Persian J. Acarol., 2024, Vol. 13, No. 3, pp. 349–359.
https://doi.org/10.22073/pja.v13i3.85004
Journal homepage: http://www.biotaxa.org/pja

http://zoobank.org/urn:lsid:zoobank.org:pub:36AF1609-67E4-409B-84BC-4DF54519F84E

Article

Laelaspis nematii sp. nov. (Mesostigmata: Laelapidae), a new species of laelapid mites from southwest Iran

Arsalan Khalili-Moghadam

Department of Plant Protection, Faculty of Agriculture, Shahrekord University, Shahrekord, Iran; E-mail: arsalan.khalili@gmail.com

ABSTRACT
A new species of the genus *Laelaspis* Berlese, *L. nematii* **sp. nov.**, is described based on adult female specimens collected from ant nest materials, *Cataglyphis fritillariae* Khalili-Moghadam *et al*., 2021 (Hymenoptera: Formicidae), in Koohrang County (Dashte Laleh), Chaharmahal Va Bakhtiari and from soil in Ahwaz city, Khoozestan Province, southwestern Iran.

KEYWORDS: Description, Dermanyssoidea, female, Iran, myrmecophilous mites, taxonomy.

PAPER INFO.: Received: 5 January 2024, Accepted by: *O. Joharchi*, 29 March 2024, Published: 15 July 2024

INTRODUCTION

Ant colonies are particularly good habitats for other arthropods because their colonies are long lived and rich in organic materials collected from a larger area than that of the nest. Thus, their nests are stable resources that can be utilized by myrmecophiles (Wheeler 1910; Laakso and Setälä 1998). Mites are the most abundant guests in ant nests (Campbell *et al.* 2013).

The family Laelapidae is one of the most abundant myrmecophilous mite groups. These mites are ecologically diverse and found in various habitats (Evans and Till 1966; Strong and Halliday 1994; Lindquist *et al.* 2009).

The genus *Laelaspis* Berlese is represented by approximately 50 described species found throughout the world (De Moraes *et al.* 2022; Duarte *et al.* 2022; Nemati and Gwiazdowicz 2023). Most species are found in association with ants, but a few species are known from soil and litter, or very rarely on other insects and small mammals (Kazemi 2015). Although limited information is available about their biology and interactions with their ant hosts (Eickwort 1990), Hunter (1964) successfully reared *Laelaspis vitzthumi* (Womersley, 1956) on a diet of freshly killed houseflies under laboratory conditions (Hunter 1964).

Based on the catalogue of the Iranian Mesostigmata provided by Nemati *et al.* (2018) and Saravani Rad *et al*. (2019), 17 species of this genus have been recorded from Iran. In a survey on mesostigmatid mites associated with ants in southwestern Iran during 2021–2022, a new species of myrmecophilous mites of the genus *Laelaspis* was collected from an ant nest, but the species was also recovered from soil. The genus diagnosis given by De Moraes *et al.* (2022) is accepted and followed in this paper.

How to cite: Khalili-Moghadam, A. (2024) *Laelaspis nematii* sp. nov. (Mesostigmata: Laelapidae), a new species of laelapid mite from southwest Iran. *Persian Journal of Acarology*, 13(3): 349–359.

MATERIALS AND METHODS

Samples were collected from an ant nest from Chaharmahal Va Bakhtiari and soil from Khoozestan Provinces, Iran. The ant nest was under a large stone. The nest materials were placed in plastic bags, transferred to the laboratory, and placed within a Berlese funnel for mite extraction. Mites were placed in lactic acid at 55 °C for clearing, and then mounted in Hoyer's medium on permanent microscope slides for examination. Illustrations were prepared with Corel DRAW X7 and figures compiled using Adobe Photoshop® software. Measurements of structures are expressed as minimum-maximum ranges in micrometers (μm) which were obtained using a scaled ocular lens of an Olympus CX–31. The dorsal setal notation followed that of Lindquist and Evans (1965). Leg and palp setal notation and chaetotactic formulae are adapted from Evans (1963a, b). Idiosomal shield notations for pore-like structures (gland pores and poroids/lyrifissures) follow the systems of Athias-Henriot (1975). Length of the dorsal shield is the distance from its anteromedian edge anterior to bases of setae *j1* to its posteromedian edge posterior to bases of setae *Z5*; width of the dorsal shield is measured at its widest part; length of the sternal shield is measured along the midline from the anterior edge to its posterior margin, width is measured between coxae II (widest point) and slightly above the insertion of *st2* (narrowest point); the length of the epigynal shield is its midline from the anterior margin to its posterior margin, and width was measured at the widest point (between *st5*-*zv1*). The length of the anal shield is its midline from the anterior margin to the posterior edge of the cribrum, and width was measured at its widest point. Setae were measured at the level of their insertions to their tips and distance between setae as the distance between their insertions. Lengths of legs were measured dorsomedially, and tarsi were measured without the pretarsus. The terms lyrifissure and pore are used to refer to slit-shaped and circular or oval-shaped cuticular openings, respectively. We have attempted to identify all pore-like structures, but we acknowledge that some may have been overlooked.

RESULTS

Genus *Laelaspis* Berlese, 1903

Laelaps (*Laelaspis*) Berlese, 1903: 13 (type species: *Iphis astronomicus* Koch, 1839, by original designation).

Diagnosis

The concept of *Laelaspis* used here is based on that of De Moraes *et al.* (2022).

Laelaspis nematii sp. nov. (Figs. 1–10)

http://zoobank.org/urn:lsid:zoobank.org:act:1BC84D3E-1F54-44B6-B3C2-3F5D1FC5B3CA

Materials examined

Holotype, female, Chaharmahal Va Bakhtiari Province, Koohrang County (Dashte Laleh) (32° 35' 15" N, 50° 12' 01" E, 2391 m a.s.l.) from nest materials of *Cataglyphis fritillariae*; coll. A. Khalili-Moghadam, 26 May 2021; paratypes: one female, same data as holotype and two females were collected from Khoozestan Province, Ahwaz city (Shahid Chamran University campus), from soil; coll. M. Kavianpour, deposited in APAS.

