Shared Nesting Tree Site for Gold-whiskered and Red-throated Barbets

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Reports of the nesting observations of the Gold-whiskered Barbet *Psilopogon chrysopogon* and Red-throated Barbet *Psilopogon mystacophanos* in the literature have been limited. We had an opportunity to observe Gold-whiskered and Red-throated Barbets nesting in the same tree at the same time. The article summarises the nesting observation and reviews the literature. As both birds were sharing the same site, the nesting is described together.

Disclosure on Nest Observations

The nests were first observed by Amar who then requested Chiu, Poon and Cheaw to assist in observations. During most observations, a single or two observers were present. Rarely three persons were present. Nest observations were done using long lens photography with observers staying approximately 7 to 10 meters from the base of the tree; at times hidden in the foliage. Birds were observed for any signs of anxiety or impaired feeding due to observer presence. Generally, all of us felt that adult birds were comfortable with our observations and that feeding and nest visits were not impaired.

Timelines of Nesting Observations

Both pairs of nesting birds were first spotted on 29 June 2023 when seen bringing food to juveniles. The nesting site was then visited almost every one to two days from 30 June to 25 July 2023. Nests were generally observed for two to three hours in the mornings. The Red-throated Barbets fledged on 13 July 2023 and the Gold-whiskered Barbet on 25 July 2023.

Nest Location and Structure

The nesting site was located next to a rushing stream in mixed secondary and primary forest. Both nests were located seven to eight meters up the dead trunk of a *Macaranga gigantea* (Giant Mahang) tree. The tree had split into two trunks from low at the base and one trunk had died (See Plate 1). The Gold-whiskered Barbets were nesting on the south side and the Red-throated Barbets on the north side of the tree. The nesting hole of the Red-throated Barbets was just 8-10cm lower than that of the Gold-whiskered Barbets. There were other unoccupied holes in the tree.

Incubation and Fledging Periods

As we did not observe nest construction or when incubation began, we have no details on the incubation periods. Note that neither nest appeared to be of fresh construction and may have been reused. From the first feeding observation on 29 June 2023, the two Red-throated Barbet juveniles fledged on the afternoon of 13 July 2023 and the single Gold-whiskered Barbet juvenile on 25 July 2023.

Parental Responsibilities

We were not able to determine the differences in Gold-whiskered Barbet parental nest behaviour as the sexes are alike. However, one bird preferred flying straight into the nesting hole with food and the other would alight on a nearby branch before entering. The first bird was also the one that usually removed faecal material, suggesting it could be the adult female. The Red-throated Barbet adults were easily differentiated and females brought more food than males (see under food items) and were responsible for removing nest waste material. No calls were heard on arrival or when leaving the nesting site by adults or nestlings.

Plate 1: Overview of the nesting holes of the Gold-whiskered (left) and Red-throated Barbets

Nest Waste Material Removal

A number of faecal removals episodes were observed for both barbet species with adults entering the cavity to retrieve this. The frequency of adult barbet removing nest waste material is erratic for both species. It was frequent or with long gaps when feeding frequency was reduced. At peak times Gold-whiskered Barbets had 4 waste material removals in 2 hours and Red-throated Barbets 10 waste material removals in 2 hours. We were unsure if material removed was eaten as it was taken far away. It was uncertain as to what suggests to the adults that there was sufficient waste to remove and, at times, they may enter the hole and leave without any waste material. There was no sac covering the waste material and uneaten prey parts could occasionally be seen for the Gold-whiskered Barbet (see Plate 2) and, on one occasion, maggots for the Red-throated Barbet. As mentioned earlier, only the female Red-throated Barbet removed waste material. The same was likely for the Gold-whiskered Barbet but this could not be confirmed.

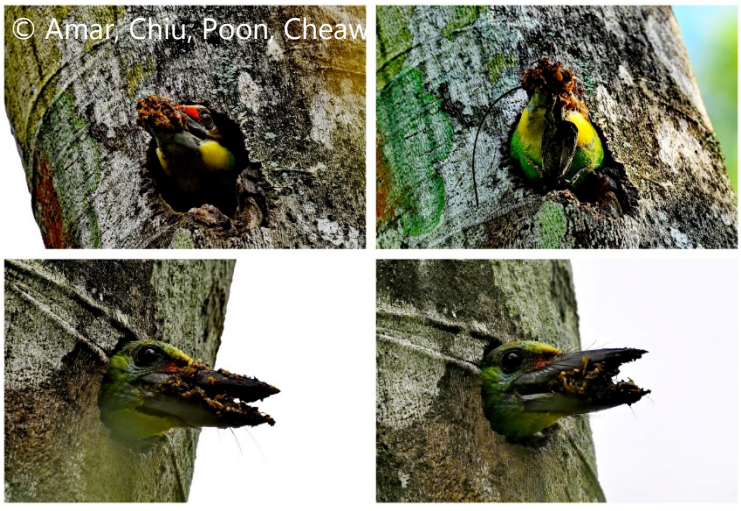

Plate 2: Nest waste material removal by Gold-whiskered (above) and Red-throated Barbets

