Lithobius (Monotarsobius) femoratus sp.n., a new centipede species from China (Chilopoda: Lithobiomorpha: Lithobiidae)

Lithobius (Monotarsobius) femoratus sp.n., новый вид губоногих многоножек из Китая (Chilopoda: Lithobiomorpha: Lithobiidae)

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KEY WORDS: Myriapoda, taxonomy, new species, eastern China.

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Introduction

Verhoeff [1905] originally proposed Monotarsobius Verhoeff, 1905 as a subgenus of Lithobius Leach, 1814 in the family Lithobiidae. It presently accommo-
shui, China (HUSLS), with a few paratypes to be shared with the collection of the Zoological Museum, State University of Moscow (ZMUM), Russia, as indicated below. The terminology of the external anatomy follows Bonato et al. [2010]. Measurements are shown in millimetres (mm). The following abbreviations are used in the text and Table: a — anterior, C — coxa, F — femur, m — median, P — prefemur, p — posterior, S, SS — sternite, sternites, T, TT — tergite, tergites, Ti — tibia, Tr — trochanter.

**Taxonomy**

**Family Lithobiidae** Newport, 1844

**Genus Lithobius** Leach, 1814

**Subgenus Monotarsobius** Chamberlin, 1919

*Monotarsobius* (*Monotarsobius*) femoratus sp.n.

Figs 1A–E, 2F–K, Table.

**TYPE MATERIAL:** HOLOTYPE ♀ (Lmon01-1) (Fig. 1A), China, Hebei Province, Shijiazhuang City, Pingxiang County, Xishui Park, 38.093677 S, 114.38752 E, 136 m a.s.l., 28 May 2017, S. Pei, H. Ma leg. PARATYPES: 24 ♀, 3 ♀ (Lmon01-1), 2 ♀, 2 ♀ (ZMUM), same data as holotype.

**OTHER MATERIAL:** 4 ♀, 10 ♂(Lmon01-2), same place, 3 May 2019, S. Pei, H. Ma leg.

**DIAGNOSIS.** In accordance with the grouping of species proposed for the subgenus *Monotarsobius* [Zapparoli, Edgecombe, 2011], the new species differs from other congeners in having the antennae composed of 19–21, commonly 20+20 articles, ocelli 6–7, usually 6 on each side, arranged in three irregular rows, with the posterior ocellus the largest, the Tömösvéry’s organ larger than the adjacent ocelli; commonly 2+2 coxosternal teeth, porodonts lying posterolaterally to the lateralmost tooth; coxal pore formula 3–5, arranged in one row; legs 14 and 15 thicker than the anterior pairs in both sexes, with two longitudinal grooves on the dorsal and a central longitudinal groove on the ventral side of the femur of ♀ legs 15. ♀ gonopods with 3+3 moderately small coniform spurs, apical claw of the third article simple, with a larger subtriangular denticle on the ventral side.

**ETYMOLOGY.** To emphasise that the dorsal side of the femur of ♀ legs 15 is white in live, translucent in 75% ethanol.

**DESCRIPTION.** Holotype 10.9 mm long, cephalic plate: 1.2 mm long, 1.2 mm wide. Body: 9.2–12.5 mm long, cephalic plate 1.16–1.34 mm long, 1.16–1.23 mm wide.

Coloration: Antennae grey-brown to brown, distal articles with yellowish hue; tergites grey-brown with yellowish hue; cephalic plate heavily brown to yellow-brown with blackish hue; pleural region pale grey with purplish hue; sternites pale brown with greyish hue; distal part of forcipules darker yellow-brown, with basal and proximal parts of forcipules and forcipular coxosternite, and SS 14 and 15 yellow-brown with blackish hue; especially, dorsal side of femur of ♀ legs 15 white in live, but translucent in 75% ethanol; all legs pale grey, tarsi yellow-brown, tarsi-II darker in all legs.

Antennae with 19–21 articles, commonly 20+20 (Fig. 1A). Antennal article I slightly longer than width at base, remaining articles significantly longer than wide; from article II on, each article gradually shortened, distalmost articles still being significantly, 2.3–3.0 times as long as wide; abundant setae on antennal surface, less so in basal articles, gradually and increasingly setose to approximately article V, then more or less constant.

