



**CALIFORNIA STATE SCIENCE FAIR  
2012 PROJECT SUMMARY**

<b>Name(s)</b> <b>Erica L. Barrett</b>	<b>Project Number</b> <b>J1704</b>
<b>Project Title</b> <b>Osage Orange: Does It Have Antibacterial or Insect Repellent Effects?</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> Last year I performed water quality tests on creek water in the Los Peñasquitos Canyon Preserve. There, I saw a grove of trees that bore lime green, warty balls of fruit. After doing research, I discovered these were Osage Orange trees. Online I learned the trees are very hardy and may contain antibacterial and antifungal compounds. Some researchers believe the Osage Orange fruit may even repel insects. I set out to try to verify these claims by performing experiments. I predicted that the Osage Orange peel and pulp would indeed have antimicrobial properties and that the fruit would repel insects.</p> <p><b>Methods/Materials</b> I made a boiling water extract from the peel and one from the pulp, then also a coldwater extract using both. I added creek water containing bacteria and fungi to the extracts and plated the solutions into 15 Petri dishes. I used Coliscan Easygel, disposable serological pipets, and an incubator. After 48 hours, I counted the colonies of bacteria. For the second trial, I ran three tests each with 18 crickets in a terrarium. In test one, an Osage Orange was placed in one corner while I observed, recorded, and photographed cricket behavior. The experiment was repeated using Osage Orange pulp, then DEET for comparison.</p> <p><b>Results</b> The Petri dishes containing Osage Orange water-soluble extracts grew mold colonies and bacteria colonies too numerous to count. There did not appear to be any water soluble antimicrobial agents in the fruit. As for repelling insects, the Osage Orange seemed to attract crickets rather than repel them. There was a 35% increase in cricket activity in the quadrant with the Osage Orange. DEET, however effectively repelled the crickets with only 5.6% of crickets on average in the DEET quadrant. On average, about 15.6% of the crickets were in the pulp quadrant. The pulp may have repelled the crickets to a small extent, but the DEET was three times more effective.</p> <p><b>Conclusions/Discussion</b> In conclusion, the Osage Orange did not appear to have water soluble compounds that are antibacterial, but fat soluble components still hold promise. I could not test these since I would have to use ethyl alcohol to extract them, the alcohol might have antibacterial properties. The whole fruit did not seem to repel insects. The pulp may have, to some degree, repelled the crickets. Osage Oranges do have unusual properties like resistance to decay and disease which still invites further study.</p>	
<b>Summary Statement</b> My project explored the antibacterial and insect repellent properties of the Osage Oranges.	
<b>Help Received</b> Thanks to my parents who helped me obtain supplies. Thanks to my science teacher who taught me sterile procedures.	