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Original article

Eriophyoid mites (Acari: Eriophyoidea) from İzmir-Turkey

İzmir, Türkiye'deki Eriophyoid akarlar

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ABSTRACT

A comprehensive faunistic research was carried out in order to detect Eriophyoid mites in İzmir. As a result of the research seventeen species of eriophyoid mites were detected for the mite fauna of Turkey. The samples were collected on fruit and ornamental plants in İzmir province, Turkey 2021. The identified eriophyid species are *Aceria erinea* Nalepa, 1891, *Aceria avanensis* Bagdasarian, 1970, *Aceria salicina* Nalepa, 1911, *Aceria filiformis* Nalepa, 1891, *Aceria ilicis* Canestrini, 1890, *Aceria massalongoi* Canestrini,1890, *Aceria oleae* Nalepa, 1900, *Aceria sheldoni* Ewing, 1937, *Eriophyes pyri* Pagenstecher, 1857, *Eriophyes tiliae* Nalepa, 1890, *Aculus fockeui* Nalepa & Trouessart, 1891, *Phyllocoptes pruni* Soliman & Abou-Awad, 1979, *Aculus schlechtendali* Nalepa 1890, *Aculus mogeri* Farkas, 1960, *Colomerus vitis* Pagenstecher, *Calepitrimerus vitis* Nalepa, 1905, *Rhyncaphytoptus ficifoliae* Keifer, 1939. Information on hosts, damage symptoms and geographical distribution of these species are given in the article.

INTRODUCTION

Eriophyoid mites are obligatory phytophagous invertebrates, with the majority of species being host plant specialists. Weed-associated eriophyoids are considered to have high potential as classical biological control agents because of their high host plant specificity. These mites are important not only as direct pests of the plants but they also act as vectors of some important plant virus diseases. Eriophyoid identification by morphological examination is quite difficult because of their small size and unclear taxonomical characteristics. Eriophyoid mites are very small, obligatory phytophagous invertebrates and the generality of these mites are specialized to the host (Lindquist et al. 1996). Weed-associated eriophyoids are thought out have high potential as biological control agents on account of their high host plant specificity (Smith et al. 2010). They infest yield all over the world and many are important pests. Turkey has rich eriophyoid biodiversity because of the position region biologic history of the country (Ekim and Güner 2000, Karagöz 2003). Many studies were carried out to determine the eriophyoid fauna of Turkey (Denizhan et al. 2006, 2021, Denizhan and Çobanoğlu 2010, Karaca 1956, Petanović and Stanković 1999). Denizhan et al. (2015) listed eriophyoid mites in the catalogue giving a description of the dispersion in Turkey. The aim of this study is to define and provide information on eriophyid in İzmir Eriophyoid fauna which were found.

MATERIALS AND METHODS

The samples were collected from the leaves of cultivated plants and weeds from the province of İzmir (Bayındır, Bergama, Beydağ, Buca, Foça, Menderes, Narlıdere, Ödemiş

and Seferihisar) from the beginning of June to the end of September. Eriophyoid mites collected from the plants were directly examined under a dissecting stereo-microscope (Leica ES2) and mounted on microscope slides according to Keifer (1975). The identification studies were made by the help of microscope Leica DM 1000. The morphological nomenclature follows Lindquist et al. (1996), all the measurements accomplished by according to Amrine and Manson (1996). For the systematic studies Amrine et al. (2003) has been followed. Assoc. Dr. Evsel Denizhan made diagnoses. Information on the hosts, damage symptoms, and geographical distribution of these species each sample are provided. The specimens are deposited in the Trakya University, Science Faculty-Department of Biology Turkey.

RESULTS AND DISCUSSION

10 species belonging to Eriophyidae Nalepa family, 4 species belonging to Phyllocoptinae Nalepa subfamily, 2 species belonging to Cecidophyinae Keifer subfamily, 1 subspecies belonging to Rhyncaphytoptinae Roivain family of Diptilomiopidae Keifer family from the samples collected from cultivated plants and weeds in İzmir province between June and September. 17 species have been identified.

Superfamily: Eriophyoidea Nalepa, 1898

Family: Eriophyidae Nalepa, 1898

Aceria erinea Nalepa, 1891

Host: *Juglans regia* L. (Juglandaceae)

Geographic distribution: Antarctic, Australian, Indomalayan, Nearctic, Neotropical, Palaearctic.

Relation to the host plant: Gall-making mite. Infested walnut leaves show a shiny, yellowish-green bulge between two leaf veins on the upper surface with whitish, furry, blister-like erinea on the lower leaf surface.

Dispersion in Turkey: Ankara, Van (Denizhan and Çobanoğlu 2010), İzmir (Buca, Seferihisar)

Aceria avanensis Bagdasarian, 1970

Host: *Juglans regia* L. (Juglandaceae)

Geographic distribution: Palaearctic.

