

Earthworm (Clitellata, Annelida) Records From Eskişehir, Sakarya and Düzce Provinces, Turkey

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ABSTRACT

In this study, earthworm samples collected from four different localities were examined. At the end of the study, 6 species belonging to 5 genus were identified: *Aporrectodea rosea* (Savigny, 1826), *Aporrectodea trapezoides* (Dugès, 1828), *Dendrobaena veneta* (Rosa, 1886), *Lumbricus rubellus* Hoffmeister, 1843, *Eisenia fetida* (Savigny, 1826), *Octodrilus transpadanus* (Rosa, 1884).

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Türkiye'nin Eskişehir, Sakarya ve Düzce İllerinden Topraksolucanı (Clitellata, Annelida) Kayıtları

ÖZET

Bu çalışmada, dört ayrı lokaliteden toplanan topraksolucanı örneklerinin determinasyonu yapılmıştır. Çalışma sonunda 5 cinse ait 6 tür tespit edilmiştir. Bunlar, *Aporrectodea rosea* (Savigny, 1826), *Aporrectodea trapezoides* (Dugès, 1828), *Dendrobaena veneta* (Rosa, 1886), *Lumbricus rubellus* Hoffmeister, 1843, *Eisenia fetida* (Savigny, 1826), *Octodrilus transpadanus* (Rosa, 1884)'dur.

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INTRODUCTION

Turkey is one of the richest countries in terms of earthworm species in the region by sustaining up to 80 registered taxa till now. Albeit having relatively a high number of species for the country, it is still believed that even more number of species yet to be discovered. Besides, the distribution of the species can give useful sign about zoogeography of the region. So, all earthworm records are valueable for the country and region.

Unfortunately, available knowledge is yet not sufficient about the distribution of earthworm species (Mısırlıoğlu, 2011; Mısırlıoğlu and Szederjesi, 2015). Therefore, objective of this study was to present some

results which could help to understand the diversity of some earthworm species.

MATERIAL and METHODS

The samples were collected by digging and hand-sorting. Earthworms were fixed in 85% and preserved in 96% ethanol.

RESULTS

Collecting sites and finding species:

1. Sakarya, Ferizli Town, Konuklu Village, Stream edge, Area like slime, stony and planted area, 03.10.2016.

Dendrobaena veneta (Rosa, 1886) 13 exemplars
Lumbricus rubellus Hoffmeister, 1843 2 exemplars

2. Eskişehir, Sultandere, left side of the high-way in entrance of the quarter, 23.05.2016.

Aporrectodea rosea (Savigny, 1826) 3 exemplars

3. Eskişehir-Türkmentokat Village, near the of ground water, 27.11.2016.

Octodrilus transpadanus (Rosa, 1884) 1 exemplar

Aporrectodea trapezoides (Dugès, 1828) 3 exemplars

4. Düzce- Emiral street 2527 way. Sancaklar-Düzce, 06.11.2016.

Eisenia fetida (Savigny, 1826) 15 exemplars

***Aporrectodea rosea* (Savigny, 1826)**

Enterion roseum Savigny, 1826: 182.

Eisenia rosea f. *acystis*: Omodeo 1952: 9.

Allolobophora rosea f. *balcanica*: Omodeo 1955: 2.

Allolobophora rosea: Zicsi 1973: 229; Omodeo & Rota 1991:177.

Allolobophora rosea complex: Omodeo & Rota 1989: 183.

Aporrectodea rosea: Mısırlıoğlu 2002: 18; Csuzdi et al. 2007: 349; Mısırlıoğlu 2007: 354 ; Mısırlıoğlu 2008b: 469; Pavlíček et al. 2009: 119; Szederjesi et al. 2014: 557; Mısırlıoğlu & Szederjesi 2015: 100.

Distribution in Turkey: Distributed in all regions of Turkey (Csuzdi et al. 2006; Mısırlıoğlu, 2011).

Zoogeographical distribution type: A common peregrine species, native to the Palearctic (Csuzdi and Zicsi, 2003).

***Aporrectodea trapezoides* (Dugès, 1828)**

Lumbricus trapezoides Dugès, 1828: 289.

Allolobophora caliginosa subsp. *trapezoides*: Omodeo 1952: 9.

Allolobophora caliginosa f. *trapezoides*: Omodeo 1955: 2.

Allolobophora caliginosa: Zicsi 1973: 229.

Nicodrilus caliginosus trapezoides: Omodeo & Rota 1989: 181.

Nicodrilus caliginosus complex: Omodeo & Rota 1991: 176.

Aporrectodea trapezoides: Mısırlıoğlu 2002: 18. Mısırlıoğlu 2004: 2; Mısırlıoğlu 2007: 353.

