Bending Genders - The Effects of Estradiol on Artemia franciscana from Great Salt Lake, Utah

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Artemia Franciscana (brine shrimp) are an integral part of the Great Salt Lake ecosystem and are impacted by variations in salinity and chemicals in their environment. Endocrine disruption has been observed in fish that live in waters that receive significant inputs of wastewater effluents. Even in trace amounts, endocrine disruptors, can have adverse effects on humans and aquatic ecosystems. The purpose of this project is to determine the effects of endocrine disruptors, specifically estrogen, on Artemia Franciscana. Six replicate populations of greater than 30 cysts were placed in 0, 2.5, 5, 7.5, 10, and 12.5 ng/L concentrations of estradiol, hatched, and grown to adult stage. One to three replicates were randomly selected for enumeration and determination of sex. Adults were separated from juveniles and the number of males and females determined by microscopic examination. Statistical analysis of the populations included a $?^2$-test of homogeneity and a linear regression T-test to determine if varying concentrations of estradiol impacted the ratio of males and females in the population. Results from the $?^2$-test of homogeneity revealed that differences in the population ratios of females to males was not statistically significant, with $?^2=1.7195$ and a p-value of 0.8864. The results of this study show that a single endocrine disruptor may not be the controlling factor in observed endocrine disruption effects in fish. The combination of multiple endocrine disruptors commonly found in wastewater may have an additive or multiplicative effect and require additional study involving T2 populations and additional forms of estrogenic hormones.

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