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Eriophyoid Mites (Acarina: Eriophyoidea, Eriophyidae) on Weeds in Erzurum*

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ABSTRACT: The main goal of this work is to determine Eriophyid (Acari: Eriophyidae) mites fauna on weeds of Erzurum during 2010–2012 years. As a result *Aceria egmirae* Denizhan et al. 2006 on *Althea roseae* L., *Aceria malherbae* (Nuzzaci, 1985) on *Convolvulus arvensis* L., *Aceria novellae* Denizhan et al. 2007 on *Hedysarum* sp. L., *Aceria salviae* (Nalepa, 1891) on *Salvia aethiopis* L., *Aceria tinctoriae* Denizhan et al. 2006 on *Anthemis tinctoriae* Rech., *Aceria verbasci* (Boczek, 1964) on *Verbascum* sp. and *Eriophyes euphorbiae* (Nalepa, 1891) on *Euphorbia peplus* L. were determined.

Key words: Acarina, Eriophyoidea, Weed, Erzurum, Turkey

Erzurum'da Yabancı Otlar Üzerinde Görülen Eriophyoid Akarlar

ÖZ: Bu çalışmanın amacı 2010-2012 yılları arasında Erzurum ilinde yabancı otlar üzerinde bulunan Eriophyid akarların tespitidir. Bu çalışmanın sonucunda; *Aceria egmirae* Denizhan et al. 2006 *Althea roseae* L. üzerinde, *Aceria malherbae* (Nuzzaci, 1985) *Convolvulus arvensis* L. üzerinde, *Aceria novellae* Denizhan et al. 2007 *Hedysarum* sp. üzerinde, *Aceria salviae* (Nalepa, 1891) *Salvia aethiopis* L. üzerinde, *Aceria tinctoriae* Denizhan et al. 2006 *Anthemis tinctoriae* Rech. üzerinde, *Aceria verbasci* (Boczek, 1964) *Verbascum* sp. üzerinde ve *Eriophyes euphorbiae* (Nalepa, 1891)'da *Euphorbia peplus* L. üzerinde tespit edilmiştir.

Anahtar Kelimeler: Acarina, Eriophyoidea, Yabancı otlar, Erzurum, Türkiye

INTRODUCTION

Eriophyid mites are obligate plant feeders provided with strong host specificity. They are tiny and often cause relevant alterations on their hosts. Their economic importance is related to the direct damage they cause to their plant hosts. A lot of species are considered pests to include in quarantine lists, other transmit viruses and other pathogens. Thanks to their host specificity and to the ability to reduce the reproductive fitness of some host plants, several species are interesting candidates for weed control and a few of them are efficiently and extensively released in weed biological control programs. The known species are still scarce in respect to the expected worldwide species and the studied geographical areas depend on the researchers involved in their study. The Turkish eriophyoid fauna is scarcely known while the geographical position and the botanical history make the Turkish territory particularly relevant for a potential large range of species. Some of these could have a scientific and economical interest on crops and weed control. Therefore, a large survey on the eriophyoid mites of Erzurum (Center, Aşkale, Çat, Horasan and Pasinler) with particular regard to the species on the ornamental plants and on the weeds is needed. Of course, the role played by the eriophyid species found on the collected weeds and the economic importance of the other species has to be searched and evaluated. Concerning the small size and the difficulties that scientists have in studying and managing these mites, methods for collecting large number of live specimens should be developed. In fact, laboratory and field studies, other than the mite release in open field, often are exposed to the risk of the accidental introduction of predators and non-target pests, and often require too much time for all procedures (Denizhan *et al*., 2015).

Eriophyoids cause a wide range of host injuries to plants and the induction of the symptoms by these mites is not yet understood, even if the saliva intake seems to be particularly involved in this phenomenon. Knowledge on this mechanism could stimulate new research lines for genetic investigations, such as it has been done on gall-making nematodes (Denizhan *et al*., 2015).

MATERIALS AND METHODS

To identify eriophyoid species on natural and cultivated plants of the Erzurum, surveys were conducted from 2010 to 2012; one survey specifically concentrated on species of ornamental and weed plants at the following sites: Center, Aşkale, Çat, Horasan and

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Pasinler. Infested leaves were collected from May to September. Specimens collected from plant materials were prepared and slide mounted according to Keifer (1975). Specimens were examined with a Leica DM 1000. The classification system followed is that of Amrine *et al*. (2003). The taxonomical verification was made according to Amrine and Stasny (1994), Amrine *et al*. (2003), and De Lillo and Amrine (1998). Host plants were identified by Dr. Işık Tepe (Department of Plant Protection, Agricultural Faculty, Yüzüncü Yil University).

