

Chestnut-cheeked Starling Komukudori (Jpn) *Agropsar philippensis*

Morphology and classification

Classification: Passeriformes Sturnidae

Total length: 192mm (183-198) n
 Wing length: ♂ 106.76±2.12mm (41) ♀ 104.55±2.36mm (33)
 Tail length: ♂ 52.71±2.16mm (41) ♀ 51.36±1.76mm (33)
 Culmen length: ♂ 19.61±0.63mm (40) ♀ 19.39±0.52mm (33)
 Tarsus length: ♂ 24.09±0.91mm (41) ♀ 23.89±0.95mm (33)
 Weight: ♂ 46.70±2.77g (38) ♀ 47.22±3.88g (33)

Total length after Enomoto (1941). Other measurements are of the breeding period in Niigata City (mean ± S.D.) by the author.

Appearance:

Males are white on the head with a brown patch on the cheek. This patch varies in size between individuals. The back is lustrous purple black. The wing and tail are lustrous greenish black. There is a white part on the shoulder. The flank is gray and the rump is pale brown. Females, on the other hand, are brown all over. The bill and mouth are black both in males and females.



Photo 1. Chestnut-cheeked Starling male (left) and female (right).

Vocalization:

Chestnut-cheeked Starlings sing like "Kyu-kyu-kyu, pee-pee, pippbee-pee-bibi" for about eight seconds. They sing to attract females, not to defend their territory. Their call sounds "Gyuk" which is lower than White-cheeked Starlings (*Spodiopsar cinereus*).

Distribution and Habitat

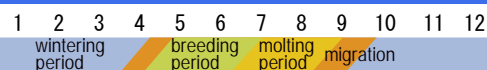
Distribution:

Chestnut-cheeked Starlings breed north of central Japan (central Honshu to Hokkaido), in the southern Kuril Islands as far as southern Sakhalin.

Habitat:

They breed in the woodland of ranches and highlands in the hills, and groves on rivers and fields as well as vegetation-rich backyards of villages and towns in the lowlands. They prefer an open habitat with a mosaic of the woods and meadows.

Life history



Breeding system:

Chestnut-cheeked Starlings arrive at the breeding grounds of Niigata City, Niigata Prefecture from early April to early May. They are monogamous, but they remain their pair-bond for a single breeding season alone, and they do not necessarily pair with the same partner the following year. When they succeed in their first breeding attempt, they do not breed for the second time in the same season.

Nest:

They nest in tree cavities and often use nest boxes. Both males and females build a nest. When old nest materials remain in a nest, they carry them out. They mostly use dry pine needles and grass as nest materials, but occasionally add green leaves. They line the inner cup with finer materials and sometimes place green leaves and feathers there as well.

Egg:

The egg was solid blue in color and was 24.4 ± 0.3mm by 18.1 ± 0.1mm (mean ± S.E., n = 13) in size. Chestnut-cheeked Starlings laid eggs from late April to early June, but about half of them started laying in mid-May in Niigata City from 1978 to 2005. "Mean first egg-laying date" varied between the years. The clutch size was 3-9 eggs and a clutch of 5-6 eggs represented more than 70% of the clutches. The clutch size decreased as the breeding season progressed. They usually laid an egg every day from six to ten o'clock in the morning. The morning egg-laying was also confirmed by measuring a difference in temperature between the inside and outside of a nest using a temperature logger placed in a fake egg (Fig. 1).



Photo 2. The egg and nestlings of Chestnut-cheeked Starlings immediately after hatching.

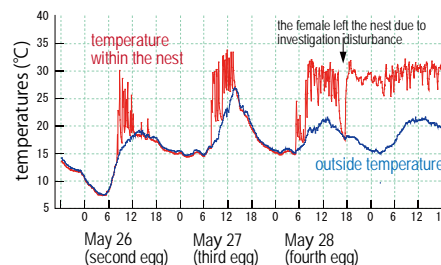


Fig. 1. Temperatures of the inside and outside of a nest in the egg-laying period. Hours of a great difference in temperature concentrate in the morning, which shows that the female stays in the nest to lay an egg in the morning.

