

A review of the anthropochore centipede fauna of Middle Asia (Chilopoda)

Обзор антропохорной фауны губоногих многоножек Средней Азии (Chilopoda)

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КЛЮЧЕВЫЕ СЛОВА: *Geophilus proximus*, *Lamyctes emarginatus*, *Lithobius crassipes*, *Lithobius forficatus*, *Schendyla nemorensis*, новые находки, Центральная Азия.

ABSTRACT. The anthropochore centipede fauna of Middle Asia is reviewed based both on the literature and new material. The following taxa are new to the Middle Asian fauna: the genus *Schendyla* Bergsøe et Meinert, 1866, the species *S. nemorensis* (C.L. Koch, 1837), *Geophilus proximus* C.L. Koch, 1847, the genus *Lamyctes* Meinert, 1868, the species *L. emarginatus* (Newport, 1844). The family Schendylidae, the genus *Geophilus* Leach, 1814, and the species *Lithobius crassipes* L. Koch, 1862 are recorded from Tajikistan for the first time, the latter species being also new to the fauna of the Almaty Region of Kazakhstan; *L. forficatus* (Linnaeus, 1758) is new to the faunas of the Turkistan and Atyrau regions of Kazakhstan. The order Geophilomorpha is reported from the Gorno-Badakhshan Region of Tajikistan for the first time. All known records are mapped.

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РЕЗЮМЕ. На основании литературных данных и новых находок рассмотрена антропохорная фауна губоногих многоножек Средней Азии. Следующие таксоны являются новыми для фауны Средней Азии: род *Schendyla* Bergsøe et Meinert, 1866, *S. nemorensis* (C.L. Koch, 1837), *Geophilus proximus* C.L. Koch, 1847, а также род *Lamyctes* Meinert, 1868 и *L. emarginatus* (Newport, 1844). Семейство Schendylidae, род *Geophilus* Leach, 1814, *Lithobius crassipes* L. Koch, 1862 впервые отмечены для фауны Таджикистана, последний вид также впервые отмечен для фауны Алмагинской области Казахстана. *L. forficatus* (Linnaeus, 1758) – новый вид для фауны Туркестанской и Атырауской областей Казахстана. Отряд Geophilomorpha впервые отмечен для фауны Горно-Бадахшанской области Таджикистана. Все находки картированы.

Introduction

The first anthropochorous chilopod reported from Middle Asia seems to have been *Lithobius crassipes* L. Koch, 1862, from the vicinity of Tashkent [Verhoeff, 1930]. The next species to be recorded, *L. forficatus* (Linnaeus, 1758), was found in Kazakhstan, from the vicinities of Almaty City (Almaty Region) and Abay Village (Kyzylorda Region) [Dyachkov, 2019]. Finally, *Cryptops hortensis* (Donovan, 1810) and *Lithobius viriatus* Sselivanoff, 1881 have recently been reported from the Almaty and Ashgabat cities, respectively [Dyachkov, 2020, 2024]. As a result, only three lithobiid and one cryptopid species have hitherto been recorded as anthropochore introductions from Middle Asia.

Middle Asia is a vast region extending from the Caspian Sea in the west to China in the east, and from the Aral Sea and Lake Alakol in the north to northern Iran and Afghanistan in the south [Jashenko, Zyuzin, 2000].

The present paper provides new faunistic records of anthropochorous Chilopoda from Middle Asia.

Material and methods

Specimens were taken by hand or using forceps, presently being preserved in 70% ethanol and deposited in the ASU collection (abbreviations below). Material was examined with an Olympus SZX16 stereo microscope. Photographs were taken using an Olympus DP74 digital camera.

All localities were mapped (Fig. 1) using SimpleMapp software [Shorthouse, 2010].

Literature references provide data only for species from Middle Asia and adjacent regions.

Abbreviations: ad. — adult; AF — A.A. Fomichev; ASU — Altai State University, Barnaul, Russia; coll. — collector; fragm. — body fragment; IT — I.I. Temreshev; YD — Yu.V. Dyachkov.



