

**THE ROLE OF HORNBILL CASQUES:
FANCY ORNAMENTATION OR INTEGRAL
THERMOREGULATORY APPARATUS?**

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THE ROLE OF HORNBILL CASQUES: FANCY ORNAMENTATION OR INTEGRAL THERMOREGULATORY APPARATUS?

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ABSTRACT

Various hypotheses have been formed to explain the function of casques in hornbills (Fam Bucerotidae), especially in large-casqued hornbill species. This study hypothesized that large-casqued hornbill species use their casques for thermoregulation by dissipating heat from the surface of the body to the surrounding air through convection and radiation. This study was conducted with a captive male Great Hornbill (*Buceros bicornis*), female Rhinoceros Hornbill (*Buceros rhinoceros*), male and female Oriental Pied Hornbills (*Anthracoceros albirostris*), male and female Wreathed Hornbills (*Rhyticeros undulatus*), and male and female White-crowned Hornbills (*Berenicornis comatus*), with the Great Hornbill being the principal focal subject. Infrared thermography was used to record surface temperatures from various body parts of all subjects in relation to ambient temperature, and heat loss was calculated from the values obtained. The average combined heat loss through convection and radiation from the casque of the Great Hornbill was 6.16 ± 1.24 W, with the average percentage loss of the bird's resting heat production (RHP) of 3.1 W being 199%. Other large-casqued hornbills also exhibited high heat loss through the casque, the Rhinoceros Hornbill losing 126% heat of its RHP, and male and female Oriental Pied Hornbills losing 55% and 27% of the RHP, respectively through their casques. It is speculated that the casques of large-casqued hornbills may serve the primary function of thermoregulation.

KEY WORDS: HORNBILL / CASQUE / THERMOREGULATION / FUNCTIONAL MORPHOLOGY

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