Arthropoda Selecta 11 (4): 265–269

On two remarkable species of lithobiid centipedes (Chilopoda: Lithobiomorpha: Lithobiidae) from the steppe of the southern Urals, Russia

О двух интересных видах многоножек-костянок (Chilopoda: Lithobiomorpha: Lithobiidae) из степей Южного Урала (Россия)

G. Sh. Farzalieva*, N. T. Zalesskaja**
Г. Ш. Фарзалиева*, Н. Т. Залесская**

Department of Invertebrate Zoology, Perm State University, Bukireva Str. 15, Perm 614600 Russia. * E–mail:fgsh@psu.ru
Кафедра зоологии беспозвоночных и водной экологии, Пермский государственный университет, ул. Букирева 15, Пермь 614600 Россия.
** Institute for Problems of Ecology and Evolution, Russian Academy of Sciences, Leninsky prospekt 33, Moscow 117071 Russia. E–mail: zoosoil@orc.ru
Институт проблем экологии и эволюции РАН, Ленинский просп., 33, Москва 117071 Россия.

KEY WORDS: Lithobiidae, taxonomy, new species, steppe, limestone, southern Urals, Russia.
КЛЮЧЕВЫЕ СЛОВА: Lithobiidae, систематика, новый вид, степь, известняки, Южный Урал, Россия.

ABSTRACT: A new centipede species, *Monotarsobius steppicus* sp.n., is described, and *Lithobius loricatus* Sseliwanoff, 1881 redescribed, based on material of both sexes taken from steppe–clad limestone denudations in the southern Urals. The female of the latter species is described for the first time.

РЕЗЮМЕ: По материалам обоих полов, собранных на поросших степной растительностью известняковых обнажениях на Южном Урале, описан новый вид *Monotarsobius steppicus* sp.n. и переописан *Lithobius loricatus* Sseliwanoff, 1881. Впервые описана самка последнего вида.

Introduction

The centipede fauna of the Ural Mountains and adjacent parts is still poorly known. This holds true even as regards the Lithobiomorpha, a high–rank myriapod group enjoying a monographic treatment in the scope of the entire ex–USSR fauna [Zalesskaja, 1978]. Indeed, no centipedes have hitherto been documented from the steppe regions of the Urals, with nearly all previous records coming from woodland or man–made environments.

The present paper puts on record the small lithobiomorph material taken recently in the steppe of the southern Urals, Russia. This particular steppe-clad region is remarkable due to sporadic limestone denudations, a highly specific habitat in itself, too. Two species have been revealed, one apparently rare, *Lithobius loricatus* Sseliwanoff, 1881, the other one a new *Monotarsobius*. *L. loricatus* has heretofore remained known but from the original description [Sseliwanoff, 1881] of a single male stemming from between Semipalatinsk and Ayaguz, present-day Kazakhstan. The opportunity is taken now to properly document both sexes of this species which appears formally new to the Russian list. In addition, *Monotarsobius steppicus* sp.n. is also described based on both male and female samples.

Type material of the new species and the allotype of *L. loricatus* are deposited in the collections of the Zoological Museum of Moscow State University (ZMUM) and Perm State University (PSU). The holotype of *L. loricatus*, re-examined, is in the collection of the Zoological Institute of the Russian Academy of Sciences, St. Petersburg.

The following abbreviations are used in the text and tables: V — ventral, D — dorsal, C — coxa, Tr — trochanter, P — praefemur, F — femur, T — tibia, Ts — tarsus, a — anterior, m — median, p — posterior. All measurements are given in mm.

Taxonomic part

Lithobius loricatus Sseliwanoff, 1881
Figs 1–13.

Lithobius loricatus Sseliwanoff, 1881, 16 (♂);
Lithobius loricatus: Zalesskaja, 1978, 119 (♂).

