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On the systematic of the water mite *Feltria ishkariensis* Imamura (Acari, Hydrachnidia, Feltriidae)

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Abstract. First illustrated description of male and redescription of female of the water mite *Feltria ishkariensis* Imamura, 1954 from running waters of Primorye Territory of Russia is given. Dorsum of male with large shield and two narrow posterior platelets. Dorsal shield bearing four pairs of setae, posterior plates with one glandularia each. Coxal plates in four groups. The genital field with deep posteromedian indentation, 40–50 pairs of acetabula and four pairs fine medial setae. III-Leg-6 with short ventrodiscal projection bearing four to five slender setae. Excretory pore in posteroventral position.

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Keywords: Acari, Feltriidae, *Feltria ishkariensis*, male, female, morphology, running waters, Primorye territory

К систематике водяного клеща *Feltria ishkariensis* Imamura (Acari, Hydrachnidia, Feltriidae)

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Аннотация. Первое иллюстрированное описание самца и переписание самки водяного клеща *Feltria ishkariensis* Imamura, 1954 из проточных вод Приморского края России. Дорсум самца с крупным щитом и двумя узкими задними пластинками. Дорсальный щит несет 4 пары щетинок, задние пластинки с одной щетинкой каждая. Коксальные пластинки в четыре группы. Генитальное поле с глубокой заднемедиальной выемкой, 40–50 парами присосок и четырьмя парами тонких медиальных щетинок. Лапка ноги III с коротким вентродистальным отростком, несущим 4–5 стройных щетинок. Экскреторная пора в заднецентральной позиции.

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Ключевые слова: клещи, Feltriidae, *Feltria ishkariensis*, самец, самка, морфология, проточные воды, Приморский край

Introduction

The species was described by Imamura (1954) on basis of five females collected in running waters of Japan. However, the description of female is short, which makes difficult identification of the species. The aim of this paper is to study the morphology, first description of male and redescription of female *F. ishikariensis* collected by T. S. Vshivkova in running waters of the Ussurijsky State Nature Reserve in the Primorye Territory of Russia. The material was sampled with a common hand net with 250 µm mesh side and fixed in 75% ethanol.

Idiosomal setae are named according to Tuzovskij (1987): *Fch* — frontales chelicera-rum, *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. Setae *Fp* and *Oi* are trichobothria and not associated with glandularia, setae *Pi* are simple and they are also not associated with glandularia.

Furthermore, the following abbreviations are used: P-1–5 = pedipalp segments (trochanter, femur, genu, tibia and tarsus); I-Leg-1–5 = first leg, segments 1–5 (trochanter, femur, genu, tibia and tarsus), i.e., III-Leg-3 = genu of third leg; H — height; L — length; n — number of specimens measured; W — width. All measurements are given in micrometers (µm); length of appendage segments is given as dorsal length.

