

A contribution to the study of the Oligochaetofauna of Cyprus

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Received: 24 May 1991

Accepted for publication: 5 Aug. 1993

MICHALIS K. 1993. A contribution to the study of the Oligochaetofauna of Cyprus. Acta zool. cracov., 36(1): 23-28.

Abstract. In 1979-1987 six oligochaete species were collected from 13 new localities of their occurrence in Cyprus. The poverty of the Oligochaetofauna in Cyprus is connected with geological and climatic circumstances.

Key words: Oligochaeta, *Acanthodrilidae*, *Lumbricidae*, Cyprus.

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I. INTRODUCTION

Cyprus lies in the north-eastern region of the eastern part of the Mediterranean Sea.

The expansion of the *Oligochaeta* took place in Europe in the Miocene (OMODEO 1952). According to OMODEO (o.c.), the distribution of the *Oligochaeta* in Cyprus represents another, "Syriano-Anatolico-Egean" type. OMODEO (o. c.) sets up the boundaries of the area of this type of distribution as follows: in the north the boundary begins on beyond the Aegean Sea or in the southern extension of the Armenian Plateau, where various endemic species of the Caucasus and Transcaucasia live. In the south the boundary runs in Palestine and the Sinai Peninsula. The eastern boundary is not very well defined and the western one is not mentioned at all by the author. In OMODEO's (1952) opinion, the area of the second type of distribution of the *Oligochaeta* in Europe is well known only in a few regions, such as Greece, in Syria and Palestine. Nothing is known of it in some other countries, e.g. Jordan, Iran, Cyprus.

It is interesting that many species abundant in the Balkan Peninsula and all over Europe do not occur in Cyprus.

The aim of this study is to explain as thoroughly as possible the specific nature of the Oligochaetofauna of Cyprus.

II. MATERIALS AND METHODS

Collection of materials was started in 1979 and ended in 1987. It was carried out by Cypriot students of the Department of Biology, the University of Thessaloniki, from which they have graduated by now. The material obtained by them was next syntetically classified in the Laboratory of Zoology. After their identification the specimens were placed in preservation container filled with 70% ethanol and 0.55% formalin. Each container bears a label with the capital T and a number. The letter T stands for Thessaloniki, the seat of the Laboratory of Zoology.

Various methods were used to classify the specimens, including those proposed by POP (1941), BOUCHÉ (1972), PEREL (1979) and ZICSI (1959) and various external and internal phylogenetic features were examined.

Localities of collection of specimens (Fig. 1):

1. Larnaca prov.: 1a – The city of Larnaca, 1b – The west region of Larnaca
2. Nicosia prov.: 2a – Strovolos, 2b – New cemetery (Nicosia), 2c – Kaimakli, 2d – Lykavitos
3. Limassol prov.: 3a – The East region of Limassol, 3b – The West region of Limassol, 3c – Paramalio area, 3d – The East region of Paramalio, 3e – Germosoya, 3f – The Northwest region of Paramalio
4. Famagusta prov.: 4a – Liopetru*



Fig. 1. A sketch map of Cyprus showing the localities at which our specimens have been collected (list of localities in text).

*No oligochaete material has been collected from the northern part of Cyprus.

III. RESULTS

Distribution of species. The following data are given for each species: locality number, number of specimens, date of collection, name of collector and finally – in parentheses – container number.

The places where our specimens were taken are plotted on the map in Fig. 1. The numeration of localities, fixed according to the district and applied both on the map and in the discussion of the distribution of particular species is follows:

1. *Acanthodrilidae*

Genus *Microscolex* ROSA, 1887

Microscolex phosphoreus (Ant. DUGÉS, 1837)

Localities: 3b: 5 spec., 4 Jan. 1979, leg. CHARILAOU (T/641); 3a: 10 spec., 20 Apr. 1987, leg. CHROSTOPHOROU (T/1196).

