

Article

Redescription of *Neophyllobius astragalusi* and *Favognathus orbiculatus* with *F. acaciae* (Acari: Raphignathoidea) as a new record from Iran

Mohammad Bagheri*, Asal Yousefi, Nazanin Seilsepour, Moosa Saber & Gholamhossein Gharekhani

Department of Plant Protection, Faculty of Agriculture, University of Maragheh, Maragheh, Iran; E-mail: mbagheri20022002@yahoo.com

* Corresponding author

Abstract

Adult females of *Favognathus orbiculatus* (Livshitz) and females, male and protonymph of *Neophyllobius astragalusi* Khanjani & Ueckermann are redescribed. Also, *F. acaciae* Doğan & Ayyildiz is reported for the first time from Iran.

Key words: Trombidiformes, Prostigmata, Cryptognathidae, Camerobiidae, new record, predatory mites, Iran.

Introduction

Mites of the Raphignathoidea are important predatory mites in suborder Prostigmata. These mites have high potential as biological control agents in agricultural ecosystems (Fan & Zhang 2005). Members of the superfamily are found on foliage, branches, trunks (tree bark and holes), moss and lichen, litter, soil, animal nests (birds, possum, and honeybee), stored products, and house dust (Fan & Zhang 2005).

The Cryptognathidae was erected by Oudemans (1902) with *Cryptognathus* Kramer 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). *Favognathus* proposed by Luxton (1973) with *Cryptognathus cucurbita* Berlese as type species. This genus comprises 41 species worldwide (Doğan 2008; Khanjani & Ueckermann 2008; Hassanzadeh *et al.* 2014; Jafari *et al.* 2014; Khanjani *et al.* 2014; Shirinbeik Mohajer *et al.* 2014).

The Camerobiidae, commonly known as “stilt-legged mites”, are widely distributed and found in various habitats such as the aerial parts of plants, soil, straw, moss and leaf litter. Species of the Camerobiidae are known to feed on crawlers of the scale insects and tarsonemid mites (Fan & Zhang 2005; Khanjani *et al.* 2014). This family contains seven genera of which *Neophyllobius* Berlese with more than 120 species is the largest genus. *Neophyllobius* was erected by Berlese (1886) with *Neophyllobius elegans* Berlese.

Up to now, 13 species of *Favognathus* (Hassanzadeh *et al.* 2014; Jafari *et al.* 2014; Khanjani *et al.* 2014; Shirinbeik Mohajer *et al.* 2014; Yousefi *et al.* 2014) and 17 species of *Neophyllobius* have been reported from Iran (Ahaniazad & Bagheri 2013; Beyzavi *et al.* 2013; Khanjani *et al.* 2014). In this paper, two species, *Favognathus orbiculatus* and *Neophyllobius astragalusi*, are redescribed and *F. acaciae* is reported for the first time in

Iran.

Material & methods

Samples were collected from field and orchards of different regions of Shahindezh and Mamaghan (Northwestern Iran). Mites were extracted from samples using a Berlese-Tullgren funnel. Collected specimens were cleared in Nesbitt's fluid and mounted in Hoyer's Medium (Walter & Krantz 2009), and examined with an Olympus Bx41 phase-contrast microscope. The length of the idiosoma was measured from the suture between the gnathosoma and idiosoma to the posterior margin of the idiosoma; the width of the idiosoma was measured at the broadest part of the idiosoma and setae were measured from their insertion to their tip; distances between setae were measured between setal bases. Leg measurements are calculated from the coxae to the tip of the claws. Dorsal setae and leg setal designations follow that of Kethley (1990). All measurements are given in micrometers (μm). All specimens are deposited in the Acarological Collection, Department of Plant Protection, Faculty of Agriculture, University of Maragheh, Maragheh, Iran.

Results

Family Cryptognathidae Kramer

Genus *Cryptognathus* Kramer

Type species: *Cryptognathus lagena* Kramer

Favognathus orbiculatus (Livshitz, 1974) (Figs. 1–8)

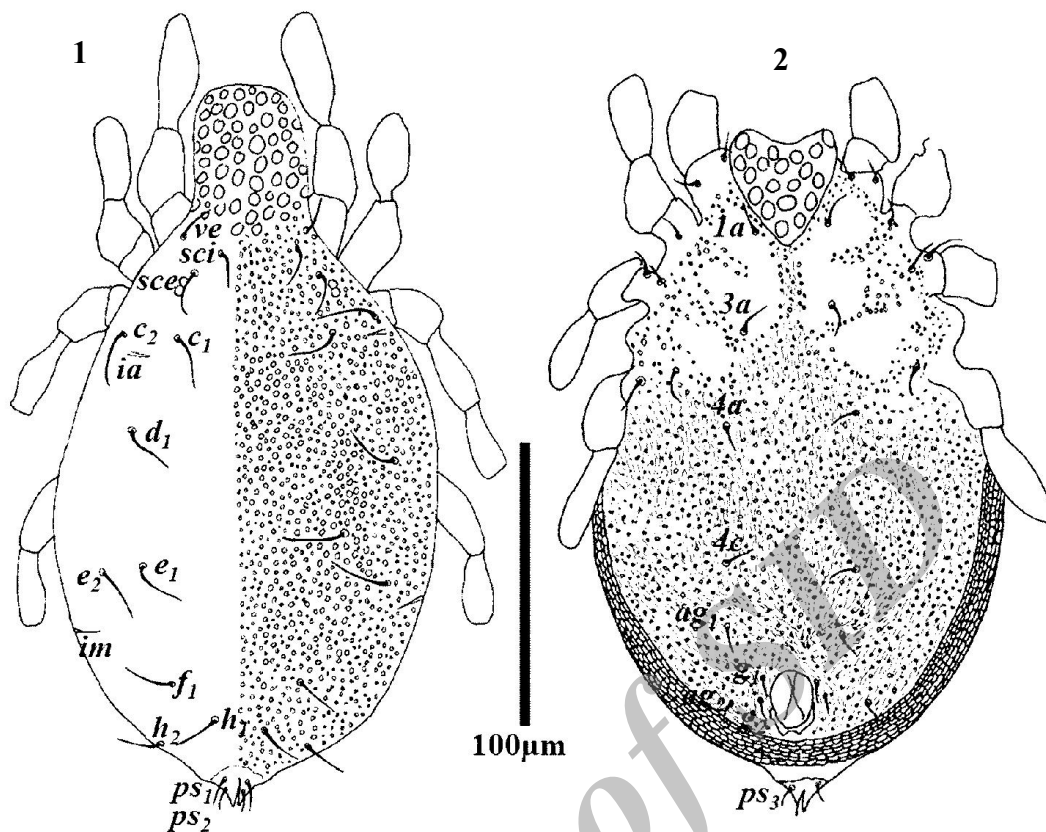
Krisper & Schneider 1998: 201; Koç & Ayyildiz 1999: 626; Doğan & Ayyildiz 2004: 123; Doğan 2008: 1678; Khaustov & Sergeyenko 2014: 366.

