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Article

One new *Aculus* species (Acari: Trombidiformes: Eriophyidae) on *Glycyrrhiza glabra* from Lorestan province, Iran

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ABSTRACT

During the study on eriophyid mites associated to Fabaceae plants in Naghare village, Lorestan province (Iran), one new *Aculus* species (Acari: Eriophyidae), *A. lorestaniensis* sp. nov., was found on *Glycyrrhiza glabra* L. and herein described and illustrated. This is the first *Aculus* mites associated to a host plant of the genus *Glycyrrhiza*.

KEY WORDS: Eriophyoidea; Fabaceae; *Glycyrrhiza*; Naghare; Prostigmata.

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INTRODUCTION

Plants of the genus *Glycyrrhiza* belong to the family Fabaceae and includes more than 20 species (The Plant List 2013). These plants are widely distributed all over the world (Ahmadi Hosseini *et al.* 2014). *Glycyrrhiza glabra* L. (or licorice) is a tall, erect, perennial herbaceous plant with branched stalks which grows up to 1.5 m. This species is native of South-East Europe and South-West Asia (Yazdi *et al.* 2011). Licorice is one of the oldest and most popular natural medicine in the pharmacopoeias of many Asian and European countries (Zhang and Ye 2009). Its roots and rhizomes are extensively used in food, confectionery and pharmaceutical products. These roots are also a powerful natural sweetener, 50–170 times sweeter than sucrose (Mukhopadhyay and Panja 2008).

Until now about 290 named species of Eriophyoid mites were recorded on plant species of the family Fabaceae (Amrine and de Lillo unpublished data), including seven species from Iran. One of them, *Tetra glycyrrhizae* Denizhan *et al.*, 2007, is reported from *Glycyrrhiza* and was collected in Lorestan and Fars provinces of Iran (Doryanizadeh *et al.* 2013; Delfan *et al.* 2015). About 30 *Aculus* species were found on Fabaceae plants (Amrine and de Lillo unpublished data) and none of them has been found on *Glycyrrhiza*, yet.

Until now 10 *Aculus* spp. have been recorded in Iran (Lotfollahi unpublished data). Considering the relevance of these subjects, an effort in the geographical survey was done on the eriophyid mite fauna of Iran for which one new species was collected and described from *G. glabra*. It is the first record of *Aculus* mites from the host plant genus *Glycyrrhiza*.

MATERIALS AND METHODS

Occasional samplings of *G. glabra* plants were done during 2014 in Naghare village of Lorestan province (Iran). Eriophyoid mites were recovered from plant materials through the direct examination of host plants under stereomicroscope. They were slide mounted according to the protocol reported in Baker *et al.* (1996). The terminology and setal notation in the morphological description of the mite follow mainly Lindquist (1996). The classification of genera follows Amrine *et al.* (2003). The number of measured specimens (n) is given within parentheses in the description. All morphological measurements were taken using a phase contrast microscope Olympus BX53 according to Amrine and Manson (1996), as modified by de Lillo *et al.* (2010), and are given in micrometers. Further details have to be added as follows: ventral semiannuli were counted from the first entire annulus at the back of the prodorsal shield; coxigenital semiannuli were counted medially from the coxal region to the anterior margin of the external genitalia and were not included in the ventral semiannuli count; measurements and means are rounded off to the nearest integer when required, referring to the length of the morphological traits unless otherwise specified. The holotype measurements are followed by range values, in parentheses, of the studied population (including holotype and paratypes). The mean measurement 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. Drawings were hand-drawn through a camera lucida, according to de Lillo *et al.* (2010), and their abbreviations follow mainly Amrine *et al.* (2003).

Host plant identified by an expert and its name is in accordance with The Plant List on-line database (2013).

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

Family Eriophyidae Subfamily Phyllocoptinae Tribe Anthocoptini

Aculus lorestaniensis sp. nov. (Fig. 1)

