Perch-site use and inter- and intraspecific aggression of migratory Brown Shrikes (Lanius cristatus) in Southern Taiwan

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Abstract: Perch-sites are important in the territorial behaviour, and influence the life-history traits of true shrikes. I studied foraging behaviour, perch choice and use, and inter- and intraspecific interactions of migratory Brown Shrikes during a 5-day stay at the Kenting National Park Youth Activity Center, southern Taiwan. Brown Shrikes overwhelmingly preferred to perch on protruding branches on a side of the tree canopy (N = 1886; 98.3%), which facilitated detection of prey and vigilance. The Brown Shrikes also rested a lot between hunting bouts while on migration, and hunting rate was very different from that during the breeding season. Of a total of 89 interactions with other individuals, 62 (69.6%) were intraspecific and 27 (30.4%) were interspecific. Of the 62 intraspecific aggressive interactions, 3 were against groups of up to 5 migrating Brown Shrikes that landed in the study plot before heading out to sea, supposedly towards the Philippines across the Luzon Strait. The 7 observed Brown Shrikes had an overall hunting success of 62.7% (106 of 169). I conclude that Brown Shrikes in Taiwan maintain feeding territories while on migration and feed en route and, like most other true shrikes, will adapt to local conditions and their diet will depend on local prey availability.

Key words: Brown Shrike, migration, perch use, aggression, Taiwan

INTRODUCTION

High-quality habitats for birds have attributes that influence their hunting success, such as perch height, perch abundance, vegetation density, and prey visibility (Fitzpatrick 1980, Simmons 1989, Sonerud 1992, Widen 1994, Malan 1995). It is usually assumed that a perched bird scans a circular area under each perch (Yosef & Grubb 1992) and that the search area increases with perch height (Fitzpatrick 1980, Tye 1989, Sonerud 1992).

True shrikes (Laniidae) are sit-and-wait predators that hunt from perches to increase efficiency (Safriel 1995). Perch-sites are important in their territorial behavior and influence their life-history traits (Yosef 1992). Perches are known to dictate territory size (Yosef 1993, Yosef & Grubb 1994), facilitate prey accessi-
bility (YOSEF 1993) and handling time (CARLSON 1985a, b, YOSEF 1993), and enable vigilance in territorial shrike pairs (YOSEF 1996).

The Brown Shrike (*Lanius cristatus*) is a common winter resident (SEVERINGHAUS & LIANG 1995) and migrant in Taiwan (HARRIS 2000). Although several studies of the species have been conducted (e.g., ISHIGAKI 1966, KENZO & YOHKO 1968, MEDWAY 1970), much of its life history and conservation status is little known (HARRIS 2000). During a 5-day stay at the Kenting National Park Youth Activity Center, southern Taiwan, I studied foraging behavior, perch choice and use, as well as interspecific interactions of migratory Brown Shrikes.

**METHODS AND STUDY AREA**

The study was conducted during 10–14 October 2003. A total of 865 minutes (14 hrs 25 minutes) of observations were made with 10×40 binoculars.

Although none of the individuals in the study were trapped and ringed for individual identification, at least 7 different individuals were followed for periods ranging from 68 to 132 (44.7 SD) minutes. Following SONERUD (1992), perching strategies of two types were considered: (1) when a shrike flew to a second perch without attempting to hunt or any interaction – “GIVING-UP”; or (2) wherein the shrike either chased a potential prey or interacted with another individual – “DETECTION”.

The hunting perches were considered be either “TOP” if the bird was perched at the topmost point of the tree, “SIDE” if it was perched on one of the lower branches that protruded beyond the circumference of the tree, or “HIDDEN” if the shrike was amongst the leaves and not visible from the outside.

I considered a shrike to be “RELAXED” if it perched with no particular interest in its surroundings, “VIGILANT” if it perched upright and wagged its tail vigorously, and “AGGRESSIVE” if it chased conspecifics or other avian species.

The Kenting National Park (KNP) is situated on Taiwan’s southernmost Hengchun Peninsula (Fig. 1). The Youth Activity Center (22°85′39″N, 24°27′24″E), where the study was conducted, is located in the northeastern extremities of the KNP. The study area was a 107 m × 154 m plot, of which 85% was covered by tree canopy. The trees comprised mostly *Calophyllum inophyllum* (45%), *Barringtonia asiatica* (25%), *Cerbera manghas* (20%) and *Cinnamomum camphora* (10%), and were mostly lower in height than the surrounding utility poles. A tar road and parking lots on three sides and dense vegetation on the fourth surrounded the plot. The wooded plot had a clearing in the middle, which covered about 15% of the total area. The study plot was less than 1 km from the shoreline of the Taiwan Straits.

**RESULTS AND DISCUSSION**

The Brown Shrike was quite numerous during my stay at the KNP Youth Activity Center and a constant flow of individuals was observed in the area. Basing on information from local environmental authorities, these were migrants passing through the area. This was also evident in the study plot where on a daily basis each individual was observed to establish a territory for the short period of time when it
remained in the area. These individuals were obviously defending a feeding territory because of the small size of the area defended and the fact that they drove away conspecifics.

