THE NEST, EGGS, AND NESTING SUCCESS OF THE ECUADORIAN THRUSH (*TURDUS MACULIROSTRIS*) IN SOUTHWEST ECUADOR

El nido, los huevos y el éxito reproductivo del Mirlo Ecuatoriano (*Turdus maculirostris*) en el suroeste de Ecuador

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ABSTRACT

The Ecuadorian Thrush (*Turdus maculirostris*) is a common bird inhabiting disturbed areas in the lowlands of western Ecuador. I studied 17 nests of this species in southwestern Ecuador and present the first available data on its eggs, incubation and nestling periods, and nesting success. Nests were placed from 0.5 to 6 m above the ground and were mud and moss cups typical of the genus. Eggs varied in color from deep turquoise to dull greenish blue and showed variation in the degree of maculation. Mean egg measurements were 27.8 ± 2.0 mm by 20.9 ± 0.7 mm and mean fresh mass, 6.5 ± 0.7 g. Eggs lost 0.55 ± 0.12% of their original mass/day during incubation. Incubation lasted 12 days, nestlings fledged after 14 days and predicted nesting success was 34%.

Keywords: egg, nest success, predation, Turdidae, *Turdus maculirostris*, water loss.

RESUMEN

El Mirlo ecuatoriano (*Turdus maculirostris*) es un ave bastante común que habita áreas intervenidas en tierras bajas del oeste de Ecuador. Estudié 17 nidos de esta especie en el suroeste de Ecuador y presento aquí los primeros datos sobre sus huevos, periodos de incubación y de pichones y éxito de anidación. Los nidos se ubicaron entre 0.5 y 6 m sobre el suelo y tenían forma de taza, construidos de lodo y musgos como es típico del género. Los huevos variaban en color de fondo desde turquesa hasta verde pálido y también en su cantidad de manchas. Las medidas promedio de los huevos fueron 27.8 ± 2.0 mm por 20.9 ± 0.7 mm y la masa promedio recién puestos fue 6.5 ± 0.7 g. Durante la incubación los huevos perdieron 0.55 ± 0.12% de su masa original por día. El periodo de incubación fue de 12 días, los pichones dejaron el nido después de 14 días y el éxito de los nidos fue de 34%.

Palabras clave: depredación, éxito de nidos, huevo, pérdida de agua, Turdidae, *Turdus maculirostris.*

INTRODUCTION

The Ecuadorian Thrush (*Turdus maculirostris*) is a common and conspicuous bird occurring from northwest Ecuador along the western slope of the Andes to northern Peru. It is an inhabitant of open areas around human dwellings and scrubby second growth, occurring from sea level to around 1900 m (Hilty & Brown 1986, Ridgely & Greenfield 2001). Despite its abundance within its geographic range, however, little has been published concerning its breeding biology. The nest has been described only in passing (Best *et al.* 1996), providing few details and no information on its eggs or reproductive biology. Here I report observations at 17 nests of Ecuadorian Thrush studied in southwestern Ecuador.

MATERIALS & METHODS

I studied nests from two locations. All of my detailed natural history observations were made in February 2004 at the Buenaventura Reserve (03º39'S, 79º46'W), located 20 km west of Piñas in the El Oro Province of southern Ecuador. This area receives most of its rainfall from January to May, but most species of plants are not deciduous. Little or no intact forest remains in the area, but a few patches of advanced second growth maintain a fairly diverse avifauna (N. Krabbe, pers. comm.). Nests were studied along the entrance road to the reserve at elevations ranging from 400 to 540 m. Further nests were found in February 2006 at the Bosque Protector Cerro Blanco reserve (02º07'S, 80º5'W; 300 m), 15 km west of Guayaquil in the Guayas Province. Habitat in the area where I found nests is lightly to moderately disturbed tropical dry forest, dominated by *Ceiba trichistandra* (Bombacaceae) trees and characterized by a dry, scrubby undergrowth.

During incubation and laying, I marked eggs individually with a permanent marker and weighed them every 2-4 days with a digital scale accurate to 0.001 g. For nests studied at Buenaventura I followed the fate of each nest, visiting them every 1-3 days during the study, more frequently during periods close to laying or hatching. I used methods developed by Mayfield (1975) and Johnson (1979) to calculate daily nest survival rates (DSR).

