J. Entomol. Res. Soc., 13(3): 101-106, 2011 *ISSN:1302-0250*

Further contributions to the Turkey Aphid (Hemiptera: Aphidoidea) Fauna

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ABSTRACT

11 aphid species are reported as new records for Turkey aphid fauna at the end of the study carried out in Samsun Province of Turkey between 2009 and 2010. New records are *Aphis gerardianae* Mordvilkoi, *Aphis loti* Kaltenbach, *Aphis middletoni* Thomas, *Aphis pashtshenkoae* Remaudière, *Aphis proffti* (Börner), *Aphis pseudocardui* Theobald, *Chaitophorus lapponum* Ossiannilsson, *Cinara watanabei* Inouye, *Lachnus longirostrum* David and Ghosh, *Sipha arenarii* Mordvilko and *Uroleucon kashmiricum* (Verma). With these new records, the number of species of aphids listed for Turkey has increased to 475.

Key words: Aphididae, Samsun, aphid fauna, new records, Turkey.

INTRODUCTION

Aphids are economically important pests around the world because of the direct damage they cause by sucking, or indirectly, as vectors of disease. The known world aphid fauna consists of about 4500 species (Blackman and Eastop, 2006). Turkey has a great diversity of aphids because of its geographical structure, floristic composition, climatic conditions and variety of crops. In Turkey, the first studies were undertaken in the early 1900s; most of them were carried out by foreign researchers, including Trotter, 1903; Houard, 1922, and Fahringer, 1922. Before 2000, studies of the Turkish aphid fauna were limited but since that time important studies have been undertaken (Toros *et al*., 2002; Gorur, 2004; Aslan and Uygun, 2005; Remaudière *et al*., 2006; Uysal *et al*., 2006; Kaygin *et al*., 2008; Cirakli *et al*., 2008; Eser *et al*., 2008; Gorur *et al*., 2009; Akyurek *et al.,* 2010; Kaygin *et al*., 2010 and Barjadze *et al*., 2011). As a result of the detailed study on all publishments related with Turkey aphid fauna, 464 species and 12 subspecies listed for Turkey aphid fauna. The current study aimed to contribute to aphid fauna of Turkey by surveying the Samsun region.

MATERIAL AND METHODS

The study area is located in the mid-coastal Black Sea region of Turkey; aphids were collected from Samsun province and surrounding districts. The main flora of

the study area are *Alnus* spp., *Quercus* spp., *Fagus* spp., *Carpinus* spp., *Acer* spp., *Fraxinus* spp., *Salix* spp., *Populus* spp., *Coryllus* spp., *Acacia* spp., *Pinus* spp., *Abies* spp., *Platanus* spp., and also various herbaceous and ornamental plants. The aphids were removed from plant materials with a fine brush and preserved in 80% alcohol in the field. All collected specimens were both apterous and alatae viviparous female individuals. During each sampling of aphid on each host plant about 30-40 individuals were taken. Specimens were prepared permanently for identification, based on the principles of Martin (1983). All samples were identified according to Blackman and Eastop (1994, 2006, http://www.aphidsonwoldsplants.info). Taxonomic status, world distribution and host plants of identified species were confirmed by checking Blackman and Eastop (1994, 2006), Remaudière and Remaudière, 1997, Holman, 2009 and http://www.fauneur.org, http://Aphid.SpeciesFile.org. Voucher specimens have been deposited at the Biology Department of Ondokuz Mayis University.

RESULTS

As a result of the study conducted between 2009 and 2010 in Samsun province, the following aphid species were determined as new records for the Turkish fauna. Of these records, 7 species belong to the subfamily Aphidinae, 2 species belong to the subfamily Lachninae and 2 species belong to the subfamily Chaitophorinae. World distribution, taxonomic category, collection date and host plant(s) are given for each new record.

Aphididae: Aphidinae: Aphidini

Aphis gerardianae Mordvilko, 1929

Material examined: One sample were collected on stem and flower of *Euphorbia* sp. from Bafra-Kolay, 06.VII.2009.

