

## New records of millipedes (Diplopoda) from the Caucasus and Crimea

Новые находки двупарноногих многоножек (Diplopoda)  
на Кавказе и в КрымуSergei I. Golovatch  
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КЛЮЧЕВЫЕ СЛОВА: таксономия, фаунистика, распространение

ABSTRACT. The faunistic results of a taxonomic treatment of Diplopoda collected recently in the Caucasus and Crimea are presented. They concern 26 species, 18 genera, eight families and five orders from the Caucasus alone, as well as one more species from Crimea.

РЕЗЮМЕ. Представлены результаты новых фаунистических находок Diplopoda Кавказа и Крыма. Они касаются 26 видов, 18 родов, восьми семейств и пяти отрядов только из Кавказа, а также еще одного вида из Крыма.

## Introduction

Studies on the millipede fauna of the Caucasus have recently received increased attention, including descriptions of new taxa and/or new records [Zuev, 2021; Vagalinski, Golovatch, 2021; Antić, Makarov, 2022; Antić, Turbanov, 2022; Evsyukov *et al.*, 2022; Golovatch, Antipova, 2022; Vagalinski *et al.*, 2023; Zuev *et al.*, 2023; Vagalinski, Evsyukov, in prep.; etc.]. Prompted by the extensive, largely fresh material of Diplopoda I have lately received for study from various parts of the Caucasus, mainly Azerbaijan, as well as two samples from Crimea, I present below their faunistic treatment. Altogether, 26 species, 18 genera, eight families and five orders are involved from the Caucasus alone, as well as one more species from Crimea.

All material is deposited in the Zoological Museum of the State University of Moscow (ZMUM), Russia.

## Faunistic part

Order Glomerida  
Family Glomeridae*Trachysphaera costata* (Waga, 1857)

MATERIAL. 3 ex. (ZMUM), Russia, North Ossetia – Alania, Mayramadag River, *Fagus* forest, rotting wood, 635 m a.s.l., N 43.005312, E 44.486156, 18.V.2023; 1 ex. (ZMUM), North Ossetia – Alania, Russia, near Koban, Gizeldon River,

966 m a.s.l., *Alnus* forest, rotting wood, N 42.917148, E 44.486985, 23.V.2023, all M. Antipova leg.; 1 ex. (ZMUM), Russia, Chechen Republic, Vedeno Distr., Tevzany, N42.985637°, E 45.896675°, bank of Jalka River, *Alnus* floodplain forest, litter, 18.X.2021, K.B. Gongalsky & D.I. Korobushkin leg.

REMARKS. A widespread Eastern European to Eastern Mediterranean species ranging from Central Europe and the Balkan Peninsula in the west, through Ukraine, Crimea, and the Near East, to the entire Caucasus region, including much of Hyrcania in Iran in the east. In the Caucasus, it is known from Armenia, Georgia, Abkhazia and Russia (Adygea, Krasnodar and Stavropol provinces, Kabardino-Balkaria, Ingushetia, Chechnya and Dagestan) [Evsyukov *et al.*, 2022].

Order Chordeumatida

Family Anthroleucosomatidae

*Metamastigophorophyllon martensi* (Mauriès, 1982)

MATERIAL. 4 ♂♂, 1 ♀ (ZMUM), Azerbaijan, Lenkoran, Az-filial, pitfall trapping, IV.2011; 2 juv. (ZMUM), same place, forest litter, 20–21.V.2011; 3 ♂♂, 7 ♀♀ (ZMUM), Azerbaijan, Lenkoran, Apo, pitfall trapping, IV.2014; 3 juv. (ZMUM), Azerbaijan, Astara, Toradi, 13–16.VII.2016; 31 juv. (ZMUM), Azerbaijan, Lenkoran, Byurjali, forest litter, 15.X.2021, all N. Snegovaya leg.

REMARK. A species endemic to Hyrcania within both Iran and the Republic of Azerbaijan [Antić, Makarov, 2016; Golovatch *et al.*, 2022].

*Pseudoflagellophorella papilioformis* Antić et Makarov, 2016

MATERIAL. 3 ♀♀, 9 juv. (ZMUM), Azerbaijan, Gakh, Ilisu, 30.V.–1.VI.2016, N. Snegovaya leg.