2. *Lumbricidae*

Genus *Aporrectodea* ÖRLEY, 1885

Aporrectodea (Aporrectodea) caliginosa (SAVIGNY, 1826)

Localities: 1a: 3 spec., 29 Apr. 1979, leg. CHARILAOU (T/647); 1b: 4 spec., 21 Apr. 1979, leg. CHARILAOU (T/638); 2a: 4 spec., 2 Jan. 1979, leg. DIOSKOURIDIS (T/637); 2b: 3 spec., 3 Jan. 1979, leg. DIOSKOURIDIS (T/640); 2c: 1 spec., 17 Apr. 1987, leg. CHROSTOPHOROU (T/1201); 2d: 2 spec., 25 Apr. 1979, leg. DIOSKOURIDIS (T/642); 3e: 10 spec., 20 Apr. 1987, leg. CHROSTOPHOROU (T/1196); 3d: 7 spec., 16 Apr. 1987, leg. CHARILAOU (T/1197); 4a: 3 spec., 16 Apr. 1986, leg. CHARILAOU (T/1058).

Aporrectodea (Aporrectodea) rosea (SAVIGNY, 1826)

Localities: 1a: 9 spec., 7 Jan. 1979, leg. DIOSKOURIDIS (T/639); 1b: 10 spec., 29 Apr. 1979, leg. CHARILAOU (T/648); 2d: 12 spec., 24 Apr. 1979, leg. DIOSKOURIDIS (T/643); 3a: 132 spec., 29 Apr. 1979, leg. CHARILAOU (T/646); 3d: 7 spec., 16 Apr. 1987, leg. CHARILAOU (T/1197); 4a: 3 spec., 16 May 1986, leg. CHARILAOU (T/1058); 3a: 12 spec., 29 Apr. 1979, leg. CHARILAOU (T/646); 3c: 9 spec., 19 Apr. 1987, leg. CHARILAOU (T/1198); 3f: 2 spec., 20 Apr. 1987, leg. CHROSTOPHOROU (T/1204); 4a: 10 spec., 16 May 1986, leg. CHARILAOU (T/1057); 4a: 41 spec., 16 May 1986, leg. CHARILAOU (T/1059).

Genus *Allolobophora* EISEN, 1874 emend. POP, 1941

Allolobophora minuscula ROSA, 1905

Locality: 3f: 17 spec., 20 Apr. 1987, leg. CHARILAOU (T/1203).

Genus *Dendrobaena* EISEN, 1874 emend. POP, 1941

Dendrobaena pantaleonis (CINAGLIA, 1913)

Locality: 2c: 10 spec., 17 Apr. 1987, leg. CHROSTOPHOROU (T/1200)

Dendrobaena veneta hibernica (FRIENT, 1892)

Locality: 3f: 5 spec., 20 Apr. 1987, leg. CHROSTOPHOROU (T/1202).

IV. DISCUSSION

As can be see from the data concerning the distribution of the species in Cyprus, excluding its northern area, the number of the species encountered is very limited. As far as we know, no one has dealt with the Oligochaetofauna of this area. In Cyprus this fauna is characterized by the lack of many genera and species.

The poverty of the Oligochaetofauna of Cyprus can be explained on the basis of climatic and geological data.

Climatic data. As it is well known, the Annelida in general and the Oligochaeta in particular live and thrive in damp places or even in water (as in the case of the Polychaeta and some families of Oligochaeta). Cyprus, owing to its geographical situation, has a Mediterranean type climate which however differs both from the climate of the Balkan Peninsula and from that of South and Central Europe. The farther to the east of the mediterranean Sea, the longer the summer droughts last. According to TAHA-HARB-NAAGIB and TANTAWY's (1981) reports, in Cyprus the period of rainfall is short; it begins in November and ends in March. They give the mean annual rainfall to be 369 mm at Nicosia, 457 mm at Limassol and 403 mm at Famagusta. A higher rainfall is observed at Kerinia (534 mm) (these observations were made over a period of 27 years, 1936-1963; see Fig. 2). Such climatic conditions account in a way for the poverty of the oligochaete families, genera and species in Cyprus.

