



Hazardeous impact of Cythion on earthworm *Essenia foetida* development in 30 days time of span

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ABSTRACT

The earthworm *Essenia foetida* were used. The Cythion use as a pesticide, but the continuous use of pesticide is very toxic to earthworm development. *Essene foetida* are major use of organic, composed and very significant for increasing soil fertility. LC₅₀ set for this experiment is 15mg/kg soil. Growth of earthworm continuously reading after 1st week, 2nd week and 3rd week time of brace.

Keywords: earthworm, cythion, artificial soil, and development.

INTRODUCTION

The role earthworms play in affecting soil fertility. In looking back the definitive study of Charles Darwin on earthworms, (Feller *et al.*, 2003) reported that earthworms play important characters in the physical and chemical weathering of stones. According to them Darwin found several small rocks or grains of grit in the gizzards of many earthworms which are sometimes combined with the hard-calcareous concretions formed by calciferous glands. These coarser particles are apparently ingested and applied by the worms to help ingested soil organic matter and leaves, and to facilitate digestion. These will, by particle attrition and conversion through the gizzard and the gut, check up larger molecules, thereby contributing to the physical weathering of soils (Madge, 1969).

An earthworm is an index of soil quality because they respond to and contribute to healthy soil. For earthworms are abundant, a pupil must meet various conditions that are likewise connected with soil quality and agricultural sustainability: moderate pH, surface residue in food and protection, and soil that is not waterlogged, compacted, drought, or excessively sandy. Not all healthy soils will have earthworms. Insects are not common in sandy soils, in drier regions of the southern and western United States, and in local areas where earthworms have not yet migrated or been introduced by human actions. Earthworm species vary in how they obtain food, and thus inhabit different regions of the world, and have somewhat

different effects on the soil environment. They settle into three distinct ecological groups based on feeding and burrowing habits. Epigamic (litter dwelling) earthworms live and feed in surface litter.

MATERIAL AND METHODS

Experimental animal

Earthworm, *Eisenia foetida* (Savigny, 1826) is a recommended earthworm test species by Organization for Economic Co-operation and Development (OECD, 1984a) and European Economic Community (EEC, 1985).

Animal collection

Earthworm, *Eisenia foetida* brought from commercial suppliers, Nursery Department of Forest, Wadali, Amravati and adopted as the test species, recommended by (OECD, 1984) guideline for testing of chemicals no. 207, earthworm, and acute toxicity tests.

Pesticides

We had selected two pesticides, i.e. cythion as a test chemical, purchased from the Agra-pesticide market, Cotton market area, Amravati and the doses were made on the basis of lethal concentration (LC50).

Chemical

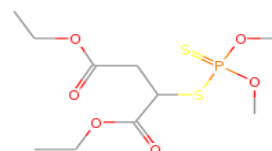
Cythion

Commercial name: Cythion 50% E.C.

Chemical name: O,O-Dimethylphosphodithionate-diethyl mercapto succinate.

Chemical Formula: C₁₀H₁₉O₆PS₂

Structural Formula:



Manufacturer: Cyanamid India Ltd.P.O.Atul Valsad 396020 (Gujrat State).

RESULTS AND DISCUSSION

From (table 1 and figure 1) showed organophosphate toxicities of 3mg/kg soil in 1week, 2 week, and 3week of the experiment showed gradual decreased in the growth of earthworm from 2 week to end of the experiment, but the present data also demonstrated significantly diminished in the growth of earthworm and it was dose and duration depended as compared to the relevant control.

Table: Impact on the Development of earthworm exposed to cythion at different toxication periods.

Toxicated periods (Day) and Concentration (mg/kg)	1 Week	2 week	3 week
Control	6.7±2.5	6.7±2.5	6.7±2.6
3mg	6.3±2.5	6.3±2.5	6.5±2.5
6 mg	6.3±2.5	6.6±2.5	6.8±2.5
9mg	6.4±2.5	6.5±2.5	6.5±02.5
12mg	6.3±2.5	6.5±2.5	6.5±2.5
15mg	6.4±2.5	6.3±2.5	6.3±2.4**

*significant and** Highly Significant differences (P < 0.05) were found between treatment and control groups were found 0.0072 in concentration.

