

SHORT COMMUNICATIONS

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PARENTAL CARE OF THE LONG-TAILED TAPACULO (*SCYTALOPUS MICROPTERUS*) IN NORTHEASTERN ECUADOR

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INTRODUCTION

Tapaculos of the genus *Scytalopus* are the most diverse genus of rhinocryptids, and include 39 species distributed from Costa Rica to the southern tip of South America (Remsen *et al.* 2008). The *Scytalopus* tapaculos are shy, furtive birds, and the basic breeding biology of this large genus is poorly known. A number of recent publications, especially nest descriptions (Stiles 1979, Christian 2001, Young & Zuchowski 2003, Greeney & Gelis 2005, Greeney & Rombough 2005, Pulgarín-R. 2007, Decker *et al.* 2007, Acros-Torres & Solano-Ugalde 2007), have contributed to a growing understanding of tapaculo natural history, but we are aware of only two previous published studies quantifying observations of parental care in *Scytalopus* (Greeney *et al.* 2005, Hosner & Huanca-Llanos 2008).

The Long-tailed Tapaculo (*Scytalopus micropterus*) ranges in subtropical forest from Colombia to northern Peru along the Amazonian slope, and was formerly considered conspecific with the Rufous-vented Tapaculo (*S.*

femorialis) (Krabbe & Schulenberg 2003). Beyond a nest description from eastern Ecuador (Greeney & Gelis 2005), the breeding biology of the Long-tailed Tapaculo remains undescribed. Here we present observations at a nest discovered at the Yanayacu Biological Station and Center for Creative Studies (00°35'S, 77°53'W, 1900–2100 m.a.s.l.) located adjacent to the private reserve of Cabañas San Isidro, Napo Province, northeastern Ecuador.

On 23 January 2007, we discovered a pair of Long-tailed Tapaculos nesting in an inactive Spotted Barbtail (*Premnoplex brunnescens*) nest. The nest was architecturally typical of this species in the area (Greeney 2008a), and situated several meters above a small stream at an elevation of 1950 m.a.s.l. The eggs at this nest, as well as the ecological significance of nest usurpation in *Scytalopus*, are discussed in a separate manuscript (Greeney 2008b). When we were able to return to the nest on 6 February, it contained two young nestlings.

To document nesting behavior with minimal disturbance, the nest was filmed using a camera mounted on a tripod 4 m from the

nest. Observer time spent in the nest area was minimal; tapes were changed every 4 h. The nest was filmed daily from 9 to 18 February (except on the 17th), generally between 06:15 and 18:30 h (EST). Daily filming time ranged from 3.75 to 11.25 h/day (mean = 7 h) for a total of 63.75 h of recordings.

Chronology. Sometime between 13 and 16 February a nestling disappeared from the nest. This likely occurred at night, as the nest was filmed extensively during daylight hours on these days and we recorded no evidence of nestling removal. Declines in adult provisioning rate and nestling fecal sac production suggest the nestling disappeared on the night of 13 February. The remaining nestling subsequently died between the night of 16 February and the early morning of 18 February. An adult came to the nest once during the morning of 18 February with a prey item, leaving after hopping to the nest entrance. At 16:00 h on 18 February, the dead nestling, already cold, appeared to be in good condition with no obvious injuries.

General observations. Two adults provisioned and brooded the nestlings, and removed fecal sacs as well. On 12 instances, a brooding adult exited the nest upon arrival of the second adult bringing food to the nest. On one of the occasions described above, the second adult brooded after feeding.

Adults generally approached the nest using one of two routes, making short flights along the nearby bank until making a final 1–3 m flight to the nest entrance. Adults left the nest with low flights over the water away from the nest area, usually downstream – the direction the nest entrance faced.

Around 3 m downstream on the same rock face, we observed a pair of Rufous-breasted Flycatchers (*Leptopogon rufipectus*) building a nearly completed nest on 11 February. We observed one interaction between the

two species, when an adult tapaculo with an insect in its bill hopped to a hanging vine between the two nests. It was aggressively displaced by an adult flycatcher, which remained in the area, sitting on the vine and raising its wings.

