

## A NEW WATER MITE SPECIES OF THE GENUS *LEBERTIA* NEUMANN (ACARIFORMES, HYDRACHNIDIA) FROM NORTHEASTERN RUSSIA

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**ABSTRACT:** A new water mite species, *Lebertia magadanensis*, inhabiting streams of Northeastern Russia is described based on the female, male, deutonymph and larva.

**KEY WORDS:** water mites, Acariformes, Lebertiidae, *Lebertia magadanensis*, new species, male, female, deutonymph, larva, Northeastern Russia

### INTRODUCTION

The purpose of this paper is to describe the female, male, deutonymph and larva of a new water mite species, *Lebertia magadanensis*. Material was collected by the author in streams of Northeastern Russia. Fresh mite specimens were mounted on slides, without prior fixation in Koenike liquid. Most specimens were not dissected, thus preserving the natural shape of the body. For several females, males, deutonymphs and larvae, the gnathosoma was mounted in a position that allowed investigating chelicerae and pedipalp in a lateral view. All mites were mounted in Hoyer's medium. The type material is deposited in the collection of the Institute for Biology of Inland waters (Borok, Russia).

Idiosomal setae terminology follows Tuzovsky (1987): *Fch* — frontales chelicerae, *Fp* — frontales pedipalporum, *Vi* — verticales internae, *Ve* — verticales externae, *Oi* — occipitales internae, *Oe* — occipitales externae, *Hi* — humerales internae, *He* — humerales externae, *Hv* — humerales ventralia, *Sci* — scapulares internae, *Sce* — scapulares externae, *Li* — lumbales internae, *Le* — lumbales externae, *Si* — sacrales internae, *Se* — sacrales externae, *Ci* — caudales internae, *Pi* — praeanales internae, *Pe* — praeanales externae, *Ai* — anales internae, *Ae* — anales externae; *s* — solenidion, *ac* — acanthoid seta. Furthermore, the following abbreviations are used: Cx-II = second coxae; P-1–5, pedipalp segments (trochanter, femur, genu, tibia and tarsus) i.e. P-3 = genu; I-Leg. 1–6, first leg, segments 1–6 (trochanter, basifemur, telofemur, genu, tibia and tarsus) i.e. III-Leg. 4 = genu of third leg; at a larva basifemur and telofemur are fused to each other and all legs consist of 5 segments (trochanter, femur, genu, tibia and tarsus); *ac*. 1–3 = genital acetabula; *L* — length, *W* — width; *n* = number of specimens measured. The length of appendage

segments was measured along their dorsal side; all measurements are given in  $\mu\text{m}$ .

**Family Lebertiidae Thor, 1900**

**Genus *Lebertia* Neuman, 1880**

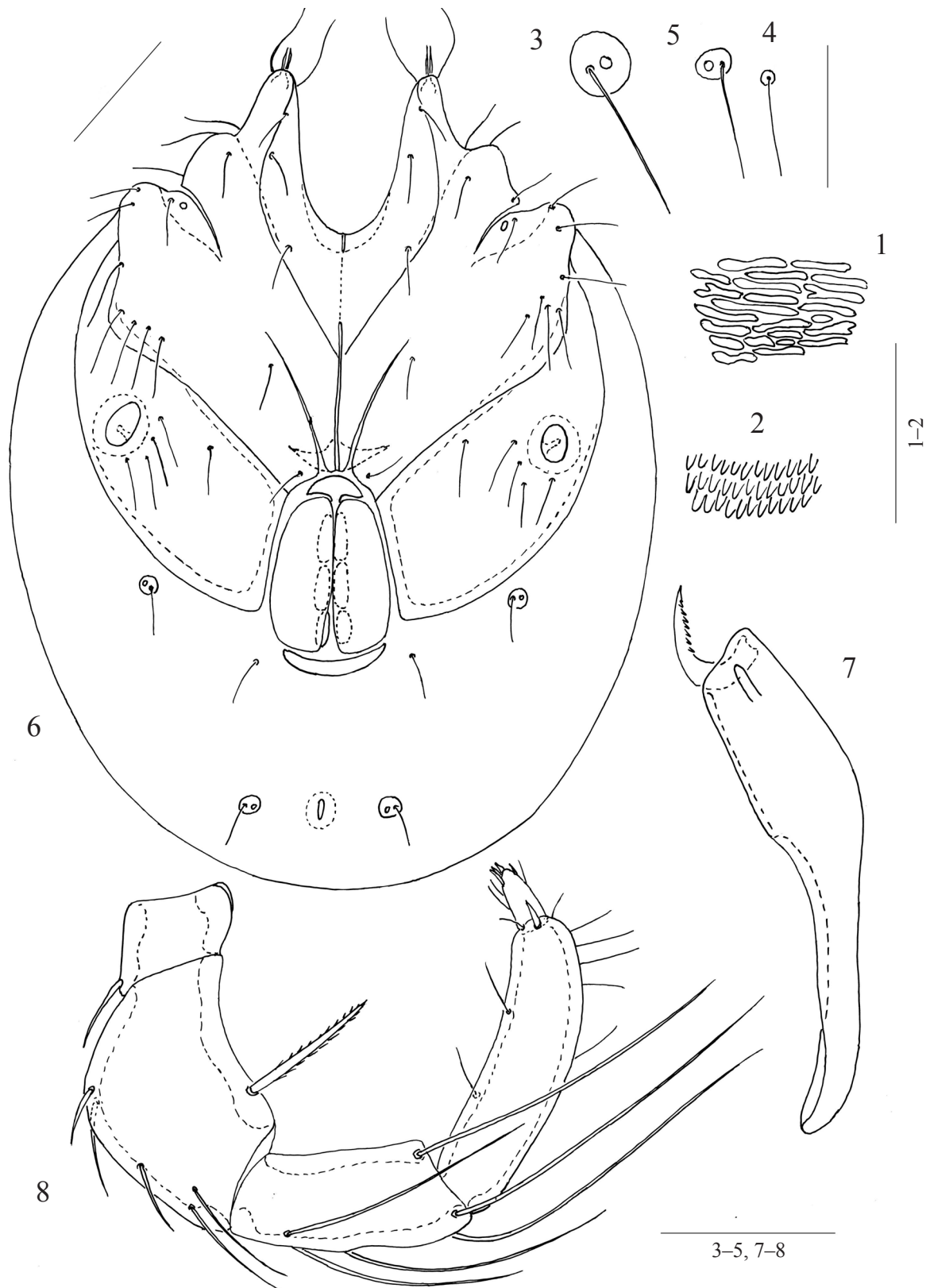
***Lebertia (Mixolebertia) magadanensis***

