

1-1-2007

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MISIRLIOĞLU, METE (2007) "The Earthworm Fauna of the Kocaeli (İzmit) City Center (Oligochaeta, Lumbricidae)," *Turkish Journal of Zoology*. Vol. 31: No. 4, Article 8. Available at: <https://journals.tubitak.gov.tr/zoology/vol31/iss4/8>

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The Earthworm Fauna of the Kocaeli (İzmit) City Center (Oligochaeta, Lumbricidae)

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Received: 27.04.2006

Abstract: Earthworm specimens collected from 10 different areas of the Kocaeli city center were examined and identified. At the end of the study, 8 species belonging to 5 genera of Lumbricidae were identified: *Lumbricus rubellus*, *Cernosvitovia schweigeri*, *Octodrilus transpadanus*, *Aporrectodea caliginosa trapezoides*, *Aporrectodea rosea*, *Aporrectodea jassyensis*, *Dendrobaena hortensis*, and *Dendrobaena veneta*.

Key Words: Turkish earthworms, Lumbricidae, Oligochaeta, Kocaeli, Fauna of Turkey

Kocaeli İl Merkezi (İzmit) Topraksolucanı Faunası (Oligochaeta, Lumbricidae)

Özet: Bu çalışmada Kocaeli İl merkezinin 10 farklı alanından toplanan topraksolucanı örnekleri incelenerek teşhisi yapılmıştır. Çalışma sonunda *Lumbricus rubellus*, *Cernosvitovia schweigeri*, *Octodrilus transpadanus*, *Aporrectodea caliginosa trapezoides*, *Aporrectodea rosea*, *Aporrectodea jassyensis*, *Dendrobaena hortensis*, *Dendrobaena veneta* olmak üzere Lumbricidae familyasının 5 cinsine ait 8 tür tespit edilmiştir.

Anahtar Sözcükler: Türkiye topraksolucanları, Lumbricidae, Oligochaeta, Kocaeli, Türkiye Faunası

Introduction

Knowledge of the earthworm fauna of Turkey, despite the increase in sampling activity in some parts of the eastern Mediterranean (Csuzdi and Pavlíček, 1999, 2005a, 2005b), is still very limited. For instance, some areas of the Marmara region in Turkey are poorly sampled and our knowledge on the earthworms of this region is insufficient.

Previously published studies on the earthworm fauna of Turkey do not contain data from Kocaeli city and its environs (Omodeo, 1952; Zicsi, 1973; Omodeo and Rota, 1989, 1991). The purpose of this paper was to present the identification results from this unexplored area of Anatolia, and to contribute to the understanding of the earthworm fauna of the Marmara region.

Materials and Methods

Samples were collected by digging and hand-sorting the soil. For fixation and conservation, 70% ethanol was used. Localities are described below. Species nomenclature is according to Csuzdi and Zicsi (2003).

Results

Collecting Sites and Species Recorded:

1. Şirintepe; humid soil, grassy area, 28.03.2004.
Aporrectodea caliginosa trapezoides (Dugés, 1828):
2 adult specimens.
Octodrilus transpadanus (Rosa, 1884): 5 adult specimens.

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- Cernosvitovia schweigeri* (Zicsi, 1973): 2 adult + 2 pre-adult + 2 juvenile specimens.
2. Kocatepe; wet clay soil, grassy area, 28.03.2004.
Cernosvitovia schweigeri (Zicsi, 1973): 3 adult specimens.
Lumbricus rubellus Hoffmeister, 1843: 4 adult + 8 juvenile specimens.
3. Bekir Paşa; house garden, spinach-planted area, 28.03.2004.
Cernosvitovia schweigeri (Zicsi, 1973): 1 pre-adult + 2 juvenile specimens.
Dendrobaena hortensis (Michaelsen, 1890): 1 adult specimen.
4. Yenikent; garden of an apartment, grassy and planted area, among the trees, 27.03.2004.
Aporrectodea rosea (Savigny, 1826): 1 pre-adult specimen.
Aporrectodea jassyensis (Michaelsen, 1891): 1 adult specimen.
Lumbricus rubellus Hoffmeister, 1843: 2 adult + 2 juvenile specimens.
5. Çınarlı Köyü; in a meadow, from naked area, 28.03.2004.
Dendrobaena hortensis (Michaelsen, 1890): 1 adult specimen.
Dendrobaena veneta (Rosa, 1886): 2 adult specimens.
Lumbricus rubellus Hoffmeister, 1843: 1 adult specimen.
Octodrilus transpadanus (Rosa, 1884): 1 adult specimen.
Aporrectodea caliginosa caliginosa (Sanigny, 1826): 7 adult specimens.
6. 60 Evler; meadow, grassy area, some stones on soil surface, 28.03.2004.
Lumbricus rubellus Hoffmeister, 1843: 12 adult specimens.
7. Kuruçeşme; house garden, grassy area, 28.03.2004.
Lumbricus rubellus Hoffmeister, 1843: 10 adult specimens.
8. Yenikent-Tepe; house garden, woody area, 27.03.2004.
Aporrectodea sp.: 1 juvenile specimen.
9. Yenidoğan, Huzurevi; edge of an asphalt road, no grass or plants, 27.03.2004.
Lumbricus rubellus Hoffmeister, 1843: 2 adult + 2 juvenile specimens.
10. 42 Evler; house garden, grassy and planted area, 28.03.2004.
Lumbricus rubellus Hoffmeister, 1843: 1 adult + 5 juvenile specimens.

