POTENTIAL OF AQUATIC MACROPHYTES *CERATOPHYLLUM DEMERSUM, LIMNOBIUM LAEVIGATUM,* AND *EGERIA DENSA* IN PHYTOREMEDIATION OF WASTEWATER

C.N. Wanigasekara*#, J.M.C.K. Jayawardana, and R.G.U. Jayalal
Faculty of Applied Sciences, Sabaragamuwa University of Sri Lanka, Belihuloya, Sri Lanka
**Correspondence E-mail: chethana.nimeshi1995@gmail.com, Phone: +94711951475*
#Presenting Author

Abstract: Phytoremediation of wastewater using aquatic plants is an environmentally sustainable technique for removing contaminants in wastewater. The objective of this study is to evaluate the phytoremediation potential of textile wastewater using locally available tropical aquatic plants *Ceratophyllum demersum, Limnobium laevigatum*, and *Egeria densa.* Reduction efficiencies of biochemical oxygen demand (BOD), total solids (TS), total dissolved solids (TDS), total suspended solids (TSS), phosphates, nitrates, and heavy metal ions Ni(II), Zn(II), Pb(II), Cr(III/VI) in textile wastewater treated with each plant species and control were estimated. Three plant species and the control were the four treatment groups and each treatment group consisted of three replicates. The bioconcentration factor (BCF) of each plant species was calculated by measuring metal ion concentrations in digested plant tissues to determine heavy metal ion absorption. One-way ANOVA was used to compare the reduction efficiency of the water quality variables. The Tukey post hoc test was used for pairwise comparisons in each treatment group. According to the results of this study, *C. demersum* indicated high reduction percentages of TS (+67.53%), TSS (+74.74%), nitrate (+52.22%), Pb(II) (+98.48%), and Zn(II) (+99.22%) from initial wastewater. There were significant reductions of BOD, TS, TSS, Ni(II), Pb(II), and Zn(II) in wastewater treated with *C. demersum* and *L. laevigatum* compared to the control ($P<0.05$). Furthermore, the study indicated that *C. demersum, L. laevigatum,* and *E. densa* are hyperaccumulators of Zn(II) and Pb(II) according to the BCF factor. The findings of the study suggest that both *C. demersum* and *L. laevigatum* are capable of effectively removing contaminants from textile wastewater.

Keywords: Contaminants; Sustainable; Phytoremediation; Wastewater