

Original article (Orijinal araştırma)

Aphid (Hemiptera: Aphididae) species determined in Çanakkale Province with a new record for the aphid fauna of Turkey¹

Türkiye yaprakbiti faunası için yeni bir kayıt ile birlikte Çanakkale ilinde belirlenen yaprakbiti (Hemiptera: Aphididae) türleri

Şahin KÖK^{2*}

İsmail KASAP²

Işıl ÖZDEMİR³

Summary

As a result of a study conducted to determine aphid species on herbaceous plants, shrubs and trees in cultivated and uncultivated areas from 2013 to 2015 in Çanakkale Province, Turkey, 39 species and one subspecies in 24 genera of Aphididae family were determined. Of these species, *Aphis sedi* Kaltenbach, 1843 collected from *Lampranthus* sp. (Aizoaceae) was new record for the aphid fauna of Turkey. Also, *Helianthus annuus* L. (Asteraceae) and *Pimpinella saxifraga* L. (Apiaceae) were determined as new host records for *Aulacorthum solani* (Kaltenbach, 1843) and *Hyadaphis foeniculi* (Passerini, 1860) in Turkey, respectively. The present study and other current studies indicated that local studies are important for the aphid fauna of Turkey.

Keywords: Aphid, aphid fauna, Çanakkale, Turkey

Özet

Çanakkale ilinde 2013-2015 yılları arasında tarım ve tarım dışı alanlarda bulunan otsu bitki, çalı ve ağaçlar üzerinde bulunan yaprakbitlerini belirlemek için gerçekleştirilen bu çalışmada Aphididae familyasından 24 cinse ait 39 tür ve bir alttür belirlenmiştir. Bu türlerden *Lampranthus* sp. (Aizoaceae) üzerinden toplanan *Aphis sedi* Kaltenbach, 1843 Türkiye yaprakbiti faunası için yeni kayıttır. Ayrıca *Helianthus annuus* L. (Asteraceae) ve *Pimpinella saxifraga* L. (Apiaceae) sırasıyla *Aulacorthum solani* (Kaltenbach, 1843) ve *Hyadaphis foeniculi* (Passerini, 1860) için ülkemizde yeni konukçu kaydı olarak belirlenmiştir. Mevcut çalışma ve yapılan diğer güncel çalışmalar bölgesel çalışmaların Türkiye yaprakbiti faunası için önemini göstermiştir.

Anahtar sözcükler: Yaprakbiti, yaprakbiti faunası, Çanakkale, Türkiye

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² Department of Plant Protection, Faculty of Agriculture, Çanakkale Onsekiz Mart University, Çanakkale, Turkey

³ Plant Protection Central Research Institute, Ankara, Turkey

* Corresponding author (Sorumlu yazar) e-mail: sahinkok@gmail.com

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Introduction

Aphids (Hemiptera: Aphididae) are important pests feeding on herbaceous plants, shrubs and trees throughout the world. While approximately 40% of the aphid fauna of the world live on trees, the other 55% live on herbaceous plants and shrubs (the host plants of the remaining 5% are unknown). Many factors such as complicated life cycle, host plants, humidity, polymorphism, stress and temperature have significant effect on morphology of aphids. Therefore, diagnosis of aphids is quite complicated (Blackman & Eastop, 2006).

Aphids cause direct damage by sucking plant sap and also excrete honeydew on plant leaves. Moreover, they cause indirect damage by transferring phytopathogenic virus diseases. Despite using different control methods against aphids, their damage to cultivated and uncultivated plants increases day by day. In developed countries, such as the USA, crop losses caused by aphids were estimated at about 30% per annum. Also, losses were estimated at about 50% per year in developing countries, including Turkey (Ruberson, 1999). For example, the invasive grapevine aphid (*Aphis illinoisensis* Shimer, 1866) is an important pest causing damage in vineyards in Turkey, Greece, Tunisia and Algeria (Remaudière et al., 2003; Tsitsipis et al., 2005; Kamel-Ben Halima & Mdellel 2010; Laamari & Coeur d'Acier, 2010).

The known world aphid fauna recently reached about 5000 species belonging to 510 genera (Blackman & Eastop, 2016). The first studies of the aphid fauna of Turkey were carried out by Trotter (1903), Fahringer (1922) and Houard (1922). Then Bodenheimer & Swirski (1957) listed the Mediterranean aphids including 90 aphid species from Turkey. The *Aphidoidea* of Turkey listed 258 aphid species collected by Çanakçioğlu (1975) and is the most comprehensive study up to the 21st century in Turkey. In the 2000s, there was a significant increase in studies of the aphid fauna of Turkey. These studies were conducted by Toros et al. (1996), Görür (2002), Toros et al. (2002), Aslan & Uygun (2005), Özdemir et al. (2005), Özdemir et al. (2006), Remaudière et al. (2006), Geneci & Görür (2007), Toper Kaygın et al. (2008), Akyürek et al. (2010), Akyıldırım et al. (2011), Barjadze et al. (2011), Görür et al. (2012), Barjadze & Özdemir (2014), Barjadze et al. (2014a), Güçlü et al. (2015) and Şenol et al. (2015a). With new records these added, the aphid fauna of Turkey reached to 532 species belonging to 142 genera (Şenol et al., 2015b).

Although these studies of the aphid fauna of Turkey were conducted in different areas, the known this aphid fauna is still limited. Also, there were no detailed studies focusing on Çanakkale Province. The aim of this study was to determine the aphid species and their host plants in cultivated and uncultivated areas of Çanakkale Province, Turkey.

Material and Methods

Aphid species were collected from herbaceous plants, shrubs and trees from 2013 to 2015 in Çanakkale Province, Turkey. Both apterous and alate aphid specimens were collected in cultivated and uncultivated areas from their host plants using a soft brush and put into an Eppendorf tube contained 70% alcohol. Collection and preparation of aphid specimens followed to the method of Hille Ris Lambers (1950).

Identification of aphid species, was conducted according to Bodenheimer & Swirski (1957), Heie (1986), Blackman & Eastop (2006, 2016). Host plants of aphids were arranged according to Holman (2009). The World distribution and taxonomic statutes of aphid species were checked according to Fauna Europaea (<http://www.faunaeur.org>) (Nieto Nafria, 2016). All of aphid specimens in this study were collected by Şahin Kök and voucher specimens were deposited in the Department of Plant Protection of Agricultural Faculty, Çanakkale Onsekiz Mart University, Turkey.

