

THE NESTING OF THE DARK-BILLED CUCKOO IN THE GALAPAGOS

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The Dark-billed Cuckoo (*Coccyzus melacoryphus*), like other members of the genus, has the reputation of being secretive in its daily activities and in its breeding habits. Harris (1982) noted that in the Galápagos the species is "More often heard than seen." Gifford (1919) reported the



Dark-billed Cuckoo (*Aguatero*).

birds to be "shy" and, although they have been reported on most of the Islands in the Archipelago, there was "seldom more than one individual being seen at a time." Consequently, there have been few reports of nesting behavior. Gifford (1919) reported that nests were "not infrequent," but he described only one active nest. Swarth (1931) compared the morphology of mainland and Galápagos forms and did not comment on reproductive behavior. Many longtime Galápagos residents and visiting scientists have never seen the nest of the cuckoo.

Related species in the genus, the Yellow-billed Cuckoo (*C. americanus*) and the Black-billed Cuckoo (*C. erythrophthalmus*), have long breeding seasons, abbreviated incubation periods, staggered incubation, asynchronous hatching, and very early nest departure of the young (Spencer 1943, Hamilton and Hamilton 1965). Hamilton and Hamilton (1965) suggested that these adaptations are correlated with seasonally abundant food supplies and insure survival of at least a part of the brood. Early maturity is also suggested to be a mechanism to permit rapid independence of young in food gathering. Such adaptations occur in widely fluctuating environments where food supplies vary considerably from year to year. Rainfall in the Galápagos fluctuates greatly from year to year. In the Galápagos, the Dark-billed Cuckoo is commonly

reported to be abundant in and following El Niño-Southern Oscillation (ENSO) years with high rainfall. Jackson (1985) reported that the cuckoo became much more abundant during the 1982-83 ENSO. Workers at the Charles Darwin Research Station and local residents of Isla

Santa Cruz also indicated that the cuckoo population increased in other wet years including the year of my visit, 1987. The local name for the cuckoo, "Aguatero," reflects this association. Cuckoos are known to breed on dry islands following an ENSO (Curry and Stoleson 1988).

During the spring of 1987, I was able to locate four nests of the Dark-billed Cuckoo in the dry zone vegetation in the vicinity of the Darwin Station east of the town of Puerto Ayora on Academy Bay, Isla Santa Cruz. The vegetation was dominated by a variety of small trees and shrubs and the cacti *Jasminocereus thouarsii* and *Opuntia echios*.

The first evidence of breeding of the cuckoo in 1987 came on 2 February with the discovery of a pair of adults feeding a single young in the scrub vegetation at the Darwin Station. The young bird was barely capable of flight and was not fully feathered. It could not be captured because of the ease with which it fled through the scrub of salt bush (*Cryptocarpus pyriiformis*) and espino (*Scutia pauciflora*). Considering my experience at later nests, I would estimate the fledgling's age at approximately 10 to 12 days. Subtracting this and a minimum incubation period of approximately 11 days would establish a date for the first egg of 10-12 January. December 1986 had a total rainfall of 12.4 mm while January

1987 had a total of 124.7 mm. The onset of breeding corresponds to the onset of the rainy season.

Nest #1 was located on 6 February in an acacia (*Acacia* sp.) approximately 3 m from the ground. The nest was not readily accessible for measurements of eggs or chicks. The nest was similar to that described for the Black-billed Cuckoo by Spencer (1943) with the exception of the absence of pine needles. The nest was composed of small sticks and twigs with an outside diameter of approximately 8-10 cm and a cup diameter of 5-6 cm. The nest contained four bluish white, chalky eggs. The adult flushed from the nest at my approach and returned immediately after I moved a short distance away from the nest. By 0815 on 8 February two eggs had hatched and a third had pipped. The brooding adult left at my approach. The young closely resembled those of the Yellow-billed and Black-billed Cuckoos in appearance and behavior (Spencer 1943, Hamilton and Hamilton 1965), but no buzzing sound was given by the chicks as reported in those two species. The young could be induced to beg by shaking the nest branch. By 9 February at 1230, three young were present and one egg remained unhatched. The young birds could no longer be induced to beg. By 1100 on 14 February the nest contained a large chick, and a smaller chick was perched bittern-like on a branch near the nest. There was no sign of the third chick or the unhatched egg. The pose of the chick out of the nest was identical to the pose described by Bent (1940) for the Black-billed Cuckoo.

