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NEW AND LITTLE-KNOWN SPECIES OF MYRMECOPHILOUS MITES OF THE GENUS *PETALOMIUM* (ACARI: HETEROSTIGMATA: NEOPYGMEPHORIDAE) FROM UKRAINE

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ABSTRACT: A new species, *Petalomium crinitus* Khaustov and Trach sp. n., collected from ants in Ukraine is described. *Petalomium lancetochaetosus* Sevastianov, 1974 and *Petalomium pseudomyrmecophilus* Mahunka, 1970 are redescribed. The latter species is recorded from Ukraine for the first time.

KEY WORDS: Neopygmephoridae, *Petalomium*, new species, redescription, ants

INTRODUCTION

The mite genus *Petalomium* Cross, 1965 (Acari: Pygmephoroidea: Neopygmephoridae) includes about 40 described species most of which are associated with different ants (Hymenoptera: Formicidae). At present 17 species of the genus *Petalomium* are recorded from Ukraine: *P. aleinikovae* (Sevastianov, 1967), *P. brevisetum* Khaustov, 2005, *P. carelitschensis* (Sevastianov, 1967), *P. chmelnickensis* (Sevastianov, 1969), *P. fimbrisetum* Ebermann and Rack, 1982, *P. formicarum* (Berlese, 1903), *P. gottrauxi* Mahunka, 1977, *P. lancetochaetosus* Sevastianov, 1974, *P. nataliae* (Sevastianov, 1967), *P. podolicus* (Sevastianov, 1967), *P. rarus* (Sevastianov, 1967), *P. sawtschuki* (Sevastianov, 1967), *P. scyphicus* (Sevastianov, 1967), *P. tauricum* Khaustov, 2005, *P. tothi* Mahunka and Zaki, 1984, *P. tumidisetosus* (Willmann, 1951), and *P. volgini* (Sevastianov, 1967) (Khaustov 2005; Sevastianov 1967, 1969, 1974, 1978). During our study of myrmecophilous mites of Ukraine, a new species of the genus *Petalomium* was found, *Petalomium crinitus*, sp. n. In this paper, we also redescribe *Petalomium lancetochaetosus* Sevastianov, 1974 (little-known species closely related to *P. crinitus*) based on the type series and additional material; and record the rare species, *Petalomium pseudomyrmecophilus* Mahunka, 1970, for the first time in Ukraine and redescribe it using our specimens.

MATERIALS AND METHODS

Mites were collected from ants and mounted in Hoyer's medium. In the taxonomic section, the terminology of idiosoma and legs follows Lindquist (1986); the nomenclature of subcapitular setae and the designation of cheliceral setae follow Grandjean (1944, 1947), respectively. The system of Pygmephoroidea follows Khaustov (2004, 2008). All measurements are given in micrometers (μm). For leg chaetotaxy the number of solenidia is given in parenthesis.