Results and Discussion

In this study conducted in Çanakkale Province, 39 species and one aphid subspecies belonging to six subfamilies (Anoeciinae, Aphidinae, Calaphidinae, Chaitophorinae, Eriosomatinae and Lachninae) in 24 genera of the family, Aphididae, were identified on host plants collected from cultivated and uncultivated areas. The sampling was done on herbaceous plants, shrubs and trees. Among identified aphid species, *Aphis sedi* Kaltenbach, 1843 collected from *Lampranthus* sp. (Aizoaceae) was determined as new record for the aphid fauna of Turkey. *Helianthus annuus* L. (Asteraceae) and *Pimpinella saxifraga* L. (Apiaceae) were determined as new host records for *Aulacorthum solani* (Kaltenbach, 1843) and *Hyadaphis foeniculi* (Passerini, 1860) in Turkey, respectively. Also, *Aphis craccivora* Koch, 1854, *Aphis fabae* Scopoli, 1763 and *Aphis gossypii* Glover, 1877 were determined as the most common aphid species. Distribution map (Figure 1), taxonomy, locality, coordinates, host plants and collected dates of identified aphid species are given below.

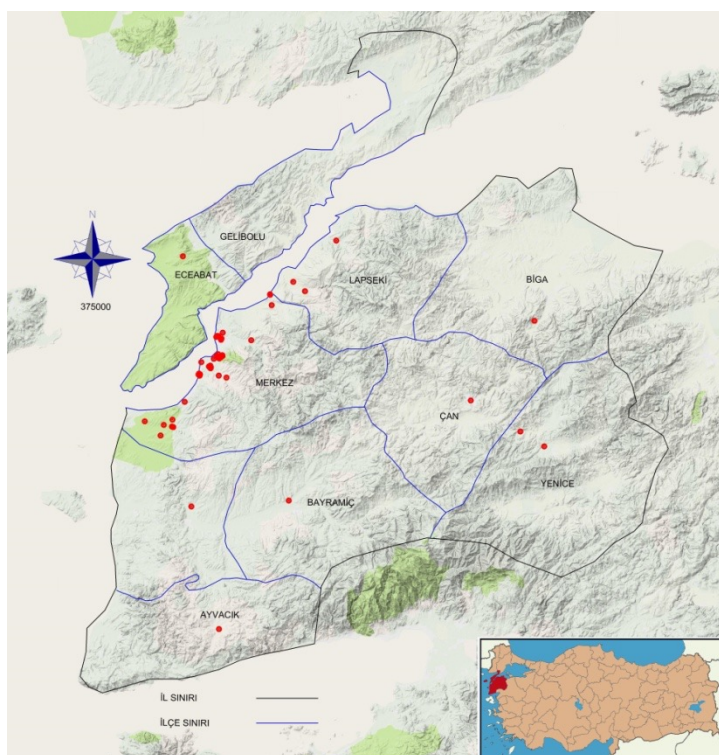


Figure 1. Location of sites sampled for aphid species in Çanakkale, Province, Turkey.

Family Aphididae

Subfamily Anoeciinae

Anoecia corni (Fabricius, 1775)

Material examined: Çanakkale, Halileli, 39°58'27.9" N 26°17'40.9" E, *Avena* sp. (Poaceae), 09.X.2013.

World distributions: Worldwide except Australian region (Nieto Nafria, 2016).

Turkish distributions: *A. corni* was recorded from Tekirdağ, Mersin, Diyarbakır, Isparta, Trabzon (Tuatay & Remaudière, 1964; Toros et al., 2002; Ölmez Bayhan et al., 2003; Akyıldırım et al., 2014; Barjadze et al., 2014b).

Subfamily Aphidinae

Tribe Aphidini

Aphis craccivora Koch, 1854

Material examined: Çanakkale, Kepez-TOKİ, 40°06'25.8" N 26°24'46.6" E, *Lycopersicum esculentum* L. (Solanaceae), *Phaseolus vulgaris* L. (Fabaceae) and *Solanum melongena* L. (Solanaceae), 28.XI.2013; Çanakkale, university campus, 40°06'31.1" N 26°24'39.0" E, *Trigonella* sp. (Fabaceae), 15.V.2014; Çanakkale, Kepez, 40°06'23.3" N 26°23'56.9" E, *Acacia* sp. (Fabaceae), 25.V.2014; Çanakkale, Yapıldak, 40°13'56.1" N 26°32'25.4" E, *Portulaca oleracea* L. (Portulacaceae), 06.VI.2015; Çanakkale, university campus, 40°06'41.0" N 26°25'00.4" E, *Robinia pseudoacacia* L. (Fabaceae), 06.VI.2015.

World distribution: Worldwide (Nieto Nafria, 2016).

Turkish distribution: *A. craccivora* was recorded from Adana, Aksaray, Ankara, Artvin, Balıkesir, Bartın, Çanakkale, Denizli, Diyarbakır, Hatay, İzmir, Kahramanmaraş, Kastamonu, Mersin, Niğde, Samsun, Trabzon and Van (Bodenheimer & Swirski, 1957; Tuatay, 1993; Toros et al., 1996; Toros et al., 2002; Ölmez Bayhan et al., 2003; Görür, 2004; Aslan & Uygun, 2005; Ünal & Özcan, 2005; Ayyıldız & Atlıhan, 2006; Özdemir et al., 2006; Geneci & Görür, 2007; Çıraklı et al., 2008; Eser et al., 2009; Toper Kaygın et al., 2009; Akyürek et al., 2012; Akyıldırım et al., 2014).

There are different remarks about *A. craccivora* on *Robinia* (Fabaceae) and other host plants. Takahashi (1966) indicated that a long-haired variant of *A. craccivora* on *Robinia* (Fabaceae) has been separated as a subspecies. Mehrparvar et al. (2012) reported that Iranian populations of *A. craccivora* associated with *R. pseudoacacia* are different from other population and their populations are not homogeneous morphological entities. Blackman & Eastop (2016) reported that *A. craccivora* populations on *Robinia* should be identified as *Aphis robiniae* Macchiati, 1885. Despite these opinions of different authors, we believe that morphological and molecular differences of *A. craccivora* populations on both *Robinia* and other host plants should be further investigated.