**Tuzovskij, sp. n.**

Figs 1–32.

**Type material.** Holotype female, slide 2422, Russia, Magadan Province, Snow Valley near Magadan-City, Medvezhiy stream, depth 0.3–0.5 m, substrates: stones, sand and mosses, 30.05.1979, leg. P.V. Tuzovsky. The holotype is deposited in the collection of Institute for Biology of Inland Waters (Borok, Russia). Paratypes (7 females, 1 male, 8 deutonymphs, 7 larvae from the same locality as holotype): 3 females, 1 male and 7 larvae collected together with holotype 30.05.1979, 1 female and 2 deutonymphs 25.07.1979, 3 females and 6 deutonymphs 15.06.1982. Non-type material: 6 females, 3 males, 2 deutonymph, 5 larvae, Russia, Magadan Province, Chukotka, Beringovskiy District, Taalavaren stream (inflow of the Khatyrka River), 03.09.1987, leg. P.V. Tuzovsky.

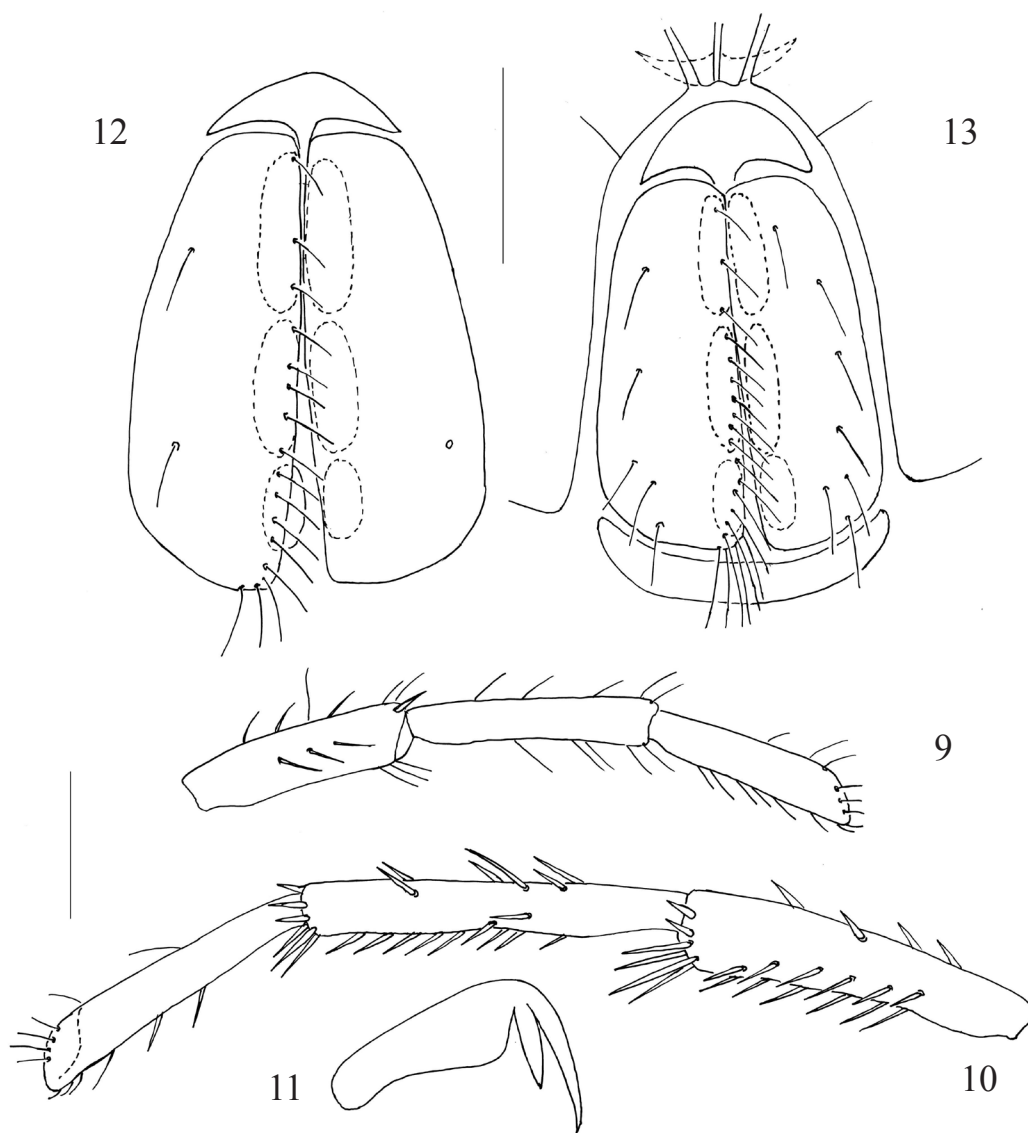
**Diagnosis. Adults.** Color red, integument with papillae and ribs, coxal shield approximately as long as wide, median portion of Cx-I slightly longer than suture line between Cx-II, posterior margin of Cx-II narrow, posteromedial corners of Cx-IV acute, P-3 with 6 setae (3 relatively short proximal setae and 3 long distal setae, distomedial seta close to distodorsal seta), P-4 slightly curved near insertion of distoventral setae, bases of two ventral setae divide P-IV into three approximately subequal parts; legs without swimming setae, IV-Leg. 1 with 2–3 dorsal spines, IV-Leg. 6 with 2 ventral spine-like setae near middle of segment; female: coxal plates surround genital field by about 1/3–1/4, each genital flap with 13–16 medial



