

DIVERSITY OF EARTHWORMS (ANNELIDA: OLIGOCHAETA) FROM TWO DIFFERENT AGROECOSYSTEMS OF WEST BENGAL

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Earthworms belong to megadrile oligochaetes and are placed in the Orders Moniligastrida and Haplotaxida excluding suborder Tubificina. Perrier (1872) was the first to report an earthworm species, *Perichaeta houletti* from West Bengal. There-after Beddard (1883), Stephenson (1923), Gates (1937, 1938a, b), Julka (1975), Halder (1998) and Chowdhury et al. (2011) have contributed to the taxonomic studies of earthworms from West Bengal. The aim of this study is to document the present distribution of earthworm fauna from two different agroecosystems; one is an orchard under North Dum Dum Municipality, North 24 Parganas and the other is a waste disposal site, Dhapa, Kolkata. The study was carried out from June, 2018 to December, 2019.

The flora of the orchard (Site I) mainly consists of *Mangifera indica*. Other notable plant species are *Cocos nucifera*, *Bombax ceiba*, *Senna siamea*, *Terminalia arjuna*, *Albizia lebbek*, *Bambusa tulda*, *Colocasia esculenta*, *Musa sp.*, *Cynodon dactylon*, *Solanum nigrum*, *Centella asiatica*, *Coccinia grandis* and *Marsilea minuta*. The soil of this site is alluvial in nature, brown in colour and clay silt loam in texture.

Dhapa, the waste disposal site (Site II) is a dumping ground for city waste, located by

the side of Eastern Metropolitan bypass, Kolkata. The main constituents of the dumped materials are household wastes, residues of vegetables, etc. Some parts of these plots were used for cultivation of different seasonal vegetables like cauliflower, maize, *Cucurbita*, lettuce, cabbage etc. The plots were covered with grasses, sedges and herbs like *Cynodon dactylon*, *Commelina benghalensis*, *Cyperus rotundus*, *Digitaria ciliaris*, *Echinochloa colona* and the margins of the plots have a few scattered trees like *Vachellia nilotica*. The soil of these plots was Gangetic alluvium in nature, blackish in colour and silty sand to sandy loam in texture with well-developed humus mainly comprised of decomposed and semi-decomposed organic matter.

For estimation of earthworm populations, each habitat was divided into 4 plots. From each plot earthworm samples were collected first by formalin and then by digging-hand sorting method from 4 quadrats each of 25 cm x 25 cm x 30 cm deep, at random, in each month during the course of study. Narcotisation and preservation of earthworm samples were carried out following Julka (1988). Identification of earthworms sampled was done as per Julka (1988) and Julka & Senapati (1987).

In the present study, 10 species of earthworms belonging to 3 families were recorded (Table 1). Out of 10 species, 5 species belong to family Megascolecidae, 4 species belong to family Octochaetidae and family Moniligastridae is represented by a single species. Peak earthworm population was found in monsoon and post-monsoon months, whereas, their population became scarce in summer as well as in winter (Fig. 1).

Among the two sites, the population of *Metaphire posthuma* was maximum in the orchard floor, whereas *Lampito mauritii* were predominant at the waste disposal site (Fig. 2 and 3) with healthy numbers of juvenile, acitellate and clitellate age groups. Earthworm diversity is much higher at the orchard, where a total of 10 earthworm species were encountered, in comparison to the waste disposal site, where only 3 earthworm species were found (Table 1).

This study clearly indicates that the orchard harbours a much more diverse

earthworm fauna than the waste disposal site. Waste disposal site of Dhapa is a polluted site, whereas, orchard is least disturbed in terms of pollutants. This might be the reason for the rich diversity of earthworm species in the orchard floor. Waste disposal site harbours a higher earthworm population than the orchard. This is due to the huge *L. mauritii* population. Not only the adults but also the cocoon, juvenile and acitellate stages of *Lampito mauritii* were present in huge numbers in the disturbed polluted site. It suggests that this species is better adapted for this environment.

The present study clearly indicates that *L. mauritii* survives and propagates successfully in decomposed and semi-decomposed organic matter. So, this indigenous species could be an ideal one for vermiculture under some specific ecological conditions which may be similar to those at the waste disposal site of Dhapa.

Table 1. Earthworm fauna of Orchard (Site I) and Dhapa (Site II), West Bengal.

Sl. No.	Site I	Site II	Family
	<i>Lampito mauritii</i> Kinberg	<i>Lampito mauritii</i> Kinberg	Megascolecidae
2.	<i>Metaphire posthuma</i> (Vaillant)	<i>Metaphire posthuma</i> (Vaillant)	
3.	<i>Perionyx excavatus</i> Perrier	<i>Perionyx excavatus</i> Perrier	
4.	<i>Metaphire houlleti</i> (Perrier)		

5.	<i>Polyphoretima elongata</i> (Perrier)		
6.	<i>Eutyphoeus incommodus</i> (Beddard)		Octochaetidae
7.	<i>Eutyphoeus nicholsoni</i> (Beddard)		
8.	<i>Eutyphoeus orientalis</i> (Beddard)		
9.	<i>Octochaetona beatrix</i> (Beddard)		
10.	<i>Drawida nepalensis</i> Michaelsen		

