



**CALIFORNIA STATE SCIENCE FAIR
2006 PROJECT SUMMARY**

Name(s) Jennifer M. Buckner	Project Number S1904
Project Title Genetic Variation among Populations of Greenhouse Whitefly (Trialeurodes vaporariorum) throughout California	
Abstract Objectives/Goals The Greenhouse Whitefly (<i>Trialeurodes vaporariorum</i>) is a huge pest to many types of plants throughout the state of California, especially in commercial agriculture. One of the biggest problems is that they can transmit a wide variety of viruses from plant to plant and are not easily controlled by pesticides. This project is to determine if significant genetic variability exists among Greenhouse Whitefly populations, in order to find out if there are biotypes, or sub-species of these populations. By knowing if there are different types of this whitefly, it will help in further studies of how to control these pests and their viruses. Methods/Materials 1. Populations of Greenhouse Whitefly (<i>Trialeurodes vaporariorum</i>) were collected from different areas, including a strawberry field in Watsonville, a greenhouse in Salinas, a common backyard plant in Salinas and UC Davis. 2. The total nucleic acid (DNA and RNA) was extracted from these populations. 3. The Polymerase Chain Reaction (PCR) was used to amplify small sections of the mitochondrial DNA from individual whiteflies. 4. The PCR products were loaded onto an electrophoresis gel to separate the DNA macromolecules. 5. The electrophoresis results were then sent to a commercial laboratory to be sequenced. 6. Using a software program to align the genetic sequences, they were compared to the vector populations (controls) of Greenhouse Whitefly to determine if variability exists between them. Results The Salinas and UC Davis populations turned out to be very similar to the controlled (genbank) sequence. They were 99%-100% alike. However, the population from Watsonville was only 82%-86% alike with the genbank sequence. This was more of a considerable difference. Conclusions/Discussion The information for the Davis and Salinas populations was not quite expected; the hypothesis stated that there would be more of a difference between them and the control. However, the Watsonville population had more of a variation compared to the control, even when repeated several times. There is not an obvious explanation as to why this is, but it means there may be significance in this species if studied further. It is useful to study this because by finding out if there are biotypes of this species of whitefly, or any type of pest in agriculture, it will help to study their effects on virus transmission and their ability to resist or be affected by pesticides.	
Summary Statement This project is to determine if significant genetic variability exists among Greenhouse Whitefly (<i>Trialeurodes vaporariorum</i>) populations to find out if there are sub-species.	
Help Received Used lab equipment at the USDA in Salinas, under the supervision of Dr. McCreight and Dr. Wintermantle.	