

EARTHWORMS OF THE MARAMUREȘ (ROMANIA) (OLIGOCHAETA, LUMBRICIDAE)

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RÂMELE DIN MARAMUREȘ (ROMÂNIA) (OLIGOCHAETA, LUMBRICIDAE): S-a realizat un studiu faunistic al râmelor din regiunea Maramureș, Romania. Au fost colectate în total 19 specii de râme dintre care patru, și anume *Allolobophora sturanyi*, *Aporrectodea carpathica*, *Dendrobaena alpina alteclitellata* și *Octodrilus robustus*, se întâlnesc exclusiv în aceasta parte a României. Pe lângă datele privind răspândirea lor, se discută și statutul taxonomic al speciilor *Allolobophora sturanyi*, *Dendrobaena alpina alteclitellata*, *Dendrobaena attemsi* și *Octodrilus compromissus*.

MÁRAMAROS (ROMÂNIA) FÖLDIGILISZTÁI (OLIGOCHAETA, LUMBRICIDAE): Dolgozatunkban a Máramarosi Régió földigiliszta faunájának áttekintését végezzük el. Összességében 19 földigiliszta faj sikertelen kimutatnunk, melyek közül négy faj, az *Allolobophora sturanyi*, az *Aporrectodea carpathica*, a *Dendrobaena alpina alteclitellata* és az *Octodrilus robustus* Romániában csak ebben a régióban fordul elő. Az eleterjedési adatok közlésén kívül, megvitatjuk az *Allolobophora sturanyi*, a *Dendrobaena alpina alteclitellata*, a *Dendrobaena attemsi* és az *Octodrilus compromissus* fajok taxonómiai státuszát.

Keywords: Lumbricidae, taxonomy, faunistics, Maramureș region, Romania

INTRODUCTION

The Maramureș, a historical region, situated in the Northern part of Romania, has a predominantly mountain relief of the crystalline Rodnei and Maramuresului Mts. from the Eastern Carpathians (the highest peak of Pietrosul Rodnei 2.303 m a.s.l.) as well as the volcanic Oas-Gutai-Tibles Mts. A large intra-mountain depression and the surrounding hills also diversify the geomorphology of this region.

The earthworm fauna of the Carpathian basin and the Carpathians itself is quite well-known due to the continuous earthworm researches carried out by Pop (1938, 1949, 1964, 1973) and V.V. Pop (1978, 1987, 1992, 1994, 1997). Nevertheless, the North-Eastern Carpathians attracted less faunistic attention than the Southern ranges, and most of V.V. Pop's research activities were focused on ecological aims, with ecological methodology, which often neglects faunistic goals. The relative scarcity of faunistic data led the Vasile Goldiș University Arad, Romania and the Hungarian Natural History Museum to launch a joint

research, in order to carry out the complex faunistic investigation of the Maramureș region.

Here only the new, unpublished records are presented. For the older records see Pop (1949 and 1964).

MATERIAL AND METHODS

Earthworms were collected by the diluted formalin method (Raw, 1959) and by digging and searching under stones and the bark of fallen logs. The animals were killed in 75% ethanol, preserved in 4% formalin and after several days transferred into 75% ethanol. Some earthworm specimens from each locality were killed and preserved in 96% ethanol for molecular studies.

Parallel collections of specimens are deposited in the earthworm collection of the Hungarian Natural History Museum Budapest, Hungary (HNHM catalogue numbers) and at the Institute of Biological Research, Cluj-Napoca, Romania (ICBCN catalogue numbers).

To help the identification of sampling sites, the following list is given:

List of localities and toponyms with the Romanian and Hungarian names

| Romanian | Hungarian | Romanian | Hungarian |
|-------------|------------|------------------|-----------|
| Baia Mare | Nagybánya | Piatra | Kövesláz. |
| Băile Borșa | Borsabánya | Piatra Mts. | Köhát |
| Băiuț | Rákosfalva | Piatra Țiganului | Cigánykő |

| Romanian | Hungarian | Romanian | Hungarian |
|------------------|--------------------|-------------------|-----------------|
| Borşa | Borsafüred | Rodnei Mts. | Radnai havasok |
| Breb | Bréb | Rona de Sus | Felsőróna |
| Budeşti | Budfalva | Săcel | Izszacsal |
| Gufii Mts. | Gutin hg | Săpânța | Szaplonca |
| Hera | Héra | Sighetu Marmăției | Máramarossziget |
| Igniș Mts. | Rozsály | Stațiunea Izvoare | Forrásliget |
| Lăpuș Mts. | Lápos hg | Vadu Izei | Farkasrév |
| Leorda | Leorda | Valea Roșie | Veresvíz |
| Maramureș basin | Máramarosi medence | Valea Vinului | Radnaborberek |
| Maramureș Mts. | Máramarosi havasok | Varfu. Cearcănul | Sárkány csúcs |
| Nedeia Tăranului | Karmajadülő | Virismort | Tiszaveresmart |
| Oaşului Mts. | Avas hg | | |

