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Contribution to the earthworm fauna of Edirne province Türkiye (Clitellata, Megadrili)

Kübra KOÇ [1], İ. Mete MISIRLIOĞLU[1], Hakan ÇALIŞKAN [*1]
ORCID: 0000-0001-6598-4440; 0000-0001-9928-8478; 0000-0001-7879-6449

[1]Eskişehir Osmangazi University, Faculty of Arts and Science, Department of Biology, Eskişehir, Türkiye

Abstract

This study was conducted between September 2019 - June 2021 to determine the earthworm fauna of Edirne province. For this purpose, 79 samples were collected from 14 localities within the borders of Edirne Province. Identification of the samples collected resulted in recording 9 species belonging to 5 genera as follows; *Aporrectodea caliginosa* (Savigny, 1826), *Aporrectodea dubiosa dubiosa* (Örley, 1881), *Aporrectodea jassyensis jassyensis* (Michaelsen, 1891), *Aporrectodea rosea* (Savigny, 1826), *Aporrectodea trapezoides* (Duges, 1828), *Eiseniella tetraedra tetraedra* (Savigny, 1826), *Lumbricus rubellus* Hoffmeister, 1843, *Octodrilus transpadanus* (Rosa, 1884), *Octolasion lacteum* (Örley, 1881). The species *Aporrectodea dubiosa dubiosa* (Örley, 1881) and *Octolasion lacteum* (Örley, 1881) were recorded for the first time from the Thracian part of the Marmara region.

Key words: Edirne, earthworms, Annelida, Clitellata, Fauna of Türkiye

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Türkiye Edirne ili topraksolucanı (Clitellata, Megadrili) faunasına katkı

Özet

Bu çalışma, Edirne İli solucan faunasını belirlemek amacıyla Eylül 2019 - Haziran 2021 tarihleri arasında yapılmıştır. Bu amaçla Edirne İli sınırları içindeki 14 lokaliteden 79 örnek toplanmıştır. Toplanan örneklerin kimliklendirilmesi sonucunda 5 cinse ait 9 tür aşağıdaki şekilde kayıt altına alınmıştır; *Aporrectodea caliginosa* (Savigny, 1826), *Aporrectodea dubiosa dubiosa* (Örley, 1881), *Aporrectodea jassyensis jassyensis* (Michaelsen, 1891), *Aporrectodea rosea* (Savigny, 1826), *Aporrectodea trapezoides* (Duges, 1828), *Eiseniella tetraedra tetraedra* (Savigny, 1826), *Lumbricus rubellus* Hoffmeister, 1843, *Octodrilus transpadanus* (Rosa, 1884), *Octolasion lacteum* (Örley, 1881). *Aporrectodea dubiosa dubios*a (Örley, 1881) ve *Octolasion lacteum* (Örley, 1881) türleri Marmara bölgesinin Trakya bölümünden ilk kez bildirilmiştir.

Anahtar kelimeler: Edirne, toprak solucanı, Annelida, Clitellata, Türkiye Faunası

1. Introduction

Earthworms (Clitellata: Megadrili) are one of the groups of animals playing an important role in nature. They significantly affect the structure, chemical composition and fertility of soils.. It is also known that they accelerate the mixing of fertilizers, lime and organic substances applied to the surface with the soil. In addition, it has been proven by laboratory studies that they support plant root development, increase soil porosity, and reduce plant root diseases.

There are 5738 earthworm species/subspecies described all over the world, of which 689 belong to the family Lumbricidae [1]. If look at our neighboring countries, 66 species are registered in Greece, 49 in Bulgaria, 21 in Cyprus, 14 in Syria, 28 in Iran, 58 in Georgia, 29 in Azerbaijan and 31 in Armenia [2]. In Türkiye 87 taxa are recorded belonging to the families Acanthodrilidae (1 genus, 2 species), Criodrilidae (1 genus, 1 species), Lumbricidae (18 genera, 80 species) and Megascolecidae (2 genera, 4 species). 32 species are endemic to Türkiye. Regarding the

* *Corresponding author* / Haberleşmeden sorumlu yazar: Tel.: 02222393750\2853; Fax.: +905055617945; E-mail: hakan@ogu.edu.tr
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zoogeographical composition of the lumbricid species, 2 belong to the Balkan-Anatolia group, 13 to the Caucasus-Anatolia group, 3 to theCircum Mediterranean group, 3 to the East Mediterranean group, 7 to the Levant-Anatolia group, 14 to the peregrines, 6 species show Trans-Aegean distribution. All the species of the other families are peregrines and allochtonous in Türkiye [3, 4].

Edirne province located in the Thracian part of the eastern tip of the Balkan peninsula in Türkiye. Thracian earthworm fauna was evaluated by the studies carried out by Mısırlıoğlu at al. [5], Mısırlıoğlu and Stojanovic [6], Mısırlıoğlu and Stojanovic [7], Valchovski and Mısırlıoğlu [8] .

2. Materials and methods

The study was carried out between 19.09.2019-02.02.2020, and the samples were collected by digging-hand-sorting method from a depth of 0-20 cm. The samples collected were first put into 85% ethanol, then transferred to the laboratory and put the samples into the 96% ethanol. All samples were examined under an Olympos VMF-1X model stereo-microscope.. The photographs were taken using a Leica EZ 16 device.

