CALIFORNIA STATE SCIENCE FAIR
2016 PROJECT SUMMARY

Name(s)
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Project Number
36855

Project Title
The Secrets to a Cleaner Toothbrush

Abstract

Objectives/Goals
The objective of this study is to determine if toothbrushes have harmful bacteria in their bristles and which one of my cleaning techniques would clean the toothbrush the most effectively. My goal was to be able to decontaminate my toothbrushes from harmful bacteria.

Methods/Materials
After I conducted all my methods to my toothbrushes, I had to cultivate my bacteria. I used a liquid median called Mueller Hinton broth to let the bristles of my toothbrushes fully dissociate into the nutrients. After that, I put the test tubes full with the broth and kept it in my homemade incubator for seven days. Then I took a pipette and drew out one pipette full and smeared the liquid from the pipette onto my homemade agar plates. After another three days on the agar plates you could see colony formation. Then I counted the colonies using a helpful app called iAnnotate.

Results
I assigned every test tube based on clarity from a scale of 0-2, 0 being the clearest. The methods that had the best degree of clarity were the mouthwash, Nano-B, pressure cooker, and the iTouchless U.V. sanitizer methods. Coincidentally, the methods with the least amount of bacteria were the mouthwash, Nano-B, pressure cooker, and the iTouchless U.V. sanitizer with 36, 75, 54, 39 colonies formed.

Conclusions/Discussion
I concluded that the methods that had the best degree of clarity in the test tubes also had the least amount of bacteria. The main problem with my results is that I cannot clearly distinguish which sanitization technique is the most effective because my results are similar. I was extremely careful on performing this experiment and I tried to minimize the amount of possible sources of errors. However, the margin of errors in this experiment is too large to clearly be able to distinguish which technique works the most effectively. However, I can conclude that there is a lot of bacteria on our toothbrushes and all of my techniques decreased the amount of bacteria on our toothbrushes.

Summary Statement
In my experiment, I concluded that there is a lot of bacteria on our toothbrushes and certain methods decreased more bacteria than others.

Help Received
I would like to thank Mrs. Conklin for providing the nutrient agar premix, Dr. Peters from Western University of Pomona for donating the Mueller Hinton Broth and the test tubes, and finally my parents for purchasing all the other supplies and for supporting me through my journey as a scientist in my