Effect of Nutrient Concentration and pH on Growth and Nutrient Removal Efficiency of Duckweed (Lemna Minor) From Natural Solid Waste Leachate

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***Abstract*— This study aims to investigate the effect of nutrient concentration and pH of leachate on growth and nutrient removal efficiency of duckweed (Lemna minor). A batch experiment was conducted using pH range of 4-10 and two initial leachate dilutions with nutrient concentrations of N (90 and 20 mg L^{-1}) and P (76 and 16 mg L^{-1}) and effect of pH and initial nitrogen (N) and phosphorous (P) contents of natural leachate was investigated on growth and nutrient removal efficiency of Lemna minor. Nutrient removal rates of duckweed increase with an increase in initial nutrient concentration of leachate at all pH levels. At both leachate dilutions, pH range of 6-8 with an optimum of 7.1 is good for nutrient removal efficiency of duckweed from leachate. The highest rates of nitrogen (1.22 g m^{-2} day^{-1}) and phosphorous (0.95 g m-2 day-1) removal were achieved from more concentrated leachate at pH 7.1. Growth rate of duckweed decreases with an increase in initial nutrient concentration of leachate at all pH levels. Maximum growth rate of duckweed (19.6 g m2 day-1) was achieved at pH 7.1 from less concentrated leachate. Nitrogen and phosphorous uptake in duckweed biomass was higher in less concentrated leachate at all pH values. Optimum pH for N and P uptake by Lemna minor is 7.1 at both leachate dilutions. At this pH duckweed showed 94 % and 91 % uptake of N and P respectively from less concentrated leachate.**

***Key Words:* Leachate, Duckweed, Lemna Minor, Nutrients, Ph, Removal Rate, Growth Rate.**

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