



Diversity of Epigeic Earthworm Species From Jammu District, Jammu

KEYWORDS

Epigeic, Earthworms, body weight, length

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ABSTRACT *Nine epigeic earthworm species have been collected from moist, well aerated, loose soils rich with organic matter, at a depth of 3 to 10 cm from soil surface in the urban and sub-urban areas of Jammu District. The nine Species have been identified as Metaphire posthuma (Vaillant), Amyntas morrisi (Beddard), Perionyx sansibaricus (Michaelsen), Octochaetona beatrix (Beddard), Eutyphoeus waltoni (Michaelsen), Lampito mauritii (Kinberg) , Metaphire houlleti (Perrier) Perionyx excavatus (Perrier) and Lennogaster pusillus (Stephenson).*

Introduction

The role of earthworms in the decomposer system has been gaining importance and the utilization of earthworms in the composting process has met with fair success (Abbasi, 1989). The importance of the earthworm has been stressed upon since Darwin's time. Darwin (1881) in his book "The formation of vegetable mould from the action of worms" opined that "earthworms have played a most important part in the history of the world."

Earthworms have drawn the attention of philosophers and naturalists since ancient times because of their great importance in soil improvement. As early as 384-322 BC, the famous Greek philosopher Aristotle described earthworms as 'the intestines of earth'. However, the zoological nomenclature of earthworms was adopted by Linnaeus (1758) who listed two annelid species in the 10th edition of his famous book, entitled "Systema Naturae": an Oligochaete (*Lumbricus terrestris*) and a Polychaete (*Lumbricus marinus*). Existence of diversity in earthworms was brought to light by Jabde (2005) during his explorations of fauna of Paris region in France. He described 20 species of Lumbricidae from the area.

Earthworms are long thread-like, cylindrical, soft-bodied, segmented invertebrate worms with uniform ring-like structures all along the length of their body. They belong to class Clitellate of order Oligochaeta of phylum Annelida. Oligochaetes can be aquatic or terrestrial. The terrestrial Oligochaete belonging to 10 families and 1800 species of earthworms are distributed all over the world. The earthworms vary in size, colour and behavior. The soil, moisture content, salinity, temperature and the type of organic matter they like to feed and the depth to which they can go in the soil vary from species to species (Govindan, 1998). Earthworms are omnivorous animals but often selective in their food habits. Earthworms derive their nutrition from organic materials, living bacteria, fungi, diatoms, algae, protozoa, nematodes and decomposing animals. Surface living earthworms feed on food materials selectively while deep soil living worms ingest soil as such. The kind and amount of food materials available influence the size of the earthworm population, species diversity, and growth rate and cocoon production. Activated sludge, manure and nitrogen rich diets help in rapid growth and more cocoon production in earthworms.

Materials and methods

Epigeic species of earthworms have been collected from moist, well aerated, loose soils rich with organic matter, at a depth of 3 to 10 cm from soil surface in the urban and sub-urban areas of Jammu District. The labelled and preserved specimens of Earthworm were identified by studying the

morphology and anatomy like presence of number of setae per segment, number of segment of clitellum, presence of male and female pores, spermathecal pores present or absent, nephridia and prostate glands, Prostomium, and genital marking in the Earthworm lab of Shoolini University of Biotechnology and Management Sciences Solan, Himachal Pradesh and identification of various collected earthworm species got confirmed by Dr J.M. Julka former Jt. Director and Emeritus Scientist Zoological Survey of India. The specimens have been deposited in Department of Environmental Sciences, University of Jammu, under accession number ENV/JU 01-09

Observation

The nine earthworm species have been collected and identified as follow:

Metaphire posthuma (Vaillant) This species has already been reported by Paliwal and Julka (2005) from Jammu. This species belongs to family megascolecidae, collected from almost all sites of Jammu district but mostly present in the agriculture field and garden soil. Average weight 2.1605 gm, average length 9.5 cm, spermathecal pores 3 pairs, genital marking very small and located within spermathecal pore on equators of segment 17 and 19. ENV/JU01, Fig. 1



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Metaphire houlleti (Perrier) This species has already been reported by Paliwal and Julka (2005) from Udhampur and Katra by but no record found from Jammu district. This species belongs to family megascolecidae. It has been collected from the site which is simple agriculture fields but field must be irrigated field. Average weight 1.4946 gm, average length 7.5 cm, spermathecal pores in intersegmental furrows 6/7/8/9, genital marking small within male copulatory pouches and spermathecal pore invaginations (recognizable internally by the presence of stalked glands) ENV/JU02, Fig.2



Eutyphoeus waltoni (Michaelsen). This species has already been reported by Paliwal and Julka (2005) from Jammu district. This belongs to family Octochaetidae. It has been collected from the sites like moist and shady place and rich in organic waste like leaf litter.

