Population ecology and sexual preferences in the mating complex of the unisexual Amazon molly *Poecilia formosa* (GIRARD, 1859)

Abstract:

The Amazon molly *Poecilia formosa* is a gynogenetic all-female ovo-viviparous fish. Gynogenesis is a special form of parthenogenesis; sperm is needed to trigger embryogenesis. Males do not contribute to the genome of ameiotically produced all-female offspring. In this unique mating system, asexually reproducing females have to rely on heterospecific matings with males of two closely related sexual host species, *Poecilia latipinna* and *Poecilia mexicana*. This asexual / sexual species complex is a unique model system to study the stability of coexistence of closely related bisexual and unisexual species.

In mixed shoals of a sexual host species and the sexual-parasite *P. formosa,* sperm donating males mate with conspecific sexual females and heterospecific asexual females. Obviously, males benefit from mating with conspecific females, whereas mating with the unisexual *P. formosa* does not increase a male's fitness. Therefore, males should discriminate between the two types of females.

Under perfect mate discrimination, *P. formosa* would disappear. On the other hand, asexually reproducing females theoretically have a faster population growth than sexually reproducing females because they do not have to incur the cost of producing males. This advantage of asexual reproduction would lead to increasingly high proportions of asexual *P. formosa* in mixed populations. By outcompeting its sexual host species, the sexual-parasite *P. formosa* would also disappear. The major question addressed in this thesis was to study the coexistence and stability of the asexual / sexual mating complex of *P. formosa* and which ecological and behavioural factors might contribute to the persistence of the complex.

Keywords:

coexistence, unisexual vertebrates, life-history, mate choice, sexual selection, game theory, frozen niche variation, turbidity, sensory ecology, mate-copying, parthenogenesis.