



CALIFORNIA STATE SCIENCE FAIR
2002 PROJECT SUMMARY

Name(s) Mark T. Tebbets	Project Number 22390
Project Title Decontamination of Insect Eggs with Sodium Hypochlorite to Control Bacteria	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals My project was to determine if sodium hypochlorite kills the spore-forming bacterium, <i>Bacillus thuringiensis</i> but does not kill the eggs of the navel orangeworm, <i>Amelois transitella</i>.</p> <p>Methods/Materials Brain Heart Infusion nutrient agar plates were streaked with the insect pathogen Bt, <i>Bacillus thuringiensis</i>, to grow the bacteria. Bacteria spores or navel orangeworm (NOW) insect eggs were exposed to selected concentrations of sodium hypochlorite for 15 minutes. They were then rinsed for 15 minutes with distilled water. The bacteria were streaked onto new agar plates, incubated for 2 days, then checked for growth. The insect eggs were incubated after rinsing for 5 days then checked for egg hatch.</p> <p>Results Sodium hypochlorite (SH) was very effective in killing the spore-forming bacteria. A 2.0% concentration of SH killed all spores of Bt and 1.0% also killed nearly all of the bacterial spores. However, 0.5% SH did not adequately kill the Bt. Sodium hypochlorite did not kill all of the NOW eggs but the proportion of eggs hatching was reduced when exposed to SH. The percentage of egg hatch was only 56 to 74% compared to 85% in the control group.</p> <p>Conclusions/Discussion In conclusion, sodium hypochlorite effectively kills spore-forming bacteria. Although SH does reduce hatch it does not significantly kill NOW insect eggs. The bacteria are controlled and there is still a good recovery of viable eggs after treatment. In practical application, sodium hypochlorite can successfully be used in insect rearing to effectively control spore-forming bacteria and still provide a good recovery of healthy insect eggs for use in research or other studies.</p>	
Summary Statement Sodium hypochlorite is tested for decontamination of insect eggs from spore-forming bacteria.	
Help Received Insect eggs, bacteria, agar plates and use of incubators supplied by USDA-ARS, Parlier, CA. Father advised in bacteria handling and rinsing procedure. Science teacher made suggestions for improving content on board.	