Type deposition

The holotype and three paratypes as permanent slides have been deposited in the Acarological Laboratory, Plant Protection Department, Agricultural College, Shahrekord University (APAS), Iran.

Diagnosis (female)

Dorsal shield with 39 pairs of smooth setae (*r2–4*, *s1* slightly barbed), including two pairs of

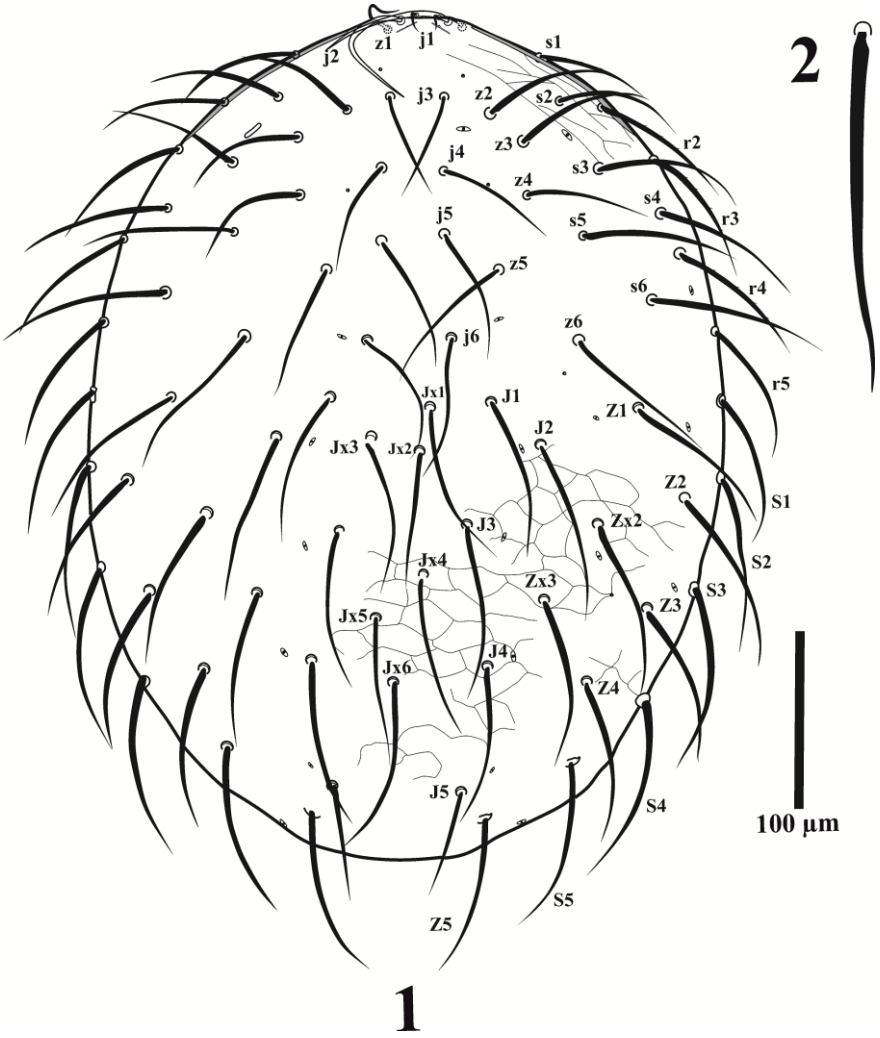
extra *Zx* setae and six unpaired extra *Jx* seta, the anteriormost inserted at level of *J1* setae; dorsal setae long without distinct basal knob, passing base of next setae in series, except *j1*, *z1* and *J5* which are shorter; setae *Z5* 1.45 times as long as *J5*; anterior margin of sternal shield sclerotized with two distinct angles near to lateral; epigynal shield longer than wide, posterior margin rounded, ornamented with "V" and "inverted V" shaped pattern, central V-shape zone with nine irregular cells, shield with two pairs of setae, *st5* on shield, *Jv1* are close to the margin, *Zv1* inserted adjacent on lateral margins of epigynal shield; ventral skin of idiosoma with nine pairs of long smooth setae (*r6*, *R1–R5*, *UR1*, *UR2*, and one pairs opposite of median part of coxae III) in addition to *Jv1–Jv5* and *Zv2–Zv5* setae, and one pair of elongate metapodal platelets; posterior edge of peritrematal shields shorter than posterior edge of parapodal shields; postanal seta thicker and longer than para-anal setae; fixed and moveable digits with three and two teeth respectively.

Description (n = 4)

