CALIFORNIA STATE SCIENCE FAIR
2008 PROJECT SUMMARY

Name(s)
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Project Number
J1515

Project Title
Effects of Aerosol Sprays on Drosophila melanogaster Reproduction and Mortality

Abstract

Objectives/Goals
I have sometimes wondered whether commonly used household sprays might affect our health. Recently, I have seen many ads for room air fresheners. I decided to design an experiment to test the toxicity of these substances on fruit flies, which are commonly used as model organisms for such studies. I hypothesized that some of the seven common household products I chose to test might have an adverse affect on fruit fly reproduction and mortality rates.

Methods/Materials
I experimented with 480 fruit flies and seven commonly used aerosol sprays: Oust, Febreze, Air Wick, Neutra Air, Lysol, and Glade; I also included a cleaning agent, Pine Sol. I cultured fruit flies in 24 vials. For each of the seven substances, I made two different concentrations of the products which I then mixed into the media to produce 13 ppt and 25 ppt. I kept four control vials; no chemicals were added to these. All of the 24 vials began with the same number of fruit flies in each of my two experiments. For each experiment, for a period of 30 days, I monitored daily the number of eggs, larvae, pupae, dead adults, and live adults in each vial. I also looked for changes in fruit fly behavior and for mutations. I based my findings on this data.

Results
My data showed that all of the household products had some impact on the health of the fruit flies. Exposure to Glade was most adverse; followed by Lysol, Neutra Air, and Air Wick. Oust, Pine Sol, and Febreze effects were the least adverse. The severity of the effect increased in proportion to the concentration in the media. Glade and Lysol produced mutated flies at both the 13 ppt and 25 ppt concentrations. No other products produced mutations.

Conclusions/Discussion
The chemicals in the aerosol sprays appeared to have an adverse affect on the health of the fruit flies. Glade and Lysol not only dramatically affected fruit fly reproduction and mortality, but also produced mutations. These findings should be confirmed by growing more cultures and repeating the experiment at various concentrations. Although the household substances I tested are considered safe, and the doses in the media were high, my results suggest that perhaps long-term repeated exposure may have an effect on health. This should to be investigated further.

Summary Statement
The purpose of this project was to investigate the health effects of commonly used air fresheners on mortality and reproduction in Drosophila melanogaster.

Help Received
Thanks to my parents who provided some of the money I need to purchase the fruit flies. Thanks to my science teacher who lent me a video microscope so I could better view the flies during my second experiment. Thanks to Timberline Inc., the fruit fly distributors who answered many of my questions.