REMARK. A species endemic to the eastern half of the Caucasus Major within both Georgia and Azerbaijan [Antić, Makarov, 2016].

Order Julida

Family Blaniulidae

*Nopoiulus kochii* (Gervais, 1847)

MATERIAL. 2 ♂♂, 1 ♀ (ZMUM), Russia, North Caucasus, Kislovodsk, pitfall trapping, 21.V.–3.VI.2023, A. Matyukhin leg. 1 juv. (ZMUM), Azerbaijan, Apsheron Peninsula,

Mardakian, 4–16.X.2002; 1 ♀ (ZMUM), Azerbaijan, Lenkoran, Byurjali, forest litter, 15.X.2021, all N. Snegovaya leg.

REMARK. This subcosmopolitan species is widespread across the entire Caucasus region, being encountered in various habitats, both man-made and natural [Golovatch, Enghoff, 1990].

*Nopoiulus martensi* Enghoff, 1984

MATERIAL. 1 ♂, 1 ♀ (ZMUM), Azerbaijan, Lenkoran, Apo, pitfall trapping, IV.2014; 11 ♂♂, 37 ♀♀ (ZMUM), Azerbaijan, Astara, Motlayatag, V.2019, all N. Snegovaya leg.

REMARK. A species endemic to Hyrcania within both Iran and the Republic of Azerbaijan [Enghoff, 1984, 1990; Golovatch *et al.*, 2022].

Family Julidae

*Byzantorhopalum rossicum* (Timotheew, 1897)

MATERIAL. 16 ♂♂, 8 ♀♀, 4 juv. (ZMUM), Russia, North Caucasus, Kislovodsk, pitfall trapping, 21.V–3.VI.2023, A. Matyukhin leg.

REMARK. A very common species subendemic to the Eastern European, or Russian, Plain, ranging from near Kursk, Russia in the north, Lugansk, in the west, Samara and Volgograd in the east, and throughout the Caucasus Major within Russia, Georgia and Azerbaijan in the south [Vagalinski, Golovatch, 2021].

*Cylindroiulus placidus* (Lignau, 1903)

MATERIAL. 7 ♂♂, 11 ♀♀, 2 juv. (ZMUM), Azerbaijan, Gakh, Ilisu, 30.V–1.VI.2016, N. Snegovaya leg.

REMARK. Endemic to the western Caucasus, widespread, ranging from the Krasnodar Province in the north to Abkhazia and southern Georgia in the south, and from the

Black Sea coast in the west to North Ossetia – Alania in the east [Read, 1992; Golovatch, Antipova, 2022]. Above seems to be the easternmost record of this species, also being new to the fauna of Azerbaijan.

*Cylindroiulus ruber* (Lignau, 1903)

MATERIAL. 5 ♂♂, 8 ♀♀, 1 juv. (ZMUM), Russia, Caucasus Major, Republic of Kabardino-Balkaria, near Arkhyz, ca 8 km upstream Arkhyz River valley from Arkhyz, Sofiyskie Vershiny, 43.54322°N, 41.20475°E, 1727–1730 m a.s.l., steep slope, edge of *Abies* forest with *Populus*, sifting dead leaves and needles, 2 & 4.VI.2023; 2 ♂♂, 2 ♀♀ (ZMUM), same place, 43.54483°N 41.20662°E, 1730 m a.s.l., mixed *Abies*, *Pinus*, *Fagus* & *Sorbus* forest near spring, herbage, sifting litter, 3.VI.2023; 3 ♂♂, 1 ♀ (ZMUM), same place, 43.54504°N 41.20756°E, 1753 m a.s.l., mixed *Abies*, *Fagus*, *Sorbus* forest on terrace, herbage with fern, cereals, etc., spots of green mosses, sifting mosses and litter, 3.VI.2023; 1 ♂, 1 ♀ (ZMUM), Republic of Kabardino-Balkaria, ca 17 km upstream Arkhyz River valley from Arkhyz, near confluence of Dukka and Arkhyz rivers, *Abies* forest with *Betula*, *Quercus*, *Sorbus*, *Corylus*, sparse herbage with fern, green mosses, sifting mosses, 43.55702°N 41.12487°E, 1830 m a.s.l., 8.VI.2023, all A. Tanasevitch leg.