LIST OF SPECIES

Allolobophora dacica Pop, 1938

Eophila dacica Pop, 1938: 142.

Allolobophora dugesi var. *dacica*: Pop 1949: 440.

Allolobophora dugesi v. *dacica*: Zicsi 1968: 158.

Allolobophora (s.l.) *dacica*: Csuzdi & Zicsi 2003: 53.

Material examined: ICBCN-70/1 2 ex., Lăpuș Mts., Leorda, 800m. Leg. V.V. Pop 27. V. 1996.

?Allolobophora sturanyi (Rosa, 1895)

Eophila sturanyi Rosa, 1895: 5.

Allolobophora dugesi var. *sturanyi*: Pop 1949: 443.

Allolobophora sturanyi: Perel 1979: 188.

Material examined: HNHM/14929 1 ex.: Piatra Tiganului Mt., meadow, 1200 m. Leg. Murányi D. & Kontschán, J. 21. IX. 2005., HNHM/14956 1 ex. Piatra Mts., Vadu Izei, 850 m. Leg. Murányi D. & Kontschán, J. 21. IX. 2005.

Remarks: *Allolobophora sturanyi* was described from the former Yugoslavia and subsequently reported from the Carpathians (Apšinec and Spidovec now Ukraine) by Černosvitov (1935) and from the Ukrainian Carpathians by Perel (1979). Meantime Pop (1938) described a new species from many localities in Romania, namely *A. dacica*. The two species have almost the same clitellar position, but the number of spermathecae proved to be variable (3 pairs in *A. sturanyi* and 3-5 pairs in *A. dacica*), therefore Perel (1979) synonymized the two names.

Our observations confirm the species description of Pop (1938) who stated, that *A. dacica* populations sampled from lower altitude always have 5 pairs of spermathecae, and that only the populations from the higher elevation of the Maramureș region possess 3 pairs of spermathecae. To settle the question whether these populations belongs to *A. sturanyi* or the two names are synonymous, more morphological and

molecular analyses need to be carried out. Till then we provisionally relegate the present specimens with three pairs of spermathecae to the species *A. sturanyi*.

Aporrectodea caliginosa (Savigny, 1826)

Enterion caliginosum Savigny, 1826: 180.

Allolobophora caliginosa: Pop 1949: 435.

Aporrectodea caliginosa: Csuzdi & Zicsi 2003: 75.

Material examined: HNHM/14960 1 ex., Sighetu Marmăției, swamp. Leg. Murányi, D. & Kontschán, J. 19. IX. 2005.

Aporrectodea carpathica Cognetti, 1927

Allolobophora carpathica Cognetti, 1927: 5.

Allolobophora carpathica: Černosvitov 1935: 51.

Allolobophora omodeoi Zajonc, 1963: 521.

Allolobophora (*Allolobophora*) *carpathica*: Plisko 1973: 109.

Allolobophora carpathica: Perel 1979: 189.

Material examined: HNHM/14930 1 ex. Piatra Mts., Valley of Săpânța stream, 500 m. Leg. Kontschán, J. & Murányi, D. 30. VI. 2005., ICBCN-70/2 1 ex., Lăpuș Mts., Leorda, 800m. Leg. V.V. Pop 27. V. 1996., ICBCN-67/3 1 ex., Lăpuș Mts. Băiuț 860 m. Leg. V.V. Pop 27. V. 1996., ICBCN-290/3 8 ex. Rodnei Mts., Prislop, 1600 m. 19.06.1974

Aporrectodea georgii (Michaelsen, 1890)

Allolobophora georgii Michaelsen, 1890: 3.

Allolobophora georgii var. *transylvanica* Pop, 1938: 141.

Allolobophora georgii var. *transylvanica*: Pop 1949: 444.

Aporrectodea georgii: Csuzdi & Zicsi 2003: 81.

