

Japanese Bush Warbler Uguisu (Jpn) *Cettia diphone*

Morphology and classification

Classification: Passeriformes Cettidae

Total length:	Approximately 14-15.5cm	
Wing length:	♂ 62.2-67.7mm	♀ 51.3-57.0mm
Tail length:	♂ 64.8-73.1mm	♀ 53.4-60.7mm
Culmen length:	♂ 10.6-13.8mm	♀ 9.9-11.7mm
Tarsus length:	♂ 24.5-27.1mm	♀ 21.4-23.2mm
Weight:	♂ 14.8-22.3g	♀ 10.0-13.7g

Total length after Yoshii (1988), and the other measurements are by the author in Niigata Prefecture in the breeding season (Hamao 1992).

Appearance:

Both male and female are olive brown on the upper part and beige on the underpart. They have creamy superciliaries. The plumage coloration varies slightly between the subspecies or the local populations.



Photo 1. Japanese Bush Warbler [Hiroshi Uchida]

Vocalization:

Males sing a loud "Hoh, hokekyo" with the accent on the "ke" of the second syllable, and shriek like "Pirrrrrr-kekkyo, kekkyo...", which is called "Taniwatari (valley crossing call)". Males also sing the same song but in a whispering voice when they court females. Females whisper "Chee, chee" softly during the incubation and nestling periods. Females would call "chatt, chatt", which is named "Sasanaki (bamboo grass call)" in the periods other than incubation and nestling-rearing. Males also utter this "Sasanaki call" in winter, but not in the breeding season.

Distribution and Habitat

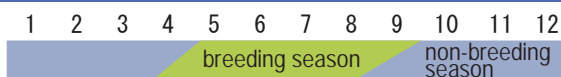
Distribution:

Japanese Bush Warblers are distributed in northeastern China, the Russian Far East, the Korean Peninsula and Japan.

Habitat:

Japanese Bush Warblers especially prefer bushes at a forest edge and in an open area of a forest from a montane belt to a subalpine zone, though they are widely distributed in a dense thicket of bamboo grass and bushes from a coastal area to an alpine region. In recent years, on the other hand, they have more frequently bred in hills and lowlands probably because bushy habitat has increased in flood-controlled river basins and abandoned farmland.

Life history



Breeding system:

Japanese Bush Warblers have polygynous mating system. It is known that a single male breeds with two females or more in his territory. There is a record of a male that mated with six or seven females one after another in the same breeding season. It is females that build a nest, incubate the eggs and raise the young. Males try to attract as many females as possible by singing throughout the breeding season, regardless of breeding stages of females. It is because females attempt to breed again with other males after they have fledged their young successfully or lost their eggs or nestlings due to predation that they

have maintained a highly developed polygynous system. Although their mating system is polygyny, a male does not necessarily acquire two females or more at the same time, nor does a female mate with only one male in a breeding period.

Nest:

They build a rugby ball-shaped nest with an opening on the side or the upper side using primarily dead leaves of bamboo grass (*Sasa* spp.). The nest is often built in a low place of the bushes. In the Myokokogen highlands, Niigata Pref., north-central Japan, for instance, they built a nest at a mean height of 54cm (5-140) above the ground in Japanese holly (*Ilex crenata*), etc.



Photo 2. Nest and nestlings two days before fledging.

Egg:

They usually lay 4-6 eggs, which are chocolate brown in color.

Incubation and nestling periods and fledging rate:

The incubation and nestling periods are about 15 and 13 days, respectively. The fledging rate is low, such as 27% due largely to predation.



Photo 3. Female incubating in a nest.

Migration:

It is assumed that they move to the lowlands of a temperate region in winter. But in a population in Mt. Tsukuba, Ibaraki Pref., central Japan, the same individuals were observed throughout the year (Tojo 1995). On the other hand, the banding records showed that a bird moved from Tobishima Island, Yamagata Pref., northern Japan to Ishigakijima Island, south Japan in autumn (Yamashina Institute for Ornithology 1987) and that a territorial male banded in May in the Hiki hills, Saitama Pref., central Japan was recaptured in Yokohama, Kanagawa Pref. in November of the same year. The populations of higher latitudes probably make a longer distance migration.