Systematics

Family **Feltriidae** K. Viets, 1926

Genus *Feltria* Koenike, 1882

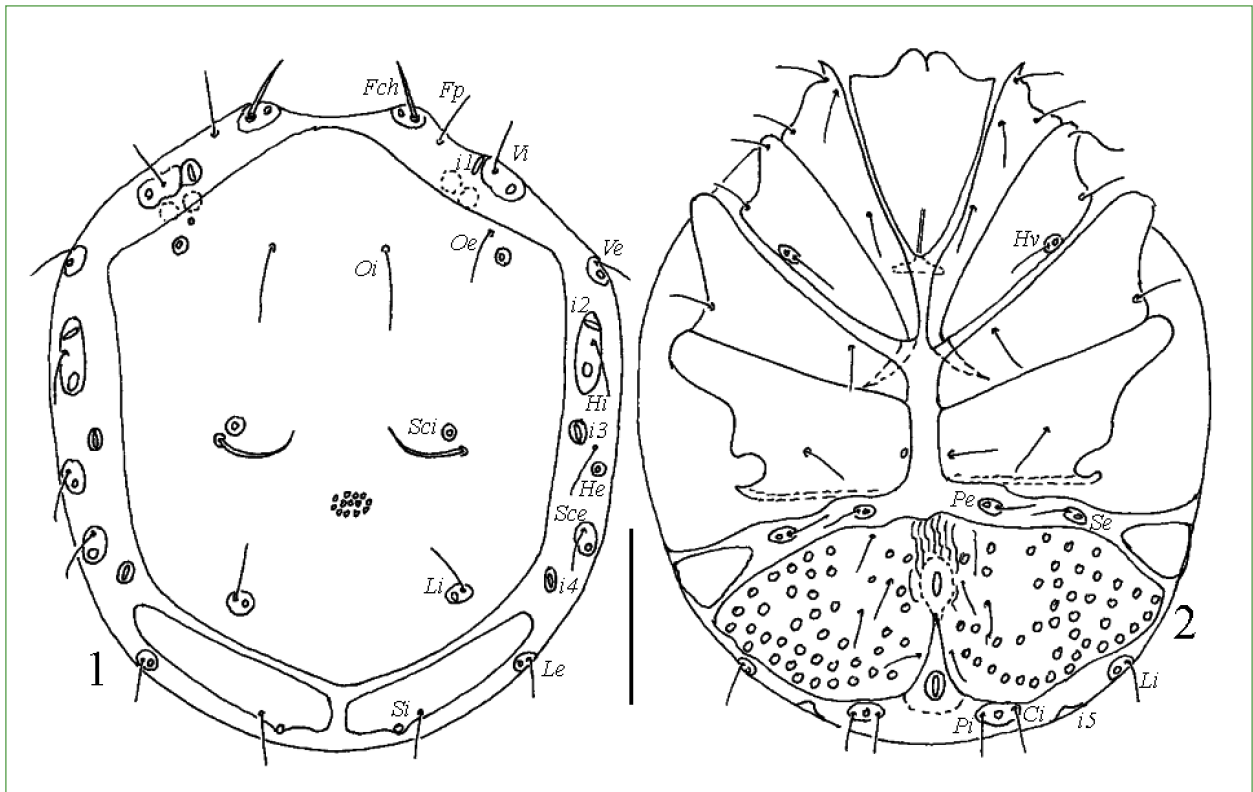
Feltria (Feltria) ishikariensis Imamura, 1954
(Figs. 1–8)

Material examined. Asia, Russia, Primorye Territory, Ussurijsky State Nature

Reserve, 1 male 17.07.1983, 2 females 27.11.1983, 2 females 20.09.1984, 1 female 30.07.1986, Komarovka stream, depth 40–50 cm, substrates: stones, gravel, sand, leg. T. S. Vshivkova.

Description. Male. Idiosoma flat and almost circular (L/W ratio 1.08), all frontal setae (*Fch*, *Fp*, *Vi*, *Ve*) located on separate sclerites (Fig. 1). Dorsum with a large shield and one pair of narrow posterior plates. Dorsal shield broad (L/W ratio 1.17), occupying almost all dorsal idiosoma surface, and bearing four pairs of setae: *Oi*, *Oe*, *Sci* and *Li*, *Sci* thicker than other setae. Setae *Hi*, *He*, *Sce* and *Le* located on soft integument along dorsolateral portions of dorsum. Posterodorsal pair of plates narrow (L/W ratio 3.4), bearing seta and glandularium *Si* on each side. First pairs of slit organs free or fused with sclerite bearing seta and glandularium *Vi* on each side; second pair of slit organs fused with glandularia *Hi*, other slit organs (*i3–i5*) lying free on soft integument along lateral portions of idiosoma.

Leg coxae incorporated into four groups, close to each other, and occupy more than half of the idiosoma ventral surface (Fig. 2). Anterior coxal groups with moderately developed posterior apodemes, seta and glandularium *Hv* situated laterally on posterior margin of coxal plate II on each side. Coxal plates IV subrectangular, posterior margin perpendicular to longitudinal axis. Medial margins of coxal plates III/IV straight, medial margin of Cx-IV longer than medial margins of Cx-III. Genital plate large transverse, anterior margin convex and slightly undulating, posteromedial margin deeply indented, close to coxal field, leaving a narrow membranous interspace containing the paired glandularia (*Se*, *Pe*) and ventrolateral platelets; gonopore small and narrow, slightly shifted anteriorly; 40–50 pairs of subequal acetabula scattered over the whole plate, and four pairs of thin medial setae. Seta *Pi* fused with glandularia *Ci*, located close to genital plates posterior margin on each side. Excretory pore in posteroventral position and fused with genital field posterior margin. Capitulum with short anchoral process.



