

## The lithobiomorph centipede types (Chilopoda: Lithobiomorpha) in the Zoological Institute of the Russian Academy of Sciences in St Petersburg, Russia

### Типы многоножек-костянок (Chilopoda: Lithobiomorpha) в Зоологическом институте Российской Академии наук, Санкт-Петербург, Россия

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КЛЮЧЕВЫЕ СЛОВА: многоножки-костянки, коллекция музея, типы, голотип, лектотип, паралектотип.

**ABSTRACT.** The type collection of lithobiomorph centipedes of the Zoological Institute of the Russian Academy of Sciences, St Petersburg, Russia, contains seven species. Lectotypes are designated for six of them: *Lithobius brandtii* Sseliwanoff, 1881, *L. czekanowskii* Sseliwanoff, 1881, *L. giganteus* Sseliwanoff, 1881, *L. potanini* Sseliwanoff, 1881, *L. sibiricus* Gerstfeldt, 1859, and *L. (Monotarsobius) porathi* Sseliwanoff, 1881. The name *L. czekanowskii* Sseliwanoff, 1881 is revalidated from the synonymy with *L. princeps* Stuxberg, 1876. Habitus photos of the type specimens and corresponding labels are presented for the first time.

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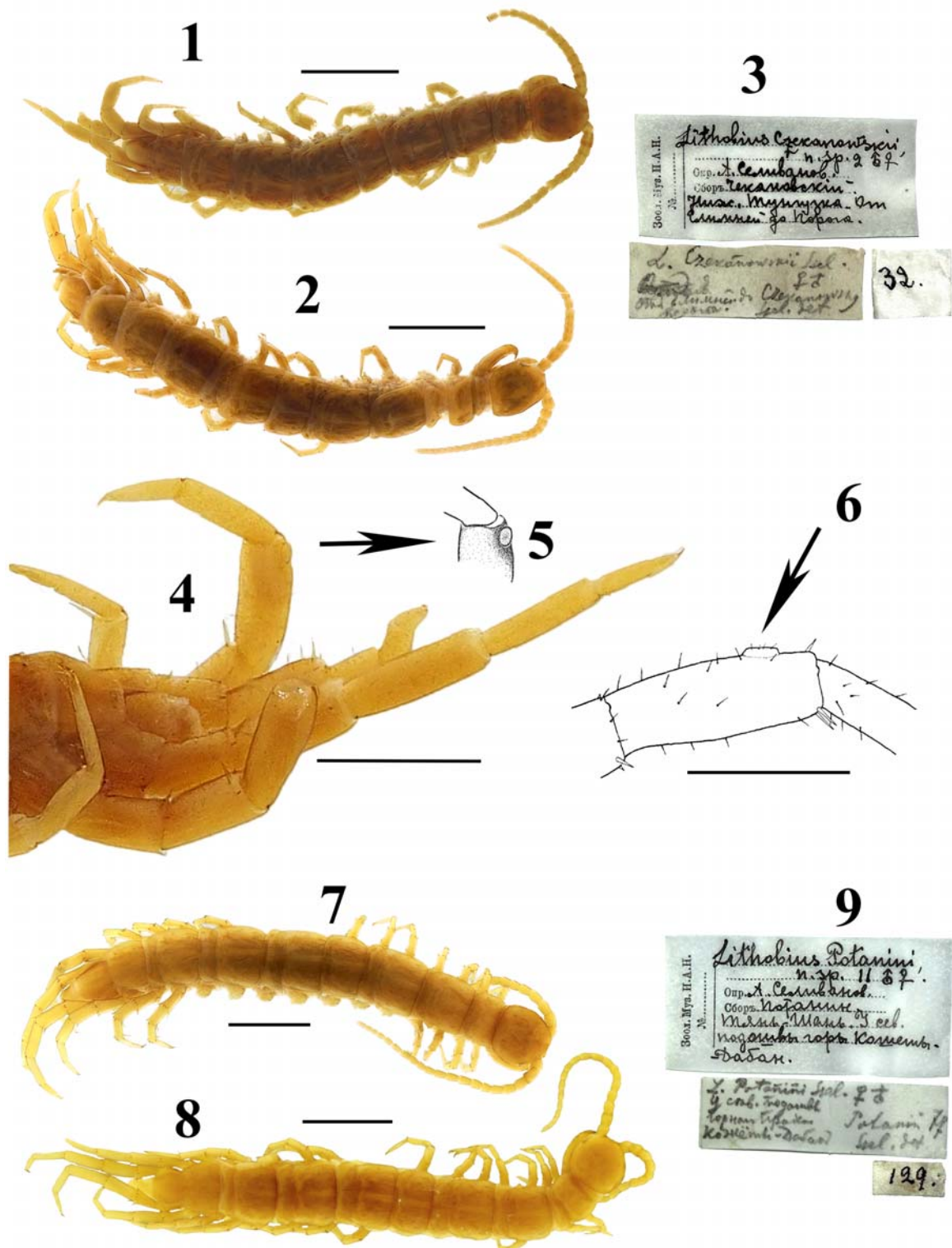
**РЕЗЮМЕ.** Типовая коллекция литобиоморфных многоножек Зоологического института РАН (г. Санкт-Петербург) насчитывает семь видов. Для шести видов выделены лектотипы: *Lithobius brandtii* Sseliwanoff, 1881, *L. czekanowskii* Sseliwanoff, 1881, *L. giganteus* Sseliwanoff, 1881, *L. potanini* Sseliwanoff, 1881, *L. sibiricus* Gerstfeldt, 1859 и *L. (Monotarsobius) porathi* Sseliwanoff, 1881. Видовое название *L. czekanowskii* Sseliwanoff, 1881 восстановлено из синонимии с *L. princeps* Stuxberg, 1876. Впервые представлены фотографии внешнего вида типов и их этикеток.

