CALIFORNIA STATE SCIENCE FAIR
2012 PROJECT SUMMARY

Name(s)

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Project Number

J2220

Project Title

What Is the Effect of Physa acuta Breeding Populations on Embryo Count and Maturation?

Abstract

Objectives/Goals

My objective for this project was to see if the difference in breeding populations would affect the Physa acuta snail reproduction and the development of the eggs laid. I hypothesized that the embryo count would be insignificant between the inbred and outbred populations. For the egg maturation, I hypothesized that the outbred population would be in advantage; I thought they would have the healthiest eggs in terms of days to hatch and complete development.

Methods/Materials

The inbred or outbred snails were only in the same bowl for a controlled mating period provided after isolation. The eggs that they laid were counted and weighed, and further observed for maturation. Egg development data was the weight taken in milligrams; a special scale was used.

Results

Standard deviation was calculated by percent difference in weight gain or loss. SD of Set 1 eggs of initial weight (in grams) for outbred was 0.0435, the inbred SD was 0.0384 (averages= 0.1095 g outbred, 0.08918 g inbred). Egg capsules laid after breeding resulted in 14 for outbred and 16 for inbred. Weight change SD was 0.057 for outbred and 0.075 for inbred (averages= 0.16% outbred, -2.57% inbred). Hatchling results showed that both populations had the same average of 54 hatchlings (SD= 24.65 inbred, 21.44 outbred). Days to hatch for both populations also resulted the same with an average of 14 days to hatch. Set 2 trials are currently in progress.

Conclusions/Discussion

My hypothesis for embryo count and days for hatching was proven correct because results showed an insignificant difference. Capsule weight however, did show a significant difference; the outbred egg capsules gained weight, while the inbred egg capsules lost weight. Research is fairly certain that mate choice is not affected by partner novelty but that sperm donation (quantity) may be affected (Koene, 2008). If we know that there are triggers that enable sperm differentiation, then we must accept that there could also be a mechanism for albumen differentiation in the female role of this hermaphroditic organism.

Summary Statement

Physa acuta breeding population affects embryo count and maturation.

Help Received

Dr. Joris Koene, Vrije University; The Netherlands