CALIFORNIA STATE SCIENCE FAIR
2007 PROJECT SUMMARY

Name(s)

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Project Number

S1907

Project Title

Comparison of Two Mantid Species Exhibiting Parthenogenesis: Iris oratoria and Brunneria borealis

Abstract

Objectives/Goals

The purpose of this project was to add the comparison of Brunneria borealis to an ongoing study of Iris oratoria and to test for the presence of pheromones. My hypothesis for this project was that pheromones still exist in Brunneria borealis. To test this hypothesis I performed behavioral assays with a Y-maze (a structure that allows the test subject to choose between two directions). Another objective was to further elucidate the survival mechanism Post-Annum Resumed Hatching. When I continue my project I will be pursuing the identification of pheromones in Iris oratoria and Brunneria borealis, and investigating parthenogenesis at the molecular level.

Methods/Materials

Mantid Rearing - Materials: various mantid lineages, their environments, food sources, heat lamp & full spectrum light, timers, thermometer. Methods: outside when warm, then add heat lamp inside when cooler, regular feeding, collect hatchlings.

Y-maze - Materials - separate environments for males and females to help prevent male scent overload, custom Y-maze to test mantids, air pump(air flow)full volume music, view shields, heat lamp & full spectrum light. Methods - place male in Y-maze (female in place) and note behavior.

Results

In the Y-maze, Iris oratoria males displayed two types of behavior: caution or flight. When tested with Iris oratoria females, males advanced with slow observant caution. When tested with a female Brunneria borealis, the males demonstrated aversion or flight behavior, getting as far away as possible. Post-Annum Resumed Hatching is confirmed by the offspring of 47 isolated 2004 females: 30 produced parthenogenetic offspring. Of those 30; 19 produced Post-Annum Resumed Hatching nymphs in 2006. Also the wild caught female from 2004 produced Post-Annum Resumed Hatching nymphs in 2006.

Conclusions/Discussion

The distinct, differential and repeated behavior of the male Iris oratoria indicated the presence of scent or pheromones in both species. The reaction of the males could only have been from scent because auditory and visual stimuli were neutralized. Iris oratoria and Brunneria borealis do not have similar pheromone composition, since Brunneria gives a clear WRONG message. Iris oratoria and Brunneria borealis have similarities, important to survival, which to date do not include Post-Annum Resumed Hatching.

Summary Statement

This study evaluates the survival strategies of the Mantid species Iris oratoria and Brunneria borealis, which include parthenogenesis and the presence of pheromones.

Help Received

Dr. David Yager - U of Maryland for advice. Dr. Richard Stouthamer - UCR for pheromone testing advice.