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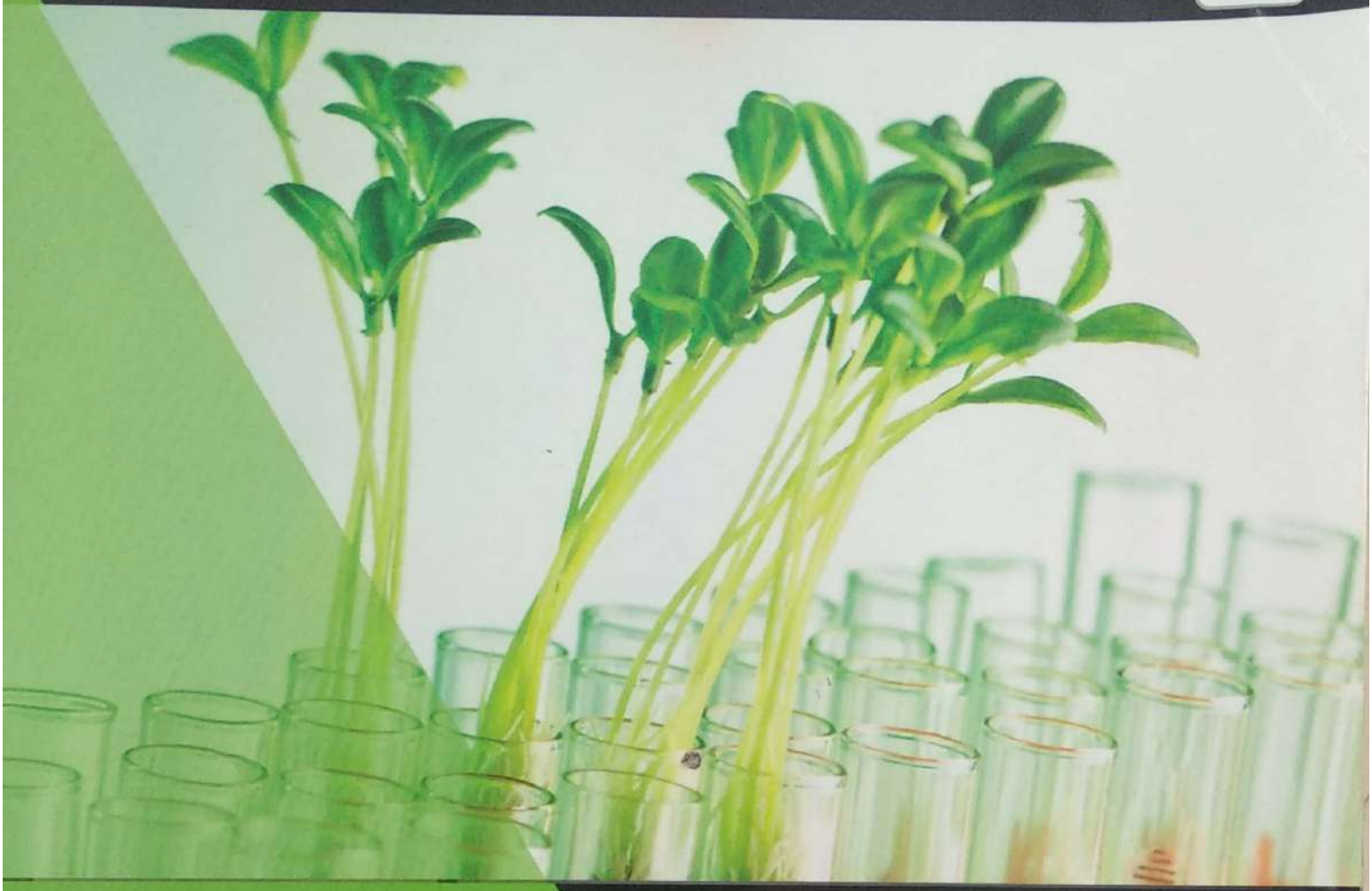

Life Science: Research, Practices and Application for Sustainable Development

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First published 2017

MACMILLAN PUBLISHERS INDIA PRIVATE LTD

Delhi Bengaluru Chennai Kolkata Mumbai
Ahmedabad Bhopal Chandigarh Coimbatore
Cuttack Guwahati Hyderabad Jaipur Lucknow Madurai
Nagpur Patna Pune Thiruvananthapuram Visakhapatnam

ISBN: 978-93870-0007-0

Published by Macmillan Publishers India Private Ltd,
21, Patullos Road, Chennai 600002, India

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ISBN 938700007-9
9 789387 000070
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Recent trends in Life Science

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Published by
MacMillan
New Delhi

LIST OF FULL LENGTH PAPERS

BIODIVERSITY AND ECOLOGICAL CATEGORY OF EARTHWORMS IN PERIYA OF WAYANAD FOREST DIVISION, KERALA

Jijo George[1], M. P. Deepthi1, K. Saminathan[2] and Kathireswari *

Abstract

Earthworms were the important soil invertebrate included in the phylum Annelida and class Oligochaeta and they were the dominating soil macro faunal communities in most terrestrial ecosystem. The diversity of earthworms in tropics was less studied when compared to those of the temperate regions. The present study revealed that the diversity and ecological category of earthworms in southern range of Wayanad forest division, Kerala. The district was rich in biodiversity with a high percentage of endemism. Earthworms were collected and categorized as to Epigeic, Endogeic and Anecic and the results showed that out of 10 species 8 epigeic, 1 endogeic and 1 species of anecic were observed in the study area Periya in southern Wayanad forest division.

