Dynamic hunting tactics in jumping spiders

Catherine Korom and Patrick Cain
Department of Biology, Georgia Gwinnett College, Lawrenceville, GA 30043, USA

Introduction

- Jumping spiders can detect harmful or acceptable prey through vibratory frequencies
- Jumping spiders rely on vision during predatory capture in which they will stalk, chase, or leap on active insects
- Salticids have a pair of forward-facing principal or antero-median (AM) eyes and three pairs of secondary eyes, the antero-lateral (AL), postero-medial (PM), and postero-lateral (PL)[1] (Fig 1.)
- The secondary eyes function as motion detectors whereas the principal eyes are responsible for acute vision
- Salticids can recognize prey based off visual cues from as far as 30 cm away
- Spiders in captivity are best kept in an environment that contains a day/night cycle, water, food, heating, humidity, and proper enrichment. They are best housed alone.[2]

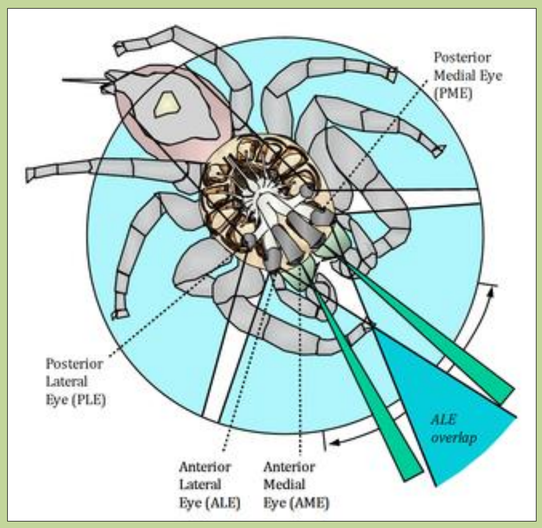

Figure 1. Visual representation of a spider's vision

Questions

- Do jumping spiders change their hunting tactics based on prey orientation?
- Are jumping spiders capable of planning hunting routes?
- Are prey more vulnerable when facing away from a jumping spider?

Methods

- There are 6 common species of jumping spiders in Georgia, ones of which will be captured and used in the experiments
- In order to catch these spiders, a beating sheet is used and a vial to store them in
- The spiders will be kept in small plastic containers. Each container will home one spider, a cardboard egg carton, and a sponge
- In order to preform the experiment, a wooden hexagonal arena (Fig 2.) has been constructed with multiple routes for a spider to take
- A spider will be placed at the edge of the platform while a dead prey item is wiggled at the center of the platform. The spider when then choose a path to take in order to reach the prey item (Fig 2.)

References
1 Carducci, J. P., & Jakob, E. M. (2000).59(1), 39–46.
2 Tarsitano, M. S., & Jackson, R. R. (1994). Behaviour, 131(1–2), 65–73.

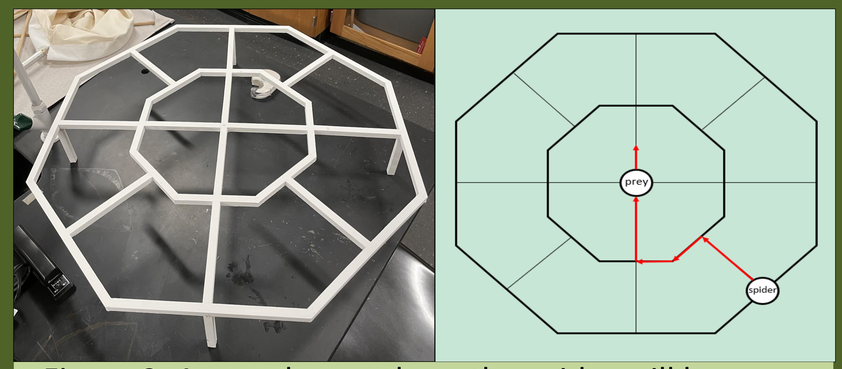

Figure 2. Arena shows where the spider will be placed and where the prey item is placed

Expected Results

- Distance and time will be measured for each trial and the expected results are as followed:
  - Prey item facing towards spider = more distance traveled and longer time
  - Prey item facing away from spider = less distance traveled and shorter time