Bouche [9], Reynolds [10], Sims and Gerard [11], Csuzdi and Zicsi [12], Csuzdi et al. [13], Mısırlıoğlu [14] and Reynolds and Mısırlıoğlu [15] were used for identification.

3. Results

In the present study 9 species were found belonging to 5 genera and two of them *Aporrectodea dubiosa dubiosa* (Örley, 1881) and *Octolasia lacteum* (Örley, 1885) are recorded for the first time from the Thracian part of the Marmara region.

3.1 List of localities and the species found

1. Edirne, center, Doyran village, forested area, grass and puddles, 27 m a.s.l., N41°29'25.7887" E26°36'27.4530", 19.09.2019.

Octolasion lacteum (Örley, 1885) 4 exemplars

2. Edirne, center, Üyüklütatar village, grassy area, 31 m a.s.l., N41°32'54.2804" E26°36'59.4754", 19.09.2019.

Aporrectodea dubiosa dubiosa (Örley, 1881) 18 exemplars

3. Edirne, center, Tayakadın village, grassy area, with a slamm stream tributary passes nearby , 46 m a.s.l., N41°34'26.1108" E26°39'59.1136", 29.01.2020.

Octodrilus transpadanus (Rosa, 1884) 1 exemple

4. Edirne, center, Tayakadın village, muddy area surrounded by grass, 44 m a.s.l., N41°33'56.3554" E26°40'5.3447", 29.01.2020.

Aporrectodea rosea (Savigny, 1826) 1 exemple

Aporrectodea trapezoides (Duges, 1828) 1 exemple

5. Edirne, **center**, Tayakadın village, grass, 47 m a.s.l., N41°34'29.4490" E26°39'51.3158", 29.01.2020.

Aporrectodea caliginosa (Savigny, 1826) 1 exemple

Octodrilus transpadanus (Rosa, 1884) 1 exemple

6. Edirne, **center**, Karakasım village, reedy area with grass, 45 m a.s.l., N41°32'35.7541" E26°39'15.7212", 29.01.2020.

Aporrectodea jassyensis jassyensis (Michaelsen, 1891) 1 exemple

Aporrectodea trapezoides (Duges, 1828) 1 exemple

Octodrilus transpadanus (Rosa, 1884) 2 exemplars

Octolasion lacteum (Örley, 1885) 4 exemplars

7. Edirne, **center**, Orhaniye village, swampy area surrounded by reeds and grass, 29 m a.s.l., N41°31'4.3860" E26°38'55.8779", 29.01.2020.

Aporrectodea dubiosa dubiosa (Örley, 1881) 4 exemplars

8. Edirne, **center**, Sazlıdere village, grassy area with a small stream and with reeds, 59 m a.s.l., N41°36'52.6660" E26°40'50.4552", 02.02.2020.

Lumbricus rubellus (Hoffmeister, 1843) 1 exemple

Octodrilus transpadanus (Rosa, 1884) 2 exemplars

Octolasion lacteum (Örley, 1885) 5 exemplars

9. Edirne, **center**, Sazlıdere village, grass and trees, 67 a.s.l., N41°36'0.4653" E26°40'25.1578", 02.02.2020.

Aporrectodea caliginosa (Savigny, 1826) 1 exemple

Aporrectodea trapezoides (Duges, 1828) 3 exemplars

Lumbricus rubellus (Hoffmeister, 1843) 3 exemplars

10. Edirne, **center**, İskender village, puddle and grass, 65 m a.s.l., N41°37'54.9075" E26°40'49.7627", 02.02.2020.

Aporrectodea caliginosa (Savigny, 1826) 2 exemplars

Octolasion lacteum (Örley, 1885) 3 exemplars

11. Edirne, **center**, İskender village, grass, 62 a.s.l., N41°37'55.4749" E26°40'48.0527", 02.02.2020.

Eiseniella tetraedra tetraedra (Savigny, 1826) 3 exemplars
Octolasion lacteum (Örley, 1885) 2 exemplars

12. Edirne, **center**, Köşençiftliği village, muddy edge of a stream and surrounded by grass, 71 m a.s.l., N41°39'11.3015" E26°41'11.1458", 02.02.2020.

Aporrectodea caliginosa (Savigny, 1826) 1 exemple
Aporrectodea jassyensis jassyensis (Michaelsen, 1891) 1 exemple
Aporrectodea trapezoides (Duges, 1828) 1 exemple
Octodrilus transpadanus (Rosa, 1884) 1 exemple

13. Edirne, **center**, Demirhanlı village, grass trees 102 m a.s.l., N41°41'42.9257" E26°43'51.1262", 02.02.2020.

Aporrectodea caliginosa (Savigny, 1826) 1 exemple
Aporrectodea trapezoides (Duges, 1828) 3 exemplars
Octolasion lacteum (Örley, 1885) 1 exemple

14. Edirne, **center**, Demirhanlı village, it was grassy area under trees, 101 m a.s.l., N41°41'44.9744" E26°43'55.2653", 02.02.2020.

