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A NEW SPECIES OF THE GENUS *PETALOMIUM* (ACARI: HETEROSTIGMATINA: NEOPYGMEPHORIDAE) FROM WESTERN SIBERIA WITH REDESCRIPTION OF *PETALOMIUM NATALIAE* (SEVASTIANOV, 1967)

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ABSTRACT: A new species of the genus *Petalomium* Cross, 1965 (Acari: Pygmephoroidea: Neopygmephoridae), *E. kurosai* sp. n. is described from ants (Hymenoptera: Formicidae) in Western Siberia, Russia. A closely related species, *P. nataliae* (Sevastianov, 1967) is recorded from Russia for the first time and redescribed.

KEY WORDS: Acari, Heterostigmata, systematics, phoresy, 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) (Khaustov and Trach 2013). At present 14 species of the genus *Petalomium* are recorded from Russia: *P. aleinikovae* (Sevastianov, 1967), *P. brevisetum* Khaustov, 2005, *P. carelitschensis* (Sevastianov, 1967), *P. fimbrisetum* Ebermann et Rack, 1982, *P. formicarum* (Berlese, 1903), *P. gottrauxi* Mahunka, 1977, *P. podolicus* (Sevastianov, 1967), *P. rarus* (Sevastianov, 1967), *P. sawtschuki* (Sevastianov, 1967), *P. scyphicus* (Sevastianov, 1967), *P. tauricum* Khaustov, 2005, *P. tothi* Mahunka et Zaki, 1984, *P. tumidisetosus* (Willmann, 1951), and *P. uralensis* Sevastianov, 1974 (Khaustov 2005; Sevastianov 1967, 1974, 1978). During a study of myrmecophilous mites of Western Siberia, a new species of the genus *Petalomium* was found, *Petalomium kurosai*, sp. n. We also redescribe *Petalomium nataliae* Sevastianov, 1967 (newly recorded from Russia species closely related to *P. kurosai*) based on the paratype and additional specimens from Western Siberia.

MATERIALS AND METHODS

Mites were collected from ants and mounted in Hoyer's medium. 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. Systematics of Pygmephoroidea follows Khaustov (2004, 2008). All measurements are given in micrometers (μm). For leg chaetotaxy the number of solenidia is given in parentheses. The type material is deposited in the mite collection of the Tyumen State University Museum of Zoology, Tyumen, Russia.

SYSTEMATICS

Family Neopygmephoridae Cross, 1965

Genus *Petalomium* Cross, 1965

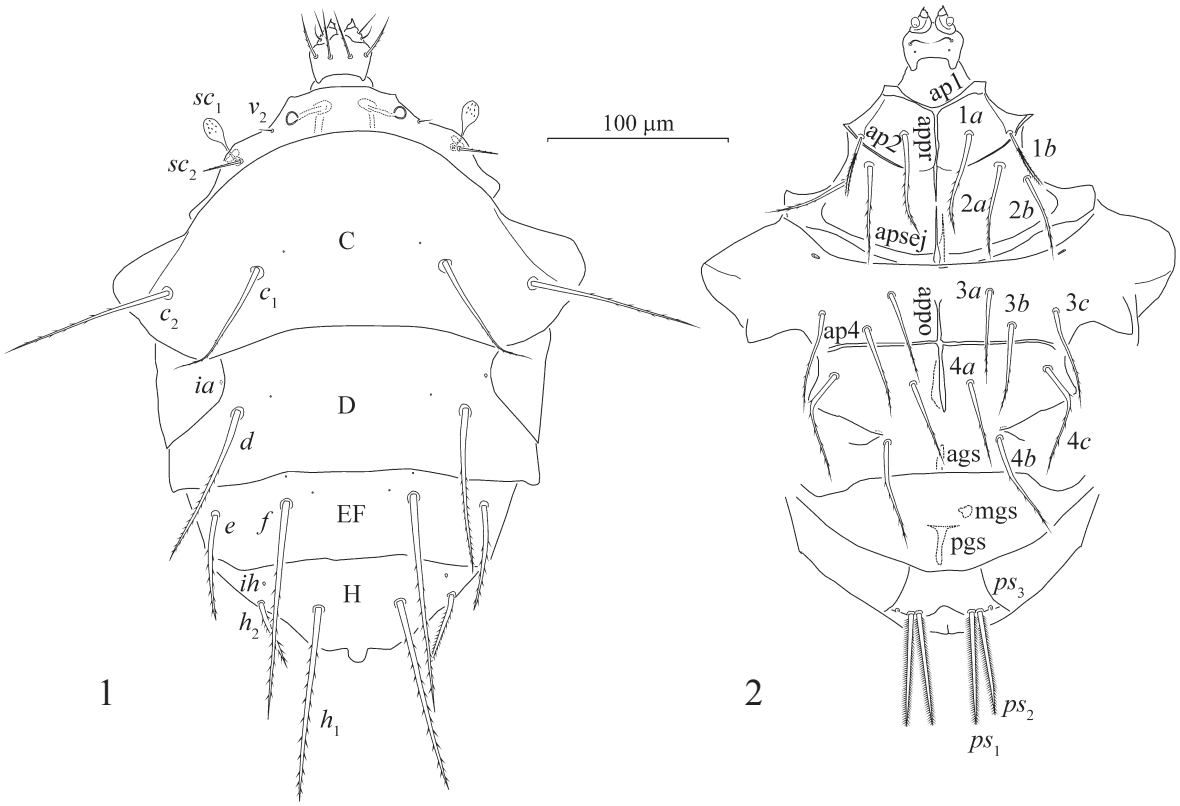
Type species: *Parapygmephorus* (*Petalomium*) *krczali* Cross, 1965, by original designation.

