BIRDS · BREEDING STRATEGIES

Why Are Doves and Hornbills So Successful?

Crop milk, sealed nests and cuckoo-proof parenting — and a warning from the Kalahari about how fast that success can change.

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> Doves and small hornbills are among the most familiar birds of the southern African bush. Both have breeding strategies that seem to keep cuckoos out of their nests, and both have unusual ways of feeding their young. Here is what makes them work — and how quickly that success can change.

01 The cuckoo question

Many southern African songbirds raise cuckoo chicks. Each cuckoo tends to target particular hosts — for example, the Diederik Cuckoo's most commonly used host in southern Africa is the Southern Red Bishop, and Levaillant's Cuckoo chiefly parasitises the Arrow-marked Babbler. **Doves and hornbills do not appear among the regular hosts** in the sources we checked.

Why not? Research on the Common Cuckoo found that **seed-eaters and hole-nesters** generally cannot serve as cuckoo hosts. Doves are seed-eaters that rear their chicks on crop milk; hornbills nest in sealed tree cavities. Both traits plausibly make them poor hosts for a cuckoo chick.

HOW SURE ARE WE?

That doves and hornbills aren't regular cuckoo hosts is well supported. *Why* they avoid parasitism, and how much this explains their success, is a **reasonable explanation rather than a proven one**. Note too that in Africa some brood parasites do use hole-nesting hosts — the Scaly-throated Honeyguide, for example, lays in the nests of woodpeckers and barbets, so a cavity alone is no guarantee.

02 Doves: the Ring-necked Dove

The Ring-necked (Cape Turtle) Dove is one of the commonest and most widespread doves of southern and eastern Africa, and copes well around people and farmland.

DIET

Seeds & grain

Mainly seeds, grain and small fruits, foraged on the ground in pairs or small flocks.

NEST

A flimsy platform

A simple platform of twigs. The clutch is usually **two white eggs**.

QUICK TURNAROUND

About a month, egg to flight

Incubation takes roughly **13–16 days**; chicks leave the nest at about **16–17 days**.

SHARED WORK

Both parents

Both parents incubate — the male typically sits through the middle of the day and the female the rest of the time — and both feed and brood the chicks and produce crop milk.

CROP MILK

Pigeons and doves feed their newly hatched chicks **crop milk**: a rich secretion made when the lining of the crop swells and its cells are shed, then regurgitated to the chick. Production is triggered by the hormone **prolactin** and by brooding behaviour, and **both parents** make it. The chicks reach into the parent's mouth to feed. As they grow, adult food is mixed in and the chicks are weaned onto seeds.

A cuckoo chick in a dove's nest would need to be raised on crop milk and then seeds — very different from the insect diet cuckoo chicks normally get. That mismatch is one likely reason doves are not cuckoo hosts.

03 Hornbills: the sealed nest

This section covers the small *Tockus* hornbills of the region, such as the **Southern Yellow-billed** and **Southern Red-billed** Hornbills. The **African Grey Hornbill** belongs to a different genus and its details can differ.

1. **The female moves in.** She chooses a tree cavity and seals herself inside, closing the entrance with mud, droppings and debris until only a narrow slit remains. She also seals cracks and seams inside the cavity.
2. **The male delivers.** Through the slit, the male feeds her — and later the chicks. The slit is also used for passing out droppings.
3. **She moults all at once.** After her clutch is complete, most females drop all their flight and tail feathers **simultaneously**, so for a while she cannot fly. (Most birds, including non-breeding hornbills, moult a few feathers at a time.) A 2018 study showed this moult is not triggered by the darkness of the nest.
4. **She breaks out.** The female stays in until the chicks are about **half-grown**, then breaks out, and both parents feed the young. The entrance is sometimes re-sealed with the chicks still inside.

TWO FACTS WORTH KNOWING

Who seals the nest? In these hornbills the *female* does the sealing, from the inside.

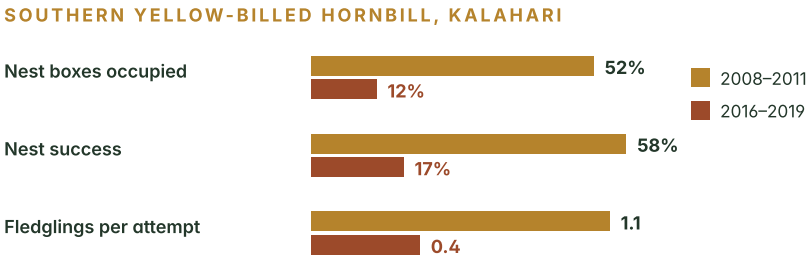
What if the male dies? A female can break out if she has to, though a breeding attempt is unlikely to succeed without the male. Male loss also seems to be rare: monitoring of about 600 nests in one study recorded only two male disappearances.

WHY THE SEALED NEST HELPS

- The sealed entrance keeps out most nest predators and intruders, including other birds.
- The female is physically on the eggs the whole time, so the nest is never left unguarded.
- Hornbills are **omnivores**, eating insects and other small animals as well as fruit, which gives them flexibility when one food source runs short.

04 A warning from the Kalahari

"Successful" can change quickly. A long-term study of **Southern Yellow-billed Hornbills** in the Kalahari compared 2008–2011 with 2016–2019:



Pattinson et al. (2022). Breeding output fell as the number of very hot days rose.

Breeding output dropped as the number of days with a maximum air temperature above **34.5 °C** increased — the point at which males have a 50% chance of panting. All 18 breeding attempts where at least 72% of days were that hot failed. Drought made things worse, and the authors concluded that **climate warming was likely the main driver**.

AT THE SIGHTING — HOW TO SAY IT

"That hornbill has a remarkable home life. When she nests, the female walls herself into a tree hole with mud and droppings, leaving just a slit. Then she drops all her flight feathers at once, and the male feeds her through the slot for weeks. No cuckoo is getting an egg in there."

IF A DOVE IS NEARBY

"Doves have their own trick: both parents feed the chicks crop milk made in their throats. A cuckoo chick wouldn't do well on that."

05 Key terms

Brood parasite	A bird, such as a cuckoo, that lays its eggs in other species' nests for them to raise.
Host	The species that raises the parasite's chick.
Crop milk	A nutritious secretion from the crop lining of pigeons and doves, fed to chicks by both parents.
Prolactin	The hormone that triggers crop-milk production.
Simultaneous moult	Dropping all flight feathers at once, as nesting female *Tockus* hornbills do.

In summary

- Doves and hornbills are not among the regular cuckoo hosts; seed diets and sealed cavities are likely reasons.
- Doves usually lay two eggs and get chicks out of the nest in about a month, on crop milk from both parents.
- Female *Tockus* hornbills seal **themselves** in, moult all their flight feathers at once and are fed by the male.
- Success isn't guaranteed: Kalahari hornbill breeding collapsed in a decade as hot days increased.

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