Feeding Behaviour, Frequency and Food Items for Juvenile Gold-whiskered Barbet

In the early stages of nesting the adults entered the nest to feed the young. When close to fledging, the juvenile would wait at the hole entrance to be fed. Feeding duration in the nest or at the nesting hole was very brief and the bird exited/left within 30-45 seconds; flying straight out of the nest without any stops. In the mornings, the mean feeding frequency was 17 minutes, mode 15 minutes and range 3-29 minutes. One adult would alight on a nearby branch to check for safety before entering. The other (possible female) preferred flying straight into the nesting hole with food; hence not all food items could be identified.

Of 137 feeding episodes observed, 46 food items could not be seen. Of the remaining 91, 62 were *Ficus* fruits, 13 were other types of fruits, eight were insects (three beetles, three praying mantis, one dragonfly and one unknown insect) and eight were different types of *Draco* species (Gliding Lizards) (see Plate 3). One of the *Draco* species is likely the *Draco blanfordii* (pers com Nick Baker). Plate 4 is a collage of some feeding items and Plate 5 shows an adult arriving at the nest with the expectant nestling.

Note that earlier in the nesting period more insects and lizard prey were brought to the nestling. Closer to the fledgling time, the food items were predominantly fruits.

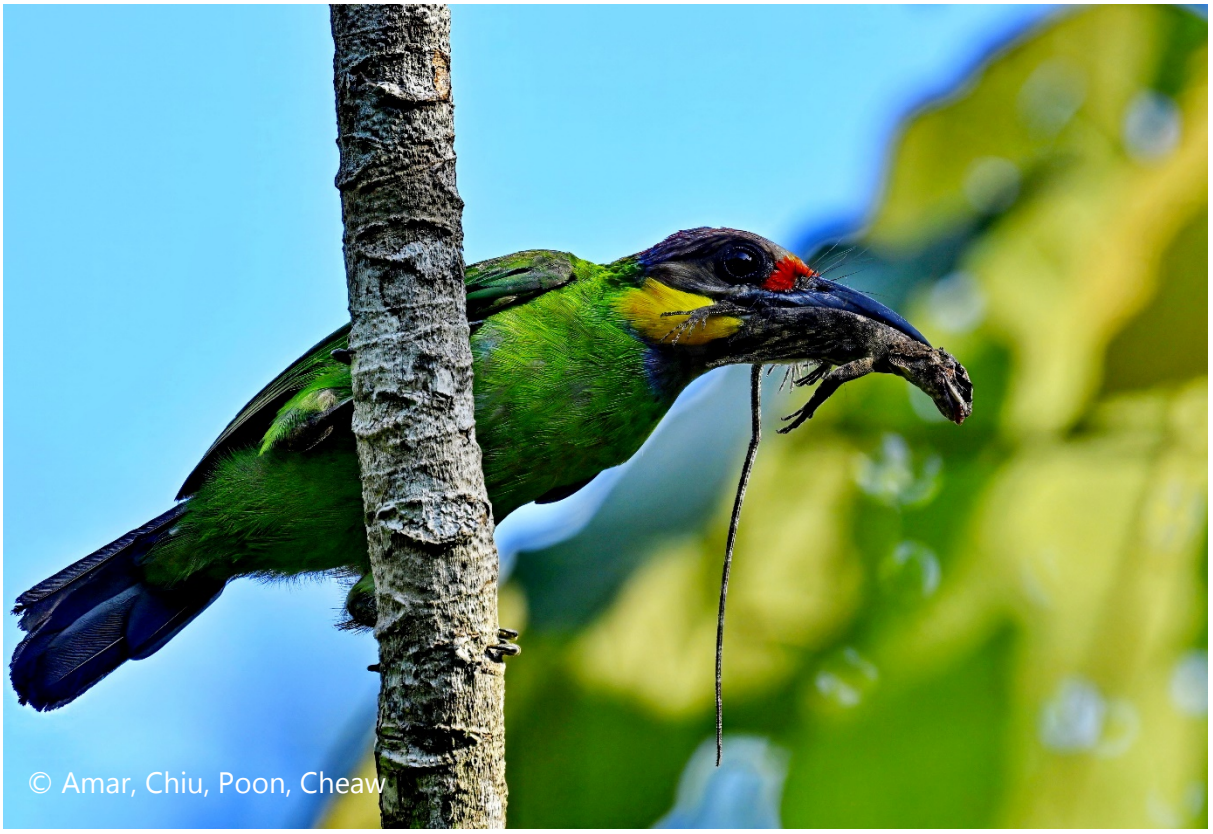

Plate 3: *Draco species* lizard brought to nest by Gold-whiskered Barbet

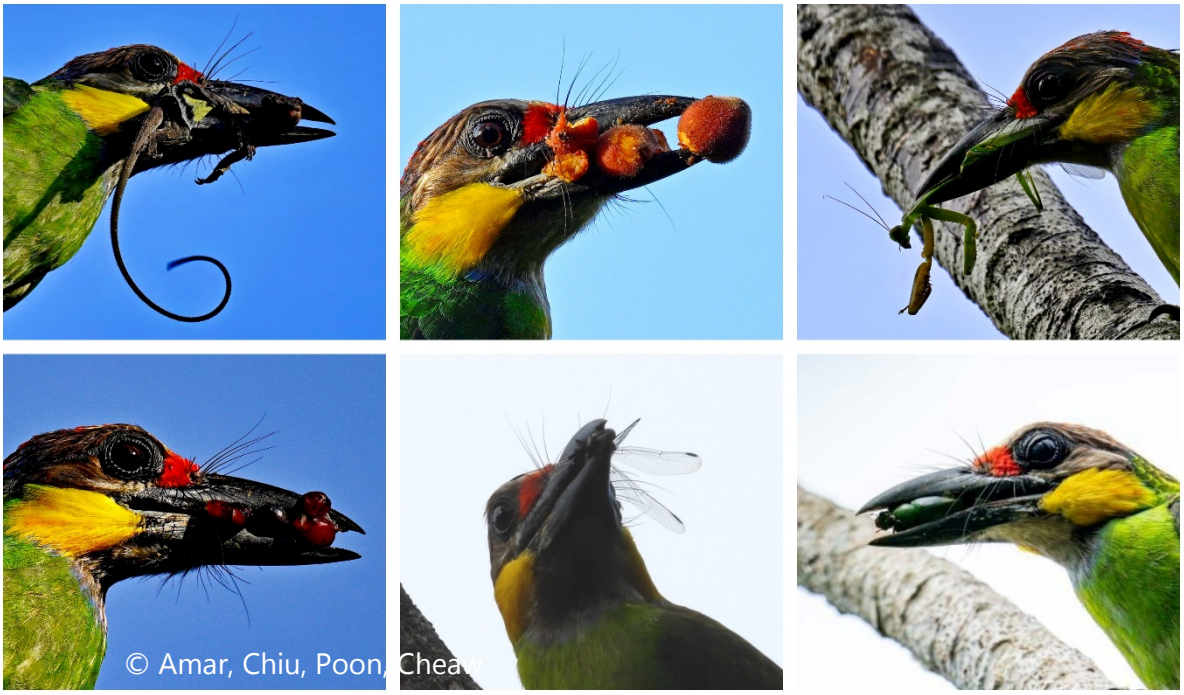

Plate 4: A variety of food items brought by adult Gold-whiskered Barbets to feed nestling

