

Izu Islands Thrush Akakokko (Jpn) *Turdus celaenops*

Morphology and classification

Classification: Passeriformes Muscicapidae

Total length:	Approx. 230mm	Culmen length: 20-23mm
Wingspan:	♂ 112.0-124.0mm	♀ 108.0-117.0mm
Tail length:	♂ 82.0-100.8mm	♀ 74.0-89.0mm
Tarsus length:	♂ 31.9-35.8mm	♀ 32.5-33.7mm
Weight:	♂ 73.7-81.3g	♀ 65.9-93.1g

Total length and bill length are quoted from Takano (1990), and Kiyosu (1978), respectively. Other measurements are taken in the banding study at Miyakejima Island.

Appearance:

Male is black from the head toward the chest, and orange on the abdomen and flank. The bill and the area around the eye are yellow. The back, shoulders and wing coverts are dark brown. Female is somewhat paler than male. Individuals of the Tokara Islands, southern Japan are darker than those of the Izu Islands, Tokyo.

Vocalization:

Male sings at dawn (about 30 minutes before sunrise) in a guttural voice that sounds like "Kyurrr, Chotts" during the first half of the breeding season. In the second half of the breeding season, however, he sings during the daytime as well. The calls sound like, "Tweet", or "Chat, Chat, Chat".



Photo 1. Male Izu Islands Thrush. [Photo by Nakata Kazuma]

Distribution and Habitat

Distribution:

Izu Islands Thrushes occur in the Tokara and the Izu Islands. They are also observed in Yakushima Island and the Danjo Islands, western Japan. In the Izu Islands, they are distributed from Oshima to Aogashima Islands, with their populations larger in the southern islands than the northern ones. In the Tokara Islands, they inhabit Nakanoshima, Kuchinoshima, Akusekijima, Tairajima and Takarajima Islands, but the population density is lower than that of the Izu Islands. In addition, there are wintering records from other areas, such as Shizuoka (Yamashina Inst. Ornithol. 1996), Chiba, Mie and Wakayama Prefectures.

Habitat:

The species occurs in a variety of habitats from natural to secondary forests of evergreen and summer green broad-leaved trees. The population density tends to be high in an area where the shrub layer of an evergreen broad-leaved forest is not well developed (Higuchi 1992). It is not only designated as a national monument but also listed as an endangered species in the Red Data Book of the Ministry of the Environment. This endemic thrush faces the reduction of its habitat due to the volcanic activity on Miyakejima Island in particular.

Life history



Breeding system:

The breeding season is between March to July. Izu Islands Thrushes are monogamous, but they live singly in the non-breeding season. Both male and female are responsible for incubation and feeding of the chicks.

Nest:

They build a bowl-shaped nest in a tree at a height of 0.5-6m above the ground (Kiyosu 1978), solidifying fine tree roots, grass stems, moss and other materials with soil. The nest has an outer diameter of 13-16.5cm, an inner diameter of 8-10cm, a depth of 5.5-7cm and a height of 9.5-13cm.



Photo 2. Eggs and nest of Izu Islands Thrushes. [Photo by Tanaka Toshihiko]

Egg:

Clutch size is usually three or four eggs, ranging from two to five eggs. The egg has a long diameter of approximately 29mm by 21 mm. The egg has red brown flecks on a blue background.

Incubation and nestling periods and fledging rate:

Incubation period is unknown. Nestling period is about 14 days. Due to the weasel introduction for rat control in Miyakejima Island of the Izu Islands, the fledging rate drastically declined from 85% (Higuchi and Koike 1977) and 71-78% (Higuchi 1981) to about 7.3% (Takagi & Higuchi 1992).



Photo 3. Izu Islands Thrush chicks. [Photo by Tanaka Toshihiko]

Diet and foraging behavior

This thrush feeds primarily at a forest edge in the early morning and in the evening. Its diet consists mainly of earthworms, crustaceans, centipedes and insects, but also includes fruits of mulberry, raspberry, *Machilus*, cherry, hackberry, *Stachyurus* and *Polygonum* seasonally. The result of video recording showed that earthworms accounted for about 70% of the food fed to the chicks and the rest included nuts, centipedes, insects and others.

Topics of ecology, behavior and conservation

● On the origin of this endemic thrush

There are two theories on the origin of Izu Islands Thrushes: (1) they are a relatively new species closely related to Brown Thrushes, and (2) they are a relict species closely related to Black-breasted Thrushes *Turdus dissimilis* in southern China. The plumage comparison, such as the pattern of undertail coverts and the color of wing coverts suggests that Izu Islands Thrushes are closely related to Brown Thrushes because Izu Islands Thrushes share common features with Brown Thrush superspecies (*T. chrysolais*, *T. pallidus* and *T. feae*), but Black-breasted Thrushes have characteristics in common with *T. hortulorum*. It is reasonable to assume, therefore, that Izu Islands Thrushes and Black-breasted Thrushes belong to distinct clades of genus *Turdus* (Kajita et al. 1998).