Morphology, Host plants and Biology: Apterous individuals are greyish black to black, wax-dusted. Body length is 1.0-1.7 mm. Feeds on stems and flower stalks of *Euphorbia sequieriana* (Blackman and Eastop, 2006). There is no information on biology of these aphids.

Distribution: Central and East Europe, Ukraine (Blackman and Eastop, 2006; Holman, 2009).

Aphis loti Kaltenbach, 1862

Material examined: One sample were collected on stem and inflorescence of *Dorycnium graecum* from Yakakent-Cam Lake, 05.VII.2009.

Morphology, Host plants and Biology: Apterous individuals are warm dark brown, without wax. Body length is 1.2-2.1 mm. Feeds on shoot apices and inflorescences of *Lotus* spp. and *Anthyllis* spp. These aphids are monoecious holocyclic (Blackman and Eastop, 2006).

Distribution: Widely distributed in Europe (Blackman and Eastop, 2006).

***Aphis middletoni* Thomas, 1879**

Material examined: One sample were collected on stem of *Centaurea iberica from* Alacam-Esentepe, 05.VII.2009.

Morphology, Host plants and Biology: Apterous individuals are pale green, bluish green, gray-green or olive-green, dusted with grayish wax. Body length is 1.5-2.5 mm. Feeds on Compositae, Cruciferae, Gramineae, Labiatae and Umbelliferae. These aphids are monoecious holocyclic but anholocyclic overwintering is probably also common (Blackman and Eastop, 2006).

Distribution: Western and central USA, Brazil, Australia and South Africa (Blackman and Eastop, 2006).

***Aphis pashtshenkoae* Remaudière, 1997**

Material examined: One sample were collected on stem of *Lysimachia* sp. from Gokcepinar, 04.VII.2009.

Morphology, Host plants and Biology: Apterous individuals are yellow-green, wax-dusted. Body length is about 2 mm. Feeds on undersides of apical leaves of *Lysimachia davurica* (Blackman and Eastop, 2006). There is no information on biology of these aphids.

Distribution: East Siberia, Kazakhstan and Ukraine (Blackman and Eastop, 2006; Holman, 2009).

***Aphis proffti* (Borner, 1942)**

Material examined: One sample were collected on stem of *Agrimonia* sp. from Ladik, 03.VII.2009.

Morphology, Host plants and Biology: Apterous individuals are pale light green or yellowish green. Body length is 0.7-1.5 mm. Feeds on undersides of leaves and in inflorescences of *Agrimonia* spp. Biology unstudied, but an ovipare was collected on *Agrimonia eupatoria* in Sweden (Blackman and Eastop, 2006).

Distribution: Europe (Austria, Czech Republic, Denmark, France, Germany, Hungary, Poland, Spain, Sweden, former Yugoslavia) (Blackman and Eastop, 2006; Holman, 2009).

***Aphis pseudocardui* Theobald, 1915**

Material examined: One sample were collected on stem and shoot of *Sonchus* sp. from Ladik, 03.VII.2009.

Morphology, Host plants and Biology: Apterous individuals are dark green or brown with covering of gray mealy wax. Body length is 1.5-2.0 mm. Feeds on *Arctotheca*, *Berkheya*, *Carduus*, *Carthamus*, *Cichorium*, *Hypochaeris*, *Lactuca*, *Pluchea*, *Pulicaria*, *Sonchus*, *Vernonia* (Blackman and Eastop, 2006). There is no information on biology of these aphids.

Distribution: Recorded from South Africa, Mediterranean Region and Middle East (Blackman and Eastop, 2006).

Aphididae: Aphidinae: Macrosiphini

***Uroleucon kashmiricum* (Verma, 1966)**

Material examined: Three samples were collected on stem and leaves of *Campanula* sp. from Gokcepinar, 04.VII.2009.

Morphology, Host plants and Biology: Apterous individuals are shiny dark reddish brown to black. Body length is 1.5-2.8 mm. Feeds on stems and young terminal leaves of *Campanula* spp. These aphids are monoecious holocyclic (Blackman and Eastop, 2006).

Distribution: Afghanistan, Pakistan, Tajikistan and North India (Blackman and Eastop 2006; Holman, 2009).