Aphis fabae Scopoli, 1763

Material examined: Çanakkale, İzmir Road, 40°05'17.1" N 26°23'28.0" E, *Vicia faba* L. (Fabaceae), 14.III.2013; Çanakkale, Halileli, 39°59'16.3" N 26°17'45.2" E, *Sonchus* sp. (Asteraceae), 21.III.2013; Çanakkale, Kepez, Dardanos Campus, 40°04'32.9" N 26°21'38.9" E, *Artemisia* sp. (Asteraceae), 18.IV.2013; Çanakkale, city center, 40°09'02.2" N 26°24'23.4" E, *Hedera helix* L. (Araliaceae), 21.IV.2013; Çanakkale, city center, 40°08'45.2" N 26°25'06.2" E, *Viburnum* sp. (Adoxaceae), 21.IV.2013; Çanakkale, Ezine, Akköy, 39°49'11.1" N 26°20'42.4" E, *Onopordum* sp. (Asteraceae), 25.IV.2013; Çanakkale, Güzelyalı, 40°01'21.6" N 26°19'35.3" E, *Cistus* sp. (Cistaceae), 02.V.2013; Çanakkale, Kumkale, 39°59'03.2" N 26°13'34.0" E, *Rumex* sp. (Polygonaceae), 02.V.2013; Çanakkale, Çan Road, 40°08'34.7" N 26°29'36.4" E, *Phaseolus vulgaris* L. (Fabaceae), 04.IX.2013; Çanakkale, university campus, 40°06'37.3" N 26°24'58.6" E, *Viburnum opulus* L. (Adoxaceae), 04.IV.2014; Çanakkale, Kepez, 40°05'29.6" N 26°23'12.5" E, *Cirsium arvense* (L.) Scop. (Asteraceae), 25.IV.2014; Çanakkale, university campus, 40°06'43.1" N 26°25'16.0" E, *Spartium junceum* L. (Fabaceae), 23.V.2014; Çanakkale, Yapıldak, 40°13'56.1" N 26°32'25.4" E, *Vitis* sp. (Vitaceae), 10.VIII.2014; Çanakkale, university campus, 40°06'41.0" N 26°25'00.4" E, *Robinia pseudoacacia* L. (Fabaceae), 06.VI.2015.

World distribution: Worldwide except Australian region (Nieto Nafria, 2016).

Turkish distribution: *A. fabae* was recorded from Adana, Aksaray, Ankara, Artvin, Balıkesir, Bartın, Çanakkale, Denizli, Diyarbakır, Hatay, İstanbul, İzmir, Kahramanmaraş, Konya, Mersin, Niğde, Osmaniye, Rize, Trabzon and Van (Bodenheimer & Swirski, 1957; Tuatay, 1993; Toros et al., 1996; Toros et al., 2002; Ölmez Bayhan et al., 2003; Aslan & Uygun, 2005; Ayyıldız & Atlıhan, 2006; Geneci & Görür, 2007; Çıraklı et al., 2008; Eser et al., 2009; Toper Kaygın et al., 2009; Akyıldırım et al., 2014).

Aphis fabae solanella Theobald, 1914

Material examined: Çanakkale, Ayvacık, Assos Road, 39°34'56.5" N 26°25'00.1" E, *Solanum nigrum* L. (Solanaceae), 10.IX.2013.

World distribution: Worldwide except Australian and Nearctic regions (Nieto Nafria, 2016).

Turkish distribution: *A. fabae solanella* was recorded from Adana, Ankara, Bartın, Diyarbakır, Hatay, Kahramanmaraş, Mersin, Osmaniye and Van (Toros et al., 1996; Toros et al., 2002; Ölmez Bayhan et al., 2003; Aslan & Uygun, 2005; Özdemir et al., 2006; Toper Kaygın et al., 2009).

Aphis gossypii Glover, 1877

Material examined: Çanakkale, Çan, Yenice Road, 39°58'00.9" N 27°10'24.1" E, *Capsicum* sp. (Solanaceae), 04.IX.2013; Çanakkale, İzmir Road, 39°58'24.7" N 26°17'53.4" E, *Gossypium hirsutum* L. (Malvaceae), 24.IX.2013; Çanakkale, Kepez, Dardanos Campus, 40°04'32.5" N 26°21'44.4" E, *Viburnum* sp., (Adoxaceae) 02.V.2014; Çanakkale, university campus, 40°06'38.9" N 26°24'43.9" E, *Malva* sp. (Malvaceae), 23.V.2014; Çanakkale, Yapıldak, 40°13'56.1" N 26°32'25.4" E, *Abelmoschus esculentus* (L.) Moench (Malvaceae), 06.VI.2015.

World distribution: Worldwide (Nieto Nafria, 2016).

Turkish distribution: *A. gossypii* was recorded from Adana, Aksaray, Ankara, Artvin, Balıkesir, Bartın, Çanakkale, Denizli, Diyarbakır, Hatay, İzmir, Kahramanmaraş, Mersin, Niğde, Rize, Samsun, Trabzon and Van (Tuatay, 1993; Toros et al., 1996; Toros et al., 2002; Ölmez Bayhan et al., 2003; Görür, 2004; Aslan & Uygun, 2005; Ayyıldız & Atlıhan, 2006; Özdemir et al., 2006; Geneci & Görür, 2007; Çıraklı et al., 2008; Eser et al., 2009; Toper Kaygın et al., 2009; Akyürek et al., 2012; Akyıldırım et al., 2014).

Aphis hederae Kaltenbach, 1843

Material examined: Çanakkale, city center, 40°09'02.2" N 26°24'23.4" E, *Hedera helix* L. (Araliaceae), 21.IV.2013.

World distribution: Afrotropical region, Nearctic region, Near East, North Africa and Neotropical region (Nieto Nafria, 2016).

Turkish distribution: *A. hederae* was recorded from Mersin (Toros et al., 2002).

Aphis nerii Boyer de Fonscolombe, 1841

Material examined: Çanakkale, city center, 40°08'56.4" N 26°24'17.9" E, *Nerium* sp. (Apocynaceae), 11.VII.2014.

World distribution: Worldwide (Nieto Nafria, 2016).

