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A NEW GENUS AND A NEW SPECIES OF THE FAMILY PYGMEPHORIDAE (ACARI: HETEROSTIGMATA) FROM WESTERN SIBERIA, RUSSIA

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ABSTRACT: Phoretic and non-phoretic females of a new genus and a new species of pygmephorid mites—*Bochkovlaster variabilis* gen. n. and sp. n. (Acari: Prostigmata: Pygmephoridae), collected from rotting birch trees—are described from Western Siberia, Russia. An updated key to the genera of Pygmephoridae is provided.

KEY WORDS: Pygmephoroidea, systematics, new taxa, female dimorphism, key.

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INTRODUCTION

Pygmephoridae—a cosmopolitan family of mites—is the second largest in the superfamily Pygmephoroidea. It includes 32 described genera and more than 300 species (Khaustov *et al.* 2019b). All pygmephorid mites are probably fungivorous (Kaliszewski *et al.* 1995). Pygmephorid mites inhabit soil, forest litter and rotting matter. Many pygmephorid species are associated with various insects, utilizing them for phoresy. Representatives of the genus *Pygmephorus* are associated with small mammals (Kaliszewski *et al.* 1995; Khaustov *et al.* 2019b). Some pygmephorid genera are characterized by the presence of two different forms of females: phoretic and non-phoretic, which differ considerably in terms of morphology. The phenomenon of female dimorphism is well described for the genus *Pediculaster* Vitzthum (see Camerik *et al.* 2006). Dimorphic females are also known in the genus *Pediculitopsis* Mahunka, 1970, which is poorly described. Most likely, female dimorphism is also present in the genus *Metasiteroptes* Cross, 1965. This statement is based on the fact that the mites of the genus *Brasilopsis* Mahunka, 1975 are very similar to *Metasiteroptes*, differing only in the fused tibia and tarsus I, as well as in the shape of seta *d* of femur I. The above differences are typical of phoretic and non-phoretic females of a closely related genus, *Pediculaster*.

During the study of heterostigmatic mites in Western Siberia, Russia, I found a new remarkable monotypic genus of Pygmephoridae, which is also characterized by female dimorphism. An updated key to the genera of Pygmephoridae is also provided.

MATERIALS AND METHODS

The mites were extracted from samples of rotting wood and bark of birch trees using Berlese funnels. Most of the collected mites were cleared in lactic acid and mounted in Hoyer's medium. The terminology used in the descriptions of the idiosoma and the legs follows that of Lindquist (1986); the nomenclature of subcapitular setae and the designation of cheliceral setae follow those of Grandjean (1944, 1947), respectively. The systematics of Pygmephoroidea follows that of Khaustov (2004, 2008). All measurements are given in micrometers (μm) for the holotype and five paratypes (in parentheses). In the description of leg chaetotaxy, the number of solenidia is given in parentheses. Mite morphology was studied using a Carl Zeiss AxioImager A2 (Carl Zeiss, Germany) compound microscope with phase contrast and differential interference contrast (DIC) objectives. Photomicrographs were taken with an AxioCam 506 color (Carl Zeiss, Germany) digital camera. For SEM microscopy, alcohol-preserved mites were dried in a freeze-drying device JFD 320 (JEOL, Japan), coated with gold, and scanned with the aid of a JEOL JSM-6510LV SEM microscope; several alive specimens were scanned without coating.

SYSTEMATICS

Family **Pygmephoridae Cross, 1965**
Genus ***Bochkovlaster* gen. n.**
Type species: *Bochkovlaster variabilis* sp. n.

Description. *Phoretic female*. Body weakly sclerotized, oval. Gnathosomal capsule of about equal length and width, prognathous, dorsally with two pairs of cheliceral setae (*cha*, *chb*); postpalpal

setae absent; palps prominent, with two pairs of setae (*dFe*, *dGe*); tibial claw distinct; palpal solenidion (*sol*) well developed, accessory setigenous structure (*ass*) large, mushroom-like. Palp tibiotarsus with tiny distal eupathidium. Palpal femorogenu with unusual oval dorsodistal projection (*dp*) (Figs. 10A, 11B). Subcapitular setae (*m*) present. A pair of long and thin trachea-like structures present inside gnathosoma. Pharyngeal pumps tripartite, situated on a very long and thin oesophagus, which rolled into a ball between pharyngeal pumps 1 and 2 (Fig. 10E); all pharyngeal pumps weakly striated; pump 1 bow-shaped, very far separated from pump 2; pumps 2 and 3 oval, situated close to each other. Prodorsum with three pairs of setae (v_1, v_2, sc_2), one pair of clavate trichobothria (sc_1) and one pair of small oval stigmata; prodorsal shield indistinctly divided into two poorly sclerotized sclerites. Tracheal trunks well developed, long (Fig. 10E). Tergite C with two pairs of setae (c_1, c_2); tergite D with one pair of setae (*d*); tergite EF with two pairs of setae (*e*, *f*); tergite H with one pair of setae (h_1) and one pair of oval cupules *ih*. Coxal fields I with three pairs of setae (1*a*, 1*b*, 1*c*), setae 1*b* not modified; coxal fields II with two pairs of setae (2*a*, 2*c*); coxal fields III with three pairs of setae (3*a*, 3*b*, 3*c*); coxal fields IV with three pairs of setae (4*a*, 4*b*, 4*c*). Pseudanal segment with one pair of setae (ps_2); alveolar pits of setae ps_1 present. Apodemes 1 (ap1) well developed; apodemes 2 (ap2) well developed, joined with well-developed prosternal apodeme (appr); sejugal apodeme not developed; secondary transverse apodeme absent; apodemes 3 (ap3) well developed, fused with well-developed poststernal apodeme (appo); apodemes 4 (ap4) well developed, fused with appo; apodemes 5 absent. Posterior margin of posterior sternal plate with median lobe. Anterior genital sclerite (ags) very small; posterior genital sclerite not evident. Leg I 4-segmented, with cylyndrical tibiotarsus. Tarsal claw simple. Unguinal setae not modified; seta *u'* absent (usually) (Fig. 3A) or present (Fig. 3B). Tibiotarsus without pinnaculum. Seta *d* of femur I long, hook-shaped (Fig. 11C). Seta *k* smooth, eupathid-like. Legs II and III each with one pair of slightly thickened hooked claws and small elongate empodium; tarsal claws of leg IV not modified, hooked, empodium wider than on tarsi II and III. Solenidia on tibiae II–IV erect (Fig. 11D). Femora III and IV divided into basi- and telofemur; basi- and telofemur IV articulated. Seta *p'* of tibiotarsus I simple, not eupathid-like. Leg setation: leg I: Tr 1 (*v'*), Fe 4 (*d*, *l'*, *l''*, *v''*), Ge 4 (*l'*, *l''*, *v'*, *v''*), TiTa 19(4) (*d*, *l'*, *l''*, *v'*, *v''*, *k*, *tc'*, *tc''*, *p'*, *p''*, *ft'*, *ft''*, *pv'*, *pv''*, *pl'*, *pl''*, *s*, *u'*, *u''*, ω_1, ω_2, φ_1, φ_2); leg II: Tr 1 (*v'*), Fe 3 (*d, l'*, *v''*), Ge 3 (*l'*, *v'*, *l''*), Ti 4(1) (*d*, *l'*, *v'*, *v''*, φ), Ta 6(1) (*tc'*, *tc''*, *pl''*, *pv'*, *pv''*, *u'*, ω); leg III: Tr 1 (*v'*), Fe 2 (*d*, *v'*), Ge 2 (*l'*, *v'*),Ti 4(1) (*d*, *l'*, *v'*, *v''*, φ), Ta 6 (*tc'*, *tc''*, *pl''*, *pv'*, *pv''*, *u'*); leg IV: Tr 1 (*v'*), Fe 2 (*d*, *v'*), Ge 1 (*v'*), Ti 4(1) (*d*, *l'*, *v'*, *v''*, φ), Ta 6 (*pl''*, *tc'*, *tc''*, *u'*, *pv'*, *pv''*).

Non-phoretic female. In general, very similar to phoretic female, except for the following characters: prodorsal shield not separated into two sclerites, with a dorsal median prodorsal apodeme; main tracheal trunks not visible (Fig. 10F); palpal femorogenu without dorsodistal projection; tibia and tarsus I separated; seta *p'* of tibiotarsus I eupathid-like; seta *d* of femur I not modified; tarsi II and III with seta *u''*; claws on legs II and III simple, hooked.

Male and *Larva* unknown.

Species included. The genus *Bochkovlaster* includes one species, *B. variabilis* sp. n.

Distribution and habitat. *B. variabilis* sp. n. inhabits rotting wood and bark of birch trees in Western Siberia. Phoretic hosts unknown.

Differential diagnosis. The phoretic female of the genus *Bochkovlaster* is most similar to *Apediculaster* Rahiminejad and Hajiqanbar, 2016 in: the absence of cupules *ia* and setae h_2, ps_1, ps_3; divided prodorsal shield; long hooked seta *d* of femur I; and oval body shape. It can be distinguished from *Apediculaster* by: the presence of three pairs of setae on the prodorsum (two pairs of setae on prodorsum in *Apediculaster*); simple claw on tibiotarsus I (the claw is thick and strongly curved in *Apediculaster*); and simple, unmodified unguinal setae on tibiotarsus I (modified, forms a structure opposing the tarsal claw in *Apediculaster*). Non-phoretic female of *Bochkovlaster* is most similar to *Metasiteroptes* Cross, 1965 in the absence of setae h_2 and ps_3. The former differs from the latter in: the oval body shape (body shape fusiform in *Metasiteroptes*); setae ps_1 being absent (present in *Metasiteroptes*); genua II and III having three and two setae, respectively (genua II and III each have only one seta in *Metasiteroptes*).

