



Feeding behaviour and dietary preference of Hornbill Species in Indian subcontinent

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Abstract:

Hornbills are good indicators of the health of forests because they require large tracts of primary forest with large trees for nesting (Poonswad and Kemp 1993). Hornbills are good indicators of the health of forests because they require large tracts of primary forest with large trees for nesting (Poonswad and Kemp 1993). Hornbills are good indicators of the health of forests because they require large tracts of primary forest with large trees for nesting (Poonswad and Kemp 1993). Hornbills are good indicators of the health of forests because they require large tracts of primary forest with large trees for nesting (Poonswad and Kemp 1993). Rate of seed dispersal and species of trees arriving at a location can be greatly influenced by the fruit preferences made by the local disperser fauna. Very few studies on frugivorous tropical birds exist, despite the fact that avian food selection is thought to be sensitive to seasonal changes. Due to relative insufficiency of minerals in fruits being essential for birds reproduction, frugivorous birds serve as a fascinating test case. When it comes to the choices that an individual or species makes about the selection of habitat, the availability of fruits in the ecosystem plays a significant role. The species' behaviors, physiology, abundance, and ultimately its persistence in a specific area will be impacted by these choices, either directly or indirectly. Due to their requirement for vast areas of primary forest, hornbills are excellent indicators of the forest's health. Hornbills have an intriguing feeding behavior. Fruits with high nutritional content are less preferred by hornbills than the fruits that are available in plenty. Hornbills actively choose fruit depending on its nutrient and mineral content, which is helpful for analyzing the diet of frugivores over time. The evolutionary trend of employing ballistic transport in hornbills' eating habit, which plays a crucial role in the ecosystem of tropical forests by dispersing seeds, may be explained by the selection of large food items in the diet.

Key Words: frugivorous, avian food selection, tropical birds, feeding behaviour, ballistic behaviour

Introduction:

Hornbills are among the most recognizable birds of the African and Asian tropics due to their stunning colors, enormous bills and head crests, and unusual behavioral traits. These birds have long been revered by humans, and in some civilizations, their depictions can be seen in artwork, heraldry, and architectural designs. The ground hornbills and the grassland-dwelling *Tockus* hornbills, which seem to be the most primitive of hornbills, are native to Africa. Early in their development (probably during the Eocene), hornbills reached Asia, and it is here that numerous types of tropical, forest-dwelling hornbills originated (Viseshakul et al. 2011). The most unique and eye-catching Old World tropical birds are hornbills. Frequently displaying vibrant colors and occasionally growing to enormous heights (the largest species have wingspans of 1.8 m), they are widely recognized for their enormous, curved bills and large bony crests, like the Great Indian hornbill. The Great Indian hornbill's casque has a flattened



upper surface and is occasionally employed for head butting. Hornbills are omnivorous forest dwellers that eat both fruit and small animals.

Hornbills are found in sub-Saharan Africa, India, southern Asia, and the Indonesian Sunda Shelf islands. However, it is thought that Asian Hornbill species need densely populated woods providing big trees for nesting and a range of fruiting trees with strangler figs (Kinnaird 2007). Bucerotidae (savannah and forest hornbills) and Bucorvidae (Ground hornbills), two distinct families within the Bucerotiformes order, are considered taxonomically distinct enough to house hornbills. The order Coraciiformes previously included them amongst birds like kingfishers, bee-eaters, rollers, trogons, and hoopoes (Raman & Mudappa 1998). Nine different hornbill species, namely the Great Hornbill (*Buceros bicornis*), the Malabar Pied Hornbill (*Anthracoceros coronatus*), White-throated Brown Hornbill (*Annorhinus austeni*), Narcondam Hornbill (*Rhyticeros narcondami*), Oriental Pied Hornbill (*Anthracoceros albirostris*), Rufous-necked Hornbill (*Aceros nipalensis*), Wreathed Hornbill (*Rhyticeros undulates*), Malabar Grey Hornbill (*Ocyrceros griseus*), and Indian Grey Hornbill (*Ocyrceros birostris*) are found in India.

