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Description of the nest, nestling and broken-wing behavior of *Conopophaga aurita* (Passeriformes: Conopophagidae)

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ABSTRACT: The Chestnut-belted Gnatcatcher is an Amazonian species with a wide distribution, but few studies exist on its reproductive biology and behavior. In this paper we describe the nest and aspects of the behavioral repertoire employed in nest defense. Observations were made on the Dimona farm, in the municipality of Presidente Figueiredo, state of Amazonas. On December 8, 2010, we observed a female Chestnut-belted Gnatcatcher doing a “broken wing” display, suggesting that the parent was trying to distract us away from an active nest nearby. On December 10, we found the nest on a fern at a height of 56 cm, containing a feathered chick; two days later, the chick was no longer in the nest. The height, shape and material of the nest, were similar to those of other *Conopophaga* species in which the clutch size is two, but commonly producing only one surviving nestling.

KEY-WORDS: Breeding, chick, egg, nesting, reproduction.

INTRODUCTION

The family Conopophagidae comprises eight insectivorous Neotropical species (Whitney 2003). Little is known about their habits, and their natural history and biology are poorly known (Hillman & Hogan 2002, Whitney 2003). They are small birds, some with flashy colors, even including red tones. They often perch on twigs close to the ground, standing upright, and can stand still for long periods (Sick 1997).

The Chestnut-belted Gnatcatcher (*Conopophaga aurita*) is an Amazonian endemic species with the widest distribution in the genus; despite the wide distribution, few studies exist of its reproductive biology and behavior. In French Guiana, the breeding period is between March and April, and a fledged offspring was observed in Manaus in July (Whitney 2003). Here, we describe the nest of this species and aspects of its behavioral repertoire in defending the nest.

METHODS

The observations were carried out in a 100 ha forest fragment on the Dimona farm (2°24'43.36"S; 60°

5'26.61"W), in the municipality of Presidente Figueiredo, about 80 km north of Manaus, state of Amazonas. Dimona is part of a set of upland forest fragments overseen by the “Biological Dynamics of Forest Fragments” - PDBFF in partnership with the Instituto Nacional de Pesquisas da Amazônia - INPA. Within the fragment there are five east-west trails at 200 meters intervals, connected by a central north-south trail 1 km long.

The observations of the defensive behavior and parental care totaled approximately 15 hours. For measurements of the nest and chick, we used a tape measure with an accuracy of 1 cm, calipers with an accuracy of 1 mm, and scales accurate within 1 gram.

RESULTS

During the field study, the trails of the fragment were visited for five days, and on the morning of 8 December 2010, D. B. M. saw a female Chestnut-belted Gnatcatcher displaying broken-wing behavior, suggesting the presence of an active nest nearby.

We returned on consecutive days to locate the nest and to conduct further observations. We returned to where the distraction display (broken-wing) occurred on the

afternoon of 8 December, and again saw the broken-wing display (Figure 1) by the female. The male was observed near the site, but did not engage in distraction display. On 9 December, in the morning, we observed both female and male performing broken-wing displays. The male displayed a short distance from its partner, but in a spot that would be less conspicuous to potential predators. Both vocalized and repeatedly dragged their wings along the ground, flying into the vegetation if we approached more closely. We observed the female with a small insect in its beak, presumably intended as food for the nestling or fledgling. The female began broken-wing distraction displays while we conducted an active search for the nest. The male was seen 5 m away, perched on a twig.

On the morning of 10 December, we returned and immediately observed the female. It was continuously foraging on the ground. It held a small insect in its beak, and was attentive to our movement. On at least

two occasions, the female disappeared for a few seconds, doing broken-wing displays until it was out of sight, then reappearing without food in its beak. During this period, we did not search for the nest, instead focusing on the movements of the adults. Later that day, we returned to the place where the pair met and found the nest with a fledgling at an advanced stage of development, feathered and almost the size of the adults (Figure 2).

