

Article

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***Stigmaeus hashtrudiensis*, a new species of the genus *Stigmaeus* (Acari: Trombidiformes: Stigmaeidae) from Northwest Iran**

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Abstract

A new species of the genus *Stigmaeus*, *S. hashtrudiensis* Bagheri & Maleki **sp. nov.**, collected from soil and rotten leaves under apple, is described and illustrated.

Key words: Prostigmata, Raphignathoidea, Stigmaeidae, predatory mites, soil mites.

Introduction

The family Stigmaeidae is the largest family within Raphignathoidea and was established by Oudemans (1931). This family contains 32 valid genera and about 500 species (Doğan *et al.* 2011; Khanjani *et al.* 2012a), of which the genus *Stigmaeus* is one of the largest and most diverse genera in this family. Members of this genus are found in various habitats such as aerial part of plants and soil. They are usually predators and feeding on a variety of arthropods (Swift 1987; Akyol & Koç 2007; Khanjani *et al.* 2010). Up to now, 28 species of this genus (Bagheri *et al.* 2013) have been described or reported from Iran (Haddad Irani-Nejad *et al.* 1999, 2005, 2006, 2010a, b; Khanjani & Ueckermann 2002; Sahraeian *et al.* 2006; Khanjani *et al.* 2010, 2012a, b; Rostami *et al.* 2010; Pahlvan-Yali *et al.* 2011; Bagheri *et al.* 2011a, b, 2012a, b, 2013; Bagheri & Zarei 2012; Changizi *et al.* 2012; Doğan *et al.* 2012; Zarei & Bagheri 2012). In this paper, *Stigmaeus hashtrudiensis* Bagheri & Maleki **sp. nov.** is described and illustrated.

Material and Methods

The samples were taken from soil and rotten leaves under apple orchards. Mites were extracted from samples using a Berlese Tullgren funnel. Collected specimens were cleared in Nesbitt's fluid and mounted in Hoyer's Medium (Walter & Krantz 2009), and examined and drawn with a phase-contrast microscope. The length of the idiosoma was measured from the suture between the gnathosoma and idiosoma to the posterior margin of the idiosoma; the width of the idiosoma was measured at the broadest part of the idiosoma and setae were measured from their insertion to their tips. Dorsal setae and leg

setal designations follow Kethley (1990) and Khanjani *et al.* (2010), respectively. All measurements are given in micrometers (μm).

Family Stigmaeidae Oudemans, 1931

Genus *Stigmaeus* Koch, 1836

Type species: *Stigmaeus cruentus* Koch, 1836.

***Stigmaeus hashtrudiensis* Bagheri & Maleki sp. nov. (Figs. 1–8)**

Diagnosis

Prodorsal shield reticulated; hysterosomal shields completely smooth; suranal shield divided and with three pairs of setae (setae *h3* present); setae *ve*, *sce*, *c2*, *d2* and *fl* longer than other dorsal setae; tarsi I-II with 13(+ ω)-8(+ ω) setae; genua I-IV with 5(+ κ)-4-1-2 setae; femora I-IV with 4-4-3-2 setae; median hysterosomal shield with two pairs of setae; eyes and post-ocular bodies absent; ventral opisthosoma with two pairs of genital and four pairs of aggenital setae; palptarsal eupathidium bifurcate.