Redescription

Female (n = 5) - Length of body (including hood) 298 (295–305); width 182 (150–157); leg I 254 (250–254), leg II 208 (217), leg III 205 (210–214), leg IV 225 (221–227).

Dorsum (Fig. 1) - Anterior margin of hood smooth, with 7–8 round dimples in each longitudinal row; dorsal plate with 11 pairs of simple setae, one pair of eyes and one pair of postocular bodies laterally between setae *sce* and *c*₂; two pairs of slit-like cupules (*ia*, *im*) present; dorsum ornamented with evenly spaced pores, without reticulation, striation, or clusters of closely set punctations. Anus opening dorsoventrally, with three pairs of setae (*ps*₁–*ps*₃). Setal measurements as follows: *ve* 22 (21–24), *sci* 22 (20–21), *sce* 24 (20–21), *c*₁ 30 (27–30), *c*₂ 22 (22–24), *d*₁ 34 (27–29), *e*₁ 31 (25–28), *e*₂ 28 (25–29), *f*₁ 28 (25–30), *h*₁ 22 (21–22), *h*₂ 22 (21–22), distances between setae: *ve*–*ve* 44 (42–43), *sci*–*sci* 32 (25–38), *ve*–*sci* 9 (9–10), *sce*–*sce* 48 (52–54), *sci*–*sce* 8 (8–11), *c*₁–*c*₁ 66 (65), *c*₂–*c*₂ 98 (103–106), *d*₁–*d*₁ 108 (107–114), *d*₁–*e*₁ 37 (45–50), *e*₁–*e*₁ 82 (83–87), *e*₁–*e*₂ 23 (19–23), *f*₁–*f*₁ 55 (55–56), *e*₁–*f*₁ 52 (55–61), *f*₁–*h*₁ 26 (27–32), *e*₂–*e*₂ 115 (116–117), *h*₁–*h*₁ 20 (19), *h*₂–*h*₂ 62 (56–61), *h*₁–*h*₂ 23 (21–25).

Venter (Fig. 2) - Prosternal apron wedge shaped with 18–20 dimples; ventral pattern similar to dorsum but with faint striations between pores; venter with 4 pairs of ventral setae (*1a*, *3a*, *4a* and *4c*); genital opening with 2 pairs of genital (*g*₁–*g*₂) and 2 pairs of aggenital (*ag*₁–*ag*₂) setae; intercoxal area smooth, without striation. Length of ventral setae: *1a* 14 (12–13), *3a* 15 (14–15), *4a* 11 (11–12), *4c* 11 (12–13).



Figures 1–2. *Favognathus orbiculatus* (Female) - 1. Dorsal view of idiosoma; 2. Ventral view of idiosoma.

Gnathosoma (Figs. 3–4) - Hypostome narrow (Fig. 3), with one pair of long setae *m* 20 (21–23) and two pairs of adoral setae (*or*₁–*or*₂); palp (Fig. 4) 91 (90–95) 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.

Legs (Figs. 5–8) - Setal formulae of leg segments (solenidia in parentheses and not included) as follows: 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, φρ)-5(+φρ)-4(+φρ)-3; tarsi 15(+ω1, ω2)-12(+ω1, ω2)-9(+ω1)-9(+ω1).

