Do black widows like it hot?
Urban spider behavior at urban heat island temperatures

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WEB BUILDING

Female spiders (N=36) were introduced to 57x38x33 cm. transparent tubs at 27 vs 33 °C and allowed to build web for 3 hours.

We found that spiders were significantly **less** active at UHI temperatures as juveniles (see Figure).

This effect disappears at adulthood, suggesting a complex interaction between development, temperature and web building.
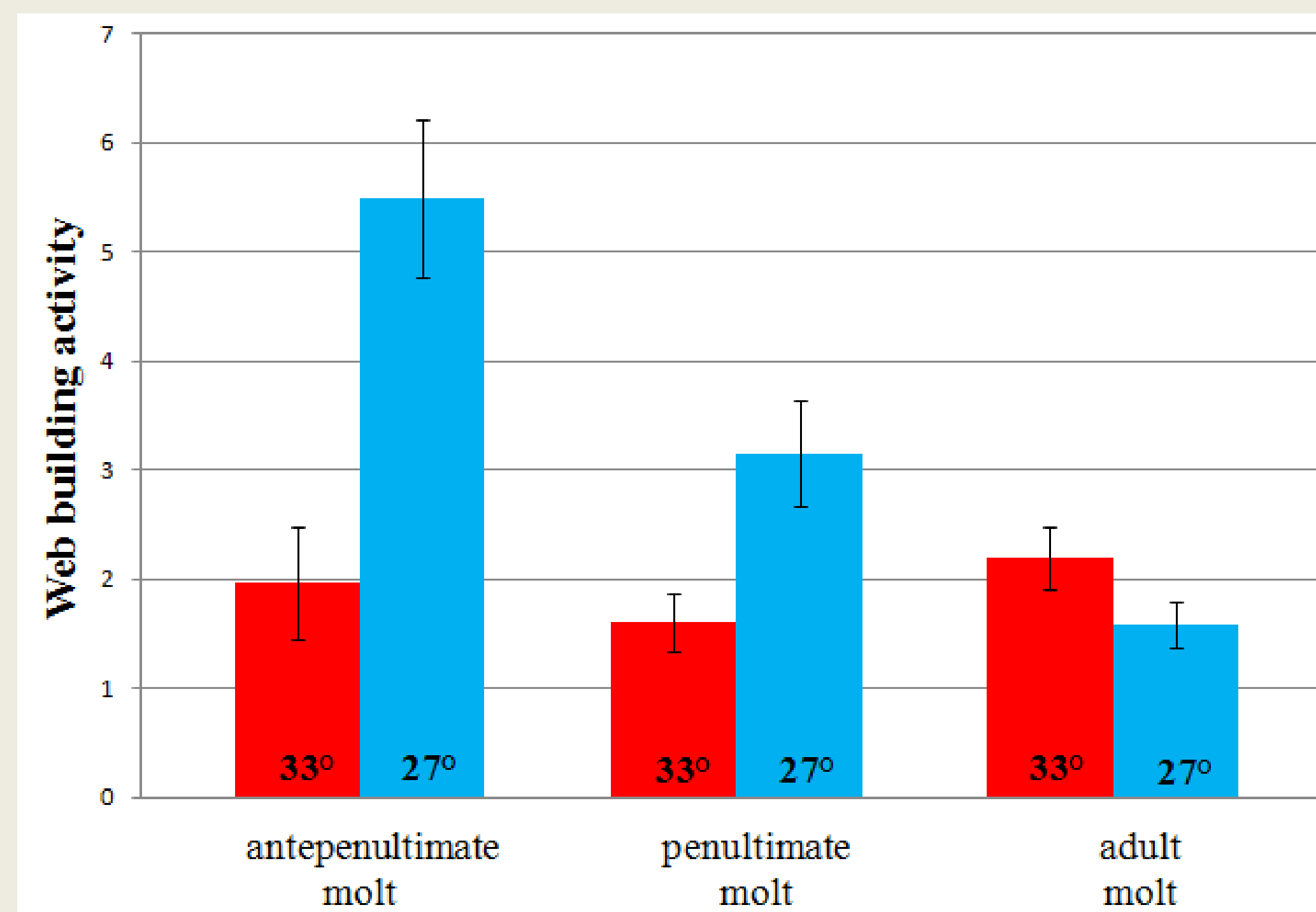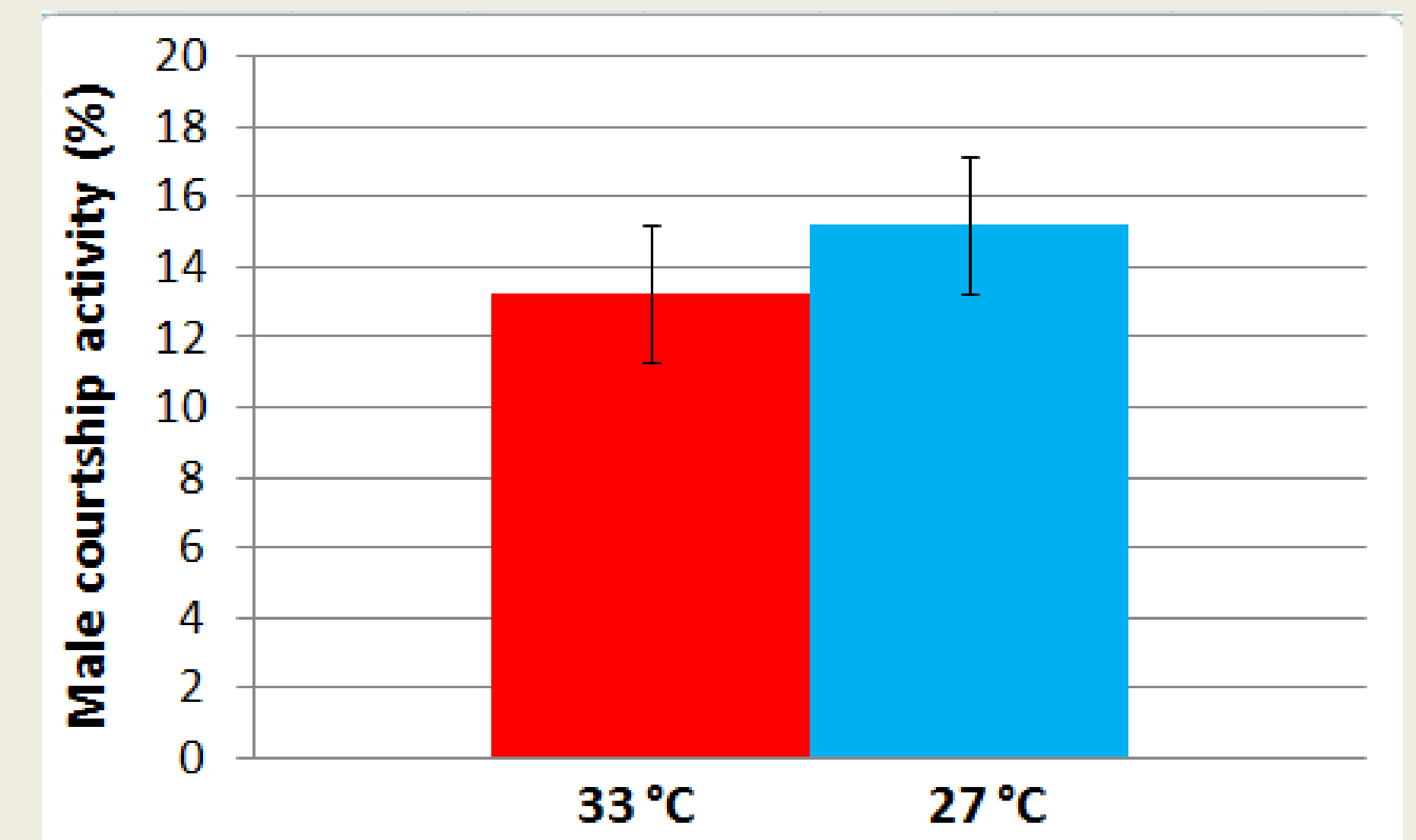

