



CALIFORNIA STATE SCIENCE FAIR 2014 PROJECT SUMMARY

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Project Title Brush This Off! Dentifrice for Developing Countries	
Objectives/Goals The objective was to determine if a charcoal based dentifrice that could be made in a rural area of a developing country would be effective in controlling bacterial growth. We believe that the charcoal based dentifrices would be ineffective. Abstract Methods/Materials Three different dentifrices containing charcoal were tested against a commercially available dentifrice containing sodium fluoride and triclosan and against a home made dentifrice containing sodium bicarbonate and sodium chloride. To simulate the acid that grows in a person's mouth, a mixture was prepared containing scrambled egg and syrup. Then, 500mg of the mixture was applied on a set of plastic dentures. Subsequently, 300mg of a dentifrice was twice brushed against the dentures. A Q-Tip swab was four times rubbed against the dentures. Then, the Q-Tip was rubbed on a petri dish in a defined Z-pattern pattern. These steps were repeated using the other four types of dentifrices. One test was performed without a dentifrice. After preparing the six petri dishes, the dishes were placed in an incubator at 37° C (the temperature in a person's mouth). Then, the cultures in the dishes were photographed and documented. This procedure was repeated six times. Results On average, the sodium chloride and unexposed charcoal based dentifrice (7 colonies ave.) was slightly less effective than the sodium fluoride and triclosan based dentifrice (6 colonies ave.). Next, the sodium bicarbonate and sodium chloride dentifrice and unexposed charcoal (charcoal made in a clean environment) dentifrice were about 3x less effective than the unexposed charcoal and sodium chloride dentifrice at 20 colonies on average. Surprisingly, the control cultivated an average of 33 colonies per petri dish or 5x less effective than the unexposed charcoal and sodium chloride dentifrice. Lastly, the exposed charcoal (created in an unclean environment) was 6x times less effective than the sodium fluoride and charcoal dentifrice. Conclusions/Discussion The unexposed charcoal with sodium chloride was almost as effective as the commercially prepared sodium fluoride and triclosan dentifrice. Secondly, the sodium bicarbonate and sodium chloride dentifrice was as effective in reducing bacterial growth as the unexposed charcoal. Finally, the test without a dentifrice only showed one third the number of colonies than the average exposed charcoal dentifrice test, 33 to 106 colonies.	
Summary Statement To determine if a charcoal based dentifrice that could be made in a rural area of a developing country would be effective in controlling bacterial growth.	
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