Fig. 1. Distribution of *Lithobius forficatus* (Linnaeus, 1758) (oval), *L. viriatus* Sseliwanoff, 1881 (diamond), *L. crassipes* L. Koch, 1862 (triangle), *Lamyctes emarginatus* (Newport, 1844), *Geophilus proximus* C.L. Koch, 1847, and *Schendyla nemorensis* (C.L. Koch, 1837) (all square) in Middle Asia, and *Cryptops hortensis* (Donovan, 1810) (star) in Kazakhstan. Yellow color indicates literature data, violet one specifies new data. Abbreviations: Af — Afghanistan, Kg — Kyrgyzstan, Tu — Turkmenistan, Tj — Tajikistan, Uz — Uzbekistan.

Рис. 1. Распространение *Lithobius forficatus* (Linnaeus, 1758) (круг), *L. viriatus* Sseliwanoff, 1881 (ромб), *L. crassipes* L. Koch, 1862 (треугольник), *Lamyctes emarginatus* (Newport, 1844), *Geophilus proximus* C.L. Koch, 1847, and *Schendyla nemorensis* (C.L. Koch, 1837) (все — квадрат) в Средней Азии, а также *Cryptops hortensis* (Donovan, 1810) (звезда) в Казахстане. Желтый цвет обозначает литературные данные, фиолетовый — новые данные. Аббревиатуры: Af — Афганистан, Kg — Киргизстан, Tu — Туркменистан, Tj — Таджикистан, Uz — Узбекистан.

Results

Order Geophilomorpha

REMARKS. This order is new to the fauna of the Gorno-Badakhshan Region of Tajikistan.

Family Geophilidae Leach, 1816
Genus *Geophilus* Leach, 1814

Geophilus proximus C.L. Koch, 1847
Fig. 1.

Geophilus proximus — Vsevolodova-Perel, 2009: 137; Dyachkov, Tuf, 2019: 25; Bragina *et al.*, 2020: 30.

MATERIAL. 3 ♀♀, 1 fragm. (ASU No. 572), Tajikistan, Gorno-Badakhshan Region, Central Pamir, Khorog Botanical Garden, N37°28'38" E71°36'3", in soil, 2260 m a.s.l., 10.VII.2023, coll. AF, YD.

DISTRIBUTION. Northern Palaearctic [Bonato *et al.*, 2005].

REMARKS. This species is new to the fauna of Middle Asia, genus *Geophilus* being new to the fauna of Tajikistan.

Family Schendylidae Cook, 1896

REMARKS. This family is new to the fauna of Tajikistan.

Genus *Schendyla* Bergsøe et Meinert, 1866
Schendyla nemorensis (C.L. Koch, 1837)
Figs 1–6.

MATERIAL. 2 ♀♀ (ASU No. 573), Tajikistan, Gorno-Badakhshan Region, Khorog Botanical Garden, N37°28'38" E71°36'3", in soil, 2260 m a.s.l., 10.VII.2023, coll. AF, YD.

DISTRIBUTION. A European species [Stoev, 2002; Zuev, 2016] known also from North Africa, introduced to North America [Simaiakis *et al.*, 2013] and Middle Asia (present record).

REMARKS. Both the genus *Schendyla* and the species *S. nemorensis* are new to the fauna of Middle Asia.

Order Lithobiomorpha

Family Henicopidae Pocock, 1901
Genus *Lamyctes* Meinert, 1868

Lamyctes emarginatus (Newport, 1844)
Fig. 1.

Lamyctes (*L.*) *emarginatus* — Dyachkov *et al.*, 2016: 439; 2022a: 162.

MATERIAL. 1 ♀ (ASU No. 595), Tajikistan, Gorno-Badakhshan Region, Khorog Botanical Garden, N37°28'22" E71°36'7", in old crumbly tree stub, 2280 m a.s.l., 9–10.VII.2023, coll. YD.