## Introduction

The first data on the centipede collection deposited in the Zoological Institute of the Russian Academy of Sciences (St. Petersburg; hereafter ZISP) were presented by Sseliwanoff [1881a] in the paper entitled as follows: «Lithobiidae, хранящиеся в музее Императорской академии наук» {Lithobiidae stored in the Museum of the Imperial Academy of Sciences}. This paper listed 28 species of stone centipedes, including the types of the following seven species: *Disphaerobius loricatus* (Sseliwanoff, 1881), *Lithobius brandtii* Sseliwanoff, 1881, *L. czekanowskii* Sseliwanoff, 1881, *L. giganteus* Sseliwanoff, 1881, *L. potanini* Sseliwanoff, 1881, *L. (Monotarsobius) porathi* Sseliwanoff, 1881 and *L. sibiricus* Gerstfeldt, 1859.

Since A.V. Sseliwanoff, specialists have turned to the ZISP centipede type collection twice. In the 1970s, slide preparations were made from the syntypes of *L. brandtii* (presumably by N.T. Zalesskaya), but no lectotype was designated. In the early 21st century, *D. loricatus* was redescribed based on the holotype and newly collected material [Farzalieva, Zalesskaya, 2003; Farzalieva *et al.*, 2017].

Now we have revised the ZISP lithobiomorph type collection, including the seven species that are represented by type series, and lectotypes for six *Lithobius* species have been designated: *L. brandtii*, *L. czekanowskii*, *L. giganteus*, *L. potanini*, *L. sibiricus*, and *L. (Monotarsobius) porathi*. In all cases, the lectotypes were designated by the sex that would be best for the identification of a particular species. When there were



Figs 1-9. Lectotypes (1, 4-7) and Paralectotypes (2 & 8) of *Lithobius czekanowskii* Sselivanoff, 1881 (1-5), *L. princeps* Stuxberg, 1876 (6) and *L. potanini* Sselivanoff, 1881 (7-9): 1-2, 7-8 — dorsal view; 4 — last part of the body, lateroventral view; 5 — leg tibia 14, lateroventral view; 6 — leg tibia 14 by Eason [1976], lateral view; 3, 9 — collection and original data labels. Scale bars: 2.0 mm.

Рис. 1-9. Лектотипы (1, 4-7) и паралектотипы (2 & 8) *Lithobius czekanowskii* Sselivanoff, 1881 (1-5), *L. princeps* Stuxberg, 1876 (6) и *L. potanini* Sselivanoff, 1881 (7-9): 1-2, 7-8 — дорсально; 4 — задняя часть тела латероventрально; 5 — голень 14-й ноги латероventрально; 6 — голень 14-й ноги по Eason [1976], латерально; 3, 9 — коллекционные и оригинальные этикетки. Масштаб: 2,0 мм.

several specimens of the same sex in the type series, the one that most closely matched the original description was chosen. Habitus photos of some types and their labels are also presented for the first time.

