Investigating Limiting Factors

Algae-2-Fuel
Research and Development Division

Investigation A

The following experiment was performed August 3–17, 2011. The results were analyzed on August 18, 2010.

Testable Question: Is light a limiting factor for the growth of a population of algae?

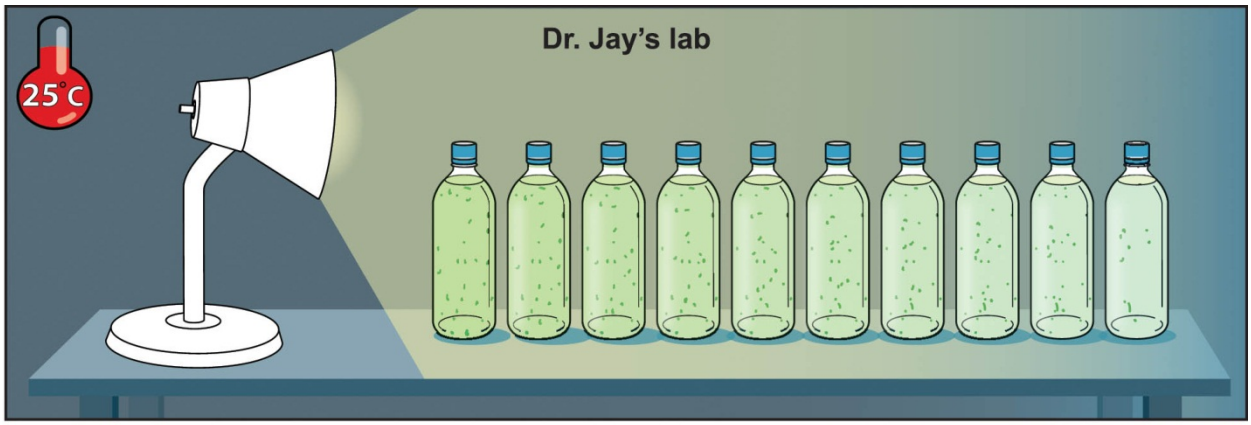
Experimental Setup
Materials

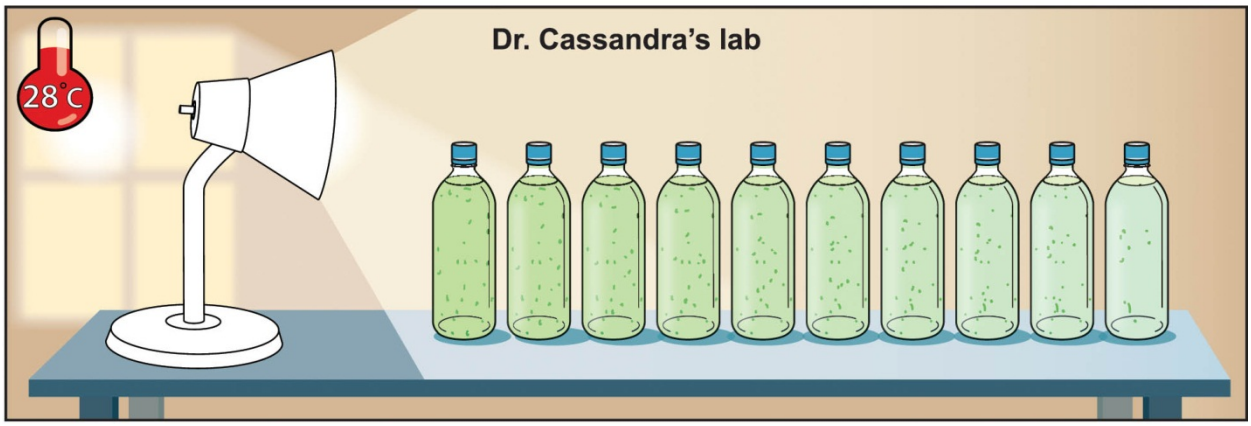
20 sample setups. Each sample contained the following:
- 1 plastic bottle and screw cap
- 200 mL of water
- 5 drops of starting algal culture

2 lamps

Step-by-Step Procedure

1. We prepared 20 samples. To make these, we added 200 mL of water to each plastic bottle. Then we added 5 drops of the starting algae culture to each bottle. The lid was screwed on each bottle, and each bottle was shaken.
2. A drop from each bottle was removed and put on separate microscope slides. We examined the slides under a microscope. We recorded the number of algae in our field of view.
3. We took 10 of the samples to Dr. Jay's lab. We placed the samples in a line in front of a lamp. We used the usual amount of light used by Algae-2-Fuel. You can see the setup in the diagram below. Note: Dr. Jay gets warm pretty easily, so his lab often has the air-conditioning running. It stays nice and cool.
4. The other 10 samples were taken to Dr. Cassandra's lab. We placed the samples in a line in front of a lamp. The lamp was much brighter than the light Algae-2-Fuel normally uses. You can see the setup in the diagram below. Note: Dr. Cassandra's lab is near a sunny window. She doesn't turn on the air-conditioning, and her room is fairly warm.
5. Each day for 14 days, we shook all 20 samples. We removed 1 drop. We placed the drops on separate microscope slides. We examined the slides under a microscope and recorded the number of algae in our field of view.





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Investigation B

The following experiment was performed September 3–17, 2011. The results were analyzed on September 18, 2011.

Testable Question: Is light a limiting factor for the growth of a population of algae?

Experimental Setup

Materials

2 sample setups. Each sample contained the following:
- 1 plastic bottle and screw cap
- 200 mL of water
- 5 drops of starting algal culture

2 lamps

Step-by-Step Procedure

1. We prepared 2 samples. To make these, we added 200 mL of water to each plastic bottle. Then we added 5 drops of the starting algae culture to each bottle. We screwed a lid on each bottle. We shook each bottle. We labeled the bottles A and B.
2. We removed a drop from each bottle. We placed the drops on separate microscope slides. We examined the slides under a microscope and recorded the number of algae in our field of view.
3. We placed sample A on a table in Dr. Jay's lab. We placed sample A 15 centimeters (cm) from a lamp with the normal amount of light that Algae-2-Fuel uses.
4. We placed sample B on a different table in Dr. Jay's lab. We placed sample B 15 cm from a lamp that is much brighter than those Algae-2-Fuel uses.
5. Each day for 14 days, Dr. Cassandra shook the 2 samples and removed 1 drop from each. She placed the drops on separate microscope slides. She examined the slides under a microscope and recorded the number of algae in her field of view.
6. After Dr. Cassandra was done, she placed the samples in front of the light again.