Remediation of Heavy Metal Contamination in Agricultural Soils

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ABSTRACT

Water being a universal solvent becomes a carrier of many potent environmental contaminants. Heavy metals are one such potent chemicals that are finding their way into the food chain due to their presence in the groundwater or irrigation waters. There is a constant need to develop a low cost and eco-friendly technology to remove pollutants like heavy metals, which are impairing the water and the soil quality alike. Phytoremediation is a green technology gaining momentum due to its low cost and aesthetic orientation. Hydroponic experiment was designed to evaluate the remediation potential of Brassica juncea and Vigna radiata for chromium contaminated water. Chromium (Cr) accumulation potential and induction of antioxidative defence system were studied in hydroponically grown Brassica juncea (Indian mustard) and Vigna radiata (mungbean) at various levels of Cr treatments (0, 50, 100, 200 μ M Cr). B. juncea accumulated twofolds higher Cr in root and shoot, respectively than in V. radiata. Compared to B. juncea, V. radiata was found to be particularly sensitive to Cr as observed by the severity and development of Cr toxicity symptoms and decreased growth. Brassica juncea displayed a very well developed defense response towards Cr toxicity and thus indicated its potential to grow in Cr contaminated water/soil substrata.

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