

Assessment of Phytoremediation to Treat Selected Metals in Textile Wastewater

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Textile wastewater causes aquatic pollution and is toxic to both human and animals. The existing conventional treatment methods ultimately add heavy metals to the sludge making it unsuitable for future usage. Hence, there is an urge for an environmentally friendly, cost effective technological solution to treat textile wastewater to remove heavy metals prior to discharge to the environment. Thus, the present study describes the application of phytoremediation to remove metal pollutants from contaminated soil and water. This work aims to compile information on the removal efficiency of four different types of plants (*Canna indica*, *Ipomoea aquatica*, *Monochoria vaginalis* and *Limnocharis flava*) on five different types of metal pollutants (Mg, Cd, Cr, Cu and Mn) in textile wastewater. The plants were grown in soil media, where the initial concentrations of the metals were known, and a synthetically prepared textile wastewater was kept in contact with the plants for two weeks. The measurements were done after 1, 4, 7 and 10 days, where concentrations of metals were measured using Atomic Absorption Spectrophotometer. Results showed that *Monochoria vaginalis* and *Limnocharis flava* plants started to die after four days from the commencement of the study showing their incapability in phytoremediation, while *Canna indica* and *Ipomoea aquatica* showed growth characteristics. The overall removal efficiency of Mg, Cd, Cr, Cu and Mn by *Canna indica* were 90.32, 88.42, 85.33, 85.08 and 23.15%, respectively, whereas removal efficiency by *Ipomoea aquatica* were 89.88, 83.74, 82.49, 80.17 and 11.27%, respectively showing similar absorptions for both plants. The study concludes that the *Canna indica* is the best plant among the selected plant types for the removal of the chosen metal pollutants. *Ipomoea aquatica* was found to be the second highest effective plant which also signifies that, contaminated plant can cause health issues by consuming it as a food.

Keywords: Phytoremediation, Textile waste, Atomic absorption spectrophotometer, Sludge treatment