

FAVOGNATHUS HYRCANENSIS N. SP., A NEW SPECIES OF THE GENUS
FAVOGNATHUS (ACARI: TROMBIDIFORMES: CRYPTOGNATHIDAE)
FROM NORTHERN IRAN

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ABSTRACT — *Favognathus hyrcanensis* n. sp. (Acari: Cryptognathidae) is described and illustrated from adult specimens collected from soil in Golestan county, Iran.

KEYWORDS — Acariformes; Trombidiformes; Cryptognathidae; *Favognathus hyrcanensis*; new species; Iran

INTRODUCTION

The Cryptognathidae was erected by Oudemans (1902) with *Cryptognathus* Kramer, 1879 as type genus. Members of this family are recognized by the presence of a protective hood anterior of the propodosoma and extremely extendable gnathosomal base (Doğan, 2008). Although these small animals had been suggested as predatory mites (Baker and Wharton, 1952; Meyer and Ryke, 1960), their delicate mouth parts and their small size make it difficult to imagine the type of prey with which they might be associated. Their chelicerae are elongate, delicate and edentate, so they may be selective feeders on, say, fungal spores. The needle-like chelicerae may also be adopted to select algal cells or

else, and this seems the best of several alternatives, to pierce plant cells and drain the contents (Luxton, 1973). Cryptognathidae comprises 57 species in three genera: *Favognathus* Luxton (35 species), *Cryptognathus* Kramer (20 species) and *Cryptofavognathus* Doğan and Dönel, 2010 (2 species) (Fan and Zhang, 2005; Khanjani and Ueckermann, 2008; Doğan 2008; Dönel and Doğan, 2011; Uluçay and Koç, 2013). Up to now 6 species of the genus *Favognathus*, namely; *F. mirazii* Khanjani and Ueckermann, 2008 and *F. luxtoni* Koç and Ayyildiz, 1999, *F. pongolensis* Meyer and Ueckermann, 1989, *F. distortus* Kuznetsov, 1974; *F. amygdalus* Doğan and Ayyildiz, 2004 and *F. cordylus* Luxton 1993 (Khanjani and Ueckermann 2008; Gheblealivand *et al.*, 2011; Bagheri *et al.*, 2013a, b and Rahmati *et al.*, 2013) have been reported from

Iran. In this paper a new species, *Favognathus hyrcanensis* n.sp. is described and illustrated.

MATERIALS AND METHODS

Soil and rotten leaves samples were collected and mites were extracted by using a Berlese-Tullgren funnel. Collected specimens were cleared in Nesbitt's fluid and mounted in Hoyer's medium (Krantz and Walter, 2009), thus examined with a phase-contrast microscope and drawn. The length of the idiosoma was measured from the suture between the gnathosoma and idiosoma to the posterior margin of the idiosoma and also from the top of the gnathosoma to the posterior margin of 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. Terminology follows that of Luxton (1973). Dorsal setal and leg setal designation follows Grandjean (1944) and dorsal setal Kethley (1990). All measurements are given in micrometers (μm).

RESULTS

Superfamily Raphignathoidea

Family Cryptognathidae

Genus *Favognathus* Luxton, 1973

Type species: *Cryptognathus cucurbita* Berlese, 1916.

Diagnosis — This genus can be easily distinguished from other genera of the family Cryptognathidae with the prosternal apron wedge-shaped, dimpled; two pairs of genital setae.

Favognathus hyrcanensis n. sp. Shirinbeik Mohajer and Bagheri (Figures 1-3)

Diagnosis — Anterior margin of the hood denticulated; dorsal shield completely ornamented with reticulations; reticular cells with 4 – 10 peripheral pores and short striae, pores distributed evenly in all reticulation cells; dorsoventrally with four slit-like cupules; dorsum with two pairs of clusters; ventral shield with lateral reticulation, fine

striae and pores; intercoxal area striate; femora I-IV: 4-3-2-2; genua I-IV: 5(+ κ)-4(+ κ)-2-3 tarsi I-IV: 15(+ ω 1+ ω 2)-12(+ ω 1+ ω 2)-9(+ ω)-9(+ ω).