Turkish distribution: *A. nerii* was recorded from Adana, Ankara, Bartın, Diyarbakır, İzmir, Kahramanmaraş, Mersin and Samsun (Bodenheimer & Swirski, 1957; Toros et al., 2002; Ölmez Bayhan et al., 2003; Aslan & Uygun, 2005; Eser et al., 2009; Toper Kaygın et al., 2009; Akyürek et al., 2012).

Aphis pomi de Geer, 1773

Material examined: Çanakkale, Kalabalık, 40°04'12.9" N 26°25'53.1" E, *Malus domestica* Borkh. (Rosaceae), 22.X.2013.

World distribution: Worldwide except Afrotropical region (Nieto Nafria, 2016).

Turkish distribution: *A. pomi* was recorded Adana, Ankara, Artvin, Bartın, Çanakkale, Diyarbakır, Hatay, Kahramanmaraş, Mersin, Niğde, Samsun and Van (Bodenheimer & Swirski, 1957; Tuatay, 1993; Toros et al., 1996; Toros et al., 2002; Ölmez Bayhan et al., 2003; Görür, 2004; Aslan & Uygun, 2005; Toper Kaygın et al., 2009; Akyürek et al., 2012; Akyıldırım et al., 2014).

Aphis punicae Passerini, 1863

Material examined: Çanakkale, Yapıldak, 40°13'56.1" N 26°32'25.4" E, *Punica granatum* L. (Lythraceae), 06.VI.2015.

World distribution: Afrotropical region, North Africa, Near East and Oriental region (Nieto Nafria, 2016).

Turkish distribution: *A. punicae* was recorded from Adana, Antalya, Bartın, Çanakkale, Denizli, Diyarbakır Hatay, İzmir, Kahramanmaraş and Mersin (Bodenheimer & Swirski, 1957; Tuatay, 1993; Toros et al., 2002; Ölmez Bayhan et al., 2003; Aslan & Uygun, 2005; Çıraklı et al., 2008; Eser et al., 2009; Toper Kaygın et al., 2009).

Aphis rumicis Linnaeus, 1758

Material examined: Çanakkale, Kepez, Dardanos Campus, 40°04'32.9" N 26°21'38.9" E, *Rumex* sp. (Polygonaceae), 18.IV.2013.

World distribution: Worldwide except Australian and Afrotropical region (Nieto Nafria, 2016).

Turkish distribution: *A. rumicis* was recorded from Adana, Ankara (Bodenheimer & Swirski, 1957; Toros et al., 2002; Özdemir et al., 2006).

Aphis sedi Kaltenbach, 1843

Material examined: Çanakkale, Kepez, 40°06'44.7" N 26°24'22.9" E, *Lampranthus* sp. (Aizoaceae), 14.V.2014.

World distribution: Australia, Europe, Kazakhstan, New Zealand, North Korea, South Africa, North and South America, (Blackman & Eastop, 2016).

Aphis sedi is new species for the Turkish aphid fauna (Figure 2).

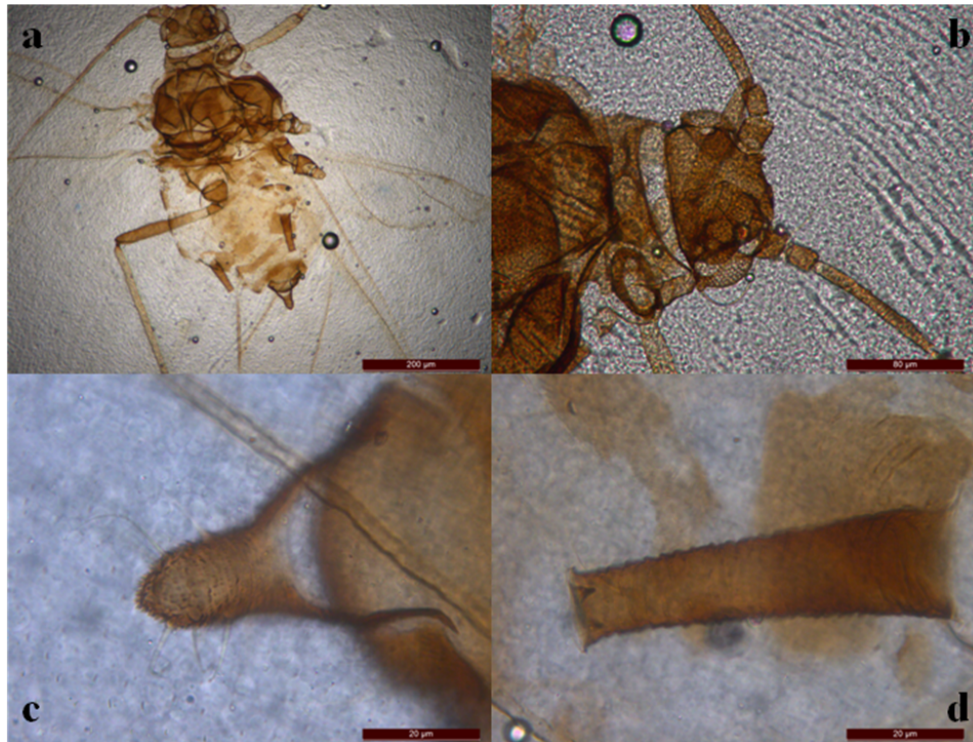


Figure 2. *Aphis sedi* Kaltenbach, 1843 (a) alate adult, (b) head, (c) cauda, (d) siphunculus.

Aphis spiraecola Patch, 1914

Material examined: Çanakkale, university campus, 40°06'34.0" N 26°25'00.8" E, *Citrus limon* L. (Rutaceae), 09.IV.2013.

World distribution: Worldwide except Australian and east Palearctic regions (Nieto Nafria, 2016).

Turkish distribution: *A. spiraecola* was recorded from Adana, Artvin, Bartın, Denizli, Diyarbakır, Hatay, İzmir, Kahramanmaraş, Mersin, Samsun and Trabzon (Toros et al., 2002; Ölmez Bayhan et al., 2003; Aslan & Uygun, 2005; Çıraklı et al., 2008; Eser et al., 2009; Toper Kaygın et al., 2009; Akyürek et al., 2012; Akyıldırım et al., 2014).

