The Effects of Arsenate on the Hemoglobin Production and Mortality Rates of Daphnia Magna

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BACKGROUND

Significance:
This project looked at three different concentrations of arsenate representing the Puget Sound, and examined how these concentrations affected the hemoglobin gene expression in Daphnia magna.

Objective:
We looked at how D. Magna hemoglobin gene expression responded to various concentrations of arsenate in order to apply this knowledge to the Puget Sound.

Hypothesis:
D. Magna exposed to higher levels of arsenate would not only experience a higher lethality rate, but they would upregulate hemoglobin gene expression.

METHODS

RNA Extraction
RNA was extracted from the D. Magna following 3-hour and 24-hour exposures to As V, and then measured for concentration (Figure 4) and purity (Figure 5).

cDNA Synthesis
We prepared the three hemoglobin genes, dhb1, dhb2, dhb3, along with beta actin and GAPDH to perform gel electrophoresis and collect our final data on hemoglobin gene expression (Figures 1-3).

FUTURE WORKS

As of now, the gels have yet to be analyzed using densitometry using ImageJ software. Following our findings on hemoglobin concentration, in the future we can see if other forms of arsenic such as As III have the same effects as As V or if there’s a significant difference.

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REFERENCES