CALIFORNIA STATE SCIENCE FAIR
2015 PROJECT SUMMARY

Name(s)

Alex M. Fera

Project Number

35202

Project Title

How Does Altering the Circadian Rhythm of Pyrocystis fusiformis Affect Its Bioluminescent Behavior?

Abstract

Objectives/Goals

The goal of my project was to determine if altering the circadian rhythm of Pyrocystis fusiformis affected its bioluminescent behavior.

Methods/Materials

Each night, for 3 nights, 9 test tubes filled with 10ml of sea water were gently sloshed back and forth 5 times per night. The brightness of their flashes was visually calculated and recorded in a lab notebook. An additional set of tests were performed, shortening the cycle each test. These alternate tests started at 19 hours and went all the way down to 8 hours.

Results

The results of my project supported my hypothesis, in that keeping 3 of the 9 test tubes in complete darkness at all times (as opposed to on a normal cycle or in constant light) would hinder the production of bioluminescence the most. The shorter tests had rather surprising results. Instead of not flashing at all, like all the research done on the topic said, rather they ended up flashing even brighter than the ones on a somewhat normal cycle.

Conclusions/Discussion

The tubes in total darkness never had the opportunity to photosynthesize and quickly ran out of the two enzymes luciferin and luciferase. Furthermore, the tubes that were kept in constant light still flashed, however not as brightly as the ones on a cycle. This is because the organelles that produce the flash, the scintillons, never had enough time to fully swap positions with the chloroplasts to go from photosynthesizing to being ready to flash.

Summary Statement

My project is about altering the light/dark cycles of Pyrocystis fusiformis and the effect that has on its bioluminescent flashes.

Help Received

Teacher proofread project report; Parents helped with display board.