Raphignathus mites from Turkey (Acari: Raphignathidae)

MUSTAFA AKYOL & KAMİL KOÇ

Department of Biology, Faculty of Arts and Sciences, Celal Bayar University, Manisa, Turkey

(Accepted 13 June 2006)

Abstract
Three new species of the genus Raphignathus from Turkey, R. emirdagiensis, R. karabagiensis, and R. afyonensis, are described and illustrated. Two species Raphignathus zhaoi Fan and Yin, 2000 and Raphignathus ensipilosus Meyer and Ueckermann, 1989 are new records for the Turkish fauna. A key to all the species of this genus is given.

Keywords: Acari, new record, new species, Raphignathidae, Raphignathus, Turkey

Introduction
Members of the family Raphignathidae are predacious (Zaher and Gomaa 1979). They are found on tree bark, in litter, moss, lichens, soil, in stored products, house dust, birds nests, and have been recorded from the intestine of a Weddell seal and the urine of a human (Atyeo et al. 1961; Atyeo 1963; Meyer and Ueckermann 1989; Fan and Yin 2000; Doğan 2003; Khanjani and Ueckermann 2003). This genus in Turkey is represented by 10 species (Koç and Ayyıldız 1996; Doğan 2003; Doğan and Ayyıldız 2003; Koç and Akyol 2004; Koç and Kara 2005).

This study deals with the description of three new species and of two new records for the Turkish fauna. In addition, a key to all the species of this genus is given.

Material and methods
Litter and soil samples taken from under Astragalus sp., Euphorbia sp., Verbascum sp., Populus sp., Juniperus oxicedrus, Quercus sp., Prunus sp., Triticum sp., Phragmites australis, and soil in a mole’s nest, in Afyonkarahisar province were brought to the laboratory in nylon bags. Mites were extracted in Berlese funnels for 7 days and preserved in 75% ethanol. The mites were picked from the samples under a stereomicroscope and mounted on slides in Hoyer’s medium.

Dorsal and leg setal designations follow Kethley (1990) and Grandjean (1944), respectively. All measurements are given in micrometres (μm). Type material and...
specimens examined are deposited in the Zoological Museum of Celal Bayar University, Manisa, Turkey.

**Systematics**

*Raphignathus* Dugés, 1884

Type species: *Raphignathus ruberrimus* Dugés, 1884.

Cheliceral bases fused to form a conical stylophore; peritremes arising from mid-basal part of stylophore, projecting to anterior margin of idisoma; palptibial claw small; subcapitulum with two pairs of supcapitular setae and two pairs of adoral setae; podosoma with three shields, opisthosoma with a large shield; dorsum with 11–12 pairs of setae; one pair of eyes on lateral podosomal shields; two pairs of aggenital setae, genital and anal covers each with three pairs of setae.

Key to the all species of *Raphignathus* Dugés (modified from Khanjani and Ueckermann 2003)

