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Contributions to the Aphid Fauna of Türkiye from the Thracian Region

Trakya Bölgesinden Türkiye'nin Yaprak Biti Faunasına Katkılar

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ABSTRACT

Aphids are obligatory phytophagous insects specific to the host plant. The aphids have attracted the attention of researchers because of their increasing damage levels due to their invasion of new host plants and new regions. The study was conducted in Kırklareli, Tekirdağ and Istanbul provices from July to November 2024. Some important distinguishing characters were measured for the identification of the samples. As a result of this study, nine aphid species, *Aphis* (*Aphis*) *eupatorii* Passerini, 1863; *Aphis* (*Aphis*) *parietariae* Theobald, 1923; *Capitophorus mitegoni* Eastop, 1956; *Dysaphis* (*Dysaphis*) *ranunculi* (Kaltenbach, 1843); *Illinoia* (*Illinoia*) *liriodendri* (Monell, 1879; *Macrosiphoniella* (*Asterobium*) *asteris* (Walker, 1849); *Protaphis carthami* (Das, 1918); *Tiliaphis shinae* (Shinji, 1924) and *Yamatochaitophorus yichunensis* Jiang, Chen & Qiao, 2016 were added to the Türkiye aphid fauna and the number of listed species increased to 685. However, the detection of *A.* (*A.*) *eupatorii* on the host plant *Chromolaena odorata* (L.) King and Robinson were observed for the first time in this study.

Keywords: Aphid, New host plant, New record, Thracian, Türkiye

ÖZ

Yaprak bitleri, konak bitkiye özgü zorunlu fitofag böceklerdir. Yaprak bitleri, yeni konak bitkileri ve yeni bölgeleri istila etmelerinden dolayı zarar seviyeleri giderek arttığından araştırmacıların ilgisini çekmiştir. Çalışma Temmuz-Kasım 2024 tarihleri arasında Kırklareli, Tekirdağ ve İstanbul illerinde yürütülmüştür. Örneklerin tanımlanması için bazı önemli ayırt edici karakterler ölçülmüştür. Bu çalışma sonucunda dokuz yaprak biti türü, *Aphis* (*Aphis*) *eupatorii* Passerini, 1863; *Aphis* (*Aphis*) *parietariae* Theobald, 1923; *Capitophorus mitegoni* Eastop, 1956; *Dysaphis* (*Dysaphis*) *ranunculi* (Kaltenbach, 1843); *Illinoia* (*Illinoia*) *liriodendri* (Monell, 1879); *Macrosiphoniella* (*Asterobium*) *asteris* (Walker, 1849); *Protaphis carthami* (Das, 1918); *Tiliaphis shinae* (Shinji, 1924) ve *Yamatochaitophorus yichunensis* Jiang, Chen & Qiao, 2016 Türkiye yaprak biti faunasına eklenmiş ve listelenen tür sayısı 685'e yükselmiştir. Ek olarak, konak bitki *Chromolaena odorata* (L.) King and Robinson üzerinde *A.* (*A.*) *eupatorii*'nin tespiti ilk kez bu çalışmada gözlemlenmiştir.

Anahtar Kelimeler: Afit, Yeni konak bitki, Yeni kayıt, Trakya, Türkiye

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Introduction

The world aphid fauna has recently been represented by approximately 6080 species belonging to 781 genera (Blackman & Eastop, 2025; Favret, 2025) and the Türkiye aphid fauna by 676 species and 28 subspecies. (Görür et al., 2025; Kök et al., 2024). One of the world's most important pests, aphids cause serious damage to crops by feeding on plant sap. It is reported that aphids cause about 40 to 45 per cent yield loss in developing countries and 30 to 35 per cent in developed countries. (Ruberson, 1999). In addition to the direct and indirect damage caused by aphids to host plants, their most important characteristics, telescopic generations and cyclic parthenogenesis, allow them to take advantage of global warming to increase their spread and damage (Görür et al., 2023; Hulle et al., 2010). Türkiye is an important geographical region in terms of geographical location between continents, geological structure, different climate characteristics and rich floristic richness. These properties of the Türkiye resulted in both insect and plant diversity. Approximately 12,000 plant species are listed in Türkiye and 31% of them are endemic (Güner et al., 2012). This floristic shows that more aphid species and new records are possible.

