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THE NEST, EGG, AND NESTLING OF THE STRIPE-HEADED ANTPITTA (*GRALLARIA ANDICOLUS*) IN SOUTHERN PERU

Harold F. Greeney

Yanayacu Biological Station & Center of Creative Studies, Cosanga, c/o Foch 721 y Amazonas, Quito, Ecuador. *E-mail:* revmmoss@yahoo.com

Resumen. – El nido, huevo, y pichón del Tororoí Andino (*Grallaria andicolus*) en el sur de Peru. – Describo por la primera vez el nido, huevo, y pichón del Tororoí Andino (*Grallaria andicolus*), una especie que habita áreas alto Andinas desde el centro de Peru hasta el oeste de Bolivia. En Noviembre de 2011 encontré ocho nidos, durante dos visitas a Abra Malaga, Región de Cuzco, Peru, 3300–4400 m s.n.m.. Los nidos eran grandes copas de musgos y palitos, con unas pocas pajas y raíces finas en la cámara interior. Parece que sitios de anidación pueden ser utilizados por varios intentos durante varios años con la construcción completa o parcial de nuevos nidos sobre los viejos. Fueron ubicados 1–1.8 m sobre el suelo en arboles de *Polylepis*, en áreas de bosque tal como áreas activamente utilizados para la ganadería. Un nido contenía dos huevos frescos, de forma sub-elípticas y de color azul claro con pequeñas manchas cafés. Pichones poco desarrollados tenían piel de color rosada, con plumones grises y con el interior de la boca anaranjado y las comisuras de color amarillo cremoso. Ambos adultos alimentaban a los pichones. Según el estado de los nidos que encontré, parece que el periodo de reproducción para el Tororoí Andino en esta área comienza alrededor de los fines de agosto o principios de septiembre.

Abstract. – I describe, for the first time, the nest, egg, and nestling of the Stripe-headed Antpitta (*Grallaria andicolus*), an inhabitant of the high Andes from central Peru to western Bolivia. In November 2011, I found eight nests during two visits to Abra Malaga, Cuzco Region, Peru, 3300–4400 m a.s.l.. Nests were bulky, open cups of moss and sticks with an internal cup sparsely lined with pale fibers and rootlets. Nesting sites appear to be reused for multiple nesting attempts across multiple breeding seasons, with the complete or partial construction of new nests on top of old ones. Nests were placed 1–1.8 m above the ground in *Polylepis* trees, in well-forested areas as well as actively grazed habitat. One nest contained a fresh clutch of two, pale-blue, subelliptical eggs with sparse brown spotting. Young nestlings had pink skin, sparse grayish natal down, bright orange mouth linings, and creamy-yellow rictal flanges. Both adults brought food to nestlings. Based on the condition of the nests I found, the reproductive period of the Stripe-headed Antpitta in this area likely begins in late August or early September. *Accepted 27 August 2012.*

Key words: Andes, egg, fledgling, *Grallaria andicolus*, nest, nestling, *Polylepis*, Stripe-headed Antpitta.

INTRODUCTION

Only a decade ago, the nests of only seven of the 32 species of *Grallaria* antpittas had been described (Krabbe & Schulenberg 2003). Of these seven described nests, the description for one species proved to be unreliable (Schäfer 2002, Greeney *et al.* 2006), one was (and still is) known only from captivity (Bell & Bruning 1976), and the nests of three other species were known only from brief notes (Sclater & Salvin 1879, Wiedenfeld 1982, de Fabrègues 1991, Whitney 1992). Additionally, at the time of Krabbe & Schulenberg's (2003)

