Georgiev, D., Bechev, D. & Yancheva, V. (Eds.)
Fauna of Sarnena Sredna Gora Mts, Part 1
ZooNotes, Supplement 9, 2020

Protura records in Sarnena Gora Mountains

JULIA SHRUBOVYCH[1, 2, 3], DILIAN GEORGIEV[4]

[1]Institute of Systematics and Evolution of Animals, Polish Academy of Science, Sławkowska 17, Pl 31-016 Krakow, Poland; [2]State Museum of Natural History, Ukrainian Academy of Sciences, Teatral'na St. 18, UA 79008 Lviv, Ukraine; [3]Institute of Soil Biology, Biology Centre, Czech Academy of Sciences, Na Sádkách 7, 370 05 České Budějovice, Czech Republic
[4]Department of Ecology and Environmental Conservation, University of Plovdiv, Tzar Assen Str. 24, BG-4000 Plovdiv, Bulgaria, email: diliangeorgiev@abv.bg

Abstract. Six species of Protura, *Acerentulus bulgaricus, Acerentulus exiguus, Acerentulus xerophilus, Acerella muscorum, Eosentomon longisquamum* and *Eosentomon zodion*, were collected from Sarnena Gora Mountains. The species *Acerentulus exiguus, Acerentulus xerophilus, Eosentomon longisquamum, Eosentomon zodion* and recently described *Acerentulus bulgaricus,* are new records for Bulgarian proturan fauna. The Proturan fauna of Bulgaria now includes eleven species.

Key words: Hexapoda, soil organisms, distribution.

Introduction

There are only few records of Protura from Bulgaria (Szeptycki 2007). Nosek (1961, 1973) recorded from Bulgaria *Acerentulus confinis* (Berlese, 1908), *Acerella muscorum* (Ionescu, 1930), *Acerella remyi* (Condé, 1944) and *Eosentomon transitorium* Berlese, 1908. Palissa (1964) recorded *Acerentulus gisini* Condé, 1952 and Szeptycki (2005) identified *Acerentulus traegardhi* Ionesco, 1937 from Bulgaria. From Sarnena Gora Mountains only one recently described species *Acerentulus bulgaricus* Shrubovych, 2019 is known (Shrubovych *et al.* 2019).

Material and Methods

The materials, 54 specimens of Protura, were collected during 2017-2018 years from Sarnena Gora Mountains as soil and detritus samples, and separated in Berlese traps by D. Georgiev. Specimens were mounted on glass slides in Faure's medium and identification was made by Julia Shrubovych. The materials were deposited at the Institute of Systematics and and Evolution of Animals, Polish Academy of Science.

Results

From Sarnena Gora Mountains we examined six proturan species, which belong to two orders, two families and three genera, including recently described species *Acerentulus bulgaricus*. Practically all from them, *Acerentulus exiguus* Condé, 1944, *Acerentulus*

xerophilus Szeptycki, 1979, *Eosentomon longisquamum* Szeptycki, 1986, *Eosentomon zodion* Szeptycki, 1985 and *Acerentulus bulgaricus,* are new records for Bulgarian fauna of Protura. The Proturan fauna of Bulgaria now includes eleven species.

Check-list of Protura from Sarnena Gora Mountains.

Order: **Acerentomata**
Fam.: **Acerentomidae** Silvestri, 1907

Genus ***Acerella*** Berlese, 1909

***Acerella muscorum* (Ionesco, 1930)**

Material examined: 4.06.2017, 1 female, Sarnena Gora Mountains, W of Kolena village, *Pinus nigra* plantation, detritus of *P. nigra*, 42°28'58.8'' N, 25°42'18.4'' E, 319 m elev.; 24.02.2018, 12 females and 5 males, Sarnena Gora Mountains, between villages of Lyulyak and Shanovo, *Quercus* sp. forest among rocks, 42°31'44.63'' N, 25°39'01.82'' E, 460 m elev.; 20.03.2018, 3 females, Zmeyova Dupka Cave, 42°30'30.33"N 25°38'5.26"E, 659 m elev..

Ecology. This species prefers forest ecosystems (Nosek 1973, Shrubovych 2006, 2010).

Distribution in Europe. Germany (Szeptycki 2005), Austria, Bosnia and Herzegovina, Bulgaria, Czech Republic, France, Greece, Hungary, Italy, Poland, Sardinia, Slovakia, Spain, Switzerland and Ukraine (Szeptycki 2007), Serbia (Blesić and Mitrovski-Bogdanović 2012); Romania (Shrubovych and Fiera 2016).

