Nesting of the Sunda Pygmy Woodpecker

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Information on the nesting of Sunda Pygmy Woodpeckers *Yungipicus moluccensis* in literature is limited; especially with respect to food items for juveniles, incubation and fledging periods. We were fortunate to observe two nests. One pair nested at the Matang Mangrove Forest Reserve, Perak, Malaysia in May to June 2023 and another at Bagan Datuk, Perak, Malaysia in February to March 2022. The article summarises the nesting observation and reviews the literature.

Disclosure on Nest Observations

Observations at Matang Mangrove Forest Reserve were made from the boardwalk in the mangrove forest, at a distance of 9.5 m from the nest hole. Observations at Bagan Datuk were from a road adjacent to the river, approximately 7-8 meters from the nest hole. At any time, there were one or two observers present who used long lens equipment for observations. At both nests the adults appeared comfortable with human observers and fed juveniles frequently while being watched.

Sunda Pygmy Woodpecker Nest at Matang Mangrove Forest Reserve, Perak, Malaysia

Key Timelines of Nesting Observations

On 11 April 2023 the pair of Sunda Pygmy Woodpeckers were seen taking turns to excavate a fresh nest. When observation ended, after one and a half hours, the nest hole was approximately 1.5 inches deep.

On 5th May 2023 the pair of Sunda Pygmy Woodpeckers were observed taking turns to incubate eggs. One change in the adult pair was seen after two hours. Once a few Velvet-fronted Nuthatch *Sitta frontalis* were chased away by an adult Sunda Pygmy Woodpecker when they came too close to the nest hole.

On 17 May 2023 the adults were seen entering the hole to feed the chick(s) inside.

By 31 May 2023 feeding was carried at the entrance of the hole, with chick(s) just visible.

On 1 June 2023 extensive observations were carried out on feeding items for juveniles (Amar-Singh HSS 2023).

On 10th June 2023 Very close to fledging with possibly two chicks (one male) sticking head and chest out of the hole. The feeding frequency had increased and chicks grabbed the food aggressively from the parents. The chicks were also noted to make soft calls frequently; louder if an adult bird was near the nest.

By 16 June 2023 neither the adults or chicks were seen at the nesting site.

Nest Location

The nest was located in a dead mangrove tree a 9.5 m off the boardwalk. The hole was excavated into the trunk of the tree, 3-4 meters above ground level. Wells (1999) notes that the tree species preferred in mangrove forests is not known. However, the majority of trees in this part of the forest (almost uniform) are *Bruguiera sexangula*, commonly called the Upriver Orange Mangrove, or locally Tumu Putih, and this could be the tree type used. See Plates 1 and 2 showing the nest location.

Plate 1 & 2 showing the nest location and environment

Incubation and Fledging Periods

Although we were not able to ascertain accurate durations from observations, the incubation period was less than 35 days and the fledging period less than 30 days.

Parental Responsibilities

Both adults helped to excavate the nest, tend to the juveniles and bring food. It is usually not possible to distinguish male from female, as the red on the hindcrown of male is often obscured. But occasionally both birds were observed arriving at the nest one after the other; one waiting for the partner to complete feeding before alighting at the nest entrance. In addition, the frequency of feeding suggests both parents feed juveniles. Wells (1999) reports that both pair-members excavate nests, incubate, tend to nestlings and fledglings.

Food Items brought to Juveniles

The adults' flights to the nest were careful. Occasionally it was direct, alighting near the nesting hole. More often they landed on a nearby branch and observed for predators. They then proceeded to land either above or below the hole and then crept down or up. The flight away from the nest was direct and fast into the forest. Over a two hours period on 1 June 2023, 21 feeding episodes were observed. The mean time between feeds was 5.7 minutes, the mode 1 min and median of 3 min; the range was 1 to 16 minutes. The vast majority of the food items were invertebrates or insects:

- Of the 9 invertebrates, 4 were worms that looked like maggots. Some could be larvae.
- Of the 9 insects, 3 were crickets, 1 large fly, 1 Woodlouse, 1 winged insect.
- One episode was fruit; small berries.
- 2 food items were unknown.
- The animal prey appeared to have been processed by the adults.

On 8 June 2023 one of the adult birds was observed, via video recording, doing an anting behaviour for 5 minutes and also eating ant eggs at a particular spot on a mangrove tree. The adult then flew back to the nest hole entrance to feed ants to the chick.

Plate 3 is a composite of some food items.

Plate 3: Composite of some food items brought to the juveniles

Removal of Waste Material

Four occasions of waste material removal were observed during a two-hour observation. Adults entered the nest to collect waste but we are unsure of the sex. Waste was taken very far away from the nest for disposal. We did not see adults consuming it. A composite of 3 waste removal episodes is shown in Plate 4. Note that the volume of waste material varied. Despite extensive feeding, some episodes have a small waste output (see extreme left image). This made us consider if one of the juveniles was younger than the other.

Juveniles

It was difficult to determine the number of juveniles present in the nest but observations suggest two birds. Initially they were fed in the nest. Later they occasionally appeared at the mouth of the nesting hole during feeding episodes. Close to fledging, the chick(s) were observed sticking its head out of the hole most of the time to observe the surroundings. Removal of waste material (see below) suggested the possibility that one juvenile was younger than the other. A composite of different feeding episodes showing a juvenile is in Plate 5. Note the white spot on the tip of the upper mandible of the juveniles. This is not a light artefact (light reflection) and can be seen in bright and dim light. There is no reference to this in the literature. Examination of juvenile images in the Macaulay Library suggests this bare-part feature is present in young juveniles. We speculate if it could, in some way, aid in feeding nestlings.