Figs 1-6. *Lebertia magadanensis* sp. n., female: 1-2 fragment of integument, 1 — dorsal view, 2 — lateral view; 3 — seta *Fch*; 4 — seta *Oi*; 5 — seta *Oe*; 6 — idiosoma, ventral view; 7 — chelicera, 8 — pedipalp. Scale bars: 1-5 = 50  $\mu$ m, 6 = 200  $\mu$ m, 7-8 = 100  $\mu$ m.

and 1-3 lateral setae; male: coxal plates surround the genital field by about 1/5, each genital flap with 17-23 medial and 5-8 lateral setae.

**Deutonymph.** Color red, coxal shield wider than long, median portion of Cx-I longer than suture line between Cx-II, posteromedian end of Cx-



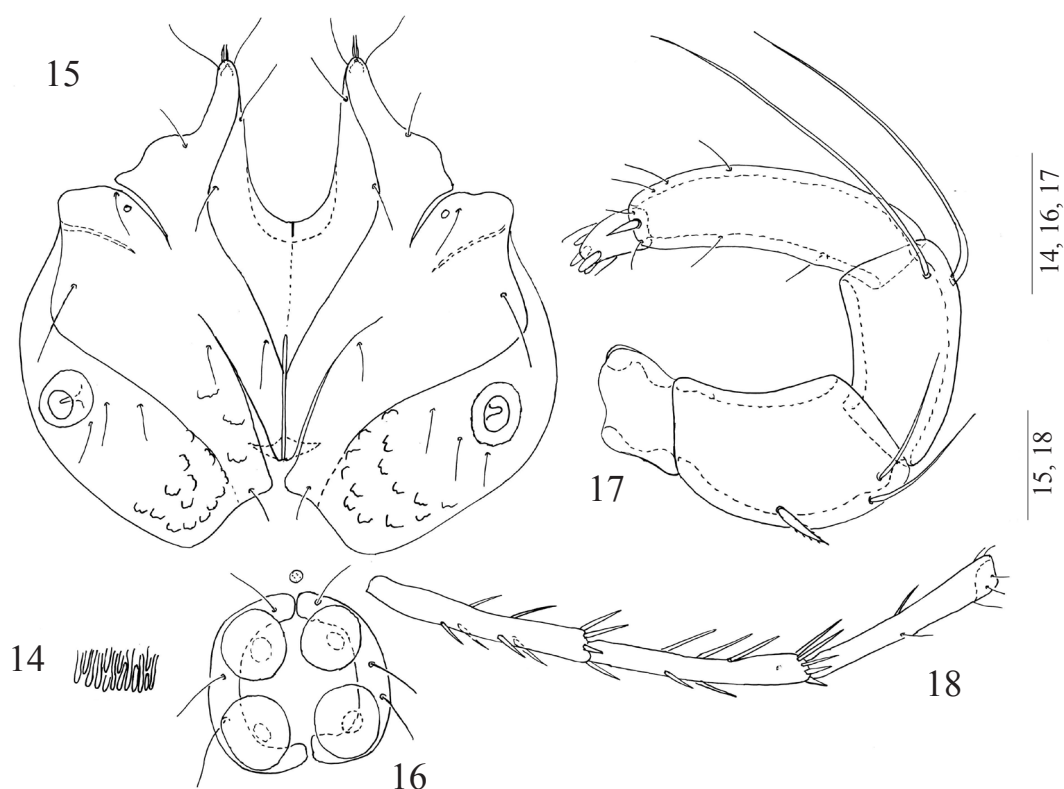
Figs 9–13. *Lebertia magadanensis* sp. n., adults: 9 — genu, tibia and tarsus of leg I; 10 — genu, tibia and tarsus of leg IV; 11 — claw, 9–11 — female; 12 — genital field of female, 13 — genital field of male. Scale bars: 9–10 = 200  $\mu$ m, 11 = 50  $\mu$ m, 12–13 = 100  $\mu$ m.

