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Eriophyoid mite species associated with *Acer monspessulanum* L. in Urmia region of Iran

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Abstract

With the aim of obtaining more information about eriophyoid mites of Iran, eriophyoid fauna of Montpellier maples (*Acer monspessulanum* L.) in Khan valley, Baranduzchay-ye Jonubi Rural District, Urmia county, West Azerbaijan Province, Iran was studied. In total, four eriophyoid species were identified; two of them, *Aceria azerbaijaniensis* Lotfollahi et Mohammad-Doustaresharaf **sp. nov.** and *Cecidophyes aceressulani* Lotfollahi et Mohammad-Doustaresharaf **sp. nov.**, were new in science. *A. azerbaijaniensis* **sp. nov.** is the third *Aceria* species found on Sapindaceae plants in Iran. *C. aceressulani* **sp. nov.** is the third *Cecidophyes* species in Iran and the first *Cecidophyes* species found on Sapindaceae plants of Iran. In addition, *Rhyncaphytoptus saccharini* Keifer, 1959 herein was recorded for the first time in Iran.

Keywords: *Acer*, *Aceria*, *Cecidophyes*, Eriophyoidea, Sapindaceae, West Azerbaijan

Introduction

Maples are a well-known, diverse and versatile group of trees and shrubs, belonging to the genus *Acer* (Sapindaceae). There are approximately 164 *Acer* species worldwide (The World Flora Online 2022); most of which are native to Asia (Mohtashamian *et al.* 2017), while a few appear in Europe, northern Africa, and North America (Gibbs & Chen 2009).

Until now more than 90 eriophyoid species were described from maples (*Acer* spp.) worldwide (Amrine and de Lillo unpublished database). Among them just five species have been found in Iran (Table 1). None of them belong to the genus *Cecidophyes* and two of them belong to the genus *Aceria*.

Eight *Acer* species occur in Iran, most of which are in the northern part of the country (Mohtashamian *et al.* 2017). With the aim of obtaining more information about eriophyoid mites of Iran, we decided to investigate maples eriophyoid mite species in Urmia region of West Azerbaijan province, Iran. As a result, information about eriophyoid species associated with maples of this region is presented here.

Material and methods

For our survey of eriophyoid mites of Urmia county, we sampled Montpellier maples in Khan valley, Baranduzchay-ye Jonubi Rural District, Urmia county, West Azerbaijan Province of Iran during September 2021.

Eriophyoid mites were recovered from the plant material by means of a modified washing method developed by Monfreda *et al.* (2007).

The collected specimens were slide mounted according to Mehri-Heyran *et al.* (2020).

The terminology and the setal notation in the morphological description of the mite follow mainly Lindquist (1996) and terminology of the internal female genital apparatus follows Chetverikov (2014) and Chetverikov *et al.* (2014).

TABLE 1. List of species found on *Acer* spp. in Iran.

Species	Host plant	Province	Reference
<i>Aceria macrorhyncha</i> (Nalepa, 1889)	<i>Acer monspessulanum</i> L.	Kermanshah	Kamali <i>et al.</i> 2001
<i>Aceria macrochela</i> (Nalepa, 1891)	<i>Acer pseudoplatanus</i> L.	Gilan (Talish Mountains)	Trotter 1903
	<i>Acer cinerascens</i> (Boiss.) Yalt.	Fars	Doryanizadeh <i>et al.</i> 2013
<i>Aculops glabri</i> (Keifer, 1952) (syn: <i>Aculops paraglabri</i> (Keifer, 1952))	<i>Acer glabrum</i> Torr.	Razavi Khorasan	Gharezare <i>et al.</i> 2013
<i>Vasates aceriscrumena</i> (Riley & Vasey, 1870)	Maple	South-western provinces	Kamali <i>et al.</i> 2001
<i>Vasates quadripedes</i> Shimer, 1869	Maple	South-western provinces	Kamali <i>et al.</i> 2001

All morphological measurements were taken by means of a phase contrast microscope Olympus BX53, 1,000 magnification (oil immersion) according to Amrine and Manson (1996) as modified by de Lillo *et al.* (2010), and are given in micrometers. Counting of dorsal, ventral and coxigenital semiannuli follows Lotfollahi *et al.* (2020). Measurements and means are rounded off to the nearest integer when required except for characters with very short length. Measurements refer to the length of the morphological trait unless otherwise specified and are given in micrometers. In the female description, the holotype measurements are followed by range values, in parentheses, of the studied population (*i.e.* holotype and paratypes) and for males and immature stages, only the range values are given. The mean values of the paratypes are reported in the few cases in which the measurements of the holotype could not be taken, due to the slide mounting position of the specimens and were marked by an asterisk (*) in the description.

Line drawings were hand-drawn through a *camera lucida* according to de Lillo *et al.* (2010) and the plates were edited with Adobe Photoshop CC 2017. The abbreviations labelling schematic drawings in figures follow mainly Amrine *et al.* (2003).

