

## **Abstract**

Cultivated soil contamination to heavy metals including cadmium is one of the important difficulties within environment. Many adsorbents exist for the removal of heavy metals from soil and aquatic environments. *Biochar* produced from thermal decomposition of biomass under the pyrolysis process and its surface includes many organic functional groups at which potential causes the complexes with metal ions increase. In present thesis, impact of *biochar* on cadmium uptake through sunflower as well as some chemical properties of soils in contaminated soils particularly cadmium was evaluated. Experiment was conducted in a completely randomized design. Experimental factors include cadmium as cadmium nitrate source in six levels of 0, 5, 10, 15, 20 and 25 milligrams per kilogram of soil and biochar in four levels of 0, 5, 10 and 15 g per Kg of soil. The results from findings showed that main treatment (biochar) did not have any significant effect on the plant height, dry weight of roots and shoots of plants, but the results of interaction of cadmium and biochar showed that in all cadmium levels in soil with increasing levels of biochar was observed an increasing trend in the above parameters, which was significant increase in some cadmium levels and did not have significant effect on the some other. But in general the greatest extent of these parameters was observed at 15 g per Kg biochar and the least extent was observed at zero level of biochar. In addition, increasing cadmium uptake and application of biochar caused decreasing cadmium uptake through root and shoots of plants. The highest extent of decrease was observed at 15 g per Kg of biochar and the least degree was observed at zero level. Soil acidity, electrical conductivity and organic carbon increased besides increasing the level of applied biochar. The results from findings showed that biochar can lead to cadmium uptake from soil where it can be used in order to reduction the heavy pollutants from contaminated soil.

**Key Word: Sunflower, Contamination, Biochar, Heavy metals, Cadmium.**



University of Zabol  
Graduate School  
Faculty of Water and Soil  
Department of Soil Science

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Cadmium Bioavailability in Soil**

**Supervisor:**

Dr. A. Gholamalizade Ahangar

**Advisor:**

Dr. A. Lakzian

**By:**

S. jalalipur

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