II narrow, posteromedial corner of Cx-IV obtuse or rounded, both pairs of genital acetabula circular and subequal, pregenital sclerite very small, P-2 with 1 short dorsoproximal seta and 2 long unequal dorsodistal setae, P-3 with 2 long dorsodistal setae, bases of two ventral setae divided P-4 into three parts (approximately as 2: 2: 3), distolateral spine on P-4 long pointed, its length approximately twice as short as tarsus, IV-Leg. 1 with single dorsodistal spine, IV-Leg. 6 with single ventral spine.

**Larva.** Color red, dorsal shield elongate (ratio length/width 2.0–2.2), anterior portion of dorsal shield narrow, with straight or concave anterior margin, lateral margins undulate and converging in posterior part at acute angle, Fch approximately

twice as short as Vi; caudal setae (Ci) smooth and slightly longer than others dorsal setae located on soft integument, medial coxal seta (C1) shorter than other coxal setae (C2–C4), which approximately subequal in length, posterior edge of coxal plates III straight, with 2 subequal setae (Pi, Pe); excretory pore plate pentagonal, excretory pore situated in posteromedian corner of excretory pore plate; setae Ai shorter than Ae.

**Description. Adults.** Idiosoma oval, its length slightly exceeding width. Color red, integument with papillae and ribs (Figs 1–2). Number and position of idiosomal setae typical for genus *Lebertia*. Setae *Fch* (Fig. 3) longer and thicker than other idiosomal setae. Trichobothria *Fp*, *Oi* and setae *Pi* (Fig. 4) without glandularia,



Figs 14–18. *Lebertia magadanensis* sp. n., deutonymph: 14 — fragment of integument, 15 — coxal shield, ventral view, 16 — genital field, 17 — pedipalp, medial view, 18 — genu, tibia and tarsus of leg I. Scale bars: 14, 15, 17 = 50  $\mu\text{m}$ ; 16, 18 = 100  $\mu\text{m}$ .

other idiosomal setae associated with glandularia (Fig. 5).

Coxal shield (Fig. 6) approximately as long as wide and occupying more than half of idiosoma length. Cx-I fused to each other completely, fragment of suture line between them distinctly visible only in posterior portion. Median portion of Cx-I slightly longer than suture line between Cx-II (L median Cx-I/Cx-II ratio = 1.15–1.31). Posterior margin of Cx-II narrow with short pointed apodemes directed laterally. Suture between coxal plates III and IV complete. Posterior margin of coxal plates IV convex and forming with medial margin acute posteromedial angle. External genital field with 3 pairs of acetabula, 2 flaps, anterior and posterior genital sclerites; anterior genital sclerite distinctly smaller than posterior one. Anterior two pairs of acetabula approximately subequal in size and longer than the posterior pair, total length ac. 1–3 on each side slightly shorter than the length of flap. Excretory pore unsclerotized.

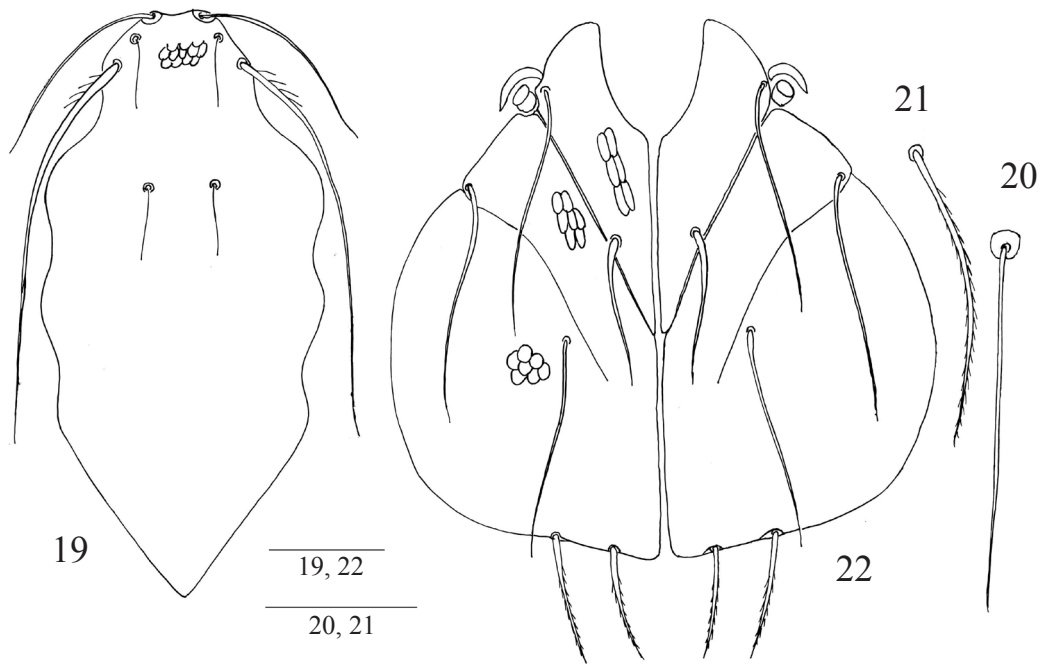
Basal segment of chelicera large, with convex dorsal and concave ventral side (Fig. 7). Cheliceral stylet short, with two rows of fine dorsal teeth.