## Methods

The following order of data representation has been accepted in the type catalogue: species name in the original description; figures; reference to the original description; collection label (CL) and accession number; original label (OL), additional museum numbers and labels if available; remarks; and current taxonomic status of the species. English translations of Russian labels are given in figure brackets, {}. Author's comments on labels are given in square brackets, [].

When working with syntypes, whenever possible, the original jars and sample tubes were preserved. Lectotypes and paralectotypes, as well as voucher specimens of other species from the same type series, have been (re)housed in individual sample tubes, but are kept together in the same jar with original labels. Slide preparations that were in poor condition have been photographed and disassembled, with the corresponding specimens being transferred to 96% ethanol.

Specimens were photographed using an Olympus OMD EM-10 camera with an Olympus M. Zuiko Digital ED 60 mm f/2.8 Macro lens.

## Type catalogue

### *brandtii* Sselivanoff, 1881, *Lithobius* Figs 16–17.

Sselivanoff, 1881a: 13–14, fig. 9.

CL: Зоол. Муз. И.А.Н. {Zoological Museum of the Imperial Academy of Sciences} № .... *Lithobius brandtii* Ssel. ♂♀. Опр. А. Селиванов. Сборъ Чекановский. Николаевск {Det. A. Sselivanoff. Collected Czekanowsky. Nikolayevsk}. В ппрепарате {slide preparation}, Кат. № 9 {Catalogue № 9}.

OL: *L. Brandtii* Ssel. ♂♀. Nikolajewin. Czekanowsky. Ssel. det.

MYR\_CHI\_0000001. Lectotype ♂ [designated here]: *Lithobius brandtii* Ssel. ♂ колл. № 9. Николаевск н/Амуре {collection № 9, Nikolayevsk-on-Amur, [Russia]} [written in ink on the slide preparation].

MYR\_CHI\_0000002. Paralectotype ♀ [separate slide preparation]: *Lithobius brandtii* Ssel. ♀ колл. № 9. Николаевск н/Амуре {collection № 9, Nikolayevsk-on-Amur} [written in ink on the slide preparation].

REMARKS: The species was described based on a male and two females [Sselivanoff, 1881a: 14], but to date one female has been lost. There were no specimens in the originally labelled jar. Both of the available slide preparations bear the same № 9, matching the old collection number and label. Complete similarity of these slide preparations is found with the drawings of *L. brandtii* by Zalesskaja [1978: Figs 63,1–9], who, presumably in the 1970s, borrowed them for re-description. However, there is no indication in Zalesskaja [1978] that the drawings were made from the type specimens, and yet no lectotype was designated.

CURRENT STATUS: *Lithobius brandtii* Sselivanoff, 1881 (Lithobiidae) [Bonato *et al.*, 2016].

### *czekanowskii* Sselivanoff, 1881, *Lithobius*, **revalidated** Figs 1–3.

Sselivanoff, 1881a: 7–8, fig.7.

CL: Зоол. Муз. И.А.Н. {Zoological Museum of the Imperial Academy of Sciences} № .... *Lithobius czekanowskii*. n. sp. ♂♀. Опр. А. Селиванов. Сборъ Чекановский. Ниж. Тунгузка. От Елимней до Порога. {Det. A. Sselivanoff. Collected [by] Czekanowsky. The lower reaches of Tunguzka [river]. From Yelimney to Porog}. №32.

OL: *L. Czekanowskii* Ssel. ♀♂. Czekanowsky. От Елимней до Порога. {From Yelimney to Porog} Ssel. det.

MYR\_CHI\_0000003. Lectotype ♂ [designated here]: *Lithobius czekanowskii* Sselivanoff, 1881.

MYR\_CHI\_0000004. Paralectotype ♀ [designated here]: *Lithobius czekanowskii* Sselivanoff, 1881.