In this study, 9 aphid species from Istanbul, Kırklareli and Tekirdağ were identified for the first time from Türkiye.

Methods

This study was conducted in Kırklareli, Tekirdağ and Istanbul provinces in July to November 2024. Samples from nine different plants were preserved in eppendorf tubes containing 96% alcohol. The permenant slides of the samples were made according to in Martin (1983). These specimens were identified by Blackman & Eastop (2025) using an Olympus BX51 microscope and the current taxonomic status was checked by Favret (2025). The voucher samples were stored at the Biotechnology Department of the Nigde Omer Halisdemir University.

Results

In the study conducted to evaluate the aphid population, nine aphid species were identified on nine plants from the study area. These species are new records for the aphid fauna of Türkiye.

Aphidoidea Latreille, 1802
Aphididae Latreille, 1802
***Aphis* Linnaeus, 1758**

It is the largest genus of aphids and contains around 500 species. About 106 species belonging to this genus have been recorded in Türkiye (Blackman & Eastop, 2025; Görür et al., 2025).

***Aphis (Aphis) eupatorii* Passerini, 1863**

General features: Distributed in Italy and Germany. Dark green or whitish yellow aptera individuals were feeding underside of leaves of *Eupatorium cannabinum* L. The populations were ant attended. Body length (BL): 0.9-2.0 mm (Blackman & Eastop, 2025; Holman, 2009).

Material examined: Kırklareli/Üsküp-Demirköy-Kadınkule pass, 22.VIII.2024. Green or yellow 30 apterae individuals (♀) feeding on the trunk and underside of leaves of *Chromolaena odorata* (L.) King and Robinson. The new host plant *C. odarata* was recorded for the first time. The populations were ant attended. Morphometric measurements of *Aphis (Aphis) eupatorii* are as follows: Body length (BL): 1.05 mm. Sixth antennal segment processus terminalis/sixth antennal segment base (PT/Base): (0.25/0.10): 2.5 mm. Siphunculi length (SIPHL): 0.18 mm. Length of rostrum segment VI + V (RIV+V): 0.10 mm (Figure 1).

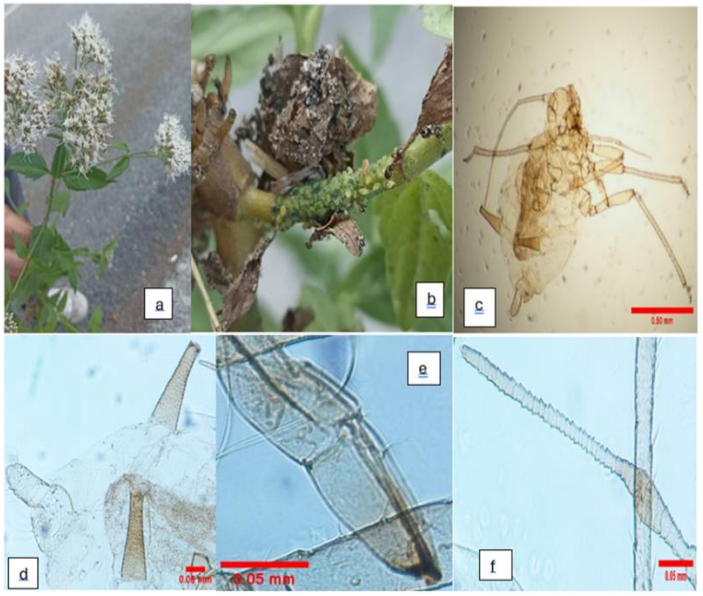

Figure 1.
a) Chromolaena odorata plant, b) Aphis (Aphis) eupatorii on C. odorata, c) General view, d) SIPH and Cauda, e) Rostrum (RIV+V), f) ANT VI (PT+Base).

***Aphis (Aphis) parietariae* Theobald, 1923**

General features: Distributed in Europe, North Africa and Middle East. Dark or pale green aptera individuals were feeding on the stem or underside of leaves of *Parietaria* sp. BL: 0.9-1.7 mm (Blackman & Eastop, 2025; Dransfield, 2025; Holman, 2009).

