

A new species of the genus *Molothrognathus* Summers & Schlinger (Acari: Caligonellidae) from Kurdistan province, Iran

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ABSTRACT

Molothrognathus kurdistaniensis sp. nov. is described and illustrated based on females collected from soil under apple trees, Qorveh, Kurdistan province, Iran. A key to all known Iranian species of the genus *Molothrognathus* is provided.

Keywords soil, apple tree, predators, arthropods, Qorveh

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Introduction

Members of family Caligonellidae are predators feeding on small arthropods and with a world-wide distribution (Fan and Zhang 2005). This family contains 5 genera and all of them have been recorded from Iran (Silva et al. 2017; Bayzavi et al. 2013). The genus *Molothrognathus* was described by Summers & Schlinger (1955) and currently contains 26 species, of which 11 species have been recorded from Iran, namely: *M. azizi* Ueckermann & Khanjani 2003; *M. bahariensis* Ueckermann & Khanjani 2003; *M. fulgidus* Summers & Schlinger 1955; *M. mehrnejadi* Liang & Zhang 1997; *M. mikaeei* Ahani-Azad & Bagheri 2012; *M. minutus* Soliman 1971; *M. phytocolus* Meyer & Ueckermann 1989; *M. terrulentus* Meyer & Ueckermann 1989; *M. tumipalpus* Meyer & Ueckermann 1989, *M. paratumipapus* Bagheri, Maleki & Changizi 2013 and *M. shirazicus* Khanjani, Bakhshi & Khanjani 2016. Here, *M. kurdistaniensis* sp. nov. from Qorveh city, Kurdistan province, Iran is described.

Materials and methods

Mites were collected from soil under apple trees, in Kurdistan province and mounted directly in Hoyer's medium. The specimens were measured, identified and drawn by means of an Olympus BX₅₁ differential interference contrast (DIC) microscope under 1000X magnification and equipped with a drawing tube. Body length measurements represent the distance between setae *v1-h1*; width was measured above coxae III. Setae were measured from their insertion to their tips; distance between setae was measured as the distance between their insertions. Legs were measured from the base of the trochanter to the pretarsus (base of claws).

The terminology and abbreviations used in the description of the new species follows that of Lindquist (1985). All measurements are given in micrometers and the measurements of the paratypes are given in parentheses.

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Results

Family Caligonellidae, Grandjean, 1944

Genus: *Molothrognathus* Summers & Schlinger, 1955

Type species: *Molothrognathus leptostylus* Summers & Schlinger, 1955

***Molothrognathus kurdistaniensis* sp. nov. (Figures 1–2)**

Diagnosis

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Dorsal integument with coarse, dual, striae; all dorsal setae terminally blunt. Palp tarsus with one solenidion (ω) and three terminal eupathidia; palp tibia swollen, with a claw and two setae and three times as long as palp tarsus; trochanters I–IV and femur IV without setae, genua I–II with 4(+ κ)–4, tibiae II–IV each with one blunt seta; tarsi I–IV with 11(+ ω)–7(+ ω)–7–6.

Material Examined — Holotype female and two female paratypes collected from soil under apple trees *Malus domestica* Borkh. (Rosaceae), Iran, Kurdistan Province, Qorveh city (35° 20' N, 47° 52' E and altitude 1906 m a.s.l), 20 September 2014, Fatemeh Amini. Holotype and paratype females are deposited as slide-mounted specimens in the Collection of the Acarology Laboratory, University of Bu-Ali Sina, Hamadan, Iran.

Description

Female (n=3) — Measurements of holotype with measurements of paratypes in parentheses: Length of body (v1–h1) 215(195–201); width 162(160–163).

Dorsum (Figures 1A–B) — Dorsal integument with coarse, dual, striae; idiosoma with longitudinal striae except area between setae d1–h1 with transverse striae; dorsal cupules absent; prodorsum with two pairs of eyes (Fig. 1A). Dorsum with 11 pairs of smooth and terminally blunt setae (Fig. 1B). Lengths of dorsal setae as follows: v1 14(14–15), v2 15(13–15), sc1 16(14–17), sc2 16(14–15), c1 13(13–16), c2 15(14–15), d1 14(13–15), e1 13(11–14), fl 10(12), h1 11(10–12), h2 11(10–11). Distances between dorsal setae: v1–v1 23(24–26), v2–v2 42(39–43), sc1–sc1 95(92–94), sc2–sc2 150(145–148), c1–c1 33(31–34), c2–c2 125(119–127), d1–d1 30(35–39), e1–e1 65(58–64), fl–fl 38(37), h1–h1 28(30), h2–h2 66(53–59), v1–v2 19(24–26), v2–sc1 34(25–28), sc1–sc2 45(40–53), c1–c2 46(42–48), c1–d1 44(39–44), d1–e1 39(34–40), e1–fl 37(30), fl–h1 30(23–27).

