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Two new species of *Neomolgus* (Acari: Trombidiformes: Bdellidae) from Syria

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Original research

ABSTRACT

Two new species of Bdellidae, *Neomolgus neoparacapillatus* **sp. nov.** and *Neomolgus syriensis* **sp. nov.** were collected from Al-Hekr, Hama province, Syria. *Bdella captiosa* Atyeo is reported for the first time from Syria, and *Cyta kreiteri* Barbar and Ueckermann is re-observed.

Keywords snout mites; Odontoscirinae; Bdellinae; new record; systematics

Zoobank <http://zoobank.org/AE2F1BC0-22BF-48E2-83D9-56476D168928>

Introduction

Members of the family Bdellidae are considered as active running predators of small arthropods such as soft bodied insects, collembolans and mites (Gerson *et al.*, 2003; Hernandez *et al.*, 2016). Currently, the family includes 11 genera and 286 valid species (Hernandez *et al.*, 2016; Barbar and Ueckermann, 2017; Wu *et al.*, 2021a, b). Among these, twelve species belonging to six genera (*Bdella*, *Neomolgus* and *Spinibdella* one of each, two *Odontoscirus*, three *Biscirus*, and four *Cyta*) were reported from Syria. All were reported from Latakia governorates (Soliman and Zaher, 1975; Barbar, 2016; Barbar and Ueckermann, 2017). Worldwide, 55 and 28 species of *Bdella* and *Neomolgus* have been described (Hernandez *et al.*, 2016; Wu *et al.*, 2021b). In this paper, *Bdella captiosa* Atyeo (Atyeo, 1963) was recorded for the first time from Syria, *Cyta kreiteri* Barbar and Ueckermann was re-observed, and two new species of *Neomolgus* are described.

Material and methods

Bdellids were collected from leaves of *Symphytum officinale* L. (Boraginaceae) at Al-Hekr (34°54'27" N, 36°19'29" E), Hama governorate, Syria. Specimens were mounted on slides in Hoyer's medium and dried in an oven at 40 °C for one week. Mites were examined using an Olympus® CH20 microscope, identified using Hernandez *et al.*'s (2016) keys to world Bdellidae. The specimens were compared with original descriptions or re-descriptions of corresponding or related species. Measurements of new species were realized using the scale of a reticle installed on the eyepiece lens. Mite body parts were pictured using a mobile phone camera (13 megapixels) fixed on the eyepiece lens and images were transferred to the professional quality vector graphics software Inkscape® 0.92 installed on a computer for drawing with the aid of the computer's mouse. All measurements are given in micrometers (µm) and the holotype measurements are followed by measurements of the range of paratypes in parentheses. Leg length was measured from the proximal edge of the coxa to the distal end of tarsus excluding claws.


The following abbreviations are consistent with Hernandez *et al.* (2016): *vh* = ventral hypostomal setae; *ad* = adoral seta; *DHS* = dorsal hypostomal seta; *des* = dorsal end seta (palp);

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ves = ventral end seta (palp); *at* = anterior trichobothrium; *pt* = posterior trichobothrium; *mps* = median prodorsal seta; *T* = trichobothrium (leg); *sts* = simple tactile seta; *asl* = attenuate solenidion; *bsl* = blunt solenidion; *pe* = peg-like seta. Specimens were deposited in the Arthropod Collection of the Department of Plant Protection, Faculty of Agriculture, Albaath University, Homs, Syria.

Systematics

Family Bdellidae

Subfamily Bdellinae Dugès

Genus *Bdella* Latreille

Bdella captiosa Atyeo, 1963

One female was collected from *S. officinale*, 30 September 2023. This is the first report of this species from Syria. It is known from Australia, Hawaii and Iran (Hernandes *et al.*, 2016). It can be distinguished from closely related species by the following characteristics: prodorsal striae between *pt* setae longitudinal; palpal basifemora and tibiotarsi with 7 and 6 setae respectively; chelicera non-striated; genua I–IV without duplex setae; genu I with 2 solenidia; tibia I with 3 solenidia and tibia II with 2 solenidia (Atyeo, 1963; Ueckermann *et al.*, 2007; Hernandes *et al.*, 2016).

