

## 短 報 (Note)

# Winter roosting sites and roosting behavior of tree creepers (*Certhia familiaris*) in Hokkaido

MATSUOKA Shigeru<sup>1)\*</sup>

### Abstract

Five winter roosting sites of tree creepers were recorded in the broad-leaved deciduous forests of southeastern Sapporo, Hokkaido, northern Japan. Tree creepers selected hemispherical shallow holes on trunks, nestled into them alone at or around sunset in Sapporo. In all cases nothing covered their backs and hid them from lateral view. The same types of winter roosting sites and roosting behaviors suggest that such roosting site selection and behaviors are common in populations in Hokkaido that is located in the eastern edge of its distribution.

**Key words :** tree creeper, *Certhia familiaris*, roosting site, roosting behavior, tree hollow

### Introduction

Sleeping is an essential activity for birds as well as for other higher vertebrates (Encyclopædia Britannica, 2005), and birds spend a relatively long time at their sleeping sites, i.e. roosting sites. Thus finding a safe place to sleep is no less important to them than finding a safe site for their nests (Skutch, 1993).

Tree creepers (*Certhia familiaris*) were thought to range widely through the Holarctic region (Cramp & Perrins, 1993; OSJ, 2000), but now an american form, the brown creeper (*C. americana*), has split from the Old World one (AOU, 1998). Tree creepers are sedentary or partially migrant throughout their range, and are resident breeders in Japan (OSJ, 2000). Their roosting behaviors have been studied in Europe, especially in winter (Cramp & Perrins, 1993). The birds select a variety of roosting sites and show variable roosting behaviors in Europe, but no research, to my knowledge, has been conducted on populations on the eastern edge of Eurasia.

This paper describes the characteristics of winter roosting sites and behavior of tree creepers in Hokkaido, northern Japan.

### Study area and methods

Studies were carried out in the broad-leaved deciduous forests of the National Agricultural Research Center for the Hokkaido Region (NARCH, 43° 00' N, 141° 24' E, about 130m above sea level) in southeastern Sapporo, Hokkaido (for a further description of the study area, see Kotaka & Matsuoka, 2002).

Over 36 evenings from 2nd February to 21st March, 2006, I followed tree creepers by ski until I either found their roosting

sites or lost track of them. After that, I scanned their roosting sites that had already been found to check whether they were being occupied or not. I defined a roosting site as a place where a tree creeper nestled into a hollow and quickly after that became motionless. Measurements of roosting hollows and trees were taken with a measuring tape and a compass.

I captured two tree creepers with a mist net and marked with color rings that could easily be recognized by binoculars.

The original numerical data on sunset time in Sapporo were downloaded from the website of the National Astronomical Observatory of Japan and the original numerical data on the daily minimum temperature near the study area were downloaded from the NARCH website.

Analysis of the circular distributions of the roosting hole direction was made using circular statistics (Zar, 1999).

### Results and discussion

**Roosting sites:** I found five roosting sites, labeled from R1 to R5. Four of them were found while tracking the birds (Photo 1) and one (R4) was found by chance when I inspected tree holes for possible roosting sites. The latter was occupied only twice (Fig. 1) and I could not take a photo of the roosting birds. All of the sites were shallow holes on trunks, and lacked tree bark, at least around the roosting hollows, except for R5, which was encircled by bark (Photo 1). Judging from the shape and size of the hole of R5, it seemed to have been a roosting hole of a great spotted woodpecker (*Dendrocopos major*) that had stopped excavating halfway. But I could not determine the origins of the other four hollows.

原稿受付：平成 18 年 9 月 14 日 Received Sep. 14, 2006 原稿受理：平成 18 年 12 月 1 日 Accepted Dec. 1, 2006

\* Hokkaido Research Center, Forestry and Forest Products Research Institute (FFPRI), Hitsujigaoka 7, Toyohira, Sapporo 062-8516, Japan; e-mail: shmatsu@affrc.go.jp

1) Hokkaido Research Center, Forestry and Forest Products Research Institute (FFPRI)

