

Observations on the breeding of Ochre-breasted Antpitta (*Grallaricula flavirostris*) in Ecuador

Observaciones sobre la reproducción de la Gralarita Ocrácea (*Grallaricula flavirostris*) en Ecuador

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Abstract

The Ochre-breasted Antpitta (*Grallaricula flavirostris*) is the most widespread species of its genus, occurring from Central America south to Bolivia. Its nest and eggs have been described from both extremes of its range but data from the central portion are lacking. Here we report on five nests found at three localities in Ecuador, representing three separate subspecies. Nests and eggs of all three subspecies appear similar, but more data are needed on this highly polymorphic species.

Key words: Ecuador, Ecuador, egg, nest, parental care, nestling diet, Ochre-breasted Antpitta, *Grallaricula flavirostris*.

Resumen

La Gralarita Ocrácea (*Grallaricula flavirostris*) es la especie con la distribución más amplia de su género, desde Centro América hasta Bolivia. Su nido y huevos han sido descritos en ambos extremos de su distribución geográfica, pero faltaban datos de la porción central. Aquí presentamos datos de cinco nidos encontrados en tres localidades en Ecuador, representando tres subespecies distintas. Los nidos y huevos de las tres subespecies son aparentemente parecidos, pero necesitamos más datos sobre esta especie variable.

Palabras clave: Ecuador, huevo, nido, cuidado parental, dieta de pichones, Gralarita ocrácea, *Grallaricula flavirostris*.

Introduction

The genus *Grallaricula* contains eight species of small (10-11.5 cm), elusive, and poorly known antpittas distributed from Costa Rica to Bolivia (Krabbe & Schulenberg 2003). Most species have fairly restricted ranges with the exception of the highly-variable (Robbins & Ridgely 1990) Ochre-breasted Antpitta (*G. flavirostris*), which occurs throughout the range of the genus, and may include several species (Ridgely & Tudor 1994, Ridgely & Greenfield 2001). Ochre-breasted Antpittas inhabit the undergrowth of humid, mid-

elevation forests (500- 2750 m), generally foraging alone or in pairs (Fjeldså & Krabbe 1990, Krabbe & Schulenberg 2003). Due to their elusive nature, there has been little published on their behavior, but nests have been described from both extremes of their range, in Costa Rica (ssp. *costaricensis*, Holley *et al.* 2001) and in Bolivia (ssp. *boliviana*, Maillard & Vogle 2003). Here we provide novel observations on the reproduction of three of the currently recognized eight subspecies of Ochre-breasted Antpitta (Krabbe & Schulenberg 2003), from both the eastern (ssp. *flavirostris*) and western (ssp. *mindoensis* and *zarumae*) Andean

slopes in Ecuador.

Materials and Methods

We studied two nests of the Ochre-breasted Antpitta in December 2002 on the slopes of the Sumaco Volcano (SU), Napo Province, Ecuador, at an elevation of 1750 m. We also studied two nests at Reserva Intillacta (RI), elevation 1800 m (00°03'N, 78°42'W), in the Pichincha Province of northwestern Ecuador where we found one in September 2006 and one in March 2007. We located a final nest in March 2007 at the Buenaventura Reserve (BV) of the Joctococo Foundation, El Oro province, southwestern Ecuador at an elevation of 1015 m (03°38.4' S 79°45.5'W). At the SU nests we used Hi8 video cameras to monitor activity at the nests with cameras placed on a tripod 5-6 m from the nest.

Results

Two nests of Ochre-breasted Antpitta were found in December 2002 at SU (*ssp. flavirostris*). The first was found on 3 December at which time it contained two nestlings. The following day they weighed 6.5 and 7.0 g, respectively. The nestlings were bare, dark skinned, paler on the ventral surface, with orange legs. Their bills still bore egg teeth and were orange with pale yellow to white gapes and strikingly bright orange mouth linings. Contour and flight feather pins were just beginning to break the skin's surface. Six days later the nestlings were covered in thick rusty down (Fig. 1) and each weighed 13.5 g. Their legs were pale pink with an orange cast to the feet. Their bills were similar to previously, but had developed a dark grey to black coloration along the middle of the upper mandible. Primary pin feathers had broken their sheaths 1-1.5 mm and secondary and tertiary feathers were broken their sheaths 2-3 mm. At this nest we videotaped activity for 230 min from 13:15 to 17:05 h (EST) on 4 December and for 172 min from 07:15 to 10:05 h on 10 De-



Figure 1. Mid-aged nestling of Ochre-breasted Antpitta (*G. f. flavirostris*), December 2002, Napo Province, Ecuador.

ember. The weather was sunny on both filming days and we observed two adults feeding the nestlings.