Petalomium kurosai Khaustov sp. n.

Figs 1–7

Description. **Female** (holotype, Figs 1–7). Length of idiosoma 310 (275–315), width 240 (225–245). Gnathosoma (Fig. 3). Gnathosomal capsule semioval, slightly shorter than width. Dorsally with 2 pairs of barbed, subequal setae (*cha, chb*). Dorsal median apodeme absent. Ventral gnathosoma with 1 pair of subcapitular setae *m* and a pair of round pits situated posteromedial to bases of *m*. Palps freely articulated to gnathosomal capsule, with setae *dFe* and *dGe* dorsolaterally. Setae *dGe* slightly longer than *dFe*. Ventrally with large accessory setigenous structure (*ass*) and extremely small solenidion. Palps terminated with a small claw; palptarsus with a tiny peg-like setigenous structure. Pharyngeal pump I small, situated inside gnathosomal capsule; pharyngeal pumps II large, about 2 times longer than pharyngeal pump III.

Idiosomal dorsum (Fig. 1). Prodorsum almost completely covered by anterior margin of tergite C, 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; Setae h_2 densely covered by numerous and thin barbs (pubescent), other dorsal setae sparsely barbed.



Figs 1–2. *Petalomium kurosai* Khaustov sp. n., female: 1 — idiosomal dorsum, 2 — idiosomal venter.

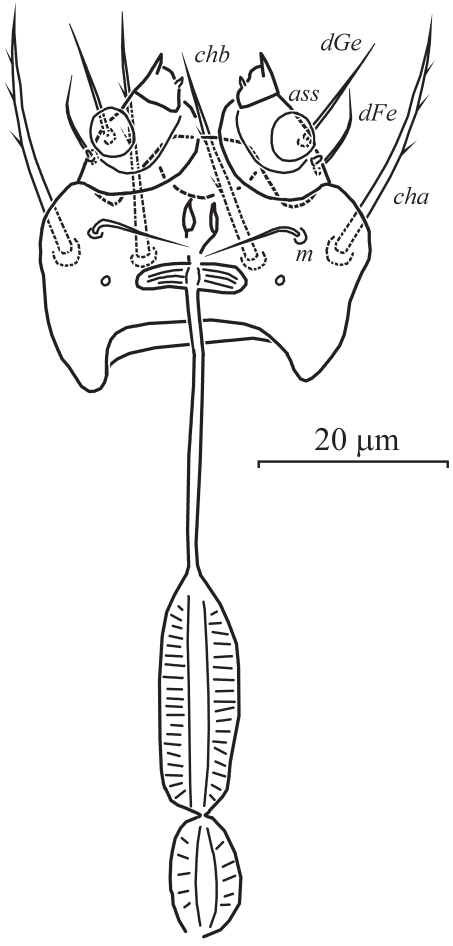
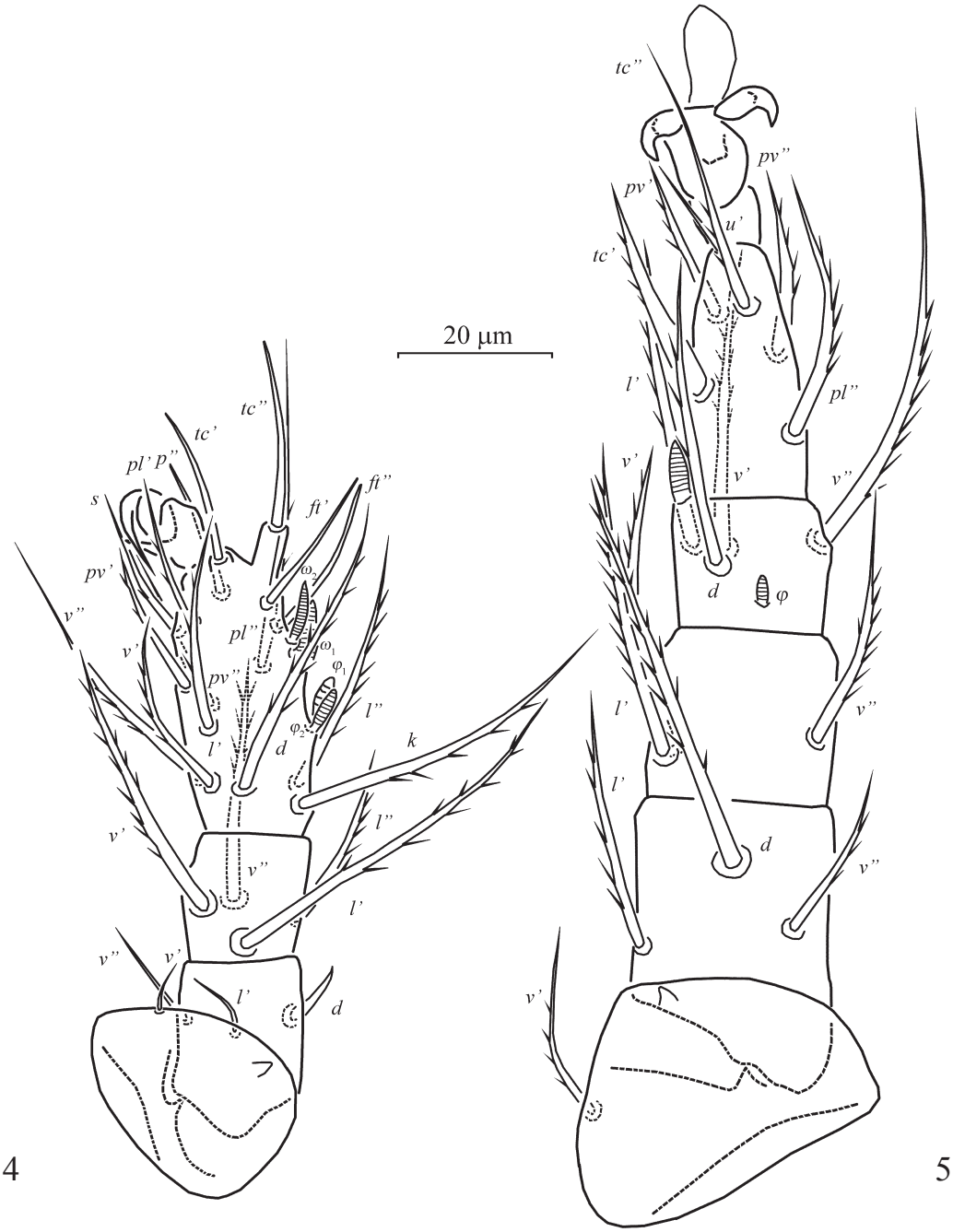


