

TERRITORY

Introduction

Territoriality is a conspicuous characteristic of many birds (Davis 1959) and is vital for obtaining food, facilitate pair formation, and for breeding. The concept of territory ownership in birds dates back in the history from the time of Aristotle, 350 BC (Nice 1953). After that the description, definition and classification of territory has been elaborated by Brown (1964), Carpenter (1958), Hinde (1956), Howard (1920), Lack (1933), Mayr (1935), Noble (1939), Tinbergen (1957), and Wilson (1975). Wilson summarized almost all work, up to 1974. Wilson's definition of territory as "an area occupied more or less exclusively by an animal or group of animal, by means of repulsion through overt defense or advertisement."

Territorial behaviors of different species of birds are studied by Davis (1959), Krebs (1971), Seastedt and Maclean (1979), and Stenger (1958). Very little studies are conducted on the territorial behavior of the birds of the family Trogonidae. Taylor (1994), Tanner and Hary (1958) described the extent of the territory of Elegant Trogon, *Trogon elegans*. Hall (1996) described its home range also. Cavity defending of Elegant Trogons explained by Cully (1986), Taylor (1994) Hall and Kurubian (1996).

This chapter deals with the territory of Malabar Trogon, type of territory, and territory defense mechanisms.

Methodology

For the study of territory the Malabar Trogon pairs were followed, (no.) 1 to 4 in the Marottichal area of Thattakad Bird sanctuary, 5 and 6 in the Bhoothathankettu forest, and 7 in the Chelamala forest. Pairs were differentiated by their individual variation. The method used to study the size of the territory is followed by Odum and Kuenzler (1955), by marking the location of the male or the pair at different times directly on a field map. The outermost points on the map were plotted on the toposheet for calculating the territory of each pair. Individual birds were followed to observe the territory defense or other behavior activities related to territory.

Results and discussion

Intraspecific territoriality

Malabar Trogons were found to defend only those portions of the territory within which they happened to encounter an intruder at close range rather than guarding the whole territory. It was impossible for a pair to defend its entire territory because of their preferences for the under growth (foraging

strata were described in chapter 3) where detection of invaders was rather difficult.

Territory defense

The territorial defense is effected mainly through the call, defense postures, and fight. Most of the time Trogons defended their territory by calls. When an intruder male Trogon appeared, the territory holder started to give the territorial calls. 'Que' of high frequency was the territorial call. It was audible from 100 m away in the thick forest. Normally in each cycle, there was 3-5 notes with the last one very feeble and low, repeated 3-4 in 60 seconds and stopped after producing several times. After a short break it again started. When the intruder was nearby, they produce 'Chrrrrr' with tail lifting and spreading. The male counter part also displayed similar mechanisms and reached up to the other male and started fighting. If the intruder retired immediately after the territory owner gave the alarm call, the encounter not resulted in real fight.

Normally fighting occurred in the air. Both the birds sallied from the respective perches and pecked each other. Sometimes during pecking, down feathers plucked from other bird and hold it in the bill for few seconds (n=16). This occurred several times and then stopped. Both the birds moved apart and take rest and engaged in foraging. After a silence of 15 to 30 minutes, again the

birds started fight. Only the male bird engaged in fight. All the time the female bird follows the male. Female produced only the defense calls and display.

During breeding season, Trogon spent a lot of time for territory defense. The mechanisms were the same, although the frequency of calling and fight are increased considerably.

The incubating and brooding Trogons never go for territory defense. After departure from the nest with the juveniles, birds become silent, producing only the low intensity 'que', used only for communication between the family members. But both male and female birds were aggressive to other Trogons, other species of birds and even to the observer. When the observer approaches the juveniles for a closer look, the parents aggressively follow and make several flights here and there with wing flapping.

Trogon shared the streams/pools for bathing with other members of the same species, here the territories of the pairs were overlapped.

The territory defenses takesplace normally in the morning hours and continued up to noon. Once observed from 9.00 hrs to 15.00 hrs between the pairs 5 and 6. The territorial encounters were thus spread out more throughout the day. The defense was more prevalent during nest site selection. Trogon maintained its territory year round.

