

Two new species of Caligonellidae (Acari: Raphignathoidea) from Crimea

Alexander Khaustov^a

^a Tyumen State University, Tyumen, Volodarskogo 6, 625003 Russia.

Original research

ABSTRACT

Female and larva of *Caligonella quinqueocellata* n. sp. and female, larva and protonymph of *Molothrognathus tauricus* n. sp. (Caligonellidae) are described from moss on the sandy soil from northern part of Crimea.

Keywords Prostigmata; mites; *Caligonella*; *Molothrognathus*; systematics; morphology

Zoobank <http://zoobank.org/8BC6D62A-C7B0-4AEF-AB2C-854B4A7CF3C1>

Introduction

The family Caligonellidae is a small group of predatory prostigmatid mites, which comprises 5 genera and about 60 species distributed almost worldwide, except Australia and Antarctica (Beron 2020). The caligonellid mites of Crimea are poorly studied. Previously only one species, *Molothrognathus dilucidus* Kuznetsov was described from Crimea (Kuznetsov 1978).

The genus *Caligonella* Berlese, 1910 comprises 11 described species: *C. afroensis* Smith Meyer and Ueckermann, 1989, *C. claviparma* Smith Meyer and Ueckermann, 1989, *C. geonoma* Smith Meyer and Ueckermann, 1989, *C. scutovata* Smith Meyer and Ueckermann, 1989 (all from South Africa), *C. humilis* (C.L. Koch, 1838) (Holarctic region), *C. haddadi* Bagheri, Maleki and Changizi, 2013 (Iran, Turkey), *C. saboorii* Hoseini, Khanjani and Javadi Khaderi, 2014, *C. astragalusi* Pishehvar and Khanjani, 2020 (Iran), *C. tunica* Fan, 2000, *C. tunxiensis* Hu and Hu, 1997 (both from China), and *C. urhani* Akyol, 2018 (Turkey) (Akyol 2018; Beron 2020; Doğan and Doğan 2020; Pishehvar and Khanjani 2020). Pishehvar and Khanjani (2020) provided the latest key to species of *Caligonella*.

The genus *Molothrognathus* Summers and Schlinger, 1955 comprises 28 described species: *M. azizi* Ueckermann and Khanjani, 2003, *M. kurdistanensis* Amini, Khanjani and Khanjani, 2018, *M. mehrnejadi* Liang and Zhang, 1997, *M. mikaeleli* Bagheri and Ahaniazad, 2012, *M. paratunipalpus* Bagheri, Maleki and Changizi, 2013, *M. seusius* Soliman and Gomaa, 1980 (all from Iran), *M. bahariensis* Ueckermann and Khanjani, 2003, *M. shirazicus* Khanjani, Bakhshi and Khanjani, 2016 (Iran, Turkey), *M. brasiliensis* Silva, Brentino and Ferla, 2017 (Brazil), *M. citrivallis* Smith Meyer and Ueckermann, 1989, *M. flatichelus* Smith Meyer and Ueckermann, 1989, *M. parmatus* Smith Meyer and Ueckermann, 1989 (all from South Africa), *M. colei* Swift, 1996, *M. conantae* Swift, 1996 (both from Hawaii), *M. fulgidus* Summers and Schlinger, 1955, *M. washingtonia* McGregor, 1959 (all from USA), *M. crucis* Summers and Schlinger, 1955 (USA, Turkey), *M. dilucidus* Kuznetsov, 1978 (Crimea), *M. kamili* Doğan, 2003 (Turkey, Iran), *M. leptostylus* Summers and Schlinger, 1955 (USA, Canada, India, Pakistan), *M. minutus* Soliman, 1972 (Egypt, Iran), *M. phytocolus* Smith Meyer and Ueckermann, 1989 (South Africa, Iran, Turkey, Yemen), *M. rosei* Smiley and Moser, 1968 (Mexico), *M. seelyae* (Andre, 1996) (Namibia), *M. terrulentus* Smith Meyer and Ueckermann, 1989 (South Africa, Iran, Turkey), *M. tunipalpus* Smith Meyer and Ueckermann, 1989 (South Africa, Iran), *M. venustus* (Khaustov and Kuznetsov, 1997) (Ukraine, Turkey), and *M. saudiensis* Halawa, 2013 (Saudi Arabia) (Halawa 2013; Beron 2020).

Received 18 August 2021
Accepted 15 October 2021
Published 26 October 2021

Corresponding author
Alexander Khaustov:
alex1973khaustov@gmail.com

Academic editor
Faraji, Farid

<https://doi.org/10.24349/DZRV-GldY>

ISSN 0044-586X (print)
ISSN 2107-7207 (electronic)

© Copyright
Khaustov A.

Distributed under
Creative Commons CC-BY 4.0



During the study of soil predatory mites, two new species, *Caligonella quinqueocellata* n. sp. and *Molothrognathus tauricus* n. sp. were collected from moss on the sandy soil in northern part of Crimea. Both species were collected from the same sample. The aim of this paper is to describe and illustrate these new species.

Material and methods

Mites were collected from the soil samples by Berlese funnels. Collected mites were mounted in Hoyer's medium. Notation applied to the body and leg setae follow that of Grandjean's system, overviewed by Kethley (1990) and Norton (1977) applied to Caligonellidae by Swift (2001); palpal setation follows Grandjean (1946). Mite morphology was studied using an AxioImager A2 compound microscope (Carl Zeiss, Germany) with phase-contrast and differential interference contrast (DIC) illumination. Photomicrographs were taken with an AxioCam ICc5 digital camera. All measurements are given in micrometers (µm) for holotype and available paratypes (in parentheses). For leg chaetotaxy, the number of solenidia is given in parentheses.

Results

Systematics

Family Caligonellidae Grandjean, 1944

Genus *Caligonella* Berlese, 1910

Type species: *Stigmaeus humilis* C.L. Koch, 1838, by original designation

Caligonella quinqueocellata n. sp.

Zoobank: 3FE8CEF5-57DF-4523-BF9A-9F15AE42AA02

(Figures 1–8)

Diagnosis — Female. Dorsal shield present, seta *ve* located on soft cuticle; prodorsum with five pairs of ocelli; one pair of pseudanal setae; ventral plate absent.

Description

Female (Figs 1–5) — Length of idiosoma 460 (405), width 275 (255).

Idiosomal dorsum (Figs 1A, 3A, 5B, C) – Ovate. Dorsal idiosomal stria thick, usually double; dorsal shield well developed, ovate, with few sparsely distributed puncta and fine stria (Fig. 5C) and located in space between setae *vi*, *ve*, and *c1*, its length 135 (130), width 68 (58). Five pairs of ocelli located posterolaterad setae *sci*, anterior ocellus much bigger than four posterior (Figs 3A, 5B). Cupuli *ia*, *im* and *ip* very large, almost round; *ia* located just posteriad ocelli, *im* posterolaterad *c1* and *ip* laterad *f*. All dorsal idiosomal setae subequal, short, smooth and indistinctly blunt-tipped. Anal valves located dorsoterminal, weakly striated and with few sparsely distributed puncta; one pair of pseudanal setae. Lengths of dorsal setae: *vi* 17 (17), *ve* 17 (17), *sci* 20 (19), *sce* 21 (18), *c1* 16 (15), *c2* 18 (15), *d* 18 (15), *e* 17 (14), *f* 15 (13), *h1* 15 (12), *h2* 16, *ps* 15 (12).

Idiosomal venter (Figs 1B, 5D) – Ventral idiosoma without plate between coxae, striated. Coxal fields I–II and III–IV with sparsely distributed puncta; coxal field IV with posterior plate-like projection delineated by stria and sparsely distributed puncta. All ventral setae smooth and pointed. Three pairs of aggenital and one pair of genital setae (Fig. 5D); cupuli *ih* located anterolaterad *ag3*. Lengths of ventral setae: *1a* 27 (26), *1b* 28 (26), *1c* 17 (17), *2c* 15 (13), *3a* 25 (26), *3b* 17 (13), *4a* 20 (19), *4c* 20 (16), *ag1* 18 (18), *ag2* 16 (12), *ag3* 14 (12), *g* 12 (11).

Gnathosoma (Figs 2, 3B, C, 5A) – Stylophore almost oval (Fig. 2 A), distinctly punctate in anterior 2/3 and finely striated in posterior 1/3 parts, its length 110 (100), width 91 (75);