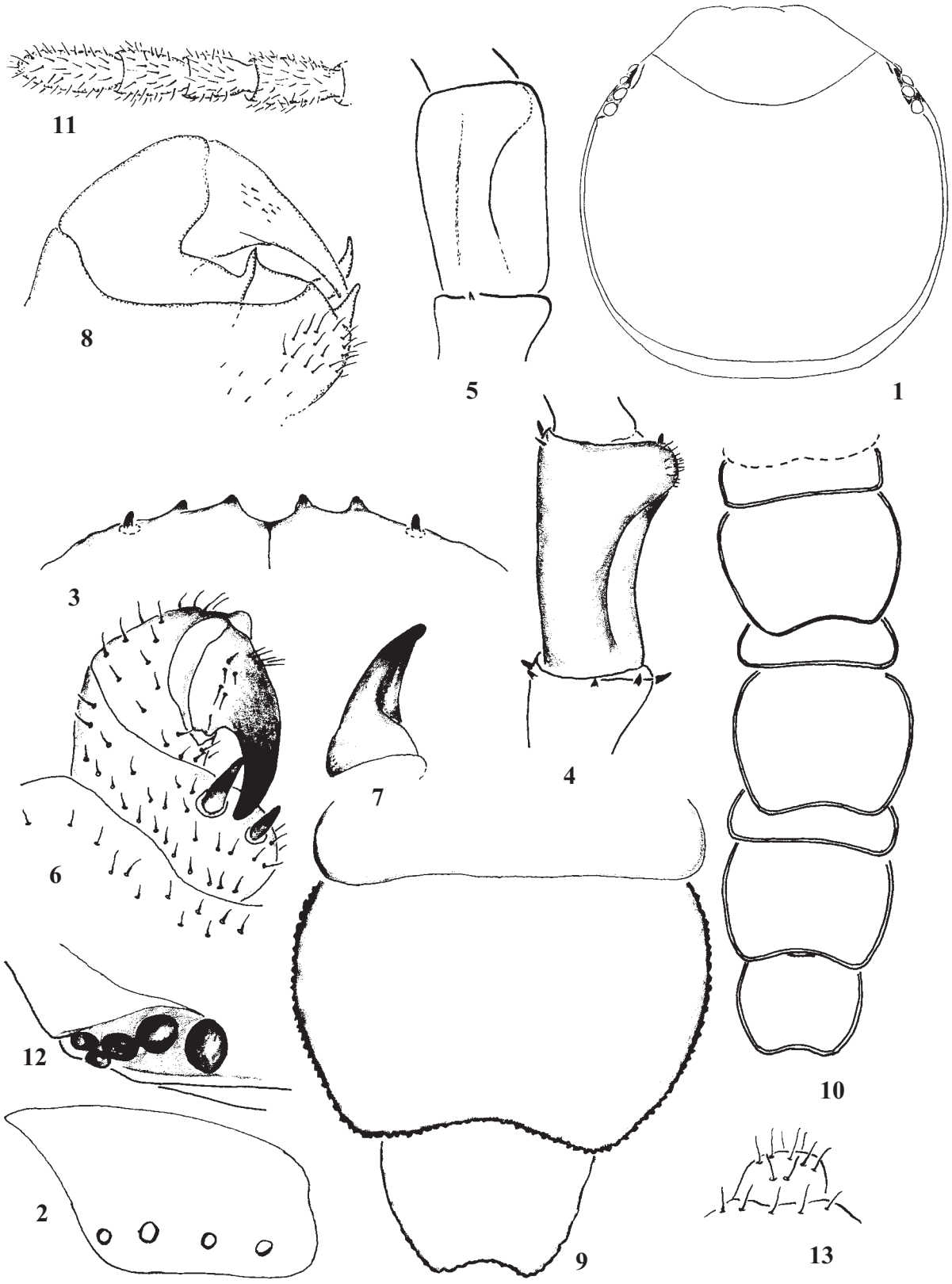
Holotype: ♂ (ZMUMρ-94), *Lithobius loricatus* Ssel., [Kazakhstan, Semipalatinsk Area], inter Semipalatinsk et Ajagus, [date unknown], A. Schrenk.

Allotype: 1 ♀ (ZMUM), Russia, Orenburg Area, Sol-Iletsk District, Chybynda, base of limestone denudation, slope, VI.2000, leg. S. L. Esyunin & G. Sh. Farzalieva.

Material: 2 ♂♂, 2 ♀♀ (PSU, No. 116), 1 ♂, 2 ♀♀ (ZMUM), Orenburg Area, Sol-Iletsk District, Chybynda, base of limestone denudation, slope, limestone plateau, salina with *Astragalus*, VI.2000, leg. S. L. Esyunin & G. Sh. Farzalieva.

DIAGNOSIS. This obviously uncommon species belongs to the *giganteus* group in the sense of Zalesskaja [1978], being very close to *L. giganteus* Sseliwanoff, 1881 as based on the presence of two dorsal sulci on ♂ femora 14 and 15,

Printed in 2003.