COURTSHIP

Male spiders (N=20) were introduced to female webs at 27 vs 33 °C and monitored for 1 hour.

We found no effect of temperature on male courtship.

Sexual selection presumably favors males that are able to court at a wide range of temperatures.


SUMMARY

- Black widow spiders (*Latrodectus hesperus*) are a troublesome pest species that frequently infests urban habitat across Phoenix.

- Urban heat capture by built structures (=Urban Heat Island =UHI) can dramatically influence urban microclimates.

- Our data suggest web-building substrate is 6°C hotter at night in the city versus the desert (e.g. 33 vs 27 °C in July).

- **We ask what effect is the UHI having on urban spider behavior and ecology.**

BALLOONING DISPERSAL

Spiderlings (N=24) were introduced (see Photo) at 21 vs 27 vs 33 °C. and we measured how long it took them to disperse.

We found a non-significant trend for spiderlings to disperse **slower** at extreme high and low temperatures.

Thus, UHI temperatures may slow dispersal and promote philopatry in urban black widow infestations.
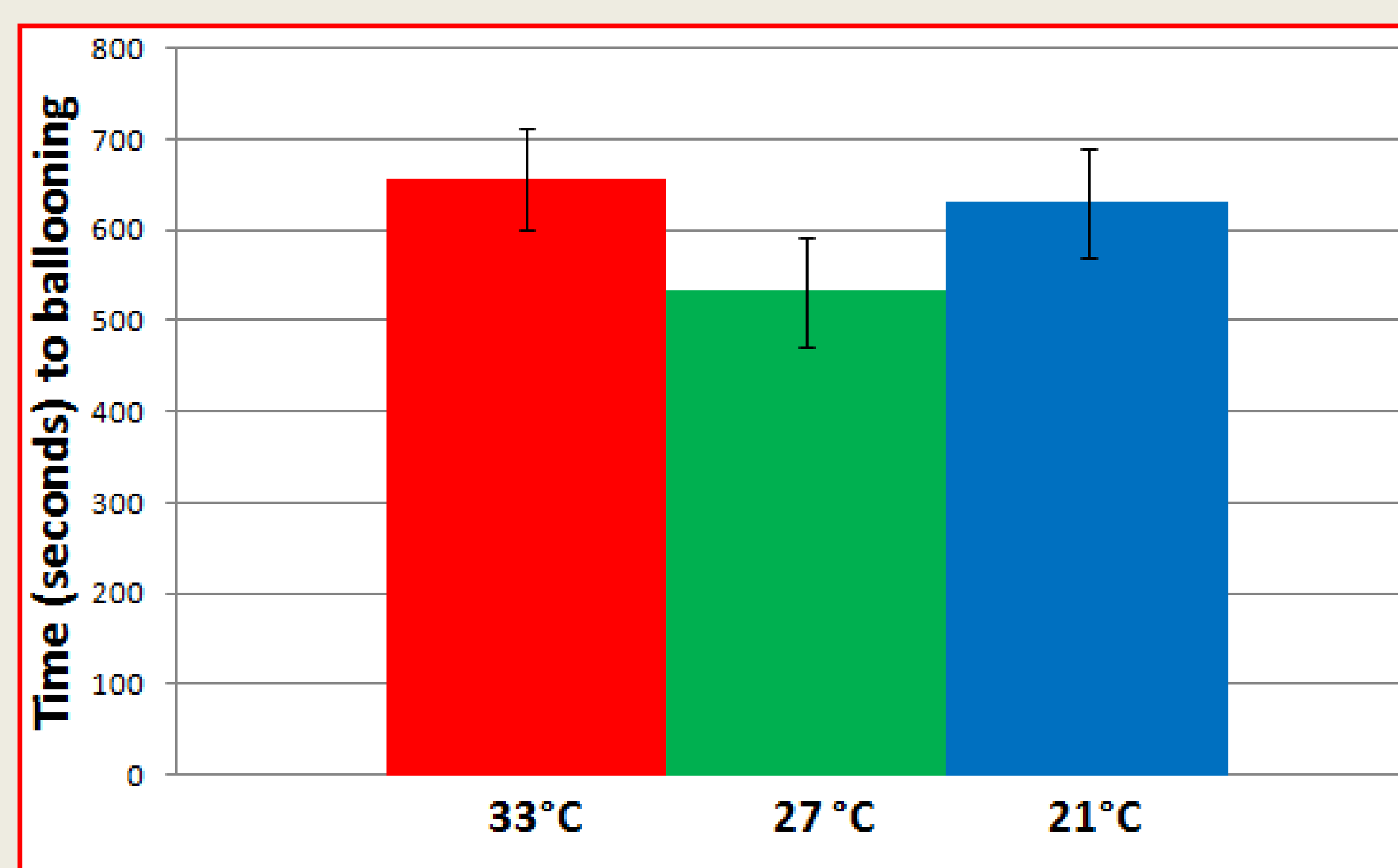
PREY ACTIVITY

Adult crickets were introduced to 57x38x33 cm. containers at 21 vs 27 vs 33 °C and we scored their activity across 3 hours.

We found that crickets were marginally less active at UHI temperatures (see Figure).

Thus, UHI temperatures may limit urban spider foraging success by lowering prey activity.

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