SYSTEMATICS

Family Neopygmephoridae Cross, 1965

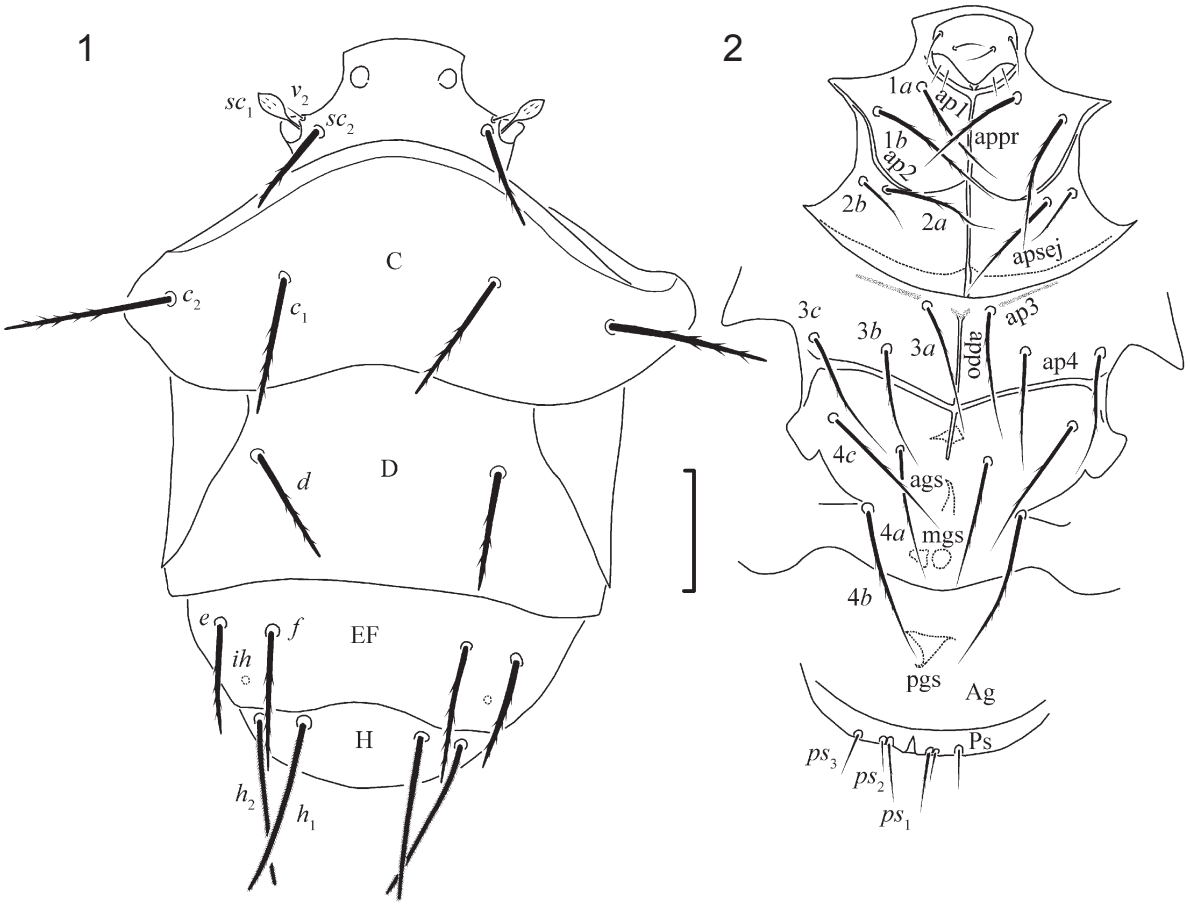
Genus *Petalomium* Cross, 1965

Petalomium crinitus Khaustov and Trach sp. n.

Figs 1–5

Description. Female. Gnathosoma (Fig. 2). Gnathosomal capsule semioval, slightly shorter than its width. Dorsally with 2 pairs of smooth, subequal setae (*cha, chb*). Dorsal medial apodeme inconspicuous. Ventral gnathosoma with 1 pair of subcapitular setae *m*. Palps freely articulated to gnathosomal capsule with subequal setae *dFe* and *dGe* dorsolaterally, 1 small solenidion, accessory setigenous structure ventrally, and small claw at tip. Pharyngeal pumps indistinct.

Idiosomal dorsum (Fig. 1). Idiosomal length 286 (308), width 193 (220). Prodorsum with 2 pairs of setae (v_2, sc_2), 1 pair of clavate and weakly barbed trichobothria (sc_1) and 1 pair of round stigmata. All dorsal plates smooth. Setae v_2 smooth, other dorsal setae distinctly barbed and blunt-ended. Setae h_1 and h_2 densely covered by numerous and thin barbs (pubescent), other dorsal setae sparsely barbed. Posterior margins of tergites C and EF distinctly concave. Length of dorsal setae: v_2 9 (10), sc_2 45 (41), c_1 55 (57), c_2 67 (68), *d* 52 (56), *e* 49 (50), *f* 57 (56), h_1 74 (72), h_2 72 (72). Distances between dorsal setae: v_2–v_2 71 (70), sc_2–sc_2 67 (64), c_1–c_1 80 (89), c_1–c_2 47 (50), *d*–*d* 90 (98), *e*–*f* 22 (22), *f*–*f* 75 (80), h_1–h_1 45 (47), h_1–h_2 14 (18).



Figs 1–2. *Petalomium crinitus* Khaustov and Trach sp. n., female: 1 — idiosomal dorsum, 2 — idiosomal venter. Scale bar 50 μm.

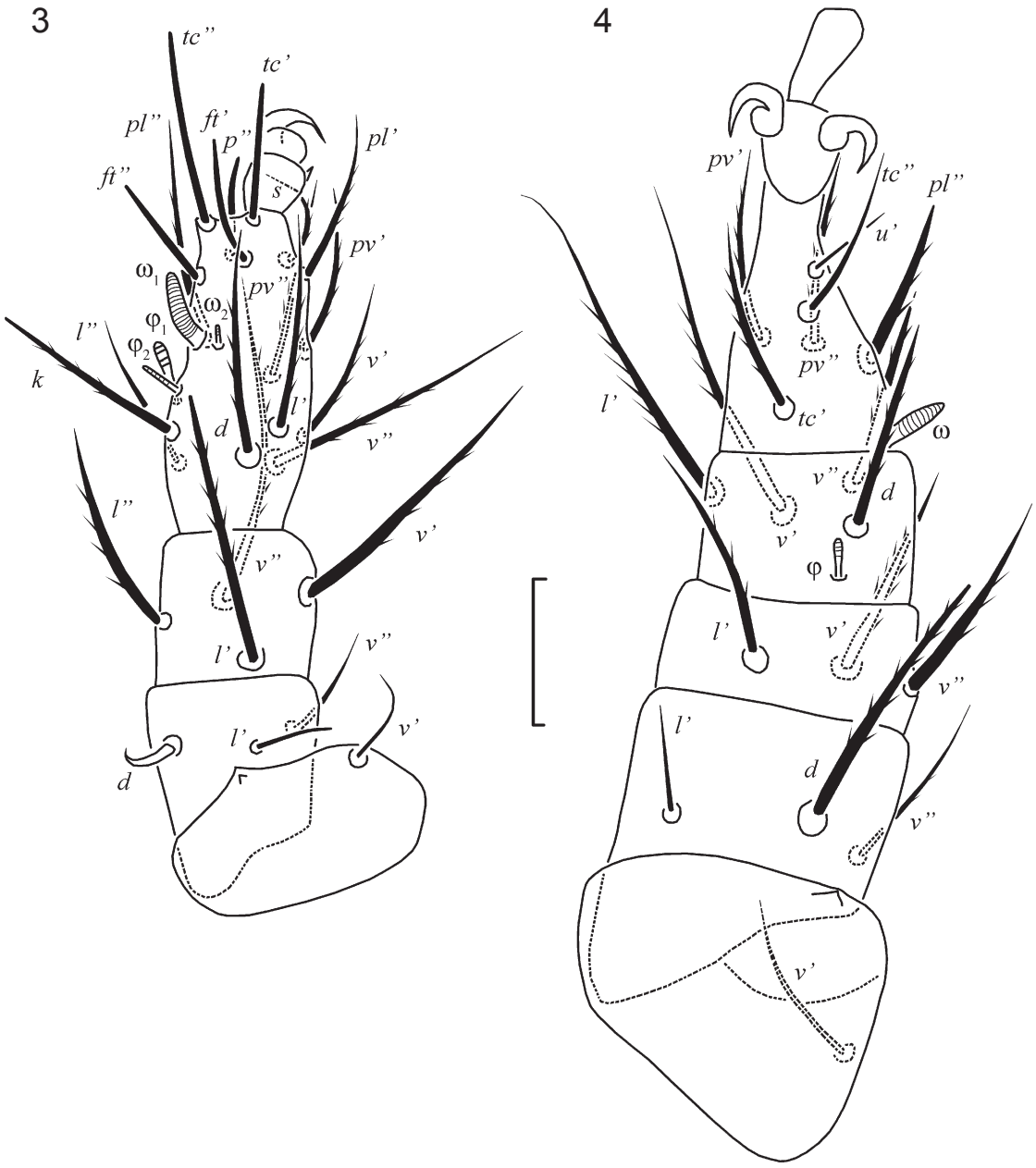
Idiosomal venter (Fig. 2). Setae ps_1 and all setae of anterior and posterior sterna plates sparsely barbed, pointed. Setae ps_2 and ps_3 smooth. Setae 1*b* not bifurcate. All ventral plates smooth. Apodemes 1 (ap1) and apodemes 2 (ap2) well developed and joined with presternal apodeme (appr); presternal and sejugal (apsej) apodemes well developed; apodemes 3 (ap3) weakly sclerotized, straight and diffuse. Apodemes 4 (ap4) well sclerotized and long, apodemes 5 absent. Posterior margin of posterior sternal plate distinctly convex in middle part. Posterior margin of aggenital plate rounded. Anterior genital sclerite (ags) bell-like, posterior genital sclerite (pgs) triangular, median genital sclerite (mgs) well developed, rounded. Length of ventral setae: 1*a* 51 (47), 1*b* 56 (57), 2*a* 56 (52), 2*b* 28 (33), 3*a* 57 (61), 3*b* 52 (53), 3*c* 54 (59), 4*a* 53 (54), 4*b* 68 (75), 4*c* 58 (65), ps_1 32 (35), ps_2 12 (17), ps_3 20 (21).

