A new species of the genus Raphignathus (Acari: Raphignathidae) from western Iran

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Abstract

A new species of the genus Raphignathus Dugès (Acari: Raphignathidae), R. khorramabadensis Bagheri sp. nov. is described and illustrated from soil in Bisheh region, suburb of Khorramabad in Lorestan province, western Iran.

Key words: Trombidiformes, Raphignathina, Khorramabad, Lorestan province.

Introduction

Raphignathidae is the oldest family in superfamily Raphignathoidea and belongs to the Trombidiformes (Walter et al. 2009). They are predaceous mites and can be found underneath tree bark, in lichens, moss, leaf litter, pigeon nest and intestine of wedded seal, in soil, on a wide range of plants and in house dusts (Fan & Yin 2000, Khanjani & Ueckermann 2003). They can be characterized by cheliceral basis forming a stylophore, cervical peritremes not embedded in dorsal surface of stylophore and confluent coxae.


Material and Methods

Mites were extracted from soil by mean using a Berlese Tullgren funnel. Specimens were cleared in Nesbitt’s fluid, mounted in Hoyer’s medium (Walter & Krantz 2009)
and examined at 1000× magnification under an Olympus BX41 phase contrast microscope. All drawings were made by using a drawing tube. The length of gnathosoma was measured from the base of the chelicerae to the tip of palp, the length of the idiosoma from the suture between the gnathosoma and idiosoma to the posterior margin of the idiosoma, the width of the idiosoma at the broadest part of the idiosoma and setae were measured from their insertion to their tips; distances between setae were measured between their insertions. The terminology and abbreviations follow that of Kethley (1990) and all measurements are given in micrometers (μm).

Family Raphignathidae Kramer, 1877
Genus Raphignathus Dugès, 1834
Type species: Raphignathus ruberrimus Dugès, 1834

Raphignathus khorramabadensis Bagheri sp. nov. (Figs. 1–7)

Diagnosis

Median shield spherical anteriorly and truncated posteriorly, with three pairs of setae; palpfemur with three setae; no setae on interscutal membrane; the small plates behind the prodorsal shields present; all dorsal shields punctated and dorsal setae setiform; coxisternal shields adjacent to coxae I–IV, with three pairs of setae; setal formula of femora-tarsi as follows: femora 6–6–4–4; genua 5(+κ)–5(+κ)–4–4; tibiae 5(φ₁–ω₁)–5(ω₁)–4(+φ₁); tarsi 19(+ω₁+ω₂)–15(+ω)–13(+ω)–13(+ω).

Description of female (n = 3)

Idiosoma oval, length of body (including gnathosoma) (the measurements for the paratypes in parenthesis): 562 (575–587); length of gnathosoma 190 (200–210); width of body 262 (282–292); length of leg I 346 (375–378); leg II 302 (330–341); leg III 323 (350–356); leg IV 399 (422–428).

Dorsum (Fig. 1). Prodorsum with one median and two lateral shields; median shield spherical anteriorly and truncated posteriorly, with three pairs of setae (vi, sci and c₁); lateral prodorsal shields with one pair of eyes, three pairs of setae (ve, sce and c₂) and one pair of cupules (ia); opisthosomal shield with six pairs of setae (d₁, e₁, f₁, h₁, h₂, and h₃) and one pair of cupules (ip); with no setae on interscutal membrane; the small plates behind the prodorsal shields present and concealed under dorsal plates; all dorsal shields punctated and dorsal setae setiform. Lengths of dorsal setae as follows: vi 70 (65–67); ve 65 (66–67); sci 72 (65–72); sce 62 (63–68); c₁ 63 (63–65); c₂ 70 (65–70); d₁ 62 (61–62); e₁ 72 (67–71); f₁ 67 (62–68); h₁ 60 (60–62); h₂ 50 (50–52); h₃ 52 (50–55); distances between dorsal setae: vi–vi 40 (38–45); sce–sci 60 (53–60); vi–sci 15 (15–20); ve–sce 37 (45–49); ve–c₂ 72 (73–75); sce–c₂ 65 (60–62); c₁–c₂ 10 (10–12); d₁–d₂ 66 (75–76); d₁–e₁ 45 (52–55); e₁–f₁ 151 (154–165); f₁–f₁ 105 (102–110); e₁–f₁ 60 (55–57); h₁–h₂ 35 (33–40); h₁–h₂ 45 (43–45); h₂–h₃ 75 (72–73); h₃–h₃ 90 (87–100).

