International Journal of Natural and Engineering Sciences 2 (1): 83-86, 2008
ISSN: 1307-1149, www.nobel.gen.tr

Contribution to the Aphid (Homoptera: Aphididae) Species Damaging on Woody Plants in Bartın, Türkiye

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Received: September 04, 2007
Accepted: October 07, 2007

Abstract

The aim of this study was an investigation of aphid (Homoptera: Aphididae) species on woody plants in Bartın, Turkiye. The determined host plant species are included family of Salicaceae, Pinaceae, Rosaceae, Leguminosae, Tiliaceae, etc. As a results of the study, totaly 31 species have been determined, which are ***Aphis craccivora*** Koch, ***A. fabae*** Scopoli, ***A. farinosa*** J. F. Gmelin, ***A. gossypii*** Glover, ***Hyalopterus pruni*** (Geoffroy), ***Brachycaudus helichrysi*** (Kaltenbach), ***B. (Acaudus) persicae*** (Passerini), ***Myzus cerasi*** (Fabricius), ***Cavariella theobaldi*** (Gillette & Bragg), ***Phorodon humuli*** (Schrank), ***Chaitophorus leucomelas*** Koch, ***Ch. melanosiphon*** Pintera, ***Ch. populeti*** (Panzer), ***Ch. populialbae*** (Boyer de Fonscolombe), ***Ch. salicti*** (Schrank), ***Ch. tremulae*** Koch, ***Ch. versicolor*** Koch, ***Cinara brauni*** Börner, ***C. cedri*** Mimeur, ***C. confinis*** (Koch), ***Cinara pectinatae*** (Nördlinger), ***C. pinea*** (Mordvilko), ***C. pini*** (Linnaeus), ***C. pinivora*** (Wilson), ***C. cupressi*** (Buckton), ***C. matsumurana*** Hille Ris Lambers, ***C. schimitscheki*** Börner, ***Eucallipterus tiliae*** (Linnaeus), ***Pemphigus bursarius*** (Linnaeus), ***P. immunis*** Buckton, ***P. protospirae*** Lichtenstein. Of these recorded species, *Cinara matsumurana* and *Chaitophorus melanosiphon* were determined as new records for the Turkish aphid fauna. *Cinara pinivora* were also considered as possible new records but it has to be recollected and reidentified to reach final decision.

Key words: Bartın, Aphid, Cinara matsumurana, Chaitophorus melanosiphon.

INTRODUCTION

Aphid species are an economically important group of insects in all over the world as they are an important disease vectors and direct plant sucking pests. Some aphid species that appear in Turkey are classified as pests and act as disease vectors. For example, the black citrus aphid is a very serious pest in citrus groves in Turkey. In the United States, pest-caused losses of yield are estimated to average about 30% annually, despite using the best pest control technology available. However, in the developing countries to which Turkey belongs, pest-caused losses are even greater, averaging 50% or more [1]. Aphids found in Turkey therefore have important economic implications.

Economic importance of aphids may be summarized as follows; (1) Removal of plant sap causes wilting and curling of the leaves and so reduces the growths, (2) by the toxic action of their salivary secretions, causing galls on leaves, stems or roots, (3) honeydew excretion favours the secondary growth of fungus and moulds which further damage the growth of leaves and young shoots, (4) as plant virus vectors, causing many diseases of plants [2, 3].

Although economic importance of aphids is clear, there are not enough study were organized in Turkiye. Recently there are growing interests on aphid studies and therefore during last decade a lot of knowledge has been accumulated about Turkish aphid fauna. Despite that, there are a lot of things to do in this area and therefore this study aimed to determine possible aphid species feeding on woody plants in Bartın.

MATERIAL and METHODS

Aphid samples were collected on various host plants in the field (Bartın central province, Amasra, İnkum, Kozcagiz, Bogaz, Ulus, Bartin forests, etc.).

The collecting and preserving technique which we used was based mainly on Hille Ris Lambers [4] method.

Collecting. Aphids were collected in the field from their host plant with a small soft brush and put in to a tube which contained 95 percent alcohol. Tubes about 3-4mm wide and 30-50mm long are available. These tubes are closed with a wet cotton plug and stored in a small closed glass which also contains some alcohol.

In temperate climates several generations can be reared in plastic bags if fresh host plant material is added to bags from which the honeydew has been washed. Alatae and often internal parasites are likely to appear in the plastic bag. In hot climates it may be practicable to keep colonies alive and it may not even be desirable to keep living colonies of each sample in some survey work. In this case the specimens may be collected directly into pickle, making sure that some adults are present [5].

Mounting. (1) Mounting medium (Berlese): 12 grs of Gum arabic are dissolved overnight in the 40 ml distilled water and 20 grs chloral hydrate, 5 ml Glasial acetic asit and 5 ml (50% w/w) glucose syrup are the added. The whole mixture is gently wormed on the water bath till entirely clear and dissolved. The solution is filtered hot through glass wall and placed in a thermostat (30-40 ^{o}C) to evaporate the surplus water. (2) The specimens are carefully transferred onto a drop of Berlese

which has been spread on the slide. The antennae, legs, wings (if present) are placed in the desired position and then covered with a cover-glass. The slides should be baked in an oven until the mounting is hard (40 °C, for about three weeks) and then ringed with Euparal and Murrayite.