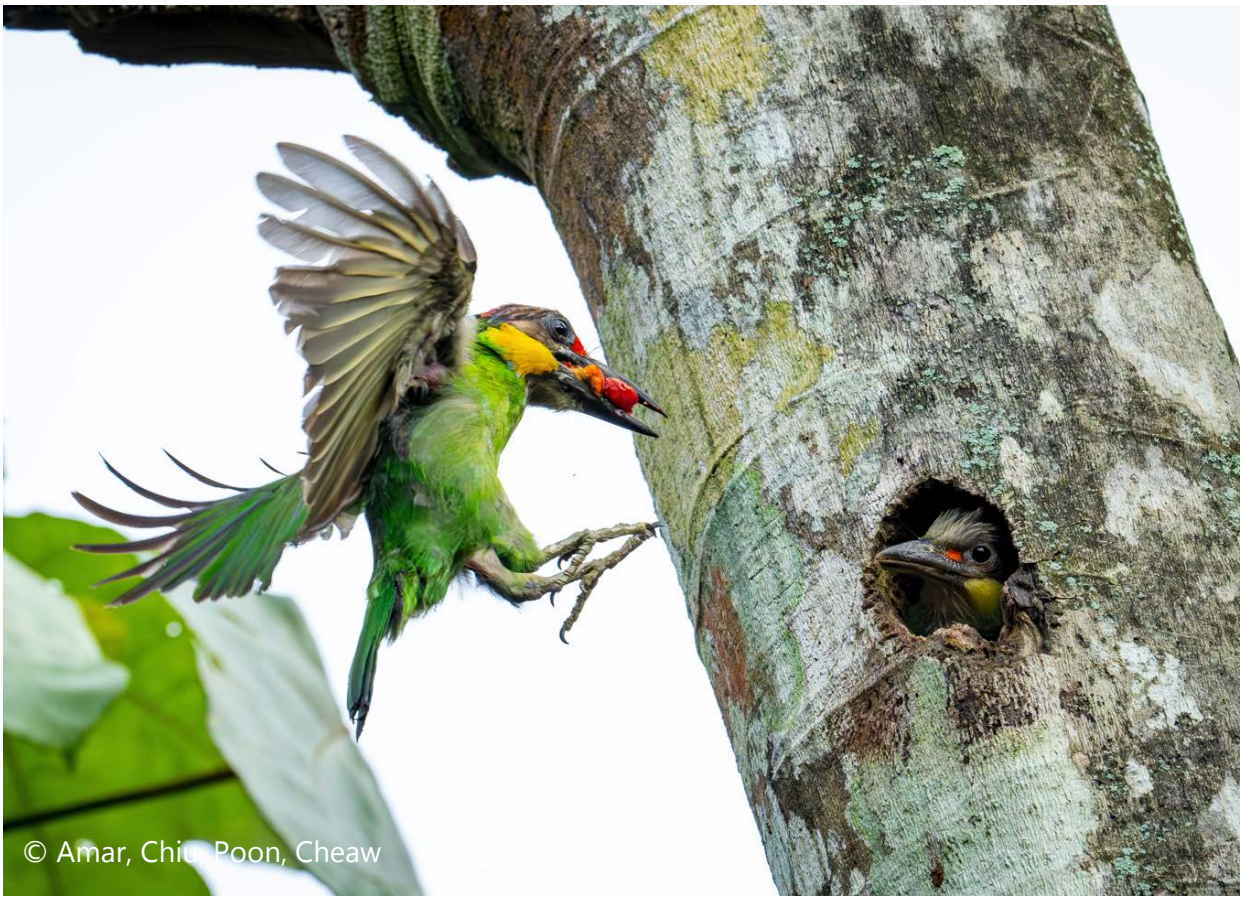

Plate 5: Adult Gold-whiskered Barbet arriving at nest to feed nestling

Feeding Behaviour, Frequency and Food Items for Juveniles Red-throated Barbet

The Red-throated Barbets usually fed nestlings at the entrance to the nesting hole but the young were not seen until closer to the fledgling period when they would take turns to wait at the hole entrance to be fed (see Plate 6). Adults entered the nest after feeding if there was a need to remove waste material; rarely they were seen exiting the nest without waste material. In the majority of feeding episodes, the adults would land on a nearby branch, look around for safety before going to the hole to feed. The Red-throated Barbet male was cautious and would back off when the Gold-whiskered Barbet came to feed their juvenile. Feeding duration in the nest was very brief (seconds) but birds may not fly off immediately. The female often flew about approximately 20 meters away to do an extensive branch swipe of the beak. The male tended to move to a branch adjacent to the hole to look around before leaving. Rarely, adults brought fruits but the nestlings did not eat them and the adult flew off with the food. Occasionally, food presented to nestlings was taken back by the adult, adjusted and re-presented for feeding. Once the adult male arrived at the nesting hole with food while the adult female was still inside and some position adjustment was required to enable the female to fly off.

During morning observations, the mean feeding frequency was 5 minutes, mode 2 minutes and range 1-12 minutes. There was a slightly higher frequency of the female feeding nestlings but note that observations were not throughout the day. At times only the female or only the male came to feed; possibly the other adult was taking a break to feed itself. Of 127 feeding episodes observed, 29 food items could not be seen. Of the remaining 98, 93 were a variety of fruits, including *Ficus* fruits. Two items were snails, one was a beetle, another a moth and one a larva. Plate 7 is a collage of some feeding items. Note that animal prey in the diet of Red-throated Barbets was very limited compared to the Gold-whiskered Barbets; fruit appeared to be the predominant food item. The feeding frequency was higher than that of Gold-whiskered Barbets, however there were two juveniles to feed.