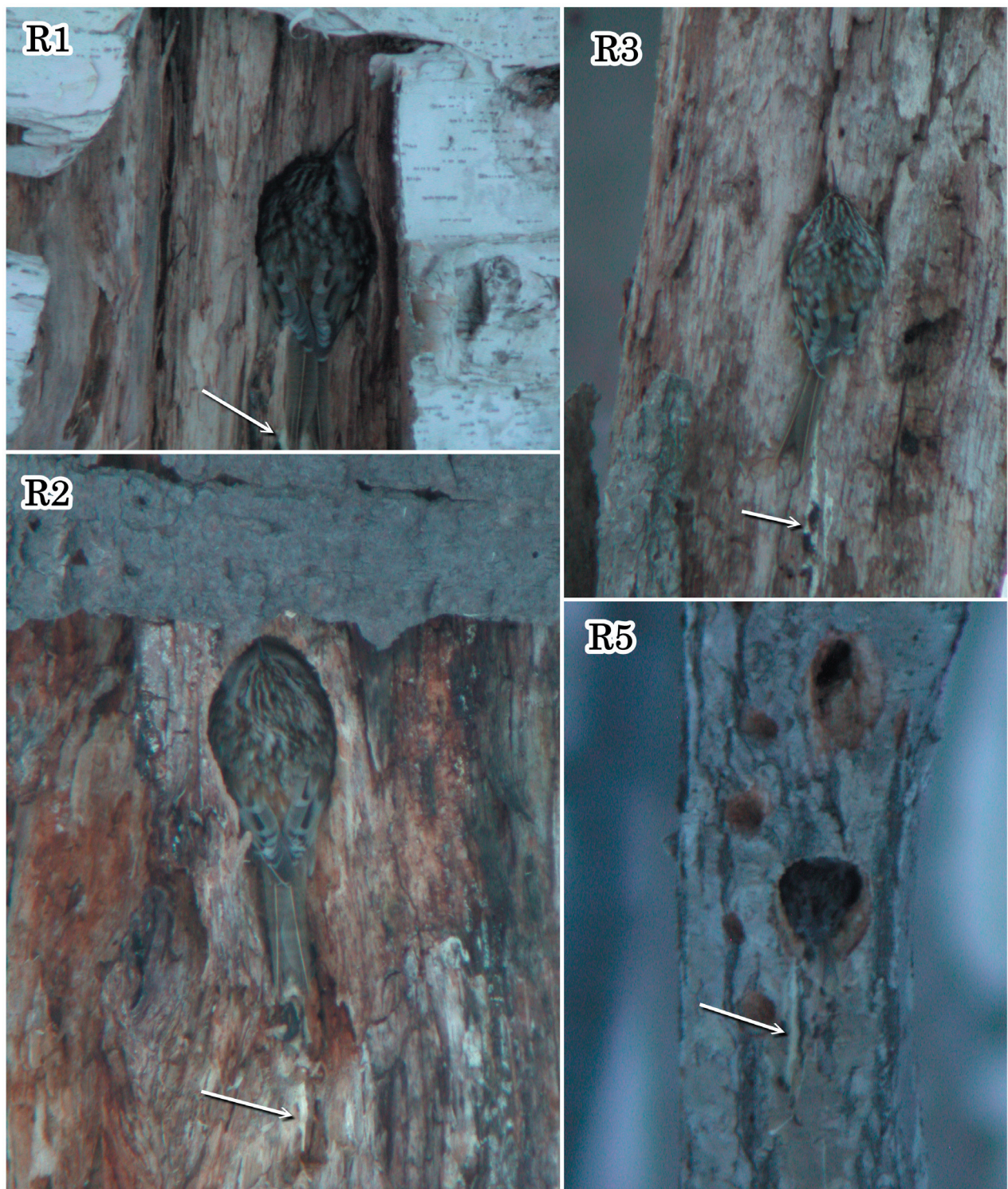


Photo. 1. Tree creepers just after roosting.

Roost labels (R1, R2, R3, and R5) are identical to those in Table 1. We cannot see the head of the tree creeper roosted in the R5 in this photo. White arrows indicate fecal droppings on the surfaces of trees beneath the roosting hollows.

Tree creepers excavate or at least enlarge hemispherical holes, mainly in the morning and evening (Cramp & Perrins, 1993), but I did not observe such behaviors at the roosting sites in this study. In Europe, the roosting sites include cracks, holes, hollows, under the bark of a variety of trees, and under ivy (Cramp & Perrins, 1993).

