



CALIFORNIA STATE SCIENCE FAIR 2012 PROJECT SUMMARY

Name(s) Kristen F. Fukunaga	Project Number J1712
Project Title The Effects of Essential Oils on Canine Acne	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals Canine acne (furunculosis) is a common problem among short-coated dogs. It is usually found on the animal's chin due to contact with bacteria around the food bowl. Veterinarians generally prescribe a 4-week antibiotic treatment when severe infections develop. My objective is to determine if essential oils can be efficient to inhibit the growth of <i>Staphylococcus epidermidis</i>, <i>Bacillus cereus</i>, and <i>Micrococcus luteus</i>, bacteria involved in canine acne.</p> <p>Methods/Materials I made nutrient agar and prepared 30 petri plates. On these plates, I tested 10 essential oils, water, and Erythromycin antibiotic three times each on three different bacteria involved in canine acne. I used the Kirby-Bauer disk diffusion method and measured the size (in mm) of the zone of inhibition after 5 days. I also tested different methods to extract pomegranate seed oil.</p> <p>Results <i>Staphylococcus epidermidis</i>, <i>Micrococcus luteus</i> and <i>Bacillus cereus</i> were all resistant to grapefruit, water (negative control), chamomile, orange, rosemary, grape seed, and pomegranate seed oils. The three bacteria showed an intermediate resistance to eucalyptus and tea tree oils and were susceptible to clove and lemongrass oils and Erythromycin.</p> <p>Conclusions/Discussion The hypothesis that essential oils can be efficient to inhibit the growth of <i>Staphylococcus epidermidis</i>, <i>Bacillus Cereus</i>, and <i>Micrococcus luteus</i> bacteria is proven. Eucalyptus, tea tree, clove bud, and lemongrass oils showed antibacterial activity against the three bacteria. Lemongrass oil was even more effective than the antibiotic in all the trials and had the largest zone of inhibition. Essential oils can be an option for the treatment of canine acne to prevent the overuse of antibiotics, lessening the chance of antibiotic resistance. A future study can investigate the effects of essential oils on feline and equine acne.</p>	
Summary Statement My project is about finding out if essential oils can inhibit bacterial growth and can be an efficient alternative to antibiotics in the treatment of canine acne.	
Help Received Dr. Gerald Oliver answered questions and gave suggestions about extracting essential oils and testing methods; my father supervised and my mother helped with the board layout.	