Material examined: İstanbul/Çatalca, 01.XI.2024. Green 10 apterae individuals (♀) feeding on the underside of leaves of *Paraetaria judaica* L. Morphometric measurements of *Aphis (Aphis) parietariae* are as follows; BL: 1.35 mm. SIPHL: 0.20 mm. RIV+V: 0.11 mm (Figure 2).

Figure 2.
a) Aphis (Aphis) parietariae on Paraetaria judaica, b) General view, c) SIPH and Cauda, d) Rostrum (RIV+V).

***Capitophorus* van der Goot, 1913**

They are widely in the Palearctic and eastern regions. The genus contains about 30 species, and 7 species have been recorded from Türkiye (Blackman & Eastop, 2025; Görür et al., 2025).

***Capitophorus mitegoni* Eastop, 1956**

General features: Palearctic (Africa) originated, distributed in Africa, Afghanistan, India, Bangladesh, Bhutan, Nepal, Hong Kong, Philippines, New Guinea and Australia. Pale green aptera individuals were feeding on the underside of leaves of *Polygonum* sp. and *Persicaria* sp. BL: 1.6-2.2 mm (Blackman & Eastop, 2025; Holman, 2009).

Material examined: Kırklareli/Pınarhisar, 18.VII.2024 and İstanbul/Eyüpsultan-Pirinçci village, 20.VIII.2024. Pale green 15 apterae individuals (♀) were feeding underside of leaves of *Persicaria* sp. and *Persicaria maculosa* Gray Morphometric measurements of *Capitophorus mitegoni* are as follows; BL: 1.62 mm. PT/Base (0.74/0.10): 7.4 mm. SIPHL: 0.55 mm. Cauda length (CaudaL): 0.22 mm (Figure 3).

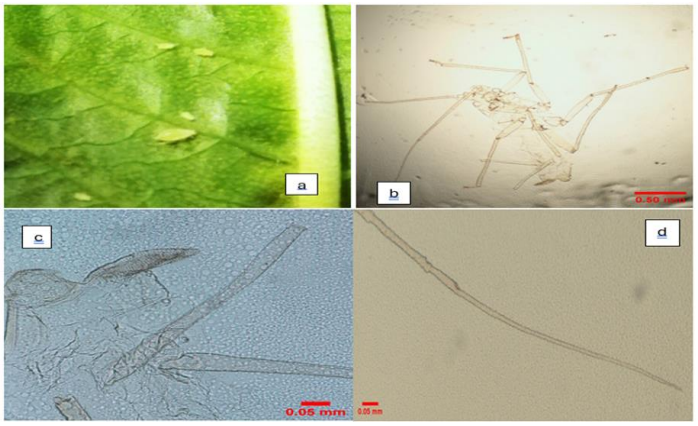

Figure 3.
a) Capitophorus mitegoni on Persicaria maculosa, b) General view, c) SIPH and Cauda, d) ANT VI (PT+Base).

***Dysaphis* Börner, 1931**

It is a Palaearctic genus and consists of about 110 species. About 19 species have been recorded from Türkiye (Blackman & Eastop, 2025; Görür et al., 2025).

***Dysaphis (Dysaphis) ranunculi* (Kaltenbach, 1843)**

General features: Distributed in Europe, Iran and Central Asia. Grey-green with wax, aptera individuals were feeding on *Ranunculus* sp. Also, pale yellowish-green aptera individuals were feeding on curled-leaf galls on *Crataegus* sp. BL: 1.7-2.3 mm (Blackman & Eastop, 2025; Holman, 2009).

Material examined: Kırklareli/Babaeski, 29.X.2024. Pale green 6 apterae individuals (♀) were feeding inside flower of *Ranunculus* sp. Morphometric measurements of *Dysaphis (Dysaphis) ranunculi* are as follows; SIPHL: 0.25 mm (Figure 4).