In the present study, four species of trees were used as roosts and they were all dead trees with the tops broken off (Table 1). The mean roost height of tree creepers was 3.6m, which is lower than that of tits and woodpeckers that roost in tree holes in the same forest (S. Matsuoka, unpublished data). The mean compass orientation of roosting hollows was about 190 degrees,



approximately facing due south, but the length of mean vector was about 0.5 (Table 1) suggesting a relatively wide dispersion. Dimensions of roosting holes were in the ranges of values described in Cramp & Perrins (1993), except for their horizontal width value of 25mm.

**Roosting behavior:** In all cases tree creepers perched 30 to 50 cm below the roosting sites and climbed up to them, then nestled into the roosting hollows. Nothing hid the bodies of roosting birds from lateral view (Photo 1). All of them roosted alone in this observation, although communal roosting has been reported in European countries during cold nights, e.g. temperature down to about minus 14 degrees Celsius (Cramp & Perrins, 1993). The daily minimum temperatures sometimes dropped below minus 15 degrees in this study area (Fig. 1), but I could not observe communal roosting.

Except for the bird that roosted in R5, all the birds had their bills pointing up after roosting in uncovered hollows. But these poses were likely alert-postures prior to sleeping; they usually turn their heads and tuck into scapular feathers (Cramp & Perrins, 1993), like the bird of R5. Cryptic coloration and motionless posture of the birds that roost in uncovered hollows may mask them from being found by predators. From only the point of view of heat loss, however, the birds take advantage in cold winter if they roost in tree holes like woodpeckers. I cannot explain why they were roosting in uncovered open hollows, and thus subjecting themselves to heat loss, in this observation.

Tree creepers usually roosted at or around sunset in Sapporo, which varied from 16:46 (2nd February) to 17:47 (21st March) during this observation period, but some roosting times were not around sunset (Fig. 1). The reason for these deviations in roosting time is not certain, but weather conditions such as temperature, snow fall, wind, and cloudiness, and/or physical conditions such as hunger level and body fat storage, might

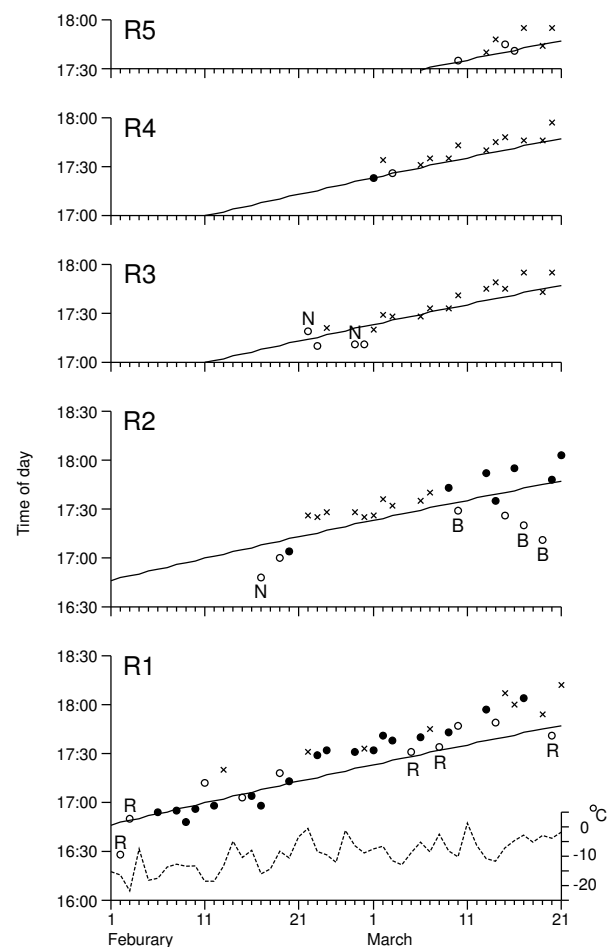


Fig. 1. Variations in time when tree creepers roosted in.

White circle: exact time when the bird roosted in. Black circle: at that time the bird was already roosting in. Cross: at that time no birds were found at the roosting sites. Alphabet letters by the white circles indicate the leg ring colors verified when the bird roosted in (R: red; B: blue (ringed 9th March, 2006); and N: without ring). The solid lines indicate sunset time in Sapporo. The dashed line indicates the daily minimum temperature.

