

Differences in Breeding Success of Tits Used Artificial Nest Boxes between Hog Fat Supplied and Non-supplied Coniferous Forests

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I . Purpose of study

In this study, we have compared cavity nester in different food abundance and availability in similar forests. The aim of this study is to describe the breeding success and clutch size of tits used the artificial nest boxes in hog fat supplied and non-supplied coniferous forests.

II . Methods

This study was conducted from Nov. 2002 to Jun. 2003, on coniferous forest (37° 16' 50" N, 126° 55' 45" E) of the Chilbosan University Forests, Seoul National University in Korea. We have selected two study sites (150 x 210m). Each study site was divided into grids consisting of a 30 x 30m array marked with flags, facilitating accurate nest boxes location. Nest boxes varied in their entrance diameter such as 3cm, 3.5cm and 4cm for different body size of cavity nesting birds. we have attached 200 pieces of hog fat (10 x 10 x 3 cm) on trunk of trees for artificial food supply from November 2002 to February 2003. There was no fat supplied in the other site. In order to describe quantitatively the habitat, variables of the forest structure, such as foliage height profile, DBH and tree species, were recorded in areas of woodland five meters in diameter in each 30 x 30m square.

III. Results and discussion

All the parameters of overstory vegetation, such as tree density, tree species

richness, tree species diversity and total basal area, were similar in both two study sites. The average foliage profiles were also similar between the two study sites. In all five vertical layers, foliage coverage was not different (t-tests, five p values were over 0.19). There were no differences in vegetation characteristics between hog fat supplied and non-supplied coniferous forests.

Table 1. Differences in no. of breeding nest boxes with different entrance diameter between hog fat supplied and non-supplied sites in coniferous forest

	Hog fat supplied site			Non-supplied site		
	3cm (n=17)	3.5cm (n=17)	4cm (n=17)	3cm (n=17)	3.5cm (n=17)	4cm (n=17)
No. of breeding nest boxes	4	6	3	2	2	-

Table 2. Differences in clutch size of three tits species used the artificial nest boxes between hog fat supplied and non-supplied sites in coniferous forest

	Hog fat supplied site	Non-supplied site
<i>P. palustris</i>	9.50±1.29*	8.00±1.41
<i>P. major</i>	10.25±0.96	7.00±0.00
<i>P. varius</i>	8.25±1.71	6.00±0.00

* Mean±SE

The total number of breeding nest boxes was higher in hog fat supplied site than in non-supplied site (Table 1). Breeding success of three tit species was different in each entrance diameter of nest boxes (Table 2). The different preference of nest box's entrance diameter would be related to body length of tit species (Lee et al., 2000). Clutches in nest boxes of fat supplied site were

significantly larger than in those of non-supplied site (Table 3).

Table 3. Differences in clutch size of three tits species used the artificial nest boxes between hog fat supplied and non-supplied sites in coniferous forest

	Hog fat supplied site	Non-supplied site
<i>P. palustris</i>	9.50±1.29*	8.00±1.41
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* Mean±SE

Nest-box programs are normally considered an effective conservation tool, particularly for cavity-nesting species (Eadie et al., 1998). In addition to good nesting facilities, the area must include good cover and good brood habitat food, shelter and areas for undisturbed rest (Zannette, 2002). Also, food supply would be good for increase of breeding success of them in poor habitat quality areas (Korea Forest Research Institute, 1996).

More intensive researches on birds nesting in cavities would be needed for further understanding of the factors that regulate populations of secondary cavity nesters and influence community structure.