



**CALIFORNIA STATE SCIENCE FAIR
2007 PROJECT SUMMARY**

Name(s) Oscar Y. Baterina, Jr.	Project Number S1404
Project Title Culturing Strains of Chlorella pyrenoidosa Increasingly Resistant to Copper Algaecide	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals This experiment was conducted in order to determine if stains of the freshwater algae, Chlorella pyrenoidosa, could be developed that were increasingly resistant to common copper algaecide toxicity.</p> <p>Methods/Materials After culturing stocks of algae with High Salt Media, Chlorella pyrenoidosa samples were exposed to a ten fold concentration, using the equation $C_1V_1=C_2V_2$, of copper algaecide to determine the LC50. Observing and recording the number of live cells of Chlorella pyrenoidosa at various concentrations of copper algaecide for 24 hours determined the LC50, which was confirmed to be 1.794 mg/L. Then, the survival rate of the algae was observed daily as the concentration of the algaecide was gradually increased over a 11 day period. Finally, the resulting acclimated strain of algae was exposed to high doses (over the expected limit of 2.99 mg/L) of copper algaecide to see if they were more resistant, compared to a strain not previously exposed to copper algaecide that was exposed to high doses of copper algaecide.</p> <p>Results From the data, it was determined that the acclimated strain of Chlorella pyrenoidosa is significantly more resistant to copper algaecide toxicity than the unexposed strain that was abruptly exposed to relative concentrations of copper algaecide.</p> <p>Conclusions/Discussion The copper algaecide concentration of 3.887 mg/L was the observed limit, in which Chlorella pyrenoidosa were not present, for the unexposed strain of Chlorella pyrenoidosa during the shocking treatments. According to the data, acclimated strains of the algae in the concentration of 3.887 mg/L survived significantly compared to unexposed strains of Chlorella pyrenoidosa. This experiment indicates that there were strains from the first generation of Chlorella pyrenoidosa that possessed the hereditary trait to survive the lethal concentrations of copper algaecide, making them increasingly resistant.</p>	
Summary Statement Create a strain of green algae commonly found in swimming pools resistant to a lethal dose of a copper-based product used to terminate their existence and compare it to an unexposed strain that was abruptly exposed with the same chemical.	
Help Received Used lab equipment at Mount Miguel High School science department under the supervision of the Biochemistry Advisor Mr. Todd Linke	