Dorsal idiosoma (Fig. 1) – Dorsal shield oval-shaped covering entire idiosoma, with faint polygonal ornamentation more distinct throughout opisthonotal region, and lineate-reticulate ornamentation at its anterolateral part; shield 470–482 long, 346–353 wide, shield with 39 pairs of long and smooth setae (*r2–4*, *s1* very slightly barbed; *j1*, *z1* and *J5* shorter), basal knob indistinct (Fig. 2), 22 pairs on podonotal (*j1–6*; *z1–6*; *s1–6*; *r2–5*) and 17 pairs on opisthonotal region (*J1–5*, *Z1–5*, *S1–5*), six unpaired setae *Jx1* (located between *J1–J1*), *Jx2–Jx3* (located posterior to *Jx1*), *Jx4* (located between *J3*), *Jx5* (located posterior to *Jx4*), *Jx6* (between *J4–J4*) and including *Zx2* between *J3* and *Z2* setae, and *Zx3* a little outside *J3* and *J4* setae. Dorsal setae almost similar in thickness and length, dorso-marginal setae slightly thicker than dorso-median setae. Lengths of podonotal setae are as follows: *j1* 31–35, *j2* 63–67, *j3* 61–66, *j4* 73–75, *j5* 85–88, *j6* 83–88; *z1* 32–36, *z2* 70–73, *z3* 72–74, *z4* 80–85, *z5* 78–81, *z6* 86–89; *s1* 69–72, *s2* 73–75, *s3* 80–84, *s4* 85–86, *s5* 88–91, *s6* 100–101; *r2* 72–74, *r3* 85–86, *r4* 84–87, *r5* 93–96, and *r6* 75–77 located in ventral side opposite to anterior margin of coxae IV. Lengths of opisthonotal setae are as follows: *J1* 90–95, *J2* 105–107, *J3-4* 95–100, *J5* 61–63; *Z1* 90–93, *Z2* 97–101, *Z3* 90–93, *Z4* 85–89, *Z5* 88–92; *S1* 83–86, *S2* 100–102, *S3* 107–109, *S4* 105–107, *S5* 100; *Zx2–3* 95–99; *Jx1* 99–103, *Jx2* 98–101, *Jx*3 97–99, *Jx*4 94–97, *Jx*5 80–83, *Jx*6 96–100. Podonotal and opisthonotal regions with 17 pairs of discernible pore-like structures as shown in Figure 1.

Ventral idiosoma (Fig 3) – Tritosternum with columnar base and pilose laciniae (48–53) long; pre-sternal plates absent; sternal shield with sparsely lineate-reticulate ornamentation on anterior and lateral surfaces, median surface smooth, 96–98 long, 146–151 wide (at level of projection between coxae II–III) and 90–95 wide at level of *st2*, anterior margin sclerotized with a small notch anteromedially at level of tritosternum placement and two distinct angle near to lateral (Fig. 4); posterior margin slightly concave; sternal setae smooth, *st1* 58–63, *st2* 51–56, and *st3* 61–65 long, *iv1* and *iv2* slit-like, located slightly behind setae *st1* and between *st2–st3* respectively. The distances between *st1–st1* 58–61, *st2–st2* 75–77 and *st3–st3* 112–114; setae *st4* 44–49 located on angulate endopodal III–IV, pore-like *iv3* on soft integument adjacent to inner margin of these plates; epigynal shield elongate and broad, 255–265 long (from anterior to posterior margins), 136–139 wide at *st5* level, 218–222 wide at broadest point between *st5–Zv1*; shield gradually narrowed from widest point, posteriorly rounded, inverted-inner V stria with nine long, rather narrow V-shape which ends in two irregular distal cells; setae *st5* 61–71 inserted on shield, setae *Zv1* 101–107 inserted on lateral margins of shield, setae *Jv1* 78–81 and *Jv2* 66–68 inserted adjacent on lateral margins of epigynal shield; paragenital pores (*iv5*) located on soft integument between lateral margins of epigynal shield and coxa IV; subtriangular anal shield with non-straight lateral sides, anterolateral corner expanded, lobe like, and with sparsely lineate-reticulate on anterolateral surfaces, median surface smooth, 76–79 long, 93–96 wide (with cribrum), paranal setae 22–25 shorter and slightly thinner than postanal seta 32–36; cribrum extending around postanal seta; opisthogastric surface with one pair of elongate metapodal plates (50–52 × 6), 16 pairs of smooth setae, *Zv2* 42–43, *Zv3* 66–69, *Zv4* 83–88, *Zv5* 93–