Material examined: HNHM/14930 1 ex. Piatra Mts., Valley of Săpânța stream, 500 m. Leg. Kontschán, J. & Murányi, D. 30. VI. 2005.

Aporrectodea rosea* (Savigny, 1826)Enterion roseum* Savigny, 1826: 182.*Allolobophora rosea* f. *typica*: Pop 1949: 451.*Aporrectodea rosea*: Csuzdi & Zicsi 2003: 92.

Material examined: **HNHM/14939** 2 ex. Maramures basin, Rona de Sus, Hera, 504 m. Leg. Murányi D. & Kontschán, J. 28. VI. 2005., **HNHM/14945** 2 ex. Rodna Mts., Stațiunea Borșa Prislop spring, 1500 m. Leg. Murányi, D. & Kontschán, J. 29. VI. 2005., **HNHM/14975** 1 ex., Gutâi Mts., Breb. Leg. Murányi, D. & Kontschán, J. 23. IX. 2005., **ICBCN-67/3** 3 ex., Lăpuș Mts. Băiuț 860 m. Leg. V.V. Pop 27. V. 1996., **ICBCN-66/1** 2 ex., Gutâi Mts. Valea Roșie, 550 m. Leg. V.V. Pop 02. VII. 1996.

Dendrobaena alpina alteclitellata* Pop, 1938 stat. nov.Eisenia aplina* var. *alteclitellata* Pop, 1938: 136*Dendrobaena alpina* var. *alteclitellata*: Pop 1943a: 20.*Eisenia veneta cognettii* Černosvitov, 1935: 40.*Dendrobaena alpina* var. *alteclitellata*: Pop 1949: 482.*Dendrobaena alpina*: Perel 1979: 231. (part.)

Material examined: **HNHM/14936** 2 ex. Rodna Mts., Borșa, 1665-1710 m. Leg. Murányi, D. & Kontschán, J. 29. VI. 2005., **HNHM/14981** 1 ex., Rodnei Mts., Săcel, Muched Lake. Leg. Murányi, D. & Kontschán, J. 22. IX. 2005.

Remarks: *Dendrobaena alpina alteclitellata* was described by Pop (1938) from the Rodnei Mts. Based on a large population of *D. alpina* possessing dark red-violet pigmentation, but later (Pop, 1964), regarded it as a synonym of the nominal subspecies *D. aplina alpina*. Previously, Černosvitov (1935) described a similar subspecies from Sinevir (the Ukrainian Carpathians), namely *E. veneta cognettii* Černosvitov, 1935, relegated to the genus *Eisenia* in accordance with the dorsal position of spermathecae. This species was also synonymized to *D. alpina alpina* by Perel (1972).

A recent molecular biological analysis of the *D. alpina* species group (Csuzdi et al. 2005) revealed that this heavily red pigmented Northern population of *D. alpina* is quite distinct from the smaller and hardly pigmented Southern populations and deserves a subspecies rank. As the senior available name, *D. alpina cognettii* (Černosvitov, 1935) is a junior homonym of *D. cognettii* (Michaelsen, 1903), the other available name, *D. alpina alteclitellata* (Pop, 1938) should be regarded as valid.

Dendrobaena attemsi* (Michaelsen, 1902)Helodrilus attemsi* Michaelsen, 1902: 47.*Dendrobaena octaedra*: Pop 1947: 108. (part.)*Dendrobaena attemsi*: Perel 1979: 236.*Dendrobaena alpina*: V.V. Pop 1972: 40. (part.)*Dendrobaena alpina*: V.V. Pop 1997: 225. (part.)

Material examined: **HNHM/14951** 1 ex. Maramureș Mts. Băile Borșa, Vf. Cearcănul, 1654 m. Leg. Murányi, D. & Kontschán, J. 29. VI. 2005., **HNHM/14954** 1 ex.

Maramures basin, Rona de Sus, Hera, 570 m. Leg. Murányi D. & Kontschán, J. 28. VI. 2005., **HNHM/14961** 3 ex. Gutâi Mts., Budești. Leg. Murányi, D. & Kontschán, J. 23. IX. 2005., **ICBCN-70/3** 20 ex., Lăpuș Mts., Leorda, 800m. Leg. V.V. Pop 27. V. 1996., **ICBCN-66/2** 1 ex., Gutâi Mts. Valea Roșie, 550 m. Leg. V.V. Pop 02. VII. 1996., **ICBCN-96/2** 4 ex. Nedeia Tăranului, 950 m. Leg. V.V. Pop 17. VI. 1997., **ICBCN-97/2** 18 ex. Rodnei Mts. Cormaia, Valea Vinului, 620 m. Leg. V.V. Pop 17. VI. 1997.