Figs 1–13. Diagnostics characters of *Lithobius loricatus* Sseliwanoff, 1881: 1 — head, dorsal view; 2 — coxal pores of leg 15; 3 — prosternum (= maxillipede); 4 — ♂ femur 15, lateral view; 5 — same, dorsolateral view; 6 — ♀ gonopod, lateral view; 7 — claw of ♀ gonopod, ventrolateral view; 8 — ♀ gonopod from inside; 9 — ♂ tergites XIII–XV; 10 — ♀ tergites IX–XV; 11 — antennomeres 17–20; 12 — ocelli, lateral view; 13 — ♂ gonopod, ventral view.

the structure of the prosternum as well as the number and shape of coxal pores and antennomeres. However, *L. loricatus* differs by the smaller body (versus 22–50 mm in *L. giganteus*), the number and location of ocelli (versus 7–9 ocelli in a group in *L. giganteus*), the poorly expressed dorsal sulci on ♂ femora 14 and 15, the absence of a dorsodistal swelling on segment 2 of the ♀ gonopod and a different pattern of leg spinulation (versus 15V = 01321 in *L. giganteus*).

In addition, *L. loricatus* seems close enough to *L. jugorum* Attems, 1904 as based on body size, number of coxal pores and antennomeres as well as ♀ gonopods. Yet *L. loricatus* is distinguished by its yellow body (versus brown in *L. jugorum*), number of prosternal teeth (versus 3+3 teeth in *L. jugorum*), spinulation of legs 15 (versus 15V = 01320(1 or 2) in *L. jugorum*). Yet *L. loricatus* seems best distinguishable from the above closely related congeners by the clearly expressed secondary sexual characters.

DESCRIPTION. MALE. Holotype. Body 28 long, poorly and sparsely punctate. Colour yellow, usually with a darker axial stripe dorsally. Field of ocelli dark. Borders of joints of prosternum (= maxillipede) and maxillae as well as posterior border of tergite I dark. Tergites XIV and XV with a granular surface, broadened, serrate and infuscate at all margins (Fig. 9).

Punctation of head heavier than of body. Head length to breadth ratio 1:1 (Fig. 1). Antennae with 20 elongate segments covered with dense, short and light setae (Fig. 11). Length to breadth ratio of terminal antennomere 1.2–1.5:1. Five ocelli in a group on each side (Fig. 12). Tõmõsváry's organ very small, several times smaller than adjoining ocelli.

Prosternum broad, with 2+2 teeth, lateral sides of prosternum gently sloping; porodonts stout and powerful, approximately as long as teeth. Medium cut wide (Fig. 3).

Legs: P 14 &15 slightly incrassate with two dorsal sulci. F 15 with two distinct sulci, i.e. a poorly expressed dorsolateral sulcus and a deep sulcus, latter forming apically a round tubercle supporting a bunch of thick and short setae (Figs 4–5). Length of legs (holotype and other material):

pair 1 — 3.37 (3.20–3.45), P 0.87 (0.80–0.90), F 0.65 (0.60–0.70), T 0.80 (0.75–0.85), Ts 1.05 (1.00–1.10);

pair 14 — 5.95 (5.70–6.10), P 1.20 (1.15–1.25), F 1.22 (1.05–1.35), T 1.47 (1.40–1.50), Ts 2.07 (2.00–2.10);

pair 15 — 8.57 (6.75–11.70), P 1.38 (1.35–1.45), F 1.43 (1.25–1.55), T 1.77 (1.65–1.85), Ts 2.38 (2.10–2.55), length ratio of tarsomeres 1 to 2 on all legs 2:1–1.3.

Leg spinulation as in Tab. 1. Due to the poor condition of the holotype, some spines could not be properly designated.

Coxal pores on legs 12–15, small, rounded, separated from one another by distances 2–2.5 times greater than their own diameter; formula 4443. Gonopod 1-segmented, with numerous short setae (Fig. 13).

FEMALE. Allotype. Body 29 long. Diagnostic characters and spinulation as in ♂ but the number of coxal pores: 5444, and tergites and legs non-modified. Length of legs (allotype and further material):

pair 1 — 3.14 (2.90–3.35), P 0.75 (0.70–0.85), F 0.63 (0.55–0.75), T 0.74 (0.70–0.80), Ts 1.03 (0.90–1.15);

pair 14 — 5.90 (5.65–6.20), P 1.26 (1.20–1.35), F 1.25 (1.05–1.50), T 1.39 (1.35–1.45), Ts 2.00 (1.85–2.20);

pair 15 — 6.60 (6.45–6.85), P 1.38 (1.35–1.40), F 1.33 (1.30–1.35), T 1.60 (1.55–1.65), Ts 2.28 (2.05–2.55), length ratio of tarsomeres 1 to 2 on all legs as in ♂.

