

Scientific paper on a water flea

[Environment](#), [Water](#)



The Effects of Alcohol and Caffeine on the Heartbeat Rate in Daphnia Magnus

? Erika Huizenga Ashley Kofahl The Effects of Alcohol and Caffeine on the

Heartbeat Rate in Daphnia Magnus Abstract The projects purpose was to

determine the effects of alcohol and caffeine on the heartbeat rate in

Daphnia Magnus. Our hypothesis is alcohol causes a decrease in heart rate, whereas caffeine causes an accelerated heart rate, predicting that the more caffeine we give the daphnia the faster it heartbeat rate will become and the heartbeat rate will decrease as we give the Daphnia alcohol.

After doing the experiment we found that the more caffeine we added to the Daphnia Magna the faster its heartbeat rate became. We also found that when we added alcohol to the Daphnia the heartbeat rate also increased not supporting our hypothesis. Methods and Materials Location: Washtenaw Community College, 4800 East Huron Drive, Ann Arbor, MI 48105 LA building 205 at 12: 30p. m. January 30, 2010 Materials: microscope, two glass micro slides, two pipettes, three Daphnia Magna, 2%, 4%, and 6% alcohol, 1%, 1 ? , and 2% caffeine, aquarium water, a stopwatch, a person to record the data, administer the drugs and water to the Daphnia, and a person to count the heat beats. Procedure for the control: In order to make sure that alcohol and caffeine are the variables effecting the heartbeat rate we started by capturing a live Daphnia and placed it in a depression slide with a drop of pond water from the culture jar. We removed any extra water with the tip of a paper towel. Next we added one drop of aquarium water to the Daphnia.

Then we began to count the number of heartbeats for 10 seconds and then multiplied by 6 to find the beats per minute and recorded the result. After two minutes we repeated the process, and the again after another two

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minutes to get three readings of heartbeat rate on the control. Procedure for alcohol and caffeine: To determine the effects of alcohol and caffeine on the daphnia we started by capturing a new Daphnia and placing it on a depression slide and removing any extra water. We placed 1 drop of a 1% caffeine solution on the Daphnia.

After waiting for a few seconds we began to count the heartbeats and recorded the results on our data sheet. Next we removed the excess solution from the Daphnia and flushed it with aquarium water. Using the same procedure we monitored the effects of 1 1/2% and 2.0% caffeine solutions and recorded our results and placed the Daphnia in the recovery tank. After completing the caffeine series, we obtained a second set of drugs. This time instead of using caffeine we used varied concentrations of alcohol 2%, 4% and 6% using the same method as the caffeine procedure.

Again recording our results and placing the Daphnia in the recovery tank when finished. Results The original purpose of this experiment was to determine how alcohol and caffeine affected the heartbeat rate of a Daphnia. The results of the experiment were that the higher percentage caffeine and alcohol placed onto the Daphnia the higher the heart rate. Average Daphnia Heartbeats per Minute ?? ? Conclusion After completing the experiment we found that when we gave the Daphnia caffeine the heartbeat rate did show an increase.

However, we also found that alcohol also increased the number of times the heart beat. Even though we performed all of the experiments very carefully, we cannot be certain that the effect we saw was due to the drugs. Perhaps

the change in heartbeat rate is caused by the heat of the microscope light or a change in temperature. When we came into the lab to do the experiment the solutions were already sitting on the tables. The lab is used by several other students, therefore we can not be sure that the percentages of solutions were accurate or that they had not been tampered with.

While trying to remove excess water the Daphnia got stuck to the paper towel which could have caused stress making the heartbeat rate increase during the alcohol test. The removal or addition of the various test solutions may have had an impact on our test subject. When comparing our results to other groups we found that they had different results with alcohol. Because of this we feel that the experiment should be repeated several times and not done only one time to gain accurate results.