Brooding behavior. Brooding bouts always commenced after a feeding, occurring on 34.1% of visits to the nest (44 of 129). Brooding sessions ranged from 2.3 to 40.2 min (mean = 14.7 ± 9.0 min). On 28 additional instances the adult entered the nest for 20 to 119 s, though its activity was undetermined. The amount of time adults brooded decreased gradually as the nestlings grew older. On 9 February, brooding occurred during 48% of the observed time, a rate which decreased until 16 February, when only 7% of the observed time was spent brooding. Similarly, the percentage of feeding trips culminating in brooding decreased from 100% on 9 February to 35% on 16 February.

Nestling provisioning. During the entire observation period, overall feeding rate was 2.6 feeds/h. We cannot quantify feeding rate per nestling across the entire period, as the exact date and time when the first nestling disappeared is unknown. Feeding rate from 9 to 13 February, when two nestlings were definitely present in the nest, was 1.7 feeds per nestling/h. In comparison, the feeding rate for the nest from 14 to 16 February was 1.49 feeds/h. This decline, echoed in fecal sac production rates (see below), suggests that the first nestling disappeared the night of the 13th. Feeding rates were slightly higher in the morning (06:00–09:00 h) and late afternoon (17:00–18:30 h) (2.87/h and 4.38/h respectively, 2.04/h for the hours between 09:00 and 17:00), although small sample size precludes statistical significance of this trend.

We observed a total of 129 feeds, including five unsuccessful attempts when the nest-

lings were unable to consume the large-sized prey items. All prey items appeared to be arthropods, and were all delivered singly. Mean estimated prey size (to the nearest 0.5 cm) was 2.1 ± 1.1 cm (range = < 0.5–4 cm). Twenty-two insects identified were generally the larger prey items, and included 20 katydids (Tettigoniidae), 1 adult lepidopteran and 1 damselfly (Odonata: Zygoptera). Adults feeding larger insects spent more time at the nest entrance, likely due to the difficulty nestlings had when handling larger prey items (estimated prey size and adult duration at nest entrance, $r^2 = 0.208$).

Fecal sacs. Nestlings produced a total of 35 observed fecal sacs, an overall average of 0.63/h for the nest. For the period when two nestlings were present, 9–13 February, fecal sacs were produced at a rate of 0.78 ± 0.32 /h, while fecal sac production from 14 to 16 February was 0.39 ± 0.14 /h. Adults disposed of most fecal sacs ($n = 24$) after arriving to the nest to feed. After feeding, the adult generally remained at the nest entrance before eventually putting its head into the nest, emerging with a fecal sac. Adult duration at the nest entrance on feeding trips ending in fecal sac removal was slightly higher than durations for trips not involving fecal sacs (18.8 ± 10.3 vs 14.0 ± 11.2 s, $n = 24$ and 105 feeds). There were an additional nine instances when a brooding adult left the nest with a fecal sac; five of these instances involved brooding times of less than 51 s. One time we observed a nestling deposit a fecal sac at the nest entrance in the absence of adults, and on one occasion a nestling moved to the nest entrance and dropped a fecal sac out the entrance into the stream below.

Nestling vocalizations. Nestlings were extremely vocal; high-pitched, insistent begging often began when adults approached to within 1–2 m of nest entrance and continued as long as

adults remained at the entrance. Begging often continued after the adult had left the nest, and after the adult had entered to brood. Additionally, we sometimes observed begging in response to observer presence in the nest area. Begging sometimes changed to rhythmic repeated “*chuck*” notes, initially given at a rate of around 2/s and slowing to around 0.5/s before nestlings became quiet. Although complete quantification of nestling vocalizations was impossible due to noise from the stream, vocalizations detected above ambient stream noise were quantified.

