



**CALIFORNIA STATE SCIENCE FAIR  
2013 PROJECT SUMMARY**

<b>Name(s)</b> Ashwini Narayan	<b>Project Number</b> <b>J1117</b>
<b>Project Title</b> <b>Reducing Our Plastic Footprint: The Promise of "Bio-Plastic"</b>	
<b>Abstract</b> <b>Objectives/Goals</b> The objective was to see whether natural plastic degraded faster than synthetic plastic. <b>Methods/Materials</b> The project was conducted in two phases: Phase 1 involved manufacturing natural plastic from milk and vinegar (casein plastic). Milk was heated and treated with vinegar - the solids were filtered and kneaded, and then dried to form a sheet of natural plastic. Phase 2 involved comparing rates of biodegradation of the natural plastic and synthetic plastic (obtained from an empty plastic milk jug): 10 cups were filled with potting soil and watered. A strip each of the natural plastic and the synthetic plastic were inserted into the soil. Every day, one cup was emptied, and the lengths of the two strips of plastic were compared with the help of an inch-ruler <b>Results</b> The natural plastic gradually decayed over time - in the first few days, the natural plastic showed increasing moistening, and had clumping of the soil on the surface. From day 5-6 onwards, the natural plastic showed signs of softening and liquefaction, and later, gradual breakdown; by day 9-10, the part of the natural plastic underneath the soil surface was seen to be completely disintegrated. In comparison, the synthetic plastic did not show any signs of change at all. <b>Conclusions/Discussion</b> Natural plastic degrades faster than synthetic plastic. This may have enormous implications for the future, e.g., preventing landfills from being clogged by synthetic plastic, if natural plastic were used instead in the manufacture of consumables, etc. However, additional research is required to determine other factors that might be used to regulate the rate of bio-degradation of natural plastic, such as additives, humidity, heat and/or soil composition.	
<b>Summary Statement</b> Bio-plastic degrades faster than synthetic plastic, and if used in the manufacture of consumables, could help reduce the clogging of landfills.	
<b>Help Received</b> Father helped with generating the experimental design, and mother helped with preparing the display board.	