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ON TWO NESTS OF THE GLITTERING-BELLIED EMERALD *CHLOROSTILBON AUREOVENTRIS* (TROCHILIDAE)

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INTRODUCTION

The Glittering-bellied Emerald *Chlorostilbon aureoventris* ranges from Maranhão to Argentina and west to Bolívia (Meyer de Schauensee 1970). It favors forest or savanna edges but builds nests even near houses. Nesting information is mostly brief and scattered (Gibson 1885, 1919; Wetmore 1926, Aplin 1894, Smyth 1928, Pereyra 1931, 1935; Erickson & Mumford 1976, Belton 1984, De la Peña 1987). Ruschi (1973), Fraga (1984), Contreras (1987), and Grantsau (1988) report more details of nests, eggs, incubation period and brooding period. Fraga (1984) reported a nest with three eggs and young attended by two disputing females. None of these authors checked brooding and feeding rates. In 1993, we studied two nests, comparing them with a nest of *C. mellisugus* in Venezuela (Thomas 1994).

STUDY SITE AND METHODS

A nest (N1) with two eggs was found on

21 August at 620 m elevation on the campus of the Universidade Estadual Paulista (UNESP) in Rio Claro (22°23'S, 47°33'W), São Paulo, Brazil. We made short visits to the nest until 4 September, when punctured eggs were collected.

Another nest (N2) was studied from about 8–10 m away for a total of 43 hours from 20 October to 4 November. Nestlings were weighed with Pesola scales and we obtained morphometrical data of bill, tarsus and wings.

RESULTS

Nest N1 was 1.33 m up in a bush (*Hibiscus rosaesinensis*, Malvaceae); it contained 2 white eggs, 0.59 g each, measuring 12.5 x 7.6 and 12.5 x 8.6 mm, slightly larger than eggs of *C. mellisugus* (Thomas 1994). The female brought a small piece of lichen to the nest at 15:56 h on 21 August, when incubation had already started. In 16 other visits until 4 September, she was away on 8 or 50% of the time, a high frequency which could have resulted from

frequent passers-by at the building entrance.

Nest N2 was 52 cm from the ground in a bush of 2.6 m in a hedge (*Murraya paniculata*, Rutaceae) around the electric installations of UNESP. It was 82 cm from the main trunk and 28 cm from the tip of the branch and measured: external diameter 4.5 cm, internal diameter 2.9 cm, external height 3 cm, and internal depth 1.7 cm, somewhat larger than for *C. mellisugus* (Thomas 1994). Between 13:55 and 17:55 h on 20 October, she was absent 61 min or 26% of the time, a more reasonable figure than the 50% of N1. She entered the nest for the night at 17:53 h, after 6 sessions of 8–58 min (mean 29.5) and 6 absences of 3–15 min (mean 8.9).

On 22 October, the first egg had hatched at 6:30 h; the second hatched before 8:16 h the next day. Eggshells remained in the bottom of the nest, as in the nests studied by Fraga (1984), except two pieces that the female carried away at 8:36 h on the 23rd; Oniki collected remains of the first egg on the 22nd. On this day, the female fed the nestling only at 6:35 h and 8:17 h onward (not on the visits of 7:00, 7:36, 7:47 and 9:46 h).

Thus, she fed on 6 of 10 visits until 11:15 h and 7 times between 13:39–16:33 h (she then stayed on until 17:30 h and probably later). On the 23rd, she fed on 19 of 22 visits between 8:36 and 16:11 h. Some visits without feeding were registered until 28 October, the last day with brooding sessions.

On 22 October, the female incubated 4–56 min ($n = 15$, mean = 21.5) and was away 2–18 min ($n = 16$, mean = 7.3); after noon, she twice fed nestlings and left without brooding. On 23 October, she brooded 4–41 min ($n = 27$, mean = 14.7) and was away 2–11 min ($n = 27$, mean = 6.0). On the afternoon of the 25th, absences were more prolonged ($n = 5$, mean = 7.8; 6–11 min) and visits also ($n = 5$, mean = 22.6; 9–34 min), continuing with the pattern of 25% of the time off the nest. On the afternoon of the 27th, with

absences of 13–89 min ($n = 7$, mean = 35.4) and visits of 1–28 ($n = 8$, mean = 10.1), the pattern was inverted, 78% of the time away; but she fed without brooding only once. On the 28th, in the morning, she was away 6–49 min ($n = 7$, mean = 21.9) and present 1–18 min ($n = 6$, mean = 8.0), with two visits only to feed. She did not brood the nestlings from the 29th on.