Measurements of the Syrian specimen. Body length (including gnathosoma) 791, body length (excluding gnathosoma) 575; width 278; diameter of anterior lateral eye 23, and posterior lateral eye 21, distance between two lateral eyes 10. Measurements of dorsal setae: *at* missing, *lps* 74, *mps* 69, *pt* missing, *c1* 69, *c2* missing, *d1* 69, *e1* 64, *f1* 53, *f2* 58, *h1* 62, *h2* 64. Distance between dorsal setae: *at*–*at* 106; *lps*–*lps* 138; *at*–*lps* 38; *pt*–*pt* 112; *mps*–*pt* 12; *mps*–*mps* 83; *at*–*pt* 116; *at*–*mps* 115; *c1*–*c1* 160; *c1*–*c2* 81; *d1*–*d1* 120; *e1*–*e1* 46; *f1*–*f1* 46; *f2*–*f2* 130; *h1*–*h1* 51; *c1*–*d1* 78; *d1*–*e1* 74; *e1*–*f1* 55; *f1*–*h1* 53; *h1*–*h2* 50. Subcapitulum 216 long, width at base 87, with six pairs of ventral setae; distal pair 42 and proximal 32; two pairs of short adoral setae *ad1* 12 and *ad2* 11. Chelicerae 207 long and 51 wide, with two setae, proximal 46 and distal 64; movable and fixed without teeth. Measurements of palp segments as follows: trochanter 13, basifemur 115, telofemur 25, genu 21, tibiotarsus 58, *des* 161 and *ves* 150. Measurements of legs I–IV as follows: 428, 398, 499, 572 respectively.

Subfamily Cytinae Grandjean

Genus *Cyta* von Heyden

Cyta kreiteri Barbar and Ueckermann, 2017

Two females and two males were collected from *S. officinale*, 30 September 2023. This is the second report of this species from Syria (Barbar and Ueckermann, 2017). It was also reported from Iran (Khosravinejad *et al.*, 2020).

Subfamily Odontoscirinae Grandjean

Genus *Neomolgus* Oudemans

Neomolgus neoparacapillatus sp. nov. Barbar and Hamadi

Zoobank: 815c6ab0-c79f-4f89-a5f9-1ca1027a48f5

(Figures 1–3)

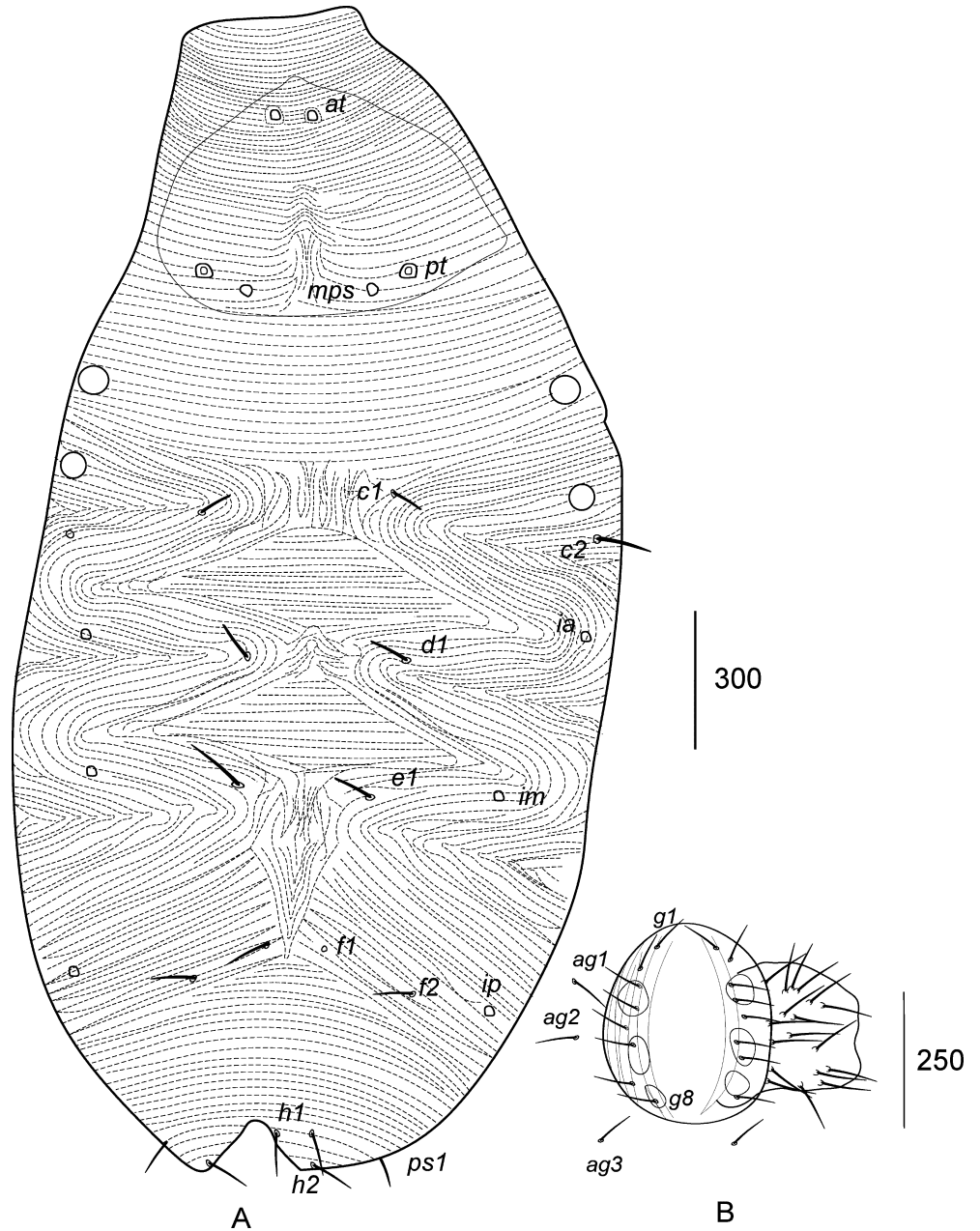


Figure 1 *Neomolgus neoparacapillatus* sp. nov. female. A – dorsum; B – genital plate and ovipositor.

