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IMPACT OF ASSOCIATED ANIONS ON LEAD UPTAKE BY *Pistia stratiotes* AND *Salvinia molesta*: A NEW PERSPECTIVE FOR PHYTOREMEDIATION

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Contamination of water with toxic metal ions is a worldwide concern due to recalcitrant impact on the ecosystem. Phytoremediation is a potentially cost-effective and eco-friendly technology to address this problem. Though many compilations on Pb(II) phytoremediation were reported, the impact of the counter ion for cation uptake was not examined. However, wastewater is a mixture of anions and cations. Accordingly, the counter ion effect on Pb(II) uptake was investigated by changing the anion type of Pb(II) salts ([Pb(II)] = 10 mg L^{-1}). Different lead salts *viz.,* $PbCl_2$, $Pb(NO_3)_2$, $Pb(C_2H_3O_2)_2$, PbF_2 and $PbHAsO_4$ were analysed as potential lead contaminants in wastewater using macrophytes, *Pistia stratiotes* and *Salvinia molesta*. Anion concentrations were altered to 10, 15 and 20 mg L^{-1} by adding $NaC_2H_3O_2$, $NaNO_3$ or NaCl, while Na-EDTA was used as a desorption simulator. Samples were analysed for cation and anion concentrations using atomic emission spectroscopy ([Pb(II)] = 0-10 mg L^{-1}) and ion chromatography, respectively. Statistical analysis was performed in one-way ANOVA with a Tukey pairwise comparison. The results show that the average Pb(II) removal exceeds 85% in all cases indicating the hyperaccumulative behaviour of macrophytes. However, *S. molesta* is more tolerant of Pb(II). Regardless of the plant type, the most effective counter ion was $C_2H_3O_2^-$, followed by NO_3^- and Cl^-. The highest Pb(II) removal was observed with 15 mg L^{-1} of anions for *P. stratiotes*. With *S. molesta*, the optimal concentrations were 10 mg L^{-1} of NO_3^- and Cl^- and 20 mg L^{-1} of $C_2H_3O_2^-$. In binary anion mixtures, Pb(II) removal was comparatively low. Na- EDTA was effective in desorbing Pb(II) from plant tissues, perhaps forming stable complexes with Pb(II). Thus, Pb(II) removal capacity of *P. stratiotes* and *S. molesta* can be influenced by the type of anion and its concentration associated with Pb(II). These findings can be utilized to maximize the effectiveness of Pb(II) phytoremediation by modifying the solute conditions and selecting the appropriate macrophyte as per the major anion type and concentration.

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