Venter (Figure 1C) — Ventral cuticle with longitudinal striae except area behind setae 4a to posterior to setae ag with transverse striae; endopodal shields absent. Length of setae: 1a 13(11–14), 1b 13(15–17), 2c 11(10–13), 3a 13(12–15), 3b 10(9), 4a 14(12–15), 4b 11(10–14), ag 11(11–13), g 9(9), ps1 7(8–10). Aggenital and genital shields with one pair of setae. Anal plate with one pair of setae.

Gnathosoma (Figures 1D–E) — Subcapitulum with one pair of subcapitular setae, m 9(8–9), two pairs of adoral setae or1 4(5–6), or2 5(4–5) (Fig. 1D). Chelicerae 39(40–43) and movable digit 28(24–26) depicted in figure 1D. Palp five-segmented, palp tarsus with one solenidion (ω) and three terminal eupathidia; palp tibia swollen, with two setae and one well developed claw and three times as long as palp tarsus; palp genu and palp femur with one dorsal seta each (Fig. 1E).

Legs (Figures 2A–D) — Leg I 117(128); leg II 113(110–118); leg III 94(96–100), leg IV 104(103–110); setal formulae of leg segments (solenidia in parentheses and not included in setal counts) as follows: coxae 2–1–1–1; trochanters 0–0–0–0; femora 2–2–2–0; genua 4(+ κ)–4–2–2; tibiae 4(+ ϕ)–1–1–1; tarsi 11(+ ω)–7(+ ω)–7–6. Length of solenidia: I ω 3(3), II ω 2(2). I ϕ 2(2), I κ 5(4–5). Setal variation on tarsi I–IV were examined, one specimen had the asymmetrical setal count of 7/8 on tarsus II and two specimens with 6/7 and 5/6 setae on tarsus IV.

Remarks — The new species *Molothrognathus kurdistaniensis* sp. nov. resembles *M. tumipalpus* Meyer and Ueckermann, 1989 in having: trochanters I–IV without seta, same dorsal integument and palp tibia swollen and three times as long as palp tarsus. However, it differs