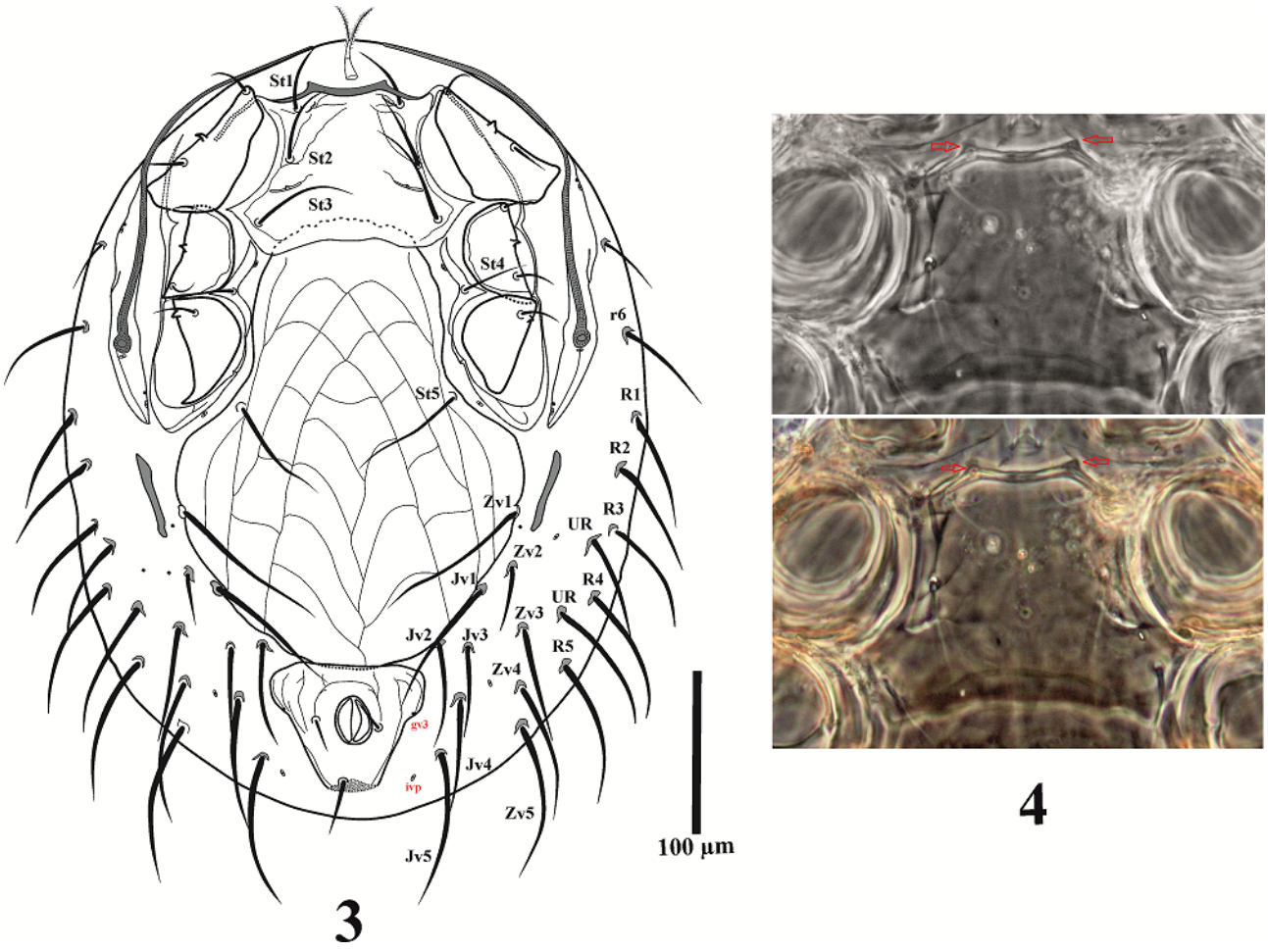
97, *Jv3* 54–59, *Jv4* 83–88, *Jv5* 93–97, *R1-R3* 67–71, *R4* 83–85, *R5* 92–94, *UR1* 70–73 and *UR*2 84–86; and six pairs of pore-like structures including *iv5* and *gv2*. In addition one pair of setae insert on opposite of median part of coxae III; peritreme long and narrow, extending almost to anterior margin of coxa I, peritrematal plate separated from exopodal shield, wider in middle part, bearing two pore-like structures (*ip* and *gp*) on lateral margin of shield at level between coxae II–III; stigma located between coxae III–IV, surrounded by relatively broad stigmatal plate and narrower apically, posterior edge of peritrematal shields shorter than posterior edge of parapodal shields; surface of poststigmatal plate bearing two pairs of poroids and one pair of gland pores; exopodal platelets narrow and fused to sternal lateral arm between coxae I–II anteriorly, those laterad of coxae IV fused to moderately developed parapodals; endopodals II–III fused to lateral margins of sternal shield, angulate endopodals III–IV fused to parapodals.



Figures 1–2. *Laelaspis nematii* **sp. nov.** (female) – 1. Dorsal idiosoma; 2. Detail of dorsal setae (Not to scale).

Gnathosoma (Figs. 5–8) – Hypostome (Fig. 5) with three pairs of smooth simple setae; *h1* (25–26), *h2* (15–17) and *h3* (31–34); palpcoxal setae (*pc*) 19–22 long; deutosternal groove with six rows of denticles each bearing 5–8 small teeth, and smooth anterior transverse row; corniculi normal, horn-like, relatively short, shorter than internal malae, reaching mid-level of palp femur; internal malae with a pair of adjacent median projections, and pair of sparsely dentate projections at lateral edges. Labrum acuminate, pilose, conspicuously longer than internal malae; epistome slightly subtriangular

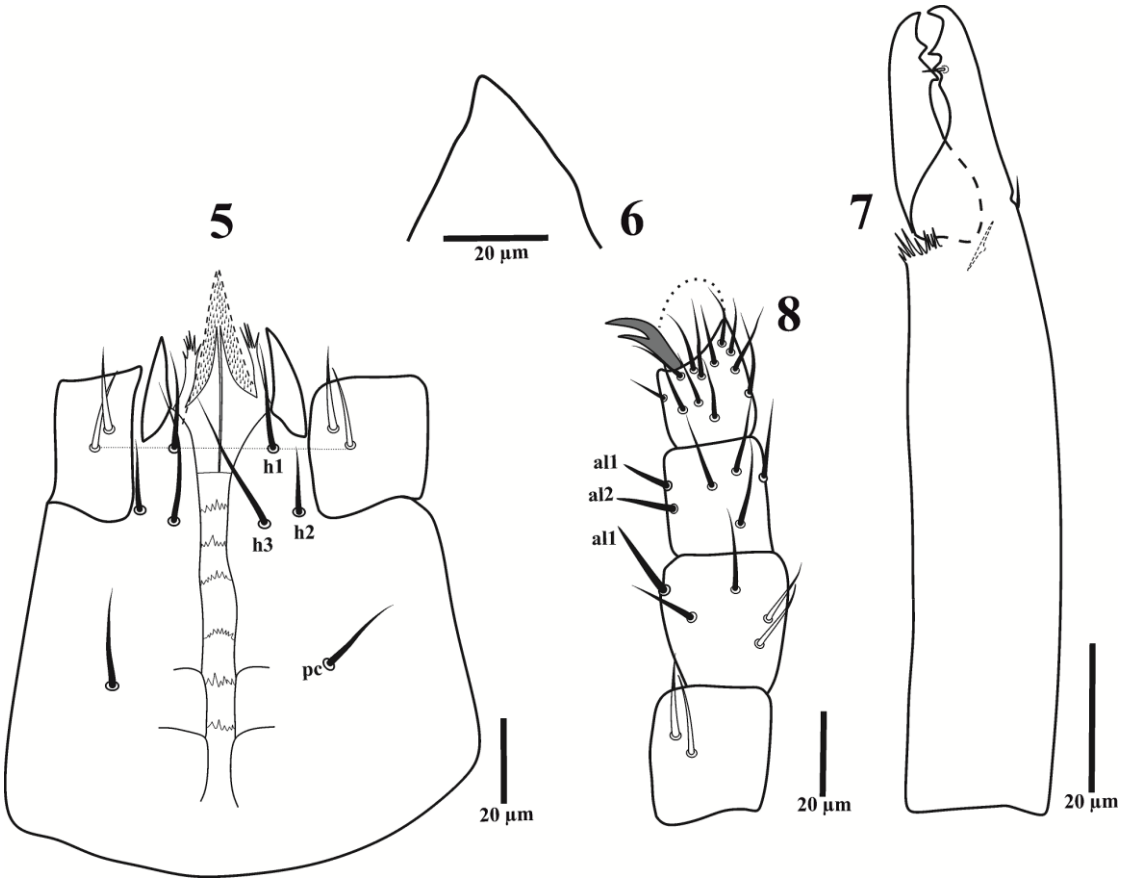
with smooth anterior margin (Fig. 6); chelicerae typical for genus, moveable digit (31–35) with two teeth, middle article (73–78) ending in fixed digit (29–32) with three teeth, dorsal seta short and simple (Fig. 7); palp (109–115), chaetotaxy normal, with simple setae (*al1* and *al2* on palpgenu and *al* on palpfemur thickened); palp apotele two-tined (Fig. 8), 14–17 long from base to anterior tip of longer tine.



