Observations on nesting biology and natural history of Slaty-backed Chat-tyrant (*Ochthoeca cinnamomeiventris*) with a description of nestling growth and plumage development

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Abstract
Nesting of the Slaty-backed Chat-Tyrant (*Ochthoeca cinnamomeiventris*) occurs throughout the year in northeastern Ecuador, with a possible peak during the drier months. Nests are open cups of moss, well lined with red-brown tree fern scales, and usually placed on wet, mossy banks, always near larger streams. Mean clutch size is 1.7 eggs, which vary in coloration from spotless to sparsely flecked with cinnamon. I describe and illustrate, for the first time, the growth and plumage development of nestlings, which fledge after 18-20 days.

Keywords: Ecuador, eggs, nest description, nestling feather development, *Ochthoeca cinnamomeiventris*, Slaty-backed Chat-Tyrant.

Resumen
El anidamiento del Pitajo Negro (*Ochthoeca cinnamomeiventris)* ocurre a lo largo de todo el año al noreste de Ecuador, con posibles picos durante la estación seca. Los nidos fueron copas abiertas de musgo bien forradas con escamas de helecho arbóreo rojo-marrón, y generalmente ubicados en barrancos húmedos con musgo, siempre cerca a quebradas largas. La media del tamaño de puesta de huevos fue de 1.7, los cuales variaron en coloración desde ausencia de manchas hasta manchas dispersadas color canela. Aquí describo e ilustro por primera vez el crecimiento y el desarrollo de las plumas de los nidícolas, que abandonaron el nido después de 18-20 días.

***Palabras clave*:** Ecuador, descripción del nido, desarrollo de la plumaje del pichón, huevos, Pitajo Negro, *Ochthoeca cinnamomeiventris*.

The Slaty-backed Chat-Tyrant (*O. cinnamomeiventris*) is distributed throughout the Andes from northern Colombia to extreme northern Peru, ranging from 1700 to 2800 m.a.s.l, occasionally much higher (Ridgely & Greenfield 2001). *O. cinnamomeiventris* is a species distinct from *O. thoracia* and *O. nigrita* (Ridgely & Greenfield 2001), which were split from *O. cinnamomeiventris* following the large genetic differences noted by García-Moreno et al. (1998). *O. cinnamomeiventris* is a stunning blackish and chestnut chat-tyrant found in the vicinity of rushing mountain streams (Ridgely & Tudor 1994). It has a white supraloral and unmarked wings.

According to the phylogeny of García-Moreno et al. (1998) and their notions of *Ochthoeca* adaptive radiation, *O. cinnamomeiventris* represents the modern, species-level example of a population that radiated down from the dry paramo into the edges of shady forest ravines. Again, following García-Moreno et al. (1998), from these populations evolved a number of species—the *Silvicultrix* subgenus—that adapted to the interior of montane and submontane forests.

While a plethora of adult morphological traits have traditionally been used in the development and testing of phylogenetic hypotheses, the lack of available information on the natural history of Neotropical birds has hindered our ability to use such data for the same means. As our knowledge increases, however, we are better prepared to apply information such as nest architecture to test modern phylogenies (eg. Zyskowski & Prum 1999, Miller & Greeney in review). In this paper, taking advantage of the technological advances of internet publishing, I present an illustrated account of feather development in the Slaty-backed Chat-Tyrant, with the hope that these data may prove useful to natural historians and taxonomists alike.

Fig. 1 & 2. Nest of Slaty-backed Chat-Tyrant (*Ochthoeca cinnamomeiventris*), January 2007 and September 2006 respectively. (Photo: H.F. Greeney).

Fig 3. Nesting site of Slaty-backed Chat-Tyrant (*Ochthoeca cinnamomeiventris*), September 2006 at the Yanayacu Biological Station, Napo, Ecuador, 2000 m. Black arrow points to the nest. (Photo: H.F. Greeney).

