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Two new water mite species of the genus *Lebertia* Neuman, 1880 (Acari, Hydrachnidae: Lebertiidae) from northern lakes of Russia

P. V. Tuzovskij

Papanin Institute for Biology of Inland Waters of the Russian Academy of Sciences, Yaroslavl'skaya Region, 152742, Borok, Russia

Author

Petr V. Tuzovskij

E-mail: tpv@ibiw.ru

SPIN: 4101-5460

Scopus Author ID: 57190753429

ResearcherID: C-3184-2017

ORCID: 0000-0001-5002-2679

Abstract. Illustrated descriptions of two new water mite species of the genus *Lebertia*: *L. (Pilolebertia) makarovaе* sp. n. and *L. (Mixolebertia) prokini* sp. n. from northern lakes of Russia are presented. Genital field in the female *L. makarovaе* sp.n. with three pairs of small subequal acetabula, lying on elongated basal sclerites. The male *L. prokini* sp. n. characterised by the following features: the integument smooth; coxal shield embracing the genital field to about $\frac{3}{4}$; P-4 ventral sectors 1:1:2; IV-Leg-6 with five to six short, thick ventral setae.

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Keywords: Hydrachnidia, Lebertiidae, *Lebertia*, *Pilolebertia*, *Mixolebertia*, female, male, morphology, lakes, Russia

Два новых вида водяных клещей рода *Lebertia* Neuman, 1880 (Acari, Hydrachnidae: Lebertiidae) из северных озер России

П. В. Тузовский

Институт биологии внутренних вод РАН им. И. Д. Папанина, Некоузский район, Ярославская область, 152742, пос. Борок, Россия

Сведения об авторе

Тузовский Петр Васильевич

E-mail: tpv@ibiw.ru

SPIN-код: 4101-5460

Scopus Author ID: 57190753429

ResearcherID: C-3184-2017

ORCID: 0000-0001-5002-2679

Аннотация. Иллюстрированное описание двух новых видов водяных клещей рода *Lebertia*: *L. (Pilolebertia) makarovaе* sp. n. и *L. (Mixolebertia) prokini* sp. n. из северных озер России. Генитальное поле самки *L. makarovaе* sp.n. с тремя парами маленьких одинаковых присосок, лежащих на удлинённых склеритах. Самец *L. prokini* sp. n. характеризуется следующими признаками: покров гладкий, коксальный щит окружает генитальное поле на $\frac{3}{4}$; вентральные секторы на голени педипальпы 1:1:2; лапка ноги IV с 5–6 толстыми вентральными щетинками.

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Ключевые слова: Hydrachnidia, Lebertiidae, *Lebertia*, *Pilolebertia*, *Mixolebertia*, самка, самец, морфология, озёра, Россия.

Introduction

This paper describes two new water mite species of the genus *Lebertia*, the female *L. (Pilolebertia) makarovae* and male of *L. (Mixolebertia) prokini*. The material was collected by O. Makarova in Domashnee Lake on Vaigach Island (Arkhangelsk Province) and by A. Prokin in Elgygytgyn Lake (Chukotka). The water mites were fixed in 75% ethanol. All specimens were dissected and slides mounted in Hoyer's medium. Idiosomal setae are named according to Tuzovskij (1987). Furthermore, the following abbreviations are used: P-1-5 = pedipalp segments (trochanter, femur, genu, tibia and tarsus); I-Leg-1-6 = first leg, segments 1-6 (trochanter, basifemur, telofemur, genu, tibia and tarsus), i.e., III-Leg-3 = genu of third leg; L = length, mL = medial length, W = width; n = number of specimens measured; all measurements are given in micrometers (μm).

