INFLUENCE OF LONG-TERM ENVIRONMENTAL CONTAMINATION AND PARENTAL BODY BURDEN ON METAL TOLERANCE IN SOUTHERN TOADS (*ANAXYRUS TERRESTRIS*)

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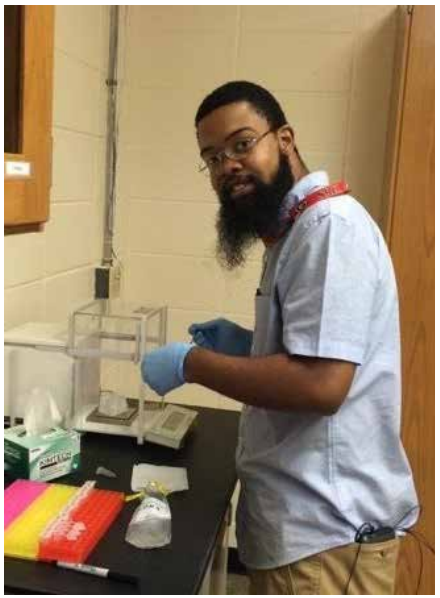
Amphibian species and populations exhibit varying levels of tolerance to heavy metals commonly found in the environment. Heavy metals are common byproducts of agricultural, urban and industrial practices and do not degrade in the environment, producing environments where multi-generational exposure can occur. One of the leading causes of metal contamination is energy production, particularly coal combustion. The Savannah River Site used several coal combustion power plants for energy production and supports >40 species of amphibians, offering an ideal location to examine the effects of heavy metals on amphibians. The ash plume wetland has been impacted by coal combustion waste for decades, providing an excellent opportunity to investigate the impacts of multi-generational metal exposure on amphibian communities inhabiting the area. Metal exposure can result in increased mortality and reduced growth rates in amphibians, yet uncertainty still persists regarding the long-term impacts of exposure to these contaminants and the potential for adaptation. We investigated how parental body burdens of metals affect offspring survivorship, and if metal exposure of parental populations affects offspring metal tolerance. We collected adult southern toads (*Anaxyrus terrestris*) from a contaminated and three reference wetlands, bred them in the lab, and used the resulting larvae in a time-to-death assay using copper as a proxy to assess heavy metal tolerance. We found offspring from parents collected at the ash plume wetlands had half the risk of mortality in response to Cu over the exposure period and time-to-death was significantly prolonged. Further, we found no evidence that parental or embryo metal body burdens negatively impacted survivorship of larvae exposed to metals early in life. These results suggest that multigenerational exposure to heavy metals in the environment can result in those populations developing elevated tolerance to heavy metals, above and beyond negative effects associated with the maternal transfer of metals to offspring.



Deonte weighing samples.