

REVIEW OF THE *MEDIOLATA* (ACARI: STIGMAEIDAE) OF RUSSIA

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ABSTRACT: In this paper, the genus *Mediolata* Canestrini (Acari: Stigmaeidae) of Russia is revised. *Mediolata neocalifornica* sp. n. is described based on female and male collected from the bark of various trees in Western Siberia. Female and male of *Mediolata pini* Canestrini, 1889, as well as females of *Mediolata conserva* Kuznetsov, 1977, *M. similans* Gonzalez-Rodriguez, 1965, and *M. granaria* Gonzalez-Rodriguez, 1965 are redescribed based on materials from Russia. *Mediolata granaria* is recorded from Russia for the first time. A key to the species of *Mediolata* is provided.

KEY WORDS: Acarina, Raphignathoidea, systematics, morphology, Russia.

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INTRODUCTION

The mite family Stigmaeidae (Acari: Prostigmata) is the largest in the superfamily Raphignathoidea; it currently includes more than 635 species distributed across 33 valid genera (Fan *et al.* 2016, 2019; Beron 2020; Khaustov 2021b). Most stigmaeid mites are free-living predators of various small arthropods. Some species of *Eustigmaeus* feed on mosses, while several species of *Stigmaeus* and *Eustigmaeus* are parasites of sand flies (Diptera: Psychodidae). Species from the genera *Zetzelia* and *Agistemus* are probably the second most important group of plant mite predators (after the Phytoseiidae) (Gerson *et al.* 2003). The genus *Mediolata* Canestrini, 1889 comprises 38 species distributed worldwide (Beron 2000). Previously, five species of *Mediolata* were recorded from Russia, namely: *M. pini* Canestrini, 1889; *M. similans* Gonzalez-Rodriguez, 1965; *M. californica* Gonzalez-Rodriguez, 1965; *M. conserva* Kuznetsov, 1977; and *M. uspenskii* Kuznetsov and Sizova, 1978 (Wainstein and Kuznetsov 1978; Khaustov 2021a). Most species are poorly and incompletely described and only *M. uspenskii* has recently been redescribed (Khaustov 2021a). Faraji and Uecker-mann (2006) provided the latest key to the species of *Mediolata*.

In the course of the present study, a new species of *Mediolata* was collected from bark of various trees in Western Siberia; this species is described herein. In addition, four species—*M. pini*, *M. similans*, *M. granaria* and *M. conserva*—are redescribed based on materials from Russia. The key to the species of *Mediolata* is also provided.

MATERIALS AND METHODS

Mites were collected from various habitats using Berlese funnels and mounted in Hoyer's me-

dium. In the description below, the palpal, idiosomal and the leg setations follow Grandjean (1939, 1944, 1946). The nomenclature of prodorsal setae follows Kethley (1990). All measurements for the holotype, paratypes (in parenthesis), and the red-described species are given in micrometers (μm). In the descriptions of leg setation, the number of solenidia is given in parenthesis. Mite morphology was studied using a Carl Zeiss AxioImager A2 compound microscope with phase contrast and DIC illumination.

SYSTEMATICS

Family **Stigmaeidae Oudemans, 1931**

Genus ***Mediolata* Canestrini, 1889**

Type species: *Stigmaeus longirostris* Berlese, 1887, by original designation

Diagnosis. *Female* and *male*: idiosomal setae *c2* and *2b* absent; ocelli and postocular bodies always present; endopodal plates absent, one pair of genital setae; chelicerae fused into stylophore, palpi distinctly elongate, palptarsus about two times longer than tibial claw, subcapitular setae *n* absent, eupathidia (*ul*) and *sul* of palptarsus fused and only their short tips separated; solenidion ϕ of tibia I, setae (*pl*) of tarsus I, *k* of genu II and *l'* of trochanter III always absent; tips of empodial raylets distinctly widened. *Male*: tarsi III and IV each with one solenidion (additional male solenidia absent).

***Mediolata neocalifornica* sp. n.**

(Figs. 1–6)

Description. *Female* (Figs. 1–4). Body ovate. Length of idiosoma 390 (380–400), maximum width 270 (270–295).

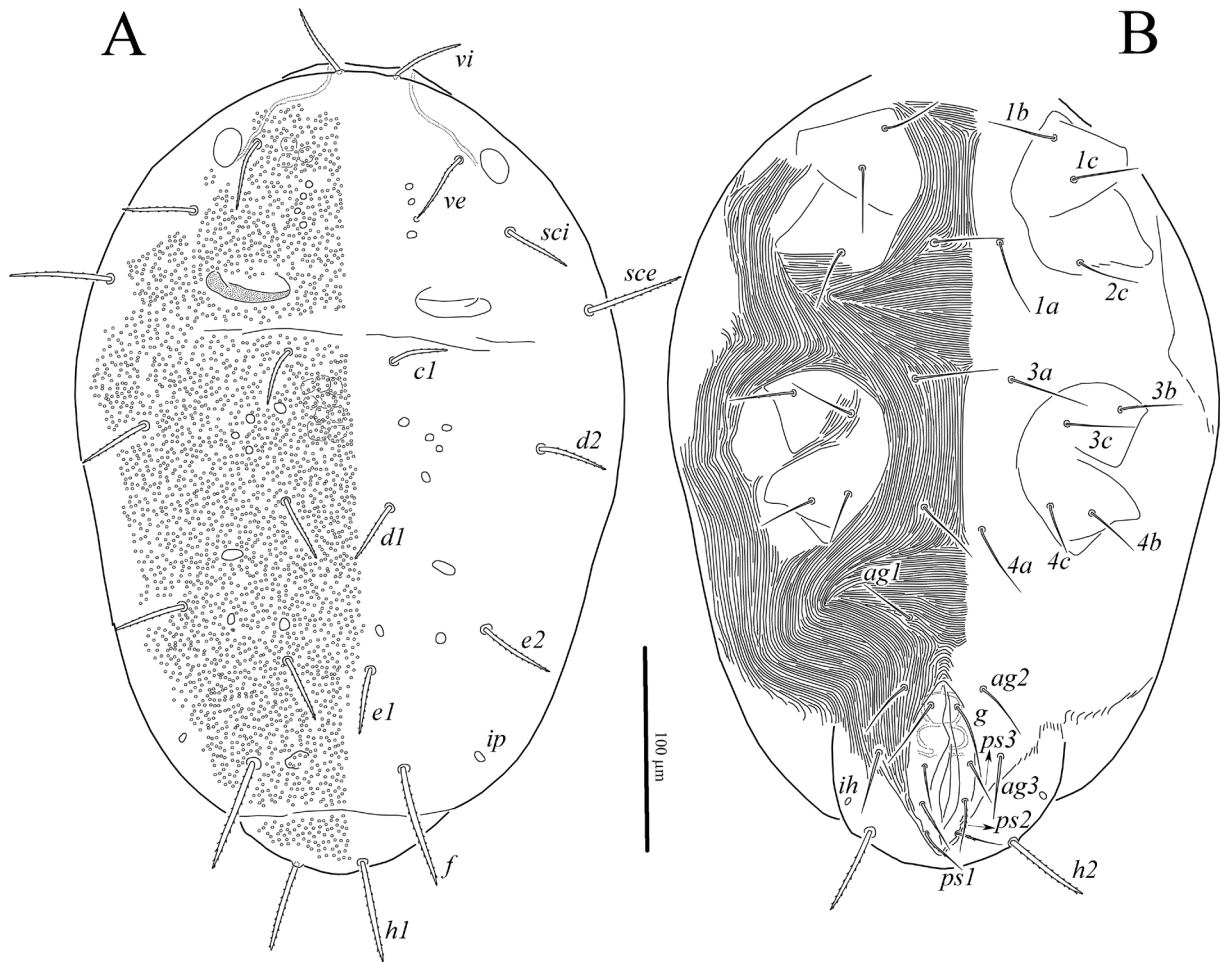


Fig. 1. *Mediolata neocalifornica* sp.n., female: A—dorsum of idiosoma, B—venter of idiosoma.

Idiosomal dorsum (Fig. 1A). Idiosoma completely covered by entire dorsal shield; some specimens with weak transverse furrows between prodorsum and hysterosoma, posteriad setae *d1*, *e1*, and between setae *f* and *h1*. Dorsal shield with weakly discernible big dimples and numerous puncta; subcuticular reticulation poorly visible in some specimens or absent. Ocelli ovate in shape. Postocular bodies large, ovate. All dorsal setae relatively short, blunt-tipped and clearly barbed, situated on short protuberances. Cupuli *ip* located anterolaterad setae *f*; cupuli *ih* located ventrally anterolaterad setae *h2*. Lengths of dorsal setae: *vi* 38 (36–39), *ve* 37 (37–39), *sci* 36 (33–37), *sce* 50 (50–55), *c1* 30 (28–31), *d1* 34 (31–35), *d2* 37 (35–38), *e1* 34 (33–35), *e2* 37 (36–38), *f* 57 (56–58), *h1* 51 (47–52), *h2* 43 (40–45).

Idiosomal venter (Fig. 1B). All ventral plates smooth. All ventral setae pointed; setae *ps1* and *ps2* weakly barbed, other ventral setae smooth. Three pairs of aggenital setae, in some specimens

one of *ag1* seta asymmetrically absent. Lengths of ventral setae: *1a* 37 (33–39), *1b* 31 (29–33), *1c* 33 (30–34), *2c* 30 (27–30), *3a* 40 (38–42), *3b* 30 (28–52), *3c* 32 (28–33), *4a* 38 (35–39), *4b* 28 (27–30), *4c* 28 (26–29), *ag1* 29 (28–30), *ag2* 30 (29–33), *ag3* 35 (32–36), *g* 36 (33–37), *ps1* 25 (24–27), *ps2* 26 (24–27), *ps3* 22 (21–23).

Gnathosoma (Fig. 2). All setae of femur and genu barbed, other palpal setae smooth; seta *d* of palpfemur blunt-tipped, other palpal setae (except eupathidia) pointed. Number of setae on palpal segments: Tr 0, Fe 3 (*d*, *l'*, *v''*), Ge 1 (*d*), Ti 3 (*d*, *l'*, *l''*), Ta 8(1) (fused eupathidia *ul'*, *ul''*, *sul*, eupathidion *acm*, *ba*, *bp*, *lp*, 1 solenidion ω). Palpal supracoxal setae (*ep*) short, spiniform. Rostrum of subcapitulum relatively long. All subcapitular setae pointed and smooth. Subcapitulum smooth. Length of subcapitular setae: *m* 35 (33–36), *or1* 23 (19–23), *or2* 22 (18–23). Length of cheliceral stylets 43 (32–45); length of palps 115 (115–120); length of palpal solenidion ω 8 (7–8).

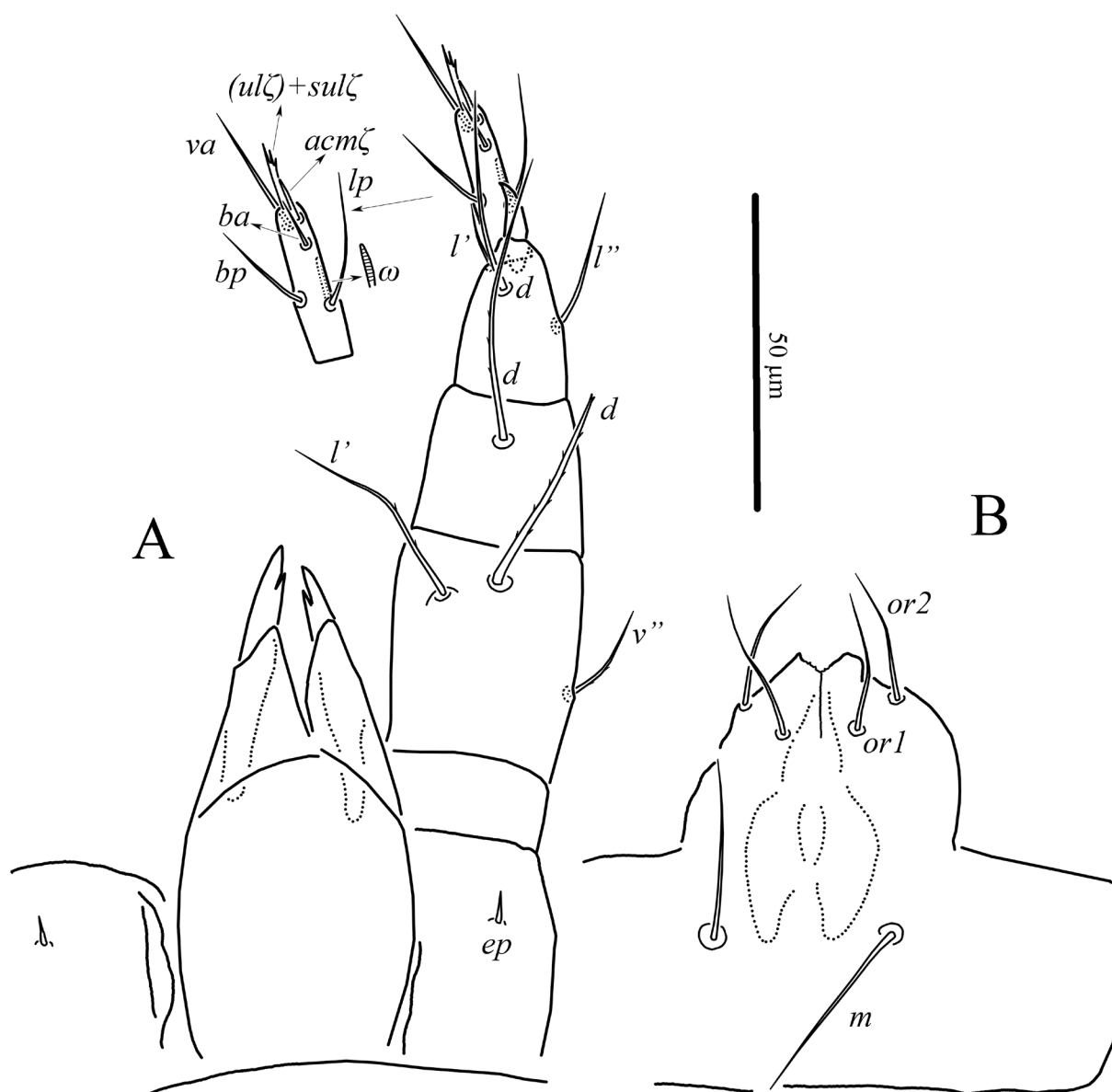


Fig. 2. *Mediolata neocalifornica* sp.n., female: A—gnathosoma, dorsal aspect, B—subcapitulum.

