Abstract

When products containing estrogen (Figure 1) such as birth control are taken, the estrogen flushes out of the body in urine and is not filtered by most processes. To see if this could have an effect on Wetland life, increasing concentrations of a dissolved estradiol solution were administered to different groups of *Simocephalus serrulatus* to analyze reproductive success. At the end of a 10-day period, the total number of *Simocephalus serrulatus* found in each group was counted to measure reproductive success, with a higher count being indicative of more success. The results indicate the reproductive success among *Simocephalus serrulatus* decreases as estradiol levels in the water increase.

![Figure 1: 17α-Ethynylestradiol](Resource: http://www.lookchem.com/cas-5252-76-6.html)

Introduction

This hypothesis tests 17α-Ethynylestradiol’s reduction of the success of organismal reproduction is important because, if it is correct, it is necessary to begin monitoring the levels of this chemical in our sewage(Dussault et al. 2008). If neglected, there is a possibility of altering an entire species (Clubbs 2005). The design consisted of checking reproductive rates at various chemical concentrations in freshwater. The expected outcome was that there would be a decrease in the numbers of offspring as the concentration of Ethynylestradiol increased in the freshwater stock.

![Figure 2](Resource:)

Materials and Methods

Waco Wetland water was filtered with 120 micron mesh to eliminate unwanted zooplankton. 12 small foil containers were used to hold the water, estrogen, and daphnia. A stock solution of 17α-Ethynylestradiol was created with a concentration of 125mcg/mL. This stock solution was added to the containers at levels to form three test groups of different concentration, plus a control which contained no stock solution. The test group concentrations were 0.01250mcg/200mL, 0.05mcg/200mL, and 0.20 mcg/200mL. Each concentration and control was in 3 of the containers. Each container was filled with 200mL of wetland’s water and 5 *S. serrulatus*. *Simocephalus serrulatus* were left alone to attempt to reproduce for 10 days. At the end of this period *S. serrulatus* were captured in pipettes and counted. Estrogen solution was then discarded into an estrogen waste container.

![Figure 3](Resource:)

Results

![Figure 3: Simocephalus serrulatus Present After 10-Day Period of Exposure to Various Concentrations of Ethynylestradiol](Resource:)

Conclusions and Discussion

According to Figure 3, the results demonstrate a significant difference in reproductive success of the *S. serrulatus*. All variables were controlled for except for the level of estradiol present in the different groups. As the concentrations increased it seemed that there was direct correlation with the amount of estradiol present in the different groups. Due to the starting stock of five *S. serrulatus* in each container, any remaining number larger than five after the ten day period shows a success in reproduction. In the control containers the highest amount of offspring were observed at just about three additional *S. serrulatus* to the original stock. Conversely, the 0.200 mcg/200 mL container contained exactly five *S. serrulatus* producing no additional organisms. Due to these findings, a reasonable conclusion can be made that an increase of 17α-Ethynylestradiol in the controlled environment of *S. serrulatus* can hinder their reproduction rates as the concentration increases(Mathissen 2008 & Clubbs 2005).

![Figure 2](Resource:)

Literature Cited


Acknowledgments

A Special Thanks to: Dr. Marty Harvill, Baylor Biology Department, Ms. Nora Shell, Lake Waco Wetlands, Carlson Hoffman, Kelly Caldwell, The College of Arts and Sciences and the Department of Biology.