Aphis umbrella (Börner, 1950)

Material examined: Çanakkale, Kepez, 40°05'35.7" N 26°23'25.3" E, *Malva* sp. (Malvaceae), 25.IV.2014.

World distribution: East Palearctic, Near East, North Africa and Nearctic region (Nieto Nafria, 2016).

Turkish distribution: *A. umbrella* was recorded from Adana, Ankara (Bodenheimer & Swirski, 1957; Toros et al., 2002; Özdemir et al., 2006).

Hyalopterus pruni (Geoffroy, 1762)

Material examined: Çanakkale-Eceabat, Küçükanafarta, 40°18'17.6" N 26°19'08.2" E, *Prunus domestica* L. (Rosaceae), 03.V.2013; Çanakkale, Çan city center, 40°01'38.1" N 27°02'54.2" E, *Prunus persica* L. Batsch (Rosaceae), 07.VI.2013; Çanakkale, Kepez, 40°06'31.9" N 26°24'31.8" E, *Typha* sp. (Typhaceae), 25.IV.2014.

World distribution: Worldwide (Nieto Nafria, 2016).

Turkish distribution: *H. pruni* was recorded from Adana, Aksaray, Ankara, Denizli, Diyarbakır, Gaziantep, Hatay, İzmir, Kahramanmaraş, Mersin, Niğde and Van (Bodenheimer & Swirski, 1957; Toros et al., 1996; Toros et al., 2002; Ölmez Bayhan et al., 2003; Aslan & Uygun, 2005; Geneci & Görür, 2007; Çıraklı et al., 2008; Eser et al., 2009).

Tribe Macrosiphini*Acyrtosiphon gossypii* Mordvilko, 1914

Material examined: Çanakkale, Biga, Eybekli, 40°10'54.0" N 27°12'33.8" E, *Sonchus* sp. (Asteraceae), 02.IV.2013.

World distribution: Worldwide except Australian, Nearctic and Neotropical regions (Nieto Nafria, 2016).

Turkish distribution: *A. gossypii* was recorded from Adana, Aydın, Diyarbakır, İzmir, Hatay and Siirt (Tuatay et al., 1972; Tuatay, 1988; Toros et al., 2002).

Aulacorthum solani (Kaltenbach, 1843)

Material examined: Çanakkale, Kepez, 40°06'55.5" N 26°24'37.2" E, *Helianthus annuus* L. (Asteraceae), 15.V.2015.

World distribution: Worldwide (Nieto Nafria, 2016).

Turkish distribution: *A. solani* was recorded from Aydın, Diyarbakır, Erzican, Eskişehir, İstanbul, İzmir, Mersin, Niğde, Osmaniye, Samsun and Van (Tuatay, 1988; Toros et al., 2002; Ölmez Bayhan et al., 2003; Görür, 2004; Eser et al., 2009; Akyürek et al., 2012).

Host plants in Turkey: *Antirrhinum* sp. (Plantaginaceae), *Cydonia oblonga* Mill. (Rosaceae), *Dianthus anatolicus* Boiss. (Caryophyllaceae), *Hydrangea macrophylla* (Thunb.) Ser. (Hydrangeaceae), *Lycopersicum esculentum* L. (Solanaceae), *Taraxacum scaturiginosum* G. Hagl. (Asteraceae), *Tulipa gesneriana* L. (Liliaceae), *Veronica anagalloides* Guss. (Scrophulariaceae) (Tuatay, 1988; Toros et al., 2002; Ölmez Bayhan et al., 2003; Görür, 2004; Eser et al., 2009; Akyürek et al., 2012).

Aulacorthum solani adults were determined from colonizes on *H. annuus*. Both winged and wingless adults of *A. solani* were collected from the host plant. In this study, *H. annuus* was determined as new host record for *A. solani* in Turkey.

Brachycaudus helichrysi (Kaltenbach, 1843)

Material examined: Çanakkale, Kepez, 40°05'29.6" N 26°23'12.5" E, *Cirsium arvense* (L.) Scop. (Asteraceae), 25.IV.2014; Çanakkale, Kepez, 40°06'55.5" N 26°24'37.2" E, *Helianthus annuus* L. (Asteraceae), 15.V.2015; Çanakkale, city center, 40°08'36.5" N 26°25'01.4" E, *Anthemis* sp. (Asteraceae), 31.V.2015.

World distribution: Worldwide (Nieto Nafria, 2016).

Turkish distribution: *B. helichrysi* was recorded from Adana, Adapazarı, Aksaray, Ankara, Antalya, Artvin, Bartın, Burdur, Denizli, Diyarbakır, Erzurum, Eskişehir, Gaziantep, Gümüşhane, Hatay, Isparta, İstanbul, İzmir, Kahramanmaraş, Rize, Samsun, Trabzon and Van (Tuatay et al., 1972; Tuatay, 1988; Toros et al., 2002; Ölmez Bayhan et al., 2003; Aslan & Uygun, 2005; Özdemir et al., 2006; Geneci & Görür, 2007; Çıraklı et al., 2008; Eser et al., 2009; Toper Kaygın et al., 2009; Akyıldırım et al., 2014).

Brachycaudus (Prunaphis) cardui (Linnaeus, 1758)

Material examined: Çanakkale, Kepez, 40°05'29.6" N 26°23'12.5" E, *Cirsium arvense* (L.) Scop. (Asteraceae), 25.IV.2014;

World distribution: Worldwide except Australian region (Nieto Nafria, 2016).

Turkish distribution: *B. cardui* was recorded from Adana, Ankara, Antalya, Artvin, Aydın, Bartın, Bitlis, Bolu, Denizli, Diyarbakır, Erzurum, Isparta, İstanbul, İzmir, Kahramanmaraş, Mersin, Rize, Samsun, Trabzon and Van (Düzgüneş & Tuatay, 1956; Tuatay & Remaudière, 1964; Giray, 1974; Çanakçıoğlu, 1975; Tuatay, 1988; Toros et al., 1996; Toros et al., 2002; Ölmez Bayhan et al., 2003; Aslan & Uygun, 2005; Özdemir et al., 2006; Çıraklı et al., 2008; Eser et al., 2009; Toper Kaygın et al., 2009; Akyürek et al., 2012; Akyıldırım et al., 2014; Barjadze et al., 2014b).