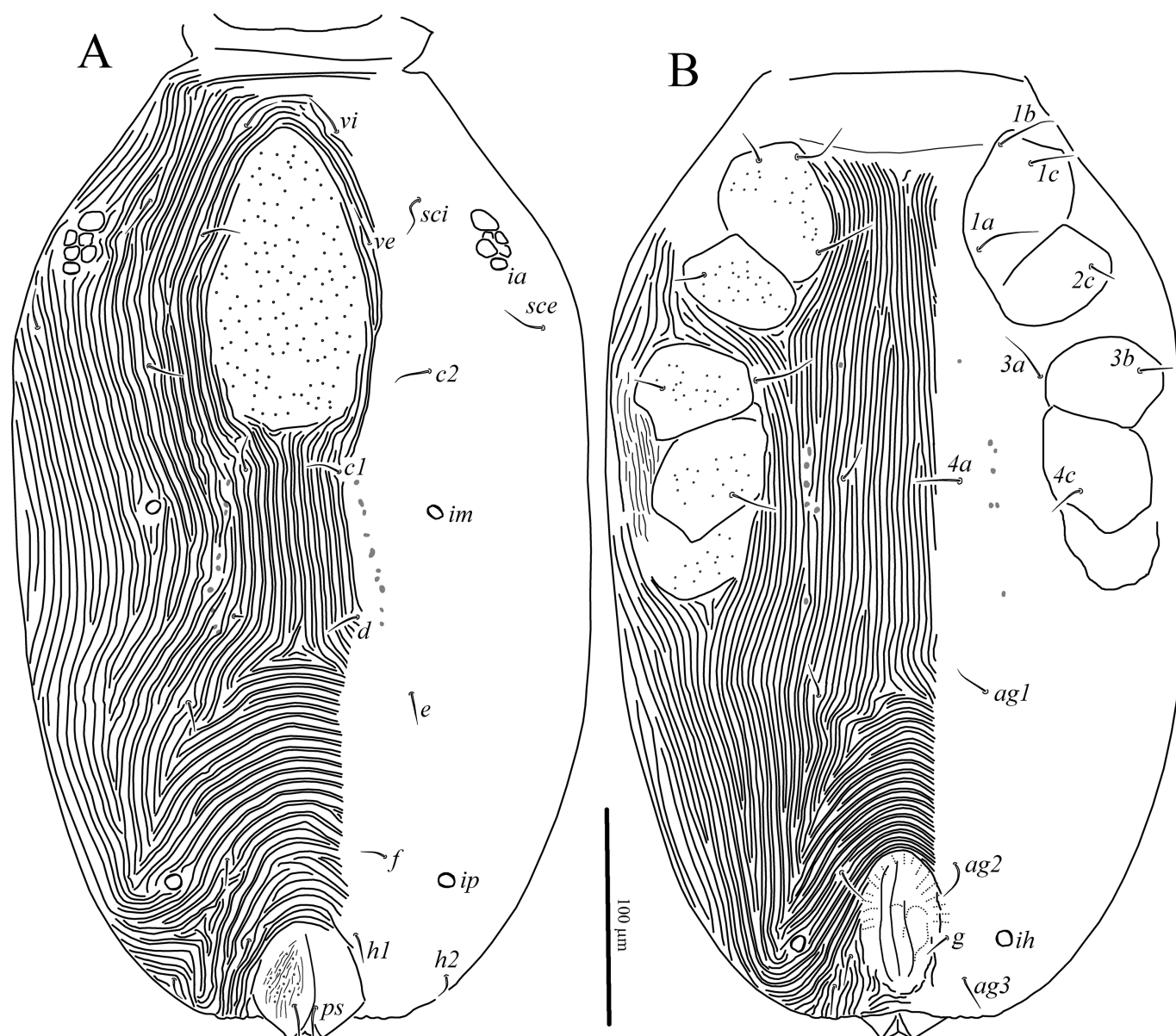


Figure 1 *Caligonella quinqueocellata* n. sp., female: A – idiosomal dorsum, B – idiosomal venter.

peritremes distinctly curved in central part of stylophore (Figs 2A, 3B, 5A); cheliceral levers large, oval, almost as long as cheliceral stylets (Fig. 5C). Palpal supracoxal setae (*ep*) located in deep depression with terminal pore; palpal chaetotaxy: Tr 0, Fe 1 (*d*), Ge 1 (*d*), Ti 3 (*d*, *l'*, *l''*), Ta 7(1) (*ba*, *bp*, *va*, *acm* ζ , *ul'* ζ , *ul''* ζ , *sul* ζ , ω); tibial claw well developed, slightly hooked; all palpal setae smooth, eupathidia *acm* ζ , *ul'* ζ , *ul''* ζ , *sul* ζ with slightly swollen tips, other palpal setae pointed. Subcapitulum with few sparsely distributed puncta (Fig. 2B); all subcapitular setae smooth, setae *m* pointed, adoral setae weakly blunt-tipped; lengths of subcapitular setae: *m* 33, *or* 1 6, *or* 2 8, length of palptarsal solenidion ω 4 (3).

Legs (Fig. 4) – Lengths of legs (excluding claws): I 300 (280), II 230 (210), III 250 (220), IV 295 (250). Leg I (Fig. 4A) longer than other legs. Leg setation: Tr 1 (*v'*), Fe 2 (*d*, *bv''*), Ge 6 (*d*, *l'*, *l''*, *v'*, *v''*, *k*), Ti 5(2) (*d*, *l'*, *l''*, *v'*, *v''*, ϕ , ϕp), Ta 16(1) (*ft'*, *ft''*, *tc'* ζ , *tc''* ζ , *p'* ζ , *p''* ζ , *it'*, *d'*,

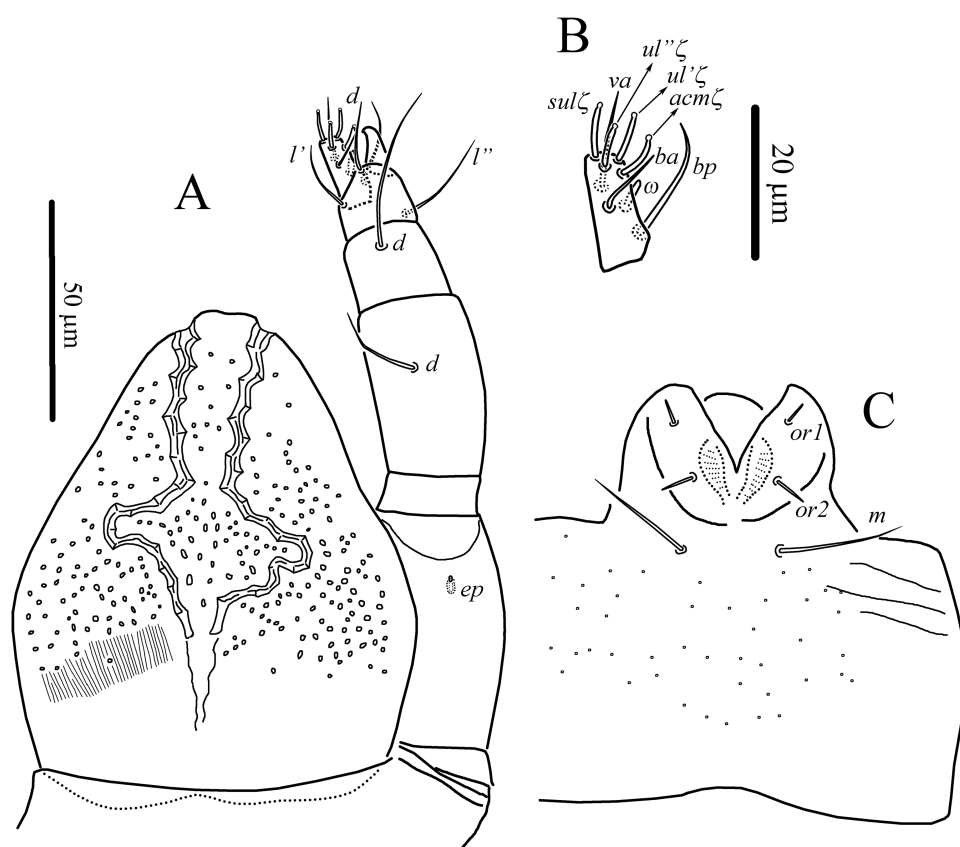


Figure 2 *Caligonella quinqueocellata* n. sp., female: A – gnathosoma, dorsal aspect, B – palptarsus, dorsal aspect. C – subcapitulum.

$a'', u', u'', vs, pv', pv'', pl', pl'', \omega$). Supracoxal seta of leg I (el) located in deep depression with terminal pore; seta k of genu located in deep depression; all leg setae smooth; setae (tc) and (p) eupathid-like, blunt-tipped, other leg setae pointed; solenidion ω 8 (7) digitiform, solenidia ϕ 4 (4) and ϕp 12 (12) baculiform. Leg II (Fig. 4B). Leg setation: Tr 1 (v'), Fe 2 (d, bv''), Ge 5 (d, l', l'', v', v''), Ti 5 (d, l', l'', v', v''), Ta 11(1) ($ft', tc', tc'', p''\zeta, it'', a', a'', u', u'', pv', pv'', \omega$). All leg setae smooth; seta $p''\zeta$ eupathid-like, blunt-tipped; other leg setae pointed; solenidion ω 7 (7) digitiform. Leg III (Fig. 4C). Leg setation: Tr 1 (v'), Fe 2 (d, ev'), Ge 2 (d, v'), Ti 4 (d, l', v', v''), Ta 9 ($tc', tc'', it', a', a'', u', u'', pv', pv''$). All leg setae smooth and pointed. Leg IV (Fig. 4D). Leg setation: Tr 1 (v'), Fe 2 (d, ev'), Ge 2 (d, v'), Ti 4 (d, l', v', v''), Ta 9 ($tc', tc'', it', a', a'', u', u'', pv', pv''$). All leg setae smooth and pointed.

Larva (Figs 6-8) — Length of idiosoma 245, width 170.

Idiosomal dorsum (Fig. 6A) – completely striated, without dorsal shield. Dorsal setae and cupuli as in female. With one pair of large anterior ocelli, posterior ocelli indistinct. Anal opening terminal. Lengths of dorsal setae: vi 11, ve 10, sci 11, sce 12, cl 10, $c2$ 10, d 9, e 10, f 11, hl 13, $h2$ 11, ps 7.

Idiosomal venter (Fig. 6B) – Ventral idiosoma completely striated. Coxal field I with two setae ($1a, 1b$), coxal field III with one setae ($3a$); genital and aggenital setae absent. All ventral setae smooth and pointed; cupuli ih located anteromesad $h2$. Lengths of ventral setae: $1a$ 19, $1b$ 15, $3a$ 16.

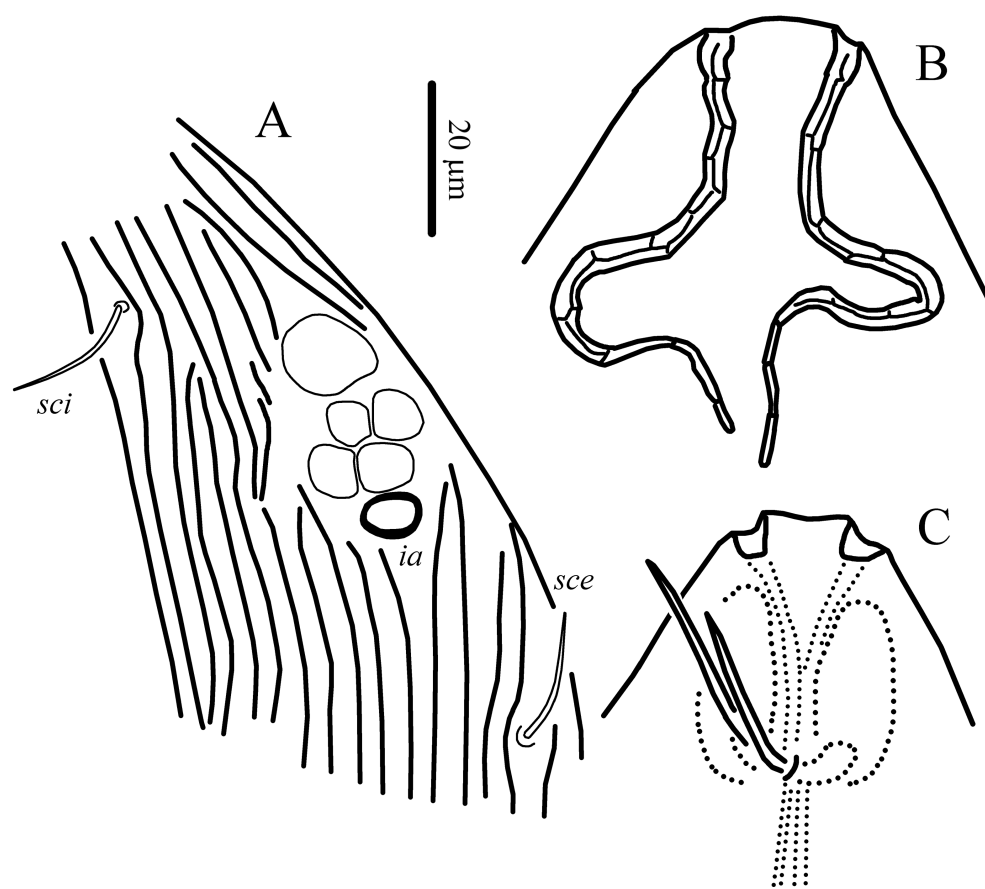


Figure 3 *Caligonella quinqueocellata* n. sp., female: A – anterolateral part of prodorsum, B – anterior part of stylophore, dorsal aspect. C – anterior part of stylophore, ventral aspect.