Fig. 3. *Petalomium kurosai* Khaustov sp. n., female: — gnathosoma and pharyngeal pumps.

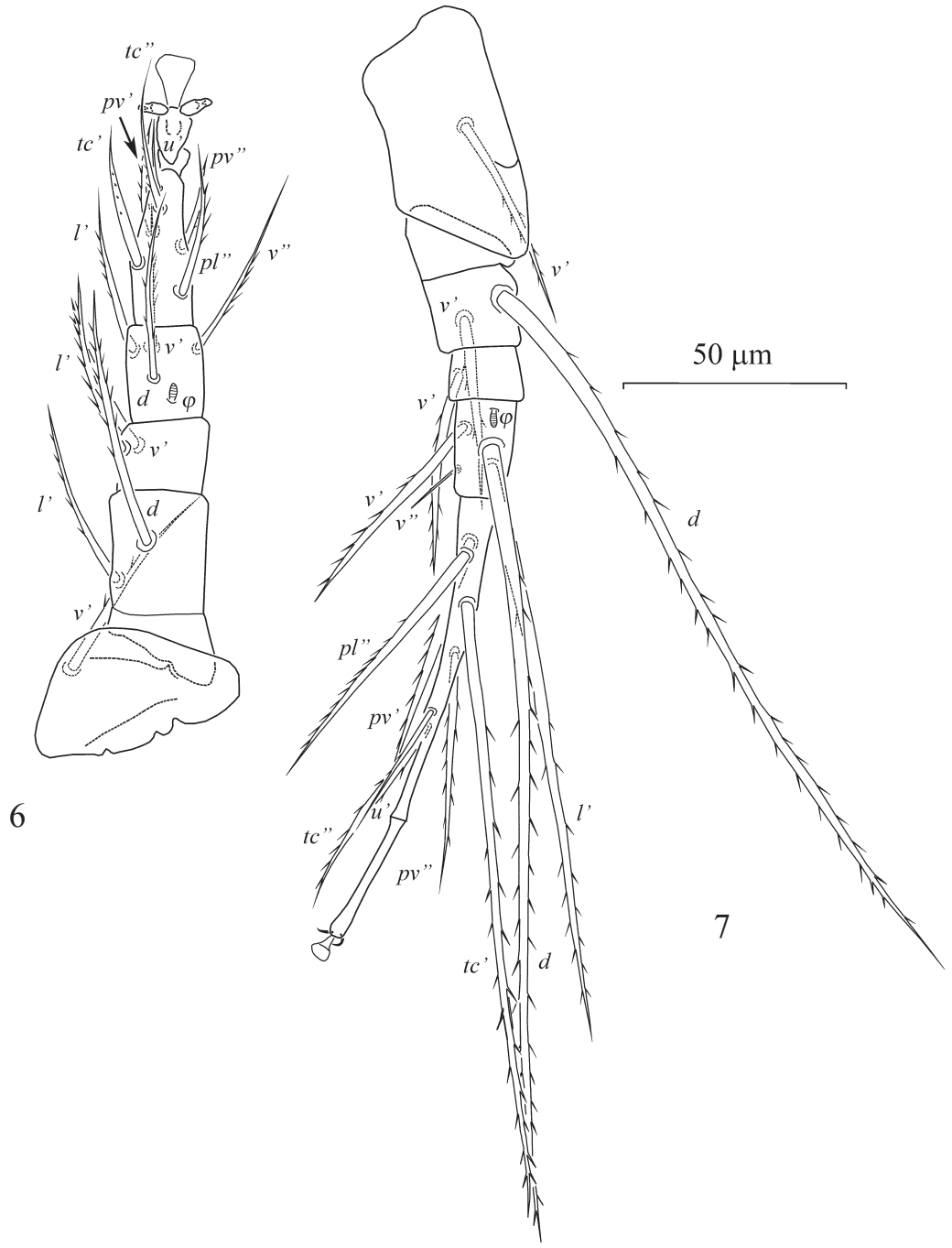
Setae c_1, c_2 and v_2 pointed, other dorsal setae blunt-ended. Posterior margin of tergite C distinctly concave; posterior margin of tergite H with tongue-like elongation medially. Cupules *ia* on tergite D and *ih* on tergite H small, round. Length of dorsal setae: v_2 6 (5–6), sc_2 24 (22–24), c_1 77 (77–82), c_2 97 (92–97), *d* 93 (90–93), *e* 61 (60–67), *f* 120 (115–120), h_1 110 (110–115), h_2 40 (40–43). Distances between setae: v_2–v_2 82 (76–82), sc_2–sc_2 120 (115–120), c_1–c_1 105 (98–105), c_1–c_2 52 (49–52), *d*–*d* 125 (120–125), *e*–*f* 39 (36–39), *f*–*f* 70 (68–70), h_1–h_1 47 (43–47), h_1–h_2 33 (29–33). Idiosomal venter (Fig. 2). All ventral plates smooth. All ventral setae barbed, except vestigial ps_3. Setae ps_1–ps_2 pubescent. Setae 1*b* bifurcate. Apodemes 1 (ap1) well developed and joined with prosternal apodeme (appr); apodemes 2 (ap2) weakly developed, thin, with median gap; prosternal and sejugal (apsej) apodemes well developed; appr usually with gap in central part; apodemes 3 indistinct. Apodemes 4 (ap4) well sclerotized and long, apodemes 5 absent. Posterior margin of posterior sternal plate straight in middle part. Posterior margin of aggenital plate weakly