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Striped plateau lizards (*Sceloporus virgatus*) do not adjust foraging position or boldness in response to the plant odorant 2-E-hexenal

Henry L. Norton

Stacey Weiss

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Striped plateau lizards (*Sceloporus virgatus*) do not adjust foraging position or boldness in response to the plant odorant 2-E-hexenal

Henry Norton and Dr. Stacey Weiss, Department of Biology, University of Puget Sound
1500 N. Warner St, CMB 1088, Tacoma, WA 98416-1088
Email: hnorton@pugetsound.edu

Introduction

- Plants release airborne chemical signals called **green leaf volatiles** (GLVs) rapidly in response to insect herbivory, which predators use to locate the insects
- Striped plateau lizards (*Sceloporus virgatus*) respond to **2-E-hexenal**, a GLV, with chemosensory behavior in captivity (Goldberg et al. 2019) – but it is unknown if this plays a role in their foraging behavior
- Hypotheses:** *S. virgatus* shifts its position towards 2-E-hexenal while foraging, and *S. virgatus* behaves more **boldly** in the presence of 2-E-hexenal because 2-E-hexenal indicates potential prey rewards

Methods

- Conducted 72 trials split among three treatments along creeks in the Chiricahua Mountains in southeastern Arizona
- Approached** a perched lizard, marking flight initiation distance (the distance at which the lizard flees), a proxy for **boldness**
- Placed cue** (25 μ l of either 10 μ g/ μ l 2-E-hexenal in lanolin, a noxious 10 μ g/ μ l hexane in lanolin control, or a plain lanolin control) 0.5 m from hiding spot
- Observed for 10 minutes**, recording tongue flicks, time to return to a foraging perch (boldness proxy), and distance to the cue at 10 minutes, estimated into categories: touching, within one snout vent length (SVL – body length excluding the tail), within 0.5 m, or over 0.5 m
- Measured** initial and final flight initiation distances and cue distance after 1 hour



