



CALIFORNIA SCIENCE & ENGINEERING FAIR 2018 PROJECT SUMMARY

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Project Title The Effects of Over-the-Counter Pain Medication on Daphnia magna	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals There's a misconception is that throwing medication down the drain is the best way to dispose of medication. This experiment was conducted to show the effects of over-the-counter pain medication on Daphnia magna, an important aquatic organism. We hypothesized that if pain medication can cause physiological changes, then the Daphnia magna should display physiological changes that could lead to a change in their heart rate. The hypothesis was supported because based on the results, results showed that the over-the-counter pain medication changed their heart beat. The results showed that the medication changed the heart rate of the Daphnia magna, showing that medication does have a negative impact on the Daphnia magna population.</p> <p>Methods/Materials 200 Daphnia magna, 9 plastic containers, 3 OTC medications: Ibuprofen, Acetaminophen, Naproxen Sodium, 30 pipettes, 1 Microscope, 4 disk plates, spring water, lab notebook, stopwatch. Each concentrations(0.5mL, 1.5mL, 2.5mL) were made for each medication and mixed with 2.5mL of spring water. With a pipette, one drop of the concentration was placed on the Daphnia magna and with a microscope, the heartbeat of the daphnia magna was observed for one minute using 10 second intervals. This procedure was done 3 times for each different concentration of every medication tested.</p> <p>Results The pattern found in the experiment was that the heartbeat of the Daphnia magna decreased when exposed to each concentration of the medications. Among the three medications tested, the most significant was Ibuprofen at 2.5mL. Therefore, since the medication administered had a negative impact on Daphnia magna showing that throwing medication down the drain has a significant impact on Daphnia magna and their population.</p> <p>Conclusions/Discussion Results supported the hypothesis that the Daphnia magna presented with a change in heart rate when exposed to the over the counter medication used. The results showed that over-the-counter pain medication did have an effect on Daphnia magna heart rate. Based on the data, the higher the concentration the OTC medication became, the greater the decrease in their heart rate. Overall, ibuprofen provided the greatest decrease in heart rate. The experiment was conducted to demonstrate the effects of over-the-counter pain medication on Daphnia magna to show that throwing pain medication down drains has a negative impact on the Daphnia magna population.</p>	
Summary Statement Exposing Daphnia magna to different concentrations of over-the-counter pain medication showed that as the concentration of medication administered increased, the heart rate of the Daphnia magna decreased.	
Help Received None. We designed and conducted this experiment on our own.	