

Species richness and density of earthworms in western Uttar Pradesh, India

(Oligochaeta: Megascolecidae, Octochaetidae)

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Abstract. The study was conducted in agricultural lands of five regions of western Uttar Pradesh, India, from 2006-2008 to identify species richness and density of earthworms in different seasons. Three species of earthworm's viz., *Metaphire posthuma* (Vaill.), *Lampito mauritii* (Kinberg, 1867) and *Perionyx excavatus* (Perrier, 1872) from the Megascolecidae family and four species of *Eutyphoeus waltoni* (Michaelsen, 1907), *E. gigas* (Stephenson, 1917), *E. orientalis* (Beddard, 1883), and *E. pharpiangianus* (Michaelsen, 1907) from Octochaetidae were identified and recorded. Bareilly of western Uttar Pradesh was identified as a density rich region of earthworms in all of the three seasons. It was species rich region of earthworms during winter and summer seasons too while the Agra region during the rainy season. Species richness and density of worms were assessed, the maximum in Bareilly and the minimum density in Saharanpur during peak winter months. However, the species richness of earthworms was found the least in three regions (Agra, Meerut, and Saharanpur) during winter months i.e. from November to February. In summers (March to June), both the density and species richness of earthworms were higher in Bareilly but their density was lower in Saharanpur. Interestingly, less species richness was noticed in Moradabad and Meerut regions with only three species. Results of taxonomic work indicated that the Bareilly region of western Uttar Pradesh has the maximum density of earthworms in all of the three seasons during the study; while the Agra region with more species richness during the rainy season. Variations in density and species richness of worms were discussed in the light of climatic conditions.

Key words. Earthworm, species richness, density, agricultural land, western Uttar Pradesh state.

Introduction

Earthworms – one of the macro fauna of the soil system, are found mostly in all kinds of ecosystems, and their population depends upon climatic and physico- chemical- biological factors of the habitat. Species richness of earthworms in a particular soil is determined by soil quality and health. The soils with rich density and more earthworm species have a higher level of macro- and micronutrients with better fertility status than that devoid of worms. Although, considerable work has been done in the past on this aspect by various workers, the density of earthworm population under natural conditions and its fluctuation in different seasons have been studied by EVANS & GUILD (1947, 1948), WATERS (1955), BALTZER (1955), BOYD (1958), ATLAVINYTE (1965), GERARD (1967) and LAVELLE (1974) and several workers in India did work on the diversity of the earthworms (KALE & KRISHNAMOORTHY 1978; ISMAIL 1986; JULKA & SENAPATI 1987; JULKA 1988; CHAUDHURI & BHATTACHARJEE 1999; AGRAWAL & AGRAWAL 2009). The work on the species richness and earthworm density in the agricultural lands of Uttar Pradesh has not yet been carried out.