CALIFORNIA STATE SCIENCE FAIR
2015 PROJECT SUMMARY

Name(s)

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Project Number

35109

Project Title

Sunscreen: Friend or Foe? The Effect of Coppertone and Reef Safe Biodegradable Sunscreen on Ghost Shrimp

Abstract

Objectives/Goals

The objective is to determine the safety of sunscreen containing Oxybenzone as compared to reef safe biodegradable sunscreen on marine life by testing how each sunscreen affects the activity level of Ghost Shrimp.

Methods/Materials

Ten environments, 5 with Coppertone (5) & biodegradable Badger (5) sunscreen with varying percentages of sunscreen, were mixed in a pint size glass with a drawn grid. (control-no sunscreen, .001%, .005%, .01%, .05%). One Ghost Shrimp was placed in the Coppertone Control and a count of how many quadrants into which it swam during a 5 minute period was recorded. That same shrimp was moved into the other four Coppertone solutions recording the number of quadrants into which it swam during a 5 minute period. The same process was repeated with the Reef Safe sunscreen. Two independent trials were run.

Results

I ran two trials, collecting data on a total of 22 shrimp in the Coppertone and Reef Safe environments. The results of the two Coppertone trials were the same. As the % of sunscreen increased, the activity level for each shrimp decreased. In the Badger environments, there was random variation. As the shrimp moved into increasingly saturated solutions, the activity level alternated: increase, decrease, increase, decrease. When comparing the activity level between the Control and .05% solution, 82% of the shrimp showed a decrease in activity in the Coppertone as compared to the Badger environment, where only 45% of the shrimp showed a decrease in activity. When the ghost shrimp completed one cycle of testing, they were released into an aquarium to live out their natural lives.

Conclusions/Discussion

As the concentration of the Coppertone sunscreen increased, there was a linear correlation of decreased activity level in Ghost Shrimp. When the concentration of Badger Reef Safe sunscreen increased, it did not have a causal effect on the activity level of the Ghost Shrimp. In fact, my results suggest that the Reef Safe sunscreen did not have any effect on the activity level of the Ghost Shrimp, whereas the Coppertone solutions had a direct negative effect on the activity level of the Ghost Shrimp.

Summary Statement

This study compares the effects of Coppertone sunscreen containing Oxybenzone to Badger reef safe biodegradable sunscreen and how they each affect the activity level of Ghost shrimp.

Help Received

My mom helped with the logistics of aquiring supplies and setting the timer during the experiments.