Harmful Algae Bloom Prevention Using Stropharia Mycofiltration

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Harmful Algae Blooms (HABs), which are fatal to aquatic ecosystems, human health, and water-reliant industries, largely occur because of an unnatural increase in Nitrate and Phosphate and are an increasing problem worldwide. The long-term purpose of this research is to develop a better method to prevent HABs because current methods are not eco-friendly and difficult to implement. The purpose of the 3rd and current year of this 5 year project was to determine the effect of Stropharia Mycelium (SM) when colonized on Alder Sawdust, on the Nitrate, Phosphate, and pH levels of water, in a Pump Filtration System (PFS) and a Funnel Filtration System (FFS). The PFS continually filters the same pre-contaminated water, allowing for Nitrate, Phosphate, and pH levels of the water to be analyzed over time. The FFS is one-time “rapid” filtration and allows for comparison of those levels pre and post filtration. It was hypothesized that SM when colonized on Alder Sawdust, will significantly reduce the Phosphate and Nitrate levels, and not affect the pH levels of water, with both the PFS and the FFS. To test the hypothesis, PFSs and FFSs containing pre-contaminated water, were run initially with the control filter medium (Alder Sawdust) and later with the test filter medium (Alder Sawdust colonized with SM). Phosphate, pH, and Nitrate levels of the control and test groups were measured using a Nitrate Ion-Selective Electrode, pH Probe, and a spectrophotometer and compared to determine the effect of SM. The results, which were found to be significant statistically after conducting t-Test analyses, suggested that SM makes water more acidic and can effectively filter Phosphate. The results also suggested that Alder Sawdust can effectively filter Nitrate and not affect the pH of water.

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