The Effect of Lemnaceae on Overall Water Quality Part II: The Loss of Nitrate Nitrogen through Decomposition

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I ran a series of tests on water samples testing the overall water quality with an emphasis on high nitrate concentrations. Based on studies I completed, this is continuation research involving tile drainage systems and runoff from agricultural operations and their effects on water quality. As a variable, I harvested and added Lemnaceae to holding tanks with a nitrate concentration of 150 ppm to simulate the amount of nitrates entering watersheds from the tile drainage systems. The holding tanks did include the use of an oxygen aerator to prevent anaerobic bacteria from killing my specimen. My purpose behind my experiment was to reduce the amount of nitrates in local watersheds in an environmentally friendly way, while using the Lemnaceae to study if any other overall water quality components were affected by the plant. With my research, I hypothesized that Lemnaceae, or commonly known as duckweed, would absorb the nitrates from effected watersheds, or in my case, water samples; along with vary the pH, dissolved oxygen, phosphates, and temperature. The Lemnaceae could then be applied to fields for agricultural purposes acting like a residue, preventing soil erosion and naturally placing the nitrates back into the soil once decomposed I tested the water from each tank routinely with a colorimeter and studied the data for any trends that may be developing. My data consist of numerous charts and graphs that support my conclusion. I have concluded that Lemnaceae does reduce the amount of nitrates, dissolved oxygen and phosphates found in water, the pH increases, and the temperature remains consistent. I also concluded that when the Lemnaceae decomposes, nitrate-nitrogen levels increase in soils, making it an effective fertilizer.

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