Topics of ecology, behavior and conservation

● Brief duration of territory

In many species, the territory is claimed at the beginning of the breeding season and maintained until its end. In Japanese Bush Warblers, however, the territory often changes hands and in shape in a short period of time. Males tend to court any females indiscriminately and spend a long time around females (Fig. 1). Therefore, the moving range of a male changes every day. In addition, the territory is frequently intruded by males of the neighboring territories and floater males without a territory, which makes it difficult to maintain the territory for a long period of time. In the

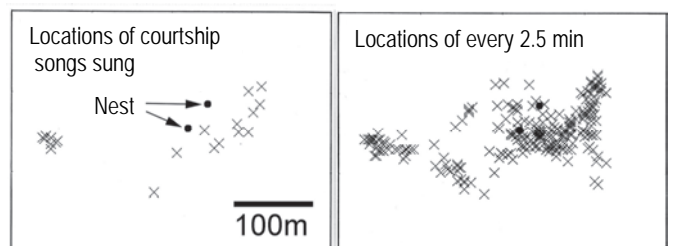


Fig. 1. Tracking record of a male with two mates from sunrise to sunset on a day.

Myokokogen highlands, for instance, territory holders in a specific period represented about 1/3 of the males that lived in the area. This is another contributory factor to their polygynous mating system.

● Vocal communication

Songs of male Japanese Bush Warblers are classified into two types. One is a type-H song that sounds as "Hoh-hokekyo" and the other is a type-L song that has intermittent whistles as "Hoh-hoho-hokekyo". The type-L song is assumed to function as a threat to rivals in the vicinity because territory owners frequently use this type in the periphery of their territory and they return this type of song to replayed songs of other males (Momose 1986).

The "Taniwatari" call is often assumed to be an alarm, but males sometimes utter this call responding to the "Chee, chee" call of females, and sometimes start this type of call immediately after the type-L song, repeating a combination of these song and call for a long period of time. In addition, this call is uttered also in the Ogasawara Islands where the predatory mammals or snakes do not occur. It would be better, therefore, not to consider this call to represent wariness.

● Taxonomic positions of Japanese Bush Warbler subspecies

Six subspecies of Japanese Bush Warblers are recorded in Japan. They are *C. d. cantans* widely distributed in the main islands of Japan, *C. d. diphone* of the Ogasawara Islands, *C. d. riukiensis* and *C. d. restricta* of the Nansei Islands, *C. d. sakhalinensis* breeding in the south Kurile Islands, and *C. d. borealis*, an irregular visitor from the continent (The Ornithological Society of Japan 2012).

But the classification is reconsidered now. *C. d. restricta* was discovered on Minami-daitojima Island and has been regarded to be extinct. However, in recent year, two types of Japanese Bush Warblers were observed on Okinawajima Island and the one with features of *C. d. restricta* (Kajita et al. 2002). This subspecies is alive in Amami and Ryukyu Islands. The other type observed on Okinawajima Island has characteristics of *C. d. riukiensis*, and appears only in winter. Therefore, it probably breeds in the northern area. *C. d. riukiensis* is thought to be a synonym of *C. d. cantans* and/or *C. d. sakhalinensis*. Further, identification of *C. d. sakhalinensis* and *C. d. cantans* is unclear, although the former has more greyish plumage. These subspecies should also be reconsidered.

● Countermeasures against brood parasitism

Japanese Bush Warblers are parasitized by Lesser Cuckoos (*Cuculus poliocephalus*). The brood parasitism is principally responsible for breeding failure in a nest where the eggs are laid after June when Lesser Cuckoos arrive. Hosts parasitized by other *Cuculus* cuckoos often eject a parasite egg or abandon their nest, but Japanese Bush Warblers are not reported to reject parasitized eggs.