Aporrectodea rosea (Savigny, 1826) 1 exemple
Lumbricus rubellus (Hoffmeister, 1843) 5 exemplars

3.2 List of species

Family Lumbricide Rafinesque-Schmaltz, 1815
Genus *Aporrectodea* Örley, 1885
Species: *Aporrectodea caliginosa* (Savigny, 1826)

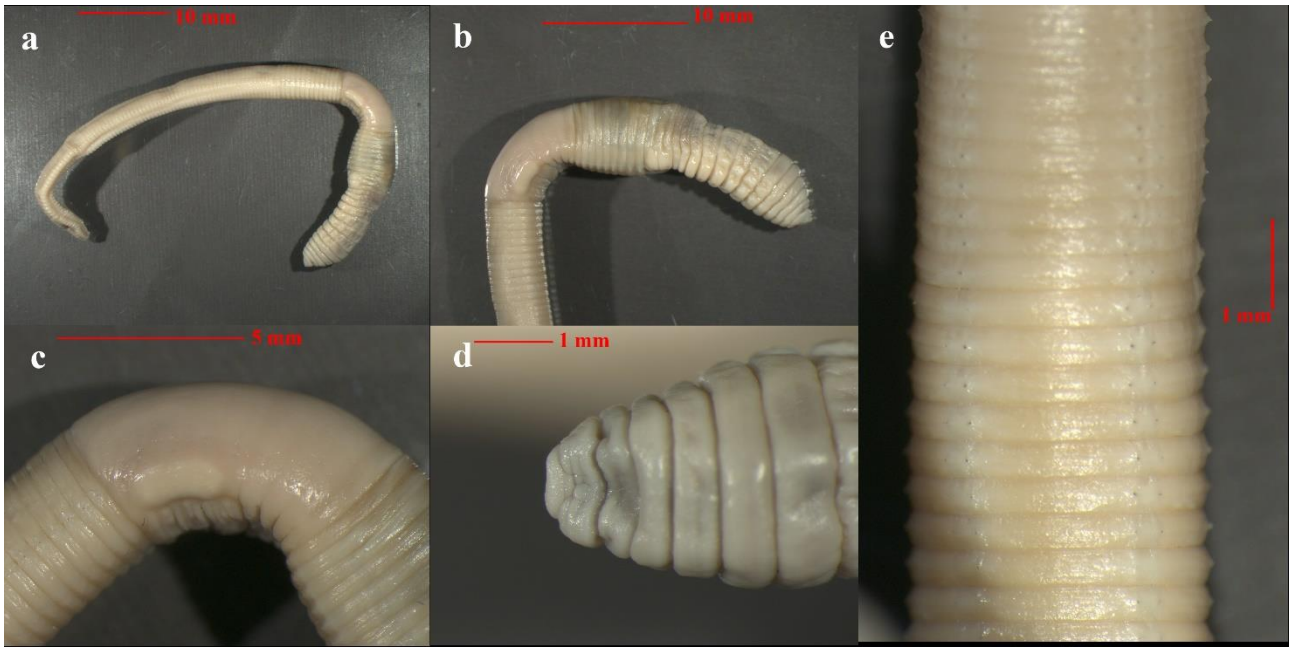

Figure 2. *Aporrectodea caliginosa*, a) general body view; b) first part of the body; c) clitellum; d) epilobic prostomium; e) closely paired setae.

Distribution in Turkey: Bolu, Bursa, Eskişehir, Kütahya,Van [13,16].

Species: *Aporrectodea dubiosa dubiosa* (Örley, 1881)

