

ADDITIONS TO OUR UNDERSTANDING OF *SCYTALOPUS* TAPACULO REPRODUCTIVE BIOLOGY

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Adiciones a nuestro conocimiento de la biología reproductiva de tapaculos del género *Scytalopus*.

Key words: *Scytalopus parkeri*, *S. latrans*, *S. micropterus*, tapaculo, egg, mass, water-loss, clutch size, nest construction, Ecuador.

The eggs and clutch size are known for only 8 of the roughly 40 species of *Scytalopus* tapaculos (Krabbe & Schulenberg 2003). Here I provide the first description of the eggs from three complete clutches, one each of Chusquea Tapaculo (*Scytalopus parkeri*), Blackish Tapaculo (*S. latrans*), and Long-tailed Tapaculo (*S. micropterus*), along with additional observations on their nesting biology in Ecuador. All species identifications were made, using vocalizations, with the help of knowledgeable field experts (i.e., N. Krabbe & M. Lysinger).

Chusquea Tapaculo. Two eggs of a completed clutch at the Tapichalaca Research Station (04°30'S, 79°10'W), Zamora-Chinchi Province, Ecuador, were immaculate white. They measured 22.7 x 17.7 mm (first egg laid) and 23.0 x 17.9 mm, respectively.

The Chusquea Tapaculo ranges from southern Ecuador to northern Peru at elevations of 2250 to 3350 m, (Krabbe & Schulen-

berg 2003). Little has been written on its reproductive biology other than a description of its nest from southeastern Ecuador (Greeney & Rombough 2005). On 16 November 2004, I encountered a nest of Chusquea Tapaculo with a single egg. Both adults were nearby, bringing moss to the nest. The nest was a mossy ball, situated in a natural earthen cavity 0.8 m up on a 1.5 m high bank adjacent to a trail at 2650 m a.s.l. At this time, however, there was no evidence of the pale fibrous lining described for other nests (Greeney & Rombough 2005). The egg was dirty and cold, partially buried in moss in the bottom of the nest. Two days later, at 09:45 h (EST), the egg cup was thinly lined with pale fibers and the egg sat on top of the lining. It showed no signs of development and weighed 3.92 g. On 21 November, at 14:30 h, the nest contained 2 eggs, and the nest cup appeared complete. The first egg had lost mass at a rate of 0.04% per day and the second weighed 4.09 g. Both were cold and

showed no signs of development. I subsequently weighed the eggs 3, 5, and 8 days later. By 29 November, both eggs showed signs of development (veins and a developing embryo), and they had lost mass at a rate of 0.55 and 0.60% of their original mass per day, respectively.

Blackish Tapaculo. Two partially incubated eggs of a completed clutch at the Yungilla Reserve (03°13'S, 79°16'W), Azuay Province, Ecuador, were immaculate white. They measured 22.6 x 17.5 mm and 23.0 x 17.9 mm.

The Blackish Tapaculo ranges at elevations of 1500 to 4000 m, from western Venezuela to central Peru (Krabbe & Schulenberg 2003). Its nest (ssp. *latrans*) was first described by Skutch (1972) from Baños, Ecuador, and a second nest (ssp. *latrans*) was later studied during the latter part of the nesting period near Cosanga, Ecuador (Greeney *et al.* 2005). On 11 March 2005, Fernando Sornoza showed me a nest of Blackish Tapaculo (ssp. *subinereus*) with two well incubated eggs. The nest was a complete mossy ball, situated in a natural earthen cavity on a gently sloping hill at 1850 m a.s.l. I did not remove it for examination. I weighed both eggs on 11 March, and again 2 days later. The first had lost mass at a rate of 0.69% per day, and the second at 0.59% per day. When weighed again 4 days later, both eggs were pipped, and subsequently hatched the following day on 18 March. Given that most passerine eggs I have examined are pipped two days prior to hatching, and that both eggs now reflected a mass loss of 1.7% and 1.5% per day, I assume pipping to have occurred 24 h prior to this final weighing. Using the percent/day loss calculated prior to pipping, I estimate that the eggs lost 4.4 and 5.5 percent of their mass during the 24 h after pipping. Indeed, the second egg, when weighed 24 h later, just prior to hatching (the first had hatched), had lost an additional 4.9% of its original mass.

