



**CALIFORNIA STATE SCIENCE FAIR
2010 PROJECT SUMMARY**

Name(s) Vivien Macnguyen	Project Number S0825
Project Title Determining the Phytoremediation Potential of Brassica rapa with Arbuscular mycorrhizae	
Abstract Objectives/Goals Phytoremediation is an environmental-friendly, cost-efficient, and entirely natural method of extracting unwanted hazardous heavy metals from soils and water as opposed to other common methods of soil remediation which include excavation and pump and treat. In my project, I attempt to optimize phytoremediation by combining a rapid-growing hyperaccumulative plant, Brassica rapa, with Arbuscular Mycorrhizal fungi (Glomus Mosseae) which lives in symbiosis with plants and elongates its roots for easier access to nutrients and trace elements. Methods/Materials In my experiment, I grew non-mycorrhizal and mycorrhizal plants in two separate water culture hydroponic systems with each containing 400 ppm cadmium chloride. Data collection consisted of taking samples of the water supply in which the roots of the plants were submerged each day, using dithizone as a heavy-metal indicator and measuring specific concentrations through a spectrophotometer. Results After two trials, running from 7-14 days, Mycorrhizal-inoculated plants proved to have a faster cadmium uptake than non-mycorrhizal plants. In general, the plants were able to tolerate the high concentration of cadmium fairly well, but mycorrhizal plants were more tolerant. Conclusions/Discussion The Brassica genus of plants is known for the ability to accumulate unusually high concentrations of heavy-metals in soil without significantly affecting its development and health, which makes Brassica rapa a promising candidate for phytoremediation. In symbiosis with the mycorrhizal fungi, my data shows that Brassica rapa plants' phytoremediative capabilities have noticeably improved.	
Summary Statement Plants in symbiosis with root-elongating fungi may be a cost-efficient and all natural way to clean our environment of heavy-metal pollution.	
Help Received Mr. Allen helped me order plants and materials and gave me suggestions for my procedures.	