Description

Female (n = 6) – Body spindle-shaped, 173 (145–190), 45 (42–50) thick, 58 (48–58) wide. Gnathosoma 31 (30–33) projecting obliquely downwards, chelicerae 26 (24–32), palp setae *ep* 2, palp genual setae *d* 4 (4–5), unbranched. Prodorsal shield 38 (36–42) including frontal lobe, 46 (46–48) wide, sub-triangular in anterior shape with a thick broad based frontal lobe, ventrally with distally pointed process, 6 (4–8), over gnathosomal base. Shield pattern weakly reticulated, composed of a short median line at rear third of prodorsal shield, a complete admedian, a complete first submedian and a relatively short second submedian line on the posterior half of the prodorsal shield; 2 transverse lines cross longitudinal lines and delimit 18 cells; many light colored tiny spots on whole prodorsal shield. Dorsal tubercles *sc* on rear shield margin, 20 (no variation) apart, setae *sc* 34 (no variation), directed divergently upward. Leg I 27 (27–31), femur 10 (7–10), genu 4 (4–5), tibia 5 (5–7), tarsus 6 (6–8), ω 8.5 (8–10) distally a little enlarged and tapered, empodium simple, 6.5 (6–7), 4-rayed; femoral setae *bv* 12 (11–13), genual setae *l''* 17 (17–22), tibial setae *l'* 5.5 (5–7), tarsal setae *ft'* 17 (17–19), setae *ft''* 27 (20–27). Leg II 25 (24–28), femur 8 (8–10), genu 3.5 (3–4), tibia 4 (4–5), tarsus 7 (7–8), ω 9 (8.5–10) distally a little enlarged and tapered, empodium simple, 6 (5.5–6), 4-rayed; femoral setae *bv* 11 (9–14), genual setae *l''* 7 (5–8), tarsal setae *ft'* 8 (7–8), setae *ft''* 22 (21–23). Coxae with scarce and fine dashes, someone lined; setae *lb* 11 (10–12), tubercles *lb* 12 (11–13) apart, setae *la* 23 (23–28), tubercles *la* 10 (9–11) apart, setae *2a* 37 (30–42), tubercles *2a* 28 (25–28) apart. Prosternal apodeme 7 (6–7). Opisthosoma dorsally arched, with 17 (16–19) dorsal

semiannuli, 60 (52–60) ventral semiannuli (counted from first annulus after coxae II), 6 (5–6) semiannuli between coxae and genital coverflap. Microtubercles: triangular on posterior margin of dorsal semiannuli, spiny circular on posterior area of ventral semiannuli, last four ventral semiannuli with elongated and linear microtubercles. Setae *c2* 19 (13–24) on ventral semiannulus 13 (11–13), setae *d* 43 (30–50) on ventral semiannulus 26 (22–26); setae *e* 10 (8–15) on ventral semiannulus 40 (36–40); setae *f* 15 (13–20) on ventral semiannulus 56 (51–56); 4 annuli behind setae *f*. Setae *h2* 47 (36–47) very fine at apex, *h1* 4 (no variation). Genital coverflap 13 (10–13), 23 (22–23) wide, with 9–10 longitudinal striae; setae *3a* 50 (30–50), 20 (17–21) apart.

Male (n = 2) – Similar in shape and prodorsal shield arrangement to female. Body 162–173. Prodorsal shield 37–40; setae *sc* 27–30; opisthosoma with 17–18 dorsal semiannuli and 53–54 ventral semiannuli; setae *3a* 42.

Type host plant – *Glycyrrhiza glabra* L. (Fabaceae) or licorice.

Relation to the host plant – Vagrant on upper surface of the leaves. No apparent damage was observed.

Type locality – Naghare village, Lorestan province, Iran (33° 29' 24.64" N, 48° 07' 3.95" E), 1069 m above sea level, coll. S. Hayatolghayb, late August 2014.

Type material. Holotype: single female on a microscope slide (GG-IL-NE14H-1). Paratypes: 5 females and 2 males mounted on separate microscope slides.

Etymology

The specific epithet, *lorestaniensis* refers to the type locality, Lorestan province in Iran.

Differential diagnosis

This species is similar to *Aculus wisterifolia* Keifer, 1963, collected on *Wisteria* sp., (originally listed as *Wistaria*) in Gainesville, Florida, USA, but differentiated from the later by *sc* setae length (20 in *A. wisterifolia* versus 34 in the new species), empodial rays (5 in *A. wisterifolia* versus 4 in the new species), dorsal semiannuli number (28 in *A. wisterifolia* versus 16–19 in the new species) and coxae ornamentation (with faint curved lines in *A. wisterifolia* versus scarce dashes and lined dashes in the new species).

