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Copriphis falcinellus and *Holostaspella exornata* two new records of eviphidoid mites (Mesostigmata: Eviphidoidea: Eviphididae and Macrochelidae) from Iran

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Mites of the superfamily Eviphidoidea are primarily humus- and litter-inhabiting predators, living in transient habitats such as dung, carrion, and beach wrack and/or in phoretic relationships with a variety of arthropods (Lindquist *et al*. 2009). The genus *Copriphis* Berlese, 1910 is the largest genus of Eviphididae with about 35 species living in tropical and subtropical regions of Africa, Asia, central and southern Europe in association with coprophagous beetles, especially Scarabaeoidea (Karg 1993; Lindquist *et al*. 2009; Mašán and Halliday 2009, 2010). Only one species of this genus has been reported from Iran, namely *Copriphis cultratellus* Berlese, 1910 (Kazemi and Rajaei 2013). The genus *Holostaspella* Berlese, 1903 is a nearly cosmopolitan genus of Macrochelidae with more than 30 species (Hartini and Takaku 2010), found in temperate, tropical and subtropical regions of both hemispheres, inhabiting different microhabitats, mostly in litter layers, manure, and as phoretic associates of insects (Krantz 1967; Bregetova 1977a; Mašán 2003). So far, only two species of this genus have been officially reported from Iran, including *H. bifoliata* (Trägårdh, 1952) (Jalaeian *et al*. 2004; Kazemi and Rajaei 2013 and references cited therein) and *H. ornata* Berlese, 1904 (Soleimani *et al*. 2010; Hamidi *et al*. 2013). The presence of one species, *H. subornata* Bregetova and Koroleva, 1960, is still doubtful, although Kamali *et al*. (2001) listed it in their checklist based on an unpublished report.

Two new species records of the genera *Copriphis* and *Holostaspella* were identified using reliable references, e.g. Mašán and Halliday (2010) and Mašán (2003), respectively, and are presented, herewith. The specimens were collected from manure and in association with an unidentified dung beetle of Scarabaeidae in Lorestan Province, then cleared in lactophenol, and eventually mounted on permanent microscope slide using Hoyer's medium. All the measurements are given in micrometers (μm). The specimens are deposited in the Acarology Collection of the Department of Entomology, College of Agriculture and Natural Resources, Science and Research Branch, Islamic Azad University, Tehran, Iran.

Copriphis falcinellus **(R. Canestrini and G. Canestrini, 1882) (Fig. 1)**

Eviphis falcinellus – Shoemake, 1970: 53.
Eviphis drepanogaster – Bregetova, 1977b: 558; Karg, 1993: 94.
Copriphis falcinellus – Mašán and Halliday, 2010: 42.

Morphological observations of studied material

Female – Dorsal shield 790–800 long and 673 wide (length/width: 1.17–1.19), subcircular, entire, with one anterolateral longitudinal sculptural line, micropunctate entirely, but weakly reticulated in small posterolateral areas. Dorsal shield with 30 pairs of setae. Dorsal setae heterogeneous in shape and length (e.g. setae *j1* 18–20, *j2* 72–74, *s2* 37, *s6* 121, *r2* 61, *r3* 107, *r5* 125, *S1* 170, *S3* 162, *S4* 190, *S5* 199, *Z5* 206). Setae *j1* thickened. Sternal shield 160–170 long and 155 wide (at the mid-level of coxae II), micropunctate, with three pairs of setae. Setae *st3*, *st4*, *st5* and posterior setae on coxae II–III thickened, slightly flattened, spur-like, and somewhat falciform. Metasternal platelets fused to endopodal platelets III–IV. Width of epigynal shield (at the mid-level of coxae IV) 107. Anal shield 205 long and 150 wide (at the widest point), strongly rounded at the anterior margin. Peritreme with minute puncations entirelty. Post-stigmatic section of peritrematal shield expanded and elongated, narrower than medial part of the shield. Ventral soft integument with distinct transverse and longitudinal striation in opisthogastric areas and outside the peritrematal shields. Movable digit of chelicera tridentate (with large teeth).