Diagnosis

Subcapitulum with 6 pairs of setae, each chelicera with 20–22 setae, palp basifemur with nine setae, palp tibiotarsus with 17 setae, palp genua 3.3–4.9 the length of palp telofemora, genital plate with eight pairs of setae.

Description

Female (n = 2) — Body length (including gnathosoma) 2725 (2445), body length (excluding gnathosoma) 2000 (1790); width 1000 (1100).

Dorsum — (Figure 1A). Dorsal idiosoma with broken striae, central region between *c1*–*c1*,

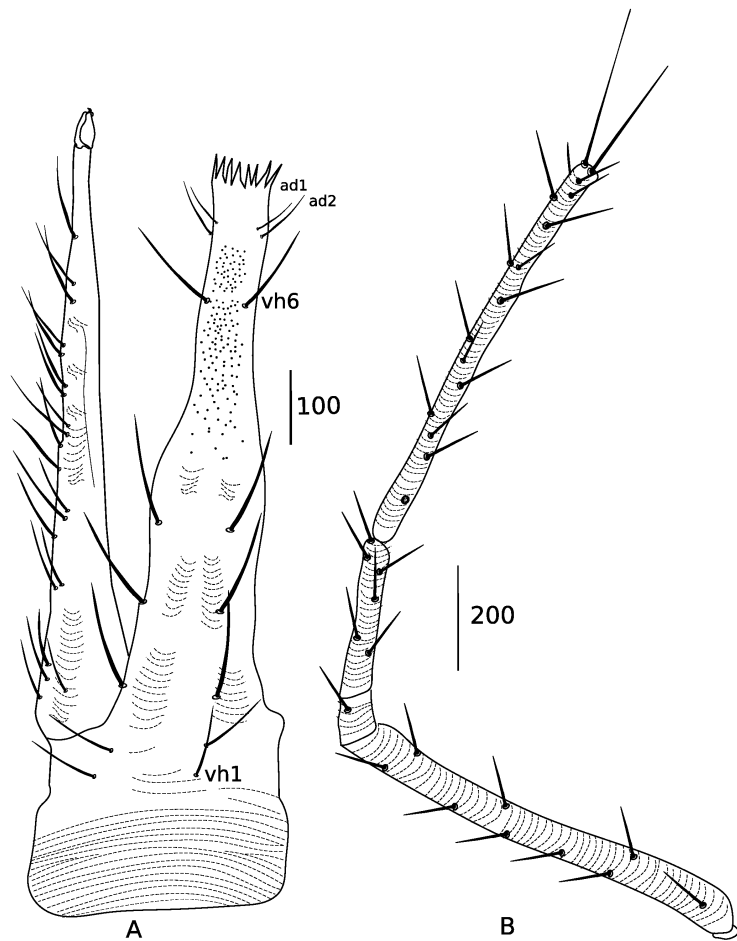


Figure 2 *Neomolgus neoparacapillatus* sp. nov. female gnathosoma. A – dubcapitulum and chelicerae; B – palp.

dl-dl and *el-el* with longitudinal and irregular striae. Regions between *cl-dl* and *dl-el* with transverse striae. Prodorsum with four eyes, diameter of anterior lateral eye 40 (36), and posterior lateral eye 43 (38), distance between two lateral eyes 96 (96). Dorsal setae smooth. Hysterosomal region with three pairs of cupules (*ia*, *im* and *ip*) at level of setae *dl*, *el* and *f2*. Measurements of dorsal setae as follows: *cl* 50 (50) partially broken, *c2* 106 (75 partially broken), *dl* 85 (85) partially broken, *el* 115 (106), *fl* 76 (65), *f2* 65 (80), *hl* 100 (82), *h2* 62 (82). Distance between dorsal setae: *at-at* 98 (74); *pt-pt* 215 (175); *mps-pt* 58 (50); *mps-mps* 317 (275); *at-pt* 317 (265); *at-mps* 325 (275); *cl-cl* 296 (280); *cl-c2* 270 (210); *dl-dl* 284 (300); *el-el* 255 (218); *fl-fl* 122 (104); *f2-f2* 342 (368); *hl-hl* 120 (144); *cl-dl* 334 (258); *dl-el* 245 (240); *el-fl* 265 (205); *fl-hl* 272 (255); *hl-h2* 92 (110).

