

Assessment of metal contamination levels and stress responses of endangered sea turtles of São Tomé and Príncipe

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São Tomé Island harbors important sea turtle nesting and feeding sites. However, insufficient enforcement of environmental laws to avoid illegal take of nesting females and eggs, associated with a great lack of knowledge about how these species interact with their environment and how human activities impact their survival in the region, constitute significant challenges for sea turtle conservation. Through current local conservation projects, some information on genetics and nutrition of sea turtle populations is being unveiled but very little is known about how ocean pollution is impacting these turtles. The main objective of this study was to assess the metal concentrations accumulated by one species of S. Tomé sea turtles (*Chelonia mydas*) and infer about possible impacts of such contamination on their general stress responses and health status. More specifically, the final goal was to find correlations between metal concentrations and the expression of key genes involved in detoxification/sequestration and metal transport, antioxidant responses and oxidative stress, immunological responses, mitochondrial respiratory and energy production, among others, which could be indicative of these organisms health and future viability. To achieve these goals, nesting female turtles were sampled for blood, immediately after egg laying in their well-documented spawning sites in S. Tomé. Blood samples were withdrawn from the external jugular vein, a portion was stored in EDTA treated tubes at -20°C until analysis of metal concentrations, and another portion was stored in RNAlater at -20°C until RNA extraction and gene expression analysis using quantitative real-time PCR (qPCR). Additionally, body mass and carapace length were also recorded, along with all information regarding egg spawning and its success. Results showed significant correlations between expression of some genes and metal contaminant levels, pinpointing some candidate genes to be used as biomarkers of interest for biomonitoring campaigns, which worrying function highlights the need for a close follow-up of these organisms. This study represents the first attempt to address pollutant levels and the biological impairments of such stressors in these turtle species nesting in S. Tomé which, given their classification as endangered species (IUCN red list), is of paramount importance to contribute for conservation measures and management.

Keywords: Blood responses, Gene Expression, Metals, Ocean contamination, Turtles

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