



Why do Selfing Fish Turn Male?

Aidan McLoughlin

College Park Scholars – Science & Global Change Program

Biology- Cell Biology & Genetics

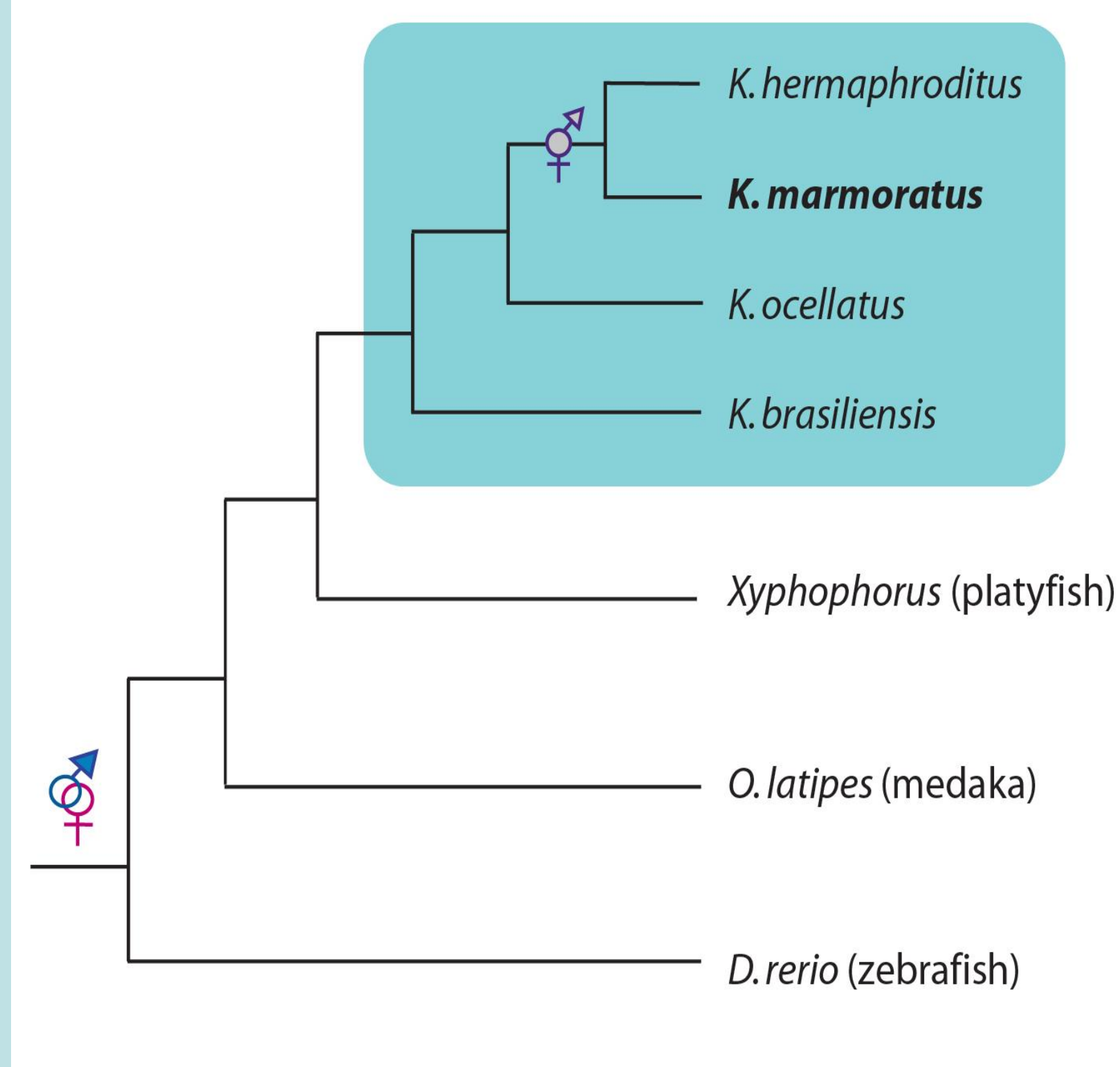
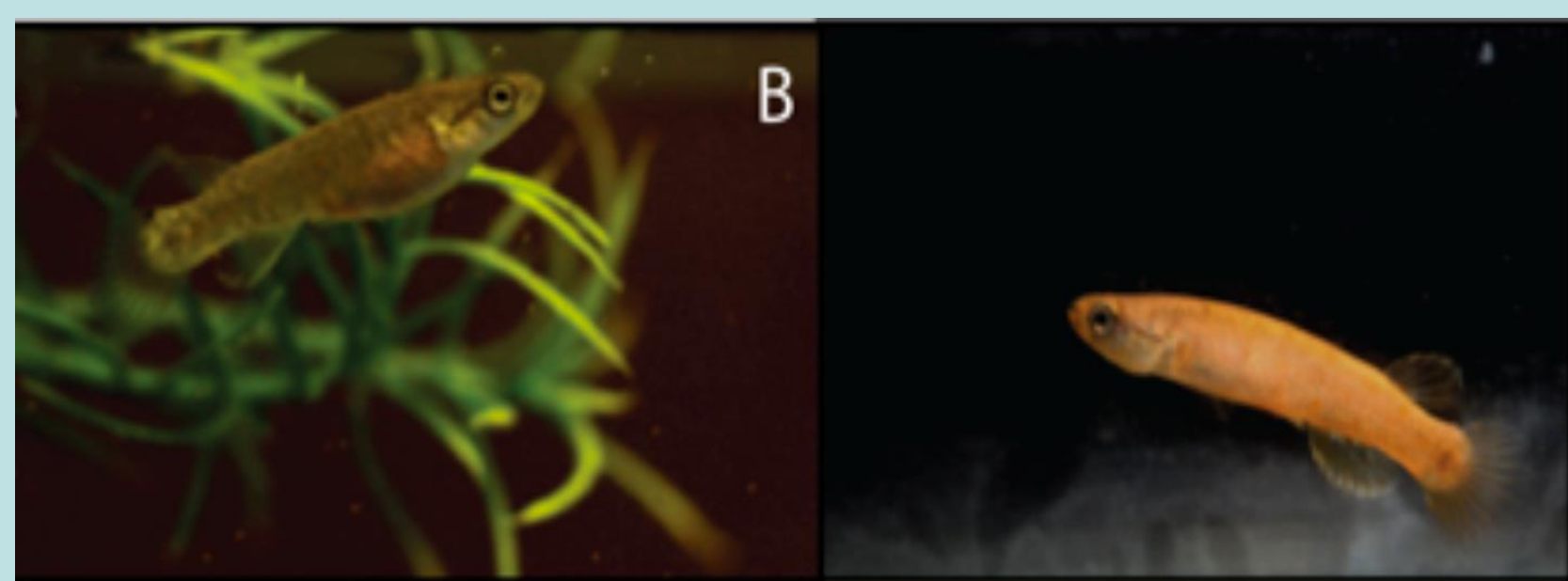
amclough@umd.edu