concave. Anterior genital sclerite (ags) bell-like, posterior genital sclerite (pgs) triangular, median genital sclerite (mgs) well developed, rounded. Length of ventral setae: 1*a* 65 (59–65), 1*b* 46 (44–46), 2*a* 59



Figs 4–5. *Petalomium kurosai* Khaustov sp. n., female: 4 — leg I, 5 — leg II.

(57–61), 2*b* 54 (54–60), 3*a* 53 (53–54), 3*b* 58 (58–60), 3*c* 60 (57–63), 4*a* 55 (55–56), 4*b* 63 (63–69), 4*c* 65 (65–73, ps_1 63 (59–63), ps_2 60 (52–60), ps_3 3 (2–3). Legs (Figs 4–7). Leg I (Fig. 4) 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 10 (8–10) > ω_2 8 (7–8) = φ_1 7 (7–8) > φ_2 6 (6); ω_2 and φ_2 baculiform, φ_1 clavate, ω_1 finger-shaped. Eupathidium *tc'* situated on small protuberance, *tc"* on well-developed pinnaculum. Setae *dFe* broadened, slightly curved at the tip. Leg II (Fig. 5). Setal formula: 1–3–3–4(1)–6(1). Tarsus with sickle-like, padded claws and large empodium. Solenidion ω 9 (7–9), finger-shaped, solenidion φ 4 (4–5) weakly clavate. Setae *tc'* thicker than other tarsal setae. Leg III (Fig. 6). Setal formula: 1–2–2–4(1)–6. Claws of same shape as on tarsus II. Solenidion φ 4 (4–5) weakly clavate. Leg IV (Fig. 7). Setal formula: 1–2–1–4(1)–6. Tarsus long and thin, pretarsus long, with two small simple claws and small empodium. Solenidion φ 4 (4–5), weakly clavate.

Male and **larva** unknown.