REMARKS: The species was formally (with a question mark “?”) synonymized with *L. princeps* Stuxberg, 1876 by Eason [1976: 97], who had not re-examined the original type series, but rather read the original description, reasoning from the fact that males of both species possess a nummular outgrowth on leg tibiae 14. His doubts he described in the remarks: “The original description of *L. czekanowski*, which was recorded from the Lower Tunguska..., agrees in most respects with *L. princeps*. But Sselivanoff mentioned, in *czekanowski*, a feeble dorsal excavation on the male 15<sup>th</sup> tibia sometimes extending on to the tarsus, so there is some doubt as to its identity”. Later, in her monograph, Zalesskaja [1978: 121] followed Eason’s opinion and listed *L. czekanowskii* as a junior synonym of *L. princeps*, but also with a question mark “?”. Yet, in Chilobase [Bonato *et al.*, 2016], the name *L. czekanowskii* is catalogued as a junior synonym of *L. princeps*, but tagged as “probable but uncertain synonymy”. When studying the type series of *L. czekanowskii*, we have found significant morphological differences between the males and females of this species from those of *L. princeps*: viz., the body colouration dull yellow to pale brown in *L. princeps* versus bright brown in *L. czekanowskii*; the number of ocelli 1+16–21 in 5 rows in *L. princeps* versus 1+7–12 ocelli in 3–4 rows in *L. czekanowskii*; the nummular outgrowth of male tibia 14 of *L. princeps* is situated some distance off the tarsus (Fig. 6), whereas in *L. czekanowski* it is at the tarsus base, in a shallow depression (Fig. 5). Therefore, the name *L. czekanowskii* is safe to remove from the synonymy with *L. princeps*.

CURRENT STATUS: *Lithobius czekanowskii* Sselivanoff, 1881 (Lithobiidae) [Bonato *et al.*, 2016].

### *giganteus* Sselivanoff, 1881, *Lithobius* Figs 10–12.

Sselivanoff, 1881a: 3–4, figs 4–6.

CL: Зоол. Муз. И.А.Н. {Zoological Museum of the Imperial Academy of Sciences} №.... *Lithobius giganteus* n. sp. ♂♀. Опр. А. Селиванов. Сборъ Потанин. Хангай. Уроч. Худжирта, к югу от Улясутая, р. Буинту-гол. {Det. A. Sselivanoff. Collected [by] Potanin. Khangai. Khudjirta tract, S of Ulyasutai, Buinto-goal river [Mongolia]} 21.VII. №76.