Systematics part

Family **Lebertiidae** Thor, 1900

Genus ***Lebertia*** Neuman, 1880

***Lebertia (Pilolebertia) makarovae* sp. n.**
(Figs. 1-8)

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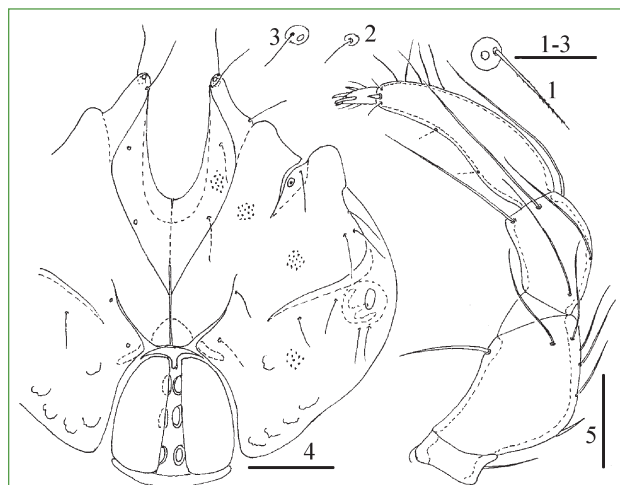
Material examined. Holotype: female, slide 9088, Europe, Arkhangelsk Region, Vaigach Island, Domashnee Lake, 65.369992 N, 47.569208 E, depth about 90 cm, substrates: stones, sand, 27.07.2004, leg. O. Makarova.

Diagnosis. Integument finely striated, coxal shield wider than long, ml of coxal plates I longer than suture line between coxal plates II, coxal shield embracing the genital field to about 5/6 with rounded posteromedial corners; genital field with three pairs of small subequal acetabula; P-2 ventral seta shorter than ventral margin of segment, P-3 medio-distal seta halfway between dorso- and ventrodistal setae, P-4 ventral sectors 1:1:1, medio-distal peg-like seta short, pointed; IV-Leg-6 with five to six short, thick ventral setae.

Description. Female. Integument soft and finely striated. Setae *Fch* (Fig. 1) longer and thicker than other idiosomal setae. Trichobothria *Fp*, *Oi* and setae *Pi* not associated with glandularia (Fig. 2), other idiosomal setae associated with glandularia (Fig. 3). Coxal shield (Fig. 4) wider than long (L/W ratio 0.82), medial length of coxal plates I longer than suture line between coxal plates II (ml Cx-I/Cx-2 ratio 1.9). Coxal plates I fused to each other nearly completely, fragment of suture line present only in their posterior portion. Capitular bay deep U-shaped, genital bay comparatively short and a little wider than long. Posterior margin of coxal plates II rather broad. Coxal shield embracing the genital field to about 5/6 and forming nearly rounded posteromedial corners.

Genital field (Figs. 4, 6) with three pairs of small subequal acetabula, lying on elongated basal sclerites, flaps with 25-29 medial and two fine lateral setae each; pregenital sclerite with short posteromedian projection, post-genital sclerite much broader than anterior one. Excretory pore unsclerotised.

Pedipalp moderately long (Fig. 5): P-1 short, with single dorsodistal setae; P-2 with three to four unequal dorsoproximal and two