Distribution in Bulgaria. This species was known from Rhodope Mountains (district Plovdiv): mixed, beech-oak and hornbeam-oak forests, and from Šipka Mtountain: beech forest (Nosek 1961).

Genus ***Acerentulus*** Berlese, 1908

***Acerentulus bulgaricus* Shrubovych, 2019**

Published for the area by Shrubovych *et al.* (2019): "2 females, Bulgaria, Sarnena Gora Mountains, near Kolena village, bank of stream, soil and detritus in roots of *Alnus glutinosa* (L.) Gaerth., 42°29'62"N, 25°41'28.61"E, 300 m elev., 15.VI.2017, coll. D. Georgiev; 1 maturus junior, 1 larva II, Sarnena Gora Mountains, near Kolena village, *Pinus nigra* J. F. Arnold., soil and detritus, 42°24'03.1"N, 25°34'09.8"E, 296 m elev., 6.VI.2017, coll. D. Georgiev."

Remarks. New record for the Bulgarian fauna.

***Acerentulus exiguus* Condé, 1944**

Material examined: 6.03.2018, 1 female and 1 male, Sarnena Gora Mountains, S slope of Medven Hill, S of Kolena village, 42°27'03.4''N, 25°43'48.2''E, 221 m elev.; 24.02.2018, 2 females, 2 males, 1 maturus junior and 1 larva II, Sarnena Gora Mountains, between villages of Lyulyak and Shanovo, *Quercus* sp. forest among rocks, 42°31'44.63'' N, 25°39'01.82'' E, 460 m elev.; 20.03.2018, 1 female and 3 maturus juniors, Sarnena Gora Mountains, Zmeyova Dupka Cave, 42°30'30.33"N 25°38'5.26"E, 659 m elev.

Ecology. Eurytopic species; abundant in soil, litter, mosses, decaying wood and plant–debris of forests, meadows, xerothermic grasslands and shrubs on rocks (Szeptycki 1991, Shrubovych 2010).

Distribution in Europe. Greek mainland and Ukraine (Szeptycki 2005); Austria, Bosnia and Herzegovina, Corsica, Czech Republic, France, Germany, Poland, Sardinia,

Slovakia (Szeptycki 2007); Serbia (Blesić and Mitrovski-Bogdanović 2012); Romania (Shrubovych and Fiera 2016).

Remarks. New record for the Bulgarian fauna.

***Acerentulus xerophilus* Szeptycki, 1979**

Material examined: 20.03.2018, 3 females and 3 maturus juniors, Sarnena Gora Mountains, Zmeyova Dupka Cave, 42°30'30.33"N 25°38'5.26"E, 659 m elev.

Ecology. Xerophilous species; reported from soil and litter of forests, meadow-steppes, dry grasslands and city squares (Szeptycki 1991, Shrubovych 2010).

Distribution in Europe. Poland and Ukraine (Szeptycki 2007, Shrubovych 2010), Serbia (Blesić and Mitrovski-Bogdanović 2012); Romania (Shrubovych and Fiera 2016).

Remarks. New record for the Bulgarian fauna.

Order: **Eosentomata**

Fam.: **Eosentomidae** Berlese, 1909

Genus ***Eosentomon*** Berlese, 1908

E. longisquamum Szeptycki, 1986

Material examined: 15.06.2017, 1 female and 1 male, Sarnena Gora Mountains, near Kolena village, broad leaf forest on a bank of stream, soil and detritus in roots of *Alnus glutinosa* (L.) Gaerth., 42°29'62"N, 25°41'28.61"E, 300 m elev.

Ecology. This species prefers forest and urban park ecosystems (Szeptycki 1986, Christian and Szeptycki 2004).

Distribution in Europe. Poland and Austria (Szeptycki 2007)

Remarks. New record for the Bulgarian fauna.

***Eosentomon zodion* Szeptycki, 1985**

Material examined: 24.02.2018, 4 females, 3 males and 2 maturus juniors, Sarnena Gora Mountains, between villages of Lyulyak and Shanovo, *Quercus* sp. forest among rocks, 42°31'44.63'' N, 25°39'01.82'' E, 460 m elev.

Ecology. This species prefers meadow ecosystems (Szeptycki 1985, Shrubovych 2006).

Distribution in Europe. Poland and Ukraine (Szeptycki 2007, Shrubovych 2010).

Remarks. New record for the Bulgarian fauna.

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