Venter — (Figure 1B) Aggenital region with three pairs of setae (*agl-3*) and genital valves each with eight setae (*gl-8*); ovipositor with 18 setae; anal region with three pairs of smooth setae (*psl-3*).

Gnathosoma — (Figure 2A and B). Subcapitulum with transverse and broken striae, dotted in its distal half, 725 (690) long, width at base 276 (270), with six pairs of ventral setae (*vh1-6*); distal pair 108 (116) and proximal pair 94 (96); two pairs of short adoral setae *ad1* 30 (29) and *ad2* 28 (23); dorsal hypostomal setae (*DHS*) absent. Chelicerae 748 (655) long and 115 (102) wide, with 20–21 (20–22) setae [left and right chelicera respectively], proximal seta 51 (50) and distal seta 110 (115); movable and fixed digits each with one tooth; striation broken (Figure

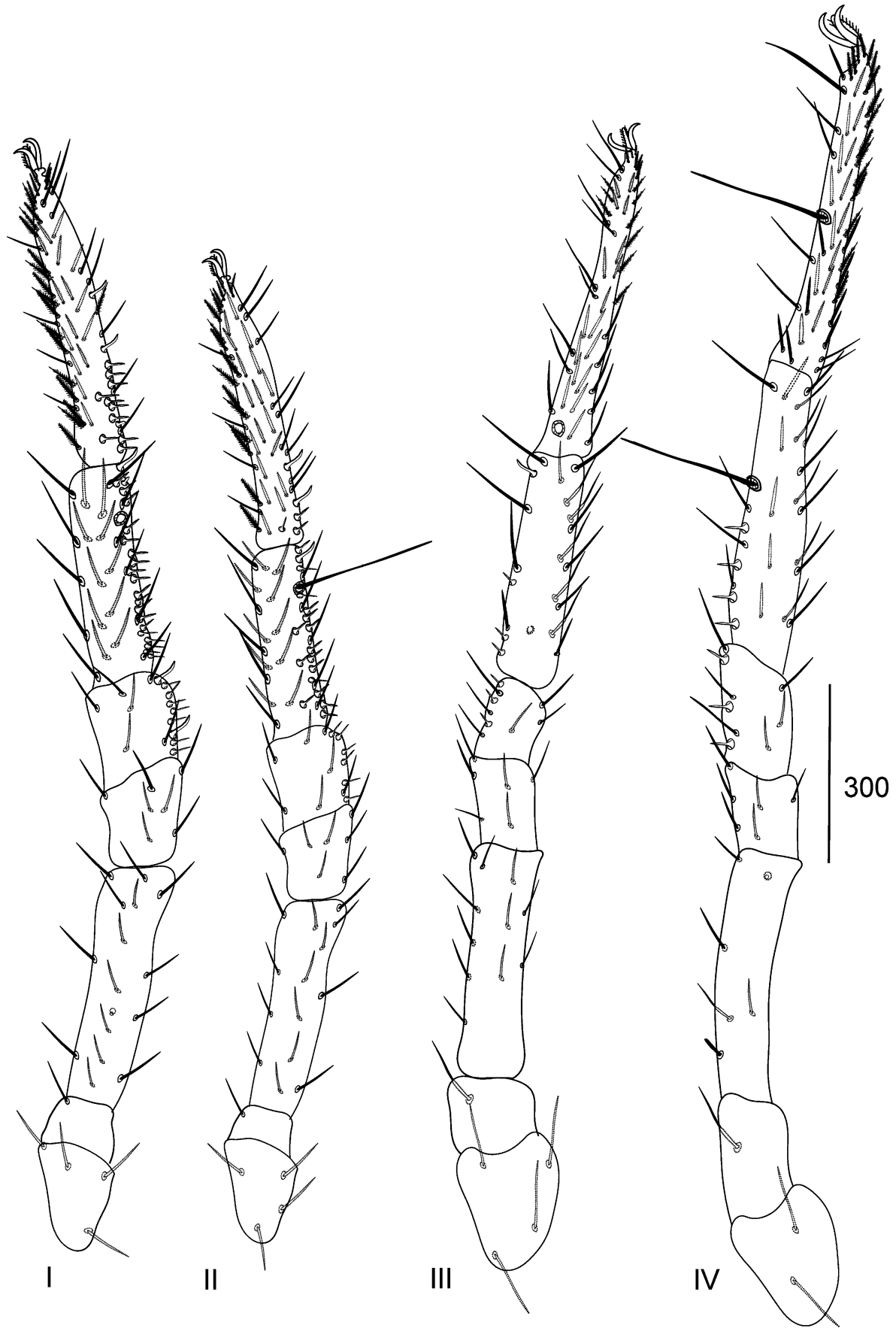


Figure 3 *Neomolgus neoparacapillatus* sp. nov. female legs I-IV

2A). palp trochanter nude, palp basifemur with nine setae; palp telofemur with one seta, palp genu with six setae; palp tibiotarsus with 17 setae: 14 *sts*, one terminal solenidion and two long terminal setae, *des* 255 (258) and *ves* 230 (245); measurements of palp segments as follows: trochanter 30 (25), basifemur 680 (667), telofemur 50 (75), genu 245 (245), tibiotarsus 700 (612); genua 3.3–4.9 the length of telofemora.