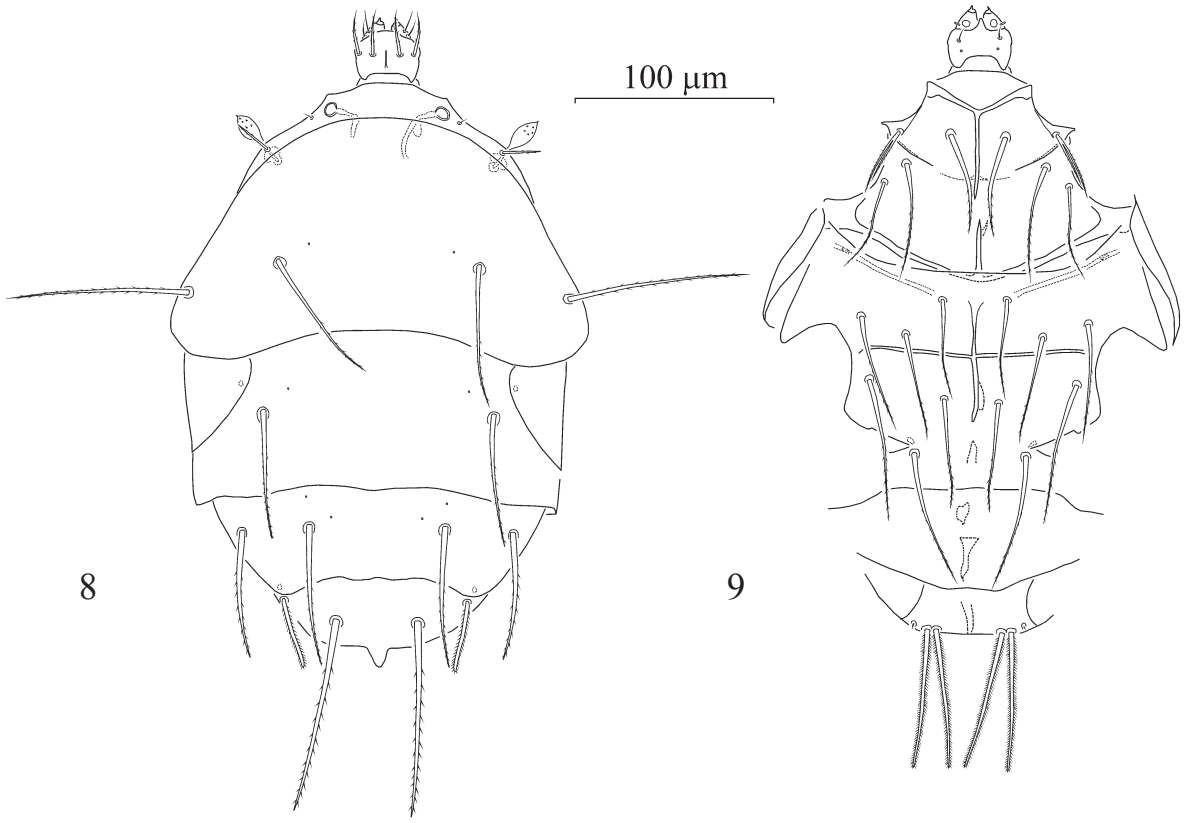


Figs 6–7. *Petalomium kurosai* Khaustov sp. n., female: 6 — leg III, 7 — leg IV.

Type material. Female holotype, slide NoVS300714, Russia: Tyumen Province, Tyumen region, vicinity of settlement Narimanovo, 57°21′56″N, 65°08′21″E, on ants *Lasius niger* (Linnaeus, 1758), 30 July 2014, coll. V.A. Stolbov. Paratypes: 7 females, same data as holotype; 1 female, Russia: Tyumen Province, vicinity of Tyumen, 57°09′55″N, 65°27′32″E, on ants *Tetramorium caespitum* (Linnaeus, 1758), 31 July 2014, coll. A.A. Khaustov.

Etymology. The new species is named for a well-known Japanese acarologist Kazuyoshi Kurosa for his great contribution to the heterostigmatic mite systematics.

Differential diagnosis. The new species is most similar to *P. nataliae* (Sevastianov, 1967) by the shape of the pharyngeal pumps, pubescent setae h_2, bifurcate setae 1*b* and subequal pubescent setae ps_1–ps_2 and vestigial ps_3. It differs from *P. nataliae* by the distinctly longer setae *f*, which al-



Figs 8–9. *Petalomium nataliae* (Sevastianov, 1967), female: 8 — idiosomal dorsum, 9 — idiosomal venter.

most *2* times longer than *e* (*e* and *f* are subequal in P. *nataliae*) and the vestigial palpal solenidion (well-developed in *P. nataliae*). The new species is also very similar to *P. formicarum* (Berlese, 1903), but differs by the distinctly shorter dorsal hysterosomal setae; by subequal setae *d* and c_2 (*d* distinctly longer than c_2 in *P. formicarum*); setae *d* are shorter than distance between their bases and not reaching beyond the posterior margin of the body (*d* is distinctly longer than distance between their bases and reaching far beyond the posterior margin of the body in *P. formicarum*).

Remarks. In a key to Japanese Tarsonemina, Kurosa (1980) illustrated dorsum of idiosoma of *Petalomium ukrainicum* (Sevastianov, 1967), which is currently considered as synonym of *P. formicarum* (Khaustov 2005; Mahunka 1980). Undoubtedly the Japanese specimen is clearly differs from *P. formicarum* by the distinctly shorter dorsal idiosomal setae and is probably conspecific with *P. kurosai* sp. n.

