

Biomass and Behavioral Responses of Earthworm, *Lumbricus Terrestris* to Copper Chloride

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ABSTRACT

Introduction: Among soil species earthworms are ubiquitous, abundant and important for soil processes, constituting the largest terrestrial faunal biomass and are also impacted by soil pollutants. The primary purpose of this study was to determine whether changes in earthworm biomass and behavior could serve as a good indicator for copper toxicity in soil systems. Another aim of the study was to determine the concentrations of copper that cause maximum toxicity to the soil organisms and also affect their abundance.

Method and Materials: The culture medium consisted of a 4-inch layer of uncontaminated red soil at the bottom, a thin layer of leaves, a 16 inches layer of cow dung mixed with soft soil and a thin layer of dried grass on the top. Wet gunny bags were placed to cover the boxes.

Result: Reduction in biomass was observed at all concentrations above 100 mg copper chloride /kg dry weight of soil which became more significant above 450 mg copper chloride /kg dry weight of soil ($p < 0.05$) while responses to prick reflex weakened at these concentrations. Coiling and impaired movement was observed in earthworms exposed to maximum concentration of 750 mg of copper chloride /kg dry weight of soil for a period of 30 days while a lower concentration of 450 mg copper chloride /kg dry weight of soil also induced coiling and impaired movement after 60 days of exposure.

Conclusion: On the basis of the results of the present study, it can be concluded that copper is toxic to earthworms as it is accumulated in its principle organs of locomotion, the muscles and nerves causing severe damage to structure and function of these tissues. Copper caused a reduction in biomass at all concentrations above 100mg/kg of dry weight of soil.

Keyword: Biomass, Behavioral Responses, *lumbricus terrestris*, Copper

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