Legs — (Figure 3). Measurements of legs as follows: leg I 1731 (1667), leg II 1654 (1535), leg III 1791 (1765), leg IV 2284 (2195); setal formulae of leg segments as follows: coxae I–IV 4–4–4–2; trochanters I–IV 1–1–1–1; basifemora I–IV 16–14(15)–11(12)–6; telofemora I–IV 7–7–6–6; genua I–IV 6*sts*,7*asl*,2*bsl*–7*sts*,6*asl*–6*sts*,3*asl*–6*sts*,3*asl*; tibiae I–IV 21*sts*,19*asl*,1*bsl*,1*pe*,1*T*–20*sts*,16*asl*,1*bsl*,1*T*–16*sts*, 3*asl*,1*bsl*–20*sts*,4*asl*,1*T*; tarsi I–IV 48*sts*,10*asl*,2*bsl*,1*pe*–48*sts*,3*asl*,2*bsl*–46*sts*,1*T*–46*sts*,1*T*.

Remarks

Neomolgus neoparacapillatus sp. nov. is close to *Neomolgus paracapillatus* Michocka (Michocka, 1987) by having six pairs of setae on the subcapitulum and nine setae on the palp basifemur, but this new species differs from it by (1) having 20–22 setae on each chelicera vs. 15 setae in *N. paracapillatus* (2) having 6 and 17 setae on palp genu and tibiotarsus respectively vs. 4 and 14 setae on these segments respectively in *N. paracapillatus* (3) having longer palp basifemur (667–680), longer palp genu 245, and longer palp tibiotarsus (612–700) vs. 264, 60, and 264 for each segment respectively in *N. paracapillatus*.

Type material

One holotype female and one paratype female were collected from leaves of *S. officinale* at Al-Hekr (34°54'27" N, 36°19'29" E), Hama governorate, Syria, 17 November 2023, (Coll. Hamadi, A.).

Etymology

The specific name of the new species refers to its similarity with the species *N. paracapillatus*.

Neomolgus syriensis sp. nov. Barbar and Hamadi

Zoobank: 19fc7ff4-6a16-41a7-bae5-682e1fbedc3b

(Figures 4–6)

Diagnosis

Subcapitulum with six pairs of setae; each chelicera with 20–22 setae; palp basifemora with 10–11 setae; palp genua 1.4–1.7 the length of palp telofemora; tibiotarsus with 14 setae; genital plate with nine pairs of setae.

Description

Female (n = 4) — Body length (including gnathosoma) 1810 (1895–2195), body length (excluding gnathosoma) 1350 (1405–1680); width 644 (736–870).

Dorsum — (Figure 4a). Dorsal idiosoma with broken striae, central region of dorsum with oblique, broken and irregular striae. Prodorsum with four eyes, diameter of anterior lateral eye 40 (40–45), and posterior lateral eye 38 (40–42), distance between two lateral eyes 75 (75–94). Dorsal setae smooth. Hysterosomal region with two pairs of cupules (*ia* anterolateral to *d1* setae and *im* posterolateral to *e1* setae), *ip* cupule invisible. Measurements of dorsal setae as follows: *at* missing in all specimens, *mps* 106 (78–98), *pt* 131, *c1* 110 (92–98), *c2* 96 (94–103), *d1* 110 (88–98), *e1* 112 (96–110), *f1* 96 (76–85), *f2* 85, *h1* 74 (62–72), *h2* 76 (62–78). Distance between dorsal setae: *at*–*at* 69 (62–78); *pt*–*pt* 294 (292–330); *mps*–*pt* 58 (53–66); *mps*–*mps* 157 (198–200); *at*–*pt* 250 (246–278); *at*–*mps* 250 (228–285); *c1*–*c1* 228 (272–253); *c1*–*c2* 180 (189–202); *d1*–*d1* 255 (212); *e1*–*e1* 246 (175); *f1*–*f1* 84 (92); *f2*–*f2* 220 (232); *h1*–*h1* 65 (75);