Figs. 1–2. *Feltria ishikariensis*, male: 1 — idiosoma, dorsal view; 2 — idiosoma, ventral view. Scale bar: 100 μ m

Рис. 1–2. *Feltria ishikariensis*, самец: 1 — идиосома, дорсальная сторона; 2 — идиосома, вентральная сторона. Шкала: 100 μ m

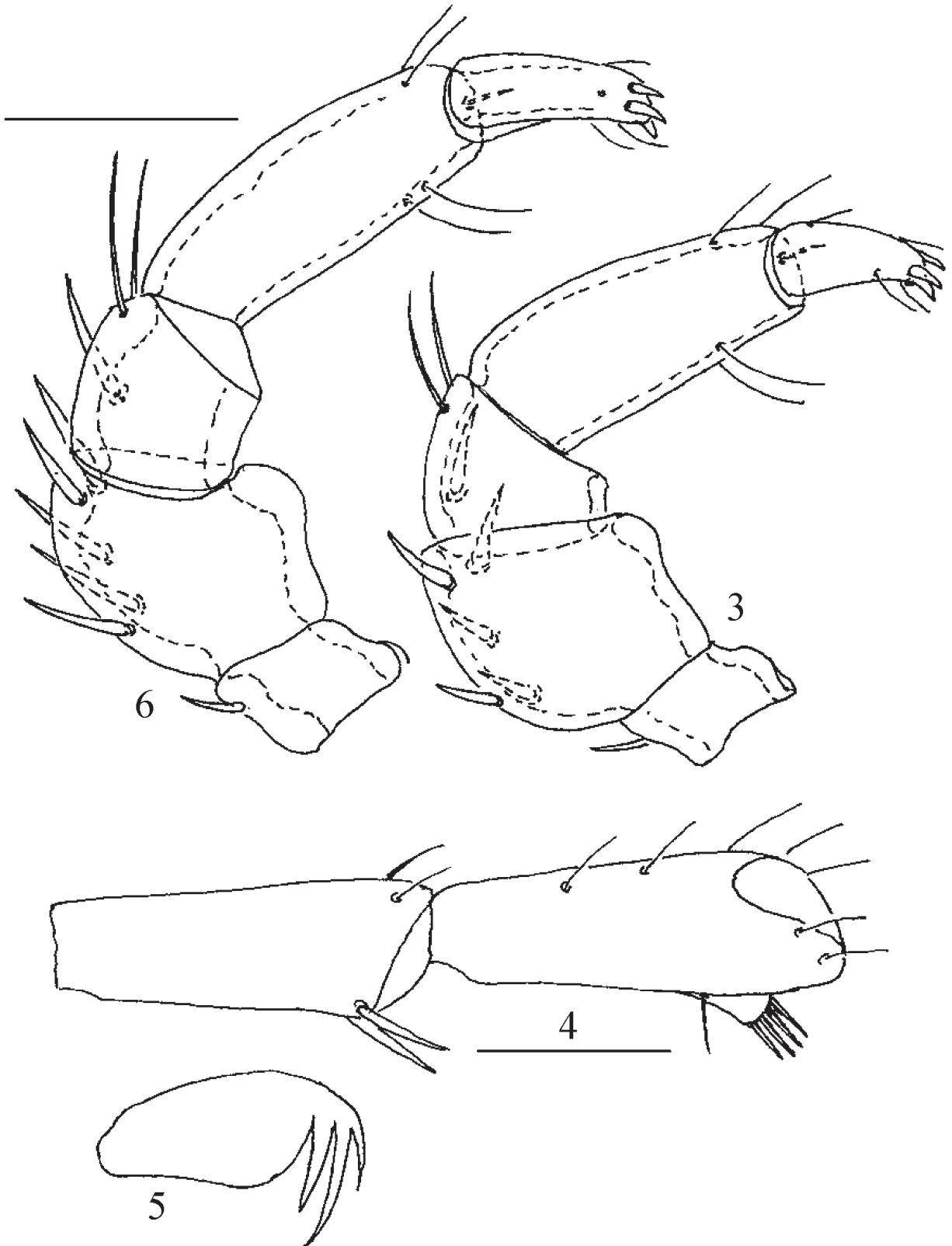
Shape and chaetotaxy of pedipalp as in (Fig. 3): P-1 short, with single dorsodistal seta; P-2 expanded (L/H ratio 1.09), with slightly concave ventral margin, two proximal and three thick subequal dorsodistal setae; P-3 short (L/H ratio 0.82), with single short, thick proximal seta and two thin dorsodistal setae; P-4 slightly tapering distally, with straight ventral margin (L/H ratio 2.72), longer than P-2 (P-2/P-4 ratio 0.9), with two unequal distoventral setae, two thin dorsal ones, medio-distal seta thin and short; P-5 a little shorter than P-3, with three pointed distal spines.

