

Roosting Behavior of the Grey-Cheeked Fulvetta *Alcippe morrisonia* Swinhoe in the Non-breeding Season

繡眼畫眉 (*Alcippe morrisonia* Swinhoe) 在非繁殖季的夜棲行爲

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Abstract

Grey-cheeked fulvetta (*Alcippe morrisonia*) is a small dominant passerine bird in broad-leaved hardwood forests in Taiwan. During the non-breeding season of July 1994 and March 1995, we made 39 observations of fulvettas roosting at 18 perch sites in the Fushan Experimental Forest. Each site was located in the dense canopy of a single tree. Of them, 14 perch sites (77.8%) had two birds clumping together. One site was used for eight consecutive nights by the same two birds identified by their color band. The pair formation in night roosting may occur for both juveniles and adults.

摘要

繡眼畫眉(*Alcippe morrisonia*)為台灣常綠闊葉林中在數量上相當占優勢的小型燕雀目留鳥。本研究自1994年7月至1995年3月，繡眼畫眉的非繁殖季節，於福山試驗林中的18個棲位，共記錄到39次繡眼畫眉的夜棲行爲。夜棲棲位都位於濃密的樹冠中，且未曾於一棵樹上同時發現兩個棲位。18個夜間棲位中有14個(77.8%)為2隻個體緊靠在一起。更有2隻連續8晚利用同一夜間棲位，因其繫有色環被證實為相同的個體。這種夜棲行爲的配對現象可能同時發生在第一年鳥與成鳥。

Key words: grey-cheeked fulvetta, *Alcippe morrisonia*, roosting behavior

關鍵詞： 繡眼畫眉、夜棲行爲

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Introduction

The grey-cheeked fulvetta *Alcippe morrisonia* Swinhoe, 1863 is a passerine bird belonging to the tribe Timaliini of the family Sylviidae (Sibley and Monroe 1990). It is only 14 to 17g in weight (Hu 1999). In Taiwan the grey-cheeked fulvetta is a resident species at elevations between the sea level and 2,800m (Yen 1990) and common in broad-leaved hardwood forests at elevations lower than 2,000 m (Ding 1993; Shiu 1995; Sun and Wang 1998). The grey-cheeked fulvetta feeds mainly on small arthropods but also plant food, of which the latter increases sharply in fall and winter (Chou *et al.* 1998; Chen and Chou 1999).

The grey-cheeked fulvetta lives in flock, often as a mixed-species feeding flock, in the non-breeding season of autumn and winter (Sun and Wang 1998; Chen and Hsieh 2002). The flock sizes differ in seasons with the largest in early non-breeding season (Lin 1996; Sun and Wang 1998). The largest flock that has been reported was 150 individuals (Chen and Hsieh 2002). The grey-cheeked fulvetta forms monogamous pairs in the breeding season of spring and summer (Lin 1996; Kuo 2000).

Many members of the tribe Timaliini have been known to roost communally in huddles in nights in the non-breeding season. The behavior has been reported for the Arabian babbler (*Turdoides squamiceps*) (Bishop and Groves 1991), the common babbler (*T. caudatus*) (Gaston 1978a), the grey-crowned babbler

(*Pomatostomus temporalis*) (King 1980), the jungle babbler (*T. striatus*) (Gaston 1977), the rufous babbler (*P. isidori*) (Bell 1982), and the yellow-eyed babbler (*Chrysomma sinensis*) (Gaston 1978b). These babblers are all cooperative breeding species living in flocks in daytime in non-breeding season. At night they roost in huddles. For the grey-cheeked fulvetta, it has not been reported to roost communally, and its roosting behavior remained unknown.

Materials and Methods

This study was conducted at the Fushan Experimental Forest of the Taiwan Forestry Research Institute. It was a subtropical evergreen hardwood forest composed predominantly of Fagaceae and Lauraceae at elevations of 400 to 1,400m (Lin *et al.* 2001) in northeastern Taiwan (121°34'E, 24°46'N). From 1993 to 1997 the monthly mean temperature of the area was 18.2°C, the lowest winter temperature was -1°C in January, and the mean annual rainfall was 3,660 mm with 221 rainy days yearly (Hsia and Hwong 1999). Observations of roosting fulvetta were made mainly in the administration area of Fushan Experimental Forest (10 ha). We also occasionally checked its botanical garden (30 ha). The elevations where we carried out the fieldwork were around 600–700m.

Fieldwork was carried out from September 1994 to January 1995. During the period, we spent three to eight nights for a month to search roosting fulvetta. We also spent one night to

search roosting fulvetta in July 1994 and March 1995, respectively. During the study period, we spent totally 26 nights to search roosting fulvetta with a flashlight from 7 to 10 pm along the roadside in the forest. When roosting fulvetta was spotted, its number was counted and the color band combination of each bird if present was recorded with a pair of Leica binoculars (8 x 32 mm). We banded 221 grey-cheeked fulvettas from January 1994 to January 1995.

Results and Discussion

In the non-breeding season, the grey-cheeked fulvettas formed a feeding flock in dawn and the flock broke in dusk. At night they roosted in trees or bushes within the home range of the feeding flock. We recorded 18 roosting sites: 17 in the canopy with height estimated from 3 to 11m, while one in a bush near the trunk of a tree at about 2m up. Perch sites were usually under dense foliage. The roosting perches were small with diameters estimated to be less than 1 cm. There were no two roosting sites simultaneously present in a single tree in the same night.