Nest #2 was located on 26 February in an acacia next to a pad of opuntia (*Opuntia echios*) that intruded into the canopy. The nest was 2.5 m above the ground. The adult was incubating five eggs. Measurements of the eggs were: 2.85 by 2.30 cm, 8.5 g; 2.80 by 2.25 cm, 8.0 g; 2.80 by 2.30 cm, 8.0 g; 3.10 by 2.45 cm, 10.5 g; and 3.00 by 2.50, 10.5 g. Incubation continued until 6 March when one egg had hatched by 0845. By 1050, three eggs had hatched and surprisingly a sixth egg was present. Two of the chicks weighed 8.5 and 9.0 g. Since the nest was checked only by touch in the interval between 26 February and 6 March, I cannot be sure of the date of the laying of the sixth egg, but it was after 27 February. By 0720 on 7 March there were four young and two unhatched eggs. I assumed the fourth egg

Table 1. Dark-billed Cuckoo nestling weights in grams for Nest #2, Isla Santa Cruz.

Chick #	Dates:			
	03/08	03/09	03/10	03/11
002	23.5	25.5	32.0	27.5
003	20.5	24.0	27.0	-
004	16.5	21.0	26.0	29.0
005	21.0	23.5	27.5	32.5
006	13.0	16.5	-	-

hatched in the afternoon of the previous day. The fifth egg hatched by 1250 (the chick was eventually marked as #006). On 8 March the eyes had opened on the third-day chicks (#s 002 through 005) and I noted a wide discrepancy in the size of the chicks. The chicks were weighed and marked with colored leg bands as well as the numbered bands noted above. The chicks' legs were already sufficiently developed and adult size (#2) leg bands were attached without risk of loss. Weights on this and subsequent dates are noted in Table 1.

On 10 March the smallest chick (#006) was missing from the nest and on 11 March a second chick (#003) had disappeared. When handled, the chicks defecated a sticky brown liquid of digested hawkmoth larvae. By 11 March, Chick #002 was sitting on a branch adjacent to the nest and was more active, possibly accounting for the small weight loss. The same bittern-like posture seen at Nest #1 was again observed. On 12 March, Chick #005 was found dead beneath the nest and was preserved for the Station's collection. One chick (#004) remained in the nest. On 13 March the sixth egg hatched by 1415. None of the older chicks were present. The new chick was begging, but apparently was not fed or brooded as it was found dead in the nest by the morning of 14 March. This chick was never banded. It is also preserved at the Station. Unfortunately none of the marked chicks were observed during the remainder of my stay; they apparently dispersed rapidly from the nest site into the scrub.

Nest #3 was located on 10 March in a lantana (*Lantana peduncularis*) overlain by climbing passion flower vines (*Passiflora foetida*). The height was approximately 2.5 m. This nest was not covered by

a canopy of vegetation as were the previous two nests. The nest contained four eggs and by 1115 on 12 March a fifth was present. I was not able to return to this nest until 24 March when one approximately 4-5 day old chick and two eggs remained. If one egg per day was laid as usual and the chick was from the first egg laid (8 March) the incubation time was 11-12 days. The chick was banded and weighed (25.0 g) on 26 March. There was no sign of broken eggs beneath the nest. The chick and remaining eggs had disappeared by the end of March.

Nest #4 was located in a white mangrove (*Laguncularia racemosa*) on 24 March. The adult present was incubating two eggs; the other adult was bringing small sticks and lichen to the nest. The nest was 3.5 m from the ground. By 0830 on 2 April the nest contained three eggs. Between 6 and 9 April no incubation was observed, and no birds were present near the nest. Following heavy rains (22.8 mm) on 9 April the nest was found tilted and abandoned with one cracked egg present.

In its breeding biology, the Dark-billed Cuckoo of the Galápagos acts like the other members of the genus. It has a short incubation period and asynchronous hatching with considerable variability in chick size. Chicks grow rapidly and are able to move about in the vegetation before they are capable of flight. The capability of feeding themselves at an early age is conjectural although ample supplies of larvae of the hawkmoth were evident in the area. The existence of second nestings in the same season is not known. It is quite likely that populations of this cuckoo fluctuate greatly in number, and the apparent paucity of birds in dry years does not necessarily reflect movement to other habitats.

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