Size

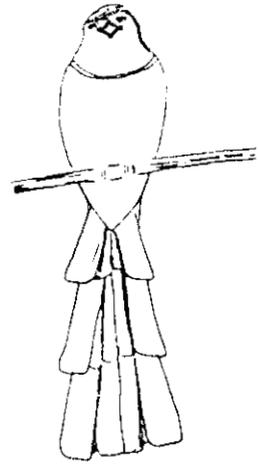
The territories of Malabar Trogon were always found to be along a forest stream. The one boarder of the territory was formed of the stream. The size of the territory varied from about 5.65 ha to 45 ha. The smallest territory (5.65 ha) was recorded at Bhoothankettu forests, for the pair 5. At Bhoothathankettu the territory size of the second pair (no. 6) was found to be about 7.85 ha. In the emerging forest of Chelamala, pairs no. 7 have defended an area of 45 ha. This size of territory is higher than that of pairs 5 and 6. The habitat in the Bhoothathankettu area is aged moist deciduous whereas in Chelamala the flora is of an emerging evergreen type. From this observation, it is apparent that the size of the territory of Malabar Trogon increases with decreasing the height and density of canopy, and with less ground vegetation as reported for other birds by Stenger (1958), Krebs (1971), Seastedt and Maclean (1979).

Interspecific territoriality

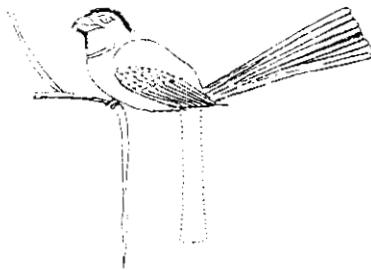
Interspecific territorialism is apparently one of the means evolved to eliminate the effect of competition between closely allied species with a similar ecology (Simmons, 1951). Malabar Trogon exhibit aggression towards birds like Grey headed myna, Hill myna, Racket tailed drongo, Velvet fronted nuthatch, Malabar golden backed woodpecker, Bronzed drongo, and Common Tree pie (Table 11).