Male - Unknown

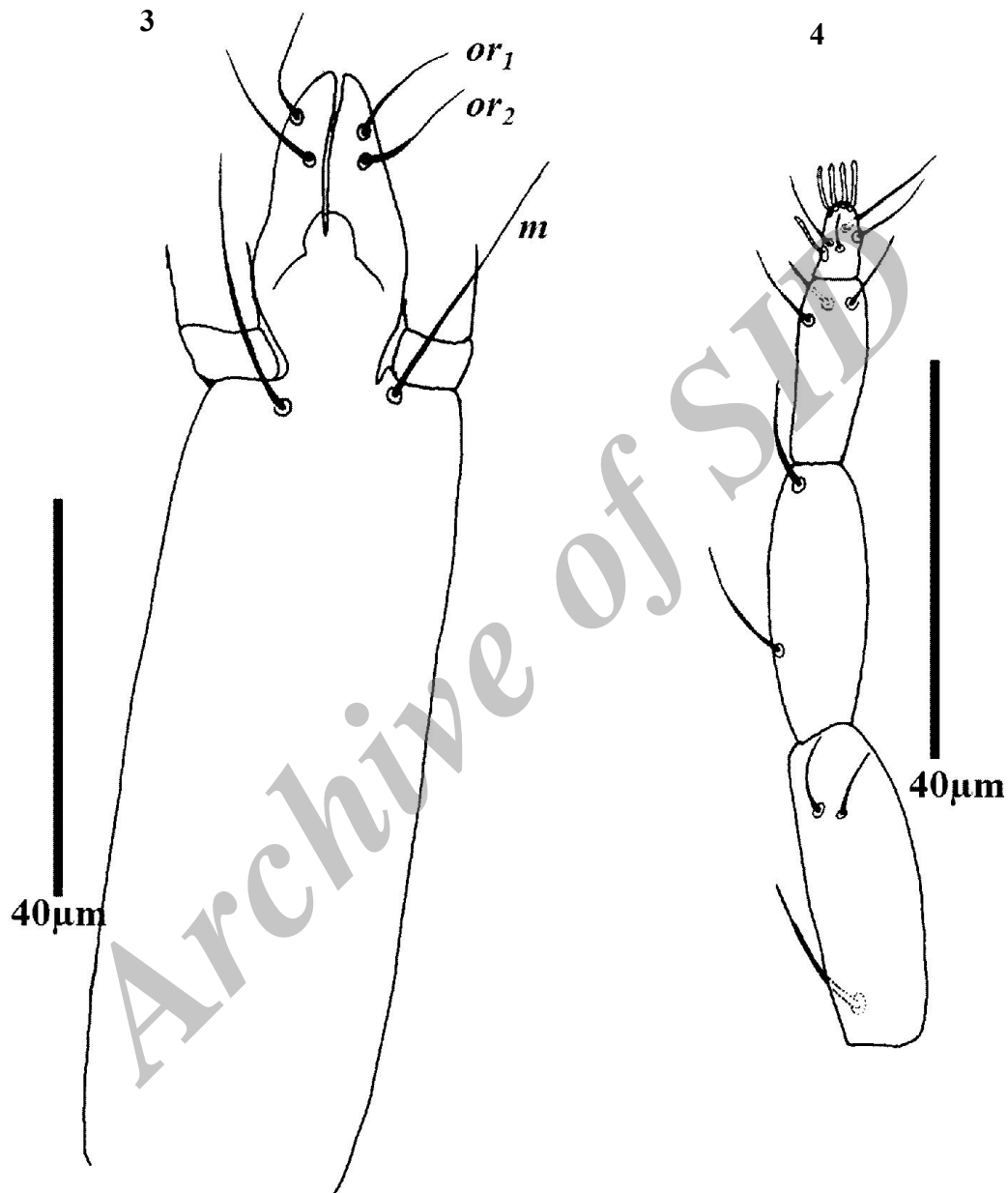
Material examined

Five females of *Favognathus* were collected from soil and rotten leaves under tamarisk (*Tamarix gallica*, Tamariaceae), 16, September, 2013, Shahindezh, West Azerbaijan province, Iran, by Asal Yousefi.

Remarks

This species was originally collected from Crimea and Russia and was described in Russian by Kuznetsov & Livshitz (1974) with lack of details and discrepancies between the description and the figures, Luxton (1978) synonymized this species with *F. cucurbita* (Berlese) according similarity of dorsal and ventral shields, both species with partial reticulations. Koç & Ayyildiz (1999) refused this synonymy and their identification was based on the original description, where no mention was made of reticulations and the leg

chaetotaxy, and for this reason, their provided diagnosis was with miscount of legs setal formula (personal communication). The Iranian specimens show all characters of the original description but with more details. Herein, we provide the only description of this species containing complete description with correct legs setal number which is missed in previous ones.



Figures 3–4. *Favognathus orbiculatus* (Female) - 3. Gnathosoma; 4. Palp.

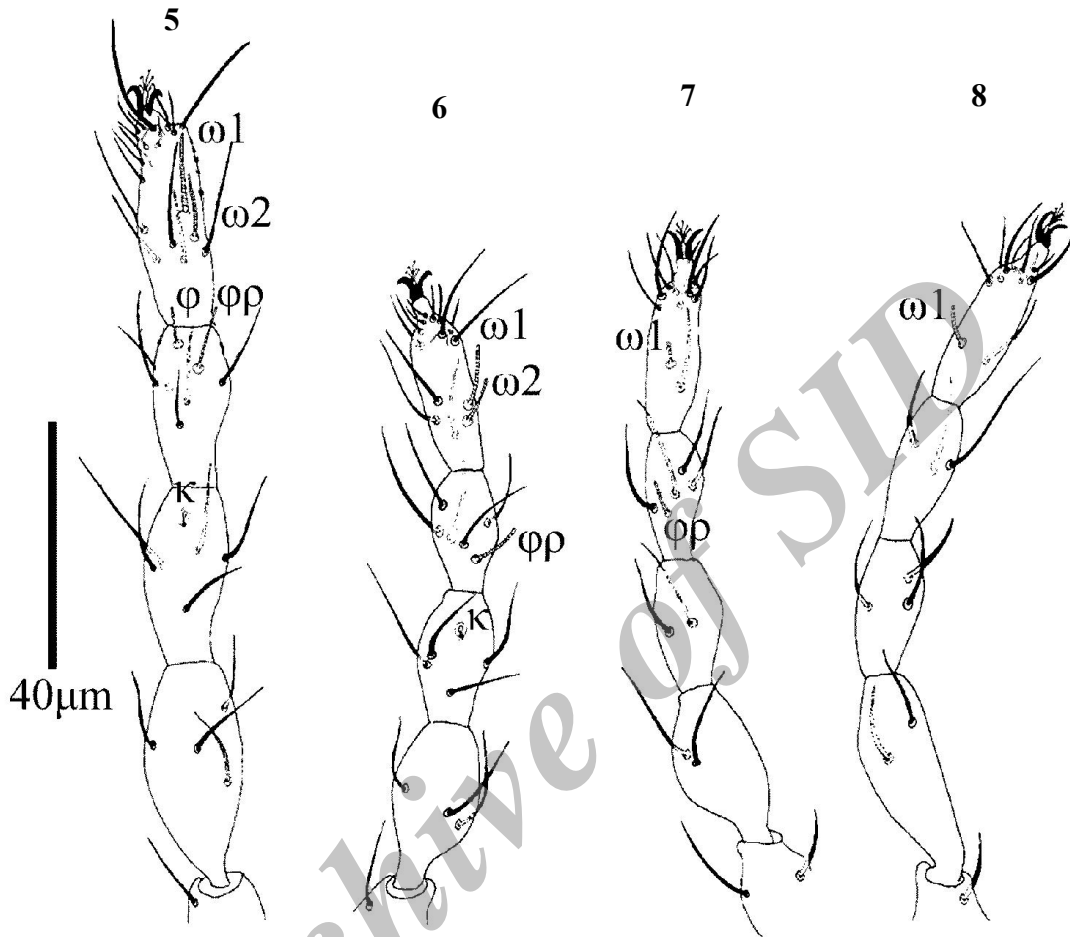
***Favognathus acaciae* Doğan & Ayyildiz, 2004**

Doğan & Ayyildiz, 2004: 127.

