CALIFORNIA STATE SCIENCE FAIR
2009 PROJECT SUMMARY

Name(s)
Susmitha Bhat

Project Number
J2303

Project Title
Effect of Various Pollutants on the Aquatic Plant, Egeria densa

Abstract

Objectives/Goals
I chose to do this project to understand the effects of pollution on aquatic plants to help better protect the ecosystems in the future. Of the several pollutants that can get into the water system, I picked motor oil, bleach, used cooking oil, and mosquito repellant to do my experiments with. I wanted to find which of these pollutants cause the most damage to the aquatic plant, Egeria Densa.

Methods/Materials
I setup the first round of experiments using one control (regular tap water) and created the polluted environment with 2%, 4%, 6%, 8%, and 10% concentrations, each of motor oil, laundry bleach, used cooking oil and mosquito repellant. All these were placed in an array of 21 different beakers. I grew 5cm sprigs of Elodea in each of these beakers and watched them grow for 3 weeks. I then repeated similar procedures at lower pollutant concentrations of 0.4%, 0.8%, 1.2% and 1.6%.
Lastly, I observed the pollution-damaged leaves under a microscope and took pictures of the cell structure.

Results
For all the levels of concentrations that I experimented with, compared to the control, the plants in the polluted waters either did not grow, or the leaves turned translucent. Since relative length measurement was not an option, I devised a new methodology to compare the effects of different pollutants. I took the digitized image of the cell structure and recorded the RGB color values (using GNU software called GIMP) for various points within the JPEG image. Using this method, I found that the bleach was the worst pollutant followed closely by motor-oil. Used cooking oil, and mosquito repellant were not too far either.

Conclusions/Discussion
My hypothesis that the pollutants that I picked would have an adverse effect on the aquatic plant was correct. However, I did not realize that some of the pollutants would discolor the plants losing all the chlorophyll (as in the case of bleach) even at 0.4% concentration levels.
I have many ideas on how to do further research in this area.I would like to see if they would return to their regular growth patterns if transplanted into fresh water. That experiment would let us know if the effects of man-made pollutions are reversible.

Summary Statement
A study of the development of aquatic plant, Egeria Densa, when subjected to polluted environments

Help Received
Brother helped with GNU tools; Father helped in brainstorming topics on pollution.