review, the nests of only two species had been described by several observers (Edwards & Lea 1955, Miller 1963, Rowley 1966, Érard 1982, Donahue 1985, Quintela 1987, Protomastro 2000, Dobbs *et al.* 2001). Our knowledge of this secretive and poorly studied genus changed drastically near the turn of the century, led by the first detailed study of *Grallaria* reproductive habits (Dobbs *et al.* 2001), based on observations of the Scaled Antpitta (*G. guatimalensis*) in southern Ecuador. This work was quickly followed by papers from these and other authors, adding nest descriptions for four species (Freile & Renjifo 2003, Price 2003, Koefed & Auer 2004, Martin & Dobbs 2004), and providing detailed natural history information for two (Dobbs *et al.* 2003, Londoño *et al.* 2004). This trend was continued (Greeney & Gelis 2005, 2006; Greeney & Martin 2005, Greeney *et al.* 2006, Martin & Greeney 2006, Greeney & Harms 2008), and only five years after Krabbe & Schulenberg's (2003) publication, our understanding of the nesting biology of *Grallaria* antpittas was well on its way to being demystified (Greeney *et al.* 2008). Enthusiasm for the study of antpitta reproductive biology continued (Greeney *et al.* 2009, Solano-Ugalde *et al.* 2009, Greeney & Juiña 2010, Juiña *et al.* 2009, Greeney & Juiña 2011) and, to date, the nests are known for more than half of the described species of *Grallaria*.

The Stripe-headed Antpitta (*Grallaria andicolus*) ranges from central Peru southward to western Bolivia (Krabbe & Schulenberg 2003). It inhabits low-canopied forests dominated by *Polylepis* (Rosaceae) and *Gynoxys* (Asteraceae) trees, as well as adjacent boulder-strewn grasslands at elevations from 3000 to 4300 m (Schulenberg *et al.* 2007), and may be locally common within some portions of its range (Krabbe & Schulenberg 2003, Schulenberg *et al.* 2007). With the exception of a cursory description of several nests found by Jon Fjeldså in Peru (Greeney *et al.* 2008), the nesting biology of the Stripe-headed Antpitta is unknown. Recently, while high in the Peruvian Andes, I was provided with the opportunity to add this species to the growing list of *Grallaria* antpittas with described nests.

METHODS

On 12 November 2001, I searched for nests of the Stripe-headed Antpitta at Abra Málaga, Cuzco Region, Peru (13°08'S, 72°19'W). I searched for nests on the western side of the pass, at elevations of 4000–4200 m a.s.l., where habitat consisted of rocky grasslands interspersed with small patches of *Polylepis*-dominated forests with an estimated maximum canopy height of 4–6 m. Forest patches were predominantly restricted to sheltered valleys and depressions. I located nests by following adults carrying nesting material or food, and by systematically searching patches of *Polylepis* forest in the vicinity of visually detected adults. I returned and searched the same area on 15 November. I present all linear measurements of eggs, nest dimensions, and nest heights with ± SD.

RESULTS

Nests. I found eight nests, all of which were built in *Polylepis* trees. Six nests were supported by 4–6 small branches (2–3 cm diameter), and the remaining two were each supported by two larger (4–6 cm) horizontal branches. One nest contained two young nestlings (estimated 5–7 days old, Fig. 1), one contained two eggs (undeveloped, Fig. 2), one was under construction (estimated 1/3 completed), and five were not currently in use. Of the inactive nests, one contained an addled egg and one was only recently abandoned, with fresh feces and several pieces of earthworm still on the rim. Mean nest height was 1.6 ± 0.6 m (range = 1.0–2.8 m), while mean height of supporting trees was 2.8 ± 0.7 m

FIG. 1. Adult Stripe-headed Antpitta (*Grallaria andicolus*) provisioning two nestlings, 15 November 2011, Abra Malaga, Cuzco, Peru (photograph: H. F. Greeney).

(range = 2.0–4.0 m). Nests were bulky, open cups, composed primarily of moss, with only sparse inner linings consisting of grass fibers and thin, flexible rootlets. In one nest (Fig. 2), the lining included pale, dried grasses, as well as fresh, green grass blades and straw. All nests also had short (5–15 cm) sticks incorporated into the outer portions of the mossy cup. The numbers of sticks varied between nests, from 10–20 sticks mixed in with the moss, to 30+ sticks forming a sparse platform below the cup and (in two nests) a circle of sticks placed around the outer rim of the cup. The recently abandoned nest had obviously been originally built some time ago, presumably at least a year prior to its most recent use, as most of the external moss was firmly attached to the supporting branches and the inner walls of the cup were partially decomposed (although the sparse lining was fresh). The nest with eggs was composed of some freshly placed moss, but this had obviously been added to a pre-existing nest, suggesting that old nests are refurbished and reused, possibly for multiple years as I have observed with the Tawny Antpitta (*G. quitensis*) in Ecuador (unpubl. data). The nest with nestlings appeared freshly constructed and the nest under construction was not built on an old nest. The rest of the inactive nests appeared to have been built at least one breeding season previously, perhaps more. Based on comparisons with an active nest of the Chiguanco Thrush (*Turdus chiguanco*) at this site, which contained one addled egg and one ca. 3-4 day-old nestling on 15 November, and based on

