



**CALIFORNIA STATE SCIENCE FAIR
2005 PROJECT SUMMARY**

Name(s) Adam S. Youssef	Project Number J1140
Project Title How Does Miswak Compare to a Toothbrush and Toothpaste in Cleaning and Killing Bacteria?	
Objectives/Goals The objective is to find out how miswak compares to a toothbrush and toothpaste in cleaning and killing bacteria.	
Abstract	
Methods/Materials Experiment 1: .4 grams of miswak was shaved off then placed in a mortar after being measured by a triple beam balance and ten grams of water was then added. The miswak and water was then smashed in the mortar with a pestle until it became a fine mixture. This was then poured into a beaker. .4 grams of toothpaste was then placed into a mortar after being measured by a triple beam balance. Ten grams of water was then added to the mortar. The toothpaste and water was then smashed with a pestle until it also became a fine mixture. Ten grams of distilled water was also added into another beaker. 48 punches were then hole punched from sterile filter paper. 16 whole punches were put into each of the three beakers. Each of the 12 Petrie dishes was then labeled into four quadrants. Nutrient agar was then poured into each dish. Staphylococcus epidermis the chosen bacteria was then added into each dish. 1 whole punch was then added to each quadrant of the Petrie dishes. The Petrie dishes were then left untouched for two days. Growth areas were then observed, measured, and compared. Experiment 2: 36 tiles were stained with one ml each of grape, juice, and coffee. 1/3 of the tiles for each liquid. The tiles were then baked at 350 degrees until thoroughly caked on. 6 tiles stained with grape juice were then brushed with miswak for thirty seconds each. They were then rinsed. 6 tiles stained with grape juice were then brushed with a toothbrush and toothpaste. The tiles were then rinsed. These steps were then repeated with coffee and tea. The tiles were then compared to see which tiles were whitened better.	
Results The results for my first experiment resulted as toothpaste being the winner. The miswak did not kill any bacteria. While the toothpaste all had rings of defense ranging from 1 to 1.7. For my second experiment miswak was the winner. Miswak cleaned the coffee stained tiles a little better than the toothpaste and toothbrush. With the tea-stained tiles miswak cleaned better. And with the grape juice stained tiles miswak cleaned much better.	
Conclusions/Discussion The conclusion is that while miswak may not be as good in killing bacteria as toothpaste it is better in whitening tough stains.	
Summary Statement The central focus of my project was to determine if miswak was a more effective material to clean teeth than the commonly used toothbrush and toothpaste.	
Help Received Mother helped in using the paper cutter. Used lab equipment under the supervision of Mr. Jeff Hodges (science teacher)	