III-Leg-6 with short ventrodistal projection directed to distal part of segment, bearing four to five slender pointed setae (Fig. 4). First four segments of all legs with mainly thick setae, terminal segments (especially tarsi) with several thin setae. Leg claws with three pointed clawlets: median clawlet largest, internal clawlet thicker and longer than external one (Fig. 5).

Measurements (n = 1). Idiosoma L 325, W 300; dorsal shield L 288, W 245; capitulum L 108; pedipalp segments (P-1–5) L/H: 19/25,

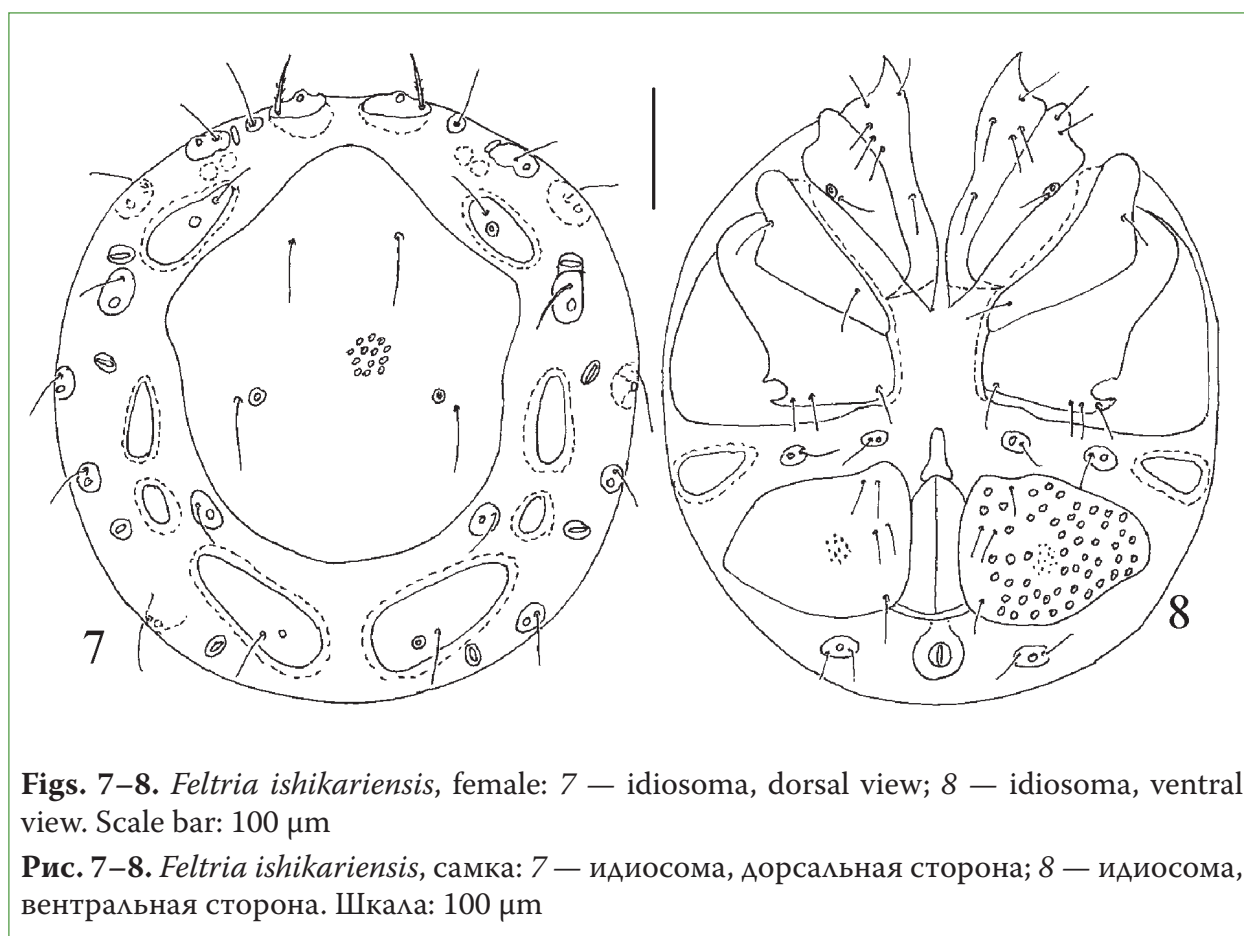
58/48, 35/36, 70/32, 32/15; leg segments L: I-Leg-1–6: 35, 40, 38, 50, 58, 60; II-Leg-1–6: 35, 38, 38, 56, 67, 74; III-Leg-1–6: 48, 40, 45, 67, 75, 83; IV-Leg-1–6: 70, 45, 48, 70, 83, 93.