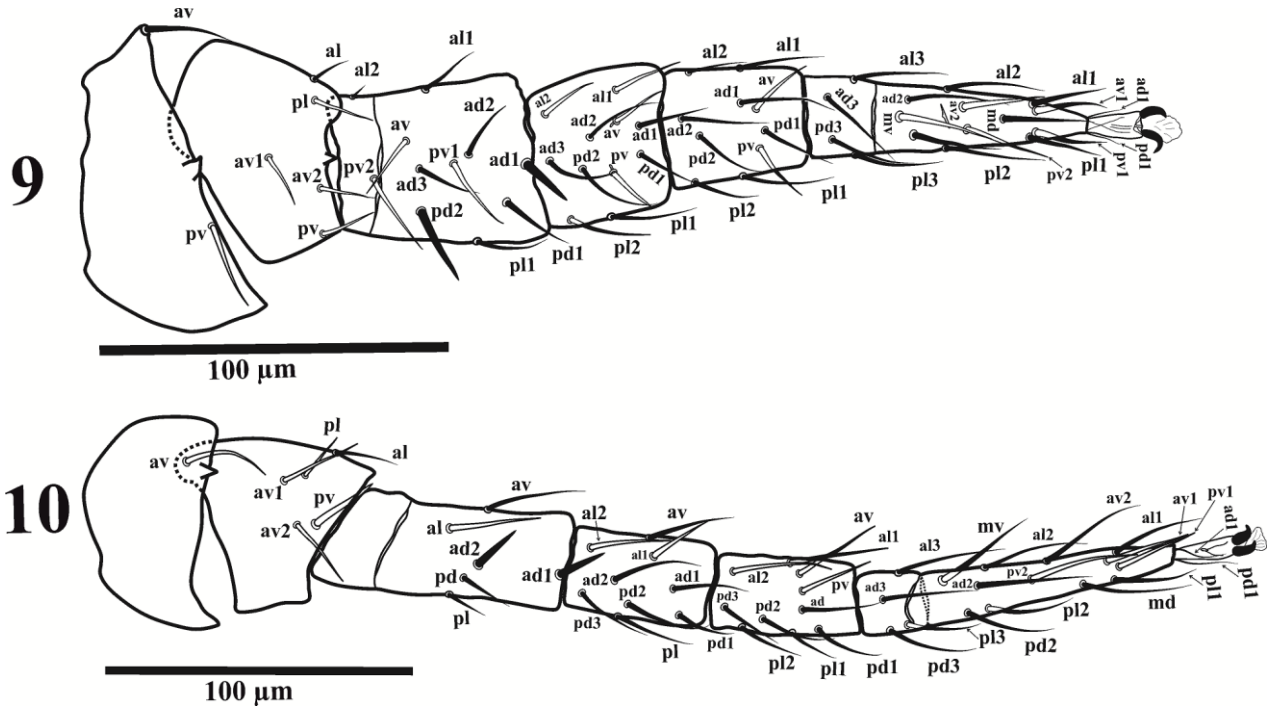
Figures 3–4. *Laelaspis nematii* **sp. nov.** (female) – 3. Venral idiosoma; 4. Sternal shield (anterior margine sclerotized with two distinct pointed processes in lateral).

Legs – Tarsi I–IV with claws and ambulacra. **leg I** 466–480, **leg II** 300–310, **leg III** 293–303, **leg IV** 366–381. Legs I and IV longer than legs II and III. Chaetotaxy of all leg segments normal for Laelapidae. All leg setae smooth and pointed. Chaetotaxy of legs are as follows: **Leg I:** coxa 0 0/1 0/1 0; trochanter 1 1/1 0/2 1; femur 2 3/2 2/2 2; genu 2 3/2 3/1 2; tibia 2 3/2 3/1 2; tarsus not counted. **Leg II (Fig. 9):** coxa 0 0/1 0/1 0; trochanter 1 0/2 0/1 1; femur 2 3/1 2/2 1, (*ad1* and *pd2* thickened, *al2* thinner and smaller); genu 2 3/1 2/1 2; tibia 2 2/1 2/1 2; tarsus 3, 3/2, 3/2, 3 + *mv*, *md*. **Leg III:** coxa 0 0/1 0/1 0; trochanter 1 1/1 0/1 1; femur 1 2/1 1/0 1; genu 2 2/1 2/1 1; tibia: 2 1/1 2/1 1; tarsus 3, 3/2, 3/2, 3 + *mv*, *md*. **Leg IV (Fig. 10):** coxa 0 0/1 0/0 0; trochanter 1 0/2 0/1 1(*pv* slightly thickened); femur 1 2/1 1/0 1 (*ad1* and *ad2* thickened); genu 2 2/1 3/0 1; tibia 2 1/1 3/1 2; tarsus 3, 3/2, 3/2, 3 + *mv*, *md*.

