

**PRELIMINARY OBSERVATION ON NESTING ECOLOGY OF  
ENDANGERED BROWN-CHEEKED BULBUL (*ALOPHOIXUS BRES*)  
IN JATIMULYO AGROFORESTRY**

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**ABSTRACT**

We found an active nest of endangered Brown-cheeked Bulbul (*Alophoixus bres*) with two chicks in nest-adoption program at Jatimulyo village, Yogyakarta province, Indonesia on 19 December 2021. It was placed on the lateral branch of apus bamboo (*Gigantochloa apus*) 1.5 m high. The nest was cup-shaped, with outer diameter of  $\pm 8$  cm, inner diameter of  $\pm 6$  cm, and depth of  $\pm 3$  cm. It was made of living non-vascular plants and plant fragments. Our observation revealed that the food of the chicks was primarily comprised of insects (in the morning) and fruits (at midday). The insect preys include caterpillars, Lepidoptera, Coleoptera, Orthoptera and Diptera. The fruits were mangir, lempeni, and senggani.

**Key words:** Brown-cheeked Bulbul, conservation, endangered species, nest adoption program

**INTRODUCTION**

The Brown-cheeked Bulbul (*Alophoixus bres* Lesson, 1832) is an endemic bird found only on the islands of Java and Bali (del Hoyo et al., 2021). It can be found in primary and secondary forests, as well as agricultural areas, from lowland to 1,500 m altitude (MacKinnon et al., 2010; ABI 2020; Birdlife International 2022). During the year 2016–2020, the Brown-cheeked Bulbul was recorded 82 times in 20 various sites, according to Burungnesia database (ABI 2020). This includes conservation zone, e.g., Meru Betiri National Park, Alas Purwo National Park, Gunung Merapi National Park, Baluran National Park, and Sempu Natural Preserve (Winnasis et al., 2011; BTNAP 2012, Kurnianto et al., 2013; Yuniatmoko & Cahyadi 2015; Purnomo et al., 2019). It can also be found in other areas, e.g., Bogor Botanical Garden (West Java province), and Jatimulyo village (Yogyakarta province) (ABI 2021). Due to over-poaching, their number has recently declined (Lee et al., 2016; Iskandar et al., 2019). As a result, the International Union for the Conservation of Nature (IUCN) Redlist elevated the species' category to Endangered (BirdLife International, 2020). There was a lack of data on its breeding activity, nesting ecology, and diets.

Based on its significant increase in conservation status over three years (from Least Concern in 2017 to Endangered in 2020) (BirdLife International, 2020), the Brown-cheeked Bulbul was elevated to the top priority list for conservation activities in Jatimulyo village through the nest-adoption program. This program focuses on restoring avian diversity and populations in Jatimulyo Village by sustainably involving local communities to gain conservation value instead economic benefits (from avitourism, including bird watching, bird monitoring, and nest guarding). It was part of an effort to raise public awareness about the importance of protecting breeding sites from anthropogenic disturbances. These initiatives have also been supported by local regulations (Peraturan Desa No.8, 2014), which were initiated by an agroforest farmer community named Kelompok Tani Hutan Wanapaksi, whose majority of members were formerly bird poachers. Moreover, residents benefited from avitourism, which provides a sustainable source of income and also serves as a venue for studies (Taufiqurrahman et al., 2019). Thus, referring to the local field observation records from 2016–2021 since the nest adoption program establishment, it was estimated there are more than seven pairs of Brown-cheeked Bulbul already present in Jatimulyo Village (Data unpublished).