Pedipalps slender (Fig. 8): P-1 with 1 distodorsal seta; P-2 with concave ventral and convex

dorsal margin, distoventral seta shorter than ventral margin of segment, with five dorsal setae, two distal setae longer than proximal ones; P-3 with three relatively short proximal setae (occasionally one proximal seta absent) and three long distal setae (distomedial seta close to distodorsal seta); P-4 slightly curved near insertion of distoventral setae, the bases of two ventral setae divided P-4 into three approximately subequal parts; distolateral spine on tibia thick and pointed, approximately subequal to  $\frac{1}{2}$  tarsus length. One dorsal seta or two dorsal thin setae located near middle of P-4.

Posterior legs slender. Terminal segments of anterior pair of legs with short and mainly fine setae (Fig. 9). Posterior pairs of legs with short and stout setae (Fig. 10). IV-Leg.1 with 1 short dorsal spine near middle of segment and 1–2 relatively large dorsodistal spines, IV-Leg.4 and IV-Leg.5 with a few ventral spine-like setae, IV-Leg.6 with 2 ventral spines near middle of segment. Claws (Fig. 13) with moderately developed blade and two pointed clawlets: short interior and long exterior; claw blade with concave ventral margin.

**Female.** (Fig. 5), genital flaps elongate (L/W ratio 2.4–2.6), each genital flap with 13–16 medial and 1–3 lateral setae (Fig. 12).



Figs 19–22. *Lebertia magadanensis* sp. n., larva: 19 — dorsal shield, 20 — seta *Ci*, 21 — seta *Hi*, 22 — coxal plates, ventral view. Scale bars: 19, 22 = 50  $\mu$ m, 20, 21 = 50  $\mu$ m.

Measurements (n=10). Length of body 1100–1350; length of seta *Fch* 85–95; length of coxal shield 750–800, width 730–790; length of median suture of coxal plates I 185–205, length of median suture of coxal plates II 155–165; length of capitular bay 200–215, length of genital bay 180–195; length of genital flaps 210–220, width 84–90; length of genital acetabula (ac. 1–3): 65–72, 50–65, 42–48; length of capitulum 215–220; length of basal segment of chelicera 245–275, length of cheliceral stylet 48–57; length of pedipalpal segments (P-1–5): 48–57, 135–145, 130–140, 138–170, 40–50; length of leg segments: I-Leg.1–6 — 90–105, 160–190, 155–170, 225–245, 240–260, 200–230; II-Leg.1–6 — 95–100, 160–190, 165–175, 260–280, 275–320, 225–270; III-Leg.1–6 — 90–100, 170–205, 175–195, 285–320, 325–345, 265–285; IV-Leg.1–6 — 195–215, 210–255, 250–295, 350–390, 365–400, 290–325.

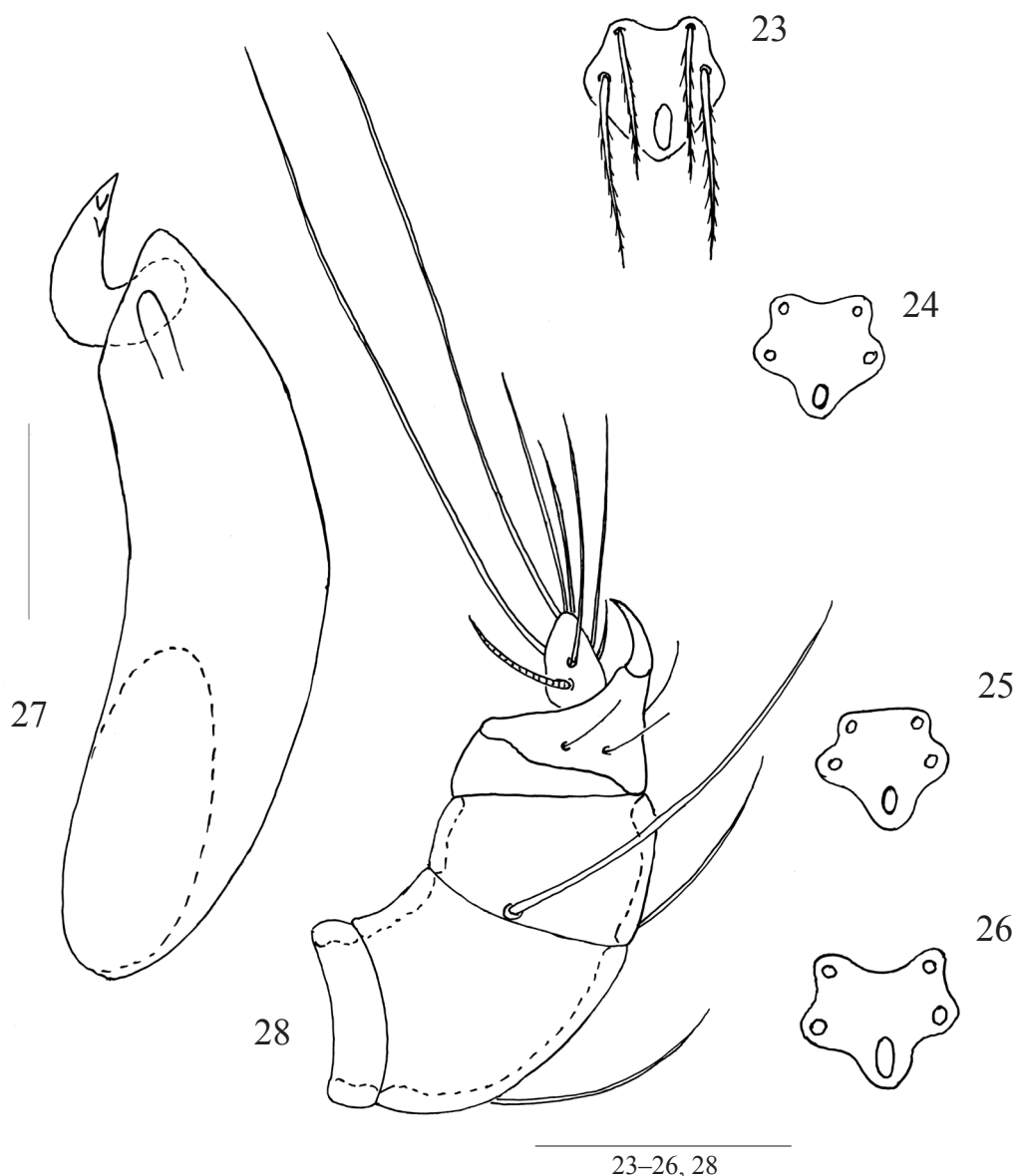
**Male.** Coxal plates surround the genital field to about 1/5 (Fig. 13), genital flaps elongate (L/W ratio 2.4–2.5), each genital flap with 17–23 medial and 5–8 lateral setae.

