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Agonistic and Cellular Analysis of Atrazine-Induced Hormone Imbalance

The purpose of this research is to examine the hormone disrupting effects of atrazine in crayfish. Two hypotheses were developed prior to research. The first stated that atrazine would have a significant hormone disrupting effect on the crayfish and as a result the crayfish will be less aggressive and become less dominant. A second hypothesis was formulated that stated that a cellular morphometric analysis of the spermatocytes within the reproductive tract will show the visible and quantifiable effects that atrazine has on Procambarus simulans. Crayfish were exposed to 30 ppb, 300 ppb, and 3000 ppb concentrations of atrazine and then tested for aggression every week for three weeks after exposure. After aggression was quantified, the reproductive tract was removed from each crayfish. The tract was sectioned and stained with a hematoxylin and eosin stain. The spermatocyte diameter was then measured with a Paxit microscope camera. The results showed that aggression over the five week period decreased after exposure to atrazine. The morphometric analysis showed that spermatocyte diameter decreased after exposure to atrazine. In the control reproductive tract, spermatocyte diameter decreased as tissue deepened in the tract. In the exposed crayfish, the superficial spermatocytes were smaller than the deeper tissue. Both hypotheses that were formed prior to investigation were supported. Aggression decreased as the crayfish became less dominant, and the spermatocyte cell size decreased in the reproductive tract after exposure to the crayfish. Possible error could have resulted from improper reading of agonistic behavior resulting in skewed aggression point values.