Average weight 3.1213 gm, average length 19.6 cm, seminal grooves absent; spermathecal pores at intersegment furrow 7/8. ENV/JU03, Fig.3.



Perionyx excavatus (Perrier) . Review of literature revealed that it is new for J&K. This species belongs to family megascolecidae. It has been collected from the sites very rich in organic matter due to supply of domestic water and also present in drains. Average weight 0.2038 gm, average length 5 cm, spermathecal pores 2 pairs in intersegmental furrows 7/8/9. ENV/JU04, Fig.4



Amyntas morrissi (Beddard). This species has already been reported by Paliwal and Julka (2005) from Doda, Bhadarwah, Poonch and Srinagar district. This belongs to family megascolecidae. This species has been collected from the moist soil covered with leaf litter near forest area of Nandni wildlife sanctuary. Average weight 0.6631 gm, average length 6.7 cm, spermathecal pores 2 pairs, in intersegmental furrows 5/6/7. Review of literature revealed that it is new for Jammu district. ENV/JU05, Fig.5



Lampito mauritii (Kinberg) Review of literature revealed that it is new for Jammu district. This species belongs to family megascolecidae. It has been collected from the site rich in organic matter like cow dung and good amount of water is present soil is sandy. Average body weight 1.5718 gm, average length 13.5 cm. ventral most seta on anterior part of body much enlarged than their neighbours. ENV/JU06, Fig.6



Perionyx sansibaricus (Michaelsen). This species has already been reported by Paliwal and Julka (2005) from H.P. This belongs to family megascolecidae. It has been collected from the sites rich in organic matter. Soil is irrigated with water which is mostly domestic water without any treatment. Average body weight 0.2739 gm, average length 5cm, Nephridiopores in 2 ranks, alternating between dorsal and ventral positions. Review of literature revealed that it is new for Jammu district. ENV/JU07, Fig.7



Octochaetona beatrix (Beddard). This species has already been reported by Paliwal and Julka (2005) from Jammu. This belongs to family Octochaetidae. It has been collected from the sites rich in cow dung manure. Average body weight 0.6126 gm, average length 8cm , spermathecal pores closely placed, near mid ventral line on segment 8 and 9. ENV/JU08, , Fig.8



Lennogaster pusillus (Stephenson). Review of literature revealed that no record of this species has been found from Jammu district. This species belongs to family Octochaetidae. It has been collected from the sites which is normal garden soil. Average body weight 0.1875 gm average length 4.9cm. ,ventral most seta on segment 8 not enlarged. ENV/JU09, , Fig.9.



Result and Discussion

A total of nine epigeic species of Earthworms have been recorded from Jammu district and out of these nine species six species i.e. *Metaphire posthuma*, *Metaphire houlleti*, *Perionyx excavatus*, *Amyntas morrissi*, *Lampito mauritii* and *Perionyx sansibaricus* belonged to family Megascolecidae and remaining three species i.e. *Eutyphoeus waltoni*, *Octochaetona beatrix* and *Lennogaster pusillus* belonged to family Octochaetidae. This study showed that the family Megascolecidae was dominant in all the habitats of the study area. This study also showed that the species *Eutyphoeus waltoni* was longest (average length of 19.6 cm) and heaviest (average weight of 3.1213 gm) whereas the species *Lennogaster pusillus* was smallest (average length of 4.9cm) and lightest (average weight of 0.1875 gm) of all the nine species collected (Table-1). Review of literature revealed that there are two species *Lampito mauritii* and *Lennogaster pusillus* is new for Jammu s where as one species out of all nine species *Perionyx excavatus* is new for J&K..

Table-1: Taxonomic position, body length and weight of nine epigeic earthworm species collected from Jammu

S. No	Species Name	Family	Length	Weight
1	<i>Metaphire posthuma</i> (Vaillant, 1868)	Megascolecidae	9.5 cm	2.1605 gm
2	<i>Amyntas morrissi</i> (Beddard, 1892)	Megascolecidae	6.7 cm	0.6631 gm
3	<i>Perionyx sansibaricus</i> (Michaelsen, 1891)	Megascolecidae	5 cm	0.2739 gm
4	<i>Octochaetona beatrix</i> (Beddard, 1902)	Octochaetidae	8 cm	0.6126 gm
5	<i>Eutyphoeus waltoni</i> (Michaelsen, 1907)	Octochaetidae	19.6 cm	3.1213 gm
6	<i>Lampito mauritii</i> (Kinberg, 1866)	Megascolecidae	13.5 cm	1.5718 gm
7	<i>Metaphire houlleti</i> (Perrier, 1872)	Megascolecidae	7.5 cm	1.4946 gm
8	<i>Perionyx excavatus</i> (Perrier, 1872)	Megascolecidae	5 cm	0.2038 gm
9	<i>Lennogaster pusillus</i> (Stephenson, 1920)	Octochaetidae	4.9cm	0.1875 gm

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