Female. Idiosoma flat and nearly circular (L/W ratio 1.03–1.05), frontal setae (*Fch*, *Fp*, *Vi*, *Ve*) located on separate platelets (Fig. 7). Dorsum with large shield and four pairs of unequal lateral plates. Dorsal shield broad (L/W ratio 1.08–1.15), anteriorly narrowed, distally widely rounded, bearing two pairs of pairs of setae (*Oi*, *Sci*). Setae *He*, *Sce* and *Le* located on soft integument along lateral portions of dorsum. Posterior pair of plates largest (L/W 2.5–3.3), bearing seta and glandularium *Si* in medial half, anterior pair plates bearing seta and glandularium *Oe* on each side. First pair of slit organs located close to glandularia *Vi*, second pair of slit organs free or fused with glandularia *Hi*, *i3–i5* lying free on soft integument along lateral portions of dorsum. Capitulum with short anchoral process. Pedipalps, especially P-4, more slender than in male (Fig. 6). III-Leg-6 without modified setae.



Figs. 3–6. *Feltria ishikariensis*: 3, 6 — pedipalp; 4 — III-Leg-5-6; 5 — leg claw; 3–5 — male; 6 — female. Scale bar: 50 μ m

Рис. 3–6. *Feltria ishikariensis*: 3, 6 — педипальпа; 4 — колено, голень и лапка ноги III; 5 — коготок ног; 3–5 — самец; 6 — самка. Шкалы: 50 μ m



Figs. 7–8. *Feltria ishikariensis*, female: 7 — idiosoma, dorsal view; 8 — idiosoma, ventral view. Scale bar: 100 μ m

Рис. 7–8. *Feltria ishikariensis*, самка: 7 — идиосома, дорсальная сторона; 8 — идиосома, вентральная сторона. Шкала: 100 μ m

Leg coxae incorporated into four groups and covering about half of ventral surface (Fig. 8). Anterior coxal groups with short posterior apodemes directed laterally. Coxal plate IV with slightly convex medial margin which is much longer than coxal plate III medial margin. Acetabular plates wider than long, with straight or weakly convex medial margin, 40–50 genital acetabula and four to six thin setae on each side, gonopore usually surrounded by frame. Pregenital sclerite small, fused to anterior genital sclerite. Setae *Pi* fused with glandularia *Ci* and placed on common sclerite on each side. Excretory pore surrounded by sclerotised ring contiguous or fused with posterior margin genital frame. Ventrolateral plates relatively large triangular and lying free between posterolateral extensions of fourth coxae and acetabular plates.