Petalomium nataliae (Sevastianov, 1967)

Figs 8–14

Pygmephorus nataliae Sevastianov, 1967, p. 357, fig. 6.

Petalomium nataliae, Sevastianov 1978: 37.

Petalomium nataliae, Kurosa 1980: 221.

Redescription. **Female** (Figs 8–14). Length of idiosoma 310–215, width 235–245. Gnathosoma (Fig. 10). Similar with that of *P. kurosai* sp. n., but dorsal median apodeme usually present. Palpal solenidion well-developed.

Idiosomal dorsum (Fig. 8). The shape of tergites, distribution and barbation of dorsal setae as in *P. kurosai* sp. n., but setae *f* distinctly shorter than h_1 and slightly longer or subequal to *e*. Length of dorsal setae: v_2 5–6, sc_2 22–27, c_1 73–77, c_2 85–92, *d* 65–70, *e* 63–74, *f* 70–83), h_1 86–98, h_2 39–44. Distances between setae: v_2–v_2 81–85, sc_2–sc_2 120–125, c_1–c_1 105–110), c_1–c_2 53–55, *d*–*d* 130–135), *e*–*f* 36–38, *f*–*f* 80–84, h_1–h_1 47–48, h_1–h_2 29–30. Idiosomal venter (Fig. 9). Similar with that of *P. kurosai* sp. n. Length of ventral setae: 1*a* 63–65, 1*b* 36–40, 2*a* 59–68, 2*b* 51–53, 3*a* 57–60, 3*b* 61–66, 3*c* 66–70, 4*a* 54–60, 4*b* 70–77, 4*c* 70–78, ps_1 63–85, ps_2 64–83, ps_3 2–3. Legs (Figs 11–14) similar with those of *P. kurosai* sp. n. Leg I (Fig. 11). Length of solenidia ω_1 9–11 > ω_2 8–9 > φ_1 7–8 > φ_2 6–7. Leg II (Fig. 12). Solenidion ω 8–9, solenidion φ 4–5. Leg III (Fig. 13). Solenidion φ 4–5. Leg IV (Fig. 14). Solenidion φ 4–5.

Male and **larva** unknown.

Material examined. Female paratype, Belarus: Grodno province, settlement Karetichi, on *Lasius niger*, 16 August 1961, coll. E.V. Labvas;

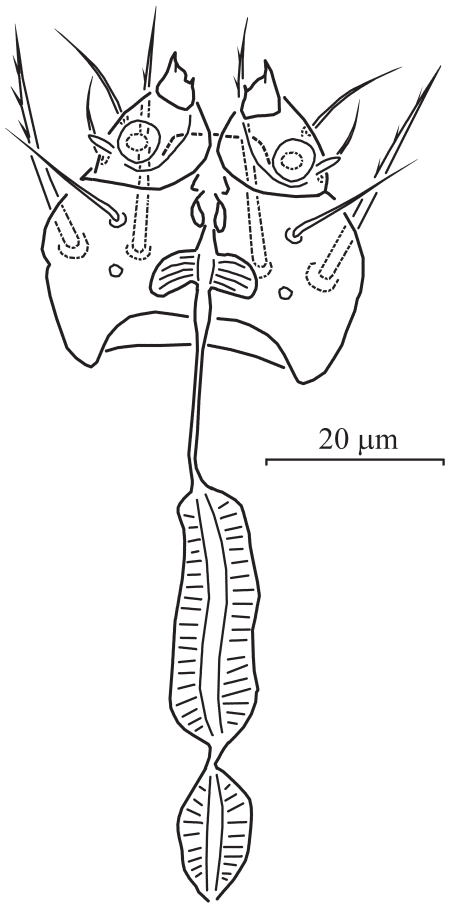


Fig. 10. *Petalomium nataliae* (Sevastianov, 1967), female: — gnathosoma and pharyngeal pumps.

11 females, Russia: Tyumen Province, Kazansk region, vicinity of settlement Maliye Yarki, 55°37′07″N, 69°21′48″E, on ants *Lasius niger*, 03 August 2014, coll. V.A. Stolbov; 9 females, Russia: Tyumen Province, Tyumen region, vicinity of settlement Narimanovo, 57°21′56″N, 65°08′21″E, on ants *Lasius niger*, 30 July 2014, coll. V.A. Stolbov; 2 females, Russia: Tyumen Province, Tyumen region, vicinity of settlement Narimanovo, 57°21′56″N, 65°08′21″E, from the nest of *Lasius niger*, 30 July 2014, coll. V.A. Stolbov; 4 females, Russia: Tyumen Province, vicinity of Tyumen, 57°04′03″N, 65°04′12″E , on ants *Tetramorium caespitum*, 17 August 2014, coll. A.A. Khaustov; 6 females, Russia: Tyumen Province, vicinity of Tyumen, 57°04′03″N, 65°04′12″E , on ants *Lasius niger*, 17 August 2014, coll. V.M. Salavatulin.