Legs (Figs. 3, 4). Length of legs: I 255 (240–255), II 230 (225–240), III 220 (210–220), IV 235 (230–235). Leg I (Fig. 3A). Coxae I posterodorsally with short spiniform leg supracoaxal setae (*el*). Leg setation: Tr 1 (*v'*), Fe 4 (*d*, *l'*, *l''*, *bv''*), Ge 4 (*d*, *l'*, *l''*, *k*), Ti 5(1) (*dζ*, *l'*, *l''*, *v'*, *v''*, φp), Ta 11(1) (*p'ζ*, *p''ζ*, *tc'ζ*, *tc''ζ*, *ft'*, *ft''*, *u'*, *u''*, *a'*, *a''*, *vs*, ω). Setae *d* of tibia and (*p*), (*tc*) of tarsus eupathid-like; seta *k* of genu short 5 (5), smooth, slightly thickened basally; other setae sparsely barbed; setae *d*, (*l*) of femur and genu, and (*l*) of tibia blunt-tipped, other setae pointed. Solenidion ω 14 (12–14) digitiform; solenidion φp 22 (20–22) uniformly thin with rounded tip. Leg II (Fig. 3B). Leg setation: Tr 1 (*v'*), Fe 4 (*d*, *l'*, *l''*, *bv''*), Ge 3 (*d*, *l'*, *l''*), Ti 5(1) (*d*,

l', *l''*, *v'*, *v''*, φp), Ta 10(1) (*p'ζ*, *p''ζ*, *tc'ζ*, *tc''*, *u'*, *u''*, *a'*, *a''*, *pl'*, *vs*, ω). Setae (*p*) and *tc'* of tarsus smooth, blunt-tipped, eupathid-like, other setae weakly barbed; setae *d*, (*l*) of femur and genu, and *d*, (*l*) of tibia blunt-tipped, other setae pointed. Solenidion ω 17 (15–17) digitiform; solenidion φp 17 (16–18) uniformly thin with rounded tip. Leg III (Fig. 4A). Leg setation: Tr 1 (*v'*), Fe 3 (*d*, *l'*, *ev'*), Ge 1 (*d*), Ti 5(1) (*d*, *l'*, *l''*, *v'*, *v''*, φp), Ta 7(1) (*tc'*, *tc''*, *u'*, *u''*, *a'*, *a''*, *vs*, ω). Solenidion ω 8 (8) digitiform; solenidion φp 13 (12–14) uniformly thin with rounded tip. Setae (*tc*) of tarsus smooth or with few tiny barbs, other setae barbed; setae *d*, *l'* of femur, *d* of genu, *d*, (*l*) of tibia blunt-tipped, other setae pointed. Leg IV (Fig. 4B). Leg setation:

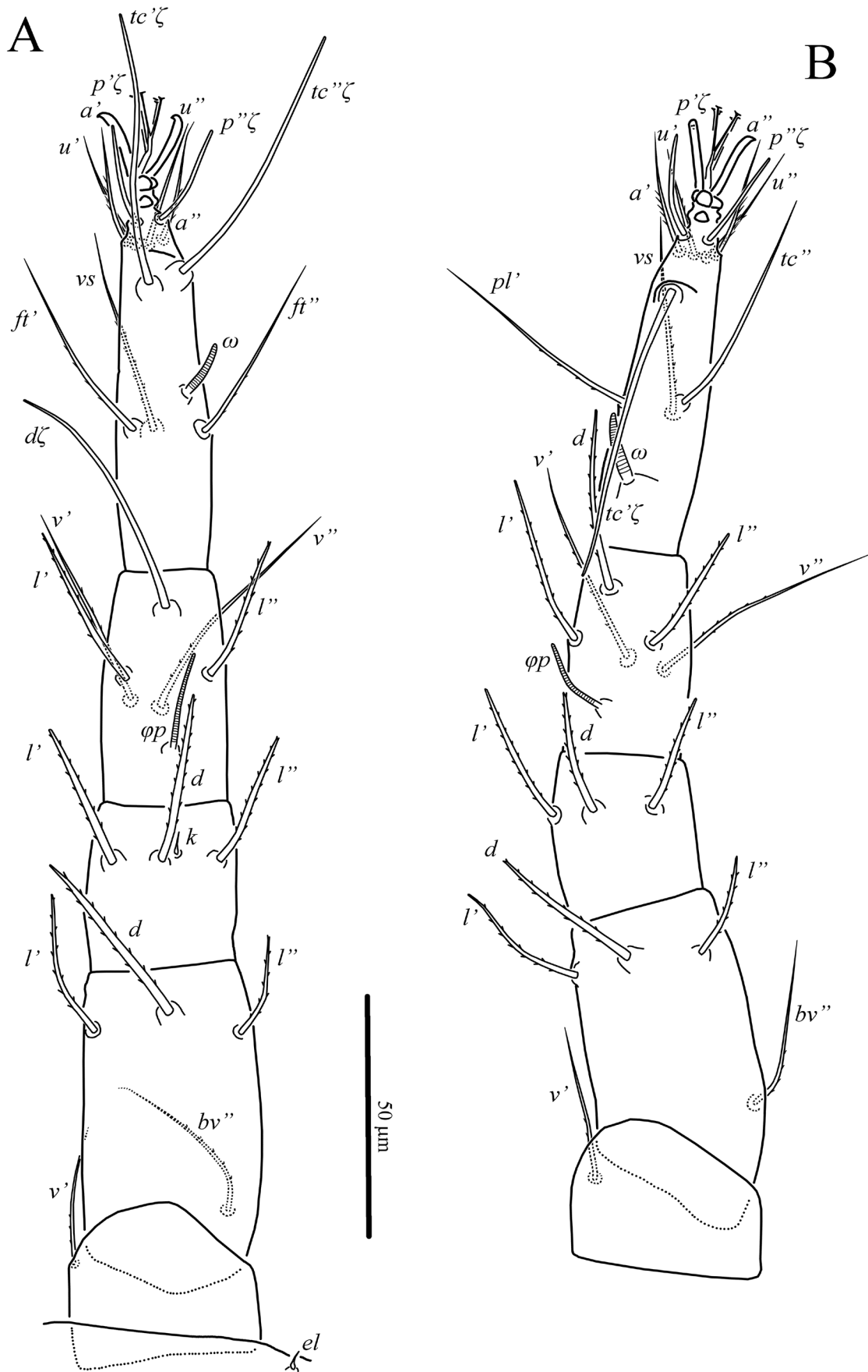


Fig. 3. *Mediolata neocalifornica* sp.n., female: A—right leg I, dorsal aspect, B—right leg II, dorsal aspect.

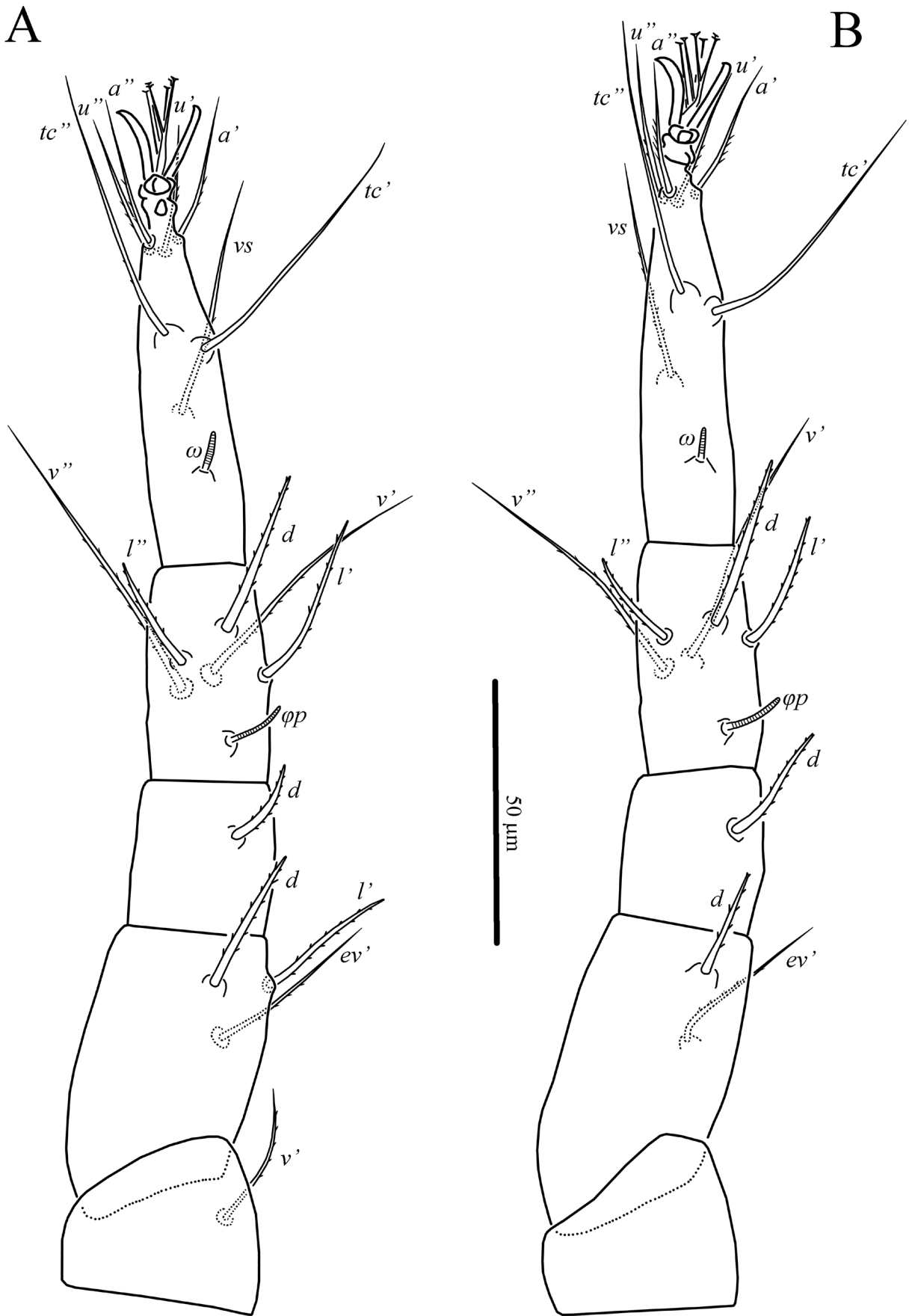


Fig. 4. *Mediolata neocalifornica* sp.n., female: A—left leg III, dorsal aspect, B—left leg IV, dorsal aspect.

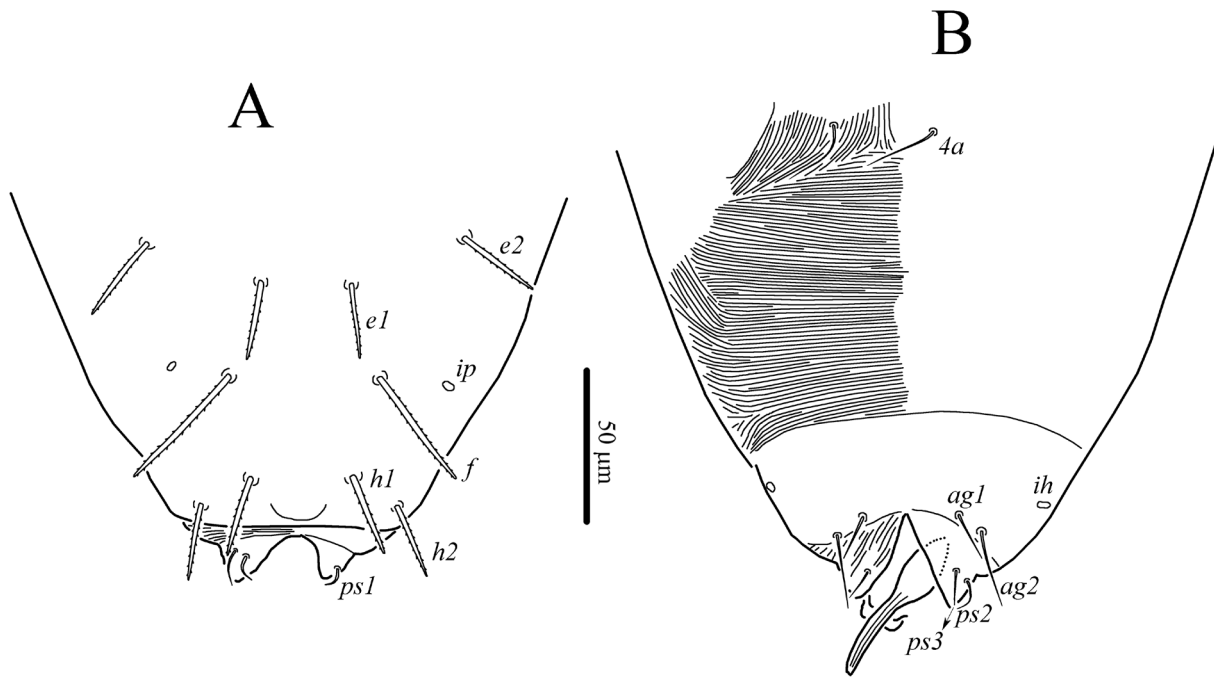


Fig. 5. *Mediolata neocalifornica* sp. n., male: A—dorsum of opisthosoma, B—venter of opisthosoma.

Tr 0, Fe 2 (*d*, *ev'*), Ge 1 (*d*), Ti 5(1) (*d*, *l'*, *l''*, *v'*, *v''*, *pp*), Ta 7(1) (*tc'*, *tc''*, *u'*, *u''*, *a'*, *a''*, *vs*, *ω*). Solenidion ω 5 (5–6) digitiform; solenidion *pp* 12 (12–13) uniformly thin with rounded tip. Setae (*tc*) of tarsus smooth, other setae barbed; setae *d* of femur and genu, *d*, (*l*) of tibia blunt-tipped, other setae pointed.

Male (Figs. 5, 6). Length of idiosoma 320, width 205. Body more narrow posteriorly than in female.

Idiosomal dorsum (Fig. 5A). Dorsum similar to that of female; setae *ps1* short, blunt-tipped, hooked, smooth; setae *ps2–3* pointed and smooth. Aedeagus swollen basally and narrowing distally. Lengths of dorsal setae: *vi* 28, *ve* 29, *sci* 29, *sce* 42, *c1* 22, *d1* 25, *d2* 28, *e1* 27, *e2* 29, *f* 46, *h1* 28, *h2* 25, *ps1* 8, *ps2* 11, *ps3* 14.

Idiosomal venter (Fig. 5B). Aggenital plate with two pairs of aggenital setae; genital setae absent. Lengths of ventral setae: *1a* 31, *1b* 26, *1c* 24, *2c* 25, *3a* 31, *3b* 25, *3c* 23, *4a* 25, *4b* 21, *4c* 22, *ag1* 16, *ag2* 23.

Gnathosoma as in female. Length of subcapitular setae: *m* 24, *or1* 17, *or2* 15. Length of cheliceral stylets 34; length of palp 100; length of palpal solenidion ω 6.

Legs (Fig. 6). Setation of legs as in female, except presence of male solenidia on tarsi I and II and larger solenidia on tarsi III and IV (Figs. 6A–D). Length of legs: I 215, II 195, III 185,

IV 200. Length of solenidia and seta *k*: ω I 11, ω I♂ 14, *pp*I 17, *kl* 3, ω II 19, ω II♂ 16, *pp*II 14, ω III 21, *pp*III 10, ω IV 21, *pp*IV 11.

Immatures unknown.

Type material. Female holotype, slide № ZISP T-St-006, Russia, Tyumen, Zatyumenskiy Park, bark of poplar (*Populus* sp.), 57°10'06.2"N 65°26'52.0"E, 07 November 2021, coll. A.A. Khaustov. Paratypes: 1 female, same data as holotype; 5 females, Russia, city of Tyumen, Zatyumenskiy Park, bark of spruce (*Picea obovata*), 57°09'53.7"N 65°26'47.6"E, 23 August 2019, coll. A.A. Khaustov; 1 male, Russia, Tyumen Oblast, Tyumensky District, vicinity of the settlement of Uspenka, 57°04'N, 65°04'E, on the bark of aspen (*Populus tremula*), 7 May 2019, coll. A.A. Khaustov; 1 female, Russia, Tyumen Oblast, Tyumensky District, vicinity of the settlement of Malinovka, 57°06'N, 65°03'E, on the bark of apple tree, 7 May 2019, coll. A.A. Khaustov; 1 female, Russia, vicinity of the city of Tyumen, 57°13'N, 65°29'E, on the bark of pine (*Pinus sylvestris*), 12 May 2020, coll. A.A. Khaustov; 1 female same locality and date, on the bark of birch (*Betula pendula*).

