

New earthworm records from various parts of Greece (Oligochaeta: Lumbricidae, Acanthodrilidae, Megascolecidae, Ocnerodrilidae)

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Abstract. Elaboration of new earthworm materials collected from the continental and insular parts of Greece resulted in recording altogether 22 species and subspecies, of which three, namely *Pontodrilus litoralis* (Grube, 1855), *Ocnerodrilus occidentalis* Eisen, 1878 and *Dendrobaena pentheri* (Rosa, 1905) as senior synonym of *Dendrobaena aegea* (Cognetti, 1913) proved to be new to the fauna of Greece. Consequently, the number of the earthworm species recorded for Greece is raised to 59.

Keywords. Earthworms, faunistics, new records, Greece.

INTRODUCTION

The earthworm fauna of continental Greece is quite well-known. After Michaelsen (1902, 1914), several other scientists carried out researches here and published new data from the country (Tzelepis 1943, Omodeo 1955, Karaman 1972, Šapkarev 1972, Michalis 1975a, 1976, 1977, Zicsi 1973, 1974). Finally, Zicsi & Michalis (1981) summarized the knowledge on the lumbricid earthworms of Greece. After this comprehensive work, four new species and many new data were added to the earthworm fauna of Greece (Michalis 1982, 1983, 1987, 1995, Zicsi & Michalis 1993, Szederjesi & Csuzdi 2012).

The situation is just the opposite regarding the Greek islands, from where we have only sporadic data. Only five papers dealt with the insular earthworm fauna; Cognetti (1913) described two new species, *Perelia phoebea* and *Dendrobaena aegea* from Rhodes, and published new data from the island. Michaelsen (1928) described *Eisenia ariadne* from Naxos and recorded the presence of *Octodrilus complanatus* (Dugès, 1828) and *Lumbricus rubellus* Hoffmeister, 1843 from Lemnos. Cognetti (1906) and Černosvitov (1934) published new data from Crete and Michalis (1975b) from the island Kos.

Besides the 54 recorded earthworm species from the family Lumbricidae (Szederjesi & Csuzdi 2012), two species, namely *Microscolex dubius* (Fletcher, 1887) and *M. phosphoreus* Dugès, 1837 from the family Acanthodrilidae (Michalis 1975a, 1975b, 1987, Szederjesi & Csuzdi 2012) and two species, *Pheretima heterochaeta* (Michaelsen, 1891) and *Ph. peregriana* v. *papillosa* (Tzelepis, 1943) from the family Megascolecidae (Michalis 1976, 1982) are also recorded from Greece. To our present knowledge, these two *Pheretima* species are synonyms of *Amyntas corticis* (Kinberg, 1867) (Csuzdi 2012).

In the last decade, researchers of the Hungarian Natural History Museum organized several collecting trips to Greece, including continental and insular regions too. This present paper summarizes the results of the collecting expeditions to the Pindus mountain range, Thrace, Rhodes, Karpathos, Crete, and Naxos between 2012 and 2014.

MATERIAL AND METHODS

Earthworms were collected by the diluted formaldehyde method (Raw 1959), complemented with digging and searching under stones and under the bark of fallen logs. The specimens were killed and fixed in 96% ethanol, then transferred

into 75% ethanol and deposited in the earthworm collection of the Hungarian Natural History Museum (HNHM). For later molecular studies, some specimens were placed into 96% ethanol.

RESULTS

Family Lumbricidae Rafinesque-Schmaltz, 1815

Aporrectodea caliginosa (Savigny, 1826)

Enterion caliginosum, Savigny 1826: 180.

Allolobophora caliginosa: Zicsi & Michalis 1981: 247., 1993: 302., Michalis 1982: 350., 1987: 61., 1995: 15.

Aporrectodea caliginosa: Szederjesi & Csuzdi 2012: 29.

