CALIFORNIA STATE SCIENCE FAIR
2012 PROJECT SUMMARY

Name(s)
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Project Number
J1714

Project Title
Water Pollution: The Effect of Cooking Oil on the Mass, Height, and Stomatal Conductance of the Ivy Plant (Hydra helix)

Abstract

Objectives/Goals
My project investigated the effects of cooking oil as a water pollutant on the height, mass, and stomatal conductance of ivy plants (Hydra Helix). I predicted that, the greater the volume of cooking oil added to a plant, the less the growth of the plant.

Methods/Materials
Three oil concentrations were tested on a total of 15 ivy plants. All the ivy plants were trimmed to an equal height of 13 cm at the beginning of the project. The 15 plants were divided into three groups: the control group, which was given no oil, the low group, which was given a low concentration (10 ml) of oil, and the high group, which was given a high concentration (20 ml) of oil. The plants were watered with 80 mL of water three times a week for four weeks. The stomatal conductance of each plant was measured using a leaf porometer every week for four weeks. At the end of the project, the height of the plants was measured. The plants were cut off at the base and dried in an Isotemp oven for a week. Then, the mass of the plants was measured.

Results
Stomatal Conductance: The average stomatal conductance for the control group of plants was 45.1 mmol/m2s over a period of four weeks. The high plants and the low plants showed a lower stomatal conductance of 38.3 mmol/m2s and 34.9 mmol/m2s, respectively.
Mass: The control plants had an average mass of 2.004 grams after 4 weeks of watering. The low plants had an average plant mass of 1.57 g. The high plants showed the lowest average plant mass of 1.504 g.
Height: The control group grew the fastest, achieving an average height of 14.76 cm. The low plants grew to an average height of 13.9 cm. The high plants had the lowest average height of 13.6 cm at the end of 4 weeks.

Conclusions/Discussion
My hypothesis that greater the concentration of oil as a pollutant, the less the stomatal conductance, height, and plant mass was supported by data. Vegetable oil as a pollutant should be considered when spills from distribution pipelines, commercial, and household use are being analyzed.

Summary Statement
This project shows that cooking oil as a water pollutant severely harms the growth and physiology of plants.

Help Received
Thankful for the support from my parents in getting me materials for this project.