

ABSTRACT

Combined textile effluents should be treated productively by using eco-friendly techniques to save the environment and natural water resources from adversative impacts. Physical, chemical, and biological treatments are discipline to de-contaminate textile effluents. The objective of this study was to check the ability of treatments for absorbing heavy metals (Cu, Cr, Pb and Cd). Experiments performed on lab scale, for physical treatment maximum timing was 96 hours, for chemical 30 minutes and biological treatments 30 days. Concentrations of heavy metals checked at zero-day which were 1.32mg/l, 1.40mg/l, 1.86mg/l and 1.15mg/l for Cu, Cr, Pb and Cd respectively. Four dilutions of each metal were prepared for the experiment. Physical treatment removed a maximum 57.82%, 48%, 46.96% and 60.81% through apple peels activated carbon and 60.3%, 48.27%, 48.10% and 58.43% through rice husk activated carbon. Three chemical treatments (Ozone, UV/H₂O₂, O₃ + UV/H₂O₂) removed Cu, Cr, Pb and Cd, removal efficiency of these treatments for metals were following 65.57%, 37.15%, 71.63, 66.75%, 60.10%, 39.19%, 65.76%, 67.36%, 72.80%, 52.24%, 79.47%, 77.15%. In biological treatment removal of Cu, Cr, Pb and Cd from *Eichhornia crassipes* were 91.68%, 92.67%, 93.04% and 93.22% congruently. *Pistia stratiotes* showed 91.14%, 91.29%, 91.89% and 91.18% for Cu, Cr, Pb and Cd respectively. Algae removed Cu (87.07%), Cr (86.68%), Pb (86.45%) and Cd (83.47%). Analysis of variance (ANOVA) was applied to compare significance level of treatments for removal of heavy metals at different concentrations. Results of all treatments showed noteworthy removal of heavy metals from effluents at $p < 0.005$. The physio chemical parameters like COD, BOD, temperature, pH, TDS of the combined textile effluent also characterized, results showed 99% reduction in value of parameters from chemical treatments and a little less from biological and physical treatments. More efficient removal of heavy metals shown through biological treatments which are environment friendly and cost effective as compared to physical and chemical treatments. In future two or more treatments can be merged to treat the combined textile effluent, the upsurge or reduction in treatments removal efficiency, power paying, and cost should be calculated in contrast to a single treatment and trials should be done at large scales.