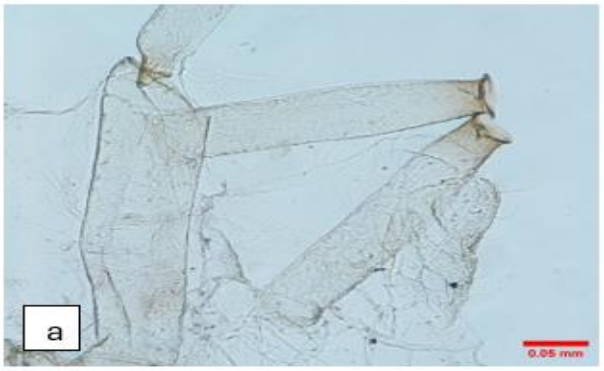

Figure 4.
SIPH and Cauda.

***Illinoia* Wilson, 1910**

This genus includes about 45 North American species and one Caucasian species. 2 species have been recorded from Türkiye (Blackman & Eastop, 2025; Görür et al., 2025).

***Illinoia (Illinoia) liriodendri* (Monell, 1879)**

General features: Nearctic (North America) originated, distributed in North America, Japan, France, Italy, UK, Germany, Luxembourg, Slovenia, Poland, Hungary, Serbia, Greece, Egypt and Korea. Pale green with lightly wax, aptera individuals were feeding underside of leaves of *Liriodendron tulipifera* L. Antennae and siphunculi black except at bases. Also, the legs are pale green except for black apices to the tibiae and tarsi. BL: 1.7-2.5 mm (Blackman & Eastop, 2025; Dransfield, 2025; Holman, 2009).

Material examined: Istanbul/Atatürk arboretum, 20.VIII.2024. Pale green or pale yellow 15 apterae individuals (♀) were feeding underside of leaves of *Liriodendron tulipifera* L. Morphometric measurements of *Illinoia (Illinoia) liriodendri* are as follows; PT/Base (1/0.15): 6.6 mm. Siphunculi length/cauda length (SIPHL/CaudaL): (0.72/0.22): 3.27 mm. RIV+V: 0.10 mm (Figure 5).

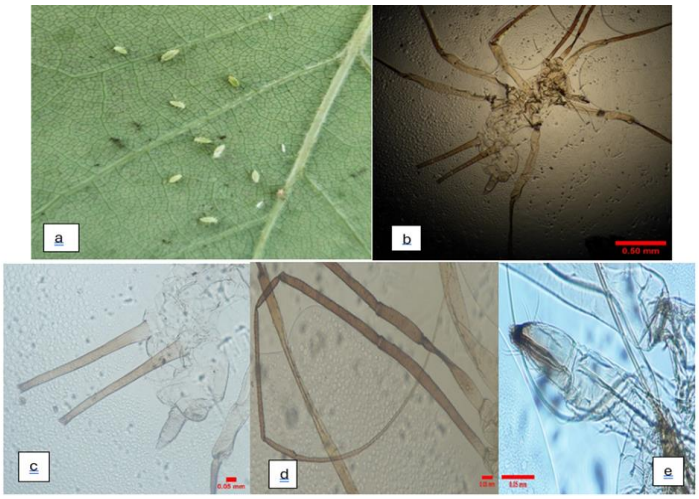

Figure 5.
a) Illinoia (Illinoia) liriodendri on Liriodendron tulipifera, b) General view, c) SIPH and Cauda, d) ANT VI (PT+Base), e) Rostrum (RIV+V).

***Macrosiphoniella* Del Guercio, 1911**

The genus, which is Palearctic and Nearctic, contains about 115 species. About 17 species have been recorded from Türkiye. (Blackman & Eastop, 2025; Görür et al., 2025).

***Macrosiphoniella (Asterobium) asteris* (Walker, 1849)**

General features: Palearctic (Spain) originated, distributed in throughout Europe, Spain and Korea. Reddish brown with little wax, aptera individuals were feeding on the upper parts of the stems and the flowers of *Aster tripolium* L. Also, *Galatella sedifolia* (L.) Greuter has been recorded. BL: 2.3-3.2 mm (Blackman & Eastop, 2025; Dransfield, 2025; Holman, 2009).

Material examined: Kırklareli/Vize/Çüvenli village/ April 10th Police Forest, 30.X.2024. Dark brown 24 apterae individuals (♀) were feeding inside flower of *Galatella linosyris* (L.) Rchb. f. Morphometric measurements of *Macrosiphoniella (Asterobium) asteris* are as follows; BL: 2.65 mm. PT/Base (1.04/0.16): 6.5 mm. SIPHL/CaudaL (1.14/0.55): 2.07 mm. RIV+V: 0.15 mm (Figure 6).