The genera classification follows Amrine *et al.* (2003) and comparisons were also made with new genera described since that publication.

Host plant names and their synonymies are in accordance with "*The World Flora Online*" (2022).

Type materials are deposited at the Acarology Laboratory, Department of Plant Protection, Faculty of Agriculture, Azarbaijan Shahid Madani University, Tabriz (Iran).

Results

In this study we found symptoms on maple leaves (Fig. 1). After examining under the stereomicroscope and preparing relevant photos, the leaf samples were washed and the extracted mites were mounted on 46 microscopic slides, which resulted in four mite species—*Aceria macrochela* (Nalepa, 1891), *Aceria azerbaijaniensis* Lotfollahi *et* Mohammad-Doustaresharaf **sp.**

nov., *Cecidophyes aceressulani* Lotfollahi *et* Mohammad-Doustaresharaf **sp. nov.**, and *Rhyncaphytoptus saccharini* Keifer, 1959. The microscopic slides and the mites mounted in them are listed in below:

AM-IWA-BJ21D-1: holotype female of *A. azerbaijaniensis* **sp. nov.**; 1 female of *R. saccharini*; 1 paratype of female *C. aceressulani* **sp. nov.**

AM-IWA-BJ21D-2: holotype female of *C. aceressulani* **sp. nov.**; 1 female of *A. macrochela*

AM-IWA-BJ21D-3: 3 paratype females of *A. azerbaijaniensis* **sp. nov.**

AM-IWA-BJ21D-4: 1 paratype female of *A. azerbaijaniensis* **sp. nov.**; 1 paratype female of *C. aceressulani* **sp. nov.**

AM-IWA-BJ21D-5: 1 paratype male of *A. azerbaijaniensis* **sp. nov.**; 1 female of *R. saccharini*

AM-IWA-BJ21D-6: 1 paratype female of *A. azerbaijaniensis* **sp. nov.**

AM-IWA-BJ21D-7: 1 paratype female of *A. azerbaijaniensis* **sp. nov.**; 1 nymph of *R. saccharini*

AM-IWA-BJ21D-8: 2 paratype females of *A. azerbaijaniensis* **sp. nov.**; 1 male of *R. saccharini*

AM-IWA-BJ21D-9: 2 paratype female of *A. azerbaijaniensis* **sp. nov.**; 1 female of *R. saccharini*

AM-IWA-BJ21D-10: 1 paratype female of *A. azerbaijaniensis* **sp. nov.**; 1 nymph of *R. saccharini*

AM-IWA-BJ21D-11: 1 paratype female of *A. azerbaijaniensis* **sp. nov.**

AM-IWA-BJ21D-12: 1 paratype female of *A. azerbaijaniensis* **sp. nov.**; 1 female of *R. saccharini*

AM-IWA-BJ21D-13: 2 paratype female of *C. aceressulani* **sp. nov.**

AM-IWA-BJ21D-14: 1 paratype male of *C. aceressulani* **sp. nov.**

AM-IWA-BJ21D-15–18: each with 1 paratype female of *C. aceressulani* **sp. nov.**

AM-IWA-BJ21D-19: 1 paratype female of *A. azerbaijaniensis* **sp. nov.**

AM-IWA-BJ21D-20: 1 paratype male and 1 paratype female of *C. aceressulani* **sp. nov.**

AM-IWA-BJ21D-21: 1 nymph of *R. saccharini*; 1 paratype male of *C. aceressulani* **sp. nov.**

AM-IWA-BJ21D-22: 1 paratype nymph of *C. aceressulani* **sp. nov.**

AM-IWA-BJ21D-23: 1 paratype nymph and 1 paratype female of *C. aceressulani* **sp. nov.**

AM-IWA-BJ21D-24: 1 paratype male of *C. aceressulani* **sp. nov.**; 1 female of *A. macrochela*

AM-IWA-BJ21D-25: 2 females of *R. saccharini*; 1 paratype female of *C. aceressulani* **sp. nov.**

AM-IWA-BJ21D-26: 2 females of *R. saccharini*; 1 paratype female of *C. aceressulani* **sp. nov.**

AM-IWA-BJ21D-27: 1 paratype male of *C. aceressulani* **sp. nov.**

AM-IWA-BJ21D-28: 1 male of *R. saccharini*; 1 paratype female of *C. aceressulani* **sp. nov.**

AM-IWA-BJ21D-29: 1 paratype female of *C. aceressulani* **sp. nov.**

AM-IWA-BJ21D-30: 2 paratype females of *C. aceressulani* **sp. nov.**

AM-IWA-BJ21D-31: 1 female of *R. saccharini*; 1 paratype female of *C. aceressulani* **sp. nov.**

AM-IWA-BJ21D-32: 1 female of *R. saccharini*; 1 paratype female of *C. aceressulani* **sp. nov.**

