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ON THE EARTHWORM FAUNA AND DISTRIBUTION IN THE STATE OF QATAR

By

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ABSTRACT

This paper is a preliminary account of the earthworms collected in February and March, 1986, from 10 localities in Qatar. Five species, *Amynthas corticis* (Family Megascolecidae), *Dichogaster bolaui* (Family Octochaetidae), *Aporrectodea caliginosa, Dendrodrilus rubidus* and *Helodrilus oculatus* (Family Lumbricidae) are found. These species are heterogeneous not indigenous to Qatar and probably have been introduced into this country with imported soil.

INTRODUCTION

Earthworms play an important ecological role by breaking down dead plant matter and forming humus. Thus, they help to fertilize the soil by releasing nitrogenous matter. Also, they change the texture of the soil to become of more crumblike structure which increases its water retaining capacity. Soil drainage and aeration are also improved by the burrows made by earthworms during their migration in the soil (Evans and Guild, 1984; Edwards and Lofty, 1977. White, 1978).

The soil nature in Qatar is generally of dry sand. However, with the aim of introducing agriculture in this State, soil has been imported from several countries such as India andSouth EastAsian countries. Therefore, organisms benificial as well as harmful to man, inhabiting the soil imported from these countries are expected to be introduced into Qatar.

In this study, we report on the earthworms found in ten different localities in the State of Qatar.

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MATERIALS AND METHODS

Ten localities in the State of Qatar, illustrated in Figure (1), were examined for the presence of earthworms. Localities No. 3,7,6,9 were of desert nature, No. 1,4,8,10 were gardens, and No. 2,5 were farms.

Two soil samples were collected from each locality during February and March, 1986. Each soil sample was collected from an area measuring 15 cm by 15 cm and for a depth of 15 cm. The soil samples were examined in the laboratory and the number of each earthworm species was reported. The main references used for identification were those of Cloudsley–Thompson and Sandy (1961); Edwards and Lofty (1977); El–Kifl and Ghabbour (1984) and Sims and Gerard (1985). The identification was confirmed in the British Museum of Natural History U.K.

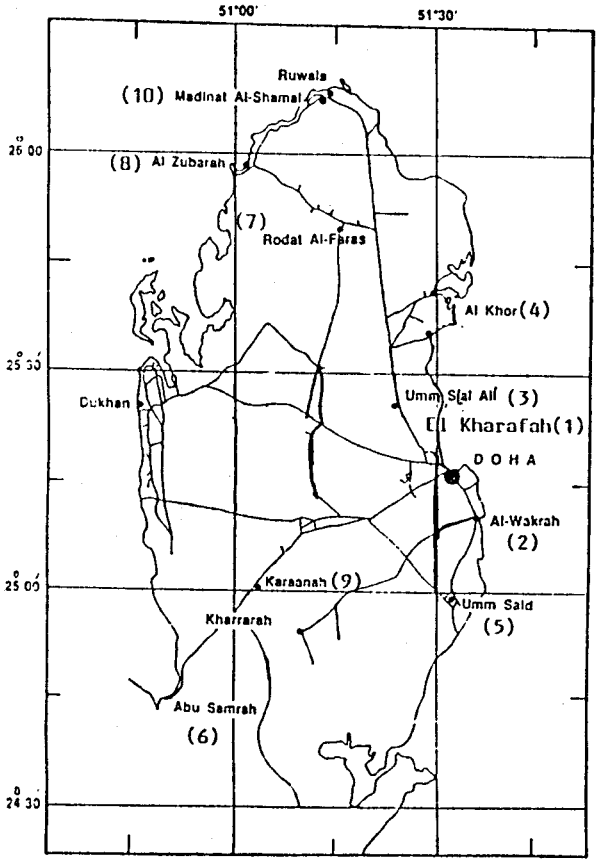

Figure 1. Map of the State of Qatar showing the survey localiies.

RESULTS AND DISCUSSION

Five species belonging to three families were found in the different soil samples. Table (1) shows the distribution and density of each species in the examined localities. The population density in the soil samples varied, ranging between an average of 10 worms/15 cm^3 to 30 worms/15 cm^3.

Table 1

Earthworm density in ten different localities in Qatar

Earthworm Family and specis name	El-Kharafah (1)	El-Wakrah (2)	Umm Slal (3)	El-Khor (4)	Umm Said (5)	Abu Samrah (6)	Rodat El-Farass (7)	Al-Zubarah (8)	Karaanah (9)	Madinat Al-Shamal (10)
Family Megascolecidae *Amynthas corticis*	X		X							
Family Octochaetidae *Dichogaster bolaui*							XX			
Family Lumbricidae *Aporrectodea caliginosa*			XXX		XXX	XXX		XXX	XXX	XXX
Dendrodrilus rubidus	XX	XXX		XXX			XXX			
Helodrilus oculatus						XX			X	

Each X = Average relative density of 10 earthworms/15 cm^3.

The following Key is provided for identification of these species :

(a) Clitellum, segments XIV–XVI. Setae numerous around the equator of each segment (Megascolecidae)... *Amynthas corticis* (Kinberg, 1867)

(b) Clitellum, segments XIV–XVIII (–XXI). Setae, four pairs on each segment (Octochaetidae) *Dichogaster bolaui* (Michaelsen)

(c) Clitellum, anterior margin behind segment XIX, Setae, four pairs on each segment (Lumbriciae) ..... 2.