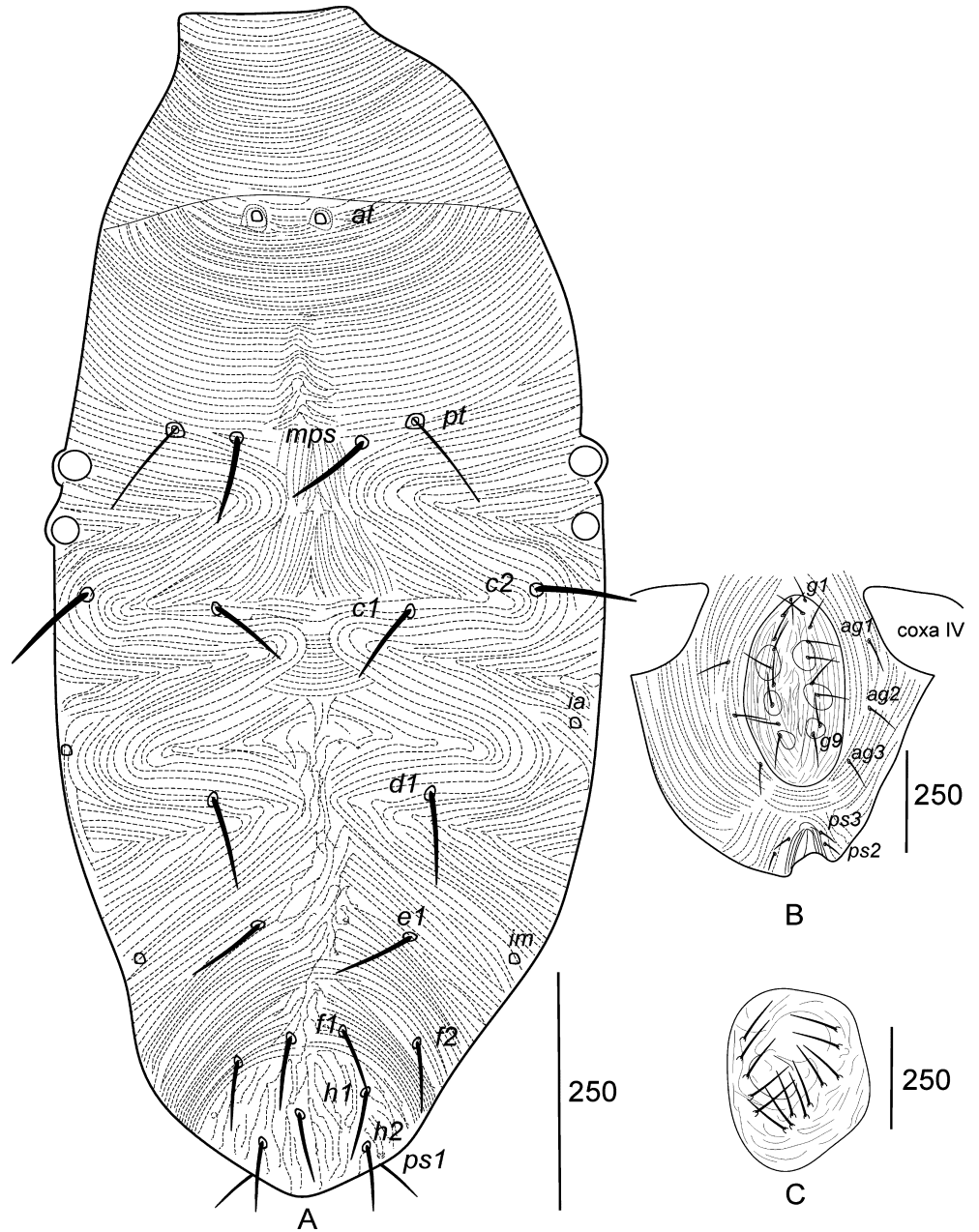


Figure 4 *Neomolgus syriensis* sp. nov. female. A – dorsum; B – genital plate; C – ovipositor.

c1–d1 212 (250–258); *d1–e1* 158 (200–212); *e1–f1* 130 (163–170); *f1–h1* 81 (130–150); *h1–h2* 69 (70–87).

Venter — (Figure 4B and C). Aggenital region with three pairs of setae (*ag1–3*) and genital valves each with nine setae (*g1–9*); ovipositor with 14 setae; anal region with three pairs of smooth setae (*ps1–3*).

Gnathosoma — (Figure 5 A and B). Subcapitulum with transverse and broken striae, 414 (414–480) long, width at base 142 (138–194), with six pairs of ventral setae (*vh1–6*); distal pair 92 (92–100) and proximal pair 57 (42–51); two pairs of short adoral setae *ad1* 23 (22–24) and *ad2* 18 (18–20); dorsal hypostomal setae (*DHS*) absent. Chelicerae 500 (470–495) long and 110 (92–114) wide, with 20 (20) [22 setae on right chelicera of the holotype, Figure 5A], proximal seta 66 (46–60) and distal seta 103 (92); movable and fixed digits each with one