Legs (Figs 3–5). Leg I (Fig. 3) distinctly shorter and thinner than leg II. Setal formula: 1–3–4–16(4). Tibiotarsus not thickened, with terminal claw situated on distinct pretarsus, tip of its claw thin. Length of solenidia ω_1 11 (11) > ω_2 2 (3) < φ_1 9 (10) > φ_2 6 (8); ω_2 and φ_2 baculiform, φ_1 clavate, ω_1 finger-shaped. Eupathidium *tc''* situated on small pinnaculum. Setae *dFe* broadened, hook-like. Setae *l'FeI*, *l'GeI* and *k* blunt-ended. Leg II (Fig. 4). Setal formula: 1–3–3–4(1)–6(1). Tarsus with sickle-like, padded claws and large empodium. Solenidion ω 10 (9), finger-shaped, solenidion φ 4 (5) weakly clavate. Setae *dFeII* blunt-ended. Leg III. Setal formula: 1–2–2–4(1)–6. Claws of same shape as on tarsus II. Solenidion φ 4 (5) weakly clavate. Setae *dFeIII* blunt-ended. Leg IV (Fig. 5). Setal formula: 1–2–1–4(1)–6. Tarsus long and thin, pretarsus relatively short with two small simple claws and small empodium. Solenidion φ 11 (12) long, weakly clavate. Setae *dFeIV*, *v'GeIV*, and *v''TiIV* blunt-ended. Setae *v'TiIV* broadened, lanceolate and pubescent.

Male and **larva** unknown.

Type material. Female holotype, slide VT102010, Ukraine, Odessa Prov., Anan'ev Reg., vicinity of settl. Strutynka, 47°57′ N, 29°50′ E, on ants *Lasius* sp., 10 October 2010, coll. V.A. Trach; one female paratype with same data as holotype.

Type depositories. The holotype of new species is deposited in the collection of the Nikita Botanical Gardens — National Scientific Center,



Figs 3–4. *Petalomium crinitus* Khaustov and Trach sp. n., female: 3–4 — legs I and II, respectively. Scale bar 20 μm.

Yalta, Ukraine; one female paratype is in the collection of the Zoological Museum of I.I. Mechnikov Odessa National University, Ukraine.

Differential diagnosis. By the presence of the broadened lanceolate setae *v'* on tibia IV, the new species is similar to *Petalomium lancetochaetosus* Sevastianov, 1974. But differs by the pubescent setae h_1 and h_2 (sparsely barbed in *P. lancetochaetosus*), the blunt-ended setae c_1, c_2, and h_2 (pointed in *P. lancetochaetosus*), setae *e* distinctly shorter than *f* (*e* longer than *f* in *P. lancetochaetosus*), apodemes 2 joined with appr (ap2 not joined with appr in *P. lancetochaetosus*), and setae ps_2 shorter than ps_3 (ps_2 slightly longer than ps_3 in *P. lancetochaetosus*). Unfortunately, the original description of *P. lancetochaetosus* is incomplete and we provide redescription of *P. lancetochaetosus* below.

Etymology. The species name, *crinitus* (hairy, Lat.), refers to the presence of the "fluffy" setae h_1 and h_2.

Petalomium lancetochaetosus Sevastianov, 1974

Figs 6–10

Petalomium lancetochaetosus Sevastianov, 1974, p. 855, figs 7–9.