This species was described from Turkey (Doğan & Ayyildiz 2004). This is a new record of this species from Iran.

Material examined

Three females from the soil and humus under apple trees, 17 June 2013, Shahindezh city, West Azerbaijan Province, Iran by Asal Yousefi.



Figures 5–8. *Favognathus orbiculatus* (Female) - 5. Leg I; 6. Leg II; 7. Leg III; 8. Leg IV.

Family Camerobiidae

Genus *Neophyllobius* Berlese

Type species: *Neophyllobius elegans* Berlese, 1886

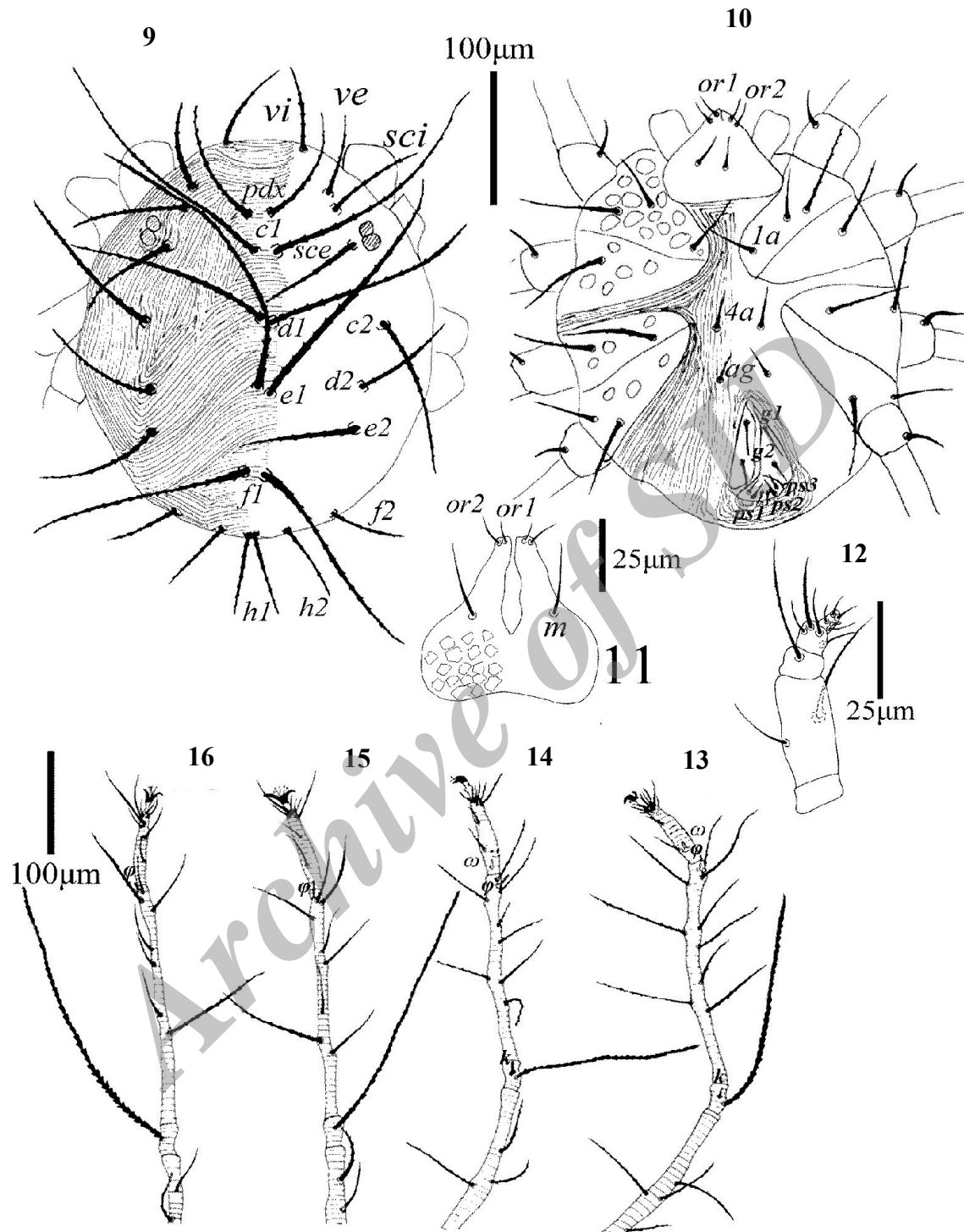
***Neophyllobius astragalusi* Khanjani & Ueckermann, 2002 (Figs. 9–29)**

Redescription

Female (n = 8) - Length of idiosoma 329–351, length of gnathosoma 65–97, width of idiosoma 285 (253–298).

Dorsum (Fig. 9) - Almost ovoid; striation on integument; with 15 pair of setae, set on tubercles, all setae long and serrate; two pairs of eyes present; setal measurements as follows: *vi* 78 (75–98), *ve* 70 (63–90), *sci* 72 (70–93), *sce* 76 (75–92), *px* 98 (100–112), *c₁* 205 (200–237), *c₂* 155 (150–185), *d₁* 194 (193–235), *d₂* 75 (75–100), *e₁* 198 (190–225),

e_2 100 (94–112), f_1 180 (164–192), f_2 80 (58–80), h_1 70 (63–75), h_2 60 (50–60).



Figures 9–16. *Neophyllobius astragalusi* (Female) - 9. Dorsal view of idiosoma; 10. Ventral view of idiosoma; 11. Gnathosoma; 12. Palp; 13. Leg I; 14. Leg II; 15. Leg III; 16. Leg IV.