Remarks: Following Pop's (1964) lumper ideas, V.V. Pop regarded this species belonging to *D. alpina alpina* (V.V. Pop, 1972, V.V. Pop, 1997), although he emphasised (V.V. Pop, 1972) that *D. alpina* has two distinct forms in Romania. The first form is characterised by smaller size and the specimens possess trapezoidal-shaped clitellum on the segments ½ 28-½ 34 and the other form is characterised by larger size and parallel-shaped clitellum on 26, 27- 33.

Revising the whole *D. alpina* material from Romania we concluded that the two groups differ also in the position of spermathecal pores, as well as in the arrangement of the nephridiopores. Accordingly, the first group with spermathecal openings in setal line *d* and regularly alternating nephridiopores should be considered as *D. attemsi*, and only the second group, with spermathecal openings in *M* and irregularly alternating nephridiopores, fits the characters of the authentic *D. alpina alpina*.

Dendrobaena clujensis* Pop, 1938Dendrobaena clujensis* Pop, 1938: 137.*Dendrobaena clujensis*: Pop 1949: 485.*Dendrobaena clujensis*: Csuzdi & Zicsi 2003: 112.

Material examined: **HNHM/14925** 1 ex. Mts. Piatra, Tiganului, meadow, 1200 m. Leg. J. Kontschán, 21. IX. 2005., **HNHM/14967** 1 ex., Gutâi Mts., Breb. Leg. Murányi, D. & Kontschán, J. 23. IX. 2005., **HNHM/14970** 1 ex., Igniș Mts., Baia Mare, Stațiunea Izvoare. Leg. Murányi, D. & Kontschán, J. 24. IX. 2005., **ICBCN-96/1** 8 ex. Rodnei Mts. Cormaia, Nedeia Tăranului, 950 m. Leg. V.V. Pop 17. VI. 1997.

Dendrobaena octaedra* (Savigny, 1826)Enterion octaedrum* Savigny, 1826*Dendrobaena octaedra*: Pop 1949: 486.*Dendrobaena octaedra*: Csuzdi & Zicsi 2003: 121.

Material examined: **HNHM/14934** 1 ex. Rodna Mts., Stațiunea Borșa, 1665-1710 m. Leg. Murányi, D. & Kontschán, J. 29. VI. 2005., **HNHM/14937** 3 ex. Maramures basin, Rona de Sus, Hera, 504 m. Leg. Murányi D. & Kontschán, J. 28. VI. 2005., **HNHM/14946** 1 ex. Rodna Mts., Stațiunea Borșa Prislop spring, 1500 m. Leg. Murányi, D. & Kontschán, J. 29. VI. 2005., **HNHM/14952** 3 ex. Maramureș Mts. Băile Borșa, Vf. Cearcănul, 1654 m. Leg. Murányi, D. & Kontschán, J. 29. VI. 2005., **HNHM/14953** 1 ex. Maramures basin, Rona de Sus, Hera 570 m. Leg. Murányi D. & Kontschán, J. 28. VI. 2005., **HNHM/14957** 1 ex. Piatra Mts., Vadu Izei, 850 m. Leg. Murányi D. & Kontschán,

J. 21. IX. 2005., **HNHM/14962** 5 ex., Gutâi Mts., Budești. Leg. Murányi, D. & Kotschán, J. 23. IX. 2005., **HNHM/14971** 3 ex., Igriș Mts., Baia Mare, Stațiunea Izvoare. Leg. Murányi, D. & Kotschán, J. 24. IX. 2005., **HNHM/14980** 10 ex., Igriș Mts., Baia Mare, Stațiunea Izvoare. Leg. Murányi, D. & Kotschán, J. 24. IX. 2005., **HNHM/14982** 1 ex., Rodnei Mts., Săcel, Muched Lake. Leg. Murányi, D. & Kotschán, J. 22. IX. 2005., **ICBCN-66/3** 4 ex., Gutâi Mts. Valea Roșie, 550 m. Leg. V.V. Pop 02. VII. 1996., **ICBCN-99/1** 4 ex., Rodnei Mts. Heniu Peak, 1250 m. Leg. V.V. Pop 18. VI. 1997.