RESULTS

NESTS. I studied nine nests at Buenaventura in early February 2004. Seven nests were situated on top of 15-40 cm diameter stumps where sprouting re-growth concealed the nest. One nest was supported by multiple forks of a small *Piper* sp. (Piperaceae) sapling, but was also well concealed by surrounding vegetation. A final nest was built onto broad horizontal branches of a large isolated tree, well concealed by surrounding bromeliads and epiphytes. I studied eight nests at Cerro Blanco in late February of 2006. Four nests were built into vertical forks (3-5 branches) of small understory saplings. One nest was in a bromeliad clump on a large horizontal branch, one was tucked into a major fork of a large *Ceiba* tree, and the final nest was built within a thick vine tangle. Nests were placed at similar heights at both sites, ranging from 0.5 to 6 m (mean 2.7 ± 1.4 m; n = 17). All nests were neat mossy cups fortified with mud and sparsely lined with dark rootlets (Fig. 1). Mean measurements (cm) of 7 nests at Buenaventura were: outside diameter 14.6 ± 0.7; inside diameter

Figure 1. Nest of Ecuadorian Thrush (*Turdus maculirostris*) in the Buenaventura Reserve, El Oro, Ecuador.

8.9 ± 0.5; outside height 7.8 ± 1.0; inside cup depth 5.7 ± 0.3.

EGGS. At 10 nests clutch size was three eggs. Twenty-five eggs (all Buenaventura) measured 27.8 ± 2.0 mm by 20.9 ± 0.7 mm (range = 25.1-31.8 x 19.6-22.3 mm). Fresh mass of 12 eggs averaged 6.5 ± 0.7 g. Egg ground color varied from turquoise-green to dull, pale greenish-blue, and markings varied from fairly even and dull red-brown flecking to strong red-brown spotting heaviest at the larger end (Fig. 2). Most eggs were also sparsely flecked with pale lavender and minute specks of black. Although there was somewhat of a continuum (Fig. 2), most eggs seemed to fall into either the turquoise-heavy-spotted (Figs. 2b and 2c) or the dull-blue-green-speckled (Fig. 2a) color pattern. In all cases, eggs within a clutch were similar. Six eggs from two nests, weighed periodically up through the fifth day of incubation lost a mean 0.55 ± 0.12% of their original mass/day. At a third nest three eggs were weighed four and nine days after clutch completion and showed a mean loss of mass of 1.41 ± 0.07 %/day. At the seven nests that I observed closely during laying, eggs were laid on each of three subsequent days. Eggs were laid between 08:00 and 14:00 h, generally after 10:00 h. Hatching was asynchronous at five nests where I made careful observations. At four nests two eggs hatched ca. 24 h prior to the final egg and at one nest the eggs hatched on each of three consecutive days. I was able to determine incubation period at two nests where the last eggs hatched 12 days after they were laid. At the nest where eggs hatched on consecutive days, the smallest nestling disappeared from the nest eight days after it hatched. Also at this nest, the two remaining nestlings fledged on consecutive days, both after 14 days in the nest.

BEHAVIOR AND NESTING SUCCESS. At Buenaventura, using direct observation or the incubation and nestling periods above, I calculate that clutches were initiated on 3, 6, 7, 7, 9, 11, 11, 12, 17, and 22 February. I observed adults with dependent fledglings on 1 and 17 February and an adult carrying nesting material on 9 February. At Cerro Blanco I calculate that clutches were initiated on 5, 7, 8, 10 (3 nests) and 20 February. This suggests that the initiation of nesting was fairly

Figure 2. A, B and C. Three complete clutches of Ecuadorian Thrush (*Turdus maculirostris*) in the Buenaventura Reserve, El Oro, Ecuador. Note the variation in egg coloration between clutches.

synchronous in these populations.