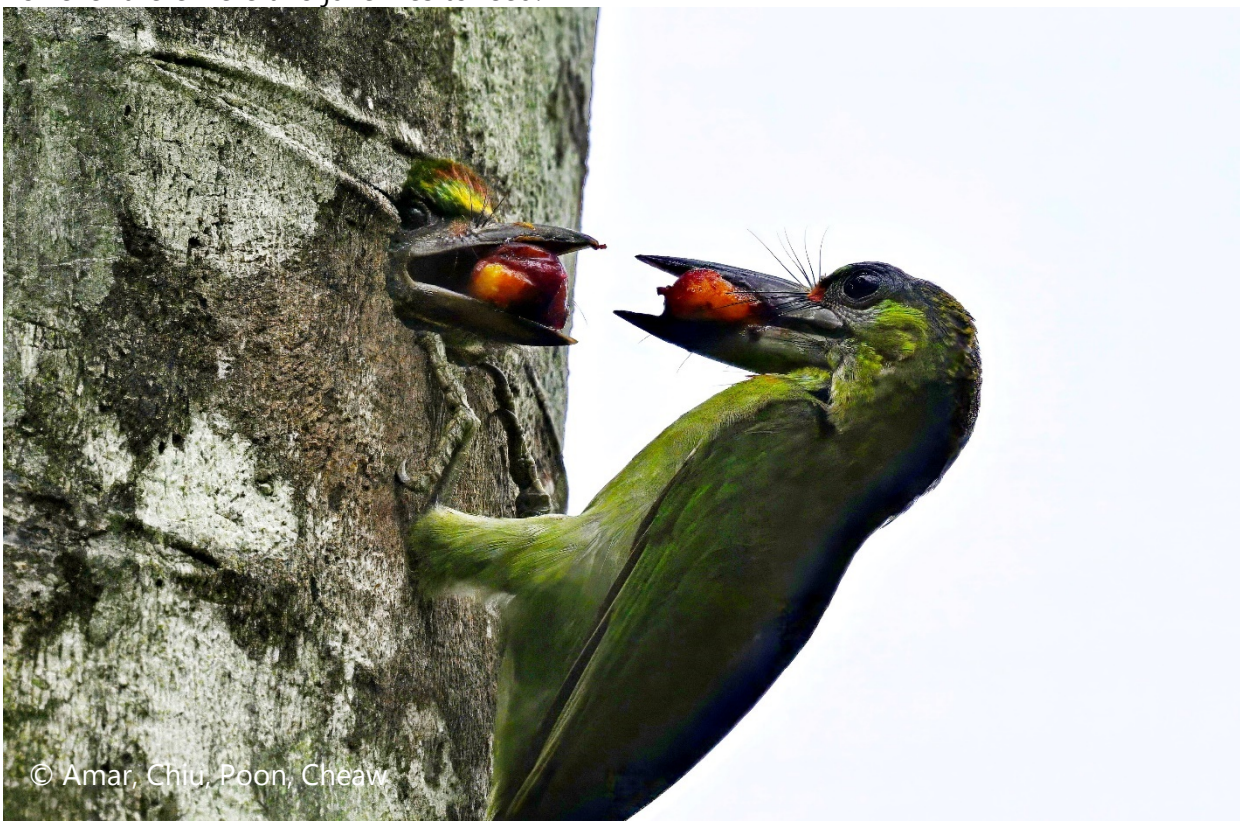

Plate 6: Adult female Red-throated Barbet feeding a male juvenile with *Ficus* fruit