The fledgling weighed 16 g, with a total length of 80 mm and a wing length of 45 mm. It had no tail, the tarsus was 27 mm, and bill length was 89 mm. Its plumage was white on the belly, brown slightly streaked with yellow on the back, and brown on the breast. During the nearly 20 minutes we measured the nest and fledgling, the female continued broken-wing displays within 1 m of us, but when the nestling began calling, it approached even closer, with more acute and repetitive vocalizations, bristling and exposing conspicuous white eyebrows. Occasionally,



FIGURE 1. Female Chestnut-belted Gnateater *Conopophaga aurita* showing broken-wing behavior, observed at the Dimona farm, Municipality of Presidente Figueiredo, Amazonas, Brazil (9 December 2010).

it stopped moving and intently observed our activity with the fledgling.

The nest was 56 cm above the ground, built on an epiphytic fern affixed to the trunk of a small tree. It was lined with 11 broad dark green leaves. The exterior of the nest consisted of dried leaves of dicotyledons and palms (Poaceae), both whole and fragmented, and thin dry sticks. The exterior color was various shades of beige, 123 mm in diameter and 96 mm in height; the nest was lined with dark fine roots, with a diameter of 58 mm and a depth of 32 mm (Figure 3).

On the morning of 11 December we inspected the nest from a distance, and the fledgling was alive inside. On the morning of 12 December, the nest was empty and intact, showing no signs of predation.

During the search for the nest, we moved in various directions, assuming that the female was trying to draw us the opposite direction from the nest. We



FIGURE 2. Nestling of Chestnut-belted Gnateater *Conopophaga aurita* photographed at the nest at Dimona farm, Municipality of Presidente Figueiredo, Amazonas, Brazil on 9 December 2010.



FIGURE 3. Nest of the Chestnut-belted Gnateater *Conopophaga aurita* in an epiphytic fern at Dimona farm, Municipality of Presidente Figueiredo, Amazonas (picture taken on 10 December 2010).

made reference points, with small branches, to where the female did broken-wing behaviors before flying. After we had found the nest we were able to determine a radius of approximately four meters around the nest within which it conducted its distraction displays. It moved in at least four different directions, “protecting” an area of approximately 48m².

Whenever we were more than 6 meters from the nest, the female returned to somewhere within the 48 m² vicinity of the nest.

DISCUSSION

Broken-wing can be considered a secondary defense, which is used when a potential predator is very close to the nest (Edmunds 1974). Broken-wing is part of the behavioral repertoire of many avian species, in many families such as Charadriidae and Caprimulgidae, as well as in other species of the genus *Conopophaga* (Deane 1944, Hilmar & Hogan 2002, Vasconcelos *et al.* 2003). In the case of Gnateaters, this behavior tends to be more intense during the final stage of reproduction, when the chicks are almost ready to leave the nest (Whitney 2003). It appears to serve to distract the predator away from the nest or nestling (Deane 1944, Hilty 1975).

The Chestnut-belted Gnateater, particularly the female, exhibited this behavior when we approached within about 4 m of the nest. Similar behavior, stimulated by observer approach to within about 4 m of the nest, has been observed for Ash-throated Gnateater *C. peruviana* (Hillman & Hogan 2002).

Our observation of just one fledgling differs from the clutch of two eggs in Manaus described by Whitney (2003), though he, too, found only one fledgling out of the nest. The previous nest was found in July, not December, as in this study. Other studies described one egg and one nestling for Ash-throated Gnateater (Hilman & Hogan 2002) and two eggs but only one fledgling for Chestnut-crowned Gnateater (Hilty 1975). For the Rufous Gnateater, Sick (1997) noted the presence and survival of two nestlings.

The nests of both the Chestnut-crowned Gnateater and Ash-throated Gnateater were at heights (65 cm and 70 cm, respectively) similar to those for our Chestnut-belted Gnateater nest. The shape, material and measurements of those nests were also similar to ours (Hilty 1975, Hilman & Hogan 2002). The Chestnut-belted Gnateater nest found by Whitney (2003) was 80 cm above the ground, and he stated that most nests for this genus of birds are less than 1 m above, but never on, the ground.

Sick (1997) and Whitney (2003) also noted similar forms and materials for their nests, such as dried leaves and twigs, suggesting that fairly similar nest construction and distraction displays occur across the genus *Conopophaga*.

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