

BEHAVIOR OF THE TAWNY ANTPITTA (*GRALLARIA QUITENSIS*) IN NORTHERN ECUADOR

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Comportamiento de incubación de la Gralaría Leonada (*Grallaria quitensis*) en el norte del Ecuador.

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Recent years have witnessed rapid advances in our knowledge of the basic breeding biology of *Grallaria antpittas* (e.g., Freile & Renjifo 2003, Price 2003, Kofoed & Auer 2004, Martin & Dobbs 2004, Greeney *et al.* 2006). Except for the Scaled Antpitta (*G. guatemalensis*) (Dobbs *et al.* 2001, 2003) and Moustached Antpitta (*G. allenii*) (Freile & Renjifo 2003, Londoño *et al.* 2004, Greeney & Gelis 2006), however, we still know few details of such aspects as incubation period, rhythms, and behavior at the nest.

The Tawny Antpitta (*G. quitensis*) ranges from northern Colombia to northern Peru, inhabiting mostly elevations between 3000 and 4500 m (Krabbe & Schulenberg 2003). At these high elevations it inhabits paramo, high temperate woodlands, and areas dominated by low scrubby vegetation (Krabbe & Schulenberg 2003). Unlike other antpittas, the Tawny Antpitta is fairly easy to observe due to its habit of running and calling in open areas, yet its nest has only recently been described (Greeney & Martin 2005) and nothing

further has been published on its breeding behavior. Here we present the first detailed observations on incubation behavior for the Tawny Antpitta. In addition, we supplement and amplify the nesting data previously reported.

We studied the nesting behavior of Tawny Antpitta from 26 September to 21 October 2005 in the paramo at the pass (00°22.4'S, 78°08.3'W), west of Papallacta, Napo province, Ecuador. On 26 September at 16:30 h (EST), we flushed an adult from a nest containing a single egg, which we noted to be warm but wet and slightly sticky, suggesting it had just been laid (HFG pers. observ.). At 16:00 h on 28 September, the nest still contained a single egg, cold to the touch. The following morning at 06:00 h, the nest contained two cold, dew covered eggs, suggesting that the second had been laid the evening before and that no adult had spent the night on the nest. At this time we placed a video camera c. 4 m from the nest and began recording adult behaviors. We continued to film the nest daily,

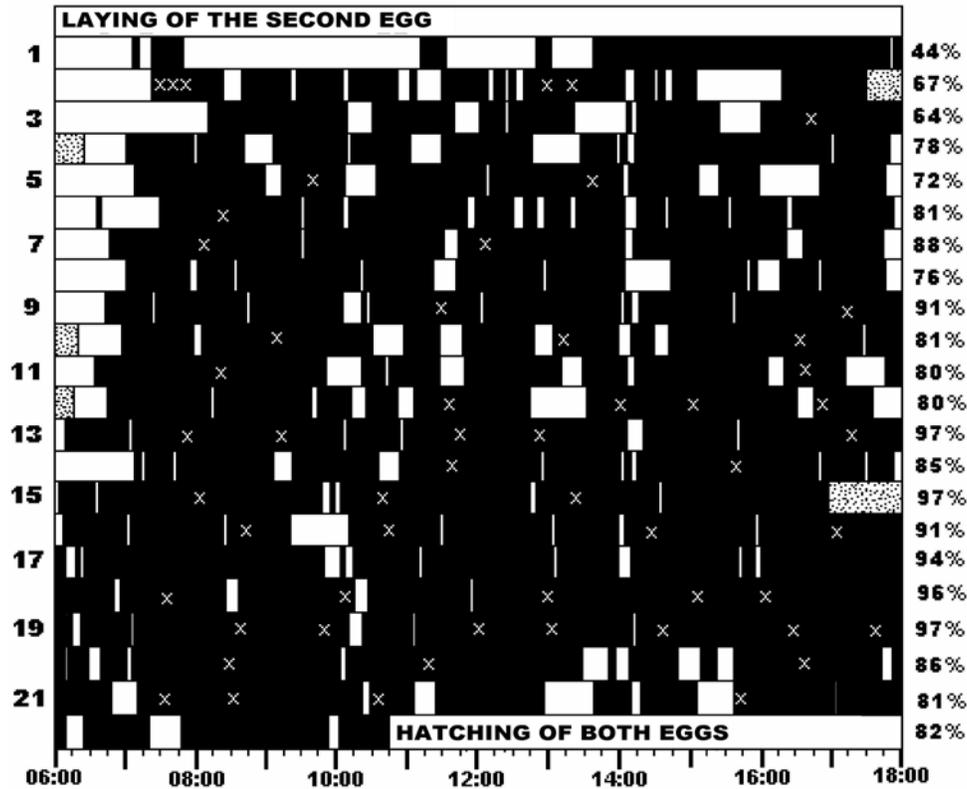


FIG. 1. Incubation rhythms of the Tawny Antpitta at 4000 m. elev., Papallacta Pass, Napo, Ecuador. The period from laying of the last egg until hatching of the entire clutch, from 06:00 to 18:00 h, is shown. Periods of attendance are shown in black, absences in white. Stippled areas represent periods not observed. White X's designate instances where adults changed places at the nest, leaving the eggs uncovered for < 1 min. The day of incubation is figured on the left with the total daily % coverage shown on the right.

from roughly 06:00 h to 18:00 h, until 20 October, when one egg hatched at 10:15 h, and the second at 10:45 h, giving an incubation period of roughly 21.5 days. We recorded and transcribed a total of 252 h of video, capturing 207 h of incubation behavior (adults present at the nest).