Brevicoryne brassicae (Linnaeus, 1758)

Material examined: Çanakkale, Halileli, 39°58'39.3" N 26°16'27.1" E, 21.III.2013; Çanakkale, Umurbey, 40°15'24.1" N 26°35'56.5" E, 31.III.2013; Çanakkale, Lapseki, 40°20'13.2" N 26°42'27.4" E, 31.III.2013; Çanakkale, Çıplak 39°57'25.2" N 26°15'58.5" E, 19.IX.2013, *Brassica oleracea* L. (Brassicaceae); Çanakkale, Kepez, 40°04'26.4" N 26°24'43.1" E, *Sinapis arvensis* L. (Brassicaceae), 02.V.2014.

World distribution: Worldwide (Nieto Nafria, 2016).

Turkish distribution: *B. brassicae* was recorded from Adana, Aksaray, Amasya, Ankara, Antalya, Diyarbakır, Hatay, İzmir, Kahramanmaraş, Mersin, Ordu, Samsun, Sinop, Şanlıurfa and Van (Bodenheimer & Swirski, 1957; Tuatay et al., 1972; Tuatay, 1988; Toros et al., 1996; Toros et al., 2002; Ölmez Bayhan et al., 2003; Aslan & Uygun, 2005; Özdemir et al., 2006; Geneci & Görür, 2007; Eser et al., 2009; Akyürek et al., 2012).

Cavariella aegopodii (Scopoli, 1763)

Material examined: Çanakkale, university campus, 40°06'48.9" N 26°25'14.2" E, *Salix* sp. (Salicaceae), 24.IV.2015.

World distribution: Worldwide (Nieto Nafria, 2016).

Turkish distribution: *C. aegopodii* was recorded from Ankara, Bartın, Burdur, Çankırı, Erzurum, Eskişehir, İstanbul, İzmir and Van (Bodenheimer & Swirski, 1957; Giray, 1974; Tuatay, 1988; Toper Kaygın et al., 2009).

Dysaphis devectora (Walker, 1849)

Material examined: Çanakkale, Yapıldak, 40°13'52.9" N 26°32'26.7" E, *Malus domestica* Borkh. (Rosaceae), 20.V.2015.

World distribution: East Palearctic, Near East and Nearctic region (Nieto Nafria, 2016).

Turkish distribution: *D. devectora* was recorded from Adana, Aksaray, Ankara, Burdur, Diyarbakır, Kahramanmaraş, Malatya, Mersin, Niğde and Van (Tuatay & Remaudière, 1964; Tuatay, 1990; Toros et al., 1996; Toros et al., 2002; Ölmez Bayhan et al., 2003; Görür, 2004; Aslan & Uygun, 2005; Geneci & Görür, 2007).

Dysaphis (Pomaphis) plantaginea (Passerini, 1860)

Material examined: Çanakkale, Yapıldak, 40°13'52.9" N 26°32'26.7" E, *Malus domestica* Borkh. (Rosaceae), 20.V.2015.

World distribution: Worldwide except Australian region (Nieto Nafria, 2016).

Turkish distribution: *D. plantaginea* was recorded from Adana, Ankara, Antalya, Burdur, Çanakkale, Diyarbakır, Elazığ, Gaziantep, Giresun, Gümüşhane, Hatay, Isparta, Kahramanmaraş, Kayseri, Mersin, Niğde, Samsun and Şanlıurfa (Bodenheimer & Swirski, 1957; Tuatay, 1990; Toros et al., 2002; Ölmez Bayhan et al., 2003; Görür, 2004; Aslan & Uygun, 2005; Akyürek et al., 2012; Barjadze et al., 2014b).

Hyadaphis foeniculi (Passerini, 1860)

Material examined: Çanakkale, city center, 40°09'26.6" N 26°25'16.4" E, *Pimpinella saxifraga* L. (Apiaceae), 21.IV.2013.

World distribution: Worldwide (Nieto Nafria, 2016).

Turkish distribution: *H. foeniculi* was recorded from Adana, Ankara, Bartın, Bitlis, Isparta, İstanbul, and İzmir (Bodenheimer & Swirski, 1957; Tuatay & Remaudière, 1964; Çanakçioğlu, 1966; Giray, 1974; Toros et al., 2002; Özdemir et al., 2006; Toper Kaygın et al., 2009; Barjadze et al., 2014b).

Host plants in Turkey: *Chenopodium album* L. (Amaranthaceae), *Daucus* sp. (Apiaceae), *Foeniculum vulgare* Mill. (Apiaceae), *Lonicera caerulea* L. (Caprifoliaceae), *Lonicera* sp. (Caprifoliaceae), *Pastinaca sativa* L. (Apiaceae), *Petroselinum* sp. (Apiaceae), *Pimpinella anisum* L. (Apiaceae), *Robinia pseudoacacia* L. (Fabaceae) (Bodenheimer & Swirski, 1957; Giray, 1974; Düzgüneş et al., 1982; Tuatay, 1990; Toros et al., 2002; Özdemir et al., 2006; Toper Kaygın et al., 2009; Barjadze et al., 2014b).

Hyadaphis foeniculi adults were determined from colonizes on *P. saxifraga*. Both winged and wingless adults of *H. foeniculi* were collected from the host plant. In this study, *P. saxifraga* was determined as new host record for *H. foeniculi* in Turkey.

Hyperomyzus lactucae (Linnaeus, 1758)

Material examined: Çanakkale, university campus, 40°06'34.8" N 26°24'52.1" E, 11.IV.2013; Çanakkale, Kepez, Dardanos Campus, 40°04'39.9" N 26°21'43.9" E, 18.IV.2013, *Sonchus* sp. (Asteraceae).

World distribution: Worldwide (Nieto Nafria, 2016).

Turkish distribution: *H. lactucae* was recorded from Adana, Ankara, Antalya, Aydın, Diyarbakır, Eskişehir, İstanbul, Kahramanmaraş, Mersin, Muğla and Sakarya (Tuatay & Remaudière, 1964; Tuatay, 1990; Toros et al., 2002; Ölmez Bayhan et al., 2003; Aslan & Uygun, 2005; Özdemir et al., 2006).

Liosomaphis berberidis (Kaltenbach, 1843)

Material examined: Çanakkale, university campus, 40°06'39.8" N 26°24'59.5" E, *Berberis* sp. (Berberidaceae), 27.VI.2015.

