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Acarologia, CBGP, CS 30016, 34988 MONTFERRIER-sur-LEZ Cedex, France

The digitalization of Acarologia papers prior to 2000 was supported by Agropolis Fondation under the reference ID 1500-024 through the « Investissements d’avenir » programme (Labex Agro: ANR-10-LABX-0001-01)

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RAPHIGNATHUS SABOORII N. SP. A NEW SPECIES OF THE GENUS RAPHIGNATHUS (ACARI: TROMBIDIFORMES: RAPHIGNATHIDAE) FROM NORTHWEST IRAN

Hamed Ghorbani¹, Mohammad Bagheri¹, Edward A. Ueckermann²,³, Reza Navaei-Bonab¹,⁵, Ali Mehrvar¹ and Moosa Saber¹

(Received 11 June 2011; accepted 05 September 2011; published online 20 December 2011)

¹ Department of Plant Protection, Faculty of Agriculture, University of Maragheh, Maragheh, Iran. hg.ghorbani@gmail.com; mbagheri200222002@yahoo.com; reza_kami2005@yahoo.com; mehrvar@mhec.ac.ir; saber@mhec.ac.ir
² ARC-PPRI, Private Bagx134, Pretoria 0121, South Africa
³ School of Environmental Sciences and Development, North-West University, Potchefstroom Campus 2520, South Africa. UeckermannE@arc.agric.za
⁴ Young Researchers Club, Islamic Azad University, Maragheh Branch, Maragheh, Iran
⁵ Young Researchers Club, Department of Entomology, Islamic Azad University, Marand Branch, East Azarbaijan Province, Iran

ABSTRACT — A new species of raphignathid mites from northwest Iran, Raphignathus saboorii n. sp. is described and illustrated. A key to all known species of Raphignathus in Iran is also given.

KEYWORDS — Acari; Raphignathidae; new species; Iran; Raphignathus

INTRODUCTION

Members of the family Raphignathidae are predacious. They can be found underneath tree bark, in lichens, in moss, in leaf litter, in pigeon nests, in soil, on a wide range of plants and in house dusts (Fan and Yin 2000; Khanjani and Ueckermann 2003). This family are easily recognized by the fused cheliceral bases, forming a stylophore; cervical peritremes not embedded in dorsal surface of stylophore and confluent coxae (Meyer and Ueckermann 1989). The genus Raphignathus Duges is the oldest genus in this family and has a worldwide distribution with more than 60 species of which seven are known from Iran, namely: R. collegiatus Atyeo, Baker and Crossley, 1961; R. gracilis (Rack 1962); R. gisela Meyer and Ueckermann, 1989; R. zaot Hu, Jing and Liang, 1995; R. aciculatus Fan, 2000; R. hecmatanaensis Khanjani and Ueckermann, 2003; R. protaspus Khanjani and Ueckermann, 2003 (Khanjani and Ueckermann 2003; Ghorbani et al. 2010). In this paper a new species, R. saboorii n. sp. from northwest Iran is described and figured.

MATERIALS AND METHODS

Litter and soil samples were taken from apple orchards at Maragheh, East Azerbaijan Province, Iran. Measurements were taken as follows: length of idiosoma from suture between gnathosoma and idiosoma to posterior margin of idiosoma; width of idiosoma at broadest part of idiosoma; and setae from their insertion to their tips. Distances between setae
were measured between their insertions. The terminology and abbreviations of dorsal and ventral setae follow Kethley (1990) and all measurements are given in micrometers (µm).

RESULTS

Family Raphignathidae Kramer, 1877

Type genus: Raphignathus Dugès, 1834

Genus Raphignathus Dugès, 1834

Diagnosis — Body soft to sclerotized; red or yellow in life; idiosoma oval in dorsoventral view; cheliceral bases fused; palpital claw small, at most one half length of palpatarsus; subcapitulum with 2 pairs of subcapitular setae and 2 pairs of adoral setae; dorsum with 11 – 12 pairs of setae, one pair of eyes laterally on propodosomal shield; ventrally, coxae II and III contiguous; two pairs of aggenital setae; genital shield with three or four pairs of setae; anal opening clearly separated from genital aperture and with three pairs of setae; leg empo- dial axis directly producing 2 rows of tenent hairs; number of male and female solenidia on tarsi often similar, but in male dorsal body shields somewhat fused and solenidia ω on tarsi enlarged.

