

**Project Title:**

Hormonal basis to mate choice behavior in a unisexual-bisexual mating system

**Investigator:** Caitlin Gabor

**Department:** Biology

**Project Summary:**

Steroid hormones play an important role in reproductive behavior. Steroid hormone levels might explain individual differences within species in the frequency of sexual behavior and species recognition. One system where hormones may affect species recognition is in the unisexual-bisexual species complex of mollies. Amazon mollies, *Poecilia formosa*, are a gynogenetic (all female) species that must mate with male sailfin mollies, *P. latipinna*, to initiate embryogenesis, but inheritance is maternal (male sailfin mollies are sexually parasitized by Amazon mollies). We examined if variation in male sailfin molly mate preference is affected by variation in steroid hormones. We tested individual male mating behavior and hormone levels with: (1) a female conspecific and (2) an Amazon molly. We measured levels of 11-Ketotestosterone (11-Kt) and Testosterone (T) in males and females before and after each 10-minute mating trial, and calculated the relative increase of each hormone (post-mating sample/pre-mating sample). We found a significant interaction between male 11-Kt hormone ratio and female species on thrusting: males that mated more with conspecifics had higher 11-Kt ratios. We also found a significant interaction between female T ratios and female species on male thrusting: males thrusting more towards conspecific females that had higher T ratios. Thus male and female sailfin molly hormone levels are important factors affecting male species recognition in this complex unisexual-bisexual mating system. When we tested this with the Atlantic mollies, the other parental species, did not show this KT response suggesting that Amazon mollies inherited this lack of ability to increase KT.

**Publications:**

C. R. Gabor & M. S. Grober. 2010. The role of male and female androgen in species recognition in a unisexual-bisexual mating complex. *Hormones and Behavior* 57:427-433.

**Presentations:**

Gabor, C. & Grober, M. 2009. The interaction of male and female androgens in male mate preference in a unisexual-bisexual mating complex. ANIMAL BEHAVIOR SOCIETY, Annual Meeting

2009 UNIVERSITY OF ALABAMA, TUSCALOOSA, Department of Biology, Evolutionary maintenance of a sexually parasitic livebearing fish: ultimate and proximate mechanisms.

2008 GEORGIA STATE UNIVERSITY, Department of Biology, Evolutionary maintenance of a sexually parasitic livebearing fish: behavioral and hormonal Perspectives.

**External Grants Applied:**

2010 Whitehall Foundation. Hormonal regulation of reproductive isolation in a unisexual-bisexual mating complex of live bearing fish \$75,000 in review.

2009 Sect 6. TPWD. The use of water-borne hormones to assess the impact of captivity on the stress response of the San Marcos salamander, *Eurycea nana*, \$31,100- in review.

2009 Advanced Research Projects “The maintenance of unisexuality: Behavioral and hormonal basis in a unisexual-bisexual complex” \$150000 preproposal not approved.

2009 NSF-IOB, submitted with Dr. Nice, and Aspbury, “The maintenance of unisexuality: Behavior, hormones, and genetic diversity in a unisexual-bisexual mating complex” \$435,438 – Not funded High fund (19% in this category which is the highest ranking)

2009 NSF-IOB, submitted with Dr. Nice, and Aspbury, “The maintenance of unisexuality: Behavior, hormones, and genetic diversity in a unisexual-bisexual mating complex” \$437,800 – not funded, medium high fund category

**External Grants Awarded:**

2010 NSF-IOB, submitted with Dr. Nice, and Aspbury, “The maintenance of unisexuality: Behavior, hormones, and genetic diversity in a unisexual-bisexual mating complex” \$449,000 – Approved for funding - amount pending...

**Student Number:** 3