New earthworm records from the Ukrainian part of the north-eastern Carpathians (Megadrili: Lumbricidae)

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Abstract. Elaboration of the earthworm material collected from the Ukrainian part of the north-eastern Carpathians resulted in recording 8 species. Revision of the former E. spelaea (Rosa, 1901) records revealed that all these specimens are misidentifications of E. lucens (Waga, 1857). D. veneta cognettii (Černosvitov, 1935), a former synonym of D. alpina alteclitellata (Pop, 1938) and junior homonym of D. cognettii (Michaelsen, 1903) has been reinstated and a new replacement name D. cernosvitovi nom. nov. is proposed.

Keywords. Oligochaeta, Eisenia, Dendrobaena, veneta cognettii, replacement name.

INTRODUCTION

Research on the earthworm fauna of the north-eastern Carpathians started at the beginning of the 20th century however, this area is still insufficiently known.

The recent research are focused mainly on the Maramureș region in Romania and revealed remarkable diversity. Csuzdi & Pop (2006, 2008) recorded presence of altogether 22 species, which is nearly the quarter of the total number of earthworm species known in the Carpathian Basin and among them, two species (Octodriloides izanus and Octodrilus parvivesiculatus) proved to be new to science (Csuzdi et al. 2011).

The Ukrainian part of the north-eastern Carpathians was first studied by Cognetti (1927), Černosvitov (1928, 1932) and then Perel (1979). Altogether, 18 earthworm taxa were reported from this region so far (Černosvitov 1935, Perel 1979).

The aim of this study is to present the results of the earthworm collectings carried out in the early 2000s, in the Zakarpatska province (Kárpátalja) of Ukraine.

MATERIAL AND METHODS

Earthworms were collected by hand-sampling, i.e. searching under stones, the bark of fallen logs, etc. The specimens were killed and fixed in 75% ethanol and deposited in the earthworm collection of the Hungarian Natural History Museum (HNHM). Additional material in the earthworm collection of Lev Černosvitov was also used for the study (C/numbers).

RESULTS

Aporrectodea carpathica (Cognetti, 1927)

Material examined. HNHM/17417 2 ex., Polonya Krasna (Kraszna-havas), spring section of a forest sidebrook of Lughanka River, N48° 22.432’ E23°45.050’, 1195 m, from wood and under stones, leg. D. Murányi, 18.05.2002.

Bimastos rubidus (Savigny, 1826)
Enterion rubidum Savigny, 1826: 182.
Dendrobaena subrubicunda: Černosvitov 1932: 531.  
Dendrobaena subrubicunda f. typica: Černosvitov 1935: 43.


Bimastos rubidus: Csuzdi 2012.

Material examined. HNHM/17413 1 ex., Polonyna Krasna (Kraszna-havas), upper section of Luzhanka River, below the ice covered sections, N48°22.759', E23°45.372', 1130 m, from wood and under stones, leg. D. Murányi, 19.05.2002.

Dendrobaena alpina alteclitellata (Pop, 1938)  
(Figure 1)

Eisenia alpina (part.): Černosvitov 1932: 528.  
Eisenia alpina f. typica (part.): Černosvitov 1935: 37.  

Material examined. HNHM/17402 1 ex., Polonyna Krasna (Kraszna-havas), Luzhanka River catchment basin, beech forest, 1000 m, leg. B. Cser, 04.07.2003. HNHM/17405 1 ex., Polonyna Krasna (Kraszna-havas), Topas hillside on the treeline, beech forest, from wood and under stones, 1300 m, leg. D. Murányi, 19.05.2002. HNHM/17420 9 ex., Polonyna Krasna (Kraszna-havas), valley of Luzhanka River, beech forest, 580 m, leg. B. Cser, 07.08.2003.

Dendrobaena attemsi (Michaelsen, 1902)

Helodrilus (Dendrobaena) attemsi Michaelsen, 1902: 47.  

Material examined. HNHM/17403 2 ex., Polonyna Krasna (Kraszna-havas), Luzhanka River catchment basin, beech forest, 1000 m, leg. B. Cser, 04.07.2003. HNHM/17406 3 ex., Polonyna Krasna (Kraszna-havas), Topas hillside on the treeline, beech forest, from wood and under stones, 1300 m, leg. D. Murányi, 19.05.2002. HNHM/17407 2 ex., Polonyna Krasna (Kraszna-havas), Kvasovets stream source region, beech forest, gulch, from leaf litter, wood and under stones, leg. D. Murányi, 21.05.2002.

Dendrobaena cernosvitovi nom. nov.

(Figure 2)

Eisenia veneta var. cognetti Černosvitov, 1935: 40 = Dendrobaena cognetti (Černosvitov, 1935) non Dendrobaena cognetti (Michaelson, 1903).

Eisenia veneta var. concolor: Cognetti 1927: 5. Černosvitov, 1932: 528.

Eisenia alpina (part.): Černosvitov 1932: 528.  
Eisenia alpina f. typica (part.): Černosvitov 1935: 37.  


Etymology. The species is named after the renowned Oligochaete taxonomist, Dr. Lev Černosvitov.