Relation to the host plant: A gall-making mite causing small, protruding pouch-like and warty galls on the leaf lamina which may also appear to be deformed.

Dispersion in Turkey: Ankara, Van, Yalova (Denizhan and Çobanoğlu 2010, Denizhan et al. 2015), İzmir (Foça, Ödemiş, Bergama) (11.06.2021, 17.07.2021, 24.08.2021).

Aceria salicina Nalepa, 1911

Host: *Salix alba* L. (Salicaceae)

Geographic distribution: Nearctic, Palaearctic.

Relation to the host plant: Gall-making mite. This species causes leaf nodules and it was found inside witches' brooms.

Dispersion in Turkey: Ankara, Erzincan, Erzurum (Alaoğlu 1996), Van (Denizhan et al. 2015), İzmir (Foça, Bergama) (19.06.2021, 23.07.2021).

Aceria filiformis Nalepa, 1891

Host: *Ulmus campestris* L.

Geographic distribution: Palaearctic, Nearctic

Relation to the host plant: Gall-making mite.

Dispersion in Turkey: Ankara (Denizhan and Çobanoğlu 2010), İzmir (Bayındır, Menderes) (26.07.2021, 13.08.2021).

Aceria ilicis Canestrini, 1890

Host: *Quercus ilex* L. (Fagaceae)

Geographic distribution: Palaearctic.

Relation to the host plant: Gall-making mite. This species causes rusty-brown erinea on the lower leaf.

Dispersion in Turkey: Ankara (Denizhan and Çobanoğlu 2010), İzmir (Foça, Narlıdere) (19.06.2021, 28.08.2021).

Aceria massalongoi Canestrini,1890

Host: *Vitex agnus-castus* L. (Verbenaceae)

Geographic distribution: Palaearctic.

Damage to the host: Gall-making mite. This species induces small pouch galls of hemispheric shape on the leaves, often on the laminar margins. Leaves become distorted even when hardly galled.

Dispersion in Turkey: İzmir (Denizhan et al. 2015), İzmir (Foça, Bergama) (19.06.2021, 01.09.2021).

Aceria oleae Nalepa, 1900

Host: *Olea europaea* L. (Rutaceae)

Geographic distribution: Palearctic

Damage to the host: This species induces leaf twisting with hair falling and fruit deformation.

Dispersion in Turkey: İzmir Denizhan et al. (2015), İzmir (Foça, Ödemiş) (19.06.2021, 03.09.2021)

Aceria sheldoni Ewing, 1937

Host: *Citrus limon* L.

Geographic distribution: Palearctic, Neotropical, Oriental, Nearctic, Australian, Ethiopian.

Damage to the host: This species distortion of shoot growth, deformation of fruit, discoloration of fruit.

Dispersion in Turkey: Afyon, Bingöl, Erzurum, Isparta, Adana (Denizhan et al. 2015), İzmir (Foça) (19.06.2021).

Eriophyes pyri Pagenstecher, 1857

Host: *Pyrus communis* L. (Rosaceae)

Geographic distribution: Africotropical, Antarctic, Australian, Nearctic, Neotropical, Palaearctic.

Damage to the host: A gall-making, mite causing blisters (pouch galls) on pear leaves.

Dispersion in Turkey: Diyarbakır, Elazığ, Malatya, Tunceli; Ankara, Eskişehir, Konya, Niğde; Çukurova region; in Erzurum-Narman, Tortum, Oltu, İspir, Erzincan, Kemaliye, Kars, Aydın, Çanakkale, Denizli, İzmir, Kütahya; the area of Van Lake Basin (Denizhan and Çobanoğlu 2010), Ankara and the area of Van Lake Basin, Yalova (Denizhan et al. 2015), İzmir (Foça, Ödemiş, Bergama) (08.07.2021, 17.08.2021).

Eriophyes tiliae Nalepa, 1890

Host: *Tilia platyphyllos* Scop.

Geographic distribution: Nearctic, Palaearctic.

Damage to the host: Galls

Dispersion in Turkey: Ankara (Denizhan et al. 2015), İzmir (Bergama, Narlıdere) (17.08.2021, 13.09.2021).

Subfamily: Phyllocoptinae Nalepa, 1892

Aculus fockeui Nalepa & Trouessart, 1891

Host: *Prunus domestica* L. (Rosaceae)

Geographic distribution: Africotropical, Australian, Indomalayan, Nearctic, Neotropical, Palaearctic.

Damage to the host: Vagrant. This species induces yellow leaf spots in spring followed by upper longitudinal curls on young leaves along with silvering and mottling of older leaves.

Dispersion in Turkey: Ankara, Van, Yalova (Denizhan and Çobanoğlu 2010), İzmir (Ödemiş, Bergama) (28.06.2021, 17.08.2021).

