

Removal of Heavy Metal Utilising *Lemna Minor*

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Background: The toxicity, durability, and bioaccumulation potential of heavy metals make their presence in household wastewater a serious environmental and public health concern. Using aquatic plants to treat household wastewater is known as phytoremediation, and it may help reduce the amount of heavy metals present in the effluent. In this study, duckweed, often referred to as *Lemna minor* (*L. minor*), is applied to household garbage in order to phytoremediate heavy metals. This study's objective is to determine the uptake of heavy metals using *L. minor*, which is present in household garbage that is collected from residential locations.

Methods: The physical growth of *L. minor* in household wastewater as well as physico-chemical parameters as pH, electrical conductivity, and chemical oxygen demand (COD) were investigated in this work. Using Inductively Coupled Plasma Optical Emission Spectroscopy (ICP-OES), the heavy metals that *L. minor* absorbed were evaluated. The quantities of heavy metals, particularly lead (Pb), copper (Cu), zinc (Zn), and arsenic (As), were measured using the acid digestion method. The COD of household wastewater was measured using a spectrophotometer. Using household wastewater, *L. minor* was grown for eighteen days in three different beakers, named A1, A2, A3, and A4.

Results: Following the 18-day period, *L. minor* was able to lower the pH from 7.28 to 6.13 and showed a modest increase in root length. The COD concentration also significantly decreased, going from 2875 mg/L to 975 mg/L. Additionally, the findings showed that *L. minor* decreased pH, COD, and electrical conductivity.

Conclusion: The results indicate that by lowering heavy metal concentrations and enhancing water quality, *L. minor* shows promise for phytoremediation of household wastewater. According to the study's findings, duckweed is a practical and long-term solution for treating heavy metal-contaminated wastewater.

Keywords: Phytoremediation, *Lemna minor*, heavy metals, domestic wastewater, water treatment, chemical oxygen demand, inductively coupled plasma optical emission spectroscopy

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