

# Intrasexual aggressive behavior in the Little Brown Skink (*Scincella lateralis*) during breeding season



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## Abstract

Many species of lizards exhibit acts of aggression and territoriality. However, not much research has been done on patterns of dominance in *Scincella lateralis*, also known as “The Little Brown Skink.” This experiment was to describe patterns of dominance and aggression in *Scincella lateralis*. I allowed two lizards to acclimate to a divided observation chamber for 48 hours prior to trial, this allowed the lizards to set up possible territories and boundaries. Once the divider was removed and the lizards were able to interact, their encounters were recorded for later review. Upon reviewing the tapes, patterns of dominance were found but territoriality was not seen. The results show that males do tend to interact more frequently than do females. Lizard size also appears to affect dominance patterns among the participants in the trial. The dominant lizard has better access to an important resource, a shelter. This suggests that if two lizards interact in natural habitats, the dominant lizard will most likely have better access to necessary resources. The results also show that dominance relationships do affect movement patterns in lizards. Although neither lizard established a territory, the fact that the lizards spent more time on opposite sides of the chamber than on the same side indicates that the dominant lizard is able to move freely about the chamber while the submissive lizard tries to avoid the dominant lizard.

## Introduction

Acts of aggression have been seen in many types of lizard. These acts of aggression can include biting, lunging, chasing, and lateral presentation (Akin, 1997). However, not many studies have been conducted on the species *Scincella lateralis*, commonly referred to as “The Little Brown Skink”, a common species found in Oklahoma. A previous study was conducted on *Scincella lateralis*, but was during non-breeding season (Akin, 1997). I was interested to see if there were aggressive and territorial behaviors during intrasexual encounters during the breeding season, so a study was conducted in order to determine dominance and patterns of territoriality in *Scincella lateralis* during breeding season (April-July). Dominance patterns and territoriality could possibly influence access to resources and survival in natural surroundings. This study wanted to answer four questions: (1) do males interact more often than females interact in a 60 minute trial; (2) does lizard size affect dominance; (3) does a dominant lizard will monopolize an important resource (shelter); and (4) do dominance relationships affect lizard movement patterns.

## Methods

### Study Animals

Twenty eight adult lizards (*Scincella lateralis*; **Figure 1**) were obtained from Sparrowhawk Primitive Area near Tahlequah, Oklahoma in summer 2012. Fourteen of the lizards were female and the other 14 were male. Once each lizard was collected, its SVL was measured (in millimeters) using a ruler, and each lizard was weighed (to the nearest 0.1 grams) using a triple beam balance. Lizards were then checked to see whether they were male or female (by eversion of the hemipenes in males). Once lizards were processed, they were placed in individual cages until it was time to begin experimentation. The cages had paper towels lining the bottom and a single shelter placed in the middle. The shelter was made from a paper towel roll that had been cut into fourths. The lizards were provided with water and meal worms (obtained from a colony that was kept in the lab) each day. Each individual cage was provided with its own 60 W heat lamp that was set to a 12:12 h light:dark cycle.



**Figure 1-** *Scincella lateralis* “The Little Brown Skink”  
 Photo by M. Paulissen

### Experimental Design and Testing

A large observation chamber was used for each of the fourteen trials (**Figs 2 and 3**). The observation chamber was split in half by a cardboard divider (which was removed for experimentation purposes) and had about 2 cm of dirt at the bottom. There was also green posterboard on the back glass and the sides of the observation tank in order to mimic natural surroundings. The observation chamber had a heat lamp (60 W set to 12:12 h light:dark cycle) that was placed over each half of the chamber (two total) to allow the lizards to remain warm enough to engage in natural behaviors. The lizards were left in the observation chamber for 48 hours prior to the trial to acclimate to their surroundings; the lizards were provided with food (mealworms from a laboratory culture) and water during this acclimation period. To begin a trial, the divider was removed so that the lizards could interact. A single shelter, large enough for one lizard to inhabit it, was placed in the middle of the observation chamber during the trial. No food or water was available during the trial. In order to keep from interfering with results, no humans were present at the time of the trials. There was a Sony REV 280 video recorder placed in front of the observation chamber to tape the lizards’ interactions for review at a later time. Each trial lasted 60 minutes. In each trial, new lizards were used for experimentation. Seven trials were done using two males, seven were done using two females (including three in which both females were gravid).

### Data Analysis

Each tape that was recorded during a trial was later retrieved and used to document the interactions between the lizards in the trial. This involved documenting each interaction, which side the interaction occurred on, and which lizard “won” the interaction. The results of this data were used to determine which lizard was dominant and which was subordinate. The tapes were also used to record how much time each lizard spent on its home side versus the opposite side of the observation chamber. The amount of time that each lizard spent in the shelter was also documented. The amount of time that the lizards spent on the same side of the chamber was also recorded. These results were used to determine whether or not this species of skink exhibits territorial behaviors and whether or not the dominant skink appeared to have more access to resources in the tank. Paired T-Tests and a Two-Sample T-Test were used to determine whether these statistics were significant.

**Figure 2-** Shows the observation chamber as it is for 48 hours prior to trial (with divider placed in middle).  
 Photo by M. Paulissen



**Figure 3-** Shows the observation chamber as the lizards are able to interact for the 60 minute trial (without divider).  
 Photo by M. Paulissen



## Results

**Table 1-** Males tend to interact more frequently during 60 minute trials than females do.

Mean $\pm$ SD number of interactions Female Trials	Mean $\pm$ SD number of interactions Male Trials	P-Value of T-test
17.0 $\pm$ 8.76	41.4 $\pm$ 31.43	0.089

**Table 2-** The trend seems to appear that lizard size does affect dominance; However, these results were not statistically significant.

Number of Trials where Dominant was Larger	Number of Trials where Dominant was Smaller	P-Value of Chi-Square test
9	4	0.17

**Table 3-** In trials excluding the gravid females, there was statistical evidence that the dominant lizard has more access to the retreat.

	Mean $\pm$ Amount of Time Dominant Spends in Shelter (sec)	Mean $\pm$ Amount of Time Submissive Spends in Shelter (sec)	P-Value
All Trials	837 $\pm$ 692.5 (n=14)	489 $\pm$ 440.3 (n=14)	0.160
Adult Males and Non-Gravid Females Only	929 $\pm$ 727.9 (n=11)	378 $\pm$ 365.1 (n=11)	0.045

**Table 4-** The lizards spend significantly more time on opposite sides than they do on the same side. This indicates that the submissive lizard attempts to avoid the dominant lizard.

	Mean Time on Same Side (seconds)	Mean Time on Opposite Side (seconds)	P-value
All Trials	763 $\pm$ 337 (n=14)	1453 $\pm$ 593 (n=14)	0.001
Adult Males and Non-Gravid Females Only	730 $\pm$ 355 (n=11)	1514 $\pm$ 631 (n=11)	0.002

## Discussion

It was found that males do interact more often than females during a 60 minute trial (**Table 1**). It was also found that lizard size does seem to follow the trend that the larger lizard will be the dominant lizard (**Table 2**), however, these data were not statistically significant. The dominant lizard does monopolize the important resource, in this case, the shelter (**Table 3**). This dominance relationship also affects movement patterns of the lizards (**Table 4**): the dominant lizard moves about the observation chamber freely while the submissive also moves to avoid contact with the dominant lizard. If these two lizards have an encounter in the wild, the dominant will have better access to resources necessary for survival.

### Literature Cited

Akin, J. A. 1997. Intra- and inter-sexual aggression in the ground skink (*Scincella lateralis*). Canadian Journal of Zoology 76: 87-93

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