



**CALIFORNIA STATE SCIENCE FAIR
2009 PROJECT SUMMARY**

Name(s) Charles P. Boyd	Project Number J0403
Project Title Molecular Migration of Plant Pigments	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The objective of my project was to determine if some plant species with similarly colored flowers use the same pigment molecules which exhibit varying rates of migration through agarose gel during electrophoresis.</p> <p>Methods/Materials The procedures for conducting both Experiment I and II were identical, with the exception of using six different plant pigments for each experiment. Flower petals were crushed, strained through a nylon filter, and 70% isopropyl alcohol was added for evaporation purposes. A 1% agarose solution was combined with a buffer and distilled water to create the gel base with reservoirs for the tray. When the gel base solidified, the tray was submerged under a diluted buffer into the electrophoresis chamber. The reconstituted pigment samples were loaded into the reservoirs. The chamber cover was snapped down onto the electrode terminals with the power source set to 70 volts. The migration rates of the pigment molecules were then recorded every 15 minutes for one hour during electrophoresis.</p> <p>Results In Experiment I, the plant pigments from the Skippy Blue Viola and the Crown Blue Pansy, flowers of the same genus, exhibited almost identical migration rates in agarose gel at timed intervals. Although there was a variance between the final measurements taken in Experiment II, all six African Violet cultivars had colored pigment bands of varying intensity that extended the full 5 cm on the agarose gel.</p> <p>Conclusions/Discussion The data in Experiment I suggests that some plant species with similarly colored flowers use the same pigment molecule when run through gel electrophoresis. It is difficult to determine if the variance in migration rates in Experiment II was due to different pigment molecule structures or combinations of the same pigments. Additional research on the organization of plants' chemical superstructures is required before scientists can address the molecular evolution between plant species and their phylogenetic relationships in order to unravel the evolutionary lines that connect or separate them.</p>	
Summary Statement My project utilizes electrophoresis to measure the migration rates of pigment molecules extracted from similarly colored flowers as a means of examining the phylogenetic relationships between plant species in molecular evolution.	
Help Received My science teacher, Brendan Gummerson, offered his electrophoresis apparatus; my mother assisted me in assembling the materials for my experiments, as well as helped in measuring the layout of my board.	