AM-IWA-BJ21D-33: 1 female of *R. saccharini*; 1 paratype female of *C. aceressulani* **sp. nov.**

AM-IWA-BJ21D-34–39: each with 1 female of *A. macrochela*

AM-IWA-BJ21D-40–43: each with 2 females of *A. macrochela*

AM-IWA-BJ21D-44: 1 female and 1 nymph of *A. macrochela*

AM-IWA-BJ21D-45: 1 male of *A. macrochela*

AM-IWA-BJ21D-46: 1 larva of *A. macrochela*

Considering that similar symptoms for *A. macrochela* have been expressed as making rounded galls with 2–4 mm diameter, with hard walls, often in angles between veins, and many-celled hairs on the inner surface. These symptoms have also been reported from different countries including Iran (Amrine and de Lillo unpublished database). We therefore consider that the signs of damage in figure

1 is related to the species *A. macrochela* and the remaining three species can be considered vagrant or inquiline species.

Family Eriophyidae Nalepa

Subfamily Eriophyinae Nalepa

Tribe Aceriini Amrine *et* Stasny

***Aceria macrochela* (Nalepa, 1891)**

Type data

Acer campestre L. (Sapindaceae); type locality not stated by the author and Austria is presumed.

Relation to the host plant

Making rounded galls with 2–4 mm diameter, with hard walls, often in angles between veins; inner surface of galls with many-celled hairs (Amrine and de Lillo unpublished database). During the current study, similar symptoms were found on the leaves of Montpellier maple, *A. monspessulanum* too (Fig. 1).



FIGURE 1. Symptoms observed on the leaves of Montpellier maple, caused by *Aceria macrochela* (Nalepa, 1891).

Previous provincial records for Iran

Gilan (Trotter 1903) and Fars provinces (Doryanizadeh *et al.* 2013).

Localities and host plant

Seventeen females, one male, one nymph and one larva from *A. monspessulanum* mounted on microscope slides (AM-IWA-BJ21D-2,24, 34–46); Khan valley, Baranduzchay-ye Jonubi Rural District, Urmia county, West Azerbaijan Province, Iran (37°18'21"N, 45°06'29"E), 1,479 m above sea level; coll. M. Mohammad-Doustasharaf, 21 September 2021.

Aceria azerbaijaniensis Lotfollahi *et* Mohammad-Doustasharaf sp. nov.

Description

FEMALE (Fig. 2; measured specimens n=7). Body vermiform, 180 (180–195, excluding gnathosoma), 52* (49–58) thick, 52* (49–58) wide. Gnathosoma projecting obliquely downwards, cheliceral stylets 27 (27–33), palp 28 (28–31), palp coxal setae *ep* 3 (2–3), dorsal palp genual setae *d* 8 (7–8), unbranched. Suboral plate rounded anteriorly, ornamented with distinct dense granules. Prodorsal shield 36 (35–39) including frontal lobe, 38 (38–41) wide, sub-triangular; with a long rectangular frontal lobe, 12 (11–13), over gnathosomal base. Shield pattern indistinct, consisting of complete very faint median line, complete admedian lines that are distinct on their basal third and faint on remained parts, short outer submedian lines and one pair of lateral lines made by connected granules and dashes; a small depression in front of setae *sc* tubercles; shield lateral parts with dense granules and ocellar spot above coxae II. Tubercles of scapular setae *sc* on rear shield margin, 19 (19–20) apart, setae *sc* 26 (24–27), very fine on most part, directed posterior. Legs with all usual segments and setae. Leg I 33 (31–35), trochanter 5 (4–6), femur 9 (9–10), genu 5 (5–6), tibia 7 (7–9), tarsus 9 (8–9), tarsal solenidion ω 9 (9–10), curved down, distally enlarged and tapered, empodium simple, 9 (8–10), 5-rayed; femoral setae *bv* 11 (11–13), genual setae *l'* 21 (20–25), paraxial tibial setae *l'* 8 (no variation), located in middle of tibia, paraxial fastigial tarsal setae *ft'* 15 (14–18), antaxial fastigial tarsal setae *ft''* 26 (24–27), paraxial unguinal tarsal setae *u'* 4 (4–5). Leg II 30 (30–34), trochanter 5 (4–5), femur 8 (8–10), genu 6 (5–6), tibia 5 (5–6), tarsus 8 (8–9), tarsal solenidion ω 9 (9–10), curved down, distally enlarged and tapered, empodium simple, 8 (8–9), 5-rayed; femoral setae *bv* 11 (10–13), genual setae *l''* 8 (8–11), paraxial fastigial tarsal setae *ft'* 7 (6–8), antaxial fastigial tarsal setae *ft''* 26 (21–28), paraxial unguinal tarsal setae *u'* 4 (4–5). Coxisternal region. Prosternal apodeme 5 (5–6), seems to be formed at a distance from the front edge of the coxisternum I (invisible on the front); anterior setae on coxisternum I *lb* 12* (11–13), 11 (11–12) apart; proximal setae on coxisternum I *la* 33 (31–35), 8 (7–9) apart; proximal setae on coxisternum II *2a* 42 (40–45), 22 (21–25) apart; 8 (8–10) very narrow microtuberculate semiannuli between coxae and genital coverflap plus 4 (no variation) transversal rows of granules at the base of the coverflap. Coxae with dense distinct granules. External genitalia 9 (8–12), 19 (18–21) wide, coverflap with 9 (8–9) longitudinal striae; setae *3a* 33 (30–38), 14 (13–15) apart. Internal genitalia: spermathecae circular, oriented posterolaterad; spermathecal tubes relatively short as long as third of spermathecal length, with tiny cone-shaped spermathecal process situated at the back end of spermathecal tube; transverse genital apodeme trapezoidal, distally folded. Opisthosoma dorsally evenly rounded, with 72 (70–77) dorsal semiannuli, 60 (53–60) ventral semiannuli. Microtubercles: oval, on posterior part of dorsal semiannuli; circular, on posterior part of ventral semiannuli, elongated and linear on last 3 (3–4) ventral semiannuli. Setae *c2* 29 (28–31) on ventral semiannulus 11 (9–11), setae *d* 48 (48–53) on ventral semiannulus 22 (19–24); setae *e* 15 (15–20) on ventral semiannulus 38 (32–39); setae *f* 24 (22–27) on ventral semiannulus 56 (49–56); 4 (no variation) annuli posterior to setae *f*. Setae *h2* 78 (75–90) apically very fine, *h1* 3 (3–4).