Females

1. Median podosomal shield with notch in posterior margin, dorsal setae very long and sickle-shaped ................................................... *R. ueckermanni* Koç and Kara
   - Median podosomal shield without notch in posterior margin, dorsal setae simple or long ................................................... 2
2. Dorsal setae simple, setose or forked distally ................................................................. 3
   - Dorsal body setae long, clavate and serrate ................................................................. *R. lanuginosus* Atyeo
3. Interscutal membrane dorsomedially with two to five pairs of setae ................................ 4
   - Interscutal membrane dorsomedially with zero or one pair of setae .......................... 30
4. Femur IV with two setae ........................................................................................................ 5
   - Femur IV with three setae .................................................................................................. 14
5. Median podosomal shield with two pairs of setae ............................................................. *R. evansi* Zaher and Gomaa
   - Median podosomal shield with three pairs of setae ...................................................... 6
6. Lateral podosomal shields reduced and opisthosomal shield small, interscutal membrane with four pairs of setae, setae $c_2$ on small platelets ..................................................... *R. hsiufui* Fan and Yin
   - Lateral podosomal shields not reduced, opisthosomal shield larger .............................. 7
7. Dorsal setae $f_1$ on interscutal membrane or on anterior margin of opisthosomal shield; genital setae finely furcated distally ................................................................. *R. karrooi* Meyer and Ueckermann
   - Dorsal setae $f_1$ located caudal of anterior margin of opisthosomal shield; genital setae simple ................................................................. 8
8. Coxae II of female with one seta; tibial claw of palp slender and spine-like ................................................................. *R. atyeoi* Meyer and Ueckermann
   - Coxae II of female with two setae; tibial claw more robust and uncinate ................................................................. 9
9. Dorsum with a pair of oval platelets posterolaterad to median podosomal shield ................................................................. *R. africanus* Meyer and Ueckermann
   - Small platelets absent ............................................................................................................... 10
10. Coxae II with two setae ................. 11
   – Coxae II with one seta ................. R. rarus Kuznetzov
11. Palp femur with three setae ............. 12
   – Palp femur with two setae ............. R. erzincanica Doğan
12. Tibiae 6-6-6-5 (including solenidia) ............. 13
   – Tibiae 6-5-5-4 ...................... R. scutatus Kuznetzov
13. Femora 6-5-3-2 ................. R. tumidus Kuznetzov
   – Femora 6-4-3-2 ...................... R. kamiensis Meyer and Ueckermann
   – Femora 5-4-3-2 ...................... R. hexeris Chaudhri, Akbar and Rasool
14. Median podosomal shield with three pairs of setae ........ 15
   – Median podosomal shield with two pairs of setae .... R. ehari Zaher and Gomaa
15. Small shields present posterolateral to median podosomal shield ............. 16
   – Small shields absent .................. 19
16. Genital covers with four pairs of setae ........ R. karabagiensis sp. n.
   – Genital covers with three pairs of setae ............. 17
17. Opisthosomal shield with setae $f_1$ close to anterior margin; coxisternal shield present ............. 18
   – Opisthosomal shield with setae $f_1$ well behind anterior margin of shield; coxisternal shield absent ............. R. aciculatus Fan and Yin
18. Seta $f_2$ seemingly on large platelets not separated from opisthosomal shield; legs also longer especially leg IV (270–344) ............. 19
   – Seta $f_2$ located off, opisthosomal shield on striated integument; legs short especially leg IV (180) ............. R. summersi Robaux
19. Palp femur with two or three setae ............. 20
   – Palp femur with one seta ............. R. membranus Fan and Yin
20. Palp femur with three setae ............. 21
   – Palp femur with two setae ............. 24
21. Coxa I without coxisternal shields ............. R. giresuniensis Doğan
   – Coxa I with coxisternal shields ............. 22
22. Integument between podosomal and opisthosomal shields with two pairs of setae ............. 23
   – Integument with three pairs of setae ............. R. aethiopicus (Meyer and Ryke)
23. Dorsal shields somewhat reduced, seta $f_1$ close to anterior margin of opisthosomal shield ............. R. orientalis Fan and Li
   – Dorsal shields larger, seta $f_1$ well behind anterior margin of opisthosomal shield ............. R. neogracilis Robaux
24. Interscutal membrane dorsomedially with two pairs of setae ............. 26
   – Interscutal membrane dorsomedially with three or five pairs of setae ............. 25
25. Dorsal shields not reduced, interscutal membrane with three pairs of setae ............. R. emirdagiensis sp. n.
26. Genital covers with three pairs of setae ........................................ 27
   – Genital covers with four pairs of setae ............................. R. sceptrum Chaudhri, Akbar and Rasool

27. Dorsal setae slightly serrated or smooth .................................. 28
   – Dorsal setae distally serrated, forming forked tips ...................... R. fuscisetus Meyer and Ueckermann