On the 31st, between 8:25 and 12:35 h, she fed the young only 5 times, plus two visits without feeding, but she was sitting on the nest at 8:00 h. On 3 November, she fed 5 times between 15:00 and 18:30 h (when she had not arrived for the night; maybe she was not sleeping in the nest anymore, as Thomas recorded no night brooding Day 18 on for *C. mellisugus*). There was an interval of 82 min, 16:06–17:28 h, with no visits after 17:28 h.

She fed both young at each visit, except when one of them did not open the bill to be fed. Approaching, she hovered, so that the wind from the beating wings reached the young. When Oniki blew on the young, small and blind, they raised their heads and opened the bills, as in the experiments of Schuchmann (1989). In feeding, the female vigorously pumped the head for each young while perched on the nest rim, sometimes returning to feed the first young in some cases. Tiny insects were seen inside the transparent crops of the young during handling.

During the first days, the female cleaned inside the nest after each feeding, swallowing fecal material. Once on 27 October, and regularly after 30 October, young were ejecting feces outward away from the nest, many times sticking to surrounding leaves. The female stopped cleaning inside the nest but on 28 and 31 October, she fussed with dry leaves or plant down inside the nest and with a homopteran near the nest. Arriving at the nest, she hovered above the young and descended like a helicopter, while she flew backward to leave the nest.

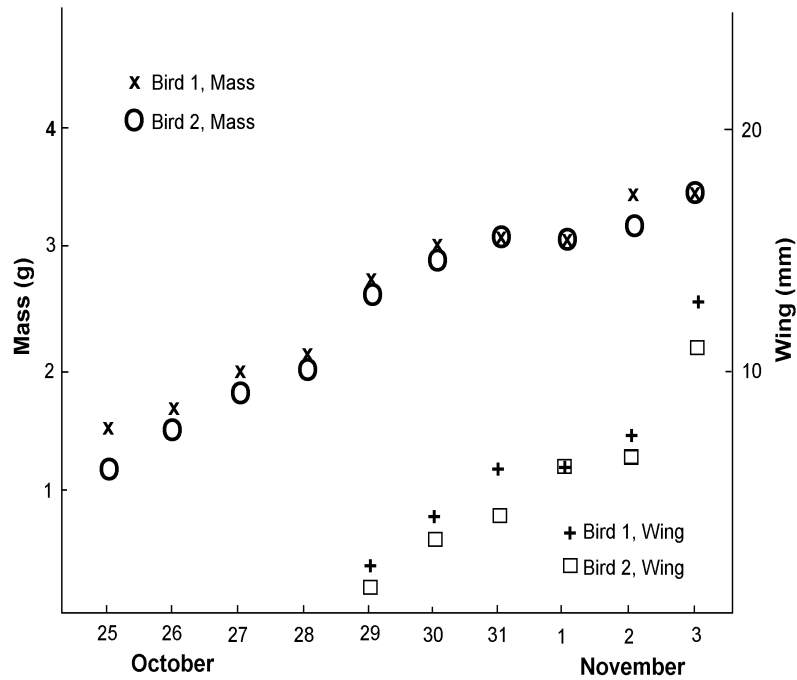


FIG. 1. Growth of two nestlings (N2) of Glittering-bellied Emerald (*Chlorostilbon aureoventris*).

Increases in body mass and wing length (chord) are indicated in Fig. 1. On 25 October, the young had 2 lines of 11 down feathers each on the back; the eyes were closed and the feet held tightly to cloth without peeping; 4 pieces of feces were collected from the bottom of the nest. Both raised their heads when the nest branch was touched lightly. On 26 October, both still had an egg-tooth.

After the 28th, nestlings were giving weak clicks during handling, sometimes defecating in the hand. They kept their eyes open after 1 November. Green feathers were present on the body on 2 and 3, and wings measured 2–4 mm while beaks were 6 and 6.5 mm.

On 4 November, at 6:58 h, the nest was found predated, probably by a cat, with a dead young on the ground 40 cm away. The nest was collected for the Museu de Ciências

da Natureza - Setor Zoologia, at UNESP.