Remarks. This species was described from Belarus and Ukraine where it was collected from ants *Lasius niger* (Sevastianov 1967). It was also recorded from Japan (Kurosa 1980), Hungary (Mahunka 1986) and Switzerland (Mahunka 1977) also from *Lasius niger*. This is the first record from Russia.

The original description of *P. nataliae* of Sevastianov (1967) and figure of idiosomal dorsum of Kurosa (1980) are incomplete, thus I made a redescription of this species. The present redescription of *P. nataliae* is based mainly on material from Western Siberia. The only female paratype available for this study is in bad condition, yet sufficient to prove its identity with the material from Western Siberia.

DISCUSSION

The newly described species, together with *P. nataliae* and *P. formicarum*, form a group of species characterized by the following combination of character states in females: the gnathosomal capsule is shorter than its width, dorsally with long, barbed subequal setae; pharyngeal pump II about 1.5–2 times longer than pharyngeal pump III; the prodorsum is almost completely covered by the anterior margin of tergite C; setae h_2 are pubescent; setae 1*b* are bifurcate; setae ps_1–ps_2 are subequal and pubescent, ps_3 are vestigial; posterior genital sclerite is triangular; legs I are distinctly shorter and thinner than legs II; solenidia ω_1 and ω_2 are subequal; the pinnaculum at the base of eupathidion *tc"* is long; pretarsus IV is long and thin. Members of this group are currently known from the Palaearctic only. Females of *P. formicarum* are phoretic mainly on relatively large ants of the genus *Formica*, while *P. nataliae* and *P. curosai* are phoretic on small soil-nesting ants of the genera *Lasius* and *Tetramorium*. I also observed phoresy of *P. nataliae* and *P. kurosai* on ants collected from the same nest. Such coexistence of two closely related species in the nest of the same host ant is well known in other groups of Pygmephoroidea. For example microdispid mites *Unguidispus lasii* Kurosa, 1979 and *U. japonicus* Kurosa, 1979 are often collected from the same nest of ants *Lasius niger* (Kurosa 1979). I also observed phoresy of several closely related species of mites of the genus *Imparipes* Berlese, 1903 (Scutacaridae) on ants *Tetramorium caespitum* (Khaustov 2008).

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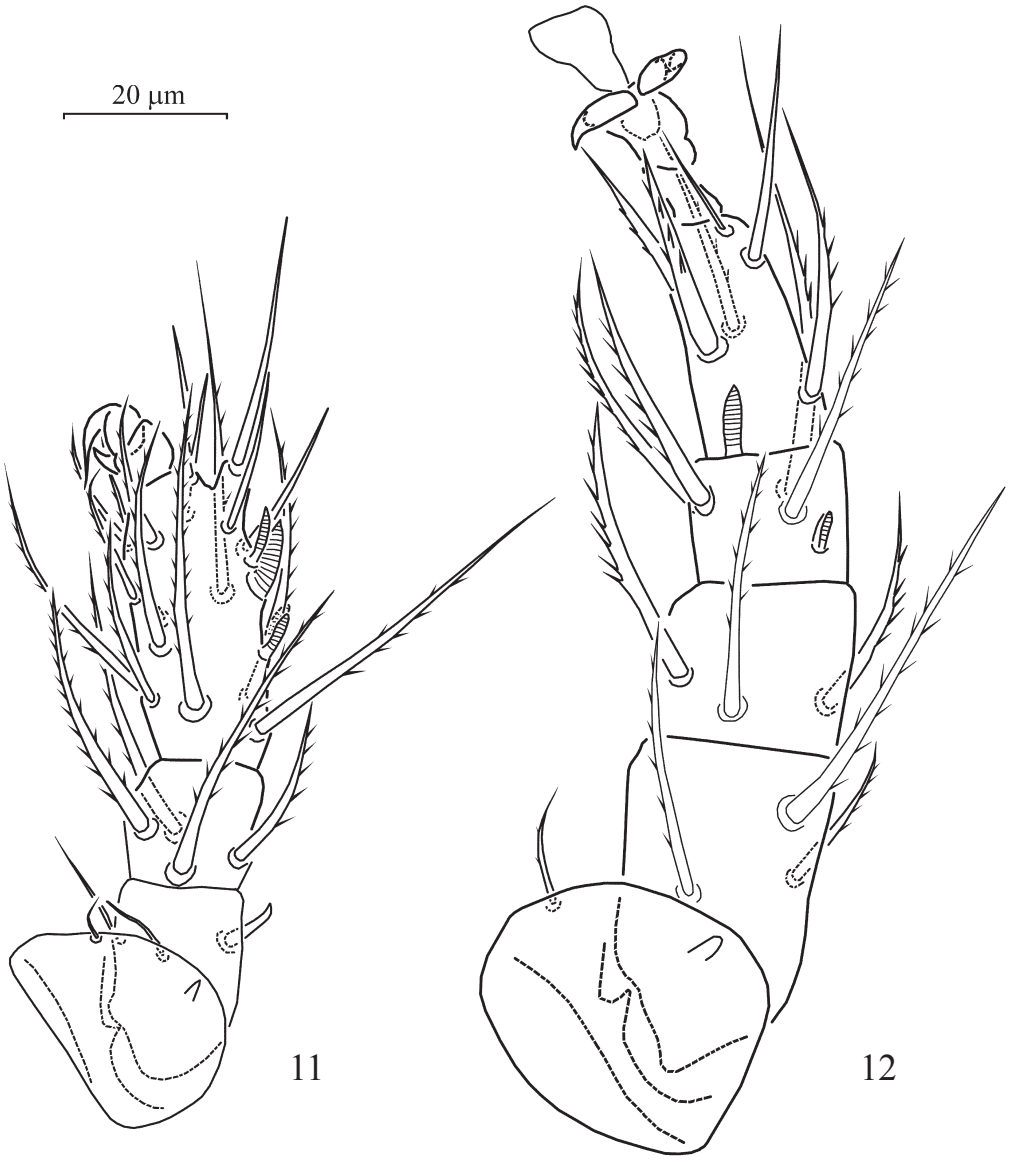

