CALIFORNIA STATE SCIENCE FAIR
2006 PROJECT SUMMARY

Name(s)

John Michael L. Jones

Project Number

S1911

Project Title

Mantid 5: Iris oratoria Displays Two Novel Survival Strategies: Cryptic Parthenogenesis & Post-Annum Resumed Hatching

Abstract

Objectives/Goals

This project is a long term generational study of the introduced mantid species, Iris oratoria, which gave opportunity to observe offspring derived by parthenogenesis. Following the observance of 5 parthenogenic progeny from an isolated F1 captive-raised female, an experiment was performed which involved 47 normally eclosed (becoming an adult), isolated females from three lineages.An unexpected discovery was finding nymphs hatching from the isolated 2003/04 oothecae which had hatched the prior season, in 2004. This study evaluates ootheca (egg case) production, parthenogenic progeny, and resumed-hatching offspring from wild caught or captive raised groups of three lineages.

Methods/Materials

MANTID REARING - MATERIALS:various Iris oratoria 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.

OOTHECA HANDLING-Oothecae were placed in glass or plastic jars grouped by parent, nylon covered, secured with rubber bands. Stored outdoors in winter. 2003/04 oothecae were shelved in a non-insulated building.Hatchlings were counted and cleared periodically.

Results

Every 2004 female that produced more than four oothecae produced parthenogenic progeny. 35 isolated females produced 346 oothecae: and 30 of those females produced more than 853 parthenogenic offspring regardless of lineage or captive-raised generation. An unexpected phenomenon was the discovery of 2005 hatchlings in the stored ootheca containers from the 2004 hatching season. All 2003/04 females that produced oothecae prolifically had post-annum (2nd season) resumed hatching nymphs (2nd season values were from 5 to 25 % of the first season values); as represented by the wild caught control and two captive-raised lineages. Five females produced 410 post-annum, 2nd season offspring.

Conclusions/Discussion

Every prolific female reproduced parthenogenicly. The progeny of the wild caught control produced the highest numbers of parthenogenic offspring. The fact that those females had male siblings is evidence of a system waiting until needed, cryptic parthenogenesis. The fact that post-annum (2nd season) resumed hatching was seen in all three lineages indicates that the phenomenon is also a species-wide or pan-specific occurrence. These two novel survival strategies explain the successful spread of Iris oratoria in California.

Summary Statement

This study evaluates novel survival strategies observed in the mantid species, Iris oratoria, such as cryptic parthenogenesis and post-annum resumed hatching.

Help Received

Dr. David Yager - U of Maryland for advice and sending me Brunneria borealis.