MALE (Fig. 2-GM; measured specimen n=1). Similar in shape and prodorsal shield arrangement to female. Body smaller than female, 155, 42 wide, 42 thick; palp genual setae *d* 7; prodorsal shield 31, 30 wide; setae *sc* 22, 19 apart. Opisthosoma with 61 dorsal semiannuli and 66

ventral semiannuli; 10 semiannuli between coxae and genitalia, with microtubercles similar to that of female. Setae: *lb* 11, *la* 23, *2a* 36, *c2* 26, *d* 47, *e* 14, *f* 20, *h1* 4, *h2* 45. Male genitalia 15 wide, setae *3a* 22, *12* apart.

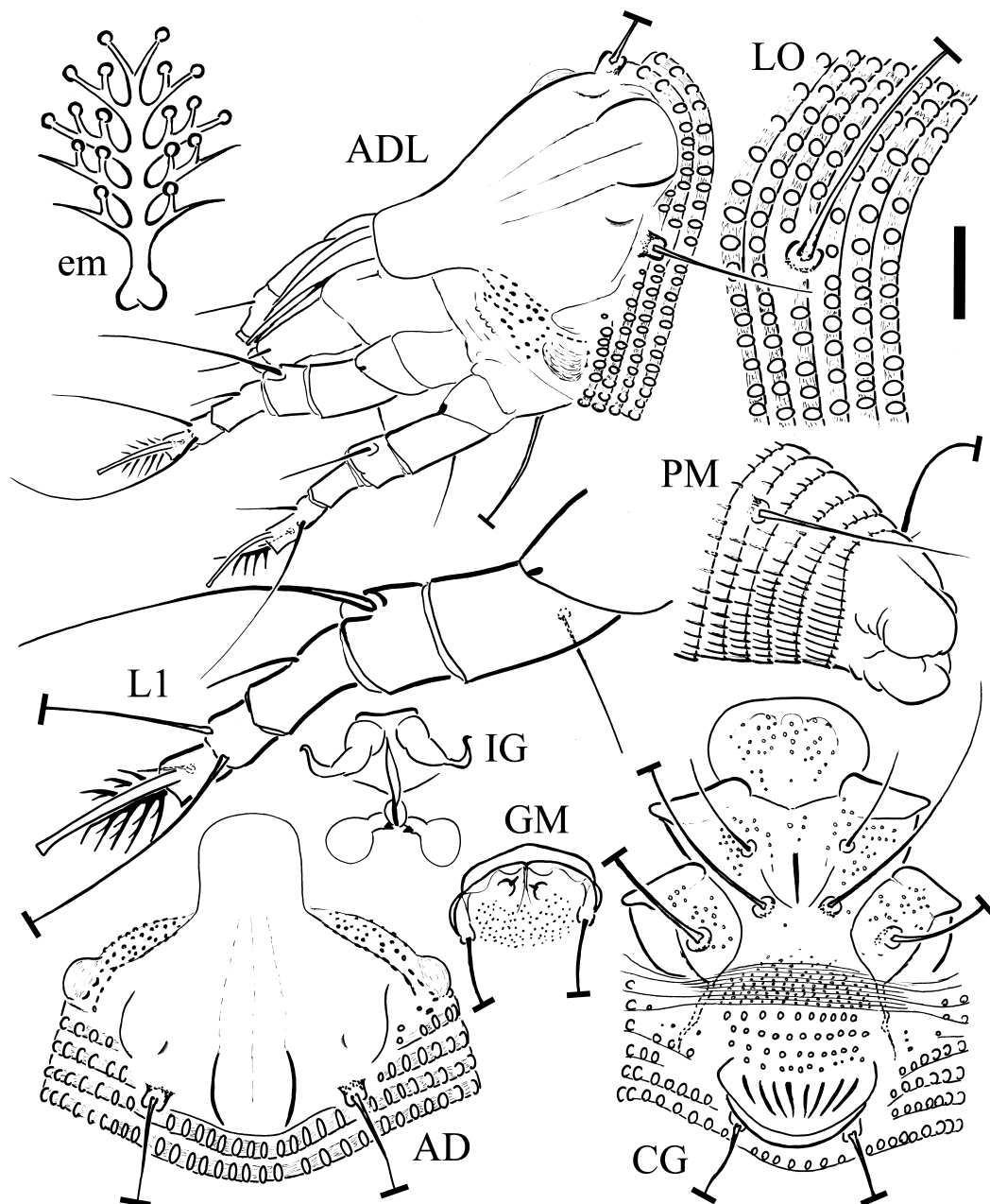


FIGURE 2. Schematic drawings of *Aceria azerbaijaniensis* Lotfollahi *et* Mohammad-Doustaresharaf **sp. nov.**: AD. Prodorsal shield; ADL. Dorso-lateral view of female anterior body region; CG. Female coxigenital region; em. Empodium; GM. Male genital region; IG. Internal female genitalia; LO. Lateral view of annuli; L1. Leg I; PM. Lateral view of posterior opisthosoma. Scale bar: 14 μ m for LO; 10 μ m for ADL, CG, GM, IG, PM; 5 μ m for L1; 2.5 μ m for em.

Type host plant

Acer monspessulanum L. (Sapindaceae), Montpellier maple.

Type locality

Khan valley, Baranduzchay-ye Jonubi Rural District, Urmia county, West Azerbaijan Province, Iran (37°18'21"N, 45°06'29"E), 1,479 m above sea level, coll. M. Mohammad-Doustasharaf, 21 September 2021.

Type material

Holotype: mounted on a microscope slide (AM-IWA-BJ21D-1). Paratypes: 14 females and 1 male mounted on microscope slides (AM-IWA-BJ21D-3–12,19).

Other material

Mites preserved in a vial (AM-IWA-BJ21D) of Oudemans' fluid (Walter & Krantz 2009) as extracted from the same sample as the type specimens.

Relation to the host plant

Mites were vagrant or inquiline on the leaves that damaged by *A. macrochela* (Fig. 1).

Distribution

Since the host plant of the new species described in this research has a wide distribution in the northern part of Iran, it is expected that this species will be found in other regions with further studies.

Etymology

The specific epithet, *azerbaijaniensis* refers to the type locality, Azerbaijan area in northwest of Iran.

Differential diagnosis

