

# Comparative Biomass Increase of Algal Species Under Different Nutrient Levels

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## ABSTRACT

Algal overgrowth has significant impacts on coral reefs, as algae occupy space and block out light necessary for the survival of coral. This problem is exacerbated by nutrient enrichment from agricultural runoff and other anthropogenic sources that may benefit algal growth. The purpose of this study is to investigate the impact of nutrient enrichment on the growth of four common algal species: *Turbinaria ornata*, *Padina boryana*, *Dictyota bartayresiana*, and *Valonia fastigiata*. Our hypothesis is that the increase in nutrient concentrations will result in a corresponding increase in algal growth rate for all species, but at species-specific rates.

Three algal subsamples from each of the four species will be placed in six tanks, with three control and three treatment replicates of potting soil to increase nutrient levels. Weights of each of the algal subsamples will be taken at the onset and endpoint of weekly experimental trials to examine changes in biomass. Three trials were conducted, doubling the amount of fertilizer in each subsequent trial. Additionally, measurements of nitrate, phosphorus, and ammonia concentrations in the experimental tanks will be taken at the start of each trial. Based on preliminary findings, it is anticipated that *P. boryana* will demonstrate the highest increase in biomass. These findings are crucial as they can provide valuable insights into species-specific responses to changing nutrient levels. This information is essential for developing effective management techniques to mitigate nutrient enrichment, thereby reducing algal overgrowth and conserving fragile coral reef ecosystems.

**KEYWORDS:** Algal overgrowth, nutrient enrichment, coral reefs

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