Measurements (n=4). Length of body 735–1060; length of seta *Fch* 72–78; length of coxal shield 570–750, width 530–710; length of median suture of coxal plates I 185–190, length of median suture of coxal plates II 150–165; length of capitular bay 180–190, length of genital bay 170–180; length of genital flaps 155–185, width 65–75; length of genital acetabula (ac. 1–3): 60–66, 54–

60, 30–38; length of capitulum 210–230; length of basal segment of chelicera 235–285, length of cheliceral stylet 45–50; length of pedipalpal segments (P-1–5): 40–50, 120–140, 120–130, 140–155, 40–50; length of leg segments: I-Leg.1–6 — 75–90, 95–155, 110–140, 160–210, 180–220, 160–195; II-Leg.1–6 — 80–90, 145–155, 135–145, 210–230, 240–255, 210–225; III-Leg.1–6 — 85–95, 160–175, 150–165, 240–255, 270–280, 240–250; IV-Leg.1–6 — 165–175, 195–205, 225–235, 300–310, 305–320, 265–275.

**Deutonymph.** Dorsal side similar to that of adults. Integument with papillae and ribs (Fig. 14). Coxae of legs occupying more than half of ventral side, their total length slightly shorter than its width (Fig. 15). Median portion of Cx-I longer than suture line between Cx-II (L median Cx-I/Cx-II ratio = 1.25–1.40). Medial and posterior margins of Cx-IV join at obtuse angle. Genital flaps (Fig. 16) narrow, bearing 3 setae on each side; both pairs of genital acetabula circular and subequal in size; pregenital sclerite very small, placed close to anterior margins of genital flaps. Excretory pore unsclerotized.

Pedipalp slender (Fig. 17): P-1 without setae; P-2 with concave ventral and convex dorsal margins, bearing 1 short dorsoproximal spine and 2 long unequal dorsodistal setae, distoventral seta absent; P-3 with two long distodorsal setae; P-4 long, with slightly concave ventral and convex dorsal margins, one dorsal seta on tibia located



Figs 23–28. *Lebertia magadanensis* sp. n., larva; 23–26 — excretory pore plate, 27 — chelicera, 28 — pedipalp. Scale bars: 23–26, 28 = 50  $\mu$ m, 27 = 20  $\mu$ m.