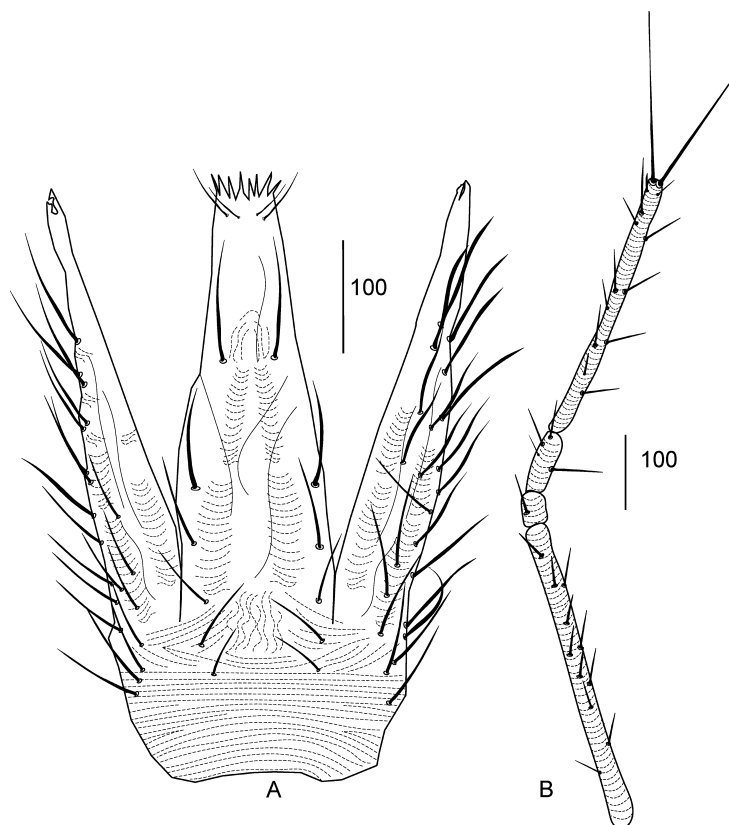


Figure 5 *Neomolgus syriensis* sp. nov. female gnathosoma. A – subcapitulum and chelicerae; B – palp.

tooth; striation broken. Palp segments were illustrated from a paratype as tibiotarsus missing in the holotype. Palp trochanter nude, palp basifemur with 10 (10) setae [11 setae on the left basifemur in a paratype, Figure 5B], palp telofemur with one seta, palp genu with four setae; tibiotarsus with 14 setae: 11*sts*, one terminal solenidion and two long terminal setae, *des* 265 and *ves* 196; measurements of palp segments as follows: trochanter 28 (28–30), basifemur 368 (368–400), telofemur 48 (53–57), genu 82 (80), tibiotarsus broken (368–373); genua 1.4–1.7 the length of telofemora.

Legs — (Figure 6). Measurements of legs as follows: leg I 1222 (1222–1318), leg II 1198 (1110–1200), leg III 1380 (1230–1290), leg IV 1538 (1454–1616); setal formulae of leg segments as follows: coxae I–IV 5–4–4–2; trochanters I–IV 1–1–1 (2 in a paratype)–1; basifemora I–IV 18–15 (16 in a paratype)–12–6; telofemora I–IV 7–7–6–6; genua I–IV 6*sts*,10*asl*–6*sts*,6*asl*–6*sts*,3*asl*–6*sts*,3*asl*; tibiae I–IV 16*sts*,10*asl*,1*bsl*,1*pe*,1*T*–15*sts*,8*asl*,1*bsl*,1*T*–16*sts*,1*bsl*–21*sts*,1*asl*–1*T*; tarsi I–IV 46*sts*,5*asl*,2*bsl*–44*sts*,1*asl*,2*bsl*–44*sts*,1*T*–36*sts*,1*T*.

Remarks

Neomolgus syriensis sp. nov. is similar to *N. paracapillatus* by having six pairs of setae on the subcapitulum and 14 setae on the palpal tibiotarsus, but the new species differs from it by (1) having 20–22 setae on each chelicera vs. 15 setae in *N. paracapillatus* (2) having simple idiosomal setae vs. setae on idiosoma plumose in *N. paracapillatus* (3) hysterosomal setae 1.55–2.8 longer than those in *N. paracapillatus* (4) body length including gnathosoma 1.5–1.8 longer than this of *N. paracapillatus* (5) palp length 1.41–1.46 longer than this of *N. paracapillatus*.