RESULTS

Family: ERIOPHYIDAE Nalepa, 1898
Subfamily: ERIOPHYINAE Nalepa, 1898
Tribe: ERIOPHYINI Nalepa, 1898

***Aceria egmirae* Denizhan et al. 2006**

Type data: *Alcea rosea* L. (Malvaceae) which was originally listed as *Althaea rosea* (L.) Cav. (misspelt as rosae); Eğmir lake area, Ankara, Turkey.

Geographic distribution: Palaearctic.

Relation to the host plant: Vagrant. Small populations of this mite have been found on leaves and flowers. No apparent damage has been observed.

Distribution in Turkey: Specimens recorded on *A. rosea* from Ankara (Denizhan *et al.,* 2015).

Examined Material: Erzurum-Center (Atatürk University Campus), Horasan and Pasinler on *Alcea rosea*.

***Aceria malherbae* Nuzzaci, 1985**

Type data: *Convolvulus arvensis* L. (Convolvulaceae); near Roma, Lazio, Italy.

Geographic distribution: Africotropical, Nearctic, Palaearctic.

Relation to the host plant: Gall-making. Leaves become folded with the leaf-edges tightly curled inwards, distorted, thickened and with a rough surface, turning yellowish-green or reddish. Plants and flowers are deformed, preventing reproduction (Denizhan *et al.,* 2015).

Distribution in Turkey: This mite has been recorded in the area of Van Lake Basin on *Convolvulus betonicifolius* Mill. and *Convolvulus arvensis* L.(Denizhan *et al.,* 2015).

Examined Material: Erzurum-Center (Atatürk University Campus), Aşkale, Çat, Horasan and Pasinler on *Convolvulus arvensis* L.

***Aceria novellae* Denizhan et al. 2007**

Type data: *Hedysarum* sp. (Leguminosae); Ankara, Turkey.

Geographic distribution: Palaearctic.

Relation to the host plant: Vagrant. Small populations of this mite found on leaves and flowers. No apparent damage.

Distribution in Turkey: Specimens were recorded on *Hedysarum* sp. in Ankara (Denizhan *et al.,* 2015).

Examined Material: Erzurum-Center (Atatürk University Campus), Aşkale, Çat; Horasan and Pasinler on *Hedysarum* sp.

***Aceria salviae* (Nalepa, 1891)**

Type data: *Salvia* sp. (Lamiaceae); Van, Turkey.

Relation to the host plant: The mites induce gall and erineum on the leaves.

Geographic distribution: Palearctic. Algeria, Austria, Bosnia Herzegovina, Bulgaria, Croatia, Cyprus, France, Greece, Hungary, Italy, Romania, Serbia, Slovenia, Turkey (De Lillo and Amrine, 1998).

Distribution in Turkey: Erzincan (Alaoglu, 1996). Van Lake Basin: Iskele on *Salvia* spp. (Lamiaceae) (Denizhan *et al.,* 2015).

Examined Material: Erzurum-Center (Atatürk University Campus), Aşkale, Çat and Horasan on *Salvia aethiopis* L. Especially, it was determined in this study that they formed significant symptoms on plants in Ataturk University Campus area (Figure 1.)

***Aceria tinctoriae* Denizhan et al. 2006**

Type data: *Anthemis tinctoria* L. (Compositae); Karagöl (Ankara), Turkey.

Geographic distribution: Palaearctic

Relation to the host plant: Vagrant. A small population was found on leaves and flowers. No damage symptoms were observed.

Distribution in Turkey: Ankara (Karagöl) on *Anthemis tinctoria* L. (Denizhan *et al.,* 2015).

Examined Material: Erzurum-Ilıca on *Anthemis tinctoria* L.

