Guppy's Sixth Sense

Effects of Predator Diet Based Chemical Cues on Inspection Behaviors in Guppies

Mary Cho
Reed College Bio 342 Fall 2015

Design

Guppy

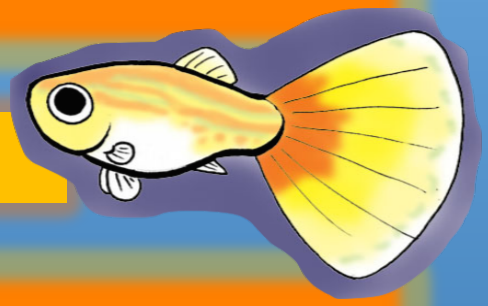
Poecilia reticulata: 16 males and 16 females

Predator

Astatotilapia burtoni: 3 wild-type males

Diets

1-2mL Guppy, Tetra, or Pellet



Main Findings

- Guppies inspect more frequently when exposed to a guppy-fed predator than to a non guppy-fed predator
- Guppies exhibit attack cone avoidance regardless of predator diet
- Males show greater attack cone avoidance when exposed to a guppy-fed predator
- Females show greater attack cone avoidance when exposed to a tetra-fed predator

Methods

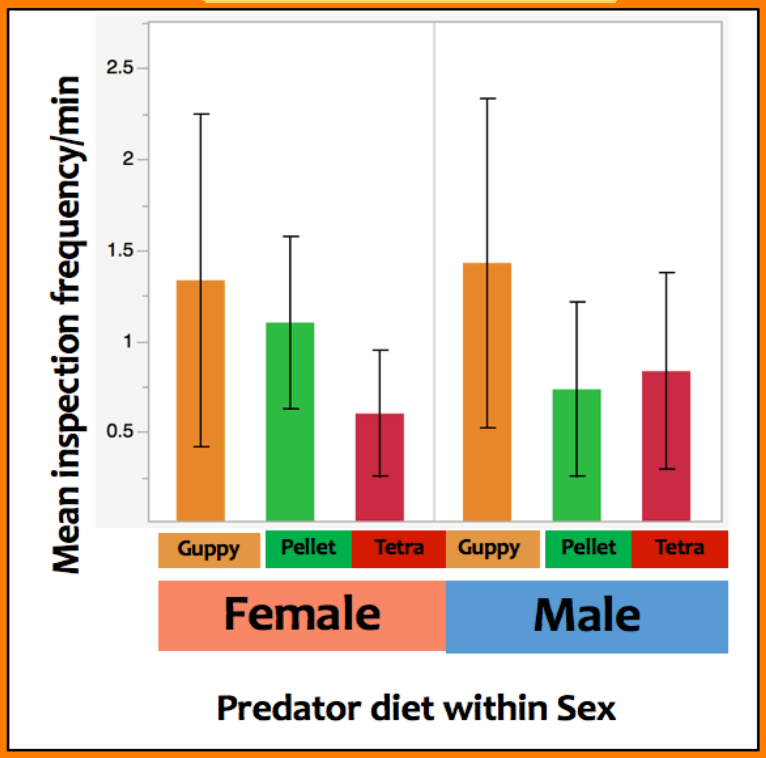
Behaviors measured

Inspection
- Frequency
- Location
- Size

- Scan sampling
- 30 min trials with 1 min intervals

Results

Inspection rates



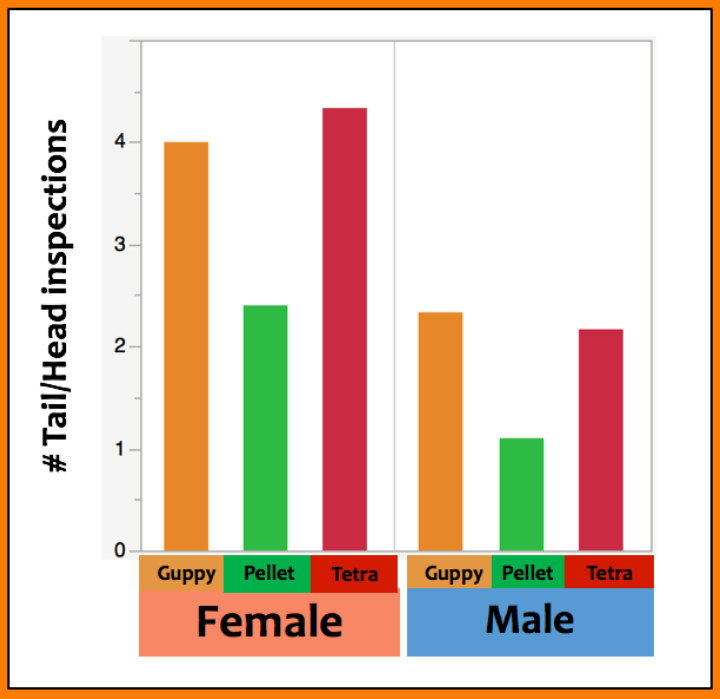
- Guppies exposed to guppy-fed cichlids had the highest inspection rate

- **Males** 1.43 insp/min

- **Females** 1.33 insp/min

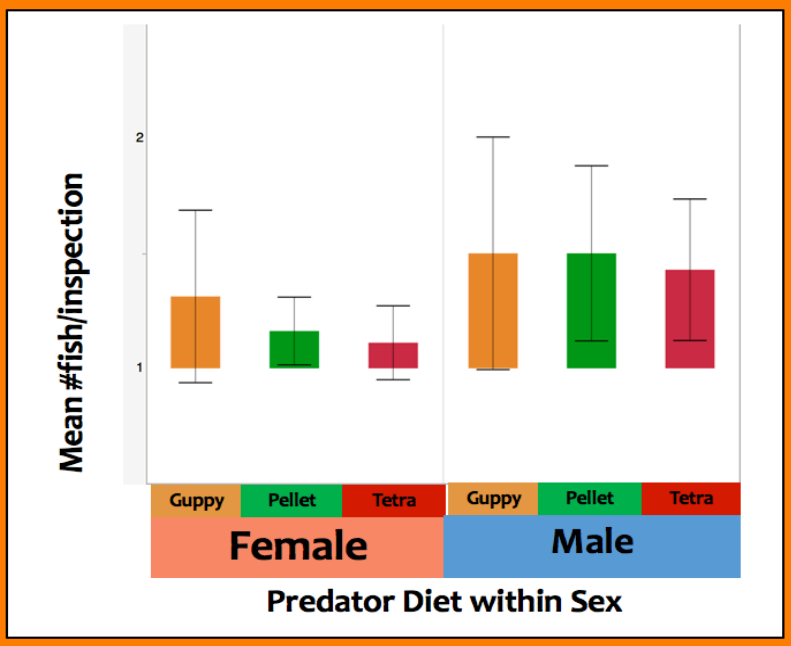
Results

Tail/Head Inspections



- All guppies had more tail than head inspections
- More tail inspections by males when exposed to guppy-fed cichlids

Inspection size



- Female guppies had a larger mean inspection size when exposed to guppy-fed cichlid than to non guppy-fed cichlid
- Indistinguishable for males

Conclusion

Guppies respond differentially to cichlids on different diets but these differences are inconsistent between the sexes.

Future Directions

- Replicate with larger sample size and more controlled conditions
- Measure stress-related hormone levels to study if there is a difference across treatments
- Replicate with different animal models to assess generalizability

References

Brown, G.E. and E.M. Schwarzbauer (2001) Chemical Predator Inspection and Attack Cone Avoidance in a Characin Fish: The Effects of Predator Diet. Behaviour 138(6):727-739.

Brown, G.E. and J.L. Golub (2001) Attack Cone Avoidance during Predator Inspection Visits by Wild Finescale Dace (Phoxinus neogaeus): The Effects of Predator Diet. J Chem Ecol 27:1657-1666.

Godin, J.J. and S.A. Davis (1995) Who Dares, Benefits: Predator Approach Behaviour in the Guppy (Poecilia reticulata) Deters Predator Pursuit. R. Soc 259:193-200.

Acknowledgements

Thank you, Suzy Renn, Kristine Hayes, Greta Glover, and Mason Kennon for all your help and support!