Impact of Compost on Metals Phytostabilization Potential of Two Halophytes Species

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Abstract:

Phytostabilization of heavy metals in contaminated soils should be subject to two conditions, the first is the choice plant must be able to stabilize heavy metals in soil, the second is the plant material which produced from the phytostabilization process must be safe and useful to avoid overload on environmental system. A field experiment was conducted out to evaluate the phytostabilization potential of two halophytes species (Atriplex lentiformis and Atriplex undulata). Compost at rates of 0, 15 and 30 ton ha-1 was used to examine its role in plant growth and heavy metals uptake. The high rate of compost (30 ton ha-1) decreased zinc (Zn) concentrations in the leaves of A. lentiformis and A. undulata by 15.8 and 13.0%, while lead (Pb) in the leaves decreased by 37.6 and 35.2% respectively. Despite the extremely high total heavy metals concentrations in the studied soil, plants of Atriplex were able grow and maintain shoots metals content below the toxic level and the produced plant materials had a high nutritive value compared to the conventional forage crops. Phosphorus (P) and chloride (Cl) in the roots of Atriplex plants play important function in heavy metals phytostabilization mechanism by the two halophyte plants.

Keywords:

phytostabilization, halophytes, Atriplex, heavy metals, contaminated soils

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