CALIFORNIA STATE SCIENCE FAIR
2010 PROJECT SUMMARY

Name(s)
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Project Number
J1730

Project Title
A Silver Lined Future

Abstract

Objectives/Goals
This experiment evolved from last year's Science Fair. Previously, silver was found the most potent agent in killing bacteria. Findings fostered an interest in the potent antimicrobial properties of silver and I wanted to test for stronger silver concentrations and their effect as antimicrobial agents. Previously, a regular dime with copper center worked as an microbial, so how would a (90%) silver dime work, or a solution of silver nitrate or a piece of paper towel rubbed with a silver dime work?

Methods/Materials
I ordered 20 Sheep's blood agar filled Petri dishes. Eighteen of the Petri dishes were innoculated with household bacteria and two were used as controls. Sheep's blood agar was used because the sheep's blood feeds the bacteria. Four drops of silver nitrate were put into three Petri dishes and the same procedure followed with bleach, Purell, and rubbing alcohol. Circular pieces of paper towel were rubbed with a silver dime and placed into each of the three Petri dishes. The 90% silver dimes were placed into three Petri dishes. Petri dishes were incubated in a metal cookie tin at 37 degrees Celsius for six days. I used a surgical mask and latex free gloves while measuring the zones of inhibition in each Petri dish. I used a centimeter ruler to measure the zone of inhibition to determine the potency of antimicrobials to inhibit bacterial growth.

Results
Results varied from 2.4 centimeter to 0 centimeters for the zone of inhibition. The bleach killed on average 1.96 centimeters. The rubbing alcohol on average killed 0. The Purell on average killed 0.33 centimeters. The silver dimes on average killed 2.25 centimeters. The silver paper killed 0.166 centimeters. The silver nitrate killed on average 0.66 centimeters. Overall the metals were the most potent in inhibiting and killing the bacteria. The metals had an average of 1.0253 centimeters. The cleaning agents had an average of 0.763 centimeters.

Conclusions/Discussion
Results indicated that silver is the most potent antimicrobial tested. Individually the silver dimes, 90% silver and 10% metal alloy did the best job of limiting growth of bacteria. My hypothesis was supported by these results.
My next question is how much bacteria is left on your hands after rubbing a silver dime on your palms for 10 minutes as compared with the amount of bacteria remaining after using a cleaning agent?

Summary Statement
Examined the potency of silver in comparison with cleaning agents in inhibiting the growth of household bacteria.

Help Received
My mother helped correct the report and supervised me while working with bacteria; Ms. Reichelt correct my papers and provided additional guidance.