The new species was compared with all *Aceria* species found on *Acer* spp. *Aceria antonimus* (Keifer, 1962) was a similar species that was described as vagrant mites in hair masses at petiole bases around expanded buds of its host plant, *Acer negundo* var. *californicum* (Torr. & Grey) Sarg. in Sacramento, California, USA (Keifer 1962).

Keifer describes the prodorsal shield of *A. antonimus* as follows: "Shield 36 long, 29 wide, somewhat elongate and subtriangular in general shape. Prominent, rather narrow frontal lobe, about 14 long, blunt apically, thin dorsoventrally. Shield design suppressed, the admedian lines present on rear 2/3, diverging to rear margin and slightly converging there. Shield laterally granular". The new species has prodorsal shield with equal length but is wider (38–41). It has a rectangular frontal lobe with equal length (11–13). The prodorsal shield has a complete very faint median line, complete admedian lines that are distinct on their basal third and faint anteriorly. Considering the accuracy of the equipment used by Kiefer, it can be said that the two species are similar in this respect. The new species has short outer submedian lines and one pair of lateral lines made by connected granules and dashes, a small depression in front of setae *sc* tubercles and with dense granules and an ocellar spot on lateral prodorsal shield. However, Kiefer did not provide any description similar to these in *A. antonimus*. In addition, in both species the coxae are ornamented with numerous granules and the genital coverflap has similar number of longitudinal striae.

However, the new species has more dorsal semiannuli (70–77 in the new species *versus* 55 in *A. antonimus*), more empodial ray number (5 in the new species *versus* 4 in *A. antonimus*), and longer setae *sc* 24–27 in the new species *versus* 13 in *A. antonimus*, *c*2 (28–31 in the new species *versus* 14 in *A. antonimus*), *d* (48–53 in the new species *versus* 35 in *A. antonimus*), *e* (15–20 in the new

species *versus* 11 in *A. antonimus*), *f* (22–27 in the new species *versus* 19 in *A. antonimus*) and *3a* (30–38 in the new species *versus* 10 in *A. antonimus*).

