Eichhornia crassipes (Water Hyacinth) as a Phytoremediator of Heavy Metals Copper (Cu), Lead (Pb), and Zinc (Zn) in Freshwater Bodies

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The heavy metals lead (Pb), copper (Cu), and zinc (Zn) cause an alarming combination of environmental and health problems (Zheng ,2023). Using the Eichhornia crassipes plant, a hyperaccumulator of heavy metals in water, it was hypothesized that it could absorb copper, lead, and zinc. To test the hypothesis, six Eichhornia crassipes plants were placed in 1000 mL solutions of copper, lead, and zinc at concentrations of 10 ppm and 20 ppm for each heavy metal, respectively, for 7 days. Two plants served as control plants. The plants were segmented into leaves, stems, and roots and placed in a drying oven at 65°C to 85°C, which yielded 3 grams per segment. The dried plant segments then underwent the nitric acid digestion method until the solution reached 50 mL and were subjected to ICP-OES testing for heavy metal readings. This study demonstrated that E. crassipes is a hyperaccumulator as it can absorb substantial amounts of heavy metals. The results showed absorption rates of up to 98.4% for copper (45,463.33 ppm) in the roots, as the plant does not translocate it to the stems and leaves. According to Lajayer (2019), plants can immobilize metals in vacuoles and form soluble complexes with metal ions to prevent their translocation to the aerial part. This plant showed characteristics of a potential phytoremediator for the freshwater ecosystem, reducing heavy metal pollution. In the future, research would be conducted in freshwater bodies, and the ability to absorb other metals such as As and Cd would be analyzed.

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