We made 39 observations of roosting fulvettas at 18 roosting sites. Of them, 14 roosting sites were found to be two birds packed together. They occupied 77.8% of the total observations. The sites with a single bird and three birds had two sites each (11.1%) (Table 1). Apparently, most grey-cheeked fulvettas roosted in pair at nights during the non-breeding season.

There were five roosting sites (4, 5, 7, 10, 17) used by fulvettas more than one night, suggesting that these birds returned to the same roosting sites occupied previously (Table 1). A

pair occupied Site 17 for eight consecutive nights from 16th to 23rd January 1995. They were identified as the same pair of birds by their color bands. The other four roosting sites (4, 5, 7, 10) were intermittently observed used by paired birds two to eight nights from September 1994 to January 1995.

Juveniles of the grey-cheeked fulvetta have been known to fledge before mid-August but to stay with their parents for additional 40 days or longer (Lin 1996). In this study it was observed that juvenile fulvettas and their parents of many families form a large feeding flock in daytime. The flock broke into smaller flocks again and again before roosting at dusk. At night most of the fulvettas roosted in pairs (Table 1).

During non-breeding season, many passerines form feeding flocks in daytime. However, the roosting behavior varies among species. Most members of genus *Parus* sleep singly in holes (Smith 1991), while vinous-throated parrotbill (*Paradoxornis webbianus*) roosts communally in a small specific area of 5 x 25 m² to 1 x 10 m² and within this small area they separated into small clusters of individuals, spreading out with one to three birds roosting side by side (Severinghaus 1987). Another type of roosting behavior is a whole flock roosting in huddle, represented by cooperative breeding babbler of the genus *Turdoides*, which live in a permanent flock and defending a territory (Gaston 1977; Gaston 1978a; Bishop and Groves 1991). Furthermore, cooperative breeding birds, such as long-tailed tit (*Aegithalos caudatus*), common bushtit (*Psaltriparus minimus*) (Smith 1972; Chaplin 1982), and yellow-eyed babbler (Gaston 1978b), also roost in huddle in cold winter, though their flocks break up before the

breeding season.

Roosting behavior of the grey-cheeked fulvetta differed from the species mentioned above. It did not roost communally in a small area as a whole flock, rarely roosted individually, but roosted in pairs. Its roosting sites were widely dispersed in the forest. The nearest distance between the two roosting sites observed was about 10m. Each site was on a single tree. There was no tree that had more than one roosting site occupied simultaneously in a single

night. Also, a pair of birds did not occupy a perch site of a tree for roosting permanently. They occupied the site for one night to a few consecutive nights, and then shifted to a site on another tree. It is a question what is the mechanism for paired birds select their perch sites.

The roosting perch sites of the grey-cheeked fulvetta were found to be beneath a dense canopy. It is reasonable to explain it as a protection mechanism against predators in

Table 1. Number of birds and dates of observations for the roosting grey-cheeked fulvetta at the Fushan Experimental Forest, July 1994 to March 1995

Roosting site	Dates of observation	Number of nights	Number of birds
1	21 July 1994	1	3
2	18 September 1994	1	1
3	18 September 1994	1	2
4	25 September 1994	2	2
	27 November 1994		
5	25-27 September 1994	6	2
	16-18 January 1995		
6	15 October 1994	1	1
7	15-16 October 1994	2	2
8	16 October 1994	1	2
9	16 October 1994	1	2
10	16 October 1994	8	2
	27-28 November 1994		
	10-12 and 17-18 December 1994		
11	17 October 1994	1	2
12	20 November 1994	1	2
13	21 November 1994	1	2
14	28 November 1994	1	3
15	12 December 1994	1	2
16	18 December 1994	1	2
17 ^{1/}	16-23 January 1995	8	2
18	13 March 1995	1	2

^{1/} Roosting site in bush.

subtropical forests. Although the Fushan Experimental Forest is fairly cold in winter (the minimum temperature of -1°C), it is suspected that paired fulvettas have adequate feather coverage to sustain their body temperature, and/or have a proper physiological adjustment against hypothermia as found in some species of the genus *Parus* which roost individually (Smith 1991). However, seasonal mortality of the grey-cheeked fulvetta has been found to be high in winter (Lin 1996; Hu 1999). There must be a better explanation than keeping warm as a mechanism for the pair formation in night roosting in winter.

Based on the data obtained (Table 1), the pair formation in night roosting of the grey-cheeked fulvetta might start as early as late summer (September), right after the breeding season that ended in the mid-summer. It has been known that the first-year juveniles are composed of more than 40% of the winter population (Hu 1999). In this study most of the birds roosted at night were found to be paired (Table 1). Accordingly, the pair formation in night roosting might occur not only for two-year adults and older, but also for the first-year juveniles. Such pair formation in juvenile birds has been also reported in chickadees and titmice (Hogstad 1987; Smith 1991).

In this study although most grey-cheeked fulvettas roosted in pair during non-breeding season, there were some birds roosting singly or in three birds. For those roosted in three birds at late-breeding season may belong to a same family. For those roosted singly might be lost their partners. A further study is needed to answer the significance of the roosting behavior of the grey-cheeked fulvetta.

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