Material examined. HNHM/16176 2 ex., South Aegean, Rhodes regional unit, Vati, roadside spring E of the village, 75 m, N36°03.225' E27°54.486', leg. J. Kontschán, D. Murányi, 08.11.2012. HNHM/16188 1 ex., South Aegean, Rhodes regional unit, Afandou, olive grove N of the village, 105 m, N36°18.167' E28°08.964', leg. J. Kontschán, D. Murányi, 13.11.1012. HNHM/16627 1 ex., South Aegean, Naxos regional unit, Mt. Zas, Filoti, vicinity of Zas Cave, 680 m, N37°01.9' E25°29.8', leg. J. Kontschán, D. Murányi, T. Szederjesi, 07.04.2013. HNHM/16633 1 ex., Crete, Rethymno regional unit, Ida Mts., spring and its outlet at an archeological site and taverna, nest of ants, 1380 m, N35°12.388' E24°50.044', leg. J. Kontschán, D. Murányi, T. Szederjesi, 02.04.2013. HNHM/16639 1 ex., Crete, Lasithi regional unit, Zakros, Zakros Spring above the village, wet litter of plane tree, 265 m, N35°06.837' E26°12.827', leg. J. Kontschán, D. Murányi, T. Szederjesi, 04.04.2013. HNHM/16641 1 ex., Crete, Heraklion regional unit, Loutraki, stream and its gorge below the village, plane tree litter, 670 m, N35°03.413' E25°24.887', leg. J. Kontschán, D. Murányi, T. Szederjesi, 05.04.2013. HNHM/16647 1 ex., Crete, Lasithi regional unit, Thriptis Mts, Orino, stream in the village, 625 m, N35°04.883' E25°54.848', leg. J. Kontschán, D. Murányi, T.

Szederjesi, 05.04.2013. HNHM/16658 1 ex., Crete, Lasithi regional unit, Agios Georgios, large reservoir below the village, 60 m, N35°03.042' E25°41.750', leg. J. Kontschán, D. Murányi, T. Szederjesi, 05.04.2013. HNHM/16666 1 ex., Crete, Chania regional unit, Lefka Ori Mts, Omalos, rocky grassland W of the village, 1060 m, N35°19.483' E23°53.507', leg. J. Kontschán, D. Murányi, T. Szederjesi, 31.03.2013.

Aporrectodea jassyensis (Michaelsen, 1891)

Allolobophora jassyensis Michaelsen, 1891: 15., Michalis 1987: 62.

Allolobophora jassyensis jassyensis: Zicsi & Michalis 1981: 250., 1993: 303. Michalis 1982: 352., Michalis *et al.* 1989: 5.

Aporrectodea jassyensis: Szederjesi & Csuzdi 2012: 30.

Material examined. HNHM/16075 1 ex., Thrace, Rhodope peripheral unit, Sapka Mts., Kizario, stream and pasture SW of the village, 140 m, N41°03.492' E25°45.672', leg. J. Kontschán, D. Murányi, T. Szederjesi, 27.05.2012. HNHM/16640 2 ex., South Aegean, Naxos regional unit, Dhamalas, rocky phrygana W of the village, 260 m, N37°02.921' E25°27.351', leg. J. Kontschán, D. Murányi, T. Szederjesi, 07.04.2013. HNHM/16644 1 ex., Crete, Lasithi regional unit, Karidi, rocky grassland W of the village, 290 m, N35°07.912' E26°12.849', leg. J. Kontschán, D. Murányi, T. Szederjesi, 04.04.2013.

Aporrectodea rosea (Savigny, 1826)

Enterion roseum Savigny, 1826: 182.

Allolobophora rosea: Zicsi & Michalis 1981: 249., Michalis 1975: 204., 1976: 156., 1977: 286., 1982: 350., 1987: 62.

Allolobophora rosea f. *typica*: Michalis 1975: 189.

Allolobophora rosea bimastoides: Michalis 1982: 350.

Material examined. HNHM/16626 1 ex., South Aegean, Naxos regional unit, Mt. Zas, Filoti, vicinity of Zas Cave, 680 m, N37°01.9' E25°29.8', leg. J. Kontschán, D. Murányi, T. Szederjesi, 07.04.2013. HNHM/16637 2 ex., South Aegean, Naxos regional unit, Ghalini, open

stream at the village, 35 m, N37°06.888' E25°25.715', leg. J. Kontschán, D. Murányi, T. Szederjesi, 06.04.2013.

***Dendrobaena attemsi* (Michaelsen, 1902)**

Helodrilus (Dendrobaena) attemsi Michaelsen, 1902: 74.

Dendrobaena attemsi: Zicsi & Michalis 1981: 258., Michalis 1982: 356., Szederjesi & Csuzdi 2012: 31.