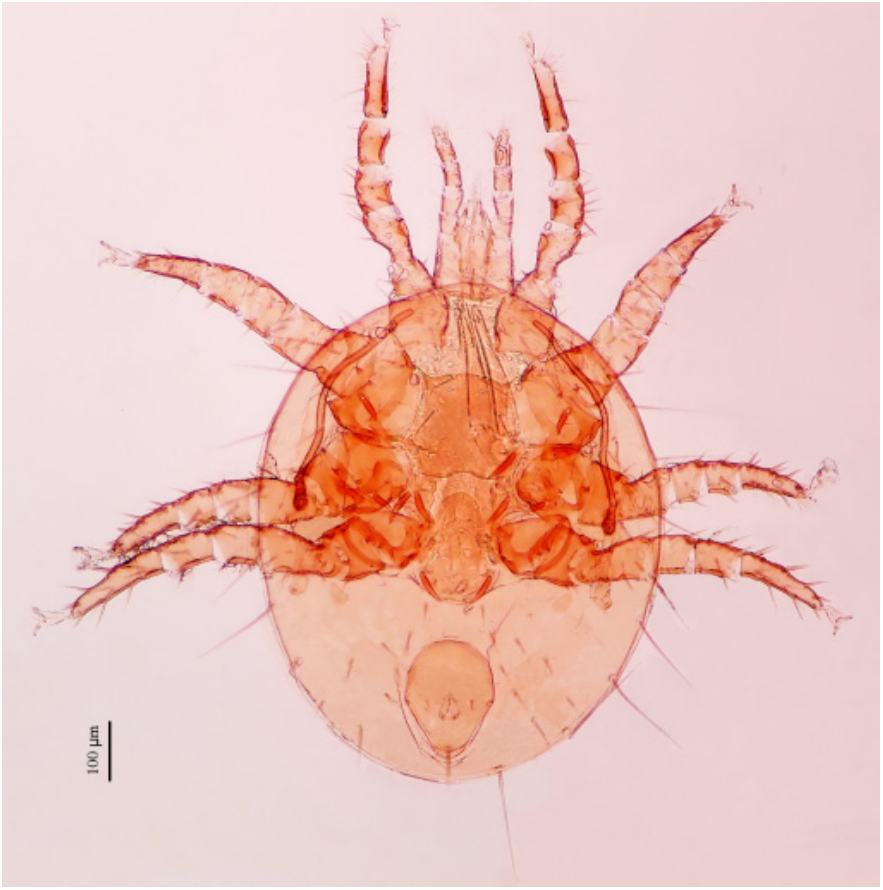

Figure 1. *Copriphis falcinellus* (female) – Ventral view of idiosoma.

Material examined

Lorestan Province, Selseleh County, Aleshtar City, Garrin Mountain, Soltan Taher region (latitude: 33° 56' 31.8" N, longitude: 48° 22' 57.3" E, altitude: 2,390 m a.s.l.), 3♀, phoretic on an unidentified dung beetle (Scarabaeidae), 11 September 2014, leg. Saman Hasani.

Distribution and habitat – Asian and European countries, e.g. Armenia, China, Greece, Italy, Kazakhstan, and the former USSR. In rodent nests, moss, and mostly in association with Scarabaeidae beetles (Bregetova 1977b; Karg 1993; Mašán and Halliday 2010).

Notes – *Copriphis falcinellus* is recorded for the first time from Iran. Bregetova (1997b) mentioned that this species is found in steppe and semi-desert zones, and also in the mountains at the altitudes of more than 1200 m a.s.l., while we found it in almost highland area with the altitude 2,390 m a.s.l. Therefore, it can be found from midland to highland areas.

Holostaspella exornata **Filipponi and Pegazzano, 1967 (Fig. 2)**

Holostaspella exornata Filipponi and Pegazzano, 1967: 230.
Holostaspella exornata – Mašán, 2003: 135.

Morphological observations of studied material

Female – Idiosomal shield oval, 785 long and 550 wide (length/width: 1.43). Most of dorsal idiosomal setae uniformly formed, relatively short, along their entire length, slightly pilose and regularly tapered apically. Setae *j1* broadly pectinate, *z1* simple and smooth, *J5* slightly pilose along their length. Lengths of dorsal idiosomal setae: *j1* 25, *j2* 51–55, *j3* 55, *j4* 35, *j5–6* 30, *J2* 45, *J5* 38–40, *z1* 23–25, *z2* 40, *z4* 55, *z5* 20, *Z1* & *Z5* 55, *Z2* 45, *Z4* 50, *s2* 30, *s4* 35–40, *s5* 50, *s6* 40, *S1–2* & *S4–5* 50–55, *r2* unavailable, *r3–4* 50. Sternal shield 173 long, 129 and 183 wide (at the mid-level of coxae II and III, respectively). Anterior margin of the sternal shield with five clearly expressed sclerotized denticles medially arranged in one transverse row. Sternal shield with distinct cruciform pattern, crista erecta on the shield undivided (sternal sculpture with four well-separated punctate-reticulate depressions). Setae *st1* lightly pilose. Genital shield 140 long and 251 wide (at the posterior marginal line) (length/width: 0.56). Ventrianal shield wider than long (length: 325, maximum width: 400, length/width: 0.81), with four pairs of pre-anal setae. Ventral shields well-ornamented with micropunctuations within large polygonal reticulated patterns. Lengths of ventral setae: *st1* 40, *st2* 46, *st3* 25–30, *st4* 18, *st5* 33–35, *JV1–3* & *ad* (adanal seta) 30, *ZV1* 10, other opisthogastric and marginal setae 12–35.