On 3 December, upon encountering the first nest, we observed an adult feed one of the nestlings a ca. 2 cm-long (snout-vent length) *Eleutherodactylus* sp. frog. The following day during filming of the nest adults fed the nestlings 11 times. On two additional occasions adults arrived at the nest with prey but did not feed the nestlings. Once the adult ate a small prey item and once they brought a 4-5 cm, hairless, green lepidopteran larva which was too big to feed to the nestlings and was consumed by the adult. On only two occasions the adults arrived without food and sat down to brood. Additional food items included two nematoceran flies (Diptera) and one adult lepidopteran. Nestlings produced five fecal sacs, two of which were eaten by the adults and three of which were carried from the nest. When arriving at the nest adults spend an average of 26 ± 46 s standing on the rim, either feeding or peering about before leaving the nest or sitting to brood. In general they stayed on the rim longer, peering about and twitching in typical *Grallaricula* fashion when they were preparing to remain at the nest to brood. The nestlings were brooded during a total of 11 bouts lasting a mean of 16.1 ± 18.0 min (range =

3.4-52.2 min). Nestlings were brooded for 177.4 min (77.2%) of the observation time. While brooding, the adults occasionally stood up and peered into the nest (7.6 times/h). On only six occasions did they simply peer down into the nest.

On eight standing bouts they probed sharply into the nest lining 1-4 times. Twenty standing bouts included rapid probing of the nest lining as described for other antpittas (Greeney *et al.* 2008), spending 1.2% of time brooding engaged in this activity and 1.4% of their time engaged in probing of some type. In total, while adults were present at the nest they spent the majority of their time sitting quietly on the nestlings, peering about with sharp movements of their head. All activities involving movement occupied 4.3% of adults' time at the nest.

On 10 December the nestlings were fed a total of 25 times. One nestling was fed 10 times, the other 14 times, and once we were unable to determine which was fed. Parents brought single food items to the nest, generally small invertebrates. Of 24 feeds, we were unable to see six prey items. Nine prey items were 5 mm or less, eight prey items were between 5 and 10 mm, and only two items were greater than 10 mm (but less than 20 mm). During feeding visits adults spent an average (\pm SD) of only 26 ± 16 s on the nest and an average of 6.0 ± 5.9 min away from the nest. Only once did an adult brood the nestlings for 1.3 min. During this time they stood twice (1 and 6 sec), to probe rapidly into the nest lining. While at the nest, including time spent on the rim feeding, adults spent 3.6% of their time occupied by non-vigilant activities.

A second nest was discovered at SU on 5 December at which time it contained two eggs (Fig. 2). The eggs were sub-elliptical and pale brown with heavy dark brown blotching, fairly evenly distributed and overlaying paler lavender spots. They



Figure 2. Nest and complete clutch of Ochre-breasted Antpitta (*G. f. flavirostris*), December 2002, Napo Province, Ecuador.

measured 20.9 by 16.6 mm and 20.7 by 16.6 mm, respectively. Upon our return on 10 December we observed both nestlings hatching at 09:00 h (Fig. 3). Although not fully out of their shells, both nestlings were capable of begging when the nest was gently bumped. The nestlings were dark-skinned with orange bills, legs, and cloacas. Their mouth linings were bright orange and their rectal flanges were pale creamy-yellow. They were bare with no sign of feathers developing below the skin. They weighed 6 g together using a 50 g pesola spring scale. Their tarsi measured 8.0 and 7.9 mm. Twenty-four hours later their appearance was unchanged and they weighed 6.5 g together and their tarsi measured 8.9 and 8.6 mm. We filmed this nest on 10 December for 214 min from 09:05 to 12:40 h.

At this nest all food items brought by adults were less than 5 mm. Adults arrived at the nest 16 times, bringing food on only 9 occasions. Only one fecal sack was produced and was consumed immediately by the attending adult. Nestlings were brooded for 73% of the observation period in bouts lasting 12.1 ± 8.7 min. While brooding, the adult stood and peered into the nest on only one occasion (3 s), rapidly probing the lining twice. Including periods when adults arrived at the nest



Figure 3. Hatching at a nest of Ochre-breasted Antpitta (*G. f. flavirostris*), December 2002, Napo Province, Ecuador.



Figure 4. Nest with single mid-aged nestling of Ochre-breasted Antpitta (*G. f. zarumae*), March 2007, El Oro Province, Ecuador.

and were feeding or standing on the rim, movement bouts at the nest occupied 2.0% of the adult's time.