Type deposition. The holotype and two female paratype are deposited in the collection of the Zoological Institute of RAS, St. Petersburg, Russia; other paratypes are deposited in the collection of

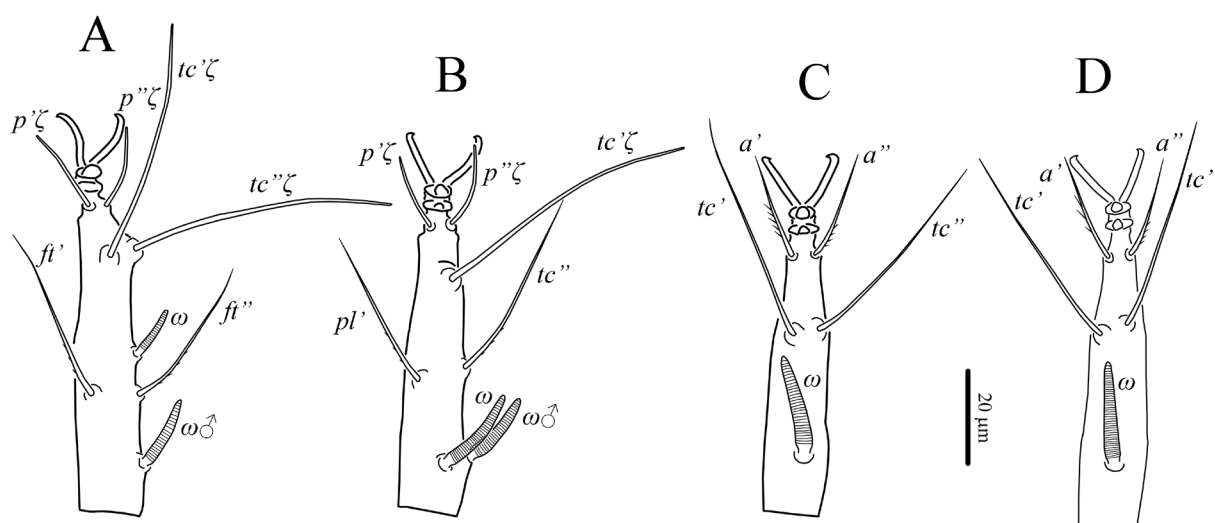


Fig. 6. *Mediolata neocalifornica* sp.n., male: A–D—tarsi I–IV, respectively (ventral setae not illustrated).

the Museum of Zoology, Tyumen State University, Tyumen, Russia.

Etymology. The name of the new species is derived from Greek *neos* meaning *new* and *californica*, the specific epithet of a closely related species.

Differential diagnosis. Female of the new species is most similar to *M. californica* Gonzalez-Rodriguez, 1965 and *M. turcica* Dönel and Doğan, 2012 in the following: presence of three setae on palpfemur and one seta on palpgenu, dorsal idiosoma completely covered by dorsal shield, genu I with four setae, genu II with three setae, femora I and II with four setae each, femur III with three setae, femur IV with two setae, and trochanter IV without setae. The new species differs from the two species mentioned above in the presence of 10 setae (p'' present) on tarsus II (nine setae on tarsus II in *M. californica* and *M. turcica*) and in having distinctly shorter dorsal idiosomal setae $d2$ 35–38, $e1$ 33–35, $e2$ 36–38 ($d2$ 60, $e1$ 58, $e2$ 65 in *M. californica* and $d2$ 53, $e1$ 48, $e2$ 63 in *M. turcica*).

Remarks. Khaustov and Kuznetsov (1997) reported *Mediolata californica* from Ukraine. The examination of a single female from Ukraine revealed that it is in fact conspecific with *M. neocalifornica* sp.n. Thus, *M. californica* should be excluded from Ukrainian fauna. Wainstein and Kuznetsov (1978) and Kuznetsov and Petrov (1984) reported and illustrated *M. californica* from European Russia and Latvia, respectively. The illustrations of *M. californica* provided in these publications show characteristic short dorsal setae, like in *M. neocalifornica* sp.n., in contrast to

rather long dorsal setae in the original description of *M. californica*. Most likely, the species reported as *M. californica* by Wainstein and Kuznetsov (1978) and Kuznetsov and Petrov (1984) is also *M. neocalifornica* sp.n.

***Mediolata pini* Canestrini, 1889**

(Figs. 7–12)

- Mediolata pini* Canestrini, 1889: 525
Eupalopsis pini: Berlese, 1894: 71 (10)
Eupalopsis reticulata Berlese, 1910: 208,
 syn. by Summers 1960
Eupalopsis pinicola Oudemans, 1923: 149,
 syn. by Summers 1960
Eupalopsis punctulata Oudemans, 1923: 149,
 syn. by Summers 1960

Redescription. *Female* (Figs. 7–10). Length of idiosoma 310–355, width 210–235.

Idiosomal dorsum (Fig. 7A). Idiosoma completely covered by dorsal shields; usually with weak transverse furrows between prodorsum and hysterosoma and posteriad setae $d1$; suranal shield clearly separated from dorsal hysterosomal shield by transverse striae of soft cuticle. Dorsal shield with big dimples and numerous tiny puncta; subcuticular reticulation clearly visible. Ocelli round in shape. Postocular bodies large, ovate. All dorsal setae relatively short, blunt-tipped and clearly barbed. Lengths of dorsal setae: vi 28–30, ve 33–39, sci 30–34, sce 35–38, $c1$ 27–30, $d1$ 27–29, $d2$ 29–31, $e1$ 30–31, $e2$ 33–37, $f42$ –44, $h1$ 35–37, $h2$ 31–37.

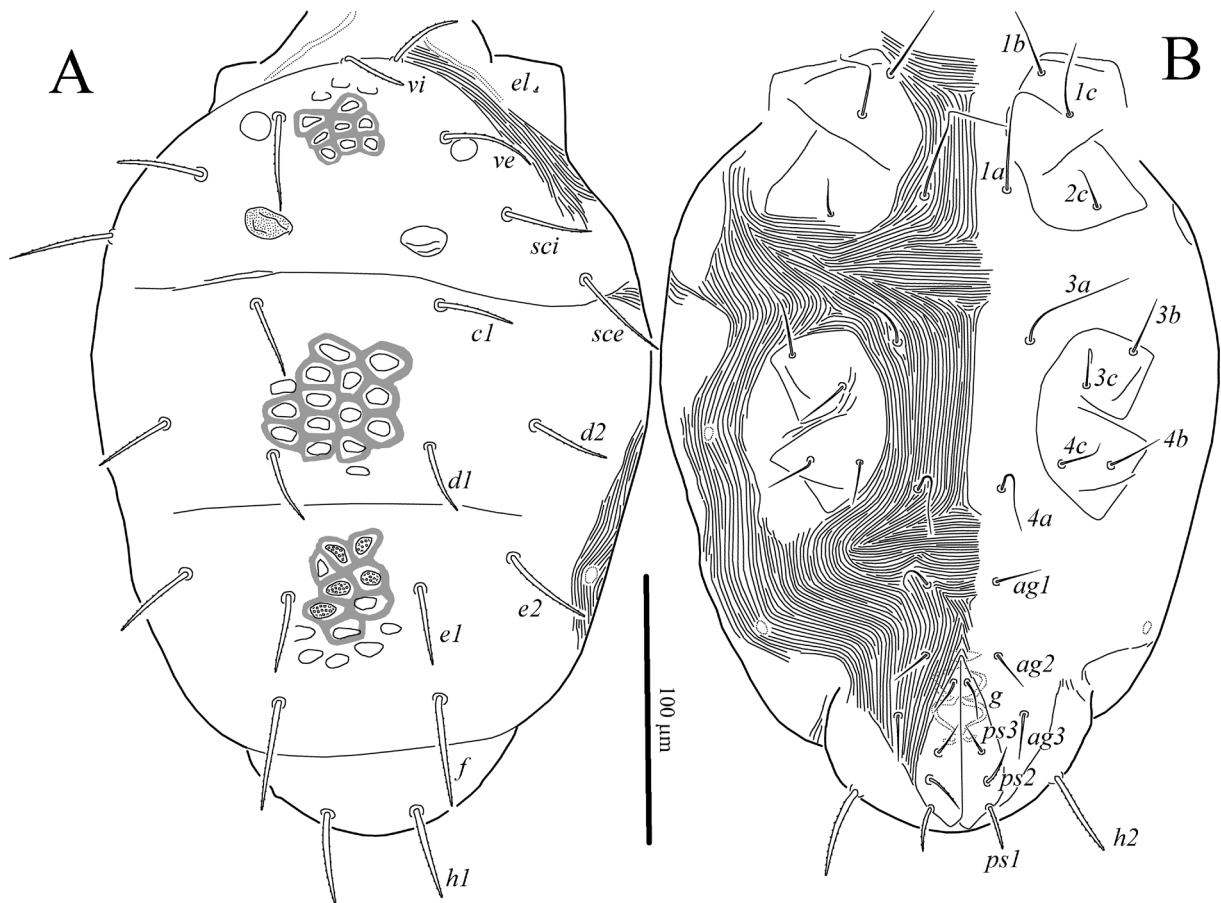


Fig. 7. *Mediolata pini* Canestrini, 1889, female: A—dorsum of idiosoma, B—venter of idiosoma.

Idiosomal venter (Fig. 7B). All ventral plates smooth. Setae *ps1* blunt-tipped, other ventral setae pointed; setae *ps1*–3 weakly barbed, other ventral setae smooth. Three pairs of aggenital setae. Lengths of ventral setae: *1a* 56–60, *1b* 28–33, *1c* 29–33, *2c* 19–25, *3a* 65–74, *3b* 25–28, *3c* 24–25, *4a* 36–39, *4b* 20–25, *4c* 17–19, *ag1* 23–26, *ag2* 15–17, *ag3* 21–24, *g* 14–18, *ps1* 18–20, *ps2* 16–17, *ps3* 15–17.

Gnathosoma (Fig. 8). All palpal setae smooth; eupathid-like setae blunt-tipped, other palpal setae pointed. Number of setae on palpal segments: Tr 0, Fe 2 (*d*, *v*'), Ge 2 (*d*, *l*'), Ti 3 (*d*, *l*', *l*'), Ta 8(1) (fused eupathidia *ul*', *ul*'', *sul*, eupathidion *acm*, *ba*, *bp*, *lp*, 1 solenidion ω). Palpal supracoxal setae (*ep*) short, spiniform. All subcapitular setae pointed and smooth. Subcapitulum smooth. Length of subcapitular setae: *m* 31–33, *or1* 14–16, *or2* 14–16. Length of cheliceral stylets 42–50; length of palps 110–125; length of palpal solenidion ω 8–9.

Legs (Figs. 9, 10). Length of legs: I 175–200, II 160–185, III 145–170, IV 150–175. Leg I (Fig. 9A). Coxae I posterodorsally with short spiniform leg supracoxal setae (*el*). Leg setation: Tr 1 (*v*'), Fe

4 (*d*, *l*', *l*'', *bv*''), Ge 2 (*d*, *k*), Ti 5(1) (*d* ζ , *l*', *l*'', *v*', *v*'', φp), Ta 11(1) (*p*' ζ , *p*'' ζ , *tc*' ζ , *tc*' ζ , *ft*', *ft*'', *u*', *u*'', *a*', *a*'', *vs*, ω). Setae *d* of tibia and (*p*), (*tc*) of tarsus eupathid-like; seta *k* of genu short 5, smooth, slightly thickened basally; other setae sparsely barbed; setae *d* of femur and genu, and *l*'' of tibia blunt-tipped, other setae pointed. Solenidion ω 11–13 digitiform; solenidion φp 18–19 uniformly thin with rounded tip. Leg II (Fig. 9B). Leg setation: Tr 1 (*v*'), Fe 4 (*d*, *l*', *l*'', *bv*''), Ge 1 (*d*), Ti 5(1) (*d*, *l*', *l*'', *v*', *v*'', φp), Ta 9(1) (*p*' ζ , *tc*' ζ , *tc*'', *u*', *u*'', *a*', *a*'', *pl*', *vs*, ω). Setae *p*' and *tc*' of tarsus smooth, blunt-tipped, eupathid-like, other setae weakly barbed; setae *d*, *l*'' of femur, *d* of genu, and *l*'' of tibia blunt-tipped, other setae pointed. Solenidion ω 12–16 digitiform; solenidion φp 17–18 uniformly thin with rounded tip. Leg III (Fig. 10A). Leg setation: Tr 1 (*v*'), Fe 2 (*d*, *ev*'), Ge 1 (*d*), Ti 5(1) (*d*, *l*', *l*'', *v*', *v*'', φp), Ta 7(1) (*tc*'', *tc*'', *u*', *u*'', *a*', *a*'', *vs*, ω). Solenidion ω 8–9 digitiform; solenidion φp 14–17 uniformly thin with rounded tip. Setae (*tc*) of tarsus smooth, other setae barbed; setae *d* of femur, genu and tibia blunt-tipped, other setae pointed. Leg IV (Fig. 10B).

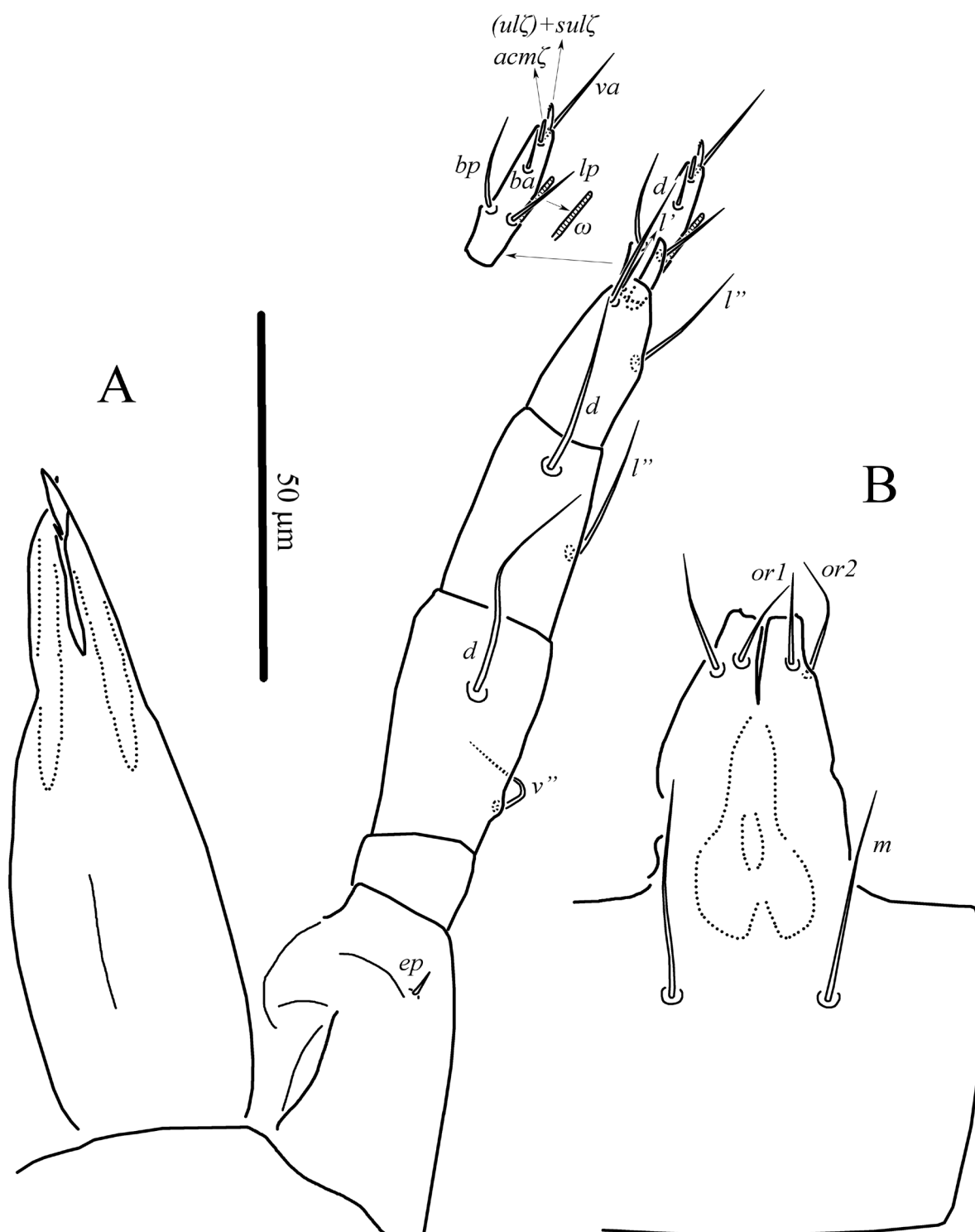


Fig. 8. *Mediolata pini* Canestrini, 1889, female: A—gnathosoma, dorsal aspect, B—subcapitulum.

Leg setation: Tr 1 (v'), Fe 1 (ev'), Ge 1 (d), Ti 4(1) ($d, l'', v', v'', \phi p$), Ta 7(1) ($tc', tc'', u', u'', a', a'', vs, \omega$). Solenidion ω 2–3 very short, peg-like; solenidion ϕp 12–18 uniformly thin with rounded tip. Setae (tc) of tarsus smooth, other setae barbed; setae d of genu and tibia blunt-tipped, other setae pointed.