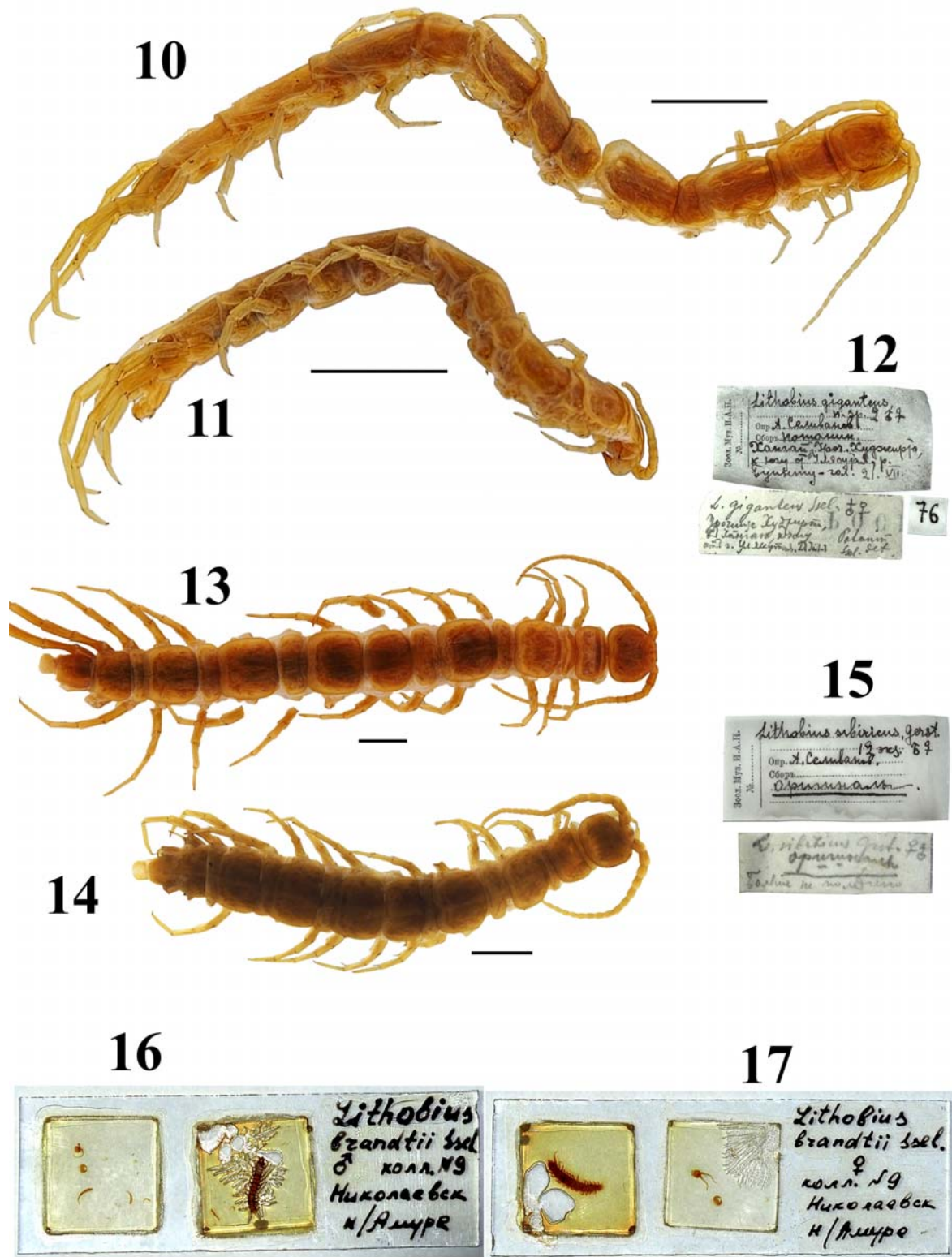
OL: *L. giganteus* Ssel. ♂♀. Урочище Худирт, в Хангай, к югу от г. Улясутая. Д. [далее неразборчиво] {Khudirt tract, Khangai, S of Ulyasutai, D. [further text is illegible]} Ssel. det.

MYR\_CHI\_0000005. Lectotype ♂ [designated here]: *Lithobius giganteus* Sselivanoff, 1881.

MYR\_CHI\_0000006. Paralectotype 1 ♀ [designated here]: *Lithobius giganteus* Sselivanoff, 1881.

REMARKS: Also described as a n. sp. by Sselivanoff [1881b: 15, 1881c: 126]. The original description [Sseli-





Figs 10–17. Lectotypes (10, 13 & 16) and Paralectotypes (11, 14 & 17) of *Lithobius giganteus* Sseliwanoff, 1881 (10–12), *L. sibiricus* Gerstfeldt, 1858 (13–15) and *L. brandtii* Sseliwanoff, 1881 (16–17): 1–2, 10–11, 13 & 14 — dorsal view; 12, 15 — collection and original data labels. Scale bars: 5.0 mm (10–11), 2.0 mm (13–14).

Рис. 10–17. Лектотипы (10, 13, & 16) и паралектотипы (11, 14, & 17) *Lithobius giganteus* Sseliwanoff, 1881 (10–12), *L. sibiricus* Gerstfeldt, 1858 (13–15) и *L. brandtii* Sseliwanoff, 1881 (16–17): 1–2, 10–11, 13–14 — дорсально, 12, 15 — коллекционные и оригинальные этикетки. Масштаб: 5,0 мм (10–11), 2,0 мм (13–14).



Figs 18–20. Lectotype (18) and paralectotype (19) of *Lithobius porathi* Sseliwanoff, 1881, dorsal view; 20 — collection and original data labels. Scale bars: 2.0 mm.

Рис. 18–20. Лектотип (18) и паралектотип (19) *Lithobius porathi* Sseliwanoff, 1881, дорсально; 20 — коллекционная и оригинальная этикетки. Масштаб: 2,0 мм.

wanoff, 1881a] stated that the type series consisted of 12 specimens. However, there are only two specimens in the ZISP collection, this corresponding to the information given on the old data label. The whereabouts of the remaining specimens remain unknown.

