J. Ent. Res. Soc., 11(3): 1-5, 2009 *ISSN:1302-0250*

New Records of Aphidoidea from Turkey

Gazi GÖRÜR[1], Mustafa IŞIK[1], Başak AKYÜREK[2], Ünal ZEYBEKOĞLU[2]

[1]Nigde University, Science and Arts Faculty, Department of Biology, 51100 Nigde, TURKEY, e-mail: gazigorur@yahoo.com

[2]Ondokuz Mayıs University, Science and Arts Faculty, Department of Biology, Samsun, TURKEY

ABSTRACT

Six aphid species were determined as new records for Turkey aphid fauna from far Eastern Black Sea Region of Turkey, where no studies have been carried out related with aphids. These species are *Adelges cooleyi, Adelges pectinatae, Aphis impatientis, Betulaphis quadrituberculata, Periphyllus aceris* and *Pterocallis albidus*. With these new records, the total number of aphid species in Turkey comes up to 446. The findings of the presented study and other recent studies showed that a higher number of aphid species is expected in Turkey due to particular ecological, geographical, climatic, continental position and floristic features of Turkey.

Key words: Adelges, Aphid fauna, new records, Turkey, Eastern Black Sea.

INTRODUCTION

The known world aphid fauna consists of about 4400 species (including adelgids). About 250 aphid species are serious pests around the world where they causing important losses of yield (Remaudière & Remaudière, 1997; Blackman & Eastop, 2006). Studies of the Turkish aphid fauna were limited up to last decade. Although preliminary studies were performed at the beginning of the 1900's, most of these studies was carried out by foreign researchers and only focused on very small parts of the Turkey. Çanakcıoğlu (1975) reviewed the previous studies and listed 258 species. Tuatay (1991, 1993) added about 30 species as new records and three additional species reported by Düzgüneş et al. (1982). Recently, many more studies have been performed and have added more than 40 new aphid species have been recorded (Toros et al., 2003; Görür, 2002; Özdemir et al., 2005). Remaudière et al. (2006) revised studies conducted on Turkey aphid fauna and listed about 417 species despite some controversies. Akyürek (2006) and Toper Kaygin et al. (2008) added 11 new records. Although there have been reasonable number of studies performed in some parts of Turkey, no studies organised have been organized in the study area so far. In this aspect this study aimed to find out aphid species of the far Eastern Black Sea region of Turkey where no detailed study was organized.

MATERIAL AND METHODS

In the collection of the Biology Department of Trakya University, Edirne, Turkey (T 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. Aphid samples were collected from Trabzon, Rize and Artvin Provinces that are located at the Far East Black Sea Region (Figure 1). Study area is the wettest part of the Turkey. Main flora of the study are forest that are mostly composed of Alnus spp, *Quercus* spp., *Carpinus* spp., *Castanea* spp., *Platanus* spp. *Abies* spp., *Picea* spp. *Pinus* spp. and also various herbaceous plants. Collection and permanent slides of each sample have been done according to the principles of Martin (1983). All aphids and adelgid samples were identified according to Heie (1982), Blackman & Eastop (1994, 2006) and Çanakçıoğlu (1975). Systematic knowledge and host plants of identified species were taken from Blackman & Eastop (1994, 2006), Remaudière & Remaudière (1997) and Holman (2008). Taxonomic status of the identified species was confirmed with http://www.faunaeur.org/taxon_tree.php. Voucher specimens are kept at the Biology Department of Nigde University.

