



**CALIFORNIA STATE SCIENCE FAIR  
2007 PROJECT SUMMARY**

<b>Name(s)</b> Nisha R. Wadhwa	<b>Project Number</b> <b>S0916</b>
<b>Project Title</b> <b>The Ability of Baccharis salicifolia to Absorb Cadmium as an Effluent: Implications for Phytoremediation</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><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, identified the maximum tolerable dose of cadmium that can be administered weekly as well as the implications for a large-scale phytoremediation project.</p> <p><b>Methods/Materials</b> The approximate maximum cadmium concentrations were determined by planting five groups of eight saplings. Cadmium was applied weekly via solutions of water and cadmium acetate in various doses. 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.</p> <p><b>Results</b> Average plant tissue dry masses in addition to leaf counts, shoot length measurements, and actual cadmium content in these tissues confirm that the maximum weekly dose tolerated by Baccharis salicifolia is somewhere between twenty-five and fifty parts per million. Beyond this level, the plant is no longer a practical phytoremediation candidate because the decline in overall health drastically decreases the mortality rate in the species.</p> <p><b>Conclusions/Discussion</b> As confirmed by the previous year's study, mule fat is a relatively plausible candidate for phytoremediation, though not necessarily better suited for cadmium as an effluent. Both a single large dose and multiple smaller doses demonstrate a similarly above-average tolerance for cadmium in Baccharis salicifolia.</p>	
<b>Summary Statement</b> This study identified a maximum tolerable weekly dose of cadmium that Baccharis Salicifolia can uptake while maintaining plant health.	
<b>Help Received</b> Katie Brandt supervised project, parents provided transportation to and from greenhouse at CSU Dominguez Hills, and Lab Technician Chris Mull helped with ICPMS at CSU Long Beach.	