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Research Article (Open Access)

A STUDY LOCAL SPECIES OF EARTHWORM IN THE KANGRA DISTRICT (H.P.)

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ABSTRACT
Among the soil macrofauna, earthworms stand as one of the most abundant organisms, contributing significantly to soil formation and the preservation of soil fertility. The present study endeavors to enhance our understanding of the diversity and distribution of these organisms in selected land use systems of the Mid-Western Himalayan hills of Himachal Pradesh.
Conducted during the years 2021 and 2022, the present study focused on a local variety of earthworms manually collected from the fields of Kangra. This survey and study led to the identification of the species *Amynthas corticis*, commonly referred to as the black wriggler or crazy worm, belonging to the Megascolecidae family.

Keywords*: Earthworm, Vermicomposting, Taxonomic*

INTRODUCTION

The towering Himalayan mountain ranges on the northern edge of the Indian subcontinent possess a pivotal role in ensuring the ecological stability of the region. The relentless eforestation in these mountains, particularly in the low and middle elevations, has resulted in a significant ecological disruption throughout the entire subcontinent. The region under study, the state of Himachal Pradesh in the northwestern Himalayas, has witnessed rapid transformations in its land use patterns (Shah and Sharma, 2015). These shifts exert an impact not solely on the aboveground communities but also on the thriving, diverse belowground biodiversity that profoundly influences soil ecosystem functioning (Saxena *et al.*, 2005; Decaens, 2010). Among the soil macrofauna, earthworms stand as one of the most abundant organisms, contributing significantly to soil formation and the preservation of soil fertility. The present study endeavors to enhance our understanding of the diversity and distribution of these organisms in selected land use systems of the mid Himalayan hills (Sharma *et al.*, 1974).
Earthworms, widely distributed invertebrates across the globe, undertake a pivotal role within the soil ecosystem by impacting its physical, chemical, and biological properties. Their contributions encompass pivotal aspects such as carbon cycling, nitrogen mineralization, soil structuring, cellulose degradation, and humus accumulation, thus shaping the soil's intricate balance and vitality.
There exist more than 4400 earthworm species across the globe, yet only a limited subset finds application in the vermicomposting process. Earthworms are broadly classified into two primary categories—those inhabiting soil and those engaged in composting. In the context of Kangra, Himachal Pradesh, there is limited understanding about earthworms and their practical utility. These creatures, termed macro-invertebrate soil organisms, play a vital role in nutrient cycling and the decomposition of organic matter, thus maintaining soil fertility. Belonging to the phylum Annelida and class Oligochaeta, terrestrial earthworms exhibit segmented bodies, bilateral symmetry, and hermaphroditic reproductive systems. Their bodies feature a clitellum responsible for cocoon production, a prostomium that serves as a sensory lobe anterior to the mouth, and an anus situated at the body's rear. Each body segment bears a few bristles, known as setae, which serve as distinctive characteristics for their taxonomic classification. Bouché (1977) introduced an ecological grouping of earthworms based on their feeding and burrowing behaviors: endogeics (soil consumers), anecics (burrowers), and epigeics (litter residents and transformers). As Kangra lacks comprehensive research on earthworm taxonomy, this study aims to

procure and identify a single earthworm species through taxonomic techniques. The overarching objective is to determine the feasibility of vermicomposting.

MATERIALS AND METHODS

The aim of the present investigation, carried out between 2021 and 2022 in Kangra, Himachal Pradesh, was to discern and categorize the earthworm species readily accessible in the region for use in the vermicomposting procedure. This involved orchestrating field expeditions to both dairy and agricultural domains to acquire earthworm specimens from various sectors of Nagrota, Shahpur, and Baijnath. In the environs of dairy cattle farms, earthworms were harvested from accumulations of cow manure. For the terrestrial earthworms inhabiting agricultural lands, a combination of scrutinizing worm castings and excavating soil to depths of 20 to 30 cm in areas displaying earthworm activity led to their collection. Several external and internal morphological features were used to identify the species.

RESULT AND DISCUSSION

In Himachal Pradesh, India, various species of earthworms can be found. Some of the commonly observed earthworm species in this region might include:

1. *Eisenia fetida* (Red Worm or Red Wiggler): This species is often used in vermicomposting due to its efficient decomposition abilities.
2. *Perionyx excavatus* (Blue Worm): Another commonly used species in vermicomposting due to its rapid composting and reproductive rates.
3. *Metaphire houlleti* (Indian Blue Worm): A large earthworm species found in many parts of India, including Himachal Pradesh.
4. *Drawida willsi:* A native earthworm species found in parts of North India.
5. *Lampito mauritii:* Also known as the Indian Blue Worm, it's found in various regions of India, including the northern states like Himachal Pradesh.
6. *Eutyphoeus gammiei:* A burrowing earthworm species found in the region.
7. *Polypheretima elongata:* This species is commonly found in soils across India, including Himachal Pradesh.

The presence of specific earthworm species can vary depending on local conditions, habitats, and ecosystems.

Shakoor *et al.*, (2020) carried out an update on the earthworm fauna of Solan District of the Himachal Pradesh. Their work was based on the field collection and published literature data. They updated a list of 32 species belonging to 18 genera and seven families, namely Moniligastridae, Lumbricidae and so on.

The litter breakdown ability of earthworms varies across species and ecological types. However, only a limited subset of these species is widely utilized for vermicomposting.

Local earthworms were studied, identified using morphological and anatomical characteristics. Among these, *Amynthas corticis* —showing soil consumption (endogeic)—was identified from the collected samples. Paliwal (2014) reported *Amynthas corticis* from Himachal Pradesh. He reported that it is a widely distributed anthropochorous species with endemicity believed to be in east and south-east Asia. It is a very agile earthworm and when disturbed responds in serpentine manner. This species can be utilized for vermi-composting. The black wriggler typically occupies environments such as arable land, pastures, and woodlands, generally within a depth of 20 cm beneath the surface or close to degrading litter and other organic materials. Remarkably agile, these worms are known for swift, dynamic movements including jumping and running.

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