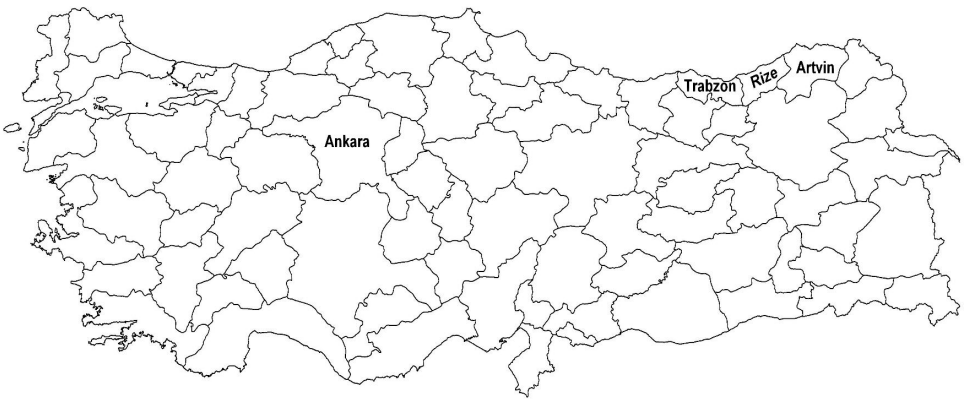

Fig. 1. Study area is located at the Far East Black Sea Region.

RESULTS

As a result of the study conducted between 2007 and 2008 in the far Eastern Black Sea region of Turkey, 800 samples from different locations were collected and 83 species were recorded (unpublished data). Below are listed the aphid species that are identified as new records for the Turkey aphid fauna. Taxonomic status, synonyms, general features, host plants, collection sites, collection date, sample sizes and distribution for each new record were given.

Adelges cooleyi (Gillette, 1907) (Adelgidae)

Material examined: 10 samples were collected on *Picea orientalis* from Artvin-Hopa (22.V.2008), Artvin-Borçka(22.V.2008), Artvin-Arhavi(24.V.2008), Rize-Çayeli(Kaptanpaşa, 26.VII.2008), Rize-Hemşin (Ayder plateau, 23.VII. 2008) cities and districts.

Distribution: It is native to Western North America and Canada and widely occurred throughout Europe and Eastern North America (Blackman & Eastop, 1994).

Host plants and Biology: Each leaf-feeding individual is covered by white wax wool. They cause pineapple like gall on shoot tips. Mature galls are reddish and can be recognized easily. This species typically host alternates between *Picea* spp. and *Pseudotsuga* spp.

***Adelges pectinatae* (Cholodkovsky, 1888) (Adelgidae)**

Material examined: Only two samples were collected on *Picea orientalis* (L.) from Rize-Hemşin (higher parts of the Ayder plateau, 23.VII. 2008).

Distribution: It is mainly distributed in Northern Europe (Sweden, Finland, Latvia, Ukraine and Norway) (Blackman & Eastop, 1994; Holman, 2008).

Host plants and Biology: It causes a cone-like gall. Gall is dull green turning to reddish brown before opening. This species host alternates between *Picea* spp. and *Abies* spp.

***Aphis impatientis* Thomas, 1878 (Aphididae: Aphidinae: Aphidini)**

Material examined: Two samples are collected on Impatiens noli-tangere L. This species are recorded for the first time for Turkey aphid fauna from Artvin (Hopa-Camlıkköy village, 22.V.2008) province, which is located at the far Eastern Black Sea region of Turkey.

Distribution : The species is originally distributed in north eastern USA and Canada (Blackman & Eastop, 2006).

Host plants and Biology: Apterous individuals are olive, purplish brown or brownish with white wax. Body length is about 1.5-1.8 mm.. The aphid is monoecious holocyclic on *Impatiens* spp.

***Betulaphis quadrituberculata* (Kaltenbach,1843) (Aphididae: Calaphidinae: Calaphidini)**

Material examined: Four samples were collected under the leaves of *Alnus glutinosa* (L.). This species was recorded for the first time for Turkey aphid fauna from Artvin (Arhavi-21.V.2008, Hopa-21.V.2008, Borcka-24.V.2008 districts) province, which is located at the far Eastern Black Sea region of Turkey.

Distribution: It is widely distributed in Europe, across Asia to Mongolia and introduced to North America (Blackman & Eastop, 1994; Holman, 2008).