***Protaphis* Börner, 1952**

This genus is closely related to *Aphis* and contains about 50 nominal species. Most nominal species are in Europe and Central Asia. About 5 species have been recorded from Türkiye (Blackman & Eastop, 2025; Görür et al., 2025).

***Protaphis carthami* (Das, 1918)**

General features: Palearctic (North Africa) originated, distributed in North Africa, Lebanon, Iran, Kazakhstan, Pakistan and India. Dark green or reddish-brown with greyish white wax, aptera individuals were feeding on the stems and flowers of *Carthamus tinctorius* L. and *Carthamus* sp. BL: 1.6-2.3 mm (Blackman & Eastop, 2025; Holman, 2009).

Figure 6.
a) Macrosiphoniella (Asterobium) asteris on Galatella linosyris, b) General view, c) Rostrum (RIV+V), d) Cauda, e) ANT VI (PT+Base).

Material examined: Tekirdağ/Muratlı, 20.VII.2024. Dark green with wax, 12 apterae individuals (♀) were feeding on the stems *Carthamus lanatus* L. The populations were ant attended. Morphometric measurements of *Protaphis carthami* are as follows; BL: 1.60 mm. SIPHL: 0.10 mm. RIV+V: 0.14 mm (Figure 7).

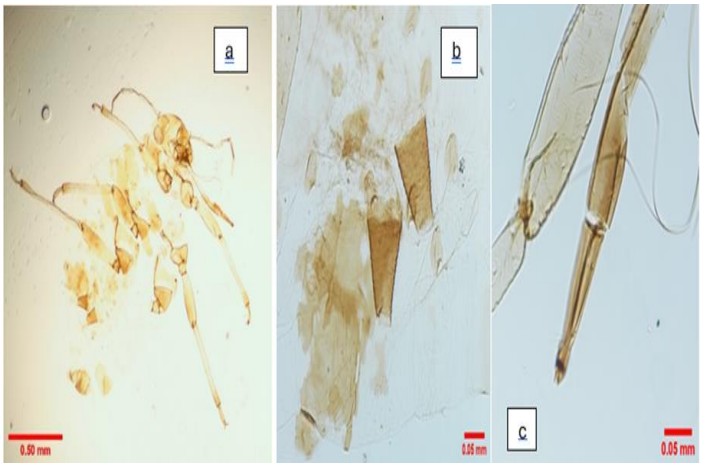

Figure 7.
a) General view, b) SIPH, c) Rostrum (RIV+V).

***Tiliaphis* Takahashi, 1961**

This genus is very similar to *Eucallipterus* and includes four oriental species. 2 species have been recorded from Türkiye (Blackman & Eastop, 2025; Görür et al., 2025).

***Tiliaphis shinae* (Shinji, 1924)**

General features: Palearctic (Japan) originated, distributed in Japan, China, Korea and eastern Siberia. Pale yellow or greenish-yellow alate individuals were feeding on the underside of leaves of *Tilia* sp. BL: 1.7-2.4 mm (Blackman & Eastop, 2025; Holman, 2009).

Material examined: Kırklareli- Central, 29.X.2024. Yellow 10 alate individuals (♀) feeding on the underside of leaves of *Tilia* sp. Morphometric measurements of *Tiliaphis shinae* are as follows; BL: 2.10 mm. PT/Base (0.19/0.08): 2.37 mm. Hind tarsus I segment length/hind tarsus II segment length (HTI/HTII): (0.05/0.10): 0.5 mm. RIV+V: 0.11 mm. (Figure 8).

Figure 8.
a) General view, b) Rhinaria on ANTIII, c) Rostrum (RIV+V), d) HTI and HTII.