Key to Iranian species of Raphignathus Dugès

1. Interscutal membrane dorsomedially with 2 pairs of setae ........................................... 2
   — Interscutal membrane dorsomedially with 1 pair of setae ........................................... 6

2. Endopodal shields present ......................... 3
   — Endopodal shields absent ......................... 5

3. Endopodal shields associated only with coxae of III-IV ............................................. 4
   — Endopodal shield associated with coxae I-IV.......................................................... R. hecmatanaensis

4. Median propodosomal shield adjacent to peritremes anteriorly; dorsal setae e1 reach anterior margin of opisthosomal shield ................. R. gracilis
   — Median propodosomal shield widely separated from peritremes anteriorly; dorsal setae e1 not reaching anterior margin of opisthosomal shield........................................... R. giselae

5. Genital shields with 4 pairs of setae.................
   ....................................................... R. saboorii n. sp.
   — Genital shields with 3 pairs of setae..............
   ....................................................... R. aciculatus

6. Femur IV with 2 setae ......................... R. zhaoi
   — Femur IV with 4 setae ......................... 7

7. Setae e1 close to anterior margin of opisthosomal shield, cupule im on integument; 2 small shields on interscutal integument, very small .... R. collegiatus
   — Setae e1 well behind anterior margin of opisthosomal shield, cupule im on shield; 2 small shields on interscutal integument, much larger .................. R. protaspus

Raphignathus saboorii
Ghorbani and Bagheri n. sp.
(Figures 1-2)

Holotype — Female: (n=2) – Length of body (paratype measurements in parenthesis) (including gnathosoma) 412 (394), (excluding gnathosoma) 277 (260), width 176 (183).

Dorsum — (Figure 1a) Propodosoma with one median and 2 lateral shields; without small shields behind median propodosomal shield. Median shield with three pairs of setae (vi, ve and c1), and separated from lateral shields by striations; each lateral shield with three pairs of setae, (sci, sce and c2), and with one eye; integument behind median propodosomal shield punctuated, interscutal membrane with two pairs of setae, (d1 and e1) situated on small platelets. Opisthosomal shield with four pairs of setae, (f1, h1, h2 and h3), setae f1 not located on margin of opisthosomal shield. Three pairs of lyrifissures present, one pair (iii) on posterior margin of lateral shields, one pair (im) on integument between lateral and opisthosomal shields, and one pair (ip) on anterior margin of opisthosomal shield. All dorsal setae simple. Dimension of setae as follows: vi 26 (25); ve 27 (26); sci 26 (26); sce 26 (24); c1

426
Figure 1: Raphignathus saboorii n. sp. (Female): a – Dorsal view, b – Ventral view, c – Subcapitulum, d – Palp.
FIGURE 2: *Raphignathus saboorii* n. sp. (Female): a – Leg I, b – Leg II, c – Leg III, d – Leg IV.
20 (19); c2 25 (24); d1 19 (21); e1 20 (21); f1 22 (24); h1 24 (29); h2 22 (29); h3 19 (26); Distances between dorsal setae: vi – vi 23 (22); ve – ve 41 (46); vi – ve 33 (30); ve – sci 25 (26); vi – sci 49 (47); sci – sci 94 (72); sci – sce 25 (25); sce – sce 130 (116); c1 – c1 13 (16); c1 – c2 42 (43); c2 – c2 90 (108); c1 – d1 41 (37); d1 – d1 53 (58); d1 – e1 30 (22); e1 – e1 59 (63); e1 – f1 27 (22); f1 – f1 42 (55); f1 – h1 33 (35); f1 – h2 49 (57); f1 – h3 60 (60); h1 – h1 119 (27); h1 – h2 28 (30); h2 – h2 43 (55); h2 – h3 13 (12); h3 – h3 73 (70); ratios: vi/ vi = 1.13; c1/c1 = 1.53; d1/d1 = d1/d1 0.35; e1/e1 = e1 0.33; f1/f1 = f1 0.52; h1/h1 = h1 1.26; h2/h2 = h2 0.51; h3/h3 = h3 0.26; c1/c1 1.13; d1/d1 = d1/d1 1.26; e1/e1 = e1 1: 1.26: 1.4: 1.