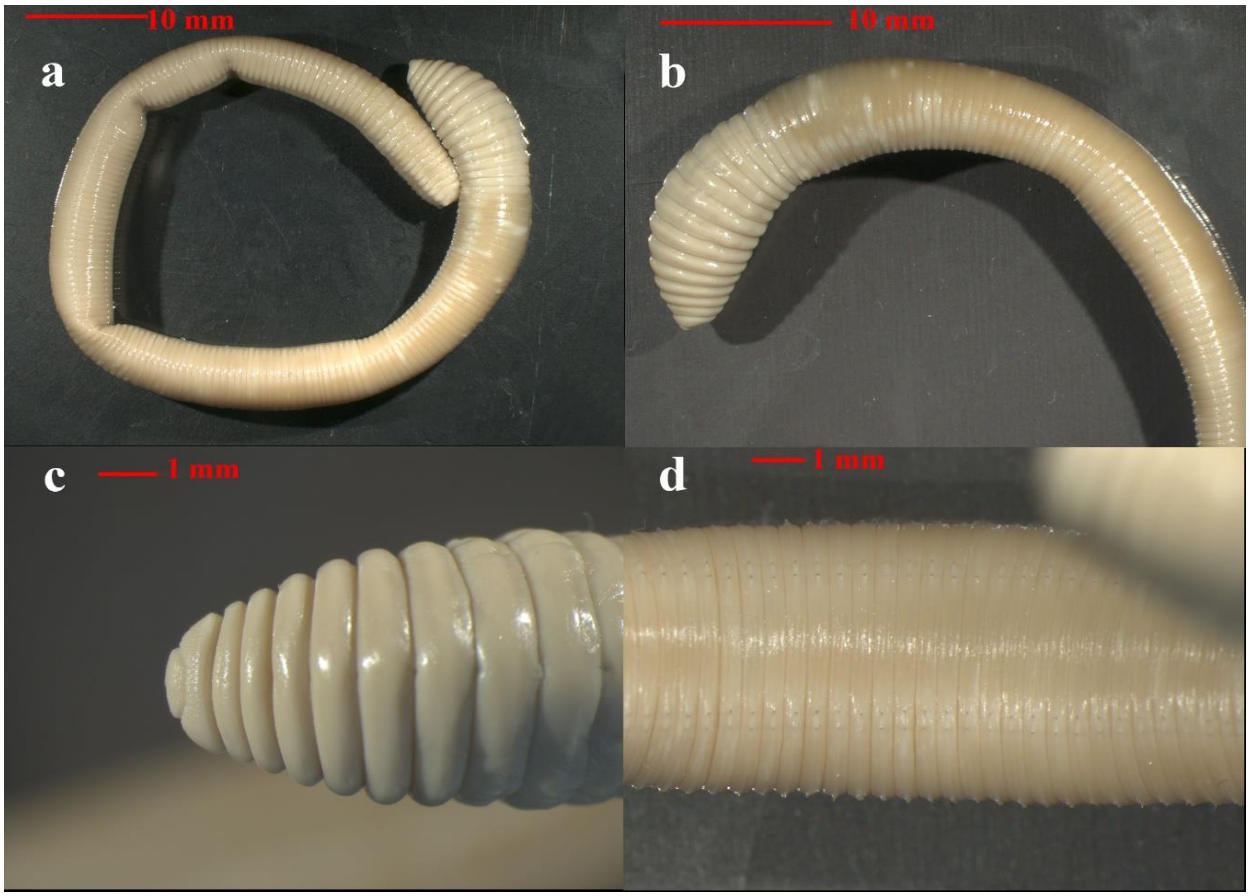

Figure 3. *Aporrectodea dubiosa dubiosa*, a) general body view; b) first part of the body and clitellum; c) epilobic prostomium; d) closely paired setae.

Distribution in Turkey: Samsun [17].

Species *Aporrectodea jassyensis jassyensis* (Michaelsen, 1891)

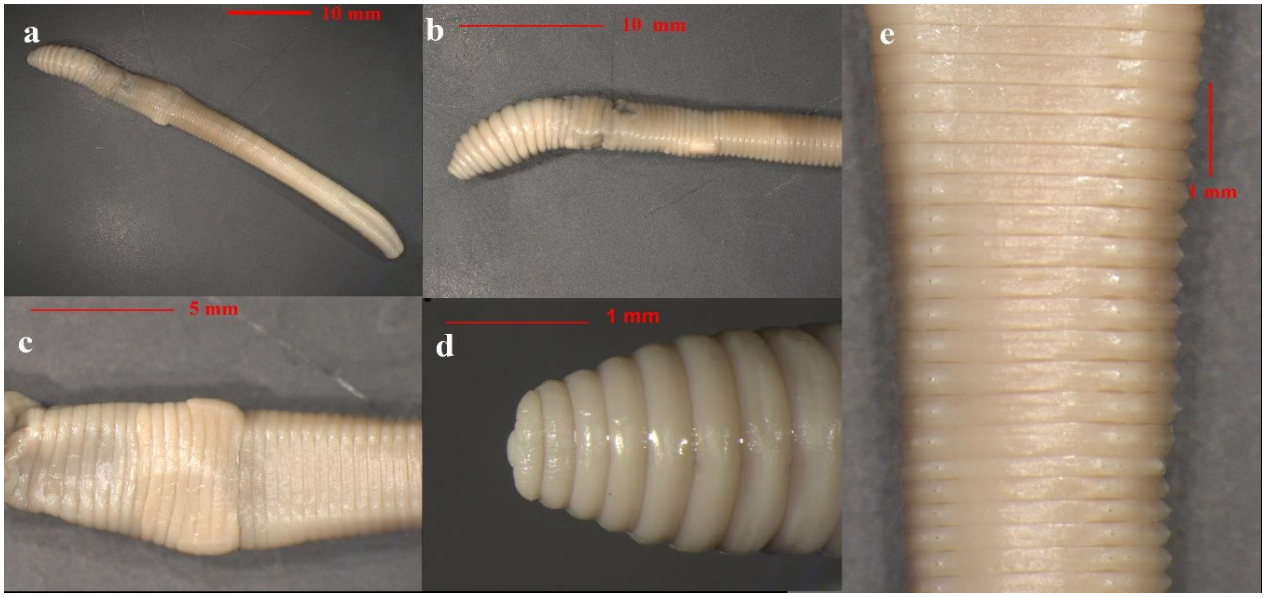

Figure 4. *Aporrectodea jassyensis jassyensis*, a) general body view; b) first part of the body; c) clitellum; d) epilobic prostomium; e) closely paired setae.

Distribution in Turkey: Adana, Ankara, Balıkesir, Bolu, Keşan-Gelibolu [18], Adapazarı, Bayburt, Çankırı, Çorum, Erzurum, Giresun, Samsun, Ordu, [13], Eskişehir [19], Isparta, İstanbul, Konya, Sinop, Trabzon [3].

