



CALIFORNIA STATE SCIENCE FAIR 2006 PROJECT SUMMARY

Name(s) Haley F. Washburn	Project Number J1435
Project Title Which Vinegar Works the Best as a Disinfectant?	
Objectives/Goals My goal for this project was to determine if vinegar worked to effectively prevent the growth of bacteria. I felt that if it was a successful antibacterial agent; it would be a much better alternative to store bought cleaners that have harsh chemicals in them. I also felt that this would be better for the environment because vinegar is safe to consume as a food product. Abstract I had 5 different test substances for this project, they were white wine vinegar, red wine vinegar, garlic wine vinegar, apple cider vinegar, and a control group of distilled water. For each test I would streak a sterile petri dish that was filled with nutrient agar with a cotton swab that was contaminated with the <i>Bacillus subtilis</i> bacteria. Then I would lightly dip an absorbent dot in the test substance and place it on the contaminated agar. These steps were repeated for a total of twenty tests per test substance. After all twenty test dots were in place and properly labeled I set the dishes in a warm dark drawer. After 72 hours I removed all of the dishes and measured the area of inhibition surrounding each test dot. These measurements were then logged in my log book. I measured the area of inhibition again at the 96 hour point. Methods/Materials I had 5 different test substances for this project, they were white wine vinegar, red wine vinegar, garlic wine vinegar, apple cider vinegar, and a control group of distilled water. For each test I would streak a sterile petri dish that was filled with nutrient agar with a cotton swab that was contaminated with the <i>Bacillus subtilis</i> bacteria. Then I would lightly dip an absorbent dot in the test substance and place it on the contaminated agar. These steps were repeated for a total of twenty tests per test substance. After all twenty test dots were in place and properly labeled I set the dishes in a warm dark drawer. After 72 hours I removed all of the dishes and measured the area of inhibition surrounding each test dot. These measurements were then logged in my log book. I measured the area of inhibition again at the 96 hour point. Results The results of my testing showed that all of the test vinegars were successful to some degree. Apple cider vinegar and distilled white vinegar were both extremely successful in preventing the growth of the <i>Bacillus subtilis</i> bacteria. After 72 hours both test substances had an average area of inhibition in the 27mm range. However, after 96 hours the apple cider vinegar had the largest average area of inhibition at 25.6mm. My control group of distilled water was unsuccessful in the prevention of bacteria growth. Conclusions/Discussion After completing my science project I found that my hypothesis was wrong. My hypothesis stated that distilled white vinegar would work the best as a disinfectant. Through my testing I discovered that all of the test vinegars worked to prevent the bacteria growth, but it was the apple cider vinegar that worked the best. I learned alot about vinegar and its different uses during the research phase of this project and after completing the testing phase of my project I am more convinced than ever that vinegar would work well as a disinfectant. I believe that it would be a safer alternative to the harsh chemicals that are in most store bought cleaners.	
Summary Statement I wanted to determine which type of vinegar would effectively work as a disinfectant.	
Help Received Mr. Carl Gong supplied the petri dishes and <i>Bacillus subtilis</i> bacteria. He also helped with my experimental flow chart. Mrs. Hillary Cloud reviewed all written work. My mom helped to type the written work and photograph the experiment process.	