Etymology. The name of the new genus is a combination of two words: *Bochkov*—family name of a Russian acarologist; and *laster*—the ending of *Apediculaster*, the closest related genus. The new genus is named after a prominent acarologist, Andrei Bochkov, who passed away too soon.

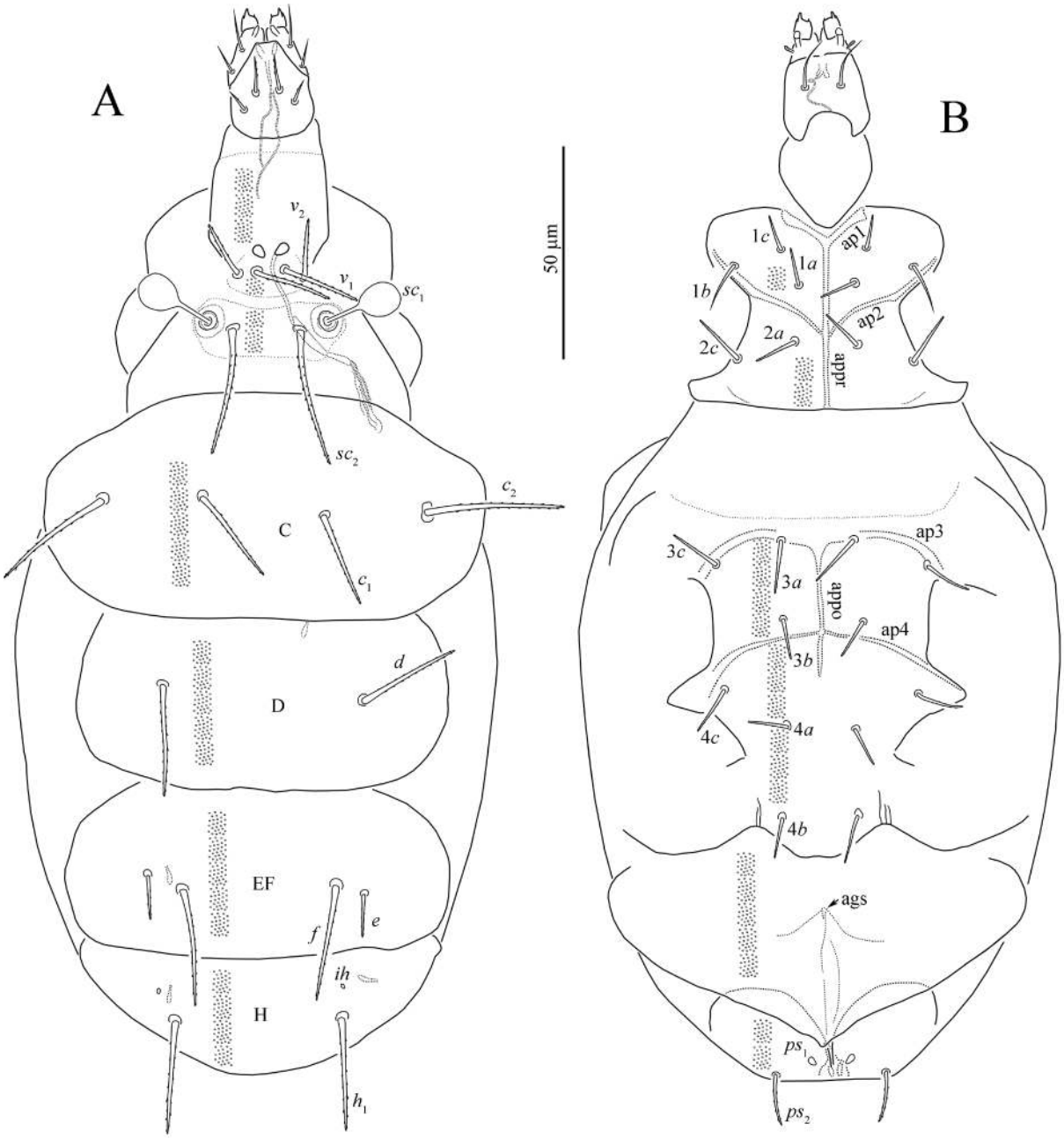

Fig. 1. *Bochkovlaster variabilis* gen. n. and sp. n., phoretic female: A—dorsum of the body, B—venter of the body. Legs omitted.

***Bochkovlaster variabilis* sp. n.**

(Figs. 1–12)

Description. *Phoretic female* (Figs. 1–5, 10A-E, 11, 12F). Length of idiosoma 220 (215–230), width 110 (105–115).

Idiosomal dorsum (Figs. 1A, 5A, 10A, C, 11A). Stigmata located just anteriad setae v_1 and close to each other (Fig. 10A). All dorsal sclerites with numerous very small dimples. All dorsal setae blunt-ended and weakly barbed. Trichobothria with short stem, clavate, smooth, with rounded apex. Tergite D unusually narrow, not covering lateral parts of idiosoma. Lengths of dorsal setae: v_1 19 (16–21), v_2 15 (13–15), sc_2 32 (31–34), c_1 24 (20–25), c_2 33 (31–36), *d* 26 (24–28), *e* 10 (11–12), *f* 27 (26–29), h_1 27 (23–27). Distances between setae: v_1–v_1 7 (7–8), v_2–v_2 16 (16–19), sc_2–sc_2 16 (16–19), c_1–c_1 29 (26–30), c_1–c_2 23 (22–25), *d*–*d* 47 (40–47), *e*–*f* 7 (6–9), *f*–*f* 36 (29–36), h_1–h_1 39 (33–39).

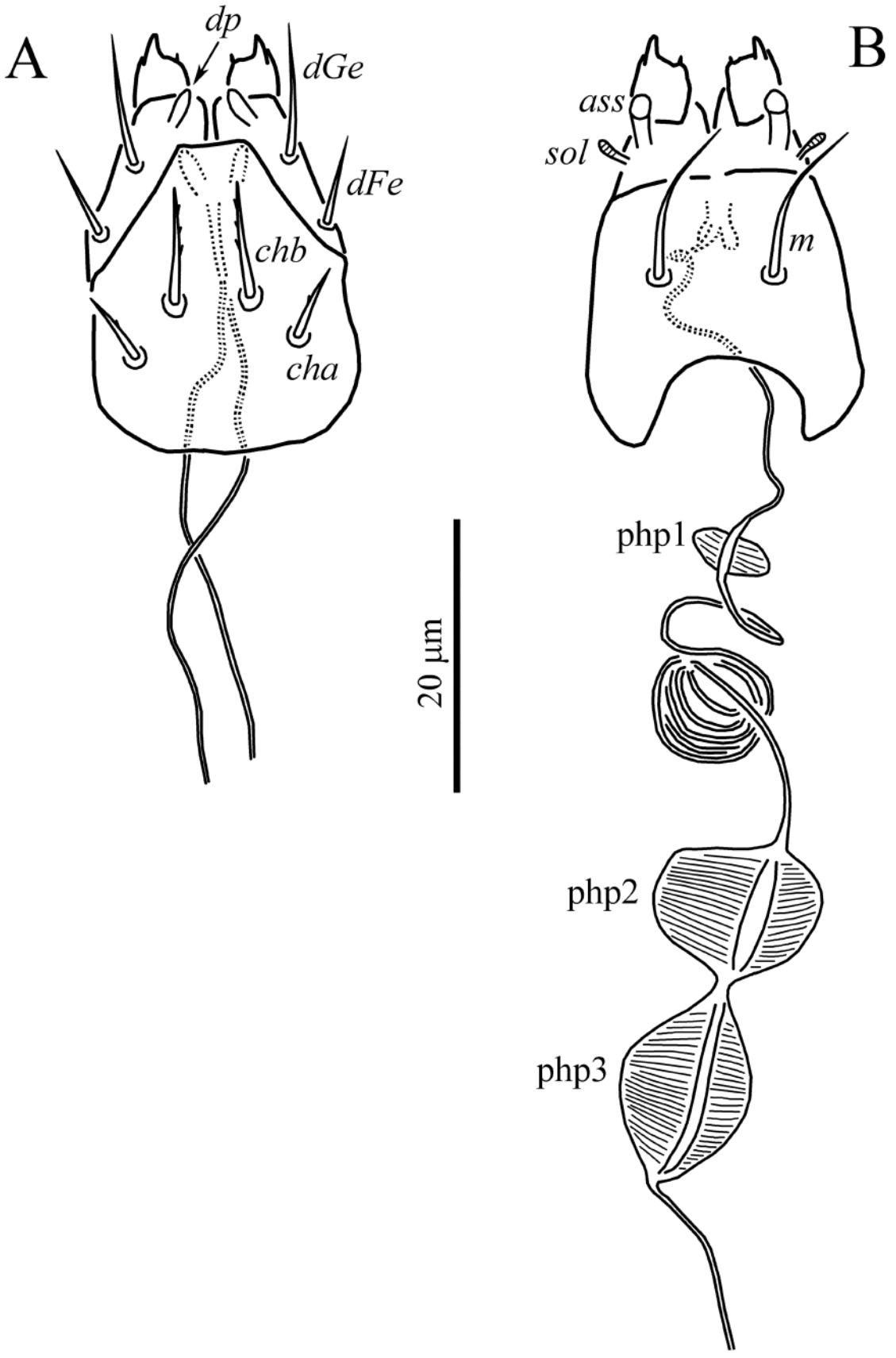

Fig. 2. *Bochkovlaster variabilis* gen. n. and sp. n., phoretic female: A—gnathosoma in dorsal view, B—gnathosoma and pharyngeal pumps in ventral view.