Material examined. HNMM/16657 3 ex., South Aegean, Naxos regional unit, Koronidha, stream in a gorge below the village, wet soil, 455 m, N37°08.580' E25°31.857', leg. J. Kontschán, D. Murányi, T. Szederjesi, 06.04.2013. HNMM/16946 1 ex., Thessaly, Trikala peripheral unit, Lakmos Mts., Chaliki, stream below Verliga Waterfall, 1935 m, N39°40.674' E21°07.818', leg. T. Kovács, D. Murányi, 09.05.2014.

***Dendrobaena byblica byblica* (Rosa, 1893)**

Allolobophora byblica Rosa, 1893: 4–5.

Dendrobaena byblica: Zicsi & Michalis 1981: 259., Michalis 1982: 356., Michalis *et al.* 1989: 5.

Eiseniella oltenica: Zicsi & Michalis 1981: 243.

Dendrobaena byblica byblica: Szederjesi & Csuzdi 2012: 31.

Material examined. HNMM/16178 1 ex., South Aegean, Rhodes regional unit, Platania, 'Koinotis Platania' Spring W of the village, 285 m, N36°15.321' E28°00.129', leg. J. Kontschán, D. Murányi, 09.11.2012. HNMM/16185 1 ex., South Aegean, Karpathos regional unit, Spoa, Plakakia, open spring along the road, 215 m, N35°39.380' E27°09.474', leg. J. Kontschán, D. Murányi, 11.11.2012. HNMM/16187 1 ex., South Aegean, Rhodes regional unit, Petaloudes, 'Butterfly Valley', stream gorge, 190 m, N36°20.269' E28°03.716', leg. J. Kontschán, D. Murányi, 13.11.2012. HNMM/16620 1 ex., Crete, Heraklion regional unit, Agii Deka, small river and its gallery at Agios Tilos basilica, 160 m, N35°03.704' E24°56.792', leg. J. Kontschán, D. Murányi, T. Szederjesi, 02.04.2013. HNMM/16622 3 ex., Crete, Lasithi regional unit, Thriptis Mts, Agios Ioannis, stream and its gallery E of the

village, 460 m, N35°03.615' E25°51.938', leg. J. Kontschán, D. Murányi, T. Szederjesi, 05.04.2013. HNMM/16651 7 ex., Crete, Rethymno regional unit, Moni Veni, springs at the monastery, soil, 595 m, N35°16.228' E24°36.377', leg. J. Kontschán, D. Murányi, T. Szederjesi, 01.04.2013. HNMM/16656 2 ex., South Aegean, Naxos regional unit, Koronidha, stream in a gorge below the village, wet soil, 455 m, N37°08.580' E25°31.857', leg. J. Kontschán, D. Murányi, T. Szederjesi, 06.04.2013. HNMM/16660 1 ex., Crete, Chania regional unit, Kakopetros, stream and its plane tree gallery near the village, plane tree litter, 430 m, N35°24.803' E23°45.391', leg. J. Kontschán, D. Murányi, T. Szederjesi, 31.03.2013. HNMM/16661 4 ex., Crete, Lasithi regional unit, Zakros, stream and its plane tree gallery N of the village, mixed soil and leaf litter, 190 m, N35°06.918' E26°13.153', leg. J. Kontschán, D. Murányi, T. Szederjesi, 04.04.2013. HNMM/16662 4 ex., Crete, Rethymno regional unit, Mirthios, D. Dason Rethymnis spring E of the village, 155 m, N35°17.619' E24°33.360', leg. J. Kontschán, D. Murányi, T. Szederjesi, 01.04.2013.

***Dendrobaena byblica olympiaca* (Michaelsen, 1902)**

Dendrobaena ganglbaueri olympiaca Michaelsen, 1902: 47.

Debdrobaena byblica: Zicsi & Michalis 1981: 259 (part.)

Dendrobaena byblica olympiaca: Szederjesi & Csuzdi 2012: 32.

Material examined. HNMM/16625 2 ex., South Aegean, Naxos regional unit, Mt. Zas, Filoti, vicinity of Zas Cave, 680 m, N37°01.9' E25°29.8', leg. J. Kontschán, D. Murányi, T. Szederjesi, 07.04.2013. HNMM/16629 4 ex., South Aegean, Naxos regional unit, Apiranthos, olive orchard E of the village, 525 m, N37°04.408' E25°31.842', leg. J. Kontschán, D. Murányi, T. Szederjesi, 07.04.2013. HNMM/16649 2 ex., South Aegean, Naxos regional unit, Koronidha, stream above the village, 670 m, N37°08.071' E25°31.507', leg. J. Kontschán, D. Murányi, T. Szederjesi, 06.04.2013.

