CALIFORNIA SCIENCE & ENGINEERING FAIR
2019 PROJECT SUMMARY

Name(s)

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Project Number

J0610

Project Title

The Effect of Temperature and Light Exposure on Pigments in Picked Leafy Greens

Abstract

Objectives

We aim to develop methods to detect the amount of leaf pigments. We will then use the methods to study the effect of temperature and light exposure to the pigments in picked leafy greens.

Methods

1. We built a device to measure chlorophyll concentration by measuring light absorption from leaf extract.
2. We used paper chromatography to separate and quantify leaf pigments.
3..We extracted and measured the amount of leaf pigments after different storage conditions for leafy greens (1 control group with 4 test groups).

Results

Extractions and Absorption Measurement:

1. Our home-made absorption meter is able to quantify the amount of chlorophyll in leaves
2. We could monitor the reduction of chlorophyll and compare different experimental groups.
3. The ideal condition for storing leafy greens is dark and cold. The temperature is a much stronger factor.
4. Extraction/absorption is a better method to measure leaf pigments.

Chromatography:

1. We successfully separated chlorophyll from other pigments on chromatography paper.
2. We noticed that chlorophyll band intensity decreased with storage time (especially for the room temperature samples).
3. The attempt to quantify chlorophyll from the chromatography paper yielded inconclusive results.

Conclusions

Through two methods, we found out that a cold and dark condition is better for preserving chlorophyll in leaves. We also concluded that absorbance is a better way for testing if the leaf maintained its chlorophyll.

Summary Statement

We found that light absorption is a better method than paper chromatography when quantifying chlorophyll and the best condition to preserve chlorophyll is in a cold and dark place.

Help Received

We built the device and performed the experiments ourselves. However, our parents helped us with heating the Isopropyl Alcohol in a water bath.