

The Introduction of Different Nitrogen and Phosphorus Levels to Regulate Phytoplankton Growth in Aquatic Habitats

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Phytoplankton are vital organisms serving as a biological carbon pump, removing approximately ten trillion kilograms of carbon from the atmosphere annually. Nitrogen and phosphorus are two nutrients essential to the survival and reproduction of phytoplankton that can accumulate within bodies of water through fertilizer runoff, upwellings, and sewage. The purpose of this experiment is to determine the effect of various nitrate and phosphate levels on the growth of phytoplankton and its ability to photosynthesize. The effects of fertilizer levels and time after treatment were measured using chlorophyll a absorbance of light. Stock-nutrient (1380 g/L nitrate & 5600 g/L phosphate) fertilizer treatments (0, 5, 10, & 20 mL) were used to spike one liter of pond water in each group of buckets tested in triplicate. All samples were evaluated for chlorophyll a concentration. The highest chlorophyll a concentration resulted at an hour after a fertilization of 5 mL. From highest to lowest, the general concentrations occurred from fertilizations in order of 5, 20, 10, and 0 mL. Both independent variables of fertilizer and the hours that had passed since time of fertilization, as well as the interaction between the two variables, were statistically significant in support of the hypothesis. It can be concluded that the level of nitrogen and phosphorus does in fact have an effect on the growth of phytoplankton and can be used as a method of controlling the level present in a given body of water.

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