

Important additional points for "Simple Ecosystem" lab

\* All students should **use a minimum concentration of 20,000 cells per jar**. Ideally the students would use two different concentrations to test bottom up effects.

\* We used the following set-up:

We built ecosystems with two different algae: *Tetraselmis* spp. and *Isochrysis galbana*.

For each type of algae, we tested four types (treatments) of ecosystems.

A: Low algae concentration (20,000 cells per ml) low shrimp = 2;

B: Low algae concentration (20,000 cells per ml); high shrimp = 6;

C: High algae concentration (40,000 cells per ml); low shrimp = 2;

D: High algae concentration (40,000 cells per ml); high shrimp = 6.

Each team tested two treatments with 3 replicate ecosystems per treatment.

Ecosystems were grown in plastic square growth vessels with a total ecosystem volume of 40 ml.

Ecosystems were placed into a growth chamber with artificial lighting. This chamber is also used for growing other plants, such as tomatoes and Arabidopsis.

After 2 weeks, we checked our ecosystems. We measured the algal concentration and checked shrimp survivorship. To our dismay, all shrimp had died! It looks like our algae did not grow fast enough during the 2 weeks. Treatment A for *Tetraselmis* spp. was the only one in which we found a bit more than doubling in concentration over 2 weeks. None of the other algae/treatment combinations even approached a doubling concentration during that time. We are assuming that an aspect of our growth conditions is not optimal for algal growth. Now we are trouble shooting on the algal growth in the absence of shrimp. This means using different volumes, glass instead of plastic, shaking instead of stationary, etc. When we get the optimal doubling time for the algae, we will try again with the shrimp.

My advice on getting this lab to work is that you have to know that the algae are developing well enough to sustain the shrimp, before adding them. Since I don't normally work with algae, this is going to take a bit of trouble shooting, before we try again with a batch of students.

Otherwise, the lab was a lot of fun and the students enjoyed 'catching' the shrimp and the open-ended aspect of the experiment. I think it would be a great lab to run again, once we are better algal farmers.