Arsenate Toxicity and Hemoglobin Response in *Daphnia magna*

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Arsenate toxicity is a prevalent problem in freshwater ecosystems primarily due to industrial metal work and neglected or no remediation efforts. The pollutant affects many biochemical processes within organisms in these habitats, and can decrease hematological components like hemoglobin in various fish. *Daphnia magna* are a species of freshwater zooplankton: *Daphnia*. The hemoglobin synthesis of *D. magna* has been understood to be induced by hypoxic environments for the organism, allowing for increased aerobic activity. In this study, the expression of two hemoglobin genes of *Daphnia magna* was examined following acute exposure (3hr, 24hr) to arsenate. The *Daphnia* were exposed to non-lethal concentrations (0.50, and 5.00 µg/ml) of arsenate and compared to a control population with no toxicity. The genes examined were 2 of 4 *Daphnia* hemoglobin genes: Dhb1, and Dhb2. The only statistically significant expression changes occurred in the Dhb2 genes, increasing expression in both concentrations of arsenate, but only at 0.5 µg/ml in the 3-hour exposure, and 5.00 µg/ml during the 24-hour. Outside of these conditions for Dhb2 and both time points and concentrations in Dhb1, expression decreased relative to control providing findings with unclear significance. Dhb2 may be an interesting focus for future research regarding eco-toxicity and its role in regulating hemoglobin production.