Results

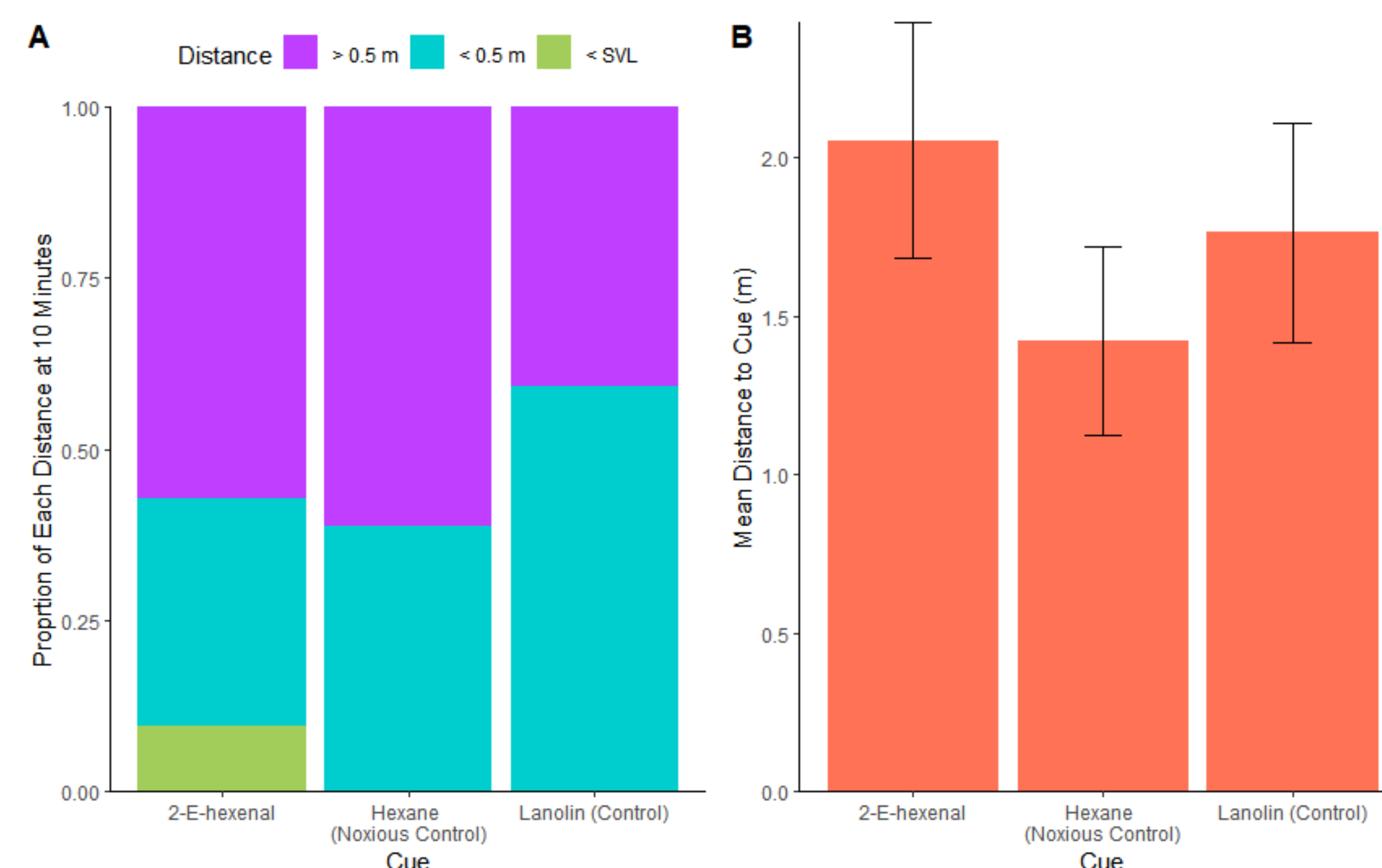


Figure 1. *S. virgatus* did not shift its position towards the 2-E-hexenal cue. (A) The distance to the cue after 10 minutes was independent of the treatment used (chi-square test of independence, $X^2 = 6.49$, $df = 4$, $p = 0.165$). (B) The distance to the cue after 1 hour did not differ significantly with the treatment used (1-way ANOVA, $F = 0.753$, $df = 2$, $p = 0.476$).

