Introduction

Guppies have a promiscuous mating system where multiple males mate with multiple females with no social associations (Norwell and Valone 2014). The guppy males’ fitness will depend on how many females he can mate with. The female guppy fitness, however, will depend on the quality of the male she mates with. Because of this the males will be selected for traits that the females find attractive, such as coloration and courtship display. In this study we tested whether female guppies preferred males with split tails or males with normal tails.

Hypotheses and Predictions

- H₁: Female guppies will prefer the whole tail males.
- P₁: Female will spend more time and favor the whole tail male.
- H₂: Female guppies will prefer the split tail males who will play a courtship display.
- P₂: Female guppies will spend more time and favor the split tail male.
- H₀: Female guppies don’t have a preference.

Methods

- Fish: Ø 3 split tail males were used
  Ø whole tail males were switched 31 times
  Ø 63 females were randomly selected
- Each trial period was 7 minutes
- Every 10 seconds we recorded which part of the middle section the female was in—right, left, or middle
- For the data to be significant, we decided that the female had to be on a side at least three more times than the other side during a trial.
- Results were considered inconclusive if:
  Ø The female was in neutral zone the majority of the time
  Ø There was a difference of two or less between the zones the female was in at the end of the trial
- The females’ location was recorded 2606 times.
  Ø Each recording counted every 10 seconds.
  Ø The large sample size cancels out the effects of random swimming by the female.

Results

- Figure 1: This data shows the percentage of time the females spent in each section. Her location was marked every 10 seconds, 2606 times. The section she was marked in was counted as though she spent the entire 10 seconds in that section. Due to the large numbers of trials, the effects of this assumption are eliminated.

- Figure 2: This data shows the overall preferences of the females. A male was counted as preferred if they had at least three more time marks than the other male at the end of the trial. If the female was in the middle of her section the most, or if she spent approximately the same amount of time on both sides, then that trial was determined to be inconclusive. There were a total of 63 trials performed.

Discussion

- We noticed the split tail males spent more time performing a courtship display.
- We noticed the full tail males did not spend as much time performing.
- The females were often spotted in the middle, making her mate choice inconclusive.

In this experiment there was inconclusive evidence that the female preferred the split tail male or the full tail male. More experiments would need to be conducted to determine a relationship between tail type’s effect on female mate choice.

References