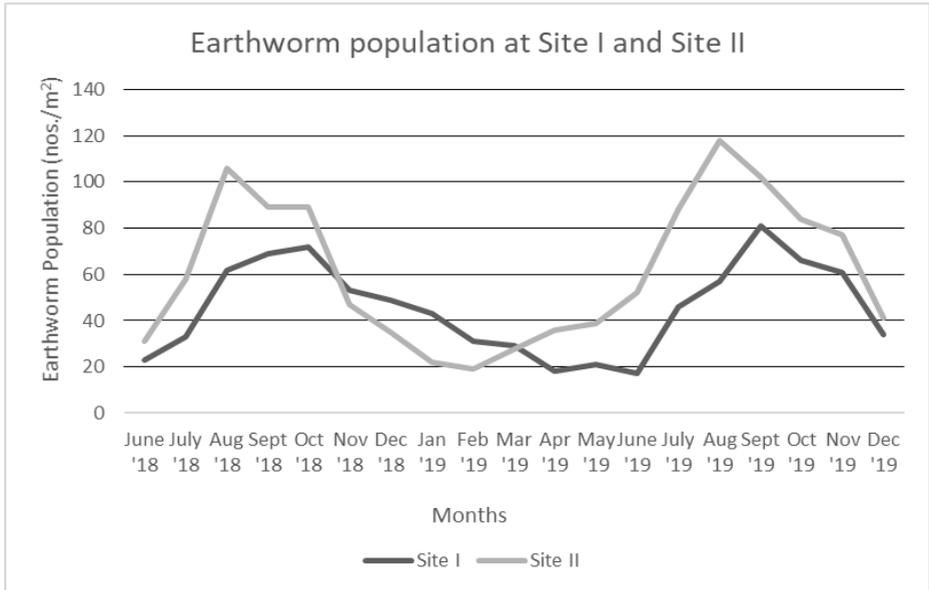


Fig. 1. Earthworm population (nos./m²) at two different sites

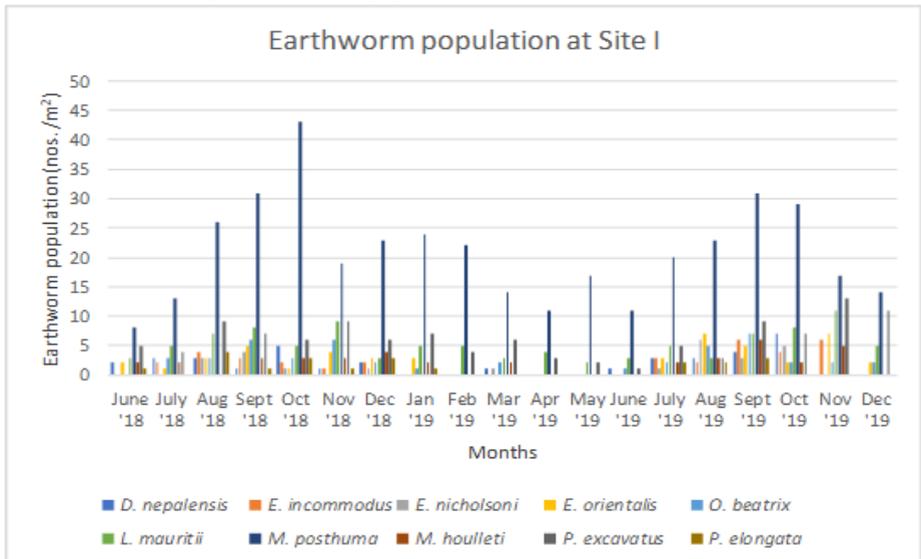


Fig. 2. Population (nos./m²) of different species of earthworms at Site I

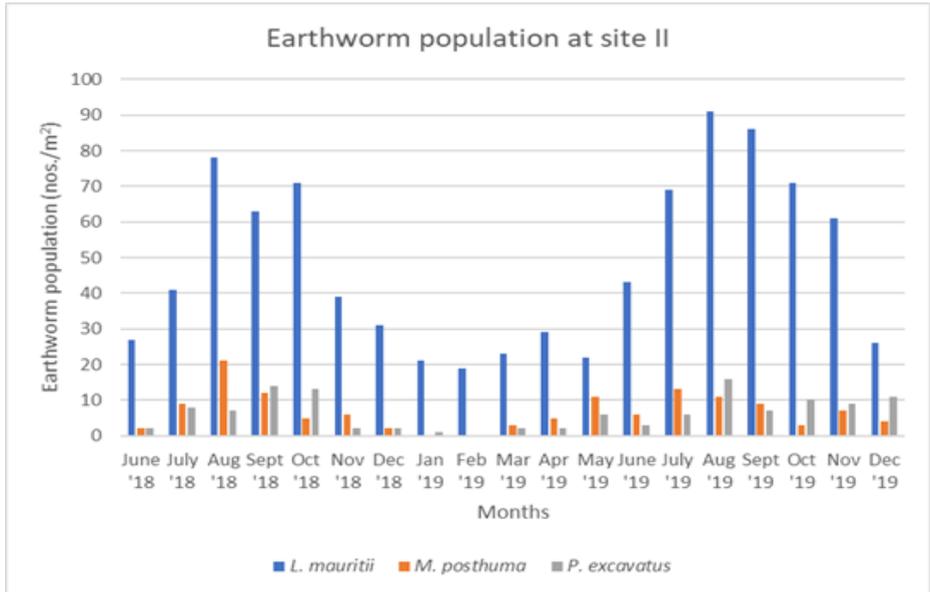


Fig. 3. Population (nos./m²) of different species of earthworms at Site II