



**CALIFORNIA STATE SCIENCE FAIR  
2014 PROJECT SUMMARY**

<b>Name(s)</b> <b>Talie L. Cloud</b>	<b>Project Number</b> <b>J1604</b>
<b>Project Title</b> <b>Healing Honey: An Evaluation of the Antimicrobial Effects of California Monofloral Honeys</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> The purpose of this science fair project is to investigate the antimicrobial effects of California monofloral honeys in the inhibition of <i>Bacillus subtilis</i>, <i>Escherichia coli</i> K-12, and <i>Rhizopus sporangia</i>. The hypothesis was that after 72 hours, all four honey varieties would maintain a greater zone of inhibition than the control of double distilled deionized water.</p> <p><b>Methods/Materials</b> Four monofloral honeys: Clover, Star Thistle, Blackberry, and Orange Blossom were diluted to a 10% concentration. Double distilled deionized water served as the control. The microbial cultures: <i>Bacillus subtilis</i>, <i>Escherichia coli</i> K-12, and <i>Rhizopus sporangia</i> were plated onto petri dishes using aseptic techniques. Four millimeter discs soaked in the test variable were placed in each sector of the petri dishes. The plates were incubated for 72 hours at maximum growth temperature and measured for zone of inhibition. This was repeated for 15 trials per variable for each microbial culture.</p> <p><b>Results</b> When measuring the zone of inhibition for <i>Rhizopus sporangia</i>, all four honey varieties as well as the control exhibited less than one millimeter of inhibition. For <i>Escherichia coli</i> K-12 and <i>Bacillus subtilis</i>, all four honey varieties had less than one millimeter of inhibition. The control exhibited an average of 12 millimeters of inhibition for <i>Escherichia coli</i> and 14.2 millimeters for <i>Bacillus subtilis</i>.</p> <p><b>Conclusions/Discussion</b> All four honeys failed to inhibit the growth of the microbial cultures tested. Although many studies indicate that honey can inhibit microbial growth, the monofloral California honeys tested are not antimicrobial agents. The <i>E.coli</i> K-12 and <i>Bacillus subtilis</i> controls using double distilled deionized water inhibited their growth. This may be due to water leaching out from the paper discs and preventing bacterial growth. This data suggests that water is a better inhibitor of microbial growth than monofloral honeys.</p>	
<b>Summary Statement</b> This project investigates the antimicrobial potential of California monofloral honeys.	
<b>Help Received</b> Used lab equipment at California State University, Fresno under the supervision of Dr. Paul Crosbie	