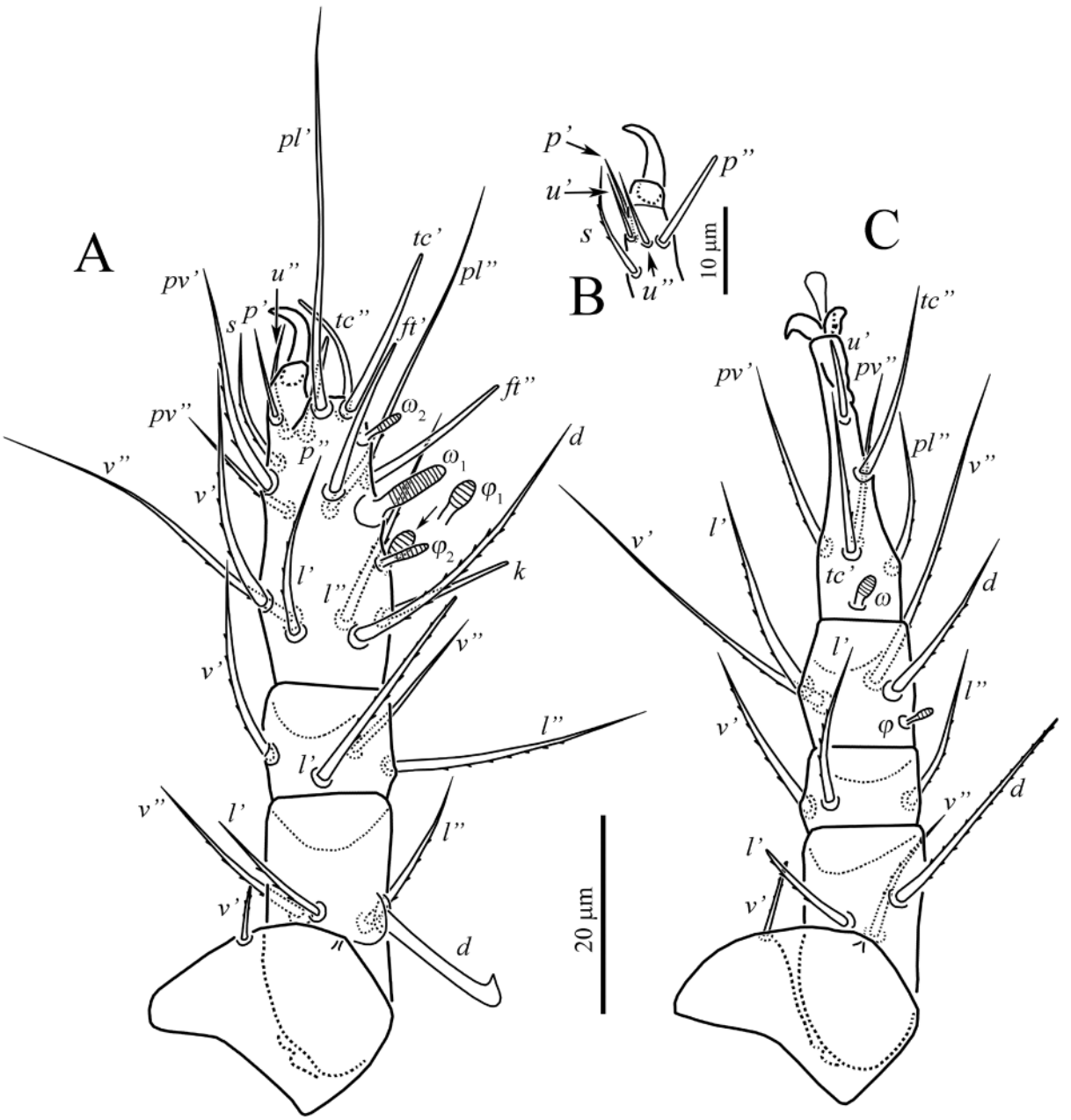

Fig. 3. *Bochkovlaster variabilis* gen. n. and sp. n., phoretic female: A—right leg I in dorsal view, B—distal part of tibiotarsus I of paratype with seta *u'* in ventral view, C—right leg II in dorsal view.

Idiosomal venter (Figs. 1B, 5 B, 10B, D). All ventral plates with numerous small dimples. All ventral setae weakly barbed; setae 1*b* pointed, other ventral setae blunt-ended. Posterior margin of aggenital plate angled. Lengths of ventral setae: 1*a* 9 (9–10), 1*b* 13 (11–14), 1*c* 9 (8–9), 2*a* 11 (10–11), 2*c* 13 (11–13), 3*a* 13 (12–14), 3*b* 10 (9–11), 3*c* 12 (11–13), 4*a* 10 (9–11), 4*b* 12 (11–13), 4*c* 11 (11–14), ps_2 13 (13–15).

Gnathosoma (Figs. 2, 11B, 12F). Length of gnathosoma 23 (22–24), width 20 (20–24). Dorsal median apodeme absent. Setae *cha* and *chb* weakly blunt-ended and barbed (Fig. 12F), other gnathosomal setae smooth and pointed. Alveolal pits *n* absent. Lengths of gnathosomal setae: *m* 13 (12–14), *cha* 6 (5–7), *chb* 8 (8–10). Pharyngeal pumps as in Fig. 2B.

Legs (Figs. 3, 4, 11C, D). Leg I (Figs. 3A, 11C). Lengths of solenidia ω_1 8 (8–9), ω_2 5 (5–6), φ_1 6 (5–6), φ_2 6 (6); solenidion ω_1 digitiform, solenidion φ_1 clavate, solenidia ω_2 and φ_2 baculiform. Setae *d* of femur, *k*, (*u*), *pl'*, *p'* and eupathidia (*ft*), (*tc*), *p"*

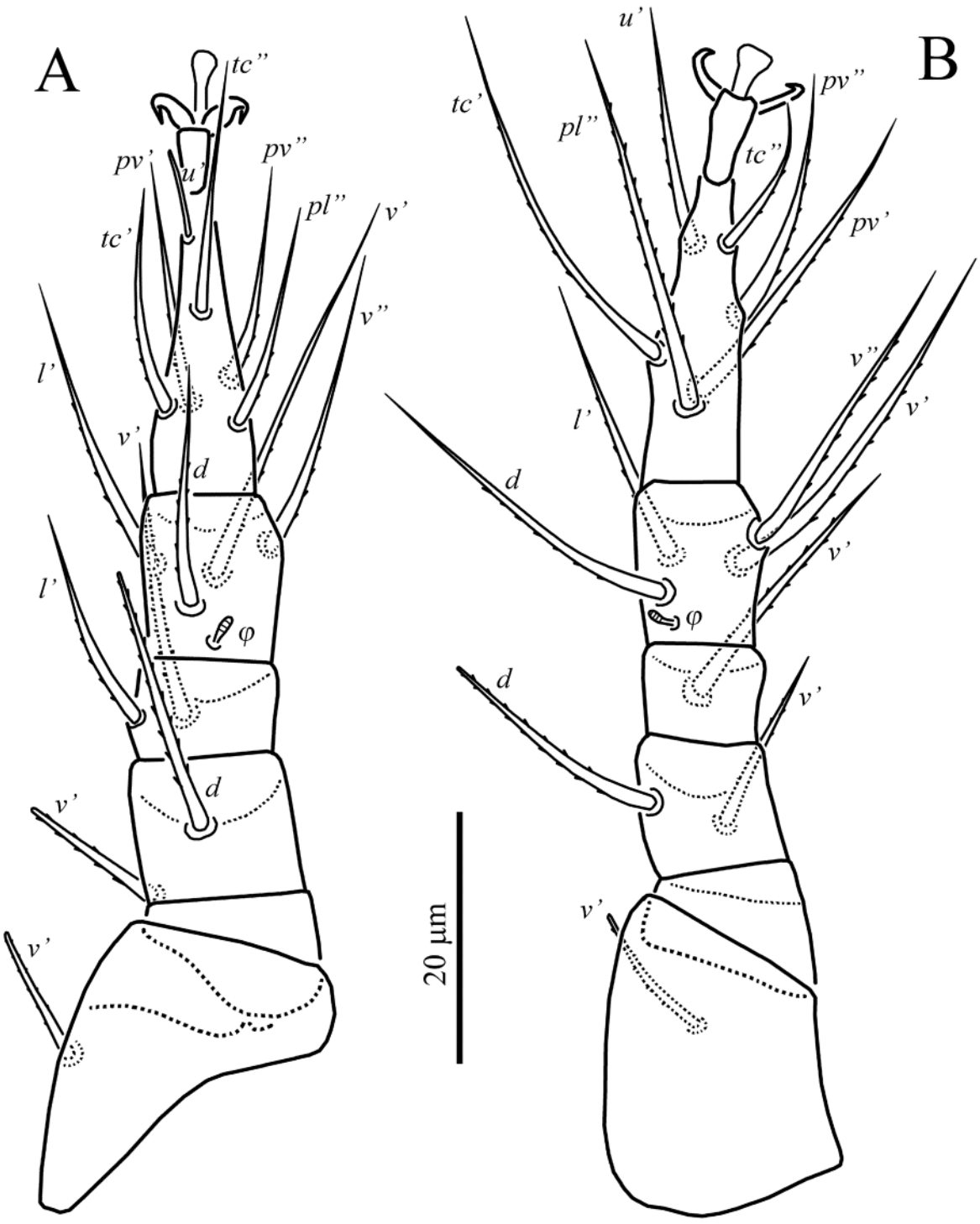

Fig. 4. *Bochkovlaster variabilis* gen. n. and sp. n., phoretic female: A—right leg III in dorsal view, B—right leg IV in dorsal view.