Incubation and nestling periods and predators:

Males and females incubate eggs alternately during the daytime. During the night, however, only females do. Not only females but also males develop a brood patch (a feather-lost bare skin area) on the abdomen. Males do not feed their partner. The incubation period is 12-13 days, but the eggs begin to hatch 11 days after the last egg was laid in more than 50% of the nests because the incubation starts before the clutch is completed. As a result, the nestling that hatched one day later sometimes grow slowly. Both males and females feed the nestlings. For a while after hatching, the parent birds brood over the nestlings after feeding them. When the nestlings grow up, the parents stop brooding at nighttime as well. They mostly feed larvae of moths to the nestlings, but also give adults of moths, spiders and grasshoppers to them (Photo. 3). In addition to these invertebrates, fruits of cherry trees, oleaster (*Elaeagnus* spp.) and *Lonicera morrowii* account for 20-30% of the food. The nestling period is about 18 days. During the incubation and nestling periods, some nests fall victim to the predation of snakes and weasels (*Mustela itatsi*). Parent birds feed the young for a while after fledging.



Photo 3. Male with larvae and imagoes of moths at the nest.

Roost:

Chestnut-cheeked Starlings form a communal roost from summer to autumn. Although they may roost with a flock of White-cheeked Starlings, they tend to make a single species flock by themselves. They leave the roost for the foraging grounds in a small flock in the morning, but they gradually disperse.

Migration:

Most Chestnut-cheeked Starlings leave the breeding grounds and head south by the end of September. They travel through the Nansei Islands, southernmost Japan, Taiwan and the Philippines to the northern part of Borneo Island to spend the winter. In spring, they retrace their migratory route and arrive at the breeding grounds from April to May (Brazil 1991).

Topics of ecology, behavior and conservation

● Dispute over a nesting site

A dispute between males over a nest site is fierce. Nest owners threaten other males intruding into the territory, fluffing their feathers up and calling vigorously. If the intruders refuse to leave, the nest owners attack them fiercely or may perch at the nest hole and threaten them, with their black mouth open. The males occasionally fall to the ground, grappling with each other. Once a dispute over territorial claims has been settled, however, neighboring males usually stop fighting. Since the function of a territory is to secure a nest site, they do not establish a large territory to acquire the foraging grounds, which allows them to breed relatively close together. In the study site, for example, they breed in a territory of about 200m². It is assumed that this behavioral flexibility contributes to the effective use of insufficient nesting sites.



Photo 4. Male Chestnut-cheeked Starling singing in front of a nest box.

When males have secured a nesting site, they sing vigorously to attract females (Photo 4). When females come flying close to them, they stop singing. They lower the wings slightly and make themselves slender, and then start to sing again, but softly this time. They also perch at the nest hole or go in and out the nest, when they may carry green leaves into the nest in the bill. Chestnut-cheeked Starling males show females that they own a suitable nest site as well to win their heart. Males tend to try to secure as many nest sites as possible early in the breeding period, which leads to polygamous pair formation. However, this polygamous relationship is temporary which accounts for 1% of the breeding pairs, and most pairs breed monogamously (Koike 1988, 1997).

● Nest box installation for conservation

The population of Chestnut-cheeked Starlings is smaller than that of closely related White-cheeked Starlings. The breeding number of Chestnut-cheeked Starlings is disproportionately small as well because White-cheeked Starlings use tree cavities which Chestnut-cheeked Starlings could otherwise use. However, Chestnut-cheeked Starlings can breed in a nest box with an entrance 4cm across without being displaced by their larger relative. An adequate supply of nest boxes is needed in open woodlands to conserve Chestnut-cheeked Starlings (Koike 1997). Even when I installed 20-30 nest boxes at 20m intervals along a woodland path, most of the boxes were used by this species.

