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PHYTOTOXICITY OF COFFEE WASTEWATER TO WATER HYACINTH AS PRIOR STEP TO PHYTOTREATMENT ASSESSMENT: INFLUENCE OF CONCENTRATION AND AMOUNT OF PLANT BIOMASS

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Abstract

Phytoremediation is an alternative technology for treating domestic and industrial wastewater. Coffee wastewater contains high value of biochemical oxygen demand (BOD), chemical oxygen demand (COD), total suspended solid (TSS) and turbidity. The wastewaters also possess a distinctive dark brown colour with acidic medium characteristic. This research was amended to determine the capability of water hyacinth (*Eichhornia crassipes*) to treat coffee wastewater. This phytotoxicity test comprised of plant analysis, coffee wastewater characterization, and removal of pollutant parameters under various amount of initial number of plants and coffee wastewater concentration. The result of wastewater characterization showed high COD, TSS, NH_3-N, colour and acidic pH. Phytotoxicity test indicated that all plants grow in 10% of coffee wastewater and in 30%, almost all the plants died at day 5. The best removal efficiency reaching up to 93.8% for COD, 90.2% for TSS, 95.0% for NH_3-N, and 45.4% for colour at 28 days of exposure confirming that phytotreatment of coffee wastewater using water hyacinth is very reliable, especially for polishing the effluent before discharge into water bodies.

Keywords: aquatic plant, *Eichhornia crassipes*, phytoremediation, toxicity, wastewater treatment

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