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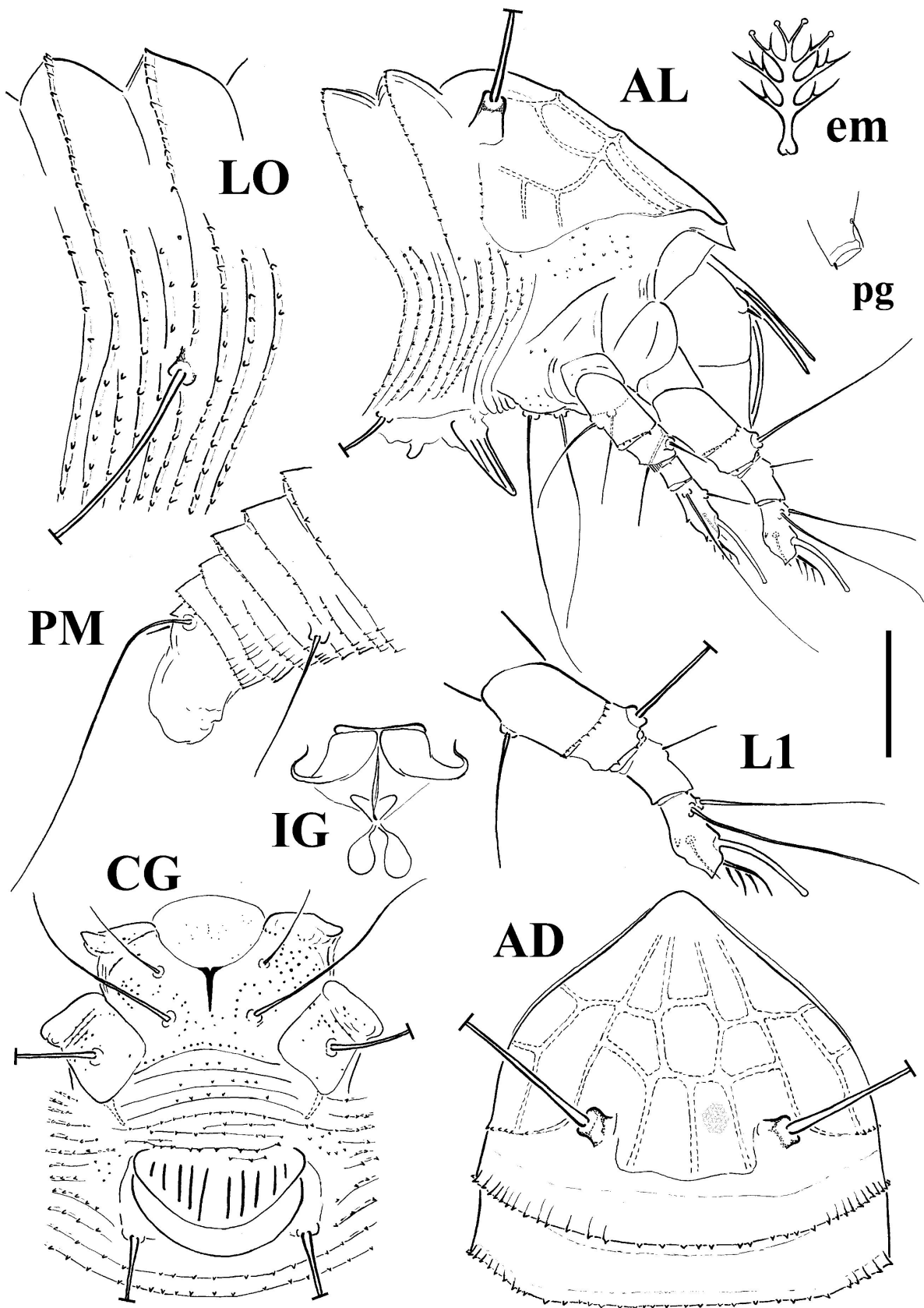



Figure 1. *Aculus lorestaniensis* sp. nov. (female) – AD. Prodorsal shield; AL. Lateral view of anterior body region; CG. Female coxigenital region; em. Empodium; IG. Internal female genitalia; LO. Lateral view of annuli; L1. Leg I; pg. palp genua; PM. Lateral view of posterior opisthosoma. Scale bar: 10 μ m for AD, AL, CG, IG, PM; 5 μ m for LO, L1; 2.5 μ m for em.

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گونه جدیدی از جنس *Aculus* (Acari: Trombidiformes: Eriophyidae) از روی
Glycyrrhiza glabra در استان لرستان، ایران

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چکیده

طی مطالعه کنه‌های اریوفید گیاهان خانواده Fabaceae روستای نقاره در استان لرستان (ایران)، گونه جدیدی از جنس *Aculus* (Acari: Eriophyidae)، *A. lorestaniensis* sp. nov. از روی *Glycyrrhiza glabra* L. جمع‌آوری شد و در اینجا توصیف و ترسیم می‌شود. این نخستین گزارش جنس *Aculus* از روی گیاه میزبانی از جنس *Glycyrrhiza* است.

واژگان کلیدی: Eriophyoidea؛ Fabaceae؛ *Glycyrrhiza*؛ نقاره؛ Prostigmata.

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