Redescription. Female. Gnathosoma (Figs 6–7). Similar to that of *P. crinitus* sp. n.

Idiosomal dorsum (Fig. 6). Idiosomal length 341–347, width 198–220. Prodorsum with 2 pairs

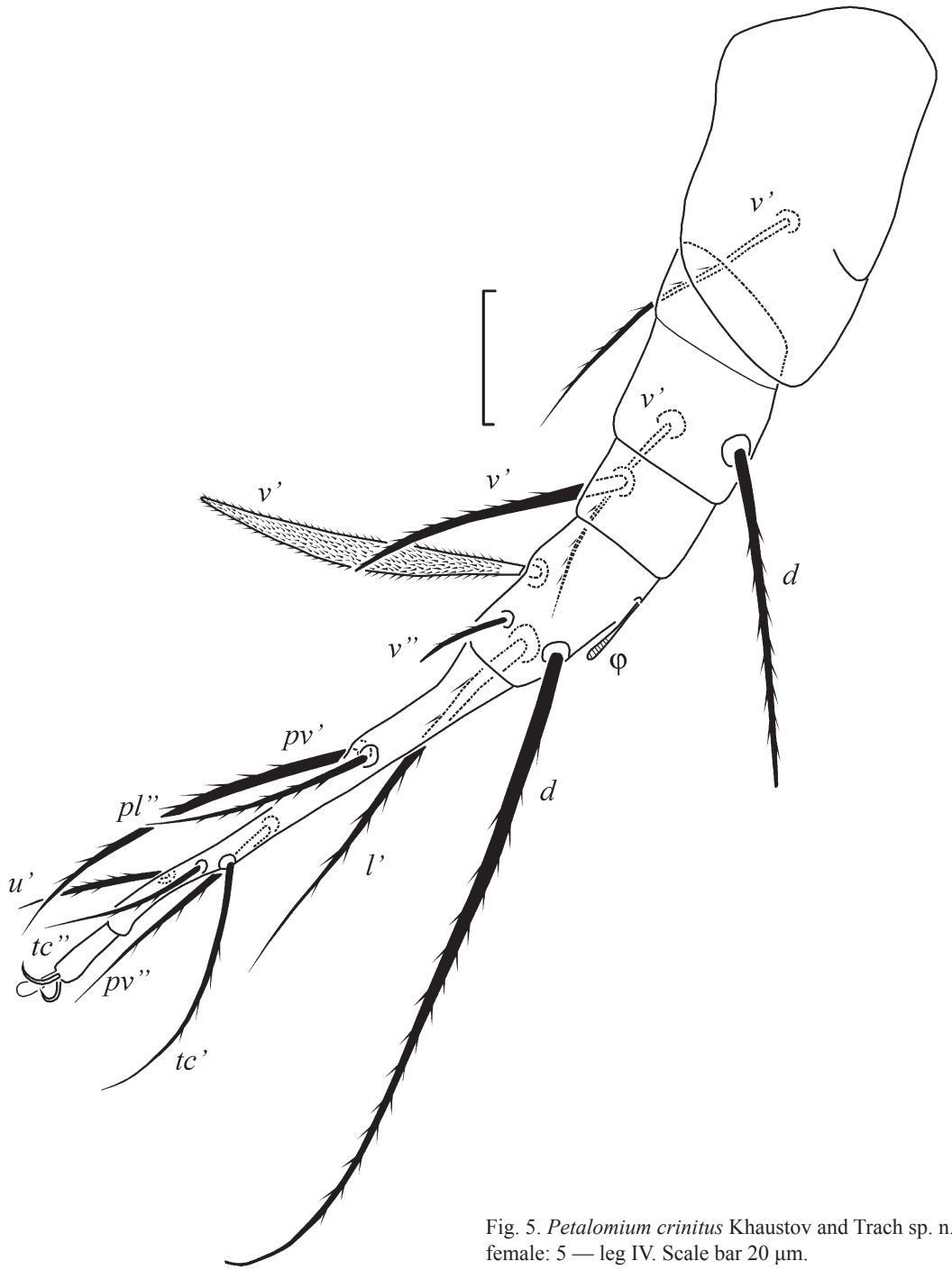
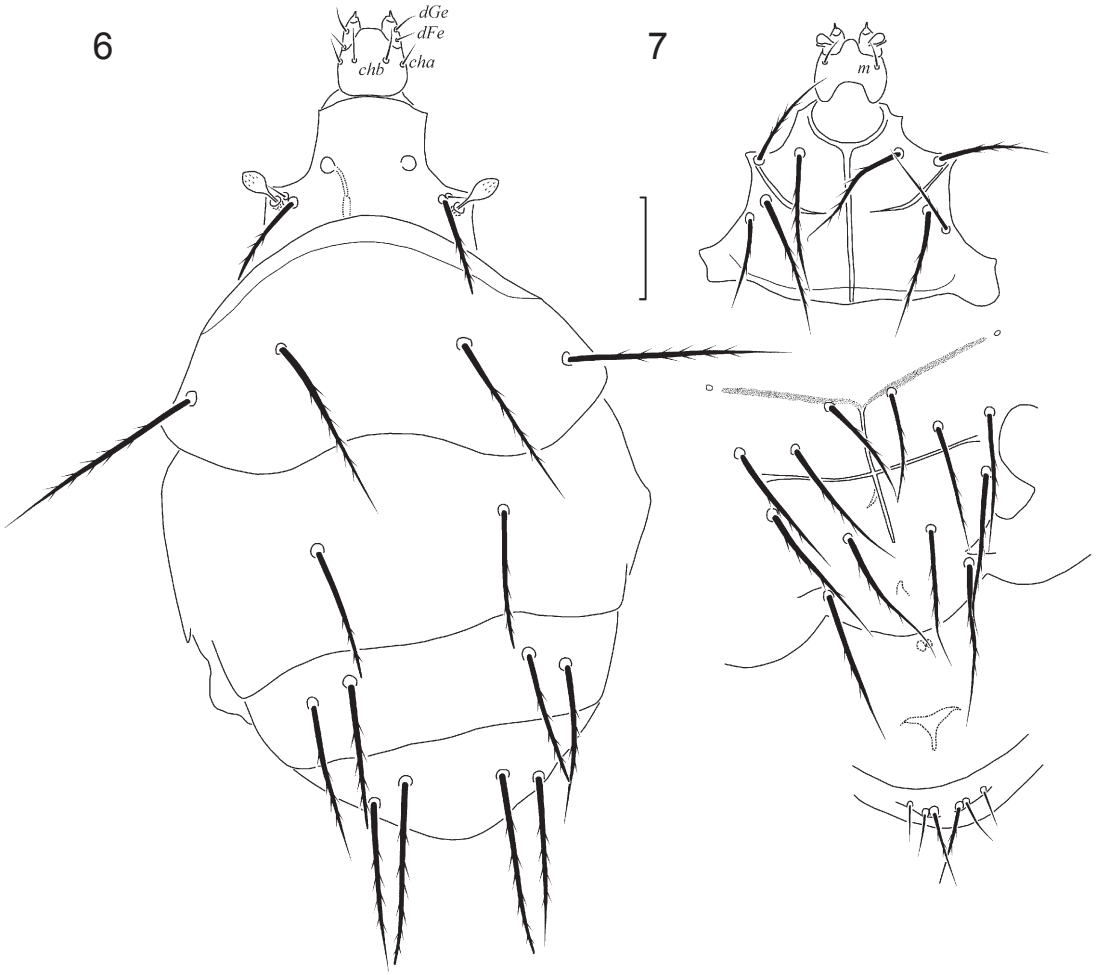


