyrrhizae* [sic]); İzmir (Klimaszewski and Lodos, 1979, as *Cyamophila odontopyx*); Kars (Burckhardt, 1988); İzmir, Ankara, Erzincan, Artvin, Kars, Kırıkkale (Burckhardt and Önuçar, 1993); Erzurum (Güçlü and Burckhardt, 1996); southeastern Anatolia (Özgen et al., 2012b).

Material examined: 3 ♂, 4 ♀, Erciyes, 38°32'N, 35°27'E, 10.08.1979 (dry mounted, SU); 3 ♀, Kırıkhan, 36°29'N, 36°21'E, 11.07.1984, Fabaceae (dry mounted, SU); 1 ♂, 2 ♀, Kırıkhan, 36°29'N, 36°21'E, 11.07.1984, *Glycyrrhiza glabra* (dry mounted, SU); 1 ♀, Pülümür, 39°29'N, 39°53'E, 17.07.1982 (dry mounted, SU); 1 ♂, 2 ♀, Adıyaman, 37°45'N, 38°16'E, 01.06.07, 15.06.2007, *Glycyrrhiza glabra*, *Morus alba* (leg. C. Gözüaıcık and İ. Özgen) (dry mounted, NHMB); 1 ♂, 1 ♀, Adıyaman, Çemberlitaş, 37°48'N, 38°20'E, 06.04.2007, 01.05.2007, *Triticum* sp., *Crataegus oxyacantha* (leg. İ. Özgen and C. Gözüaıcık) (dry mounted, NHMB); 4 ♂, 2 ♀, Adıyaman, Küçükboyalı, 37°45'N, 38°16'E, 07.06.2007, 16.06.2007, *Glycyrrhiza glabra* (leg. İ. Özgen and C. Gözüaıcık) (dry mounted, NHMB).

Cyamophila stoklosai Klimaszewski and Lodos, 1979

Reported from Bitlis (Klimaszewski and Lodos, 1979), Gümüşhane (Burckhardt, 1988), Erzurum (Güçlü and Burckhardt, 1996).

Livilla hodkinsoni (Burckhardt, 1979)

Reported from İzmir (Burckhardt, 1989, as *L. smyrnensis*), Aydın (Burckhardt and Önuçar, 1993).

Livilla horvathi (Scott, 1879)

Reported from İzmir (Klimaszewski and Lodos, 1979; Önuçar, 1983, as *Floria horvathi*), Kars (Burckhardt, 1988), Konya (Burckhardt and Önuçar, 1993), Erzurum (Güçlü and Burckhardt, 1996).

Livilla spectabilis (Flor, 1861)

Reported from İzmir (Önuçar and Ulu, 1991).

Material examined: 1 ♂, 2 ♀, Hatay, Gavur Dağ, 36°45'N, 36°19'E, 18.07.1984, *Genista* sp. (dry mounted, SU); 1 ♀, Altınözü, 36°7'N, 36°15'E, 10.07.1984, grass (dry mounted, SU).

Psylla alni (Linnaeus, 1758)

Reported from İzmir (Klimaszewski and Lodos, 1979; Önuçar, 1983).

Material examined: 1 thorax with forewing, Düzce, 40°50'N, 31°9'E, 05.07.1979 (dry mounted, SU).

Spanioneura caucasica Loginova, 1968

Reported from Artvin (Burckhardt, 1988).

Spanioneura pechai (Klimaszewski and Lodos, 1977), stat. rev.

(Figures 1a and 1b)

Reported from Mardin (Klimaszewski and Lodos, 1977, as *Amblyrhina pechai*), southeastern Anatolia (Özgen et al., 2012b).