Species *Aporrectodea rosea* (Savigny, 1826)

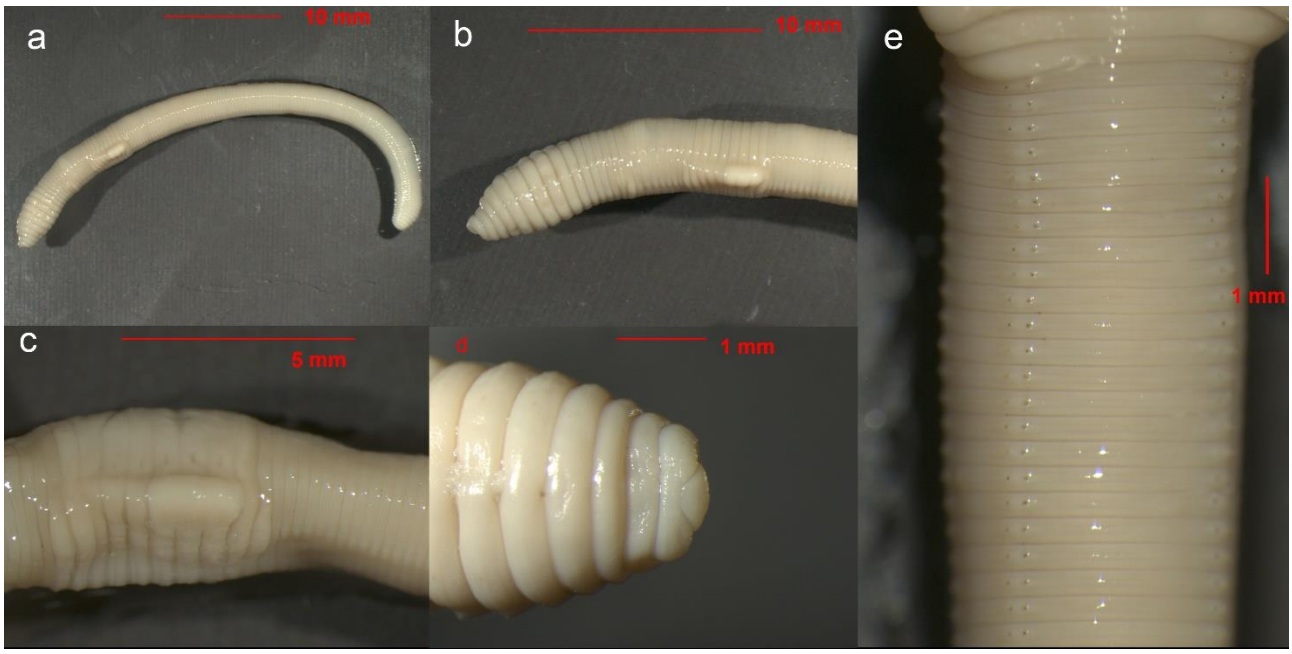

Figure 5. *Aporrectodea rosea*, a) general body view; b) first part of the body; c) clitellum; d) epilobic prostomium; e) closely paired setae.

Distribution in Turkey: Adana, Afyon, Ankara, Antalya, Amasya, Aydın, Balıkesir, Bolu, Burdur, Bursa, Çorum, Eskişehir, Kahramanmaraş, Kayseri, Konya, Kütahya, Muğla, Trabzon, Van [13].

Species *Aporrectodea trapezoides* (Dugès, 1828)