REMARK. Endemic to the western Caucasus: Krasnodar and Stavropol provinces, as well as the republics of Kabardino-Balkaria, Russia and Abkhazia [Read, 1992; Evsyukov *et al.*, 2022].

*Cylindroiulus treptoflagellum* Read, 1992

MATERIAL. 2 ♂♂, 1 ♀ (ZMUM), Azerbaijan, Lenkoran, Azfilial, pitfall trapping, IV.2011; 18 ♂♂, 7 ♀♀, 1 juv. (ZMUM),

same place, forest litter, 20–21.V.2011; 1 ♂, 1 ♀ (ZMUM), Azerbaijan, Lenkoran, Apo, pitfall trapping, IV.2012; 1 ♂ (ZMUM), same place, pitfall trapping, VIII.2012; 2 ♂♂, 1 ♀ (ZMUM), same place, pitfall trapping, IV.2014; 2 ♂♂, 1 juv. (ZMUM), Azerbaijan, Astara, Toradi, 13–16.VII.2016; 6 ♂♂, 8 ♀♀, 7 juv. (ZMUM), Azerbaijan, Astara, Motlayatag, V.2019; 23 ♂♂, 28 ♀♀ (ZMUM), Azerbaijan, Lenkoran, Byurjali, forest litter, 15.X.2021, all N. Snegovaya leg.

REMARK. A species endemic to Hyrcania within both Iran and the Republic of Azerbaijan [Read, 1992; Golovatch *et al.*, 2022].

*Iraniulus fagorum* (Attems, 1951)

MATERIAL. 2 ♀♀ (ZMUM), Azerbaijan, Lenkoran, Azfilial, pitfall trapping, VI–VII.2019; 2 juv. (ZMUM), same place, forest litter, 20–21.V.2011; 1 ♂, 4 ♀♀, 1 juv. (ZMUM), Azerbaijan, Lenkoran, Apo, pitfall trapping, IV.2014; 1 juv. (ZMUM), same place, pitfall trapping, IV.2014; 1 ♀, 7 juv. (ZMUM), Azerbaijan, Astara, Toradi, 13–16.VII.2016; 2 ♀♀ (ZMUM), Azerbaijan, Lenkoran, Byurjali, forest litter, 15.X.2021, all N. Snegovaya leg.

REMARK. A species endemic to Hyrcania within both Iran and the Republic of Azerbaijan [Vagalinski, Golovatch, 2021].

*Julus kubanus* Verhoeff, 1921

MATERIAL. 5 ♂♂, 8 ♀♀ (ZMUM), Russia, Caucasus Major, Republic of Kabardino-Balkaria, environs of Arkhyz, ca 8 km upstream Arkhyz River valley from Arkhyz, Sofiyskie Vershiny, 43.54322°N 41.20475°E, 1727–1730 m a.s.l., steep slope, edge of *Abies* forest with *Populus*, sifting dead leaves and needles, 2 & 4.VI.2023; 2 ♀♀ (ZMUM), Republic of Kabardino-Balkaria, environs of Nizhniy Arkhyz, *Fagus* forest on slope with *Quercus*, *Acer*, *Sorbus*, *Corylus*, etc., sifting dead leaves and litter, 43.67678°N 41.44228°E, 1231 m a.s.l., 6.VI.2023; 5 ♂♂, 15 ♀♀ (ZMUM), Republic of Kabardino-Balkaria, ca 17 km upstream Arkhyz River valley from Arkhyz, near confluence of Dukka and Arkhyz rivers, *Abies* forest with *Betula*, *Quercus*, *Sorbus*, *Corylus*, sparse herbage with fern, green mosses, sifting mosses, 43.55702°N 41.12487°E, 1830 m a.s.l., 8.VI.2023 all leg. A. Tanasevitch.

REMARK. A widespread species ranging from lowlands to above 2000 m a.s.l. and endemic to the northwestern Caucasus: Krasnodar Province, Adygea, Karachaevo-Cherkessia and North Ossetia – Alania republics, and Abkhazia [Evsyukov *et al.*, 2018; Zuev *et al.*, 2023].