28. Dorsal setae relatively short (23–34), setae vi and ve on anterior fifth of median podosomal shield, setae f1 usually just behind anterior margin of opisthosomal shield ........................................ 29
   – Dorsal setae relatively long (34–46), setae vi and ve on anterior three-fifths of median podosomal shield, setae f1 usually on anterior margin of opisthosomal shield, setae e1 usually just behind anterior margin of opisthosomal shield, d1−d2<e1−e1 ................ R. gracilis (Rack)
   – Setae e1 not reaching to opisthosomal shield, the distance between d1−d2 and e1−e1 subequal ...................... R. vahiti Doğan

29. Dorsal shields somewhat reduced, opisthosomal shield rectangular lateral margin slightly concave. ................................. R. giselae Meyer and Ueckermann
   – Dorsal shields larger, opisthosomal shield with lateral margin not concave but bend ventrally ...................... R. bakeri Zaher and Gomaa

30. Dorsal interscutal integument without setae .................................. 31
   – Dorsal interscutal integument with one pair of setae ...................... 34

31. Tibia I with one solenidion .......................................................... 32
   – Tibia I with two solenidion .................................................... R. cardinalis (Ewing)

32. Genu IV with four setae ............................................................. 33
   – Genu IV with three setae ........................................................ R. hirtellus Athias-Henriot

33. Members of setae d far apart almost in line with c2, seta f1 further apart than members of h1, setae f1 and f2 equal in length ..................... R. conspicus (Berlese)
   – Members of setae d closer together, distance between these setae twice the distance between members of c1, seta e1 and f1 longitudinally in line, setae f2 much shorter than f1 ...................... R. neocardinalis Atyeo

34. Femur IV with three or four setae ................................................. 37
   – Femur IV with two pairs setae ................................................ 35

35. Genu II with six setae .............................................................. 36
   – Genu II with five setae ......................................................... R. costatus Chaudhri, Akbar and Rasool

36. Dorsal body setae with spinules along the entire length ........ R. zhaoi Fan and Yin
   – Dorsal body setae with bilaterally spinulated only along the distal half .............................. R. kuznetzovi Doğan and Ayyıldız

37. Femur IV with three setae .......................................................... 38
   – Femur IV with four setae ........................................................ 39

38. Members of setae d close together, almost longitudinally in line with setae e1 ................................. R. cometes Atyeo
Members of setae \( d \) almost longitudinally in line with setae \( c_2 \)  

39. Most dorsal setae much shorter than the distances between their bases and those of consecutive setae  
40. Dorsal setae much longer, almost as long as distances between their bases and those of consecutive setae.  

40. Trochanters III with three setae, tibia I and II with seven setae.  

41. Small shields present posterolateral to median podosomal shield  
42. Small shields absent posterolateral to median podosomal shield  

42. Setae \( e_1 \) close to anterior margin of opisthosomal shield, cupule \( im \) on integument  
43. Setae \( e_1 \) well behind anterior margin on opisthosomal shield, cupule \( im \) on shield; two shields on interscutal integument much larger  

\[ \text{Raphignathus emirdagiensis} \text{ sp. n.} \]  
(Figure 1)  

\textbf{Type material}  
Holotype female and two paratype females from litter under \textit{Astragalus} sp., Emirdağları, Çukurburun place, B. Karabağ, Bolvadin district, 1300 m, 24 July 2005; one paratype female from litter under reeds, \textit{Phragmites australis}, swamp of the Acıgöl, Sarkavak village, Dazkırı district, Afyonkarahisar, Turkey, 22 August 2005, leg. M. Akyol.  

\textbf{Female}  
Dimensions of holotype (measurements in parentheses are variation in paratypes): length of body (including gnathosoma) 309 (309–320); length of body excluding gnathosoma 261 (261–272); width 170 (165–181).  

\textit{Gnathosoma.} Length of gnathosoma 48. Subcapitulum with two pairs of long setae \((n=30, m=27)\) and one pair of pilose adoral setae \((or_{1,2})\). Dorsal stylophore with striae. Palp tibial claw about third as long as palptarsus. Setae formula (from femur to tarsus): \(2–2–3+1\) claw, \(4+1or_{1}+4\) eupathidia.  