FIG. 2. Clutch of the Stripe-headed Antpitta (*Grallaria andicolus*) provisioning two nestlings, 15 November 2011, Abra Malaga, Cuzco, Peru (photograph: H. F. Greeney).

extensive personal experience with nests of the Great Thrush (*Turdus fuscater*) in Ecuador, I feel confident that the inactive nests I found belonged to Stripe-headed Antpittas. Nevertheless, the following measurements (cm) pertain only to the two active, completed antpitta nests: maximum outer diameter, 24 and 24; minimum outer diameter, 22 and 22; outer height, 13 and 15; inner diameter, 9.5 and 12; inner depth, 6.5 and 8.5.

On 15 November, an adult antpitta carried a stick in the direction of the partially completed nest, but dropped the stick while still below the nest, presumably because it detected my presence. Based on my examination of this nest, I surmise that nests are built by placing a variable number of sticks on the supporting branches to form a loose platform, upon which the mossy cup is built. It seems likely that additional sticks are added near the end of construction to create the indistinct ring around the rim of the inner cup. The presence of sticks incorporated into the mossy walls of nests likely represents

sticks from the nest-rim which were added during previous occupancies and subsequently covered with fresh moss.

Eggs. All three eggs (including the addled one) were sub-elliptical and pale blue. The two eggs in the active nest were sparsely blotched with brown, with markings only slightly more concentrated on the larger end (Fig. 2). The addled egg was too heavily stained to determine if it bore markings. Mean linear measurements of all three eggs were 29.9 ± 0.5 by 23.3 ± 0.5 mm, and the two viable eggs both weighed 8.3 g on 15 November.

Nestlings. On 12 November, at 14:00 h (EST), the two nestlings weighed 17.0 and 16.5 g, and left tarsal measurements were 18.4 and 18.1 mm, respectively. They were pink-skinned and had sparse, dark grey or black natal down on the capital, spinal cervical, spinal dorsal, femoral, and humeral feather tracts (all dorsal). Ventrally they lacked natal down except for a few sparse plumes on the sub-malar and ventral cervical tracts. Contour pin-feather development was most advanced on the spinal dorsal, femoral, and humeral tracts, with pins in these areas unbroken but emerged from the skin 1-2 mm. These pin feathers were pale, rusty-brown near the base and black apically. Contour pin feathers had emerged only < 1 mm on the capital, spinal cervical, ventral cervical, ventral sternal, and ventral abdominal tracts. These pins were dark, except for those of the lower ventral sterna and ventral abdominal tracts which were pale yellow-white. The only contour pinfeathers to have broken their sheaths where those of the lower ventral abdominal tracts, which had < 1 mm of exposed white feather plumes. Primary flight feathers were just emerging from the skin and secondaries were broken through the skin ca. 2–3 mm. On 15 November, at 09:15 h, the nestlings weighed 24.3 and 24.7 g, with tarsal measurements of 23.4 and 22.9 mm, respectively. Contour feathers on all tracts had broken their sheaths, with those on all upper tracts and the ventral sterna tracts being tawny-buff with small black tips, and those on the ventral abdominal tracts entirely buffy-cream colored. Primary feathers were 3-4 mm long and had not broken their sheaths, while secondary pin feathers were 5-7 mm long and just beginning to break their sheaths. Tail feather development was still not visible. On both visits, nestling bills were orange, with cream-colored rictal flanges and bright orange mouth linings. Egg teeth were still evident on the second visit, and leg coloration had darkened only slightly.

