



CALIFORNIA STATE SCIENCE FAIR 2012 PROJECT SUMMARY

Name(s) Matthew Sorge	Project Number J2217
Project Title Do Cool Temperatures Impact the Parasitism Rate of <i>Psytallia humilis</i>?	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals Parasitoid wasps are natural predators that are a great alternative to pesticides. Scientists are currently releasing a parasitoid wasp, <i>Psytallia humilis</i>, to combat the olive fruit fly which has become a huge threat to California's olive industry. Scientists are still unsure if <i>P. humilis</i> will survive during the cool winter months. Therefore, my project is to determine if cool winter temperatures affect the ability of <i>P. humilis</i> to parasitize the olive fruit fly larvae inside of the olive fruit.</p> <p>Methods/Materials U. C. Riverside's Entomology Department provided me with 160 olives infested with fruit fly larvae and 40 mated female <i>P. humilis</i>. I prepared 20 identical containers and divided them into four treatments: infested olives without <i>P. humilis</i> held at room temperatures; infested olives with <i>P. humilis</i> held at room temperatures; infested olives without <i>P. humilis</i> held at cool outside temperatures; infested olives with <i>P. humilis</i> held at cool outside temperatures. Each treatment was replicated 5 times. The high and low temperature was recorded daily. After seven days, all of the cool temperature containers were placed inside and all of the parasitoids were removed. The containers were checked daily and the number of emerging larvae, fruit flies, and parasitoid wasps were counted and recorded.</p> <p>Results The results show that cool temperatures did impact <i>P. humilis</i>'s ability to parasitize the fruit fly larvae, but overall <i>P. humilis</i> was able to reproduce in cool temperatures at numbers similar to the parasitoids held in warmer temperatures.</p> <p>Conclusions/Discussion Although more adult fruit flies did develop from the cool temperature larvae exposed to <i>P. humilis</i>, <i>P. humilis</i> was still able to stop a large number of the larvae from developing into adult fruit flies. In addition, the cool temperatures slowed the development of <i>P. humilis</i> by ten days. Although the cool temperature treatment suggested that <i>P. humilis</i>'s mobility is affected when parasitizing olive fly larvae, the most important fact is that the cool temperature treatment also produced adult <i>P. humilis</i> parasitoids. This means there is promise in using <i>Psytallia humilis</i> as a biological control, and there is the possibility of establishing permanent populations in Southern California.</p>	
Summary Statement The purpose of this project was to determine if cool winter temperatures affect the ability of <i>Psytallia humilis</i> to parasitize the olive fruit fly larvae inside of the olive fruit.	
Help Received Dr. Marshall Johnson from U.C. Riverside answered all of my questions through emails and sent me the parasitoid wasps and infested olives. My science teacher gave me guidance, and my parents bought supplies. My sister helped me with public speaking.	