of tibiotarsus smooth, other setae weakly barbed; setae *v'* of trochanter, *l'* of genu, *k* and eupathidia of tibiotarsus blunt-ended, other leg setae pointed; seta *u'* present or absent, sometimes asymmetrically present and absent on the left and right legs of the same specimen. Leg II (Fig. 3B). Solenidion ω 6 (5–6) digitiform, solenidion φ 3 (3–4) weakly clavate. Seta *tc"* and *u'* of tarsus smooth, other leg setae weakly barbed; setae *v'* of trochanter, *d*, *l'* of femur, and *u'* of tarsus blunt-ended, other leg setae

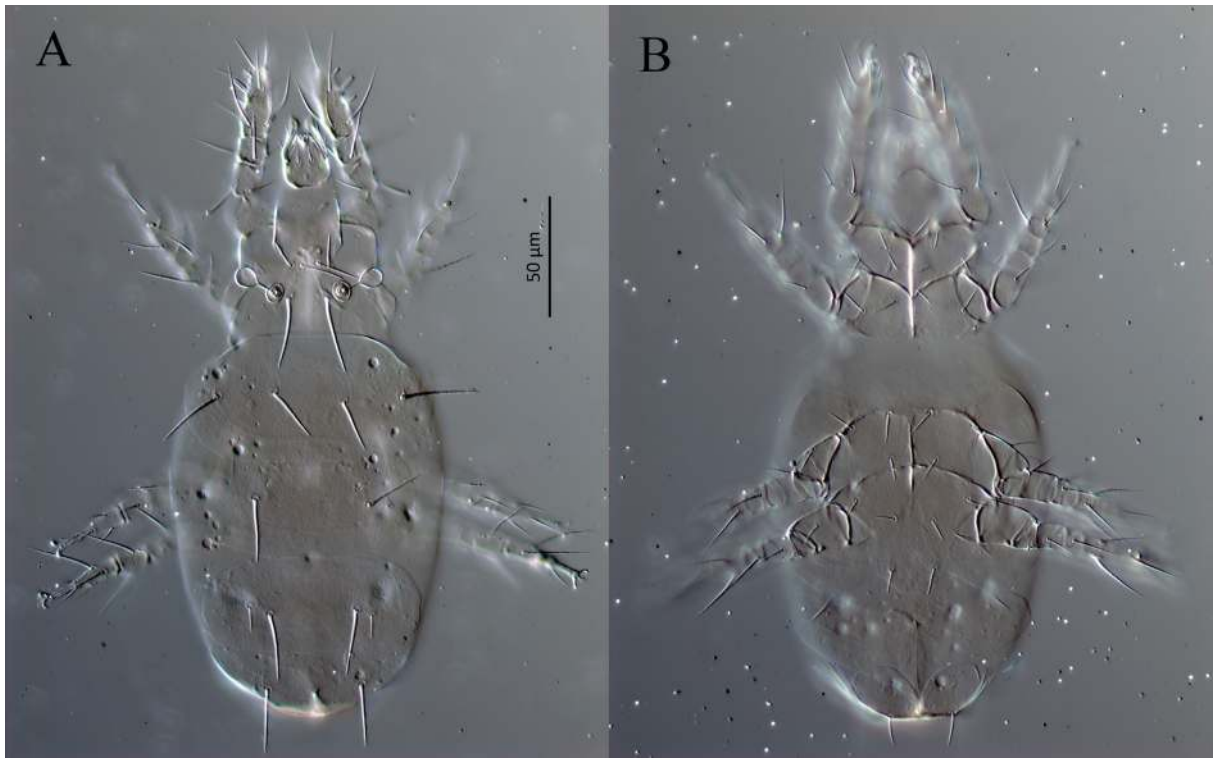

Fig. 5. DIC micrographs of *Bochkovlaster variabilis* gen. n. and sp. n., phoretic female: A—general view dorsally, B—general view ventrally.

pointed. Leg III (Figs. 4A, 11D). Solenidion φ 3 (3–4) weakly clavate. Setae *tc"* and *u'* of tarsus smooth, other leg setae weakly barbed; setae *v'* of trochanter, *d*, *v'* of femur and *u'* of tarsus blunt-ended, other leg setae pointed. Leg IV (Fig. 4B). Solenidion φ 2–3 weakly clavate. All leg setae weakly barbed. Setae *v'* of trochanter and *d* of femur blunt-ended, other leg setae pointed.

Non-phoretic female (Figs. 6–9, 10F, 12A–E). Length of idiosoma 180–245, width 90–125.

Idiosomal dorsum (Figs. 6A, 12A, B). Prodorsum with dorsal median prodorsal apodeme, located between bases of trichobothria. Dorsal setae and dimples as in phoretic female. Lengths of dorsal setae: v_1 15–18, v_2 11–13, sc_2 28–30, c_1 18–24, c_2 26–35, *d* 22–27, *e* 8–12, *f* 22–29, h_1 21–27. Distances between setae: v_1–v_1 7–8, v_2–v_2 17–20, sc_2–sc_2 18–22, c_1–c_1 22–36, c_1–c_2 21–27, *d*–*d* 37–51, *e*–*f* 8–9, *f*–*f* 31–40, h_1–h_1 37–41.

Idiosomal venter (Figs. 6B, 12C, D). Setae and dimples as in phoretic female. Lengths of ventral setae: 1*a* 7–10, 1*b* 11–13,1*c* 8–10, 2*a* 10–13, 2*c* 10–13, 3*a* 10–12, 3*b* 8–11, 3*c* 10–13, 4*a* 8–11, 4*b* 10–14, 4*c* 10–13, ps_2 12–14.

Gnathosoma (Figs. 7, 12E). Gnathosoma as in phoretic female, except for the absence of dorsal projection on palpal femorogenu. Length of gnathosoma 22–24, width 20–23. Lengths of gnathosomal setae: *m* 13–14, *cha* 6–7, *chb* 7–10.

Legs (Figs. 8, 9). Leg I (Fig. 8A). Lengths of solenidia ω_1 8–9, ω_2 4–5, φ_1 5–6, φ_2 5–6); solenidion ω_1 digitiform, solenidion φ_1 clavate, solenidia ω_2 and φ_2 weakly clavate. Setae *k* of genu, *pl'*, and eupathidia (*ft*), (*tc*), (*p*) of tarsus smooth, other setae weakly barbed; setae *v'* of trochanter, *d*, *l'* of femur, *l'* of genu, *k* and eupathidia of tarsus blunt-ended, other leg setae pointed. Leg II (Fig. 8B). Solenidion ω 5–6 digitiform, solenidion φ 3–4 weakly clavate. All leg setae weakly barbed; setae *v'* of trochanter and *d*, *l'* of femur blunt-ended; other leg setae pointed. Leg III (Fig. 9A). Solenidion φ 3–4 weakly clavate. All leg setae weakly barbed; setae *v'* of trochanter and *d*, *v'* of femur blunt-ended; other leg setae pointed. Leg IV (Fig. 9B). Solenidion φ 2–3 weakly clavate. All leg setae weakly barbed. Setae *v'* of trochanter and *d* of femur blunt-ended, other leg setae pointed.

Type material. Phoretic female holotype, slide AK100719: Russia, Tyumen Region, Tyumen, Zatyumenskiy Park, 57°09′56.2″N, 65°26′48.8″E, in the rotting bark of birch, 10.VII.2019, coll. A.A. Khaustov; paratypes: 7 phoretic females, 7 non-phoretic females, same data; 6 phoretic, 6 non-phoretic, 7.VII.2019, same locality; 27 non-phoretic,