Insemination structures – Not seen.



Figures 5–8. *Laelaspis nematii* **sp. nov.** (female) – 5. Hypostome; 6. Epistome; 7. Chelicera; 8. palp.



Figures 9–10. *Laelaspis nematii* **sp. nov. (**Female): 9. Leg II; 10. Leg IV.

Remarks

The new species most resembles *Laelaspis pennatus* Joharchi & Halliday, 2012 and *Laelaspis*

mossadeghi Babaeian & Joharchi, in Babaeian *et al.* (2013) [couplet 11 in the identification key to Iranian species of the genus provided by Saravani Rad *et al.* (2019) and couplet 5 in the identification key to Western Palaearctic species of the genus provided by Joharchi *et al.* (2012)], due to having the genitiventral shield broad and oval, posterior margin of genital shield rounded with two pairs setae on the surface, setae *Z5* clearly longer than *J5*, postanal seta longer than para-anal setae and peritreme extends to anterior margin of coxa I. However, the new species can easily be distinguished from both species by combination of some important morphological characters explained as follows: (1) dorsal shield setae long, smooth and without knob basally [vs. with distinct knob basally, marginal setae, *j2*, *j3*, *z1* and *Z5* distinctly serrated in *L. mossadeghi* and *L. pennatus*; in first one dorsal setae shorter, just reaching the base of next posterior setae], (2) presence of six *Jx* setae [vs. three in *L. pennatus* and *L. mossadeghi*], (3) ratio of *Z5*/*J5* length ≈1.45 [vs. ≈2 in *L. pennatus*], (4) anterior margin of sternal shield sclerotized with a pair of distinct pointed processes [vs. non-sclerotized, without pointed processes in two mentioned species], (5) genitiventral shield broadly oval and almost level with outer margin of coxae IV [vs. smaller, circular and nearly extending to mid-level of coxae IV in *L. mossadeghi*], (6) opisthogastric soft integument with 16 pairs of smooth setae each arising on minute sclerotized platelet [vs. 15 and 17 pairs of serrate setae each arising on soft skin directly in *L. pennatus* and *L. mossadeghi* respectively], (7) posterior edge of peritrematal shields shorter than posterior edge of parapodal shields [vs. well past the posterior edge of parapodal shields in two mentioned species].

The new species shares some features with *Laelaspis equitans* (Michael, 1891), *Laelaspis humeratus* (Berlese, 1904); *Laelaspis sinicus* Zhang *et al*., 1963, *Laelaspis lundi* Hunter, 1961 and *Laelaspis volgini* Shereef & Afifi, 1980: long dorsal and opisthogastric setae, the genitiventral shield broad and oval, setae *Z5* clearly longer than *J5* and postanal seta longer than para-anal setae (Michael 1891; Berlese 1904; Hunter 1961; Zhang *et al*. 1963; Evans and Till 1966; Shereef and Afifi 1980; Kazemi 2015). Each of these species is compared as follows: ***Laelaspis equitans*** is separated from the new species based on the edentate movable digit [vs. bidentate in the new species], position of anteriormost *Jx* setae [at level of *j6* and *J1* in *L. equitans* and *L. nematii* **sp. nov.** respectively], ratio of *Z5*/*J5* and post-anal/para-anal setae length [both ≈1.45 in *L. nematii* **sp. nov.**, ≈2 and ≈2.4 in *L. equitans* respectively], anterior margin of sternal shield sclerotized with a pair of distinct pointed processes [vs. non-sclerotized, without pointed processes in *L. equitans*]. In addition, the dorsal shield setae in *L. equitans* are very long and wavy, ***Laelaspis humeratus*** is separated from *L. nematii* **sp. nov.** based on the posterior margin of epigynal shield truncate [vs. distinctly wider and rounded in the new species], ratio of *Z5*/*J5* length more than 2 [vs. ≈1.45 in *L. nematii* **sp. nov.**], anterior margin of sternal shield sclerotized with a pair of distinct pointed processes [vs. non-sclerotized, without pointed processes in *L. humeratus*], opisthogastric soft integument with 15 pairs of setae each arising on soft skin directly [vs. 16 pairs each arising on minute platelet in the new species], ***Laelaspis volgini*** is distinguished from the new species based on the epigynal shield wider than long and almost trapezoidal [vs. oval, longer than wide in *L. nematii* **sp. nov.**], number and position of anteriormost *Jx* setae [vs. five and six *Jx* setae with anteriormost at level of *j5* and *J1* in *L. volgini* and *L. nematii* **sp. nov.** respectively], ***Laelaspis sinicus*** is separated from the new species based on ratio of *Z5*/*J5* and post-anal/para-anal setae length [both ≈1.45 in *L. nematii* **sp. nov.**, ≈2 and more than 3 in *L . sinicus* respectively], opisthogastric region with 12 pairs of setae each arising on soft skin directly [vs. 16 pairs each arising on minute platelet in the new species], anterior margin of sternal shield sclerotized with a pair of distinct pointed processes [vs. non-sclerotized, without pointed processes in *L. sinicus*], ***Laelaspis lundi*** is distinguished from the new species based on dorsal shield setae with distinct knob basally [vs. without knob basally in the new species], posterior margin of epigynal shield tapered to pointed [vs. distinctly wider and rounded in the new species], anterior margin of sternal shield sclerotized with a pair of distinct pointed processes [vs. non-sclerotized, without pointed processes in *L. lundi*], ratio of post-anal/para-anal setae length ≈1.8 [vs. ≈1.45 in the new species], opisthogastric soft integument with 18 pairs of setae each arising on soft skin directly [vs. 16 pairs each arising on minute platelet in the new species].

