

# Welcome to the 11<sup>th</sup> Annual P.U.R.E. Symposium! *Spring Session*

Thursday Apr 21, 2016; LSF 102

Snacks 3:45, Talks begin at 4pm



**4:00 – 4:10pm:**

**“White-crowned Manakin (*Dixiphia pipra*) Vocalization Activity at Wildsumaco.”**

**Student: Devin Kellis; Faculty Mentor: Dr. Paul Zwiers**

White-crowned Manakins (*Pipra pipra*), best known for their elaborate courtship displays, are small birds of the Pipridae (Manakin) family located primarily in tropical forests. Previous research has shown that White-crowned Manakins exhibit a bimodal pattern of vocalization activity during mating season with highs occurring during the early morning and mid-afternoon that is consistent with other Manakin species in eastern Ecuador (Durães et al. 2011). To build on these findings, the current study aimed to examine patterns of vocalization activity of the White-crowned Manakin during a non-mating season at Wildsumaco Biological Station located on the eastern slopes of the Andes Mountains in Ecuador. Vocalization activity was obtained unhindered for approximately two weeks using a Song Meter SM3 bioacoustic recorder nearby a potential lek in which activity was confirmed via direct observation and audiovisual recording. Initial results replicate the bimodal pattern of White-crowned Manakin vocalization activity, but peaks in activity occurred earlier than in Durães et al. 2011 and with the greatest magnitude of vocalizations occurring in the early morning. These results have implications for analyses of vocal and behavioral variation that occur based on whether or not mating season is ongoing and to determine optimum times for behavioral observation.

**4:10 – 4:20pm:**

**“Isolation of microsatellite primers from *Manayunkia speciosa* using a modified PIMA approach.”**

**Student: Cameron Leyers; Faculty Mentor: Dr. David Malakauskas**

Microsatellites are short segments of repeated sequences of DNA that occur throughout organismal genomes, and are used to examine relatively recent evolutionary genetic changes in populations. The objective of our study is to develop microsatellite markers for *Manayunkia speciosa*, a freshwater polychaete, found in the Laurentian Great Lakes and coastal areas of the United States. This will be done by isolating DNA from *Manayunkia speciosa* and amplifying random sections of its genome for screening using RAPD PCR. The resultant amplicons will be inserted into the plasmids pUC19 and pGEM3-Z using sticky end and T/A cloning techniques. Positive clones will be isolated with blue-white selection. Diagnostic multiplex PCR will be used to screen putatively positive clones for the presence of microsatellite markers. Clones believed to contain microsatellite markers will be sent for sequencing, and data acquired will be used to design 12 to 15 microsatellite primer pairs. Our microsatellite primers will be used for future population genetic studies such as determining the geographic origin of the potentially exotic Lake Erie population of *M. speciosa*.

**4:20 – 4:30pm:**

**“Understanding the gene variation among three populations of Pine Barrens Tree Frogs (*Hyla andersonii*).”**

**Student: Autumn Lupotsky; Faculty Mentor: Dr. Paul Zwiers**

Our research is a phylogeographic study investigating phylogenetic relationships among three different populations of Pine Barrens Tree Frogs from New Jersey, South Carolina, and Florida. Pine Barrens Tree Frogs are considered threatened because of their sensitivity to changes in pH, and a study describing genetic differences among these populations would help inform future conservation measures. Previous work has identified some genetic variation, but is based on few genetic data. Our research focuses on including additional mitochondrial DNA, and we have identified three gene regions of importance. We performed PCR and gel electrophoresis to amplify these gene regions. Samples have been sent to the University of Georgia Genomics Facility and the Clemson Genomics Institute for sequencing. From our results, we will be able to estimate historical population size and distribution, as well as divergence times.

**4:30 – 4:40pm:**

**“Analyzing the Types and Quantities of Bacteria in Ice and Toilet Water on the FMU Campus.”**

**Students: Lucas Murley and Whitney Weber; Faculty Mentor: Dr. Jennifer Lyles**

A foodborne illness is described as an infection within the GI tract from food or beverages that contain harmful bacteria, parasites, or viruses. Prevalent in the United States, as well as the rest of the world, foodborne illnesses can have severe consequences resulting in hospitalization, or even death. Although improperly prepared meats are the most common source of foodborne illnesses, other sources should be considered. One item that many Americans consume on a daily basis that is often overlooked when studying foodborne illnesses is ice. A common misconception is that bacteria cannot survive at 0°C, which is the temperature of ice. These low temperatures may slow the growth of the bacteria, but they do not kill it. In this study, ice samples were obtained from various dining locations on the Francis Marion University campus and tested for bacterial contamination. As a comparison, toilet water—which is expected to be “dirty”—was also collected from the same locations and subjected to the same microbiological tests. Preliminary results indicate that many species of bacteria are present on the ice samples obtained from all dining locations tested. Ongoing analysis will confirm the identity of those species. In direct comparison, fewer species of bacteria were found in toilet water from the same locations.

**4:40 – 4:50pm:**

**“Molecular evidence of an undescribed *Ceratonova* sp. (Cnidaria: Myxosporea) in freshwater polychaete, *Manayunkia speciosa*, from western Lake Erie.”**

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

We used PCR to screen pooled individuals of the freshwater polychaete, *Manayunkia speciosa*, from western Lake Erie, Michigan for myxosporean parasites. Amplicons from positive PCRs were sequenced and showed *Ceratonova* in an estimated 1.2% (95% CI = 0.53%, 1.9%) of *M. speciosa* individuals. We sequenced 18S, ITS1, 5.8S, ITS2 and most of the 28S rDNA regions of this *Ceratonova* sp. and part of the protein-coding EF2 gene. Phylogenetic analyses of ribosomal and EF2 sequences showed Lake Erie *Ceratonova* are most similar to, but genetically distinct from, *C. shasta*. Marked interspecific polymorphism in all genes examined, including the ITS barcoding genes, along with geographic location suggests this is an undescribed *Ceratonova* species. This finding represents the third known parasite in the genus *Ceratonova*.

**4:50 – 5:00pm:**

**“Research Surveys on Wildlife Populations and Ecosystems with the S.C. Department of Natural Resources.”**

**Student: Ashley Watford; DNR Mentors: Mr. Jake Oates, Mr. Johnny Stowe, & Mrs. Brittany Waller**

During the summer of 2015, I was granted the wonderful opportunity of working as an intern with the Florence Department of Natural Resources (DNR) serving Region II in the Pee Dee area. During this twelve week internship, I took part in twenty wildlife studies, maintenance projects, and education outreach programs. Some of the wildlife studies involved population analyses of black bears, bats, deer, fish, turkeys, doves, and many others. South Carolina DNR (SCDNR) conducts multiple population studies and maintenance projects annually. The results are used to help them maintain properties such as Wildlife Management Areas (WMAs) and predict bag limits for the coming seasons. SCDNR works in partnership with many other groups such as Clemson University’s Extension Services and North Carolina’s Wildlife and Resources Commission. DNR biologists also aid many graduate students with their own research. Dozens of people believe DNR consists of game wardens only, but there is an entire section of DNR devoted to the behind the scenes biological concerns of our natural resources. There is much more work that goes into it than one might think. This presentation provides a peek into the world of DNR’s wildlife biologists.

The Biology Dept. 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), the coordinator of P.U.R.E., to answer any questions you might have and get you started on a research project!