



**CALIFORNIA SCIENCE & ENGINEERING FAIR  
2019 PROJECT SUMMARY**

<b>Name(s)</b> <b>Jorja Moes; Anjali Slyker</b>	<b>Project Number</b> <b>S1808</b>
<b>Project Title</b> <b>Silver Nanoparticles on Freshwater Aquatic Java Plant Growth</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives</b> This experiment was performed in order to determine the positive and/or negative effects different concentrations of silver nanoparticles have on the growth of freshwater plants.</p> <p><b>Methods</b> 3 Black Forest Asian Java Fern Potted Live Water Aquatic Aquarium Plants, 3 large clear 2.5 quart plastic containers, 1800 mL of distilled water, 1800 mL of silver nanoparticle solution that we made, various rocks (for a plant base), and a ruler. Every 5 days, measured leaf growth of 3 aquatic Java plants in 3 silver nanoparticle concentrations(0%, 50%, 100%).</p> <p><b>Results</b> The 0% silver nanoparticle concentration resulted in a decrease of 25%. The 50% silver nanoparticle concentration resulted in a decrease of 5%. The 100% silver nanoparticle concentration resulted in a decrease of 7%. The measurements collected after approximately 5 weeks suggest that the silver nanoparticles did take part in a decrease in growth, however do provide a more substantial environment for the java plant rather than distilled water alone.</p> <p><b>Conclusions</b> The mixture of distilled water and the silver nanoparticle solution resulted in the least amount of leaf length decrease, suggesting that the silver nanoparticles do help in the health of the plant along with the presence of water.</p>	
<b>Summary Statement</b> We proved that silver nanoparticles can elevate the growth of aquatic plants more so than distilled water alone.	
<b>Help Received</b> Our chemistry teacher assisted us in providing materials needed to make silver nanoparticles, as well as her classroom/lab to make them in.	