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## **The Effect of Calcium Carbonate on Chlorella Growth**

*~A Green Algae Biology Project*

The purpose of this project was to determine whether the amount of calcium carbonate ( $\text{CaCO}_3$ ) added to a Chlorella culture would affect its growth. Eutrophication, caused by dumping fertilizer into rivers, has created algal blooms, due to excess nitrogen and phosphorous. Some blooms create a nuisance, by blocking sunlight from marine life, while some can be toxic to human life and aquatic life, by producing toxins and depleting the water of oxygen, during decomposition. Adding calcium carbonate would block nutrients from being used by algae, to help decrease growth and eutrophication.

$\text{CaCO}_3$  amounts of 0.25, 0.5, 0.75, 1, and 2g were added to two algae samples each, with fertilizer, for two trials of ten days. Pretrials determined fertilizer and  $\text{CaCO}_3$  amounts. The amount of chlorophyll, measured by the spectrophotometer, was related to an increase in biomass, so chlorophyll was used to determine growth. Chlorophyll extraction, done before and after testing, was performed by grinding samples in an acetone solution, which was put into the spectrophotometer to measure the absorbances at 663 nm and 644 nm, that were used to determine mg of chlorophyll/ gram of tissue.

Observations showed the control was greener than samples with  $\text{CaCO}_3$ . Despite the constant fertilizer amount, samples with more  $\text{CaCO}_3$  were more blue than green, meaning the fertilizer was not being used, due to  $\text{CaCO}_3$ . Data shows that the controls had a higher percent change of mg chlorophyll, than those with  $\text{CaCO}_3$ . However, changing the amount of  $\text{CaCO}_3$  had no significant effect on the growth of the biomass, as the t-tests and graphs showed. Further testing would further support this experiment's findings, that  $\text{CaCO}_3$  inhibited Chlorella growth, meaning this method could be used to help treat eutrophication.