Material examined: 2 ♂, 3 ♀, Adıyaman, 37°45'N, 38°16'E, 18.06.2007, 29.06.2007, *Prunus dulcis* (leg. İ. Özgen and C. Gözüaıcık) (dry mounted, NHMB); 4 ♂, 3 ♀, Adıyaman, Çemberlitaş, 37°48'N, 38°20'E, 01.05.2007, 22.05.2007, 31.05.2007, *Hippophae rhamnoides*, trees (leg. İ. Özgen and C. Gözüaıcık) (dry mounted, NHMB); 22 ♂, 13 ♀, Adıyaman, Küçükboyalı, 37°45'N, 38°16'E, 01.06.2007, 07.06.2007, 16.06.2007, 23.06.2007, 29.06.2007, *Prunus dulcis*, *Ficus carica*, *Glycyrrhiza glabra* (leg. İ. Özgen and C. Gözüaıcık) (dry mounted, NHMB); 1 ♀, Bahçecik, 38°40'N, 36°17'E, 30.05.2007, *Olea europaea* (leg. C. Gözüaıcık and İ. Özgen) (dry mounted, NHMB); 1 ♀, Bölükayla, 37°52'N, 38°28'E, 18.09.1909, *Prunus dulcis* (leg. İ. Özgen and C. Gözüaıcık) (dry mounted, NHMB); 1 ♂, Hilvan, Faik, 37°38'N, 38°58'E, 14.06.2007, *Prunus dulcis* (leg. İ. Özgen and C. Gözüaıcık) (dry mounted, NHMB); 3 ♂, 2 ♀, Şanlıurfa, Birecik, 37°1'N, 37°58'E, 26.06.2007, *Crataegus oxyacantha*, *Prunus dulcis* (leg. C. Gözüaıcık and İ. Özgen) (dry mounted, NHMB); 6 ♂, 6 ♀, Yalıca, 37°26'N, 38°23'E, 23.05.2007, 22.06.2007, 27.07.2007, 03.11.2007, *Prunus dulcis* (leg. İ. Özgen and C. Gözüaıcık) (dry mounted, NHMB); 6 ♂, 6 ♀, Yaylalı, 36°30'N, 32°6'E, 01.06.2007, *Prunus dulcis* (leg. İ. Özgen and C. Gözüaıcık) (dry mounted, NHMB).

Comment: *Spanioneura pechai* was synonymized by Burckhardt and Önuçar (1993) with *S. turkiana*. *S. pechai* was described by Klimaszewski and Lodos (1977) only from females. We examined a long series of male and female *S. pechai* (NHMB). *S. pechai* has broadly rounded genae with whitish, dense, and very conspicuous setae, and white, semiopaque forewings with black contrasting dots at the apices of the veins along apical wing margin. *S. turkiana*, in contrast, has indistinctly angular genae covered with sparse setae, and semitransparent forewings that are colorless at the base and infuscate apically, with brown, weakly contrasting dots at the apices of the veins along the apical wing margin. The closely related *S. pechai*, *persica*, and *turkiana*, which probably all develop on *Prunus dulcis* (Rosaceae), can be separated by the key given below.

Spanioneura persica Burckhardt and Lauterer, 1993 (Figures 1c and 1d)

Material examined: 2 ♀, Kırşehir, Hirfanlı Barajı, 39°16'N, 33°31'E, 18.08.1979, *Prunus dulcis* (dry mounted, SU).

Comment: New record for Turkey.

Spanioneura turkiana (Klimaszewski and Lodos, 1977)

(Figures 1e and 1f)

Reported from Malatya, Adıyaman, Elazığ, Siirt (Klimaszewski and Lodos, 1977, 1979, as *Amblyrhina turkiana*), Elazığ (Burckhardt and Önuçar, 1993).

Material examined: 3 forewings, head and thorax, Kırşehir, 39°8'N, 34°10'E, 18.08.1979, *Prunus dulcis* (dry mounted, SU).

Key to Turkish species of *Spanioneura* spp. associated with *Prunus dulcis*

1 Forewing colorless basally and ochreous along apical wing margin, with brown, weakly contrasting dots at the apices of the veins along apical wing margin (Figure 1e) ... *S. turkiana*

- Forewing colorless with light brown patches along apical wing margin or whitish; with black, strongly contrasting dots at the apices of the veins along apical wing margin (Figures 1a and 1c) 2

2 Forewing whitish, with short, straight to concave vein M_{3+4} (Figures 1a). Genae broadly, evenly rounded, densely covered in very conspicuous setae (Figure 1b) *S. pechai*

- Forewing colorless with light brown patches along apical wing margin, with long, sinuate vein M_{3+4} (Figures

1c). Genae indistinctly angular, sparsely covered in less conspicuous setae (Figure 1b)..... *S. persica*

Triozidae

***Bactericera albiventris* (Foerster, 1848)**

Reported from Ankara (Vondráček, 1953, as *Trioza albiventris*), Tunceli, Kars (Burckhardt, 1988), Konya (Burckhardt and Önuçar, 1993, as *Trioza albiventris*), Erzurum (Güçlü and Burckhardt, 1996).

