CALIFORNIA STATE SCIENCE FAIR
2016 PROJECT SUMMARY

Name(s)
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Project Number
36490

Project Title
Saliva the Samurai: The Effect of Human Saliva on Bacterial/Fungal Skin Diseases-: An Effective/Eco-Friendly Alternative

Abstract

Objectives/Goals
The emergence of antibiotic-resistant bacteria is a global threat. Each year in the US alone, approximately 23,000 people die as a result of antibiotic-resistant bacterial infections. In addition, there are related losses of roughly $55 billion. Antibiotics have serious known side effects and impact the environment as they can enter the human food chain.

The objective of my project is to find out if human saliva can be an effective and eco-friendly alternative to antibiotics and antifungals in the treatment of common skin diseases.

Methods/Materials
The main materials used were 36 agar plates, Staphylococcus Epidermidis (bacteria), Candida Albicans (fungi), morning saliva, Mupirocin Ointment USP 2% (antibiotic), Cipladine Povidone-Iodine IP 5% (antifungal), Lab-Line Barnstead100 Incubator, bleach, ImageJ software (online),and safety apparatus.

First, I prepared sets of 5 Petri dishes for control, antibiotics, and saliva separately for the bacterial experiment group. Next, I left the control plate as is, applied antibiotics to the antibiotics plate, and applied my morning saliva to the saliva plate. After putting the Petri dishes back in the incubator, I observed bacterial growth and took pictures of all the Petri dishes every day for four days. After the 4th day, I disposed of the Petri dishes. I repeated these steps for the fungi group as well. At the end, I analyzed all the colonies using an ImageJ software.

Results
In total, I collected 510 data points and analyzed each one using the ImageJ software. I found that the antibiotic inhibited bacterial growth by 83%, and the saliva inhibited bacterial growth by 77%, showing that the saliva was 71% as effective as the antibiotics. I also found that the antifungal inhibited fungal growth by 79%, and the saliva inhibited fungal growth by 73%, showing that the saliva was 78% as effective as the antifungal.

Conclusions/Discussion
In this experiment, I wanted to see if saliva could effectively treat skin diseases as compared to antibiotics and antifungals. My results show that the saliva was 71% as effective as the antibiotic and 78% as effective as the antifungal in the experimental setup. These results are very promising as they show that saliva can be effective when treating skin diseases, but they need to be further evaluated in a professional setup.

Summary Statement
I found that human saliva can be an effective and eco-friendly alternative to antibiotics and antifungals in the treatment of common skin diseases.

Help Received
I performed the entire experiment in my school's science lab and analyzed the results myself. However, my teacher, Mrs. Mackewicz, arranged the incubator for this experiment, and my parents purchased the necessary materials from Carolina.com. I also consulted with the Carolina.com technical team.