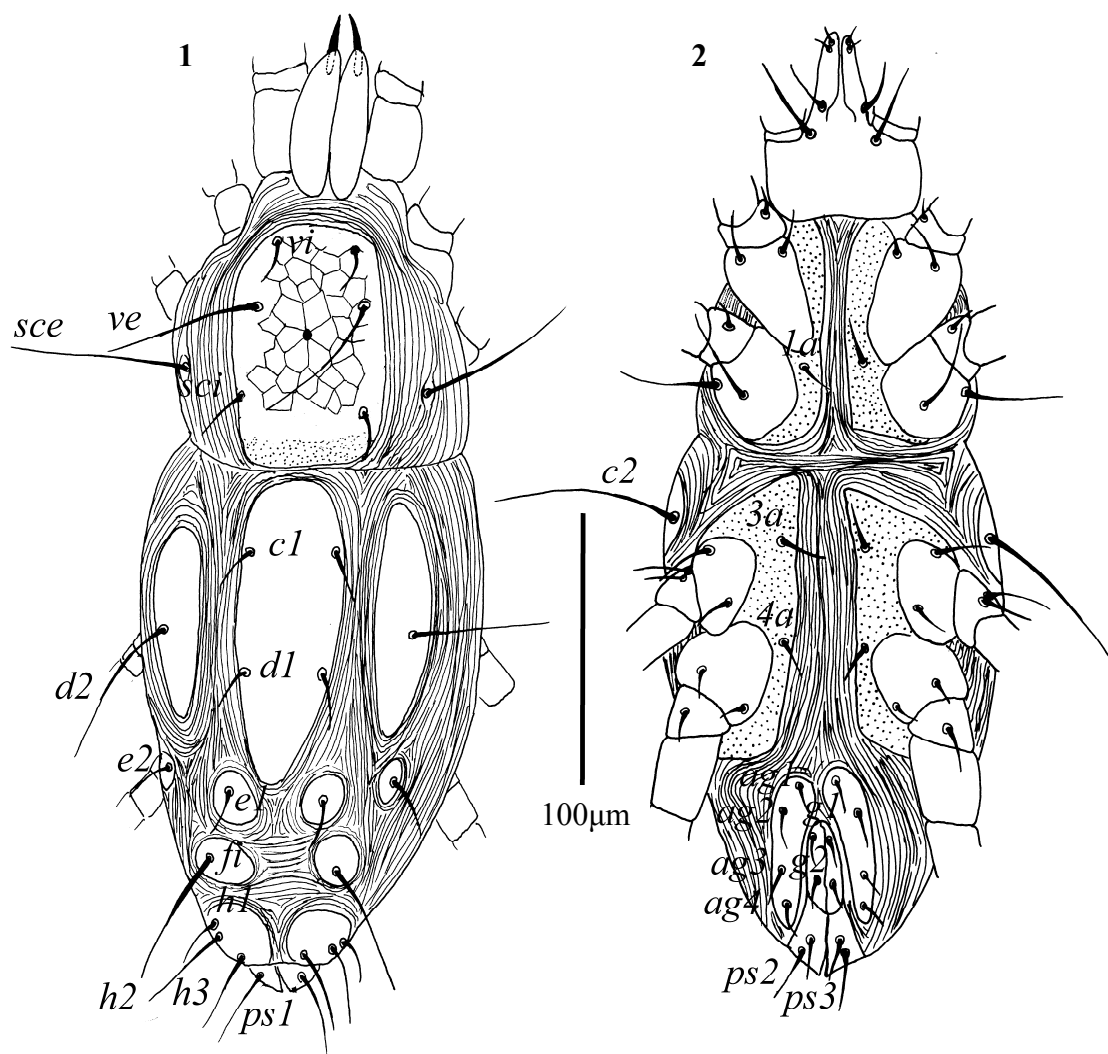
Description of female (n = 3)

Length of idiosoma 318 (285–305); length of gnathosoma 83 (75–78); width of idiosoma 135 (125–138). Length of legs (from base of coxa to tip of tarsal claw): leg I 183 (175–180), leg II 143 (133–137), leg III 138 (128–134), leg IV 158 (150–152).

Dorsum (Fig. 1). Dorsum with 14 pairs of setae (setae *h3* present); prodorsal shield reticulated centrally and with 3 pairs of setae (*vi*, *ve* and *sci*); setae *sce* on integument; eyes and post-ocular bodies absent; median hysterosomal shield without reticulation and with two pairs of setae (*c1* and *d1*); setae *d2* located on smooth longitudinal lateral shields; humeral shields situated latero-ventrally and bearing setae *c2*; median zonal and intercalary shields separated, with setae *e1* and *fl*, respectively; *e2* situated on small shields; suranal shield divided and with three pairs of setae (*h1*, *h2* and *h3*); setae *ve*, *sce*, *c2*, *d2* and *fl* the longest setae. Length of dorsal setae: *vi* 18 (18–19), *ve* 61 (55–60), *sci* 21 (19–22), *sce* 73 (65–68), *c1* 21 (19–20), *c2* 73 (65–70), *d1* 21 (18–20), *d2* 60 (57–61), *e1* 21 (20–21), *e2* 21 (19–21), *fl* 60 (55–61), *h1* 31 (26–30), *h2* 33 (26–32), *h3* 15 (14–16); distances between dorsal setae: *vi-vi* 31 (28–27), *ve-ve* 40 (36–37), *vi-ve* 20 (20–21), *ve-sci* 40 (38–40), *sci-sci* 52 (46–50), *sci-sce* 22 (25–24), *sce-sce* 95 (95–100), *c1-c1* 33 (30–34), *c2-c2* 130 (124–135), *c1-c2* 50 (49–52), *c1-d1* 49 (48–49), *d1-d1* 30 (28–30), *d1-d2* 39 (39–40), *d1-e1* 46 (45–47), *e1-e1* 35 (36–37), *e2-e2* 87 (86–90).

