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The Implications of Using Carbon Nanotubes to Promote Algal Growth

Algae grows at a rate 20-30% faster than current food crops such as corn and soybeans. It also yields the highest level of oil compared to all generation two biofuel crops. Carbon nanotubes are allotropes of carbon with a cylindrical structure. CNT's have been shown to have the unique property to increase germination in tomato seeds through penetration. The objective of this research was to observe and measure the implications and effects of CNT's and the growth of Algal colonies. The first of two hypotheses stated that CNT's would increase algal growth because it would increase water and nutrient uptake. The second hypothesis stated that nutrient uptake would also increase there for depleting a given amount of nutrients faster. Algal colonies were exposed to different concentrations of CNT's before measuring dissolved oxygen (DO) levels and trisodium-phosphate levels. A control of only water and CNT concentrations were established to observe the effect of CNT's on natural water DO levels. Results showed that CNT's were not beneficial to the promotion of growth in the algal colonies. Data further showed that TSP levels decreased much faster in the highest concentrations of CNT's (20 $\mu\text{g/mL}$ and 40 $\mu\text{g/mL}$). This concludes that the first hypothesis was rejected because carbon nanotubes didn't promote and increase growth but decreased the rate of growth. Another conclusion was that CNT's were beneficial to nutrient uptake, supporting the second hypothesis. A single way ANOVA showed that growth sample data was statistically significant.