Fig. 5. *Petalomium crinitus* Khaustov and Trach sp. n., female: 5 — leg IV. Scale bar 20 μm.

of setae, 1 pair of clavate and weakly barbed trichobothria, and 1 pair of round stigmata. All dorsal plates smooth. Setae v_2 smooth, other dorsal setae distinctly barbed. Setae sc_2, *d*, *f*, and h_1 blunt-ended, other dorsal setae pointed. Posterior margin of tergite C distinctly concave. Length of dorsal setae: v_2 7–8, sc_2 41–50, c_1 84–85, c_2 107–108, *d* 59–65, *e* 78–84, *f* 66–67, h_1 83–87, h_2 83–84. Distances between dorsal setae: v_2–v_2 70–72, sc_2–sc_2 67, c_1–c_1 85–95, c_1–c_2 49–52, *d*–*d* 86–103, *e*–*f* 18–21, *f*–*f* 85–92, h_1–h_1 43–44, h_1–h_2 17–18.

Idiosomal venter (Fig. 7). Setae ps_1 and all setae of anterior and posterior sternal plates sparsely barbed, pointed. Setae ps_2 and ps_3 smooth. Setae 1*b* not bifurcated. All ventral plates smooth. Ap1 and ap2 well developed, ap2 not joined with appr; appr and apsej well developed; ap3 weakly sclerotized, straight and diffuse. Ap4 well sclerotized and long, apodemes 5 absent. Posterior margin of posterior sternal plate distinctly convex in middle part. Posterior margin of aggenital plate rounded. Ags bell-like, pgs triangular, mgs well developed,



Figs 6–7. *Petalomium lancetochaetosus* Sevastianov, 1974, female: 6 — idiosomal dorsum, 7 — idiosomal venter. Scale bar 50 μm.

rounded. Length of ventral setae: 1*a* 58–63, 1*b* 52–54, 2*a* 63–65, 2*b* 42–43, 3*a* 53–55, 3*b* 68–69, 3*c* 62–63, 4*a* 69–78, 4*b* 75–82, 4*c* 73–82, ps_1 43–44, ps_2 28–30, ps_3 20–22.

Legs (Figs 8–10). Leg chaetotaxy as in *P. crinitus* sp. n. Leg I (Fig. 8) slightly shorter and thinner than leg II. Tibiotarsus not thickened, with terminal claw situated on distinct pretarsus, tip of the claw thin. Length of solenidia ω_1 16–17 > ω_2 3–4 < φ_1 10–11 > φ_2 8–9; ω_2 and φ_2 baculiform, φ_1 clavate, ω_1 finger-shaped. Eupathidium *tc"* situated on small pinnaculum. Setae *dFe* broadened, hook-like. Setae *l'FeI*, *l'GeI* and *k* blunt-ended. Leg II (Fig. 9). Tarsus with sickle-like padded claws and large empodium. Solenidion ω (12–15), finger-shaped, solenidion φ (6) weakly clavate. Setae *dFeII* blunt-ended. Leg III. Claws of same shape as on tarsus II. Solenidion φ (5–6) weakly clavate. Setae *dFeIII* blunt-ended. Leg IV (Fig. 10). Tarsus long and thin, pretarsus relatively short with two small simple claws and small empodium. Solenidion φ (10–11) long, weakly clavate. Setae *dFeIV* blunt-ended. Setae *v'TiIV* broadened, lanceolate and pubescent.

Male and **larva** unknown.