General observations on nesting phenology. During the course of fieldwork at the Yanayacu Biological Station and Center for Creative Studies (00°36.0 S, 77°53.4 W, 1900-2100 m.a.s.l) in the Napo Province of northeastern Ecuador, I opportunistically encountered 21 nests of Slaty-backed Chat-Tyrant. I encountered nests under construction in September (4), October (2), March (1) and June (1). I found nests with incubation underway in September (5), October (3), and January (1), and already containing nestlings in September (2) and May (1). In addition, I found an active nest of unknown stage in September, and a dependent fledgling in August. Taken as a whole, these records suggest nesting year-round in our area, with a peak in the drier months of September-November.

While not quantified directly, I feel that more time was spent in appropriate nesting habitat (see below) during these drier months, and that the peak suggested above may be slightly inflated. My gut feeling, however, is that this is a real pattern. Due to their generally remote location (from the research station), I was unable to closely monitor many nests. At one nest, incubation lasted at least 14 days. At another, two nestlings fledged after 18-19 days. At the most closely monitored nest, the single nestling fledged 20 days after hatching. At least one of the nests examined was built on top of 2-3 old nests, presumably of this species. One nest site was used on at least two consecutive years, and one site has now been used 4+ times during the past 6 years. For the above description of nest height and site selection, each of these was counted only once.

Fig. 4. Nesting site of Slaty-backed Chat-Tyrant (*Ochthoeca cinnamomeiventris*), January 2007 at the Yanayacu Biological Station, Napo, Ecuador, 2000 m. Black arrow points to the nest. (Photo: H.F. Greeney).

Nest and nest sites. Nests were open mossy cups, thickly lined with red-brown tree fern scales (Figs. 1 & 2). Mean outer dimensions of 8 nests were 10.8 ± 1.5 cm wide by 7.8 ± 1.4 cm tall. Mean inner dimensions of the egg cups of these nests were 5.6 ± 0.7 cm wide by 4.0 ± 0.4 cm deep. Most (n = 14) were built in a sheltered crevice on vertical rock faces (Figs. 3 & 4). One was built in a similar situation but on a clay bank rather than rock, and one was built into a large (1.5 wide by 2 m tall) hanging clump of epiphytes and mosses. Nests were always partially or entirely supported below, but a few had up to 12 cm of moss packed into the rock crevice below the nest, building up the natural supporting surface of rock. All nests were immediately adjacent to or overhanging wide (3-10 m) streams, 0.9-5 m above the water (mean = 1.8 ± 1.1 m). Despite more extensive searching of adjacent, 1-3 m wide streams, I found no nests along these.

Eggs. Clutch size ranged from 1-2 eggs, with the mean clutch at 12 nests being 1.7 eggs. In addition all three nests I found after hatching contained two nestlings. Most eggs were pale cream or ivory colored, with small, sparse (5-30), fairly evenly distributed cinnamon flecking (Fig. 5). At the extreme, a few eggs were unmarked, and one had a distinct ring of flecking around the larger end. Mean dimensions of 17 eggs were 18.4 ± 0.8 by 14.3 ± 0.5 mm (range = 16.3-19.4 by 12.7-14.8 mm). One of these, however, was much smaller than the others (16.3 x 12.7 mm) and did not develop, suggesting it was unviable to begin with. With this egg removed from the data, mean egg dimensions were 18.5 ± 0.6 by 14.4 ± 0.3 mm, with the smallest egg dimensions being 17.3 x 13.8 mm. One egg of a single-egg clutch lost 1.1% of its original mass per day of incubation. At a second nest with two eggs, they lost 0.6% and 0.7% of their mass per day, respectively. Mean (±SD) weight of three eggs, which had already begun development, was 2.0 ± 0.12 g.

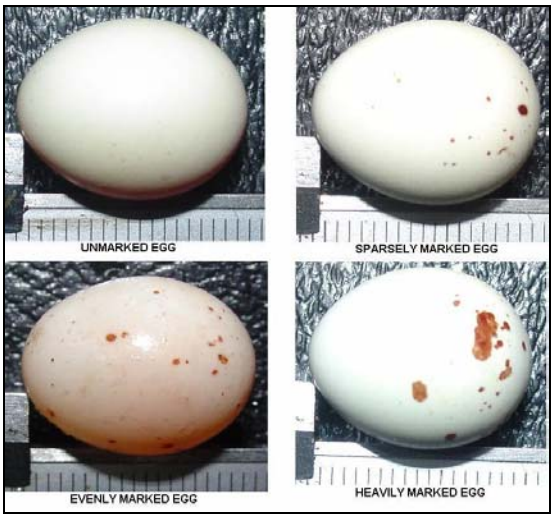

Fig. 5. Eggs of Slaty-backed Chat-Tyrant (*Ochthoeca cinnamomeiventris*) at the Yanayacu Biological Station, Napo, Ecuador showing variation in maculation. Note that exposures vary so that true color may not be properly represented. (Photos: H.F. Greeney).

