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# Earthworm (Clitellata: Lumbricidae) records from Belasitsa Mts

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**Abstract**. The research is a contribution to the knowledge of earthworm diversity in the Belasitsa Mountains (Bulgaria). This study presents new records of three taxa: *Dendrobaena misirlioglui* Csuzdi & Szederjesi, 2023, *D. hortensis* (Michaelsen, 1890), and *Cernosvitovia rebeli* (Rosa, 1897), which are registered for the first time from the Belasitsa Mts. The paper also provided information about the earthworm diversity of this region.

**Keywords**: earthworms, Lumbricidae, Bulgaria.

## Introduction

Belasitsa is a mountain range in Southeastern Europe, shared by northeastern Greece, southeastern North Macedonia and southwestern Bulgaria. The mountain is about 60 km long and 7 to 9 km wide and is situated just northeast of Dojran Lake. The highest point is Radomir at 2,031 m. The earthworm fauna from Belasitsa Mts was investigated by Černosvitov (1934), Plisko (1963), Šapkarev (1986), Duhlinska (1988) and Valchovski (2016).

## Materials and methods

Investigations were carried out during 2022 and 2025. Earthworms were collected by the diluted formaldehyde method (Raw 1959). The specimens were killed in 70% ethanol, fixed in 4% formalin solution and then in 70% ethanol. Localities in the Belasitsa Mts were investigated during this research.

## Results

**Family Lumbricidae Rafinesque-Schmaltz, 1815**

***Cernosvitovia rebeli* (Rosa, 1897)**

*Allolobophora rebeli* Rosa, 1897: 2.
*Octolasium rebeli*: Černosvitov 1934: 77.; Mihailova 1966: 194.
*Cernosvitovia rebeli*: Valchovski 2012: 91; Szederjesi 2013: 78.
2 ex. Luda Mara River, 41°22'00"N, 23°12'40"E, 460 m, leg. T. Teofilova, N. Kodzhabashev.

***Dendrobaena misirlioglui* Csuzdi & Szederjesi, 2023**

*Eisenia alpina* f. *typica*: Černosvitov 1937: 80; Mihailova 1966: 185.
*Dendrobaena alpina*: Plisko 1963: 437; Šapkarev 1986: 80; Valchovski 2012: 91.
*Dendrobaena alpina alpina*: Szederjesi 2013: 78.
3 ex. Luda Mara River, 41°22'00"N, 23°12'40"E, 460 m, leg. T. Teofilova, N. Kodzhabashev.

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***Dendrobaena byblica* (Rosa, 1893)**
*Allolobophora* (*Dendrobaena*) *byblica* Rosa, 1893: 4.
*Dendrobaena ganglbaueri* var. *bulgarica* Černosvitov, 1937: 84.
*Dendrobaena byblica*: Plisko 1963: 437; Šapkarev 1986: 79; Stojanović *et al.* 2012: 9.
*Dendrobaena byblica byblica*: Szederjesi 2013: 79.
2 ex. Kolarovo village., 41°21'17''N, 23°07'32''E, 690 m, near, leg. T. Teofilova, N. Kodzhabashev

***Dendrobaena hortensis* (Michaelsen, 1890)**
*Allolobophora subrubicunda var. hortensis* Michaelsen, 1890: 15.
*Dendrobaena veneta var. hibernica f. typica*: Mihailova 1966: 187.
*Dendrobaena hortensis*: Valchovski 2012: 92; Szeserjesi 2013: 79.
2 ex. Luda Mara River, 41°22'00"N, 23°12'40"E, 460 m, leg. T. Teofilova, N. Kodzhabashev; 1 ex. Kolarovo village., 41°21'17''N, 23°07'32''E, 690 m, near, leg. T. Teofilova, N. Kodzhabashev; 3 ex. , Dolo River, Skrat vill., 41°21'23"N, 23°00'03"E, 650 m, leg. T. Teofilova, N. Kodzhabashev

***Dendrobaena octaedra* (Savigny, 1826)**
*Enterion octaedrum* Savigny, 1826: 183.
*Dendrobaena octaedra*: Plisko 1963: 435; Šapkarev 1986: 79.
1 ex. Kolarovo vill., 41°21'02''N, 23°08'05''E, 666 m, leg. T. Teofilova, N. Kodzhabashev.

***Dendrodrilus rubidus rubidus* (Savigny, 1826)**
*Enterion rubidum* Savigny, 1826: 182.
*Dendrodrilus rubidus*: Perel 1979: 200.
*Dendrobaena rubida*: Plisko 1963: 434.
*Bimastus tenuis*: Mihailova 1966: 192.
*Dendrodrilus rubudus rubidus*: Šapkarev 1986: 79.
3 ex., Dolo River, Skrat vill., 41°21'23"N, 23°00'03"E, 650 m, leg. T. Teofilova, N. Kodzhabashev.

***Eisenia lucens* (Waga, 1857)**
*Lumbricus lucens* Waga, 1857: 161–227.
*Eisenia submontana* (Vejdovský): Černosvitov 1934: 71; Mihailova 1966: 184.
*Eisenia lucens*: Plisko 1963: 428; Šapkarev 1986; Szederjesi 2013: 80; Valchovski 2014: 4.
2 ex. Leshnishka River, 41°20'59"N, 23°10'46"E, 1070 m, leg. T. Teofilova, N. Kodzhabashev; 1 ex. Kolarovo vill., 41°21'02''N, 23°08'05''E, 666 m, leg. T. Teofilova, N. Kodzhabashev; 2 ex. Luda Mara River, 41°22'00"N, 23°12'40"E, 460 m, leg. T. Teofilova, N. Kodzhabashev.

