STIGMAEUS IRANENSIS, A NEW SPECIES OF THE GENUS STIGMAEUS KOCH (ACARI: STIGMAEIDAE) FROM NORTHWEST IRAN

M. Bagheri¹, S. S. Gheblealivand¹ and H. Ghorbani¹,²

¹ Department of Plant Protection, Faculty of Agriculture, University of Maragheh, Maragheh, Iran; e-mails: mbagheri20022002@yahoo.com, sa.alivand@gmail.com, hg.ghorbani@gmail.com
² Young Researchers Club, Islamic Azad University, Maragheh Branch, Maragheh, Iran

ABSTRACT: Stigmaeus iranensis sp. n. is described and illustrated. The new species was collected from soil in apple orchards in Northwest Iran. A key to the known Iranian species of the genus Stigmaeus is provided.

KEY WORDS: Acari, Stigmaeidae, Stigmaeus, Iran, mite

INTRODUCTION

Stigmaeidae (Acariformes: Raphignathoidea) are small prostigmatan mites that occur in many habitats and form an important component of the acarofauna of soil, litter and plants. It is a large cosmopolitan group that consists of predators feeding on a variety of arthropods, ectoparasites of dipterans and pollen feeders (Summers 1966; Ueckermann and Meyer 1987; Walter et al. 2009). The genus Stigmaeus Koch is one of the most famous genera of this family and is known from just eleven species in Iran, namely: S. alvandis Khanjani and Ueckermann, 2002; S. shabestariensis Haddad, Lotfollahi and Akbari 2010; S. marandienensis Bagheri and Ueckermann, 2011; S. pilatus Kuznetzov, 1978; S. unicus Kuznetzov, 1977; S. malekii Haddad et al. 2006; S. boshroyeinhensis Khanjani et al. 2010; S. shendabadiensis Haddad, Lotfollahi and Akbari 2010; S. candidus Fan and Li, 1993; S. elongatus Berlese, 1886 (Khanjani and Ueckermann 2002; Faraji and Ueckermann 2006; Haddad Irani-Nejad et al. 2006, 2010 a and b; Khanjani et al. 2010; Bagheri et al. 2011). In this paper we describe another species of this genus, S. iranensis sp. n.

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. The gnathosoma was measured from the base of the chelicerae to the tip of palptibial claw, the length of idiosoma from the suture between gnathosoma and idiosoma to the posterior margin of suranal shield, the width of idiosoma at the broadest part of the idiosoma and setae were measured from their insertion to 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

Stigmaeus iranensis

Bagheri and Gheblealivand sp. n.

Figs 1–7

Diagnosis. With 16 smooth dorsal shields; setae ve, sce, c2, d2, and f1 longer than other dorsal setae; all dorsall setae smooth; suranal shield divided; genital and anal shields fused; setae ag1–ag4 on single shields flanking anogenital area; genua III without setae; solenidion on tarsi IV absent.

Description. Female (holotype and 2 paratypes). Length of idiosoma 260 (236–240 in 2 paratypes); length of gnathosoma 100 (86–90); width of idiosoma 125 (92–110). Length of legs I–IV, respectively (from base of femora to tip of tarsal claw): 115 (105–110), 80 (80–83), 85 (85–90), and 110 (105–108).

Dorsum (Fig. 1). Dorsum covered with 16 smooth shields; prodorsal shield with 3 pairs of setae (vi, ve, and si); se located on lateral platelets; no eyes and postocular bodies observable; opisthosoma with central shield bearing setae c1 and d1; setae d2 located on longitudinal lateral shields; humeral shields bearing setae c2 and situated latero-ventrally; median zonal shields separated, each with one seta (e1), lateral shields each with setae e2; intercalary shields bearing setae f1; suranal shield divided and with 3 pairs of setae (h1–h3); all dorsal setae smooth; length of dorsal setae: vi 17 (17–19); ve 50 (56–60); sce 25 (26–28); c2 68 (68–70); cl 30 (30–32); c2 55 (60–66); d1 33 (31–33); d2 55 (53–55); e1 30 (30–32); e2 30 (30–33); f1 55 (55–58); h1 35 (33–36); h2 35 (34–39); h3 18 (18–20); distances between dorsal setae: vi–vi 32 (29–31); ve–ve 40 (37–39); vi–ve 22 (22–25); ve–sci 40 (32–34); vi–sci 50 (53–55); sci–sci 50 (50–53); sci–sce 23 (20–21); sce–sce 90 (65–67); c1–cl 35 (30–33); c1–d1 45 (40–44); c1–d2 40
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(30–32); d1–d1 35 (30–32); d1–d2 37 (30–34); d2–d2 95 (85–87); d1–e1 46 (40–42); d1–e2 43 (38–40); e1–e1 35 (31–34); e1–e2 20 (20–23); e1–fl 22 (22–25); e2–fl 33 (30–33); fl–fl 53 (49–52); fl–h1 25 (25–28); fl–h2 23 (21–23); fl–h3 25 (24–25); h1–h1 20 (20–21); h1–h2 20 (17–18); h2–h2 43 (41–42); h2–h3 10 (6–9); h3–h3 45 (41–43); ratios: vi/vi 0.53; c1/c1 0.87; d1/d1 0.94; e1/e1 1.03; h1/h1 0.75; h2/h2 0.81; h3/h3 0.4; c1–c1:d1–d1:e1–e1:fl–fl 1:1.05:1:1.51.

