Lidth's Jay Ruri-kakesu (Jpn) *Garrulus lidthi*

Morphology and classification

Classification: Passeriformes Corvidae

Total length: ca. 38cm (n)
Culmen length: 29.5-42.2mm (21) Tarsus length: 42.1-46.3mm (6)
Wing length: 169-178mm (6) Tail length: 92-116mm (15)
Body weight: ♂ 164.8-210.4g (26) ♀170.5-194.7g (16)

Total length after Yoshii (1988), body weight measured by N. Kawaji (pers. comm.), and the others measured by K. Ishida from specimens (unpubl.) .

Appearance:

Photo 1. Lidth's Jay [Mikio Takashi]

Lidth's Jays are deep blue from the head behind the eyes to the neck, in the outer vane of flight feathers, the wing coverts and the upperpart of the tail. The lower abdomen and upper back are reddish chestnut. The face, the inner vane of flight feathers and the underside of the wing and tail are black. The edge of flight and tail feathers is white. There are black stripes on the wing coverts, the outer vane of flight feathers and the upperpart of the tail. The throat has fine vertical streaks. The eyes are dark brown and the bill is ivory white. The legs and toes are charcoal gray. Occasional albinism is observed especially in the tail feathers.

Vocalization:

Lidth's Jays make a wide variety of calls. When they are alert to the possibility of danger, for instance, they call “Jarr- jarr”. When they go in and out of the roost, or when they call between parents and young, they utter “Kyrurr - kyrwhir, kywhir, kurrwhir". The old nestlings sometimes make a sharp rattling noise similar to that made by a rattle snake. It can also have an anti-predator effect.

Distribution and Habitat

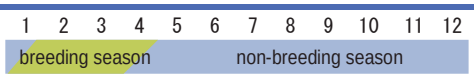
Distribution:

Lidth's Jays breed in Amami-Oshima, Kakeroma-jima, Uke-jima and Edateku-jima Islands, Kagoshima Prefecture, southern Kyushu. A femur fossil resembling this species was discovered from the ca. 10,000-year-old strata of Okinawa Island (Matsuoka 2000).

Habitat:

Lidth's Jays occur primarily in laurel natural forests and secondary forests mixed with Riukyu Pines (*Pinus ryuchuensis*). They also visit houses, barns and farmland 100 or 200m from a forest. They usually roost in the canopy of a tall broad-leaved ever green tree, but young birds occasionally roost on an electric cable along a forest road.

Life history



Breeding:

They are generally monogamous breeders, but an uncertain old report on a helper is known.

Nest:

Lidth's Jays use as a nest site tree cavities (including cavities at the base of trees), tree branches, thickets of epiphytic ferns, the hollows of slopes and cliffs, eaves and even on human houses. The nest is 30-50cm in diameter with an inner cup about 10cm across. They build a cup-shaped nest using fine twigs and vines for the base and fine dead grass for the inner cup from late January to early March. At the earliest, however, they start to carry nest materials on a warm day in late December and build a nest again after the failure of the first breeding attempt until May.

Photo 2. Lidth's Jay eggs in a nest box.

Eggs:

The egg is pale blue with no flecks, and the size is ca. 32mm by 24mm.

Incubation and nestling periods and fledging rate:

Photo 3. Lidth's Jay nestlings begging for food.

Lidth's Jays lay one egg per day during the morning. The clutch size is mostly 4 eggs with a range of 2-5 eggs. Females incubate eggs and raise nestlings. The incubation period is about 17-20 days, but eggs usually hatch asynchronously because females start to incubate after they lay the first egg or any time later. The nestling period is about 25 days, but the young often fledge prematurely due probably to predation pressure. Both incubation and nestling periods vary considerably between pairs and it is not uncommon that some eggs do not hatch or some nestlings die (probably of starvation). Eggshells are carried out of a nest soon after hatching and the dead nestlings are also removed quickly (or possibly consumed) by parent birds. Nestlings are provided with food regurgitated by parents. The structure of a family flock or breeding population is still unknown. Young birds start to form a flock around June. Hatching rates are 50-80%, fledging rate are 7-88% (for 5-22 clutches in 11 years). Since the food is provided directly from mouth of the parent to the mouth of the young, the detail of the nestling diet is unknown.

Diet and caching

Photo 4. Lidth's Jays are active on the ground. The photo was taken with an automated camera.

Lidth's Jays are omnivorous. The diet consists of invertebrates (insects and spiders), vertebrates (reptiles and birds), the fruits and seeds of plants and crops (sweet potatoes, etc.). They prefer acorns of *Castanopsis sieboldii* and *Quercus glauca* which they feed in trees and on the ground. They are also observed to cache *Q. glauca* acorns on the ground. They can carry about six acorns at once in the throat pouch and the bills.