Aphididae: Chaitophorinae:Chaitophorini

***Chaitophorus lapponum* Ossiannilsson, 1959**

Material examined: One sample were collected on leaves of *Salix* sp. From Havza and Vezirkopru, 01.X.2009.

Morphology, Host plants and Biology: Apterous individuals are broadly oval, probably blackish with legs paler. Body length is 1.7-2.3 mm. Alatae have narrow dorsal abdominal cross-bands. Feeds on leaves, petioles on shoot apices of Salix spp. Sexuales undescribed, these aphids are monoecious holocyclic (Blackman and Eastop, 1994).

Distribution: Finland and Sweden (Blackman and Eastop, 1994; http://www.aphidsonworldsplants.info).

Aphididae:Chaitophorinae: Siphini

***Sipha arenarii* Mordvilko, 1921**

Material examined: One sample were collected on inflorescence of *Triticum aestivum* from Ladik-Kilicarslan Gorge, 03.VII.2009.

Morphology, Host plants and Biology: Apterous individuals are greenish yellow to brown with pale longitudinal stripes. Body length is 2.0-2.4mm. Feeds on Leymus arenarius and Elymus hispidus. These aphids are monoecious holocyclic (Blackman and Eastop, 1994).

Distribution: In Europe, eastward to West Siberia and Kazakhstan (Blackman and Eastop, 2006; Holman, 2009).

Aphididae: Lachninae: Eulachnini

***Cinara watanabei* Inouye, 1970**

Material examined: One sample were collected on branches of *Pinus sylvestris* from Ladik-Asagigolyazi, 30.VIII.2009.

Morphology, Host plants and Biology: Head and thorax is dark brown, and abdomen is shiny brown of apterous individuals. Body length is 4.8-5.4 mm. In large colonies on wood of branches of older trees, or on trunk of young trees, of *Pinus* spp. These aphids are monoecious holocyclic (Blackman and Eastop, 1994).

Distribution: Japan, Far East, Russia, Korea, Sakhalin (Blackman and Eastop, 1994; Holman, 2009; http://www.aphidsonworldsplants.info).

Aphididae: Lachninae: Lachnini

***Lachnus longirostrum* David and A.K. Ghosh, 1982**

Material examined: One sample were collected on branches of *Salix* sp. from Asarcik-Seyhli, 02.X.2009.

Morphology, Host plants and Biology: Body length is about 4.4 mm. Alata with hyaline forewings. Feeds on *Salix fragilis.* Biology and life cycle unknown. (Blackman and Eastop, 1994).

Distribution: India (Ghosh, 1982; http://www.aphidsonworldsplants.info)

DISCUSSION

The list of Turkish aphids increased to 475 with these 11 new records. From these new records, *Cinara watanabei* Inouye was recorded from far east, *Chaitophorus lapponum* Ossiannilsson was recorded from northern europe, *Aphis middletoni* Thomas was recorded from America and Australia before now. These species may have been moved with different means of transport from these areas to Turkey or from Turkey to these areas. And some new records species was sampled once, but there are more samples. Considering the ecological, geographical, climatic, floristic and agricultural characteristics of Turkey, relatively a few aphid species have been recorded. In comparison with the records from other countries that are not as geographically or floristically diverse as Turkey, it is reasonable to assume that the current number of listed species of Turkey does not accurately reflect the actual number of aphid species. Recently, a number of studies (Uysal *et al*., 2006; Kaygin *et al.,* 2008; Cirakli *et al*., 2008; Eser *et al*., 2008; Gorur *et al.,* 2009; Akyurek *et al*., 2010; Kaygin *et al.,* 2010 and Barjadze *et al*., 2011) reported new aphid species, indicating that such studies are important for the incremental documentation of the Turkish aphid fauna. To more accurately determine the true number of aphid species in Turkey, systematic studies should be conducted across all regions.

ACKNOWLEDGEMENTS

The financial support of the Ondokuz Mayis University Scientific Research Projects Commission for Project No. PYO.FEN.1904.09.030 is gratefully acknowledged. The authors also thank Gregory T. Sullivan of OYDEM at the same university for editing the English in an earlier version of this manuscript.

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Received: May 11, 2011 Accepted: October 25, 2011