Laelaspis guilaniensis Ramroodi *et al*., 2014, *L. kamalii* Joharchi & Halliday, 2012 and *L. angustiseta* Khalili-Moghadam *et al*., 2018 may be similar to *Laelaspis nematii* **sp. nov.** in general appearance, but is distinguished based on: (1) dorsal shield setae long, smooth and without knob basally [vs. with distinct knob basally, most dorsal setae serrated in *L. kamalii*, *L. angustiseta* and *L. guilaniensis*; thinner and shorter, just reaching the base of the next posterior setae in second one], (2) presence of six *Jx* setae [vs. two pairs in two later species, three pairs in *L. kamalii*], (3) ratio of *Z5*/*J5* length ≈1.45 [vs. equal in *L. kamalii*], (4) anterior margin of sternal shield sclerotized with a pair of distinct pointed processes [vs. non-sclerotized, without pointed processes in three mentioned species], (5) genitiventral shield broadly oval and almost level with outer margin of coxae IV [vs. smaller, circular and nearly extending to mid-level of coxae IV in *L. guilaniensis*, wider than long and almost trapezoidal in *L. kamalii*], (6) opisthogastric soft integument with 16 pairs of smooth setae [vs. 13, 10 and 14 pairs of serrate setae in *L. kamalii*, *L. guilaniensis* and *L. angustiseta* respectively]; (7) posterior edge of peritrematal shields shorter than posterior edge of parapodal shields [vs. well past the posterior edge of parapodal shields in three mentioned species], movable digit bidentate [vs. edentate in *L. kamalii* and *L. guilaniensis*], post-anal seta smooth [vs. serrate in *L. guilaniensis*], ratio of post-anal/para-anal setae length ≈1.45 [vs. ≈2 in *L. guilaniensis*], two pairs setae (*st5*, *Zv1*) on the epigynal shield [vs. three pairs of setae (*st5*, *Zv1* and *Jv1*) on the shield in *L. angustiseta*].

Etymology

This species is named in honor of Prof. Alireza Nemati, a distinguished professor of acarology (Shahrekord University), who devoted many years for teaching acarology and training acarologists in Iran.

ACKNOWLEDGEMENTS

This work has been financially supported by the research deputy of Shahrekord University (grant number 141/6574) which is greatly appreciated. I also sincerely thank Prof. Alireza Nemati (Department of Plant Protection, Faculty of Agriculture, Shahrekord University, Shahrekord, Iran) who confirmed specimen identification.

REFERENCES

Athias-Henriot, C. (1975) Nouvelles notes sur les Amblyseiini. II. Le relevé organotaxique de la face dorsale adulte (Gamasides, protoadéniques, Phytoseiidae). *Acarologia*, 17: 20–29.

Babaeian, E., Joharchi, O. & Seraj, A.A. (2013) A new species of the genus *Laelaspis* Berlese (Acari: Laelapidae) from Iran. *Persian Journal of Acarology*, 2: 353–360.

Berlese, A. (1903) Diagnosi di alcuni nuove specie di Acari italiani, mirmecofili e liberi. *Zoologischer Anzeiger*, 27(1): 12–28.

Berlese, A. (1904) Illustrazione iconografica degli Acari mirmecofili. *Redia*, 1: 299–474 + Plates 7–20.

Campbell, K.U., Klompen, H. & Crist, T.O. (2013) The diversity and host specificity of mites associated with ants: the roles of ecological and life history traits of ant hosts. *Insectes Sociaux*, 60: 31–41. DOI: 10.1007/s00040-012-0262-6

De Moraes, G.J., Moreira, G.F., Freire, R.A.P., Beaulieu, F., Klompen, H. & Halliday, B. (2022) Catalogue of the free-living and arthropod-associated Laelapidae Canestrini (Acari: Mesostigmata), with revised generic concepts and a key to genera. *Zootaxa*, 5184(1): 1–509.

Duarte, A.D.F., Rueda-Ramírez, D., Cunha, U.S.D. & Moreira, G.F. (2022) Description of a new species of *Laelaspis* Berlese (Acari: Mesostigmata: Laelapidae) from Brazil, with a key to the

species of the Western Hemisphere. *Zootaxa*, 5133(4): 567–576. DOI: 10.11646/zootaxa.5133.4.7

Eickwort, G.C. (1990) Associations of mites with social insects. *Annual Review of Entomology*, 35(1): 469–488.

Evans, G.O. (1963a) Observation on the chaetotaxy of the legs in the free-living Gamasina (Acari: Mesostigmata. *Bulletin of British Museum (Natural History), Zoology*, 10: 277–303.

Evans, G.O. (1963b) Some observations on the chaetotaxy of the pedipalps in the Mesostigmata (Acari). *Annals and Magazine of Natural History*, 13(6): 513–527.

Evans, G.O. & Till, W.M. (1966) Studies on the British Dermanyssidae. Part II. Classification. *Bulletin of British Museum (Natural History), Zoology*, 14: 107–370.

Hunter, P.E. (1961) The genus *Laelaspis*, with a description of three new species (Acarina: Laelaptidae). *Annals of the Entomological Society of America*, 54: 672–683. DOI: 10.1093/aesa/ 54.5.672

Hunter, P.E. (1964) Observations on the Biology of *Laelaspis vitzthumi* (Acarina: Laelaptidae). *Journal of the Kansas Entomological Society*, 37(4): 289–292.

