

Exploring the Effects of Aquatic Phytoremediation on Excessive Nutrients Using Lemna minor

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The influx of nutrients like phosphorus and nitrogen have resulted in the conditions for aquatic life and ecosystems to start degrading, causing dissolved oxygen that was once abundantly available to now disappear, causing algal blooms to occur. Phytoremediation uses plants to transform toxic chemicals and reduce the destruction of ecosystems. The primary question was how do nutrient-absorbing plant species contribute to mitigating excess nutrients in aquatic environments via phytoremediation, and is there a critical threshold where their impact on nutrient reduction diminishes? This will be done by replicating eutrophication in separate groups in a controlled setting. The plant used in this study to combat eutrophication is Lemna minor, small, low-growing aquatic plant that can be cultivated in minor bodies of water and is highly effective at nutrient removal. The chosen hypothesis was that the presence of a higher density of nutrient-absorbing plants (Lemna Minor) within a group is expected to see a significant decrease in excess nutrients such as phosphorus and nitrogen. To test this hypothesis, 5 trials were setup with 4 mL of nutrient-rich liquid fertilizer added, with increasing levels of L. minor per container. During a period of 10 days, water quality was tested to determine nutrient levels for nitrate, nitrite, and phosphate. Trends within nutrient levels were noted and data was analyzed to confirm significance of these trends. Overall, the chosen hypothesis was proven right due to the slight decrease in nutrients over the time period. Although no major trends were seen, the evidence still points to a slightly higher decrease of nutrients when more L.minor was present in the testing environment.