Abstract

This study was carried out in two stages, the first stage to determine the efficiency of the Phytoremediation of soils contaminated with cadmium and lead *Puccinellia distans* and *Pennisetum divisum* and in the presence of EDTA and DTPA and in the second stage to reduce the risk of metal leaching into groundwater. was studied. Soil samples from pastures Farashband city located in the South West Fars Province of 0-15 cm depth were collected randomly collected. For contaminated soil to cadmium the amount 7.15 mg/kg $CdCl_2$ and to lead the amount 400 mg/kg $PbNO_3$ were used. The treatments were used in 10 levels with 5 replications C (unpolluted soil, non-chelated), W (soil without chelate), 2.5DTPA, 5DTPA, 2.5EDTA, 5EDTA, 2.5EDTA + 2.5DTPA, 2.5EDTA + 5DTPA, 5EDTA + 2.5EDTA, 5EDTA + 5DTPA the treatments to C and W were used as control. Bio Concentraation Factor (BCF), Translocation Factor (TF) and Tolerance Index (TI) to determine plant the efficiency phytoextraction were measured. The results showed that the use of DTPA and EDTA significantly increased with cadmium and lead tissues of the plant. The maximum concentration accumulation factor 5DTPA and 5EDTA treatments, respectively, and maximum translocation factors in the treatment 2.5EDTA + 2.5DTPA was observed. in addition effect of DTPA and EDTA on TI (Tolerance Index) and DW (Dry Weight) showed that the indicators decreased with increasing doses of DTPA and EDTA. To reduce the leaching risk of cadmium and lead concentrations of 5 mg/kg of DTPA and EDTA in three ways of single, three successive dosage and six successive dosage were added to the soil. To determine optimum of method of DTPA and EDTA application to reduce Pb and Cd leaching risk into ground waters. The results showed that under single dosage application, Pb and Cd contents in the soil reached at its minimum concentration. The data indicated that the maximum Pb and Cd concentrations in the plant organs was calculated at the single dosage. Overall, optimum phytoextraction of P. distans and Pb and Cd leaching risk reduction was observed when 5 mg/kg DTPA and EDTA was added in single dosage.

Keywords: Phytoextraction, Cadmium, Lead, Leaching, *Puccinellia distans* (Jacq.) Parl and *Pennisetum divisum* (Gmel) Henrard

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Phytoremediation potential of two plant species *Puccinellia distans* (Jacq.) Parl and *Pennisetum divisum* (Gmel) Henrard and strategy to reduce Cadmium and Lead leaching into groundwaters

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