Venter (Fig. 2). Endopodal shields divided and smooth; aggenital area with 4 pairs of aggenital setae (ag1–ag4); genital and anal shields fused and with 2 pairs of genital setae (g1–g2) and 3 pairs of pseudanal setae (ps1–ps3); length of ventral setae as follows: 1a 15 (13–16); 3a 15 (13–14); 4a 13 (13–14); ag1 12 (12–13); ag2 12 (12–14); ag3 12 (12–14); ag4 15 (15–16); g1 12 (13–14); g2 15 (15–17); ps1 32 (33–35); ps2 28 (26–28); ps3 17 (19–21). Subcapitulum smooth; length of subcapitular and oral setae as follows: m 19 (18–19), n 26 (24–26) orl 5 (5–7), or2 6 (6–7).

Legs (Figs. 4–7). Chaetotaxy of leg segments as follows: coxae (excluding 1a, 3a and 4a) 2–2–2–2, trochanters 1–1–2–1, femora 4–4–3–2, genua 5+1κ–4–0–2, tibiae 5+1φ +1φ–5+1φ–5+1φ–5+1φ–5+1φ, tarsi 13+1ω–8+1ω–7+1ω–7.

**Male and immature stages.** Unknown

**Type material.** Holotype and 2 paratypes females of *Stigmaeus iranensis* sp. n. were collected from the soil of apple orchards, IRAN: East Azerbaijan province, Bonab, 15 July 2010, coll. Saeede Sadat Gheblealivand.

**Type depositories.** Holotype and 1 female paratype are deposited at the Arachnida Collection of the Plant Protection Research Institute, Pretoria, South Africa; 1 female paratype is deposited in the Acarological Collection, Department of Plant Protection, Faculty of Agriculture, University of Maragheh, Maragheh, Iran.

**Etymology.** This species is named after the country, Iran, where it was collected.

**Remarks.** *Stigmaeus iranensis* sp. n. is very close to *S. marandiensis* Bagheri and Ueckermann, 2011 in the shape of the dorsal shields but can be distinguished from the later by following characters: (1) dorsal setae are smooth vs. slightly serrated in *S. marandiensis* (Bagheri et al. 2011); (2) setae sce, c1, d1, d2 and f in this species are more longer than those in *S. marandiensis* (68, 30, 33, 55 and 55 vs. 46, 20, 18, 23 and 28 respectively);
(3) genua I–IV are with 6–4–0–2 vs. 6–4–1–2 in S. marandiensis; (4) tarsi IV are without solenidion vs. with solenidion in S. marandiensis. The new species is also close to S. planus Kuznetsov, 1978 in the shape of the dorsal shields but can be separated by following characters: (1) the prodorsal shield is completely smooth vs. reticulated in S. planus (Kuznetsov 1978); (2) e2 are on the distinct small platelets vs. on integument in S. planus; (3) ag1–ag4 are located on a single shield vs. ag1–ag2 and ag3–ag4 located on different shields in S. planus; (4) genua I–IV are with 6–4–0–2 setae vs. 6–3–0–1 in S. planus.

**Key to the Iranian species of the genus Stigmaeus Koch, female**

1. Opisthosoma without a distinct central shield ................................................. 9
   — Opisthosoma with distinct central shield ................................................. 2
2. Central hysterosomal shield with 3 pairs of setae ............................................. 8
   — Central hysterosomal shield with 2 pairs of setae ........................................ 3
3. Eyes present ................................................................................................. 7
   — Eyes absent ............................................................................................... 4
4. Median prodorsal shield with polygonal cells .................................................... 5

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Figs 3–7. *Stigmaeus iranensis* sp. n., female. 3 — dorsal view of palp, 4–7 — legs I–IV, respectively in dorsal view. Scale bars: 3 = 25 μm, 4–7 = 50 μm.
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— Median prodorsal shield smooth .................. 6
5. Trochanters III with 1 setae .......... *S. alvandis*
— Trochanters III with 2 setae .......................... .......................... *S. shabestariensis*
6. Tarsi IV with 1 solenidion ...... *S. marandiensis*
— Tarsi IV without solenidion .......................... .......................... *S. iranensis* sp. n.
7. Setae h3 on suranal shield present .... *S. pilatus*
— Setae h3 on suranal shield absent ..... *S. unicus*
8. Tibia II with 1 solenidion ........... *S. malekii*
— Tibia II with 2 solenidia ...... *S. boshroyeensis*
9. Suranal shield divided ...... *S. shendabadiensis*
— Suranal shield entire .................................... 10
10. Genua III without setae .......... *S. candidus*
— Genua III with 3 setae .......... *S. elongatus*

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