CALIFORNIA STATE SCIENCE FAIR
2002 PROJECT SUMMARY

Name(s)
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Project Number
22605

Project Title
Why Do Corals Fluoresce?

Abstract

Objectives/Goals

In my science project last year, I noticed coral fluorescence. I thought that this stunning array of beaut€ would be important to the coral. Coral fluorescence has been known about, off and on, since 1940, ax was rediscovered in 1998, yet not much research has been conducted on this striking phenomenon.

My hypotheses are:

1) Corals use fluorescence to convert blue light into colors that benefit photosynthesis by symbiotix algae.

2) Corals florescence to attract prey like copepods.

Methods/Materials

I built a spectrometer to measure the absorption spectra of algae, emission spectrum of coral fluorescence, and colors of the LEDS that stimulate coral fluorescence.

I built a tank on which I mounted LEDs of different colors to see which attracted prey best -- coralx fluorescence color, or others. I used Brine Shrimp because they have a similar visual system to copepods but are easier to obtain and handle.

Results

I found Algae strongly absorb light shortward of 500 nm, and longward of 600. The wavelengths that they absorb the least are in the range of 500 to 600. My absorption spectrum for Algae is in got quantitative agreement with published spectra for chlorophyll.

The LEDs which produced the most coral fluorescence were the violet and blue.

My spectrum of coral fluorescence peaks between 500 and 600 nm. The wavelengths that algae absorbs the least, those least useful for photosynthesis, are also in the range of 500 to 600 nm.

I found Brine Shrimp were 8 times more attracted to actinic blue than to green coral fluorescence color.

Conclusions/Discussion

I have disproved both of my hypotheses. The wavelengths where coral fluoresces most, between 500 anx

Summary Statement

Understanding the benefit of fluorescence to a Coral -- Why do they do it?

Help Received

Father supervised use of power tools in constructing equipment. Mother provided paper, poster, etc... for project presentations.

Preliminary