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Studies on effect of pesticides to earthworms

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ABSTRACT

The experiment on effect of pesticides to *Eudrilus eugeniae* earthworms species was conducted at the Department of Agricultural Entomology, Regional Agricultural Research Station, Bijapur, The results of the experiment revealed that, when the food material was topically applied with various pesticides, there was wide variation among the treatments (pesticides) with respect to mortality of adult earthworms ranging from 0.0 to 31.3 and 0.0 to 33.3 per cent during 2004-05 and 2005-06, respectively. Significantly highest per cent mortality of 31.3 and 33.3 per cent was recorded with the endosulfan @ 2.0 ml/litre of water during2004-05 and 2005-06, respectively . The highest juveniles mortality of 31.69 per cent was recorded during 2004-05 and it was 35.85% during 2005-06 with the topical application of endosulphan 35 EC. The lowest juvenile mortality of 8.10 % and 8.13 % was recorded with the streptomycin sulphate during 2004-05 and 2005-06, respectively.The average data of two years study indicated that the highest mortality was with endosulphan 35EC (33.77%) followed by dimethoate (22.38%), alphamethrin (20.06%), cypermethrin (19.42%) and the lowest was with the streptomycin sulphate treatment (8.13%). Fungicides/bactericides , among the pesticides were safer to earthworms when applied topically on the earthworm food material.

Key words : *Eudrilus eugeniae* , *E*arthworm, Pesticides.

INTRODUCTION

Different species of earthworms contribute in different degrees to the mixing of the organic and inorganic components of soil. The earthworms move large amounts of soil from the deeper strata to the surface the amounts moved in this way range from 2 to 250 tons per hectare per annum, 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 soil surface. Earthworms also affect soil structure through their burrowing activities for better aeration and in filtration. Earthworms generally prefer soils with near neutral pH values and the absence of worms in acid soils leads to the accumulation of thick mat of slow decaying organic matter as the surface characteristic feature of soils (Wood, 1995).

Chemical intensive farming has many harmful side effects and limitations such as increased incidence of pest and diseases, biomagnifications of chemicals through food chains, destruction of physical and chemical properties of soil, atmospheric pollution etc. and we are also facing the disposal problem of waste materials like solid and liquid excreta of livestock, human population and urban wastes. These aggravated problems can be resolved by recycling wastes through vermiculturing by using suitable and potential earthworm species. Vermicomposting of wastes and *in situ* vermiculturing in various crops form a component of significance in bioremediation and its utility in the crop husbandry.

The earthworms activity 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-ingested soil (Lee, 1985).

In the agricultural front pesticides usage for crop management /plant protection is increasing in recent days. Use of synthetic pesticides for pest management known to remain as active ingredients in the produce after harvest and in the plant residues like stlks,husks etc. Plant residues after the harvest of the produce is used as feed for the earthworms for the production of vermicompost. Some of the pesticides are toxic to the earthworms which are going to affect the normal functions of the earthworms and earthworm reproductions. Hence, the studies on safe chemicals for the earthworms are need of the hour.

MATERIALS AND METHODS

The studies were conducted at the Department of Agricultural Entomology, Regional Agricultural Research Station, Bijapur. It is situated in the northern dry zone (Region II and Zone-3) of Karnataka at 15^0 49' North lattitude, 75^0 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

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