Distances between setae: $vi-vi$ 60 (58–67), $ve-ve$ 100 (105–107), $vi-ve$ 45 (45), $pdx-pdx$ 15 (14–17), $vi-pdx$ 50 (50–55), $ve-pdx$ 50 (47–52), c_1-pdx 42 (23–30), $sci-pdx$ 48

(47–50), *sce-pdx* 75 (70–75), *sci-sci* 112 (112–115), *sce-sce* 138 (112), *sci-sce* 40 (43–58), *c1-c1* 18 (17–20), *c2-c2* 175 (175–178), *sce-c2* 60 (65–68), *d1-d1* 10 (7–12), *e1-e1* 5 (5), *f1-f1* 5 (5–7), *d1-e1* 50 (55–65), *e1-f1* 52 (45–67), *f1-h1* 47 (38–48), *d2-d2* 150 (150–160), *e2-e2* 137 (138–150), *f2-f2* 125 (120–125), *c2-d2* 47 (42–50), *d2-e2* 37 (37–39), *e2-f2* 38 (38), *h1-h1* 3 (3–5), *h2-h2* 45 (45–47), *h1-h2* 28 (25–30).

Venter (Fig. 10) - Endopodal shields divided and with pronounced reticulation; aggenital area with one pair of aggenital setae (*ag1*); genital and anal shields fused and with two pairs of genital setae (*g1*) and three pairs of pseudanal setae (*ps1-ps3*); length of ventral setae as follows: *1a* 30 (30–32), *4a* 40 (40–42), *ag1* 15 (13–19), *g1* 20 (18–20), *g2* 13 (12–15), *ps1* 8 (9–10), *ps2* 5 (6–8), *ps3* 5 (5–8).

Gnathosoma (Fig. 11) - Subcapitulum reticulate, with one pair of subcapitular setae (*m*) and two pairs of adoral setae (*or1*, *or2*). Palpal chaetotaxy: tarsus with two terminal eupathidia, one solenidion and two tactile setae; tibia with one blade-like seta and three tactile setae; genua with one long smooth or slightly serrated seta, femur with two serrated setae, trochanter without seta (Fig. 12).

Legs (Figs. 13–16) - Length of legs I–IV (from base of coxa to tip of tarsal claw): 590 (560–590), 500 (475–510), 540 (525–580) and 600 (575–600). Chaetotaxy of leg segments as follows (solenidia in parentheses and not included): coxae 3-1-2-2; trochanters 1-1-1-1; femora 4-3-2-2; genua 1(+*k*)-1(+*k*)-1-1; tibiae 9(+*φ*)-8(+*φ*)-8(+*φ*)-7(+*φ*); tarsi 10(+*ω*)-9(+*ω*)-8-8. Length of genual setae as follows: I 238–281, II 275–345, III 355–358, IV 313–368.

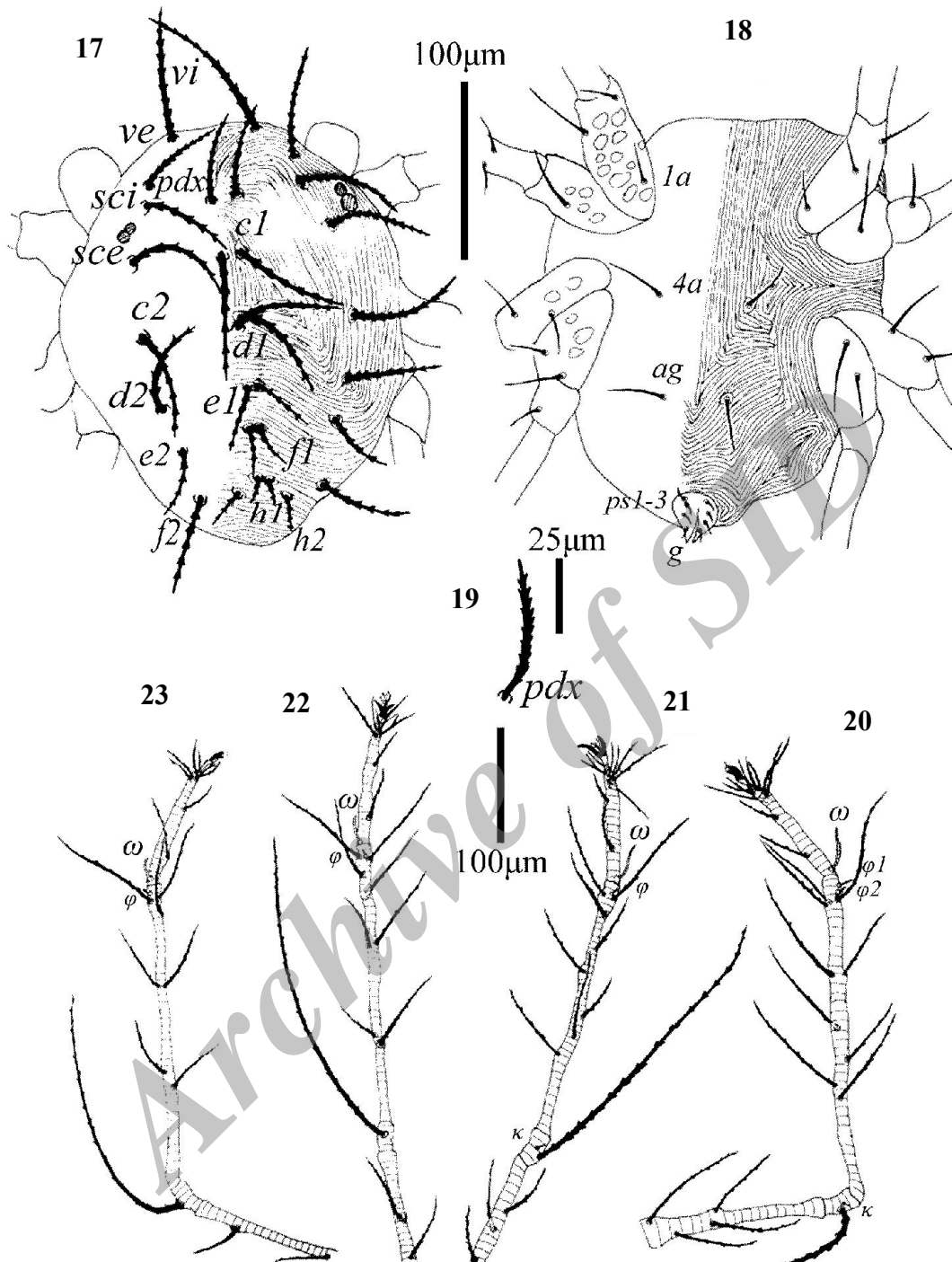
Male (n = 1) - Length of idiosoma 245, length of gnathosoma 60, width of idiosoma 200.