Fig. 1A–E. *Lithobius* (*Monotarsobius*) femoratus sp.n., ♀ holotype. A — habitus, dorsal view; B — ocelli and Tomosvary’s organ (To), lateral view; C — cephalic plate, dorsal view; D cephalic plate, ventral view; E — forcipular coxosternite, ventral view.

Cephalic plate smooth, convex, equal to or slightly longer than wide; tiny setae emerging from pores scattered very sparsely over the whole surface; frontal marginal ridge with a shallow anterolateral furrow; short to long setae very sparsely scattered along marginal ridge of cephalic plate; lateral marginal ridge discontinuous, posterior margin continuous, straight, slightly wider than lateral marginal ridge (Fig. 1C).

Ocelli six to seven, commonly six oval ocelli on each side, from small to large, arranged in three irregular rows, posterior ocellus the largest. Ventral ocelli smaller than dorsal ones, domed, translucent and usually dark (Fig. 1B).

Tömösvéry’s organ located close to ocelli at anterolateral margin of cephalic plate, surrounding sclerotised area always narrow, slightly larger than adjoining ocelli (Fig. 1B, To).

Coxosternite subtrapezoidal (Fig. 1D), anterior margin narrow, lateral margins slightly longer than medial margins; median diastema moderately deep, U-shaped; anterior margin with 2+2 acute triangular teeth; porodonts feebly thick, posterolateral, separated from lateral tooth, lying posterolaterally to lateralmost tooth, with a marked bulge at base (Fig. 1D, E); long setae scattered on ventral side of coxosternite, longer setae near dental margin.

All tergites smooth, without wrinkles, dorsum slightly convex; tiny setae emerging from pores scattered sparsely over entire surface; T1 narrower posterolaterally than anterolaterally, generally inverted trapezoidal; cephalic plate and T1 obviously narrower than T 3, cephalic plate slightly wider than T 1. Lateral marginal ridges of all tergites continuous. Posterior margin of TT 1, 3 and 5 continuous, posterior margin of TT 10, 12 and 14 discontinuous. Posterior marginal ridges of TT 1, 3 and 5 feebly concave, posterior marginal ridges of TT 8, 10, 12 and 14 moderately concave. Posterior angles of tergites rounded, without triangular projections. Short to long miniscule setae scattered sparsely over surface.

Sternites: Posterior side of sternites narrower than anterior one, generally inverted trapezoidal, smooth; setae emerging from very sparsely scattered pores on surface and at
Lithobius femoratus sp.n., a new centipede from China

499

Fig. 2F–K. Lithobius (Monotarsobius) femoratus sp.n., ♀ paratype (F–H), ♂ holotype (I–K). F — posterior segments and gonopods, ventral view; G, H — apical claw of gonopods, ventral and dorsal views, respectively; H–I — posterior segments and gonopods, ventral view J, K — femur of legs 15, dorsal and ventral views, respectively.

Рис. 2F–К. Lithobius (Monotarsobius) femoratus sp.n., паратип ♀ (F–H), голотип ♂ (I–K). F — задние сегменты и гоноподы, снизу; G, H — вершинный коготь гоноподов, соответственно снизу и сверху; H–I — задние сегменты и гоноподы, снизу; J, K — бедро ног 15, соответственно сверху и снизу.

lateral margin. Middle part of each sternite with a very shallow depression. One pair of approximately symmetrical-ly arranged long setae in middle part of anterior portion, and 2–3 long setae in anterior and posterior parts of each sternite.

Legs: Relatively robust, tarsi ill-defined on all legs, tar-sal articulations on dorsal side indistinct, being visible only as a shallow ventral suture; well-defined on legs 14 and 15. From short to long setae sparsely scattered over surface of coxa, trochanter, prefemur, femur, and tibia of all legs, more setae on tarsal surface; setae on dorsal and ventral surfaces slightly longer; some notably thickened setae arranged in one row on ventral surface of tarsi 1–13, no setae arranged in one row on ventral surface of tarsi 14 and 15. All legs with moderately long and curved claws; legs 1–13 with anterior and posterior accessory spurs, anterior accessory spurs moderately long and slender, forming a moderately small angle to claw; posterior accessory spurs slightly more robust, forming a comparatively large angle to claw, only posterior accessory spurs present in legs 14 and 15. Legs 14 and 15 thicker than anterior pairs in both sexes, ♂ legs 15 thicker and stronger than ♀ ones. Femur 2.2–2.4 or 1.8–2.0 times longer than width in ♀ and ♂, respectively. Tarsus-II,
Table. Leg plectrotaxy of Lithobius (Monotarsobius) femoratus sp.n.

