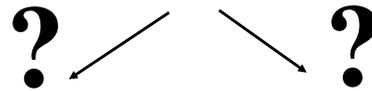


## Introduction & Hypotheses

- Animals with sexually-selected carotenoid signals should evolve preferences for eating plants
- Painted turtles have stripes colored by carotenoids (Steffen et. al. 2015)
- Painted turtles eat a wide variety of aquatic plants but also eat animals, including fish.
- Ernst (1971): Painted turtles might experience a dietary shift
  - juvenile turtles eat fish & are carnivorous
  - adults begin to eat plants and become omnivorous.
- We hypothesized: turtles prefer plants because they maintain sexually selected colors.
- We also hypothesized: juvenile turtles eat mostly fish, but adult turtles eat combination of aquatic plants and fish

## Methods & Materials

- Cut 3.5 cm<sup>2</sup> pieces of
  - Water lily (*Nymphaeaceae*)
  - Waterweed (*Anacharis*)
  - Arrowhead (*Sagittaria*)
  - Cattail (*Typha*) stem
- Cut 3.5 cm<sup>2</sup> pieces of juvenile Bluegill sunfish (*Lepomis macrochirus*)
- Presented turtles all 5 items at the same time
- Observed turtles for 5 minutes.
- Used independent sample T-test in SPSS to analyze differences in number and type of food item eaten



## Results

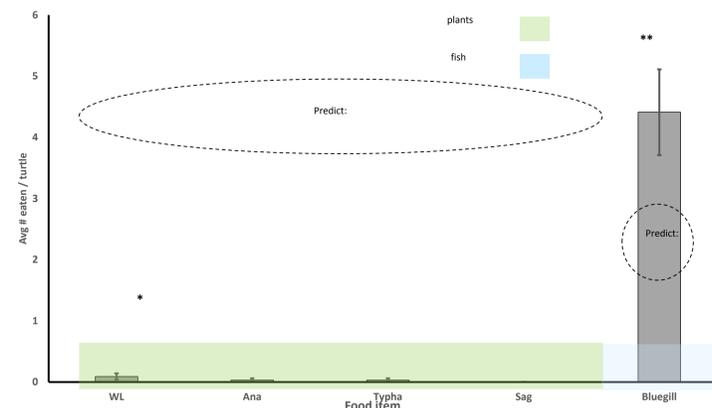


Figure 1. Lack of preference for plants. Error bars are S.E. \* =  $P < 0.05$ , \*\* =  $P < 0.001$ .

**Predict:** Turtles eat significantly more native aquatic plants than Bluegill fish

**Observed:** Turtles ate significantly more Bluegill fish than aquatic plants

- Turtles showed a clear preference for fish over plants.
- 31 out of 32 turtles ate at least one piece of Bluegill sunfish
- Avg # of fish pieces eaten / turtle = 4.41
- Very few turtles ate a piece of native aquatic plant (see Figure 1)

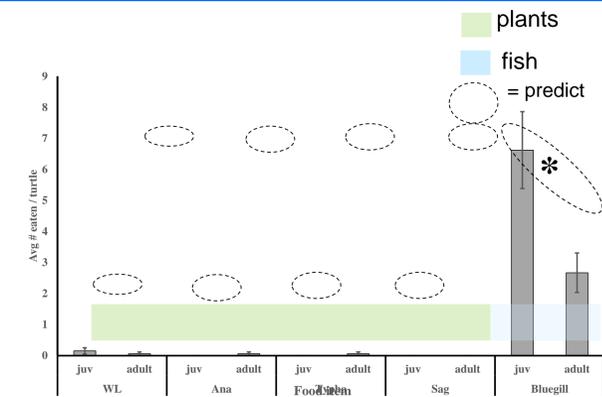


Figure 2. Lack of carnivorous—to omnivorous ontogenetic shift in number of food items eaten / turtle. Error bars are S.E. \* =  $P < 0.05$ .

**Hypothesis:** There is a carnivorous-to-omnivorous dietary shift from juvenile to adulthood

**Predict:** low #'s of plants eaten in juveniles

**Predict:** increased #'s of plants eaten in adults.

**Predict:** high #'s of fish eaten by juvenile turtles

**Predict:** decreased #'s of fish eaten by adult turtles

**Observed:** juvenile turtles ate a lot of Bluegill (avg juv = 6.62 pieces of blue gill)

- Adult turtles ate fewer bluegill (avg adult = 2.67 pieces of blue gill)
- Neither juveniles nor adults ate many aquatic native plants

## Discussion & Conclusion

- Turtles prefer fish over plants
- There is no increase in preference for plants as adults
- Turtles lack a preference for plants as juveniles and adults
- = 1 piece of evidence refuting sexual selective role for carotenoid-based colors
- Plants may be so abundant that there is no need for preference
- Fish may be preferred because the overall rewards outweigh those of plants
- Carotenoids still interact with aspects of health consistent with stripe and spot color role in sexual selection
- Fish are rich in oils & fats, which facilitates the absorption and delivery of carotenoids to the skin.

## References

- Ernst, C.H. 1971. Growth in the painted turtles, *Chrysemys picta* in southeastern Pennsylvania. *Herpetologica*, 27:135-141.
- Steffen, J.E. et al. 2015. Carotenoid composition of colorful body stripes and patches in the painted turtle (*Chrysemys picta*) and red-eared slider (*Trachemys scripta*). *Chelonian and Conservation Biology*, 11(2): 8 pages.