Remarks

This is the third *Aceria* species found on Sapindaceae plants in Iran.

Subfamily Cecidophyinae Keifer

Tribe Cecidophyini Keifer

Cecidophyes aceressulani Lotfollahi et Mohammad-Doustaresharaf sp. nov.

Description

FEMALE (Fig. 3; measured specimens *n*=8). Body fusiform, 206 (183–229, excluding gnathosoma), 59* (56–62) thick, 61 (49–61) wide. Gnathosoma projecting obliquely downwards, cheliceral stylets 31 (30–37), palp 29 (27–29), palp coxal setae *ep* 3 (3–4), dorsal palp genual setae *d* 8 (7–8), unbranched. Suboral plate smooth, with rounded protrusion anteriorly. Prodorsal shield 39 (35–39) including frontal lobe, 42 (38–42) wide, sub-triangular; with a broad and blunt frontal lobe, 12 (9–12), over gnathosomal base. Shield pattern distinct, reticulated consisting of 24 closed and opened cells made by complete median, admedian, inner and outer submedian lines and two pair of lateral lines and 14 pairs of transverse lines; lateral lines with distinct granules on them. Tubercles of scapular setae *sc* and setae *sc* absent. Legs with all usual segments and setae. Leg I 30 (28–33), trochanter 5 (4–5), femur 8 (8–10), genu 6 (5–6), tibia 7 (6–9), tarsus 8 (8–9), tarsal solenidion ω 9 (9–10), curved down, distally tapered, empodium simple, 9 (8–10), 8-rayed; femoral setae *bv* 19 (18–20), genual setae *l'* 29 (24–30), paraxial tibial setae *l'* 9 (9–12), located in basal third of tibia, paraxial fastigial tarsal setae *ft'* 18 (18–20), antaxial fastigial tarsal setae *ft''* 25 (25–28), paraxial unguinal tarsal setae *u'* 6 (5–6). Leg II 29 (27–30), trochanter 5 (no variation), femur 9 (7–10), genu 5* (4–6), tibia 5 (5–6), tarsus 8 (7–8), tarsal solenidion ω 10 (no variation), curved down, distally tapered, empodium simple, 9 (no variation), 8-rayed; femoral setae *bv* 20 (20–22), genual setae *l''* 10 (10–12), paraxial fastigial tarsal setae *ft'* 9 (9–11), antaxial fastigial tarsal setae *ft''* 28 (22–28), paraxial unguinal tarsal setae *u'* 6 (6–7). Coxisternal region. Coxae I narrowly connate at center line and made short prosternal apodeme 3 (3–3.5), anterior setae on coxisternum I *lb* 8* (7–11), 12 (12–14) apart; proximal setae on coxisternum I *la* 24 (19–24), 13 (12–13) apart; proximal setae on coxisternum II *2a* 40 (30–40), 28 (27–28) apart; 7* (6–7) microtuberculate semiannuli between coxae and genital coverflap. Coxae with very few distinct lines. Genitalia appressed to coxae; External genitalia 12 (10–12), 21 (20–23) wide, coverflap with longitudinal striae broken in two uneven ranks; anterior rank (closer to the coxae) with 12 (10–12) longitudinal striae and posterior rank with 13 (12–13) longitudinal striae; setae *3a* 29 (24–30), 16 (14–18) apart. Internal genitalia: spermathecae ovoid, oriented laterad; spermathecal tubes relatively short as long as half of spermathecae diameter; transverse genital apodeme bent up and distally folded. Opisthosoma dorsally evenly rounded, with 47 (40–48) dorsal semiannuli, 68 (61–71) ventral semiannuli. Microtubercles: triangular, on posterior margin of dorsal semiannuli and on posterior part of ventral semiannuli, elongated and linear on last 7 (6–7) ventral semiannuli. Setae *c2* 26 (21–28) on ventral semiannulus 8 (8–9), setae *d* 43* (39–51) on ventral semiannulus 25 (21–25); setae *e* 11 (10–12) on ventral semiannulus 39 (30–39); setae *f* 23* (21–25) on ventral semiannulus 66 (56–66); 5 (4–5) annuli posterior to setae *f*. Setae *h2* 65 (55–66) apically very fine, *h1* absent.

MALE (Fig. 3-GM; measured specimens *n*=3). Similar in shape and prodorsal shield arrangement to female. Body smaller than female, 172–180, 50 wide, 47–48 thick; palp genual setae *d* 5–6; prodorsal shield 32–35, 31–38 wide; tubercles of scapular setae *sc* and setae *sc* absent.

Opisthosoma with 35–39 dorsal semiannuli and 57–61 ventral semiannuli; 5–7 semiannuli between coxae and genitalia, with microtubercles similar to that of female. Setae: *lb* 5–8, *la* 17–21, *2a* 32–38, *c2* 20–21, *d* 34–45, *e* 7–10, *f* 16–17, *h1* absent, *h2* 60–63. Male genitalia 16–18 wide, setae *3a* 17–19, 14–15 apart.

