

The Nest, Egg and Incubating Behaviour of a Blue Bird of Paradise *Paradisaea rudolphi*

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The Blue Bird of Paradise *Paradisaea rudolphi* is a little known member of the seven *Paradisaea* species. Beehler *et al.* (1986) give its altitudinal range as 1300–1800 m in the eastern part of the Central Ranges; however, the extent of the bird's distribution remains poorly known (Diamond 1972). It occurs up to 2200 m on Mt. Missim (Pruett-Jones & Pruett-Jones 1988). Knowledge of displays and other behaviour of this species is based on few field observations (LeCroy 1981; Pruett-Jones & Pruett-Jones 1988). The egg has been described (Hartert 1910; Schönwetter 1944; Bishop & Frith 1979). I report here observations made at an active Blue Bird of Paradise nest and describe the nest and egg.

A nest with an attending, presumed, female was found near Ubaigubi Village (145°10'E, 6°30'S), at 1900 m asl, Eastern Highlands Province, Papua New Guinea, on 12 September 1987. A well-concealed hide was built while the bird was away, in order to minimise disturbance. The hide was upslope of the nest, presenting a clear, level view of the nest 15 m away. Fifty hours of observation were made from the hide between 15–22 September using 10x binoculars. On 23 and 24 September the female did not appear.

The nest was built in a crotch of a *Casuarina oligodon* tree about 9 m above ground. The tree was on a steep slope in secondary-growth at the edge of inactive gardens. The nearest mature forest was *c.* 25 m upslope. The nest was an oblong cup of small twigs, pieces of vines and mostly the needle-like twigs of casuarina less than 2 mm diameter. External nest dimensions (mm) were 150 long by 120 wide and 80 deep; internal dimensions were 70 by 50 and 50 deep. The nest was not lined but plant material inside the cup was slightly finer than materials outside of it. Due to the paucity of surrounding vegetation, the nest was fairly conspicuous but, being made of casuarina twigs, it resembled a clump of fallen, dead twigs such as accumulate in casuarina crotches. Goodfellow (1926) found a nest that contained two chicks in May in the Owen Stanley Range. That

nest was *c.* 4 m above the ground, made of pandanus and palm leaves, and was unlined. A nest with one egg was found in September on Mt. Missim (Pruett-Jones & Pruett-Jones 1988).

The single egg measured 38.6 x 24.7 mm; its background colour was salmon with the broad end densely ringed with splotches of cinnamon-rufous and tawny, and the narrow end slightly flecked with the same two colours (colours from Smithe 1975). This agrees with the descriptions that Hartert (1910) and Schönwetter (1944) give for the same egg, collected in the Owen Stanley Range and for an egg laid in captivity (Bishop & Frith 1979).

Observations of the incubating bird were made on 15 and 18–22 September 1987. The earliest observations began at 0615 and the latest observations ended at 1825 h. Between these times a total of 49 h and 55 min were spent in the hide (Fig. 1). No bird appeared during 6 h of observation on 23 September or during 3 h of observation on 24 September. The egg was cold and wet on the afternoon of 24 September.

Only a female-plumaged, presumed female, bird incubated the egg. No other bird came to the nest while this bird incubated, nor were any other conspecifics seen in the vicinity. A seed stuck to the forehead of the incubating bird made it possible to confirm that only the one bird attended the nest during one day.

Figure 1 portrays the observed incubating periods of the attending female. The nest was observed for a total of 2294 min, excluding periods when humans disturbed the female (marked with an asterisk on Fig. 1). The 22nd was the last day the female was seen. The female incubated 64% of total observation time and was absent, presumably foraging, 36% of the time; mean length of incubation bouts was 31 min ($n = 47$, range = 6–106 min) and mean length of absences 19 min ($n = 43$, range = 4–49 min).

Mean incubating bout initiated before noon was 23 min ($n = 25$) and mean afternoon incubating bout was

