

Phytoremediation of Lead Polluted Soils with Native Weeds in Nigeria

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Abstract : Lead pollution by mining, industrial dumping, and other anthropogenic uses are corroding the environment. Efforts being made to control it include physical, chemical and biological methods. The failure of the aforementioned methods are largely due to the fact that they are cumbersome, expensive, and not eco-friendly. Some plant species can be used for remediation of these pollutants. The objective of this work is to investigate the abilities of two native weed species to remediate two lead-polluted soils: a) Battery dumpsite and, (b) Naturally occurring lead mine. Soil samples were taken from the two sites: a) Kumapayi in Ibadan, a battery dumpsite, (b) Zamfara, a natural lead mine. Screen house experiment in Complete Randomized Design (CRD) replicated three times was carried out at I.I.T.A. Unpolluted soils were collected and polluted with various rates of lead concentrations of 0, 0.1, 0.2, and 0.5%. These were planted with weed species. Plant growth parameters were monitored for twelve weeks, after which the plants were harvested. Dry weight and plant uptake of the lead were taken. Analysis of data was carried out using, Genstat, Excel and descriptive statistics. Relative concentration of lead (Pb) in the above and below ground parts of *Gomphrena celusoides* revealed that a higher amount of Pb is taken up in the root compared with the shoots at different levels of Pb pollution. However, lead uptake at 0.5% > 0.2% > 0.1% > Control. In essence, phytoremediation of *Gomphrena* is highest at soil pollution of 0.5% and its retention is greater in the root than the shoot. In *S. pyramidalis*, soil retention ranges from 0.1% > 0.5% > 0.2% > control. Uptake is highest at 0.5% > 0.1% > 0.2 in stem. Uptake in leaves is highest at 0.2%, but none in the 0.5% pollution. Therefore, different plant species exhibited different accumulative mode probably due to their physiological and rooting systems. *Gomphrena* spp. rooting system is tap root, while that of *S. pyramidalis* is fibrous.

Keywords : grass, lead, phytoremediation, pollution

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