\textit{Dorsum.} With one median and two lateral shields, without small shields behind median podosomal shield. Opisthosaoma with one opisthosomal shield. Median shield with three pairs of setae. Each lateral shield with one pair of eyes, three pairs of setae and one pair of lyrifissures \((ia)\). Three pairs of setae \((d_1, e_1, \text{and } f_1)\) and one pair of lyrifissures \((im)\), located on interscutal membrane. Opisthosomal shield with three pairs of setae and one pair of lyrifissures \((ip)\). All dorsal shields punctuated. Body surface striated between podosomal and opisthosomal shields. Dorsal setae simple. Dimensions of dorsal setae as follows
Figure 1. *Raphignathus emirdagiensis* sp. n. (female). (A) Dorsal view; (B) ventral view; (C) palpus; (D) leg I; (E) seta $d_1$. 

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Venter. With two pairs of coxisternal shields, one pair between coxae I and II, one pair between coxae III and IV. Anogenital area with one pair of aggenital setae, \( \text{ag} = 19 \), and three pairs of genital setae, \( \text{g} = 19 \). Genital and coxisternal shield punctuated. Venter striated. A pair of lyrifissures (\( \text{ih} \)) located laterally to genital shield. Anal shield with three pairs of setae, \( \text{ps} = 16 \).

Legs. Lengths of legs I–IV (from base of femur to tip of tarsal claw) (measurements in parentheses are variations in paratypes): 234 (234)–181 (181–186)–207 (207–213)–245 (245–250). Setal formulae of legs I–IV: coxae \( 1a+2+2+2+3 \), trochanters \( 1+1+2+1 \), femora \( 6+5+3+3 \), genua \( 6(k)+5(k)+4-4 \), tibiae \( 6+6+6+5 \), tarsi \( 21 + 216 + 14 + 13 \).

Male
Unknown.

Etymology
The species is named after the type locality, Emirdağ mountains, Afyonkarahisar, Turkey.

Remarks
This species is close to \( R. \text{evidus} \) Fan and Yin, 2000 in having more than two pairs of setae on interscutal membrane, the same setation on leg femur IV and on palp femur, but it can be recognized by following features: (1) dorsal shields not reduced, interscutal membrane with three pairs of setae \( (d_1, e_1, \text{and } f_1) \); (2) genu II with five setae; (3) opisthosomal shield with three pairs of setae; (4) setae \( h_1 \) well behind anterior margin on opisthosomal shield; (5) interscutal membrane with one pair of lyrifissures (\( \text{im} \)).

\textit{Raphignathus karabagiensis} sp. n.
(Figure 2)

Type material
Holotype female and one paratype female from litter under \( Euphorbia \) sp., Çayderesi place, 1200 m, B. Karabağ, Bolvadin district, Afyonkarahisar, Turkey, 26 July 2005, leg. M. Akyol.

Female
Dimensions of holotype (measurements in parentheses are those of paratype): length of body (including gnathosoma) 346 (346); length of body excluding gnathosoma 282 (282); width 197 (186–197).
Figure 2. *Raphignathus karabagiensis* sp. n. (female). (A) Dorsal view; (B) ventral view; (C) palpus; (D) leg I; (E) seta c₁.

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Gnathosoma. Length of gnathosoma 64. Subcapitulum with two pairs of long setae \((n=30, m=30)\) and two pairs of pilose adoral setae \((or_{1-2})\). Dorsal stylophore with striae. Palp tibial claw about one-third as long as palpatarsus. Setae formula (from femur to tarsus): \(2–2–3+1\) claw, \(4+1\omega+4\) eupathidia.

