

Growing Chlorella using Inda-gro light

Karl Simon

kaseemon@gmail.com

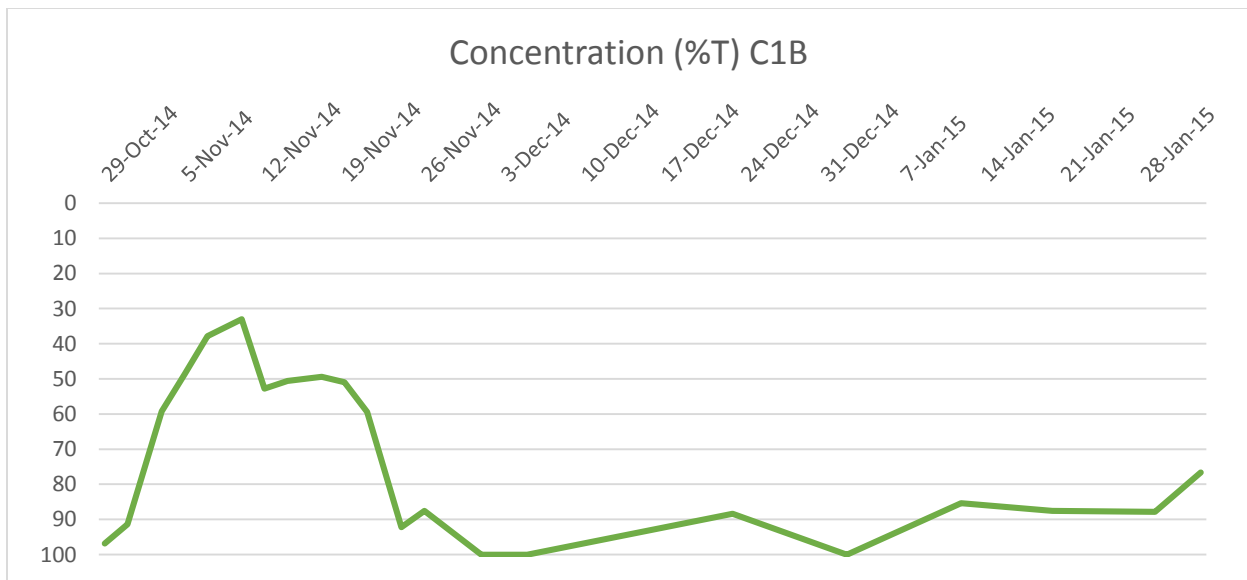
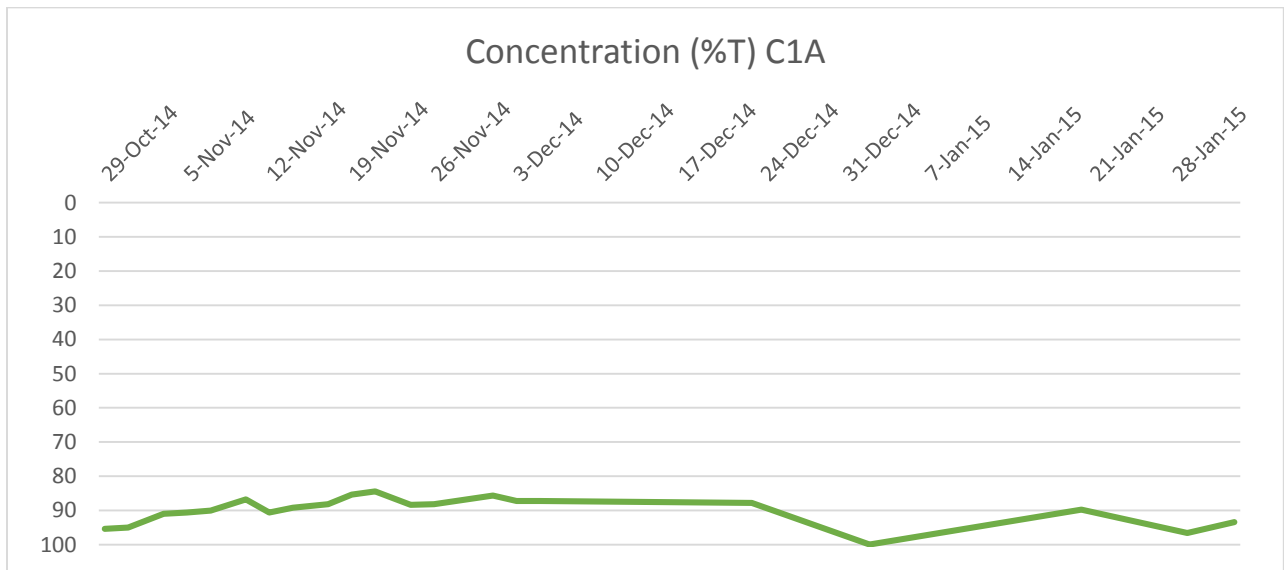
National Algae Association ran a trial test for Inda-gro on a submersible light for growing algae. For this test we used the algae Chlorella and grew in a 200 gal tank. The tank was compared against another 200 gal tank of Chlorella with a LED light. This report looks at the effectiveness of the light on this scale. We will also run the test with the light in a 2000 gal tank. This report will look also at how the light affected the different properties of the algae culture. I will also address some of the problems with the light that I have come across.