Phyllocoptes pruni Soliman & Abou-Awad, 1979

Host. *Prunus domestica* L. (Rosaceae)

Geographic distribution. Antarctic, Australian, Indomalayan, Nearctic, Neotropical, Palaearctic.

Damage to the host. Vagrant.

Dispersion in Turkey. Ankara, Van (Denizhan et al. 2015), İzmir (Foça) (01.09.2021).

Aculus schlechtendali Nalepa 1890

Host: *Malus domestica* Borkh. (Rosaceae)

Geographic distribution: Antarctic, Australian, Indomalayan, Nearctic, Neotropical, Palaearctic.

Damage to the host: Vagrant. This mite causes pitting and rusting of young leaves.

Dispersion in Turkey: Ankara, Van (Denizhan and Çobanoğlu 2010), İzmir (Narlıdere, Bayındır, Foça, Ödemiş) (23.06.2021, 07.07.2021, 01.08.2021, 06.09.2021).

Aculus mogeri Farkas, 1960

Host: *Populus alba* L. (Salicaceae)

Geographic distribution: Palaearctic.

Damage to the host: Vagrant. Mites cause leaf discolouration

Dispersion in Turkey: Ankara (Denizhan and Çobanoğlu 2010), İzmir (Buca, Foça) (04.06.2021, 23.09.2021).

Subfamily: Cecidophyinae Keifer, 1966

Colomerus vitis Pagenstecher

Host: *Vitis vinifera* L. (Vitaceae)

Geographic distribution: Africotropical, Australian, Nearctic, Neotropical, Palaearctic.

Damage to the host: Gall-making mite

Dispersion in Turkey: Ankara, Yalova (Denizhan and Çobanoğlu 2010), İzmir (Foça, Ödemiş, Seferihisar) (15.06.2021, 23.07.2021, 11.08.2021).

Calepitrimerus vitis Nalepa, 1905

Host: *Vitis vinifera* L. (Vitaceae)

Geographic distribution: Ethopian, Nearctic, Neotropical, Palaearctic.

Damage to the host: The mites inhabit lower leaf surfaces, causing some chlorosis

Dispersion in Turkey: Erzurum (Denizhan et al. 2015), İzmir (Foça, Beydağ, Bergama) (03.06.2021, 05.08.2021, 04.09.2021, 13.09.2021).

Family: Diptilomiopidae Keifer, 1944

Subfamily: Rhyncaphytoptinae Roivainen, 1953

Rhyncaphytoptus ficifoliae Keifer, 1939

Host: Ficus sp. (Moraceae)

Geographic distribution: Australian, Indomalayan, Nearctic, Neotropical, Palaearctic.

Damage to the host: Vagrant

Dispersion in Turkey: Ankara (Denizhan and Çobanoğlu 2010), İzmir (Foça, Ödemiş, Bergama, Seferihisar, Buca) (23.07.2021, 11.08.2021, 04.09.2021, 13.09.2021).

As a result, the species found in the fauna study conducted for the detection of Eriophyoid mites in the province of Izmir, which is the main aim of the study, will have an important contribution to the Eriophyoid fauna of Turkey. In addition, the fact that İzmir province has a high diversity

and importance in terms of fruit growing will shed an important light on the future studies to be made in this sense.

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ÖZET

İzmir ilinde Eriophyoid akarların tespiti amacıyla kapsamlı bir faunistik araştırma yapılmıştır. Yapılan araştırma sonucunda Türkiye eriophyid akar faunası için 17 tür tespit edilmiştir. Bitki örnekleri İzmir ilinden meyve bahçeleri ve süs bitkilerinden toplanmıştır. Tespit edilen türler *Aceria erinea* Nalepa, 1891, *Aceria avanensis* Bagdasarian, 1970, *Aceria salicina* Nalepa, 1911, *Aceria filiformis* Nalepa, 1891, *Aceria ilicis* Canestrini, 1890, *Aceria massalongoi* Canestrini,1890, *Aceria oleae* Nalepa, 1900, *Aceria sheldoni* Ewing, 1937, *Eriophyes pyri* Pagenstecher, 1857, *Eriophyes tiliae* Nalepa, 1890, *Aculus fockeui* Nalepa & Trouessart, 1891, *Phyllocoptes pruni* Soliman & Abou-Awad, 1979, *Aculus schlechtendali* Nalepa 1890, *Aculus mogeri* Farkas, 1960, *Colomerus vitis* Pagenstecher, *Calepitrimerus vitis* Nalepa, 1905, *Rhyncaphytoptus ficifoliae* Keifer, 1939' dır. Tespit edilen türlerin coğrafik dağılım, konukçusu ve verdiği zarar şekli ile ilgili bilgiler makale içerisinde verilmiştir.

Anahtar kelimeler: Acarina, Eriophyoid, fauna, dağılım.

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