



**CALIFORNIA STATE SCIENCE FAIR  
2006 PROJECT SUMMARY**

<b>Name(s)</b> <b>Nisha R. Wadhwa</b>	<b>Project Number</b> <b>S0817</b>
<b>Project Title</b> <b>The LD50 Level of Cadmium on Baccharis salicifolia</b>	
<b>Abstract</b> <b>Objectives/Goals</b> Cleanup of soil pollutants is often expensive and environmentally unsound. Phytoremediation is an area of frontier science that provides a safe and cost-effective alternative to the conventional cleanup methods. This study featured a native California plant, Baccharis Salicifolia, or mule fat, and identified the median lethal dose (LD 50 Level) of cadmium on saplings of the species, as well as the accumulation and distribution of cadmium in the plant tissues. The experiment was designed to indicate the possible success of mulefat in large-scale phytoremediation projects. <b>Methods/Materials</b> The LD50 level was determined by planting nine groups of saplings of mule fat in various cadmium concentration levels. Cadmium was applied via solutions of water and cadmium sulfate. The saplings were observed during the eight-week growth period, and then harvested. Plant tissues were separated and analyzed via ICP-MS (Inductively Coupled Plasma Mass Spectroscopy), and cadmium content was determined in the leaves and shoots of various groups <b>Results</b> Mortality data showed that the median lethal dose of cadmium on mule fat was around 225 mg Cd/ kg soil. Observations indicate that after this point, the plant becomes significantly affected by the cadmium and is unable to grow normally. Accumulation data show that increased cadmium content in the soil causes increased cadmium uptake by mule fat. The leaf tissues contained the highest levels of cadmium. <b>Conclusions/Discussion</b> Mule fat, when compared to other plant species used in similar studies, is able to efficiently uptake high amounts of cadmium in a relatively short period of time. This study suggests that mule fat is a feasible and effective candidate for large-scale cadmium cleanup project.	
<b>Summary Statement</b> This study was designed to determine if Baccharis Salicifolia, or mule fat, is an eligible candidate for a cadmium-clean up project.	
<b>Help Received</b> Katie Brandt, a graduate student at California State University Dominguez Hills, supervised me in the greenhouse and the lab at the university facilities. My parents provided transportation and Mr. Starodub assisting in guiding me throughout the entire process.	