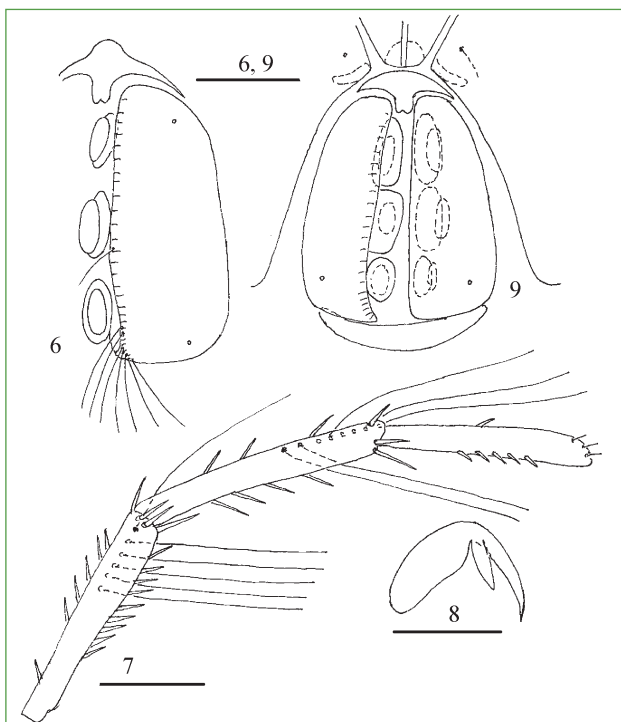


Figs. 1-5. *Lebertia makarovae* sp. n., female: 1 — seta *Fch*; 2 — seta *Oi*; 3 — seta *Oe*; 4 — ventral view; 5 — pedipalp. Scale bars: 1-3, 5 = 100 μm ; 4 = 200 μm

Рис. 1-5. *Lebertia makarovae* sp. n., самка: 1 — щетинка *Fch*; 2 — щетинка *Oi*; 3 — щетинка *Oe*; 4 — вентральная сторона; 5 — педипальпа. Шкалы: 1-3, 5 = 100 μm ; 4 = 200 μm

long subequal dorsodistal setae, ventral margin slightly concave, ventrodistal seta thick, shorter than ventral margin of segment inserted away from ventrodistal segment edge; P-3 comparatively short, ventral margin concave, mediiodistal seta halfway between dorso- and ventrodistal setae, both dorsoproximal setae well-separated; P-4 thickened proximally and narrowed distally, ventral sectors about 1:1:1, two to three dorsodistal setae shifted to middle of segment, mediiodistal peg-like seta thick and pointed.

Legs II–IV with swimming setae, their number as following: five to six on II-Leg-5 and IV-Leg-4, five on III-Leg-4, 7–11 on III-Leg-5, 10–11 on IV-Leg-5; IV-Leg-6 with five to six short spine-like ventral setae (Fig. 7). Leg claws with short internal and comparatively long external clawlets, lamella moderately developed with slightly concave ventral margin (Fig. 8).



Figs. 6–9. *Lebertia* females: 6–8 — *Lebertia makarovae* sp. n., 6 — genital field; 7 — IV-Leg-4–6; 8 — 1 leg claw; 9 — *Lebertia porosa*, genital field. Scale bars: 6, 9 = 100 μ m, 7 = 200 μ m, 8 = 50 μ m

Рис. 6–9. *Lebertia* самки: 6–8 — *Lebertia makarovae* sp. n., 6 — генитальное поле; 7 — нога IV-4-6; 8 — коготок ног; 9 — *Lebertia porosa*, генитальное поле. Шкалы: 6, 9 = 100 μ m; 7 = 200 μ m; 8 = 50 μ m

Measurements (n = 1). Idiosoma L 1250; coxal shield L 875, W 1060; coxal plate I mL 235, coxal plate II mL 125, posterior margin of coxal plates II W 80; capitular bay L 275, W 135; genital bay 250, W 310; genital flap L 275, W 125, genital acetabula (ac-1–3) L 55, 55–60, 55; pedipalp segments (P-1–5) L: 42, 155, 120, 180, 45, P-4 medio-distal peg-like seta L 14–15; leg segments L: I-Leg-1–6: 100, 125, 160, 225, 225, 185; II-Leg-1–6: 100, 160, 185, 285, 310, 260; III-Leg-1–6: 110, 185, 250, 375, 410, 335; IV-Leg-1–6: 225, 225, 285, 435, 460, 375.

Male. Unknown.

Differential diagnosis. The new species is similar to *Lebertia porosa* Thor, 1900 and *L. chaunensis* Tuzovskij, 2011. The adults of *L. porosa* are characterised by the following features: anterior two pairs of acetabula subequal in the shape and size and distinctly larger than the posterior pair; all acetabula located close to each other on each side (Fig. 9). In contrast, in the female *L. makarovae* all acetabula small, subequal in the shape and size and distinctly separated on each side, Fig. 6. *Lebertia chaunensis* differs in the integument with ribbed sculpture, setae *Fch* with a short proximal furca (Tuzovskij 2011).