Topics of ecology, behavior and conservation

Predator:

Habu vipers (*Protobothrops flavoviridis*) can be one of the major predators of Lidth's Jays because the remains of Lidth's Jays have been often found in the stomach of a Habu viper, their carcasses with Habu bites have been collected and Habu vipers have been observed to be in their active nest. Large-billed Crows and Gray-faced Buzzards may also be a predator because a Large-billed Crow was sighted to take an egg out of a Lidth's Jay nest and Lidth's Jays have been observed to mob the two species especially in the breeding season. An invasive introduced Small Indian mangoose was reported to attack a Lidth's Jay nest which is well controlled at present since 2006 or later.

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Ken Ishida

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Acorn production affecting Lidth's Jay breeding performance

When *C. sieboldii* predominating in the natural forests of Amami-oshima Island bears acorns, eaten acorns are found in great numbers on the forest floors because Lidth's Jays consume them in a flock if they are green but matured. We would find the forest floor full of acorns on the ground at the rich crop years. Research has shown that the acorn production varies greatly from year to year and affects the breeding performance of Lidth's Jays (Fig. 1). It is assumed that an acorn failure has less effect on Lidth's Jays than rats (*Ratus ratus*) because Lidth's Jays feed acorns on trees before rats which eat fallen acorns on the ground. In a poor year for acorns, however, they are at higher risk from nest predation probably because other animals also suffer a food shortage.

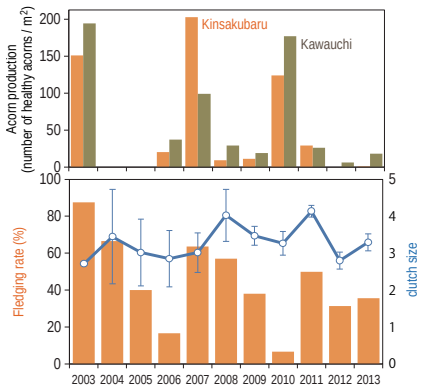

Fig. 1. Relationship between acorn abundance (above) and Lidth's Jay breeding performance (below). Fledging rate was estimated based on that of 10 (2003-2008) and 20 (2009-) nest boxes. Acorn abundance was measured by bucket traps.

Possibilities of helpers and intra-specific egg destruction

Young nestlings usually beg for food with open mouths, but older nestlings may utter alarm calls and lie flat in a nest when research workers approach the nest to band them. Once they are taken out of the nest, however, they open their mouth to beg for food or they even draw themselves closer to the researcher's feet when they are laid on the ground. A flock of several birds which is assumed to be a family is often observed in the nestling period, which suggests they have a helper, though the author and others have not yet confirmed it. The presence of a helper bird was reported at a nest about 30 years ago, but the author has not yet found one in more than ten years' study of breeding pairs in nest-boxes. Lidth's Jays are also assumed to be social because their vocal communication has been highly developed. There were some cases that eggs had disappeared from their nests. Lidth's Jays usually abandon their nests when they lose their eggs due to nest predation. From the fact that the parent continued laying eggs and incubated them after the egg disappearance, some of the eggs were suspected to be stolen by members of the same species. Such an intra-specific egg destruction is reported on Acorn woodpeckers and Florida Scrub Jays (Carin et al. 2002). Some of such nests, however, succeeded to fledge young. Comparison in behaviour and ecology with Florida Srub Jays will be interesting, as the latter has been studied intesively (Woolfenden & Fitzpatrick 1984, 1991). Plumage and base sequence analyses of DNA suggest that Lidth's Jays are most closely related to Black-headed Jays (*G. lanceolatus*), which inhabit Himalayan forests of acorn production (Yamashina 1941, Kajita et al. 1999, Asimova 2007). Both of these jays are thought to be relict species.

History of conservation

Since the last 19th and earliest 20th centuries, thousands of the Lidth's Jay were killed to be exported to Europe or North America for millinery use. It was listed as a national natural monument in 1921. They were designated as an “Endangered Species” in the Red List of the Ministry of the Environment because it was feared that their population would decline due to the rapid deforestation of their habitats and the range expansion of introduced small Indian mongooses from about the 1970s to the 1990s. The density of mongooses has been greatly reduced due to the large-scale mongoose control project started by the Ministry of the Environment in 2000. Forests have recovered in their major habitats with the decline of forestry. The population of Lidth's Jays has stabilized. As a result, Lidth's Jays were removed from the Red List in 2008.

Lidth's Jays as a flagship and indicator species in the ecosystem management

Lidth's Jays have characteristic traits such as endemism to a restricted region and habitat, and to have a significant interaction with the acorn production of the dominant trees of the local forest of the Amami Island. These traits, as well as their remarkable plumage and closeness to the islanders' life, make them a good flagship and indicator species of the issues of ecosystem management and biodiversity conservation. My colleagues and I are currently studying their ecology, pathology and genetics. We have also started a new ex-situ conservation project with zoos since 2002 (Connolly & Cree 2008).

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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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I have visited Amami-oshima Island to study birds and forests since 1988. I am interested in the population dynamics of *Zoothera (dauma) major* and *G. lidthi* in relation to *C. sieboldii* acorn production, and forest ecosystem management. I have also been conducting a long-term ecological plot survey, *Ratus ratus* monitoring and others, collaborating with local nature conservation groups, such as the Amami Orniholotists' Club.

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