Description — Female (n=4)- Color red in life. Length of body (including gnathosoma) (the ranges of measurements are in the parentheses): 300 (313 – 345); Length of body (excluding gnathosoma): 260 (283 – 290); width of body: 195 (190 – 210); leg I: 225 (235 – 250), leg II: 175 (180 – 211), leg III: 188 (183 – 200), leg IV: 220 (208 – 233).

Dorsum (Fig. 1A) — Anterior margin of the hood denticulated; hood with 6-7 dimples in each longitudinal row. Dorsal shield completely ornamented with reticulations except region beside setae *h1*, reticular cells with 4-10 peripheral pores and short striae, pores distributed evenly in all reticulation cells; dorsum with 11 pairs of simple setae, one pair of eyes and one pair of postocular bodies laterally between setae *sci* and *sce*; dorsal body with three pairs of slit-like cupules as follows: *ia* between setae *sce* and *c1*, *im* beside setae *e2* and *ip* beside setae *h2*; clusters of reticulated cells associated with setae *c1* and *d1* present, these rosette patterns consist of 6-8 cells, of which one of them arrange as central cell; anal opening dorsoventrally, with three pairs of setae (*ps1.3*). Length of dorsal setae and their distances: *vi*: 17 (20 – 35); *ve*: 31 (30 – 34); *sci*: 35 (38 – 39); *c1*: 44 (43 – 45); *sce*: 28 (29 – 43); *d1*: 40 (45 – 50); *e1*: 45 (43 – 50); *e2*: 40 (38 – 52); *f1*: 43 (35 – 44); *h1*: 28 (35 – 41); *h2*: 30 (27 – 43); *vi-vi*: 32 (33 – 39); *vi-ve*: 17 (15 – 17); *ve-ve*: 34 (35 – 41); *ve-sci*: 10 (13 – 20); *sci-sci*: 52 (54 – 65); *c1-c1*: 64 (70 – 74); *sce-sce* 101 (102 – 110) *c1-sce*: 18 (18 – 22); *d1-d1*: 108 (120 – 130); *d1-e1*: 42 (50 – 54); *e1-e1*: 75 (80 – 90); *e1-e2*: 21 (20 – 23); *e2-e2*: 95 (95 – 114); *e1-f1*: 53 (50 – 60); *f1-f1*: 35 (35 – 45); *f1-h1*: 28 (34 – 35); *h1-h1*: 16 (15 – 19); *h1-h2*: 29 (21 – 30); *h2-h2*: 72 (70 – 78).

Venter (Fig. 1B) — Prosternal apron wedge-shaped with 13-15 foveolae; venter with 4 pairs of ventral setae (*1a*, *3a*, *4a* and *4c*); genital opening with 2 pairs of genital (*g1.2*) and 2 pairs of aggenital (*ag1-2*) setae; ventral shield with lateral reticulation, fine striae and pores, intercoxal area striate and with a longitudinal row of pores; venter with cupule *ih*. Length of ventral setae: *1a* 26 (24 – 27), *3a* 21 (20 – 23), *4a* 17 (18 – 20), *4c* 17 (13 – 18), *ag1* 15 (13 – 15),