Etymology. The species is named after the collector, Dr. Olga Makarova.

Habitat. Lakes.

Distribution. Europe, Russia: Arkhangelsk Region.

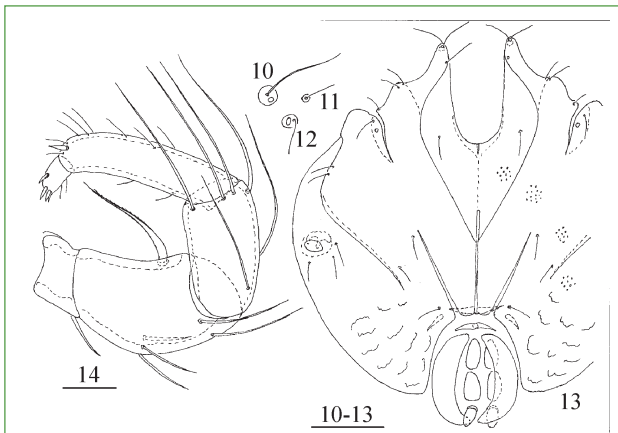
***Lebertia (Mixolebertia) prokini* sp. n.**

(Figs. 10–18)

<http://zoobank.org/References/7D957D63-A03B-41E1-A567-5CEB2AACA492>

Material examined. Holotype: male, slide 9945, Asia, Russia, Chukotka, Anadyr District, Elgygytgyn Lake, littoral zone, 67.489177 N, 172.087.142 E, bottom: stones, gravel, 6.08.2020, leg. A. Prokin.

Diagnosis. Integument finely striated, coxal shield slightly wider than long, ml of coxal plates I longer than suture line between coxal plates II, coxal shield embracing the genital field to about 3/4; genital field with three pairs of relatively large unequal acetabula; P-2 ventral seta and ventral margin of segment subequal in length,



Figs. 10–14. *Lebertia prokini* sp. n., male: 10 — seta *Fch*; 11 — seta *Oi*; 12 — seta *Oe*; 13 — ventral view; 14 — pedipalp, lateral view. Scale bars: 10–13 = 100 µm; 14 = 50 µm

Рис. 10–14. *Lebertia prokini* sp. n., самец: 10 — щетинка *Fch*; 11 — щетинка *Oi*; 12 — щетинка *Oe*; 13 — ventральная сторона; 14 — педипальпа, боковая сторона. Шкалы: 10–13 = 100 µm; 14 = 50 µm

P-3 with two mediiodistal setae located close to dorsodistal seta, P-4 ventral sectors 1:1:2, mediiodistal peg-like seta comparatively large; IV-Leg-6 with five to six short, thick ventral setae.

Description. Male. Integument finely striated. Setae *Fch* (Fig. 10) long, trichobothria *Fp*, *Oi* and setae *Pi* not associated with glandularia (Fig. 11) and other idiosomal setae short and thin (Fig. 12). Coxal shield (Fig. 13) wider than long (L/W ratio 0.85), ml of coxal plates I slightly longer than suture line between coxal plates II (ml Cx-I/Cx-2 ratio 1.05). Coxal plates I fused to each other nearly completely, fragment of suture line present only in their posterior portion. Capitular bay deep U-shaped, genital bay comparatively short and a little wider than long. Posterior margin of coxal plates II rather broad. Coxal shield embracing the genital field to about 3/4 with rounded posteromedial corners.