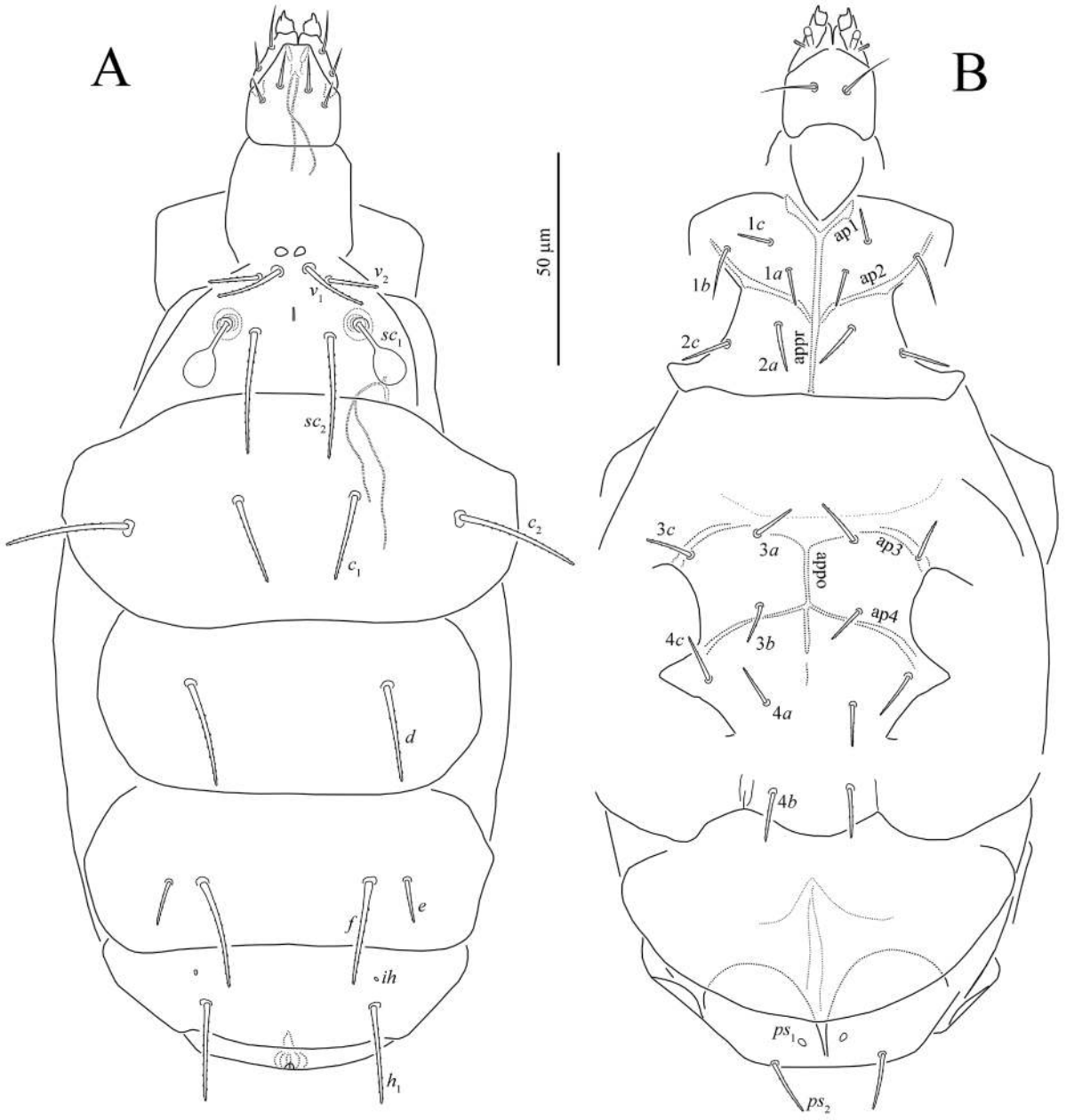

Fig. 6. *Bochkovlaster variabilis* gen. n. and sp. n., non-phoretic female: A—dorsum of the body, B—venter of the body. Legs omitted.

same locality, in a rotting birch log, 29.IX.2019; 5 non-phoretic, Russia, Kurgan Region, Zverinogolovskiy District, vicinity of settlement Ukrainets, 54°24′11.6″N 64°49′08.6″E, in a rotting birch log, 20.IX.2019, coll. A.A. Khaustov.

Type deposition. The holotype and five paratypes are deposited in the acarological collection of the Zoological Institute of RAS, St. Petersburg, Russia, other paratypes are deposited in the mite collection of the Tyumen State University Museum of Zoology, Tyumen, Russia (TSUMZ).

Etymology. The name of the new species is derived from Latin *variabilis*, meaning *variable* and refers to the unusual variability in the number of unguinal setae on tibiotarsus I in the phoretic female.

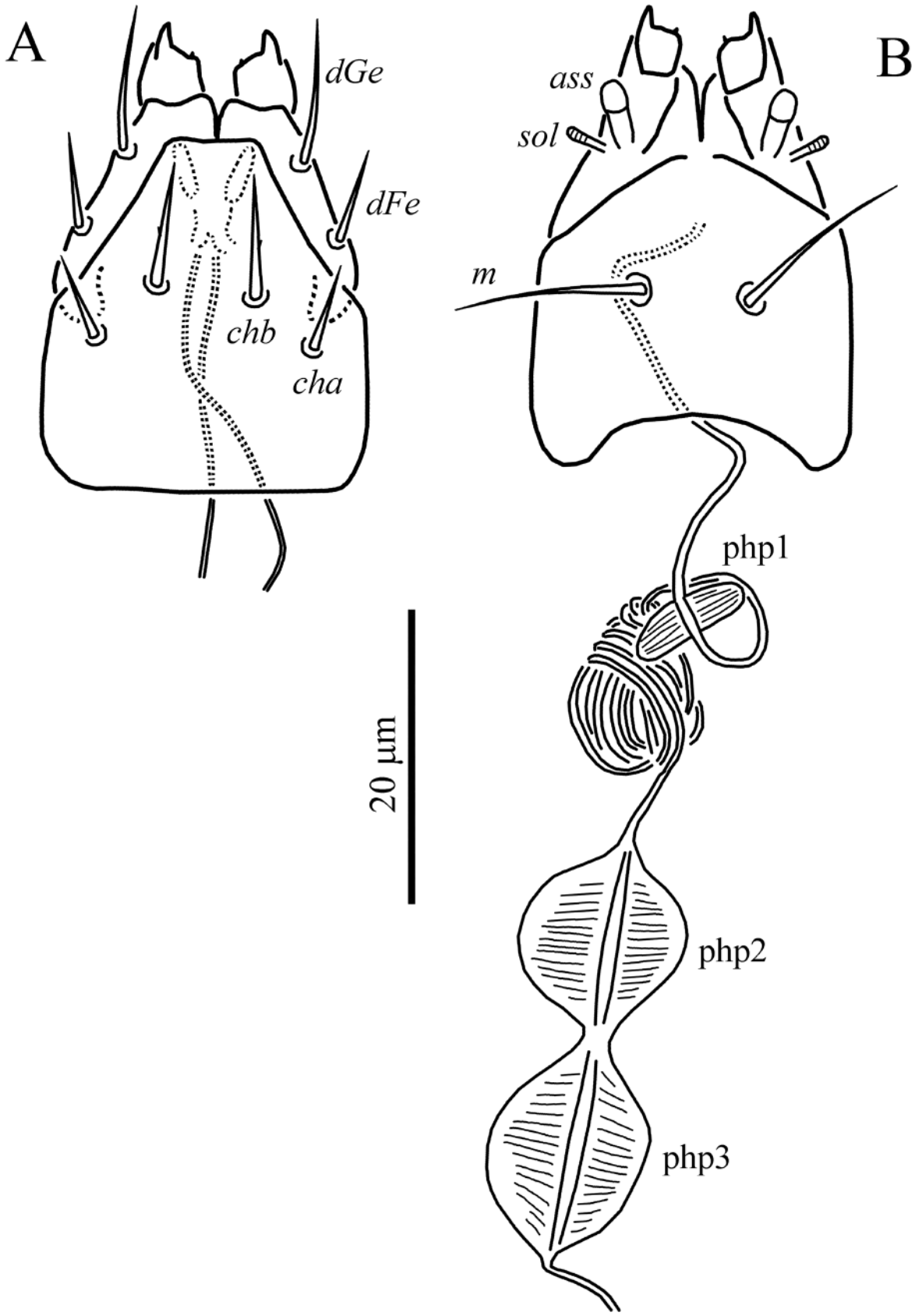

Fig. 7. *Bochkovlaster variabilis* gen. n. and sp. n., non-phoretic female: A—gnathosoma in dorsal view, B—gnathosoma and pharyngeal pumps in ventral view.

