

Earthworm as Bio-indicator of Heavy Metal Pollution around Lafarge, Wapco Cement Factory, Ewekoro, Nigeria

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Abstract

Heavy metal pollution of terrestrial and aquatic ecosystems has long been recognized as a serious environmental concern. The use of earthworm as bio-index of soil heavy metal pollution was hereby examined. Using the Lagos/Abeokuta express road as transect, four replicates each of soil and earthworm samples were collected from five points: 100m north, 500m south, 1000m north, 1000m south, 2000m north of the Lafarge WAPCO cement factory, Ewekoro and a sixth point at the Arboretum, University of Agriculture, Abeokuta (control site). Using spectrophotometry method, heavy metal concentrations (Pb, Cu, Mn, Zn, Cd, Co) were measured in all samples of soil and earthworm. Histological studies were conducted on earthworm sections. All data obtained were subjected to analysis of variance and post hoc tests to establish significance at ($p < 0.05$). Heavy metal concentrations in earthworm and soil decreased significantly ($p < 0.05$) with increasing distance from the factory. The heavy metal concentrations in soil and earthworm around the factory were significantly higher than that obtained at the control site ($P < 0.05$). Histological studies on the earthworm body wall revealed dark spots and patches on the tissues of the earthworm samples collected from the cement factory area compared with clear earthworm tissues at the control site. Bioaccumulation of heavy metal in soil and earthworm was noticeable around West Africa Portland Cement factory, Ewekoro, Nigeria and could serve as a possible bio-index of heavy metal pollution.

Key words: Bio-indicator, Bio-index, Earthworm, Heavy metal, Spectra-photometry
