Mosquito Fish Ethinylestradiol and Testosterone Exposure Experiment

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Goals

- Learn the effects of Estrogen and Testosterone
- Replicate accidental spills that can occur in the environment
- Pave the way for future studies
- Give back to mother nature
Introduction

- Scientific name Gambusia Affinis
- Mosquitofish are viviparous
- Live in freshwater systems
- Diets are very diverse but mainly include Mosquito larva
- Behavior is aggressive towards Medaka (Japanese fish)
- Morphological changes

Figure 1 Female mosquitofish top left, and male mosquitofish bottom right
Procedure-3 Day Behavioral

- Control, 50 ng/L T2, 50 ng/L EE2
- Fed 0.5 mL brine shrimp daily
- 1 female mosquitofish per replicate
- All pregnant
- Controlled light conditions
- Measure weights & standard length of body
- Euthanized with MS22

Figure 2: Standard length measured from tip of mouth to just before the tail fin

Figure 3: Housing Station
Behavior Recording

- Timed interaction for 5 minutes each
- Female least killifish
Results
\[ P = 0.038 \]
\[ p = 0.028 \]
Procedure-7 Day Morphological

- Control, 5 ng/L T2 & EE2, 50 ng/L T2 and EE2
- Fed 0.5 mL brine shrimp daily
- 1 female mosquitofish per replicate
- Some pregnant, some not pregnant
- Controlled light conditions
- Measure length of anal fins, weights, & standard length
Results

![Graph showing standard lengths (mm) for different concentrations.](image)

- Control
- T2 50 ng/L
- EE2 50 ng/L
- EE2 5 ng/L
- T2 5 ng/L
<table>
<thead>
<tr>
<th>Behavioral</th>
<th>Morphological</th>
</tr>
</thead>
<tbody>
<tr>
<td>● Decrease in standard lengths</td>
<td>● Decrease in standard lengths</td>
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<tr>
<td>● Exposure to T2 at 50 ng/L induced</td>
<td></td>
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<tr>
<td>birth</td>
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<td>● Estrogen exposure caused</td>
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<tr>
<td>increased aggression</td>
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Conclusion

- EE2 and T2 may have devastating effects on mosquitofish populations
- As EE2 and T2 increase, the body length and anal fin size decrease
- High levels of T2 induce early birth in pregnant females

Future Research

- Effects of T2 on pregnant females
- Longer studies for behavior
- Histology
- Formulate models to determine how organism level effects translate into population level impacts
Citations

