



**CALIFORNIA STATE SCIENCE FAIR  
2006 PROJECT SUMMARY**

<b>Name(s)</b> <b>David P. Kari</b>	<b>Project Number</b> <b>S1912</b>
<b>Project Title</b> <b>How Skillful Are <i>Drosophila virilis</i> in Discerning Natural and Artificial Esters?</b>	
<b>Abstract</b> <b>Objectives/Goals</b> I plan to test two cultures of <i>Drosophila virilis</i> to determine how effective they are in distinguishing between artificial and natural esters. The goal of the project is to discover which fruity esters are the most attractive and why the fruit flies choose them. <b>Methods/Materials</b> A closed testing apparatus was constructed using five jars and a cardboard box. Four of the jars were attached to the box, each jar to a separate side. The fifth jar was used in transferring the flies from the culture tube into the contained area. Nine chemicals were used, including the following: butyric acid, concentrated acetic acid, ethyl alcohol, methyl alcohol, n-octyl alcohol, n-pentyl alcohol, phenylacetic acid, and 6M sulfuric acid. <b>Results</b> Nearly all of the visits by the <i>Drosophila virilis</i> were to natural esters as opposed to the artificial esters. There was little difference in the results between the unfasted Culture 1 and the fasted Culture 2 in terms of results. The majority of the visits were to the control water. The most attractive esters were natural orange and banana. The least attractive were pineapple and honey. <b>Conclusions/Discussion</b> Clearly, the fruit flies preferred the natural esters above the artificial esters because it is possible that the synthesis between the alcohols and the acids in the artificial esters was incomplete, deterring any potential visits. <i>Drosophila virilis</i> also felt the need for water more than intangible foods, overwhelmingly choosing water over the esters. This research confirms that fruit flies have a keen sense of smell that can help in the development of artificial esters designed to be used in products such as scented candles, perfumes, and soft drinks.	
<b>Summary Statement</b> My project is about revealing the refined and highly adaptive fruit fly olfactory system as well as the complexity of ester composition.	
<b>Help Received</b> Dr. Don Lorange of Vanguard University helped select the esters to be tested and supplied raw chemicals; Dr. Nelson Samuel of California Baptist University suggested the use of fruit flies.	