Labeling and slide storage. Square pieces of cardboard about 0.5 – 1.0 mm thick are glued to either end of the slide. On the left side of the label the scientific name of the aphid, the form and the name of the person who identified the aphid are indicated. The label on the right hand side lists the host plant, locality, date, name of collector and the number of collection.

Slides are stored in boxes or drawers in a horizontal position, and the genera are arranged in alphabetical sequence. The species are also arranged alphabetically within the genera.

RESULTS

Aphid species on Woody Plants in Bartın

31 species were determined from Bartın on woody host plants which are *Aphis craccivora*, *A. fabae*, *A. farinosa*, *A. gossypii*, *Hyalopterus pruni*, *Brachycaudus helichrysi*, *B. (Acaudus) persicae*, *Myzus cerasi*, *Cavariella theobaldi*, *Phorodon humuli*, *Chaitophorus leucomelas*, *Ch. melanosiphon*, *Ch. populeti*, *Ch. populialbae*, *Ch. salicti*, *Ch. tremulae*, *Ch. versicolor*, *Cinara brauni*, *C. cedri*, *C. confinis*, *C. pectinatae*, *C. cupressi*, *C. matsumurana*, *C. pinea*, *C. pini*, *C. pinivora*, *C. schimitscheki*, *Eucallipterus tiliae*, *Pemphigus bursarius*, *P. immunis*, *P. protospirae* in 5 subfamilies (Aphidinae, Chaitophorinae, Drepanosiphinae, Lachninae, Pemphiginae). Aphids were generally found on leaves, especially young leaves and branches of host plants. Present distribution, host plant list and nomenclature of the determined species were checked according to catalogue of Remaudière and Remaudière [6] and the recent update of Fauna European [http://www.faunaeur.org/] Host plants, locality and collection date were mentioned for all the recorded species. Identification of aphid species which are new records for the Turkish aphid fauna were confirmed by aphid specialists.

Aphidinae: Aphidini: Aphidina

Aphis craccivora Koch, 1854:

Material examined: Bartın central provience, Halatçıyaması, 06.08.2005, from *Robinia pseudoacasia*; Bartın Faculty of Forestry Campus, 03.08.2006, from *Pyrus malus.*

Aphis fabae Scopoli, 1763:

Ağdacı, Bartın Faculty of Forestry Campus, Amasra, 05.08.2006 from *Morus* sp.

Aphis farinosa J. F. Gmelin, 1790:

İnkum, 04.08.2006; Amasra, 05.08.2006 from *Salix alba*.

Aphis gossypii Glover, 1877:

Karaköy, 25.04.2006, *Salix alba*; Faculty campus of Forestry, 15.07.2006, *Prunus domestica*; İnkum, 04.08.2006, from *Robinia pseudoacacia.*

Aphidinae: Aphidini: Rhopalossiphina

Hyalopterus pruni (Geoffroy, 1762):

Karaköy, 29.07.2005, from *Prunus cerasus*; Ulus, 31.04.2006, *Prunus domestica.*

Aphidinae: Macrosiphini

Brachycaudus helichrysi (Kaltenbach, 1843):

Karaköy, 28.07.2005, from *Folrum eriobotryae*.

Brachycaudus (Acaudus) persicae (Passerini, 1860):

Karaköy, 28.07.2005, from *Prunus cerasus*.

Cavariella theobaldi (Gillette & Bragg, 1918):

Faculty campus, 15.07.2006, from *Salix alba.*

Myzus cerasi (Fabricius, 1775):

Amasra, 18.07.2005; Ağdacı, 24.05.2006 from *Prunus cerasus:* Karaköy, 20.07.2005, Çatmaca, 06.06.2006, from *Prunus avium*.

Phorodon humuli (Schrank, 1801):

Faculty campus, 04.08.2006, from *Prunus domestica*

Chaitophorinae: Chaitophorini

Chaitophorus leucomelas Koch, 1854:

Bartın Faculty of Forestry Campus, 16.05.2005, from *Populus nigra*.

Chaitophorus melanosiphon Pintera 1987:

Karaköy, Belediye sosyal tesisleri, Kampüs, 29.07.2005, from *Populus nigra*.

Chaitophorus populeti (Panzer, 1801):

Bartın-Amasra road, 08.06.1995, from *Populus nigra*.

Chaitophorus populialbae (Boyer de Fonscolombe, 1841):

Bartın central provience, Halatçıyaması, Okul Sokak, 05.10.2005, *Populus alba*.

Chaitophorus salicti (Schrank, 1801):

Kutlubey Demirci, 03.08.2006, from *Salix alba.*

Chaitophorus tremulae Koch, 1854:

Kanlıırmak Street, 30.05.1995, *Populus x euramaricana*.

Chaitophorus versicolor Koch, 1854:

Bartın-Amasra road, 05.06.1995, from *Populus nigra*.