***Dendrobaena cognettii* (Michaelsen, 1903)**

Helodrilus cognettii Michaelsen, 1903: 130.

Dendrobaena cognettii: Zicsi & Michalis 1981: 260., 1993: 306., Michalis 1982: 356., Szederjesi & Csuzdi 2012: 32.

Material examined. HNHM/16630 1 ex., South Aegean, Naxos regional unit, Apiranthos, olive orchard E of the village, 525 m, N37°04.408' E25°31.842', leg. J. Kontschán, D. Murányi, T. Szederjesi, 07.04.2013.

***Dendrobaena hortensis* (Michaelsen, 1890)**

Allolobophora subrubicunda var. *hortensis* Michael- sen, 1890: 15.

Dendrobaena hibernica (Friend, 1892): Michalis 1982: 356.

Dendrobaena hortensis: Michalis 1995: 16., Szederjesi & Csuzdi 2012: 32.

Material examined. HNHM/16180 1 ex., South Aegean, Rhodes regional unit, Prophitis Ilias, rocky cedar forest at the monastery, 605 m, N36°16.624' E27°56.543', leg. J. Kontschán, D. Murányi, 07.11.2012. HNHM/16352 1 ex., South Aegean, Rhodes regional unit, Salakos, 'Butterfly River', a gorge NE of the city, 135 m, N36°17.391' E27°57.007', leg. J. Kontschán, D. Murányi, 10.11.2012. HNHM/16632 5 ex., Crete, Rethymno regional unit, Ida Mts., spring and its outlet at an archeological site and taverna, nest of ants, 1380 m, N35°12.388' E24°50.044', leg. J. Kontschán, D. Murányi, T. Szederjesi, 02.04. 2013. HNHM/16642 2 ex., Crete, Heraklion regi- onal unit, Loutraki, stream and its gorge below the village, plane tree litter, 670 m, N35°03.413' E25°24.887', leg. J. Kontschán, D. Murányi, T. Szederjesi, 05.04.2013.

***Dendrobaena pentheri* (Rosa, 1905)**

Allolobophora (Notogama) pentheri Rosa, 1905: 1.

Dendrobaena pentheri: Szederjesi *et al.* 2014: 560.

Helodrilus (Dendrobaena) aegaeus: Cognetti 1913: 4.

Syn. nov.

Dendrobaena aegaea: Zicsi & Michalis 1981: 260.

Material examined. HNHM/16179 1 ex., South Aegean, Rhodes regional unit, Prophitis Ilias, rocky cedar forest at the monastery, 605 m, N36°16.624' E27°56.543', leg. J. Kontschán, D. Murányi, 07.11.2012. HNHM/16181 3 ex., South Aegean, Rhodes regional unit, Aghios Nektarios, pine forest E of the monastery, 145 m, N36° 15.943' E28°04.822', leg. J. Kontschán, D. Murányi, 14.11.2012. HNHM/16184 3 ex., South Aegean, Rhodes regional unit, Mt. Atavyros peak region, rocky grassland, 1095 m, N36°12.233' E27°51.913', leg. J. Kontschán, D. Murányi, 07.11.2012. HNHM/16186 1 ex., South Aegean, Karpathos regional unit, Lefkos, pine forest S of the village, 135 m, N35°35.730' E27°05.577', leg. J. Kontschán, D. Murányi, 12.11.2012.

Remarks. Cognetti (1913) described *Dendro- baena aegaea* from Rhodes. According to the original description, this species is very similar to *D. pentheri*; the slight differences are in the position of the tubercles (29–31 vs. $\frac{1}{2}$ 28– $\frac{1}{2}$ 32) and the opening of the spermathecal pores (*d* vs. *d*–*M*).

Zicsi & Michalis (1981) also recorded *D. aegaea* from Rhodes and mentioned that their specimens differ from the type material in the length of the tubercula pubertatis which is on $\frac{1}{2}$ 28– $\frac{1}{2}$ 32.