Dorsum. Median podosomal shield spherical anteriorly and tapered posteriorly, bearing three pairs of setae and suture remnants \(ds_j\), which also occur on the two small shields on interscutal membrane. Each lateral shield with one pair of eyes, three pairs of setae and one pair of lyrifissures \((ia)\). Interscutal membrane with two pairs of setae \((d_1\) and \(e_1)\) situated on small platelets and one pair of lyrifissures \((im)\). Opisthosomal shield with four pairs of setae and one pair of lyrifissures \((ip)\). All dorsal shields punctuated. Body surface striated between podosomal and opisthosomal shields. Dorsal setae simple. Dimensions of dorsal setae as follows (measurements in parentheses are variations in paratypes): \(vi=30\ (30), \(sci=32\ (32), \(ve=30\ (30–32), \(sce=30\ (30–32), \(c_1=24\ (24), \(c_2=30\ (30), \(d_1=24\ (24), \(e_1=27\ (27), \(f_1=24\ (24), \(h_1=24\ (24), \(h_2=22\ (22), \(h_3=22\ (22–24); \) distances between setae: \(vi–vi=27\ (24–27), \(vi–ve=54\ (54–57), \(vi–sci=38\ (38–43), \(ve–ve=92\ (92–95), \(ve–sci=24\ (24), \(sci–sci=41\ (41–43), \(ve–sce=27\ (27), \(sce–sce=138\ (138–144), \(sce–c_1=87\ (81–87), \(c_1–c_1=16\ (16), \(c_1–c_2=49\ (49), \(c_2–c_2=114\ (111–114), \(c_2–d_1=49\ (49), \(d_1–d_1=54\ (54–60), \(d_1–e_1=27\ (27–30), \(e_1–e_1=68\ (68–73), \(e_1–f_1=27\ (27), \(f_1–f_1=49\ (49–54), \(f_1–h_1=32\ (32), \(h_1–h_1=24\ (22–24), \(h_1–h_2=27\ (27), \(h_2–h_2=38\ (38), \(h_2–h_3=16\ (13–16), \(h_3–h_3=68\ (63–68).

Venter. With two pairs of coxisternal shields, one pair between coxae I and II, one pair between coxae III and IV. Anogenital area with one pair of aggenital setae, \(ag=16\), and four pairs of genital setae, \(g_1=g_2=g_3=g_4=16\). Genital and coxisternal shields punctuated. Venter striated. A pair of lyrifissures \((ih)\) located laterally to genital shield. Anal shield with three pairs of setae, \(ps_1=16, ps_2=13, ps_3=16\).

Legs. Lengths of legs I–IV (from base of femur to tip of tarsal claw) (measurements in parentheses are variations in paratypes): \(250\ (250–213\ (197–213)–229\ (224–229)–277\ (271–277). Setal formulae of legs I–IV: coxae \(1a+2–2–3a+2–1\), trochanters \(1–1–2–1\), femora \(6–5–3–3\), genua \(6(k)–6(k)–4–4\), tibiae \(6(\omega)–6(\omega)–6(\omega)–4\), tarsi \(21(\phi,\rho,\omega)–16(\omega)–14(\omega)–13\).

Male

Unknown.

Etymology

The species is named after the type locality, B. Karabağ, Afyonkarahisar, Turkey.

Remarks

This species is related to \(R. hecmatanaensis\) Khanjani and Ueckermann, differing from the latter in: (1) genital covers with four pairs of setae (genital covers with three pairs of setae in \(R. hecmatanaensis\)); (2) setae \(f_2\) not located on large platelets on opisthosoma (setae \(f_2\) located on large platelets on opisthosoma in \(R. hecmatanaensis\)).
Raphignathus afyonensis sp. n.
(Figure 3)

Type material
Holotype female, one paratype female and one abnormal female from litter under Verbascum sp., Kayadanağıl place, 1300 m, B. Karabağ, Bolvadin district, Afyonkarahisar, Turkey, 17 December 2004, leg. M. Akyol.

Female
Dimensions of holotype (measurements in parentheses are variation in paratypes): length of body (including gnathosoma) 501 (480–501); length of body excluding gnathosoma 389 (389–421); width 240 (229–240).