Discussion

In this study, the identification results of earthworm samples collected in 10 different localities of the Kocaeli city center are presented. In all, 8 species belonging to 5 genera of Lumbricidae were identified.

Lumbricus rubellus, which was found at 7 localities, is the most common species in Kocaeli.

Previous studies carried out in Turkey showed that *Lumbricus rubellus* is a common species in northwestern Turkey, but the genus *Lumbricus* itself is poorly represented; only the species *L. rubellus* is present in Turkey, its southern distribution limit (Omodeo and Rota, 1989, 1991, 1999).

This is a common peregrine species, preferring humid habitats in gardens and woody areas (Perel, 1997; Sims and Gerard, 1999; Mısırlıoğlu, 2001).

Cernosvitovia schweigeri, which was recorded from 3 localities in this study, is endemic to the Marmara region of Turkey. It was previously known from 2 localities in Bursa and on the Asiatic side of İstanbul.

In previous records of this rare species some differences were noted, especially in the anatomy of the esophageal hearts and the occurrence of thickened septa (Zicsi, 1973; Omodeo and Rota, 1991). As to the openings of the male ducts, Zicsi initially (1973) stated that they lie in segment XV and then in a second paper (1981: 441) he stated that they are located at the level of the tubercula pubertatis. Omodeo and Rota (1991) excluded the location on segment XV, but they could not see them at all because of the poor condition of the clitellar region of the specimen. Therefore, it seems useful to provide additional information about this

species. In the specimens collected for this study, the clitellum is on 24-33 and the tubercula appear as small bands on 26-32. Dissepiment 5/6 is somewhat thickened, while those at 6/7-8/9 are significantly strengthened. Two pairs of testes and funnels are enclosed in periesophageal testis sacs. There are 2 pairs of seminal vesicles in 11 and 12, and 2 pairs of spermathecae in 9/10-10/11. The male pores are located in segment 27.

Another peregrine species, *Dendrobaena hortensis*, was found at localities 3 and 5. In Turkey it occurs particularly in northern Anatolia, including the Asiatic side of İstanbul and the Marmara region; however, it has also been collected in the northwestern part of inner Anatolia and near Antalya in the Mediterranean region.

Surprisingly, *Aporrectodea caliginosa trapezoides* was recorded only at locality 1. It is one of the most common species in Turkey and was previously recorded from almost all parts of Turkey (Omodeo and Rota, 1989, 1991; Mısırlıoğlu, 2002). It is known that this species is abundant and is dominant in humid plots like riversides, forests, and farming areas (Perel, 1997; Sims and Gerard, 1999; Mısırlıoğlu, 2001). Some samples from Çınarlı village also belong to *Ap. caliginosa*, but identification to the subspecies level was not possible. Ecological preferences of these subspecies are very similar and both of them are common in Turkey. Sometimes the morphological differences between these subspecies show completely intermediary development, which raises the question of their validity (Csuzdi and Zicsi, 2003). Furthermore, some juveniles belonging to the genus *Aporrectodea* from locality 8 could not be identified to species level.

Another widespread Turkish species is *Dendrobaena veneta*. It was recorded only at locality 5. It is reported to occur under decaying leaves and in soils that contain

abundant organic material, in manure, and in sewer systems (Sims and Gerard, 1999). The present samples were collected under the litter layer on earth in a woody area, conditions that verify the species preferences.

Octodrilus transpadanus was recorded at 2 localities. According to previous studies it is not very common in Turkey, but it has been found in different regions of Turkey, including northern Anatolia (Samsun, Bolu, and Amasya), the Marmara region (İstanbul and Bilecik), the Mediterranean region (Mersin), the Aegean region (Kütahya), and inner Anatolia (Eskişehir).

Aporrectodea rosea is also very common in Turkey. This species inhabits all parts of Anatolia (Zicsi, 1973; Omodeo and Rota, 1989, 1991). It was recorded at locality 4, together with *A. jassyensis*. It is known that these species resemble each other in ecological preferences, and a close association among them was previously observed (Mısırlıoğlu, 2001). Usually they prefer grassy and woody areas (Perel, 1997; Sims and Gerard, 1999).

Our knowledge of the earthworms of Anatolia remains insufficient. I think, however, that the present study will add to our understanding of the earthworm fauna of the Marmara region, a district of zoogeographical significance due to the faunal connections between Anatolia and the Balkans.

Acknowledgments

I would like to thank Prof. Andras ZICSI (University of Budapest, HUNGARY) for his kind help in the identification and confirmation of samples. My thanks are due also to Dr. Csaba CSUZDI (University of Budapest, HUNGARY) who kindly revised the text and provided useful comments.

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