World Academy of Science, Engineering and Technology
International Journal of Environmental and Ecological Engineering
Vol:11, No:06, 2017

Potential of Two Pelargonium Species for EDTA-Assisted Phytoextraction of Cadmium

Authors : Iram Gul, Maria Manzoor, Muhammad Arshad

Abstract : The enhanced phytoextraction techniques have been proposed for the remediation of heavy metals contaminated soil. Chelating agents enhance the availability of Cd, which is the main factor in the phytoremediation. This study was conducted to assessed the potential of two Pelargonium species (Pelargonium zonale, Pelargonium hortorum) in EDTA enhanced phytoextraction of Cd using pot experiment. Different doses of EDTA (0, 1, 2, 3, 4, 5 mmol kg-1) was used, and results showed that there was significant increase (approximately 2.1 folds) in the mobility of Cd at EDTA 5 mg kg-1 as compared to control. Both plants have TF and BCF more than 1 and have potential for the phytoextraction of Cd. However, the Pelargonium hortorum showed higher biomass and Cd uptake as compared to Pleragonium zonale. The maximum Cd accumulation in shoot and root of Pelargonium zonale was 484.4 and 264.41 mg kg-1 respectively at 2 mmol kg-1. However, the Pelargonium hortorum accumulate 996.9 and 350 mg kg-1 of Cd in shoot and root respectively at 4 mmol kg-1. Pelargonium hortorum uptake approximately 10.7 folds higher Cd concentration as compared to the Pelargonium zonale. Results revealed that P. hortorum performed better than P. zonal even at higher Cd and EDTA doses however toxicity and leaching potential of increased Cd and EDTA concentrations needs to be explored before field application.

Keywords : Cadmium, EDTA, Pelargonium, phytoextraction
Conference Title : ICPTM 2017 : International Conference on Phytoremediation, Technologies and Methods
Conference Location : New York, United States
Conference Dates : June 04-05, 2017