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## Suitability of Ten Genotypes of Sunflower for Phytoremediation

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### Abstract

Heavy metal contaminated soils can be used in agricultural production but careful guidelines have to be established for their use, especially if the plants are used as human food. Guidelines must be based on actual data from trials carried out under appropriate environmental conditions. In the current study, field trials were carried out in a soil contaminated with Zn, Cu, Pb, Ni, and Cd to explore the uptake of these metals by ten genotypes of sunflower. Sunflower genotypes were obtained from selfing from different parents up to S5 generation. Analysis of variance showed that, the uptake of Zn, Cu, and Cd varied significantly ( $p < 0.05$ ) among the different genotypes. Despite the large total and extractable content of Pb and Ni in the studied soil, seed concentrations of these metals in all the studied genotypes were negligible. The concentrations of Zn and Cu in the seeds of all studied genotypes were within the normal levels. The Cd concentrations in the seeds of seven genotypes were below healthy acceptable levels ( $0.1 \text{ mg Cd kg}^{-1}$ ) and considered safe for human consumption, while other three genotypes contained higher concentrations. Two genotypes contained Cd concentration of more than  $150 \text{ mg Cd kg}^{-1}$ , these genotypes can be used in phytoremediation of contaminated soils. The current study clearly indicated that some sunflower genotypes have a high ability to keep the concentrations of heavy metals in their seeds below the healthy acceptable levels. These genotypes can be cultivated on soils contaminated with heavy metals for safe food production.

**Keywords:** Metals contaminated soils, phytoremediation, phytostabilisation