Material studied. One female paratype, Ukraine, Khmelnitsk prov., vicinity of settl. Chemerovtsy, in nest of ants *Lasius umbratus*, 26 August 1960, coll. V.D. Sevastianov; one female, Ukraine, Odessa Prov., Belyaevsky Reg., vicinity of settl. Kholodnaya balka, 46°35′ N, 30°36′ E, on ants, 2 May 2010, coll. V.A. Trach.

Distribution. This species currently known only from Ukraine (Sevastianov 1974).

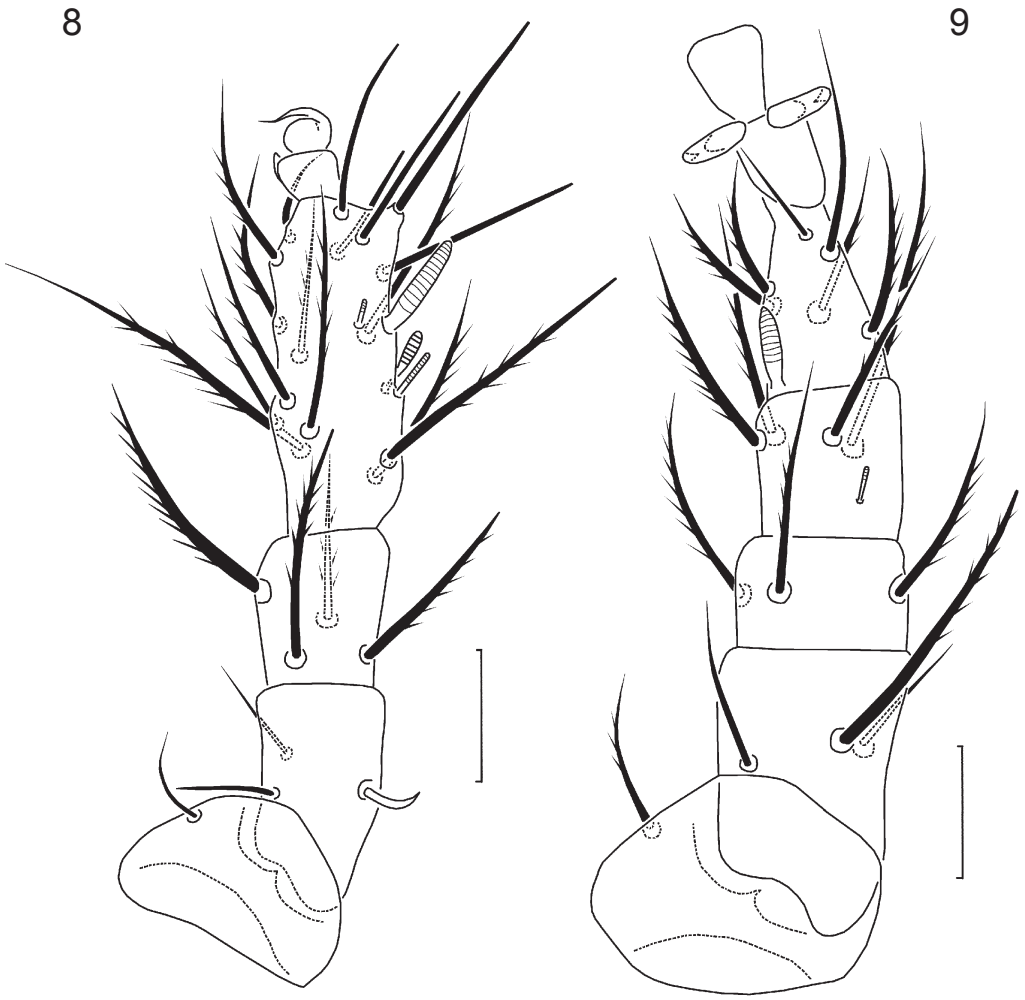
Petalomium pseudomyrmecophilus Mahunka, 1970

Figs 11–15

Petalomium pseudomyrmecophilus Mahunka, 1970, p. 162, fig. 14.

Redescription. Female. Gnathosoma (Figs 11–12). Similar to that of *P. lancetochaetosus*.

Idiosomal dorsum (Fig. 11). Idiosomal length 385, width 264. Prodorsum with 2 pairs of setae, 1



Figs 8–9. *Petalomium lancetochaetosus* Sevastianov, 1974, female: 8–9 — legs I and II, respectively. Scale bar 20 μm.

pair of capitate and weakly barbed trichobothria and 1 pair of round stigmata. All dorsal plates smooth. Setae v_2 smooth, other dorsal setae distinctly barbed. Setae sc_2, *d*, *f*, and h_1 blunt-ended, other dorsal setae pointed. Posterior margins of tergites C and EF distinctly concave. Length of dorsal setae: v_2 11, sc_2 36, c_1 94, c_2 106, *d* 63, *e* 70, *f* 79, h_1 87–92, h_2 79. Distances between dorsal setae: v_2–v_2 79, sc_2–sc_2 74, c_1–c_1 100, c_1–c_2 56, *d*–*d* 105, *e*–*f* 21, *f*–*f* 96, h_1–h_1 45, h_1–h_2 23.

Idiosomal venter (Fig. 12). Setae ps_1–ps_2 and all setae of anterior and posterior sterna plates sparsely barbed. Setae ps_3 smooth. Setae ps_1–ps_2 blunt-ended, other ventral setae pointed. Setae 1*b* not bifurcated. All ventral plates smooth. Ap1 and ap2 well developed and joined with appr; appr and apsej well developed; ap3 well sclerotized, straight. Ap4 well sclerotized and long, apodemes 5 absent. Posterior margin of posterior sternal plate distinctly convex in middle. Posterior margin of aggenital plate almost straight. Ags bell-like, pgs triangular, mgs small, rounded. Length of ventral setae: 1*a* 59, 1*b* 53, 2*a* 68, 2*b* 46, 3*a* 58, 3*b* 64, 3*c* 62, 4*a* 68, 4*b* 79, 4*c* 80, ps_1 50, ps_2 33, ps_3 24.