Dorsum (Fig. 17) - Hysterosoma somewhat tapered; striation on integument; with 15 pairs (including *pdx* setae) of long and serrated setae, two pairs of eyes present; setal measurements as follows: *vi* 57, *ve* 58, *sci* 57, *sce* 60, *pdx* 50 (Fig. 19), *c1* 65, *c2* 74, *d1* 50, *d2* 50, *e1* 35, *e2* 45, *f1* 25, *f2* 50, *h1* 15, *h2* 20, distances between setae: *vi-vi* 50, *ve-ve* 87, *vi-ve* 32, *vi-pdx* 44, *ve-pdx* 37, *c1-pdx* 35, *sci-pdx* 35, *sce-pdx* 55, *sci-sci* 87, *sce-sce* 113, *sci-sce* 30, *c1-c1* 12, *c2-c2* 125, *sce-c2* 51, *d1-d1* 5, *e1-e1* 5, *f1-f1* 5, *d1-e1* 36, *e1-f1* 19, *f1-h1* 26, *d2-d2* 107, *e2-e2* 97, *f2-f2* 70, *c2-d2* 37, *d2-e2* 27, *e2-f2* 40, *h1-h1* 5, *h2-h2* 21, *h1-h2* 13.

Venter (Fig. 18) - Coxae I–II and III–IV fused; ventral setae *4a* present; aggenital area with one pair of aggenital setae (*ag1*); genital and anal shields fused and with one pair of genital seta (*g1*) and three pairs of pseudanal setae (*ps1-ps3*); length of ventral setae as follows: *1a* 23, *4a* 32, *ag* 17, *g1* 7, *ps1* 7, *ps2* 7, *ps3* 7.

Gnathosoma - Gnathosoma often covered by prodorsum; chelicerae fused to form a stylophore; subcapitulum reticulate, with one pair of subcapitular setae (*m*) and two pairs of adoral setae (*or1*, *or2*). palpal chaetotaxy: tarsus with two terminal eupathidia, one solenidion and two tactile setae; tibia with one blade-like seta and three tactile setae; genua with one long smooth or slightly serrated seta, femur with two serrated setae, trochanter without seta.

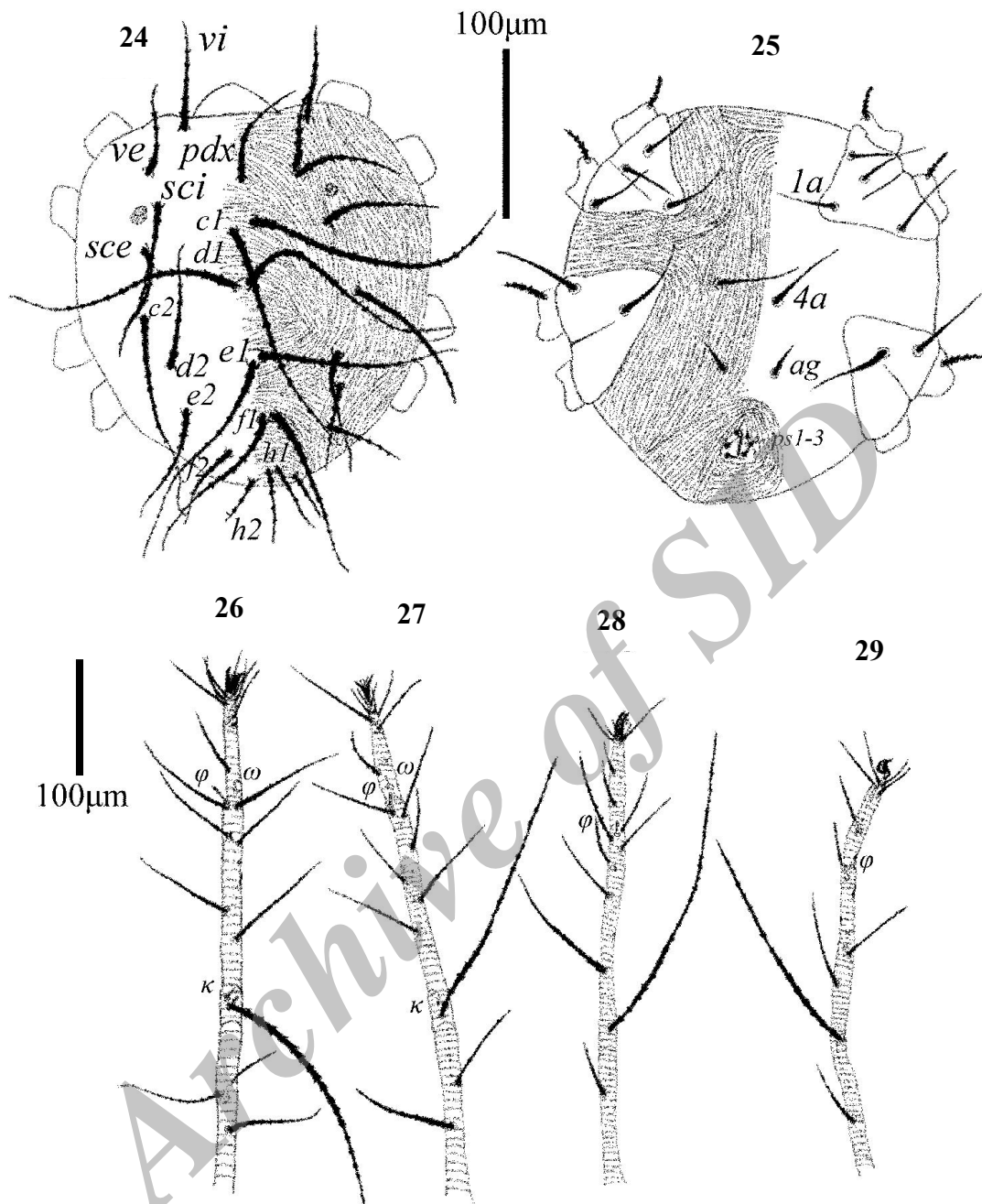
Legs (Figs. 20–23). Length of legs I–IV, (from base of coxa to tip of tarsal claw): 612, 500, 530 and 609. Chaetotaxy of leg segments as follows (number of solenidia on tarsi same as female but enlarged): coxae 3-1-2-2; trochanters 1-1-1-1; femora 4-3-2-2; genua 1(+*κ*)-1(+*κ*)-1-1; tibiae 9(+2*φ*)-8(+*φ*)-8(+*φ*)-7(+*φ*); tarsi 10(+*ω*)-9(+*ω*)-8(+*ω*)-8(+*ω*). Length of genual setae as follows: I 203, II 278, III 310, IV 240.