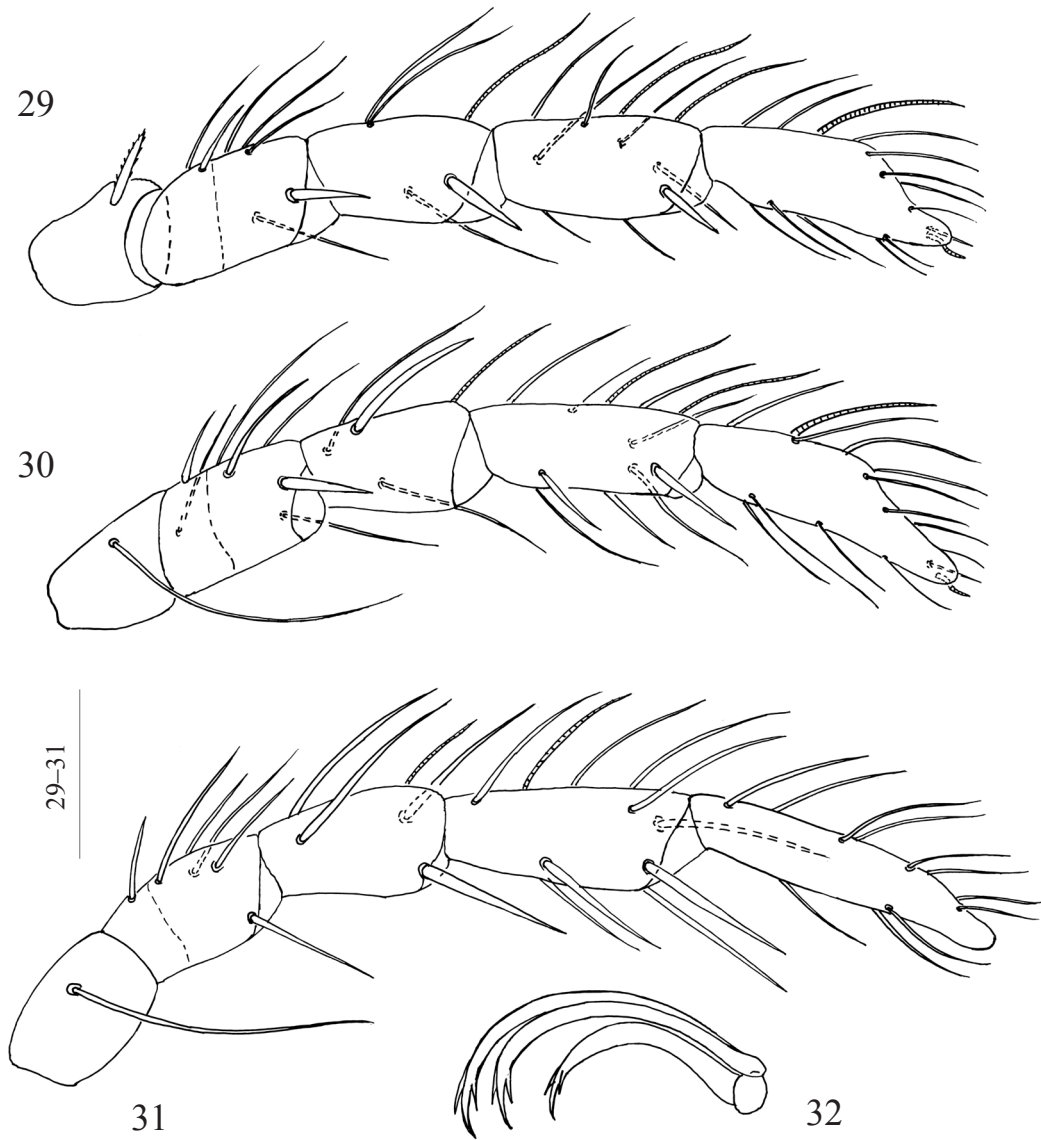
near middle of segment, bases of two ventral setae divided tibia into three parts (approximately as 2:3:2), distolateral spine on P-4 long pointed, its length approximately twice as short as tarsus.

Legs, especially posterior pair (Fig. 18) long, without swimming setae. IV-Leg.1 with single dorsodistal spine; IV-Leg. 2 with 2 distal spines (short dorsal and relatively long ventral); IV-Leg. 3 to 5 with a few spines, and IV-Leg. 6 with single ventral spine near middle of segment and several thin, short setae.

Measurements (n=10). Length of body 600–765; length of seta Fch 60–68; length of coxal shield 360–400, width 385–450; length of median suture of coxal plates I 100–110, length of median suture

of coxal plates II 78–90; length of capitular bay 105–110, length of genital bay 54–60; length of genital flaps 60–66, width 10–12; length of genital acetabula (ac. 1–3): 24–27, 24–27; length of basal segment of chelicera 130–135, length of cheliceral stylet 30–32; length of pedipalpal segments (P-1–5): 24–30, 65–78, 60–66, 75–82, 21–24; length of leg segments: I-Leg.1–6 — 48–60, 65–72, 78–90, 105–115, 125–135, 120–130; II-Leg.1–6 — 60–66, 65–72, 78–90, 100–120, 144–156, 140–150; III-Leg.1–6 — 57–65, 70–75, 80–95, 135–145, 155–170, 155–165; IV-Leg.1–6 — 95–110, 90–100, 120–126, 165–180, 185–195, 170–185.

**Larva.** Dorsal shield elongate (L/W ratio 2.0–2.2) in unengorged larva covers large part of



Figs 29–32. *Lebertia magadanensis* sp. n., larva: 29 — leg I, 30 — leg II, 31 — leg III, 32 — claws. Scale bars: 29–31 = 50  $\mu$ m, 32 = 20  $\mu$ m.

dorsum, with porous and reticulated sculpture. Anterior portion of dorsal shield (Fig. 19) narrow, with straight or concave anterior margin, lateral margins undulate and converging in posterior part at acute corner. Dorsal shield bears 4 pairs of setae: 2 pairs of simple setae (Fch, Vi) and 2 pairs of trichobothria (Fp, Oi); simple setae long and thick, Fch approximately twice as short as Vi; both pairs of trichobothria subequal short and thin. Nine pairs of long, subequal serrate idiosomal setae (Oe, Hi, He, Sci, Sce, Li, Le, Si, Se) situated on soft wrinkled integument. Caudal setae (Fig. 20) smooth and slightly longer than others dorsal setae, located on soft integument (Fig. 21).