Keywords: Earthworm, ecological category, Wayanad, epigeic, endogeic, anecic

Introduction

Earthworms were the most important soil invertebrates belonging to the phylum Annelida, class Oligochaeta found in rich nutrient paddy fields, agricultural and also forest land. Since long, earthworm, have been known as 'Farmer's Friend', and 'Intestine of Earth'. Darwin (1837) though popularly known for his theories on evolution, was one of the pioneers who highlighted the role of earthworm in soil health. Large portion of Wayanad landscape comprised of plantations which have resulted in the severe fragmentation of its forests. Remaining forests of Wayanad plateau were of small packets of evergreen and deciduous forest, with scrub. Earthworms have a functional role in agriculture, solid waste management, and in therapeutic areas. Earthworms played a vital role in plant growth. Earthworm was an important invertebrate community component in most soils in terms of their contribution to overall below ground biomass (Smith *et al.* 2008). They contributed to soil structure formation (Sheena *et al.* 2006*)* and organic matter dynamics through nutrient cycling, decomposition of residues (Dominguez *et al.*2009*)* besides soil pore water dynamics (Eisenhaur *et al.*2007) with the consequence of increased productivity of aerable lands (Pfiffner and Luka, 2007). At present the Indian earthworm fauna comprised of about 505 species (Julka, *et al.* 2009) and first record of earthworms from Indian subcontinent was provided by Templeton (1844). Subsequently, several species were added by various workers like Michaelsen (1907), Stephenson (1923), Gates (1940, 1945), Julka (1976).

Materials & Methods

The district of Wayanad was located in the Northern Eastern part of Kerala State. It lay between 11°27'N and 12°58'N latitudes and 74°52'E and 76°07'E longitudes. Geographical area was about 2,132 sq.Km, bounded on the east by Nilgiris District of Tamil nadu and Mysore and Kodagu District of Karnataka on the north and east in the south by Malapuram and on the west by Kozhikode and Kanur. Peria was located at 11.60°N 75.58°E. It has an average elevation of 15m (49 ft). Geographically, Peria was situated about 48km to the north of Wayanad city, approximately 44 km to the south of Kannur city and it was proximate to Mananthavadi. This was the third largest town in North Malabar. The town lay by the side of a river known by different names as Moorad River, Kuttiadi River or Kottakal River. This city posse's tropical climate and rainfall is significant in most months of the year, and the short dry season has little effect.

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Adult earthworms were collected from the four region of Peria, Wayanad, Kerala, India by digging and hand sorting method (Julka 1993). Collection was done during the last week of 2015. The collected specimens were identified up to species level by Dr. (Mrs.) P. Kathireswari an Indian earthworm taxonomist, Tamil Nadu, India. The presence of earthworm was located by the presence of worm casts on the surface soil and colour and humidity of soil. Adult earthworms were sorted and taken in to the college laboratory along with their native soil. Then they were washed with distilled water and preserved in formalin solution.

Results and Discussion

In the present study, 10 different species of earthworms were collected and classified into 3 main ecological categories *viz* epigeic, endogeic, anecic (Table 1). Eight epigeic species were identified from the sampling station *viz Perionyx excavates, Megascolex sp., Dichogaster bolaui, Malabaria sp., Plutellus variabilis, Glyphidrilus annandalei, Lumbricus rubellus, Eudrilus euginiae.* Anecic species were collected at the depth of more than 15cm and identified as *Dravida sp.* The endogeic species were collected in the depth less than 15cm and non - burrowing forms and identified as *Pontoscolex corethrurus*.

Table.1 List of earthworm species and their ecological category in the Wayanad forest Division of Kerala

S.No	Name of the species	Family	Ecological category	Habitat	Feeding type	Biography	Origin
1	*Perionyx excavatus*	*Megascolecidae*	Epigeic	Litter	Phytophagous	Native	India
2	*Megascolex sp.*	Megascolecidae	Epigeic	Litter	Phytophagous	Native	India
3	*Dichogaster bolaui*	Octochaetidae	Epigeic	Litter	Phytophagous	Native	India
4	*Malabariae sp.*	Malabarinae	Epigeic	Litter	Phytophagous	Native	India
5	*Plutellus variabilis*	Acanthodrilidae	Epigeic	Litter	Phytophagous	Native	India
6	*Glyphidrilus annandalei*	Almidae	Epigeic	Litter	Phytophagous	Native	India
7	*Lumbricus rubellus*	Lumbricidae	Epigeic	Litter	Phytophagous	Native	India
8	*Dravida sp.*	Moniligastridae	Anecic	Lives in burrows	Geophytophagous	Native	India
9	*Eudrilus euginiae*	Eudrilidae	Epigeic	Surface soil	Phytophagous	Exotic	West Africa
10	*Pontoscolex corethrurus*	Glossoscolecidae	Endogeic	Surface soil	Geophagous	Native	India

The 10 different species of earthworms were obtained from different land areas like crop lands, agricultural lands, dense forests and river side's ecosystems. The present results revealed that 10 species were in rich habitats which were approximately more in numbers. The different species of earthworms identified were belonging to 9 families *viz,* Eudrilidae, Megascolecidae, Moniligastridae, Malabarinae, Almidae, Glossoscolecidae, Octochaetidae, Acanthodrilidae and Lumbricidae. Among these species there were 4 exotic and 6 native species and they were ecologically categorised into 8 epigeic, 1 endogeic, and 1 anecic earthworms. In the present study we concluded that the Peria village of Wayanad south forest division of the Western Ghats have high endemism and richest diversity of earthworms.

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