What conditions do Chara algae grow best?

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Abstract

The purpose of this experiment was to determine the conditions that Chara algae grows best. We had twelve beakers full of Chara algae, de-chlorinated tap water, goose feces and growth solution. Three beakers had Chara algae and de-chlorinated tap water. The next three had Chara algae, de-chlorinated tap water and vial of growth solution. The next three had Chara algae, de-chlorinated tap water, vial of growth solution and goose feces. According to our results we found that the Chara algae, de-chlorinated water, goose feces and vial of growth solution produced the most algae. Our conclusions were that this was the solution that would produce the most algae and we were correct.

Introduction

Our group is looking into the process of algae growth in different types of conditions. We would like to see what type of conditions the algae grows best in since there is a lot of geese at Vilas Park and the goose feces flows into the water, thus contaminating it so people cannot swim in it. These conditions would be just water and algae, water, algae, algae growth solution and water, algae, algae growth solution and goose feces. We believe that the algae will grow best in the water with algae, goose feces and the algae growth solution. The type of water we will be using is de-chlorinated water. This is water that has been sitting for at least one week before the water can be used in an experiment, so the chlorine is gone. Some background information we found was the description of Chara algae. Chara algae are yellow in appearance and are often mistaken for higher vascular plants. It is commonly found in lakes and ponds where calcium is abundant as carbonate or bicarbonates. Deposits of calcium on the surface of the plants make them feel rough to the touch. They are readily recognized by their musky or garlicky odor. Problems with the species occur when dense growths impede water flow and interfere with recreational activities (http://el.erdc.usace.army.mil/pmis/plants/html/algae_pl.html). The water in the vicinity of Chara is often clear. Chara algae are also known as Charaphyta. It is commonly found at the bottom of ponds attached by rhizoids. A rhizoid is a nutrient absorbing filament. A rhizoid absorbs nourishment much the same way that a root would. Algae are a form of bacteria and that is why it is bad to have all over our lakes and ponds. Excessive growth may clog filters, cause depletion in the oxygen content of the water, provide mosquito breeding sites, or give the water an unsightly appearance. When algal blooms begin to decompose, the water may take on an objectionable taste or smell. (http://el.erdc.usace.army.mil/pmis/plants/html/algae_pl.html) For this reason, we wanted to find out where algae grow best.

Methods

To set up our experiment, we initially had to grow enough culture of chara algae to be used in the entire experiment. We placed the samples of algae in a type of environmental chamber at 20 degrees Celsius (room temperature) and scheduled the lights in the chamber to be on for 23 out of 24 hours per day. We also made a solution of goose feces and de-chlorinated water by adding 50 grams of goose poop to 50 mL of de-chlorinated tap water. We allowed the solution to sit for seven days to let the goose feces dissolve and then whenever we used it we made sure that it was stirred well. Then, after the algae began to grow in the de-chlorinated tap water, we made our samples. In 3 50 mL beakers, we added 25 mL of de-chlorinated tap water and approximately 1 gram of chara algae. We weighed the chara algae on a scale to get the exact amount that we needed before adding it to the tap water. In 3 more 50 mL beakers, we added 25 mL of de-chlorinated tap water, approximately 1 gram of chara algae and 1 vial of algae growth culture. In 3 more 50 mL beakers, we mixed 25 mL of de-chlorinated tap water, approximately 1 gram of chara algae, 3 mL of the goose feces solution and 1 vial of algae growth culture. In 3 more 50 mL beakers, we mixed 25 mL of de-chlorinated tap water, approximately 1 gram of chara algae, 3 mL of the goose feces solution. We then decided to wait for four weeks for the algae to grow. We set the project up before we left for winter break and then checked the progress when we came back. We found out that some of the algae we put in the solutions died because it did not grow well indoors. First, we weighed the tin separately and we weighed the filter paper we used when filtering the algae. Then we weighed the algae in the tin on the filter paper while it was wet. We then put the tins in a chamber that is used to dry things. The chamber was set at 103 degrees. We were told by professor Lorman that the algae would dry in two days, which is why we waited this long for the algae to dry. When we went back after the 2 days, we weighed the algae dry.

Results:

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Discussion

After compiling our results, we were able to draw some conclusions about our project. According to our data, our hypothesis was correct. The sample containing the water, chara algae, and vial culture and goose feces grew to produce the most algae. Next, we studied the water and chara algae. This sample grew to produce the second largest amount. The third largest amount was a little more difficult. According to the wet algae data results, the water, chara algae and culture produced the third largest amount. However, according to our dry algae results the water, chara algae and feces produced the third largest amount. When we got the final numbers for the weight of the actual algae we were pleased that our hypothesis was correct. We thought that the culture

with the algae, the goose feces and the algae growth solution would contain the most algae and we were right. The beaker labeled number nine had algae growth and goose feces in it. However, the other two beakers that contained the same thing were not as high as we thought them to be. Beaker number seven weighed .19 grams and beaker number eight weighed .10 grams. Maybe beaker number nine had a little more goose feces in it than the other two but we thought we were very precise on how much was put in. Another error could have been weighing the filter paper and the tins. There is a possibility that we put our hand on the table or bumped the table while weighing the tins and filter paper. The scales are very temperamental and it is possible that the scale was not zeroed out every time we weighed each of these items. These were each weighed separately and then figured in at the end.