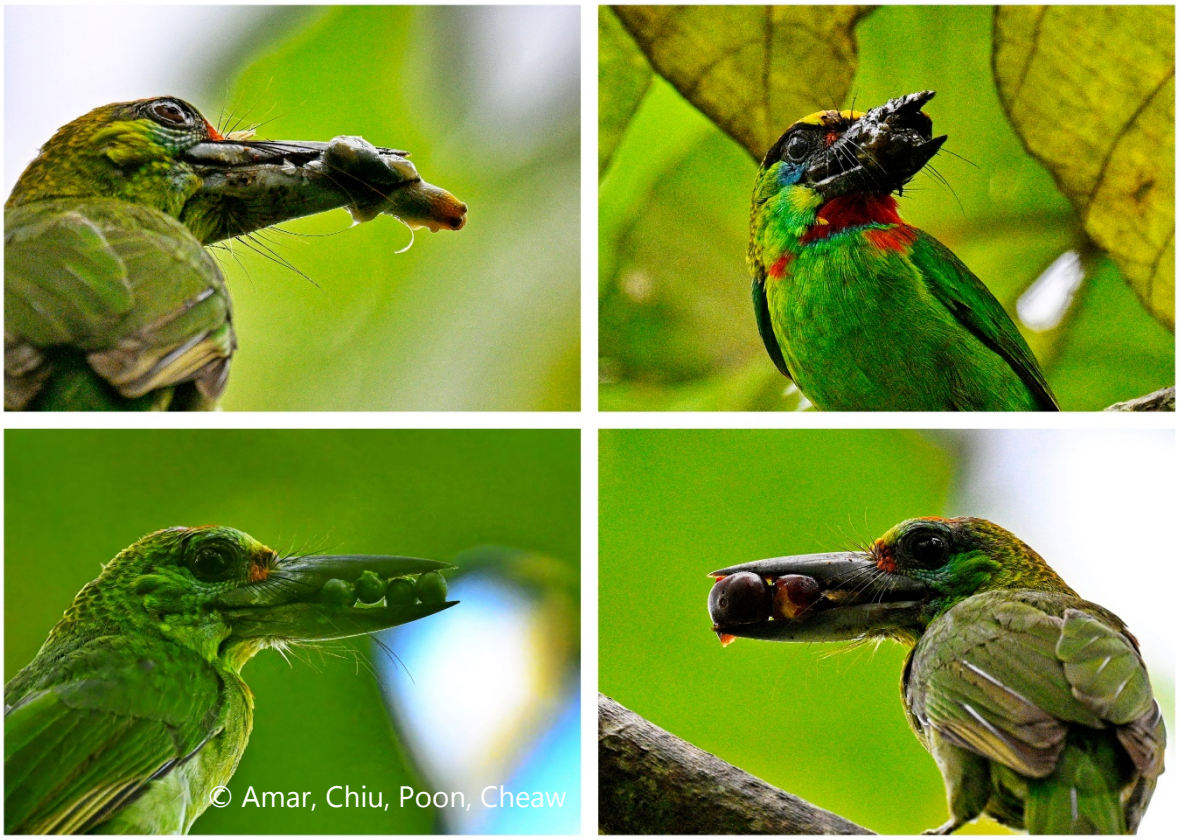

Plate 7: A variety of food items brought by adult Red-throated Barbets to feed nestlings

Fledging Observations

The single Gold-whiskered Barbet nestling fledged on 25 July 2023. It was noted that two days before, the feeding frequency by parents had decreased considerably. On the day the juvenile fledged, feeding was limited – only two episodes were seen. At 0953 the juvenile fledged and flew out of sight. At 0955 an adult parent entered the nest to check for the juvenile and flew off immediately after. The fledged juvenile was found at 1005. It was alone and perched on a branch about 50 metres away from the nest site. The juvenile was quiet and not calling out for parents. The fledgling appeared to be independent and able to fend for itself after leaving the nest. The juvenile Gold-whiskered Barbet had developed a fairly mature plumage just before fledging, with a yellow malar patch, red on the hind cap and lores but was browner in the face. The orbital skin was a lighter brown, compared to adults. The tip of the beak was pale. Plate 8 is an image of the juvenile Gold-whiskered Barbet on the day it fledged.

