

FIELD STUDY

Notes on the nesting of the Red-bearded Bee-eater *Nyctyornis amictus* in Peninsular Malaysia

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Introduction

Bee-eaters of the genus *Nyctyornis* are represented by two species, both of which are essentially birds of tropical and subtropical forests in South-East Asia and wetter parts of the Indian subcontinent. The Blue-bearded Bee-eater *Nyctyornis athertoni* and Red-bearded Bee-eater *N. amictus* are both significantly larger and heavier than typical *Merops* bee-eaters, and share a number of morphological and ecological similarities. For example, both species have predominantly green plumage, square-ended tails, round-ended wings and the distinctive long, loose throat feathers that give the ‘bearded’ appearance (Fry *et al.* 2001). Ecologically, *Nyctyornis* bee-eaters are sluggish during foraging, spending long periods of time on a look-out perch in the middle to upper canopy level and flying down to pick up arthropod prey when spotted (Fry *et al.* 2001).

Plate 1. Male Red-bearded Bee-eater *Nyctyornis amictus* with prey item (a large wasp) on look-out perch near the nest, Panti forest reserve, Malaysia, April 2010.



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The Red-bearded Bee-eater is a common bird of primary and secondary evergreen forest from the lowlands to lower montane elevations in the Thai-Malay Peninsula, Borneo, Sumatra and Bangka (Wells 1999, Robson 2002). Its unobtrusive habits mean that it is more often heard than seen. As such, documentation of its nesting cycle is relatively incomplete (Wells 1999). Here we present details of our observations of a nesting pair in the Panti forest reserve, a large, partly protected area made up of a mosaic of primary and secondary lowland/hill dipterocarp and freshwater swamp forest in Johor, southern Peninsular Malaysia (Yeap *et al.* 2007).

Description of nest-site

Consistent with published descriptions of its nesting habits (Fry *et al.* 2001, Robson 2002), the nest-site was a burrow with a circular entrance, dug into a raised, exposed sandy bank by the side of an old logging track. The immediate surrounding vegetation was tall secondary forest that was formerly logged. The entrance was approximately 1 m above ground level and we were able to estimate the depth of the burrow (after nesting was concluded) at approximately 1 m by inserting a long stick into it. In the vicinity of the nest was a ‘look-out perch’ on a branch 4–5 m up on a tree, and this was where the adults perched before flying to the nest to deliver food, after which they did not return to the perch but flew straight into the forest.

Discovery of the nest

At a site where a pair of Red-bearded Bee-eaters had been regularly observed since 2009, a male was first observed by CF on 28 March 2010 with unidentified arthropod prey in its bill, suggesting that it might be feeding young, and eventually we were able to watch the bird fly down to the nest burrow on a raised, sandy platform at the forest edge. The male and female were subsequently seen taking turns to bring prey items to the young, which we observed to approach the entrance whenever the parents returned with food. We were unsure of the brood size at first as only one chick was seen at a time when the adults returned to the nest. The female’s tail-feathers were noticeably worn, suggesting that she might have spent more time inside the nest than the male.



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Plate 2. Male Red-bearded Bee-eater carrying prey back to the nest burrow dug into an exposed mound, Pantii forest reserve, Malaysia, April 2010.



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Plate 3. Female Red-bearded Bee-eater carrying prey back to the nest burrow, Pantii forest reserve, Malaysia, April 2010. Note the worn appearance of the outer tail feathers, which may have arisen from frequent entry into the nest hole.

When first seen, we estimated that the chicks were about one week old. Frequently throughout the day either the male or female would position itself on the look-out perch, calling loudly before flying down to the nest. We inferred that the call was made to attract the attention of the chicks, as one of them appeared every time an adult called. We subsequently recorded one instance, on 13 April, when the adults called from the look-out perch, prompting the chicks to respond with a harsh call which lacked the guttural quality typical of the adults.

Further observations

The nest was visited by us on a further 12 occasions over the following three weeks to observe and

document nesting activities, enabling us to obtain considerable detail on the bee-eaters' feeding habits and the frequency with which they visited the nest. Feeding of the chicks was observed as early in the day as 07h30 and as late as 17h00. The frequency with which prey items were brought to the nest suggested that more than one chick was present, but we remained uncertain of the brood size as one or more chicks may have been obscured when another chick moved to the entrance to receive food.

