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PS 67-130: Removing arsenic from polluted area, using green technology: Phytoremediation

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Arsenic is a ubiquitous element, present in the atmosphere as well as in the aquatic and terrestrial environments. It is an environmental pollutant with high toxicity to organisms. Remediation of arsenic contaminated soils has become a major environmental issue. Phytoremediation is an ecofriendly approach for remediation of contaminated soil and water. *Phragmites australis*, common reed, characterized by elevated water detoxification capacity can be used in phytoremediation. In order to model a successful phytoremediation strategy from polluted area, we collected *Phragmites australis* from five stations in arsenic polluted area, Chelpo, and compared with samples collected from unpolluted area, Bazangan, northeast Iran. Arsenic was measured in different parts (root, rhizome, stem and leaf) of *Phragmites australis* using graphite furnace atomic absorption spectrophotometer method. Maximum arsenic uptake in root, rhizome, stem and leaf samples is 21.25, 18.5, 4.5 and 4.05 mg kg⁻¹ respectively. The leaves were also analyzed for Chlorophyll a, a/b and carotenoids by spectrophotometer method. In contrast to control samples chlorophyll a concentration and chlorophyll a/b ratio decreased significantly ($P \leq 0.05$). Whereas total carotenoids as an important antioxidant compound are increased significantly from 0.65% to 1.53% ($p \leq 0.01$). We also measured Mn, Ca, Zn, Mg, P, Na, K and Fe concentrations in the samples. The results show that the arsenic uptake by roots of *P. australis* mostly decreased uptake of nutrient elements, Mn, Ca, Zn, Na, Mg and P ($p \leq 0.01$), however Fe and K concentrations in roots increased significantly ($P \leq 0.05$). It is concluded that common reed (*P. australis*) qualifies as an arsenic hyperaccumulator and thus naturally has potential application in phytoremediation from arsenic contaminated site.

Key words: phytoremediation, Arsenic, *Phragmites australis*, Chelpo, pollution

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