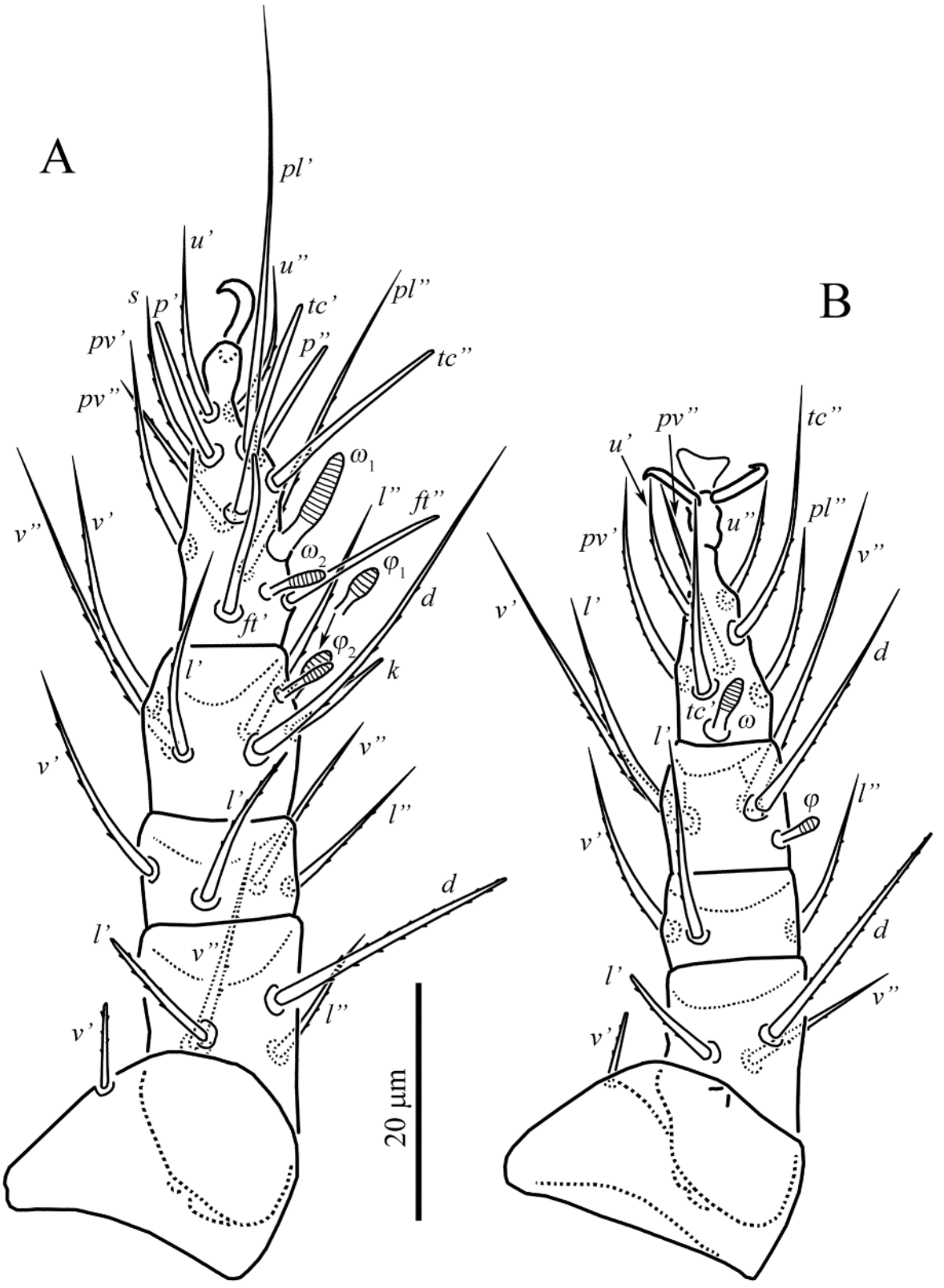

Fig. 8. *Bochkovlaster variabilis* gen. n. and sp. n., non-phoretic female: A—right leg I in dorsal view, B—right leg II in dorsal view.

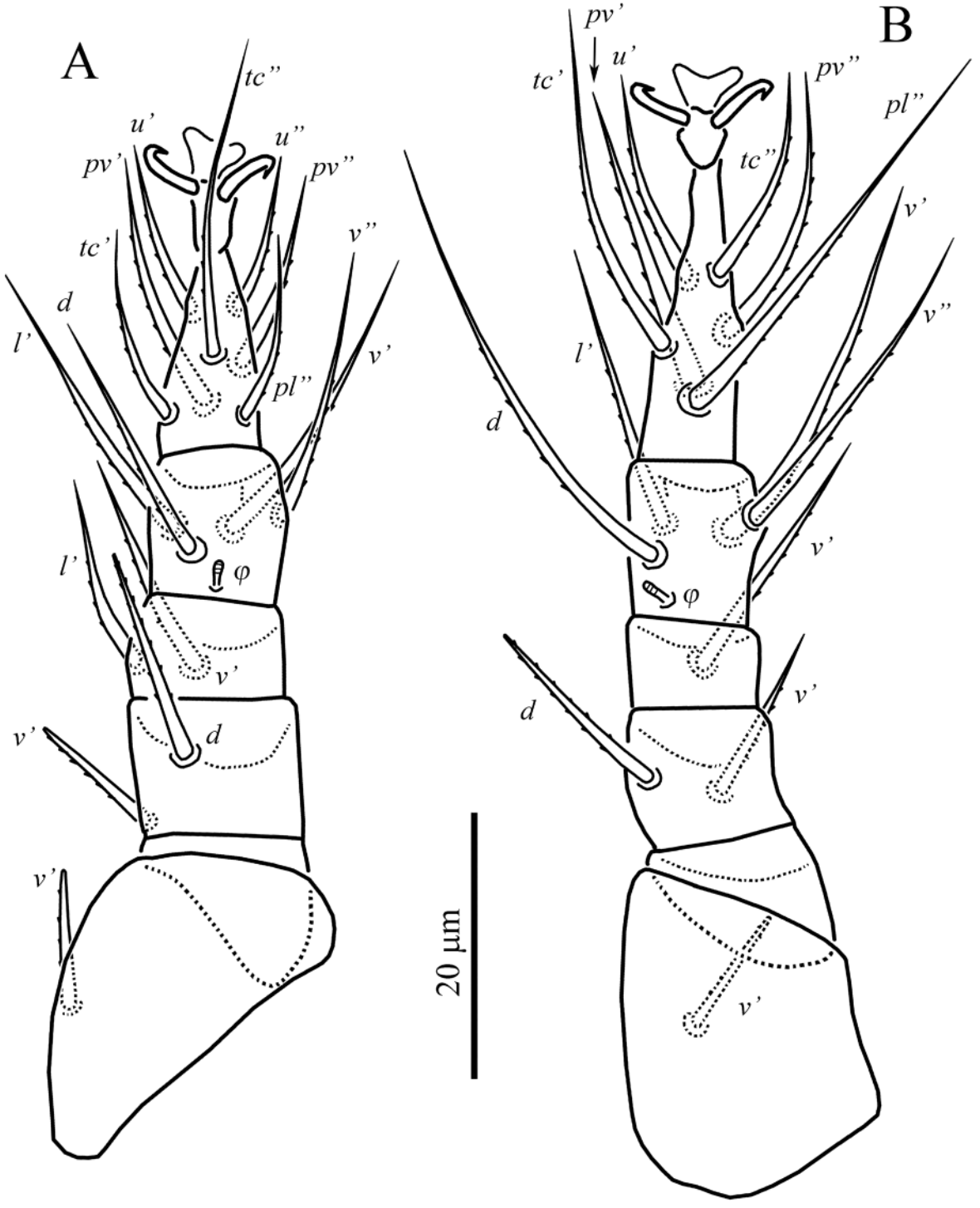

Fig. 9. *Bochkovlaster variabilis* gen. n. and sp. n., non-phoretic female: A—right leg III in dorsal view, B—right leg IV in dorsal view.

Key to genera of Pygmephoridae

(based on females, after Khaustov *et al.* 2019)

1. Legs I 5-segmented (tibia and tarsus separated) 2
— Legs I 4-segmented (tibia and tarsus fused) 11

2. Setae *e* absent 3
— Setae *e* present 6

3. Prodorsum with one or three pairs of simple setae (excluding trichobothria) 4
— Prodorsum with two pairs of simple setae (excluding trichobothria) ..... *Parasiteroptes* Livshits, Mitrofanov and Sharonov, 1986

