CALIFORNIA STATE SCIENCE FAIR
2015 PROJECT SUMMARY

Name(s)

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Project Number

J0506

Project Title

How Will Chlorophyll a Concentrations React to Different Wavelengths of Light?

Abstract

Objectives/Goals

The objective of this experiment was to determine how some of the most common light sources exposed to aquatic life containing chlorophyll a would affect their concentrations of that substance.

Methods/Materials

The Diatoms samples in cuvettes were set out under three different light sources to be measured over a one week period of time. Over a one week observation period a spectrometer was used to determine the expelled green light from the Diatoms in each sample. The data from the spectrometer was substituted into a trichromatic equation to determine the concentrations of chlorophyll a in micrograms. Each of the samples was filled with 50mL of water containing the phytoplankton as well as 0.8 ounces of organic material. I took both qualitative measurements including color of the water. In addition I also took quantitative measurements which included results from the spectrometer, temperature, and visual observations.

Results

The spectrometer used to measure the amount of reflected green light from the Diatoms returned the results in a graph indicating the expelled light over different nanometer wavelengths. These measurements in the form of optical density or depth were then substituted into a trichromatic equation. The results calculated from the trichromatic equation were amount of chlorophyll a in each sample in micrograms. This data allowed me to see the growth of chlorophyll a in a living specimen therefore in their aquatic habitats these results are essential in indicating how the light being exposed to phytoplanton in aquatic habitats will affect their reproduction in numbers and production of chlorophyll a.

Conclusions/Discussion

After observing the growth of Diatoms and their chlorophyll a concentrations I can conclude that natural light provides all the necessary energy for the photosynthesis process to take place in the Diatoms. However, Ultra-violet light showed the least growth as it provides too much energy for the photosynthesis process to take place efficiently as it also threatens the longevity of this process. From observation day one, Diatom#s under natural light doubled their produced chlorophyll a. In conclusion, my valid results allowed me to prove my hypothesis correct because of my extensive research. The information from this project expands our knowledge of how different wavelengths of light can affect the production of chlorophyll a in critical aquatic life.

Summary Statement

I tested to see how chlorophyll a concentrations would react under the exposure of different light sources using phytoplankton to see this change.

Help Received

Feedback from an online community used to verify the accuracy of my data.