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cell biology

Photosynthesis Lab Report

Purpose

The purpose of this experiment is to explore the factors that might affect the rate of photosynthesis. In our own experiment, our purpose was to determine how different light condition/intensity affects the rate of photosynthesis.

Hypothesis

According to the concept of photosynthesis, elodea could produce oxygen and glucose if water and carbon dioxide, light are available. So in our experiment, we try to measure how much oxygen could be produced under different light condition. The higher watt light bulb would provide more heat which could fasten the rate of photosynthesis. So we predicted that the higher watt the light bulb is, the more oxygen will be produced.

Materials

3 beakers

one 25 watt light bulb

one 60 watt light bulb

3 small test tubes

3 sprigs of elodea, each one is 4cm

Graduate cylinder

Marker

Water

3 lamps

Procedure

1 Use a piece of elodea. Cut the elodea stem and make sure each of the sprigs is 4cm.

Put 3 of these pieces to three different test tubes

2 Fill each test tube with water until the top; make sure there is no bubble. And cover it with thin square glass pieces.

3 Fill three beakers with water

4 Gently place each of those test tubes to one beaker that is fill with water, make sure the test tube is up side down and there is no bubbles at the end of them. Remove the glass pieces.

5 Put control #1 in a dark cabinet

6 Put set up#2 under a 25 watt lamp 10cm from the plant

7 Put set up #3 under a 60 watt lamp 10cm from the plant

8 Wait for the result until next day

9 Next day, flick the tube to make more bubbles that are sticked on the leaves to flow to the end of the tube. Then mark each test tube where the water lever is

10 Empty each test tube

11 Fill each test tube with water until the black mark

12 Put the water into graduate cylinder

13 Record the amount of water in each of the three graduate cylinders, the amount of water is equal to the amount of oxygen that is being produced

Results

The watt of light bulb(watt)	Amount of oxygen being produced(ml)
Dark condition (no light)	0
25 watt	0.25
60watt	0.5

Graph

Conclusion

Green plants have a food making process that is called photosynthesis. Photosynthesis originally means to put together with light. Plants use green pigments called chlorophylls to trap light energy. The light energy is used to make glucose. So we all knew that light is one of the most important factor that affects the rate of photosynthesis. In this experiment, we were discovering the rate of photosynthesis using different light intensity (different watt of light bulb). During the process of photosynthesis, oxygen is produced, so we can use the amount of oxygen given off by a plant as a measure of how much photosynthesis is taking place. If a lot of oxygen is being produced, that means photosynthesis is occurring rapidly. If little oxygen is being given off, photosynthesis is occurring slowly. The aquatic plant, elodea is used because it gives off oxygen in bubbles as it carries on the food making process.

My conclusion doesn't really contrast with my hypothesis. The more powerful the light bulb is, the more photosynthesis takes place. The higher watt bulb will produce more oxygen. Because of the heat that is generated by the light bulb could fasten the rate of photosynthesis. It is kind of surprising to see there isn't any oxygen produced by the control. I thought very small amount of oxygen going to be produced. It is because that we didn't put the control in the light long enough that ATP isn't even produced during light reaction.

During the process, there are many factors that affect the accuracy of the result of the test. There are also spaces to improve this experiment. First of all, we can't make sure the distance between each lamp and beaker is the same. Second, the measurement of oxygen is also not very accurate. There are a lot bubbles attached to the leaves that

wont flow towards the end. So its hard to count them. Also because such small amount of oxygen is been given off, its very hard to dip the exactly amount of water into the test tubes.

Carbon dioxide is also another important factor in photosynthesis. In this experiment, water does not contain a lot of carbon dioxide, extra carbon dioxide has to be added to the water in this experiment. I think if we add baking soda to water, elodea will definitely produce more CO₂.

Over all, I am pretty satisfied to our result, it still very accurate even there are some errors. From this experiment, I learned how the light intensity affects the rate. I had a better sense on the process of photosynthesis.