NYMPH (measured specimens *n*=2). Body fusiform, 160–170 (excluding gnathosoma), 57 wide, 45 thick; palp genual setae *d* 5. Prodorsal shield 28–29 including frontal lobe, 26–32 wide, its shape and ornamentation seems to be similar to the females, but due to the poor clearing quality of the nymph slide mounted dorsoventrally, its pattern details could not be drawn. Tubercles of *sc* setae and setae *sc* absent. Opisthosoma with 41–45 dorsal semiannuli and 45–49 ventral semiannuli, with microtubercles similar to females. Setae: *lb* 6–7, *la* 17, *2a* 31–33, *c2* 18–22, *d* 24–29, *e* 8–9, *f* 16–18, *h2* 36–48, *h1* absent. Setae *3a* 15–18, 8–9 apart on semiannulus 8 after coxae; empodium 7-rayed

Type host plant

Acer monspessulanum L. (Sapindaceae), Montpellier maple.

Type locality

Khan valley, Baranduzchay-ye Jonubi Rural District, Urmia county, West Azerbaijan Province, Iran (37°18'21"N, 45°06'29"E), 1,479 m above sea level, coll. M. Mohammad-Doustasharaf, 21 September 2021.

Type material

Holotype: mounted on a microscope slide (AM-IWA-BJ21D-2). Paratypes: 17 females, 5 male and 2 nymphs mounted on microscope slides (AM-IWA-BJ21D-1,4,13–18,20–33).

Other material

Mites preserved in a vial (AM-IWA-BJ21D) of Oudemans' fluid (Walter & Krantz 2009) as extracted from the same sample as the type specimens.

Relation to the host plant

Mites were vagrant or inquiline on the leaves that damaged by *A. macrochela* (Fig. 1).

Distribution

Since the host plant of the new species described in this research has a wide distribution in the northern part of Iran, it is expected that this species will be found in other regions with further studies.

Etymology

The specific epithet comes from the combination of the genus name, *Acer*-, and the last seven letters of species name, *-essulani*, of the type host plant.

Differential diagnosis

The new species was compared with all *Cecidophyes* species found on maples. The closest species was *Cecidophyes campestris* de Lillo *et* Fontana, 1996, collected and described on *Acer campestre* L. in Maser, Treviso Province, Veneto, Italy. In both species prodorsal shield is reticulated, and the opisthosoma with similar dorsal semiannuli (44–51 in *C. campestris* and 40–48 in the new species) and a similar number of coxigenital annuli (7 in *C. campestris* and 6–7 in the new species) and similar length of setae *c2* (28–33 in *C. campestris* and 21–28 in the new species), *d* (40–70 in *C. campestris* and 39–51 in the new species), *e* (10–15 in *C. campestris* and 10–12 in the new

species) and *f* (27–30 in *C. campestris* and 21–25 in the new species). However, there are differences between the two species in ventral semiannuli number (59–65 in *C. campestris* versus 61–71 in the new species), empodial ray number (6 in *C. campestris* versus 8 in the new species) and length of setae *3a* (15–21 in *C. campestris* versus 24–30 in the new species). In *C. campestris*, the prodorsal shield is composed of 14 closed and opened cells, while the new species has 24 closed and opened cells. Microtubercles of *C. campestris* are bead-like and slightly pointed over margins but in the new species semiannuli are ornamented by triangular microtubercles on their rear margin.

Remarks

Until now two *Cecidophyes* species have been found in Iran on plants of genus *Quercus* including: *C. digephyrus* Keifer, 1966 from *Q. vaccinifolia* Kell. in Mazandaran province (Ranjbar-Varandi *et al.* 2019) and *C. aliabadi* Gol *et al.*, 2018 from *Q. castaneifolia* C. A. Mey. in Golestan province (Gol *et al.* 2018). *C. aceressulani* Lotfollahi et Mohammad-Doustasharaf **sp. nov.** is the third *Cecidophyes* species of Iran and the first *Cecidophyes* species found in Sapindaceae plants of Iran.

Family Diptilomiopidae Keifer

Subfamily Rhyncaphytopinae Roivainen

Rhyncaphytopus saccharini Keifer, 1959

Type data

Acer saccharinum L. (Sapindaceae), Silver Maple; University of Maryland Campus, College Park, Maryland, USA.

Relation to the host plant

Vagrant on underside of the leaves. In this study mites were vagrant on the leaves that damaged by *A. macrochela* (Fig. 1).

Localities and host plant

Eleven females, two males and three nymphs from *A. monspessulanum* mounted on microscope slides (AM-IWA-BJ21D-1,5,7–10,12,21,25,26,28,31–33); Khan valley, Baranduzchay-ye Jonubi Rural District, Urmia county, West Azerbaijan Province, Iran (37°18'21"N, 45°06'29"E), 1,479 m above sea level; coll. M. Mohammad-Doustasharaf, 21 September 2021.

