

Assessment of Sodium Perchlorate as Disrupter of Environmental Sex Determination in *Daphnia Magna*

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Abstract

Environmental sex determination (ESD) is described as the environmental trigger that creates an alternative genetic signal within the organism that regulates the sex determining gene. *Daphnia magna* is an aquatic microcrustacean that undergoes ESD and is a model organism in ecotoxicology. *D. magna* have two forms of Doublesex gene (Dsx). Dsx 1 is responsible for male trait development when it is expressed ESD, while Dsx 2 expression is not associated with sex-specific phenotypic changes. The focus of this study was to evaluate the effects that sodium perchlorate on Dsx gene expression in *D. magna*. Sodium perchlorate is a known endocrine disruptor in vertebrates and is becoming more prevalent in our water and ecosystem. We hypothesized that the *D. magna* will increase the expression of Dsx1 gene, and both α & β variants, when acutely (2, 24hrs) exposed to concentrations of perchlorate (0 mg/L, 10 mg/L and 100 mg/L). We evaluated gene expression using a semi-quantitative reverse transcriptase PCR. Densitometry analyses revealed a significant down regulation of the Dsx 1 gene in the 2-Hour 100 mg/L concentration. No other statistically significant effects were detected. Further research is needed to fully elucidate the potential effects of sodium perchlorate on the *D. magna* endocrine system.