Gnathosoma. Length of gnathosoma 112. Subcapitulum with two pairs of long setae (n=32, m=38) and two pairs of pilose adoral setae (or1–r2). Dorsal stylophore with striae. Palp setal formula (from femur to tarsus): 3–2–3+1 claw, 4+1ω+4 eupathidia.

Dorsum. Body broadly oval; podosoma with one median and two lateral shields separated by striae; podosoma also with one pair of small shields behind median podosomal shield; opisthosoma with a large opisthosomal shield; dorsal setae simple; median shield bearing three pairs of setae; each lateral shield oval with three pairs of setae, one pair of eyes, and one pair of lyrifissures (ia); five pairs of setae and two pairs of lyrifissures on opisthosomal shield (im and ip); setae e well behind anterior margins of opisthosomal shield; setae h3 situated on ventral extension of opisthosomal shield; members of lyrifissures (im) almost longitudinally in line with lyrifissures (ia) and situated on or near anterolateral margin; members of lyrifissures (ip) lateral or in front of f1 and anterior margin of opisthosomal shield; d1 only setae located on small plates on the interscutal membrane; all dorsal shields punctuated but not striated; body surface striated between podosomal and opisthosomal shields. Dimensions of dorsal setae as follows (measurements in parentheses are variations in paratype):

Venter. With two pairs of coxisternal shields, one pair between coxae I and II, one pair between coxae III and IV; coxisternal shields between coxae III and IV with much larger; venter striated, with three pairs of setae, ag=22; three pairs of genital setae, g1=g2=g3=16; genital and coxisternal shields punctuated; one pair of lyrifissures (ih) located laterally to genital shield; anal shield with three pairs of setae, ps1=ps2=ps3=19.

Legs. Lengths of legs I–IV (from base of femur to tip of tarsal claw) (measurements in parentheses are variations in paratypes): 293 (288–293)–240 (213–245)–245 (234–250)–
Figure 3. *Raphignathus afyonensis* sp. n. (female). (A) Dorsal view; (B) ventral view; (C) leg I; (D) palpus; (E) dorsum of coxae I; (F) ventral of coxae I.
309 (298–320); setal formulae of legs I–IV: coxae 1\(a+2−2−3a+2−1\), trochanters 1−1−3−1, femora 6−6−4−4, genua 6\((k)−6(k)−4−4\), tibiae 7\(\phi\rhoω−7(ω)−6(ω)−5(ω)\), tarsi 21\(\phi\rhoω−16(ω)−14(ω)−13\). Dorsum of coxae I with a minute solenidion (Figure 3E) and on venter of coxae I are two pairs of thumb-like structures (Figure 3F).

**Male**

Unknown.

**Etymology**

The species is named after the type locality, Afyonkarahisar, Turkey.

**Remarks**

This new species is related to *R. protaspus* Khanjani and Ueckermann, differing from the latter in: (1) trochanters III with three setae (trochanters III with two setae in *R. protaspus*); (2) tibia I and tibia II with seven setae (tibia I and tibia II with six setae in *R. protaspus*); (3) lyrifissure \((im)\) almost longitudinally in line with lyrifissure \((ia)\) (lyrifissure \((im)\) not longitudinally in line with lyrifissure \((ia)\) as in *R. protaspus*); (4) lyrifissure \((ip)\) lateral of \(f_1\) setae (lyrifissure \((ip)\) behind lateral of \(f_1\) in *R. protaspus*).

*Raphignathus zhaoi* Fan and Yin, 2000

(Figure 4)

**Material examined**

One female from litter under *Populus* sp., Yakasenek, 1050 m, Sultandağı district, 21 July 2004; one female from litter under *Juniperus oxicedrus*, Emirdağları, Karapınar place, 1560 m, B. Karabağ, Bolvadin district, 16 October 2004; two females from litter under *Populus* sp., Taşköprü place, 950 m, Sultandağı district, 18 December 2004; one female from litter under *Quercus* sp., Akdağ, 900 m, Dinar district, 19 May 2005; one female from litter under wild plum, *Prunus* sp. and two females from litter under *Juniperus oxicedrus*, Emirdağları, Kocatash place, 1550 m, B. Karabağ, Bolvadin district, 20 May 2005; one female from litter under *Quercus* sp., Özdilek, Zafer memorial, 1040 m, Afyonkarahisar, 22 May 2005; one female from litter under wheat, *Triticum* sp., field, Gökkoyak place, 1300 m, B. Karabağ, Bolvadin district, 21 July 2005; eight females from litter under *Quercus* sp., Kestanelik place, 1100 m, Çakırköy, 18 August 2005, Afyonkarahisar, Turkey, leg. M. Akyol.