Figures 17–23. *Neophyllobius astragalusi* (Male) - 17. Dorsal view of idiosoma; 18. Ventral view of idiosoma; 19. Setae *pdx*; 20. Leg I; 21. Leg II; 22. Leg III; 23. Leg IV.

Protonymph (n = 1) - Length of idiosoma 220, length of gnathosoma 60, width of idiosoma 210.

Dorsum (Fig. 24) - As in female but with less sclerotization, with 15 pairs of setae, eyes present; setal measurements as follows: *vi* 68, *ve* 67, *sci* 62, *sce* 75, *pdx* 90, *c1* 150, *c2* 100, *d1* 160, *e1* 140, *e2* 70, *f1* 107, *f2* 58, *h1* 43, *h2* 33.



Figures 24–29. *Neophyllobius astragalusi* (Protonymph). 24. Dorsal view; 25. Ventral view; 26. Leg I; 27. Leg II; 28. Leg III; 29. Leg IV.

Distances between setae: $vi-vi$ 50, $ve-ve$ 87, $vi-ve$ 32, $vi-pdx$ 35, $ve-pdx$ 40, c_1-pdx 32, $sci-pdx$ 45, $sce-pdx$ 65, $sci-sci$ 92, $sce-sce$ 118, $sci-sce$ 37, c_1-c_1 15, c_2-c_2 138, $sce-c_2$ 47, d_1-d_1 7, e_1-e_1 6, f_1-f_1 4, d_1-e_1 53, e_1-f_1 34, f_1-h_1 35, d_2-d_2 107, e_2-e_2 98, f_2-f_2 77, c_2-d_2 38, d_2-e_2 25, e_2-f_2 40, h_1-h_1 4, h_2-h_2 25, h_1-h_2 14.

Venter (Fig. 25) - Aggenital area with one pair of aggenital setae (ag_1); genital shields and setae absent, anal shields present and with three pairs of pseudanal setae (ps_1-ps_3); length of ventral setae as follows: $1a$ 22, $4a$ 32, ag_1 10 ps_1 5, ps_2 5, ps_3 5.

Gnathosoma - Stylophore stout, subcapitulum with one pair of subcapitular setae (m) and two pairs of adoral setae (or_1 , or_2). palpaltarsus with two eupathidia, one solenidion

and two simple setae.

Legs (Figs. 26–29) - Length of legs I-IV: 410, 375, 395 and 380. Chaetotaxy of leg segments as follows: coxae 3-1-2-0; trochanters 1-1-1-0; femora 3-2-1-1; genua 1(+ κ)-1(+ κ)-1-1; tibiae 6(+ φ)-6(+ φ)-6(+ φ)-3(+ φ); tarsi 8(+ ω)-8(+ ω)-7-5. Length of genual setae as follows: I 205, II 231, III 262, IV 238.

Discussion

Khanjani & Ueckermann (2002) described this species base on one female collected from Hamedan, Iran and we decided to redescrbed it with more females, one male and one protonymph. Our specimens resembles original description but differ from it in having one more seta (this was also confirmed by original authors, personal communication) on tarsus IV and also seta h_1 is longer than h_2 .

Material examined

Specimens of *N. astragalusi* were collected from the soil of apple orchards, Mamaghan, Iran, 23 July 2013, by Nazanin Seilsepur.

Acknowledgement

We greatly appreciate the support for this project provided by the Research Divisions of University of Maragheh, Maragheh, Iran. The authors wish to thank Mr. Saeed Paktinat-Saeed and Mrs. Mansoureh Ahaniazad (Ph. D. students) for their kind help in preparation of the manuscript.

References

- Ahaniazad, M. & Bagheri, M. (2013) A new species of *Neophyllobius* from Iran, re-description of *Stigmaeus echinopus* Summers and a key to the Iranian species of *Neophyllobius* (Acari: Trombidiformes: Prostigmata). *International Journal of Acarology*, 39(4): 341–346.
- Berlese, A. (1886) Acari, Myriapoda et Scorpiones ucusque in Italia reperta. *Padova*, 30(7): 1–30.
- Beyzavi, Gh., Ueckermann, E.A., Faraji, F. & Ostovan, H. (2013) A catalog of Iranian prostigmatic mites of superfamilies Raphignathoidea & Tetranychoida (Acari). *Persian Journal of Acarology*, 2(3): 389–474.
- Doğan, S. (2008) A catalogue of cryptognathid mites (Acari: Prostigmata, Cryptognathidae) with the description of a new species of *Favognathus* Luxton and newly discovered male of *F. amygdalus* Doğan & Ayyildiz from Turkey. *Journal of Natural History*, 42: 1665–1686.
- Doğan, S. & Ayyildiz, N. (2004) Mites of the genus *Favognathus* (Acari: Cryptognathidae) from Erzurum Province, Turkey. *International Journal of Acarology*, 30: 123–130.
- Fan, Q.-H. & Zhang, Z.-Q. (2005) Raphignathoidea (Acari: Prostigmata), Fauna of New Zealand 52. Manaaki Whenua Press, 400 pp.
- Hassanzadeh, M., Khanjani, M., Safaralizadeh, M.H. & Mirfakhraee, Sh. (2014) A new species of the genus *Favognathus* Luxton (Acari: Cryptognathidae) from western Azerbaijani, Iran. *Persian Journal of Acarology*, 3(4): 311–320.