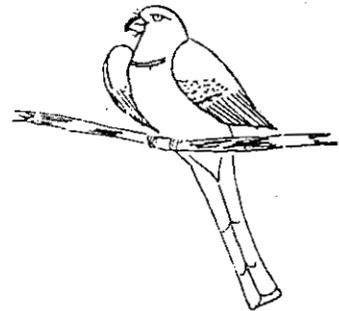
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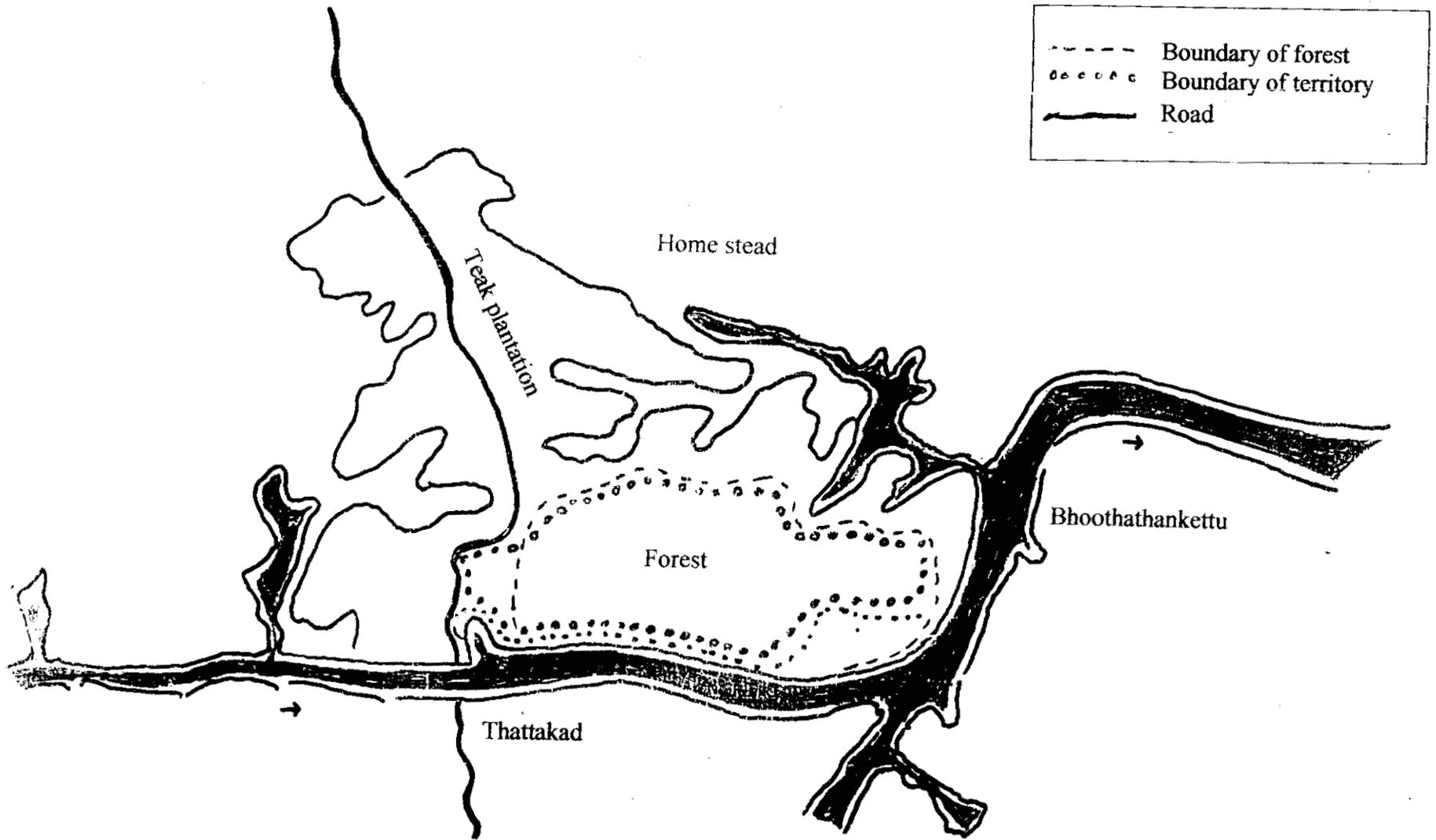
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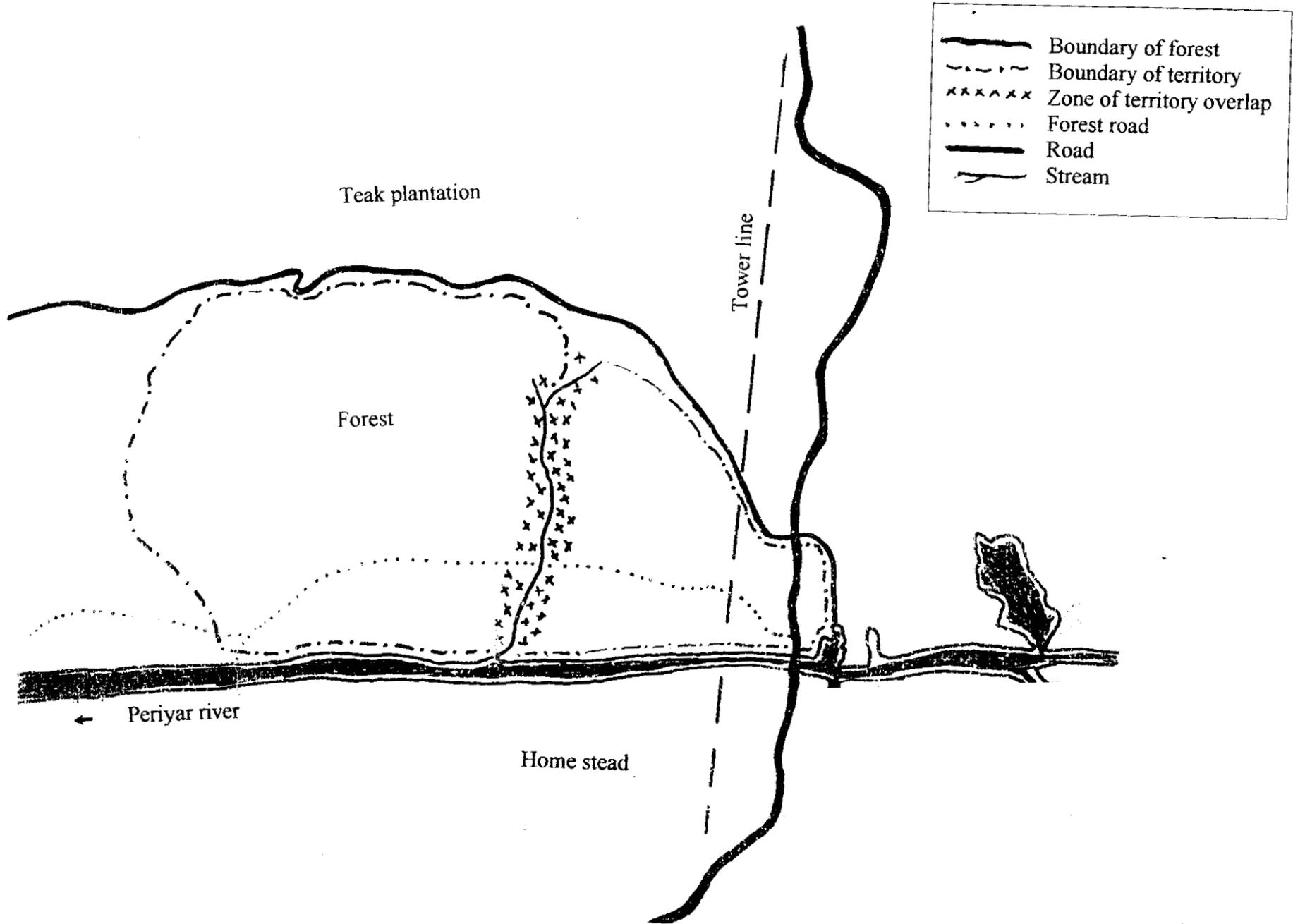
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Behavioral aspects of Malabar Trogon