**Female**

Length of body (including gnathosoma) 405 (405–410); length of body excluding gnathosoma 341 (336–346); width 171 (171–207).

**Gnathosoma.** Length of gnathosoma 64. Subcapitulum with two pairs of long setae \((n=41,\ m=43)\) and two pairs of pilose adoral setae \((or_{1−2})\). Dorsal stylophore with striae. Palp setal formula (from femur to tarsus): 3−2−3+1 claw, 4+1\(ω\)+4 eupathidia.
Figure 4. *Raphignathus zhaoi* Fan and Yin (female). (A) Dorsal view; (B) ventral view; (C) leg I; (D) palpus; (E) setae $h_1$; (F) setae $ve$. 

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Dorsum. Podosoma with one median and two lateral shields separated by striae; podosoma with one pair of small shields behind median podosomal shield; opisthosoma with a large opisthosomal shield; dorsal setae simple; median shield bearing three pairs of setae; lateral shields bearing three pairs of setae, one pair of eyes, and one pair of lyrifissures (ia); five pairs of setae and two pairs of lyrifissures on opisthosomal shield (im and ip); im situated on or near anterolateral margin; d1 only setae located on small plates on the interscutal membrane; all dorsal shields punctuated; body surface striated between podosomal and opisthosomal shields. Dimensions of dorsal setae as follows (measurements in parentheses are variations): vi=32 (32–35), sci=43 (43–49), ve=41 (41–46), sce=41 (41–43), c1=41 (41–49), c2=41 (41–46), d1=38 (38–46), e1=41 (41–54), f1=49 (46–49), h1=43 (43–54), h2=38 (38–49), h3=30 (30–38); distances between setae: vi–vi=30 (27–30), vi–ve=68 (62–68), vi–sci=35 (32–35), ve–ve=116 (116–122), ve–sci=54 (43–54), ve–sce=24 (24–27), sce–sce=157 (157–179), sce–c1=100 (100–116), c1–c1=16 (16–19), c1–c2=62 (62–65), c2–c2=135 (133–135), c1–d1=60 (54–60), d1–d1=114 (108–114), d1–e1=43 (43–46), e1–e1=81 (81–89), e1–f1=35 (32–35), f1–f1=122 (116–136), f1–h1=54 (54–57), h1–h1=32 (32–35), h1–h2=32 (32–38), h2–h2=54 (54–60), h2–h3=11 (11–27), h3–h3=103 (81–103).

Venter. With two pairs of coxisternal shields, one pair between coxae I and II, one pair between coxae III and IV; venter striated and three pairs of setae, ag=16; three pairs of genital setae, g1=g2=g3=13; genital and coxisternal shield punctuated; one pair of lyrifissures (ih) located laterally to genital shield; anal shield with three pairs of setae, ps1=16, ps2=16, ps3=13.

Legs. Lengths of legs (from base of femur to tip of tarsal claw): leg I 192 (192–207), leg II 186 (186–202), leg III 213 (213–224), leg IV 266 (266–277); setal formulae of legs I–IV: coxae 1a+2–2–3a+2–1, trochanters 1–1–2–1, femora 6–5–3–2, genua 6(k)–6(k)–4–4, tibiae 6(ω)–6(ω)–6(ω)–5(ω), tarsi 21(ϕρ,ω)–16(ω)–14(ω)–14(ω).