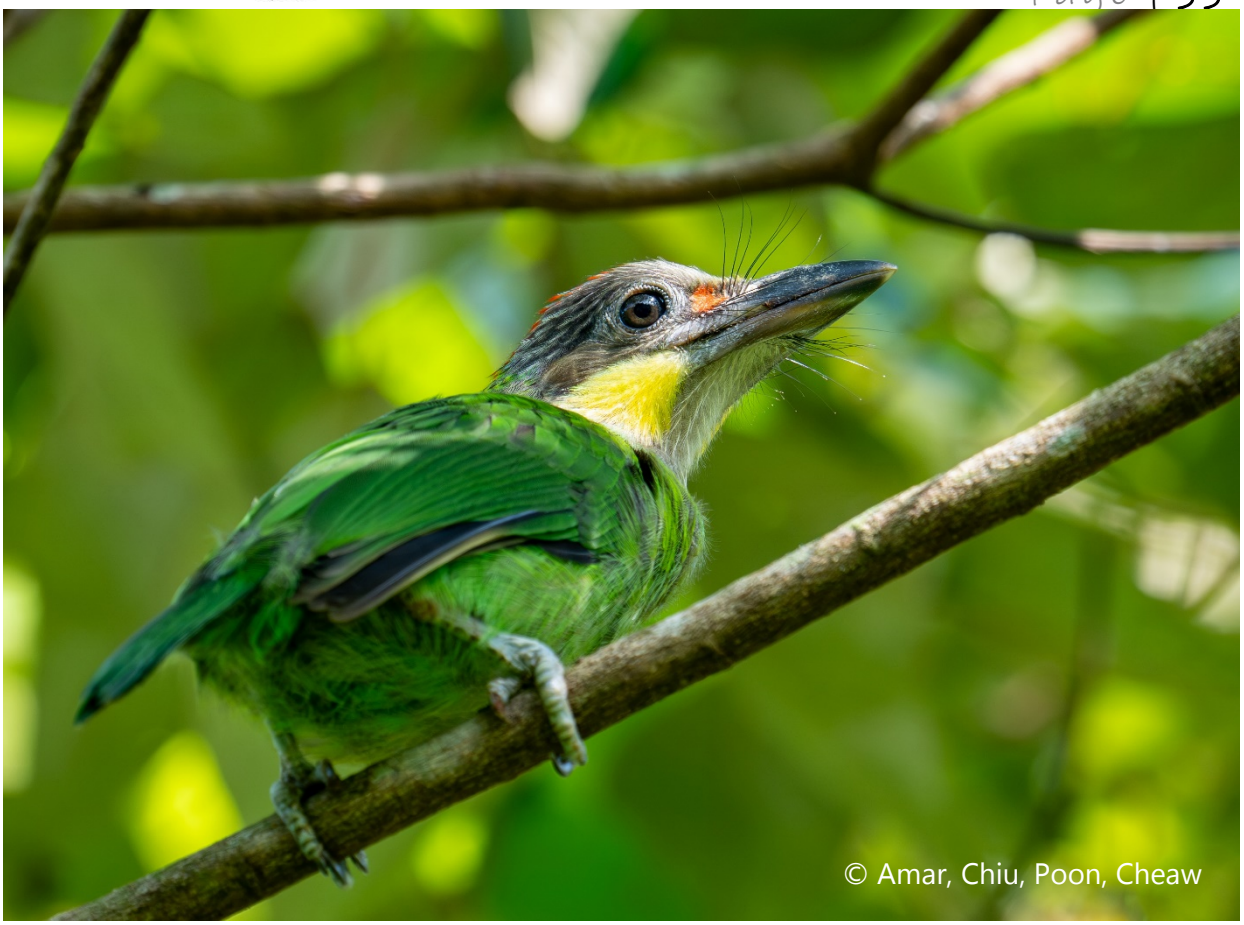

Plate 8: Gold-whiskered Barbet on the day it fledged

The sex of nestling Red-throated Barbets could be differentiated a few days before fledging (see Plate 9). The red crown of male was apparent as was the yellow forehead of both males and females. Notice again the pale tip to the beaks. The Red throated Barbets fledged on the afternoon of 13 July 2023; an observation on 14 July 2023 morning showed an empty nest.

Interaction Between the Barbet Species and with Other Birds

Generally, the two barbet species nested without any conflict. However, on a few occasions we observed the male Red-throated Barbet hesitant to approach the nest hole or withdrew with food in the beak when a Gold-whiskered Barbet arrived with food at their nesting hole.

A number of other bird species came close to both nesting holes while foraging, to rest on the tree or on a fly-by. These included a Banded Bay Cuckoo *Cacomantis sonneratii*, Pin-striped Tit-Babblers *Mixornis gularis*, Verditer Flycatchers *Eumyias thalassinus*, Blue-eared Kingfisher *Alcedo meninting*, Buff-necked Woodpeckers *Meiglyptes tukki*, Whiskered Treeswifts *Hemiprocne comata* and a variety of Bulbul and Sunbird species. There were no altercations with the barbets or distress shown by the nesting birds.