Remarks

The only difference between Iranian specimens compared with Keifer's description is in the number of dorsal semiannuli (46–51 in Iranian specimens versus 60–65 in Keifer description). Other characteristics match well with the original description. This is the first record of this species from Iran.

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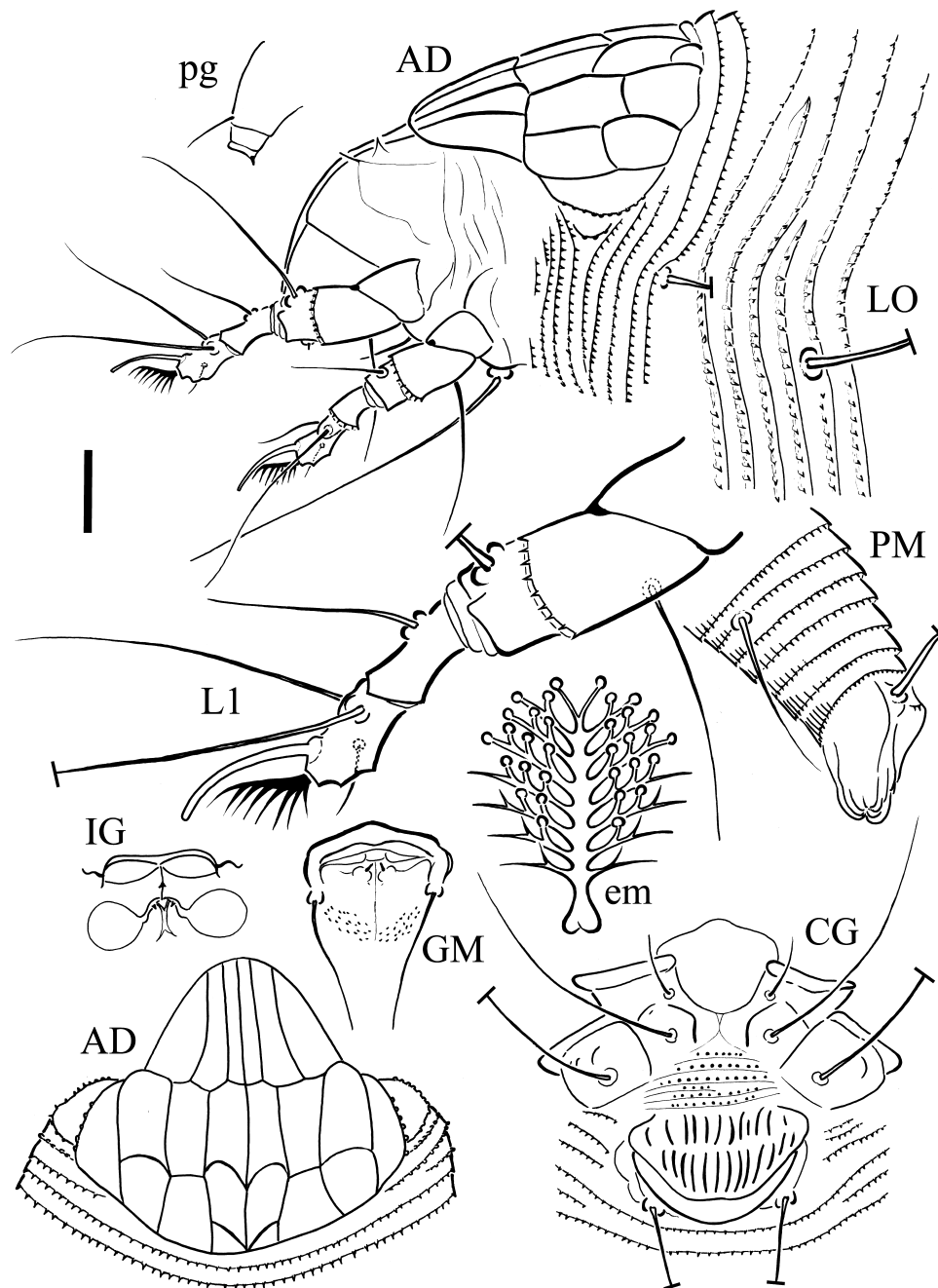


FIGURE 3. Schematic drawings of *Cecidophyes aceressulani* Lotfollahi *et* Mohammad-Doustaresharaf **sp. nov.**: AD. Prodorsal shield; AL. Lateral view of anterior body region; CG. Female coxigenital region; em. Empodium; GM. Male genital region; IG. Internal female genitalia; LO. Lateral view of annuli; L1. Leg I; pg. palp genua; PM. Lateral view of posterior opisthosoma. Scale bar: 14 μ m for LO; 10 μ m for AD, AL, CG, GM, IG, pg, PM; 5 μ m for L1; 2.5 μ m for em.

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