Table 1. Spinulation of *L. loricatus* (holotype).
Таблица 1. Распределение шипов на ногах *L. loricatus* (голотип).

Leg pairs	ventrally					dorsally				
	C	Tr	P	F	T	C	Tr	P	F	T
1	–	–	mp2	amp	amp	–	–	amp	a p	a p
2–4	–	–	mp	amp	amp	–	–	amp	a p	a p
5	–	–	mp	amp	amp	–	–	amp	(a)p	(a)p
6–7	–	–	mp	amp	amp	–	–	amp	a p	(?)p
8–9	–	–	mp	amp	amp	–	–	amp	a p	(a)p
10–11	–	–	mp	amp	amp	–	–	amp	a p	a p
12	–	–	mp	amp	amp	–	–	amp	p	a p
13	–	–	amp	amp	(a)mp	a	–	amp	p	p
14	–	m	amp	amp	(a)	a	–	amp	p	?
15	–	m	amp	amp	–	a	–	amp	p	–

Table 2. Spinulation of *L. loricatus* (allotype).
Таблица 2. Распределение шипов на ногах *L. loricatus* (аллотип).

Leg pairs	ventrally					dorsally				
	C	Tr	P	F	T	C	Tr	P	F	T
1–10	–	–	mp	amp	amp	–	–	amp	a p	a p
11	–	–	mp	amp	amp	–	–	amp	(a)p	a p
12	–	–	mp	(a)mp	amp	(a)	–	amp	(a)p	a p
13	–	–	mp	amp	(a)mp	a	–	amp	p	p
14	–	m	amp	amp	amp	a	–	amp	p	p
15	–	m	amp	amp	a	a	–	amp	p	–

Gonopods with thin setae, 2+2 unequal spurs and simple claws; spurs strongly separated (Figs 6 & 7). Gonopod segment 1 with numerous setae on external and internal surfaces (Fig. 8).

DISTRIBUTION. Kazakhstan: Semipalatinsk Area [Sseliwanoff, 1881]. Russia, southern Urals: Orenburg Area.

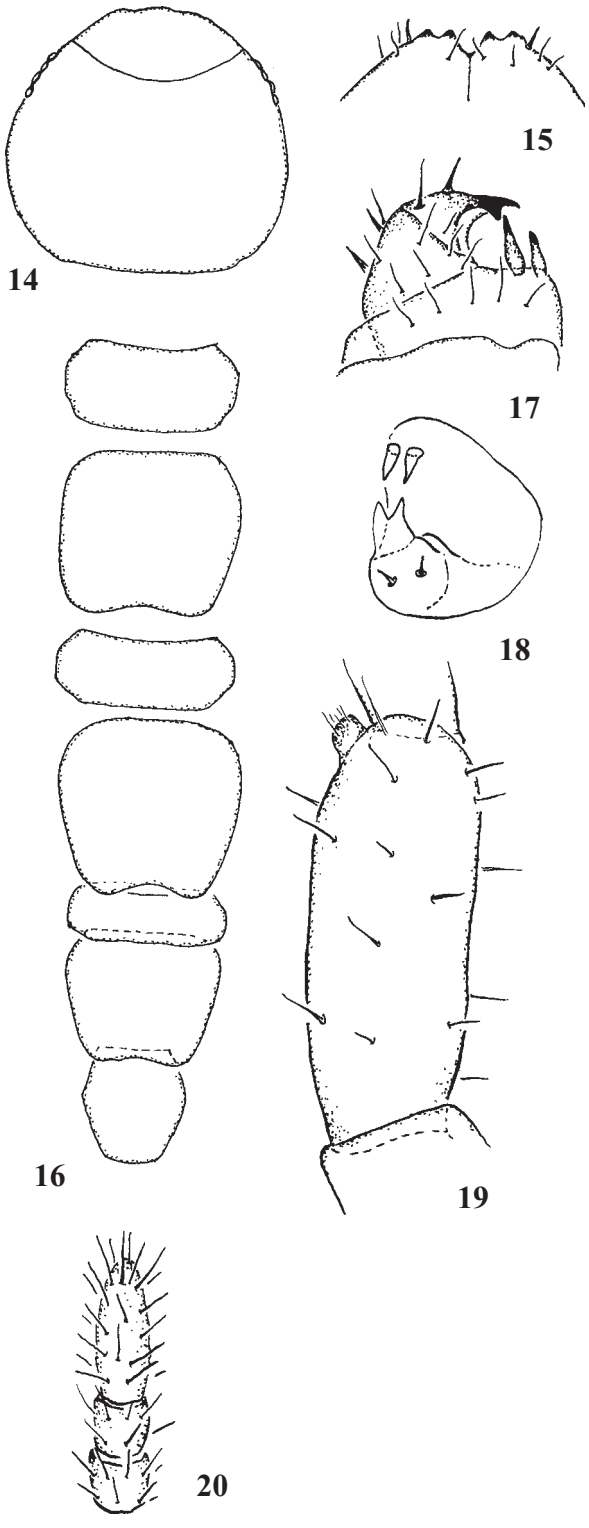
Monotarsobius steppicus **sp.n.**
Figs 14–20.