Daily coverage of the eggs ranged from 64 to 97%, except on the first day of incubation, when coverage was only 44% (Fig. 1). For the entire incubation period, the eggs were covered for 82% of daylight hours, or 86% if the first 3 days of irregular attendance

are excluded. Both adults incubated, with average periods of attendance of 55 ± 37 min ($n = 209$) and periods of absence of 12 ± 21 min ($n = 164$).

While incubating, adult Tawny Antpittas spent 3.9% of their time engaged in frequent (10.7 times per h) bouts of movement, including one or more of the following behaviors. During 27% of 2158 movement bouts, adults leaned over and rapidly thrust their bill in and out of the nest lining at least once, as reported for this (Greeney & Martin 2005) and other antpittas (Dobbs *et al.* 2003, Greeney & Gelis

2005, Greeney & Sornoza 2005). In total, we observed 634 rapid probing events (3.1 times per h). While the purpose of this behavior is still unconfirmed, it is thought to be a means of parasite removal in other birds (Haftorn 1994, Greeney 2004) and, as adults often ingested something removed from the nest after probing, we feel this is likely the case for Tawny Antpitta. In some instances, rapid probing appeared to facilitate rolling of the egg, but we are unsure if this was deliberate. On 28% of these movement bouts, adults arranged material on the rim or in the cup of the nest (3.2 times per h). During 5% of movement bouts, adults briefly preened their contour or wing feathers (0.5 times per h). Other bouts of movement included only standing and peering into the nest or shuffling about to change position. While not moving, adults frequently closed their eyes for brief periods, apparently dozing. On 28% of adult arrivals to the nest ($n = 229$), they brought with them a pale grass fiber, which they added to the lining of the nest before settling to incubate. On one occasion, the arriving adult passed the material to the second, which added it before leaving. Also on one occasion, an adult removed and carried away a stray feather from the lining of the nest.

Adults frequently sang from the nest on every day of observation, with the exception of the first. Generally, singing bouts (interval between songs > 30 s) began softly and increased in volume, beginning with a one or two-note partial song, and ending with a full-volume three-note song. Bouts of singing ranged in length from single songs to 4.2 min (mean \pm SD = 1.9 ± 1.3 min). At times, we recorded adults singing at rates of up to 17 songs per min (mean \pm SD = 10 ± 2 songs/min.). If all adult time at the nest and all songs are included, adults sang at an overall rate of 4.5 songs/h. In addition to these periods of singing, on eight occasions adults made 3–7, single note calls while sitting on the nest, usu-

ally in response to similar calls heard away from the nest, and presumably made by their mate. The calls were described by Ridgely & Greenfield (2001) as a penetrating “*keeyurr!*” and from our experience appear to be given in alarm.

Conclusions. An incubation period of 21.5 (22 days if laying and hatching times were not known) is the longest documented for the family Formicariidae. Holley *et al.* (2001) estimate 17–21 days for the Ochre-breasted Antpitta (*Grallaricula flavirostris*), Skutch (1996) reports a 20 day period for Black-faced Antthrush (*Formicarius analis*), and the Peruvian Antpitta (*Grallaricula peruviana*) has a 20 day incubation period (Greeney *et al.* 2004). Other documented periods are 16–17 days for Rusty-breasted Antpitta (*Grallaricula ferrugineipectus*) (Schwartz 1957), 17 days for Variegated Antpitta (*Grallaria varia*) (Erard 1982), 20 days for Scaled Antpitta (Dobbs *et al.* 2003), and 15 days for Rufous-faced Antpitta (*Grallaria erythrotis*) (Bell & Bruning 1976).

The general patterns of nest attendance for Tawny Antpittas are similar to those reported for other antpittas. They show limited and irregular incubation for 1–3 days after completion of the clutch and, once regular incubation begins, cover the eggs for a high percentage of the day (Dobbs *et al.* 2003, Greeney 2006). Also like other antpittas, and given that they likely spent the entire night on the nest, Tawny Antpittas tend to have their longest period of inattendance around dawn (Londoño *et al.* 2004, Greeney 2006). Average periods of attendance during incubation are similar to those reported for Slate-crowned Antpitta (*Grallaricula nana*) (Greeney & Sornoza 2005), higher than those for Peruvian Antpitta (*Grallaria peruviana*) (Greeney 2006), but considerably lower than the average for Scaled Antpitta (Dobbs *et al.* 2001, 2003).

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