

EUSTIGMAEUS SETIFERUS, N. SP. (ACARI: STIGMAEIDAE) FROM IRAN

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ABSTRACT – A new species of *Eustigmaeus* Berlese, 1910 (Acari: Stigmaeidae), *Eustigmaeus setiferus* n. sp., is described and illustrated from soil in apple orchards at Maragheh, East Azerbaijan Province, Iran.

Key words – Acari, *Eustigmaeus*, new species, Stigmaeidae, Iran.

INTRODUCTION

Stigmaeids are prostigmatic mites; most are predators and feed on a variety of arthropods but most species feed on moss and pollen and a few are ectoparasitic (Walter *et al.*, 2009). The genus *Eustigmaeus* is one of the largest genera of this family and can be found in ground litter, soil, and ant's nest being bryophagous (Summers and Price, 1961; Gerson, 1972; Dogan *et al.*, 2003); it contains more than 100 species worldwide (Faraji *et al.*, 2007). Rimando and Corpuz-Raros (1997) split this genus into four closely related genera but this idea was not accepted by more recent researchers (Khanjani and Ueckermann, 2002; Dogan *et al.*, 2003; Fan and Zhang, 2005; Faraji *et al.*, 2007) so we maintain here the previous concept of this genus as suggested by Wood (1973). Up to now seven species of this genus have been reported from Iran, namely, *Eustigmaeus nasirinae* Khanjani and Ueckermann, 2002; *Eustigmaeus segnis* (Koc, 1836); *Eustigmaeus jiangxiensis* Hu, Chen and Huang, 1996; *Eustigmaeus ornatus* Ueckermann and Meyer, 1987; *Eustigmaeus spathatus* Ueckermann and Meyer, 1987; *Eustigmaeus sculptus* Dogan *et al.*, 2003; and *Eustigmaeus azerbaijanensis* Haddad *et al.*, 2011 (Kamali *et al.*, 2001; Kheradmand *et al.*, 2007;

Haddad *et al.*, 2011; Khanjani and Ueckermann, 2002). In this study we describe and illustrate another species of this genus which was collected from soil in an apple orchard.

MATERIALS AND METHODS

Mites were extracted from soil using a Berlese funnel; specimens were cleared in Nesbitt's fluid and mounted in Hoyer's medium. Measurements were taken as follows: length of idiosoma from end of chelicera to posterior margin of suranal shield, width of idiosoma at broadest part, and setae from their insertion to their tips; distances between setae were measured between their insertions. The terminology and abbreviations are based on Grandjean (1944) and Kethley (1990). All measurements are given in micrometers (µm).

