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CAPABILITY OF AQUATIC PLANTS FOR HEAVY METALS UPTAKE IN SIMULATED SEDIMENTS

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Abstract

Heavy metals are considered important pollutants found in sewage sludge. That is why sewage sludge can have a limited use as fertilizer in agriculture. Some aquatic plants can remove nutrients and heavy metals from media as sewage sludge or contaminated sediments. In this paper, we investigated the effects of different concentration levels of two heavy metals (Ni and Cd), respectively, 10, 35, 85 and 20, 50, 150 mg/kg in sedimentary media on plant uptake of Ni and Cd, considering three aquatic plants: *Typha latifolia*, *Phragmites australis* and *Scirpus tabernaemontani*. These uptake abilities were investigated at the 60-days of experiment through a completely random design. Results showed that Ni and Cd accumulation in root and rhizome was higher than similar amounts for the stem and leaf of the three plant species. Also, with the increase in the concentration levels of the two heavy metals in sediments, their accumulation in plant tissues was increased. Cd accumulation in belowground tissues of *T. latifolia* was 8.43, 24.97 and 70.5 mg/kg in dry weight at the 10, 35 and 85 mg/kg metal concentration in the simulated sediments respectively. Also, Translocation factor (TF) and Bioconcentration factor (BCF) for Ni and Cd were calculated for the three plant species. The results showed that TF and BCF were 0.44, 0.32, 0.26 and 0.58, 0.48, 0.42 for Ni respectively in *T. latifolia*, *P. australis* and *S. tabernaemontani* at the higher value of the concentration. The values of TF and BCF were 0.34, 0.21, 0.24 and 0.83, 0.68 and 0.34 for Cd in the three plants, respectively. According to our results, the accumulation of Ni and Cd in the above-ground and below-ground tissues in *T. latifolia* was the highest. Also, our results are important for bioindication, bioremediation and biomonitoring of aquatic ecosystems and heavy metals removal from sewage sludge.

Key words: aquatic plants, Cd, heavy metal accumulation, Ni, sewage sludge

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