Gnathosoma (Fig. 7) – in general similar to that of female except following: peritremes straight, subcapitulum without setae *m*, palptarsus with setae *acm* and *sul* simple (not eupathidia). Length of stylophore 56, width 53, lengths of setae: *or1* 6, *or2* 7, length of palptarsal solenidion ω 3.

Legs (Fig. 8) – Lengths of legs: I 170, II 130, III 145. Leg I (Fig. 8A) longer than other legs. Leg setation: Tr 0, Fe 2 (*d*, *bv''*), Ge 5 (*l'*, *l''*, *v'*, *v''*, *k*), Ti 5(2) (*d*, *l'*, *l''*, *v'*, *v''*, ϕ , ϕp), Ta 15(1) (*ft'*, *ft''*, *tc'*, *tc''*, *p''\zeta*, *p''\zeta*, *a'*, *a''*, *u'*, *u''*, *vs*, *pv'*, *pv''*, *pl'*, *pl''*, ω). Seta *k* of genu located in shallow depression; all leg setae smooth; setae (*p*) eupathid-like, blunt-tipped, other leg setae pointed; solenidion ω 7 digitiform, solenidia ϕ 3 and ϕp 7 baculiform. Leg II (Fig. 8B). Leg setation: Tr 0, Fe 2 (*d*, *bv''*), Ge 4 (*l'*, *l''*, *v'*, *v''*), Ti 5 (*d*, *l'*, *l''*, *v'*, *v''*), Ta 10(1) (*ft'*, *tc'*, *tc''*, *p''\zeta*, *a'*, *a''*, *u'*, *u''*, *pv'*, *pv''*, ω). All leg setae smooth; seta *p''\zeta* eupathid-like, blunt-tipped; other leg setae pointed; solenidion ω 6 digitiform. Leg III (Fig. 8C). Leg setation: Tr 0, Fe 2 (*d*, *ev'*), Ge 1 (*v'*), Ti 4 (*d*, *l''*, *v'*, *v''*), Ta 8 (*tc'*, *tc''*, *a'*, *a''*, *u'*, *u''*, *pv'*, *pv''*). All leg setae smooth and pointed.

Type material — Female holotype, slide ZISP T-Cal-01, Crimea, Arabat Spit, 45°17'54.0"N 35°28'19.0"E, 14 June 2021, moss on sandy soil, coll. A.A. Khaustov. Paratypes: 1 female, 1 larva, same data.

Type deposition — The holotype of the new species is deposited in the acarological collection of the Zoological Institute of RAS, St. Petersburg, Russia; paratypes are deposited in

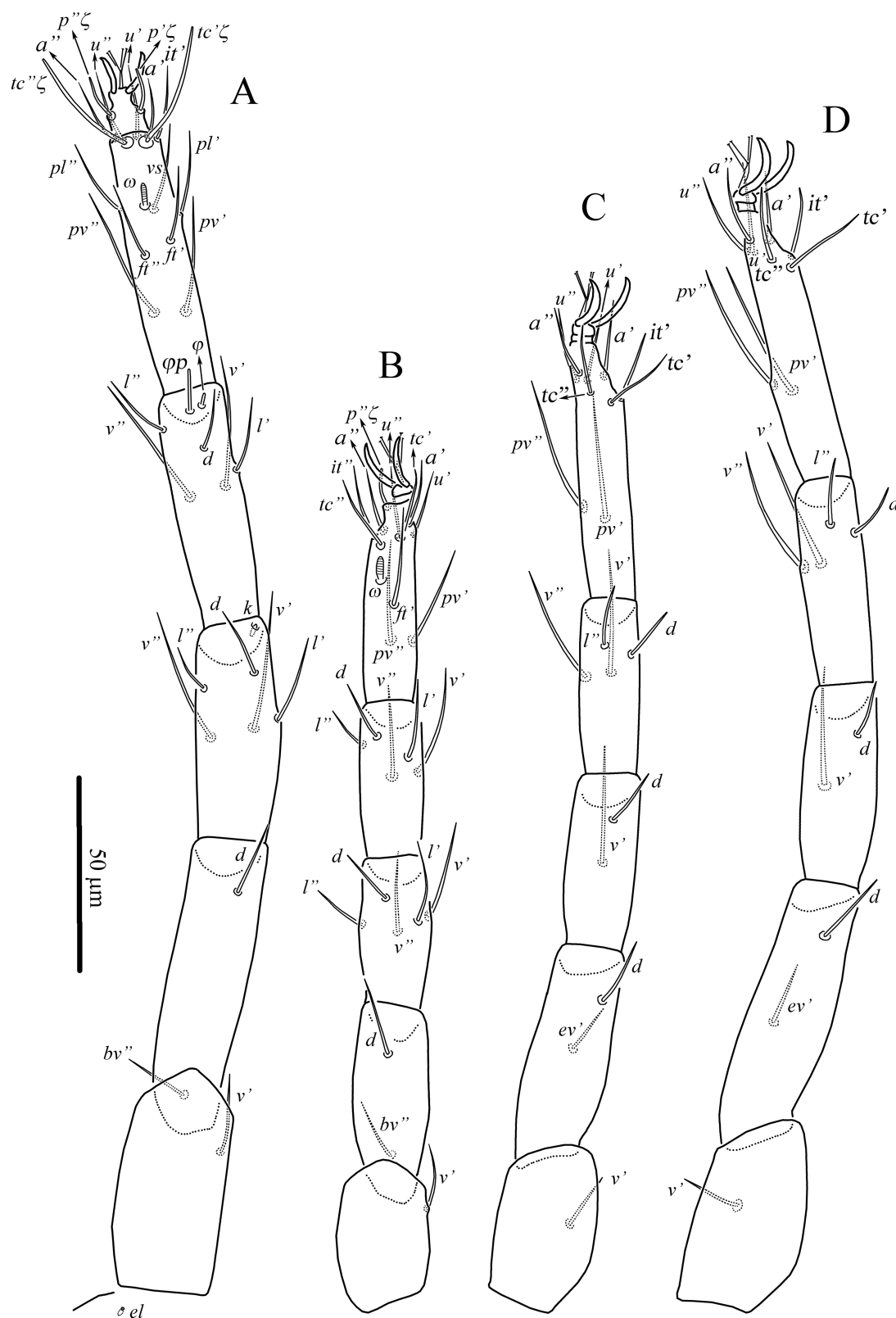


Figure 4 *Caligonella quinqueocellata* n. sp., female: A-D – legs I-IV respectively, dorsal aspect.

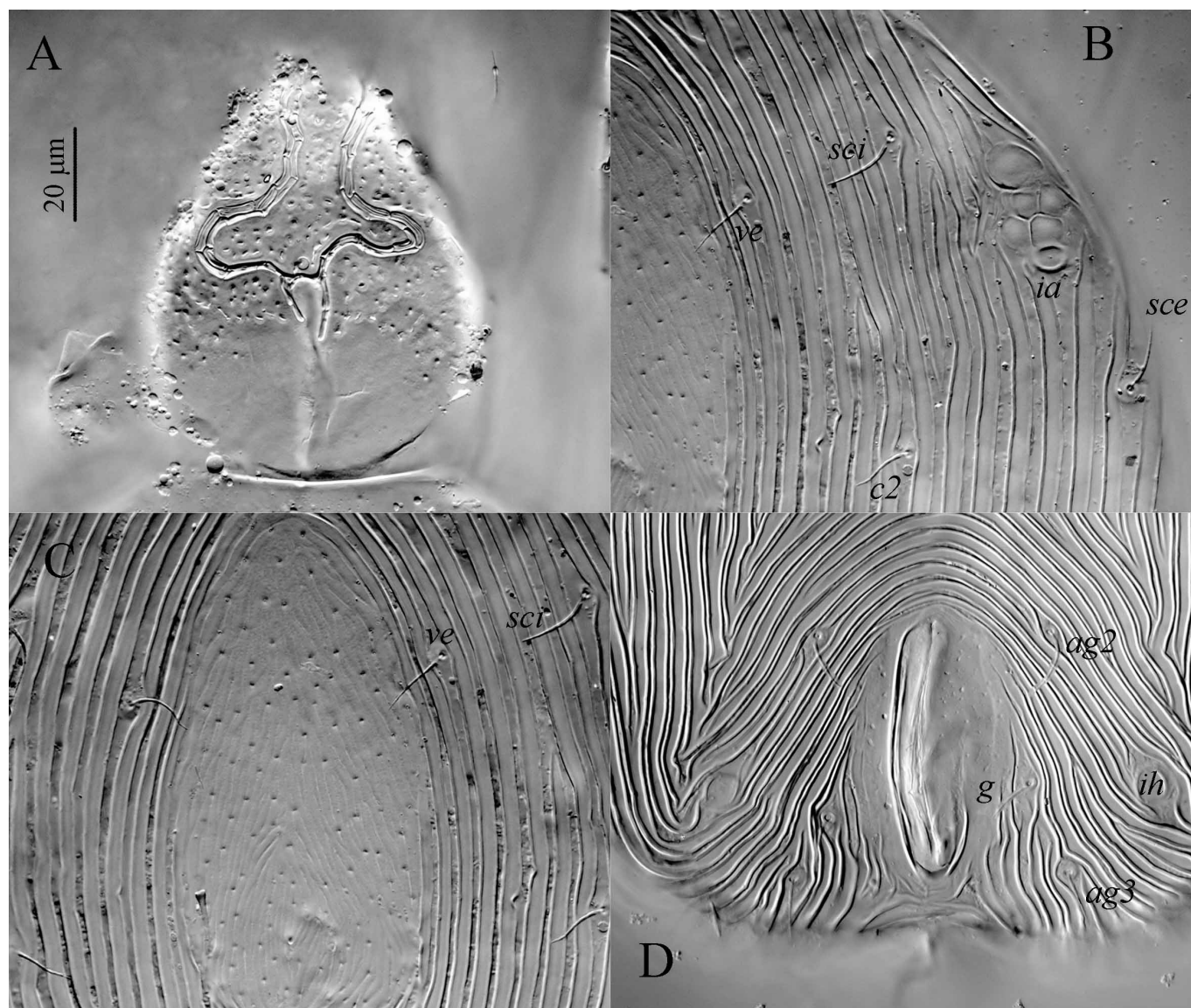


Figure 5 DIC micrographs of *Caligonella quinqueocellata* n. sp., female: A – stylophore, dorsal aspect, B – anterolateral part of prodorsum. C – dorsal shield, D – genital area.