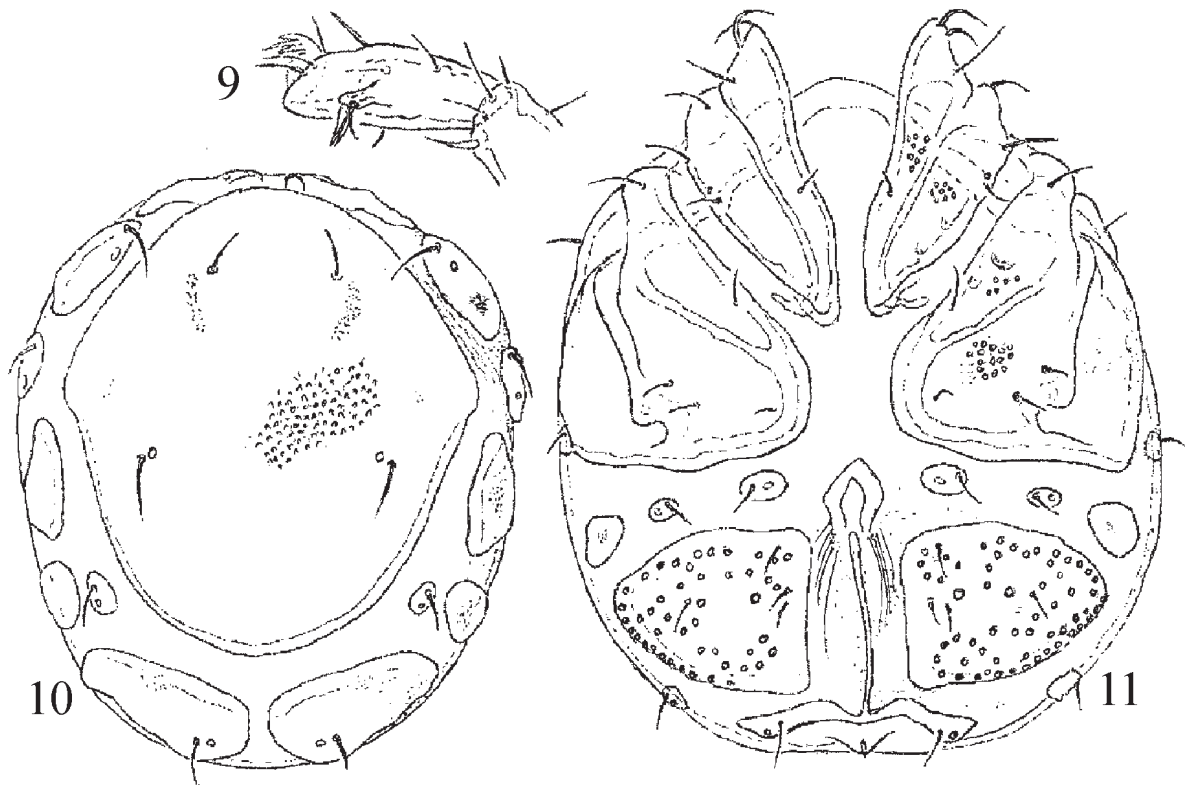
Measurements (n = 5). Idiosoma L 450–470, W 435–450; dorsal shield L 280–310, W 220–275; capitulum L 95–110; cheliceral segments: base L 75–80, chela L 23–25; pedipalp segments (P-1–5) L/H: 18–24, 42–50, 30–36, 60–69, 33–35; leg segments L: I-Leg-1–6:

35–37, 35–42, 35–42, 54–60, 54–66, 60–72; II-Leg-1–6: 35–42, 35–42, 38–48, 48–60, 57–69, 70–78; III-Leg-1–6: 40–45, 35–45, 45–48, 60–67, 65–85, 70–90; IV-Leg-1–6: 65–75, 48–52, 50–58, 75–85, 75–95, 85–95.

Remarks. The present species is closely related to *F. minuta* Koenike, 1892. Differences between *F. ishikariensis* and *F. minuta* are found in the following characters (character states of *F. minuta* are given in parentheses, data from Gerecke 2009 and Gerecke et al. 2016): **Male:** The genital field with 40–50 pairs of acetabula (with 65–82 pairs of acetabula); III-Leg-6 with short stout projection bearing four to five slender setae, Fig. 4 (with finger-shaped projection bearing two to three setae, Fig. 9); **Female:** The dorsal shield anteriorly narrowed, Fig. 7 (widely rounded, Fig. 10), the genital field with 40–50 pairs of acetabula (with 62–110 pairs of acetabula); the excretory pore plate relatively small in posteroventral position, Fig. 8 (large in terminal position, Fig. 11).

Habitat. Running waters.

Distribution. Asia, Japan, Russia: Primorye territory.



Figs. 9–11. *Feltria minuta*: 9 — III-Leg-6; 10 — idiosoma, dorsal view; 11 — idiosoma, ventral view; 9 — male; 10–11 — female (after Gerecke et al. 2009)

Рис. 9–11. *Feltria minuta*: 9 — лапка ноги III; 10 — идиосома, дорсальная сторона; 11 — идиосома; вентральная сторона; 9 — самец; 10–11 — самка (по Гереке и др. 2009)

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