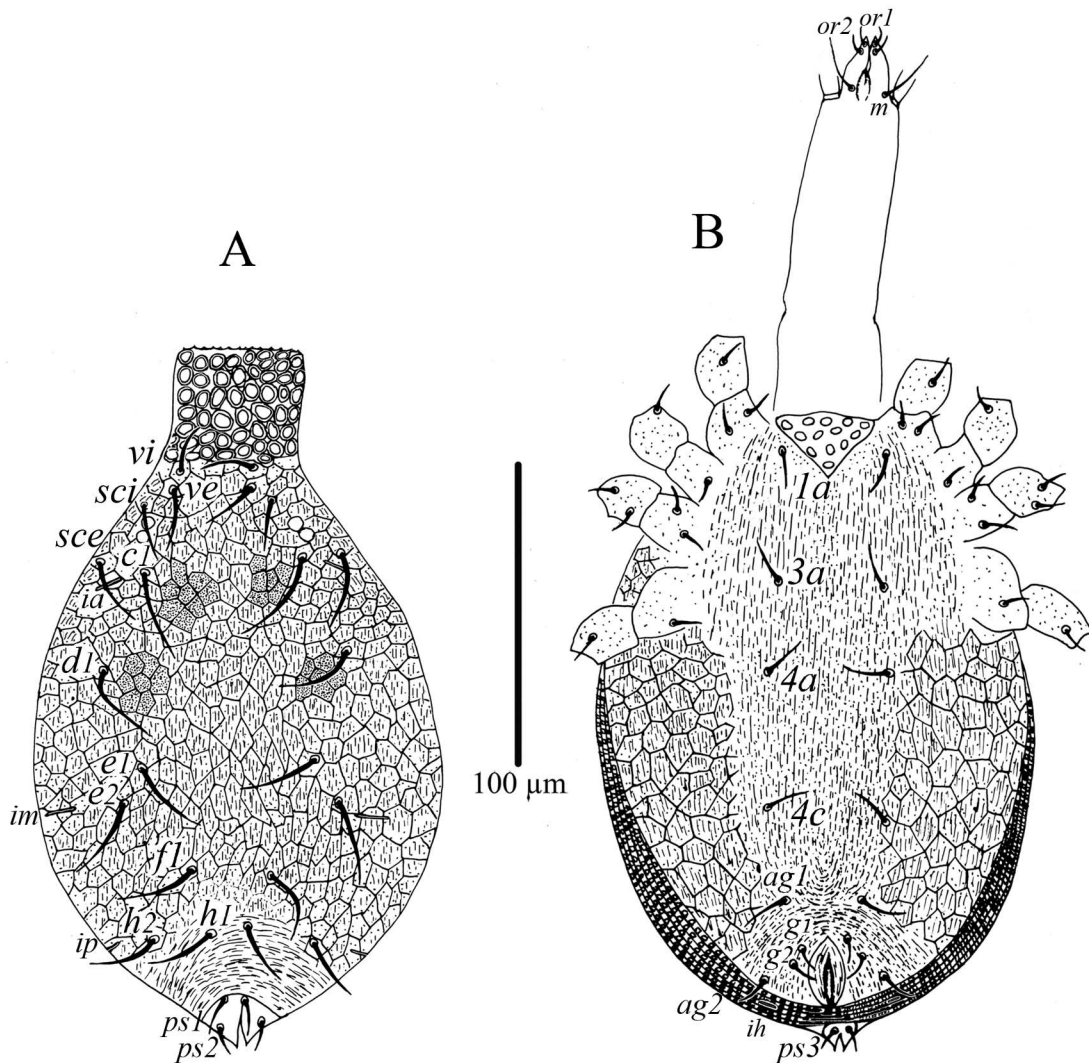


FIGURE 1: *Favognathus hyrcanensis* n. sp. (Female): A – Dorsal view of idiosoma; B – Ventral view of idiosoma.

ag2 14 (13 – 15), *g1* 13 (14 – 16), *g2* 18 (16 – 20); *ps1* 15 (13 – 16), *ps2* 13 (12 – 16), *ps3* 15 (12 – 14).

Gnathosoma (Fig. 1B) — Hypostome narrow (Fig. 1B), with one pair of long setae *m* 28 (30 – 34) and two pairs of adoral setae, *or1* 8 (7 – 10), *or2* 12 (10 – 14) (Fig. 1B); chelicerae: 105 (106 – 113); stylophore: 20 (18 – 30) (Fig. 2A); palp (Fig. 2B) 91 (85 – 98) long, palptarsus with four eupathidia, four simple setae and one solenidion; palptibia with three simple setae; palpgenu with two and palpfemur with three simple setae. Palp trochanter without seta.

Legs (Figures 3A–D) — Setal formulae of leg segments (solenidia in parentheses and not included): coxae 2-1-2-1; trochanters 1-1-2-1; femora 4-3-2-2; genua 5(+ κ)-4(+ κ)-2-3; tibiae 5(+ φ + φp)-5(+ φp)-4(+ φp)-3; tarsi 15(+ ω 1+ ω 2)-12(+ ω 1+ ω 2)-9(+ ω)-9(+ ω).

Male and immature stages — Unknown.

Etymology — This species is named *F. hyrcanensis* n. sp., because Hyrcana is the ancient name of our city, Gorgan, where we found this species.

