

# 10<sup>th</sup> Annual P.U.R.E. Symposium “Fall Session”

Thursday Nov 20, 2014, LSF 104, 3:34 – 5:00pm



## **3:45:5:00:**

**“First Report of a Microsporidian in the Freshwater Polychaete, *Manayunkia speciosa*.”**

Student: Emory Altman; Faculty Mentor: Dr. David Malakauskas

The Microsporidia are parasites that infect a wide variety of organisms. To date, most research on microsporidians has focused on those that infect terrestrial organisms. Therefore, research on Microsporidia that infect aquatic hosts furthers our understanding of the evolutionary history of these parasites. Previous work has found evidence of microsporidian infections in a population of *Manayunkia speciosa*, a freshwater polychaete found in western Lake Erie, MI. Our objectives were 1) to use a PCR-based assay to estimate prevalence of microsporidian infection in a population of *M. speciosa* from western Lake Erie and 2) to obtain ribosomal sequence data of the parasite to perform a phylogenetic analysis. Our preliminary findings showed 1 in 500 (0.2%) individuals were infected by the microsporidian. The DNA obtained most closely resembles that of the microsporidian genus *Nosema*. Previously, *Nosema* have only been identified from Arthropoda. Thus this represents the first identification of a putative *Nosema* species within a polychaete.

## **4:00 – 4:15pm:**

**“Methods for Collecting and Analyzing White-Crowned Manakin Displays from the Wildsumaco Biological Station.”**

Student: Morgan McDaniel; Faculty Mentor: Dr. Paul Zwiars

The purpose of our trip to Wildsumaco was to identify the leks of the white-crowned manakin and to monitor the behaviors of the males of that species. Certain behaviors have already been recorded, such as the turning-around display, the to-and-fro flights, and the frenzied flutter (Castro-Astor, et. al, 2007). Our group identified possible leks for the manikins and motion-detecting cameras were set up at display sites. The cameras recorded the birds for about two weeks, with videos being collected each day. The videos were analyzed for male interaction between present females, males, and juvenile males. It was concluded that most of the interactions during this time period were between males and juvenile males; these interactions are thought to be a result of competition on the lek.

## **4:15 – 4:30pm:**

**“Comparison of Displays Among White-Crowned Manakin Subspecies.”**

Student: Hunter Johnson; Faculty Mentor: Dr. Paul Zwiars

The purpose of this work is to examine the divergence of sexual displays in the white-crowned manakin (*Dixiphia pipra*). Currently, the white-crowned manakin is separated into thirteen separate subspecies. In each of these subspecies, researchers have observed different sexual displays. These differences in sexual displays may cause these subspecies to evolve separately until they become separate species. White-crowned manakins were observed at Wildsumaco Biological Station in Ecuador. To gather data, motion-sensor video cameras were placed at males' display sites. The behaviors observed in the videos will be compared with behaviors documented in other populations of the white-crowned manakin. Understanding differences in the sexual displays of these birds will contribute to novel research regarding the current classification of the species.

**4:30 – 4:45pm:**

**“Population Genetics Study of the Pine Barrens Tree Frog, *Hyla andersonii*.”**

Student: Sarah Rawlins and Autumn Lupotsky; Faculty Mentor: Dr. Paul Zwiers

The endangered pine barrens tree frog, *Hyla andersonii*, is found along the Gulf Coast and East Coast with 3 distinct populations in Florida, South Carolina/North Carolina border, and New Jersey. I am continuing a project started by Dr. Jeff Camper and Dr. Paul Zwiers, and contributed to by other undergraduates, with the goal of defining genetic variation within these populations using molecular techniques. Extracted DNA from each population was mixed with several primer pairs to amplify target gene regions by using PCR, followed by agarose gel electrophoresis to determine if the primer pairs were amplifying the desired gene region by comparing banding pattern to a known DNA ladder. All 22 primer pairs have amplified nuclear and mitochondrial DNA regions of appropriate length. DNA sequences will be obtained in order to verify the amplified gene region and eventually compare genetic diversity between the populations.

**4:45 – 5:00pm:**

**“Determining the Rate of *Ceratomyxa shasta* Infection in *Manayunkia speciosa*, a Freshwater Polychaete, of Western Lake Erie.”**

Student: Rob Snipes; Faculty Mentor: Dr. David Malakauskas

*Ceratomyxa shasta* is a myxosporean parasite that is known to infect salmonid fish and is responsible for a large percentage of Chinook salmon losses in the Pacific Northwest. *Manayunkia speciosa* is a freshwater polychaete found throughout the U.S. and is the necessary, intermediate host between *C. shasta* and salmonid fish. While both hosts, *M. speciosa* and Chinook salmon, are found in western Lake Erie, there is presently no evidence of the hazardous *C. shasta*. Determining the existence or absence of *C. shasta* in the Great Lakes will aid natural resource agencies to make more informed decisions about Chinook salmon management in the future. Our goal will be to screen 1000 random polychaete worms collected from western Lake Erie to estimate the prevalence of *C. shasta* infection. This will be done by DNA extraction of 200 pools of polychaete worms each containing 5 individual worms. The DNA from each pool will then be tested by standard polymerase chain reaction, using the best suited DNA primers, and the results will be viewed in agarose gels.

***The Department of Biology at FMU strongly encourages student participation in research activities. We offer many opportunities for undergraduates to assist in faculty research or develop their own independent research projects. Students can earn academic credit through Special Studies (BIOL 497) and Honors Independent Study.***

***If you are interested in learning more about P.U.R.E. or available research opportunities, please visit our website at: [http://people.fmarion.edu/tbarbeau/PURE\\_symposium.htm](http://people.fmarion.edu/tbarbeau/PURE_symposium.htm). You can also contact Dr. Barbeau ([tbarbeau@fmarion.edu](mailto:tbarbeau@fmarion.edu)), the coordinator of P.U.R.E., to answer any questions you might have and get you started on a research project!***