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

Etymology — The name of the new species is combined from two Latin words *quinque* meaning *five* and *ocellus* and refers to presence of five pairs of ocelli in female.

Differential diagnosis — The new species differs from all species of *Caligonella* in having five pairs of ocelli on prodorsum (only two in other species), The new species is most similar to *Caligonella scutovata* Smith-Meyer and Ueckermann described from South Africa (Smith-Meyer and Ueckermann 1989), by the presence of dorsal idiosomal shield and in having one pair of pseudanal setae. The new species differs from *C. scutovata* by the absence of ventral plate between coxae (present in *C. scutovata*) and location of setae *ve* on soft cuticle (*ve* located on dorsal shield in *C. scutovata*).

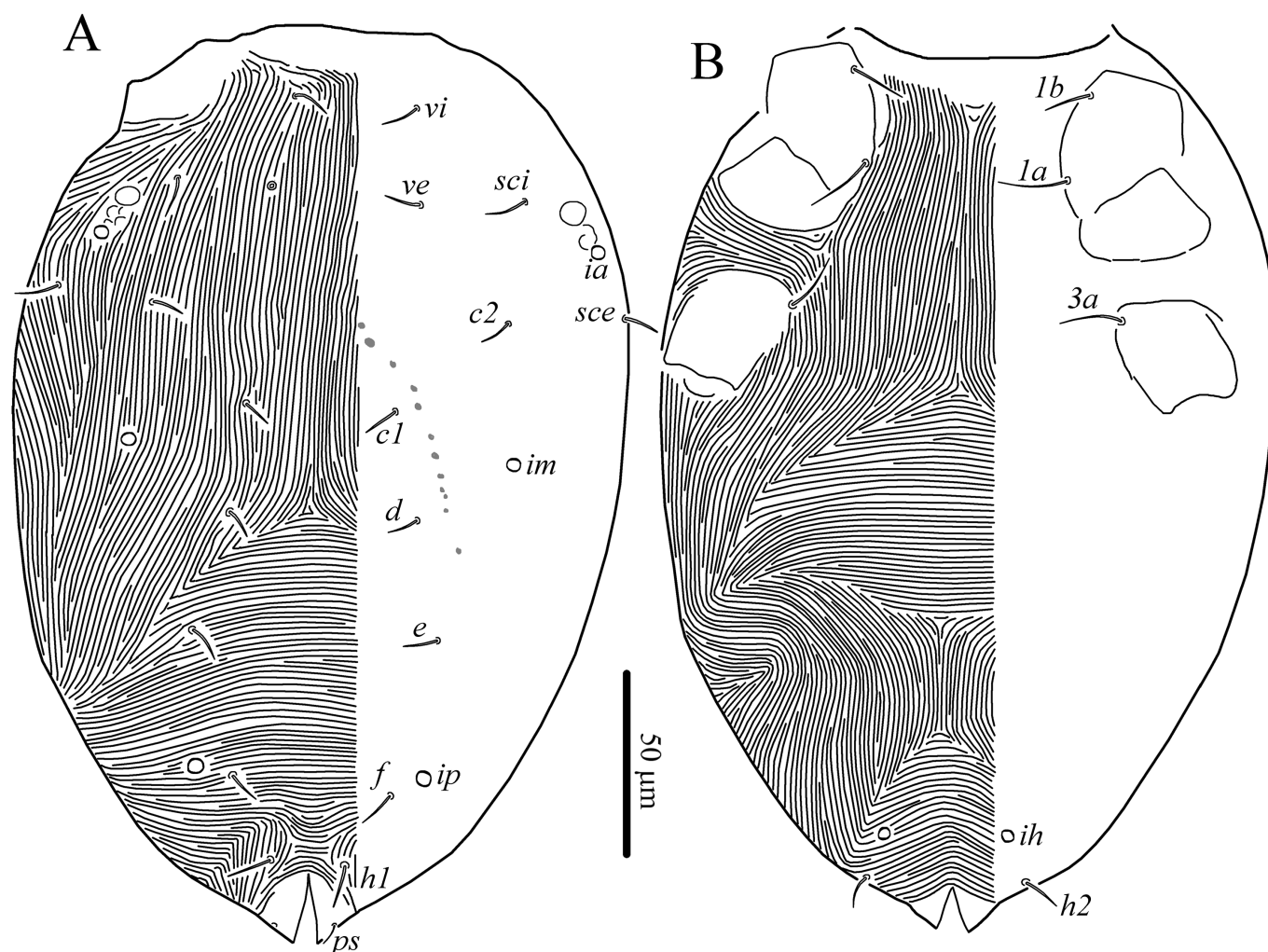


Figure 6 *Caligonella quinqueocellata* n. sp., larva: A – idiosomal dorsum, B – idiosomal venter.

Genus *Molothrognathus* Summers and Schlinger, 1955

Type species: *Molothrognathus leptostylus* Summers and Schlinger, 1955, by original designation

Molothrognathus tauricus n. sp.

Zoobank: 1A3D7D07-6A22-4AB1-BD09-E44266190FC1

(Figures 9–15)

Diagnosis — Female. Dorsal shield present in space between setae *vi*, *ve* and *c1*; setae *sce* distinctly longer than other dorsal setae; setae *c2* much shorter than *sce* and subequal with *ve*; setae *ag3* absent.

Description

Female (Figs 9–11) — Length of idiosoma 320, width 185.

Idiosomal dorsum (Fig. 9A) – Ovate. Dorsal idiosomal stria thin, usually double; dorsal shield present, smooth, weakly sclerotized, ovate, and located in space between setae *vi*, *ve*, and

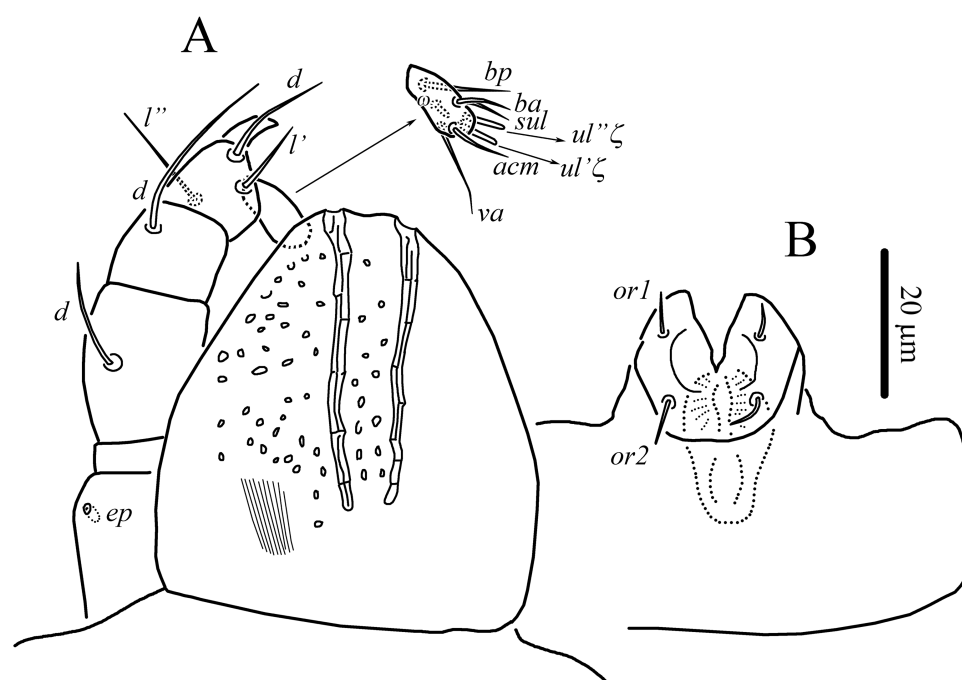


Figure 7 *Caligonella quinqueocellata* n. sp., larva: A – gnathosoma, dorsal aspect, B – subcapitulum.

c1. Two pairs of ocelli located posterolaterad setae *sci*, posterior ocellus poorly visible. Cupuli *ia*, *im* and *ip* large, almost round; *ia* located just posteriad ocelli, *im* anterolaterad *d* and *ip* laterad *f*. All dorsal idiosomal setae smooth and pointed; *sce* distinctly longer than other dorsal setae; setae *ve*, *sci* and *c2* subequal, *c1* slightly shorter than *c2*. Anal valves located dorsal; two pairs of pseudanal setae. Lengths of dorsal setae: *vi* 22, *ve* 18, *sci* 21, *sce* 44, *c1* 14, *c2* 20, *d* 16, *e* 20, *f* 19, *h1* 27, *h2* 26, *ps1* 7, *ps2* 10.

Idiosomal venter (Fig. 9B) – Ventral idiosoma without plate between coxae, striated. Coxal fields I-II and III-IV smooth. All ventral setae smooth and pointed. Two pairs of aggenital and one pair of genital setae; cupuli *ih* located posterolaterad *ag2*. Lengths of ventral setae: *1a* 30, *1b* 25, *1c* 26, *2c* 23, *3a* 37, *3b* 23, *4a* 27, *4c* 21, *agl* 25, *ag2* 17, *g* 15.

Gnathosoma (Fig. 10) – Stylophore almost triangular (Fig. 10A), split distally, longitudinally striated, its length 82, width 46; peritremes tubular, typical for the genus; cheliceral stylets long, about three times longer than cheliceral levers. Palpal supracoxal setae (*ep*) located in deep depression with terminal pore; palpal chaetotaxy as in *Caligonella quinqueocellata*; tibial claw well developed, slightly hooked; all palpal setae smooth, eupathidia *acm*ζ, *ul'*ζ, *ul''*ζ, *sul*ζ blunt-tipped, other palpal setae pointed. Subcapitulum with few sparsely distributed puncta (Fig. 10B); all subcapitular setae smooth and pointed; lengths of subcapitular setae: *m* 35, *or1* 8, *or2* 9, length of palptarsal solenidion ω 5.