Lachninae: Cinarini

Cinara brauni Börner, 1940:

Bartın-Uluyayla, 04.07.1995, from *Pinus nigra* subsp. *pallasiana.*

Cinara cedri Mimeur, 1936:

Çatmaca, 07.05.2006, from *Cedrus* sp.

Cinara confinis (Koch, 1856):

Bartın-Uluyayla, 04.07.1995, from *Abies bornmulleriana*.

Cinara cupressi (Buckton, 1881):

Bartın Faculty of Forestry Campus, 06.06.2006, *Biota orientalis.*

Cinara matsumurana Hille Ris Lambers, 1966:

Çatmaca, 07.05.2006, *Abies* sp.

Cinara pectinatae (Nördlinger, 1880):

Bartın-Uluyayla, 04.07.1995, from *Abies bornmulleriana*.

Cinara pinea (Mordvilko, 1895):

Bartın-Uluyayla, 04.07.1995, from *Pinus nigra* subsp. *pallasiana*.

Cinara pini (Linnaeus, 1758):

Bartın Faculty of Forestry Campus, 30.05.2006; İnkum, 04.08.2006, *Pinus pinaster.*

Cinara pinivora (Wilson, 1919):

Bartın Faculty of Forestry Campus, İnkum, Çatmaca, 07.05.2006, 04.08.2006, *Pinus pinaster*

Cinara schimitscheki Börner, 1940:

Bartın-Ulus, 03.07.1995, *Pinus nigra* subsp. *pallasiana.*

Drepanosiphinae: Phyllaphidini

Eucallipterus tiliae (Linnaeus, 1758):

Karaköy, 25.07.2005, *Tilia alba*.

Pemphiginae: Pemphigini

Pemphigus bursarius (Linnaeus, 1758):

Karaköy, 08.06.1995, 10.07.2006, *Populus x euramericana*.

Pemphigus immunis Buckton, 1896:

Ağdacıköyü, 26.05.1995, *Populus x euramericana*.

Pemphigus protospirae Lichtenstein, 1884 et 1885:

Bartın-Amasra road, 03.06.1995, from *Populus nigra.*

Aphid Species and Their Host Plants

The distributions of different aphid species on different host plants are listed in Table 1.

Table 1. Determined aphid species and host plants in Bartın.

Host Plants	Aphid Species
Pyrus malus, Robinia pseudoacasia	*Aphis craccivora*
Morus sp.	*Aphis fabae*
Salix alba	*Aphis farinose, Chaitophorus salicti, Cavariella theobaldi*
Salix alba, Prunus domestica, *Robinia pseudoacacia*	*Aphis gossypii*
Prunus cerasus, *Prunus domestica*	*Hyalopterus pruni*
Prunus cerasus	*Brachycaudus (Acaudus) persicae*
Prunus cerasus, Prunus avium	*Myzus cerasi*
Prunus domestica	*Phorodon humuli*
Folrum eriobotryae	*Brachycaudus helichrysi*
Populus nigra	*Chaitophorus leucomelas, Chaitophorus melanosiphon, Chaitophorus populeti, Chaitophorus versicolor, Pemphigus protospirae*
Populus alba	*Chaitophorus populialbae*
Populus x euramaricana	*Chaitophorus tremulae, Pemphigus bursarius, Pemphigus immunis*
Pinus nigra subsp. *pallasiana*	*Cinara brauni, Cinara pinea, Cinara schimitscheki*
Cedrus sp.	*Cinara cedri*
Abies bornmulleriana	*Cinara confinis, Cinara pectinatae*
Biota orientalis	*Cinara cupressi*
Abies sp.	*Cinara matsumurana*
Pinus pinaster	*Cinara pini, Cinara pinivora*
Tilia alba	*Eucallipterus tiliae*

DISCUSSION

Studies conducted so far showed that Turkey aphid fauna consists of aphid species belongs to all 11 Aphididae subfamilies. As a results of the studies conducted to search aphid species feeding on woody plants in Bartın, 31 aphid species belongs to 5 subfamilies were determined. 20 aphid species on woody host plants are new records for the Bartın while remaining of them were recorded previously from different parts of the Bartın [8, 9, 10]

Of these determined species, *Cinara matsumurana* and *Chaitophorus melanosiphon* were recorded for the first time in Bartın and Türkiye. *Cinara pinivora* was also considered as a possible new records but it has to be collected again and identified. Remaudiere *et al*. [11] annotated review of about 410 aphid species and subspecies in Turkiye and they did not mentioned record of these species from Turkiye.

The presented results show that although Bartın has a very rich flora and considerable amount of crops were grown, there were no enough study organized so far to determine aphid fauna of Bartın. Findings of the this study suggests that organization of the similar local studies is going to play an important role in applied entomological studies and may add more species to Turkish aphid fauna. Recently Özdemir *et al*. [12], Uysal *et al*. [13] and Akyurek [14] described new species from different parts of the Turkey. Results of this study and other recent conducted studies indicate that Turkish aphid fauna should have much more species.

Acknowledgement

Financial support from DPT Scientific Research Projects Commission Project No. 2003K121110 is gratefully acknowledged.

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