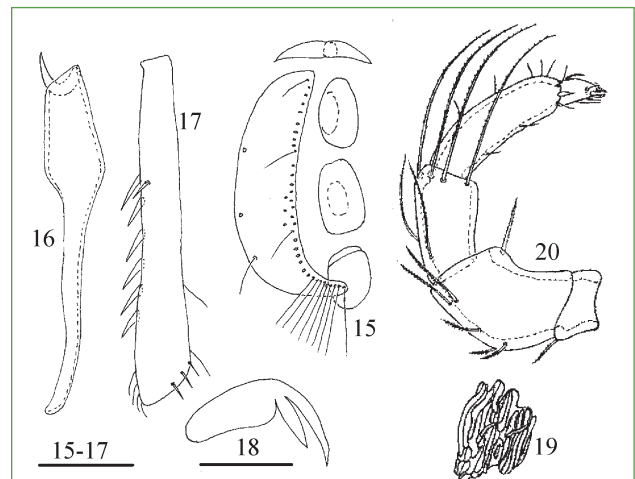
Pedipalp moderately long (Fig. 14): P-1 short, with single dorsodistal setae; P-2 with three dorsoproximal and two long subequal dorsodistal setae, ventral margin slightly concave, ventrodistal seta long, thickened basally, inserted away from ventrodistal segment edge; P-3 with four distal setae, two mediiodistal setae located close to dorsodistal seta, P-4 ventral sectors 1:1:2, mediiodistal peg-like seta

comparatively large, two to three fine dorsal setae located near middle of segment.

Genital field (Fig. 15) with three pairs of rather large unequal acetabula, first two pairs large than posterior one; flaps with 35–40 medial and three lateral fine setae each; pre-genital sclerite without posterior projection. Basal segment of chelicera slender, thickened distally, chela small, sickle-shaped (Fig. 16). Excretory pore unsclerotised.

Legs without swimming setae. IV-Leg-6 with six short, thick ventral setae (Fig. 17). Leg claws with short internal and comparatively long external clawlets, lamella moderately developed with straight ventral margin (Fig. 18).

Measurements (n = 1). Idiosoma L 1100 coxal shield L 850, W 875; coxal plate I mL 225, coxal plate II mL 215, posterior margin of coxal plate II W 85; capitular bay L 250; genital bay 160; genital flap L 235, W 125, genital acetabula (ac-1–3) L 65–75, 70–72, 50–55; pedipalp segments (P-1–5) L: 55, 150, 130, 165, 50, P-4 medio-distal peg-like seta L 16–19; leg segments L: I-Leg-1–6: 100, 135, 160, 210, 250, 185; II-Leg-1–6: 100, 150, 175, 250, 310, 275; III-Leg-1–6: 125, 160, 185, 310, 375, 310; IV-Leg-1–6: 225, 200, 300, 410, 425, 350.



Figs. 15–18. *Lebertia prokini* sp. n., male: 15 — genital field, right side; 16 — chelicera; 17 — IV-Leg-6; 18 — leg claw. *Lebertia porosa*, male: 19 — fragment of integument; 20 — pedipalp. Scale bars: 15–17 = 100 µm, 18 = 50 µm

Рис. 15–18. *Lebertia prokini* sp. n., самец: 15 — генитальное поле, правая сторона; 16 — хелицера; 17 — лапка ноги IV; 18 — коготок ног. *Lebertia porosa*, самец: 19 — фрагмент покрова; 20 — педипальпа. Шкалы: 15–17 = 100 µm, 18 = 50 µm

Female. Unknown.

Differential diagnosis. The present species is similar to *Lebertia mamolinensis* Tuzovskij, 1982 in the structure of the pedipalps. The adults of *L. mamolinensis* are characterised by the following features: the integument with irregular rugose sculpturing, Fig. 19; coxal shield embracing the genital field to about 2/3; P-2 ventrodiscal seta shorter than ventral margin of segment, P-4 ventral sectors 1:1:1, Fig. 20; IV-Leg-6 with two to three short, thick ventral setae (Tuzovskij 1982). In contrast, in male *L. prokini* **sp. n.** the integument smooth; coxal shield embracing the genital field to about ¾, Fig. 13; P-2 ventrodiscal seta longer than ventral

margin of segment, P-4 ventral sectors 1:1:2, Fig. 14; IV-Leg-6 with five to six short, thick ventral setae (Fig. 17).

Etymology. The species is named after the collector, Dr. Alexandr Prokin.

Habitat. Lakes.

Distribution. Asia, Russia: Chukotka.

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