Legs (Fig. 11) – Lengths of legs: I 205, II 150, III 170, IV 200. Setation of legs as in *Caligonella quinqueocellata*. Leg I (Fig. 11A) longer than other legs. Supracoxal seta of leg I (*el*) located in deep depression with terminal pore; seta *k* of genu located in shallow depression; all leg setae smooth; setae (*tc*) and (*p*) eupathid-like, blunt-tipped, other leg setae pointed; solenidion ω 10 digitiform, solenidia φ 3 and φφ 7 baculiform. Leg II (Fig. 11B). All leg setae smooth; seta *p''*ζ eupathid-like, blunt-tipped; other leg setae pointed; solenidion ω 4 digitiform.

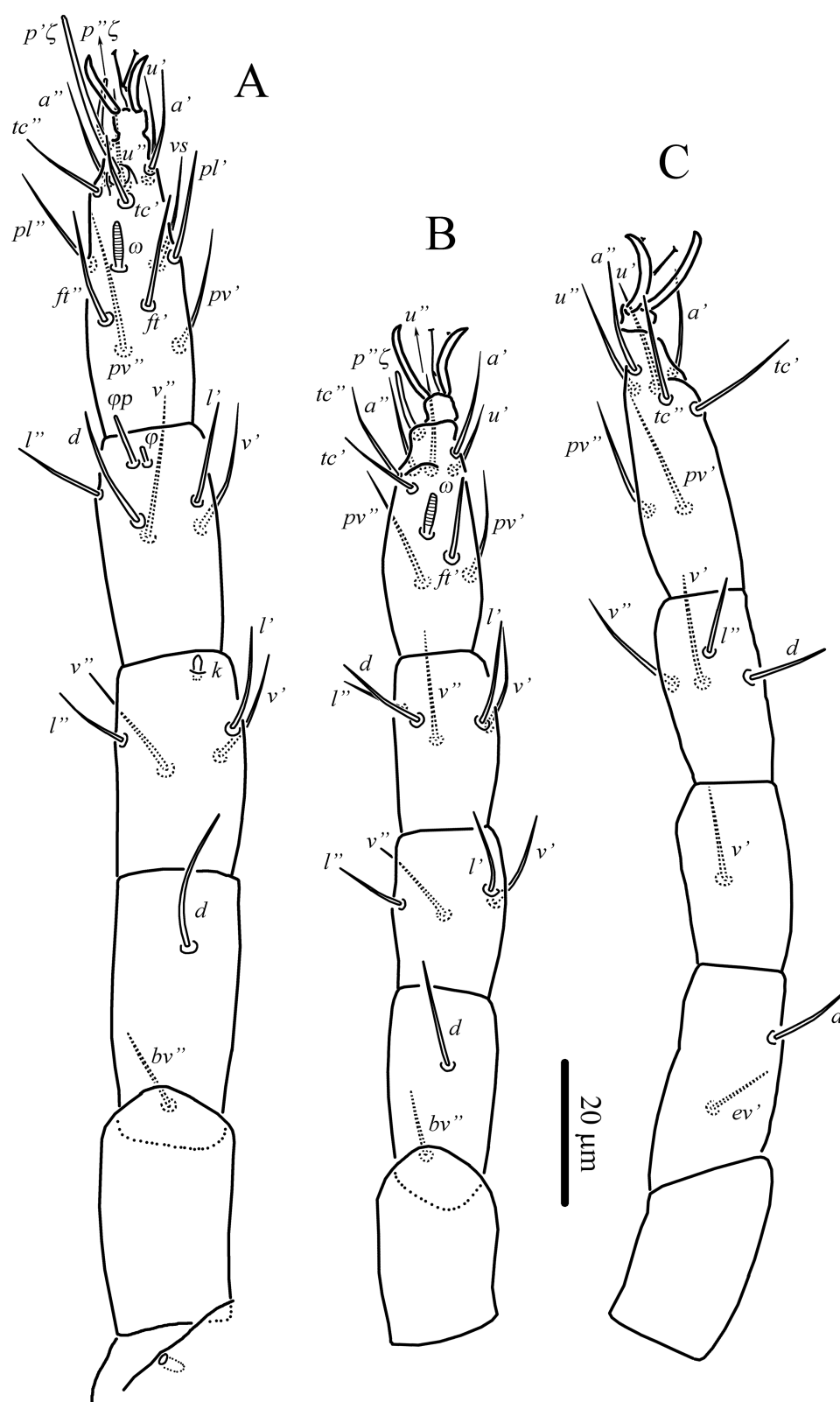


Figure 8 *Caligonella quinqueocellata* n. sp., larva: A-C – legs I-III respectively, dorsal aspect.

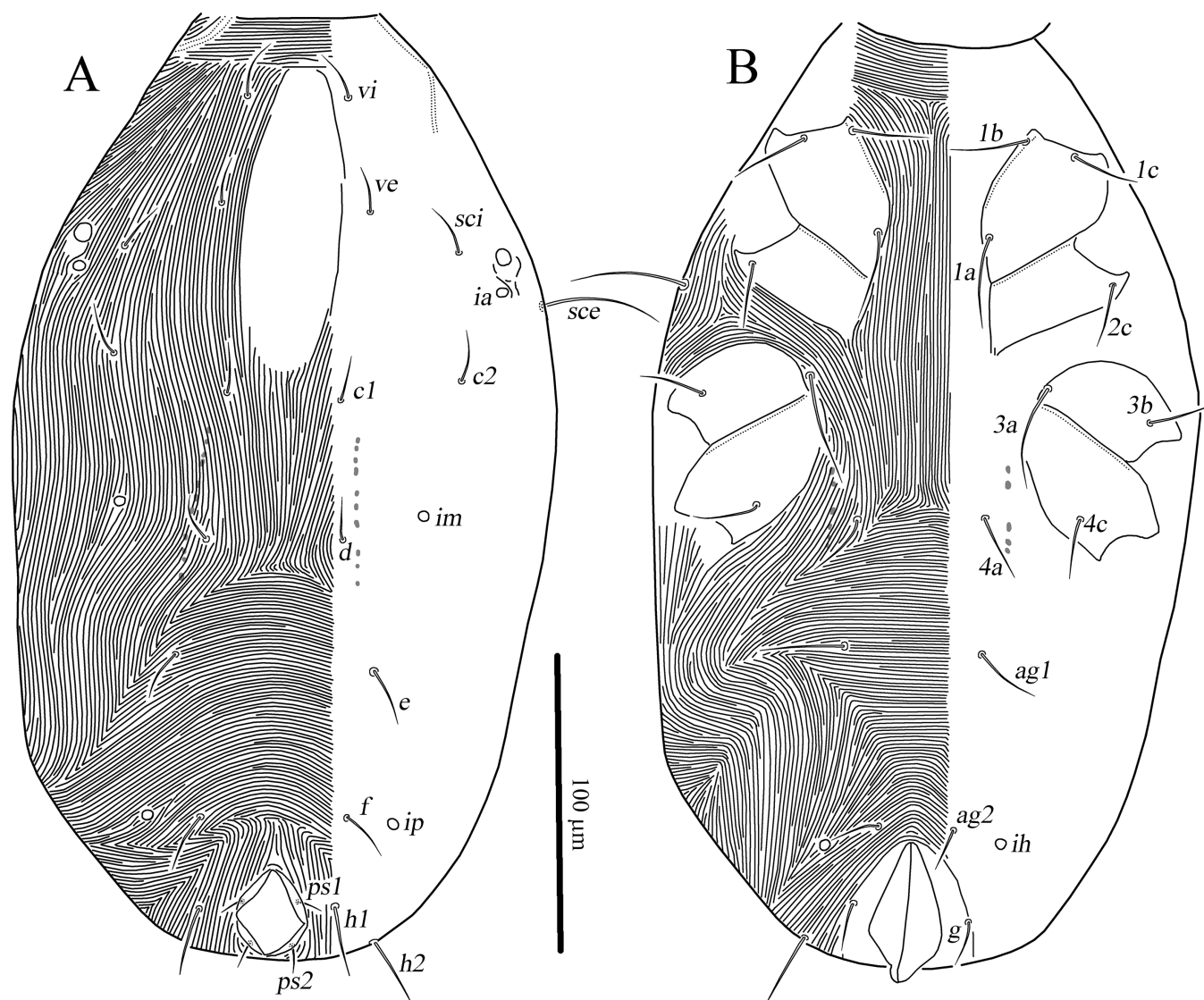


Figure 9 *Molothrognathus tauricus* n. sp., female: A – idiosomal dorsum, B – idiosomal venter.

Leg III (Fig. 11C). All leg setae smooth and pointed. Leg IV (Fig. 11D). All leg setae smooth and pointed.

Protonymph (Figs 12, 14C) — Length of idiosoma 250–275, width 155–160.

Idiosomal dorsum (Fig. 12A) – completely striated, without distinct dorsal shield, with oval area with very thin stria antieriad *c1*. Dorsal setae and cupuli as in female. Anal opening terminal. Lengths of dorsal setae: *vi* 18, *ve* 17, *sci* 17, *sce* 46, *c1* 15, *c2* 19, *d* 17, *e* 18, *f* 20, *h1* 33, *h2* 35, *ps1* 8, *ps2* 8.

Idiosomal venter (Fig. 12B) – Ventral idiosoma completely striated. Coxal field I–III as in female; coxal fields IV without setae; one pair of aggenital setae. All ventral setae smooth and pointed; cupuli *ih* located antieriad *h2*. Lengths of ventral setae: *1a* 24, *1b* 22, *1c* 22, *2c* 17, *3a* 34, *3b* 17, *ag* 18.

Gnathosoma – as in female. Length of stylophore 69, width 40, lengths of setae: *m* 24, *or1* 7, *or2* 7, length of palptarsal solenidion ω 4.

