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Municipal Solid Waste Management and Vermiremediation using *Eudrilus eugeniae* and *Eisenia fetida*

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Abstract : Bioaccumulation of heavy metals (Cd, Cu, Fe and Zn) from MSW soil by two earthworm species, *Eudrilus eugeniae* and *Eisenia fetida* was investigated. The soil sample was brought from the dumpsite of Rajendra Nagar, Patna and subjected to a 45 days experiment to study the change in nutrient availability (OC%, nitrogen, phosphorus and potassium) and the change in concentration of heavy metals in the substrate on 0, 15th, 30th and 45th days. The concentration of macronutrients increased in the substrate. There was significant decrease in metal content of substrate indicating

that earthworm can bioremediate the heavy metals. There was significant bioaccumulation of heavy metals in the body tissues of both species, while that in *Eudrilus eugeniae* was higher than in body of *Eisenia fetida*.

Key Words: Bioaccumulation, earthworms, municipal solid waste, vermiremediation, heavy metals.

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Introduction:

Municipal Solid Waste (MSW) generation is a continually growing problem at global, regional and local levels. Municipal solid wastes contain many toxic elements and compounds that are hazardous to human health and environment (Kaviraj and Sharma, 2003). Toxic heavy metals pose major environmental problems if present in water and soil. The remediation approaches currently in vogue are not adequate. (Xiaomel et al, 2004).

Earthworms can bio-accumulate high concentrations of metals including heavy metals in their tissues without affecting their physiology (Ireland 1983). This applies particularly to the metals that are mostly non-bioavailable for plant roots (cannot be absorbed by cell membranes).

Earthworms ingest soil, contaminating metals and change their ionic state in the gut through physiological