Venter (Fig. 2). Venter striated, with coxisternal shields adjacent to coxae I–IV; setae 4a on coxisternal shields; aggenital area with two pairs of setae (ag₁ and ag₂); genital and anal opening contiguous; genital shields punctated, with three pairs of setae (g₁–g₃); anal opening dorsoventrally, with three pairs of setae (p₁, p₁ dorsally and p₂–p₃ ventrally; one pair of cupules (ih) located anterolaterally to genital shields.

Lengths of setae as follows: ag₁ 27 (30–35); ag₂ 25 (24–25); g₁ 18 (17–25); g₂ 24 (25–26); g₃ 20 (20–23); p₁ 27 (25–27); p₂ 25 (27–29); p₃ 25 (24–27); la 40 (44–52);
Gnathosoma: Subcapitulum (Fig. 2) smooth with reticulations under cuticle; two pairs of subcapitular setae \( m \) 51 (56–60), \( n \) 50 (55–60) and two pairs of adoral setae \( or_1 \) 17 (20–21), \( or_2 \) 18 (21-22) present; stylophore conical and with bacillus-like striation; palpi (Fig. 3) five-segmented; palp chaetotaxy (femur-tarsus) as follows: 3-2-3+1claw-4+1\( \omega \)+4 eupathidia.

Legs (Figs. 4–7): Number of setae on legs I–IV: coxae 2-2-2-1; trochanter 1-1-2-1; femora 6-6-4-4; genua 5(\( +\kappa \))-5(\( +\kappa \))-4-4; tibiae 5(\( \phi+\phi_p \))-5(\( \phi+\phi_p \))-5(\( \phi+\phi_p \))-4(\( \phi+\phi_p \)); tarsi 19(\( +\omega I+\omega 2 \))-15(\( +\omega \))-13(\( +\omega \))-13(\( +\omega \)).

Male and immature stages: Unknown.

Etymology
This species is named after the city, Khorramabad, where it was collected.

Type material
Holotype female and two paratype females from soil in Bisheh region, suburb of Khorramabad in Lorestan province, southwestern Iran, collected by Shahriar Jafari. The holotype and one paratype female were deposited in the Arachnida Collection of Plant Protection Research Institute, Pretoria, South Africa and one paratype female was deposited in the Acarological Collection, Department of Plant Protection, Faculty of Agriculture, University of Maragheh, Iran.

Remarks
The new species is very close to *R. neocardinalis* Atyeo by having a well-developed hysterosomal shield with setae \( (d_l-h_3) \) and no setae on interscutal membrane but differs from that in: 1. Dorsal setae in new species are longer than distances to setae next behind (shorter in *R. neocardinalis*); 2. \( e_l-e_l > f_j-f_j \) in new species \( [e_l-e_l < f_j-f_j \) *R. neocardinalis*; (according to Fig. 21; Atyeo 1963)]; 3. Lengths of tarsi I-II-IV: 95 (100–102)-78 (85-86)-101 (105-106) in new species vs. 66-50-70 in *R. neocardinalis*; Lengths of legs I-IV: 346 (375–378)-302 (330–341)-323 (350–356)-399 (422–428) in new species vs. 249-207-232-283 in *R. neocardinalis*.

*R. khorramabadensis* Bagheri sp. nov. is also close to *R. conspicuus* (Berlese), *R. cardinalis* (Ewing). However the new species can easily distinguish from the latter species by having two distinct solenidia on tibia I (5+\( \phi+\phi_p \)) and one obvious solenidion on tarsus IV (13+\( \omega \)), whereas *R. cardinalis* has just one solenidion on tibia I and *R. conspicuus* has 13 simple setae on tarsus IV.

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References

Atyeo, W.T. (1963) New and redescribed species of Raphignatidae (Acarina) and a discussion of the chaetotaxy of the Raphignathoidea. *Journal of the Kansas


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گونه جدیدی از جنس Raphignathus (Acari: Raphignathidae) از غرب ایران

محمدم باقری، شهریار جعفری و سعید باکیمیت سنج

چکیده

Raphignathus Dugès (Acari: Raphignathidae) به نام R. khorramabadensis Bagheri sp. nov. گونه جدیدی از جنس Raphignathus Dugès (Acari: Raphignathidae) به نام R. khorramabadensis Bagheri sp. nov. است که از خاک منطقه بیشه از حومه شهرستان خرمآباد واقع در استان لرستان در غرب ایران جمع‌آوری شده بود، توصیف و ترسیم شده است.

واژگان کلیدی: Raphignathina، Trombidiformes

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