Material examined

Lorestan Province, Selseleh County, Aleshtar City, Gereyrān Village (latitude: 33° 32' 4" N, longitude: 48° 08' 25" E, altitude: 1,633 m a.s.l.), 1♀, in manure in a walnut orchard, 5 June 2014, leg. Saman Hasani.

Distribution and habitat – Argentina, England, Italy, Kazakhstan, Poland, Russia and Slovakia. Decaying organic matters (e.g. compost), humid substrates, under hay and in

the nest of birds, phoretic on Diptera and in the nest of ants (Bregetova 1977a; Hyatt and Emberson 1988; Mašán 2003).

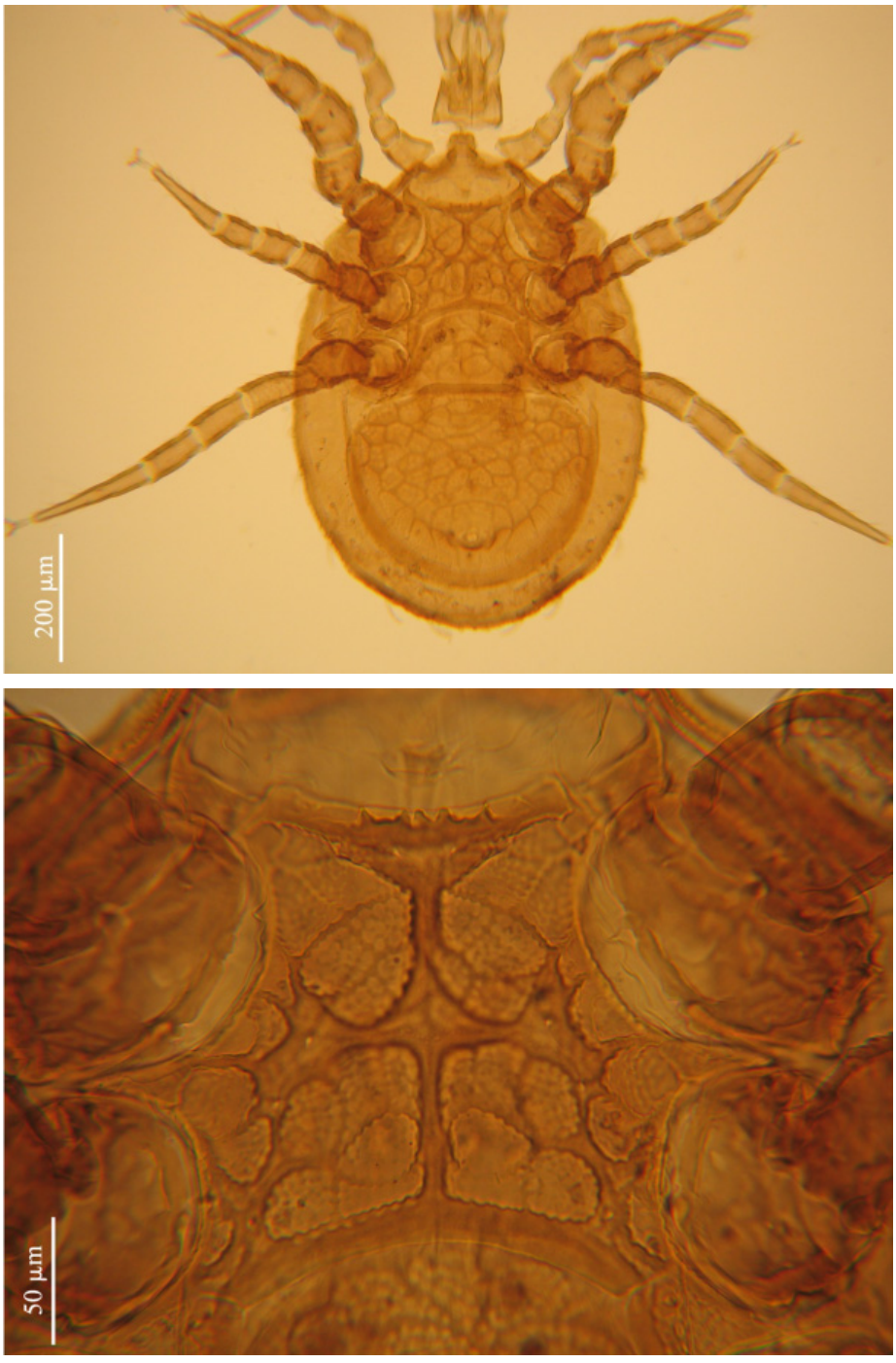

Figure 2. *Holostaspella exornata* (female) – A. Ventral view of idiosoma; B. Sternal shield.

Notes – This is the first record of *Holostaspella exornata* from Iran. Although Mašán (2003) indicated its distribution in lowlands, we found it in a locality in relatively highland area (1,633 m a.s.l.). Therefore, it can inhabit in a wide range of areas.

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