CURRENT STATUS: *Lithobius giganteus* Sseliwanoff, 1881 (Lithobiidae) [Bonato *et al.*, 2016].

#### *loricatus* Sseliwanoff, 1881, *Lithobius*

Sseliwanoff, 1881a: 4–5, figs 1–3.

CL: Зоол. Муз. И.А.Н. {Zoological Museum of the Imperial Academy of Sciences} № 94 *Lithobius loricatus* n. sp. ♂. Опр. А. Селиванов. Сборь Шренк. Между Семипалатинском и Айягусом. {Det. A. Sseliwanoff. Collected [A.I.] Schrenk. Between Semipalatinsk and Ayagus.}. №94. [the label is attached to the jar's side].

OL: *L. loricatus* Ssel. ♂, Inter Semipalatinsk et Ajagus, A. Shrenk, Ssel. det.

MYR\_CHI\_0000007. Holotype ♂.

REMARKS: Also described as a n. sp. by Sseliwanoff [1881b: 15, 1881c: 127]. The species was re-described by Farzalieva et Zaleskaja [2002] based on the holotype and newly collected material. In the same work, the allotype ♀ (sic!) of *L. loricatus* was designated and described, with the label as follows: “Allotype: 1 ♀ (ZMUM), Russia, Orenburg Area, Sol-Iletsk District, Chybynda, base of limestone denudation, slope, VI.2000, leg. S.L. Esyunin & G.Sh. Farzalieva”. This female is deposited in the Zoological Museum, Moscow State University (Moscow, Russia, curator Ark.A. Schileyko) and does not belong to the original type series.

CURRENT STATUS: *Disphaerobius loricatus* (Sseliwanoff, 1881) (Lithobiidae) [Bonato *et al.*, 2016].

#### *porathi* Sseliwanoff, 1881, *Lithobius* Figs 18–20.

Sseliwanoff, 1881a: 8–9, fig. 15.

CL: Зоол. Муз. И.А.Н. {Zoological Museum of the Imperial Academy of Sciences} №... *Lithobius porathi*. n. sp. ♂♀. Опр. А. Селиванов. Сборь А. Шренк. Николаевск {Det. [by] A. Sseliwanoff. Collected [by] A.[I.] Schrenk. Nikolayevsk [Nikolayevskon-Amur, Russia]}. №122.

IL: L. Porati Ssel. ♂♀ Nikolajewsk №23 списка Селив. {according to Ssel[iwanoff's] list}.

MYR\_CHI\_0000007. Lectotype ♂ [designated here].

MYR\_CHI\_0000008. Paralectotype 1 ♀ [designated here].

REMARKS: Also described as a n. sp. by Sseliwanoff [1881b: 16, 1881c: 131]. The original label lacks the collection date, but the original description [Sseliwanoff, 1881a: 9] indicated that the material was taken in September 1854.

CURRENT STATUS: *Lithobius porathi* Sseliwanoff, 1881 (Lithobiidae) [Bonato *et al.*, 2016].

#### *potanini* Sseliwanoff, 1881, *Lithobius* Figs 7–9.

Sseliwanoff, 1881a: 2–3, fig. 16.

CL: Зоол. Муз. И.А.Н. {Zoological Museum of the Imperial Academy of Sciences} №... *Lithobius potanini*. n. sp. 11 ♂♀. Опр. А. Селиванов. Сборь Потанин. Тянь-Шань. У сев. подошвы горы Кошегы-Дабан. {Det. A. Sseliwanoff. Collected [I.] Potanin. Tien Shan. At the northern foothills of Mount Koshety-Daban.}. №129.

OL: *L. potanini* Ssel. ♀♂ у сев. подошвы горной тропы Кошегы-Дабан {at the northern foothills of Mount Koshety-Daban} Potanin [further text is illegible] Ssel. det.

MYR\_CHI\_0000009. Lectotype ♀ [designated here]: *Lithobius potanini* Sseliwanoff 1881.

MYR\_CHI\_0000010. Paralectotypes 7 ♂♂, 3 ♀♀ [designated here]: *Lithobius potanini* Sseliwanoff 1881.