***Eiseniella tetraedra* (Savigny, 1826)**
*Enterion tetraedrum* Savigny, 1826: 184.
*Eiseniella tetraedra* f. *typica*: Mihailova 1966: 182.
*Eiseniella tetraedra tetraedra*: Šapkarev 1986: 84; Stojanović *et al.* 2012: 9;
*Eiseniella tetraedra*: Plisko 1963: 433.
5 ex. Kolarovo vill., 41°21'17''N, 23°07'32''E, 690 m, leg. T. Teofilova, N. Kodzhabashev;

***Lumbricus rubellus* Hoffmeister, 1843**
*Lumbricus rubellus* Hoffmeister, 1843: 187; Plisko 1963: 438; Mihailova 1966: 194; Šapkarev 1986: 85; Stojanović *et al.* 2012: 9; Valchovski 2014: 5.

1 ex. Kolarovo vill., 41°21'02''N, 23°08'05''E, 666 m, leg. T. Teofilova, N. Kodzhabashev; 2 ex. Kolarovo village, 41°21'17''N, 23°07'32''E, 690 m, near, leg. T. Teofilova, N. Kodzhabashev.

***Octolasion lacteum* (Örley, 1881)**

*Lumbricus terrestris var. lacteum* Örley, 1881: 584.

*Octolasium lacteum*: Černosvitov 1934: 76., Plisko 1963:432; Mihailova 1966: 193.

*Octolasion lacteum*: Šapkarev 1986: 84; Szederjesi 2013: 81; Valchovski 2014: 6.

1 ex. Luda Mara River, 41°22'00"N, 23°12'40"E, 460 m, leg. T. Teofilova, N. Kodzhabashev; 2 ex. Kolarovo village, 41°21'17''N, 23°07'32''E, 690 m, near, leg. T. Teofilova, N. Kodzhabashev.

## Discussion

Three taxa are found for the first time in the explored region. *Dendrobaena misirlioglui* Csuzdi & Szederjesi, 2023, *Dendrobaena hortensis* (Michaelsen, 1890) and *Cernosvitovia rebeli* (Rosa, 1897), which are registered for the first time from the Belasitsa Mts. *Dendrobaena misirlioglui was* formerly registered in Bulgaria as *Dendrobaena alpina* (Rosa, 1884). The sp. nov. is named after the late Prof. Dr. Mete Mısırlıoğlu, the renowned earthworm scholar. It was found in many mountains (Vitosha, Rila, Pirin, Sredna Gora, Rhodopes, Sakar) in previous research. *Dendrobaena hortensis* is a peregrine species that was registered in Sredna Gora and Strandja Mts. *Cernosvitovia rebeli* is a Balkan endemic taxon, found in Rhodope, Stara planina, Strandja and Sredna Gora Mts.

According to the current study and literature data, 21 earthworm species are registered on the territory of the mountain range (Table 1). Earthworm fauna of Belasitsa Mts is dominated by peregrine species (9 taxa), 4 taxa are Endemic and Balkan endemic, Trans-Aegean, 2 taxa are Balkanic-Alpine, 1 taxon is Central European and Circum-Mediterranean. Knowledge of the earthworm fauna is still insufficient, because the Belasitsa Mts is still not well explored.

**Table 1.** Diversity and zoogeographical position of earthworm species from Belasitsa Mts.

| Species | Zoogeography type |
|---|---|
| *Allolobophora chlorotica* (Savigny, 1826) | Peregrine |
| *Aporrectodea caliginosa* (Savigny, 1826) | Peregrine |
| *Aporrectodea georgii* (Michaelsen, 1890) | Trans-Aegean |
| *Aporrectodea handlirschi* (Rosa, 1897) | Trans-Aegean |
| *Aporrectodea jassyensis* (Michaelsen, 1891) | Trans-Aegean |
| *Aporrectodea rosea* (Savigny, 1826) | Peregrine |
| *Aporrectodea trapezoides* (Dugès, 1828) | Peregrine |
| *Cernosvitovia bulgarica* (Černosvitov, 1934) | Endemic |
| *Cernosvitovia rebeli* (Rosa, 1897) | Balkan endemic |
| *Dendrobaena attemsi* (Michaelsen, 1902) | Balkanic-Alpine |
| *Dendrobaena misirlioglui* Csuzdi & Szederjesi, 2023 | Balkanic-Alpine |
| *Dendrobaena byblica* (Rosa, 1893) | Circum-Mediterranean |
| *Dendrobaena hortensis* (Michaelsen, 1890) | Peregrine |
| *Dendrodrilus rubidus* (Savigny, 1826) | Peregrine |
| *Eisenia lucens* (Waga, 1857) | Central-European |
| *Eisenia storkani* Černosvitov, 1934 | Endemic |
| *Eiseniella tetraedra* (Savigny, 1826) | Peregrine |
| *Lumbricus rubellus* Hoffmeister, 1843 | Peregrine |
| *Octolasion lacteum* (Örley, 1881) | Peregrine |
| *Proctodrilus tuberculata* (Černosvitov, 1935) | Trans-Aegean |
| *Spermophorodrilus antiquus* (Černosvitov, 1938) | Endemic |

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