Host plants and Biology: Apterae are pale yellowish-green or pale yellow to almost white. Our samples are almost white with slight dark pigment. Body length is about 1.5-2.0 mm. The species generally feed on *Betula* spp, and also rarely *Alnus* spp.

***Periphyllus aceris* (Linnaeus, 1761) (Aphididae: Chaitophorinae: Chaitophorini)**

Material examined: Three samples were collected on growing shoots and under the leaves of *Acer campestre* in Artvin (Central, 23.V.2008) province at the far Eastern Black Sea region of Turkey.

Distribution: The species is widely distributed throughout Europe and it has introduced to North America (Blackman & Eastop, 1994; Holman, 2008).

Host plants and Biology: Apterae is yellow with green flecks dorsally. Body length of the apterae is about 1.5-3.7 mm. Alatae have dorsal cross bands with equally dark marginal sclerites and pterostigma. Body length of the alatae is 3.2- 4.5. The species mainly feeds on undersides of leaves, petioles and growing shoots of *Acer* spp.

***Pterocallis albidus* Börner, 1940 (Aphididae: Calaphidinae: Panaphidini)**

Material examined: Eight samples were recorded on *A. glutinosa*. The study area is close to Georgia, so it is rather expected to record *P. albidus* on *A. glutinosa*. The species has been found in Artvin-Borçka (22.V.2008), Trabzon-Of (22.VI.2008), Trabzon-Sürmene (23.VI.2008), Trabzon-Köprübaşı (24.VI.2008), Trabzon-Çaykara (Longlake-25.VI.2008), Trabzon-Akçaabat (27.VI.2008) and Trabzon-Düzköy (30.VI.2008) regions and districts

Distribution: The species is mainly distributed in Europe and some parts of the Asia (Heie, 1982; Holman, 2008).

Host plants and Biology: The species is very much like *Pterocallis alni* but apterous viviparous female of *P. albidus* is yellowish white-white while apterous form of *P. alni* is yellowish green-green. Body size is about 1.2 mm. The aphid is rarely recorded on *A. glutinosa* only from Georgia and Romania (Dzhibladze, 1958; Holman & Pintera, 1981) but mostly recorded on *A. incana* (Holman, 2008).

DISCUSSION

The presented study reports original information on aphids from far Eastern Black Sea region of Turkey, where no detailed study on aphid fauna has been performed. Aphid species listed for Turkish aphid fauna raised up to 446 with these new records. Considering the ecological, geographical, climatic, floristic, agricultural and continental characteristics of Turkey, the present recorded aphid species do not sufficiently reflect a real estimation of the aphid fauna in Turkey. Although Turkey is larger and has richer floristic composition than some neighboring countries, their aphid fauna consist of more aphid species. For example, while Italy has 6000 plant species but Italian aphid fauna are composed of 760 aphid species. Romania has les plant species but 490 aphid species were recorded for Romanian aphid fauna. Turkey's close neighbor Greece aphid fauna consist of 364 aphid species (Patti & Barbagallo, 1998; Tsitsipis *et al*., 1998). Recently Özdemir *et al*. (2005), Uysal *et al*. (2006) and Kaygın *et al*. (2008) identified new aphid species indicating that such studies are important for the determination of the Turkish aphid fauna. Turkey is a geographically large country and aphid fauna in some regions has not been studied yet adequately. Thus, it is expected that further research will reveal more new aphid species for the Turkey aphid fauna.

ACKNOWLEDGEMENT

This study is supported by the Turkish Scientific Council (TUBİTAK).

REFERENCES

Akyürek, B., 2006, *Ondokuz Mayıs Üniversitesi Kurupelit Kampüs Alanı Afit (Homoptera:Aphididae) Faunasının Belirlenmesi*. Samsun, 98. (Turkish with English summary)

Blackman, R. L., Eastop, V. F., 1994, *Aphid's on The World's Trees. An Identification and Information Guide*. CAB International, Walligford, 1004.

Blackman, R. L., Eastop, V. F., 2006, *Aphid's on The World's Herbaceous Plants and Shrubs: An Identification and Information Guide*. Wiley, Chichester, 1460 pp.