Legs (Figs 13–15). Leg chaetotaxy as in *P. crinitus* sp. n. Leg I (Fig. 13) slightly shorter and thinner than leg II. Tibiotarsus not thickened, with terminal claw situated on distinct pretarsus, tip of the claw thin. Length of solenidia ω_1 14 > ω_2 4 < φ_1 10 = φ_2 10; ω_2 and φ_2 baculiform, φ_1 clavate, ω_1 finger-shaped. Eupathidium *tc"* situated on distinct pinnaculum. Setae *dFe* broadened, hook-like. Setae *l'FeI*, *l'GeI* and *k* blunt-ended. Leg II (Fig. 14). Tarsus with sickle-like padded claws and large empodium. Solenidion ω (13), finger-shaped, solenidion φ (6) weakly clavate. Setae *dFeII* blunt-ended. Leg III. Claws of same shape as on tarsus II. Solenidion φ (7) weakly clavate. Setae *dFeIII* blunt-ended. Leg IV (Fig. 15). Tarsus long and thin, pretarsus relatively long, with two small simple claws and small empodium. Solenidion φ (10), weakly clavate. Setae *dFeIV*, *v'GeIV*, *v'TiIV* blunt-ended.

Fig. 10. *Petalomium lancetochaetosus* Sevastianov, 1974, female: 10 — leg IV. Scale bar 20 μm.

Male and **larva** unknown.

Material studied. One female, Ukraine, Odessa Prov., Belyaevsky Reg., vicinity of settl. Kholodnaya balka, on ants, 2 May 2010, coll. V.A. Trach.

Distribution. This species was described from Hungary (Mahunka 1970), and later recorded from Switzerland from *Lasius umbratus* (Nylander) (Mahunka 1977). This is a new record for the Ukrainian fauna.

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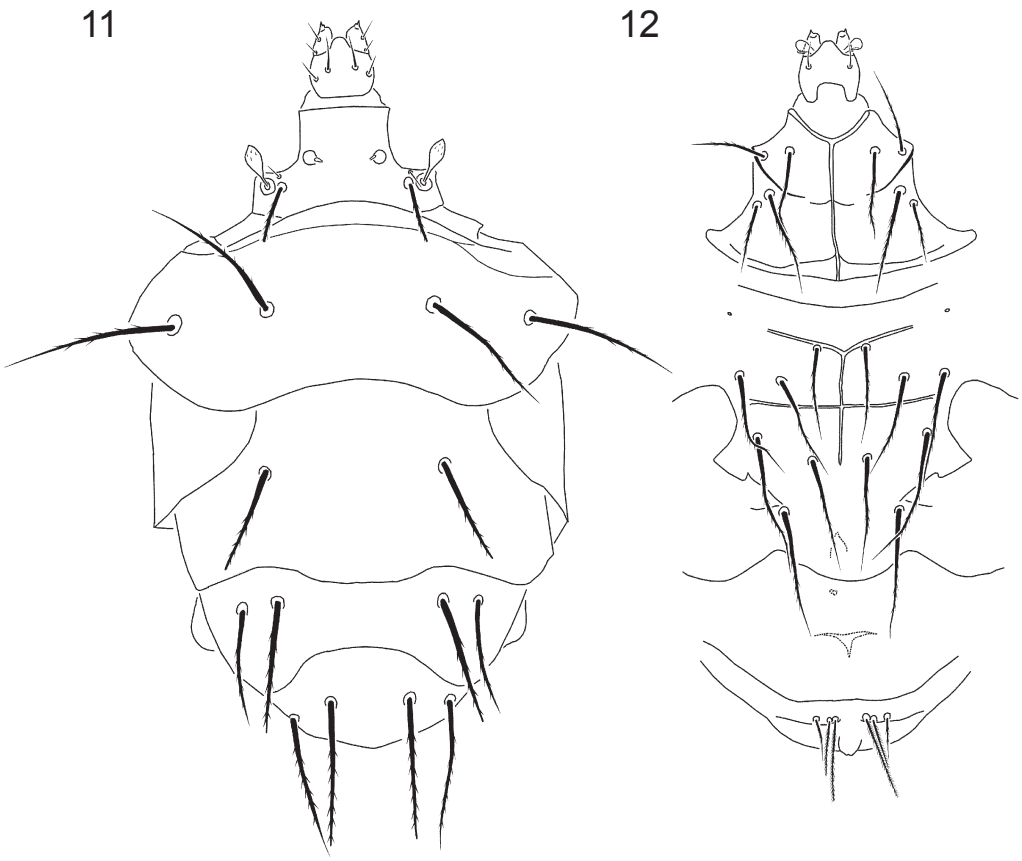
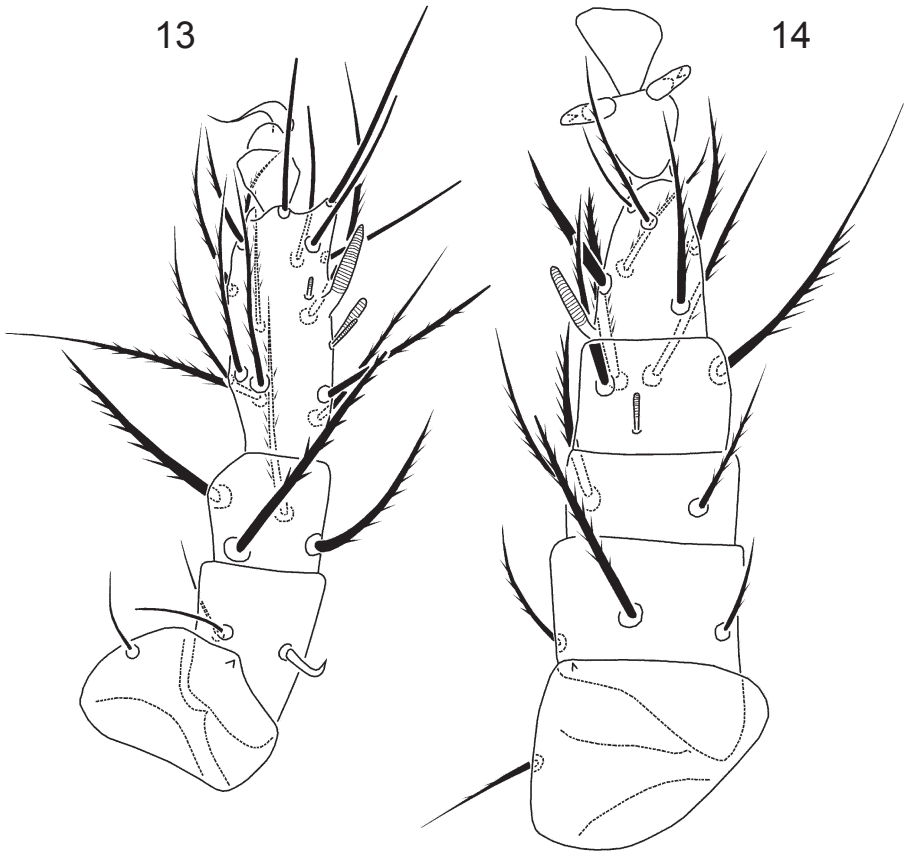