- Jafari, S., Bagheri, M. & Saboori, A. (2014) A new species of the genus *Favognathus* from Iran and re-description of *Eryngiopus affinis* Barilo (Acari: Cryptognathidae, Stigmaeidae). *Systematic & Applied Acarology*, 19(3): 353–362.
- Kethley, J. (1990) Acarina: Prostigmata (Actinedida). In: Dindal, D.L. (Ed.), *Soil Biology Guide*. John Wiley & Sons, New York, pp. 667–756.
- Khanjani, M., Ahmad Hoseini, M., Yazdanpanah, Sh. & Masoudian, F. (2014) *Neophyllobius lorestanicus* sp. nov. and *N. ostovani* sp. nov. (Acari: Camerobiidae) from Iran. *Zootaxa*, 3764(4): 441–454.
- Khanjani, M., Khanjani, M., Rafeian Najaf-Abadi, P. & Seeman, O.D. (2014) Three new species of the genus *Favognathus* Luxton (Acari: Cryptognathidae) and re-description of *Cryptognathus lagena* Kramer from Iran. *International Journal of Acarology*, 40(5): 370–383.
- Khanjani, M. & Ueckermann, E.A. (2002) Camerobiidae of Iran with descriptions of three new species (Acari: Camerobiidae). *Systematic & Applied Acarology*, 7: 159–166.
- Khanjani, M. & Ueckermann, E.A. (2008) New species of the genus *Favognathus* Luxton (Acari, Cryptognathidae) from Iran. *Acarologia*, 48: 177–186.
- Khaustov, A.A. & Sergeyenko, A.L. (2014) Raphignathoid mites (Acari: Raphignathoidea) of the Cape Martyan Nature Reserve, Crimea. *Systematic & Applied Acarology*, 19(3): 363–372.
- Koç, K. & Ayyildiz, N. (1999) Some species of *Favognathus* Luxton, 1973 (Acari: Actinedida: Cryptognathidae) from Turkey. *Journal of Natural History*, 33: 621–628.
- Krisper, G. & Schneider, T. (1998) Erstnachweis und Verbreitung der Milbenfamilie Cryptognathidae (Acari, Actinedida, Raphignathoidea) in Österreich und Slowenien. *Mitt. naturwiss. Verein für Steiermark*, 128: 193–202.
- Kuznetsov, N.N. & Livshitz, I.Z. (1974) Raphignathoid mites of Crimea. I. The Family Cryptognathidae Oudemans. *Zoologicheskij zhurnal*, 53(11): 1721–1726 [in Russian].
- Luxton M. (1973) Mites of the genus *Cryptognathus* from Australia, New Zealand and Niue Island. *Acarologia*, 15: 53–75.
- Luxton, M. (1987) Mites of the family Cryptognathidae Oudemans, 1902 (Acari: Prostigmata) in the British Isles. *Entomologist Monthly Magazine*, 123: 113–115.
- Oudemans A.C. (1902) Acari, neue Arten, Klassifikation. *Tijdschrift voor Entomologie*, 45: 50–64.
- Shirinbeik Mohajer, Sh., Bagheri, M., Yazdani, M., Saboori, A. & Paktinat Saeij, S. (2014) *Favognathus hyrcanensis* n. sp., a new species of the genus *Favognathus* (Acari: Trombidiformes: Cryptognathidae) from northern Iran. *Acarologia*, 54(2): 193–199.
- Walter, D.E. & Krantz, G.W. (2009) Collecting, rearing, and preparing specimens. In: Krantz, G.W. & Walter, D.E. (Eds.), *A Manual of Acarology*. 3rd edition. Texas Tech University Press, pp. 83–94.
- Yousefi, A., Bagheri, M., Saber, M., Gharekhani, Gh. & Maleki, N. (2014) Predatory raphignathoid mites (Acari: Trombidiformes: Prostigmata) in Shahindezh, West Azerbaijan province, Iran. *Abstract book of the 21th Iranian Plant Protection Congress, Urmia, Iran*, p. 984.

Received: 25 November 2014

Accepted: 28 December 2014

Published: 15 January 2015

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بازتوصیف گونه‌های *Favognathus orbiculatus* و *Neophyllobius astragalusi* با
گزارش جدید گونه *F. acaciae* (Acari: Raphignathoidea) از ایران

محمد باقری*، عسل یوسفی، نازنین سیل سپور، موسی صابر و غلامحسین قره‌خانی

گروه گیاه‌پزشکی، دانشکده کشاورزی، دانشگاه مراغه، مراغه، ایران؛ رایانامه: mbagheri20022002@yahoo.com

* نویسنده مسئول

چکیده

کنه‌های کامل (*Favognathus orbiculatus* (Livshitz) و کنه‌های کامل نر، ماده و پوره سن یکم گونه *Neophyllobius astragalusi* Khanjani & Ueckermann بازتوصیف شده و همچنین گونه *F. acaciae* Doğan & Ayyildiz برای نخستین بار از ایران گزارش می‌شود. واژگان کلیدی: Trombidiformes، پیش‌استیگمایان، Camerobiidae، Cryptognathidae، گزارش جدید، کنه‌های شکارگر، ایران.

تاریخ دریافت: ۱۳۹۳/۹/۴

تاریخ پذیرش: ۱۳۹۳/۱۰/۷

تاریخ چاپ: ۱۳۹۳/۱۰/۲۵