Male (Figs. 11, 12). Length of idiosoma 275–280, width 160–170. Body more narrow posteriorly than in female.

Idiosomal dorsum (Fig. 11A). Dorsum similar to that of female; setae $ps1$ slightly thickened, short, blunt-tipped, hooked, smooth; setae $ps2-3$ pointed and smooth. Aedeagus thick, curved and slightly

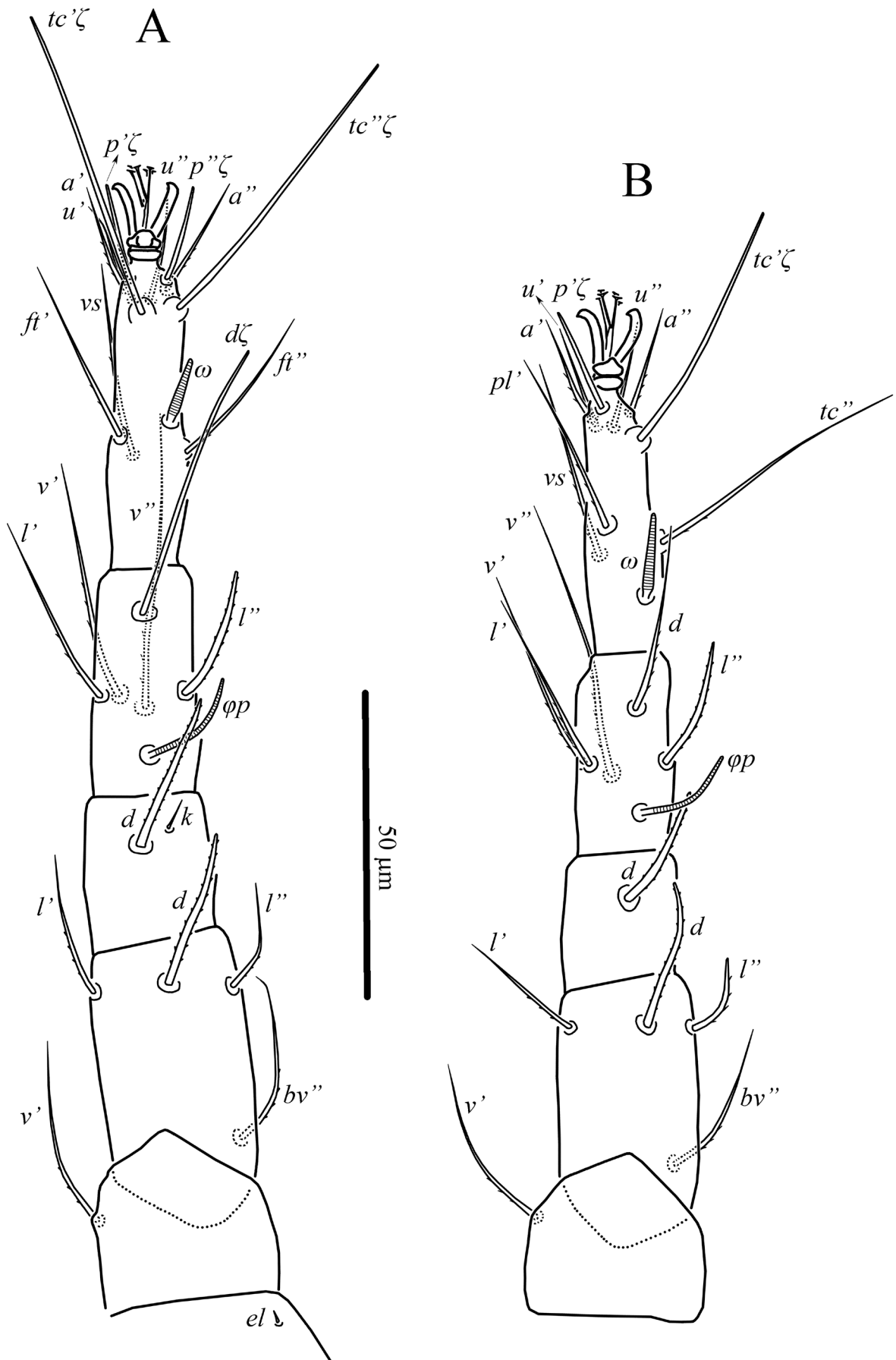


Fig. 9. *Mediolata pini* Canestrini, 1889, female: A—right leg I, dorsal aspect, B—right leg II, dorsal aspect.

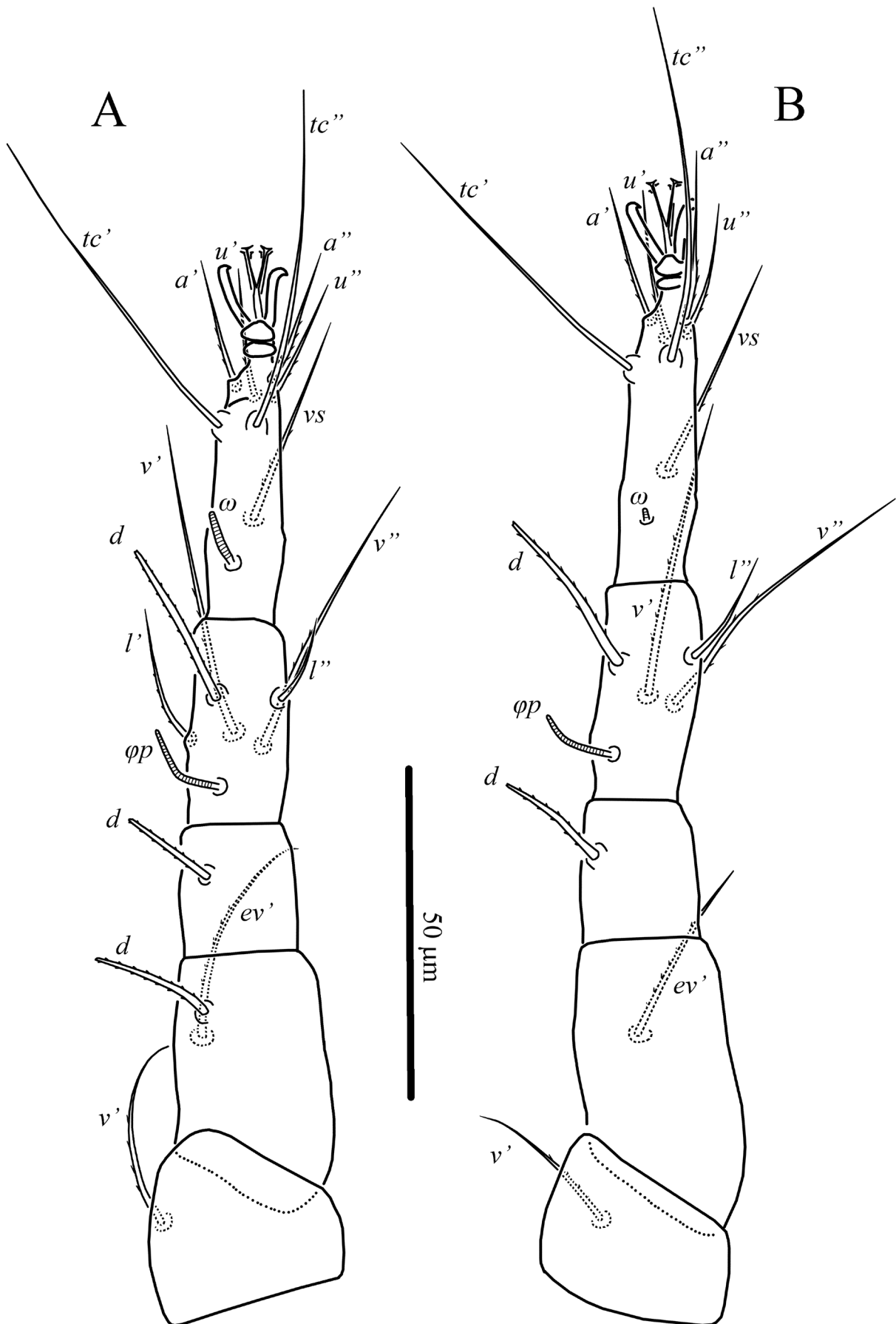


Fig. 10. *Mediolata pini* Canestrini, 1889, female: A—right leg III, dorsal aspect, B—right leg IV, dorsal aspect.

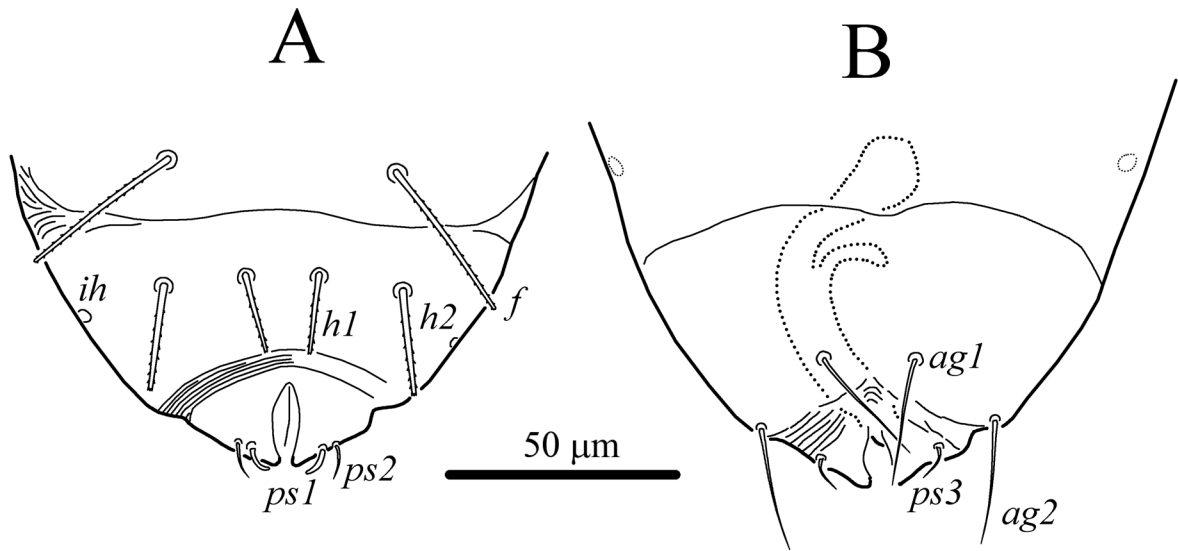


Fig. 11. *Mediolata pini* Canestrini, 1889, male: A—dorsum of opisthosoma, B—venter of opisthosoma.

swollen basally. Lengths of dorsal setae: *vi* 20–21, *ve* 25–26, *sci* 23–25, *sce* 26–32, *cl* 22–24, *dl* 25–26, *d2* 25–29, *e1* 22–24, *e2* 28–30, *f* 37–41, *h1* 18–19, *h2* 21–22, *ps1* 6–7, *ps2* 9–10, *ps3* 11–12.

Idiosomal venter (Fig. 11B). Aggenital plate with two pairs of aggenital setae; genital setae absent. Lengths of ventral setae: *1a* 45–47, *1b* 26–27, *1c* 24–25, *2c* 22–24, *3a* 45–47, *3b* 22–24, *3c* 19–21, *4a* 28–30, *4b* 22–24, *4c* 19–21, *ag1* 28–30, *ag2* 31–33.

Gnathosoma as in female. Length of subcapitular setae: *m* 30–32, *or1* 13–16, *or2* 15–17. Length of cheliceral stylets 40–44; length of palp 105–115; length of palpal solenidion ω 7.

Legs (Fig. 12). Setation of legs as in female, except presence of male solenidia on tarsi I and II and larger solenidia on tarsi III and IV (Fig. 12A–D). Length of legs: I 170–175, II 150–155, III 150–155, IV 165–170. Length of solenidia and seta *k*: ω I 16–18, ω I♂ 13–15, φ pI 18–19, *kl* 5, ω II 16–17, ω II♂ 13–14, φ pII 16–17, ω III 19–20, φ pIII 13–14, ω IV 18–19, φ pIV 14–15.

Immatures unavailable.

Material examined. Five females, two males, Russia, Tyumen Oblast, Tyumensky District, vicinity of the settlement of Uspenka, 57°04'N, 65°04'E, moss on the bark of spruce (*Picea obovata*), 23 May 2019, coll. A.A. Khaustov; 3 females, Russia,

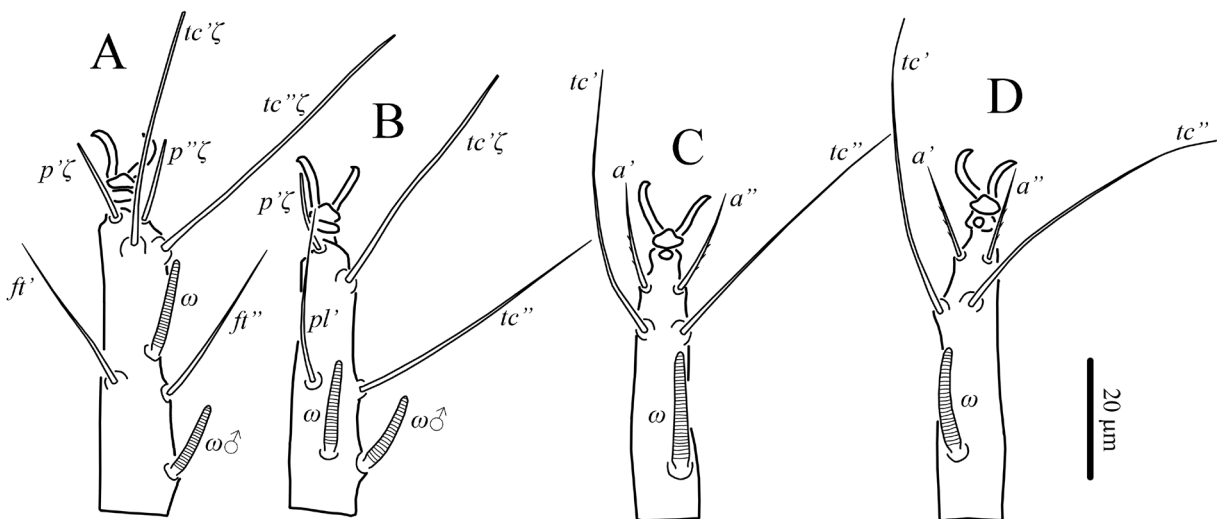


Fig. 12. *Mediolata pini* Canestrini, 1889, male: A–D—tarsi I–IV, respectively (ventral setae not illustrated).

vicinity of the city of Tyumen, 57°13'N, 65°29'E, in the nest of ants (*Formica polyctena*), 10 September 2014, coll. A. A. Khaustov.

Remarks. This species is widely distributed in the Holarctic and was recorded from Austria, Azerbaijan, Canada, Egypt, Italy, Latvia, Moldavia, Poland, Russia, Switzerland, Turkey, Ukraine and the USA (Beron 2020). In Russia, it was recorded from the European part (Wainstein and Kuznetsov 1978) and the Altai Republic (Khaustov 2021a).

Despite several redescrptions of this species (Summers 1960; Gonzalez-Rodriguez 1965; Kuznetsov and Petrov 1994; Dilkaraoglu *et al.* 2016), a detailed illustration and description of gnathosomal, leg and some idiosomal structures are absent. That is why I provided another redescription based on my materials from Western Siberia.

Mediolata conserva Kuznetsov, 1977

(Figs. 13–16)

Mediolata conserva Kuznetsov, 1977: 302

Redescription. *Female* (Figs. 13–16). Length of idiosoma 355, width 210.

