



**CALIFORNIA STATE SCIENCE FAIR
2005 PROJECT SUMMARY**

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Project Title The Mantis Project Stage 4: Is Observed Parthenogenesis Cryptic or Induced?	
Abstract Objectives/Goals This is the 4th year of a study on the introduced mantid species <i>Iris oratoria</i> , the Mediterranean Mantid. Babies hatching from an isolated female indicate previously undocumented parthenogenesis. The goal of this study is the extraction of <i>Iris oratoria</i> DNA and the use of PCR technology to determine if the observed parthenogenesis is a cryptic event, or caused by an external factor such as a symbiotic bacteria. Also presented is data concerning a gender ratio distortion observed in the progeny of the non-isolated parthenogenic daughters; and egg laying data compares isolated progeny (wild caught or parthenogenic lineages) with wild caught control values. Methods/Materials MANTID REARING Materials: various <i>Iris oratoria</i> lineages, environments, food sources, heat lamp & full spectrum light, timers, thermometer. Methods: Record-source, hatch dates, final molt, and egg laying dates. 47 captive-raised, isolated females were kept to evaluate parthenogenesis. DNA PROCEDURES Materials: laboratory solutions & biochemicals, centrifuges, electrophoresis apparatus, micropipetters, etc. Methods: modified cricket phenol/chloroform & Chelex DNA Extraction protocols, PCR with D2 primers, flat bed 1% Agarose gel electrophoresis with UV photo record. Results The modified cricket DNA extraction protocol worked for mantid DNA extraction. The Chelex method also worked as determined by PCR evaluation. Control (wild caught), and Norco lineage babies hatched at comparable rates, whereas progeny from parthenogenic daughters hatched at the same, very- low-rate as their mothers. All progeny from (non-isolated) parthenogenic females that reached adulthood are female. The progeny from the control group (wild caught) had a significant number of adult males. Captive-raised isolated females (all lineages) lay egg cases at the same rate as the wild-caught controls. Conclusions/Discussion If all adult progeny from the parthenogenic lineage are females, a gender ratio distortion exists. If captive-raised isolated females lay eggs at the same rate as wild-caught, the stage is set for parthenogenic progeny. The DNA extraction protocols have provided workable DNA. Now optimized PCR technology can be used to determine the gender of non-surviving progeny, identical genetic make-up between generations, or if external factors are present, such as symbiotic bacterial DNA.	
Summary Statement This study evaluates aspects of parthenogenesis observed in the mantid species, <i>Iris oratoria</i> .	
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