

Studies on multiplication rate of different species of earthworms under laboratory conditions

A.P. BIRADAR*, P. K. SINGH¹ AND R. A. BALIKAI

Department of Entomology, University of Agricultural Sciences, Regional Agricultural Research Station, BIJAPUR (KARNATAKA), INDIA

ABSTRACT

The experiment was conducted at the Department of Agricultural Entomology, Regional Agricultural Research Station, Bijapur. Different earthworm species required for the study were obtained from different sources. The feed culture was prepared by using organic wastes (*viz.*, dried leaves, sunflower stalks, and green leafy matter and dung. Organic waste and dung were mixed in the proportion of 10:1 and were arranged in a brick wall (aboveground) pit of size 10 x 1 x 0.33 m (LxWxH) in layer wise. The results on multiplication rate of different species of non-clitellate earthworms under laboratory conditions revealed that, at 45 days after release of earthworms, significantly higher number of non-clitellate earthworms (33.33) were recorded with *Eudrilus eugeniae* (Kinberg) over the other species in the study which was followed by *Perionyx excavatus* (E.Perr) (23.02). Similar trend was observed at 60 and 90 days after release also. Number of clitellate earthworms at 45 days after release with *E. eugeniae* was significantly higher (27.33) and was superior over all other species in the study. At 60 and 90 days after release also, *E. eugeniae* found superior over the other species. Lowest number of non clitellate and clitellate earthworms were recorded with the *Polypheritima elongata* (Mich.). In conclusion, at 45, 60 and 90 days after release, *E. eugeniae* found significantly superior by reducing highest number of non clitellate and clitellate worms.

Key words : Earthworm species, Multiplication, Vermicompost

INTRODUCTION

Earthworms constitute a major portion of the soil fauna biomass. The activity of earthworms in soil is known to influence various physical, chemical and biological properties. This activity is associated with increased enzyme activities and microbial population in the worm casts compared to non-injected soil (Lee, 1985).

Different species of earthworms contribute in different degrees to the mixing of organic and inorganic components of soil. The earthworms move large amounts of soil from the deeper strata up to the surface. The amount moved in this way ranges from 2 to 250 tons per hectare per annum, which is equivalent to bringing a layer of soil between one mm to five cm thick to surface every year creating a stone free layer on the surface of soil. Earthworms also affect soil structure through their burrowing activities for better aeration and infiltration. Earthworms generally prefer soils with near neutral pH values and the absence of worms in acid soils, which leads to the accumulation of thick mat of slow decaying organic matter as the surface characteristic feature of soils (Wood, 1995).

Screening of naturally available efficient earthworm species is a pre-requisite for commercial vermiculture

development. The selection criteria exercised for commercial exploitation of vermiculture should generally include, abundant occurrence of species in a natural habitat that is rich in organic matter, adaptability to fluctuating environmental stress conditions, high growth rate and conversion ratio, short developmental period, low incubation period, high fecundity and high metabolic demand, assimilability, production efficiency. Hence, an attempt was made to know the multiplication rate of different species for efficient utilization in vermicomposting.

MATERIALS AND METHODS

The present studies were conducted at the Department of Agricultural Entomology, Regional Agricultural Research Station, Bijapur. Bijapur It is situated in the northern dry zone (Region II and Zone-3) of Karnataka at 15° 49' North latitude, 75° 43' East longitude and altitude of 573 m above the mean sea level. The rainfall is confined to the monsoon period from June to November with occasional showers in pre monsoon months of April and May with an average rainfall of 594.3 mm per annum. The mean maximum and minimum temperatures are 33.6° and 18.2°C, respectively. The relative humidity values are uniformly high during the monsoon months from July to September (RH₁ & RH₂)

* Author for correspondence.

¹ Department of Agril. Zoology & Entomology, R.B.S. College, Bichpuri, AGARA (U.P.) INDIA