Idiosomal dorsum (Fig. 13A). Idiosoma not completely covered by several dorsal shield clearly separated by soft striated cuticle. Prodorsum with unpaired prodorsal shield with three pairs of setae (*vi*, *ve*, *sci*) and two small platelets with setae *sce*. Hysterosoma with four dorsal shields: shield CD with three pairs of setae (*c1*, *d1*, *d2*); shield E with two pairs of setae (*e1*, *e2*); shield F with one pair of setae *f* and suranal shield with two pairs of setae (*h1*, *h2*). Dorsal shields with very

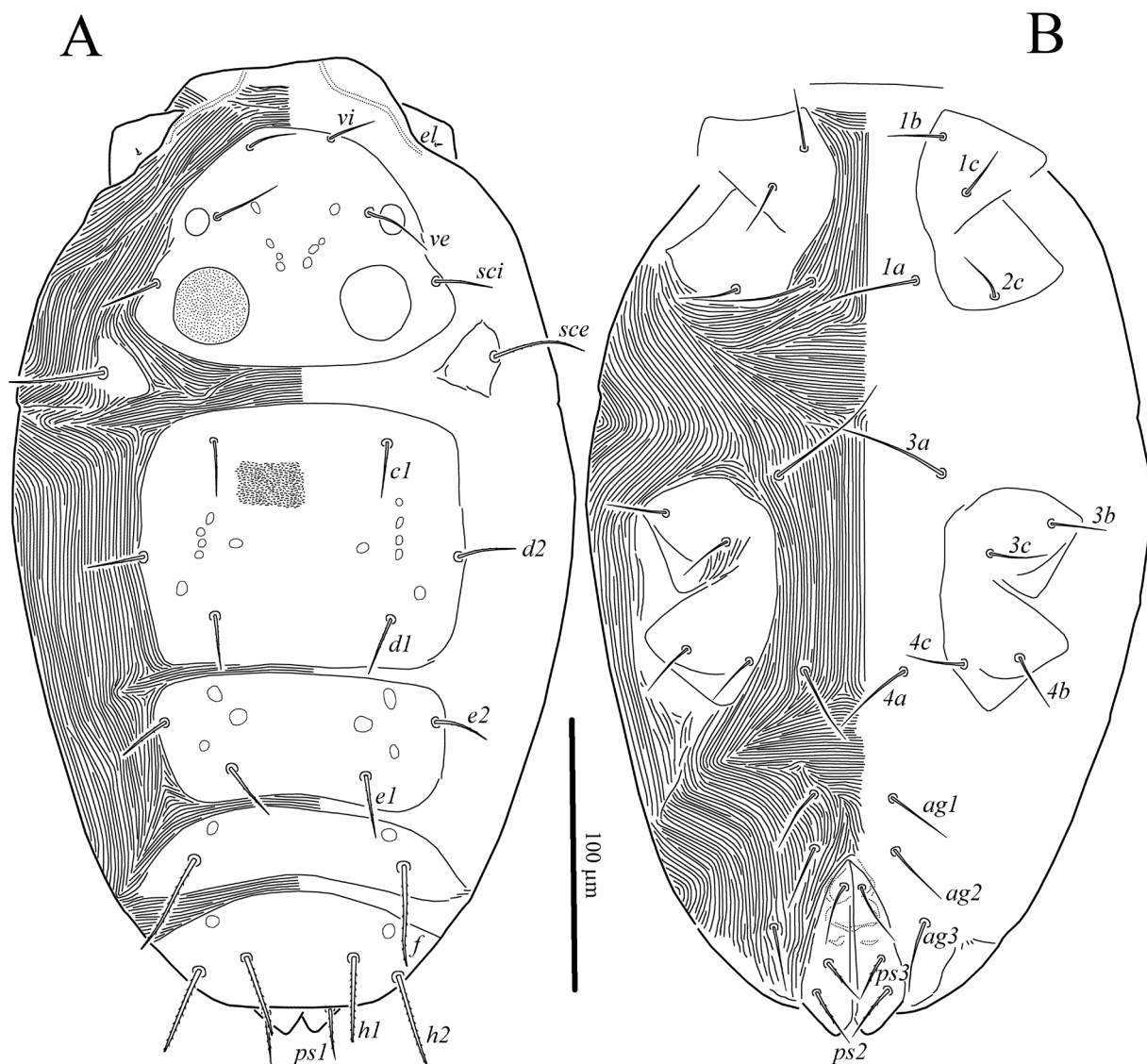


Fig. 13. *Mediolata conserva* Kuznetsov, 1977, female: A—dorsum of idiosoma, B—venter of idiosoma.

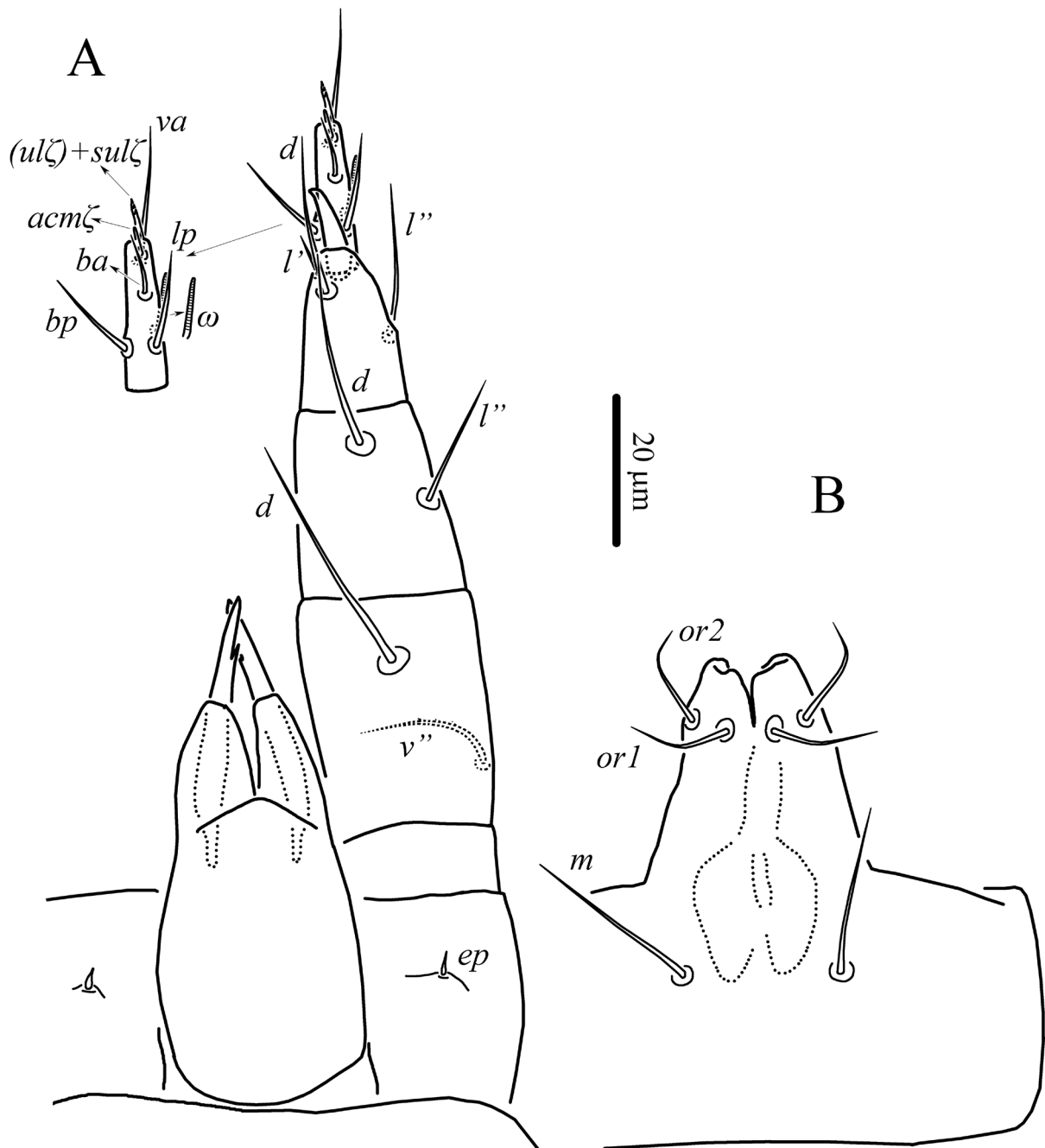


Fig. 14. *Mediolata conserva* Kuznetsov, 1977, female: A—gnathosoma, dorsal aspect, B—subcapitulum.

delicate microtubercles. Ocelli round in shape. Postocular bodies large, round. Dorsal setae *vi* and *ve* smooth, setae *f*, *h1*, *h2* distinctly barbed, other dorsal setae weakly barbed; setae *f*, *h1* and *h2* clearly blunt-tipped, other setae weakly blunt-tipped. Setae *ps1* located dorsally. Cupuli not evident. Lengths of dorsal setae: *vi* 18, *ve* 27, *sci* 22, *sce* 34, *cl* 21, *d1* 22, *d2* 22, *e1* 24, *e2* 21, *f* 39, *h1* 31, *h2* 35.

Idiosomal venter (Fig. 13B). All ventral plates smooth. Setae *ps1* weakly blunt-tipped, other ven-

tral setae pointed; setae *ps1–3* weakly barbed, other ventral setae smooth. Three pairs of aggenital setae. Lengths of ventral setae: *1a* 47, *1b* 21, *1c* 21, *2c* 22, *3a* 54, *3b* 22, *3c* 21, *4a* 31, *4b* 22, *4c* 22, *ag1* 26, *ag2* 24, *ag3* 25, *g* 22, *ps1* 22, *ps2* 21, *ps3* 20.

Gnathosoma (Fig. 14). All palpal setae smooth; eupathid-like setae blunt-tipped, other palpal setae pointed. Number of setae on palpal segments: Tr 0, Fe 2 (*d*, *v''*), Ge 2 (*d*, *l''*), Ti 3 (*d*, *l'*, *l''*), Ta 8(1) (fused eupathidia *ul'*, *ul''*, *sul*, eupathidion *acm*, *ba*, *bp*, *lp*, 1 solenidion *ω*). Palpal supracoxal setae

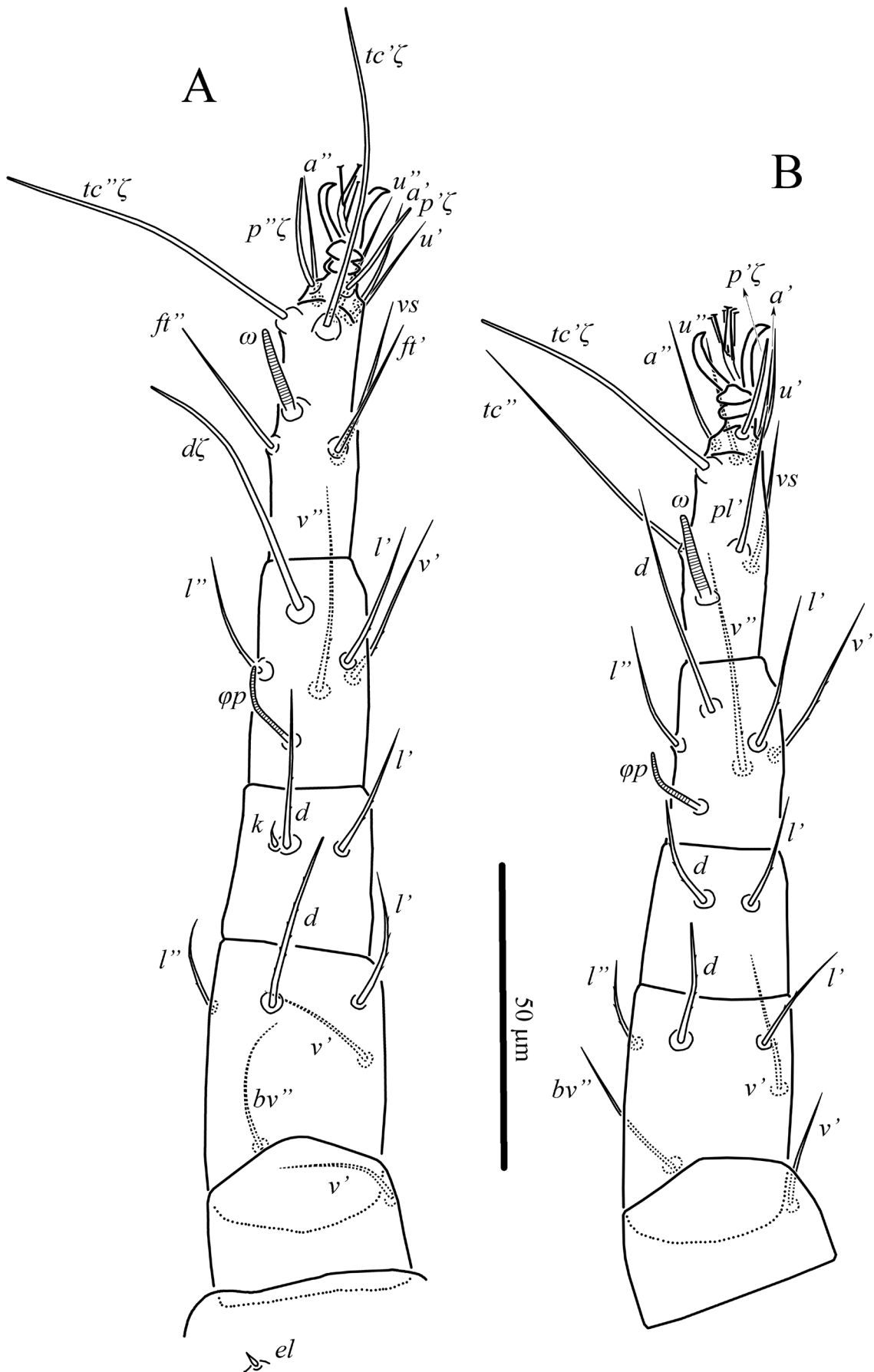


Fig. 15. *Mediolata conserva* Kuznetsov, 1977, female: A—left leg I, dorsal aspect, B—left leg II, dorsal aspect.

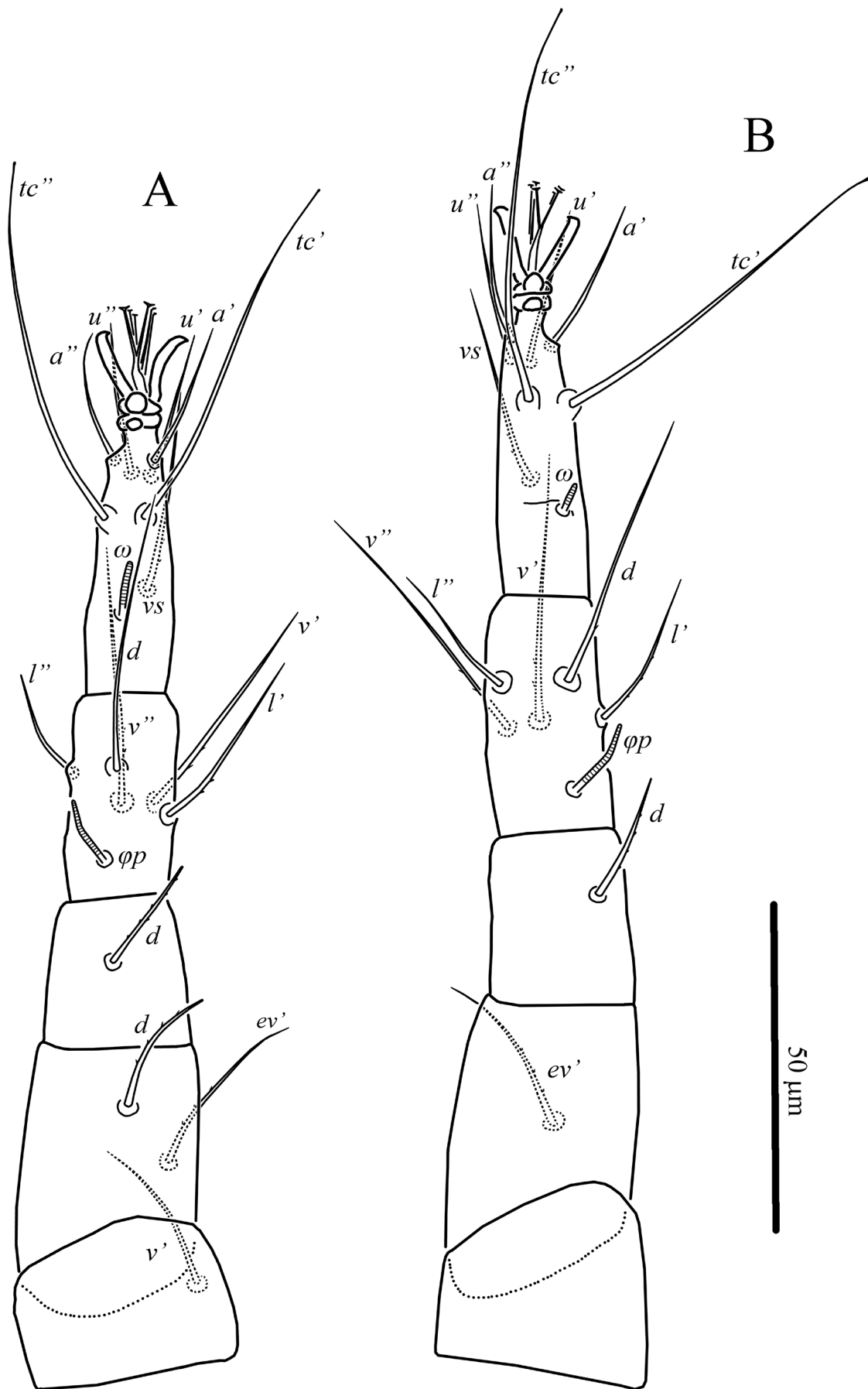


Fig. 16. *Mediolata conserva* Kuznetsov, 1977, female: A—left leg III, dorsal aspect, B—left leg IV, dorsal aspect.