Venter (Fig. 2). Endopodal shields faintly punctate, well divided by striae and with three pairs of ventral setae (*1a*, *3a* and *4a*); with four pairs of aggenital setae (*ag1-ag4*); anogenital area with two pairs of genital setae (*g1-g2*) and three pairs of pseudanal setae (*ps1-ps3*); length of ventral setae as follows: *1a* 19 (19–20), *3a* 19 (19–20), *4a* 18 (17–18), *ag1* 12 (11–12), *ag2* 13 (12–13), *ag3* 13 (12–13), *ag4* 15 (14–15), *g1* 14 (15–15), *g2* 20 (19–20), *ps1* 35 (30–34), *ps2* 20 (17–19), *ps3* 32 (27–32).

Gnathosoma (Figs. 3–4). Hypostome faintly punctate (Fig. 4), with two pairs of subcapitular setae (*m*, *n*), *m* 18 (20–21), *n* 33 (30–34) and two pairs of adoral setae (*or1*, *or2*). Palps (Fig. 3) 70 (68–70) long, five segmented: palptarsus with one terminal bifurcate eupathidium, one solenidion and five simple setae; palptibia with one developed claw and three setae, accessory claw seta-like; palp genua with one seta and palp femur with three setae.



Figures 1–2. *Stigmaeus hashtrudiensis* Bagheri & Maleki **sp. nov.** (female). 1. Dorsal view of body; 2. Ventral view of body.

Legs (Figs. 5–8). Setal formulae of leg segments (solenidia in parentheses and not included) as follows: coxae 2-2-2-2, trochanters 1-1-2-1, femora 4-4-3-2, genua 5(+κ)-4-1-2, tibiae 5(+φ, φφ)-5(+φ)-5(+φ)-5(+φ), tarsi 13(+ω)-8(+ω)-7(+ω)-7(+ω).

Male and immature stages: Unknown.

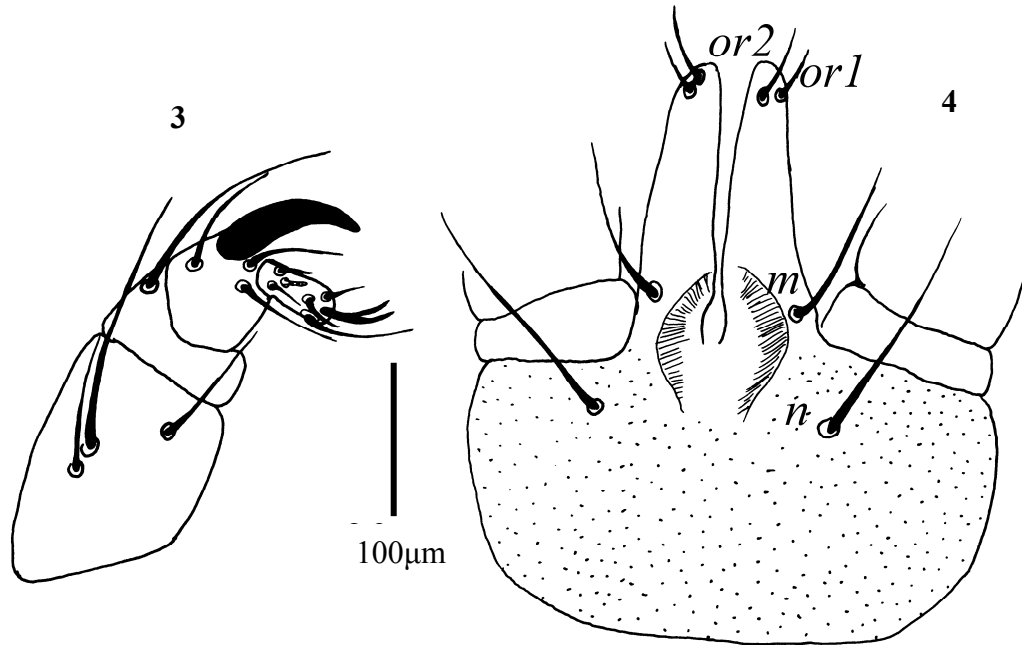
Etymology

This species is named after the city “Hashtrud” where it was collected, East Azerbaijan province, Iran.

