



# CALIFORNIA STATE SCIENCE FAIR 2014 PROJECT SUMMARY

<b>Name(s)</b> <b>Shomik Jain</b>	<b>Project Number</b>  34336
<b>Project Title</b> <b>The Effect of Bisphenol A on Lactuca saliva var. Longifolia</b>	
<b>Objectives/Goals</b> The purpose was to test the effects of Bisphenol A (BPA) on Lactuca sativa var. Longifolia, and whether or not BPA could make its way into the plant. My hypothesis was that BPA will be absorbed by Lactuca sativa var. Longifolia, and it will have an effect on the plant height, mass, and overall health. <b>Abstract</b> <b>Methods/Materials</b> 4 experimental groups were set up, and each group was watered with different levels of BPA. Group 1, the control, was watered with DI H(2)O (no BPA). Group 2 was watered with the amount of BPA a water bottle leeches (7.5 x 10 <sup>-7</sup> g BPA/ 1 L DI H(2)O Solution). Group 3 was watered with the amount of BPA a water bottle left in the sun leeches (7.5 x 10 <sup>-6</sup> g BPA/ 1 L DI H(2)O Solution). Group 4 was watered with 0.1 g BPA/ 1 L DI H(2)O Solution. Plant height was measured every class for 53 days, and plant mass was measured at the end. The amount of BPA that was absorbed by the plant was measured with an ELISA assay. <b>Results</b> The control plants had an average height of 18.49 cm, an average mass of 5.960 g, and 430 picograms (pg) BPA/g plant. Plants exposed to the amount of BPA a water bottle leeches had an average height of 28.34 cm, an average mass of 20.830 g, and 2700 pg BPA/g plant. Plants exposed to the amount of BPA a water bottle left in the sun leeches had an average height of 26.89 cm, an average mass of 19.299 g, and 6100 pg BPA/g plant. Plants exposed to 0.1 g BPA / 1 L DI H(2)O Solution had an average height of 15.4 cm, an average mass of 1.710 g, and 34000 pg BPA/g plant, and 2 plants from this group died. <b>Conclusions/Discussion</b> For plant height, mass, and BPA levels, there were statistically significant differences between group means as determined by an ANOVA. T-Tests between the control and the other groups were statistically significant. An explanation for varying plant heights and masses is that BPA acted as a plant hormone at trace levels. The control group may have gotten BPA from plastic tubes used in the extraction procedure. Bisphenol A was absorbed by Lactuca sativa var. Longifolia, and it had a significant effect on plant height, mass, and health. Plants in all groups were able to take up and store measurable levels of BPA in their leaves. Further research with BPA and its effects on plants are needed to determine if there are any significant health risks for humans.	
<b>Summary Statement</b> This project tested the effects of Bisphenol A (BPA) on Lactuca sativa var. Longifolia, and whether or not BPA could be absorbed and stored by the plant.	
<b>Help Received</b> Used plate reader at Santa Clara University under supervision of Dr. Katy Korsmeyer. Project Advisor: Mrs. Cathy Messenger	