Joharchi, O., Halliday, B. & Saboori, A. (2012) Three new species of *Laelaspis* Berlese from Iran (Acari: Laelapidae), with a review of the species occurring in the Western Palearctic Region. *Journal of Natural History*, 46: 1999–2018. DOI: 10.1080/00222933.2012.707240

Kazemi, S. (2015) A new of *Laelaspis* Berlese (Acari: Mesostigmata: Laelapidae) from Iran, with a revised generic concept and notes on significant morphological attributes in the genus. *Zootaxa*, 4044(3): 411–428. DOI: 10.11646/zootaxa.4044.3.5

Khalili-Moghadam, A., Saboori, A., Nemati, A. & Zahedi Golpayegani, A. (2018) A new ant-associated species of *Laelaspis* (Acari: Mesostigmata: Laelapidae) from Iran. *Persian Journal of Acarology*, 3: 221–234.

Koch, C.L. (1839) Deutschlands Crustaceen, Myriapoden und Arachniden. Ein Beitrag zur Deutschen Fauna. *Regensburg: Herrich-Sch ffer*, 24: 1–11.

Laakso, J. & Setälä, H. (1998) Composition and trophic structure of detrital food web in ant nest mounds of *Formica aquilonia* and in the surrounding forest soil. *Oikos*, 81: 266–278.

Lindquist, E.E. & Evans, G.O. (1965) Taxonomic concepts in the Ascidae, with a modified setal nomenclature for the idiosoma of the Gamasina (Acarina: Mesostigmata). *Memoirs of the Entomological Society of Canada*, 47: 1–64.

Lindquist, E.E., Krantz, G.W. & Walter, D.E. (2009) Order Mesostigmata. *In*: Krantz, G.W. & Walter, D.E. (Eds.), *A manual of acarology*. 3rd Edition. Texas Tech University Press, Lubbock, Texas, USA, pp. 124–232.

Michael, A.D. (1891) On the association of gamasids with ants. *Proceedings of the Zoological Society of London*, 43: 638–653.

Nemati, A. & Gwiazdowicz, D.J. (2023) New Species of *Laelaspis* (Acari: Mesostigmata: Laelapidae) from the Philippines with notes on *L. regalis* Berlese and *L. aviator* Berlese. *Annales Zoologici*, 73(4): 587–598. DOI: 10.3161/00034541ANZ2023.73.4.002

Nemati, A., Riahi, E., Khalili-Moghadam, A. & Gwiazdowicz, D.J. (2018) A catalogue of the Iranian Mesostigmata (Acari): additions and updates of the previous catalogue. *Persian Journal of Acarology*, 7(2): 115–191.

Ramroodi, S., Joharchi, O. & Hajizadeh, J. (2014) A new species of *Laelaspis* Berlese (Acari: Laelapidae) from Iran and a key to Iranian species. *Acarologia*, 54(2): 177–182.

Saravani Rad, S., Ramroodi, S., Joharchi, O. & Sahebzadeh, N. (2019) A new species of *Laelaspis* Berlese (Acari: Mesostigmata: Laelapidae) from southeast Iran. *International Journal of Acarology*, 45(3): 125–130. DOI: 10.1080/01647954.2018.1534888

Shereef, G.M. & Affifi, A.M. (1980) Five new species of mesostigmatid mites, inhabiting organic manures (Acari: Laelapidae). *Proceedings of the First Conference of the Plant Protection Research Institute, Cairo, Egypt*, 3: 121–134.

Strong, K.L. & Halliday, R.B. (1994) Three new species of *Hypoaspis* Canestrini (Acarina: Laelapidae) associated with large Australian cockroaches. *Journal of the Australian Entomological Society*, 33: 87–96.

Wheeler, W.M. (1910) *Ants: Their structure, development and behavior*. Columbia University Press, New York, USA, 704 pp.

Womersley, H. (1956) On some new Acarina–Mesostigmata from Australia, New Zealand and New Guinea. *The Journal of the Linnean Society of London*, 42: 505–599. DOI: 10.1111/j.1096-3642.1956.tb02218.x

Zhang, J., Zheng, Z., Yin, S. & Wang, F. (1963) Preliminary report on mites in northeast China (Acarina: Hypoaspidinae). *Journal of Norman Bethune University of Medical Sciences*, 5(2): 185–197.

گونهٔ جدیدی از هرناهای للاپید *Laelaspis nematii* sp. nov. (Mesostigmata: Laelapidae) از جنوب‌غرب ایران

ارسلان خلیلی‌مقدم

گروه گیاهپزشکی، دانشکدهٔ کشاورزی، دانشگاه شهرکرد، شهرکرد، ایران؛ رایانامه: arsalan.khalili@gmail.com

چکیده

گونهٔ جدیدی از جنس *Laelaspis* Berlese، با نام ***L. nematii* sp. nov.** براساس ویژگی‌های نمونه‌های ماده جمع‌آوری شده از لانهٔ مورچه، *Cataglyphis fritillariae* Khalili-Moghadam *et al*., 2021 (Hymenoptera: Formicidae)، در شهرستان کوهرنگ (دشت لاله)، استان چهارمحال و بختیاری و از خاک در شهر اهواز، استان خوزستان، جنوب‌غربی ایران توصیف می‌شود.

واژگان کلیدی: توصیف، Dermanyssoidea، ماده، ایران، کنه‌های مورچه‌دوست؛ آرایه‌شناسی.

اطلاعات مقاله: تاریخ دریافت: ۱۴۰۲/۱۰/۱۵، پذیرش توسط /. جوهرچی: ۱۴۰۳/۱/۱۰، تاریخ چاپ: ۱۴۰۳/۴/۲۵