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ADDITIONAL NOTES ON THE NEST LOCATION AND PARENTAL CARE OF OCELLATED ANTBIRDS (*PHAENOSTICTUS MCLEANNANI*)

Alexandra M. Class[1,2] & Johel Chaves-Campos[3,4]

[1]Department of Wildlife Fish and Conservation Biology, University of California, Davis, CA 95616, USA.

[3]Department of Biological Sciences, Purdue University, West Lafayette, IN 47907, USA.
E-mail: jchaves@uno.edu, jchavesc@costarricense.cr

Notas adicionales sobre la ubicación de nidos y el cuido parental de *Phaenostictus mcleannani.*

Key words: Ocellated Antbird, *Phaenostictus mcleannani*, Thamnophilidae, foraging behavior, food provisions.

INTRODUCTION

Ocellated Antbird (*Phaenostictus mcleannani* Ridgway) belongs to the monotypic family Thamnophilidae and is a resident of lowland humid forest understory from southeastern Honduras to northwestern Ecuador (Willis 1973, American Ornithologists' Union 1998, Zimmer & Isler 2003). Ocellated Antbirds depend on army ants for food, feeding on arthropods and small vertebrates escaping from swarms of army ants, especially *Eciton burchellii* (Willis 1973, Chaves-Campos & DeWoody 2008). The breeding behavior of Ocellated Antbird is poorly known; published observations are limited to a single nest description (Zimmer & Isler 2003, Buehler *et al.* 2004). Here we present new data on the breeding behavior of this species, including the first description of nestling provisioning for Ocellated Antbird.

METHODS

Study site. We conducted all research at La Selva Biological Station, in the lowlands of northeastern Costa Rica (10°25'N, 84°01'W). La Selva Biological Station encompasses approximately 1600 ha of lowland forest, partially connected to the 45,000 ha Braulio Carrillo National Park. Data were taken from ten nests opportunistically found between 2004

[2]*Current address:* Department of Biological Sciences, Virginia Polytechnic Institute and State University, Blacksburg, VA 24061.

[4]*Current address:* Department of Biological Sciences, University of New Orleans, New Orleans, LA 70148.

and 2007 by following radio-tagged parental birds to their nests during a larger project investigating the social behavior of Ocellated Antbirds (Chaves-Campos & DeWoody 2008).

Nest descriptions. We recorded the location of the nests found, and monitored three of them to document nestling development. We checked these three nests every three days when both parents were out of radio detection range to minimize disturbance. We determined the ages of nestlings with reasonable certainty, as we found nests either prior to hatching, or on hatch day (day 0). Nestlings found damp and partly inside of eggshells were considered age day 0. Slightly larger, darker-skinned nestlings, without feather pins or eyes open, but with dots where pins were apparent under the skin, were considered age day 1. Parents were sexed with standard molecular methods (cf. Chaves-Campos & DeWoody 2008).

Nestling provisioning. We monitored two nesting radio-tagged pairs to document provisioning behavior. For one pair, we observed the nest for three days after it was found (which also allowed more detailed data on nestling development). Observations were conducted at dawn and lasted three hours (i.e., 05:15–08:15 h), for a total of 540 min of observation. During this time, we watched the nest from ~25 m distance, the farthest vantage point possible in dense forest undergrowth. To minimize the potential impact of observation, we never repeated the same route to the observation site. The second pair was monitored foraging at *E. burchellii* swarms to establish how often the parents visited swarms during the day to feed the nestlings. We recorded the feeding trips from swarm fronts on three days (totaling 487 min of observation), when nestlings were 0, 5, and 6 days old.

RESULTS

Nest descriptions. We found nine nests on the ground between buttresses of large trees in old-growth forest, of which seven were found in *Pentaclethra macroloba* (Fabaceae), one in *Xylopia sericophylla* (Anonnaceae; Fig. 1), and another one in *Pterocarphus rohrii* (Fabaceae). An additional nest was built about a meter above the ground, directly above the buttresses in a *Terminalia oblonga* (Combretaceae) tree. This nest was located in regenerating, selectively-logged forest (e.g., 18–24 yrs since logging), which was adjacent to an old-growth forest. All trees were 30–67 cm in diameter, measured directly above the buttresses. All nests were loosely woven open cups snugly fitted within enclosed areas formed by buttress roots (enclosed areas: 8.3–26.5 cm wide and 14.5–45.0 cm deep; n = 9). Nests were mainly composed of small twigs, dried vine tendrils, and rhizomorphs. Occasionally, stripes of palm bark and leaves were also integrated.

We found eggs at six nests; observed clutch sizes were one (n = 2) or two (n = 4). Eggs in one clutch (n = 2) measured 26 mm (length) × 20 mm (width) and both weighed 5.0 g. We observed or detected both sexes incubating at the six nests with eggs, although nocturnal brooding was done exclusively by females. Males were found incubating mainly during the morning.

In three nests we monitored nestling development. Nestlings had eye-slits 4–5 days after hatching. At this time, feathers began protruding from pin sheath for all remiges as well as on the head, and along feather tracts all over the body. We measured the body mass of two nestlings from the same nest on days 6–7, the smaller nestling weighing 15 g and the larger nestling weighing 19 g. We did not weigh the nestlings before this period. By days 6–7, wing primary and secondary pins were protruding, as well as breast and back

FIG.1. Active Ocellated Antbird nest located on the ground between buttresses (indicated by arrow) in old-growth forest at La Selva Biological Station, Costa Rica. The inset shows the nest with one nestling.

feathers, but not tail pins. The nestlings on the three monitored nests disappeared between days 8–12.

