The Differential Responses via Growth & Photosynthetic Rates of Non-Calcifying I. galbana & Calcifying T. chuii to Calcium & Foreign Algae Exposure

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Ocean acidification is a major environmental problem caused by excess oceanic exposure to carbon dioxide. This phenomenon has been studied and shown to slow down calcification in many calcifying groups, which has been proven to correlate with photosynthetic rates, killing types of corals and algae, destroying the biodiversity of several reefs. Whether the presence of excess calcium would positively affect the photosynthetic rate of I.galbana, a non-calcifying species of algae, and T.chuii, a calcifying species of algae, despite the acidifying conditions were tested to evaluate the differing effects ocean acidification via carbon dioxide enrichment has on non-calcifying algae and calcifying algae. The effects while artificially mixing the two cultures were tested to explore whether the introduction of a non-calcifying algae culture would positively affect the growth and photosynthetic rate of the culture. Testing this hypothesis included growing two algae cultures of each species plus two cultures with the combined mix for 5 days in a bioreactor complete with water replicating acidifying conditions, allowing the algae to be tested during its exponential growth phase (excess carbon dioxide concentration of 5000 ppm). Periodically throughout the growth process, the growth of the algae was measured using a spectrophotometer to determine optical density. pH, Nitrate, Carbonate Hardness, and Calcium levels were quantitated to determine any underlying trends. Through the data collection and analysis, it was concluded that I.galbana was not adversely affected to the acidifying water while T.chuii was, supporting the initial hypothesis. Also, when combined, the results of the tests were sporadic and showed no obvious trend.

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