- ❶ Normal perching position of Malabar Trogon
- ❷ Tail spreading of Malabar Trogon
- ❸ Tail twitching of Malabar Trogon
- ❹ Posture of Malabar Trogon during Mobbing



Map: 3 Territorial boundary of Malabar Trogon in the Chelamala forest



Map: Territorial boundary and zone of territory overlap between the neighboring pairs of Malabar Trogon in the Bhoothankettu forest

Table 11**Various behavior responses of Malabar Trogon observed during the study period**

Prominent causative agent	Type of behavior	No of observation
Observer	Alarm call	70
	Hiding	35
	Flying out of cavities	15
Raptor	Alarm call	12
	Hiding	2
Barred jungle owlet	Alarm call	1
	Mobbing	1
Grey headed Myna	Mobbing	1
Hill Myna	Mobbing	1
	Chasing	1
Racket tailed drongo	Chasing	1
Velvet fronted nuthatch	Chasing	1
Malabar golden backed woodpecker	Chasing	2
Bronzed Drongo	Chasing	1
Common Tree pie	Chasing	1

Conclusion

Malabar Trogon was a territorial bird and maintained its territory year round. Male and female birds defended the territory. Female birds were not participated in the territory defense fight. The territories of Malabar Trogon guaranteed essential cover, nesting facilities and food for the young, protection of the nest, female, and young against the despotism of other males. The size of the territory varied from site to site depending upon the vegetation of the area. Malabar Trogon usually reacted to other animal, by flying out of cavities,

calling and physically attacking and or chasing them. The behavior responses of Trogons identified were mobbing, chasing, hiding, alarm call and moving out of cavities.

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