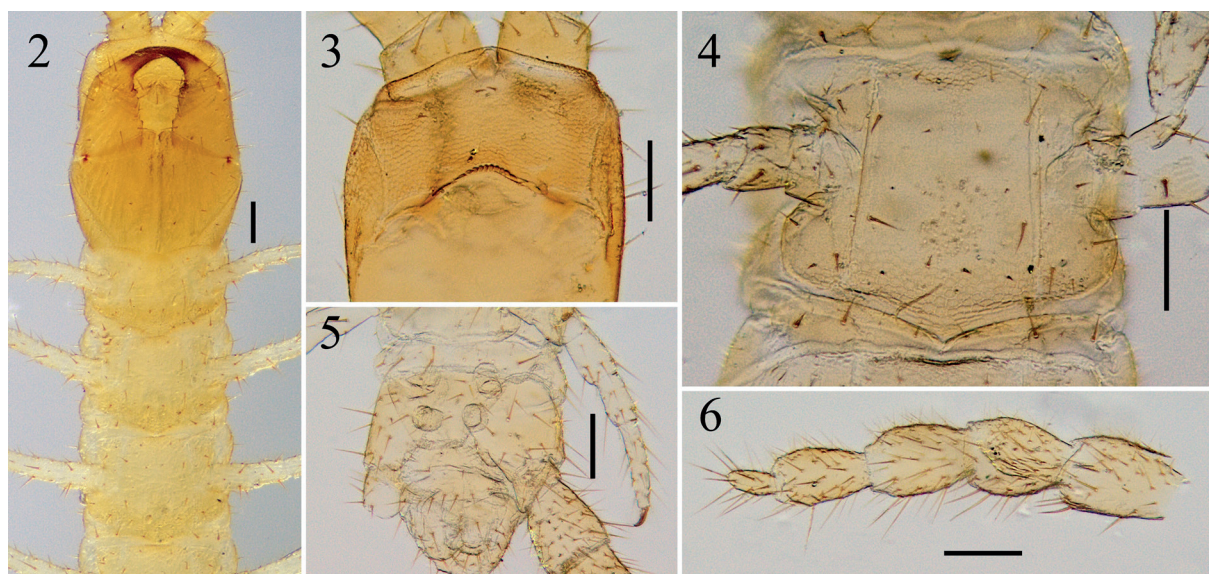
DISTRIBUTION. Originally coming from the Southern Hemisphere, it is presently widespread as anthropochore introductions to Europe, the Near East, North Africa, Siberia, North and South America [Voigtländer, Reip, 2013; Nefediev *et al.*, 2016b].

REMARKS. The genus *Lamyctes* and the species *L. emarginatus* are new to the fauna of Middle Asia.

Family Lithobiidae Newport, 1844
Genus *Lithobius* Leach, 1814

Lithobius (*Monotarsobius*) *crassipes* L. Koch, 1862
Fig. 1.

Monotarsobius crassipes — Verhoeff, 1930: 251; Zaleskaja, 1978: 168.



Figs 2–6. *Schendyla nemorensis* (C.L. Koch, 1837) (ASU No. 573, female), ventrally: 2 — front body fragment; 3 — clypeus and labrum; 4 — some anterior body segment; 5 — rear body fragment; 6 — ultimate leg. Scale: 0.1 mm.

Рис. 2–6. *Schendyla nemorensis* (C.L. Koch, 1837) (ASU No. 573, самка), вентрально: 2 — передняя часть тела; 3 — клипеус и лабрум; 4 — один из передних сегментов тела; 5 — задняя часть тела; 6 — последняя нога. Масштаб: 0,1 мм.

Lithobius (M.) crassipes — Dyachkov *et al.*, 2016: 439; Bragina *et al.*, 2020: 29; Dyachkov *et al.*, 2022a: 172.

MATERIAL. 3 ♂♂, 4 ♀♀ (ASU No. 571), Tajikistan, Gorno-Badakhshan Region, Khorog Botanical Garden, N37°28'22" E71°36'7", in old crumbly tree stub, 2280 m a.s.l., 9–10.VII.2023, coll. YD; 5 ♂♂, 5 ♀♀ (ASU No. 540), Kazakhstan, Almaty Region, Karasay District, Dzhandosova Village, man-made ground, 14.IV.2022, coll. IT; 1 ♂, 1 ♀ (ASU No. 548), near Kayrat Village, man-made ground, 15.IV.2021, coll. IT.

DISTRIBUTION. A western Palaearctic species presently known also from Taiwan and North America [Nefediev *et al.*, 2016b; Dyachkov *et al.*, 2022a, 2022b], as well as Middle Asia: Uzbekistan (Tashkent Region) [Verhoeff, 1930], Kazakhstan (Almaty Region, present record), Tajikistan (Gorno-Badakhshan, present record).

REMARKS. This species is new to the faunas of both Tajikistan and the Almaty Region of Kazakhstan.

Lithobius (Lithobius) forficatus (Linnaeus, 1758)

Fig. 1.

Lithobius (L.) forficatus — Dyachkov, 2019: 14; Bragina *et al.*, 2020: 29; Dyachkov *et al.*, 2022a: 171.