Type material — Holotype and three paratype of *Favognathus hyrcanensis* n.sp. were collected

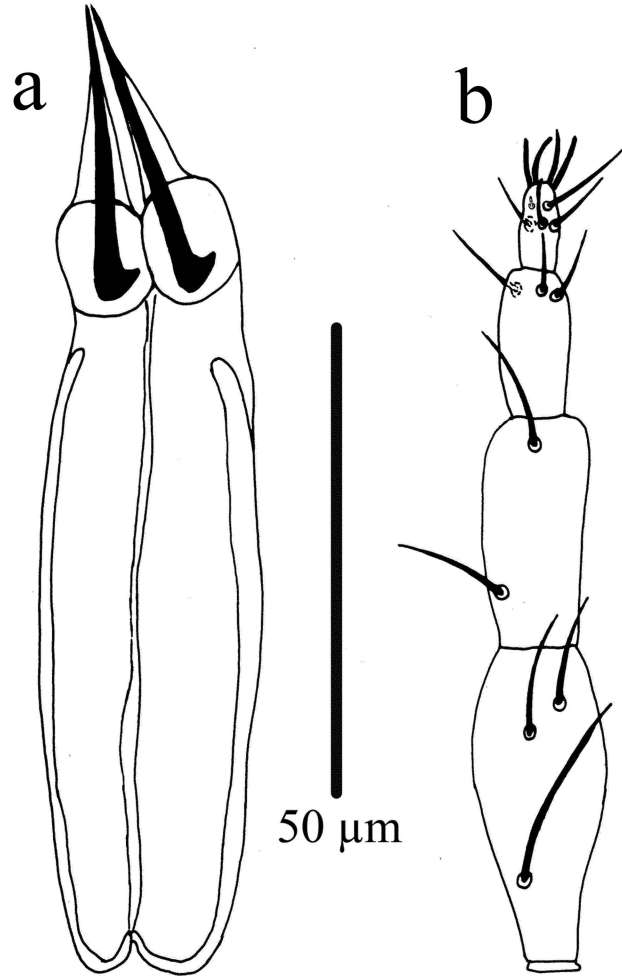
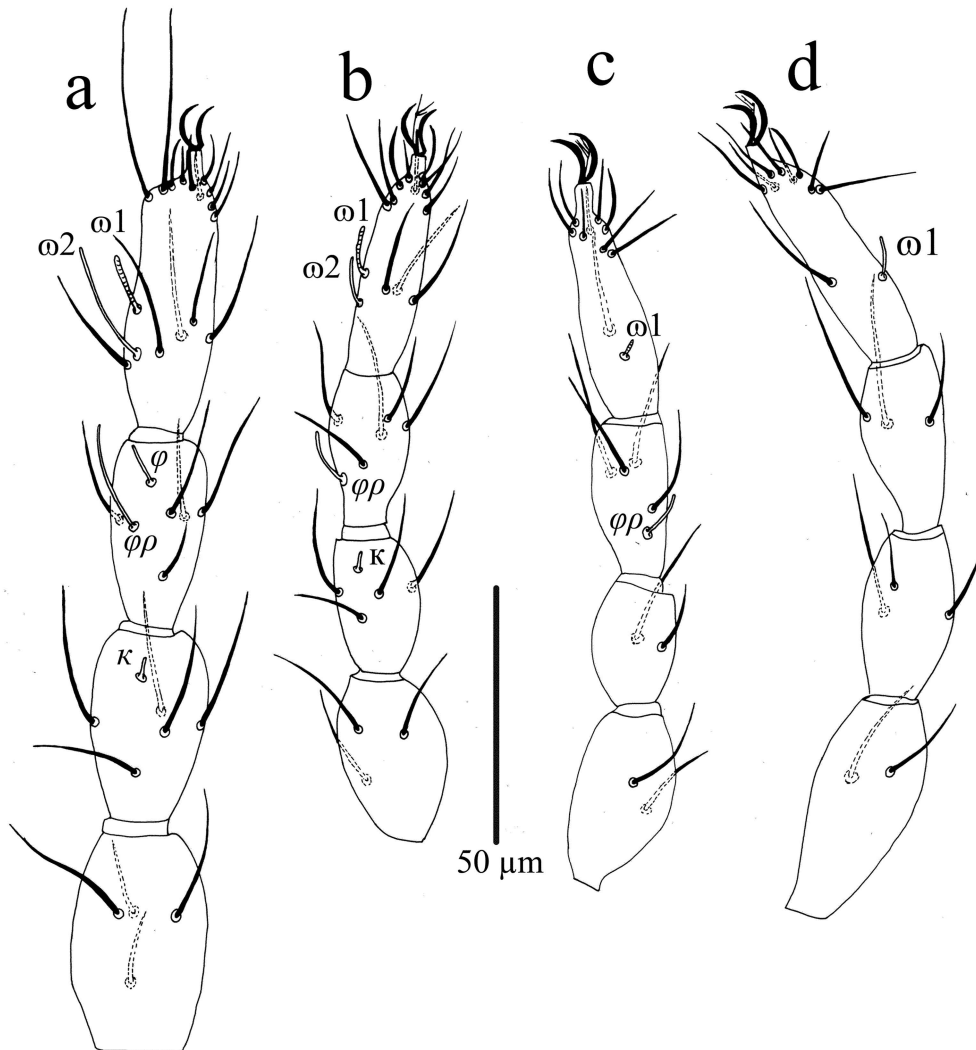


