



**CALIFORNIA STATE SCIENCE FAIR
2010 PROJECT SUMMARY**

Name(s) Christina E. Gerges	Project Number S2006
Project Title A Newly Discovered Species: A Study of the Basalt Dependency of the Brodiaea santarosae	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals Around 5 million years ago, long after the spread of basaltic magma over the southern California region, the Brodiaea Santarosae came into play. Despite its long existence, the Brodiaea Santarosae was not discovered until 2006 by Kay Madore, Tom Chester, and Wayne Armstrong. Many botanists predict that the majority of newly discovered species will be discovered to flourish best on soils that are considered strange and are in remote places such as southern California. In accordance with this speculation, this lily like flower seemed to the discoverers to grow only on basaltic soils. The purpose of this project is to verify their assumption that the Brodiaea Santarosae only grows on basalt.</p> <p>Methods/Materials In order to visit the Santa Rosa Plateau it is necessary to apply for and receive a researcher's pass. Familiarize yourself with the park and its history during the first visit. Next, inspect the area for specimens of the Brodiaea Santarosae and place flags near them. Select areas in which soil samples will be taken. Throughout the next visit, collect 24 soil samples including one from each area in which a flower grew. Go to a soil chemistry lab and after sifting the soils conduct soil tests including texture, bulk density, moisture content, pH, electric conductivity, and mineral content.</p> <p>Results The results show that the locations in which flowers were found generally contained high amounts of iron and magnesium, which are the markings of basaltic soils. Despite this, over half of the specimens were found on felsic soils. Also, the basaltic soil had a generally higher bulk density than that of the felsic. Most physical attributes are similar in both mafic and felsic soils.</p> <p>Conclusions/Discussion The Brodiaea specimens that were found on felsic soils were actually in a drainage ditch. Throughout every rainstorm that has occurred in the past 5 millions of years, basaltic minerals have been flowing down into felsic soils, elevating the amounts of minerals vital to the Brodiaea Santarosae. The higher bulk densities of the mafic soils result in hindered root penetration, which means that the likelihood of healthy Brodiaea Santarosae specimens growing is greater in the drainage ditch. The hypothesis was proven correct because, as predicted, the Brodiaea Santarosae only grew in soils that contained basaltic minerals. This proves that the Brodiaea Santarosae is dependent on the minerals contained in mafic soil.</p>	
Summary Statement The purpose of this project is to verify the discoverer's assumption that the Brodiaea Santarosae flourishes only on basaltic soil by conducting multiple soil tests and analyses.	
Help Received Worked in Dr. Chris Amrhein's lab; Worked in lab with 2 other high school students	