On average the adults brought prey items to the nest-hole about every 15 minutes, although there were periods with no activity for up to an hour and other occasions when the frequency of visits increased. Both the male and female often appeared on the look-out perch together and fed the chicks in quick succession. We noted that prey, consistent with the literature (Fry *et al.* 2001), included a variety of large arthropods, especially cicadas, which formed the bulk of prey items (50–75%) brought back to the nest, as well as some orthopterans (grasshoppers) and hymenopterans (e.g. hornets, wasps). On six occasions an adult bee-eater was seen with a small *Draco* gliding lizard in its bill, tentatively identified as *Draco sumatranus*, a common species of secondary forests

Plate 4. Female Red-bearded Bee-eater reaching her head into the nest burrow to feed one of the chicks, Pantii forest reserve, Malaysia, April 2010.



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Plate 5. Male Red-bearded Bee-eater carrying a Common Gliding Lizard *Draco sumatranus* back to feed to its young, Pantı forest reserve, Malaysia, April 2010.

Plate 6. Male Red-bearded Bee-eater approaching the nest with a Common Gliding Lizard *Draco sumatranus*, Pantı forest reserve, Malaysia, April 2010.

Plate 7. Red-bearded Bee-eater chick takes prey from the male at the entrance to the nest, Pantı forest reserve, Malaysia, April 2010.



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Plate 8. One of the Red-bearded Bee-eater chicks sticks its head out of the nest moments before it left the burrow, Panty forest reserve, Malaysia, 19 April 2010.

and various disturbed habitats (Cox *et al.* 1998, Das 2010). Previously undocumented, this suggests that Red-bearded Bee-eaters occasionally capture small vertebrates in the forest mid-storey and canopy to supplement their diet, especially flying lizards *Draco* and possibly tree skinks *Dasia* and tree frogs *Rhacophorus* when the opportunity arises.

During periods of feeding, the adult invariably adjusted the prey item so that it was presented head-first to the chick. The adult bird would put its head into the nest and into the gape of the chick. Interestingly, neither of the adults was seen entering the nest during the period of observation, or removing faecal sacs, a behaviour observed in many nesting birds.

On 19 April at about 10h00 we were able to observe one chick relatively well after it shifted half its body out of the burrow and looked around for about five minutes before retreating. On the same day, the adult male was observed to dive-bomb a potential nest predator, a large Clouded Monitor Lizard *Varanus nebulosus*. At one point the lizard got as near as 10 m from the nest although the adult bird's aggressive behaviour deterred it from getting too near to the nest burrow.

On 20 April at about 07h45 one chick looked around curiously from the nest entrance. After two



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Plate 9. Newly fledged Red-bearded Bee-eater chick outside the nest. It was later joined by two more chicks and the adults before flying into the forest, Panty forest reserve, Malaysia, 19 April 2010.

minutes it flew out of the nest for about 50 m and came to rest on a tree, landing in an ungainly manner. A few minutes later, a second chick repeated the same process, flying in a different direction and landing in a different tree. Finally a third chick appeared and flew from the nest, yet again in a different direction. This happened in the presence of both adults, although no vocalisations were heard. The third chick left at 08h00, all three therefore leaving the nest within a period of 15 minutes.

Within half an hour, the adults and all three chicks had congregated on a tree near the nest. We noticed that the adult birds made soft churring sounds, unlike the usual call of the species, possibly to attract the attention of the chicks. All the birds remained on the same tree until about 09h30. No feeding of the chicks was noted in this time and the family subsequently moved into the forest and was not observed thereafter.

Discussion

Despite it being a widespread Sundaic forest species, information on the Red-bearded Bee-eater is relatively incomplete and much remains to be learnt, especially in relation to its brood size, survival and time to fledging (D. R. Wells *in litt.*

2010). Our observations therefore add to the current knowledge of the breeding cycle of this elusive forest bee-eater.

Based on the extent of their plumage development when first seen, we inferred that the chicks were at least one week old. The chicks left the nest 24 days later, suggesting that the time from hatching to fledging is about 31–34 days. Although we were not able to determine the number of chicks while they were still in the nest, or document any evidence of chick mortality, the fact that three juveniles were seen to leave the nest confirms that the clutch size can exceed the two documented in Wells (1999) and Robson (2002), and may be even higher.

Our multiple observations (n = 6) of at least one species, the Common Gliding Lizard *Draco sumatranus*, being fed to the chicks is also the first instance of Red-bearded Bee-eater taking small vertebrates and is contrary to an all-arthropod diet as previously reported (Wells 1999, Fry *et al.* 2001). The adults may therefore have a broader diet than previously thought and opportunistically capture larger vertebrate prey in the middle levels of the forest.

Red-bearded Bee-eaters are widespread and relatively common birds of lowland to submontane evergreen forest in Peninsular Malaysia (Wells 1999). Given that exposed banks and mounds are the most frequently documented nesting locations, the species may potentially benefit from selective logging which creates exposed mounds where trees

have been removed, creating sites where burrows may be excavated.

Acknowledgements

We thank David Wells and Albert Low for their helpful input during the preparation of this note.

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