Figs 11–12. *Petalomium nataliae* (Sevastianov, 1967), female: 11 — leg I, 12 — leg II.

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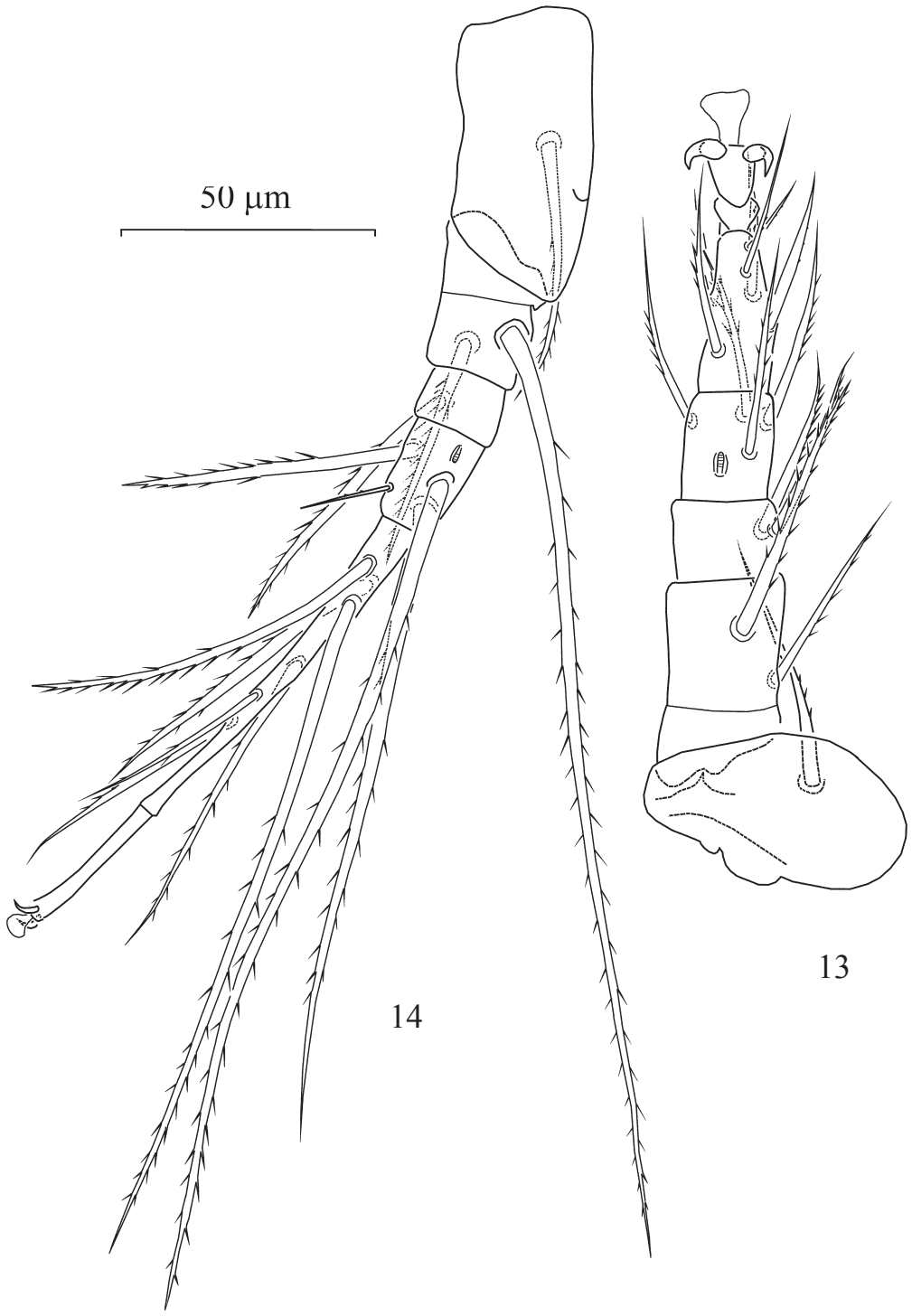

Figs 13–14. *Petalomium nataliae* (Sevastianov, 1967), female: 13 — leg III, 14 — leg IV.

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