World distribution: Australian, east Palearctic, Nearctic and Near East regions (Nieto Nafria, 2016).

Turkish distribution: *L. berberidis* was recorded from Ankara, Bitlis, Çankırı, Giresun, Isparta, İstanbul and Konya (Tuatay & Remaudière, 1964; Tuatay, 1990; Barjadze et al., 2014b).

Macrosiphum euphorbiae (Thomas, 1878)

Material examined: Çanakkale, city center, 40°08'45.2" N 26°25'01.6" E, *Rosa* sp. (Rosaceae), 21.IV.2013.

World distribution: Worldwide (Nieto Nafria, 2016).

Turkish distribution: *M. euphorbiae* was recorded from Adana, Aksaray, Amasya, Ankara, Balıkesir, Bartın, Denizli, Erzurum, Hatay, İstanbul, İzmir, Mersin, Sakarya and Samsun (Tuatay & Remaudière, 1964; Giray, 1974; Tuatay, 1990; Toros et al., 2002; Ayyıldız & Atlıhan, 2006; Özdemir et al., 2006; Geneci & Görür, 2007; Çıraklı et al., 2008; Eser et al., 2009; Toper Kaygın et al., 2009; Akyürek et al., 2012).

Macrosiphum rosae (Linnaeus, 1758)

Material examined: Çanakkale, city center, 40°09'02.9" N 26°24'29.3" E, 09.IV.2013; Çanakkale, Kepez, 40°05'59.6" N 26°22'03.3" E, 05.VI.2015, *Rosa* sp. (Rosaceae).

World distribution: Worldwide except east Palearctic (Nieto Nafria, 2016).

Turkish distribution: *M. rosae* was recorded from Adana, Ankara, Antalya, Bartın, Bolu, Burdur, Çankırı, Denizli, Diyarbakır, Giresun, Hatay, Isparta, İstanbul, İzmir, Kahramanmaraş, Mersin, Samsun and Van (Düzgüneş & Tuatay, 1956; Bodenheimer & Swirski, 1957; Giray, 1974; Tuatay, 1990; Toros et al., 1996; Toros et al., 2002; Ölmez Bayhan et al., 2003; Aslan & Uygun, 2005; Çıraklı et al., 2008; Eser et al., 2009; Toper Kaygın et al., 2009; Akyürek et al., 2012; Barjadze et al., 2014b).

Myzus cerasi (Fabricius, 1775)

Material examined: Çanakkale, Umurbey, 40°14'19.2" N 26°37'43.5" E, 30.IV.2013; Çanakkale, Yapıldak, 40°13'56.1" N 26°32'25.4" E, 15.V.2015, *Prunus avium* L. (Rosaceae).

World distribution: Worldwide except Afrotropical and Neotropical regions (Nieto Nafria, 2016).

Turkish distribution: *M. cerasi* was recorded from Adana, Diyarbakır, Isparta, Kahramanmaraş, Kocaeli, Mersin, Samsun, Trabzon and Van (Bodenheimer & Swirski, 1957; Toros et al., 1996; Toros et al., 2002; Ölmez Bayhan et al., 2003; Aslan & Uygun, 2005; Akyürek et al., 2012; Akyıldırım et al., 2014; Barjadze et al., 2014b).

Myzus (Nectarosiphon) persicae Sulzer, 1776

Material examined: Çanakkale, Yenice, 39°56'16.8" N 27°14'00.2" E, *Capsicum* sp. (Solanaceae), 04.IX.2013.

World distribution: Worldwide (Nieto Nafria, 2016).

Turkish distribution: *M. persicae* was recorded from Adana, Aksaray, Ankara, Balıkesir, Bartın, Çanakkale, Diyarbakır, İstanbul, İzmir, Kahramanmaraş, Mersin, Samsun and Van (Bodenheimer & Swirski, 1957; Tuatay, 1991; Toros et al., 1996; Toros et al., 2002; Ölmez Bayhan et al., 2003; Aslan & Uygun, 2005; Özdemir et al., 2006; Ayyıldız & Atlihan, 2006; Geneci & Görür, 2007; Eser et al., 2009; Topper Kaygın et al., 2009; Akyürek et al., 2012).

Sitobion avenae (Fabricius, 1775)

Material examined: Çanakkale, Kepez, 40°05'25.4" N 26°23'19.3" E, 25.IV.2013; Çanakkale, Yapıldak, 40°12'40.5" N 26°32'40.7" E, 27.IV.2014, *Triticum* sp. (Poaceae); Çanakkale, Kepez, Dardanos Campus, 40°04'34.0" N 26°21'52.5" E, *Elymus* sp. (Poaceae), 23.V.2014.

World distribution: Worldwide (Nieto Nafria, 2016).

Turkish distribution: *S. avenae* was recorded from Adana, Çanakkale, Diyarbakır, Hatay, İzmir, Kahramanmaraş, Mersin, Samsun and Van (Tuatay, 1991; Toros et al., 1996; Toros et al., 2002; Ölmez Bayhan et al., 2003; Aslan & Uygun, 2005; Eser et al., 2009; Akyürek et al., 2012).

Uroleucon sonchi (Linnaeus, 1767)

Material examined: Çanakkale, Kepez, 40°05'24.0" N 26°23'31.1" E, *Sonchus oleraceus* L. (Asteraceae), 14.III.2013; Çanakkale, Kepez, Dardanos Campus, 40°04'25.1" N 26°21'48.8" E, 18.IV.2013; Çanakkale, Bayramiç, Doğanç, 39°49'56.6" N 26°35'24.8" E, 25.IV.2013, *Senecio vernalis* Waldst. & Kit. (Asteraceae).

World distribution: Worldwide (Nieto Nafria, 2016).

Turkish distribution: *U. sonchi* was recorded from Adana, Ankara, Çanakkale, Diyarbakır and Mersin (Tuatay, 1991; Toros et al., 2002; Ölmez Bayhan et al., 2003; Özdemir et al., 2006).

Subfamily Calaphidinae**Tribe Panaphini***Chromaphis juglandicola* (Kaltenbach, 1843)

Material examined: Çanakkale, Kepez, 40°06'38.1" N 26°24'23.6" E, *Juglans regia* L. (Juglandaceae), 31.V.2015.