The *Dendrobaena aegaea* specimens (HNHM/ 6449) reported by Zicsi & Michalis (1981) and two syntype specimens (HNHM/12675), and also *D. pentheri* specimens from Turkey (HNHM/ 16583, 16604) and Cyprus (HNHM/1 4664) were re-examined to clear this question.

All the examined specimens' tubercles show very similar extension, stretching from $\frac{1}{n}$ 28 to $\frac{1}{n}$ 32, the *D. aegaea* syntypes examined have tubercles on 29– $\frac{1}{2}$ 32. The position of the spermathecal pores show geographic transition. The spermathecae of the specimens from Rhodes open in setal line *d*, from Turkey in setal line *d* or just above *d*, and from Cyprus the specimens has openings between *d* and the mid-dorsal line, or

near the mid-dorsal line. Besides, all specimens have tanylobic head.

Considering all these facts *D. aegaea* is proposed as a synonym of *Dendrobaena pentheri* and in this sense *D. pentheri* is a new species name in the list of the earthworm fauna of Greece.

***Dendrobaena veneta* (Rosa, 1886)**

Allolobophora veneta Rosa, 1886: 674.

Dendrobaena veneta: Zicsi & Michalis 1981: 258., Michalis 1982: 355., 1995: 16.

Dendrobaena veneta veneta: Szedzerjesi & Csuzdi 2012: 34.

Material examined. HNHM/16189 6 ex., South Aegean, Rhodes regional unit, Afandou, olive groove N of the village, 105 m, N36°18.167' E28°08.964', leg. J. Kontschán, D. Murányi, 13.11.2012. HNHM/16619 1 ex., Crete, Heraklion regional unit, Agii Deka, small river and its gallery at Agios Tilos basilica, 160 m, N35°03.704' E24°56.792', leg. J. Kontschán, D. Murányi, T. Szedzerjesi, 02.04.2013. HNHM/16631 1 ex., Crete, Rethymno regional unit, Ida Mts., spring and its outlet at an archeological site and taverna, nest of ants, 1380 m, N35°12.388' E24°50.044', leg. J. Kontschán, D. Murányi, T. Szedzerjesi, 02.04.2013. HNHM/16635 2 ex., Crete, Chania regional unit, Lefka Ori Mts, Samaria, spring in oak stand at the rest area, 1250 m, N35°18.481' E23°55.051', leg. J. Kontschán, D. Murányi, T. Szedzerjesi, 31.03.2013. HNHM/16643 1 ex., Crete, Lasithi regional unit, Dikti Mts., Pinakiano, slow stream in a meadow, W of the village, 815 m, N35°11.615' E25°25.976', leg. J. Kontschán, D. Murányi, T. Szedzerjesi, 03.04.2013. HNHM/16648 2 ex., Crete, Rethymno regional unit, Ida Mts., limestone rocks at a pasture towards the observatory, 1480 m, N35°12.560' E24°52.536', leg. J. Kontschán, D. Murányi, T. Szedzerjesi, 02.04.2013.

***Dendrodrilus rubidus subrubicundus* (Eisen, 1873)**

Allolobophora subrubicunda Eisen, 1873: 51.

Dendrobaena rubida subrubicunda: Zicsi & Michalis 1981: 257., Michalis 1982: 355., 1987: 63.

Dendrodrilus rubidus subrubicundus: Szedzerjesi & Csuzdi 2012: 35.

Material examined. HNHM/16183 1 ex., South Aegean, Karpathos regional unit, Aperi, spring and stream in the village, 265 m, N35°32.995' E27°10.187', leg. J. Kontschán, D. Murányi, 11.11.2012. HNHM/16664 1 ex., South Aegean, Naxos regional unit, Koronidha, stream above the village, 670 m, N37°08.071' E25°31.507', leg. J. Kontschán, D. Murányi, T. Szedzerjesi, 06.04.2013.

***Eisenia fetida* (Savigny, 1826)**

Enterion fetidum Savigny, 1826: 182.

Eisenia foetida: Zicsi & Michalis 1981: 254., Michalis 1982: 353., 1987: 63.

Eisenia fetida: Szedzerjesi & Csuzdi 2012: 35.

