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Effect of Corn, Pea and Wheat Plants on Leaching and Uptake of Nickel in Soil-Plant System

,***Zeynep Gorkem Dogaroglu***[1], Aydeniz Demir[1] and Nurcan Koleli[1]

[1, 2,3] Mersin University, Faculty of Engineering, Department of Environmental Engineering, 33342 Mersin,TURKEY
(gorkemgulmez@gmail.com)

Human activities such as industrial production, exhaust gases, mining, the use of fertilizers and pesticides cause heavy metal pollution in soil. Heavy metals in the soil include some significant metals of biological toxicity, such as nickel (Ni), cadmium (Cd), lead (Pb), chromium (Cr) and arsenic (As). In recent years, accumulation of these heavy metals in ecosystem (soil, water and air) cause significantly adverse effect to the environment and living organisms. These metals can uptake by plants and they translocate and accumulated in several parts of plants such as root and leaves so, they can be increased in the food chain for long time. The aim of this study was to evaluate the effects of corn, pea and wheat plants on Ni leaching and uptake in soil. The Ni contaminated soil sample was collected from Mersin-Fındıkpınarı/Turkey (0-30 cm depth). Every plants were grown which containing 1 kg Ni contaminated soil and 5 seeds in different pots during 37 days. Pots were saturated 3 days intervals and about 3 mL soil solutions were collected after seed germination (7 days). After the filtration of soil solution were analyzed for pH, EC and Ni concentration, and also morphological changes, chlorophyll content and Ni uptake by plants were determined. Results showed that corn is the most accumulator plants for Ni in chosen plants and Ni concentration in corn, wheat and green pea soil solution were not determined (<5 µg/L) after 15th, 12th and 9th day, respectively.

Keywords: Nickel, Corn, Wheat, Soil, Leaching