**Raphignathus ensipilosus** Meyer and Ueckermann
(Figure 5)

**Material examined**

One female from litter under *Verbascum* sp., Kayadanağılı place, 1100 m, B. Karabağ, Bolvadin district, 21 May 2005; 15 females from litter under *Astragalus* sp., 1500 m, B. Kalecik, Afyonkarahisar, 16 June 2005; two females from soil in a mole’s nest, Emirdağları, Gökkoyak place, 1350 m, B. Karabağ, Bolvadin district, 21 July 2005, Afyonkarahisar, Turkey, leg. M. Akyol.

**Female**

Length of body (including gnathosoma) 448 (448–469); length of body excluding gnathosoma 373 (373–384); width 240 (240–267).

**Gnathosoma.** Length of gnathosoma 64. Subcapitulum with two pairs of long setae (n=41, m=43) and two pairs of pilose adoral setae (or1–3). Dorsal stylophore with striae. Palp setal formula (femur to tarsus): 3–2–3+1 claw, 4+1ω+4 eupathidia.
Dorsum. Podosoma with one median and two lateral shields separated by striae; podosoma with one pair of small shields behind median podosomal shield; opisthosoma with a large opisthosomal shield; dorsal body setae smooth and ensiform; median shield bearing three
pairs of setae; lateral shields bearing three pairs of setae, one pair of eyes, and one pair of lyrifissures (ia); five pairs of setae and one pair of lyrifissures (im) on opisthosomal shield; setae h3 situated on ventral extension of opisthosomal shield; im situated on or near anterolateral margin; d1 only setae on small platelets on the interscutal membrane posterior to anterolateral shields; all dorsal shields punctuated; body surface striated between podosomal and opisthosomal shields. Dimensions of dorsal setae as follows (measurements in parentheses are variations): vii = 46 (46–54), sci = 60 (60–62), ve = 51 (51–60), sce = 51 (51), c1 = 57–60, c2 = 21 (21–22), d1 = 57 (54–57), e1 = 68 (68), f1 = (65–68), h1 = 60 (60), h2 = 49 (49–54), h3 = 43 (43); distances between setae: vii–vii = 30 (30), vii–ve = 65 (65–70), vii–sci = 41 (41–43), ve–ve = 127 (127–149), ve–sci = 32 (32–43), sci–sci = 65 (57–60), ve–sce = 30 (30–38), sce–sce = 187 (179–195), sce–c1 = 49 (49–57), c1–c1 = 16 (16–19), c1–c2 = 73 (73–92), c2–c2 = 162 (162–176), c2–d1 = 68 (68–84), d1–d1 = 87 (87–92), d1–e1 = 32 (30–35), e1–e1 = 114 (103–122), e1–f1 = 43 (41–51), f1–f1 = 97 (95–97), f1–h1 = 57 (54–57), h1–h1 = 27 (22–27), h1–h2 = 32 (32–41), h2–h2 = 60 (57–60), h2–h3 = 32 (32–41), h3–h3 = 125 (114–141).

Venter. Coxal groups I–II and III–IV with coxisternal shields; venter striated and three pairs of setae, ag = 16; three pairs of genital setae, g1 = g2 = g3 = 16; genital and coxisternal shield punctuated; one pair of lyrifissures (ih) located laterally to genital shield; anal shield with three pairs of setae, ps1 = ps2 = ps3 = 16.

Legs. Lengths of legs (base of femur to tip of tarsal claw): leg I 267 (267–277), leg II 207 (207–224), leg III 224 (224–240), leg IV 304 (298–309); setal formulae of legs I–IV: coxae 1a+2−2−3a+2−1, trochanters 1−1−2−1, femora 6−5−3−3 genua 6(k)−6(k)−4−4, tibiae 6(ω)−6(ω)−6(ω)−5(ω), tarsi 21(φρ,ω)−16(ω)−14(ω)−13(ω).

Acknowledgements
We thank Professor Dr E. A. Ueckermann, Plant Protection Research Institute, South Africa for a critical review of the manuscript.

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