In Japanese Bush Warblers, however, they showed remarkably aggressive responses to the dummy of the Lesser Cuckoo, and levels of aggression were higher after the cuckoo arrived (Hamao 2011). This experiment indicated that Japanese Bush Warblers have countermeasures before the cuckoos laid eggs and adaptively adjust their nest defense



Photo 4. Eggs of the Japanese Bush Warbler (left) and the Lesser Cuckoo (right) with a Japanese five-yen coin (diameter 22mm) (above).

behavior in response to the increased risk of being parasitized.

Japanese Bush Warblers start breeding before Lesser Cuckoos arrive in Japan as a summer resident. Therefore, they can fledge their nestlings successfully from the first or second clutch free from the brood parasitism of Lesser Cuckoos. The cost of brood parasitism is reduced by starting to breed before the arrival of Lesser Cuckoos. It may be one of the factors that they have not evolved apparent countermeasures, i.e. egg rejection, against brood parasitism as in other bird species. Incidentally, Japanese Bush Warblers are parasitized by Oriental Cuckoos (*Cuculus optatus*) in Hokkaido, northernmost Japan, where Lesser Cuckoos are rare.



Photo 5. Japanese Bush Warbler (Cd) attacking a stuffed Lesser Cuckoo (Cp) placed in front of the nest (N).

Literature

- Hamao S. 1992. Lack of pair-bond: a polygynous mating system of the Japanese Bush Warbler *Cettia diphone*. Jpn. J. Ornithol. 40: 51-66. [J+E]
 Hamao S. 1997. Japanese Bush Warblers: a polygynous bird. Bun-ichi Sogo Shuppan, Tokyo. [J]
 Hamao, S. 2011. Seasonal increase in intensity of nest defence against little cuckoos by Japanese bush warblers. Anim. Behav. 82: 869-874.
 Hamao S. & Matsubara H. 2001. The first breeding record of the Bush Warbler *Cettia diphone* on a flooded bed. Jpn. J. Ornithol. 50: 85-89.
 Kajita M., Mano T. & Sato F. 2002. Two forms of Bush Warbler *Cettia diphone* occur on Okinawajima Island: re-evaluation of *C. d. riukiensis* and *C. d. restricta* by multivariate analyses. J. Yamashina Inst. Ornithol. 33: 148-167. [J+E]
 Momose H. 1986. Function of territory maintenance by vocal communications. In: Breeding strategies of birds (vol. 2), 127-157. Tokai University Press, Tokyo. [J]
 The Ornithological Society of Japan. 2012. Check-list of Japanese Birds, 7th revised edition. The Ornithological Society of Japan, Sanda.
 Tojo H. 1995. Population dynamics of Japanese Bush Warblers *Cettia diphone* on Tsukuba Cooperative Examination site. Ornithological Society of Japan annual meeting abstract. 1995: 25. [J]
 Yamashina Institute for Ornithology. 1987. Bird observation station report. (1987 fiscal year) Yamashina Institute for Ornithology, Abiko. [J]
 Yoshii T. ed. 1988. Concise dictionary of bird names. Sanseido, Tokyo. [J]

Languages of literature cited other than English: [J] in Japanese, [J+E] in Japanese with English summary.

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I started to study Japanese Bush Warblers in 1990 and continue it now. The subjects are territoriality, mating system, ecology of insular populations, songs and anti-parasite behaviors. The study sites are also widespread: Niigata, Saitama and Kyoto Prefectures, and Izu, Ogasawara and Amami Islands. In recent years, I am studying an artificially introduced population in Hawaii. Japanese people generally feel the coming of spring when they hear elegant warbles of Japanese Bush Warblers. But, for me, their songs tell the start of fieldwork season, and give a tense atmosphere. hamao@kahaku.go.jp

