

NOTEBOOK

Oriental Pied Hornbill: two recent failed nesting attempts on mainland Singapore

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Introduction

Historically, three species of hornbill occurred on Singapore—Oriental Pied *Anthracoceros albirostris*, Rhinoceros *Buceros rhinoceros* and Helmeted *Rhinoplax vigil* (Bucknill & Chasen 1927, Gibson-Hill 1949), but these subsequently became extinct. Since 1994 a few Oriental Pied Hornbills have been sighted on the offshore island of Pulau Ubin, probably visitors from the southern Malaysian state of Johor (Wee & Subaraj 2006, Wang & Hails 2007).

Unlike most South-East Asian species that require extensive tracts of mature rainforest to nest, the Oriental Pied Hornbill is an exception (Poonswad 1995) and is adaptable to habitat changes and able to thrive around human habitation, as long as there is an ample supply of food and large mature trees for nesting (Chong 1998). This probably explains its reappearance on Pulau Ubin. More recently, two pairs have

apparently moved to the main island, staying around the northern coastal area of Changi, close to Pulau Ubin.

Prospecting for nesting cavities

During October 2006, a pair was seen around Changi indulging in courtship feeding. The male caught a gecko and offered it to the female, who was ready to accept it but the male apparently changed his mind and flew to a nearby wayside angšana tree *Pterocarpus indicus* and placed it inside a cavity. Failing to get the female to fly over, he then flew off with it to a nearby branch and ate it.

In November 2006 a pair was seen prospecting for a nesting cavity about 22 m up an old yellow meranti tree *Shorea gibbosa*. In early 2007 another pair was seen checking out a cavity about 20 m up an angšana tree. In both cases courtship feeding, whereby the male fed his mate with fruits, was

Plate 1. Male hornbill offering his mate a gecko during a courtship feeding ritual.



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Plate 2. Male hornbill about to place a gecko into the tree cavity.



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Plate 3.

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Plate 4.

Plate 5.

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Plate 3. Male hornbill emerging from the meranti cavity during cavity enlargement.

Plate 4. Female hornbill entering meranti cavity while her mate waits outside with a piece of food in his bill.

Plate 5. Male hornbill delivering a Changeable Lizard *Calotes versicolor* to the female who is sealing herself in the cavity.

Plate 6. Male hornbill delivering a garden snail *Dyakia striata* to the female inside the cavity.

Plate 7. Female hornbill sealed inside meranti cavity.



Plate 6.

Plate 7.

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Plates 8 and 9. Male hornbill bringing lumps of mud for the female to seal herself inside the angšana cavity.

observed. Again, fruits were placed inside the respective cavities to entice the female over. Whenever the female refused to fly over, the male retrieved the fruits and flew over to feed her. At times the male would even enter the cavity himself.

Sealing the female bird in the cavity

Once the females approved their respective cavities, they enlarged them and began the slow process of sealing themselves in. A female hornbill began to seal herself inside the meranti cavity on 8 February 2007 while another was sealing herself in the angšana cavity on 17 February. The sealing process took 13 days in the former and 7 days in the latter case.

Throughout the period, the male made regular trips, about once every 10–15 minutes, bringing lumps of mud in his bill for the female to work with. He would not allow her to take the entire lump but to chip off pieces until the lump disintegrated. This procedure led to the accumulation of debris inside the cavity that the female had to shovel out. At times the male swallowed the mud to regurgitate it to the female in a softened wet form. The female was sometimes fussy and rejected the mud by throwing it out of the nest.

In between bringing lumps of mud, the male brought fruits that included MacArthur palm *Ptychosperma macarthurii*, *Bhesa robusta* and inevitably figs, probably either *Ficus stricta* or *F. kerkhoveni*. These were stored in his gullet, regurgitated and positioned at the tip of his bill before passing them to the female. Depending on size, he would deliver 10–50 fruits at a time. Other food included beetles, praying mantis and lizards.

Twice Changeable Lizards *Calotes versicolor* were brought, to be rejected both times by the female. In both instances the male ate it, in one case tossing it around in the air before swallowing it.

A liquid was seen to be dribbling from the nasal cavities of one of the males while delivering fruit. This has also been reported in ground-hornbills *Bucorvus* and is probably due to the excretion of excess salts from as yet undescribed salt glands (Kemp 2001).

Molluscs

In addition to food, the male brought pieces of Giant African Land Snail *Achatina fulica* shell to the female. He would display a piece to the female before gently dropping it inside the cavity. In another instance he brought a garden snail *Dyakia striata*, cracked it open and transferred the meat into the open bill of the female. The practice of delivering mollusc shell pieces has also been reported from Malaysia for the same hornbill species (Chan Kai Soon *in litt.*, Chong 1993).

The need to eat extraneous calcium in the form of snail shells or calcareous grit during the egg-laying period is well reported (Ficken 1989, Kast *et al.* 1998, Dhondt & Hochachka 2001).

Figs are the favourite food of hornbills, and they are also rich in calcium. It is possible that during breeding, the female needs more calcium than usual, thus the extra supply in the form of snail shells. And there are also the developing chicks to cater to.

Breeding failure

Based on observations made in Pulau Ubin where the female hornbill broke out of the cavity within

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Plate 10. Male hornbill delivering Giant African Land Snail *Achatina fulica* shell to the female.



Plate 11. Male hornbill passing fruits to female inside angšana cavity.

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65–78 days (M. Cremades & S. C. Ng *in litt.*), the emergence of the female nesting in the meranti tree was estimated to be in late April and that in the angšana in early May 2007. However, the bird reportedly broke out of the former nest sometime in April and was not seen to return. As for the latter nest, the bird was still inside on 6 April, but in mid-April a nearby resident reported seeing her emerge from the cavity and fly away. Again, she did not return to the nest and this implies there were no chicks to feed.

Usually, once the chicks are big enough, the female breaks the seal and leaves the cavity. The chicks inside may reseal the entrance and emerge a few days later. Sometimes she will emerge followed by her chicks on the same day.

The fact that the cavities were not resealed and the birds did not return implies that both nestings failed. It is possible that the eggs were infertile and failed to hatch. This appears to be relatively common in the wild population on Pulau Ubin as well as the captive birds at the Jurong Bird Park (M. Cremades & S. C. Ng *in litt.*). However, as the nests were not checked, this cannot be confirmed.

These are the first two recorded cases of hornbill nesting in Changi in modern times. The two pairs of birds appear to have moved from nearby Pulau Ubin to seek out new territories. It is possible that these were their first breeding attempts. Hopefully, subsequent nesting attempts will be successful and we will see more hornbills around Changi.

Discussion

Hornbills are secondary cavity nesters, preferring cavities high up in tall living trees (Mudappa & Kannan 1997). These cavities are usually formed



Plate 12. A pair of Tanimbar Corellas *Cacatua goffini* annoying female hornbill sealed inside angšana cavity.

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Plate 13. A Red-breasted Parakeet *Psittacula alexandri* annoying female hornbill sealed inside angšana cavity.



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Plates 14 and 15. Male hornbill in flight.



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Plate 16. Male hornbill dribbling liquid from his nasal cavities while delivering fruits.

through decay or excavated by primary cavity nesters like woodpeckers, barbets and parakeets. Such cavities are not common in Singapore, especially in urban areas where old trees are considered a hazard to public safety. Where available, they are also sought after by other cavity nesters.

The lack of suitable nesting cavities is a major problem for a breeding population on mainland Singapore. However, work on finding suitable nesting boxes on Pulau Ubin and the Jurong Bird Park has been encouraging and we await the time when these boxes can be tested in suitable locations.

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