Political Views Essay, Research Paper

Phototaxis in Euglena Gracilis

Abstract: The unicellular flagetta Euglena gracilis (E. gracilis) shows positive phototaxis. We studied E. gracilis to see its effects of photosynthesis under the compound microscope. What I came up with is that E. gracilis uses photosynthesis to make their food and to have a positive phototaxis. While under the microscope, we studied the number of E. gracilis that went from light to shaded areas. Our results were that the. E. gracilis has a positive phototaxis.

Introduction: In this experiment we tested the reaction of E. gracilis to light (phototaxis). What is E. gracilis? E. gracilis is in the Kingdom Protista, Phylum Mastiogophora, Class Flagelleta, Order Euglenophyta, and Class Euglenoids. Euglenoids are unicellular organisms whose classification as plants or animals can be debated equally either way (Euglenophyta, 1). They have similar characteristics of both plants and animals. They are not related to any algae, but because they occupy the same kinds of habitats as algae and are of comparable simplicity (Euglenophyta, 1).

E. gracilis lives in marine and fresh waters. Their pigment is green ; a few are colorless- chl a+b and carotenoids (Euglenophyta, 1). The most important Euglenoid parts are the nucleus, chloroplasts, flagellum, cell wall, eyespot, and cell membrane (Algae, 1). They are single celled with different layers inside the cell wall.

They move by one long flagella. Some Mastigophorans have many flagella, up to six or more. E. gracilis are plant-like because they have chloroplasts, but if the chloroplasts are removed or shaded from sunlight the E. gracilis will hunt for food which makes them animal-like too (Euglena, 1). Euglena are light-sensitive and are a valuable food source for fish and other aquatic animals (Euglenophyta, 1).

E. gracilis rely on photosynthesis to survive. They need photosynthesis to produce their food. One would expect a positive phototaxis. Phototaxis is the tendency to move toward light. The purpose of studying E. gracilis is to see how they react with light. How long would they be attracted to light or how long would it take for them to become negatively phototaxed. Therefore, we can determine that E. gracilis uses photosynthesis to make their food and have a positive phototaxis.

Materials and Methods: The first step is to take a clean glass slide and use Vaseline to outline a small square on the slide. Then place a few E. gracilis drops on the slide, in the square. Make sure to not put too much of the substance on the slide or they will overflow the Vaseline. Place a clean cover slip over the square of Vaseline. Make sure that there are no air bubbles trapped between the E. gracilis and the cover slip. Take a piece of black paper and cover half of the slide with it. Check to see if the paper covers the bottom of the slide as well. Place the slide under a compound microscope so that half of the slide is in the light and the other half contains the black paper. When using the microscope, be sure to use the lowest power at first. Too much light could kill the life forms. Carefully focus until you are able to see the E. gracilis clearly. Accurately count the number of swimming E. gracilis in the field of view every two minutes for ten minutes total. Properly record the data on graphs and tables. Next you must perform a control experiment. In the control experiment you will perform the same experiment as before with one exception. The exception is that the black paper will not be used. It is important to keep as many of the other factors as constant as possible (temperature, number of organisms, time intervals, field of view counted, etc.) (Jacklet, 20).

Results: We found what one would expect to find when dealing with phototaxis in E. gracilis. The control number of E. gracilis fell because the light was too strong and it would kill the organisms. The experimental number of E. gracilis went down because the organism was smart enough to get out of the light. For every two-minute interval we can see the number of E. gracilis decrease. See attached tables.

Discussion: The results were fairly similar through both experiments. As you can see, the numbers went down with each interval change. There is an error in the control experiment due to the strength of light. We see that some E. gracilis disappeared. They died due to over-phototaxis (too much light). This proves my hypothesis that E. gracilis use photosynthesis to make their food and have a positive phototaxis.

References:

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