Material examined. HNHM/16182 4 ex., South Aegean, Karpathos regional unit, Aperi, spring and stream in the village, 265 m, N35°32.995' E27°10.187', leg. J. Kontschán, D. Murányi, 11.11.2012. HNHM/16663 1 ex., South Aegean, Naxos regional unit, Koronidha, stream above the village, 670 m, N37°08.071' E25°31.507', leg. J. Kontschán, D. Murányi, T. Szedzerjesi, 06.04.2013.

***Eisenia oreophila* Szedzerjesi & Csuzdi, 2012**

Eisenia oreophila Szedzerjesi & Csuzdi, 2012: 36.

Material examined. HNHM/16947 2 ex., Thessaly, Trikala peripheral unit, Lakmos Mts., Chaliki, open stream SW of the village, 1430 m, N39°40.267' E21°09.176', leg. T. Kovács, D. Murányi, 09.05.2014.

Remark. The specimens were found near the type locality.

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

Enterion tetraedrum Savigny, 1826: 184.

Eiseniella tetraedra tetraedra: Zicsi & Michalis 1981: 242., 1993: 308., Michalis 1982: 524., 1995: 16.

Eiseniella tetraedra: Michalis 1987: 63., Szedzerjesi & Csuzdi 2012: 37.

Material examined. HNHM/16177 5 ex., South Aegean, Rhodes regional unit, Vati, roadside spring E of the village, 75 m, N36°03.225' E27°54.486', leg. J. Kontschán, D. Murányi, 08.11.2012. HNHM/16621 1 ex., Crete, Heraklion regional unit, Agii Deka, small river and its gallery at Agios Tilos basilica, 160 m, N35°03.704' E24°56.792', leg. J. Kontschán, D. Murányi, T. Szederjesi, 02.04.2013. HNHM/16623 1 ex., Crete, Lasithi regional unit, Thriptis Mts, Agios Ioannis, stream and its gallery E of the village, 460 m, N35°03.615' E25°51.938', leg. J. Kontschán, D. Murányi, T. Szederjesi, 05.04.2013. HNHM/16628 1 ex., South Aegean, Naxos regional unit, Mt. Zas, Filoti, vicinity of Zas Cave, 680 m, N37°01.9' E25°29.8', leg. J. Kontschán, D. Murányi, T. Szederjesi, 07.04.2013. HNHM/16634 2 ex., Crete, Rethymno regional unit, Ida Mts., spring and its outlet at an archeological site and taverna, nest of ants, 1380 m, N35°12.388' E24°50.044', leg. J. Kontschán, D. Murányi, T. Szederjesi, 02.04.2013. HNHM/16638 2 ex., South Aegean, Naxos regional unit, Ghalini, open stream at the village, 35 m, N37°06.888' E25°25.715', leg. J. Kontschán, D. Murányi, T. Szederjesi, 06.04.2013. HNHM/16646 2 ex., Crete, Rethymno regional unit, Sisarcha, stream and its plane tree gallery N of the village, plane tree litter, 575 m, N35°18.073' E24°54.800', leg. J. Kontschán, D. Murányi, T. Szederjesi, 03.04.2013. HNHM/16655 2 ex., Crete, Chania regional unit, Skafi, stream and its plane tree gallery S of the village, mixed soil and plane tree litter, 370 m, N35°18.806' E23°47.612', leg. J. Kontschán, D. Murányi, T. Szederjesi, 31.03.2013.

***Lumbricus rubellus* Hoffmeister, 1843**

Lumbricus rubellus Hoffmeister, 1843: 187., Zicsi & Michalis 1981: 255., Michalis 1975: 207., 1976: 163., 1982: 358., 1987: 63.

Material examined. HNHM/16069 1 ex., Thrace, Rhodope peripheral unit, Sapka Mts., Nea Sanda, open brook and pasture NE of the village, 790 m, N41°07.965' E25°54.052', leg. J. Kontschán, D. Murányi, T. Szederjesi, 26.05.

2012. HNHM/16659 1 ex., Crete, Chania regional unit, Kakopetros, stream and its plane tree gallery near the village, plane tree litter, 430 m, N35°24.803' E23°45.391', leg. J. Kontschán, D. Murányi, T. Szederjesi, 31.03.2013. HNHM/16948 1 ex., West Macedonia, Kozani peripheral unit, Neapoli, Aliakmonas River NE of the city, 555 m, N40°19.976' E21°24.678', leg. T. Kovács, D. Murányi, 08.05.2014.

***Octodrilus complanatus* (Dugès, 1828)**

Lumbricus complanatus Dugès, 1828: 289.