***Bactericera crithmi* (Löw, 1879)**

Reported from Ankara, Adana (Vondráček, 1953, as *Trioza crithmi*).

***Bactericera femoralis* (Foerster, 1848)**

Reported from Erzurum (Güçlü and Burckhardt, 1996).

***Bactericera nigricornis* (Foerster, 1848)**

Reported from Ankara (Vondráček, 1953, as *Trioza nigricornis*), Gümüşhane (Burckhardt, 1988, as *Bactericera brassicae*), Burdur, Ankara, Konya, Tunceli, Ağrı (Burckhardt and Önuçar, 1993, as *Trioza nigricornis*), Erzurum (Güçlü and Burckhardt, 1996).

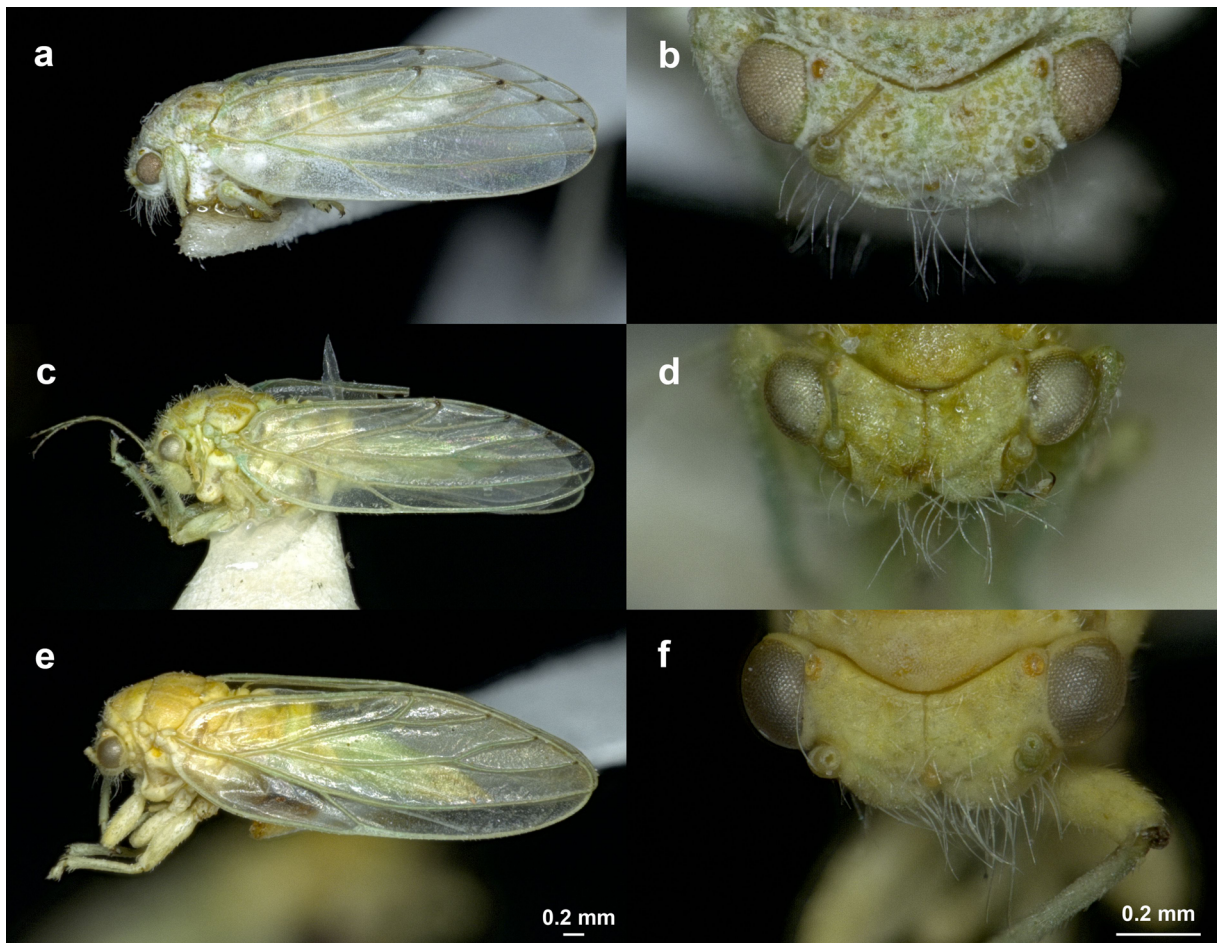


Figure 1. *Spanioneura* spp.: a, b) *S. pechai*; c, d) *S. persica*; e, f) *S. turkiana*. — a, c, e) habitus; b, d, f) head.