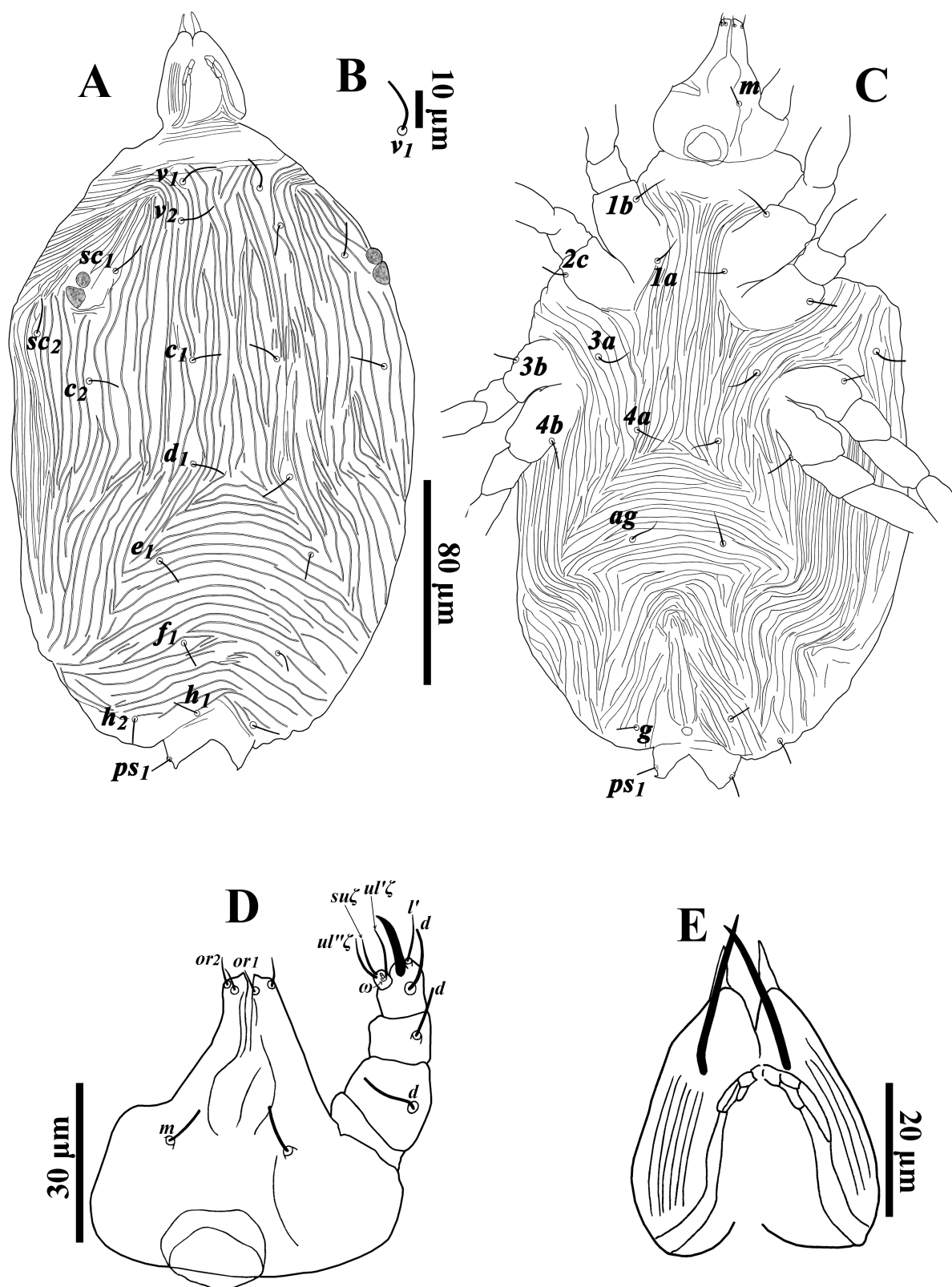


Figure 1 *Molothrognathus kurdistanensis* sp. nov. — Female: A — Dorsal view; B — Dorsal setae (v_1); C — Ventral view, D — Subcapitulum and Palp; E — Chelicerae.