(*ep*) short, spiniform. All subcapitular setae pointed and smooth. Subcapitulum smooth. Length of subcapitular setae: *m* 25, *or1* 14, *or2* 14. Length of cheliceral stylets 37; length of palps 105; length of palpal solenidion ω 8.

Legs (Figs. 15, 16). Length of legs: I 175, II 160, III 150, IV 165. Leg I (Fig. 15A). Coxae I posterodorsally with short spiniform leg supracoxal setae (*el*). Leg setation: Tr 1 (*v'*), Fe 5 (*d, l', l'', v', bv''*), Ge 3 (*d, l', k*), Ti 5(1) (*d ζ , l', l'', v', v''*, ϕp), Ta 11(1) (*p' ζ , p'' ζ , tc' ζ , tc'' ζ , ft', ft'', u', u'', a', a'', vs, ω*). Setae *d* of tibia and (*p*), (*tc*) of tarsus eupathid-like; seta *k* of genu short 4, smooth, slightly thickened basally; other setae of trochanter, femur, genu and tibia sparsely barbed; all tarsal setae smooth; setae *d* of femur and genu weakly blunt-tipped, other setae pointed. Solenidion ω 14 digitiform; solenidion ϕp 15 uniformly thin with rounded tip. Leg II (Fig. 15B). Leg setation: Tr 1 (*v'*), Fe 5 (*d, l', l'', v', bv''*), Ge 2 (*d, l'*), Ti 5(1) (*d, l', l'', v', v''*, ϕp), Ta 9(1) (*p' ζ , tc' ζ , tc'', u', u'', a', a'', pl', vs, ω*). Setae *p'* and *tc'* of tarsus smooth, blunt-tipped, eupathid-like, other setae smooth or with few weak barbs; setae *d* of femur and genu blunt-tipped, other setae pointed. Solenidion ω 14 digitiform; solenidion ϕp 13 uniformly thin with rounded tip. Leg III (Fig. 16A). Leg setation: Tr 1 (*v'*), Fe 2 (*d, ev'*), Ge 1 (*d*), Ti 5(1) (*d, l', l'', v', v''*, ϕp), Ta 7(1) (*tc', tc'', u', u'', a', a'', vs, ω*). Solenidion ω 8 digitiform; solenidion ϕp 11 uniformly thin with rounded tip. All setae of tarsus smooth, other setae with few weak barbs; setae (*tc*) of tarsus with slightly clavate tips; setae *d* of femur and genu blunt-tipped, other setae pointed. Leg IV (Fig. 16B). Leg setation: Tr 1 (*v'*), Fe 1 (*ev'*), Ge 1 (*d*), Ti 5(1) (*d, l', l'', v', v''*, ϕp), Ta 7(1) (*tc', tc'', u', u'', a', a'', vs, ω*). Solenidion ω 5 digitiform; solenidion ϕp 12 uniformly thin with rounded tip. All setae of tarsus smooth, other setae with few weak barbs; setae (*tc*) of tarsus with slightly clavate tips; seta *d* of genu blunt-tipped, other setae pointed.

Male and Immatures unknown.

Material examined. One female, Russia, Crimea, Yalta, Nikita Botanical Gardens, 44°30'N, 34°14'E, on the bark of Caucasian zelkova (*Zelkova carpinifolia*), 17 June 1974, coll. N.N. Kuznetsov.

Remarks. This species was described from European Russia (Voronezh Region) from oak forest litter (Kuznetsov 1977). In the original description (Kuznetsov 1977) the number of setae on femur II is six. I have examined the single available

specimen of *M. conserva* from Crimea identified by N.N. Kuznetsov. In fact, it has five setae on femur II. Furthermore, the maximum number of setae on femur II in the Stigmaeidae mites is five. Without any doubt, the mention of six setae on femur II is a typo.

***Mediolata similans* Gonzalez-Rodriguez, 1965**

(Figs. 17–20)

Mediolata similans Gonzalez-Rodriguez, 1965: 11

Redescription. *Female* (Figs. 17–20). Length of idiosoma 290, width 190.

Idiosomal dorsum (Fig. 17A). Idiosoma completely covered by dorsal shields; usually with weak transverse furrows between prodorsum and hysterosoma and posteriad setae *dl* and *el*; suranal shield clearly separated from dorsal hysterosomal shield by transverse striae of soft cuticle. Dorsal shield with big dimples and numerous tiny puncta; subcuticular reticulation poorly visible. Ocelli round in shape. Postocular bodies large, round. All dorsal setae relatively short, blunt-tipped and clearly barbed. Lengths of dorsal setae: *vi* 27, *ve* 39, *sci* 34, *sce* 43, *cl* 30, *dl* 30, *d2* 31, *el* 38, *e2* 40, *f46*, *hl* 35, *h2* 32.

Idiosomal venter (Fig. 17B). All ventral plates smooth. All ventral setae pointed; setae *ps1–3* weakly barbed, other ventral setae smooth. Three pairs of aggenital setae. Lengths of ventral setae: *la* 54, *lb* 22, *lc* 25, *2c* 22, *3a* 62, *3b* 22, *3c* 21, *4a* 32, *4b* 21, *4c* 22, *ag1* 23, *ag2* 19, *ag3* 25, *g* 22, *ps1* 21, *ps2* 20, *ps3* 16.

Gnathosoma (Fig. 18). Setae of palpfemur weakly barbed, other palpal setae smooth; setae of palpfemur and eupathid-like setae blunt-tipped, other palpal setae pointed. Number of setae on palpal segments: Tr 0, Fe 2 (*d, v''*), Ge 2 (*d, l''*), Ti 3 (*d, l', l''*), Ta 8(1) (fused eupathidia *ul', ul'', sul*, eupathidion *acm, ba, bp, lp*, 1 solenidion ω). Palpal supracoxal setae (*ep*) short, spiniform. All subcapitular setae pointed and smooth. Subcapitulum smooth. Anterior margin of subcapitular rostrum with well-developed papillae. Length of subcapitular setae: *m* 31, *or1* 14, *or2* 18. Length of cheliceral stylets 42; length of palps 105; length of palpal solenidion ω 7.

Legs (Figs. 19, 20). Length of legs: I 160, II 145, III 140, IV 145. Leg I (Fig. 19A). Coxae I posterodorsally with short spiniform leg supracoxal

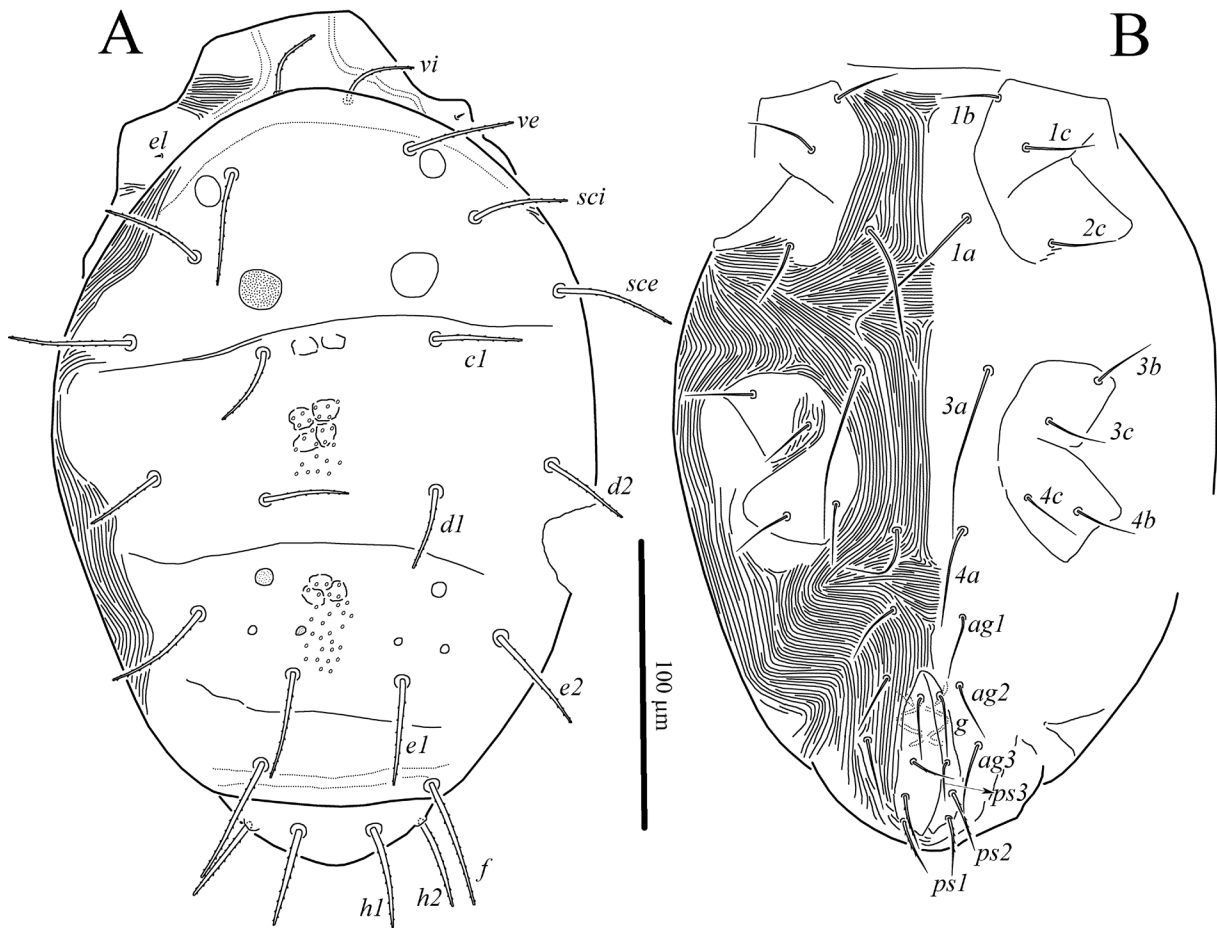


Fig. 17. *Mediolata similans* Gonzalez-Rodriguez, 1965, female: A—dorsum of idiosoma, B—venter of idiosoma.

setae (*el*). Leg setation: Tr 1 (*v'*), Fe 5 (*d, l', l'', v', bv''*), Ge 4 (*d, l', l'', k*), Ti 5(1) (*d₅, l', l'', v', v'', φp*), Ta 11(1) (*p'₅, p''₅, tc'₅, tc''₅, ft', ft'', u', u'', a', a'', vs, ω*). Setae *d* of tibia and (*p*), (*tc*) of tarsus eupathid-like; seta *k* of genu short 4, smooth, slightly thickened basally; setae *v'* of trochanter, *bv''* of femur and all tarsal setae smooth, other setae sparsely barbed; setae *d, l''* of femur, *d, (l)* of genu, and (*l*) of tibia blunt-tipped, other setae pointed. Solenidion ω 9 digitiform; solenidion φp 15 uniformly thin with rounded tip. Leg II (Fig. 19B). Leg setation: Tr 1 (*v'*), Fe 5 (*d, l', l'', v', bv''*), Ge 3 (*d, l', l''*), Ti 5(1) (*d, l', l'', v', v'', φp*), Ta 9(1) (*p'₅, tc'₅, tc'', u', u'', a', a'', pl', vs, ω*). Setae *p'* and *tc'* of tarsus smooth, blunt-tipped, eupathid-like; setae *v'* of trochanter, *bv''* of femur and all tarsal setae smooth, other setae weakly barbed; setae *d, l''* of femur and tibia, *d* and (*l*) of genu blunt-tipped, other setae pointed. Solenidion ω 11 digitiform; solenidion φp 14 uniformly thin with rounded tip. Leg III (Fig. 20A). Leg setation: Tr 1 (*v'*), Fe 2 (*d, ev'*), Ge 1 (*d*), Ti 5(1) (*d, l', l'', v', v'', φp*), Ta 7(1) (*tc', tc'', u', u'', a', a'', vs, ω*).

Solenidion ω 7 digitiform; solenidion φp 12 uniformly thin with rounded tip. Setae *v'* of trochanter, *ev'* of femur and most setae of tarsus (except *vs*) smooth, other setae barbed; setae *d* of femur and genu, *d, l'* of tibia blunt-tipped, other setae pointed. Leg IV (Fig. 20B). Leg setation: Tr 0, Fe 1 (*ev'*), Ge 1 (*d*), Ti 5(1) (*d, l', l'', v', v'', φp*), Ta 7(1) (*tc', tc'', u', u'', a', a'', vs, ω*). Solenidion ω 5 digitiform; solenidion φp 11 uniformly thin with rounded tip. Most setae of tarsus (except *vs*) smooth, other setae barbed; setae *d* of genu, *d, l'* of tibia blunt-tipped, other setae pointed.

Male and Immatures unknown.

Material examined. One female, Russia, Crimea, vicinity of Yalta, 44°29'N, 34°08'E, on the bark of pine, 26 December 2000, coll. A.A. Khaustov.

Remarks. This species was described from apple tree bark, from England (Gonzalez-Rodriguez 1965). It was also recorded in Israel and European Russia (Wainstein and Kuznetsov 1978; Beron 2020).