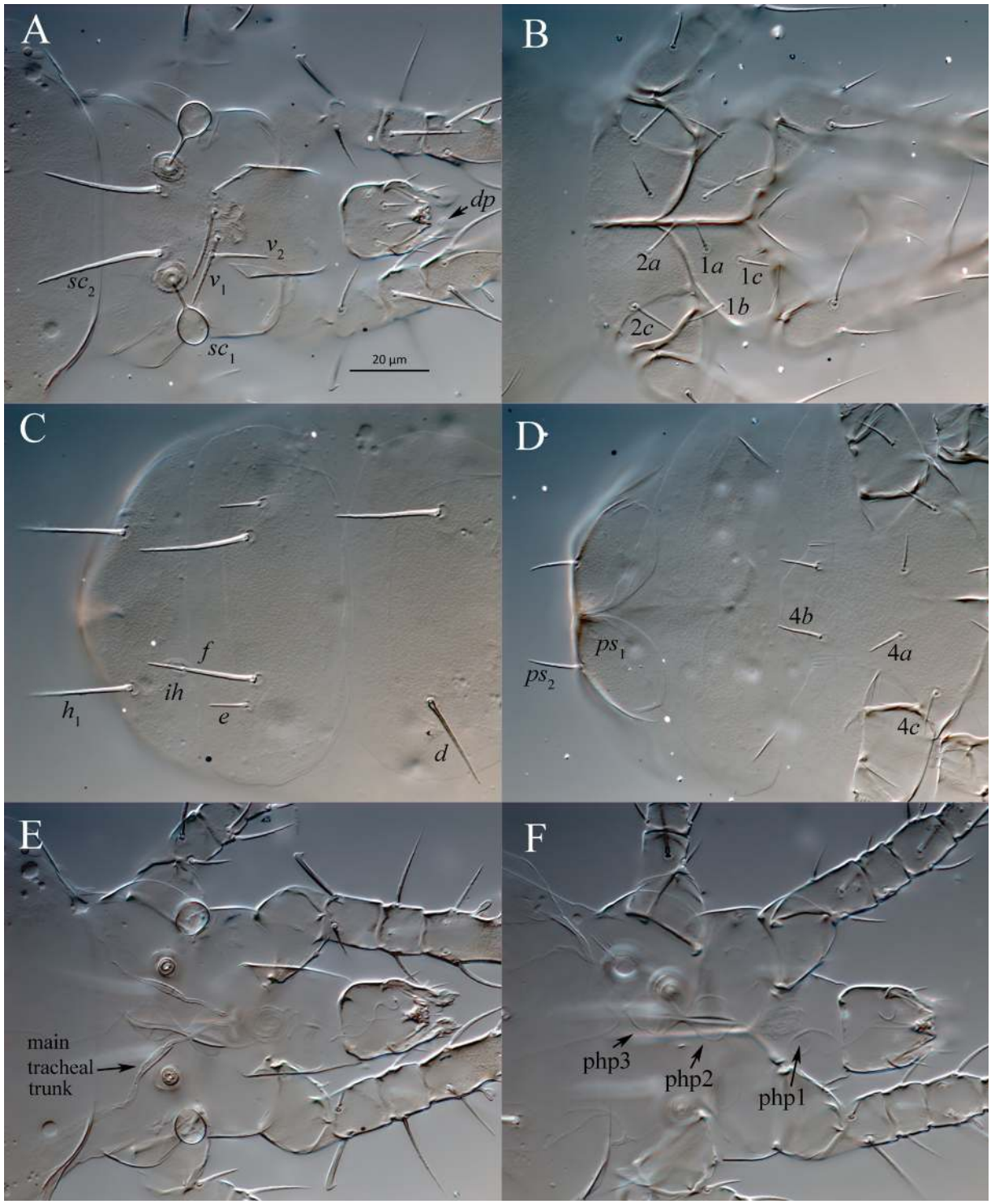

Fig. 10. DIC micrographs of *Bochkovlaster variabilis* gen. n. and sp. n., phoretic female: A—prosoma in dorsal view, B—prosoma in ventral view, C—hysterosoma in dorsal view, D—hysterosoma in ventral view, E—tracheal trunks and pharyngeal pumps; non-phoretic female: F—pharyngeal pumps.

4. Prodorsum with three pairs of simple setae (excluding trichobothria)..... 5
— Prodorsum with one pair of simple setae (excluding trichobothria)..... ..... *Pediculitopsis* Mahunka, 1970 (non-phoretic form)

5. Setae 4*a* present, 4*c* absent, body oval .... *Krczaldania* Sasa, 1961
— Setae 4*a* absent, 4*c* present, body fusiform..... ..... *Siteroptes* Amerling, 1861

6. Setae h_2 present 8
— Setae h_2 absent 7

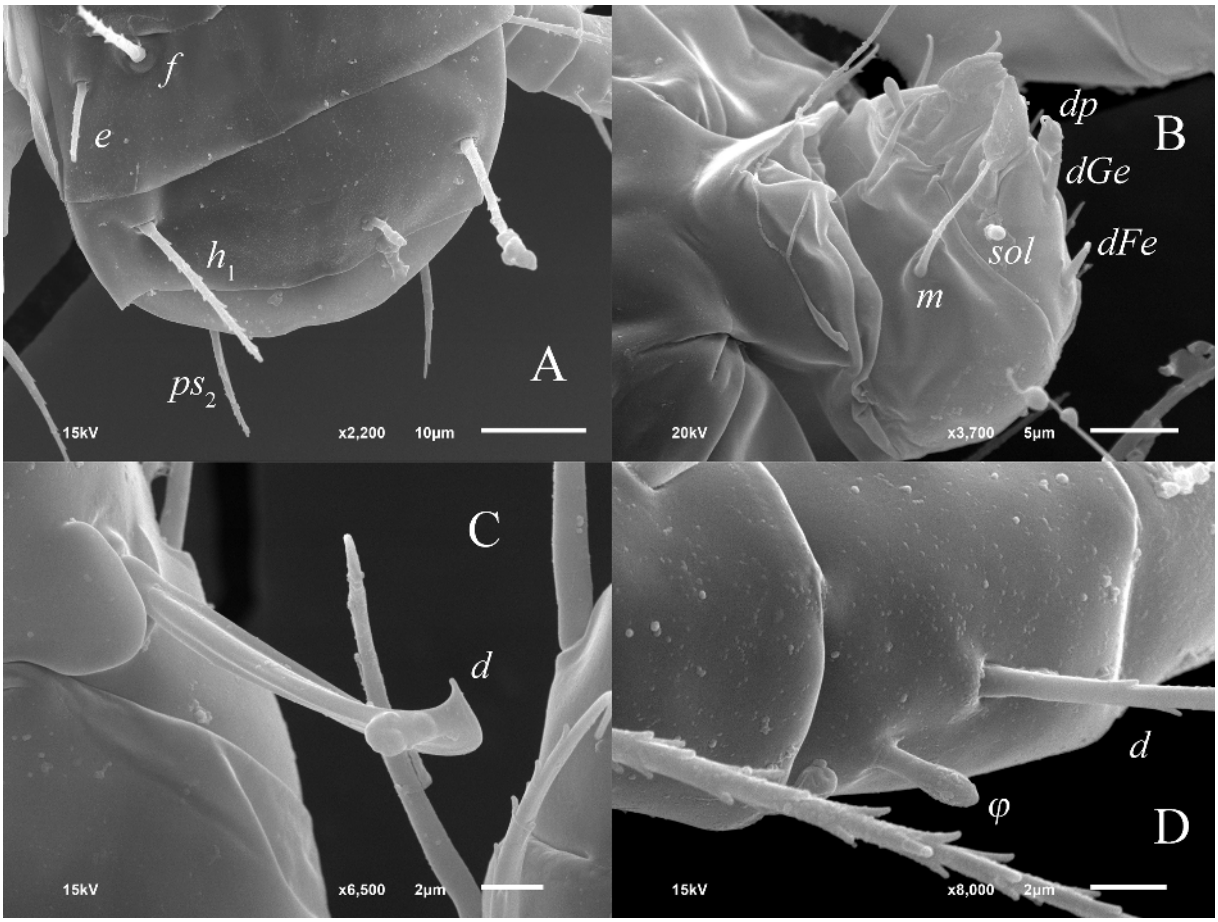

Fig. 11. SEM micrographs of *Bochkovlaster variabilis* gen. n. and sp. n., phoretic female: A—opisthosoma in dorsal view, B—gnathosoma in ventrolateral view, C—modified seta D of femur I, D—tibia III in dorsal view.

7. Body fusiform, genua II and III with one seta each ..... *Metasiteroptes* Cross, 1965
— Body oval, genu II with three setae, genu III with two seta ..... *Bochkovlaster* gen. n. (non-phoretic form)
8. Prodorsum with three pairs of simple setae (excluding trichobothria)..... 9
— Prodorsum with two pairs of simple setae (excluding trichobothria).... ..... *Ultrasiteroptes* Livshits, Mitrofanov and Sharonov, 1986
9. Cupules *im* present, postpalpal setae present, setae 1*b* usually bifurcate, coxal fields II with two pairs of setae 10
— Cupules *im* absent, postpalpal setae absent, setae 1*b* not bifurcate, coxal fields II usually with three pairs of setae ..... *Pediculaster* Vitzthum, 1931 (non-phoretic form)
10. Coxal fields I with two pairs of setae ..... *Sevastianoviella* Livshits, Mitrofanov and Sharonov, 1986
— Coxal fields I with three pairs of setae ..... *Neositeroptes* Livshits, Mitrofanov and Sharonov, 1986
11. Coxal fields II with three pairs of setae..... 12
— Coxal fields II with two pairs of setae 18
12. Setae *v'* of femur and *pl"* of tarsus of leg IV not sword-like, claw of tibiotarsus I usually not very large, not striated..... 13
— Setae *v'* of femur and *pl"* of tarsus of leg IV sword-like, claw of tibiotarsus I very large, striated, associated with small mammals..... ..... *Pygmephorus* Kramer, 1877
13. Stigmata usually oval or round, sometimes with chambers, not long and narrow..... 14
— Stigmata long and narrow .... *Luciaphorus* Mahunka, 1981
14. Tibiotarsus I with claw..... 15
— Tibiotarsus I without claw .... *Microdispodides* Vitzthum, 1914
15. Seta *d* of femur I modified 16
— Seta *d* of femur I not modified .... *Pseudoluciaphorus* Khaustov *et al*., 2019
16. Setae *l"* of femur I not modified and not similar in shape with *d* of femur I 17
— Setae *l"* of femur I spine-like, similar in shape with *d* of femur I ..... *Mahunkania* Rack, 1972

