

2017 Research Week Proposal

Title: Identification of microbiota associated with the ectosymbiotic community structure of the Appalachian brook crayfish (*Cambarus bartonii*)

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Abstract:

Microbes play a significant role in ecosystems, effecting the vital functions of other organisms, interspecies relationships, and population sizes. Based upon previous research (Skelton et al., 2016), it has been hypothesized that crayfish symbionts (branchiobdellidans) play a significant role in regulating the amount of microbiota associated with the host. A growing body of knowledge is known regarding both the condition of gill fouling and the annelid worm's symbiotic relationship with the crayfish (Skelton et al., 2016; Skelton et al., 2016). However, there is little to no evidence available concerning the bacteria's role in the process (Skelton et al., 2016). Microbial involvement in the symbiosis between crayfish and brachiobdellid worms has been underemphasized in previous studies. Therefore, this research project primarily seeks to identify the various species of bacteria in relation to crayfish. Two groups of *Cambarus bartonni* (with and without symbionts) were swabbed for bacteria, and the bacteria were cultured. After isolating microbial colonies, DNA extractions were performed with a MoBio DNA extraction kit. Primers were selected for the bacterial DNA, based off the 16S DNA of similar bacteria. Using polymerase chain reaction (PCR), identifiable segments of bacterial DNA were amplified, collected, and separated via gel electrophoresis. The DNA present in the bands was collected, and the sequences were obtained; these sequences enabled the identification of the various types of bacteria found on the carapaces and gills of *Cambarus bartonni*. The taxonomy of the bacteria from the crayfish carapace and stream environment identified at this point include: *Pseudomonas sp.*, *Ensifer sp.*, and *Paenibacillus sp.*, all with a 99% match.

References

Skelton, J., Doak, S., Leonard, M., Creed, R. P., and Brown, B. L. (2016). The rules for symbiont community assembly change along a mutualism-parasitism continuum. *Journal of Animal Ecology*, 85, 843-853.

Skelton, J., Geyer, K. M., Lennon, J. T., Creed, R. P., and Brown, B. L. (2016). Multi-scale ecological filters shape the crayfish microbiome. *Symbiosis*, 1-12.