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The effect of behavior and testosterone levels on mating in garter snakes

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Introduction

- The reproductive success of male reptiles is dependent on finding a reproductive female. Male snakes locate reproductive females by following a "mating trail" of chemical messengers (pheromones) produced by the females[1,2]. In male snakes, reproductive cycles are controlled by testosterone[3].
- This project investigated differences in scent trailing behavior in *Thamnophis sirtalis* and *Thampnophis elegans* (garter snakes) to determine what prevents snakes from mating with snakes of other species.
- Behavior studies were conducted by presenting male snakes with scents from snakes of the same species, and with scents from snakes of a different species. We observed which scent the males followed.

1. We also measured testosterone levels in male snakes in the field. Ford NB (1986) *Ecol Evol Comp Biol*
2. Mason et al. (1989) *Science*
3. Schuett et al. (1996) *Gen Comp Endocrin*

Methods

- Male snakes were placed into a glass tank, with one end having a snake scent and the other no scent.
- Each snake was presented with scent from a female of the same species, from a female of a different species, and from a male of the same species in separate trials.
- After releasing the snake in the tank, number of tongue flicks and seconds spent in each section of tank (scent, center, and no scent) were recorded.
- We conducted a radioimmunoassay (RIA) to determine the levels of hormones in the plasma samples

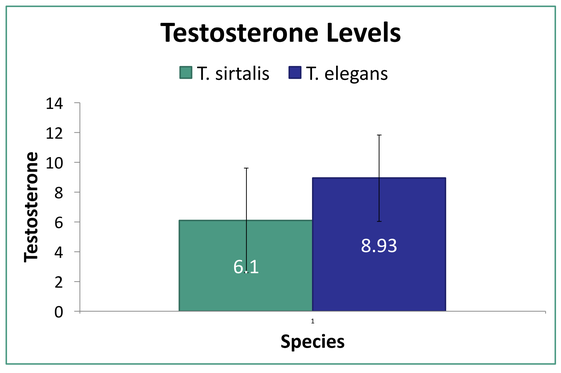

Figure 3: Male testosterone levels of snakes in the field.

Figure 1: Male snake presented with snake pheromone or no scent.

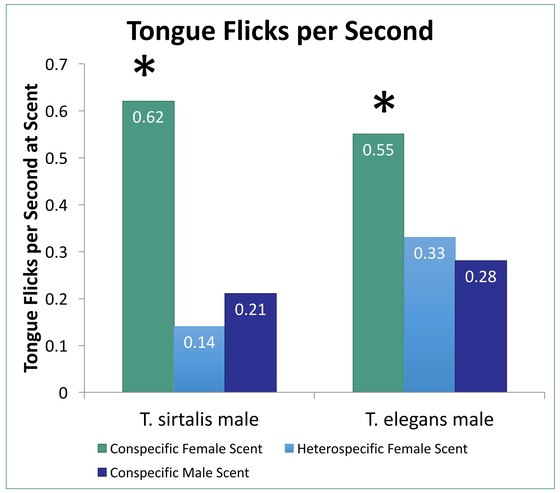

Figure 2: The number of tongue flicks per second at each scent.

Results

- Both *T. elegans* and *T. sirtalis* males showed preference toward scents from females of the same species, measuring by number of tongue flicks and time spent at each scent (Fig. 2).
- There did not appear to be a difference in the preference shown between scents from females of different species and scents from males of the same species.
- There was not a significant difference in testosterone levels in males of different species (Fig. 3).

Conclusions

- There are likely differences in the pheromones produced by females of different species, resulting in different scent trails.
- Males likely use chemical cues from females instead of from males of the same species.
- This difference in pheromones and mating behavior does not seem to be related to testosterone levels.

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