Life in Tropical Forests:

In certain species, the bill is straight, although it is normally curved along its length. The group's name can be understood from its outward resemblance to a cow's horn. With the help of its enormous bill, several species can reap the benefits of the canopies of tropical forests, dry forests, grasslands, and semi-deserts. The majority of species use their bill as a hammer to break up bark or soil in order to dig for insects, but other species utilize it for selecting fruits and grasping tiny animals while foraging in trees. Large prey like snakes and bunnies can be caught by ground hornbills. Hornbills are significant seed dispersers due to their size, voracious appetites, and propensity to travel widely in quest of fruit.

In many species, the only sections of the jaws that are fully in contact are the ends of the upper and lower jaws. These are used by the birds to manipulate things before eating them and to accomplish accurate gripping activities. Since their tongues are so short, hornbills cannot manipulate food; instead, they throw it backward into their throats after positioning it at the points of their jaws. Ballistic transport is the term used to describe this method (Baussart & Bels 2010). The similar feeding method has convergently evolved in toucans; this is all somewhat different from the "catch and toss" method used by ratites and some other birds. Studies on hornbills' visual fields reveal that they have highly developed binocular



vision, which makes it logical to presume that they can see the tip of their own bill (Martin & Coetzee 2004). The bill tip is typically out of the bird's field of vision, making this rare among birds. When compared to the palates of most other birds, the hornbill's palate is fortified and sturdy because it is roofed with bone (Burton 1984). Hornbills frequently beat their prey to death against perches after capturing it. Some species' long, thick eyelashes serve as a solar protection for the eyes.

The majority of birds that live in forests have broad, rounded wings, including hornbills. They make a lot of noise while flying, and occasionally, people hear them before they see them because of the whooshing sound made by their wing feathers.

Diet and Foraging Behaviour:

The biggest fruit-eating birds in Asian rainforests are hornbills. A species' or an individual's decision to choose a particular habitat is largely influenced by the availability of fruits in the environment. These choices will have a direct or indirect impact on the behavior, physiology, abundance, and eventually persistence of the species in a given landscape. Hornbills typically consume fruits (75- 100% of their diet) and occasionally add animal products to it at times of scarcity or when there are young in the nest (Ground Hornbills in Africa, an exception are predominantly flesh-eaters). *Ocyeros*, *Anthracoceros*, and *Anorrhinus* are just a few of the Asian hornbill genera that really consume more animal products than others. Research has shown a relationship between the supply of fruits within a landscape and increasing number of hornbills in specific seasons (Kinnaird et al. 1996; Anggraini et al. 2000; Naniwadekar et al. 2015). One species of hornbill, may consume fruits of as many as 30-40 tree species in an exceedingly year betting on its availability and also the season. Feeding during the morning hours is finished in high frequency, which declines towards noon but again increases through the late afternoon hours. This is often also noted as 'Bimodal Activity'. Feeding frequency is believed to be influenced by temperature and changes with the solar intensity. Different fruit types vary in their nutritional content. Fruits with high fat levels and moderate sugar and fiber levels are the 'drupes' whereas high in fiber content and lower in sugar, lipids and protein content are the 'figs'. Arillate capsular fruits are rich in fat content. The selection of fruit is not only based on its nutritional content, thereby compelling the Hornbills to incorporate several species of fruits to form up for its total nutritional requirements. During the breeding season after chick hatching, animals like frogs, snakes, lizards, crabs, beetles and other insects are dropped at the nest by the male to feed the feminine and chick inside the nest.



Within the breeding season, hornbills' diet includes more lipids (from oily fruits) and protein (from animal matter), since the feminine is stationary inside the nest, and also the chick is tiny.



Great Hornbill
Buceros bicornis

Rufous-Necked Hornbill
Aceros nipalensis

Wreathed Hornbill
Rhyticeros undulates



Narcondam Hornbill
Rhyticeros narcondami

Malabar Pied Hornbill
Anthracoceros coronatus

Oriental Pied Hornbill
Anthracocero salbistrostris



White-throated Brown Hornbill
Anorrhinus austeni

Malabar Grey Hornbill
Ocyrceros griseus

Indian Grey Hornbill
Ocyrceros birostris

Figure 1: Hornbill Species found in India

**Conclusion:**

To summarize, Hornbills are important forest creatures; serving and depending on forest ecosystems. In many cultures, hornbills are seen as lucky symbols and important ecosystem players. These birds are not only intriguing to observe, but they are also crucial for the health and sustenance of the forest.

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