Holotype: ♂ (ZMUM), Russia, Orenburg Area, Sol-Iletsk District, Chybynda, limestone denudation, slope, 13–23.VIII.2001, leg. S. L. Esyunin & G. Sh. Farzalieva.

Paratype: 1 ♀ (ZMUM), same data as holotype; 1 ♀ (PSU), Orenburg Area, Sol-Iletsk District, Chybynda, limestone slope, 13–23.VIII.2001; 1 ♀ (ZMUM), environs of Orenburg City, Donguzskaya Steppe, under stones, 20.IV.2000, all leg. S. L. Esyunin & G. Sh. Farzalieva.

ETYMOLOGY. Named after the typical environment.

Рис. 1–13. Диагностические признаки *Lithobius loricatus* Sseliwanoff, 1881: 1 — голова, дорсально; 2 — коксальные поры на ноге 15; 3 — коксостернум ногочелюсти; 4 — бедро 15 самца, латерально; 5 — то же, дорсолатерально; 6 — гонопод самки, латерально; 7 — коготь гонопода самки, вентролатерально; 8 — гонопод самки с внутренней стороны; 9 –тергиты XIII–XV самца; 10 — тергиты IX–XV самки; 11 — членики антенн 17–20; 12 — глазки, латерально; 13 — гонопод самца, вентрально.



Figs 14–20. Diagnostic characters of *Monotarsobius steppicus* sp.n.: 14 — head, dorsal view; 15 — prosternum; 16 — tergites IX–XV; 17 — ♀ gonopod, lateral view; 18 — same, dorsodistal view; 19 — ♂ tibia 15, lateral view; 20 — antennomeres 18–20.

Рис. 14–20. Диагностические признаки *Monotarsobius steppicus* sp.n.: 14 — голова, дорсально; 15 — коксостернум ногочелюсти; 16 — тергиты IX–XV; 17 — гонопод♀, латерально; 18 — то же, дорсодистально; 19 — голень 15 ♂, латерально; 20 — членики антенн 18–20.

DIAGNOSIS. The new species is extremely close to *Monotarsobius ferganensis* (Trotzina, 1894) based on body length and colour, the number of antennomeres, the number and position of ocelli, the shape of the prosternum, the simple claws on legs 15, the dorsodistal wart on ♂ tibia 15, the bidentate claws of ♀ gonopods. The differences concern the shorter porodonts, the spinulation of legs 15 (01300/01320 in *M. ferganensis*), and two dorsal spines on segment 3 of ♀ gonopod (one in *M. ferganensis*). Compared to *M. ferganensis*, the new species is characterized by 1–2Dp and the absence of this spine until legs 11 or 12; the absence both of spines 14–15DF and 12–15DD; the almost never present VPa, VFp and DPa, and the very seldom present but minute VCa.

DESCRIPTION. MALE. Body 9 long, yellow–brown. Head and tergites as in Figs 14 & 16.

Left antenna with 19 segments, right one broken off, terminal segment 2 times as long as broad, previous ones alike in breadth and length (Fig. 20). 6–9 ocelli on each side in two rows, dark. Tõmõsváry's organ smaller than adjoining ocelli.

Prosternum with 2+2 acute teeth and thin porodonts. Lateral sides of prosternum more strongly sloping behind porodonts (Fig. 15).

Legs 14 and 15 slightly incrassate. Leg 14 with accessory, 15 with simple apical claws. Tibia 15 with a dorsodistal wart supporting 3–5 thin and short setae at apex (Fig. 19). Length of legs:
pair 1 — 0.68, P 0.18, F 0.11, T 0.17, Ts 0.22;
pair 2 — 0.80, P 0.24, F 0.10, T 0.18, Ts 0.28;
pair 14 — 1.48, P 0.31, F 0.32, T 0.35, Ts 0.50;
pair 15 — 1.82, P 0.35, F 0.43, T 0.48, Ts 0.56; length ration of tarsomeres 1 to 2 as 1:0.6–0.7.