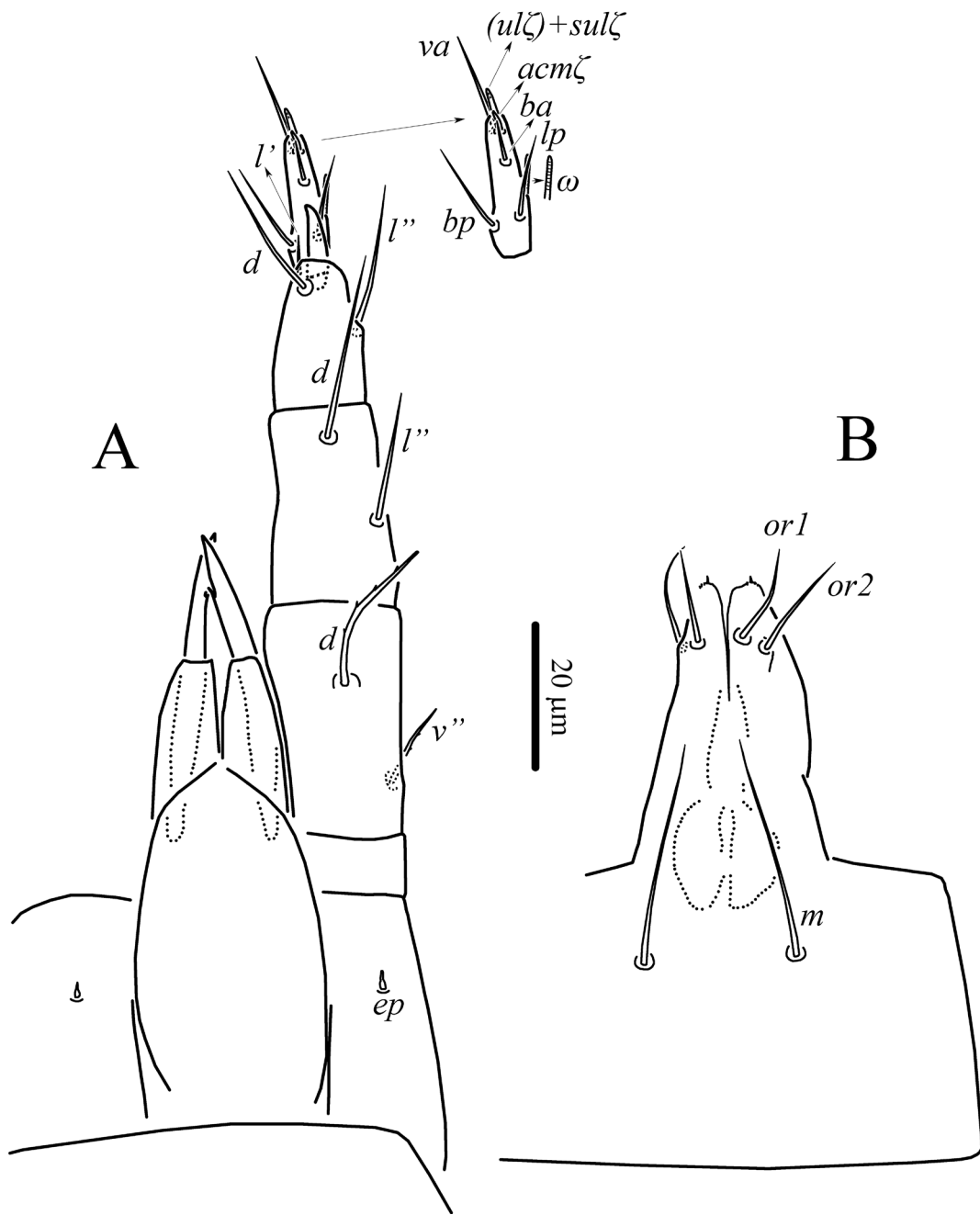


Fig. 18. *Mediolata similans* Gonzalez-Rodriguez, 1965, female: A—gnathosoma, dorsal aspect, B—subcapitulum.

***Mediolata granaria*
Gonzalez-Rodriguez, 1965**

(Figs. 21–24)

Mediolata granaria Gonzalez-Rodriguez, 1965: 14

Redescription. *Female* (Figs. 21–24). Length of idiosoma 350–375, width 210–230.

Idiosomal dorsum (Fig. 21A). Idiosoma not completely covered by several dorsal shields; prodorsal shield with four pairs of setae (*vi*, *ve*, *sci*,

sce) and with clearly concave posterior margin; hysterosoma with relatively narrow dorsal hysterosomal shield with six pairs of setae (*c1*, *d1*, *d2*, *e1*, *e2*, *f*) and with weak transverse furrows posterior setae *d1* and *e1*; suranal shield clearly separated from dorsal hysterosomal shield by transverse striae of soft cuticle. All dorsal shields with numerous puncta; subcuticular reticulation absent. Ocelli round in shape. Postocular bodies large, round. Cupuli *ip* located anterolaterad setae *f*; cupuli *ih* located laterad setae *h2*. All dorsal setae

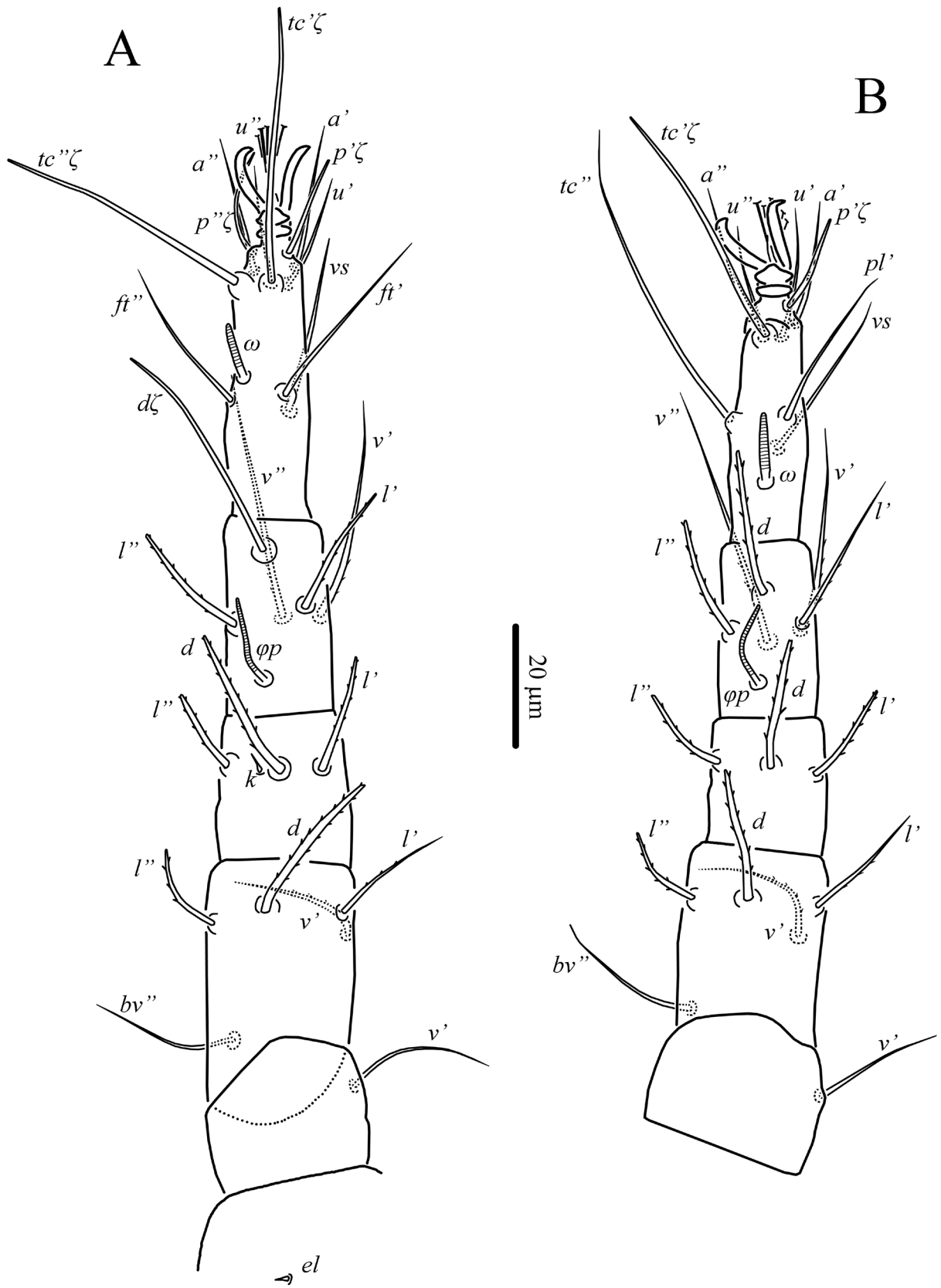


Fig. 19. *Mediolata similans* Gonzalez-Rodriguez, 1965, female: A—right leg I, dorsal aspect, B—right leg II, dorsal aspect.

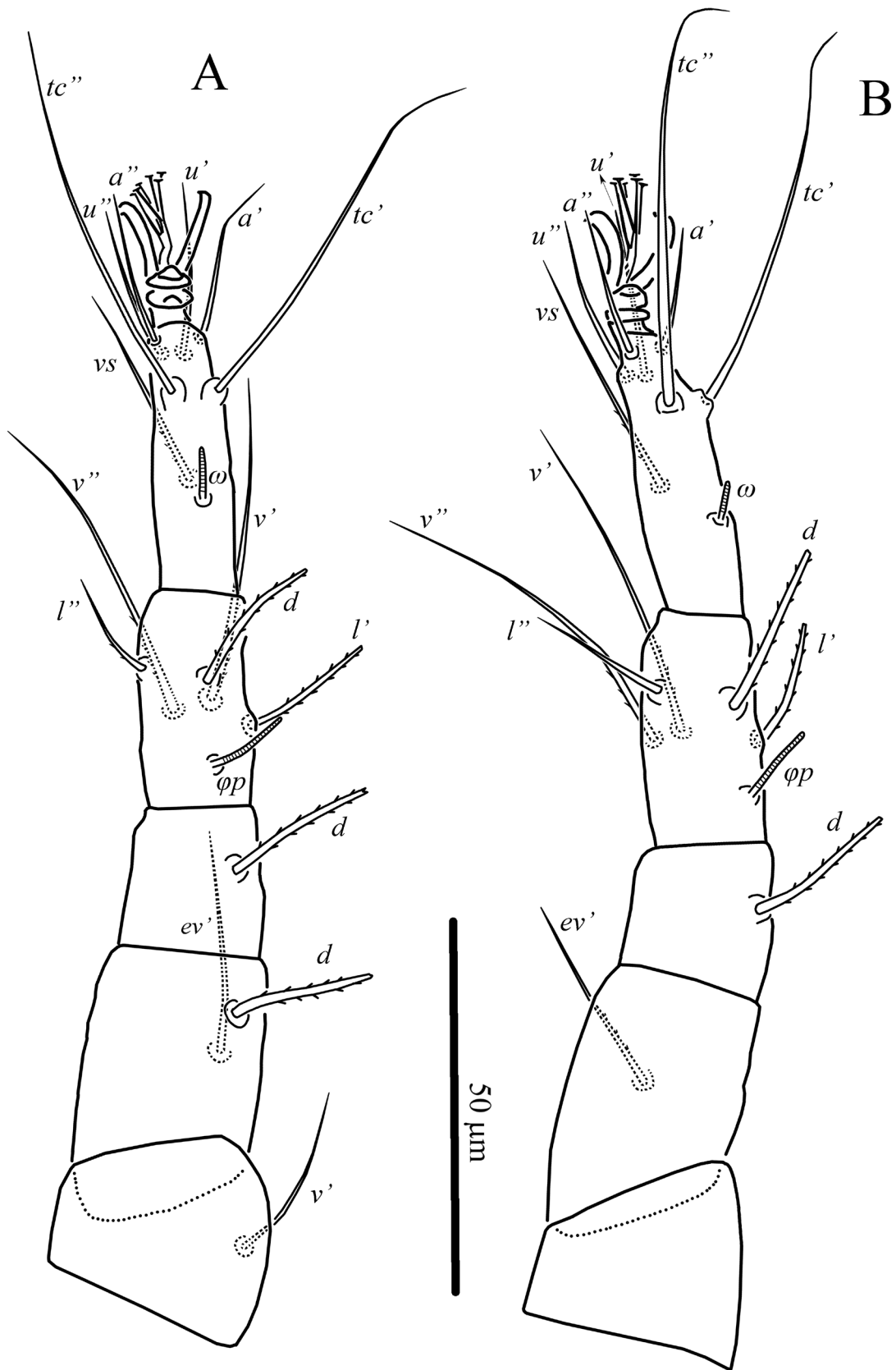


Fig. 20. *Mediolata similans* Gonzalez-Rodriguez, 1965, female: A—left leg III, dorsal aspect, B—left leg IV, dorsal aspect.

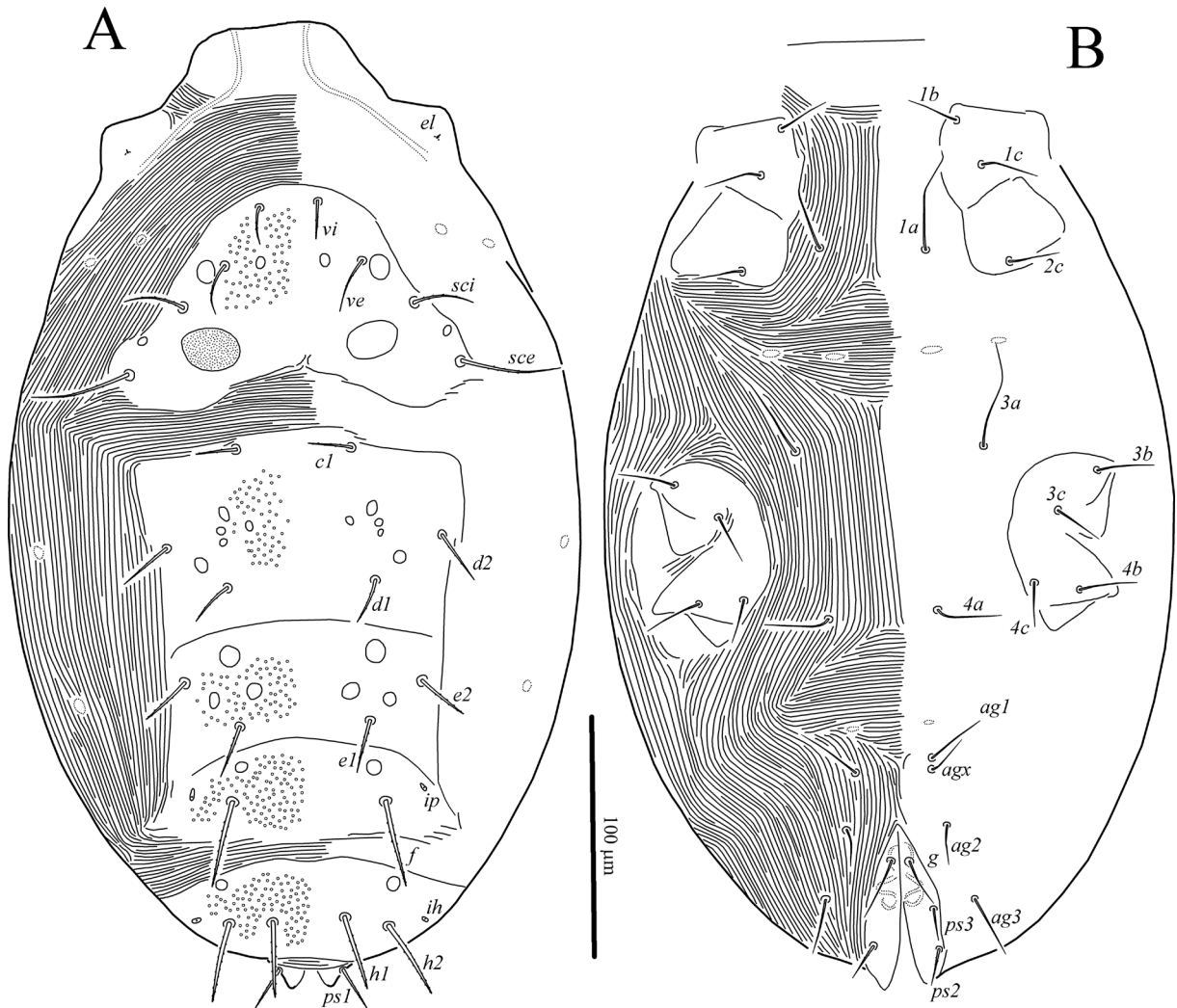


Fig. 21. *Mediolata granaria* Gonzalez-Rodriguez, 1965, female: A—dorsum of idiosoma, B—venter of idiosoma.

barbed and blunt-tipped. Setae *ps1* located dorsally. Lengths of dorsal setae: *vi* 17, *ve* 24, *sci* 26, *sce* 43, *cl* 19, *d1* 20, *d2* 24, *e1* 23, *e2* 23, *f* 37, *h1* 32, *h2* 34.

Idiosomal venter (Fig. 21B). All ventral plates smooth. Setae *ps1* weakly blunt-tipped, other ventral setae pointed; setae *ps1*–*2* weakly barbed, other ventral setae smooth. Three pairs of aggenital setae. One specimen with additional unpaired aggenital seta (*agx*) on right side and without seta *ps3* on left side (Fig. 21B). Lengths of ventral setae: *1a* 45, *1b* 20, *1c* 22, *2c* 19, *3a* 49, *3b* 21, *3c* 20, *4a* 28, *4b* 20, *4c* 20, *ag1* 31, *ag2* 16, *ag3* 26, *g* 26, *ps1* 22, *ps2* 20, *ps3* 16.

