CALIFORNIA STATE SCIENCE FAIR
2008 PROJECT SUMMARY

Name(s)
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Project Number
J1707

Project Title
Albino Plants

Abstract

Objectives/Goals
The purpose of my project is to determine what effect aminotriazole (ATA), an herbicide, has on Oxalis. I also determined its effect on Elodea, a water plant. My hypothesis is that ATA will either damage the chloroplasts or chlorophyll in the Oxalis and Elodea, which turns the plants white.

Methods/Materials
Aminotriazole, Elodea, Oxalis (in woods behind my house), camera, computer, microscope, flasks, pectrophotometer, chromatography plates, chloroform/methanol, mortar and pestle, pipet

1. Mark out 1 square meter oxalis space
2. Make ATA solutions
3. Collect three leaves from oxalis area (control)
4. Spray oxalis with 1.0% ATA solution
5. Collect three leaves from oxalis after 1, 2, 3 and 4 days
6. Weigh leaves
7. Extract chlorophyll and measure with spectrophotometer at 660 nm (red light).
8. Cut 5 sprouts of growing Elodea
9. Put a sprout in each ATA solution and allow growth (0, 0.125, 0.25, 0.5, 1.0 percent ATA in water.)
10. Use microscope to count chloroplasts in each Elodea treated sample and take pictures
11. Extract chlorophyll and measure as in step 7.
12. Record results

Results
I determined the amount of chlorophyll (mg/g wet weight leaf tissue) every day for four (4) days after the ATA solution was sprayed on the Oxalis. There was no trend apparent in the chlorophyll content. However, the Elodea results showed that as the concentration of ATA increased, the chlorophyll content decreased. The average number of chloroplasts in Elodea cells also decreased after ATA treatment.

Conclusions/Discussion
The chloroplast count and chlorophyll content results for Elodea support my hypothesis that at higher ATA concentrations, fewer chloroplasts are present and the amount of chlorophyll decreases. This is expected because the chlorophyll is present in the chloroplasts, and therefore if there are fewer chloroplasts, there would be less chlorophyll. It is known that ATA inhibits protein synthesis in bacteria by blocking histidine synthesis, and probably in plants as well.

Summary Statement
My project shows how an herbicide works by inhibiting chloroplast protein synthesis.

Help Received
mother and father helped edit written pieces, used the lab of Dr.David Deamer (father) at UCSC