CALIFORNIA STATE SCIENCE FAIR
2013 PROJECT SUMMARY

Name(s)
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Project Number
J1706

Project Title
Viva La Coffee! The Effects of Various Coffee Bean Roasts on the Heart Rate and Longevity of Daphnia magna

Abstract

Objectives/Goals
An objective of my science project was to determine whether the consumption of various coffee bean roasts would affect the lifespan of Daphnia magna. In addition, I tested the effects of the degree of coffee bean roasts to the heart rate of Daphnia magna.

Methods/Materials
I used three types of coffee bean roasts: light, medium, and dark roasted beans. The coffee bean roasts were prepared by roasting the coffee in a hot air popper for specific time increments to achieve the desired roast. The coffee solution was developed by brewing the roasts with distilled water. To test the effects on Daphnia magna heart rate, I counted the resting heart rate of a Daphnia that was placed onto a cavity slide with one drop of pond water. Then I placed one drop of the test variable onto the Daphnia and counted the heart rate. This was repeated ten times per test variable. To test longevity, I inserted 10mL of pond water,10 Daphnia, and 2mL of the test variable solution into a petri dish. I counted and recorded the number of living Daphnia every 30 minutes for 18 hours. This was repeated 15 times per test variable. My control was brewed distilled water.

Results
The results of my investigation on Daphnia heart rate indicated that the dark roasted coffee caused the greatest drop in heart rate when compared to the other roasts. In comparison, the light roasted coffee led to the smallest decrease. For longevity, the Daphnia immersed in the light roasted coffee had a survival rate of 76% after 18 hours while those in the dark roasted coffee had a 0% survival rate.

Conclusions/Discussion
The type of coffee bean roast does have an effect on the longevity and heart rate of Daphnia magna. Light roasted coffee increased longevity; whereas, the medium and dark roasted coffee shortened it. Dark roasted coffee inhibited the heart rate the most when compared to the other roasts and the control.

Summary Statement
I used different coffee bean roasts to demonstrate that there is a significance between coffee roasts and the longevity and heart rate of Daphnia magna.

Help Received
I borrowed the microscope from school. My parents assisted in purchasing supplies.