*Leptoiulus hastatus* Lohmander, 1932

MATERIAL. 1 ♂ (ZMUM), Azerbaijan, Kedabek, near Novosaratovka, 6.X.2015, N. Snegovaya leg.

REMARK. A species widespread across most of the Caucasus, both the Caucasus Major and Caucasus Minor: Georgia, Armenia and Azerbaijan [Evsyukov *et al.*, 2020].

*Leptoiulus tanymorphus* (Attems, 1901)

MATERIAL. 1 ♀ (ZMUM), Azerbaijan, Lenkoran, Apo, pitfall trapping, IV.2012; 1 ♂, 2 ♀♀ (ZMUM), same place, pitfall trapping, IV.2014; 5 ♂♂, 5 ♀♀, 1 juv. (ZMUM), Azerbaijan, Kedabek, near Novoivanovka, 26.VI.2014; 1 ♂, 4 ♀♀ (ZMUM), Azerbaijan, Siazan, Galaalty, 18–20.V.2017; 9 ♂♂, 17 ♀♀, 13 juv. (ZMUM), Azerbaijan, Gakh, Ilisu, 30.V–1.VI.2016; 4 ♂♂, 4 ♀♀, 4 juv. (ZMUM), Azerbaijan, Apsheron Peninsula, Mardakian, 4–16.X.2002; 1 ♂, 4 ♀♀, 4 juv. (ZMUM), Azerbaijan, Kedabek, near Novoivanovka, forest litter, 6–7.X.2015; 3 ♀♀

(ZMUM), Azerbaijan, Astara, Motlayatag, V.2019; 1 ♀ (ZMUM), Azerbaijan, Lenkoran, Byurjali, forest litter, 15.X.2021; 1 ♂, 1 ♀ (ZMUM), Azerbaijan, Nakhichevan Republic, Shakhbuz, Lake Batabat, 27.V.2022, all N. Snegovaya leg.

REMARK. A widespread species known yet only across much of Azerbaijan, within both Caucasus Major and Hyrcania [Evsyukov *et al.*, 2021].

*Megaphyllum tauricum* (Attems, 1907)

MATERIAL. 2 ♀♀ (ZMUM), Russia, Crimea, environs of Orlioe, 44.42589°N, 33.7863°E, 349 m a.s.l., *Quercus* forest with *Fagus* on steep slope, sifting dead leaves and litter, 26.V.2023; 2 ♂♂ (ZMUM), same place, 44.423870°N, 33.785790°E, 420 m a.s.l., *Quercus* forest with *Fagus* on slope, sifting dead leaves and litter, 28.V.2023, all leg. A. Tanasevitch.

REMARK. A species endemic to Crimea [Vagalinski, Lazányi, 2018].

*Omobrachiulus caucasicus* (Karsch, 1881)

MATERIAL. 2 ♂♂, 3 ♀♀, 2 juv. (ZMUM), Russia, North Ossetia – Alania, Russia, near Koban, Gizeldon River, 966 m a.s.l., *Alnus* forest, rotting wood, N 42.917148, E 44.486985, 23.V.2023; 1 juv. (ZMUM), Russia, North Ossetia – Alania, Skalistyi Mt. Range, Koban Gorge, 1175 m a.s.l., vegetation on rock, N 42.887752, E 44.453964, 22.V.2023; 3 ♂♂, 1 juv. (ZMUM), North Ossetia – Alania, Mayramadag River, *Fagus* forest, rotting wood, 635 m a.s.l., N 43.005312, E 44.486156, 18.V.2023, all M. Antipova leg.; 1 ♂, 2 ♀♀ (ZMUM), Azerbaijan, Khachmas, Nabran, pitfall trapping, V–VI.2010; 9 ♂♂, 3 ♀♀ (ZMUM), Azerbaijan, Kuba, pitfall trapping, IV.2011; 1 ♀ (ZMUM), Azerbaijan, Kedabek, near Novoivanovka, 26.VI.2014; 7 ♂♂, 12 ♀♀, 10 juv. (ZMUM), Azerbaijan, Shemakha, Pirkuli, pitfall trapping, X.2011, all N. Snegovaya leg.