Figs 11–12. *Petalomium pseudomyrmecophilus* Mahunka, 1970, female: 11 — idiosomal dorsum, 12 — idiosomal venter. Scale bar 50 μm.



Figs 13–14. *Petalomium pseudomyrmecophilus* Mahunka, 1970, female: 13–14 — legs I and II, respectively. Scale bar 20 μm.

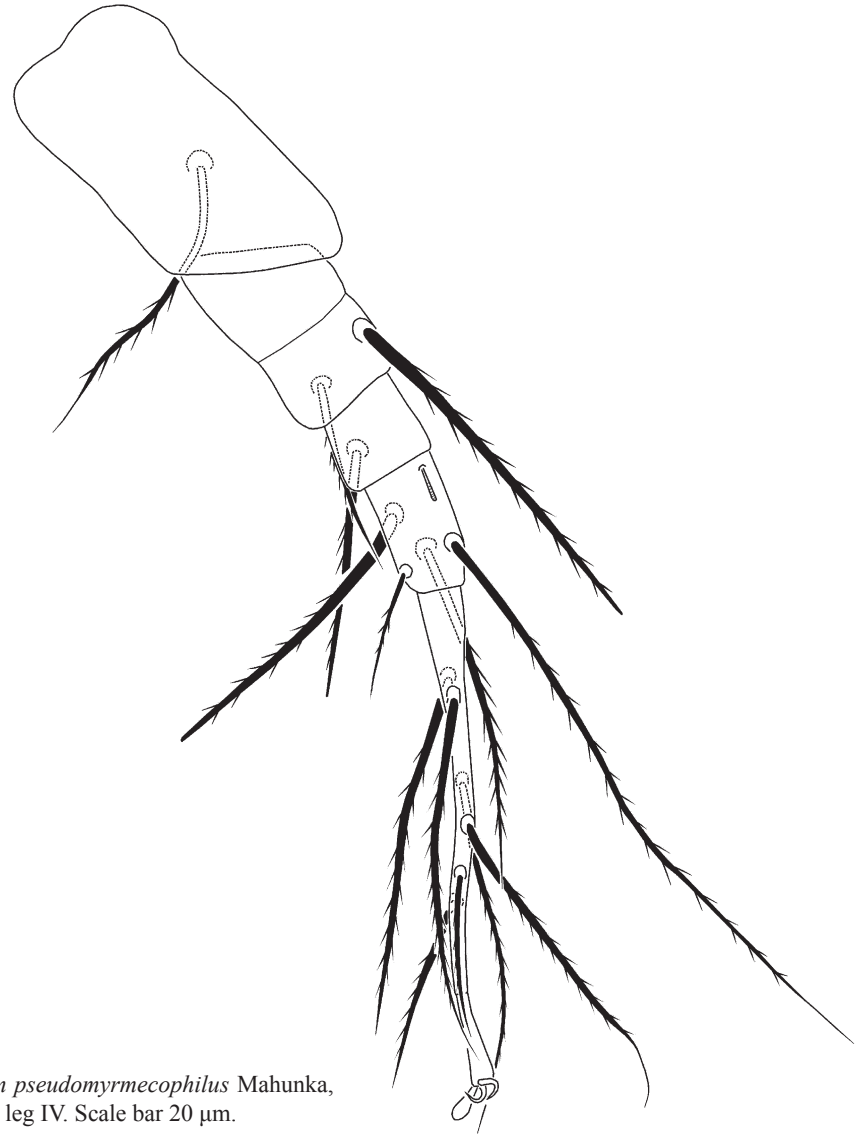


Fig. 15. *Petalomium pseudomyrmecophilus* Mahunka, 1970, female: 15 — leg IV. Scale bar 20 μm.

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