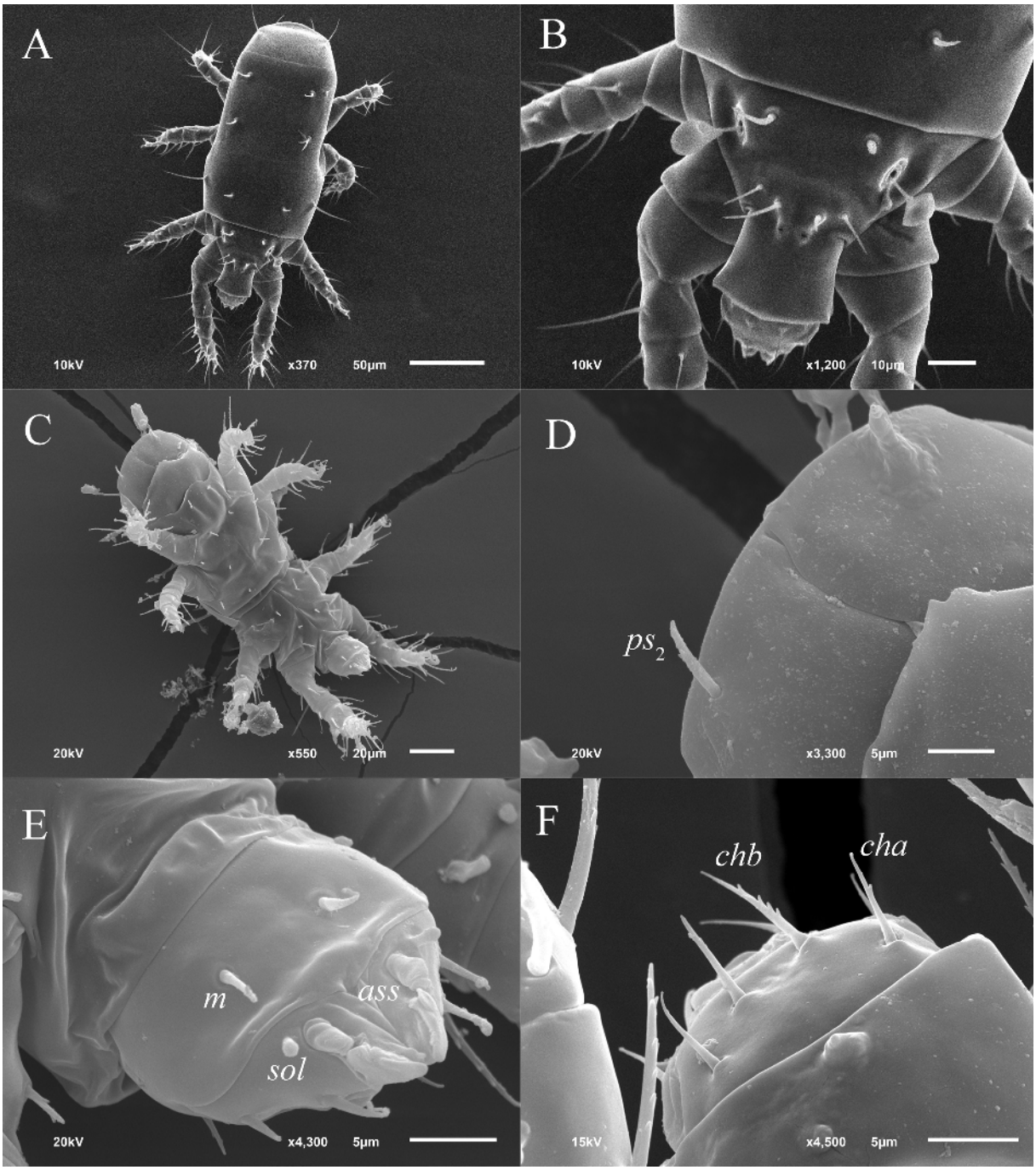

Fig. 12. SEM micrographs of *Bochkovlaster variabilis* gen. n. and sp. n., non-phoretic female: A—general view dorsally, B—prosoma in dorsal view, C—general view ventrally, D—pseudanal segment in ventral view, E—gnathosoma in ventral view; phoretic female: F—gnathosoma in dorsal view.

17. Setae *d* of femur I spatulate, longer than width of femur I ..... *Pediculaster* Vitzthum, 1931 (phoretic form) (part)
— Setae *d* of femur I blade-like, shorter than width of femur I ..... *Propygmephorus* Cross, 1974
18. Coxal fields I with two pairs of setae 19
— Coxal fields I with one or three pairs of setae 23
19. Prodorsum with three pairs of simple setae (excluding trichobothria) 20
— Prodorsum with two pairs of simple setae (excluding trichobothria) ..... *Sasadania* Kurosa, 1989
20. Setae *d* of femur I not modified 21
— Setae *d* of femur I spatulate 22
21. *Trichobothria* present .....
..... *Dudichiana* Mahunka, 1970

— *Trichobothria* absent ..... *Asensilla* Rack, 1974
22. Tarsus II with four modified, spine-like setae ..... *Pygmephoroides* Mahunka and Fain, 1989
— Tarsus II without spine-like setae .... *Pediculaster* Vitzthum, 1931 (phoretic form) (part)
23. Coxal fields I with three pairs of setae 24
— Coxal fields I with one pair of setae .... *Geotrupophorus* Mahunka, 1970
24. Tarsi II and III with six setae each, trichobothria present 25
— Tarsi II and III with only four setae each (*tc'* and *pl"* absent), trichobothria absent .... *Micropygmephorus* Khaustov, Hugo-Coetzee and Ermilov, 2017
25. Setae *d* of femur I longer than width of femur I 26
— Setae *d* of femur I shorter than width of femur I 31
26. Prodorsum with three pairs of simple setae (excluding trichobothria) 28
— Prodorsum with two pairs of simple setae (excluding trichobothria) 27
27. Pseudanal segment distinctly narrowed and elongate posteriorly .... *Pediculitopsis* Mahunka, 1970 (phoretic form)
— Pseudanal segment of normal shape, evenly rounded posteriorly ..... *Apediculaster* Rahiminejad and Hajiqanbar, 2016
28. Setae h_2 present 30
— Setae h_2 absent 29
29. Body fusiform, genua II and III with one seta each ..... *Brasilopsis* Mahunka, 1975 (probably phoretic form of *Metasiteroptes*)
— Body oval, genua II with three setae, genu III with two seta ..... *Bochkovlaster* gen. n. (phoretic form)
30. Leg IV distinctly shorter than leg III, tarsus IV short, with three very long, whip-like setae .... *Acarothorectes* Cross, 1965
— Leg IV not shorter than leg III, tarsus IV not short, sometimes with only one whip-like setae *tc'* ..... *Pediculaster* Vitzthum, 1931 (phoretic form) (part)
31. Empodia on tarsi II–IV present 32
— Empodia on tarsi II–IV absent ..... *Mesopotamiophorus* Sevastianov and Zahida Al Douri, 1991
32. Genu I with one or two setae, genu IV without setae 33
— Genu I with three or four setae, genu IV with one seta 34
33. Tibiotarsus I with two solenidia, setae *d* of femur I hook-like, two pairs of pseudanal setae, setae 4*a* and 4*c* absent … *Elattoma* Mahunka, 1969
— Tibiotarsus I with four solenidia, setae *d* of femur I spatulate, three pairs of pseudanal setae, setae 4*a* and 4*c* present ..... *Spatulaphorus* Rack, 1993
34. Lateral surfaces of tibiotarsus I without slit-like structures, most setae of anterior and posterior sternal plates not modified 35
— Lateral surfaces of tibiotarsus I with slit-like structures, most setae of anterior and posterior sternal plates spine-like ..... *Strephocheir* Mahunka, 1983
35. Stigmata oval, unguinal setae (*u*) of tibiotarsus I present as modified structure opposing to tarsal claw 36
— Stigmata long and narrow, unguinal setae (*u*) of tibiotarsus I absent .... *Parapediculaster* Khaustov, 2015
36. Subcapitular setae *m* present, setae 2*b* not bifurcate 37
— Subcapitular setae *m* absent, setae 2*b* bifurcate ..... *Metapygmephorellus* Rahiminejad, Hajiqanbar and Khaustov, 2015
37. Genu I with four setae, genu II with three setae 38
— Genu I with three setae, genu II with two setae ..... *Pseudopygmephorellus* Khaustov, 2008
38. Cupules *im* present, empodia on tarsi II–II rounded distally, claw on tibiotarsus I situated dorsally .... *Pygmephorellus* Cross and Moser, 1971
— Cupules *im* absent, empodia on tarsi II–II pointed distally, claw on tibiotarsus I twisted ventrally ..... *Cerattoma* Mahunka, 1972

DISCUSSION

The new genus is characterized by a combination of apomorphic and plesiomorphic characters. Most of the apomorphic characters are losses of structures (cupules *ia* and *im* absent; setae h_2, ps_1 and ps_3 absent; absence of main tracheal trunks in non-phoretic female), except for the presence of an unusual dorsal projection on the palpal femorogenu in phoretic female (Figs. 10A, 11B). Similar structures have never been recorded in other pygmephorid mites. However, this structure is present in the sister-family Microdispidae, e.g., in the genera *Punicodoxa* Mahunka, 1978 and *Sidorchukdispus* Khaustov *et al*., 2019 (Khaustov *et al*. 2018, 2019a). Some plesiomorphic characters are also unique. Phoretic female of *Bochkovlaster* retains an unmodified tarsal claw and unguinal setae on tarsus I—these structures are almost identical in

non-phoretic female. Moreover, unmodified unguinal setae on tarsus I are unknown in all described pygmephorid genera with fused tibia and tarsus I. Another unique plesiomorphic character is the retainment of articulation between basi- and telofemur of leg IV. Probably in all pygmephoroid mites, femur IV is separated into basi- and telofemur. However, these leg segments are always tightly fused with only a thin line separating them. In contrast to this condition, in *Bochkovlaster*, basi- and telofemur of leg IV are clearly separated ventrally by a soft cuticle, similar to the articulations between femur and genu.

The differences between phoretic and non-phoretic females are not as distinct as in the sister genus *Pediculaster*. In *Pediculaster*, phoretic female is usually much stronger sclerotized, tarsal claw and unguinal setae on tibiotarsus I are always modified. In *Bochkovdispus*, on the other hand, phoretic female is poorly sclerotized; and the tarsal claw, along with unguinal setae on tibiotarsus I, are not modified. Most likely, female dimorphism in *Bochkovdispus* is most plesiomorpnic among all pygmephorid mites.

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