Aporrectodea caliginosa trapezoides: Mısırlıoğlu 2008a: 474; Mısırlıoğlu 2008b: 470.

Aporrectodea caliginosa trapezoides: Mısırlıoğlu 2008b: 470; Mısırlıoğlu & Szederjesi 2015: 101.

Distribution in Turkey: Distributed in all regions of Turkey (Csuzdi et al. 2006; Mısırlıoğlu, 2011).

Zoogeographical distribution type: One of the most widely distributed peregrine earthworms (Csuzdi and Zicsi, 2003).

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

Allolobophora veneta Rosa, 1886: 674.

Allolobophora (Notogama) veneta Rosa, 1905: 5.

Allolobophora (Notogama) veneta succinta Rosa, 1905: 5.

Dendrobaena veneta var. *concolor*: Pop 1943: 22.

Dendrobaena veneta var. *zebra*: Pop 1943: 22.

Eisenia veneta typica: Omodeo 1952: 6.

Dendrobaena veneta typica: Omodeo 1955: 7.

Dendrobaena veneta: Zicsi 1973: 225; Omodeo & Rota 1989: 187, 1991: 179; Mısırlıoğlu 2002: 18 , 2004: 2, 2008a: 474, 2008b: 469; Szederjesi et al. 2014: 560; Mısırlıoğlu & Szederjesi 2015: 100.

Dendrobaena veneta veneta: Csuzdi et al. 2007: 354.

Distribution in Turkey: Distributed in all regions of Turkey (Csuzdi et al. 2006; Mısırlıoğlu, 2011).

Zoogeographical distribution type: This is a peregrine species introduced worldwide due to vermicomposting (Sims and Gerard, 1999; Csuzdi and Zicsi, 2003; Csuzdi et al., 2006). It is probably Eastern Mediterranean origin (Perel 1997).

***Lumbricus rubellus* Hoffmeister, 1843**

Lumbricus rubellus: Rosa 1905: 7.

Lumbricus rubellus: Omodeo 1952: 14.

Lumbricus rubellus: Zicsi 1973: 231.

Lumbricus rubellus: Omodeo & Rota 1989: 183.

Lumbricus rubellus: Omodeo & Rota 1991: 178.

Lumbricus rubellus: Mısırlıoğlu 2002: 18.

Lumbricus rubellus: Mısırlıoğlu 2004: 2.

Lumbricus rubellus: Mısırlıoğlu 2007: 354.

Lumbricus rubellus: Mısırlıoğlu 2008b: 470.

Lumbricus rubellus: Mısırlıoğlu & Szederjesi 2015: 100-101.

Lumbricus rubellus: Szederjesi and Mısırlıoğlu, 2017: 59.

Distribution in Turkey: Prinkipo im Marmarameere (Rosa 1905); Polonezköy (Omodeo 1952); Abant Mountains near of Bolu, Abant Mountains Gölü, Uludağ near of Bursa, İstanbul Belgrad Forest, İstanbul Kalender, Alemdağ near of İstanbul, Rize, Kandilli, Zigana Dağı near of Trabzon, Mudanya, Yalova, Kilyos, Kazdağı-Mount Ida, İstanbul Kadıköy and Karaköy, Kızılcahamam Ankara, Namrun, Yamanlar İzmir (Zicsi 1973); Bursa Uludağ, Ordu River Bolaman, Giresun, Görele, Artvin Çiftköprüler, Artvin Cankurtaran pass, Ordu Caca Gölü, Bolu-Boludağı Geçidi, Bolu Konuralp, İstanbul Belgrad Ormanı (Omodeo & Rota 1989); Bilecik 75 km E. of Bursa, Bursa N. face of Uludağ (Omodeo & Rota 1991); Eskişehir Sarıcakaya, Eskişehir Alpagut Village (Mısırlıoğlu 2002); Kütahya Çerte (Mısırlıoğlu 2004); Kocaeli-Kocatepe, Kocaeli-Yenikent, Kocaeli-Çınarlı Village, Kocaeli-Altımeşverler, Kocaeli-Kuruçeşme, Kocaeli-Yenidoğan, Kocaeli-Kirkikievler (Mısırlıoğlu 2007); Karabük (Mısırlıoğlu 2008b); Konya-Ereğli,

İstanbul-Yakacık, Edirne-Havsa, Kastamonu-Senpazar (Mısırlıoğlu & Szederjesi 2015).

Zoogeographical distribution type: A widely introduced peregrine species, native to the Palearctic (Perel, 1997, Sims & Gerard, 1999, Csuzdi & Zicsi 2003).