Octodrilus complanatus: Zicsi & Michalis 1981: 256., 1993: 305., Michalis 1982: 357., 1987: 64., Szederjesi & Csuzdi 2012: 38.

Octodrilus peleensis: Michalis, 1995: 15–20.

Material examined. HNHM/16092 3 ex., Thrace, Evros peripheral unit, Loutra Traianoupolis, river and thermal spring at the ruins, 15 m, N40°51.889' E26°01.881', leg. J. Kontschán, D. Murányi, T. Szederjesi, 28.05.2012. HNHM/16616 1 ex., HNHM/16617 2 ex., Crete, Rethymno regional unit, Axos, spring S of the village, 590 m, N35°17.934' E24°50.485', leg. J. Kontschán, D. Murányi, T. Szederjesi, 02.04.2013. HNHM/16618 3 ex., Crete, Heraklion regional unit, Agii Deka, small river and its gallery at Agios Tilos basilica, 160 m, N35°03.704' E24°56.792', leg. J. Kontschán, D. Murányi, T. Szederjesi, 02.04.2013. HNHM/16645 1 ex., Crete, Rethymno regional unit, Sisarcha, stream and its plane tree gallery N of the village, plane tree litter, 575 m, N35°18.073' E24°54.800', leg. J. Kontschán, D. Murányi, T. Szederjesi, 03.04.2013. HNHM/16650 1 ex., HNHM/16652 6 ex., Crete, Rethymno regional unit, Moni Veni, springs at the monastery, soil, 595 m, N35°16.228' E24°36.377', leg. J. Kontschán, D. Murányi, T. Szederjesi, 01.04.2013. HNHM/16653 1 ex., Crete, Rethymno regional unit, Apostoli, stream and its plane tree gallery N of the village, 320 m, N35°16.211' E24°36.821', leg. J. Kontschán, D. Murányi, T. Szederjesi, 01.04.2013. HNHM/16654 1 ex., Crete, Rethymno regional unit, Goulediana, olive grove with oak stands at the village, 440 m, N35°17.206'

E24°29.949', leg. J. Kontschán, D. Murányi, T. Szederjesi, 01.04.2013. HNHM/16665 1 ex., Crete, Lasithi regional unit, Dikti Mts., Katharo, rocky evergreen oak forest E of the settlement, mixed soil and leaf litter, 1070 m, N35°09.242' E25°35.185', leg. J. Kontschán, D. Murányi, T. Szederjesi, 03.04.2013.

***Octodrilus croaticus* (Rosa, 1895)**

Allolobophora lissaensis var. *croatica* Rosa, 1895: 5.
Octodrilus croaticus: Zicsi & Michalis 1981: 257., 1993: 305., Michalis 1982: 358., Szederjesi & Csuzdi 2012: 39.

Material examined. HNHM/16944 2 ex., Thessaly, Trikala peripheral unit, Lakmos Mts., Chaliki, rocky grassland W of the village, 1715 m, N39°40.516' E21°08.583', leg. T. Kovács, D. Murányi, 09.05.2014. HNHM/16945 3 ex., Thessaly, Trikala peripheral unit, Lakmos Mts., Chaliki, stream below Verliga Waterfall, 1935 m, N39°40.674' E21°07.818', leg. T. Kovács, D. Murányi, 09.05.2014.

***Octodrilus transpadanus* (Rosa, 1884)**

Allolobophora transpadana Rosa, 1884: 45.
Octodrilus transpadanus: Zicsi & Michalis 1981: 257., 1993: 305., Michalis 1982: 358., 1995: 16., Szederjesi & Csuzdi 2012: 39.
Octodrilus transpadanum: Michalis 1987: 64.

Material examined. HNHM/16076 4 ex., HNHM/16079 4 ex., Thrace, Evros peripheral unit, Lesitse Mts., Loutros, stream and its gallery N of the village, 55 m, N40°55.485' E26°03.673', leg. J. Kontschán, D. Murányi, T. Szederjesi, 27.05.2012. HNHM/16086 3 ex., Thrace, Rhodope peripheral unit, Tsifliki, slow stream SW of the village, 35 m, N41°03.085' E25°37.569', leg. J. Kontschán, D. Murányi, T. Szederjesi, 26.05.2012.

