

TERRITORIAL AND SITE FIDELITY BEHAVIOUR OF *LYRIOCEPHALUS SCUTATUS* (AGAMIDAE: DRACONINAE)

Imesh Nuwan Bandara* and Suyama Meegaskumbura

Department of Zoology, Faculty of Science, University of Peradeniya

Introduction

There are six genera of Agamid lizards in Sri Lanka. Of these three genera; *Lyriocephalus*, *Ceratophora* and *Cophotis* are endemic to the island. *Lyriocephalus scutatus*, the only species of the genus, is known to show territorial behaviour and atypical site fidelity (Manamendra-Arachchi, 1998). However, no detailed studies on territorial or site fidelity behaviour of this species were conducted. Here, we record the territorial and site fidelity behaviour of *L. scutatus*.

Materials and Methods

Two populations (five and seven individuals) in two sites of Gannoruwa Forest Reserve were observed for 25 consecutive field sessions; from October 2008 to February 2009. A total of 180 focal observations on 12 individuals were conducted for 15 days. Data were gathered under three reproductive groups: adult males, adult females and subadult males. Both field sites (~200 m² in size) were partitioned into 1 m² grids and two template grid maps were created for each. Each lizard was captured, sexed, measured, marked by a coloured elastic band on the waist and given a field identification name. Each population was observed continuously for 20 min. to 2 h in each observation session between 0600 to 1800 h in a given day. Location of Lizards on

the ground and on trees were recorded and territory on the ground was graphically displayed by hand-drawn polygons. A territory is an area occupied by an animal and defended against intruders, especially those of the same species.

Results

Lyriocephalus scutatus showed striking territorial behaviours (Table 1). Territories of females, males and subadults decreased in size, respectively (average size: females - 264.94 ± 59.8 m², males - 178.72 ± 32.1 m² and subadults - 174.73 ± 32.3 m²). One fourth of the male and female territories overlapped (Figure 1). There was no overlap of territories among the adults of the same gender, except for a slight overlap between two males and two females in one of the sites (Figure 1).

All six adult males observed in the two study sites occupied a single tree throughout the study period. In contrast, females and subadults were observed to occupy several trees. Though the occupied tree species differed, the diameter at breast height of all the trees was >30 cm. All individuals in the study spent the mornings on the trees for about three hours displaying and in the evening about one and a half hours. Territorial display was performed only when perched on trees. During the display they position themselves on

the tree trunks so that they can see almost all the individuals (Figure 2). The lizards show synchronized territorial maintenance behaviour within their group. This begins with the display by a single individual followed by others. The synchronized territorial behaviour is followed by

walking on the ground and feeding. The evening is spent mostly resting (Figure 3). Behavioral Patterns differed with gender, where adult males spent more time lifting the body, displaying the gularsac, bobbing the head and wagging the tail than the other two groups (Figure 4).

Table 1. Commonly observed behaviors of *L. scutatus* in their natural environment.

Behaviours	Description
*Body lift	straightened all four limbs, push body off surface
*Gularsac display	Extension of gularsac, with lateral side compression of body
*Head bob	Rapid up and down movement of the head or head and neck region
*Tail wag	Undulating movement of tail
Still	Sitting without notable movements on the ground or tree
Adjustment	Small change in position
Walking	Moving about in an area slowly
Feeding	Taking in a food item

* Territorial behaviours (Sheldahl and Martins 2000)

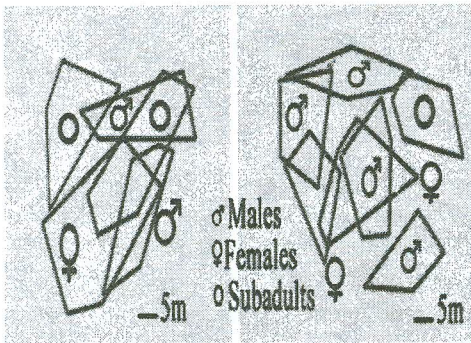


Figure 1. Territory sizes of adult males, adult females and subadult male of *L. scutatus* in the two populations.

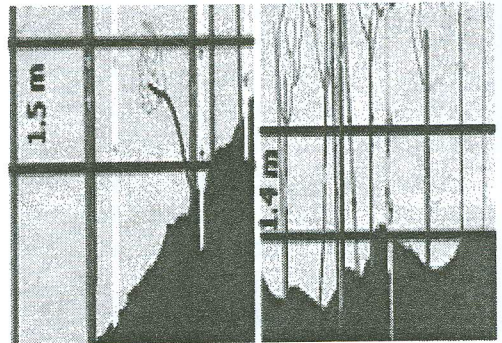


Figure 2. Areal horizontal distribution shown by *L. scutatus* in the two populations.

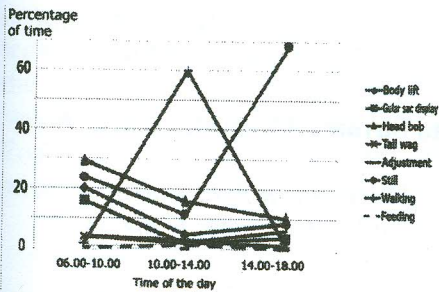


Figure 3. Changes in behaviours with time (between 06.00 to 18.00 h). Mean for all individuals of *L. scutatus* in the study from October 2008 to February 2009.

Discussion

Lyriocephalus scutatus is territorial and shows site fidelity behaviour. One or two female territories always overlapped with that of a male. This suggests that a single male has access to one or two females. This is also observed in other lizards (Jennings and Thompson, 1999). Subadults on the other hand have territories which overlapped with females and adult males. This may be due to the fact that they do not compete for mates with the adult males. Site fidelity in *L. scutatus* was observed at different levels. All individuals remained in their territories throughout the study. Males showed greater site fidelity than females by having smaller territories. Adult males also occupied a single tree throughout the study period, on which they display territorial behaviors in the mornings and slept at night. In contrast, females and subadult males occupied several trees within their territories.

Lyriocephalus scutatus also had specific active times. They displayed territorial behaviours in the mornings and sometimes in the evenings.

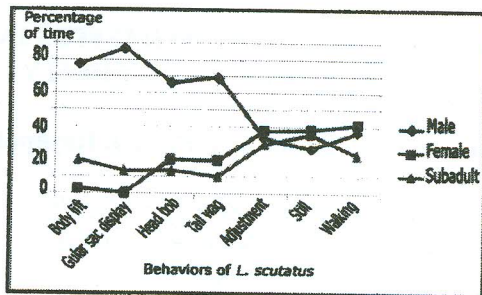


Figure 4. Time budgets for behaviours of different reproductive groups of *L. scutatus*: males, females and male subadults.

Feeding was done during the midday. Evening was mostly spent resting. Aerial horizontal distribution of individuals in the same group is a behaviour which permits the individuals within the group to keep all or most of the other individuals in sight during display. This increased communication among the individuals in the population. The horizontal distribution of *L. scutatus* on tree trunks during territorial behaviour is a novel aspect observed for herpetofauna. Further studies should be carried out to investigate this peculiar behavior of *L. scutatus* in detail.

References

- Jennings, W. B. and Thompson, G.G. (1999). Territorial behavior in the Australian scincid lizard *Ctenotus fallens*. *Herpetologica*, 55(3): 352-361.
- Manamendra-Arachchi, K. (1998). Gecko! *Sri Lanka Nature*, 1(1): 45-55.
- Sheldahl, A. and Martins, P. (2000). The Territorial Behavior of the Western Fence Lizard, *Sceloporus occidentalis*. *Herpetologica*, 56(4): 469-479.