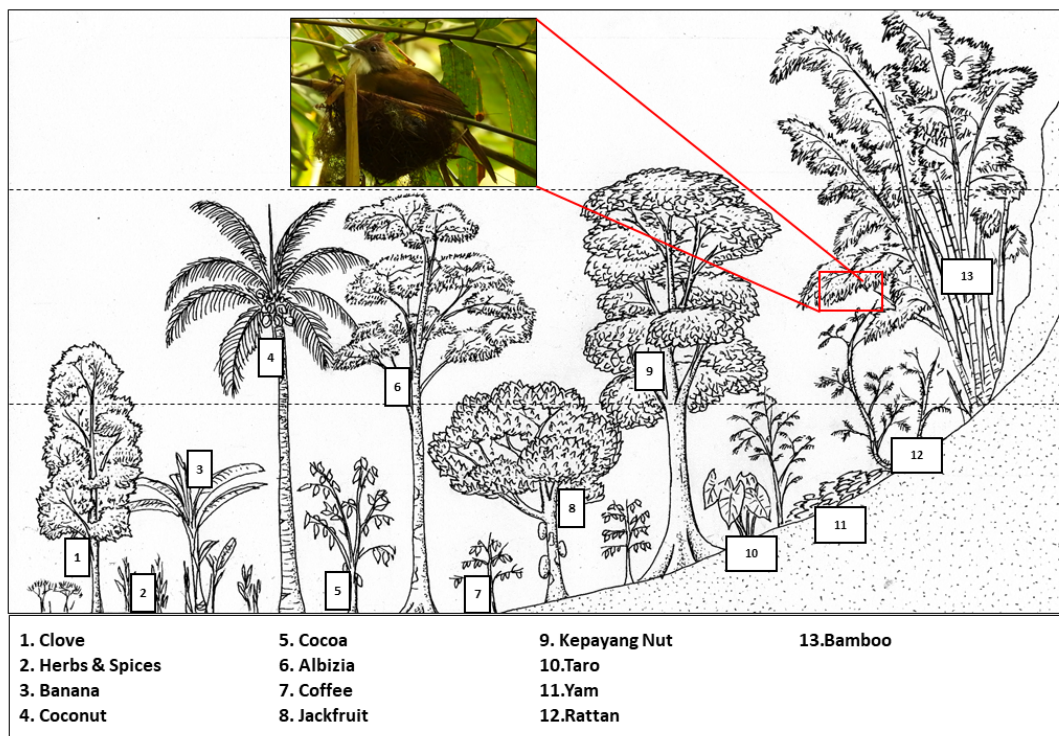
Here, we serve our local observation through *A. bres* from Jatimulyo Village. We investigated several factors that may affect the survival success of this endangered Brown-cheeked Bulbul during the pre-fledging phase, highlighting the critical role of the existing agroforestry-based in-situ conservation initiative in Jatimulyo agroforestry.

## MATERIALS AND METHODS

### Observation and Monitoring

The nest observation and monitoring were conducted on December 2021-January 2022. It was located above the Gunungkelir karst ecosystem in the resident's agroforestry area. The agroforestry habitat is comprised of bamboo grooves roughly 10 m in height, coffee and albizia plantations, forest shrubs, and tubers (taros and yams). Vegetation stratification within agroforestry habitat is illustrated below (Fig. 1). After the nest discovered, Soon KS built a camouflage bird hideout from Rattan foliage roughly 8 m east of the nest to monitor the bird's behavior and minimize disturbance. Later, the nest activities were captured with a Nikon Coolpix P900 camera. The diet was identified following the field guide and suggestions from experts.

We observed the nest for three days in a row (29 December 2021, 31 December 2021, and 2 January 2022). On 2 January 2022, we thoroughly monitored the nest's activity from 07.30–12.30 h Western Indonesia Standard Time (WIST) to investigate feeding durations (Fig. 2). We did not observe in wet or foggy weather.

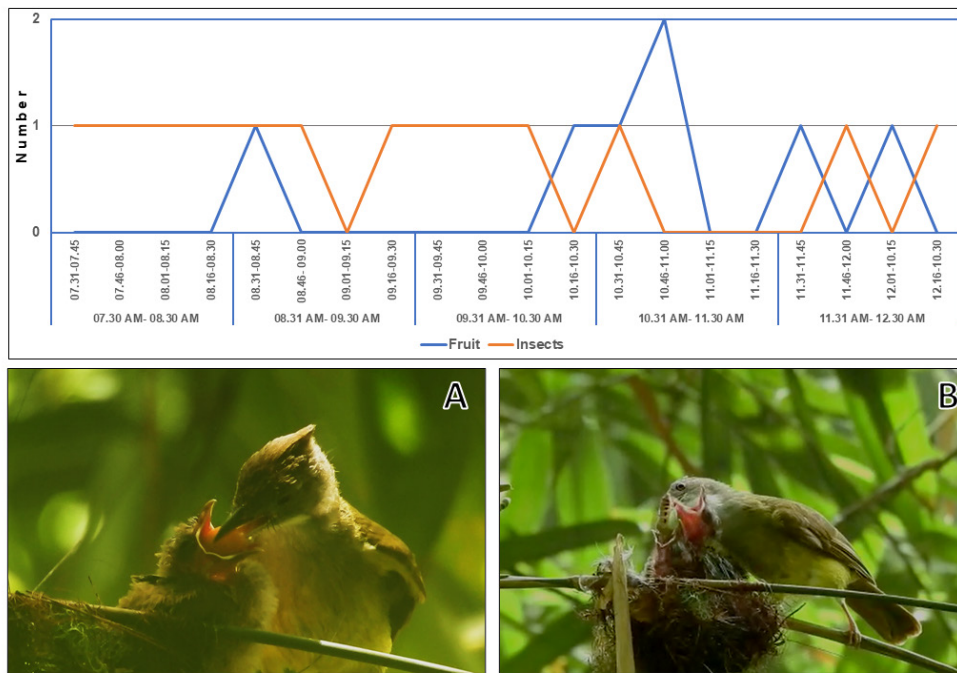


**Figure 1.** General view of the vegetation in Jatimulyo agroforestry habitat, which was discovered to be the nesting site of the Brown-cheeked Bulbul (red box).