REMARKS. Perhaps the most common and widespread subendemic Caucasian species [Vagalinski, Golovatch, 2021]. New to the fauna of North Ossetia – Alania, occurring there in its northern parts.

*Omobrachiulus macrourus* (Lohmander, 1928)

MATERIAL. 1 ♀, 1 juv. (ZMUM), Russia, Chechen Republic, Vedeno Distr., Tevzany, N 42.985637°, E 45.896675°, bank of Jalka River, *Alnus* floodplain forest, litter, 18.X.2021, K.B. Gongalsky & D.I. Korobushkin leg.

REMARKS. This Caucasian endemic species has been found in Abkhazia, Russia (Kabardino-Balkaria and Chechnya) and most of Georgia [Vagalinski, Golovatch, 2021; Evsyukov *et al.*, 2022], thus being new to the fauna of North Ossetia – Alania [cf. Golovatch, Antipova, 2022].

*Ommatoiulus caspius* (Lohmander, 1928)

MATERIAL. 1 juv. (ZMUM), Azerbaijan, Lenkoran, Azfilial, pitfall trapping, VI–VII.2019; 2 ♀♀ (ZMUM), Azerbaijan, Lenkoran, Byurjali, Azfilial, 13–14.X.2021, all N. Snegovaya leg.

REMARK. A species endemic to Hyrcania within both Iran and the Republic of Azerbaijan [Golovatch *et al.*, 2022].

*Rossiulus kessleri* (Lohmander, 1927)

MATERIAL. 19 ♂♂, 29 ♀♀, 8 juv. (ZMUM), Russia, North Caucasus, Kislovodsk, pitfall trapping, 21.V–3.VI.2023, A. Matyukhin leg.

REMARK. A very common species subendemic to the Eastern European, or Russian, Plain, ranging from near Arkhangelsk, Russia in the north, Minsk, Belarus in the west, northern Caucasus, Russia in the south, and the middle and southern Volga River regions (Tatarstan, Bashkortostan, Ulyanovsk, Saratov) in the east [Golovatch, 1984; Golovatch, Antipova, 2022].

*Unciger kubanus* Lohmander, 1936

MATERIAL. 1 ♂, 1 ♀ (ZMUM), Russia, North Caucasus, Kislovodsk, pitfall trapping, 21.V–3.VI.2023, A. Matyukhin leg.

REMARK. This species seems to be endemic to the north-western Caucasus [Vagalinski, Evsyukov, in preparation].

Family Nemasomatidae

*Nemasoma caucasicum* (Lohmander, 1932)

MATERIAL. 2 ♂♂, 3 ♀♀ (ZMUM), Russia, North Ossetia – Alania, Mayramadag River, *Fagus* forest, rotting wood, 635 m a.s.l., N 43.005312, E 44.486156, 18.V.2023; 1 ♀ (ZMUM), North Ossetia – Alania, Russia, near Koban, Gizeldon River, 966 m a.s.l., *Alnus* forest, rotting wood, N 42.917148, E 44.486985, 23.V.2023, all M. Antipova leg.

REMARK. A species subendemic to the Caucasus, having been recorded from Russia, Georgia, Azerbaijan, Armenia and Turkey. In the northern Caucasus, it has hitherto been found in the Stavropol and Krasnodar territories, as well as the republics of North Ossetia–Alania, Karachay-Cherkessia and Dagestan [Golovatch, Antipova, 2022; Zuev *et al.*, 2023]. Usually, it occurs under the bark of trees and in rotting wood.

Order Polydesmida

Family Paradoxosomatidae

*Strongylosoma kordylamythrum* Attems, 1898

MATERIAL. 2 ♀♀ (ZMUM), Russia, Caucasus Major, Republic of Kabardino-Balkaria, near Arkhyz, ca 8 km upstream Arkhyz River valley from Arkhyz, Sofiyskie Vershiny, 43.54483°N 41.20662°E, 1730 m a.s.l., mixed *Abies*, *Pinus*, *Fagus* & *Sorbus* forest near spring, herbage, sifting litter, 3.VI.2023; 1 ♂, 1 ♀ (ZMUM), Republic of Kabardino-Balkaria, ca 17 km upstream Arkhyz River valley from Arkhyz, near confluence of Dukka and Arkhyz rivers, *Abies* forest with *Betula*, *Quercus*, *Sorbus*, *Corylus*, sparse herbage with fern, green mosses, sifting mosses, 43.55702°N 41.12487°E, 1830 m a.s.l., 8.VI.2023, all A. Tanasevitch leg.