Adult behavior. All adults that I encountered away from nests were extremely wary, quickly disappearing from view when I approached to within 10–15 m, making it difficult to follow them through the dense *Polylepis.* On two occasions, however, while sitting quietly after following adults into the forest, an adult reappeared within 3–6 m from where I sat, periodically hopping out of view and reappearing from a different direction, seemingly less shy once I stopped walking. At the nest under construction I was unable to determine how many adults participated in building, but at the nest with young two adults fed the nestlings, one of which was distinguished by an engorged tick attached to its fore-crown (Fig. 1). During my first attempt to photograph adults provisioning nestlings (12 November), I set my camera tripod only 5 m from the nest, with no attempt at concealment. The first adult to arrive, upon detecting my presence while it was still several meters from the nest, quickly ran into dense cover. Only 5 min later, an adult fed the nestlings and then settled to brood while clearly aware of my presence. It left the nest only when I moved to within 2 m of the nest. On 15 November, while I photographed the nest from only 3 m away, I detected no reluctance to approach the

nest. After four adult visits an adult settled to brood, flushing only when I approached to within 1 m. Of the five feedings I observed, three were by the adult with the tick, which was also the individual which brooded on both occasions.

Adults approached the nest by running along the ground, hopping up to several perches below the nest before arriving at the rim from the same direction on all five visits. On all but one visit, the adults brought multiple prey items but fed to only one of the nestlings. Food items were predominantly earthworms, with a few larval insects similar to crane fly larvae (Tipulidae). Adult departures from the nest, both natural and when flushed, were quick and silent and accomplished by dropping straight to the ground below the nest and running rapidly away. During a total of 50 min spent at the nest with nestlings, as well as during 15 minutes at the nest with eggs and 30 min at the nest under construction, I heard no adult vocalizations.

DISCUSSION

The bulky, deep, open cup nests of Stripe-headed Antpittas are as described for other *Grallaria* (see references in introduction). Similarly, egg form and ground color are a match with congeners. With regards to egg markings, only the eggs of Tawny Antpitta (Greeney & Martin 2005, Greeney & Harms 2008), Undulated Antpitta (*G. squamigera*; Greeney & Juiña 2011), White-bellied Antpitta (*G. hypoleuca*; Price 2003), and Jocotoco Antpitta (*G. ridgelyi*; unpubl. data) are known to have sparse, dark flecking. This is variable in the Tawny Antpitta, however, and other species may prove to show similar variation once larger sample sizes have been examined. With regards to nest placement, Stripe-headed Antpittas join Tawny, Chestnut-naped (*G. nuchalis*), Chestnut-crowned (*G. ruficapilla*), Watkins's (*G. watkinsi*), and Plain-backed (*G. haplonota*) Antpittas in seeming to prefer locations with multiple, small supports, as opposed to the more firmly supported sites chosen by other species (e.g., tree trunks, stumps, banks). Sample sizes are still very low for most species, however, and some species show variation in nest placement (Greeney *et al.* 2008). The nestlings of Stripe-headed Antpittas are also similar to those described for other *Grallaria*, being most similar to those of the Tawny Antpitta, both of which also share similarities in habitat, nest placement, and egg coloration (Krabbe & Schulenberg 2003, Greeney & Martin 2005, Greeney & Harms 2008).

The secretive and elusive nature of *Grallaria* antpittas has historically retarded our understanding of their behavior, ecology, and distribution. Numerous works by an expanding number of talented field workers have changed this trend during the past two decades, with four new species described (Stiles 1992, Kattan & Beltrán 1997, Krabbe *et al.* 1999, Carantón-Ayala & Certuche-Cubillos 2010) and novel information published on the biology, taxonomy, distribution, and conservation of many species (Krabbe & Coopmans 2000, Greeney *et al.* 2008, Salaman *et al.* 2009, Freile *et al.* 2010). I sincerely hope this trend continues, and encourage others to use this new body of information to document the life histories of the 15 *Grallaria* species which have no published account of their breeding biology.

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