2 (a) Setae behind clitellum widely paired *Dendrodrilus rubidus* (Savigny, 1926)

(b) Setae behind clitellum closely paired ..... 3.

3 (a) Tubercula pubertatis on segments XIXX and XXX (Small species) ..... *Helodrilus oculatus* (Hoffmestic, 1845).

(b) Tubercula pubertatis on segments XXXI–XXXIII (larger species) ..... *Aporrectodea caliginosa (Saviginy, 1828).*

Non of these 5 species is indigenous to Qatar. A. corticis and *D. bolaui* are tropical and widesprend (El–Kifl and Ghabbour, 1984). The indigenous range of these species includes all Australia, the pacific islands, tropical Africa and American greenhouse in temperate regions (Sims and Garard, 1985).

D. rubidus is distributed in the Holarctic region from Western Siberia to Western United State, and from South to North Africa and Mexico. Currently , this species has introduced into northern India, Australia, and central and South America. In contrast, *H. oculatus* is distributed throughout Europe (Sims and Gerard, 1985). *A. caliginosa* is distributed through the Western paleoarctic region and the eastern Neoarctic region. It has been introduced into other temperate regions of the world mainly cultivated areas.

There did not appear to be any earthworms at the agricultural station of Umm Said despite repeated examination of its soil. However, *A. caliginosa* has been obtained from the private gardens nearby. At Abu Samrah, earthworms were extremely numerous in the damp soil of dry judwalls in the older part of the station. They were less common in the newer parts of the agricultural station. Since both areas are irrigated, it would appear that there has been insufficient time for populations to build up in the newer areas of the station. This impression is supported by the fact that, at Umm Slal Ali, muture *A. caliginosa* are numerous in irrigated soil at the bases of the palm trees in apparently older parts of the agricultural station, while mainly immature worms were obtained from the region in which tomotoes, beans, and other vegetables were growing.

The soil in all sites was a sandy clay, but there was more humus where earthworms were most numerous at Abu Samrah. However, earthworms are very plentiful at the bases of the palm trees at Umm Slal Ali where there was not much humus on leaf litter. Most likely, the large earthworm numbers at Abu Samrah might be owing to introducing earthworm in this locality at an earlier time than at Umm Slal Ali. Another factor that might also be relevant is the variation in amount of nitrogen and other fertilizers in the soil of the different localities. Determination of these factors and their possible role in earthworm density remain to be investigated.

In a garden near the Airport Road, in Doha, there was a rich garden soil containing numerous slugs and earthworms; but the only earthworm species found was *D. rubidus*. All the other species recorded in Qatar would have thrived in this locality; the only reason why they are not present seems to be that they have not been introduced to it.

In addition to earthworms, Cockroaches (*Blatella spp.*) were extremely plentiful among the leaf litter at Abu Samrah. They were scare at Umm Slal Ali where the leaf litters were drier. Cockroaches also may contribute to the amount of humus in the soil. The trees were more dense at Abu Samrah than at Umm Slal Ali, and this might have engendered conditions favourable to earthworms. If so, humus formation and improvement of the soil might well be achieved by planting trees closer together or by planting shrubs with dense foliage in the gaps between the crowns of the trees. The tree (Sedder) provides the most dense leaf litter and is presumably most beneficial.

It is to be expected that the five earthworm species found in Qatar will become further distributed throughout Qatar with transfer of soil from one area to another. Also, additional species will be introduced with imported soil from new localities.

The possibility of deliberately introducing beneficial earthworm species should be seriously considered : *Eisenia foetida* (Savigny, 1828) is a very useful temperate species not surviving in the tropics (Cernosvitov and Evans, 1947 ; Cloudsley-Thompson and Sandy, 1961). Consequently, it is probably not worthwhile attempting to introduce it into Qatar. On the other-hand, *Octolasion cryaneum* (Savigny, 1828), *Eisenia hortnsis* and *Aporrectodea longa* (Vd) might, however, be considered in this context.

Earthworm populations are harmed by the application of insecticides and herbecides. In trying to increase their numbers in Qatar agricultural schemes, this

fact should be taken in consideration. In a dry, arid climate, insect pests and fungal pests are less of a problem than in a more humid climate. The reduced need for spraying should be needed to encourage the increase in earthworm numbers matched against the great; liming the soil which increases pH often enhances earthworm population.

Further investigations of the distribution and population density of earthworm in different localities in Qatar should be undertaken at various seasons of the year to assess their capability to withstand the climatic conditions of Qatar.

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قائمة بأنواع ديدان الأرض وتوزيعها في دولة قطر

شعاع اليوسف و أحمد الوزير هجرس

تعتبر هذه الدراسة تقريراً أولياً عن أنواع ديدان الأرض وتوزيعها بدولة قطر ، وقد تم جمعها في الفترة من فبراير إلى مارس ١٩٨٦ من عشرة أماكن مختلفة في الدولة .

تم تصنيف خمسة أنواع مختلفة من طائفة قليلة الأشواك حسب التالي :

الاجناس هي : **ألولوبوفورا كاليجينوزا ، دندرودرلس روبيدس ، هيلودربلس أوكيولاتس ، أمنثاس كورتيسس ، ديكوجاستر بولاوي .**

والمرجح أنها موجودة في التربة المختلفة المستوردة للدولة .