## RESULTS

We discovered a productive nest containing two Brown-cheeked Bulbul chicks on 19 December 2021 (during the rainy season) by following the adult’s chirping sound from the bamboo grooves. It was the bird’s 12th sighting and the nest’s fourth record in Jatimulyo agroforestry. The nest was found on 7°45’39.6” S, 110° 7’12” E, 659 m above sea level, and located on the lateral branch of apus bamboo (*Gigantochloa apus*), 1.5 m above the ground. The nest was cup-shaped, with outer diameters of ± 8 cm, inner diameters of ± 6 cm, and depth of ± 3 cm. The nest was composed of living non-vascular plants (lichens and mosses), and also plant fragments.

The diets based on our observations, mostly consisted of fruits and insects (Fig. 2). The frequency of food supplied by adults was 20 times (13 times for insects, and 7 times for fruits). The insect’s prey includes caterpillars, butterflies and moths (Lepidoptera) (Fig. 2b), beetle larvae (Coleoptera), cicadas (Homoptera) crickets and grasshoppers (Orthoptera), also tephritid fruit flies (Diptera); whereas the fruits include mangir (*Ganophyllum falcatum*) (Fig. 2a), lempeni (*Ardisia elliptica*), and senggani (*Melastom malabathricum*). To feed the chicks sequentially, the adult perched on the nest for 3–10 seconds at a time. There was a competition between the chicks to get food from the adult.



**Figure 2.** Feeding frequency of Brown-cheeked Bulbul displaying the number of fruits and insects delivered during 0730–1230 h WIST on 2 January 2022 in Jatimulyo agroforestry. Adult feeds (a) mangir fruits (*G. falcatum*) and (b) moth (Lepidoptera) to its chicks. Photos by A. Nurrofik and K. Suparno.

## DISCUSSION

Most Bulbuls made their nests from of plant fragments, and constructed cup-shaped nests (Li et al., 2015; Price & Griffith, 2017). The observed nest was located on the low stratum of vegetation, as reported in the previous studies (del Hoyo et al., 2021). The nest was also camouflaged with moss and lichen materials, perhaps to avoid predators such as owls and snakes. In addition, Brown-cheeked Bulbul nests have previously been recorded on the trees of in majegau (*Dysoxylum densiflorum*), melinjo (*Gnetum gnemon*), cacao (*Theobroma cacao*), and mahogany (*Switenia mahagoni*) trees in Jatimulyo village.

The chicks rely on the presence and availability of fruits and insects surrounding the nesting area. We argued that the high number of delivered insects feed (in comparison to fruits) was to support the growth and daily protein needs, as previously observed on Red-whiskered Bulbul *Pycnonotus jocosus* (Li et al., 2015). Fruits are required as a source of energy and vitamins for their juvenile plumage and immunity (Alan et al., 2013). Further monitoring could provide more data and insight into the feed proportion, preferences, and feeding pattern.

The hatchling and nestling phases are crucial for the survival of the Brown-cheeked Bulbul. In parallel, the adult female Puff-throated Bulbul’s (*Alophoixus pallidus*) may lay 2–3 eggs and incubate them for 12–13 days, where the nestling periods may take around 10–11 days until the feathers are fully developed and ready to leave the nest (entering fledgling phases) (Pierce et al., 2004). Assuming they have a similar development phase, it may take more than a month for the Brown-cheeked Bulbul’s offspring to be able to find food by itself. This will



greatly depend on the food availability, the degree of disturbances, and competition within ecosystems.

All hatchlings from four adopted-nests (consecutively 2 chicks per nest, including this observations) were reportedly survived through the nest-adoption program, indicating that agroforestry habitats in Jatimulyo village provide critical role in sustaining their population (by supplying daily diets and nest materials) and provide protection for the Brown-cheeked Bulbul. Nonetheless, their survival is most vulnerable during transitional phases (fledgling to adult), when the mortality rate after the fledgling phase is at the highest (Martin et al., 2018). It will be necessary to conduct ethological studies on fledgling nursing behavior, particularly until they are self-sufficient from adults. Additionally, individual banding can substantially assist in behavioral and population monitoring.

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