Long-tailed Tapaculo. Both eggs of a completed clutch at the Yanayacu Biological Station & Center for Creative Studies (00°36'S, 76°53'N), Napo, Ecuador, were immaculate white. They measured 24.2 x 20.1 and 25.0 x 20.0 mm.

The Long-tailed Tapaculo, also known as Equatorial Rufous-vented Tapaculo, lives at elevations of 1250 to 2300 m, from eastern Colombia to northern Peru (Krabbe & Schulenberg 2003). Almost nothing is known of its reproductive biology except for descriptions of the nestlings and two nests from Sumaco, Ecuador (Greeney & Gelis 2005). On 23 January 2007, I discovered a nest of Long-tailed Tapaculo containing two partially developed eggs. At 13:30 h I flushed an incubating adult of this species, positively identified visually and by voice, from the nest of a Spotted Barbtail (*Premnoplex brunnescens*). I have monitored the reuse of this nest since September of 2001, and it has previously contained at least 5 separate clutches of Spotted Barbtail, as recently as May 2006 (HFG unpubl.). The nest was as described previously for Spotted Barbtail (Skutch 1967), a tight mossy ball. In this case, as is true of all Spotted Barbtail nests at Yanayacu (HFG unpubl.), the egg cup was thickly lined with pale fibers as described by Marín & Carrión (1994). It was attached by the top to a rocky overhang, directly over a small stream. Exterior measurements of the nest were roughly 16 cm tall by 11 cm wide. The entrance was a short, downward-directed tube, 7.5 cm long with a 5 cm wide by 4 cm tall opening. The nest appeared unmodified from its appearance during the previous 6 years. Subsequently, the tapaculos using this nest were studied and videotaped extensively while feeding nestlings (Freeman & Greeney in review).

Conclusions. The clutch size, egg coloration, and egg dimensions provided here are as expected, based on prior descriptions for

Scytalopus (Krabbe & Schulenberg 2003). This appears, however, to be the first description of mass loss in eggs (= waterloss; e.g., Ar & Rahn 1980) for the family Rhinocryptidae. While little is known about this aspect of reproductive physiology for most Neotropical groups, a recent summary of data on two genera of antpittas (Formicariidae) suggests that rates of 0.6–0.7% mass loss per day are slightly less than those for antpittas (Greeney *et al.* 2008). This may be a reflection of differing microclimates between the open-cup nests of antpittas and the subterranean, enclosed nests of *Scytalopus* (Ar & Sedis 2002), but further studies are needed for both groups. In addition, for Chusquea Tapaculo, it is interesting to note that eggs were laid > 48 h apart. The fact that the first egg had lost no more than 0.04% of its mass per day before the second egg was discovered 5 days later suggests an even greater period between laying, or at least a significant delay in the onset of incubation. In fact, if not for recent observations on Mérida Tapaculo (*S. meridanus*; Decker *et al.* 2007), I might have thought this long period between laying was in error. It appears, however, that the laying of eggs separated by 5+ days might not be uncommon in this genus.

Perhaps the most interesting datum presented here, however, is the usurpation of a Spotted Barbtail nest by Long-tailed Tapaculo. Until now, there has been no reason to believe that *Scytalopus* spp. do not build their own nests. Indeed, the evidence above shows that both adults participate in nest construction in Chusquea Tapaculo. The two nests previously described for Long-tailed Tapaculo (Greeney & Gelis 2005) were fairly dissimilar in placement (earthen tunnel vs log crevice) and construction (simple cup vs complete ball). Other descriptions of *Scytalopus* nests (Krabbe & Schulenberg 2003) indicate little or no excavation takes place during construction, but rather natural cavities are utilized. In retrospect, I believe it is possible that the two nests

of Long-tailed Tapaculo (neither examined closely) were perhaps usurped nests of a *Thripadectes* treehunter and a Spotted Barbtail, respectively. In addition, in October of 2006, Robert C. Dobbs observed adult Long-tailed Tapaculos near the Yanayacu Research Station feeding nestlings in a mossy clump of epiphytes, over 20 m above the ground (RCD pers. com.). All of these observations suggest that this species regularly occupies abandoned nests of other species. I encourage all future observations of *Scytalopus* nests to carefully evaluate nest placement and architecture, and suggest that any observations on construction behavior and egg laying would be extremely useful.

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