Brown Shrikes overwhelmingly preferred to perch on the protruding branches from the side of the tree canopy (N = 1886; 98.3%) and not on top of the tree (N = 32; 1.7%). This facilitated a better observation of the open area of the woodlot, with no dead area around or under it, allowing a better detection of prey and vigilance. The shrikes were observed to move to the top of the tree only during intraspecific interactions when an effort was undertaken to drive the intruding shrikes out of the territory. This strategy for accessing prey conforms to previous perch-choice studies in Red-backed (L. collurio; CARLSON 1985a) and Great Grey Shrikes (L. excubitor; ROTTHAUPT 1995). An obvious advantage of the proximity of a perch to foliage became evident when a flock of Gray-faced Buzzards (Butastur indicus) flew low overhead and the Brown Shrike under observation disappeared amongst the leaves and stayed there hidden until all the raptors had passed. This was the only time the Brown Shrikes were observed to hide amongst the foliage and this predator-avoidance is similar to that reported by CADE (1967) and SCHON (1979).

Fig. 1. Map of Taiwan showing the location of the Kenting National Park at its southern end.
The Brown Shrikes were observed to stay on a perch for periods of up to 18 minutes ($\pm 21$, $N = 412$). Giving-up was observed 1643 times when no prey was detected or attacked and the shrike changed perches. On 610 of these changes the shrikes were observed to be relaxed and not searching actively for prey. The shrikes left the perch either to chase a potential prey or interacted with another individual – Detection – on 271 occasions. This suggests that Brown Shrikes also rest a lot between hunting bouts while on migration and hunting rate is very different from that during the breeding season (Severinghaus & Liang 1995).

Of a total of 89 interactions with other individuals, 62 (69.6%) were intraspecific and 27 (30.4%) were interspecific. Of the 62 intraspecific aggressive interactions, 3 were against groups of up to 5 migrating Brown Shrikes that landed in the study plot before heading out to sea, supposedly towards the Philippines across the Luzon Strait (Fig. 1). The flocks appeared to be cohesive and the groups did not return the aggressive reactions of the territorial shrike. The intruders were observed to leave the study area and to fly towards the shore.

Interspecific aggressive interactions were observed when the territorial Brown Shrike vocalized in an irritated manner, flicked its tail, and then chased away Himalayan Tree-pie (*Deudrocitta formosae*; $N = 11$), Styan’s Bulbul (*Pycnonotus taivanus*; $N = 8$); Spotted Flycatcher (*Muscicapa striata*, $N = 5$), and Blue Rock Thrush (*Monticola solitarius*; $N = 2$). One of the shrikes also made a half-hearted attempt to displace a Black-browed Barbet (*Megalaima oorti*; $N = 1$), which ignored the shrikes’ attacks. Other species observed to fly within the area of the territory defended by the shrike were ignored: Black Drongo (*Dicrurus macrocercus*), White-shouldered Starling (*Sturnia sinensis*), Bank Swallow (*Riparia riparia*), Pacific Swallow (*Hirundo tahitica*).

In all the hunts recorded, a perch was used to locate the prey and to launch the attacks. All glides from the perch ($N = 37$) were initiated with a strong thrust of the legs, with wings folded and held tightly, close to the body, and in the case of a successful attempt the prey was attacked on the ground ($N = 31$). No attempts to walk or jump at prey that got away were observed ($N = 6$). Aerial pursuits were more frequent ($N = 132$) and butterflies were the most obvious of the prey taken ($N = 79$). Shrikes were observed to follow the flight path of the aerial insect from the perch and to fly in its direction with a fast take-off and to try to catch the insect in a direct attack. Prey that succeeded in avoiding the shrike on the first attack were chased for periods of 3–11 seconds (mean $6.1 \pm 2.2$; $N = 27$). Gleaning from the branches and leaves were not quantified owing to the difficulty of assessing success.

The large proportion of butterflies in the Brown Shrike’s diet is of interest and conforms to Severinghaus & Liang (1995), who also reported that invertebrates were the most frequent prey item, and amongst them, Lepidoptera were of the greatest frequency. They also reported that during fall migration they saw Brown Shrikes swoop at bird flocks. This was not observed during this study, probably because the study site did not have any transit flocking species. Further, they reported that Brown Shrikes caught a variety of amphibians and reptiles. Again, no vertebrate were successfully caught during this study, probably because in the woodlot in the vicinity of the Youth Center there were few or no resident vertebrates.
The 7 observed Brown Shrikes had an overall hunting success of 62.7% (106 of 169). SEVERINGHAUS & LIANG (1995) found that the number of successful prey captures seen for each shrike was significantly correlated with the amount of time it was observed. Hence, the fact that I observed the birds for up to several hours continuously gives us the effective hunting success for the species in the study area.

I conclude that Brown Shrikes in Taiwan maintain feeding territories while on migration and feed en route. It remains to be studied whether age- and sex-related aspects dictate which individual will defend transit territories and which individuals will migrate, singly or in groups, to the wintering grounds in Southeast Asia. Like all other shrike species, the Brown Shrike is a sit-and-wait predator that uses perches for prey-detection, vigilance, and rest. Brown Shrikes, like most other true shrikes, will adapt to local conditions and their diet will depend on local prey availability. However, this study also illustrates the need for additional studies of the lesser-known shrike species of eastern Asia.

REFERENCES