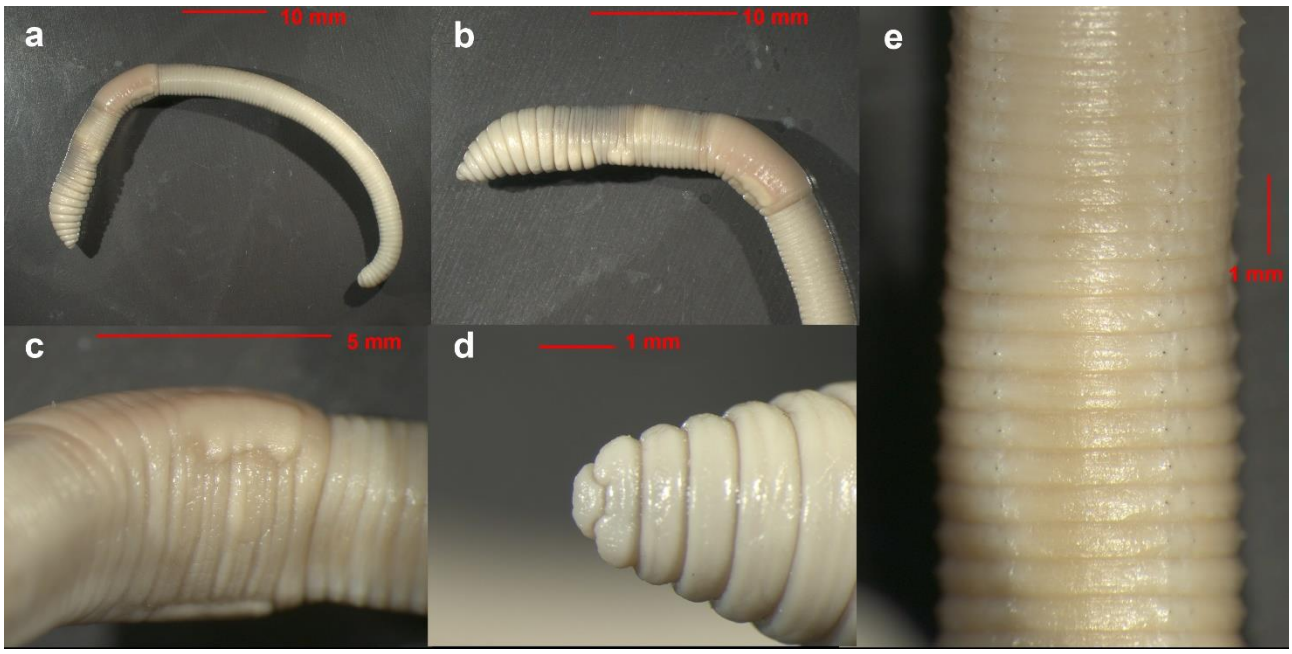

Figure 6. *Aporrectodea trapezoides*, a) general body view; b) first part of the body; c) clitellum; d) epilobic prostomium; e) closely paired setae.

Distribution in Turkey: Afyon**,** Ankara, Artvin, Bitlis, Bursa, Çankırı, Çorum, Denizli, Eskişehir, Giresun, Gümüşhane, Hatay, Kars, Kütahya, Ordu, Samsun, Tatvan, Tekirdağ Van [13].

Genus *Eiseniella* Michaelsen, 1900
Species *Eiseniella tetraedra tetraedra* (Savigny, 1826)

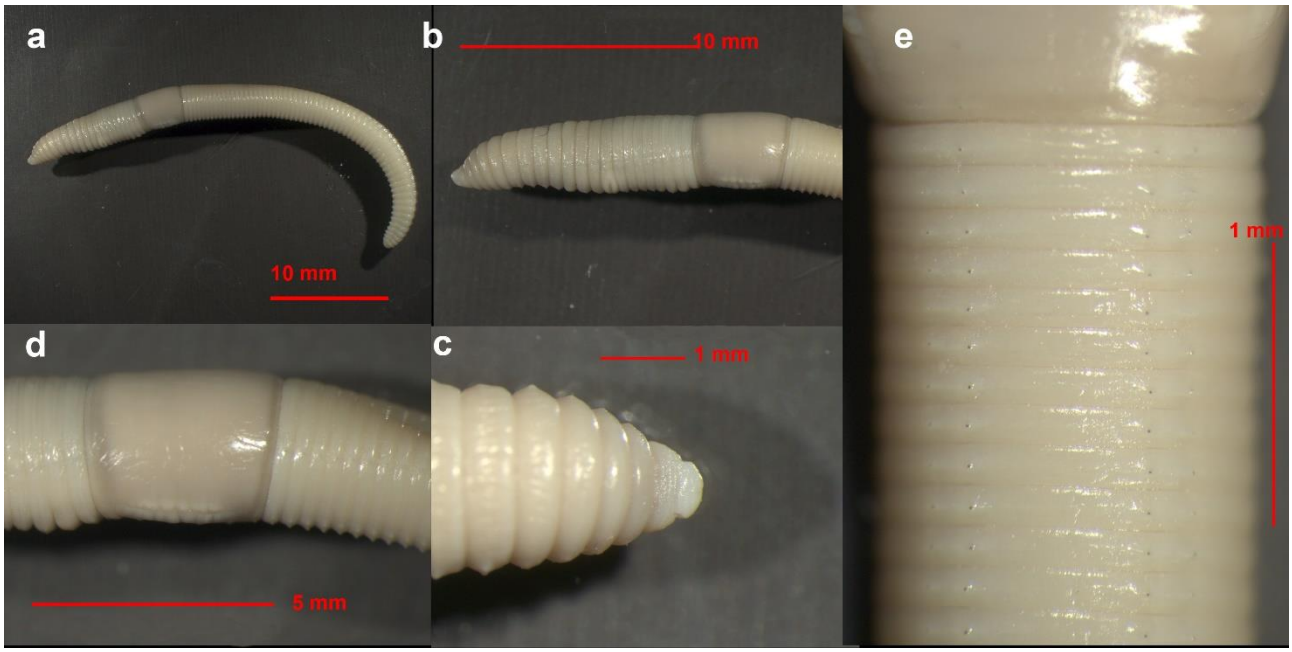

Figure 7. *Eiseniella tetraedra tetraedra*, a) general body view; b) first part of the body; c) clitellum; d) epilobic prostomium; e) closely paired setae.

Distribution in Turkey: Antalya, Artvin, Bolu, Bursa, Erzurum, Eskişehir, Gümüşhane, Hatay, Kayseri, İstanbul, İzmir, Kütahya, Ordu, Tekirdağ [13].