Legs (Fig. 14C) – Lengths of legs: I 175, II 130, III 150, IV 165. Setation of legs I–III as in female. Leg I longer than other legs. Solenidion ω 8 digitiform, solenidia ϕ 3 and $\phi\phi$ 6

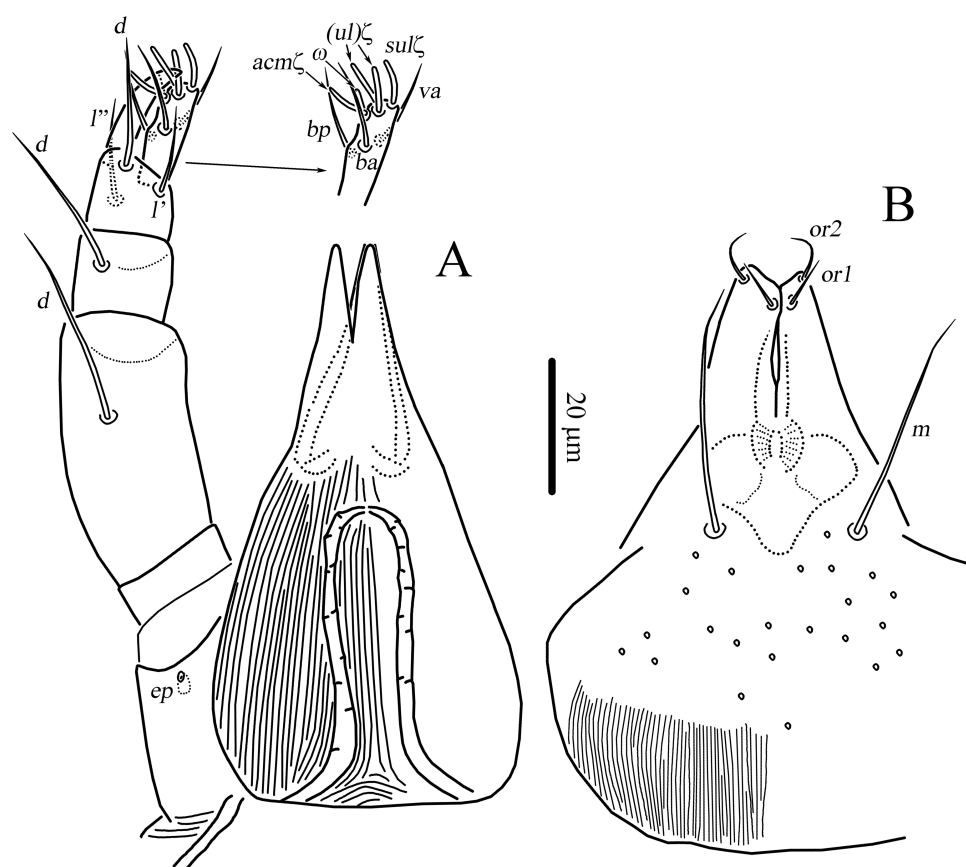


Figure 10 *Molothrognathus tauricus* n. sp., female: A – gnathosoma, dorsal aspect, B – subcapitulum.

baculiform. Leg II. Solenidion ω 4 digitiform. Leg IV (Fig. 14C). Leg setation: Tr 0, Fe 1 (ev'), Ge 1 (v'), Ti 4 (d, l'', v', v''), Ta 8 ($tc', tc'', a', a'', u', u'', pv', pv''$). All leg setae smooth and pointed.

Larva (Figs 13, 14A, B, 15) — Length of idiosoma 235, width 135.

Idiosomal dorsum (Fig. 13A) – completely striated, without dorsal shield. Dorsal setae $c2$ much longer than in female and protonymph. Anal opening terminal. Lengths of dorsal setae: vi 21, ve 17, sci 19, sce 78, $c1$ 20, $c2$ 57, d 17, e 25, f 38, $h1$ 49, $h2$ 35, $ps1$ 7, $ps2$ 8.

Idiosomal venter (Fig. 13B) – Ventral idiosoma similar with that of protonymph, except absence of setae $2c$, $3b$ and agl . Lengths of ventral setae: $1a$ 25, $1b$ 26, $3a$ 35.

Gnathosoma (Fig. 14A, B) – in general similar to that of female except following: subcapitulum without setae m (Fig. 14A), palptarsus with setae acm and sul simple (not eupathidia) (Fig. 14B). Length of stylophore 60, width 33, lengths of setae: $or1$ 7, $or2$ 8, length of palptarsal solenidion ω 3.

Legs (Fig. 15) – Lengths of legs: I 165, II 125, III 145. Setation of legs as in larva of *Caligonella quinqueocellata*, except absence of seta p'' on tarsus II. Leg I (Fig. 15A) longer than other legs. All leg setae smooth; setae (p) eupathid-like, blunt-tipped, other leg setae pointed; solenidion ω 7 digitiform, solenidia ϕ 3 and ϕp 6 baculiform. Leg II (Fig. 15B). All leg setae smooth and pointed; solenidion ω 5 digitiform. Leg III (Fig. 15C). All leg setae smooth and pointed.

Type material — Female holotype, slide ZISP T-Cal-02, Crimea, Aeabat Spit, 45°17'54.0"N 35°28'19.0"E, 14 June 2021, moss on sandy soil, coll. A.A. Khaustov. Paratypes: 1 larva, 2

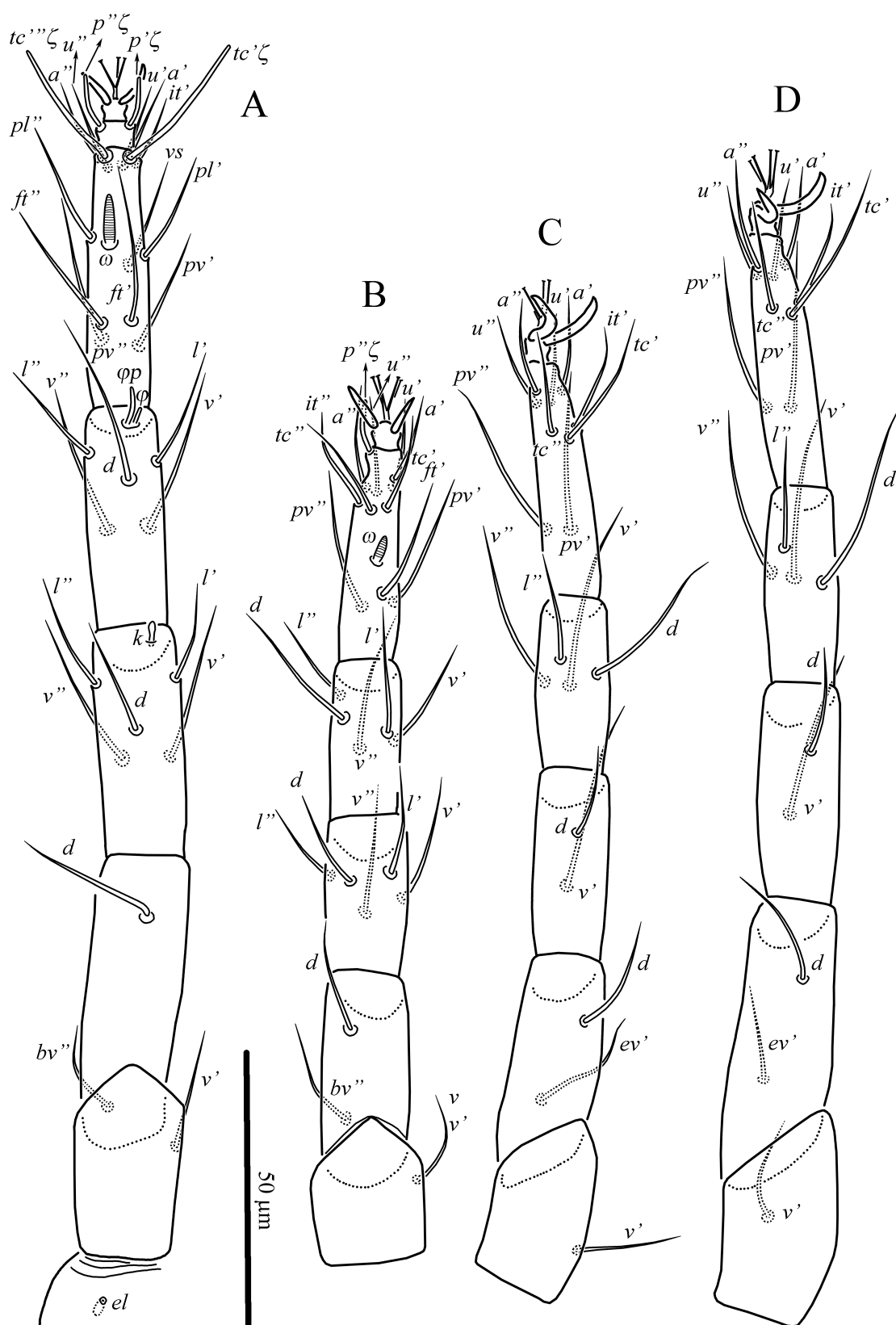


Figure 11 *Molothrognathus tauricus* n. sp., female: A-D – legs I-IV respectively, dorsal aspect.

