

Photosynthesis in plants

[Science](#), [Biology](#)



Lab: Photosynthesis in plants al affiliation Background information:

Photosynthesis is the process by which plants use light energy to convert water and carbon dioxide into carbohydrates and oxygen. Carbohydrates are useful for plant processes. Factors that affect photosynthesis include water, temperature, carbon dioxide and light intensity. This experiment is aimed to find out how light intensity affects photosynthesis

Methods: Three leaves of lilies were covered by aluminum foil. A leaf was uncovered weekly, observed and photographed.

Results: The leaves that were covered for a longer time turned brown and dried out.

Discussion: an increase in light intensity increases the rate of photosynthesis while a decrease in light intensity decreases the rate of photosynthesis.

Conclusion: Light is essential for the process of photosynthesis.

Introduction

Photosynthesis is the process through which plants use light energy to convert carbon dioxide and water into carbohydrates and oxygen. In this process, light energy from the sun is absorbed by the chlorophyll found in chloroplasts and is converted to chemical energy. The chemical energy is used to break down the bonds in the byproducts to form products.

There are two phases of photosynthesis, the light reaction and the dark reaction phase. In the light reaction phase, there is excitation of chlorophyll, formation of ATP from ADP, splitting of water and reduction of NADP to NADPH. In the dark reaction phase, the NADPH molecules and ATP molecules are utilized to produce sugar (Rao & Kaur, 2007).

The main carbohydrate processed during photosynthesis is glucose and is

used as an energy source for leaves, flowers, fruits and seeds. Factors that affect photosynthesis include, presence of water, air, light intensity and temperature. The aim of this experiment was to find out how light affects photosynthesis.

Materials and methods

Equipment and supplies

A plant with big leaves (bouquet of lilies)

Aluminum foil and tape

Procedure

Three leaves of the bouquet were covered by aluminum foil ensuring that the foil was blocking light from the leaves. The foil was removed on one leaf every week, photographed and observed for the three-week period.

Results

Week One (a)(b)

Figure 1: Photographs of leaves (a) front and (b) back after week one

Week Two (a)(b)

Figure 2: Photographs of leaves (a) front and (b) back after week 2

Week Three (a)(b)

Figure 3: Photographs of leaf (a) front and (b) back after Week 3

In Figure 1, the leaves were green and healthy. Figure 2 shows leaves that had turned to light green and almost white in color. Vascular bundles were clearly visible in addition to the green spots on the leaf. The color at the

center of the leaf was lighter than the periphery. Figure 3 shows leaves that are brown and dried out.

Discussion

The findings indicate that light is necessary for photosynthesis. The leaf in Figure 1 was green and healthy despite being covered by the aluminum foil because the energy in the chloroplast could still sustain photosynthesis. The leaf in Figure 2, was turning light green to indicate minimum photosynthesis was taking place. The leaf in Figure 3 had been covered for a longer period of time and the energy needed for photosynthesis was depleted. Moreover there was no more light energy that could be absorbed for photosynthesis (Lambers , Chapin, & Pons, 1998).

This experiment shows that a low light intensity leads to a low rate of photosynthesis. This would deduce that an increased light intensity would lead to a high rate of photosynthesis until an optimum level (Roberts & Ingram, 2001).

Conclusion

In summary, photosynthesis is essential for plants. Therefore water, temperature, light intensity and carbon dioxide should be made available to ensure the survival of plants.

References

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