● Song difference between the island populations

The song of the Izu Islands Thrushes is similar to that of Brown Thrushes, but it is shorter and more guttural. The song of Miyakejima Island population consists of two syllables, as shown in Fig 1. The song of the population of Mikurajima Island which is located about 18 km south of Miyakejima Island is similar to that of Miyakejima population. However, the song of the population of Hachiojima Island which lies approximately 90 km south of Miyakejima Island is made up of a single syllable (Fig. 2), and

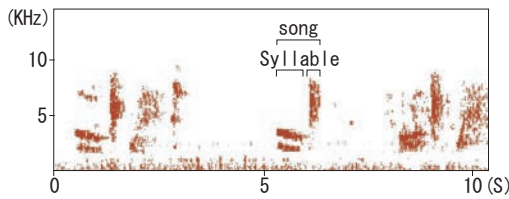


Fig. 1. Sonogram of a Izu Islands Thrush song (Miyakejima).

sounds entirely different from that of Miyakejima population. In addition, the songs of the populations of Aogashima Island which is south of Hachijojima Island and Nakanoshima Island of the Tokara Islands are composed of more syllables (Fig. 2).

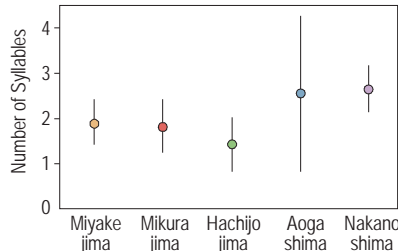


Fig. 2. Syllable number of songs in different islands

● Reduced breeding success rate due to weasel introduction

Weasels were introduced to Miyakejima Island in the 1970s and 1980s to reduce rat damage to crops. In particular, Izu Islands Thrushes declined drastically due to the release of weasels around 1982. The eggs and chicks in a nest are prone to the predation by weasels that can climb trees. The population density of this thrush dwindled to about 1/3 and the reproductive success rate dropped from 80% to about 7 percent (Takagi and Higuchi 1992). Since weasels were introduced to other islands of the Izu Islands, such as Hachijojima, Toshima and Aogashima Islands in former times, it is assumed that Izu Islands Thrushes also declined on these islands due to the predation of introduced weasels. It is absolutely essential to control weasels to recover the populations of Izu Islands Thrushes on these islands.

● Impact of volcanic activity on the habitat

Volcanic ash, mudflow and gas resulting from the volcanic eruption of June 2000 have affected about 60% of the forest area in Miyakejima Island, the major habitat of Izu Islands Thrushes. In the early volcanic activity, volcanic ash emitted from the crater of Mt. Oyama piled up more than 1m in the area above 400 m above sea level and denuded most of the forest.



Photo 4. Forest of eastern Miyakejima Island where most trees have withered.

In the eastern area downwind from the crater, most trees have died due to volcanic gas and Izu Islands Thrushes have disappeared (Photo 4). The effects of 2000 eruption on small ground-dwelling animals were investigated in 2002. The result showed that earthworms were confirmed only in the "locations without ash nor gas damage" among the "locations with ash damage", "locations with gas damage", "locations with both ash and gas damage" and "locations without ash nor gas damage".

In June 2006, the study of soil animals was carried out in conjunction with the census of birds in similar sites (four points, two samples each). Soil animals were not detected in the "locations with both ash and gas damage". Only insects were confirmed in the "locations with ash damage", while earthworms, beetles, pill bugs and springtails were confirmed in the "locations with gas damage" and earthworms, beetles and Geophilids occurred in the "locations

without ash nor gas damage". Izu Islands Thrushes were not detected in the "locations with both ash and gas damage". Although the habitability of Izu Islands Thrushes must be measured in terms of not only food but also a shelter and a nesting site, it is assumed that the volcanic eruption still have a negative effect on their range because no earthworms that are their staple food occur in the "locations with volcanic ash damage".

Mt. Oyama emitted a record-level volume of volcanic gas, which amounted to 20000-50000 tons per day at the peak period (December 2000). In 2006, however, the amount of volcanic gas was reduced to about 1/20 (1000-3000 tons per day). As the volcanic gas decreases, the forests at the foot of Mt. Oyama have been gradually recovering (Photo 5). I hope that the forests and soil will recover soon even at high altitudes and Izu Islands Thrushes will return to their former habitats of this island.



Photo 5. Nature is recovering. *Miscanthus* and *Alnus* have started to penetrate even into areas covered with mud flow or stricken by volcanic gas.

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

Author

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Thirteen years have passed since I first saw Izu Islands Thrushes. It is a familiar bird that everyone knows in the Izu Islands, but it does not mean that the study of its ecology and the solution to the conservation issues has advanced enough. Making use of this opportunity to organize the information on this endemic thrush, I would like to make steps toward solution even though they are small.
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The author guiding visitors in Miyakejima Island (Photo left).