Best Spider Friends Forever: Female-female socialization and cohabitation in intertidal jumping spiders (*Terralonus californicus*)

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Introduction

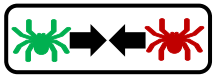
Sociality in jumping spiders is rare but not unprecedented; the few cases known are characterized by shared and interconnected silk nests.[1] In these nests, female jumping spiders are known to guard their egg clutches.[2] Additionally, cooperative brood-laying and care have been shown to be beneficial in other social spiders.[3]

This experiment tested repulsion and attraction between two female intertidal jumping spiders (*Terralonus californicus*) by introducing an intruder to a resident spider's nest, comparing cohabitation in trials of resident spiders with and without eggs.

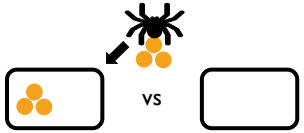
Hypotheses

Hypothesis 1)
Residents with eggs are more likely to repel Intruders from the nest.

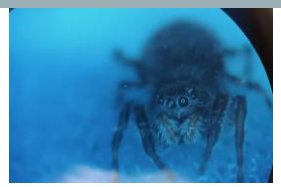
Hypothesis 2)
The spiders are socially attracted to each other and will cohabit in a nest.



Hypothesis 3)
Females are more willing to lay eggs when eggs are already present.



Methods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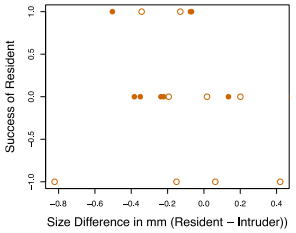
- Adult female specimens were collected from the field
- Spiders were kept in individual vials and fed fruit flies
- Intruder spiders were marked and introduced to the resident's vial
- Data recorded after 24 hours and 7 days
- Egg clutch count was recorded after 30 days
- Cephalothorax widths were photographed and measured
- Statistical analysis was conducted in R

Results

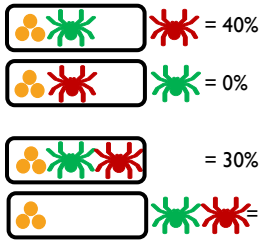
After 24h

Size difference had no effect on repulsion.

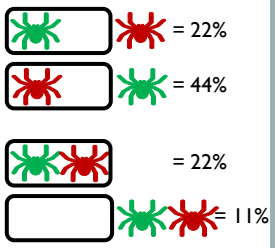


Filled circles = Eggs present
Open circles = Eggs Absent

Eggs present



Eggs absent



Egg presence/absence had no significant effect on repulsion. The repulsion rate was low.

After 7d

Resident and intruder spiders were found together in 14 of 19 total trials.
Binomial test: $P = 0.0318$

14/19 (74%) 5/19 (26%)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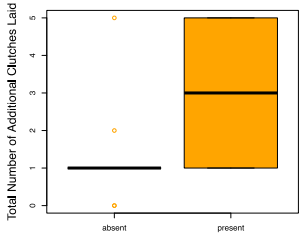
After 30d

Higher mean number of egg sacs laid in eggs present treatment trials



Conclusions

The trials showed low rates of repulsion after 24 hours regardless of size difference and egg presence or absence, rejecting hypothesis 1.

Hypothesis 2 was supported; a significant percentage of the resident and intruder spiders were found nesting together after 7 days.

On average, more egg clutches were laid after 30 days by both spiders in nests with preexisting egg sacs (the eggs present treatment) compared to the trials with eggs absent, supporting hypothesis 3. Further research could be conducted to investigate the benefits of female spiders cohabiting and laying eggs together.

References

1. Avilés, L., and J. Guevara. 2017. Sociality in Spiders. Pp. 188-223 in Comparative Social Evolution, D. Rubenstein and P. Abbot, eds. Cambridge University Press.
2. Vieira, C. and G. Q. Romero. 2008. Maternal care in a neotropical jumping spider (*Salticidae*). *Journal of Zoology* 276:237-241.
3. Salomon, M., and Y. Lubin. 2007. Cooperative breeding increases reproductive success in the social spider Stegodyphus dumicola (Araneae, Eresidae). Behav Ecol Sociobiol 61:1743-1750.