

Abstract

The study of concentration of heavy metals, especially cadmium and lead in soil system, water and plants is important due to the impact of these substances on the food chain and health of organisms. In order to study the effect of potassium fertilizers on phytoremediation of cadmium and lead by medical herb, Lavandula, a pot experiment as factorial experiment in a completely randomized design with three replications was conducted. Experimental treatments were include: cadmium at two levels (0 and 15 mg of cadmium per kg of soil from the source of cadmium chloride) and lead at two levels (0 and 100 mg of lead per kg of soil from the source of lead nitrate) and potassium fertilizer in seven levels (55 and 110 mg per kg of soil from each of fertilizer source potassium chloride, potassium sulfate, potassium nitrate and control). Pots were filled with 3 kg of farm soil. Rooted plants, lavender, were planted and 60 days after the end of the vegetative growth period, shoot harvested from the crown and after the determining of weight, shoots were transferred to the laboratory. Also separating the roots was done gently and was separated of soil by sieving and was washed with water and after determining the fresh weight of them, were transferred to the laboratory. for later steps. Data were analyzed with SAS software. The results of variance analysis showed that different resources and amounts of potassium had not significant effect on dry and fresh weight of root and shoots, but had a significant effect on concentration of potassium, cadmium and lead of root and shoots. In soil polluted with cadmium, the highest concentration of cadmium in shoots of plant was obtained with consumption of 110 mg of potassium per kg of potassium chloride. Also in soil polluted with lead, the highest concentration of lead in shoots of plant was obtained with consumption of 110 mg of potassium per kg of potassium chloride. potassium chloride can improve the efficiency of phytoremediation of soil polluted with lead and cadmium. In general the aim of this study was to investigate the possibility of cadmium and lead phytoremediation by medicinal plant, lavender, that according to performance, high compatibility and usability of biomass obtained in the paper industry, production of compost, producing biofuels, production of essential oils, in the production of plant fibers and fabrics were detected suitable for the phytoremediation. To better understand of behavior of heavy metals in soil and food chain, further research in infected fields is recommended.

Keywords: Essential oil, Heavy metals, Medicinal Plant, Potassium fertilizers, Phytoremediation



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Phytoremediation by Lavender (*Lavendula
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