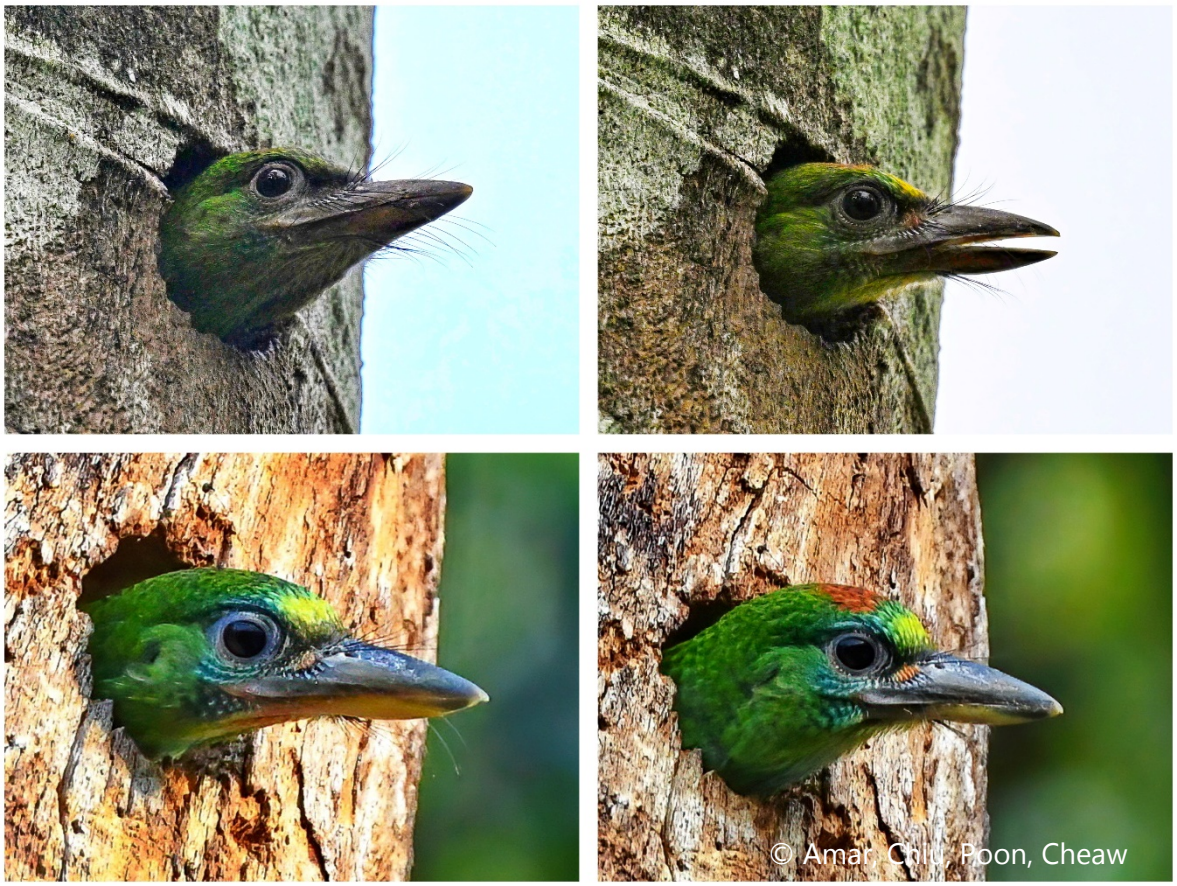

Plate 9: Red-throated Barbet nestlings at nesting hole, on the day of fledging - female above left, male above right. The images below are of another Red-throated Barbet nest observed in September to October 2021 with the female and male juvenile shown on the day of fledging.

Discussion

Different bird species may share nesting locations but to find a pair of Gold-whiskered and Red-throated Barbets nesting back-to-back, on the opposite side of the same dead tree at almost the same height, is unusual. It is uncertain how close the two cavities were within the tree trunk. It would be interesting to find out what the holes looked like inside and how far apart the juveniles were located. In addition, how the birds tolerated each other excavating holes is an enigma. It could be that nesting holes were constructed at different times and now reused. Wells (1999) has described Black-thighed Falconets *Microhierax fringillarius* using barbet holes a few meters away from an active Gold-whiskered Barbet nest.

A summary of available key nesting information from the literature for both barbet species is outlined in the tables below.

Table 1: Key nesting information for Gold-whiskered Barbet

	Our nest	**Wells 1999**	**Short & Horne 2020a**	**Davison 1999**	**Amar-Singh HSS 2014**	**Amar-Singh HSS 2017**
Location	Next to a stream, mixed secondary & primary forest in a	At the edge of forest; once in a 'drown' tree	NA	Primary forest location	Fringe of primary forest in a *Durio zibethinus*	Adjacent to an ex-logging trail

	Macaranga gigantea (Giant Mahang) tree				(Durian) tree	
Height (meters)	7-8	6-17	NA	NA	7-8 & 13-14	7-8
Clutch size	NA	2	2	NA	NA	NA
Incubation period (days)	NA	NA	NA	NA	NA	NA
Nestling period (days)	>28	NA	NA	NA	NA	NA
Number fledged	1	NA	NA	2	NA	NA

Table 2: Key nesting information for Red-throated Barbet

	Our nest	**Wells 1999**	**Short & Horne 2020b**	**Davison 1999**	**Guy 2015**	**Cheaw, Poon & Amar 2021***
Location	Next to a stream, mixed secondary & primary forest in a *Macaranga gigantea* (Giant Mahang) tree	Regenerating forest; twice holes excavated in still-active, arboreal ant-nests or termitaria	NA	NA	By side of a wide, quiet road	Orchard with second in a *Durio zibethinus* (Durian Tree)
Height (meters)	7-8	6 & 3	3-6	3 & 3	NA	6-7
Clutch size	NA	Report of 4 needs verification	2-4	NA	NA	NA
Incubation period (days)	NA	NA	17–18 in captivity	NA	NA	NA
Nestling period (days)	>15	NA	24–29 in captivity	NA	NA	NA
Number fledged	2	NA	NA	NA	2	2

* This was another Red-throated Barbet nest observed in September to October 2021 in Perak.

While breeding information on both of these barbet species is still lacking, our observations offer details on the feeding of juveniles.

References

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