



**CALIFORNIA STATE SCIENCE FAIR
2006 PROJECT SUMMARY**

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Project Title In Vitro Combinatorial Effect of Bio-Active Plant Extracts

<p style="text-align: center;">Abstract</p> <p>Objectives/Goals We set out to find if combining medicinal plant extracts would increase its potency. We chose plants that we were able to acquire from around our school such as garlic, eucalyptus, and sequoia. We chose to use E. Coli instead of yeast because it has a weaker resistance towards the plant extracts, allowing us to get a more concise result.</p> <p>Methods/Materials Materials: Assay disks, agar, Petri dishes, scissors, weigh boat, LFH, methanol, auto pipetter, electronic balance, culture tube, sharpie, garlic, eucalyptus, mint, sequoia, E. Coli, positive and negative controls, forceps, incubator, oven, aluminum foil, bacterial spreader. Procedures: Cut plants to make a 50% plant tissue to Isopropanol ratio. Drop an assay disk into the culture tube and soak for 24 hours. Prepare Agar and autoclave the sample at 121°C at 30psi. Pour the agar into Petri dishes. Label the agar plates. Spread 200µL of E. Coli cell culture. Allow all pre-soaked disks to dry in an oven before placing onto the agar plate. Using forceps, place the dried assay disk onto the pre-marked locations on the agar plate. Place the Petri dishes upside down in the incubator for 24 hours. Take digital image and computer analysis of the kill zone. Repeat the steps with different combinations of the plant extracts with each combination consisting of 50% of 1 plant extract and 50% of another. Explore all the combinations of 2 plant extracts possible.</p> <p>Results We found that garlic alone destroys more bacteria, but when combined with other medicinal plant extracts, such as eucalyptus and sequoia, hinders its overall potency. Combining all three bio active plant extracts did not prevent the microorganisms from surviving as much as we would have liked it to. What surprised us that most was that garlic was the most effective in generating a kill zone.</p> <p>Conclusions/Discussion At first, we believed that combining more medicinal plant extracts would create a more powerful weapon against bacteria. Nevertheless, our results refuted our hypothesis. Based on our observation that our assay disks and the kill zones it created, we concluded that the disks were soaked and dried unevenly. The longer the disks were dried in the oven, the more shriveled up the assay disks became. Due to the elliptical-shape of the kill zone areas, we also concluded that the plant extracts were not evenly distributed.</p>
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Summary Statement To determine if combining bio active plant extracts will increase the potency of the medicine and the effect it has on bacteria.
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Help Received Mr. Okuda