***Dendrodrilus rubidus rubidus* (Savigny, 1826)**

Enterion rubidum Savigny, 1826

Dendrobaena rubida: Pop 1949: 490. (part.)

Dendrodrilus rubidus rubidus: Csuzdi & Zicsi 2003: 132.

Material examined: **HNHM/14926** 2 ex. Mts. Piatra, Tiganului, meadow, 1200 m. Leg. J. Kotschán, 21. IX. 2005., **HNHM/14966** 1 ex., Gutâi Mts., Breb. Leg. Murányi, D. & Kotschán, J. 23. IX. 2005., **HNHM/14972** 2 ex., Igriș Mts., Baia Mare, Stațiunea Izvoare. Leg. Murányi, D. & Kotschán, J. 24. IX. 2005., **HNHM/14976** 1 ex., Gutâi Mts., Breb. Leg. Murányi, D. & Kotschán, J. 23. IX. 2005.

***Eisenia lucens* Waga, 1857**

Lumbricus lucens Waga, 1857: 161.

Eisenia submontana (Vejdovsky, 1875): Pop 1943a: 18.

Eisenia submontana: Pop 1949: 473.

Eisenia lucens: Csuzdi & Zicsi 2003: 146.

Material examined: **HNHM/14927** 2 ex. Mts. Piatra, Tiganului, meadow, 1200 m. Leg. J. Kotschán, 21. IX. 2005., **HNHM/14935** 5 ex. Rodna Mts., Stațiunea Borșa, 1665-1710 m. Leg. Murányi, D. & Kotschán, J. 29. VI. 2005., **HNHM/14941** 1 ex. Rodna Mts., Stațiunea Borșa, 878-1022 m. Leg. Murányi, D. & Kotschán, J. 28. VI. 2005., **HNHM/14938** 1 ex. Maramures basin, Rona de Sus, Hera, 504 m. Leg. Murányi D. & Kotschán, J. 28. VI. 2005., **HNHM/14947** 3 ex. Rodna Mts., Stațiunea Borșa, Prislop spring, 1500 m. Leg. Murányi, D. & Kotschán, J. 29. VI. 2005., **HNHM/14949** 1 ex. Piatra Mts. lower valley of the Săpânța stream. Leg. Murányi, D. & Kotschán, J. 30. VI. 2005., **HNHM/14963** 1 ex., Gutâi Mts., Budești. Leg. Murányi, D. & Kotschán, J. 23. IX. 2005., **HNHM/14974** 1 ex., Gutâi Mts., Breb. Leg. Murányi, D. & Kotschán, J. 23. IX. 2005., **HNHM/14977** 1 ex., Rodnei Mts., Săcel. Leg. Murányi, D. & Kotschán, J. 22. IX. 2005., **HNHM/14979** 1 ex., Igriș Mts., Baia Mare, Stațiunea Izvoare. Leg. Murányi, D. & Kotschán, J. 24. IX. 2005., **ICBCN-70/5** 4 ex., Lăpuș Mts., Leorda, 800m. Leg. V.V. Pop 27. V. 1996., **ICBCN-98/2** 1 ex., Rodnei Mts. Măgura Peak, 1000 m. Leg. V.V. Pop 18. VI. 1997., **ICBCN-308/5** 1 ex., Leg. V.V. Pop 1. IX. 1975.

***Eiseniella tetraedra* (Savigny, 1826)**

Enterion tetraedrum Savigny, 1826: 184.

Eiseniella tetraedra f. *typica*: Pop 1949: 456.

Eiseniella tetraedra: Csuzdi & Zicsi 2003: 153.

Material examined: **HNHM/14973** 1 ex., Igriș Mts., Baia Mare, Stațiunea Izvoare. Leg. Murányi, D. & Kotschán, J. 24. IX. 2005.

***Fitzingeria platyura montana* (Černosvitov, 1932)**

Octolasion montanum Černosvitov, 1932: 535.

Dendrobaena platyura var. *montana*: Pop 1943b: 402.

Dendrobaena platyura var. *montana*: Pop 1949: 489.

Fitzingeria platyura montana: Csuzdi & Zicsi 2003: 166.

Material examined: **ICBCN-98/3** 7 ex. Rodnei Mts. Măgura Peak, 1000 m. Leg. V.V. Pop 18. VI. 1997.