MATERIAL. Kazakhstan, coll. IT: 1 ♂, 1 ♀ (ASU No. 496), Almaty Region, Karasay District, Dzhandosova Village, man-made ground, 25.IV.2022; 1 ♀ (ASU No. 497), Turkistan Region, Aksu District, near Akbulak Village [N42°23' E69°20'], forest belt, 7.XII.2021; 1 ♂ (ASU No. 498), Atyrau Region, Zhylyoi District, near Kulsary City [N46°59' E54°01'], steppe, 12.IV.2022.

DISTRIBUTION. Widespread as anthropochore introductions to North and South America, Greenland, Europe, western Siberia, and Japan [Zalesskaja, 1978; Zuev, Evsyukov, 2016; Prado *et al.*, 2018; Dyachkov *et al.*, 2022a], as well as to Middle Asia: Kazakhstan, the Almaty, Kyzylorda [Dyachkov, 2019], Atyrau and Turkistan regions (present records).

REMARKS. This species is new to the faunas of the Turkistan and Atyrau regions of Kazakhstan.

Order Scolopendromorpha Family Cryptopidae Kohlrausch, 1881 Genus *Cryptops* Leach, 1814

Cryptops hortensis (Donovan, 1810)

Fig. 1.

Cryptops (C.) hortensis — Zalesskaja, Schileyko, 1991: 24; 1992: 368; Dyachkov, 2020: 179.

MATERIAL. 1 ad. (ASU No. 567), Kazakhstan, Almaty Region, Karasay District, near Kayrat Village, man-made ground, 24.IV.2021, coll. IT.

DISTRIBUTION. A Turano-Euro-Mediterranean species [Zalesskaja, Schileyko, 1991, 1992; Stoev, 2000; Dyachkov *et al.*, 2022b] recorded from anthropogenic habitats in Sweden, Finland, Cis-Urals, and western Siberia [Nefediev *et al.*, 2016a; Dyachkov, 2020; Farzaliyeva, Vil'kova, 2023]. Middle Asia: Turkmenistan, Uzbekistan, Tajikistan [Zalesskaja, Schileyko, 1991, 1992], and Kazakhstan [Dyachkov, 2020].

REMARKS. The distribution in Turkmenistan, Uzbekistan, and Tajikistan is shown in Zalesskaja & Schileyko [1992: Fig. 5]. Perhaps this species may be regarded as an anthropochore introduction to Kazakhstan because it has only been recorded from anthropogenic habitats alone.

Conclusions

At least six species from four genera (*Geophilus*, *Schendyla*, *Lamyctes*, and *Lithobius*), four families (Geophilidae, Schendylidae, Henicopidae, and Lithobiidae), and two orders of Chilopoda seem to occur in Middle Asia as anthropochore introductions. Because one more species, *Cryptops hortensis* (Cryptopidae), has been recorded from Kazakhstan in anthropogenic habitats alone, it is considered here as a possible anthropochore introduction.

The genus *Schendyla*, with *S. nemorensis*, the genus *Lamyctes*, with *L. emarginatus*, and *Geophilus proximus*

are all new to the fauna of Middle Asia. The family Schendylidae, the genus *Geophilus* and the species *Lithobius crassipes* are new to the fauna of Tajikistan. The latter species is also new to the Almaty Region of Kazakhstan, while *L. forficatus* is new to the faunas of both Turkistan and Atyrau regions of Kazakhstan. The order Geophilomorpha is new to the fauna of the Gorno-Badakhshan Region of Tajikistan.

Geophilus proximus, *Schendyla nemorensis*, *Lamyctes emarginatus*, and *Lithobius viriatus* are strictly confined to anthropogenic habitats in Middle Asia; *Cryptops hortensis* is known from Kazakhstan from anthropogenic habitats alone, its habitat preferences in other Middle Asian countries being unknown. Both *Lithobius crassipes* and *Lithobius forficatus* have been recorded from semi-natural or natural habitats located close to anthropogenic ones.

Some of these species are also known to occur in areas in Kazakhstan adjacent to Middle Asia. *Lithobius crassipes* and *L. forficatus* are also known from the East Kazakhstan [Dyachkov *et al.*, 2016; Dyachkov, 2019] and Kostanay [Bragina *et al.*, 2020] regions. *Geophilus proximus* has been reported from the East Kazakhstan, Karaganda, West Kazakhstan [Dyachkov, Tuf, 2019] and Kostanay [Bragina *et al.*, 2020] regions.

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