Gnathosoma (Fig. 22). Setae of palpfemur weakly barbed, other palpal setae smooth; eupathid-like setae blunt-tipped, other palpal setae pointed. Number of setae on palpal segments: Tr 0, Fe 2 (*d*, *v*"), Ge 2 (*d*, *l*"), Ti 3 (*d*, *l*, *l*"),

Ta 8(1) (fused eupathidia *ul'*, *ul*", *sul*, eupathidion *acm*, *ba*, *bp*, *lp*, 1 solenidion ω). Palpal supracoxal setae (*ep*) short, spiniform. All subcapitular setae pointed and smooth. Subcapitulum smooth. Anterior margin of subcapitular rostrum with tiny papillae. Length of subcapitular setae: *m* 26, *or1* 14, *or2* 15. Length of cheliceral stylets 40; length of palps 115; length of palpal solenidion ω 8.

Legs (Figs. 23, 24). Length of legs: I 185, II 165, III 160, IV 165. Leg I (Fig. 23A). Coxae I posterodorsally with short spiniform leg supra-coxal setae (*el*). Leg setation: Tr 1 (*v*'), Fe 5 (*d*, *l*', *l*"', *v*', *bv*"'), Ge 4 (*d*, *l*', *l*"', *k*), Ti 5(1) (*d* ζ , *l*', *l*"', *v*', *v*"', φp), Ta 11(1) (*p*' ζ , *p*" ζ , *tc*' ζ , *tc*" ζ , *ft*' ζ , *ft*" ζ , *u*', *u*"', *a*', *a*"', *vs*, ω). Setae *d* of tibia and *ft*' (*p*), (*tc*) of tarsus eupathid-like; seta *k* of genu short 4, smooth, slightly thickened basally; setae *v*' of trochanter, all setae of genu,

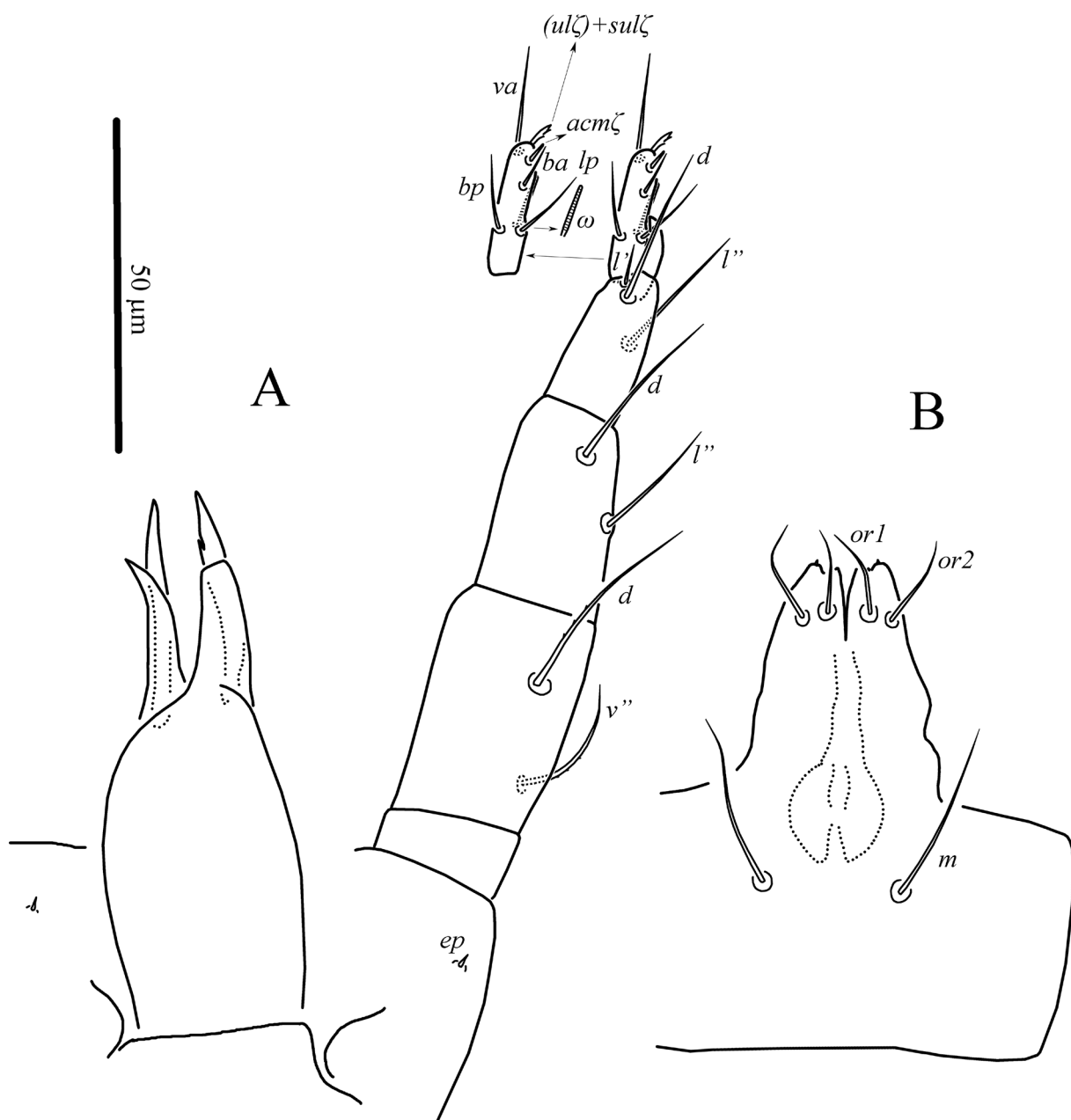


Fig. 22. *Mediolata granaria* Gonzalez-Rodriguez, 1965, female: A—gnathosoma, dorsal aspect, B—subcapitulum.

(*l*) of tibia and all tarsal setae smooth, other setae sparsely barbed; setae *d* of femur, *d*, *l*' of genu blunt-tipped, other setae pointed. Solenidium ω 12 digitiform; solenidium ϕp 19 uniformly thin with rounded tip. Leg II (Fig. 23B). Leg setation: Tr 1 (*v*'), Fe 5 (*d*, *l*', *l*'', *v*', *bv*''), Ge 3 (*d*, *l*', *l*''), Ti 5(1) (*d*, *l*', *l*'', *v*', *v*'', ϕp), Ta 9(1) (*p*' ζ , *tc*' ζ , *tc*'', *u*', *u*'', *a*', *a*'', *pl*', *vs*, ω). Setae *p*' and *tc*' of tarsus smooth, blunt-tipped, eupathid-like; seta *v*' of trochanter and most tarsal setae (except *va*) smooth, other setae weakly barbed; setae *d*, *l*' of femur and genu blunt-tipped, other setae pointed. Solenidium ω 19 digitiform; solenidium ϕp 16

uniformly thin with rounded tip. Leg III (Fig. 24A). Leg setation: Tr 1 (*v*'), Fe 2 (*d*, *ev*'), Ge 1 (*d*), Ti 5(1) (*d*, *l*', *l*'', *v*', *v*'', ϕp), Ta 7(1) (*tc*', *tc*'', *u*', *u*'', *a*', *a*'', *vs*, ω). Solenidium ω 7 digitiform; solenidium ϕp 14 uniformly thin with rounded tip. Setae *l*' of tibia, (*tc*) and (*u*) of tarsus smooth, other setae barbed; setae *d* of femur and genu blunt-tipped, other setae pointed. Leg IV (Fig. 24B). Leg setation: Tr 0, Fe 1 (*ev*'), Ge 1 (*d*), Ti 5(1) (*d*, *l*', *l*'', *v*', *v*'', ϕp), Ta 7(1) (*tc*', *tc*'', *u*', *u*'', *a*', *a*'', *vs*, ω). Solenidium ω 5 digitiform; solenidium ϕp 15 uniformly thin with rounded tip. Setae *l*' of tibia, (*tc*) and (*u*) of tarsus smooth, other setae

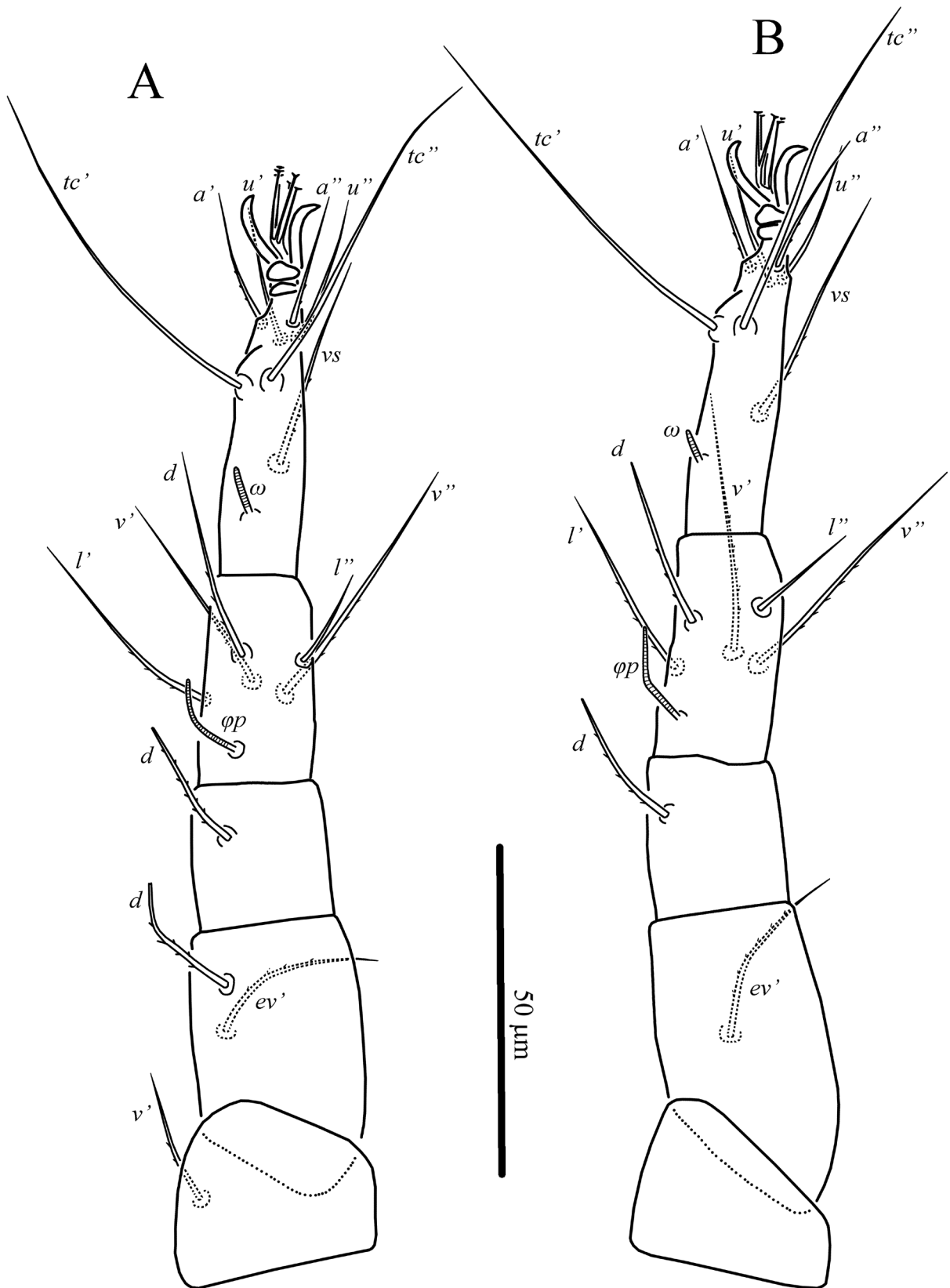


Fig. 24. *Mediolata granaria* Gonzalez-Rodriguez, 1965, female: A—right leg III, dorsal aspect, B—right leg IV, dorsal aspect.

barbed; setae *d* of genu and tibia blunt-tipped, other setae pointed.

Male and immatures unavailable.

Material examined. One female, Russia, Tyumen Oblast, vicinity of Tyumen, 57°13'N, 65°29'E, on the bark of birch (*Betula pendula*), 20 May 2019, coll. A.A. Khaustov.

Remarks. This species was described from the USA (Gonzalez-Rodriguez 1965). It was also recorded in Poland, Turkey and Ukraine (Beron 2020). This is the first record of *M. granaria* from Russia. The Russian specimen is well congruent with the original description and redescription of Dönel and Doğan (2012).

**Key to adult females of *Mediolata*
(after Faraji and Ueckermann (2006),
with modifications; *Mediolata ronaldi*
based on deutonymph)**

Mediolata aegyptiaca (Zacher and Soliman, 1966), *M. pentascuta* (Zacher and Gomaa, 1979) and *M. mirus* Chaudhri, Akbar and Rasool, 1979 are not included in the key due to their original descriptions being incomplete.

1. Palpfemur with three setae.....2
— Palpfemur with one or two setae.....5
2. Palpgenu with one seta, femora 4–4–3–23
— Palpgenu with two setae, femora 5–5–2–1
.....*M. horrida* Momen, 1987
3. Tarsus II with nine setae (*p*'' absent)4
— Tarsus II with 10 setae (*p*'' present).....
.....*M. neocalifornica* sp.n.
4. Suranal shield located ventrally and clearly separated from dorsal hysterosomal shield.....
.....*M. turcica* Dönel and Doğan, 2012
— Suranal shield located dorsally and fused with dorsal hysterosomal shield.....
.....*M. californica* Gonzalez-Rodriguez, 1965
5. Palpfemur with two setae.....6
— Palpfemur with one seta
.....*M. delicata* Fan and Zhang, 2005
6. Femur II with five setae7
— Femur II with four setae.....12
7. Genu I with four setae (including *k*)8
— Genu I with two or three setae (including *k*) ...10
8. Tibia IV with five setae9
— Tibia IV with four setae
.....*M. ozkani* Dönel and Doğan, 2012
9. Hysterosoma almost completely covered with shields, seta *ft*' of tarsus I simple.....
.....*M. similans* Gonzalez-Rodriguez, 1965

- Hysterosomal shields somewhat reduced, seta *ft*' of tarsus I eupathid-like.....
.....*M. granaria* Gonzalez-Rodriguez, 1965
10. Genu I with three setae, genu II with two or three setae.....11
— Genu I with two setae, genu II with one seta...
.....*M. ornatula* Gonzalez-Rodriguez, 1965
11. Seta *k* of genu I absent, genu II with three setae
.....*M. belfieldi* Momen, 1987
— Seta *k* of genu I present, genu II with two setae.....*M. conserva* Kuznetsov, 1977
12. Genu I with two setae (including *k*).....13
— Genu I with three or four setae (including *k*)...17
13. Three pairs of aggenital setae.....14
— Two pairs of aggenital setae.....15
14. Solenidion ω on tarsus IV very short, distinctly shorter than solenidion on tarsus III
.....*M. pini* Canestrini, 1889
— Solenidia ω on tarsi III and IV subequal.....
.....*M. obtecta* Dönel and Doğan, 2012
15. Femur I with four setae, trochanter IV with one seta16
— Femur I with five setae, trochanter IV without seta*M. xerxes* Fan and Zhang, 2005
16. Setae *sce* on prodorsal shield
.....*M. petilus* Doğan and Ayyildiz, 2004
— Setae *sce* on separate platelets
.....*M. uspenskii* Kuznetsov and Sizova, 1978
17. Genu I with four setae.....18
— Genu I with three setae26
18. Femur III with two setae19
— Femur III with three setae20
19. Dorsal shields reduced, prodorsal shield concave posteriorly; palpgenu with two setae; genu II with three setae
.....*M. longirostris* (Berlese, 1887)
— Dorsum almost completely covered with shields; palpgenu with one seta; genu II with one seta
.....*M. brevisetis* Wood, 1967
20. Trochanter IV with seta.....21
— Trochanter IV without seta.....22
21. Setae *ve* longer than distance *ve–sci*; setae *cl* as long as or longer than *cl–cl*
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