REMARK. A widespread Caucasian subendemic species recorded from Turkey, Russia, Georgia, Armenia, Azerbaijan and Iran [Evsyukov *et al.*, 2016].

*Strongylosoma lenkoranum* Attems, 1898

MATERIAL. 3 ♂♂, 4 ♀♀ (ZMUM), Azerbaijan, Khachmas, Nabran, pitfall trapping, V–VI.2010; 4 ♂♂, 1 ♀ (ZMUM), Azerbaijan, Lenkoran, Azfilial, pitfall trapping, IV.2011, all N. Snegovaya leg.

REMARK. A species subendemic to the eastern Caucasus, mostly Hyrcania within both Iran and the Republic of Azerbaijan [Evsyukov *et al.*, 2016].

Family Polydesmidae

*Brachydesmus kalischewskyi* Lignau, 1915

MATERIAL. 3 ♀♀ (ZMUM), Azerbaijan, Kuba, pitfall trapping, IV.2011; 3 ♂♂, 5 ♀♀, 10 juv. (ZMUM), Azerbaijan, Lenkoran, Azfilial, pitfall trapping, IV.2011; 7 juv. (ZMUM), same



place, forest litter, 20–21.V.2011; 4 ♂♂, 7 ♀♀ (ZMUM), Azerbaijan, Lenkoran, Apo, pitfall trapping, IV.2014; 24 juv. (ZMUM), Azerbaijan, Lenkoran, Byurjali, forest litter, 15.X.2021; 48 ♂♂, 2 ♀♀ (ZMUM), Azerbaijan, Shemakha, Pirkuli, pitfall trapping, X.2011; 1 juv. (ZMUM), Azerbaijan, Astara, Toradi, 13–16.VII.2016; 1 ♂ (ZMUM), Azerbaijan, Kedabek, near Novoivanovka, forest litter, 6–7.X.2015, all N. Snegovaya leg.

REMARKS. A polymorphous species subendemic of the Caucasus region, this

being very common and highly widespread in the Russian Caucasus, Azerbaijan, Georgia,

Armenia, eastern Turkey and northwestern Iran [Golovatch *et al.*, 2016; Evsyukov *et al.*, 2022].

#### *Polydesmus abchasius* Attems, 1898

MATERIAL. 1 ♂, 4 ♀♀ (ZMUM), Russia, Caucasus Major, Republic of Kabardino-Balkaria, near Arkhyz, ca 8 km upstream Arkhyz River valley from Arkhyz, Sofiyskie Vershiny, 43.54322°N, 41.20475°E, 1727–1730 m a.s.l, steep slope, edge of *Abies* forest with *Populus*, sifting dead leaves and needles, 2 & 4.VI.2023, A. Tanasevitch leg.

REMARK. A common species widespread in and endemic to the Colchidan part of the Caucasus [Golovatch *et al.*, 2016; Evsyukov *et al.*, 2022].

#### *Polydesmus muralewiczii* Lohmander, 1936

MATERIAL. 2 ♀♀, 2 juv. (ZMUM), Russia, North Caucasus, Kislovodsk, pitfall trapping, 21.V.–3.VI.2023, A. Matyukhin leg.

REMARK. An uncommon species endemic to the northwestern Caucasus [Golovatch *et al.*, 2016].

#### Order Platydesmida

#### Family Andrognathidae

#### *Fioria hyrcana* Golovatch, 1980

MATERIAL. 2 ♂♂, 2 ♀♀ (ZMUM), Azerbaijan, Astara, Motlayatag, V.2019; 1 ♂ (ZMUM), Azerbaijan, Astara, Toradi, 13–16.VII.2016, all N. Snegovaya leg.

REMARK. A species endemic to Hyrcania within both Iran and the Republic of Azerbaijan [Golovatch *et al.*, 2021; Golovatch *et al.*, 2022].

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