ABSTRACT

Heavy metals like chromium (Cr) are the hazardous pollutants in the aquatic bodies. Similarly, lithium (Li) is also an emerging pollutant that is contaminating soil and water which later pollute plants as well. The aim of the present study is to evaluate the potential of *Eichhornia crassipes* for the removal of both Cr and Li. The impacts of Cr and Li on the growth and physiological parameters were also determined. Different parameters like fresh weight, lengths of roots, stems and leaves, chlorophyll content, photosynthetic rate, stomatal conductance and rate of transpiration were also measured. The rate of the removal of Cr and Li by roots, stems and leaves of *E. crassipes* were evaluated along with the translocation factor (TF) and bioaccumulation factor (BAF) of Cr and Li. The concentrations of 2, 4, 6 and 8mg/l of Cr and Cr+Li while 10, 20, 30 and 40mg/l of Li were added in the tap water. Plant samples were analyzed for Cr and Li removal from water. Results showed that for 2, 4, 6 and 8 mg/l of Cr *E. crassipes* removed 91, 91, 95, 98% during 1st setup while 96, 98, 95, 99% and 83, 93, 94 and 96% during 2nd and 3rd setup respectively. For 10, 20, 30 and 40mg/l of Li *E. crassipes* removed 89, 89, 90, 75% during 1st setup while during 2nd and 3rd setup it removed 96, 92, 96, 85% and 71, 87, 88 and 83% of Li respectively. Roots of *E. crassipes* accumulated more concentration of Cr and Li as compared to the stems and leaves. BAF for Cr and Li showed that *E. crassipes* effectively accumulated the Cr and Li in the roots as compared to the stems and leaves. Results were analyzed statistically by the use of single factor ANOVA in SPSS 16. Statistical analysis showed that *E. crassipes* is highly significant for the removal of given concentrations of Cr and Li ($p \leq 0.05$). Thus, this study recommends that Cr and Li can be effectively removed by *E. crassipes*. High concentrations of Cr and Li could also be removed by *E. crassipes* and other aquatic macrophytes. Moreover, morphological and anatomical changes in *E. crassipes* and other aquatic species could be observed by future researchers. This study also encourages novel policy making to mitigate Cr and Li concentration to bring it to a safe level prior to its release into the environment. This technology could also be used for the cleanup of environment because it is eco-friendly and cost effective.