Remarks. This species was first reported as E. veneta var. concolor (Cognetti 1927, Černosvitov 1928, 1932), which was originally described from the Caucasus and Transcaucasus, but based on the differences in the extension of the clitellar organs (cl: 27–32, tb: 30–31 vs. cl: 28–33, tb: 31–32) Černosvitov (1935) described it as a new variety; E. veneta var. cognetti. Perel (1972), highlighting that no D. veneta occurrences had yet been reported from the Carpathians, synonymized D. veneta v. cognetti with D. alpina (Rosa, 1884) due to the morphological similarities. Csuzdi & Pop (2006) reinstated D. alpina alteclitellata (Pop, 1938) from the synonymy with D. alpina alpina on the basis of recent molecular phylogenetic results (Csuzdi et al. 2005) and regarded D. veneta cognetti as a senior synonym of D. alpina alteclitellata. However, as the senior synonym name represents a junior homonym of D. cognetti (Michaelsen, 1903) they regarded the junior name D. alpina alteclitellata as valid.

The differences in the position of the tubercles (31–32 vs. 30–31), the opening of the spermathecae (d–M vs. M), the position of the last hearts (10 vs. 11 and extraoesophageal vessels in 12) and the presence of calciferous diverticula in 11–12 clearly distinguish D. veneta cognetti from D. veneta and unequivocally shows its relationship with the D. alpina species group, especially with D. alpina alteclitellata. However, cognetti clearly differs from alteclitellata in the position of the tubercles (31–32 vs. 30–32) and the opening of the spermathecae (d–M vs. M). Besides, their distribution overlaps in the studied region of the north-eastern Carpathians, therefore D. veneta cognetti is suggested to be raised to species rank. As this name is a junior homonym of D. cognetti (Michaelsen, 1903), a new replacement name is proposed.

Revision of the material of Černosvitov revealed that several specimens previously reported as D. alpina from the studied region in fact belong to D. cernosvitovi. These and the newly collected specimens showed that the shape of the tubercles are thicker and look more like to that of D. alpina alteclitellata and D. clujensis instead of the thinner tubercles presented by Černosvitov (1935: 40).

Figure 1. Dendrobaena alteclitellata (Pop, 1938). Ventrolateral view of the fore body. Cl = clitellum, Mp = male pore, Tb = tubercles.

Figure 2. Dendrobaena cernosvitovi nom. nov. Ventrolateral view of the fore body.
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**Dendrobaena octaedra (Savigny, 1826)**

*Enterion octaedrum* Savigny, 1826: 183.


**Material examined.** HNHM/17408 1 ex., Polonyna Krasna (Kraszna-havas), Kvasovets stream source region, beech forest, gulch, from leaf litter, wood and under stones, leg. D. Murányi, 21.05.2002. HNHM/17419 3 ex., Polonyna Krasna (Kraszna-havas), valley of Luzhanka River, beech forest, 580 m, leg. B. Cser, 07.08.2003.

**Eisenia lucens** (Waga, 1857)


*Eisenia spelaea*: Cognetti 1927: 3. (misidentification)


**Eisenia lucens**: Csuzdi & Pop 2006: 40; 2008: 149.


**Remarks.** The early literature contains several *E. spelaea* (Rosa, 1901) records from this region (Cognetti 1927, Černosvitov 1928, 1932, 1935). Distinguishing the *E. lucens/E. spelaea* species pair is rather difficult due to the high morphological similarity. Besides the ability of bioluminescence in case of *E. lucens*, the only difference is in the position of the spermathecal pores, which are near the mid-dorsal line (M) in *E. lucens* and near setal line *d* in *E. spelaea*. However, in case of this character a certain degree of variance can be observed. Examination of the newly collected specimens and the material of Černosvitov clearly showed that the openings of the spermathecal pores of the *E. lucens* specimens in the north-eastern Carpathians are halfway between M and d. A recent molecular study (Szederjesi et al. 2018) revealed that the species pair separates well in the Carpathian Basin. *E. spelaea* can only be found in the western edge, while *E. lucens* possesses a wider range and is distributed through the whole Carpathian arch. Consequently, the earlier records of *E. spelaea* from the north-eastern Carpathians are treated here as misidentifications of *E. lucens*.

**Lumbricus rubellus** Hoffmeister, 1843


**Material examined.** HNHM/17404 2 ex., Talabor River under Nehrovets (Felsőkalocsa), under stones, leg. D. Murányi, 23.05.2002.
DISCUSSION

The earthworm collectings in the Ukrainian part of the north-eastern Carpathians resulted in recording altogether 8 earthworm species.

Revision of the former E. spelaea (Rosa, 1901) records and its comparison with the newly collected material showed that all specimens from this part of the Carpathians are in fact E. lucens (Waga, 1857) however, a slight variance in the position of the openings of the spermathecae can be observed.

The new material also revealed that D. veneta var. cognettii described by Černosvitov (1935) from Bilky-Sinevir shows characteristic differences from D. alpina alteclitellata (Pop, 1938), therefore its resurrection from synonymy and a new replacement name D. cernosvitovi nom. nov. was proposed.

With the new records and the actualisation of the former data, the number of the known earthworm species in the Ukrainian part of the north-eastern Carpathians is 16. Taking into account the recent results of Csuzdi & Pop (2006, 2008), with thorough researches in the Ukrainian Carpathians the occurrence of several additional species is expected.

Acknowledgements – The Author would like to thank Dávid Murányi and Balázs Cser for the valuable material collected.

REFERENCES


