Earthworm fauna of Indian Thar Desert

(Oligochaeta)

Ghanshyam Tripathi, Kesu Ram Panwar

Abstract. Studies were carried out to explore earthworm fauna in a part of Indian Thar Desert. In addition to species diversity, the qualitative composition, density, biomass, biodiversity indices and habitat relationship of earthworms were studied. There were apparently abundant, moderate and low distribution of earthworm in different pedoecosystems. Maximum density of total earthworm species was in grassland, while it was minimum in cultivated field. Biomass was also maximum in grassland but it was minimum in bare land. Species richness varied from 4-6 in arid environment. Evenness and species diversity indices were highest under natural plantation and lowest in bare land. Some kind of species-habitat relationship appeared in relation to physicochemical characteristics of soil system. In spite of a low population density of earthworm in desertic soil system, species diversity was appreciable in desert region.

Key words. Earthworm, biomass, density, species diversity, habitat-relationship, desert.

Introduction

STEPHENSON (1920) firstly described earthworm fauna of Indian arid land. Subsequent studies were done by GATES (1937), HANDA (1969), JULKA (1996) and TRIPATHI & BHARDWAJ (2004). No systematic study has been done on earthworms of extreme desertic region. In this perspective, a detailed study was warranted to enrich the knowledge of earthworm biodiversity and its applicability in arid areas. Therefore, an investigation was done on species diversity, density, biomass and habitat relationship of earthworm resources in a part of Indian Thar desert.

Materials & Methods

The survey was done in Bikaner district of Rajasthan, which is located in Thar desert of India at 28°01'N and 73°19'E. Average rain fall in this area is 200-300 mm. Soil of this region is course loamy, mixed (cal.) hyperthermic and Typic Haplocambids. Earthworms were collected by digging an area of 1.0×1.0×0.35 m in different habitats. Hand sorting method was employed for extraction of earthworms. Samplings were done thrice in a month (generally on 5th, 10th and 25th day) at an interval of ten days during the period from July 2009 to December 2010. Collections were brought to the laboratory and washed in fresh water and kept in 4-10% of formaldehyde (depending on body size of earthworms) for overnight. Earthworms were finally preserved in 70% ethanol for their identification. The earthworms were identified using identification keys as described by JULKA (1988). Identifications were finally confirmed by an expert. Soil samples were also collected from the sites of earthworms sampling at the same time. The pH of soil was observed with the help of a digital pH meter. Walkley-Black method (1947) was used for determination of organic carbon. Total nitrogen was measured by Kjeldahl method as described by

Advances of the 5th International Oligochaeta Taxonomy Meeting
Zoology in the Middle East, Supplementum 4, 2012: 133–140.
ISSN 2193-1550 © Kasparek Verlag, Heidelberg