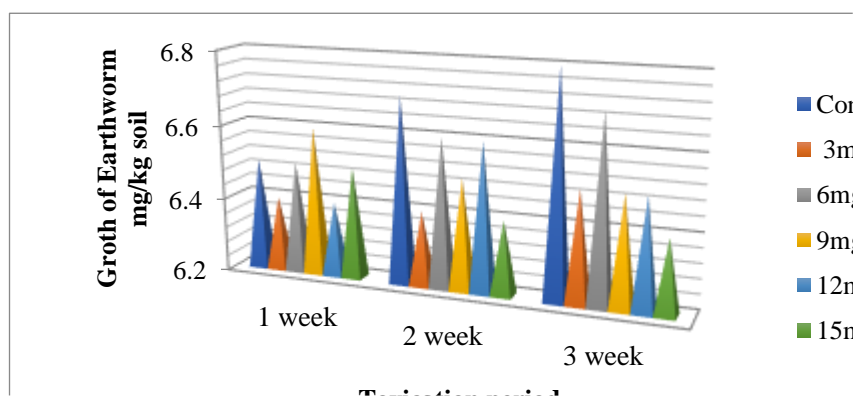


Figure 1: Impact on the growth of earthworm exposed to cythion at different toxication periods.

The present studies show that the 6mg/kg concentration of organophosphate showed non-significant difference in the earthworm growth in all toxication duration. But the increase rate was decreased from initial to end of experiment as compared to control. 12mg/kg and 15mg/kg showed very toxic on the growth of earthworm.

DISCUSSION

The Negative impact of pesticides on earthworm growth has been accounted by several researchers. Xiao suggested that development can be regarded as sensitive parameters to assess the toxicity of acetochlor on earthworms (Xiao, *et al.*, 2006.). Respectively the organophosphate showed an impact along the growth of earthworm due to which the size of an earthworm was decreased. From (table and figure) showed cythion toxication of 3mg/kg soil in 10, 20 and 30 days of the experiment showed a gradual increase in growth of earthworm from 20 days to end of the experimentation. This result brought about significant differences in dose and duration dependent as compared to the relevant control. Mosleh studied the effects of aldicarb on *Lumbricus terrestris* and have suggested growth rate as important biomarkers for contamination by endosulfan and aldicarb (Mosleh, *et al.*, 2003). We were looking into the earthworm growth were decreased than the control the organophosphate showed an impact along the development of the dew worm, the weight and size of an earthworm was not growing properly than the command. The present survey was limited as a chronic test for higher concentration of toxicant 15mg/kg soil of organophosphate. It was mentioned that the growth rate gradually decreased with increase in duration of toxicities till 3 week. And slightly significant increased in the growth of earthworm was also observed from 3 week onwards. This was passed due to adaptation and overcome the stress of toxicants by long duration treatment. Shuttle, assesses and found chlorpyrifos had adverse effect on growth in earthworm exposed to 5mg/kg chlorpyrifos after eight weeks (Zhou, *et al.*, 2007). Similarly, the organophosphate showed impact in the highest concentration on the earthworm growth. In the present survey (table and figure) toxicity of organophosphate was determined for different duration of days on earthworm *Eisenia foetida*. It was noted the growth response rate gradually declined with an increase in the duration of days. A gradual reduction in the growth of earthworm was observed,

which is significant and suggest that both responses was altered intoxicated earthworm than the control earthworm. Data from the present work showed that a reduction in the growth response of earthworm gradually from 1week to 3week, which latter on highly decrease response was documented by long days of duration test, that was highly significant different as compared to control. The Growth rate was diminished at an initial day of the experiment, which latter on decreased significantly up to 3 week of toxication periods. At the conclusion of the experiment highly significant result was observed and we establish that the effect was dose and duration dependent. The present data (table and shape) of the growth response test showed that the growth was significantly lessened as compared to control. The decrement was noted in all tested earthworm meaning that organophosphate impacted on the growth of earthworm. Some surveys have shown that growth of earthworms appeared to be more severely affected at juvenile stage than at adult stage (Booth and K. O'Halloran, 2001; Zhou, *et al.*, 2008).

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