The light had many effects on the algae culture, the main effects were on pH, Temperature, and the concentration over time. The pH of the culture with the Inda-gro light was about 0.5 to 1 pH higher than the culture with the LED light. The Chlorella prefers a lower pH than where it was; this was fixed by adding CO₂ to the culture to bring the PH down. The Temperature of the culture was kept slightly warmer with the Inda-gro light. This was good in helping to maintain a constant temperature of the culture. The following graphs show the concentrations of the two cultures over the course of 3 months. **The concentration of the tank with the LED light never reached the high concentrations that we reached with the Inda-gro light. The Inda-gro light also reached the higher concentrations over a less amount of time. This is a plus for this light because if a specific concentration can be reached faster a harvest can be held sooner.**

The only problem that presented itself was that when the bulb was in the culture horizontally the algae adhered to the bulb itself because of the light source. This was a problem because as more algae adhered to the light the less light got out to the rest of the culture. The heat of the bulb also baked the algae onto its surface, making it more difficult to clean. This was resolved by two things, placing the bulb vertically in the tank and increasing the turbulence around the bulb itself. The first was easy to address the second however took more work. We achieved higher turbulence by placing a ring of air hose with small holes in it around the base of each bulb (image attached). Through this ring we ran an air supply to bubble air into the tank and around the outside of the bulb.

Attached are also some images of the tanks themselves to see the lights compared to each other.

100 means no algae, closer to 0 the algae concentration increases.



C1B – the culture is low through all the diluting we did over the last 2 weeks with starting new tanks and harvesting from this tank.

February 4, 2015



Right: C1A Chlorella grown with LED lighting system. Grown in a 200 gallon tank.

Left: C1B Chlorella grown with Inda-gro light. Grown in a 200 gallon tank.

Center: the 2000 gallon tank which we will move the Chlorella into next. We will test the Inda-gro light in this tank next

February 4, 2015



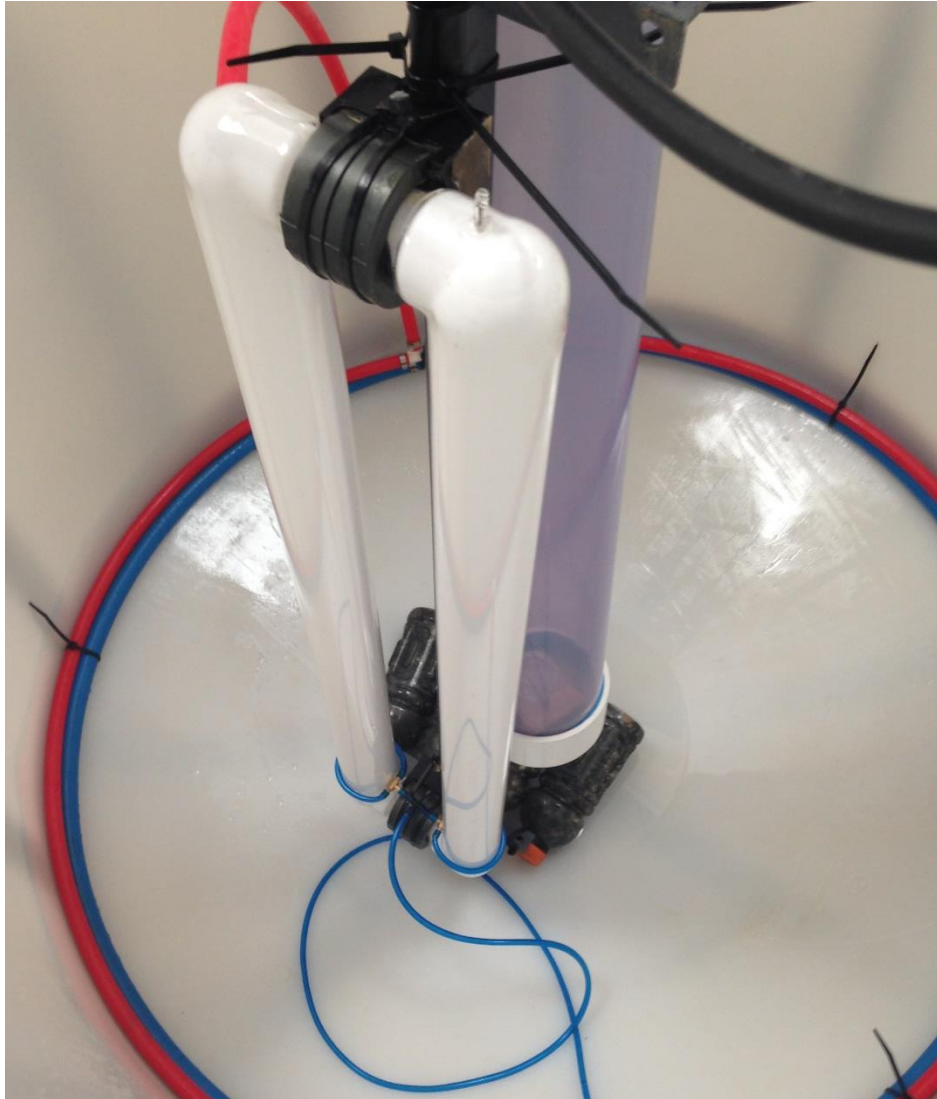
C1B: Inda-gro test tank

February 4, 2015



C1A LED test tank

February 4, 2015



This is how I addressed the light and algae growth problem. The blue hose bubbles in air and CO₂ this prevents the algae from adhering to the light by increasing the turbulence around the light.