Plate 4: Composite of waste removal episodes

Plate 5: A composite of different feeding episodes showing a juvenile nest entry

Sunda Pygmy Woodpecker Nest at Bagan Datuk, Perak, Malaysia

This nest was identified on the afternoon of 27 February 2022 when a Sunda Pygmy Woodpecker was observed flying to a bamboo pole that was used as a mooring pole for fishing boats. The bird perched at the entrance of a nest hole before entering. The nest hole was around 2.3 m from the water level. At times one of the adults would look out from or perch just outside the nest hole while waiting for the partner. One of the adults that was looking out from the nest hole ate

an ant that came near the nest hole. Later one adult flew in with grub and perched at the nest hole entrance and waited for the other adult to exit the nest before entering into the nest to feed. From this feeding behaviour it was obvious that there were chick(s) inside the nest hole. Adults were seen flying away with waste collected from inside the nest hole.

Subsequent observations on 6, 13 and 17 March 2022 documented feeding behaviour. Both adults were observed bringing various types of grubs (25 times) and unidentified insects (three times) to feed the chick(s) inside the nest hole (Plate 6). At peak times, the feeding frequency was once every one to eight minutes. By 17 March 2022 feeding was carried out at the nest hole entrance and the chick was visible at the nest entrance.

Plate 6: Adult with food item for juvenile at nest hole

One of the adults was observed drinking water accumulated in the top section of a bamboo pole and also from the top section of a vertical PVC pipe (Plate 7).

Plate 7: Adult drinking water from a bamboo pole and PVC pipe

On 20 March 2022, from 10.45am onwards, a chick's head would most of the time be at the nest hole entrance. A number of times the chick would climb halfway out and appear that it was going to take its maiden flight but always backed down.

Adults appeared to use a number of techniques to encourage the chick(s) to fledge (Plate 8). Firstly, they slowed down their feeding frequency in the later morning and afternoon. The second method used by the adults was to perch with food on a nearby pole in view of the chick(s) to lure them to fly to them. The third method used by the adults was to fly to the chick at the nest hole and then fly to a nearby pole. It would repeat this a few times demonstrating to the chick where to fly to. All the effort was not fruitful as the chick(s) did not make their maiden flight that day.

Plate 8: Adult trying unsuccessfully to encourage the chick to take its maiden flight

We were not able to observe the fledging of the chick(s) but from information from local fishermen at the site, the chick(s) fledged sometime around 24 to 25^{h} March 2022. This suggests a fledging period of more than 27 days.

Discussion

Wells (1999) describes nesting tree sites as "*preferred in mangrove forest*" and inland nests in *Peltophorum pterocarpum* (Yellow Flame tree) and *Erythrina spp.* (Coral tree). Davison (1999) reports the use of a *Casuarina* tree to excavate a nest. Our mangrove nesting site is possibly the *Bruguiera sexangula*. Nests have been recorded as low as "*2 m up in scrubby mangroves but most nests are 3-18 m above ground or water*" (Wells 1999). Winkler & Christie (2021) quote nest heights as "*range 2–14 m, mostly 4–10 m*". Our nest was 3-4 meters above ground level. Nests can be on the underside of a dead branch.

Wells (1999) notes that "*there are also records from artificial sites over water, including bamboo mooring-poles, old jetty timbers and the uprights of permanent, off-beach fish-traps*". All of us have observed this, as seen in the second nest described. On 9 September 2013 at Kuala Baram, Miri, Sarawak, Malaysia, Amar-Singh HSS observed a pair using an old wooden post, previously used to anchor a cloth drying line; the nest was 2.5 m up (see Plate 9).

Clutch and brood are two according to Wells (1999), while Winkler & Christie (2021) quote a clutch size of two to three eggs.

Gorman (2014) notes that adult food items include "*various insects, especially ants and beetles … also fruit, berries and nectar*" but offers no idea of food for nestlings. On food items, Winkler & Christie (2021) mention "*insects, particularly ants and other hymenopterans, beetles and their larvae, caterpillars; fruits, berries and flower nectar also taken*". Wells (1999) states that "*prey appears mostly to be small arthropods, but fig-like fruits as well as insect larvae have been identified among food taken to nestlings*". Our observation has documented the wide range of food items provided to chicks with a predominance of invertebrates or insects and the occasional fruit item.

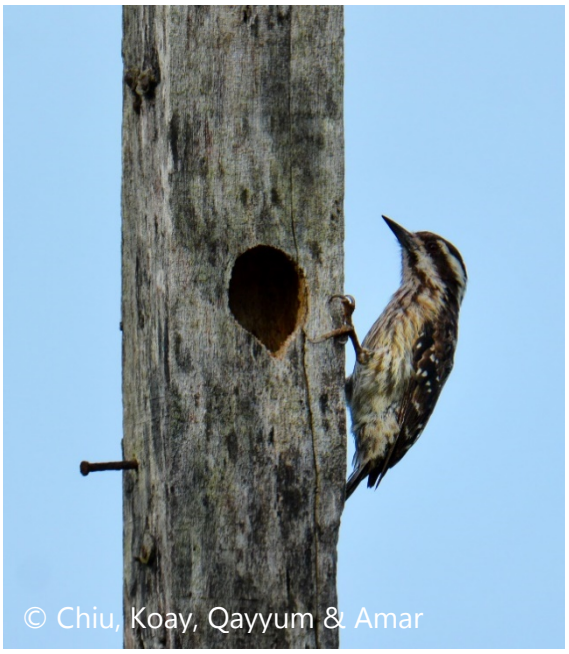

Plate 9: Prior records of nesting in artificial sites

Reference

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