CALIFORNIA SCIENCE & ENGINEERING FAIR
2018 PROJECT SUMMARY

Name(s)
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Project Number
38769

Project Title
Rely on Aquatic Plants to Reduce Global Warming

Abstract

Objectives/Goals
The objective of this study is to find out which aquatic plant absorbs the most carbon dioxide from the atmosphere to reduce global warming. My hypothesis was that algae would absorb the most carbon dioxide.

Methods/Materials
The materials used were 4 different plants, aquariums, National Geographic Aquarium Substrate, a thermometer, pH meter, KH test kit, and carbon dioxide generator.
With each of the aquariums containing 500 mL of water and 100 grams of the substrate, 90 grams of a plant was placed inside its corresponding aquarium.
For the outdoor experiment, the aquariums were taken outside at 8:00 AM, the results, pH value, KH value, and temperature, were recorded at 3:30 PM, and the aquariums were brought back inside the house at 5:30 PM.
For the indoor experiment, the aquariums were always inside the house with lights shining on them from 7:00 AM to 8:00 PM. The carbon dioxide generator, made from warm water, yeast, and sugar, was flowing into each of the aquariums at all times.
A carbon dioxide meter using an Arduino was created to alert a user#s phone when the carbon dioxide level is high.

Results
For the outdoor experiment, on average, phytoplankton absorbed the most carbon dioxide at 440 PPM, and algae came in as a close second with 427 PPM, while elodea was the plant absorbing the least carbon dioxide at 159 PPM.
For the indoor experiment, algae absorbed the most carbon dioxide with 332 PPM on average, and phytoplankton absorbed just one PPM less than algae. This time, duckweed was the plant that absorbed the least carbon dioxide at 130 PPM.
Both experiments were conducted for 30 days.

Conclusions/Discussion
My hypothesis was partially supported as algae and phytoplankton absorb high amounts of carbon dioxide. However, phytoplankton releases toxic chemicals into the water, which would eventually be a disadvantage to other organisms. Algae is able to absorb lots of carbon dioxide because it contains cyanobacteria and a light-absorbing pigment called phycocyanin, helping to speed up the photosynthesis process.

Summary Statement
After measuring the amount of carbon dioxide different aquatic plants absorbed, I found out that algae is the most effective and efficient plant that is able to carry out this task.

Help Received
My dad helped me with the Arduino part of the project when I was not able to make some connections correctly at times. My mom helped me with setting up the experiment.