CALIFORNIA STATE SCIENCE FAIR
2004 PROJECT SUMMARY

Name(s)
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Project Number
S1416

Project Title
The Cardiovascular Effects of Ephedra on a Cyprinid Fish

Abstract

Objectives/Goals
To find detrimental effects of ephedra on goldfish and how these effects translate to larger vertebra organisms like human beings. Also, find the dosage of Children#s Supedrine(nasal decongestant including chemical form of ephedra)that cause increase heart/breath rate & dramatic long-term effects.

Methods/Materials
Baseline study, goldfish are tested absent of drug to find normal heart rate & tested after being put in a plastic cup of water with 5cc of suphedrine. I place a fish in each cup and weigh each fish using scale to find the weight. Using microscope to count the cells passing a chosen spot on the fin for 30sec, I measure the heart rate of each fish before/after given suphedrine. I place a fish inside a cotton ball with its fin exposed, and place it on microscope. I measure breath rate by counting the times the operculum opens/closes in 15sec and multiply it by 4 for breath/min. I put 4cc of suphedrine in each cup w/dropper.

Results
The heart rate of the fish sped up after given suphedrine since the effects of ephedra are attributed to alkaloid ephedrine, which produces central nervous system stimulation & rise of blood pressure. The max dosage that fish can take is 4cc of suphedrine since 5cc is an overdose. Weight has little effect to end results since graphs of the correlation of weight & heart/breath rates don#t reveal any pattern. The base line experiment results in death of 20 fish, but the four extras labeled 1cc, 2cc, 3cc, & 4cc lived since 4cc of suphedrine is the max amount that fish can take. For primary experiment, another 20 fish were tested with 4cc & lived.

Conclusions/Discussion
The effects in the experiment could be used to design future research of larger vertebra as comparative study. These effects could be shown in future study measuring possible longterm detrimental effects to the heart of humans. Other areas to explore could be testing effects of ephedra on other species similar to humans to see relation of over-the-counter drugs on them. Investigating the areas that the FDA produce to extract ephedra from any supplement would lead to ultimate findings as to benefits and dangers of it. Based on the info, it#s believed that ephedra should be regulated. With number of harmful side effects & deaths caused, one should take serious precaution as to taking a product with the ingredient and how much.

Summary Statement
To find the detrimental effects of ephedra on goldfish in order to translate those effects for the benefit of human beings.

Help Received
My parents helped me time the heart and breath rates; my physics teacher, Mr. Lum, gave me advice as to how to go about the experiment and planted the idea of using goldfish as my tests; and biology teacher, Mrs. Houseman, who allowed me to borrow the triple-beam balance and microscope.