Nestling growth and feather development. At hatching (weight generally >1.5 g; Fig. 6), nestling skin is pink to pinkish-orange with a bright yellow cloaca. The bill is dusky yellow, slightly brighter yellow near the tip of the lower mandible. The mouth lining is bright yellow, with a slightly whiter-yellow gape. Down is grey, with most concentrated on the head, back, and wings. Smaller patches of grey down adorn the cural (legs) region while a sparse row of bright white down runs down the lateral portion of the ventral abdominal area. Four days later (weight roughly 5.5 – 6.5 g; Fig. 6) the skin turns pinker, with the cloaca bright yellow and more distinctly differentiated from the surrounding skin.

Fig. 6. Nestlings of Slaty-backed Chat-Tyrant (*Ochthoeca cinnamomeiventris*), 0-8 days old, at the Yanayacu Biological Station, Napo, Ecuador showing feather development. Note that exposures vary so that true color may not be properly represented. (Photos: H.F. Greeney).

The bill, gape, mouth lining, and down have changed little. Contour pinfeathers are just beginning to become visible below the skin, with only a few breaking through. Primary pinfeathers have just begun breaking through the skin. At eight days old (weight roughly 9.5 – 11.5 g; Fig. 6), soft part colors have changed little, but the legs have begun to darken slightly and the upper mandible has become duskier. Contour feathers in the capital and dorsal areas have begun breaking their sheaths slaty grey. Those on the ventral feather tracts are just breaking sheaths rusty-rufous while those in the cural region remain mostly unbroken. Primary and secondary pinfeathers have not yet broken their sheaths, while rectrices have just begun to break. Nestling down covering has become sparser, but still remains prominent. Three days after this (weight roughly 11.5 – 14.5 g; Fig. 7) soft part color is similar with the legs and upper mandible darker and the ocular area appearing more olive colored. The cloaca is now less well-differentiated from the surrounding flesh, having become darker.

Fig. 7. Nestlings of Slaty-backed Chat-Tyrant (*Ochthoeca cinnamomeiventris*), 11-19 days old, at the Yanayacu Biological Station, Napo, Ecuador showing feather development. Note that exposures vary so that true color may not be properly represented. (Photos: H.F. Greeney).

Contour feathers are well broken their sheaths, slaty in the dorsal, capital and throat regions, paler grey along the ventral abdomen and cural areas, and dark rusty red in the breast and upper belly. Rectrice pinfeathers have broken their sheaths roughly 1 mm while wing pinfeathers have broken their sheaths 1-4 mm. Down covering is now noticeably sparser. At 13 days old (weight roughly 13 – 15 g; Fig. 7), nestlings are beginning to distinctly resemble adults with the lower mandible beginning to darken and the legs being dark olive-grey. Feathers in the ocular region have begun to develop and the first hints of a white loral stripe are visible. Rectrices have broken their sheaths 2-3 mm while wing pinfeathers have emerged roughly ¼ of their length. Only sparse down remains in the frontal capital region and the rump.

At 15 days old (weight roughly 13 – 15 g) nestlings have lost all but a few down tufts on the head and most of the remaining down is concentrated on the rump. Wing feathers have broken their sheaths half to two-thirds their length while rectrices remain broken only 4-6 mm.

Their supraloral white stripe is already prominent and by 17 days of age (weight roughly 13 – 15 g) nestlings completely resemble adults and just prior to fledging (weight roughly 12 – 14 g; Fig. 7) can be differentiated only by their gape and shorter tail. For an illustration of nestling weight gain (see Fig. 8).

