

Species richness and density of earthworm populations in grasslands of western Uttar Pradesh, India

(Oligochaeta: Megascolecidae, Octochaetidae)

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Abstract. This study presents the first survey of earthworm species from the grasslands of Uttar Pradesh, a northern state of India. The study was conducted in all five political regions (e.g., Agra, Bareilly, Meerut, Moradabad and Saharanpur) of western Uttar Pradesh, during different climatic seasons from the year 2007 till 2009. Seven species belonging to two earthworm families were recorded: *Metaphire posthuma* (Vaillant), *Lampito mauritii* (Kinberg, 1867) and *Perionyx excavatus* (Perrier, 1872) from Megascolecidae and *Eutyphoeus* i.e. *E. waltoni* (Michaelsen, 1907), *E. gigas* (Stephenson, 1917), *E. orientalis* (Beddard, 1883) and *E. pharpingianus* (Michaelsen, 1907) from Octochaetidae. Moradabad was identified as the region of western Uttar Pradesh showing the highest species richness of earthworms during rainy season (July to October). Species richness and density of worms were assessed the maximum in Moradabad and the minimum density in Saharanpur during peak winter months i.e. from November to February. However, species richness of worms was found the least in Meerut region during winter and summer months and Saharanpur during summers (March to June). *M. posthuma* was found in all the regions round the years but *L. mauritii* and *E. waltoni* have been reported from all the regions only during the rainy season. *P. excavatus* was next in occurrence pattern, as it was recorded from all the regions except from Meerut. *E. pharpingianus* was found in all the regions except Meerut. Occurrence of *E. orientalis* and *E. gigas* was recorded rarely.

Key words. Earthworm, species richness, population density, grassland, climatic factors, Uttar Pradesh state.

Introduction

The distribution and abundance of earthworms are governed by several ecological factors including temperature, level of moisture, climatic season, food contents and physico-chemical and biological factors of particular ecosystem. Species richness and abundance of earthworms are considered as one of the indexes of soil quality. Soil rich in earthworms is always porous containing more organic matter than the one which is poorer. In addition, level of macro and micronutrients is also found higher in earthworm rich soils and therefore, studying the species richness and density of earthworm populations could be used as a parameter to assess the fertility status of an ecosystem.

Most of the works on India's earthworms deal with taxonomy and distribution; ecological studies are few and include KALE & KRISHNAMOORTHY (1978), JULKA (2001), SINGH et al. (2009, 2010), and AGRAWAL & AGRAWAL (2009). We present here the results of the first survey on the species richness and population of earthworms in grasslands of western region of Uttar Pradesh with special reference to climatic and seasonal ecological factors.