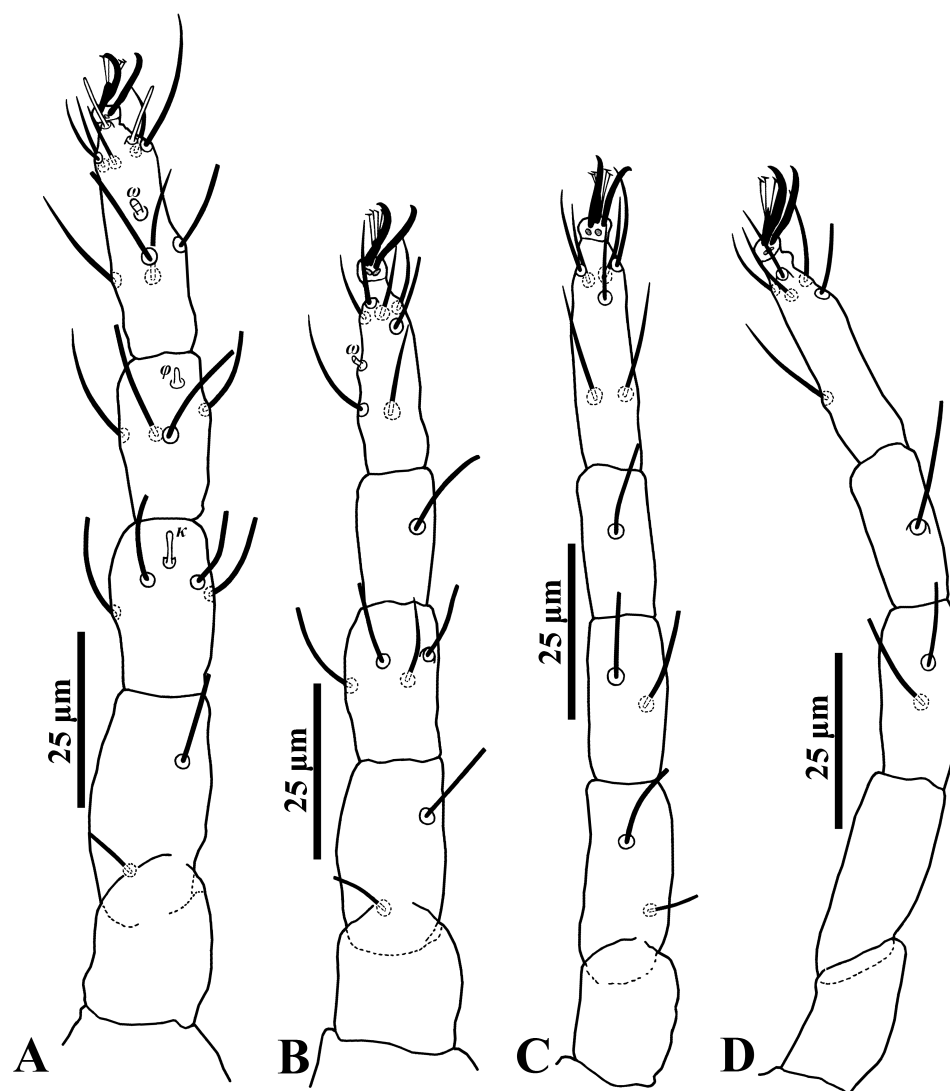


Figure 2 *Molothrognathus kurdistaniensis* sp. nov. — Female: A — Leg I; B — Leg II; C — Leg III; D — Leg IV.

from the latter in: coxa II with one seta in the new species instead of without setae; femur IV without setae in the new species versus one seta and palp tarsus with three eupathidia in *M. kurdistaniensis* sp. nov. instead of with four eupathidia in *M. tumipalpus*. The new species is also similar to *M. paratumipalpus* Bagheri, Maleki and changizi, 2013, in that palp tibia is swollen and three times as long as palp tarsus and genua II-IV with 4-2-2 setae. However, *M. kurdistaniensis* differs from the latter in: trochanters I-IV without setae instead of one seta each in *M. paratumipalpus*, dorsal cupules absent versus with three pairs of cupules in *M. paratumipalpus* and tibiae I-IV 4 (+φ)-1-1-1 in the new species instead of 5(+φ)-4-4-4 in *M. paratumipalpus*.

Male and Immature Stages — Unknown.

Etymology — The new species is named after locality of Kurdistan province, where type specimens were collected.

Key to species of the genus *Molothrognathus* in Iran (females)

1. Palptarsus small, about one-third the length of tibial claw of the palpus 2
— Palptarsus as long as or longer than the length of tibial claw of the palpus 4
2. Genua III-IV with 2 setae; coxae II with 1 seta 3
— Genua III-IV with 1 seta; tibiae III-IV with 2 setae ... *M. tumipalpus* Meyer & Ueckermann
3. Trochanters I-IV without setae; dorsal cupules absent *M. kurdistanensis* sp. nov.
— Trochanters I-IV with 1 seta; dorsal cupules present
..... *M. paratumipalpus* Bagheri, Maleki & Changizi
4. Setae *sc2* as long as *c2* and clearly longer than other dorsal setae 5
— Setae *sc2* and *c2* not equally long 7
5. Prodorsum with large shield medially; setae *sc2* and *c2* ≤ 85
..... *M. terrulentus* Meyer & Ueckermann
— Prodorsum without median shield, setae *sc2* and *c2* ≥ 98 6
6. Setae *fl* 91–123 long; tarsus I 16(+ ω) setae *M. bahariensis* Ueckermann & Khanjani
— Setae *fl* 38–44 long; tarsus I 15(+ ω) setae *M. azizi* Ueckermann & Khanjani
7. Setae *c2* as long as setae *v2* and longer than setae *v1*, *sc1*; dorsal pores absent
..... *M. minutus* Soliman
— Setae *c2* as long as or longer than setae *v1*, *v2* and *sc1*; dorsal pores present 8
8. Setae *c2* longer than setae *v1-2*, *sc1*, *c1*, *d1* and *e1*; setae *h3* present 9
— Setae *c2* as long as setae *v1-2*, *sc1*, *c1*, *d1* and *e1*; setae *h3* absent
..... *M. mikaeei* Ahaniazad & Bagheri
9. Tarsi II and IV with 9(+ ω) and 10 setae respectively *M. mehrnejadi* Liang & Zhang
— Tarsi II and IV with 10(+ ω) and 9 setae respectively 10
10. Tarsi I with 15(+ ω) setae; prodorsum medially with weak striae or smooth and shield-like 11
.....
— Tarsi I with 16(+ ω) setae, prodorsum striated medially, without shield
..... *M. fulgidus* Summers & Schlinger
11. Area between setae *v1-d1* with smooth shield; setae *h1-2* 45–56 long
..... *M. shirazicus* Khanjani, Bakhshi & Khanjani
— Area between setae *v1-d1* with weak striae; setae *h1-2* 25–32 long
..... *M. phytocolus* Meyer & Ueckermann

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