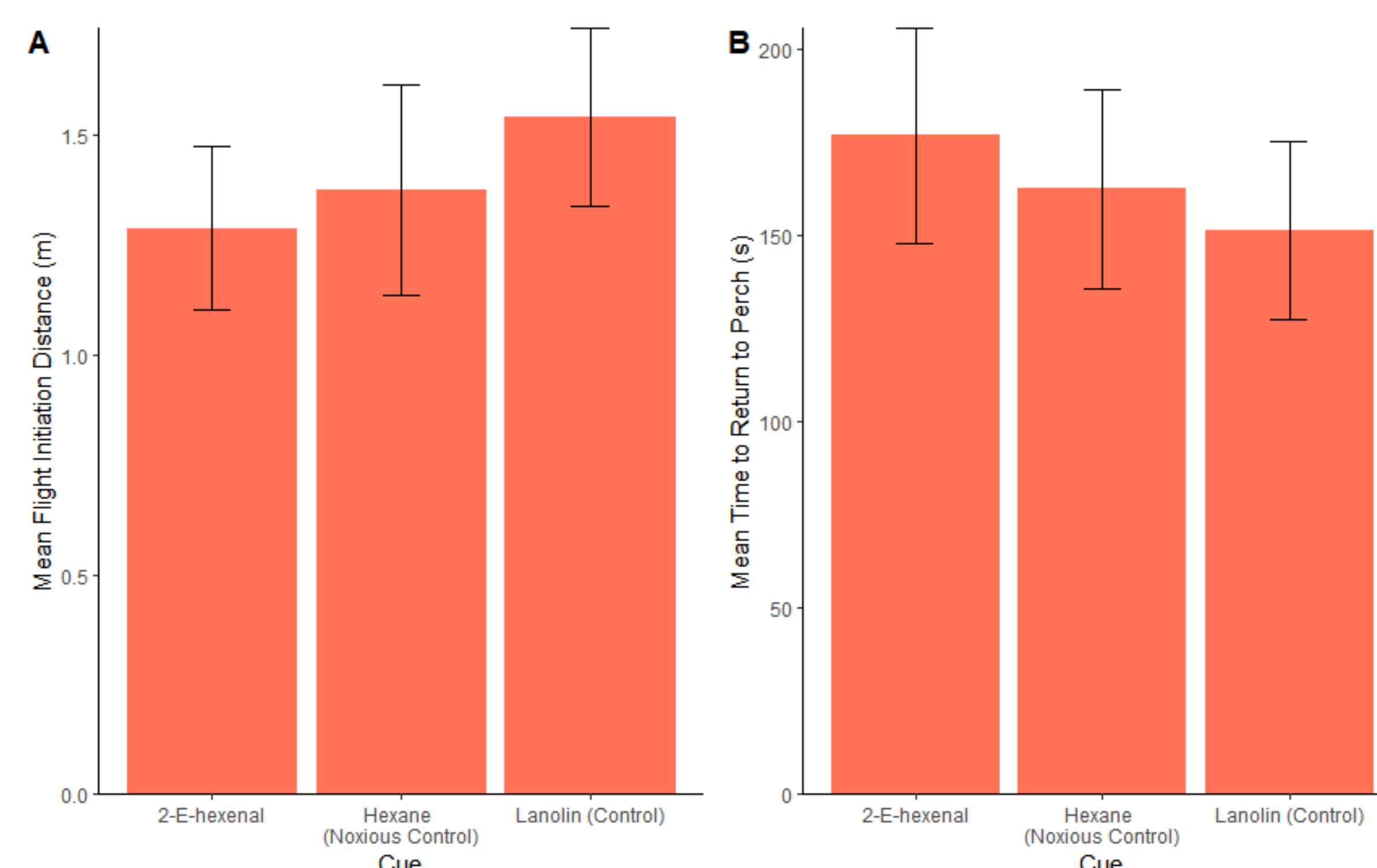


Figure 2. *S. virgatus* did not act more boldly in response to 2-E-hexenal. (A) The average flight initiation distance after 1 hour did not differ significantly with the treatment used (1-way ANOVA, $F = 0.368$, $df = 2$, $p = 0.694$). (B) The average time to return to a foraging perch did not differ significantly with the treatment used (1-way ANOVA, $F = 0.239$, $df = 2$, $p = 0.788$).

Discussion and Conclusions

- Neither of my two hypotheses was supported**
- Interestingly, the presence of tongue flicking (a chemosensory behavior observed in response to 2-E-hexenal in the lab) was independent of the treatment used (chi-square test of independence, $X^2 = 2.186$, $df = 2$, $p = 0.335$)
 - This could be the result of difficulty with consistency for tongue flick observations (e.g. if the lizard was behind an object from the observer, tongue flicks would not be noted)
 - This could also indicate that the lizards were simply not able to sense the cue due to wind or some other factor, but this is unlikely
- Since *S. virgatus* responded to 2-E-hexenal with chemosensory behavior in the lab, but none of my predictions were supported in the field, it is likely that 2-E-hexenal serves a purpose we did not test for
 - For example, 2-E-hexenal could help *S. virgatus* to initially select a perch rather than to select position near an established perch

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References

- Goldberg, J. K., G. Pintel, S. L. Weiss, and E. P. Martins. 2019. Predatory lizards perceive plant-derived volatile odorants. *Ecology and Evolution* 9:4733–4738.