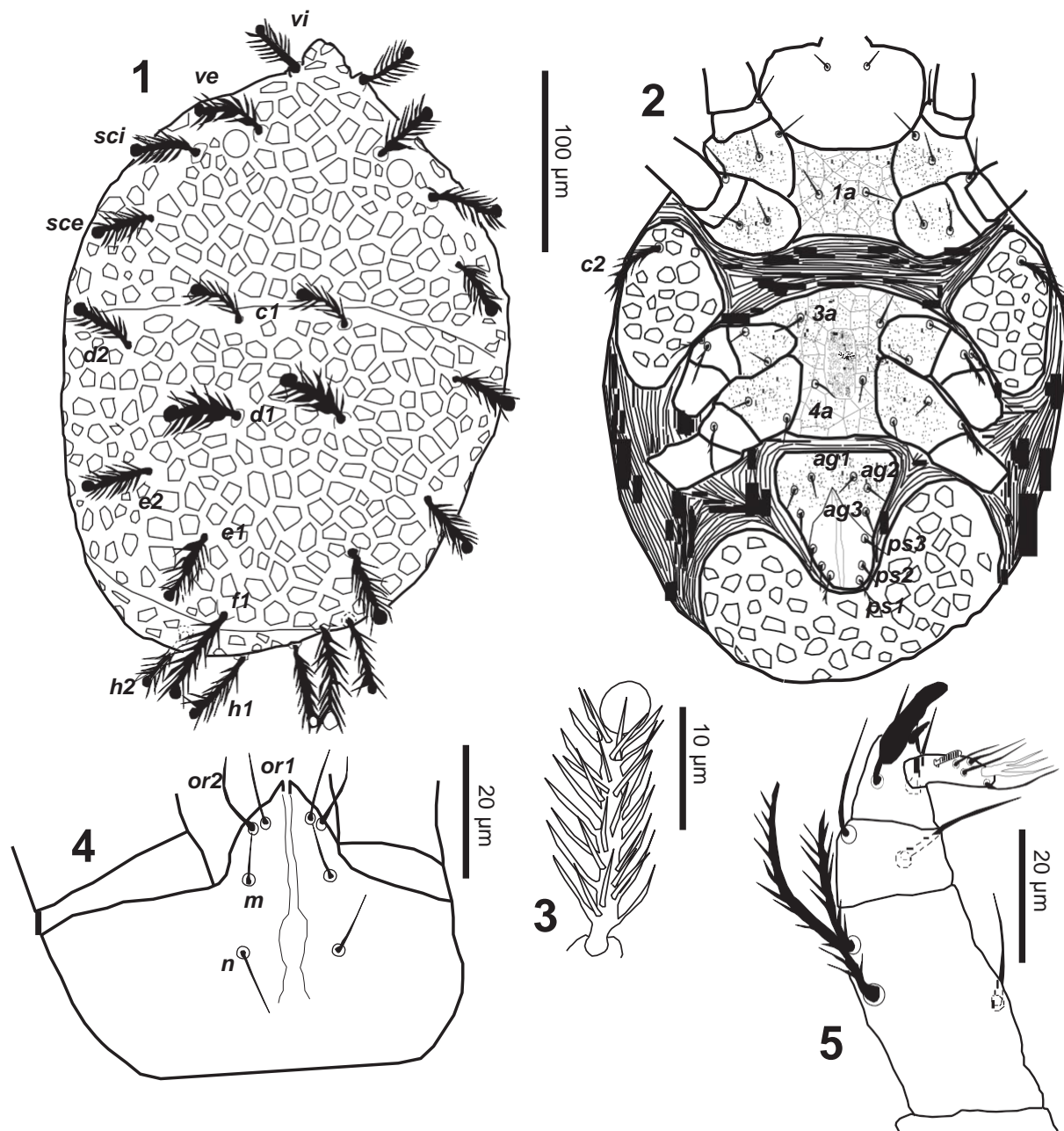
Family STIGMAEIDAE Oudemans, 1931

Type genus *Stigmaeus* Koch, 1836

Genus *Eustigmaeus* Berlese

Type species *Stigmaeus kermesinus* Koch, 1841

***Eustigmaeus setiferus* n. sp.
(Figs. 1–10)**

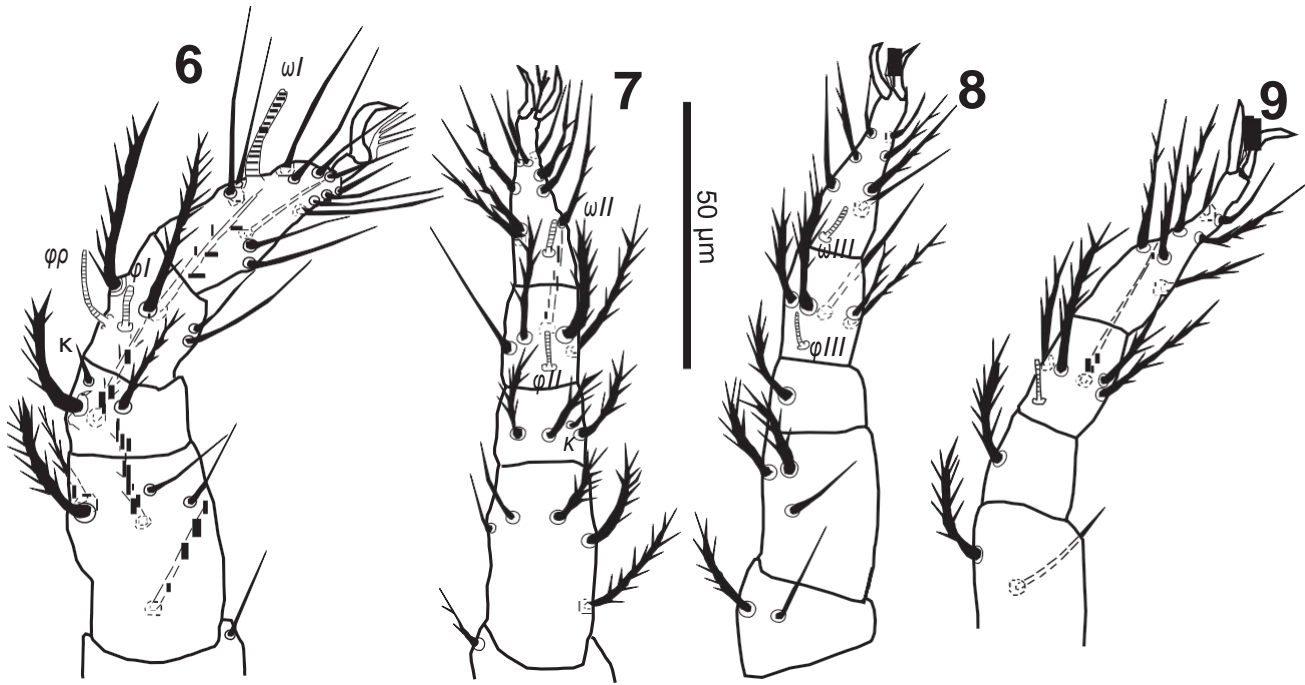


Figs. 1–5. *Eustigmaeus setiferus* n. sp. female – 1. dorsal view; 2. ventral view; 3. seta *e1*; 4. subcapitulum; 5. palp.

FEMALE ($n = 5$) – Idiosoma oval, length of body (including gnathosoma) 335 (330–337); width of body 217 (192–220); length of leg I 163 (156–165); leg II 141 (138–141); leg III 144 (141–145); leg IV 163 (162–170).

Dorsum (Fig. 1) – Idiosoma covered with two dorsal shields and also one dorsoventral suranal shield ornamented, all with polygonal dimples, without vacuoles or vacuoles vague; prodorsal shield triangular, with protuberance in front and bearing four pairs of

setae (*vi*, *ve*, *sci*, and *sce*) and one pair of eyes between setae *ve* and *sci*; postocular bodies not evident; hysterosomal shield with six pairs of setae (*c1*, *d1*, *d2*, *e1*, *e2*, and *f1*); dorsal body setae multi-pectinate, bulbous distally, and set on small