<table>
<thead>
<tr>
<th>Legs</th>
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NB: Letters in brackets indicate variable spines.

3.6–4.9 times longer than width; tarsus-II, 71.7%–94.7% or 69.7–87.2% length of tarsus-I of legs 15 in and \( \sigma \), respectively; tarsus-II, 4.0–4.5 times longer than width. Leg plectrotaxy as in Table.

Coxal pores: Round, 3–5 in a row, 3-4-4-4 in smaller and 4-5-5-5 in larger \( \varphi \), 3-4-4-3(3) in \( \sigma \); commonly round, coxal pore field set inside a relatively shallow groove, coxal pore-field fringe with a slight prominence and moderately long setae sparsely scattered over surface.

\( \varphi \): S 15 anterior margin broader than posterior one, posterior angles generally rounded, posterior marginal ridges straight. Moderately long setae sparsely scattered on S 15 surface. Surface of lateral sternal margin of genital segment well-chitinised, posterior margin of genital sternite deeply concave between condyles of gonopods, except for a small, median, rhomboid bulge. Short to long setae very sparsely scattered over ventral surface of genital segment, slightly more setae in posterior part, especially at posterior edge. Gonopods: first article fairly broad, bearing 20–22 moderately long setae arranged in three irregular rows; with 3+3 moderately small coniform spurs, inner spur slightly smaller than outer one (Fig. 2F); second article with 3–5 long setae in ventral part, arranged in two irregular rows; third article with 3–5 long setae in ventral part, arranged in two irregular rows, with a simple apical claw with a larger subtriangular denticle in ventral part (Fig. 2G, H).

\( \sigma \): S 15 posterior margin narrower than anterior one, straight postero-medially, generally inverted trapezoidal, covered with sparse long setae; sternite of genital segment evidently smaller than in \( \varphi \), usually sclerotised; posterior margin deeply concave between gonopods, without medial bulge. Short to long setae equably scattered over ventral surface of genital segment. Gonopods: first article simple, with a larger subtriangular denticle on the distal end, apical claw of the third article simple, with a larger subtriangular denticle on the ventral side. However, they can easily be distinguished by the following characters: the new species has two longitudinal grooves on the dorsal side and one longitudinal groove on the ventral side of the femur of \( \sigma \) legs 15, vs. no other special features except that the dorsal side is slightly flat in \( L. (M.) \) fugax; DaC spine on legs 14 and 15, vs. DaC spine on legs 13, 14 and 15 in \( L. (M.) \) fugax; the dorsal plectrotaxy is 121 in legs 2, 10300 in legs 15, vs. 222 in legs 2, 10310 in legs 15 in \( L. (M.) \) fugax; Tomösváry’s organ larger than the adjacent ocelli. vs. smaller than the adjacent ocelli in \( L. (M.) \) fugax.

HABITAT. Under the leaf litter of a mixed pine and poplar forest.

COMMENTS. Morphologically, the new species seems to be extremely close to Lithobius (Monotarsobius) fugax Stuxberg, 1876 [Stuxberg, 1876; Loksa, 1965; Zaleskajaja, 1978] from Siberia and Mongolia, with which it shares the antennae with 19–21 articles, and 6–7 ocelli on each side, the posterior ocellus being the largest, 2+2 prosternal teeth, and the coxal pore formula as 3–5, \( \varphi \) gonopods with 3+3 moderately small coniform spurs, apical claw of the third article simple, with a larger subtriangular denticle on the ventral side. However, they can easily be distinguished by the following characters: the new species has two longitudinal grooves on the dorsal side and one longitudinal groove on the ventral side of the femur of \( \sigma \) legs 15, vs. no other special features except that the dorsal side is slightly flat in \( L. (M.) \) fugax; DaC spine on legs 14 and 15, vs. DaC spine on legs 13, 14 and 15 in \( L. (M.) \) fugax; the dorsal plectrotaxy is 121 in legs 2, 10300 in legs 15, vs. 222 in legs 2, 10310 in legs 15 in \( L. (M.) \) fugax; Tomösváry’s organ larger than the adjacent ocelli. vs. smaller than the adjacent ocelli in \( L. (M.) \) fugax.

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