Anterior coxal plates separated from coxal plates II and III, which fused to each other, suture

line between them incomplete, obliterated medially (Fig. 22). Medial seta (C1) on coxal plate I shorter than other coxal setae (C2–C4), which approximately subequal in length. Posterior edge of coxal plates III straight and bears 2 of subequal setae (Pi, Pe). All coxal plates have reticulated pattern consisted more or less of elongated cells. Larval organs (ur stigma) lateral to border between coxae I and II, covered by flaps.

Excretory pore plate pentagonal (Figs 23–26), anterior anal setae (Ai) shorter than posterior setae (Ae); excretory pore situated in posterior corner of excretory pore plate.

Chelicera (Fig. 27) with large basal segment, its dorsal margin convex, ventral margin concave. Cheliceral stylet relatively small, crescent, with two subapical teeth.

Pedipalp (Fig. 28) compact: P-1 short, without setae; P-2 relatively large, with single dorsal seta proximally to middle of segment; P-3 shorter than P-2, with two unequal proximal setae, dorsal seta nearly twice as short as lateral one; P-4 with short dorsodistal projection, bearing thick pointed claw, with two short subequal lateroproximal setae and one dorsodistal seta, length of P-4 is less than its height; P-5 very small, with 1 proximal solenidion (slightly longer than this segment), 2 very long subequal setae, 4 moderately long setae, and 1 very short seta (shorter than of segment).

Total number of setae on legs I–III except for eupathidias follows (number of sensilla shown in parentheses): I–Leg. 1–5: 1, 7, 5 (s), 10 (2s), 15 (s, ac); II–Leg. 1–5: 1, 7, 5 (s), 11 (2s), 15 (s, ac); III–Leg. 1–5: 1, 6, 5 (s), 10 (s), 11. Basifemur and telofemur of all legs (Figs 29–31) fused to each other, with indistinct suture line. Trochanter I has short thick seta, trochanters II and III have 1 long seta each. Both solenidia on I–Leg.4 and II–Leg.4 subequal and located in distal part of segment. Distal solenidion on III–Leg.3 shorter than proximal solenidion on III–Leg.4. Base of solenidion on I–Leg.5 and II–Leg.5 situated near middle of segment, base of solenidion on II–Leg.5 situated proximally at middle of segment. Acanthoid setae present only on I–Leg. 5 and II–Leg. 5. Empodium on tarsus of all legs thick, short, ambulacra long and thin. Empodium I shorter than empodia II and III. All claws with two subapical short teeth (Fig. 32).

Measurements (n=10). Length of dorsal shield 275–290, width 115–130; length of setae *Fch* 60–70, length of setae *Fp* and *Oi* 25–30, length of setae *Vi* 120–150, length of setae *Oe* 100–110, length of setae *Hi* 125–140, length of setae *He* 120–130, length of setae *Sci* 105–120, length of setae *See* 100–110, length of setae *Li* 95–105, length of setae *Le* 80–90, length of setae *Si* 80–90, length of setae *Se* 75–85, length of setae *Ci* 120–130, length of setae *Pi* 54–56, length of setae *Pe* 58–62, length of setae *Ai* 30–33, length of setae *Ae* 36–39, length of setae *C1* 90–95, length of setae *C2–C4* 115–

125, length of medial edges of coxae I 85–100, length of medial edges of coxae II+III 95–110; length of excretory pore plate 19–22, width 16–26; length of basal segment of chelicera 85–100, length of cheliceral stylet 19–22; length of pedipalpal segments (P-1–5): 9–10, 32–42, 28–30, 19–22, 10–15; length of legs segments: I–Leg.1–5: 40–48, 48–58, 57–67, 65–77, 70–80; II–Leg.1–5: 40–48, 45–48, 52–60, 65–83, 80–93; III–Leg. 1–5: 50–60, 55–65, 60–68, 75–90, 95–118.

**Differential diagnosis.** The new species is similar to *Lebertia convergens* Thor, 1911, which is described only from the female from Kamchatka (Thor 1911). The female of the new species differs from *L. convergens* by the following characters (character states of female *L. convergens* are indicated in parentheses after Thor 1911 and Sokolow 1940): the posteromedial corner of coxal plate IV obtuse (acute), the posterior end of coxal plate II wide (narrow), the genital plate with 22 medial setae (with 13–16 medial setae), one proximal seta on P-3 is situated distally at the middle of the segment (all proximal setae are situated proximally at the middle of the segment), IV–Leg. 1 with 4 dorsal spines (with 2–3 dorsal spines).

**Etymology.** The species epithet *magadanensis* is derived from the name of the Province where it was collected (Magadan).

**Habitat.** Streams.

**Distribution.** Russia: Magadan Province.

## REFERENCES

- Sokolow, I.I. 1940. *Vodyanye kleshchi Hydracarina. Chast' I. Hydrachnellae*. [Hydracarina — the aquatic mites. Part I — Hydrachnellae]. Fauna of the SSSR Paukoobraznye (nouv. sér., no. 20), 5 (2). Publisher: Nauka, Moscow-Leningrad, 24 pp. + 511. [In Russian]
- Thor, S. 1911. Neue Acarina aus Asien (Kamchatka), I. Zoologischer Anzeiger, 38 (18–19): 420–427.
- Tuzovsky, P.V. 1987. *Morfologiya i postembrional'noe razvitie vodyanykh kleshchey* [Morphology and Postembryonic Development of Water Mites]. Publisher: Nauka, Moscow. 172 pp. [In Russian]