



**CALIFORNIA STATE SCIENCE FAIR
2008 PROJECT SUMMARY**

Name(s) Jessica H. Davis	Project Number J1708
Project Title Plant Wars	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals My goal was to discover if oil in Purple Sage leaves is allelopathic and whether it inhibits the germination of the California Poppy or Fennel the most drastically. My objective was to either confirm or disprove the results of Cornelius Muller who was a prominent ecologist in the 1960s and believed strongly in allelopathy. My hypotheses were that the Purple Sage would prove allelopathic and the California Poppies would be less effected by the supposedly allelopathic oils due to possible adaptation since it is a native plant that grows in close proximity to sage. My goal was to, perhaps, find that by not clearing native chaperal, we could prevent the invasion of many nonative species.</p> <p>Methods/Materials Over the course of two trials I planted 1000 seeds (half Fennel, half California Poppy). My constant was the seeds I watered with distilled water and my variables were the plants treated with Purple Sage oil infused water, and for the second trial, nutrient enriched water. I made the allelopathic treatment by collecting Purple Sage and soaking it in water for a brief time to imitate rain falling through a sage canopy.</p> <p>Results I was very surprised with my results. The Purple Sage oil actually drastically benefitted the germination rate of my Fennel seeds and had no substantial affect on the California Poppies. After trial one, I hypothesised the the increase germination could be due to nutrients in oils. However, after adding another treatment with nutrients for my second trial, I realized that the nutrients added actually lowered my germination rate. Moreover, I was unable to find any evidence of the controversial theory of allelopathy.</p> <p>Conclusions/Discussion Although in this experiment I was unable to prove the allelopathic affect, I believe there is still a good possibility it exists. For future experiments, I would test with volatile gases that some scientist believe plants emit. Also, I would limit the amount of water given to the seeds thus stressing them and perhaps causing them to demonstrate allelopathy for a competitive advantage. There is much more research opprotunity in this area, because although allelopathy has been proven in labs, it is very hard to demonstrate in nature.</p>	
Summary Statement The Allelopathic Effectiveness of the Oils in Purple Sage Leaves on Inhibiting the Germination of California Poppy vs Fennel.	
Help Received Mom edited report. Advisor provided interview information and references and helped determine how to extract oils.	