Two new mite species of the genus Raphignathus Dugès (Acari: Raphignathidae) from Turkey

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Abstract: Two new Raphignathus species from Turkey, R. quadrigeminus sp. nov. and R. koseiensis sp. nov., are described and illustrated.

Key words: Acari, Raphignathidae, Raphignathus, new species, Turkey

1. Introduction
Raphignathid mites can be found underneath tree bark and in litter, moss, lichens, soil, stored products, house dust, and birds’ nests (Doğan, 2003; Dönel and Doğan, 2011). They are recognized by cheliceral bases forming a stylophore with cervical peritremes running laterally from its bases and confluent coxae (Dönel and Doğan, 2011).

This family contains 2 valid genera: Raphignathus Dugès and Neoraphignathus Smiley and Moser. Raphignathus has a worldwide distribution, represented by more than 60 species (Dönel and Doğan, 2011; Zhang et al., 2011; Bagheri et al., 2012). Twenty species are known from Turkey (Doğan, 2007; Erman et al., 2007; Dönel and Doğan, 2011). In this paper 2 new species from Turkey, Raphignathus quadrigeminus sp. nov. and R. koseiensis sp. nov., are described. In addition, a key to Raphignathus species having 4 pairs of genital setae is given.

2. Materials and methods
Methods used for the collection, extraction, preparation, and drawing of the specimens were as discussed by Doğan and Ayyıldız (2003) and Doğan (2006). The setal notations used in the description of the species follow those of Kethley (1990) and Grandjean (1944). Chaetotaxy of all leg segments is given with solenidia in parenthesis. All measurements are given in micrometers and refer to length of the structure unless otherwise stated. The type materials are deposited in the Acarology Laboratory of Erzincan University, Erzincan, Turkey.

3. Results and discussion

3.1. Raphignathus quadrigeminus sp. nov.
Holotype. Female (Figure 1).
Length of body 350, width 190.
Dorsum. Prodorsum with 1 median and 2 lateral shields separated by striae, without small shields posterior to median prodorsal shield. Median shield bearing 3 pairs of setae (vi, sci, c1). Lateral shields bearing 3 pairs of setae (ve, sce, c2), 1 pair of eyes, and 1 pair of cupules (ia). Opisthosomal shield with 3 pairs of setae and 2 pairs of cupules (ip and ih). Setae h1 and 1 pair of cupules (ih) situated on ventral extension of opisthosomal shield; setae d1, e1, f1, and 1 pair of cupules (im) located on the interscutal membrane. All dorsal shields punctuated. Body surface striated between propodosomal and opisthosomal shields. Dorsal setae setiform.

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Dimensions of setae as follows: vi: 27; ve: 30; sci: 20; sce: 20; c₁: 20; c₂: 23; d₁: 15; e₁: 23; f₁: 25; h₁: 20; h₂: 20; h₃: 15; vi–vi: 20; ve–c₁: 55; vi–sci: 35; sci–sci: 40; ve–sce: 30; c₂–sce: 40; c₁–c₁: 13; d₁–d₁: 55; d₁–e₁: 30; e₁–e₁: 65; f₁–f₁: 55; f₁–h₁: 30; h₁–h₁: 27; h₂–h₂: 35; h₂–h₂: 30.

Venter. With 2 pairs of coxisternal shields, 1 pair between coxae I and II, 1 pair between coxae III and IV. Anogenital area with 2 pairs of aggenital setae (ag₁,₂) and 4 pairs of genital setae (g₁,₂,₃,₄). Anal shield with 3 pairs of anal setae (ps₁,₂,₃). All ventral shields punctuated.
Legs. Leg I: 240; leg II: 195; leg III: 200; leg IV: 240. Setae and solenidia (in parentheses) on leg segments as follows: coxae 2–2–2–1; trochanters 1–1–2–1; femora 6–5–3–3; genua 6(κ)–6(κ)–4–4; tibiae 6(ϕρ)–6(ϕρ)–6(ϕρ)–5(ϕρ); tarsi 21(ϕρ,ω)–16(ω)–14(ω)–13.