Nestling provisioning. The breeding pair monitored at army ant swarms made daily foraging visits to one or two *Eciton burchellii* swarms during the observation period. Each parent captured prey for about an hour on each visit to the swarm (67 ± 30 min, mean ± SD) and was absent from the ant swarm for a shorter period (39 ± 14 min) in which it presumably returned to the nest to feed the nestlings. The male and female usually fed at swarms at different times, one parent exiting the swarm area shortly after the other had arrived. However, both parents foraged together occasionally.

The pair monitored at the nest spent a significant amount of time absent from the nest area during the provisioning period. The parents visited the nest only a few times per day and for very short periods (Table 1). The total time each parent spent provisioning was 4:06 min by the male and 2:06 min by the female (less than 1% of the observation period of 540 min). Longer periods were spent in the proximities of the nest (e.g., within 25 m of the nest) (Table 1). For about 205 min (38%) of the total observation period, both parents were absent. For the majority of the time, only one parent was near or at the nest. The average time between visits to the nest area by each parent (about an hour; Table 1) was similar to the time each parent spent foraging in the case of the pair monitored at ant swarms.

TABLE 1. Observations from one nest of an Ocellated Antbird pair at La Selva Biological Station, Costa Rica. Number of visits to the nest during three observations (each from 05:15–08:15 h), total time spent provisioning nestlings or in the vicinity of the nest site (5–25 m; within auditory and/or visual range, but not feeding or at the nest), and time between visits to the nest site are shown (mean ± standard deviation were provided if the number of visits was > 2). Age in days is provided above each column.

Observations	Days 4–5		Days 6–7		Days 8–9	
	Male	Female	Male	Female	Male	Female
Number of visits	0	2	1	3	3	6
Provisioning (sec)	0	23	73	41	173	62
Vicinity (min)	37	8	12	13	49	11
Between visits (min)	-	89	-	54.5 ± 3.5	68.0 ± 25.5	33.2 ± 8.6

Both sexes contributed to parental provisioning. The frequency of feeding trips apparently increased with nestling age, but the relative frequency of female food provisions to the nestlings seem to increase more than for the male (Table 1). We observed the male devoting more time to feeding at the nest in the morning later in the nesting period. On two occasions, we observed the male feeding the nestlings with arthropods collected from plants near the nest.

The parents arrived at the nest with a variety of prey items, provisioning nestlings with individual items during several short trips from nearby perches. Around half of all prey items were orthopterans (30–40 mm), the remainder consisted largely of unidentified arthropods. The pair occasionally fed considerably larger prey to the nestlings, including an anole lizard (~12 cm; *Norops* sp.). The legs and tail of the *Norops* prey hung from the mouth of the nestling (then about 6–7 days old) to which it was fed for two hours before it was swallowed. On several occasions, nestlings had not finished ingesting the large quantities of prey by the time the next adult arrived from the ant swarm with food items. Extra prey items were stashed in the nest cup after the adults removed the prey's extremities.

DISCUSSION

This study expands our knowledge on the nesting behavior of Ocellated Antbird. All ten nests we found were located on or near to the ground within buttress roots of trees, similar to the nest site described by Buehler *et al.* (2004). All nests were found in or near old-growth forest, which indicates that Ocellated Antbird may depend on mature forest habitat. Many antbirds nest in low vertical stumps or cavities, on or just off the ground in leaf litter or other organic debris, tree roots, ferns or low herbaceous vegetation; ground nests have been described as oven-shaped or domed (Willson 2000, Zimmer & Isler 2003). To our knowledge, this is only the second antbird species (besides Sooty Antbird; Wilkinson & Smith 1997) documented to build open-cup nests between buttresses on the ground.

As it is typical for antbirds, the average clutch size appears to be two eggs, and both parents brooded and fed nestlings (Zimmer & Isler 2003). Parents partitioned the incubation temporally, with the female incubating primarily at night and the male primarily in the morning, as it was observed in other antbirds (Willis 1967, 1972; Zimmer & Isler 2003). Although both parents provisioned nestlings with multiple food items per visit, females may be more diligent providers, as we

observed nearly three times as many feeding trips by the female as by the male (Table 1). This finding is contrary to what has been reported in other ant-following antbirds (e.g., Bicolored Antbird; Willis 1967). Still, nest visitation rates were relatively low, and time spent provisioning at the nest was very brief, regardless of the sex of the parent. Visitation rates are much less frequent than reported for Bicolored Antbirds (Willis 1967), but Ocellated Antbirds may bring more prey to the nest than other antbirds. To our knowledge, there are no reports of prey stashing in nests of Bicolored Antbirds or any army-ant-following bird. These observations suggest that nesting Ocellated Antbird pairs collect prey at army ant swarms, deliver items to the nest, and return to the swarm immediately to collect more food. Pairs may deposit prey as insurance against periods of unfavorable weather conditions (e.g., constant hard rain), in which army ants will stop foraging (Willis 1967).

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