College Park Scholars Academic Showcase, May 1, 2020



Introduction

For my Practicum, I worked in Dr. Haag's lab in the UMD Biology department examining the sexual genetics of *Kryptolebias marmoratus* or "Kmar": a mostly selfing brown colored hermaphroditic species of killifish that will occasionally undergo physiological changes to become an orange male, capable of outcrossing with hermaphrodites



Top. Comparison of hermaphrodite and male Kmar.

Bottom. Phylogenetic tree representing evolution of Kmar and indicating changes in sex distribution from male/female to hermaphroditic.

Source: Dr. Eric Haag UMD Biology Department

Site Information:

Dr. Haag Fish Lab UMD Biology Department

1210 Biology-Psychology Building College Park, MD 20742

Supervisors: Dr. Eric Haag, John Ficklin

Goals: to explore the sexual genetics and physiologic pathways of Kmar fish.

Challenges: Life span of fish, relative lack of previous research on species.

Project and Methods:

I worked/am working on a double cross project with Dr. Haag to eventually determine the genetic basis for sex and sex change.

My responsibilities:

- general upkeep and recording of sex visible sex change
- new fish rearing
- genetic confirmation of cross success using PCR and gel chromatography.



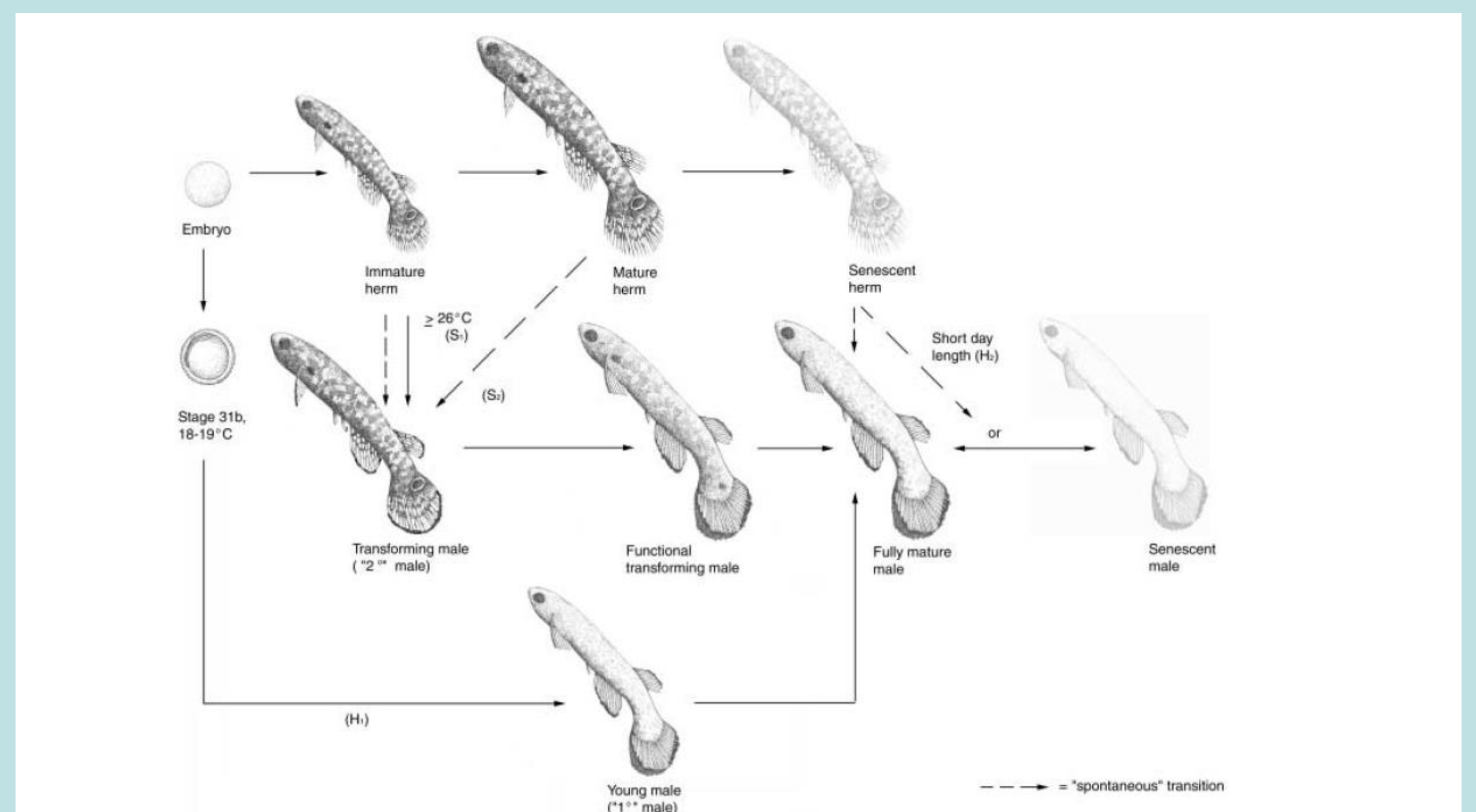
Top. Hermaphroditic specimen of Kmar indicated visually by prominent tail spot, dark brown color and lack of tail bar.

Bottom. Male specimen of Kmar indicated by orange color, lack of tail spot and presence of tail bar.

Source: Dr. Eric Haag UMD Biology Department

Results and Experience:

The current results seem to show that the crossing of strains was successful, and we are waiting for the 2nd generation to start undergoing sex change. Even though my project is not yet completed, I have learned a lot about how science is done on a day to day basis, while working in this lab, which is extremely helpful in informing my choices in career. While I worked there, I began to understand how to think analytically, how a lab runs and operates, how it is funded, and how it produces accurate data. I plan to continue working in this lab as a research assistant.



Flow chart of possible sex change pathways of Kmar.

Source: Turner, et al.2006.Evolution in 'maleness' and outcrossing in a population of self-fertilizing killifish, *Kryptolebias marmoratus*. *Evolutionary Ecology Research* 8: 1475-1486.



Acknowledgments:

I would like to thank Dr. Eric Haag and John Ficklin for their continued support and for many of the materials used in this poster. I would also like to thank Dr. Holtz & Dr. Merck for their expertise and knowledge, and my undergrad lab mates for showing me the way and their comradery.

