CALIFORNIA STATE SCIENCE FAIR
2002 PROJECT SUMMARY

Name(s)
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Project Number
22141

Project Title
The Effect of Ultraviolet (UV-B) Radiation on Spirogyra

Abstract

Objectives/Goals
The goal of my project was to determine if low-intensity radiation exposure in addition to normal sunlig| effects a simple unicellular organism. My experiment uses a UV-B light in addition to normal sunlight t| demonstrate that increased UV-B radiation reaching the Earth#s surface through the hole in the ozonex layer might have a similar effect on unicellular organisms.

Methods/Materials
Spirogyra samples from a laboratory supply store were put in petri dishes filled with rainwater. Half t| samples were placed on a table in the sun and half were placed on the same table but also exposed tox five watt UV-B light. I took extreme care to prevent my exposure to any radiation. Every five hours I looked at individual spirogyra strands under a microscope to count any changes in the number of cells. | the next part of the experiment I weighed new spirogyra samples on an electronic balance and thet repeated placing the samples on the table in equal groups. At various times I measured the amount ox light passing through the spirogyra samples. I used a data logger with a light sensor attached and downloaded the data to my computer. The experiment was repeated numerous times and a statisticat analysis was conducted.

Results
When compared to spirogyra in sunlight, the samples exposed to both sunlight and UV-B radiation developed a weaker pigmentation and exhibited reduced growth. Longer exposure made these differencex more noticeable. In the first part of the experiment the sunlight spirogyra strands increased in cell count or remained constant while the samples exposed to sun and UV-B radiation decreased. In the main part of| the experiment more sunlight consistently passed through the sunlight and UV-B samples, indicating less chlorophyll, while less sunlight went through the sunlight only spirogyra, indicating more chlorophyll. | #Student T Test# statistical analysis of this data shows that the differences between the samples wex significant, and not due to chance.

Conclusions/Discussion
Spirogyra in only sun continued to thrive but samples exposed to sun and UV-B radiation showed weakex pigmentation and reduced growth. Since pigmentation indicates the amount of chlorophyll present it appears that UV-B radiation effects spirogyra's photosynthesis process. The experiment#s statisticax evidence is strong. Low intensity UV-B radiation has a detrimental effect on the unicellular organix spirogyra.

Summary Statement
My project determines if low-intensity UV-B radiation exposure, like that passing through the hole in the ozone layer, will have an effect on a simple unicellular organism, spirogyra.

Help Received
My former science teacher Mrs. Sniffen loaned me a microscope, data logger, UV light, and an electronic balance and let me bring these home. Mrs. Taylor guided me through my project. My former math teacher, Mr. Whitaker, reviewed my statistical analysis. My dad connected the data logger to our