CALIFORNIA STATE SCIENCE FAIR
2005 PROJECT SUMMARY

Name(s)
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Project Number
S1306

Project Title
Wolbachia: A Potential WMD for West Nile Virus

Abstract

Objectives/Goals
Wolbachia: A Potential WMD for Insects is an experimental study to determine how quickly Wolbachia is spreading amongst an insect population and to test whether or not it can jump minor geographic barriers such as the 20 miles of ocean separating Santa Cruz Island from the mainland. my hypothesis is that if the island flies are tested for Wolbachia infection, then it will be found that there is infection present in the island flies and that the rate of infection found in Santa Barbara will be greater than those found in the Monterey bay area.

Methods/Materials
Drosophila Melanogaster fruit flies were captured at various locations through the dispersal of several fly-traps: large buckets with holes drilled in the side, so as to allow entry but deny escape, with rotting fruit and yeast in the bottom of the bucket to act as a lure. Once the flies are captured, they are anesthetized with ether and Polymerase Chain Reaction is utilized to multiply Wolbachia DNA. Agarose gel electrophoresis is used to detect a specific band and determine whether or not the fly was infected with Wolbachia.
Materials: DNA prep:15 mg/ml Proteinase K, 10x PCR buffer, purified H2O
PCR mixture: DNA prep, 16sF primer, 16sR primer, Taq polymerase, dNTPs, 10x buffer, MgCl2, purified H2O
Agarose Gel: Agarose, TBE buffer, EtBr

Results
After extensive testing and trapping, Wolbachia was detected in some but not all wild Drosophila Melanogaster collected from various locations. Two of the five Drosophila melanogaster found on Santa Cruz Island were infected with Wolbachia. And three of the nine Drosophila melanogaster caught in Santa Barbara tested positive for Wolbachia infection.

Conclusions/Discussion
My hypothesis was correct that there would be D. melanogaster infected with Wolbachia on Santa Cruz Island, however, my hypothesis was incorrect in the assertion that the rates of infection found in Santa Barbara would be greater than those in the Monterey bay area. If strains of Wolbachia could be developed that counteracted West Nile Virus, this information on the pervasiveness of the bacteria could be used to predict how fast the modified strain could be expected to spread.

Summary Statement
my project's purpose is to run tests on Drosophila Melanogaster to discover if the bacteria Wolbachia can spread through a population over a geographic barrier; for example: to Santa Cruz island.

Help Received
used lab equipment at UCSB and UCSC under supervision of Dr. Steve Poole and Dr. Bill Sullivan, mother helped cutting papers