Gnathosoma. Palp 100 long; 5-segmented; setal formula (from trochanters to tarsi) 0–2–2–3 + 1 claw–4 + 1ω + 4 eupathidia. Length of gnathosoma 90. Ventral with 2 pairs of adoral setae (ro1ω), 2 pairs of subcapitular setae. Length of subcapitular setae as follows: m–m: 23; n–n: 15.

Adult male and other immature stages. Unknown.

Type material. Holotype female from decayed bark of Quercus sp., 40°34′2″N, 735 m, Niksar, Tokat, Turkey, 30 September 2008.

Etymology. The name of this species is the Latin compound word “quadrigeminus”, meaning 4 pairs, because of the 4 pairs of genital setae.

Remarks. The new species is similar to Raphignathus karabagiensis Ak yol and Koç, R. saboorii Ghorbani and Bagheri, and R. sceptrum Chaudhri, Akbar, and Rasool in having 4 pairs of genital setae and 2 setae on the palp. Ventral with 2 pairs of subcapitular setae (ro1ω), 2 pairs of adoral setae (ro1ω). All setae situated on ventral side of palp. Length of subcapitular setae as follows: m–m: 23; n–n: 15.

Table. Comparison of some features of the Raphignathus species having 4 pairs of genital setae.

<table>
<thead>
<tr>
<th>Characters / Species</th>
<th>R. quadrigeminus sp. nov.</th>
<th>R. koseiensis sp. nov.</th>
<th>R. sceptrum</th>
<th>R. saboorii</th>
<th>R. karabagiensis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tibiae</td>
<td>6(ϕρ)–6(ϕρ)–6(ϕρ)–5(ϕρ)</td>
<td>7(ϕ,ϕρ)–6(ϕρ)–6(ϕρ)–5(ϕρ)</td>
<td>6(ϕρ)–6(ϕρ)–6(ϕρ)–5(ϕρ)</td>
<td>6(ϕρ)–6(ϕρ)–6(ϕρ)–5(ϕρ)</td>
<td>6(ϕρ)–6(ϕρ)–6(ϕρ)–4(ϕρ)</td>
</tr>
<tr>
<td>Interscutal setae</td>
<td>3 pairs</td>
<td>1 pair</td>
<td>3 pairs</td>
<td>2 pairs</td>
<td>2 pairs</td>
</tr>
<tr>
<td>Palp femoral setae</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>Present</td>
</tr>
<tr>
<td>Dorsal small shields</td>
<td>Absent</td>
<td>Absent</td>
<td>Present</td>
<td>Absent</td>
<td>Present</td>
</tr>
<tr>
<td>Coxisternal shields</td>
<td>Present</td>
<td>Present</td>
<td>Absent</td>
<td>Absent</td>
<td>Present</td>
</tr>
</tbody>
</table>
by having 4 pairs of genital setae (Chaudhri et al., 1979; Akyol and Koç, 2006; Ghorbani et al., 2011). It can be distinguished from them by 1 pair of setae on the interscutal membrane and 3 pairs of setae on the palp femur. The comparison of the new and related species has been given in the Table.

Figure 2. *Raphignathus koseiensis* sp. nov. female: A) dorsal view; B) palp; C) ventral view; D) leg I; E) leg II; F) leg III; G) leg IV.
Key to the *Raphignathus* species having 4 pairs of genital setae

1. Palp femur with 3 setae; interscutal membrane with 1 pair of setae .......................................................... *R. koseiensis* sp. nov.

2. Palp femur with 2 setae; interscutal membrane with more than 1 pair of setae .......................................................... 2

3. Interscutal membrane with 2 pairs of setae ................................................................................................................. 3

4. Interscutal membrane with 3 pairs of setae .................................................................................................................... 4

3. Dorsal small shields absent ........................................................................................................................................... *R. saboorii* Ghorbani and Bagheri

4. Dorsal small shields present ........................................................................................................................................ *R. karabagiensis* Akyol and Koç

4. Dorsal small shields absent ............................................................................................................................................... *Raphignathus quadrigeminus* sp. nov.

4. Dorsal small shields present ............................................................................................................................................. *R. sceptrum* Chaudhri, Akbar, and Rasool

References