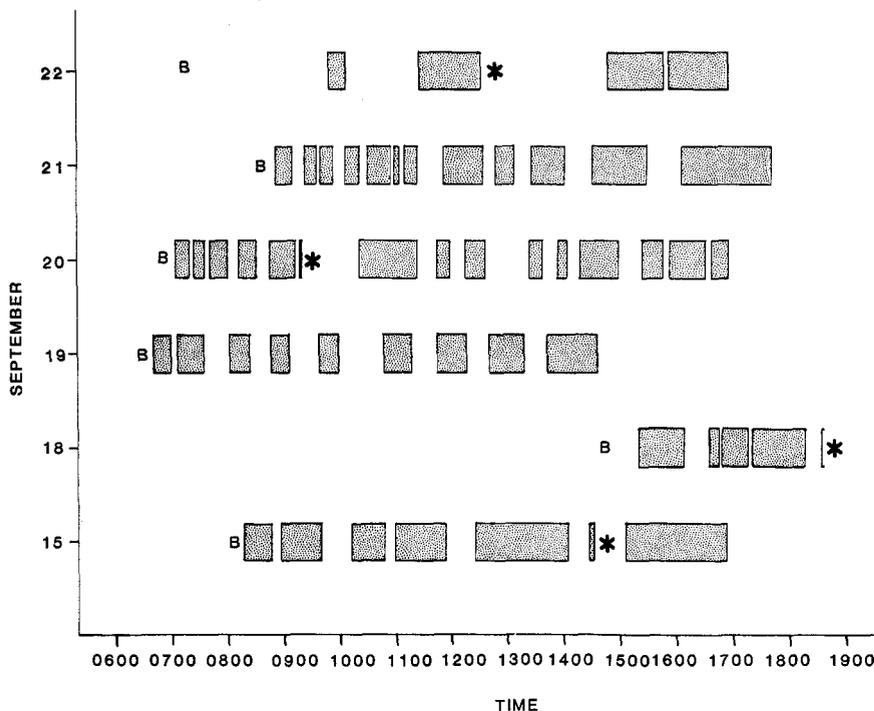


Figure 1 Incubation bouts by a presumed female Blue Bird of Paradise *Paradisaea rudolphi* in September 1987. 'B' indicates when observations began each day. An asterisk indicates disturbances near the nest, usually village children or people on a nearby trail, which caused the female to leave the nest. Disturbances were not caused by the author.

43 min ($n = 19$). The parent tended to make more and shorter incubating bouts in the morning (Mann-Whitney U -test $t_s = 2.16$, $0.05 > P > 0.02$). Afternoon absences were not significantly longer than morning ones (Mann-Whitney U -test, $t_s = 1.63$, $0.1 < P < 0.2$). These observations support the expectation that the parent should forage more in the morning to make up for energy expended during the cool night. Additionally, the fruits the parent was consuming (the bird frequently regurgitated seeds while incubating) might have been more available in the morning if they ripened during the night when birds are inactive.

It is noteworthy that the nest was in young secondary growth close to active gardens, as Diamond (1972) considered this species less able to colonise second growth than the Raggiana Bird of Paradise *Paradisaea raggiana* and Lesser Bird of Paradise *P. minor*. He did not find this species around villages during his surveys in the same region, but Bulmer (in Diamond 1972) did. Fully plumed male Blue Bird of Paradise are widely hunted by highland people as their feathers are highly prized for adornment. This might make it difficult for the birds to colonise near villages. A voluntary moratorium on the hunting of birds had been in effect for three years when these observations were made. It is possible

the moratorium enabled the female to initiate nesting so close to the village. Many birds, including males of this species were observed close to the village (pers. obs.) suggesting the moratorium is somewhat effective. Disturbance around the nest, mostly by children may have caused it to be deserted. A female-plumaged Blue Bird of Paradise with a brood patch was mist-netted 30 m from the nest site in November. Possibly this was the same individual re-nesting, or a different bird incubating in the same vicinity. Although the moratorium on hunting may allow a population of breeding adult Blue Birds of Paradise to establish near the village, the population might have difficulty fledging young due to the deprivations of village children.

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New Guinea Harpy-Eagle Attempts to Capture a Monitor Lizard

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The New Guinea Harpy-Eagle *Harpyopsis novaeguineae* (subsequently referred to as Harpy-Eagle) is a very large, inconspicuous, forest-dwelling raptor endemic to the New Guinea mainland (Coates 1985; Beehler *et al.* 1986). It is both heard and seen with some frequency by field ornithologists but only rarely are individuals observed for extended periods at close range. To date, there have been no published firsthand accounts of hunting technique or active predation by this species.

From the evidence of prey caches and accounts from Papua New Guinean informants (Diamond 1972; Majnep & Bulmer 1977; B. Beehler pers. obs.) it is known that the Harpy-Eagle subsists almost entirely upon mammalian prey — primarily giant rats (*Uromys* spp., *Mallomys* spp.), ringtail possums (*Pseudocheirus* spp.), cuscuses (*Phalanger* spp.) and also small wallabies, small pigs and even small dogs (Majnep & Bulmer 1977). There are unconfirmed reports of the Harpy-Eagle taking birds and snakes (Coates 1985).

Here we report the first instance of *Harpyopsis* at-

tempting to capture a lizard, and the first account of attempted predation by this species based on detailed first-hand observation.

Our observations were made on 16 August 1991 at the rainforest research station established by Andrew Mack and Debra Wright in Chimbu Province, Papua New Guinea, 9.6 km due east of Haia, c. 6°43'N, 145°5'E, c. 880 m asl. We were sitting in the Mack camp house when at c. 1320 h, MJ looked through the screen window to see a large bird swoop into the vegetation directly out from the elevated front porch. We grabbed binoculars and quietly moved out to the porch to examine and identify the bird.

We found the Harpy-Eagle perched in clear view on a branch about 30 m from us (eye level), in the middle story of the forest vegetation. Although the bird's attention was drawn to us when we came onto the porch, it did not appear in any way fearful of our presence. For the subsequent 10 min (an approximation, because no one timed the events), we watched the bird without interruption as it attempted to capture a juvenile *Varanus*