World distribution: East Palearctic, Near East, Nearctic, North Africa and Oriental regions (Nieto Nafria, 2016).

Turkish distribution: *C. juglandicola* was recorded from Adana, Diyarbakır, Hatay, Mersin, Van and Kahramanmaraş (Toros et al., 1996; Toros et al., 2002; Ölmez Bayhan et al., 2003; Aslan & Uygun, 2005).

Panaphis juglandis (Goeze, 1778)

Material examined: Çanakkale, Kepez, 40°06'38.1" N 26°24'23.6" E, *Juglans regia* L. (Juglandaceae), 31.V.2015.

World distribution: East Palearctic, Near East, Nearctic and Oriental region (Nieto Nafria, 2016).

Turkish distribution: *P. juglandis* was recorded from Adana, Diyarbakır, Kahramanmaraş, Kastamonu, Mersin and Van (Toros et al., 1996; Toros et al., 2002; Ölmez Bayhan et al., 2003; Aslan & Uygun, 2005; Ünal & Özcan, 2005).

Tinocallis (Sarucallis) kahawaluokalani (Kirkaldy, 1906)

Material examined: Çanakkale, university campus, 40°06'37.1" N 26°24'47.1" E, *Lagerstroemia indica* L. Pers. (Lythraceae), 27.VI.2015.

World distribution: Afrotropical, east Palearctic, Nearctic, Neotropical and Oriental regions (Nieto Nafria, 2016).

Turkish distribution: *T. kahawaluokalani* was recorded from Adana (Remaudière et al., 2006).

Tinocallis (Sappocallis) saltans (Nevsky, 1929)

Material examined: Çanakkale, city center, 40°09'03.8" N 26°24'26.3" E, *Ulmus* sp. (Ulmaceae), 20.VI.2015.

World distribution: East Palearctic, Near East, Nearctic, Neotropical and Oriental regions (Nieto Nafria, 2016).

Turkish distribution: *T. saltans* was recorded from forest trees by Çanakçioğlu (1966).

Eucallipterus tiliae (Linnaeus, 1758)

Material examined: Çanakkale, university campus, 40°06'36.4" N 26°24'49.5" E, *Tilia* sp. (Malvaceae), 06.VI.2015.

World distribution: Worldwide except Afrotropical and Oriental regions (Nieto Nafria, 2016).

Turkish distribution: *E. tiliae* was recorded from Bartın, Isparta, İzmir and Kastamonu (Ünal & Özcan, 2005; Toper Kaygın et al., 2008; Eser et al., 2009; Demirözer et al., 2015).

Subfamily Chaitophorinae

Tribe Chaitophorini

Chaitophorus leucomelas Koch, 1854

Material examined: Çanakkale, university campus, 40°06'32.9" N 26°24'59.3" E, *Populus* sp. (Salicaceae), 11.IV.2013.

World distribution: Worldwide except Australian and Oriental regions (Nieto Nafria, 2016).

Turkish distribution: *C. leucomelas* was recorded from Adana, Ankara, Diyarbakır, Kahramanmaraş, Konya, Mersin and Van (Bodenheimer & Swirski, 1957; Toros et al., 1996; Toros et al., 2002; Ölmez Bayhan et al., 2003; Aslan & Uygun, 2005; Uysal et al., 2006).

Subfamily Eriosomatinae

Tribe Pemphigini

Prociphilus fraxini (Fabricius, 1777)

Material examined: Çanakkale, university campus, 40°06'41.6" N 26°25'01.4" E, *Fraxinus excelsior* L. (Oleaceae), 13.V.2015.

World distribution: Near East and Oriental regions (Nieto Nafria, 2016).

Turkish distribution: *P. fraxini* was recorded from İstanbul and Kastamonu (Çanakçioğlu, 1970; Ünal & Özcan, 2005).

Subfamily Lachninae

Tribe Eulachnini

Cinara pini (Linnaeus, 1758)

Material examined: Çanakkale, Kepez, 40°06'37.7" N 26°24'37.1" E, *Pinus* sp. (Pinaceae), 14.V.2014.

World distribution: East Palearctic, Near East, Nearctic and Oriental regions (Nieto Nafria, 2016).

Turkish distribution: *C. pini* was recorded from Bolu, Antalya, Çanakkale, Çankırı, İzmir, Kahramanmaraş, Kars, Muğla, Samsun and Trabzon (Çanakçioğlu, 1966; Tuatay, 1999; Aslan & Uygun, 2005; Akyürek et al., 2012; Akyıldırım et al., 2014).

Tribe Lachnini

Pterochloroides persicae (Cholodkovsky, 1899)

Material examined: Çanakkale, city center, 40°09'02.2" N 26°24'36.7" E, *Prunus* sp. (Rosaceae), 17.VI.2015.

World distribution: Worldwide except Australian and Nearctic regions (Nieto Nafria, 2016).

Turkish distribution: *P. persicae* was recorded from Adana, Aksaray, Ankara, Artvin, Denizli, Hatay, Kahramanmaraş, Mersin, Niğde and Van (Bodenheimer & Swirski, 1957; Toros et al., 1996; Toros et al., 2002; Görür, 2004; Aslan & Uygun, 2005; Geneci & Görür, 2007; Akyıldırım et al., 2014).

Local studies are very important to determine the aphid fauna in any country. Although biodiversity in Turkey is more rich than its neighboring countries, the aphid fauna recorded for Turkey is so far quite limited. For example, while the aphid fauna of Greece and Italy consist of 364 and 760 species respectively, the aphid fauna of Turkey had only reached 532 species (Patti & Barbagallo, 1998; Tsitsipis et al., 1998; Şenol et al., 2015b). Likewise, Iran is located in the same biogeographical region as Turkey. The aphid fauna of Iran is represented by 485 species based on recent local studies (Mortazavi et al., 2015). Owing to the fact that many local areas have been sampled only sporadically, both the aphid fauna of Turkey and Iran are still quite limited. The results of both in the current study and other recent studies (Akyürek et al., 2010; Görür et al., 2011; Barjadze & Özdemir, 2014a; Şenol et al., 2015a) show that Turkey has a rich aphid fauna and the number of species will increase as local studies are conducted in different areas. Therefore, it is recommended that local aphid fauna studies be conducted so that the aphid species diversity and richness of Turkey is more fully known.

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