At RI we discovered two nests of *ssp. mindoensis*. The first was found while clearing a trail on 2 September 2006, at which time we flushed a bird from a nest attached to the main trunk (80 cm above the ground) of a canopy tree within partially disturbed forest. Two eggs rested inside a fairly big mossy nest (outer diameter 7.5 cm, outer height 13.0 cm, and depth 3.8 cm). Eggs were similar to those described from SU, however they had a greenish cast to the ground color. The eggs measured 20.5 by 16.1 mm and 20.4 by 15.0 mm. This nest was subsequently abandoned and later discovered to be in use by Scaled Antpitta (*Grallaria guatemalensis*), when at the time the nest looked as if rebuilt.

The second nest, discovered on 4 March 2007, was about 8 m distant from the first nest. This nest was simpler (mostly twigs and little moss), and was supported by a vine tangle (45 cm above ground, outer diameter 11.7 cm, outer height 9.0 cm, and inner cup depth 3.8 cm). The nest contained a single egg (21.0 by 16.9 mm), similar in pattern and

coloration to those previously described, but with a greater amount of blotching towards the larger end. This nest was checked again one week later, at which time it was found destroyed, with pieces of eggshell nearby.

We found a fifth nest on 6 March 2007 at BV (*ssp. zarumae*). The nest was beside a small stream and contained a single *ca.* week-old nestling. The nest was composed externally of moss and was lined with dark flexible fibers. Below this mossy structure was a sparse platform of small sticks and large leaf petioles. It was placed 1.2 m up in a small Melastomataceae shrub and supported by three *ca.* 3 cm diameter branches (Fig. 4). Externally the nest was 15.5 cm tall and 11 cm in diameter (1.7 cm deep) appearing to have possibly been built on top of another nest which accounted for approximately 6 cm of this total external height. Figure 5 shows the tall mossy nest and what appears to be two separate nests piled one upon the other, separated by a sparse platform of sticks similar to that described at the bottom of the overall structure. Internally the nest cup was 7.4 cm wide and 4.7 cm deep. The single nestling was covered in dense red-brown down and its primary feathers were just beginning to break their sheaths (Fig. 4).



Figure 5. Nest of Ochre-breasted Antpitta (*G. f. zarumae*), March 2007, El Oro Province, Ecuador. Upper line (white) shows where currently active nest has been built on a base of small sticks and leaf petioles. Lower line (black) shows where old nest was built on top of a similar base.

The bill was mostly orange, dusker on the upper mandible, the gape was pale yellow-white and the mouth lining was a strikingly bright orange.

Discussion

The nest, in form and placement, and eggs, in color and markings, of Ochre-breasted Antpitta in Ecuador closely match those of other *Grallarica* antpittas (Greeney *et al.* 2008 and references therein). It is interesting to note, however, that the eggs of ssp. *mindoensis* appear to vary slightly in ground-color from those of other subspecies, more closely matching that described for Rusty-breasted Antpitta (*Grallarica ferrugineipectus*) (Schwartz 1957). Nests of Ochre-breasted Antpitta have now been described from three countries within its extensive range: Costa Rica (ssp. *costari-*

ensis; Holley *et al.* 2001); Ecuador (ssp. *flavirostris*, *mindoensis* and *zarumae*; this study); Bolivia (ssp. *boliviana*; Maillard & Vogel 2003). While all nests and eggs are described as being superficially similar, additional detailed studies are required to confirm apparent similarities in these and other parts of its range. With the nests described here, five of the eight recognized subspecies (Krabbe & Schulenberg 2003) now have published nest descriptions. As species limits are unclear (Ridgely & Tudor 1994; Krabbe & Schulenberg 2003), further detailed studies of this species are needed, in particular of vocalizations (Krabbe & Schulenberg 2003), to properly assess how many species-level taxa are involved.

Perhaps the most remarkable observation from the data presented here is the apparent shared use of a nest by Scaled Antpitta and Ochre-breasted Antpitta, two species which build quite different nests (Greeney *et al.* 2008). While we do not know which species originally built the nest described here, our observations suggest that there may be some intergeneric competition for nesting sites within the Grallariidae. Given that all *G. flavirostris* nests described (Holley *et al.* 2001, Maillard & Vogel 2003, this study), have been supported by several rather small branches, it seems likely that in the case presented here Ochre-breasted Antpitta was taking advantage of the platform provided by an old nest of Scaled Antpitta, as many *Grallaria* spp. often reuse old nesting sites (HFG pers. observ.). Further observations on such interactions are needed, however, before any strong conclusions may be drawn.

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