Aquatic Habitat Nitrate Levels on Long Island: The Effect of High Nitrate Levels on Anuran Species Abundance

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In this study, the effect of nitrate concentrations on the anuran species abundance in aquatic habitats across Long Island was investigated. Anurans are frogs and toads. With recent declines in the world's population of amphibians, research studying the causes for these decreases has become increasingly important. Past research indicates that higher nitrate concentrations in aquatic habitats lead to lethal and sublethal effects on anurans. The natural urbanization gradient on Long Island provides an excellent location to study the impact of nitrates on anurans. It is imperative that this research is brought to Long Island as urbanization increases. Nitrate concentration restrictions are in place for the human consumption of water, but not for anurans. Anurans exposed to high nitrate levels experience sublethal effects such as methemoglobinemia, nervous system deficits, and deformities. These sublethal effects lead to predator and prey imbalances resulting in decreasing biodiversity and ultimately creating a less sustainable environment. Visual surveys were conducted to find the species abundance at parks across Long Island and water samples were analyzed for nitrate levels at each park. The results show a small negative correlation between nitrate concentrations and the anuran abundance in that area, providing initial support to the hypothesis that an increase in nitrate concentration leads to a decrease in anuran species abundance. However, these results were not found to be statistically significant. Thus, future research on anurans on Long Island must continue to preserve the biodiversity of Long Island.

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