Bactericera tremblayi (Wagner, 1961)

Reported from Erzurum (Klimaszewski and Lodos, 1979), Konya, Gümüşhane, Erzurum (Burckhardt and Önuçar, 1993, as *Trioza tremblayi*).

Material examined: 1 ♂, 1 ♀, İzmir, Menemen, Süleymanlı, 38°38'N, 27°10'E, 07.12.2006, *Allium cepa* (leg. T. Kilic) (dry mounted, NHMB); 1 ♂, 1 ♀, İzmir, Tire, Osmancık, 38°4'N, 27°53'E, 08.12.2006, *Allium cepa* (leg. T. Kilic) (dry mounted, NHMB).

Bactericera trigonica Hodkinson, 1981

Reported from İzmir (Hodkinson, 1981, as *Trioza* (*Bactericera*) *trigonica*), Sakarya (Burckhardt and Önuçar, 1993, as *Trioza trigonica*).

Egeirotrioza populi (Horváth, 1915)

Reported from Kars (Burckhardt, 1988).

Eutrioza opima Loginova, 1964

Reported from Konya (Klimaszewski and Lodos, 1980, as *Eutrioza bifasciata*).

Phyllopecta trisignata (Löw, 1886)

Reported from İzmir (Önuçar and Ulu, 1991, as *Trioza trisignata*).

Trioza achilleae Wagner, 1955

Reported from Artvin, Kars (Burckhardt, 1988).

Trioza alacris Flor, 1861

Reported from İzmir (Klimaszewski and Lodos, 1979; Önuçar, 1983, as *Heterotrioza alacris*), İstanbul (Burckhardt and Önuçar, 1993).

Material examined: 2 ♂, 1 ♀, İçel, Göktepe Dağı, 1.5 km S of Aydınlar, 36°45'N, 34°08'E, 1395 m, 19–23.07.2004, cedar forest (dry mounted, USMB); 2 ♂, 2 ♀, İçel, Göktepe Dağı, 1.5 km S of Aydınlar, 36°45'N, 34°08'E, 1395 m, 19.07.2004, in light, cedar forest (dry mounted, USMB); 3 ♂, 2 ♀, İçel, Göktepe Dağı, 1.5 km S of Aydınlar, 36°45'N, 34°08'E, 1395 m, 20.07.2004, in light, cedar forest (dry mounted, USMB); 1 ♂, 2 ♀, İçel, surroundings of Aydınlar, 25 km NW Erdemli, 36°48'N, 34°10'E, 09–12.06.2000, cedar forest (dry mounted, USMB); 2 ♀, İçel, Aydınlar, N of Erdemli, 36°45'N, 34°08'E, 1390 m, 09–11.06.2005, cedar forest (dry mounted, USMB); 1 ♂, İçel, 3 km S of Aydınlar, 36°44'N, 34°08'E, 1400 m, 31.05.2001, *Abies* sp. (preserved in 70% ethanol, USMB); 3 ♂, 3 ♀, İçel, Aydınlar, surroundings of Avgadı, 25 km N of Erdemli, 36°48'N, 34°10'E, 1380 m, 10.06.2000, cedar forest (preserved in 70% ethanol, USMB).

Trioza anthrisci Burckhardt, 1986

Reported from Artvin, Kars (Burckhardt, 1988).

Trioza centranthi (Vallot, 1829)

Reported from Sakarya, Çankırı (Burckhardt and Önuçar, 1993).

Trioza foersteri Meyer-Dür, 1871

Reported from Sakarya (Burckhardt and Önuçar, 1993).

Trioza galii Foerster, 1848

Reported from Urfa (Klimaszewski and Lodos, 1979, as *Trioza galli* [sic]), Kars (Burckhardt, 1988), Aydın (Burckhardt and Önuçar, 1993).

Trioza ilicina (De Stefani Perez, 1901)

Reported from Konya, Adana (Burckhardt and Önuçar, 1993).

Trioza kantshavelii Gegechkori, 1977

Reported from Artvin (Burckhardt, 1988).

Trioza magnisetosa Loginova, 1964

Reported from İçel, Adana (Klimaszewski and Lodos 1977, as *Heterotrioza magnisetosa*), Nevşehir, Tunceli (Burckhardt and Önuçar, 1993), southeastern Anatolia (Özgen et al., 2012b).