When many nest boxes are provided in a new area and a small number of pairs start to use them, more males and females are attracted by the songs of nest box users and visit the area. Although the densely breeding situation may give them an image of colonial breeders, it is due to the placement of nest boxes that are densely-placed. They are non-colonial breeders and often use a single nest box installed alone.

● Effects of global warming

The study conducted in Niigata City for 28 years from 1978 to 2005 revealed that Chestnut-cheeked Starlings started to lay eggs earlier.

The regression ($y = 22.94 - 0.57x$ (1978 = 0)) shows that the first egg-laying dates of 1978 and 2005 were May 22.9 and May 7.6,

respectively. The date was advanced by 15.3 days in 28 years, which corresponds to 0.57 days per year (Fig. 2). In the breeding grounds (Niigata City: 37° 54' N, 139° 01' E) and the stopover site (Naha City, Okinawa Pref.: 26° 12' N, 127° 41' E), on the other hand, the temperatures in the early spring (February-April) increased by 1.5°C and 1.1°C in 28 years, respectively. In addition, the first egg-laying date is correlated with the temperatures of these two areas. There was a tendency for Chestnut-cheeked Starlings to lay eggs early in the years when the temperatures of the breeding grounds or stopover site were high. The analyses suggest that the advanced first egg-laying date was induced by a rise in temperature in the last 30 years as a result of the rapidly progressing global warming. Many pairs started breeding in a short span of time with the advanced first egg-laying date. The clutch size also increased from 5.0 to 6.1 eggs (Koike & Higuchi 2002, Koike et al. 2006).

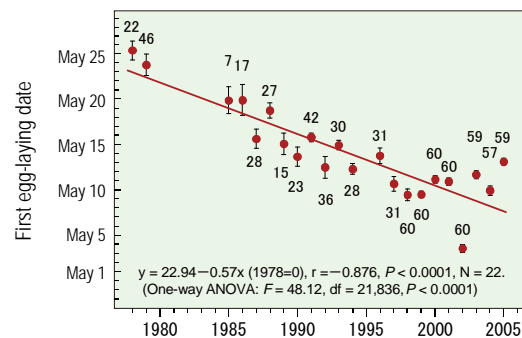


Fig. 2. Annual changes of first egg-laying date (1978-2005). Figures on the graph are the number of nests studied each year. (modified from Koike et al. 2006).

Literature

Brazil M.A. 1991. The Birds of Japan. A & C Black, London.
 Enomoto Y. 1941. Wild Bird Handbook (Vol.2). Osaka Chapter of Wild Bird Society of Japan, [J]
 Koike S. 1988. Breeding ecology of the Red-Cheeked Myna *Sturnia philippensis*. Strix 7:113-148. [J+E]
 Koike S. 1997. Chestnut-cheeked Starling. Encyclopedia of Animals of Japan. Birds. II. 164. Heibonsha, Tokyo. [J]
 Koike S., Fujita G. & Higuchi H. 2006. Climate change and the phenology of sympatric birds, insects, and plants in Japan. Global Environmental Research 10:167-174.
 Koike S. & Higuchi H. 2002. Long-term trends in the egg-laying date and clutch size of Red-cheeked Starlings *Sturnia philippensis*. Ibis 144:150-152.

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

Author

Shigeto KOIKE

Teacher at Niigata Municipal Ohgata Junior High School

It has been 30 years since I started to study Chestnut-cheeked Starlings. I really feel that time flies. At first I could not understand the meaning of their behavior, but as I continued the study, the whole picture suddenly came into sight. I noticed that the date of the first egg-laying was becoming early about 20 years after I began to study. Since it is important to accumulate data for a long period of time, I have been studying Chestnut-cheeked Starlings to collect data without a break.
 myna@syd.odn.ne.jp