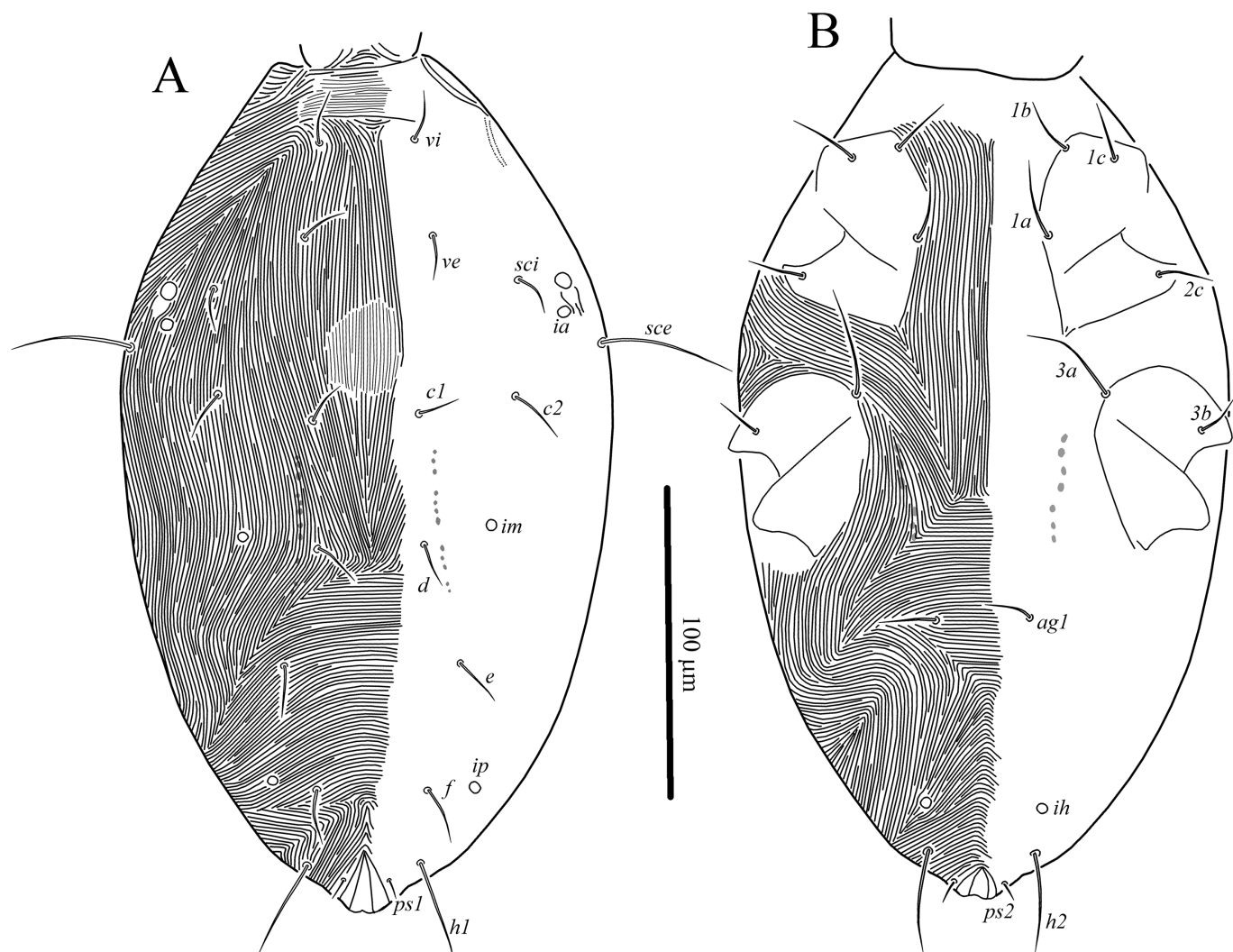


Figure 12 *Molothrognathus tauricus* n. sp., protonymph: A – idiosomal dorsum, B – idiosomal venter.

protonymphs, same data.

Type deposition — The holotype and 2 protonymph paratypes of the new species are deposited in the acarological collection of the Zoological Institute of RAS, St. Petersburg, Russia; other paratype is deposited in the mite collection of the Tyumen State University Museum of Zoology, Tyumen, Russia.

Etymology — The name of the new species refers to its distribution in Crimea.

Differential diagnosis — The female of the new species is most similar to *Molothrognathus crucis* Summers and Schlinger, 1955, described from USA (Summers and Schlinger 1955) and redescribed from Turkey (Doğan 2003), and *M. mikaeeli* Bagheri and Ahamazad, 2012, described from Iran (Ahanazad and Bagheri 2012), by the absence of setae *ag3*, and setae *c2* subequal with *c1* and *ve* and distinctly shorter than *sce*. The new species differs from *M. mikaeeli* by the presence of dorsal idiosomal shield (absent in *M. mikaeeli*). The new species differs from *M. crucis* in having dorsal idiosomal shield much shorter, its posterior margin not exceeding beyond bases of setae *c1* and oval in shape (dorsal idiosomal shield very long,

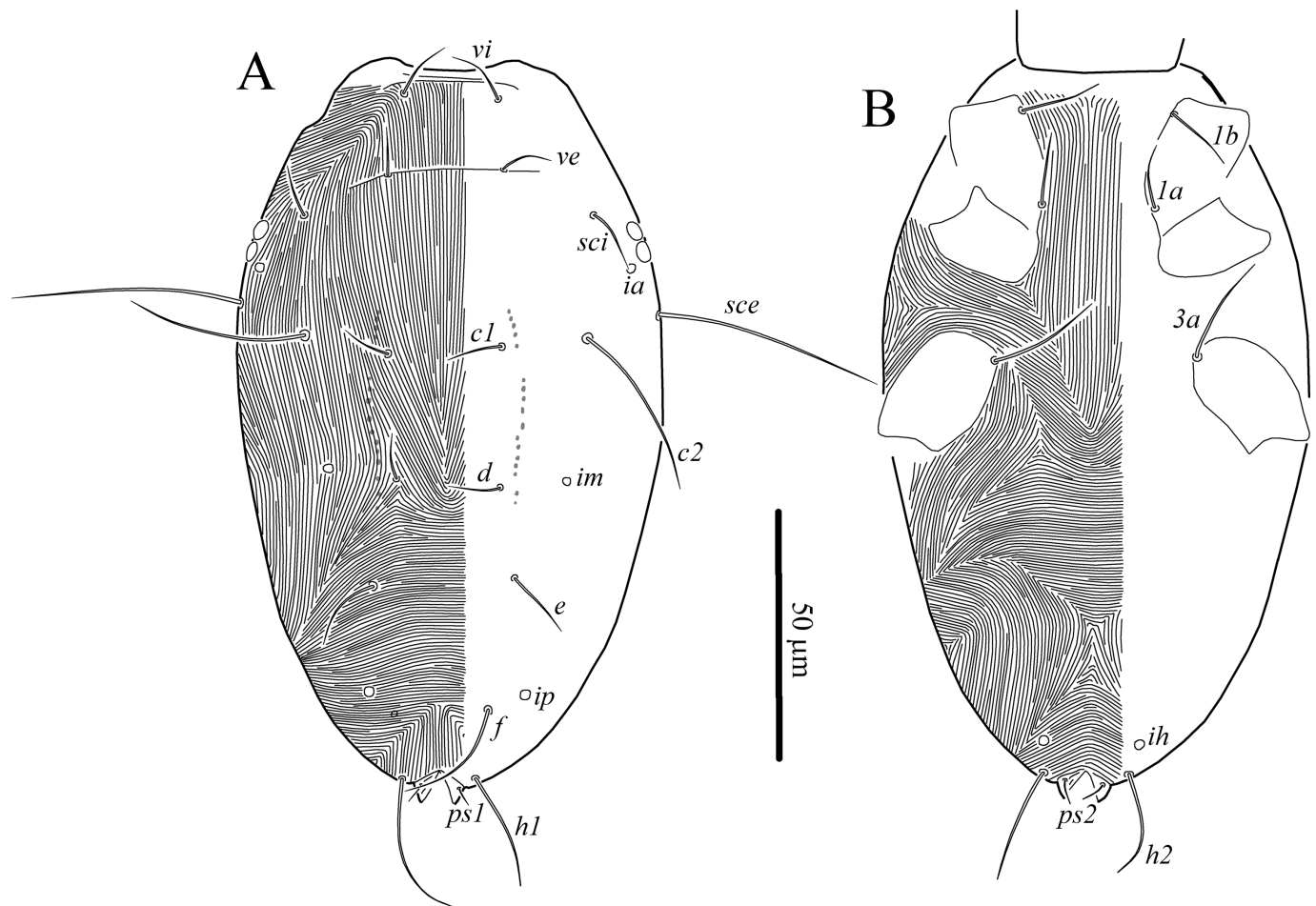


Figure 13 *Molothrognathus tauricus* n. sp., larva: A – idiosomal dorsum, B – idiosomal venter.

tongue-shaped, its posterior margin exceeding beyond bases of setae *d* in *M. crucis*) and by distinctly shorter setae *sce*, which about twice longer than *c2* (*sce* much longer, about three times longer than *c2* in *M. crucis*). The female of the new species is also similar to *M. shirazicus* Khanjani, Bakhshi and Khanjani, 2016, described from Iran (Khanjani *et al.* 2016) and *M. colei* Swift, 1996, described from Hawaii (Swift 1996), by the similar shape of dorsal idiosomal shield. The new species differs from both species by the absence of setae *ag3* (present in *M. shirazicus* and *M. colei*). The new species differs from *M. shirazicus* in having setae *c2* subequal with *ve* and *sci* (*c2* distinctly longer than *ve* and *sci* in *M. shirazicus*). The new species differs from *M. colei* in having setae *c2* twice shorter than *sce* (*c2* and *sce* subequal in *M. colei*).

Discussion

The genera *Caligonella* and *Molothrognathus* are the most derived group of Caligonellidae (Fan 2000) and very similar morphologically. The only difference between genera is position

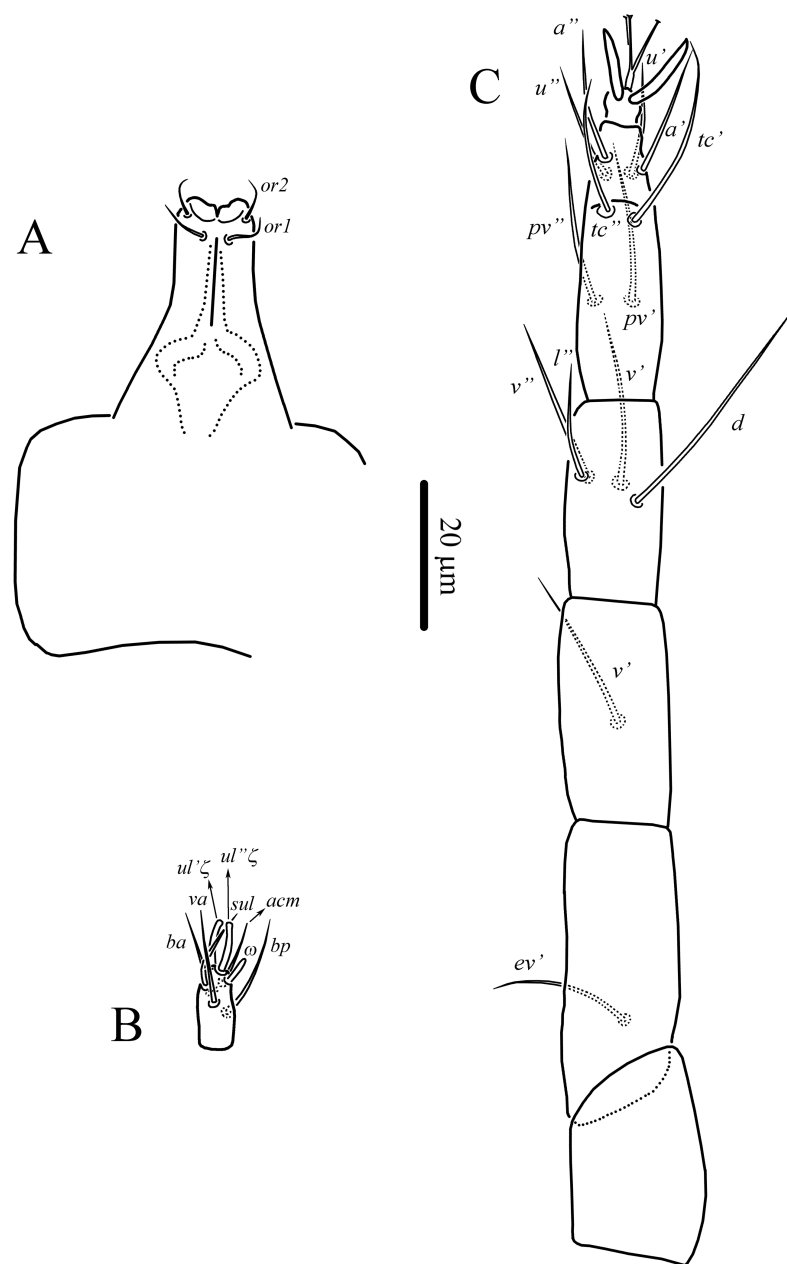


Figure 14 *Molothrognathus tauricus* n. sp., larva: A – subcapitulum, B – palptarsus, ventral aspect; protonymph: C – leg IV, dorsal aspect.