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

Eisenia foetida: Omodeo 1956: 329.
Eisenia foetida: Omodeo & Rota 1989: 180.
Eisenia foetida: Mısırlıoğlu 2002: 18.
Eisenia foetida: Mısırlıoğlu 2004: 3.
Eisenia fetida: Mısırlıoğlu 2008b: 470.
Eisenia fetida: Pavlíček et al. 2009: 119-120.
Eisenia fetida: Szederjesi et al. 2014,: 565.
Eisenia fetida: Mısırlıoğlu & Szederjesi 2015: 101.
Eisenia fetida: Mısırlıoğlu and Valchovski 2017:387.
Eisenia fetida: Szederjesi and Mısırlıoğlu, 2017: 59.

Distribution in Turkey: İstanbul Şile (Omodeo 1955); Bolu-Boludağı Geçidi, İstanbul Belgrad Ormanı (Omodeo & Rota 1989); Eskişehir Mihalçıcık, Eskişehir Karagözler Village (Mısırlıoğlu 2002); Eskişehir Osmangazi Üniversitesi Meşelik Kampüsü (Mısırlıoğlu 2004); Antalya-Manavgat, Antalya-Meltem District (Mısırlıoğlu 2008b); Diyarbakır-Betw. Ergani and Maden, Soğuksu, cultivated slope with a spring 5 km south of Maden (Pavlíček et al. 2009); Istranca Mts., Alabalık stream and its gallery along the Pınarhisar-Demirköy road, Diyarbakır, Ergani Maden arası Soğuksu, 5 km S of Maden (Szederjesi et al. 2014); Aydın-Didim (Mısırlıoğlu & Szederjesi 2015).

Zoogeographical distribution type: A common peregrine species introduced by human all over the world. However, according to Perel (1997) it is probably originate from the Caucasus region in Russia (Perel 1997, Sims & Gerard 1999, Csuzdi & Zicsi 2003).

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

Octolasion (Octodrilus) transpadanum: Zicsi 1973: 226.
Octodrilus transpadanus: Omodeo & Rota 1989: 183.
Octodrilus transpadanus: Omodeo & Rota 1991: 178.
Octodrilus transpadanus: Mısırlıoğlu 2002: 18.
Octodrilus transpadanus: Mısırlıoğlu 2002: 2.
Octodrilus transpadanus: Csuzdi et al. 2007: 357.
Octodrilus transpadanus: Mısırlıoğlu 2007: 353-354.
Octodrilus transpadanus: Mısırlıoğlu 2008b: 469-470.
Octodrilus transpadanus: Pavlíček et al. 2009: 119-120.
Octodrilus transpadanus: Szederjesi et al. 2014: 567.
Octodrilus transpadanus: Mısırlıoğlu & Szederjesi 2015: 100.

Distribution in Turkey: Marmara (Zicsi 1973, Omodeo & Rota 1989, Csuzdi et al. 2007, Mısırlıoğlu 2007, Mısırlıoğlu & Szederjesi 2015); North Anatolia

(Omodeo & Rota 1989, Omodeo & Rota 1991); Aegean (Omodeo & Rota 1991, Mısırlıoğlu 2008b); Inner Anatolia (Mısırlıoğlu 2002); Mediterranean (Csuzdi et al. 2007, Mısırlıoğlu 2008b); South-East Anatolia (Pavlíček et al. 2009, Szederjesi et al. 2014).

Zoogeographical distribution type: A widely distributed trans-aegean species recorded from Switzerland to Turkey (Csuzdi and Zicsi, 2003; Szederjesi 2017).

DISCUSSION

In this study, earthworm samples collected from four different localities were determined. At the end of the study, 6 species belonging to 5 genus were identified: *Aporrectodea rosea* (Savigny, 1826), *Aporrectodea trapezoides* (Dugès, 1828), *Dendrobaena veneta* (Rosa, 1886), *Lumbricus rubellus* Hoffmeister, 1843, *Eisenia fetida* (Savigny, 1826), *Octodrilus transpadanus* (Rosa, 1884).

Five of them are peregrine: *Aporrectodea rosea*, *Aporrectodea trapezoides*, *Dendrobaena veneta*, *Lumbricus rubellus* and *Eisenia fetida*.

Octodrilus transpadanus is a widely distributed Trans-Aegean species It lives from Switzerland, to Turkey in Europe and also North and South America. So, in our present knowledge, Turkey is easternmost country where the species was found up until now (Csuzdi and Zicsi, 2003; Szederjesi, 2017).

Knowledge about the diversity of earthworms is insufficient because of the majority of the country yet to be studied (Mısırlıoğlu and Szederjesi, 2015). Therefore, all results could be helpful to understand the distribution of the earthworm species. So, we hope that these results will help to understand Turkey's earthworm species diversity.

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