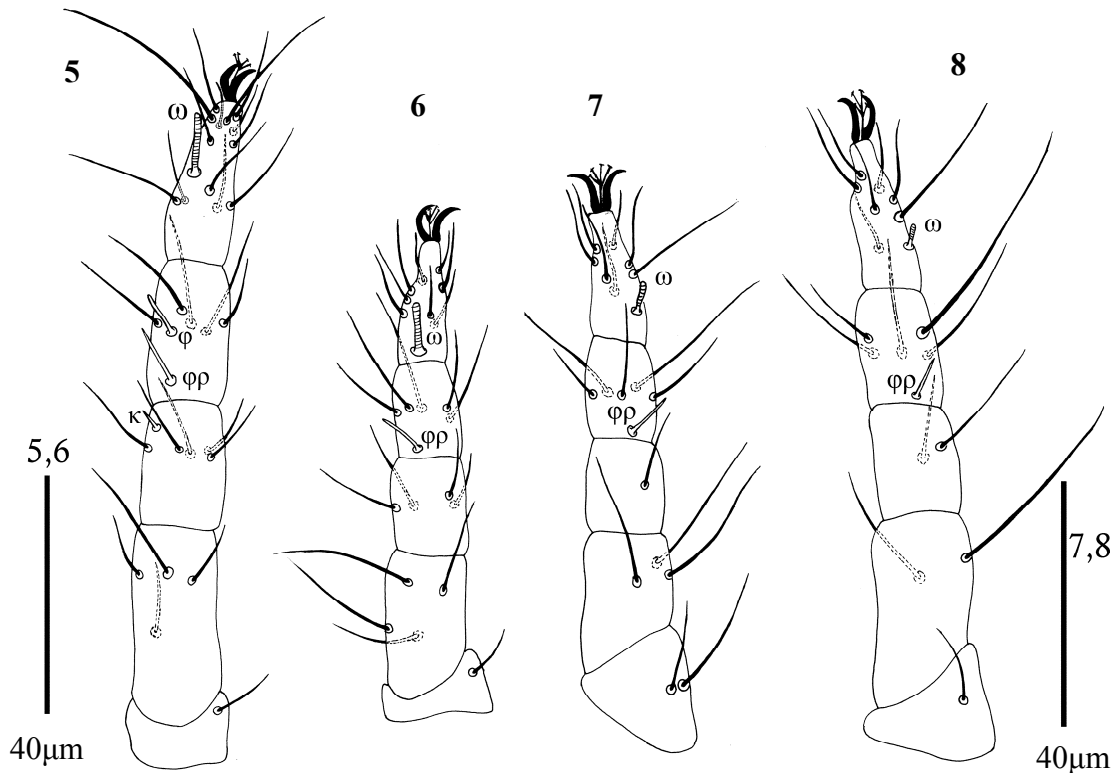
Type material

Holotype and two paratype females of *S. hashtrudiensis* Bagheri & Maleki **sp. nov.** were collected from soil and leaf litter under tamarisk (*Tamarix gallica*, Tamariaceae), 14 August 2012, in Makou, west Azerbaijan province, Iran, by Naser Maleki, also from soil under apple orchards, 22 September 2012, Hashtrud, East Azerbaijan province, Iran, by Ghorban Rahimi. Holotype and one paratype female were deposited in the

Acarological Collection, Department of Plant Protection, Faculty of Agriculture, University of Maragheh, Iran and one paratype female will be deposited in the Arachnida Collection of Plant Protection Research Institute, Pretoria, South Africa.



Figures 3–4. *Stigmaeus hashtrudiensis* Bagheri & Maleki **sp. nov.** (female). 3. Palp; 4. Hypostome.



Figures 5–8. *Stigmaeus hashtrudiensis* Bagheri & Maleki **sp. nov.** (female): 5. Leg I; 6. Leg II; 7. Leg III; 8. Leg IV.

Remarks

Stigmaeus hashtrudiensis Bagheri & Maleki **sp. nov.** resembles *S. makouiensis* Bagheri & Maleki, 2013 in having same dorsal shields pattern, setal formulae of legs and bifurcate terminal eupathidium on palp tarsus. However, it can be distinguished from this species by: (1) hysterosomal shields completely smooth in *S. hashtrudiensis* Bagheri & Maleki **sp. nov.** vs. reticulated in *S. makouiensis*; (2) lengths of setae *sce* 73, *d2* 60 and *f1* 60 in new species longer than those in *S. makouiensis* [33, 19 and 21, respectively]. The new species is also similar to *S. cariae* Khanjani *et al.* by having the same dorsal shield pattern and reticulations, bifurcate terminal eupathidium, two pairs of genital and four pairs of aggenital setae. However it can be distinguished from the latter (1) in the number of setae on genua II-IV 4-1-2 instead of 2-0-1 in *S. cariae*; (2) lengths of setae *d2* 60 and *f1* 60 in new species two-times longer than those in *S. cariae* [31 and 33, respectively]; (3) palp-tibia with two simple setae and one seta-like accessory claw instead of three simple seta and one spine-like accessory claw.

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Stigmaeus hashtrudiensis گونه جدیدی از جنس *Stigmaeus* (Acari)

Trombidiformes: Stigmaeidae از شمال غرب ایران

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چکیده

گونه جدیدی از جنس *Stigmaeus*، *S. hashtrudiensis* Bagheri & Maleki **sp. nov.**، جمع‌آوری

شده از خاک و برگ‌های پوسیده در زیر درختان سیب، توصیف و ترسیم می‌شود.

واژگان کلیدی: Prostigmata، Stigmaeidae، Raphignathoidea، کنه‌های شکارگر، کنه‌های

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