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Graduate school
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Department of Soil Science

The Thesis Submitted for the Degree of M. Sc

**Study Effect of Soil and Amendments on
Phytoremediation of Cadmium (Cd) and Lead
(Pb) from Contaminated Soil by Rosemary
(Rosmarinus Officinalis L.)**

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Abstract

Today one of the biggest problems communities are facing with, is the problem of environmental pollution. Phytoremediation is one of the most recent methods for environmental Purgation. In this method, a plant with high adsorption capacity is used as phytoremediate. The aim of this study was to investigate the type of soil amendments on phytoremediation of soil contaminated with cadmium and lead by the herb, rosemary. For data analyzing on this research Factorial test in a completely randomized design with 2 factors including factor A (soils Cool, Rahdar, Dehe Haj Abbas Khan and Pokak) And factor B (four amender and control) in 3 Repeat for phytoremediation of contaminated soils with cadmium and lead by Rosemary (*Rosmarinus Officinalis* L.) was used. This research was done in the greenhouse of the University of Zabol in Agricultural Research department (Education-hobby Integrated Chah Nimeh, Bagheyatolah Al'Azam).

Results showed that the highest uptake of cadmium and lead by Rosemary's roots and aerials was in Cole area soil with fungual amendment G.In, which the uptake by roots was much higher than aerials. The lowest uptake from soil was in Dehe Haj Abbas Khan and control samples. The highest amount of dried weight root in contaminated soils with cadmium belonged to Pokak soil containing vermicompost amendments. The highest amount of the aerial dried weight in soils contaminated with cadmium and lead was observed in Cole soil and Cole soil containing vermicompost amendment, respectively. A comparison of the average amounts for the highest range of chlorophyll a, b and carotenoids in soils contaminated with cadmium and lead was observed in cole soil containing vermicompost, and Cole soil and Pokak area soil containing vermicompost, respectively. Results of this research generally indicates that the herb rosemary can be effective for remediation of soils contaminated with lead and cadmium, especially lead and the highest concentration of heavy metals were found in the roots. among the four amendments used in this study, G.In fungual amendment had the greatest impact on increasing the uptake of heavy metals in soil contaminated with cadmium and lead. This fact was due to reducing the acidity of the soil, supplying plant nutrients, increasing plant resistance stress and the amount of soluble cadmium and lead contamination in the soil by G.In fungual amendment.

Keywords: Phytoremediation, Cadmium, Lead, Rosemary, Soil Amendmen