

Welcome to The 14th Annual P.U.R.E. Symposium “Spring Session”!

Thursday Apr 18th, 2019, LSF 207

Snacks 3:45, Talks begin at 4:00pm



This Semester's Presentations and Speakers:

4:00 – 4:15pm:

“Comparing benthic microalgae communities’ biomass from two tidal creeks in the Winyah Bay Estuary System.”

Student: Connor Graham; Faculty Mentor: Dr. Ann Stoeckmann

Benthic Microalgae (BMA) have been used as bioindicators in Europe, Australia, and the West Coast of the United States and have been known to indicate water quality in marine estuaries. The first step in BMA bioindication on South Carolina's coast is identifying the microbial community structure. Understanding the community structure of the BMA is a two-part process including determining which species are present and their abundance. Our research focused on the abundance of the primary producers in the benthic community by measuring chlorophyll a. We collected sediment at two sites in the Winyah Bay-North Inlet Estuary system at the Belle Baruch Marine Laboratory during low tide in December 2018 and February 2019. At each site we sampled two subsites (1m from the water's edge and 10m further into the marsh). The sediment samples went through two main analyses. The first was extracting the chlorophyll a from the sediment samples and calculating the biomass. The second was analyzing sediment samples for environmental factors such as organic matter, moisture content and porewater salinity and pH. We found that biomass was higher at the subsites furthest from the estuary (10m) and was greater in February at both sites and the subsites. We found the same pattern for organic matter. Salinity was lower at the subsites (10m). We predict that the environmental factors will have a positive correlation with *chlorophyll a*.

4:15 – 4:30pm:

“Singing and lung function: A study on how singing affects lung function in students in a university level choir.”

Student: Zaira Reyesk; Faculty Mentors: Dr. Shayna Wrighten and Dr. Mary Frances Coleman

Singing has been used in some healthcare settings as a form of treatment; however, there is not a lot of research on the effects singing have on health. In particular, the effects of singing on lung function have been widely understudied. This study investigated the effects of singing on lung function in a population of students from a Chorus 101 class at Francis Marion University. There were 8 subjects who consented to participate in the study. The subjects participated by answering a background questionnaire on their health and previous singing experience. Following the questionnaire spirometric tests that measured their tidal volume, inspiratory reserve volume, expiratory reserve volume and forced vital capacity were performed. The objective was to see if singing improved lung function over time. We hypothesized that singing will improve lung function. The effects of singing on lung function needs further studying to explore the different possible outcomes on pulmonary health. More specifically, there needs to be more information on the possibility of singing being a form of treatment for pulmonary diseases.

4:30 – 4:45pm:

“Identifying the fungal symbiont of *Neottia bifolia*.”

Student: Andrew Westfall; Faculty Mentor: Dr. Jeremy Rentsch

Mutualism is an integral part for the survival of a multitude of species and is observed in at least ninety-five percent of angiosperms. The most common type of plant mutualism is an association with fungi known as arbuscular mycorrhizae. This association, of fungi in the plant roots, increases the plant root's surface area. This increased surface area allows the plant to obtain additional water and nutrients; in turn, the plant feeds the fungus. The family Orchidaceae heavily depends on this mutualism for germination and more, depending on the species. The Southern Twayblade, *Neottia bifolia*, is a rare orchid found in the United States and Canada. Because of its rarity and peculiar habitat, few scientific studies have been completed on it. Most orchids species documented so far have only had a mutualistic relationship with one species of fungus at a time. However, preliminary research on *N. bifolia* has failed to reveal the identity of this fungal symbiont conclusively. Preliminary research has been largely confined to DNA extraction, PCR, and gel electrophoresis. Normally, these methods would suffice in amplifying the locus for one species, but conducting these procedures revealed a larger than average band, implying the presence of multiple fungi in the genomic DNA extraction. Therefore, we propose to use cloning techniques with *Escherichia coli* to isolate and sequence each amplicon individually and identify the fungal symbiont; separating it from potential contaminants. Sequencing revealed that the DNA of the fungal symbiont belonged to clade B of the genus *Sebacina*, and the remaining DNA that was present belonged to *Neottia bifolia*.

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. 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!