

# Marching on the Web: Prey preference in social spiders *Stegodyphus dumicola* (Eresidae) may influence movement strategies during collective hunting

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## Background

Social Eresids on a 2D sticky web move in a stop-and-wait motion and attack prey as a group

- Do spiders attack every prey type at equal latency?
- Does conspecifics on web affect individual stop-and-wait motion?

## Assumptions :

1. Prey preference influences latency to attack
2. 1st attacker gets the highest nutritional return



Fig 1.1

Fig. 1.1. Group of *Stegodyphus dumicola* (Pocock, 1898) attacking a hopper (pic: Jakob Gübel)

## Results

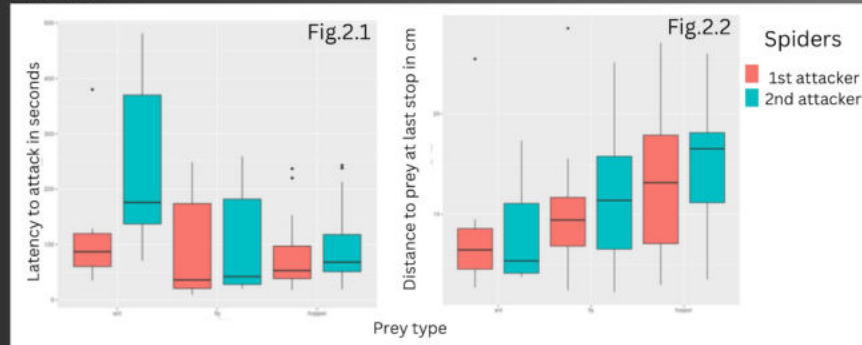


Fig 2. Box plots compare 1st and 2nd attackers across ant, fly, and hopper, whiskers show the 1.5 \* IQR. Fig. 2.1. Latency to attack in seconds. Fig 2.2. The Distance (cm) of spiders from prey at the last stop. Fig 2.3. For fly and hopper, the 2nd attackers have a lower stop duration than the 1st

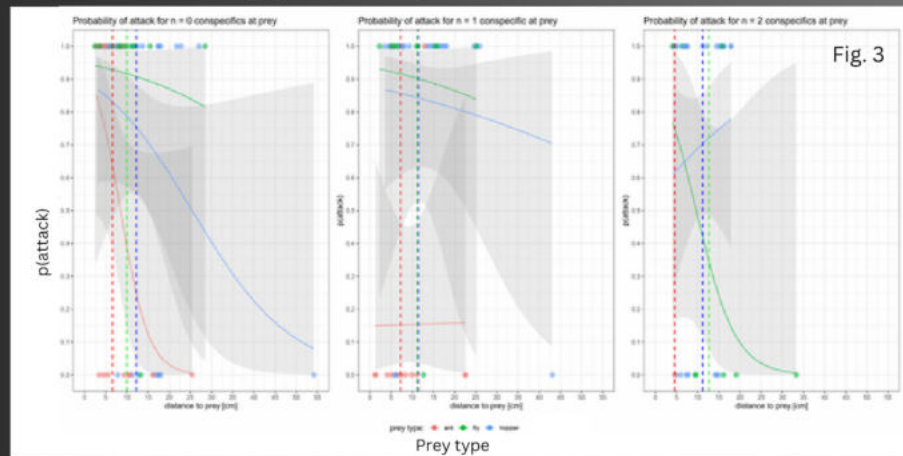
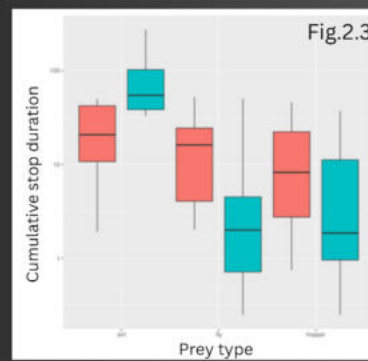


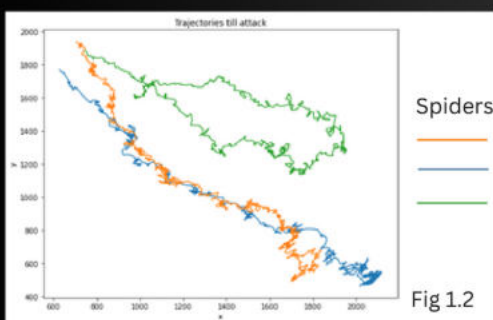
Fig 3. Lines showing probability to attack  $p(\text{attack})=1$  or  $0$ , across prey types *flies*, *ants*, and *hoppers* when spider 'n' at the last stop is at a distance 'd' from prey and 0, 1 or 2 conspecifics are attacking prey

## Predictions

- Hopper trials will have lower latency and more attackers than fly
- Each spider moves slower when more conspecifics are on the web

## Methods

- Videos of 39 live prey feeding trials in Namibia
- **TrackUtil** (Francisco et al. 2020) for tracks
- **BORIS** (Friard, Gamba 2016) to code stop duration, distance from prey at the last stop before attack, attacker 1st or 2nd
- Mixed-effects models (**GLMMs**) to test responses: Latency to attack, stop duration



## Key takeaways

1. Latency of attack is lowest for flies followed by hoppers and ants
2. Median distance at the last stop: 2nd > 1st attacker (except ants)
3. The interaction of rank of attacker and prey type has a significant effect on Cumulative stop duration (CSD) ( $p < 0.001$ ).
4. Hopper attack probability increases when  $n=2$  conspecifics at prey while it decreases steeply for fly



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Fig 1.2. Trajectories till attack of 3 spiders in a hopper trial in 2D space (x,y), axes show coordinates