

Crowned Hornbills — the inside story

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The two forest or forest-nesting hornbills in southern Africa are Crowned Hornbill *Lophoceros alboterminatus* and Trumpeter Hornbill *Bycanistes bucinator*. This article explores the nesting habits of Crowned Hornbill, unlike Trumpeter Hornbill, which seldom feed on fruit, but live mainly on animal prey, feeding on both, vertebrates and invertebrates. The photographs were taken over three breeding seasons (December 2018 - 2020) at a nest in Dlinza Forest, Eshowe, KwaZulu-Natal, South Africa (-28.8944° S; 31.4481° E).



Male and female Crowned Hornbills are slightly sexually dimorphic, with differences in their casque sizes. The male (upper) has a longer bill and casque than that of the female (lower).

Additionally, female Crowned Hornbills usually have conspicuous throat skin patches, but they may be hidden, depending on the angle of the head. It is usually cream coloured, becoming blue-green at the onset of the breeding season. Similar throat skin patches are also present in female Bradfield's Hornbill *Lophoceros bradfieldi*, Monteiro's Hornbill *Tockus monteiri*, and the African Grey Hornbill *L. nasutus*. Males have far less prominent throat skin patches, are dark coloured, and are usually hidden by feathers. The species is also known to regularly feed on chameleons.



The nest observed was a natural hole in a Forest Apple-leaf *Philenoptera sutherlandii* within the Dlinza forest. The dark margins to the edge of the entrance hole is the plaster cast made by the female to narrow the entrance hole as security from predators. Each season, two to three eggs were laid. Nests soon became foul smelling as a result of continual inhabitation and the regular bodily process, so in order to maintain nest hygiene, and perhaps reduce ectoparasites, bits of bark were regularly brought by the male to be added as nest lining. Notice the lack of a throat pouch in these images of the male. The female also continually added to and strengthened the entrance cast by smearing a mix of her own faeces, nest debris, and other matter in order to protect herself and the contents of the nest. These phases and processes are depicted in the following three images.





The newly hatched Crowned Hornbill nestlings are born featherless and blind, emphasising the importance of the enclosed nest entrance.



The chicks develop relatively quickly, as is observed in this four- to five-day old chick, already showing skin and beak changes.



The nestling was estimated to be just under two weeks old at the time these photos were taken. The female always climbed up into the "chimney" of the nest cavity when the nest was approached.



These Crowned Hornbill nestlings, from another season were known to be about 10 days of age and appeared to be at the same developmental stage as the previously photographed chick.



The primary food choice for nesting Trumpeter Hornbills, the other forest nesting species in southern Africa, is fruit. Males, after foraging, are able to return to the nest with crop fills of ripe fruit, regurgitating up to 30 - 40 items sometimes in a single delivery. Because of this, there is slightly less demand on the males, so female Trumpeter Hornbills break out and exit the nest simultaneously with the chicks, when they are ready to fly. This prolonged nesting of the female is one of the major differences between the breeding biology of these two forest nesting hornbills.

The male's role in providing sufficient food when there are nestlings becomes critically important. About half way through the nestling period, the female's flight feathers are sufficiently grown for her to fly again. This is when pressure on the male to keep supplying sufficient food (mainly invertebrates) is at its peak. It's at this stage that the female breaks the entrance cast, exits the nest cavity, and helps the male provide the chicks with food. If the male is killed or injured at any stage before the female's flight feathers are re-grown, she and her chicks will die of starvation, because she'll be incapable of collecting prey.

Here a male delivers various small invertebrates, including Mantids (left), and Cicada (right), to the nest.



Millipedes are generally avoided by most birds as a food source, but hornbills utilize their sticky secretions to help seal their nest entrances. Here, a Red and Black Millipede, *Centrobolus* sp. is delivered to the nest, and was probably crushed for its milky coloured secretions which help strengthen the entrance seal. It is also possible that the foul-smelling millipede liquid secretions could act as a mosquito deterrent, especially with the female having moulted her flight and tail feathers, and her nestlings being mostly featherless in their early stages of development. Studies have shown that Wedge-capped Capuchin monkeys *Cebus olivaceus* in the tropical forests of Venezuela protect themselves against mosquitoes by rubbing their fur with the secretions of millipedes. Also, studies on Monteiro's Hornbill in Namibia show that millipedes are regularly brought to the nest, not only to help plug the entrance hole, but also to help minimize fungal and bacterial growth within the dark nest cavity, suggesting that the hornbills are benefiting from the antibiotic secretions.



Another interesting prey species provided by the male, also strong smelling and noxious, was a Milkweed Locust *Phymateus viridipes*.



The male provides the chicks in the nest with a variety of caterpillar species. Documented below is one of the hawkmoth species; possibly a Measly Hawkmoth *Platysphinx piabilis*.



Even spiky caterpillars are suitable prey items (Wahlberg's Emperor *Imbrasia wahlbergi*) and do not appear to deter Crowned Hornbills.



As mentioned, Crowned Hornbills consume large numbers of chameleons. Those shown here are all Common Flap-necked chameleons *Chamaeleo dilepis*, but they also regularly feed on the smaller geographically restricted, endemic Dwarf chameleons *Bradypodion* spp.





Fruit is less important in the diet of breeding Crowned Hornbill and is utilised more in the non-breeding, winter (May – August) periods. The upper image is of Fluted-milkwood *Chrysophyllum viridifolium*, a sticky fruit sometimes also used to help seal the nest entrance. The lower image is the fruit of one of the Cycad species.



Approximately two thirds of the way through the nestling period, the female's flight feathers are sufficiently well developed for her to fly and gather food for her quickly developing chicks. What appears to be a well beaten African Banana Slug *Elisolimax flavescens* and a Leaf Katydid *Tettigoniidae* spp. are two of her first deliveries to the nest after her approximate two-month incarceration during the laying and incubation phase.



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