REMARKS: Also described as a n. sp. by Sseliwanoff [1881b: 16, 1881c: 125]. The type series of this species contains 11 specimens, this corresponding to the number written on the original label; yet, in the original description, 13 specimens were mentioned [Sseliwanoff, 1881a: 3]. Furthermore, the sample with the type series also contained a Carabidae larva, which was re-housed to a separate vial, but inside the same jar.

CURRENT STATUS: *Lithobius potanini* Sseliwanoff, 1881 (Lithobiidae) [Bonato *et al.*, 2016].

#### *sibiricus* Gerstfeldt, 1859, *Lithobius* Figs 13–15.

Gerstfeldt, 1859: 275–276.

CL: Зоол. Муз. И.А.Н. {Zoological Museum of the Imperial Academy of Sciences} №... *Lithobius sibiricus* Gerst. 12 ♀♂. Опр. А. Селиванов. Оригиналы. {Det. [by] A. Sselivanoff. Originals} №143 [on the jar's lid].

OL: *L. sibiricus* Gerst. ♀♂ Оригиналы. Больше не получено {Originals. No more [specimens] received}.

MYR\_CHI\_0000011. Lectotype ♀ [designated here]: *Lithobius sibiricus* Gerstfeldt 1859.

MYR\_CHI\_0000012. Paralectotypes 3 ♂♂, 1 ♀ [designated here]: *Lithobius sibiricus* Gerstfeldt 1859.

REMARKS: In the original description, the author did not indicate the depositary of the type series, but mentioned that it was brought over to St. Petersburg: "Ausser Maack, meinem Reisegefährten auf dem Amur, welcher den grössten Theil der hier zu behandelnden Thiere aufgefunden und die betreffenden Sammlungen mit vielen Schwierigkeiten glücklich nach St. Petersburg gebracht hat ..." [Gerstfeldt, 1859: 261] {Except for Maack, my traveling companion on the Amur, who found the largest part of the animals to be treated here and successfully brought the relevant collections to St. Petersburg with many difficulties...}. Besides this, in the original labels handwritten by Gerstfeldt himself, "originals" were mentioned; in the 19th century, "originals" were sometimes referred to as type material. The fact that the original label was written by Gerstfeldt is confirmed by a special paper by Sselivanoff devoted to the problem of *L. sibiricus* [Sselivanoff, 1880: 542]: "Auf dem Glase, worin die Lithobien lagen, war noch ein Zettel, eigenhändig von Gerstfeldt geschrieben, zu sehen." {On the jar in which the Lithobiidae lay was a note written by Gerstfeldt himself}. Finally, a bit later, while revising the collection of the Imperial Academy of Sciences, Sselivanoff re-described *L. sibiricus*, mentioning the examination of Gerstfeldt's "originals" [Sselivanoff, 1881a: 7].

The type series consists of 12 specimens, of which five belong to *L. sibiricus*. The remaining seven specimens belong to at least four different species of lithobiomorph centipedes: 1 ♀ *Lithobius* cf. *microcephalus* Sselivanoff, 1878 (headless specimen), 1 ♀ *Lithobius* (*Monotarsibius*) sp. (headless specimen, gonopods with 3+3 spurs), 1 ♀ *Lithobius* (*Monotarsibius*) sp. (no forcipula, gonopods with 3+3 spurs), 1 ♂ *Lithobius* cf. *ostiacorum* Stuxsberg, 1876 (the 15th pair of legs is absent, therefore a positive identification is impossible), 1 ♀ *Lithobius* (*Monotarsibius*) *nordenskoeldi* Stuxsberg, 1876, 1 ♀ *Lithobius* (*Monotarsibius*) cf. *fugax* Stuxsberg, 1876 (headless specimen), 1 larva Carabidae. All these specimens are damaged to a greater or lesser degree: the lecto- and paralectotypes of *L. sibiricus* are without forcipules

and some legs. A pair of the forcipules was established to belong to the lectotype; the other appendages could not be assigned.

CURRENT STATUS: *Lithobius sibiricus* Gerstfeldt, 1859 (Lithobiidae) [Bonato *et al.*, 2016].

#### Disclosure statement

No potential conflict of interest was reported by the authors.

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