Genus *Lumbricus* Linnaeus, 1758
Species *Lumbricus rubellus* Hoffmeister, 1843

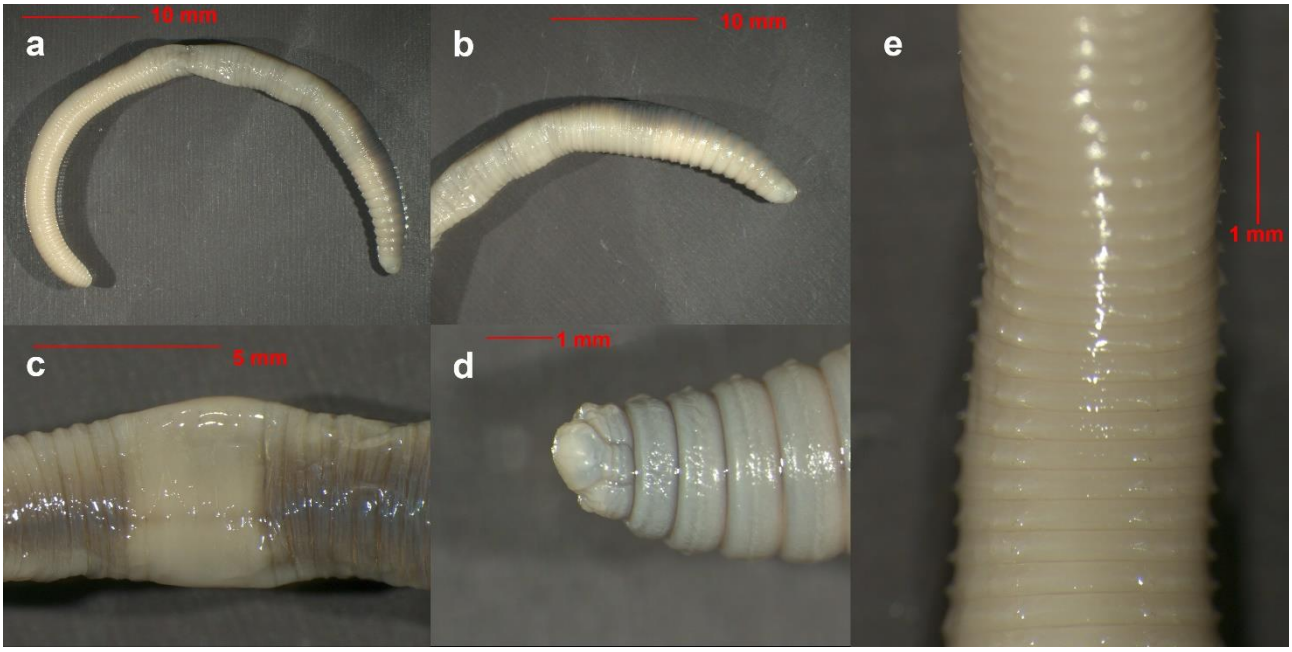

Figure 8. *Lumbricus rubellus*, a) general body view; b) first part of the body; c) clitellum; d) tanylobic prostomium; e) closely paired setae.

Distribution in Turkey: Artvin, Bolu-Abant, Bursa, Edirne, Edremit-Kazdağı, Eskişehir, Giresun-Görele, İstanbul-Belgrad, İstanbul-Kilyos, İstanbul-Yakacık, Kastamonu-Şenpazar, Konya, Rize, Trabzon [13], Yalova, İzmir, Ankara, Giresun, Ordu, Bilecik, Kastamonu, Kocaeli, Karabük [21].

Genus *Octodrilus* Omodeo, 1956
Species *Octodrilus transpadanus* (Rosa, 1884)

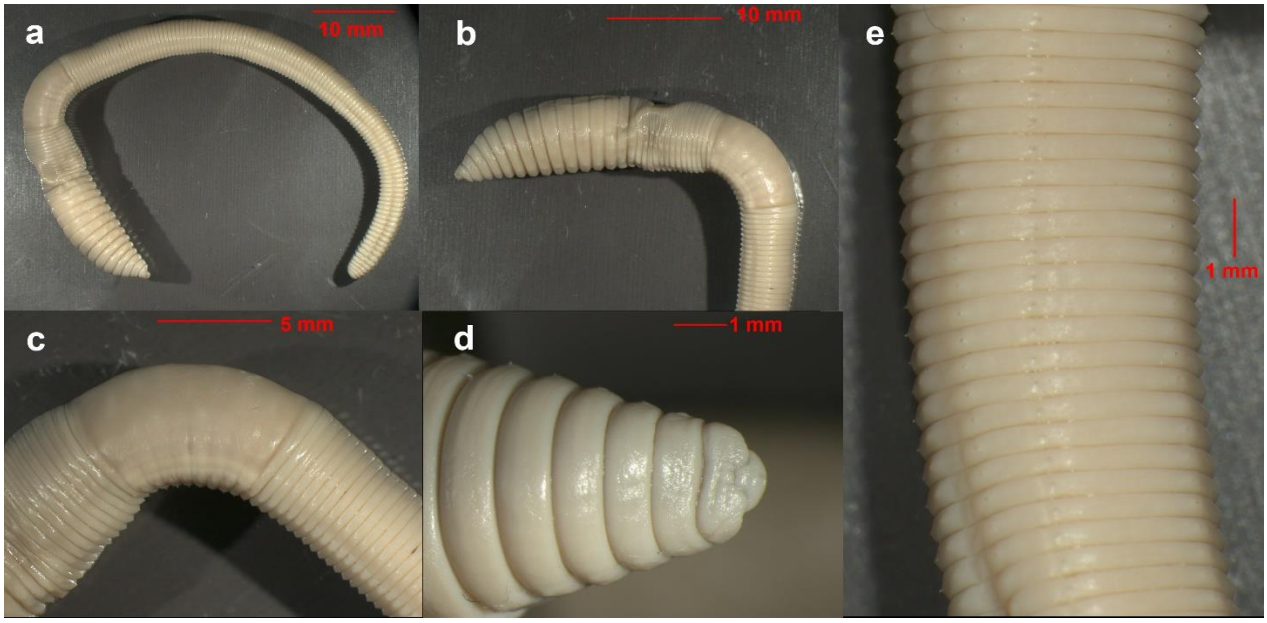

Figure 9. *Octodrilus transpadanus*, a) general body view; b) first part of the body; c) clitellum; d) epilobic prostomium; e) widely paired setae.