FIGURE 2: *Favognathus hyrcanensis* **n. sp.** (Female): a – Chelicerae; b – Palpus.

TABLE 1: Comparative characters between *Favognathus hyrcanensis* **n. sp.** and closely related species.

Species/Characters	Anterior margine of hood	Tarsi I,II	Tibia III,IV	Genua I,II	Femur I	Trochanter I-IV	Intercoxal area
<i>F. hyrcanensis</i> n. sp.	denticulate	15(+2)-12(+2)	4(+1)-3	5(+1)-4(+1)	4	1,1,2,1	striae
<i>F. bafranus</i>	smooth	14(+2)-10(+2)	4(+1)-3	5(+1)-5 or 4(+1)	4	1,1,2,1	striae
<i>F. luxtoni</i>	smooth	14(+2)-12(+2)	4(+1)-3	5(+1)-4	3	1,1,1,0	striae
<i>F. observabilis</i>	smooth or denticulate	15(+2)-12(+2)	4(+1)-3	5(+1)-4	3	1,1,2,1	smooth
<i>F. pictus</i>	smooth	14(+2)-12(+2)	4(+1)-2(+1)	5 or 6(+1)-5(+1)	4	1(0),1,2,1	striae

FIGURE 3: *Favognathus hyrcanensis* n. sp. (Female) - Legs.

from soil on 25th May, 2010, Gorgan city, Golestan province, Iran, by Sheila Shirinbeik Mohajer. The holotype and one paratype will be deposited to Jalal Afshar Zoological Museum, Department of Plant Protection, Faculty of Agriculture, University of Tehran, Karaj, Iran and two paratypes were deposited to the Acarological Collection, Department of Plant Protection, Faculty of Plant Protection, University of Gorgan, Iran.

Remarks — This new species is closely related to *F. bafranus* Doğan 2008; *F. luxtoni* Koç and Ayyıldız, 1999; *F. observabilis* Kuznetsov, 1974 and *F. pictus* Summers and Chaudhri, 1965 in having same

dorsal and ventral shields patterns and in the presence of rosettes; however, it can be distinguished by the combination of characters provided in Table 1.

Key to the Iranian species of *Favognathus*

1. Dorsum without rosette patterns.....2
— Dorsum with rosette patterns.....3
2. Sternocoxal region with a pair of angular condyles *F. cordylus* Luxton
— Sternocoxal region without angular

- condyles..... *F. mirazii* Khanjani and Ueckermann
3. Dorsum partly reticulated 4
— Dorsum completely reticulated 5
4. Setal formula of tarsi 17-14-10-10.....
.....*F. pongolensis* Meyer and Ueckermann
— Setal formula of tarsi 16-14-10-10.....
.....*F. amygdalus* Doğan and Ayyildiz
5. Anterior margine of hood denticulated.....
..... *F. hyrcanensis* **n. sp.**
— Anterior margine of hood smooth 6
6. Setal formula of tarsi 16-14-10-10, pores are present in the centre of each cell, intercoxal area striated.....*F. luxtoni* Koç and Ayyildiz
— Setal formula of tarsi 17-14-10-10, 3-6 pores present in the corner of each cell, intercoxal area smooth *F. distortus* (Kuznetsov)

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