***Lumbricus rubellus* Hoffmeister, 1843**

Lumbricus rubellus Hoffmeister 1843: 187.

Lumbricus rubellus: Pop 1943a: 20.

Lumbricus rubellus: Pop 1949: 478.

Lumbricus rubellus: Csuzdi & Zicsi 2003: 183.

Material examined: **HNHM/14928** 5 ex. Piatra Mts., Tiganului, meadow, 1200 m. Leg. J. Kotschán, 21. IX. 2005., **HNHM/14940** 4 ex. Rodna Mts., Stațiunea Borșa, 878-1022 m. Leg. Murányi, D. & Kotschán, J. 28. VI. 2005., **HNHM/14942** 1 ex. Maramures basin, Tisa, floodplain. Leg. Murányi, D. & Kotschán, J. 28. VI. 2005., **HNHM/14950** 3 ex. Sighetu Marmăției, marsh. Leg. Murányi, D. & Kotschán, J. 30. VI. 2005., **HNHM/14959** 1 ex., Sighetu Marmăției, swamp. Leg. Murányi, D. & Kotschán, J. 19. IX. 2005., **HNHM/14969** 1 ex., Igriș Mts., Baia Mare, Stațiunea Izvoare. Leg. Murányi, D. & Kotschán, J. 24. IX. 2005., **HNHM/14978** 2 ex., Rodnei Mts., Săcel. Leg. Murányi, D. & Kotschán, J. 22. IX. 2005., **ICBCN-70/6** 1 ex., Lăpuș Mts., Leorda, 800m. Leg. V.V. Pop 27. V. 1996.

***Lumbricus terrestris* Linnaeus, 1758**

Lumbricus terrestris Linnaeus, 1758: 647.

Lumbricus herculeus (Savigny, 1826): Pop 1949: 477.

Lumbricus terrestris: Csuzdi & Zicsi 2003: 188.

Material examined: **HNHM/14958** 1 ex. Sighetu Marmăției, swamp. Leg. Murányi, D. & Kotschán, J. 19. IX. 2005.

***Octodrilus compromissus* Zicsi & V.V. Pop, 1984**

Octolasion lissaense (Michaelsen, 1891): Pop 1949: 466.

Octolasion lissaense: Pop 1943a: 17.

Octolasion (Octodrilus) lissaense: Zicsi 1968: 144. (part.)

Octodrilus compromissus Zicsi & Pop, 1984: 245.

Octodrilus lissaensis: Zicsi 1991: 179.

Octodrilus compromissus: Csuzdi & Zicsi 2003: 207.

Material examined: HNHM/14932 2 ex. Maramures basin, Rona de Sus 570 m. Leg. Murányi, D. & Kotschán, J. 28. VI. 2005., HNHM/14933 1 ex. Oaşului Mts., Piatra. Leg. Murányi, D. & Kotschán, J. 27. VI. 2005., HNHM/14943 1 ex. Rodna Mts., Staţiunea Borşa, 1700 m. Leg. Murányi, D. & Kotschán, J. 29. VI. 2005., HNHM/14948 1 ex. Piatra Mts. lower valley of the Săpânţa stream. Leg. Murányi, D. & Kotschán, J. 30. VI. 2005., HNHM/14965 3 ex. Gutâi Mts., Breb. Leg. Murányi, D. & Kotschán, J. 23. IX. 2005., HNHM/14968 1 ex., Piatra Mts. Vadu Izei. Leg. Murányi, D. & Kotschán, J. 20. IX. 2005., ICBCN-67/3 3 ex., Lăpuş Mts. Băiuţ 860 m. Leg. V.V. Pop 27. V. 1996., ICBCN-66/4 1 ex., Gutâi Mts. Valea Roşie, 550 m. Leg. V.V. Pop 02. VII. 1996., ICBCN-97/3 3 ex. Rodnei Mts. Cormaia, Valea Vinului, 620 m. Leg. V.V. Pop 17. VI. 1997.

Remarks: *Octodrilus compromissus* is a morphologically quite heterogeneous species. The nominotypical subspecies consist of medium sized or large worms (130.35± 4.94 mm) and the subspecies *O. compromissus minimus* Pop, 1989 represents a group of quite small worms (101±9.48 mm). In the present samples we found several extremely large specimens (longer than 200 mm) with variable male pore position on the segments 16, 17. This male pore location seems to represent a transitory stage toward the genus *Octodriloides* Zicsi, 1986 and unknown in the other populations of *O. compromissus*. To evaluate the taxonomic significance of this population more investigations (including DNA studies) are needed.