Venter — (Figure 1b) Endopodal shields absent; setae 1a and 3a near coxae I and III respectively, setae 4a on membrane posterior to coxae IV; venter striated except for coxae; aggenital area with two pairs of aggenital setae (ag1 – ag2); genital area with four pairs of setae (g1 – g4); anal shield with three pairs of anal setae (ps1 – ps3). Measurements of setae: ia 33 (30), 3a 26 (27), 4a 22 (25), ag1 17 (20), ag2 18 (19), g1 16(16), g2 15 (15), g3 15 (15), g4 15 (15), ps1 15 (15), ps2 15 (15) and ps3 14 (16).

Gnathosoma — Subcapitulum (Figure 1c) ventrally with two pairs of subcapitular setae (m and n), equal in length, m = n = 30, and 2 pairs of adoral setae (or1and or2) which are slightly serrated; distances between n – n 36, m – m 19, n – m 12. Dorsal stylophore with striae. Palpi (Figure 1d) five segmented; palpatarsus with four setae, four eupathidia and one solenidion (ω); palpibgia with three setae and one small claw; palpgenu and palpfemur each with two setae; palptrochanter without setae.

Legs — (Figure 2) length of legs I-IV (from base of coxae to tip of tarsal claw): 275(251) – 235(205) – 243(225) – 319(255). Chaetotaxy of leg segments as follows: coxae (excluding 1a, 3a and 4a) 2-2-2-1, trochanters 1-1-2-1, femora 6-5-3-3, genua 5+1х5+1х4-4, tibiae 5+1φ-5+1φ-5+1φ-4+1φ, tarsi 19+1ω+1ω+16+1ω-13+1ω-13. Male and immature stages — Unknown.

Etymology — The species is named in honor of Prof. Ali Reza Saboori (Professor of Entomology, University of Tehran, Iran), for his great efforts to develop of Acarology in Iran.

Type material — Holotype and 1 paratype female of Raphignathus saboorii n. sp. were collected from soil in apple orchards, 20 August 2009, Maragheh, East Azerbaijan province, Iran, by Hamed Ghorbani. The holotype and paratype females will be deposited in the Arachnida Collection of Plant Protection Research Institute, Pretoria, South Africa.

Remarks — The new species is very closely related to R. sceptrum Chaudhri, Akbar and Rasool (Chaudhri et al. 1979) by having: 4 pairs of genitalic setae, 2 pairs of setae on interscutal membrane, 2 pairs of setae on palpfemur and simple dorsal setae but can be distinguished from the later as follows:

1. R. sceptrum has one pair of small shields behind the anteromedian propodosomal shield which are absent in new species.
2. Setae f1 in new species well behind the anterior margin of opisthosomal shield but in R. sceptrum f1 situated on anterior margin of opisthosomal shield.
3. Tarsi I and IV with 21 and 13 setae in new species vs 19 and 12 in R. sceptrum, respectively.

Raphignathus saboorii also resembles R. gracilis by having 2 pairs of interscutal setae, 2 setae on palpfemur, simple dorsal setae and absence of small shields on interscutal membrane but, can be separated by following features:

1. Genital shields with 4 pairs of setae in R. saboorii vs. 3 pairs in R. gracilis
2. Tarsus II with 17 setae vs. 16 in R. gracilis.
3. Coxisternal III-IV is absent in new species but present in R. gracilis.

ACKNOWLEDGEMENTS

We greatly appreciated the support for this project provided by the research division of University of Maragheh, Maragheh, Iran.
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