Incubating adults flushed from the nest when an observer approached to within 2-3 m, but they rarely flushed unless the observer stayed within this distance for more than 30 s. Flushed individuals flew to an elevated perch 4-8 m away and repeatedly gave the "*meow*" alarm call described by Ridgely & Greenfield (2001). Often, the second adult would then appear and join its mate in alarm calling. Only one individual was ever seen around nests during building and incubation, but both sexes were observed provisioning nestlings.

I was able to closely monitor nine nests at Buenaventura. The daily survival rate of these nests was 0.9632 (81.5 observation days, 3 failures). Using a 29-day nesting cycle (3 laying, 12 incubation, 14 nestling) this gives a predicted success of 33.7% for the Ecuadorian Thrush.

DISCUSSION

The nests of Ecuadorian Thrush described here are similar to previously published data for this species (Best *et al.* 1996) and come as no surprise given the relative uniformity of nest architecture in the Turdidae (Collar 2003). Similarly, the eggs described here resemble those of other species of *Turdus* (Collar 2003). Although sample sizes for this and most other Neotropical species are small, it is interesting to note the large variation in egg size and color seen in Ecuadorian Thrushes, which may be typical for at least Neotropical species (G. Londoño, pers. comm.). The rather high degree of synchrony in nest initiation in early February is unusual in Neotropical species breeding in more humid environments, but resembles that observed in the closely related *T. grayi* in an area of similarly highly seasonal rainfall in Panama (Morton 1971, 1983). The asynchrony of hatching dates in *T. maculirostris* may indicate that incubation commenced with the second (or third) egg, as was also found by Morton in Panama.

The rate at which eggs lose mass during incubation may be used as a surrogate for estimating water loss during this period (Ar & Rahn 1980), and is an easily-measured variable that may be informative in understanding variation in nest-site selection, nest micro-climate, and incubation rhythms. Despite nesting in a generally more arid environment, Ecuadorian Thrush eggs lost mass at a rate lower than that reported for other Ecuadorian species (e.g., Dobbs *et al.* 2003, Martin & Greeney 2006, Greeney *et al.* 2008), including two other species of thrush (Greeney & Halupka 2008, Halupka & Greeney 2009). It is possible that this difference is due to the relatively earlier period of incubation during which most eggs were weighed in this study, supported by the relatively higher rates of water loss measured in the nest later in incubation. Additional data on variation in size and rates of water loss may prove informative in understanding aspects of Ecuadorian Thrush breeding biology and allow for comparisons with other species.

In this study nesting success of the Ecuadorian Thrush was comparable to that of three species of thrush breeding in montane forests in Argentina (23 – 29%, calculated from Tables 2 and 5 in Auer *et al.* 2007). The 34% nest survival estimated here is also similar to that predicted for understory, open-cup nesting birds in a lowland humid forest in Panama that averaged 32-38% (Table 2 in Robinson *et al.* 2000). This estimate was lower than estimated success for two other species of Ecuadorian thrushes studied in humid, montane forests (Greeney & Halupka 2008, Halupka & Greeney 2009), which showed survival rates more comparable to values from North America (41% average for shrub or low-foliage nesting species; Martin 1995) and from wet-season nests of *T. grayi* in Panama (Morton 1971). By contrast, Morton (1971) found that dry-season nests were much less successful (15%), mainly due to much higher rates of nest predation. As predation is thought to be an important factor in shaping the evolution of life-history traits in birds (Ricklefs 1969, Martin 1995), it will be interesting to compare these results to further studies on other species nesting at similar latitudes and in similar habitats. I hope that this contribution highlights how little is known about even common and easily studied Neotropical birds and encourages others to continue to publish their findings.

ACKNOWLEDGEMENTS

I thank the Jocotoco Foundation and the staff at Buenaventura and Cerro Blanco for their logistical support and Rudy Gelis, Murray Cooper, and Andrew McClean for help in the field. My natural history studies are supported financially by Matt Kaplan and John V. Moore through the Population Biology Foundation, Field Guides Inc., and the PBNHS. I thank Gustavo Londoño and an anonymous reviewer for improving earlier versions of this manuscript. This is publication number 211 of the Yanayacu Natural History Research Group.

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Recibido: 18 febrero 2010
Aceptado: 10 diciembre 2010