Family Acanthodrilidae Claus, 1880

***Microscolex dubius* (Fletcher, 1887)**

Eudrilus dubius Fletcher, 1887: 378.

Microscolex dubius: Cognetti 1913: 1., Michalis 1975a: 202., 1976: 154., 1985: 348., 1987: 61., Szederjesi & Csuzdi 2012: 40.

Microscolex dibius: Michalis 1975b: 189.

Material examined. HNHM AF/5565 1 ex., South Aegean, Naxos regional unit, Mt. Zas, Filoti, vicinity of Zas Cave, 680 m, N37°01.9' E25°29.8', leg. J. Kontschán, D. Murányi, T. Szederjesi, 07.04.2013. HNHM AF/5567 1 ex., South Aegean, Naxos regional unit, Apiranthos, olive orchard E of the village, 525 m, N37°04.408' E25°31.842', leg. J. Kontschán, D. Murányi, T. Szederjesi, 07.04.2013. HNHM AF/5568 1 ex., Crete, Heraklion regional unit, Krasi, spring system in the village, 610 m, N35°14.010' E25°28.154', leg. J. Kontschán, D. Murányi, T. Szederjesi, 03.04.2013. HNHM AF/5569 5 ex., Crete, Chania regional unit, Sougia, seashore tamarisk stands at the village, 0 m, N35°14.917' E23°48.706', leg. J. Kontschán, D. Murányi, T. Szederjesi, 31.03.2013.

***Microscolex phosphoreus* Dugès, 1837**

Lumbricus phosphoreus Dugès, 1837: 17.

Microscolex phosphoreus: Michalis 1975a: 202., 1976: 154.

Material examined. HNHM AF/5566 1 ex., South Aegean, Naxos regional unit, Mt. Zas, Filoti, vicinity of Zas Cave, 680 m, N37°01.9' E25°29.8', leg. J. Kontschán, D. Murányi, T. Szederjesi, 07.04.2013.

Family Megascolecidae Rosa, 1891

***Pontodrilus litoralis* (Grube, 1855)**

Lumbricus litoralis Grube, 1855: 127.

Pontodrilus litoralis: Blakemore 2007: 4.

Material examined. HNHM AF/5562 6 ex., Thrace, Evros peripheral unit, Dikelle, rocky seashore SE of the village, 0 m, N40°50.910' E25°42.440', leg. J. Kontschán, D. Murányi, T. Szederjesi, 27.05.2012.

Remarks. *Pontodrilus litoralis* is a cosmopolitan shoreline species, distributed from the

Mediterranean sea-shores to India (Narayanan *et al.* 2014) the Caribbean (Csuzdi & Pavlíček 2009) and the Pacific regions (Blakemore 2007). This is the first record from Greece.

Family Ocnerodrilidae Beddard, 1891

Ocnerodrilus occidentalis Eisen, 1878

Ocnerodrilus occidentalis Eisen, 1878: 10., Blakemore 2008: 149.

Material examined. HNHM AF/5561 1 ex., South Aegean, Rhodes regional unit, Aghios Nektarios, pine forest E of the monastery, 145 m, N36°15.943' E28°04.822', leg. J. Kontschán, D. Murányi 14.11.2012.

Remark. This species is new to the fauna of Greece.

DISCUSSION

Out of the 22 earthworm species and subspecies found, three proved to be new to the fauna of Greece. *Dendrobaena pentheri* was described from Turkey (Rosa 1905). It has later been reported from Azerbaijan (as *Helodrilus (Eisenia) schemachaensis* Michaelsen, 1910) Georgia, Armenia (Kvavadze 1985) and, recently from Cyprus (Pavlíček & Csuzdi 2006, Pavlíček *et al.* 2010). Here we proved that *D. aegaea* described from Rhodes is a synonym of *Dendrobaena pentheri* and in this sense *D. pentheri* is a new species name in the list of the earthworm species of Greece.

Pontodrilus litoralis is of uncertain origin (Blakemore 2007) and found all over the world on the shorelines of warmer oceans and seas. Our specimens were found in seashore debris on the Aegean coast.

The South American *Ocnerodrilus occidentalis* is widespread as well in tropical and Mediterranean regions, and can be found even in cooler climates, e.g. in Hungary in greenhouses (Csuzdi *et al.* 2007).

Together with these new records, the number of earthworm species recorded for Greece is 59.

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