Çanakçıoğlu, H., 1975, *The Aphidoidea of Turkey*, İstanbul Univ Faculty of Forestry, Istanbul, 309.

Dzhibladze, A. A., 1958, Studies on fauna of aphids of the eastern part of Kakhetia. *Trudy Instituta Akademii Nauk Gruzii*, 16 : 291-321.

Düzgünes, Z., Toros S., Kılınçer, N., Kovancı, K., 1982, *Ankara ilinde bulunan Aphidoidea türlerinin parazit ve predatörlerinin tesbiti.* Ankara, 251. (Turkish with English summary).

Görür, G., 2002, New records for Turkish aphid fauna (Homoptera: Aphididae). *Zoology in the Middle East***,** 25: 67-69.

Heie, O. E., 1982, The Aphidoidea (Hemiptera) of Fennoscandia and Denmark II. The family Drepanosiphidae. *Fauna Entomologica Scandinavia*, 11: 176.

Holman, J., Pintera, A., 1982, Übersicht der Blattlause (Homoptera, Aphidoidea) der Rumanischen Sozialistichen Republik. *Studie CSAV*, 15: 1-125.

Holman, J., 2008, *Host Plant Catalog of Aphids. Palaearctic Region*. Springer, 1216.

Kaygin, T. A., Görür, G., Cota, F., 2008, Contribution to the Aphid species damaging on woody plants in Bartın, Türkiye. *IJNES*, 2(1): 83-86.

Martin, J. H., 1983, The identification of common aphid pests of tropical agriculture. *Tropical Pest Management*, 29 (4): 395-411.

Özdemir, I., Remaudiere, G., Toros, S., Kılıncer, N., 2005, New aphid records from Turkey including the description of a new *Lachnus* species (Hemiptera: Aphididae). *Revue française d'Entomologie,* 27(3): 97-102.

Patti, I., Barbagallo, S., 1998, *An approach to the knowledge on the Italian aphid Fauna*. *In*: Nieto Nafria, J.M., Dixon, A.F.G., (Eds.), Aphids in natural and managed ecosystems. Universidad de Leon, Leon, Spain, 397-405

Remaudiere, G., Remaudiere, M., 1997, *Catalouge des Aphididae du Monde (Catalouge of the World's Aphididae)*, INRA, Paris, 473.

Remaudiere, G., Toros, S., Ozdemir, I., 2006, New Contribution to the Aphid Fauna of Turkey [Hemiptera, Aphidoidea]. *Revue française d'Entomologie,* 28 (2): 75-96.

Toros, S., Özdemir, I., Çanakcıoglu, H., 2003, The Betula aphids of Turkey. *Journal of Pest Science*, 76: 173-175.

Tsitsipis, J. A., Lykouressis, D., Katis, N., Avgelis, A. D., Gargalianou, J., Papapanayotou, A., Kokinis, G. M., 1998, *Aphid species diversity demonstrated by suction trap captures in different areas in Greece*. *In:* Nieto Nafria, J. M., Dixon, A. F. G., (Eds.), Aphids in natural and managed ecosystems. Universidad de Leon, Leon, Spain, 495-501.

Tuatay, N., 1991, Türkiye Yaprakbitleri (Homoptera: Aphididae) I. Aphidinae: Macrosiphini (III. Kısım) *Bulletin of Plant Protection*, 31(1-4): 3-18. (Turkish with English summary)

Tuatay, N., 1993, Aphids of Turkey (Homoptera : Aphididae) IV. Aphidinae: Macrosiphini Part IV.*Bulletin of Plant Protection,* 33(1-2)**:** 83-105. (Turkish with English summary)

Uysal, M., Sahbaz, A., Özdemir, I., 2006, Aphid species (Homoptera:Aphididae)on poplar trees in Konya Region. *Journal of Agriculture Faculty*, 20(38): 143-149.

Received: January 21, 2009 Accepted: July 28, 2009