Conclusions

Despite much confusion over nest architecture within *Ochthoeca* (eg. Millery & Greeney in review), it is clear that Slaty-backed Chat-Tyrant, builds a simple cup nest.
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I hope this contribution to breeding ecology may be helpful to future investigations into the phylogenetic history of this group, as well as encourage others to provide such details for other species.

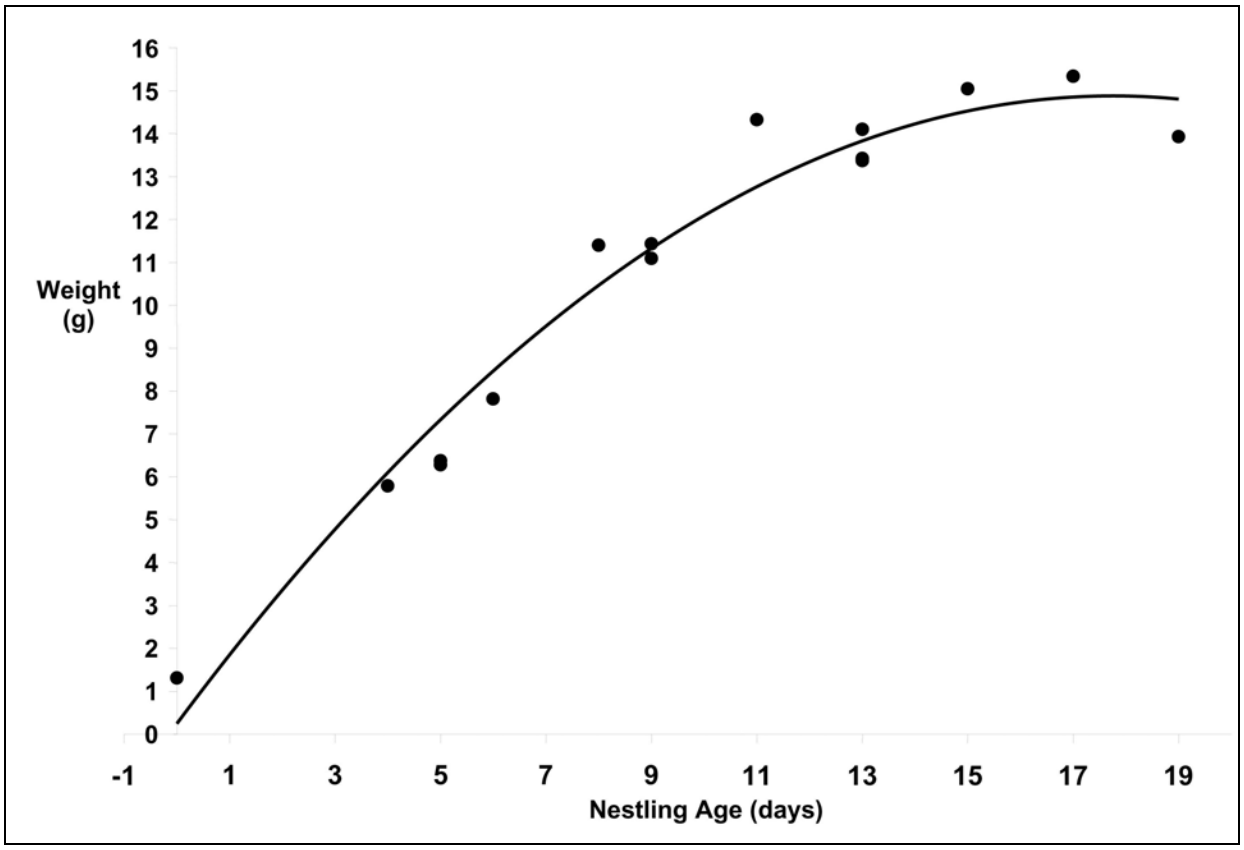

Fig. 8. Growth of 3 nestlings from two nests of Slaty-backed Chat-Tyrant (*Ochthoeca cinnamomeiventris*) at the Yanayacu Biological Station, Napo, Ecuador. Nestling weight is shown on the left with nestling age below, hatching occurred at day 0.

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