Octodrilus robustus (Pop, 1973)

Octolasion (Octodrilus) robustus Pop, 1973: 265.
Octodrilus robustus: Zicsi 1986: 108.

Material examined: HNHM/14964 1 ex., Gutâi Mts., Breb. Leg. Murányi, D. & Kotschán, J. 23. IX. 2005., ICBCN-98/4 3 ex., Rodnei Mts. Măgura Peak, 1000 m. Leg. V.V. Pop 18. VI. 1997.

Octolasion lacteum (Örley, 1881)

Lumbricus terrestris var. *lacteus* Örley, 1881: 584.
Octolasion lacteum: Pop 1943a: 17.
Octolasion lacteum: Pop 1949: 464.
Octolasion lacteum: Csuzdi & Zicsi 2003: 197.

Material examined: HNHM/14944 1 ex. Rodna Mts., Staţiunea Borşa, 1700 m. Leg. Murányi, D. & Kotschán, J. 29. VI. 2005. ICBCN-308/5 9 ex. Maramuresului Mts., Prislop, Leg. V.V. Pop, 1. IX 1975.

DISCUSSION

The recent faunistic survey of the Maramureş region (Romania) resulted in recording of 19 earthworm species. This represents approximately 30% of the total earthworm fauna known from Romania (V.V. Pop, unpublished). Three species: *Ap. carpathica*, *A. sturanyi* and *D. alpina alteclitellata* occur exclusively in this part of Romania and one, namely *Octodrilus robustus* seems to be endemic here. The highland character of the earthworm fauna from Maramures region is corroborated by the frequent occurrence of

Eisenia lucens, a European montane species, and the occurrence of *Fitzingeria platyura montana*, characteristic species of the Central European mountain ranges.

ACKNOWLEDGEMENT

This study was supported by the Vasile Goldiş University, Arad (Romania), and by the National Office for Research and Technology, Hungary (grants No. 3B/023/04), and partly by the Romanian Ministry of Education and Technology (Projects No.6/1996 and 61/1997).

REFERENCES

Černosvitov L, Die Oligochaetenfauna der Karpathen. II. - Die Lumbriciden und ihre Verbreitung. Zool. Jahrb. Syst., 62, 525–546, 1932.
Černosvitov L, Monographie des tschechoslovakischen Lumbriciden. Arch. Pri. Vyzk. Cech, 19, 1–86, 1935.
Cognetti de Martiis L, Lumbricidi dei Carpazi. Boll. Mus. Zool. Anat. Comp. Genova, 7, 1–8, 1927.
Csuzdi Cs, Zicsi A, Earthworms of Hungary (Annelida: Oligochaeta; Lumbricidae). In: Csuzdi Cs, Mahunka S (eds.), Pedozoologica Hungarica 1. Hungarian Natural History Museum & Systematic Zoology Research Group of the Hungarian Academy of Sciences, Budapest, 271 pp, 2003.
Csuzdi Cs, Pop AA, Pop VV, Zicsi A, Wink M, Revision of the *Dendrobaena alpina* (Rosa) Species Group (Oligochaeta, Lumbricidae). In: Pop VV, Pop AA (eds.), Advances in earthworm taxonomy II. Univ. Press, Cluj, in press, 2005.
Hoffmeister W, Beitrag zur Kenntnis deutscher Landanneliden. Arch. Naturg., 91, 183–198, 1843.
Linnaeus C, *Systema Naturae*. Laurentii Salvii Holmiae, 824 pp., 1758.
Örley L, A magyarországi Oligochaeták faunája. I. terricolae. Math. Term. Tud. Közl., 16, 562–611, 1881.
Michaelsen W, Die Lumbriciden Norddeutschlands. Jahrb. Hamb. Wiss. Anst., 7, 1–19, 1890.
Michaelsen W, Neue Oligochaeten und neue Fundorte alt-bekannter. Mitt. Mus. Hamburg, 19, 3–53, 1902.
Perel TS, Revision of the *Dendrobaena* Eisen emend Pop species in the fauna of USSR and their distribution. Probl. Pochv. Zool. Mater IV. Vsesz. Szov. Baku, pp. 109–110, 1972.
Perel TS, Range and regularities in the distribution of earthworms of the USSR fauna. Nauka, Moscow, 272 pp., (in russian), 1979.
Plisko JD, Lumbricidae (Annelida, Oligochaeta). Fauna Poloniae, Warsawa pp. 156, 1973.
Pop V, Neue Lumbriciden aus Rumänien. Bul. Soc. Stii. Cluj, 9, 134–152, 1938.
Pop V.; Hazai és külföldi Lumbricidák a Magyar Nemzeti Múzeumban. Ann. His-Nat. Mus. Nat. Hung., 34, 12–24, 1943a.
Pop V, Das Verwandtschaftsverhältnis zwischen *Dendrobaena platyura* (Fitzinger) und *Octolasion montanum* Černosvitov (Oligochaeta). Zool. Jahrb. Syst., 76, 397–412, 1943b.