We detected nestling vocalizations after the adult departed on 71.3% of feeding events ($n = 129$), and on 18.6% of adult exits after brooding ($n = 70$). On average, nestling begging was audible for 21.9 ± 18.6 s (range: 2–74 s, $n = 95$). Of these, 30 begging events segued into “*chuck*” notes; a further 12 times we observed “*chuck*” notes without detection of normal begging. “*Chuck*” notes were often given for several minutes on end, with an average duration of 91.5 ± 74 s (range= 9–307 s). In fact, the longest nestling vocalization lasted for 335 s after the adult had fed and left the nest area. Additionally, there appeared to be an increase in begging and “*chuck*” notes as the nestlings grew older.

DISCUSSION

Previous records of active Long-tailed Tapaculo nests in eastern Ecuador were from October to December (Greeney & Gelis 2005, Dobbs *in* Greeney 2008b). In conjunction with this nest and observations of Long-tailed Tapaculo juveniles at the same site on 23 January and 14 November (BFG & HFG pers. observ.), these records suggest that the breeding period for Long-tailed Tapaculo in eastern Ecuador is from September to February. This period corresponds to the dry season extending slightly into the wet season in this area (Greeney *et al.* 2006).

The loud nestling vocalizations observed in this study concur with other published notes of *Scytalopus* nests (Skutch 1972, Young & Zuchowski 2003, Greeney & Rombough 2005; but see Hosner & Huanca Llanos 2008), some of which were first encountered due to nestlings' loud begging (Skutch 1972, Young & Zuchowski 2003, Greeney & Gelis 2005, Greeney & Rombough 2005, Greeney *et al.* 2005). Such vocalizations were observed during this study, frequently lasting several minutes and audible from over 4 m, even over substantial stream noise. These vocalizations would appear to be an obvious signal to predators of the presence of the nest, and are a curious behavior worthy of further investigation.

When dealing with such a poorly known and morphologically uniform genus, the null hypothesis is often that all *Scytalopus* are fairly similar in their natural history. The Long-tailed Tapaculos in this study, however, were markedly different in their behavior from the other *Scytalopus* in which parental care has been described, e.g., the Blackish (*S. latrans*) (Greeney *et al.* 2005) and the Puna (*S. simonsi*) tapaculos (Hosner & Huanca-Llanos 2008). While all three species exhibited biparental care, feeding rates and prey items delivered to nestlings were very different. Blackish Tapaculos fed at rates 5 times higher than Long-tailed Tapaculos (8.7 and 1.7 insects/nestling/h, respectively). Secondly, Blackish and Puna tapaculos fed tiny, 1–3 mm insects, while the Long-tailed Tapaculos fed large insects, often around 2 cm long.

Additionally, we suspect that the Long-tailed Tapaculo nestlings produced fecal sacs in the presence of adults. While we could not directly observe this interaction due to the long entrance tunnel, this supposition is supported by our observations of fecal sac production. It is suggestive that, adults typically remained at the nest entrance after feeding, later inserting their head into the nest and

emerging with a fecal sac. Additionally, we only observed a nestling deposit a fecal sac at the nest entrance in the absence of adults. These observations are contrary to previous observations of *Scytalopus* nestlings producing fecal sacs in the absence of adults (Greeney & Rombough 2005, Greeney *et al.* 2005), and are perhaps associated with the nest's open location, in contrast to the more typical *Scytalopus* nest located in a subterranean cavity (see Greeney & Rombough 2005, Greeney 2008b).

These observations illustrate that “the devil is in the details.” While the species may exhibit similarly furtive behavior and dull plumage, *Scytalopus* species' natural history contains a diversity of breeding behaviors which may prove valuable for testing phylogenetic hypotheses. It is through the publications of short notes that the natural history of this and other poorly known genera will be elucidated, and we hope that researchers working in the Neotropics will continue to publish their observations, and add to the limited yet rapidly growing body of literature describing *Scytalopus* life history and ecology.

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