



**CALIFORNIA STATE SCIENCE FAIR
2002 PROJECT SUMMARY**

Name(s) Jonathan T.S. Hoh	Project Number J1314
Project Title Can an Algae Spiral be Used to Promote a Mass Growth of Chlorella Algae?	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The purpose of this experiment was to find out what effect a chosen fertilizer concentration in a coil of tubing would have on the growth of algae. Phosphates, often found in detergents and fertilizer would help promote growth to algae. Too much of it could cause the algae to die, but just the right amount diluted could be extra food for the algae and promote growth.</p> <p>Methods/Materials Information gathered from a previous series of experiments was used to determine the best concentration for the system. This year is the second phase in experiments where tubing was wrapped in a circular pattern and tied onto a mat for support. Algae and the concentration of fertilizer were added in the coil with a light source in the center. Using calculations, it was increased in proportion in a larger system than a petri dish.</p> <p>Results Using these techniques, algae approximately doubled in growth daily compared to a petri dish method with the same dilution that took a week to double. What caused algae to die was direct exposure to sunlight (overheating) and the shredding of algae because of a too powerful pump motor. Repeating the experiments using the motor for about ten seconds two times a day, the algae were not shredded.</p> <p>Conclusions/Discussion A mass growth of Chlorella algae can be grown with a fertilizer concentration of 1:128, which was determined from testing as the best concentration to stimulate growth. The results show algae grew best with the 1:128 serial dilution and gentle circulation of nutrients. With such a design, algae doubled in amount daily while it took a whole week for the same concentration in a petri dish to grow. These experimental findings also demonstrate that algae cannot withstand extreme heat and can die from being shredded by spinning blades of a pump. The right dilution of fertilizer and limited circulation through the algae spiral promoted algae growth far better than a stationary system.</p> <p>If the concentration of fertilizer is known, using calculations, the size of the growing system can be increased far larger than a petri dish. This has practical applications for growing algae in large quantity for food products.</p>	
Summary Statement Optimal concentration of fertilizer determined and used in closed spiral to cause double growth/day.	
Help Received Supplies and equipment purchased by Dad. Helped with construction. Science teacher advised.	