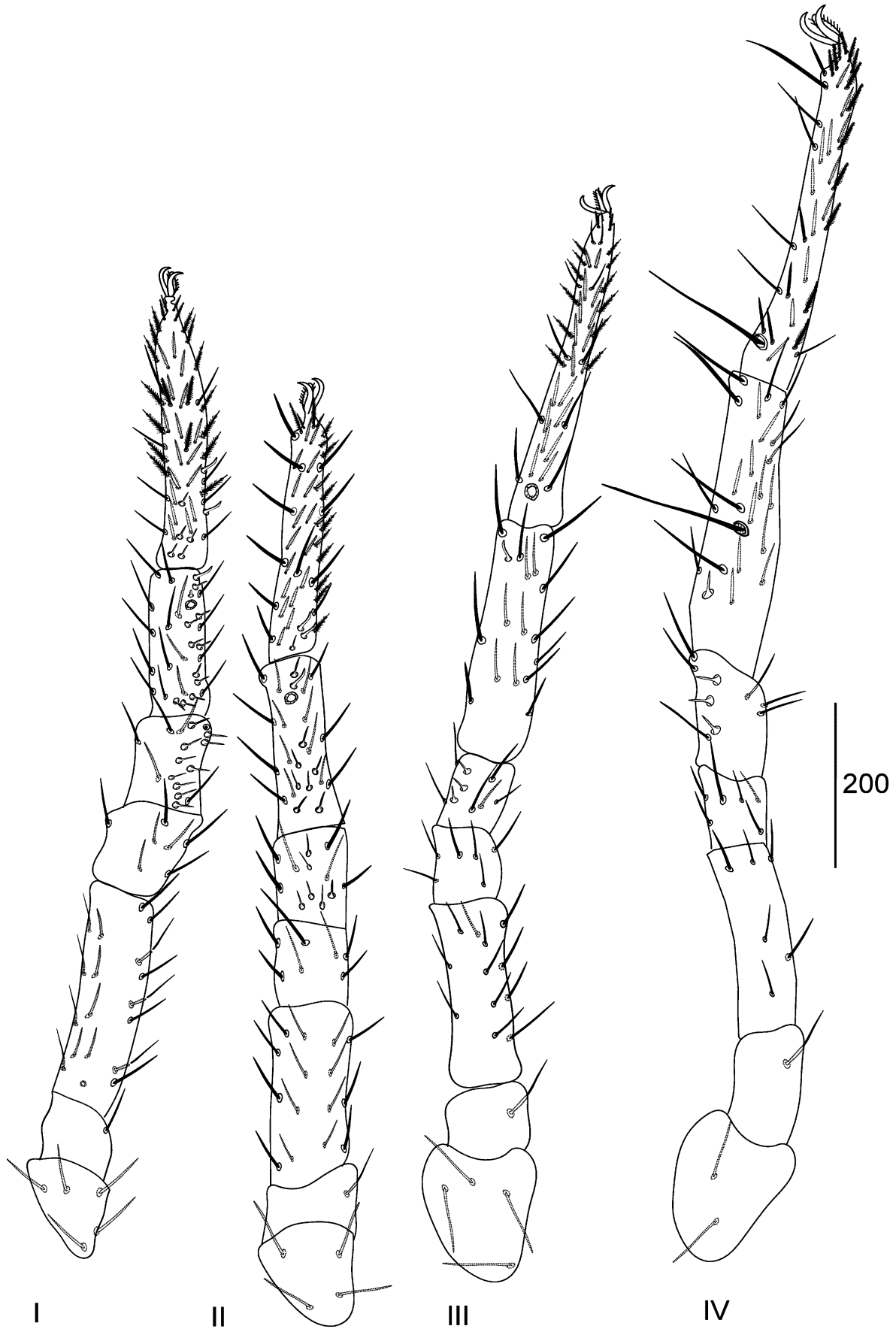


Figure 6 *Neomolgus syriensis* sp. nov. female legs I–IV.

Neomolgus syriensis **sp. nov.** is also similar to *N. neoparacapillatus* (described in the present paper) by having six pairs of setae on subcapitulum and 20–22 setae chelicerae but it differs from *N. neoparacapillatus* by (1) having four setae on pedipalpal genu vs. six setae in *N. neoparacapillatus* (2) having 14 setae on the tibiotarsus vs. 17 setae in *N. neoparacapillatus* (3) having nine setae on genital plate vs. eight setae *N. neoparacapillatus* (4) palp genua 1.4–1.7 the length of palp telofemora vs. 3.3–4.9 in *N. neoparacapillatus*. (5) having less number of solenidia on tibiae I–IV (10*asl*,1*bsl*,1*pe*,1*T*–8*asl*,1*bsl*,1*T*–1*bsl*–1*asl*–1*T* vs. 19*asl*,1*bsl*,1*pe*,1*T*–16*asl*,1*bsl*,1*T*–3*asl*,1*bsl*–4*asl*,1*T*) and on tarsi I–II (5*asl*,2*bsl*–1*asl*,2*bsl* vs. 10*asl*,2*bsl*,1*pe*–3*asl*,2*bsl*).

Type material

One holotype female and three paratype females were collected from leaves of *S. officinale* at Al-Hekr (34°54'27" N, 36°19'29" E), Hama governorate, Syria, 30 September 2023. (Coll. Hamadi, A.).

Etymology

The specific name is derived from Syria, the country where it was collected.

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