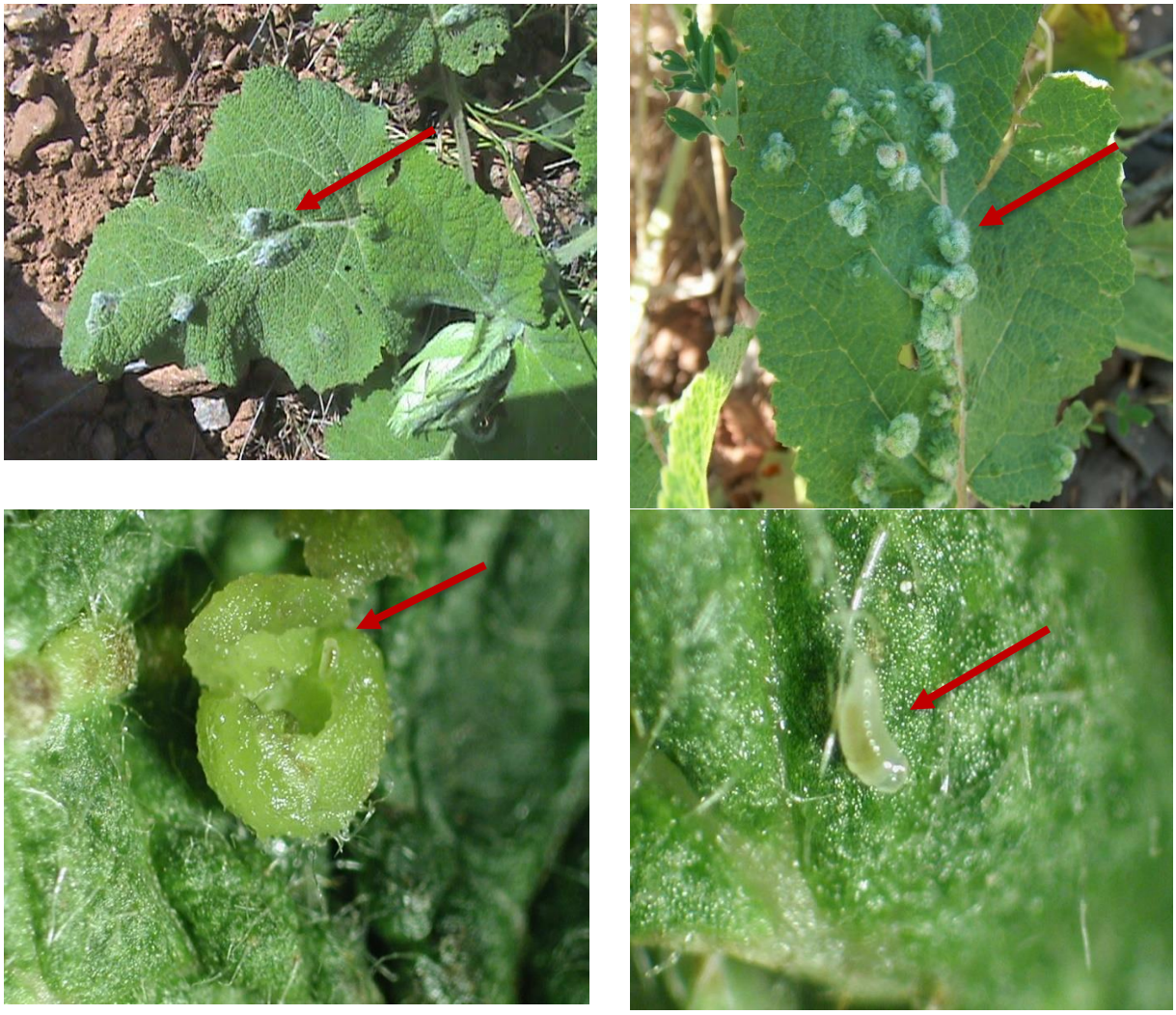

Figure 1. General view of *Salvia aethiopis* L. found in Ataturk University's Campus, Erzurum, damaged due to feding of *Aceria salviae* feeding. (photo by Goksel Tozlu)

***Aceria verbasci* (Boczek, 1964)**

Type data: *Verbascum* spp. (Scrophulariaceae) Ankara, Turkey

Geographic distribution: Palearctic

Relation to the host plant: Vagrant

Distribution in Turkey: Ankara.

Examined Material: Erzurum-Center (Atatürk University Campus) Aşkale and Çat on *Verbascum* sp.

Eriophyes euphorbiae **(Nalepa, 1891)**

Type data: *Euphorbia peplus* L. (Euphorbiaceae) Van, Turkey

Relation to the host: Vagrant on upper leaf surfaces.

Geographic distribution: Palearctic. Austria, Hungary; Italy, Romania, Serbia, Slovenia (De Lillo and Amrine, 1998).

Distribution in Turkey: Van Lake Basin: Gürpinar on *Euphorbia peplus* L. (Euphorbiaceae) (Denizhan *et al.,* 2015)

Examined Material: Erzurum-Center (Atatürk University Campus), Aşkale, Çat, Horasan and Pasinler on *Euphorbia peplus* L.

This article presents the results of a 2-year study on wild eriophyoid mites in Erzurum. The aim of this study was to collect and identify eriophyoid species infesting wild. Understand of a herbivore's host specificity is necessary to develop effective control strategies and is fundamental to the application of herbivores as biological control agents of weeds.

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