On 11 Dec 1996, Oniki was called about another nest of *C. aureoventris* on a hanging plant, *Rhypsalis* cf. *cassutha* (Cactaceae), in a vase on a porch in Rio Claro. The 2 young, about 8–10 days old, were vocalizing loudly at 10:30 h, as the female had been hit by a passing car and had died the previous day about 16:00 h. The young had the body covered with short feathers and were ejecting feces outside the nest. When Oniki was handed the vase, it turned and fell; however, young held to the material and remained inside the nest. Oniki tried to raise the young on sugar water and spiders caught around the house; but they did not survive and died on 15 December. Both young were doing well and even peeping in the nest at times, but were heavily infested with macronyssid mites (Acari), which feed on blood and wander on the nest

and young. As the young faced the plant holding the nest, with bills pointed upward, the mites often remained at the tips of their bills. Before feeding, Oniki had to put two fingers on their bills; the mites crawled to her hand and were collected in 70° alcohol. Only after most of them were collected could she feed them. This operation was repeated each time young were fed, about once an hour.

This nest was 167 cm up, and weighed 2.0 gm; internal diameter = 2.5 cm, external diameter = 3.5 x 4.0 cm, external height = 4.5 cm, and internal height = 1.2 cm. It was built with whitish plant down, decorated externally with brown bark fragments tied with cobweb to the nest; some bark was pendent up to 50 cm from the nest on cobwebs.

DISCUSSION

C. aureoventris was not found nesting on the campus recently. The number of students is increasing as are buildings and other busy areas. Cats and dogs, fed and protected by students, hunt for nests daily and especially on weekends when students are not present to feed them. Trees are cut without even warning students and professors developing scientific projects and, nests are disturbed or destroyed. Other nests of various other species were not successful on campus, due to cats, parasitic flies, or human interference (frequent visits, robbery of nests or young). It is desirable to verify if the birds of such areas are reproducing well, otherwise fewer species will survive each year. Another cause of loss was death of female hit by a car and of young heavily infested with parasites (Acari). Thomas (1994) reported many mites on a nestling in dry habitat in Venezuela, however. These mites seem to thrive in dry sites under roofs as in 3 cases with *Zonotrichia capensis* on the UNESP campus (Oniki, pers. obsev.).

Lack of success of nests indicates that even a bird adapted to live at forest edges can

have difficulties in surviving near humans. It is a problem of "source/sink" (Pulliam 1988) where birds searching for seemingly suitable habitats come to the cities and die, not surviving and reproducing. In recent years, many persons have made lists of birds of parks, universities and campuses, without noting that many species are vagrants or, in the case of *C. aureoventris*, can be unsuccessful at nesting even if listed. Other species of birds are invading the cities, especially from dry zones, and try to benefit from the presence of humans, but they are common birds from distant habitats, not disappearing birds of local habitats.

Ruschi (1973) reports on nests, eggs, incubation of 14 days and brooding period of 20–22 days, while Grantsau (1988) reports 28 days for the nestling period. Sick (1985) reports 15 days for incubation and 20 days for nestlings. These authors did not give details of specific nests observed. Contreras (1987) studied 3 nests and found incubation periods of 16, 18, and 18 days and nestling periods of 18, 20, and 24 days. Fraga (1984) reports an incubation period of 15 days and nestling period of 21–23 days. The differences among incubation and nestling periods may be due to the way counts are made or could indicate variation. If everyone could follow Nice (1957), comparisons would be easier.

Belton (1984) reports 2 nests: one with 2 white eggs on 4 November and young on 17 November and another with 2 young on 15 November. Erickson & Mumford (1976) found nest building in March, while Oniki and E. Willis found a nest with 2 eggs at Imitagem (Rio de Janeiro) on 8 April 1994. Gibson (1919) found nests in October-January while De la Peña (1987) found nests between August-December. From this, it seems that the nesting period for *C. aureoventris* is from August to April.

Apparently the species can use the same location for the nest year after year, for Con-

treras (1987) found a nest built above another old one while Aplin (1894) found a nest used for 3 years and as high as 8 cm.

Authors have found nests in several different types of sites. Wetmore (1926) found a nest on hanging roots of a fern in Jan, while Friedmann (1927) found a nest above a palm leaf with 2 nestlings in November. The April nest found by Oniki and Willis was on hanging twigs on a road bank.

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