tubercles (Fig. 3); humeral shields ornamented with dimples, more or less triangular, bearing *c2*, and situated ventrally; suranal shield situated ventrally, with dimples and bearing two pairs of setae (*h1* and *h2*); lengths of dorsal setae *vi* 28



Figs. 6–9. *Eustigmaeus setiferus* n. sp. female – 6. leg I; 7. leg II; 8. leg III; 9. leg IV.

(24–27); *ve* 33 (29–34); *sci* 31 (29–32); *sce* 29 (27–29); *c1* 24 (24–27); *c2* 32 (30–33); *d1* 27 (26–29); *d2* 27 (26–29); *e1* 30 (27–30); *e2* 27 (27–28); *fl* 46 (42–47); *h1* 35 (33–37); *h2* 32 (32–33); distances between dorsal setae: *vi–vi* 33 (33–34); *ve–ve* 58 (57–60); *vi–ve* 33 (30–32); *ve–sci* 27 (25–27); *vi–sce* 61 (54–63); *sci–sci* 125 (129–130); *sci–sce* 34 (30–35); *sce–sce* 141 (132–140); *c1–c1* 43 (37–44); *c1–c2* 99 (85–100); *c2–c2* 213 (191–210); *c1–d1* 44 (42–45); *c1–d2* 52 (52–58); *c2–d2* 56 (49–59); *d1–d1* 45 (43–45); *d1–d2* 57 (56–60); *d2–d2* 149 (143–146); *d1–e1* 59 (58–60); *d1–e2* 47 (45–48); *d2–e2* 52 (48–54); *e1–e1* 65 (62–67); *e1–e2* 41 (40–43); *e1–fl* 29 (30–32); *e1–e2* 119 (117–123); *fl–fl* 48 (44–49); *fl–h1* 17 (16–17); *fl–h2* 23 (21–23).

