



**CALIFORNIA STATE SCIENCE FAIR  
2014 PROJECT SUMMARY**

<b>Name(s)</b> <b>Kennith A. Carpio</b>	<b>Project Number</b> <b>J1602</b>
<b>Project Title</b> <b>Can Acidic Water Be a Green Disinfectant?</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> My objective was to learn if plain Acidic Water can be used as a bacterial disinfectant. My hypothesis was that if I increase the level of acidity in the water used for household cleaning, then the number of bacterial colonies that can grow on household surfaces will be reduced or eliminated because common pathogenic bacteria will not be able to survive on an acidic medium.</p> <p><b>Methods/Materials</b> Materials: Water ionizer, pH Meter, 25 Petri dishes with Super Broth nutrient agar, Two 100 ml bottles of sterile water, E. coli broth culture, four 5-ml plastic test tubes, five 1-ml sterile syringes, 25 sterile cell spreaders and a home made incubator. Methods: Collect water at different pH. using the water ionizer and label them as follows: A- pH 2.5, B - pH 3.5, C - pH 5.5 and D - pH 7.0. Prepare serial dilutions of E. Coli bacteria to obtain a 1:10,000 dilution. Plate 0.2 ml of the bacterial solution into each of the Petri dishes labeled A to E. Then plate 0.2 ml of acidic water in the Petri dish according to how it is labeled. For each of the four pH levels, repeat this process. Petri Dish labeled E, is the control with no solution and just a dry paper disc. Cover the Petri dishes, and turn them upside down and place them in the incubator. At 12 hour intervals, observe each plate and perform measurements of the inhibition zone and the total number of Colony Forming Units (CFUs). Do five different runs of the experiment to confirm results.</p> <p><b>Results</b> Bacteria grew at a fast pace on all the runs. At 5 days, all Petri Dish plates on all 5 runs had bacterial colonies at an average of 309.4 CFUs at ph 2.5, 309.6 CFUs at pH 3.5, 311.6 CFUs at pH 5.5, 312.6 CFUs at pH 7.0 and 314.6 CFUs in the control. There was a difference in the average number of bacterial colonies, with the control having a higher number of bacteria. However, the difference was not significant.</p> <p><b>Conclusions/Discussion</b> The experiment failed to show a significant effect of acidic water in the growth of E. Coli bacteria. More research is needed with better measurement instruments and with a higher dose of acidic water to determine its impact.</p>	
<b>Summary Statement</b> This project is about using acidic water to kill bacteria and disinfect	
<b>Help Received</b> Father helped supervise the dangerous parts with bacteria and taught me how to use Microsoft excel well.	