Distribution in Turkey: Bursa-Uludağ [23], Eskişehir [24], Adana-Yüreğir [25], Amasya, Balıkesir, Bilecik, Bolu, İstanbul, Kütahya, Mersin, Samsun [17].

Genus *Octolasion* Örley, 1885
Species *Octolasion lacteum* (Örley, 1881)

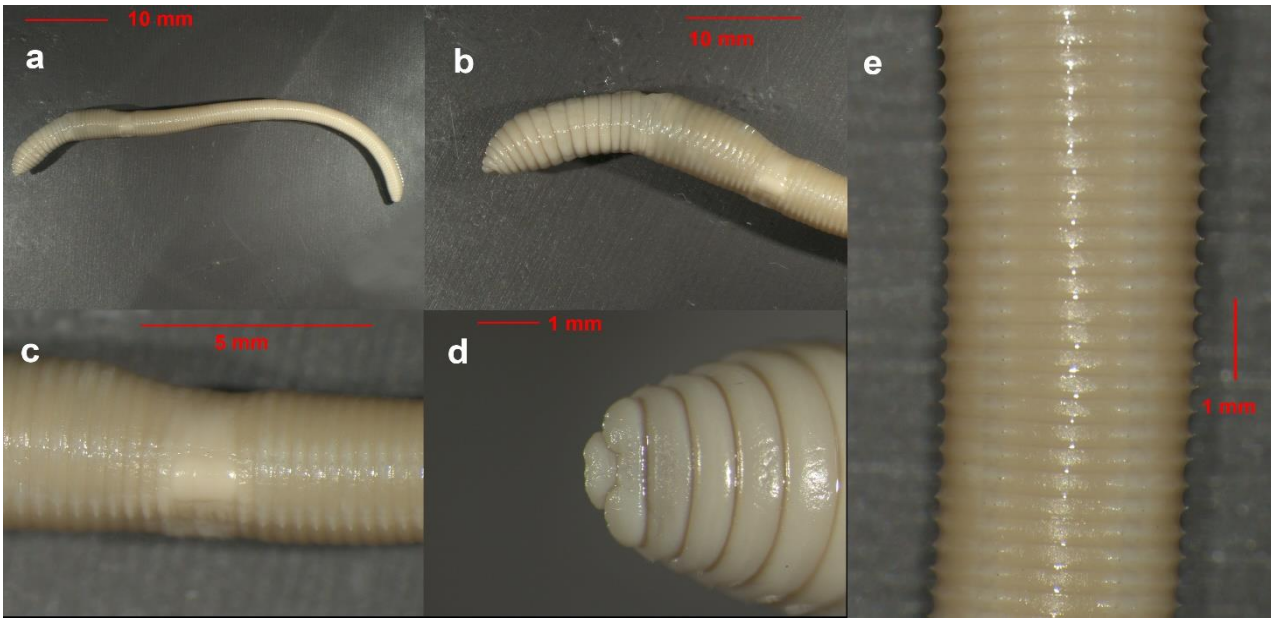

Figure 10. *Octolasion lacteum*, a) general body view; b) first part of the body; c) clitellum; d) epilobic prostomium; e) in closer pairs anteriorly and somewhat wider posteriorly.

Distribution in Turkey: Afyon, Artvin-Şavşat Geçidi, Bursa-Uludağ, Eskişehir [17, 22].

4. Conclusions and discussion

Out of the nine species collected in Edrine Province during the present study six are widely distributed peregrine (*Aporrectodea caliginosa*, *Ap. rosea*, *Ap. trapezoides*, *Lumbricus rubellus*, *Eiseniella tetraedra tetraedra*, *Octolasion lacteum*). Two species, *Aporrectodea dubiosa dubiosa Octodrilus transpadanus* show Trans-Aegean distribution and *Aporrectodea jassyensis jassyensis* is Eastern Mediterranean [13, 29].

Octodrilus transpadanus was previously recorded from several provinces of Marmara, Central Anatolia, the Black Sea, the Aegean and the Mediterranean regions [17, 20, 23, 24, 25].

The other Trans Aegean species, *Aporrectodea dubiosa dubiosa* was previously recorded only from Samsun (Black Sea Region) [19]. Now, it is recorded for the first time from the Thracian part of the Marmara region as well.

The other new record, *Octolasion lacteum* is a peregrine species that was previously recorded from the Marmara, Black Sea, Aegean and Central Anatolia regions [23, 26, 27]. Now, it is recorded from the Thracian part of the Marmara region as well.

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