Leg spinulation as in Tab. 3 (holotype with missing right leg 14 and left legs 1, 2, 12 and 15).

Coxal pores present on legs 12–15, 1122 in number, poorly visible, small, rounded.

Gonopod 1–segmented, with a single seta.

FEMALE. Body 7.80 (6.10–8.85) long. Antenna with 20 segments. Colour, diagnostic characters and spinulation as in ♂ but without secondary sexual characters. Length of legs:
pair 1 — 0.75 (0.70–0.78), P 0.20 (0.17–0.21), F 0.11 (0.10–0.11), T 0.18 (0.18–0.18), Ts 0.26 (0.25–0.28);
pair 2 — 0.83 (0.76–0.87), P 0.21 (0.17–0.22), F 0.13 (0.13–0.14), T 0.20 (0.18–0.22), Ts 0.29 (0.28–0.29);

Table 3. Spinulation of *M. steppicus* sp. n. (holotype).
Таблица 3. Распределение шипов на ногах *M. steppicus* sp. n. (голотип).

Leg pairs	ventrally					dorsally				
	C	Tr	P	F	T	C	Tr	P	F	T
1	–	–	–	m	m	–	–	p	p	a
2	–	–	–	(a)m	m	–	–	p	p	a
3–8	–	–	–	am	m	–	–	–	a p	a p
9–10	–	–	–	(a)m	m	–	–	–	a p	a p
11	–	–	(p)	(a)m	m	–	–	–	(a)p	a p
12	–	–	p	am	m	–	–	–	(p)	–
13	–	–	p	am	m	–	–	mp	–	–
14	–	m	mp	m	–	–	–	mp	–	–
15	–	m	mp	m	–	–	–	mp	–	–

Table 4. Spinulation of *M. steppicus* sp. n. (paratypes)
Таблица 4. Распределение шипов на ногах *M. steppicus* sp. n. (паратипы)

Leg pairs	ventrally					dorsally				
	C	Tr	P	F	T	C	Tr	P	F	T
1	–	–	–	(a)m	m	–	–	p	a p	a
2	–	–	–	m	m	–	–	p	a p	a
3	–	–	–	m	m	–	–	–	a p	a(p)
4–7	–	–	–	m	m	–	–	–	a(p)	p
8–9	–	–	–	am	m	–	–	–	a p	a p
10	–	–	–	am	m	–	–	–	a p	a p
11	–	–	(p)	am	m	–	–	–	p	p
12	–	–	(p)	am	m	–	–	(m)p	p	–
13	–	–	(p)	am	m	a	–	mp	p	–
14	–	m	mp	m	m	a	–	mp	p	–
15	–	m	(a)mp	m	–	–	–	mp	(p)	–

pair 14 — 1.62 (1.31–1.79), P 0.35 (0.31–0.38), F 0.35 (0.29–0.38), T 0.39 (0.29–0.43), Ts 0.53 (0.45–0.60);
pair 15 — 2.08 (1.84–2.16), P 0.41 (0.35–0.45), F 0.48 (0.41–0.43), T 0.54 (0.49–0.57), Ts 0.65 (0.59–0.71).

Leg spinulation as in Tab. 4.

Coxal pores 1222.

Gonopods with 2+2 unequal, long and slender spurs; claws bidentate. Gonopod segment 2 with two dorsolateral, segment 3 with two dorsodistolateral spinicles (Figs 17 & 18).

DISTRIBUTION. Type locality only.

ACKNOWLEDGEMENTS. The first author is most grateful to Dr. Sergei L. Esyunin (Perm) for his constant guidance, encouragement and support. Dr. Sergei I. Golovatch (Moscow) has kindly checked the English of an advanced draft.

References

Sseliwanoff A.V. 1881. Neue Lithobiiden aus Sibirien und Centralasien // Zool. Anz. Bd.4. H.73. S.15–17.

Trotzina N. 1894. Vier neue *Lithobius*–Arten aus Centralasien // Trudy Russk. Ent. Obshch. T.28. P.247–253.

Zalesskaja N.T. 1978. [Identification book of the lithobiomorph centipedes of the USSR (Chilopoda, Lithobiomorpha)]. Moscow: Nauka Publ. 212 p. [in Russian]