CALIFORNIA STATE SCIENCE FAIR
2012 PROJECT SUMMARY

Name(s)
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Project Number
J1921

Project Title
Suffocating Stomata: The Effect of CO(2)

Abstract

Objectives/Goals
The goal of this experiment was to determine how increased amounts of carbon dioxide exposed to plants affect their stomata. I hypothesized that the plant that was exposed to the most carbon dioxide will have the most stomata open compared to the plants that were exposed to less carbon dioxide. I theorized this because the stoma#s main function is to open and close for gases to pass in and out of the plant, which meant it would be ideal for the plant that was exposed to the most dry ice to have the most stomata open.

Methods/Materials
Firstly, I gathered five ice plants from school. Next, I labeled each plant as A, B, C, D, and E, and placed them each in different containers. I exposed plant A to 0 g of dry ice, plant B to 100 g, plant C to 200 g, plant D to 300 g, and plant E to 400 g and left the plants exposed for 24 hours. Later, I extracted one leaf from plant A and removed the epidermis and proceeded to create a wet mount slide by placing the sample on a slide, adding one drop of water and one of iodine, and placing a cover slip on the sample. I viewed the slide under a microscope and observed/recorded how many stomata were open and closed and repeated the process with 4 more leaves from plant A. Finally, I repeated the process of observing 5 stomata samples with plants B, C, D, and E.

Results
The final data showed that the plant with the most carbon dioxide exposed to it had the most stomata open. Plant A, exposed to 0 g of dry ice, had an average of 17.6 stomata open, and Plant B, exposed to 100 g, had an average of 12.6 stomata open. Plant C, exposed to 200 g, had an average of 13 stomata open, Plant D, exposed to 300 g, had an average of 12.2 stomata open, and lastly, Plant E, exposed to 400 g, had an average of 20.2 stomata open.

Conclusions/Discussion
My hypothesis that the plant with the most dry ice exposed to it will have the most stomata open compared to the plants with less dry ice exposed to them was supported by the data. I hypothesized that the plant with the most carbon dioxide exposed to it will have the most stomata open because the main function of stomata is to open and close to let gases like oxygen and carbon dioxide enter and exit the plant. This experiment connects to the real world because if the stomata on plants did not open or close, then it would be impossible for plants to receive carbon dioxide or release oxygen, which will make it impossible for human beings to live.

Summary Statement
My project is about how carbon dioxide affects the stomata on plants.

Help Received
Mother bought supplies; Ms. Fisher supplied me with and taught me how to use items such as microscopes and slides, and she stayed afterschool for me; Mrs. Diaz helped me write my research report; Classmates helped me clean up my experiment after I was done; Sisters helped me make board.