Venter (Fig. 2) – Endopodal shields entire, vaguely reticulated, and also punctuated, central part of posterior endopodal shield punctate, bearing *la* 11(10–12), *3a* 14 (13–14), *4a* 12 (12–14); aggenital shield punctate, bearing three pairs of aggenital setae (*ag1–ag3*); pseudanal shield with three pairs of pseudanal setae (*ps1–ps3*); measurements of setae: *ag1* 9 (9–10), *ag2* 10 (10–11), *ag3* 12 (11–12), *ps1* 12 (12–14), *ps2* 13 (12–13), and *ps3* 13 (12–14).

Gnathosoma – Subcapitulum (Fig. 4) smooth with two pairs of subcapitular setae (*m* and *n*), *m* 13 (11–13), *n* 10 (10–11), and two pairs of adoral setae (*or1* and *or2*), *or1* 10 (10–12), *r2* 14 (13–14); palpi (Fig. 5) five-segmented; palptarsus with five tactile setae plus one solenidion (ω) and one tridentate eupathidium; palptibia with two tactile setae plus one

spine-like accessory claw plus one well-developed claw; palpgenu with two setae; palpfemora with three setae; palptrochanter without setae.

Legs (Figs. 6–9) – Counts of setae (solenidia and setae κ included) on legs I–IV: coxae 2-2-2-2; trochanters 1-1-2-1; femora 6-5-3-2; genua 4(κ)-4(κ)-1-1; tibiae 7(2)-6(1)-6(1)-6(1); tarsi 14(1)-9(1)-8(1)-7; lengths of solenidia: ωI 18(16–18), ωII 12(11–12), ωIII 5(4–5); ϕI 8 (7–8); $\phi \rho$ 13 (13–14); ϕII 12 (11–12); ϕIII 7 (7–8); ϕIV 7 (6–7).

Male and immature stages – Unknown

Etymology – This species is named from the Latin *setiferus*, meaning “bearing bristles” and refers to the long bristles of the dorsal setae.

Type material – Holotype and four paratype females were collected from soil in apple orchards, on 15 August 2009, in Maragheh, East Azerbaijan Province, Iran, by Mohammad Bagheri. The holotype and two paratype females were deposited in the Arachnida Collection of Plant Protection Research Institute, Pretoria, South Africa, and two paratype females were deposited in the Acarological Collection, Department of Plant Protection, Faculty of Agriculture, University of Maragheh, Iran.

Remarks – The new species is similar to *Eustigmaeus plumifera* (Halbert, 1923) in leg chaetotaxy, shielding, and anogenital area but differs (1) in the shape of the dorsal setae, which is multi-pectinated with a big bulb distally opposed to bushy and without bulb distally in *Eustigmaeus plumifera*, and (2) in

dimples of dorsal shields without vacuoles or vacuoles are vague (vs. about 15 vacuoles in *E. plumifera*). The new species is also close to *E. sculptus* Dogan, Ayyildiz, and Fan, in that the propodosoma tapers to a pointed apex, having three aggenital setae, entire and reticulated endopodal shields but differs (1) in the shape of dorsal setae, which is bushy in without bulb distally in *E. sculptus*, and (2) in having eight simple setae on tarsus II (vs. nine in *E. sculptus*).

Key to species of the genus *Eustigmaeus* Berlese, 1910 of Iran

1. Eyes absent *E. azerbaijanensis* Haddad *et al.*
– Eyes present **2**
2. Femur II with four setae **3**
– Femur II with five setae **4**
3. Coxisternal shields divided
..... *E. spathatus* Ueckermann and Meyer
– Coxisternal shields fused
..... *E. nasrinae* Khanjani and Ueckermann
4. With one pair of aggenital setae **5**
– With more pairs of aggenital setae **6**
5. Coxisternal shields reticulated and fused
..... *E. segnis* (Koch)
– Coxisternal shields smooth and divided
..... *E. ornatus* Ueckermann and Meyer
6. With two pairs of aggenital setae
..... *E. jiangxiensis* Hu, Chen and Haung
– With three pairs of aggenital setae **7**
7. Tarsus II with nine simple setae + dorsal setae
bushy and without bulb distally
..... *E. sculptus* Dogan, Ayyildiz and Fan
– Tarsus II with eight simple setae + dorsal setae
multi-pectinated and with a big bulb distally
..... *E. setiferus* n. sp.

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