

Efficacy of *Lemna minor* and *Typha latifolia* for the treatment of textile industry wastewater in a constructed wetland under citric acid amendment: A lab scale study

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Heavy metals (HMs) contamination is currently a major environmental concern; as most agricultural land is being polluted from municipal discharge. Among various other pollutants, lead (Pb), copper (Cu) and chromium (Cr) are one of the most harmful heavy metals, enters into the food chain through the irrigation of crops with an industrial effluent. The present study was performed to evaluate the toxic effects of textile effluents and performance of citric acid (CA) on phytoextraction potential of *Lemna minor L.* and *Typha latifolia L.* in an artificial designed wetland. Different doses of textile wastewater (0, 25, 50, 75, and 100%) and CA (10mM) were applied alone and in combinations to plants. Plants were harvested and the data was recorded regarding agronomic traits, photosynthetic pigments, antioxidant enzymes, reactive oxygen species (ROS), electrolytic leakage (EL) and heavy metals uptake and accumulation. Our results depicted that the concentration and accumulation of Pb, Cu and Cr in different parts of *T. Latifolia* plant was increased with and without CA addition. The Pb, Cu and Cr concentration increased in leaf by (279, 240 & 171%), stem by (192, 172 & 154%) and root by (224, 183 & 168%) respectively. Similarly, the accumulation of Pb, Cu and Cr increased in leaf by (91, 71 & 36%), stem by (57, 46 & 36%) and root by (76, 53 & 45%) respectively in plants treated with 100% textile effluent as compared to the 25% textile effluent treated plants. In *L. minor*, the concentration of Pb, Cu & Cr increased 542, 411 and 397% while accumulation increase 101, 59 & 55% respectively..