Material examined: 1 ♂, 1 ♀, Gülşehir, 38°44'N, 34°37'E, 16.08.1979, *Elaeagnus* sp. (dry mounted, SU); 1 ♂, Sarıkamış, 40°19'N, 42°35'E, 15.07.1982, *Verbascum* sp. (dry mounted, SU); 2 ♂, 1 ♀, Nevşehir, 38°37'N, 34°42'E, 06.08.2009, *Vitis vinifera* (leg. S. Bayram) (dry mounted, NHMB); 1 ♂, 3 ♀, Ergani, 38°16'N, 39°46'E, 02.06.2008, 27.06.2007, *Hippophae rhamnoides* (leg. İ. Özgen and C. Gözüaıcık) (dry mounted, NHMB); 1 ♂, 2 ♀, Ergani, Pınarkaya, 38°14'N, 39°41'E, 06.06.2007, 12.06.2007, 15.09.2008, *Hippophae rhamnoides*, *Rosa canina*, tree (leg. İ. Özgen and C. Gözüaıcık) (dry mounted, NHMB).

Trioza neglecta Loginova, 1978

Reported from Nevşehir (Loginova, 1978); Urfa, Elazığ (Klimaszewski and Lodos, 1979, as *Heterotrioza neglecta*), Kars (Burckhardt, 1988), Adana (Lauterer and Janiček, 1990), Burdur, Konya, Adana, Niğde, Nevşehir (Burckhardt and Önuçar, 1993), southeastern Anatolia (Özgen et al., 2012b).

Material examined: 3 ♀, Düziçi, 37°15'N, 36°28'E, 07.06.1984, *Hippophae rhamnoides* (dry mounted, SU); 1 ♀, Altınözü, 33°7'N, 36°15'E, 10.07.1984; 1 ♀, Yozgat, İçde, 39°49'N, 34°48'E, 19.08.1979, *Hippophae rhamnoides* (dry mounted, SU); 2 ♂, 7 ♀, 1 damaged adult, Ergani, 38°16'N, 39°46'E, 30.05.2007, 02.06.2008, 23.06.2007, 14.07.2007, *Hippophae rhamnoides* (leg. İ. Özgen and C. Gözüaıcık) (dry mounted, NHMB); 1 ♂, 2 ♀, Ergani, Pınarkaya, 38°14'N, 39°41'E, 12.06.2007, 27.06.2007, *Hippophae rhamnoides* (leg. İ. Özgen and C. Gözüaıcık) (dry mounted, NHMB); 5 ♂, 4 ♀, Faik, Hilvan, 37°38'N, 38°58'E, 30.05.2007, *Hippophae rhamnoides* (leg. İ. Özgen and C. Gözüaıcık) (dry mounted, NHMB); 1 ♂, Küçük Boyalı, 41°0'N, 29°5'E, 16.06.2007, *Glycyrrhiza glabra* (leg. İ. Özgen and C. Gözüaıcık) (dry mounted, NHMB).

Trioza remota Foerster, 1848

Reported from İzmir (Önuçar and Ulu, 1991), İçel (Burckhardt and Önuçar, 1993), southeastern Anatolia (Özgen et al., 2012b).

Material examined: 1 ♀, Ergani, Pınarkaya, 38°14'N, 39°41'E, 26.07.2007, *Morus alba* (leg. İ. Özgen and C. Gözüaıcık) (dry mounted, NHMB); 1 ♀, Adıyaman,

Çemberlitaş, 37°48'N, 38°20'E, 14.07.2007, *Crataegus oxyacantha* (leg. İ. Özgen and C. Gözüaık) (dry mounted, NHMB).

Trioza rhamni (Schrank, 1801)

Reported from Kars (Burckhardt, 1988).

Trioza scottii Löw, 1880

Reported from Konya (Klimaszewski and Lodos, 1980, as *Heterotrioza scotti* [sic]).

Trioza urticae (Linnaeus, 1758)

Reported from İcel, Adana (Klimaszewski and Lodos, 1979), Artvin (Burckhardt, 1988), Erzurum (Güçlü and Burckhardt, 1996).

Material examined: 1 ♀, Bolu, Yedigöller, 40°55'N, 31°44'E, 27.05.1980, grass (dry mounted, SU).

Trioza sp.

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- Comment: The specimens at hand resemble *Trioza marginepunctata* Flor, 1861. More material is required for identification.
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