- Pop V, Die Lumbriciden der Ostalpen. Anal. Acad. Rom. Mem. Ştii. Ser. III, 22, 85–133, 1947.
- Pop V, Lumbricidele din România. Anal. Acad. Rep. Pop. Române, 1, 383–505, 1949.
- Pop V, Noi date faunistice și sistematice asupra lumbricidelor (Oligochaeta) din România. Stud. Univ. Babeş-Bolyai, Ser. Biol., 2, 107–115, 1964.
- Pop V, *Octolasion (Octodrilus) robustum* nouvelle espèce de Lumbricidae et ses affinités. Rev. Roum. Biol. Ser. Zool., 18, 265–268, 1973.
- Pop VV, Contribuții la studiul lumbricidelor (Oligochaeta) din Parcul Național Retezat. Ocrot. Nat. Bucureşti, 16: 33–41, 1972.
- Pop VV, Modifications in the earthworm fauna after clearing the European dwarf-pine in the Maramures Mountains. Publ. Acad. R.S. România, Fil. Cluj-Napoca, Subcom. Man and Biosphere, 120–125, 1978.
- Pop VV, Density and biomass of earthworm synusia in forest ecosystems of the Romanian Carpathians. – In: Bonvicini Pagliani A.M, Omodeo P (eds.), On Earthworms. Selected symposia and monographs. Mucci Modena, pp. 183–190, 1987.
- Pop VV, Structura și dinamica comunităților de Lumbricidae. In: Popovici I (ed) Parcul Național Retezat, Studii Ecologice, Braşov, pp. 215–227, 1992.
- Pop VV, On the speciation in the Genus *Octodrilus* Omodeo, 1956 (Oligochaeta, Lumbricidae). Mitt. Hamb. Zool. Mus. Inst., 89, 37–46, 1994.
- Pop VV, Earthworm-vegetation-soil relationships in the Romanian Carpathians. Soil. Biol. Biochem., 29, 223–229, 1997.
- Raw F, Estimating earthworm populations by using formalin. Nature, 184, 1661–1662, 1959.
- Rosa D, Nuovi lombrichi dell'Europa orientale. Boll. Mus. Zool. Anat. Comp. Torino, 10, 1–8, 1895.
- Savigny JC, In: Cuvier G, Analyse des Travaux de l'Académie royale des Sciences, pendant l'année 1821, partie physique. Mem. Acad. Sci. Inst. Fr., 5, 176–184, 1826.
- Waga A, Sprawozdanie z podróży naturalistów opdytej w. r. 1854 do Ojcowa. Bibl. Warszawie. 2, 161–227, 1857.
- Zajonc I, *Allolobophora omodeoi* n. sp. Neue Regenwurm-Art (Oligochaeta, Lumbricidae) aus der Ostslowakei. Biologia, Bratislava, 18, 521–524, 1963.
- Zicsi A, Ein zusammenfassendes Verbreitungsbild der Regenwürmer auf Grund der Boden- und Vegetationsverhältnisse Ungarns. Opusc. Zool. Budapest, 8, 99–164, 1968.
- Zicsi A, Über die Regenwürmer Ungarns (Oligochaeta: Lumbricidae) mit Bestimmungstabellen der Arten. Opusc. Zool. Budapest, 24, 167–191, 1991.
- Zicsi A, Über die taxonomischen Probleme der Gattung *Octodrilus* Omodeo, 1956 und *Octodriloides* gen. n. (Oligochaeta: Lumbricidae). – Opusc. Zool. Budapest, 22: 103–112, 1986.
- Zicsi A, Pop VV, Neue Regenwürmer aus Rumänien (Oligochaeta: Lumbricidae) Acta zool. Hung., 30, 241–248, 1984.

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