of anterior end of peritremes. In *Caligonella* anterior end of peritremes situated anteroventrally and in *Molothrognathus* dorsomedially on stylophore. The discovery of larval stages of *Caligonella quinqueocellata* and *Molothrognathus tauricus* and description of their legs shows more derived leg setation in comparison to more primitive genus *Coptocheles* (Swift 2001). The only difference between larval legs setation in *Caligonella quinqueocellata* and *Molothrognathus tauricus* is the absence of seta *p''* on tarsus II in *M. tauricus*. The chaetotaxy of palptarsus in larval stage of Caligonellidae has never been described. In both described species, palptarsus of larva has the same number of setae as adults. However, setae *acm* and *sul* are not modified (not eupathid-like). In contrast to more early derivative genus *Neognathus*,

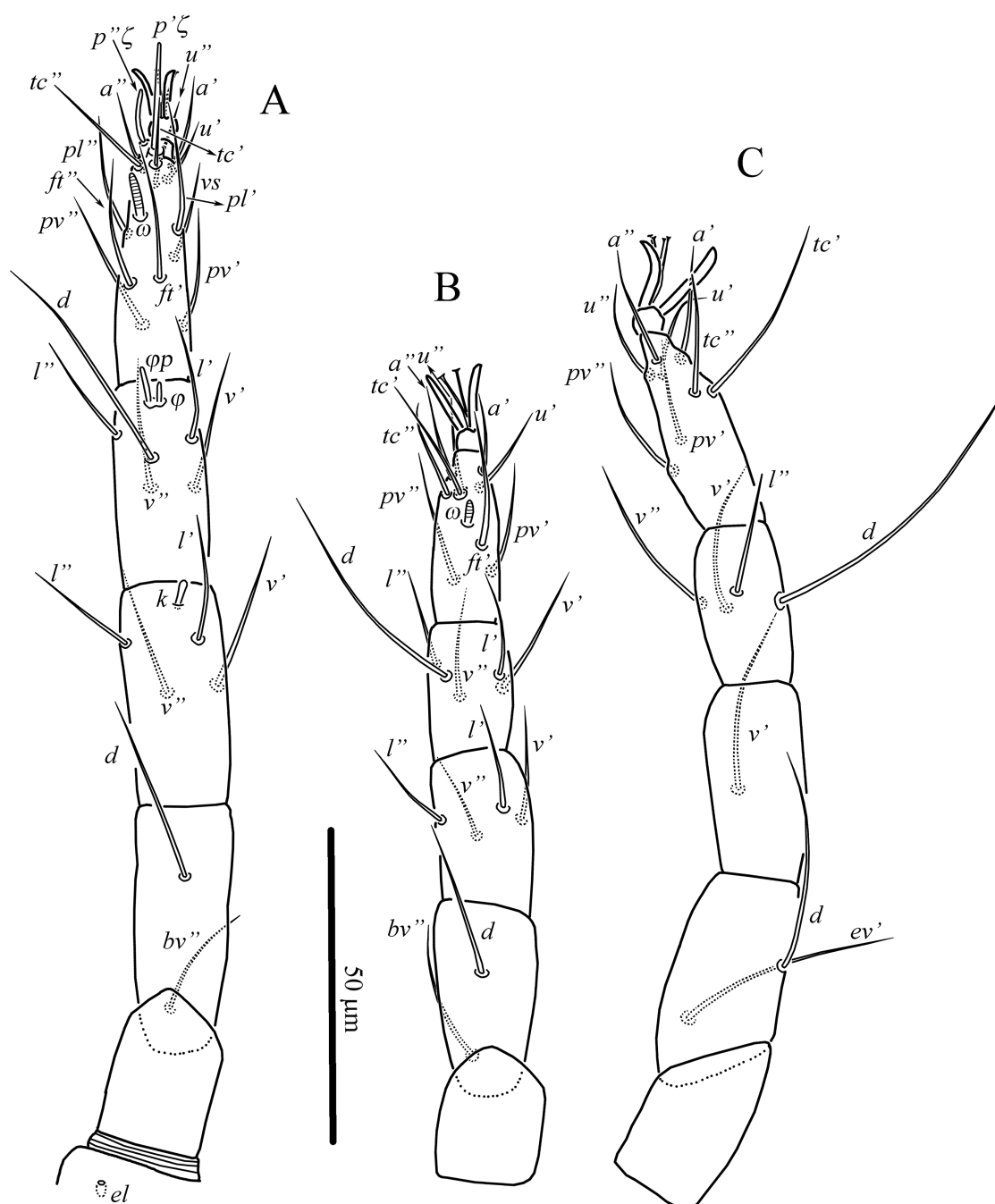


Figure 15 *Molothrognathus tauricus* n. sp., larva: A-C – legs I-III respectively, dorsal aspect.

palptarsus of *Caligonella* and *Molothrognathus* lacks seta *lp*.

Acknowledgements

The author thanks Mr. Latyntsev, R.V. (Tyumen State University, Tyumen, Russia) for the logistics.

The present research was supported by the Russian Science Foundation, grant No. 20-64-47015.

References

- Ahaniazad M., Bagheri M. 2012. A new species of the genus *Molothrognathus* Summers and Schlinger (Acari: Trombidiformes: Caligonellidae) from Iran. *Acarologia*, 52(4): 373-376. <https://doi.org/10.1051/acarologia/20122066>
- Akyol M. 2018. A new species of *Caligonella* Berlese (Acari, Caligonellidae) from Turkey. *Syst. Appl. Acarol.*, 23(12): 2339-2344. <https://doi.org/10.11158/saa.23.12.6>
- Beron P. 2020. *Acarorum catalogus VII: Trombidiformes, Prostigmata, Raphignathoidea* (Fam. Barbutidae, Caligonellidae, Camerobiidae, Cryptognathidae, Dasythyreidae, Dytiscacaridae, Eupalopsellidae, Homocaligidae, Mecognathidae, Raphignathidae, Stigmaeidae, Xenocaligonellidae). Sofia: Pensoft, National Museum of Natural History, Sofia: Bulgarian Academy of Sciences. pp. 306.
- Doğan S., Doğan S. 2020. *Caligonella haddadi* Bagheri & Maleki Türünüm (Acari: Trombidiformes: Caligonellidae) Erkek, Protonymph ve Larva Evrelerinin ilk Tanımları. *Erzincan Univ. J. Sci. Technol.*, 13(2): 465-476. [in Turkish]. <https://doi.org/10.18185/erzifbed.704612>
- Doğan S. 2003. On Caligonellid mites from Turkey (Acari: Caligonellidae). *Arch. Sci.*, 56(2): 63-77. <https://doi.org/10.5169/seals-740431>
- Fan Q.-H. 2000. A phylogenetic analysis of the family Caligonellidae (Acari: Prostigmata) with description of two new species. *Acta Entomol. Sin.*, 43: 421-428.
- Grandjean F. 1946. Au sujet de l'organe de Clapar'ede, des eupathides multiples et des taenidies mandibulaires chez les Acariens actinochitineux. *Arch. Sci. Phys. Natur.*, 28: 63-87. [in French]
- Halawa A.M. 2013. A new species of *Molothrognathus* Summers and Schlinger (Prostigmata: Caligonellidae) from Saudi Arabia. *Acarines*, 7(2): 3-6.
- Kethley J. 1990. Acarina: Prostigmata (Actiniedida). In: Dindal, D.L., (Ed.). *Soil Biology Guide*. New York: John Wiley and Sons. p. 667-756.
- Khanjani M., Bakhshi S., Khanjani M. 2016. *Molothrognathus shirazicus*, a new species of Caligonellidae (Acari: Prostigmata) from Iran. *Pers. J. Acarol.*, 5 (4): 291-297. <https://doi.org/10.22073/pja.v5i4.23685>
- Kuznetsov N.N. 1978. New records of raphignathoid mites (Raphignathoidea, Acariformes). *Biol. Nauki*, 12: 49-54. [in Russian]
- Norton R.A. 1977. A review of F. Grandjean's system of leg chaetotaxy in the Oribatei and its application to the Damaeidae. In: Dindal, D.L. (Ed.), *Biology of oribatid mites*. SUNY College of Environmental Science and Forestry, Syracuse, pp. 33-62.
- Pishevvar S., Khanjani M. 2020. *Caligonella Astragalusi* N. Sp. (Acari: Trombidiformes: Caligonellidae) From Western Iran. *Sys. Appl. Acarol.*, 25(11): 1988-1993. <https://doi.org/10.11158/saa.25.11.5>
- Smith Meyer M.K.P., Ueckermann E.A. 1989. African Raphignathoidea (Acari: Prostigmata). *Entom. Mem., Dep. Agric. Tech. Serv., RSA*, 74: 1-58.
- Summers F.M., Schlinger E.I. 1955. Mites of the family Caligonellidae (Acarina). *Hilgardia*, 23: 539-561.
- Swift S.F., 2001. The leg chaetotaxy of Caligonellidae (Prostigmata: Raphignathoidea). In: Halliday, R.B., Walter, D.E., Norton R.A. & Colloff, M.J. (Eds). *Acarology: Proceedings of the 10th International Congress*. Australia: CSIRO Publ. p. 242-249.
- Swift S.F. 1996. Hawaiian Raphignathoidea: family Caligonellidae (Acari: Prostigmata), with descriptions of five new species and key to genera and species. *Ann. Entomol. Soc. Amer.*, 89: 313-327.