2017 Research Week Proposal

Title: The effects of aquatic predator chemicals (crayfish kairomones) on the development of amphibians (*Lithobates sylvatica*)

Presentation Type: Poster

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Abstract:

Antipredator behavior is commonly observed throughout the animal kingdom, and these behaviors can be critical to the life history of various prey species (Nunes et al., 2013). Larval aquatic prey have been widely studied in relation to the effects of predators. However, few studies have focused upon the effects of varying predator density on Wood Frog (*Lithobates sylvatica*) larval development (Mathis, Murray, & Hickman, 2003; Schoeppner & Relyea, 2009). In this study, the Appalachian Brook Crayfish (*Cambarus bartonii*) is a caged predator in the presence of developing larval Wood Frogs (*Lithobates sylvatica*). This interaction provides an opportunity to study the dynamics of predator-prey relationships within aquatic systems (Mathis et al., 2003). Crayfish presence can be detected by the larval amphibians with chemoreceptors that cover amphibian skin. The ability of prey to detect kariomones is thought to be an innate predator detection mechanism, rather than an acquired mechanism (Batabyal, Gosavi, & Gramapurohit, 2014; Woodley, 2014). In addition, the presence of kairomones throughout amphibian development is thought to increase the rate of metamorphosis while reducing the size of the amphibians at their various life stages (Steiner & Buskirk, 2009). It has been speculated that predators do not continuously produce kariomones, instead producing kariomones only when consuming their prey, as this constant production would be costly and potentially reduce the amount of prey residing near them (Schoeppner & Relyea, 2009). The predators in this study are fed two shrimp pellets once per week. The goal of this study is to assess the potential effects of varying levels of predatory kairomones on larval amphibian development. If predator density is directly related to the concentration of predatory kairomones, then variation in metamorphosis size and rate should be observable between control and experimental groups. Measurements will be taken after metamorphosis on hind limb length, hind limb width, body length, body width, and mass following the methods of Relyea (2001).

References:

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