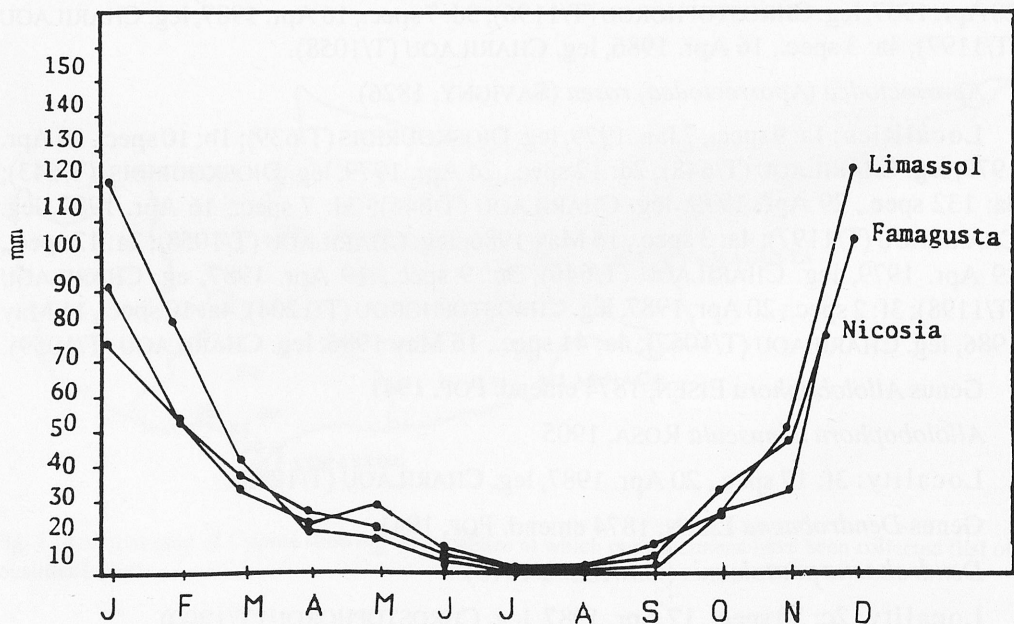


Fig. 2. Mean rainfall in particular months of the year on the basis of the data from 27 years for three places (After TAHA et al. 1981).

Geological data. Having considered various geological data presented by the Geological Survey Department, the Government of Cyprus, on a geological map printed by COUVAS and Sons L.T.D., LIMASSOL (1963), we were able to establish relatively precisely when the expansion of the *Oligochaeta* had taken place. The possible time of their expansion falls in the Pleistocene. Generally speaking, the problem of the primary expansion of the *Oligochaeta* is quite obscure and it caused frequent controversies between scientists (e. g. MICHAELSEN 1921, ČERNOSVITOV 1936). According to MICHAELSEN (1921), the primary expansion of the *Oligochaeta* occurred towards the end of the Palaeozoic. He explains the discontinuity of their distribution on the basis of Vegener's continental drift theory. ČERNOSVITOV (1936) agrees with MICHAELSEN's opinion, whereas OMODEO (1952) assumes that the *Oligochaeta* expanded in Europe in the Miocene.

OMODEO (1952) explains also the present distribution of the *Oligochaeta* in Cyprus. He thinks that the big islands in the eastern part of the Mediterranean Sea, such as Cyprus, Crete and some other smaller ones arose by being cut off from the mainland around the Middle Miocene.

Notes on the Oligochaetofauna of Cyprus. As has already been mentioned, the Oligochaetofauna of this area is very poor in genera and species. This is confirmed by a systematic investigation of our specimens.

Owing to peculiar climatic circumstances prevailing in this area – a long spell of drought, a poor rainfall – the species that live here now have managed to survive thanks to their being very resistant. From among the species found we should mention *Aporrectodea rosea*. This species was recorded from Oslo in Norway; it was found in a large part of the Alps and even in an oasis in the Sahara (OMODEO 1952). FÜLLER (1952/53) writes about the occurrence of *Aporrectodea rosea* in all kinds of soil. KOLLMANNSPERGER (1934) considers this species to be ecologically tough. OMODEO (1960) writes that *Dendrodillus rubidus* is absent from the eastern part of the Aegean Sea and Greece. This opinion is not sustained today, because since that time this species has been found in many places in Greece (MICHALIS 1972, 1975, 1976) and in the area of the Sea of Marmara in Turkey (OMODEO & ROTA 1989). The same is also true of *Eisenia fetida*. According to OMODEO (1960), this species is absent from all the East Mediterranean areas and consequently also from Greece. But we have frequently come across this species both in the mainland and in the islands of Greece. As far as *Allolobophora chlorotica* is concerned, OMODEO (1960) claims that it lives in Greece but is absent from Kos (Dodecanese) (MICHALIS 1975).

The small number of the genera (*Microcolex*, *Aporrectodea*, *Allolobophora* and *Dendrobaena*) and species present in Cyprus supports our opinion that the Oligochaetofauna of Cyprus belongs to the second type of distribution, termed the "Syriano-Anatolico-Egean" distribution (OMODEO 1952).

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