Table 1. Measurements of roosting trees and sites of tree creepers.

Roost label	Tree species <sup>1)</sup>	Tree status <sup>2)</sup>	Tree height <sup>3)</sup> (m)	Diameter at breast height (cm)	Roost height (m)	Diameter at roost height (cm)	Slant from vertical (degrees)	Direction of roosting hole <sup>4)</sup> (degrees)	Dimension of roosting hole <sup>5)</sup> (mm)
R1	<i>Betula platyphylla</i>	dead	9.4	37.6	2.9	37.6	0	147	48x41x40
R2	<i>Prunus sargentii</i>	dead	3.5	22.3	2.3	22.0	0	145	40x36x46
R3	<i>Quercus mongolica</i>	dead	6.2	16.2	4.5	12.0	0	156	-
R4	<i>Betula maximowicziana</i>	dead	4.0	29.3	3.2	27.0	10	261	-
R5	<i>Quercus mongolica</i>	dead	5.4	15.0	5.1	10.0	0	282	-
mean			5.7	24.1	3.6	21.7	2	189.9 (0.51)*	

<sup>1)</sup> Scientific names of trees were taken from Takahata et al. (2000).

<sup>2)</sup> All the tops of roosting trees were broken off.

<sup>3)</sup> All heights were measured from the snow surface one to three days after the roosts were found.

<sup>4)</sup> North is designated 0 (or 360) and values in degrees increase clockwise.

<sup>5)</sup> Dimensions measured were vertical length, horizontal width, and depth.

\* The number in parentheses is the length of the mean vector (a measure of concentration). It varies from 0 (when there is so much dispersion that a mean angle cannot be described) to 1 (when all the data are oriented toward the same direction) (Zar, 1999).

have affected the time they roosted. I think, in many of the cases which were shown with cross symbols in Fig. 1, that tree creepers did not use the hollows after I confirmed no birds occupied there, and they possibly used two or more roosting sites.

Judging from the leg ring colors of the birds that roosted in R1 and R2, each bird used the same roosting site in this study area (Fig. 1). Tree creepers, however, occupy a site used previously by another bird in Europe (Cramp & Perrins, 1993).

A few fecal droppings were on the surfaces of trees beneath the roosting hollows in all five cases (Photo 1), but I have not observed that tree creepers excreted fecal droppings in a few minutes after they roosted in. Thereafter the birds might excrete fecal droppings while roosting.

Cramp & Perrins (1993) reported finding a wide variety of roosting sites and behaviors in tree creepers. In this observation, I recorded five roosting sites which were mostly similar. These limited types might be prevalent in the easternmost populations, especially in Hokkaido. However, it is necessary to study more examples of roosting sites of the birds to determine whether these limited types are common in the eastern populations of Eurasia or whether the populations exhibit a variety of roosting behaviors like the European populations.

#### Acknowledgment

I would like to thank Hitoshi Tojo and two anonymous reviewers for their useful comments on the manuscript. I also thank the National Agricultural Research Center for the Hok-

kaido Region and the National Astronomical Observatory of Japan for providing meteorological and astronomical data.

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## 冬期間におけるキバシリ (*Certhia familiaris*) のねぐら場所とねぐら入り行動について

松岡 茂<sup>1)</sup> \*

### 要 旨

キバシリは、ユーラシア大陸に広く分布する種であるが、極東地域での生態研究は少ない。この報告では、北海道札幌市の落葉広葉樹林で観察された冬期間のキバシリのねぐら場所およびねぐら入り行動を記載した。キバシリは、調査地の日の入り時刻前後に、樹幹に掘られた浅い穴に体を埋めるようにねぐら入りしたが、体が隠れるような樹洞や樹皮下へのねぐら入りは観察されなかった。個体識別された個体は、観察された限りではそれぞれ同じねぐらに入った。ねぐら場所の特徴やねぐら入りの行動に大きな変異は認められなかった。

キーワード：キバシリ、ねぐら場所、ねぐら入り行動、樹洞

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\* 森林総合研究所北海道支所 〒 062-8516 北海道札幌市豊平区羊ヶ丘 7 番地 e-mail:shmatsu@affrc.go.jp  
1) 森林総合研究所北海道支所

