

## BIOACCUMULATION OF HEAVY METAL AND METALLOID IN *CRASSOSTREA VIRGINICA* IN THE GULF OF MEXICO

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**Abstract:** Metal and metalloid including arsenic (As) and zinc (Zn) are naturally occurring in estuarine ecosystems. There remains an insufficient amount of research data on the bioaccumulation and detoxification of As and Zn on the eastern oyster, *Crassostrea virginica*, particularly in the context of anthropogenic loads from water pollution such as industrial offshore oil spills. Working in the Grand Bay NERR located in the northern Gulf of Mexico, we aim to assess the following regarding As and Zn exposure in oysters: 1) determine the concentrations of As and Zn in sediments and soft tissue; 2) elucidate the enzymatic activity following laboratory treatments to As and Zn; 3) perform a sequential extraction for arsenic fractionation in sediments. Preliminary ICP-MS analyses indicate a differential accumulation of Zn and As in tissues, including muscle, gill, heart and kidney that may translate into respective differences of metal detoxification. Results revealed that oysters' gill and digestive gland are the primary sites of bioaccumulation. Heavy metal exposure increased lipid peroxidation within the cell membrane to induce oxidative stress. Our modified method of extraction results can be a useful tool to better understand the speciation of arsenic in sediments. We are exploring the differential modes of As and Zn bioaccumulation in oysters on a tissue specific basis, to further resolve the relationship between metal bioaccumulation and metal toxicity. Researchers should monitor the ecological health of estuaries in order to provide recommendations in maintaining a healthy ecosystem.

**Keywords:** arsenic, zinc, lipid peroxidation