The Effects of Varying Nitrogen: Phosphorus: Potassium (NPK) Ratios on Algal Growth in Wetland Water

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This experiment will determine if different nitrogen:phosphorus:potassium ratios limit the growth of algae in wetland water. We hypothesized that if we test the effects of varying NPK ratios on algal growth in wetland water samples, then the samples with the higher potassium ratios, 1:1:3 and 1:1:5, will have the least algal growth, the samples affected with more phosphorus (1:3:1 ratio) will have the most growth, and the 3:1:1 NPK ratio will have the second most algal growth. The method began with measuring wetland water into 25 petri dishes, four groups of varying NPK ratios and control group. The NPK solutions were added to the samples and were visually observed for two weeks, then quantitatively measured on the final day. Additionally, when analyzing the pH levels, each group treated with nutrients decreased its pH level to six or seven. Our results also displayed that the samples with 3:1:1 had an average 0.58 cm and 1:3:1 had 0.40 cm algae colony diameter. The samples with higher concentrations of potassium had an average of 0.86 and 1.16 cm diameters; more growth than nitrogen and phosphorus. Moreover, our hypothesis was not supported, likely because of adding unintentional excess nutrients, leading to pH level dropping and less algal growth than expected. Although our findings contradicted our initial hypothesis, these results will benefit others by understanding the limits of nutrient runoff and its toxicity to wetland environments.

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