CALIFORNIA STATE SCIENCE FAIR
2013 PROJECT SUMMARY

Name(s)

Arka Bagchi; Rachit Kataria

Project Number

S1102

Project Title

The Maximization of CO2 Intake through Phytochrome Genetic Overexpression, Chemical Enhancement, and Fungal Alteration

Abstract

Objectives/Goals

The objective is to maximize the amount of Carbon dioxide taken in during photosynthesis by Red Mangrove plants in order to alleviate the problems caused by Global Warming.

Methods/Materials

We implemented a powdered chemical called Kinetin, a fungi known as Endomycorrhizae, and a chromatic tinge of Far Red Light. These factors were applied singularly and in pairs to root tips and leaves of 14 plants per combination or single factor. The intake was recorded using several Vernier Labquest Carbon dioxide gas sensors within closed environments replicating tropical atmospheric conditions and compared to the intake of the control group of Mangroves.

Results

The combination of Mycorrhizae and Kinetin yielded an intake of 32 ppm, or parts per million, left of Carbon dioxide, as opposed to the 410 ppm remaining from the control's intake after the recording period of 10 hours. This is an inherent 12-fold increase in intake of Carbon dioxide.

Conclusions/Discussion

With the prevalent detrimental impacts of excessive Carbon dioxide damaging the Earth's biosphere today, our project shows the ability to neutralize this excessive amount of gas by maximizing Carbon dioxide intake rather than adopting the mindset of wasting biomass and planting more plants. We estimate that by implementing this procedure on 20,000 Mangroves per each of the world's coastal countries, we can save 400,000,000 tonnes (1,000 kg per tonne) of Carbon dioxide annually.

Summary Statement

This project maximizes the amount of Carbon dioxide intake in Mangrove plants in order to alleviate the detrimental impacts of global warming with a potential impact of a 400,000,000 tonnes decrease of Carbon dioxide in the world annually.

Help Received

Used Vernier Labquest Carbon dioxide sensors provided by Lynbrook High School