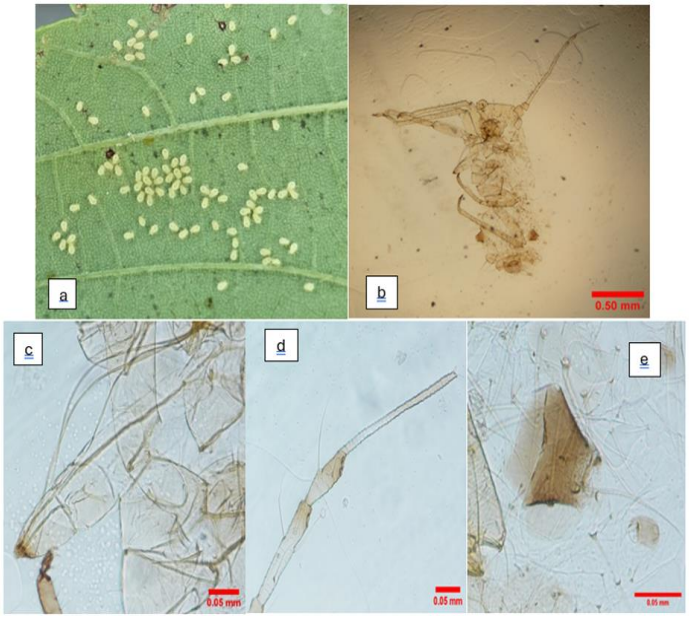

Figure 9.
a) Yamatochaitophorus yichunensis on Acer sp., b) General view, c) Rostrum (RIV+V), d) ANT VI (PT+Base), e) SIPH.

***Yamatochaitophorus* Higuchi, 1972**

This genus includes two east Asian species (Blackman & Eastop, 2025).

***Yamatochaitophorus yichunensis* Jiang, Chen & Qiao, 2016**

General features: Palearctic (China) originated, distributed in China. The records are given on undersides of leaves of *Acer tegmentosum* Maxim. BL: 0.8-1.4 mm (Blackman & Eastop, 2025).

Material examined: Kırklareli/ Değimenköy/ Sarpköy/ Dupnisa cave, 17.VII.2024. Green 35 apterae individuals (♀) aptera individuals were feeding on the underside of leaves and petiole of *Acer* sp. Morphometric measurements of *Yamatochaitophorus yichunensis* are as follows; BL: 1.55 mm. PT/Base (0.25/0.09): 2,77 mm. SIPHL: 0.06 mm. RIV+V: 0.10 mm (Figure 9).

Discussion

Approximately 676 aphid species have been identified in Türkiye so far (Görür et al., 2025; Kök et al., 2024). As a result of various studies, 97 aphid species were identified in Istanbul and approximately 30 species of aphids were recorded from the Thrace region of Istanbul (Çanakçıoğlu, 1967, 1975; Toper Kaygın & Çanakçıoğlu, 2003). Akyıldırım Beğen & Görür (2021), detected 43 aphids in Istanbul (Büyükada) and 2 of these species are new records for the Türkiye aphid fauna. Kök et al. (2016) identified 39 aphid species in Çanakkale and *Aphis sedi* Kaltenbach, 1843 was a new record for the aphid fauna of Türkiye. Kök (2021) described 27 aphid species as a result of their study in Çanakkale (Çardak Lagoon) and stated that *Aphis symphyti* Schrank, 1801 is a new record for the aphid fauna of Türkiye. Tayat & Özder (2024) identified 83 aphid species in their study conducted in Tekirdağ. In another study, 4 species (*Sitobion avenae, Rhapalosiphum padi, Rhapalosihum maidis* and *Schizaphis graminum*) were identified in Edirne (Tayat & Özder, 2016). Considering these studies, it is thought that the aphid diversity in this region is even higher.

Conclusion and Recommendations

With this study, 9 aphid species determined as new records for Türkiye aphid fauna and Türkiye aphid fauna reached to 685 aphid species. In addition, new host plant relation was determined during the conducted study. *Aphis* (*Aphis*) *eupatorii* was detected on the new host plant preference *Chromolaena odorata* (L.) King and Robinson. These studies are very important for determining the aphid fauna of the country. The number of aphid species is expected to increase due to Türkiye geographical characteristics, climatic variability and rich plant diversity. Therefore, further studies are recommended. These findings represent preliminary results of an ongoing project.

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Ethics Committee Approval: Since insects are used, ethics committee approval is not required.

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