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## The Nest and Eggs of the Rufous Mourner (*Rhytipterna h. holerythra*)

Samuel S. Snow,<sup>1,4</sup> Luis Sandoval,<sup>2</sup> and Harold F. Greeney<sup>3</sup>

**ABSTRACT.**—We provide the first description of nest architecture and composition, adult construction behavior, and egg characteristics for the genus *Rhytipterna*. We provide these data for a nest of the Rufous Mourner (*Rhytipterna h. holerythra*) found under construction and followed through clutch completion and subsequent failure at La Selva Biological Station, Heredia, Costa Rica. Given the historically labile taxonomic placement of the genus *Rhytipterna*, our observations provide important additional lines of evidence further supporting its affinity to *Myiarchus* within the Tyrannidae. We highlight our record of the incorporation of shed reptile skins in the nest lining, only the second instance of this nest character within Tyrannidae outside of the genus *Myiarchus*. The phylogenetic distribution of this specialized nesting trait suggests the possibility of a single origin near the base of the subclade Tyranninae. Received 29 August 2016. Accepted 30 November 2016.

Key words: Costa Rica, La Selva Biological Station, Neotropical, nesting materials, reptile skin, Tyrannidae.

Rufous Mourner (*Rhytipterna holerythra*) is a tropical New World flycatcher (Tyrannidae) that inhabits the mid-level and sub-canopy of primary forest, forest edges and selectively logged forest, from lowland rainforest up to ~1,200 m (Orsini 1969, Stiles and Skutch 1989, Blake and Loiselle 2001, Scholes 2004b, Lindell et al. 2004, Ramírez-Alboreo 2010). Two subspecies of Rufous Mourner are currently recognized: nominate *holerythra* is found from southern Mexico to western Panama and northern/central Colombia; subspecies *rosenbergi* replaces *holerythra* southward in the Pacific lowlands of western Colombia and northwest Ecuador (Scholes 2004b). Rufous Mourners are most abundant near the center of their range (e.g.,

Central America), but they have become less abundant near the northern and southern portions of their range (e.g., Mexico and Ecuador respectively), leading to a conservation designation of Near Threatened in Ecuador (Stiles and Skutch 1989, Blake and Loiselle 2000, Puebla-Olivares et al. 2002, Jahn and Valenzuela 2006, Ramírez-Alboreo 2010).

Rufous Mourners have previously been reported to breed March–June in Costa Rica, February–May in Colombia, and perhaps as early as December in southeast Mexico from gonadal data and observations of fledglings (Graber and Graber 1959, Stiles and Skutch 1989, Scholes 2004b). They reportedly nest in tree cavities, such as old woodpecker holes and perhaps also in earthen riverbank cavities (Hilty and Brown 1986, Howell and Webb 1995). Reproductive details such as nest architecture, nest composition, and adult behavior were not previously available for *R. holerythra* and remain unavailable for its congeners, *R. immunda* (Pale-bellied Mourner) and *R. simplex* (Grayish Mourner). Here, we present the first description of nest architecture and composition, adult construction behavior, and egg characteristics for *R. h. holerythra*.

### OBSERVATIONS

We discovered a nest of Rufous Mourners on 20 March 2015, under construction near La Selva Biological Station, Heredia, Costa Rica (10° 25' N, 84° 01' W; ~50 m a.s.l.). The nest was a cavity 7 m high in a medium-sized tree on the forest edge, within sight of the station building and very near one end of a bridge spanning the Sarapiquí River. We filmed the nest from the ground at the base of the tree by using a tripod-mounted Sony video camera (model DCR-SR47) from 1318 to 1812 hrs CST on 20 March 2015, and then from predawn to sundown on the following 2 days, totaling 29 hrs and 6 mins of video. During this period, we recorded 83 visits to the nest (Fig. 1). The mean ( $\pm$ SD) visit duration was 46.65  $\pm$  45.00 secs; the

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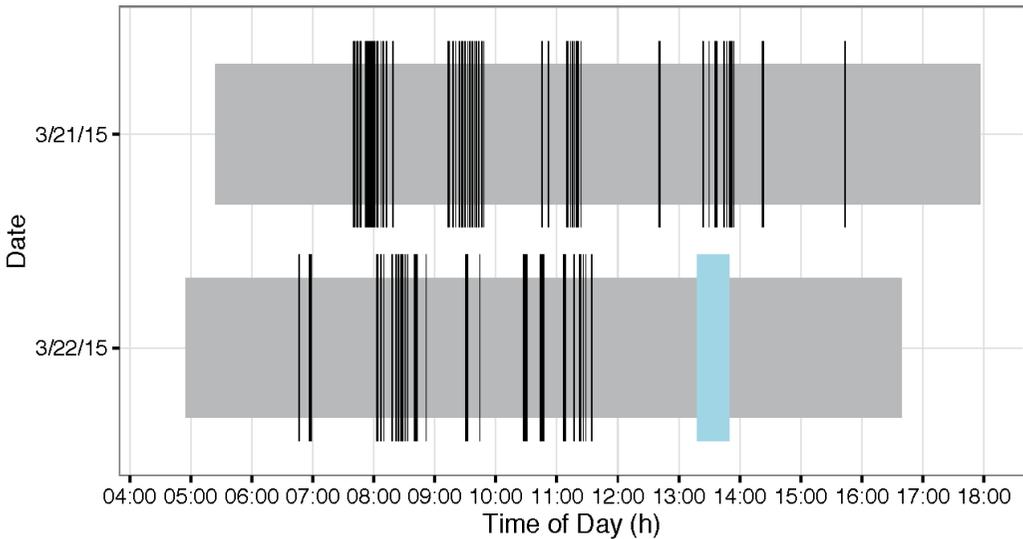


FIG. 1. Diagram of nest construction visits. Black bars represent episodes where a Rufous Mourner was present at the nest. The width of the bar corresponds to the duration of the visit. The gray bars represent the interval of the day during which the camera was recording. The blue bar is the interval during which the authors HFG and SSS ascended the tree to examine the contents of the nest (see description in the text). The interval that represents video recorded on the afternoon of 20 March 2015 is not shown here because there were no nest visits during that time.

median duration was 29 secs. All but four visits involved an individual carrying nesting material to deposit in the cavity. The building adult generally arrived with a single type of material. We were able to identify materials on 46 of 79 visits, as follows ( $n =$  visits): twigs ( $n = 3$ ), moss ( $n = 30$ ), thin vegetal fibers ( $n = 3$ ), mammal hair ( $n = 4$ ), and reptile skin ( $n = 6$ ; Fig. 2). Visits to the nest were concentrated in spurts of activity, occurring roughly every 45 mins to 1 hr (Fig. 1).

In general, the close-focused nature of our video recordings prevented us from confirming whether just one or both sexes were involved in nest construction. In one instance, however, we were able to confirm that both the male and female were at least present during the nest construction process. During the observation, first, an individual arrived at the nest and entered the cavity. While it was inside, a second individual (carrying nothing in its beak) arrived. It sat outside the nest for ~20 secs, then it went to the entrance, and apparently finding it already occupied, it departed. The first individual then departed 8 secs later. While this indicates some sort of involvement by both members of the breeding pair, we cannot now say if they both contribute to nest construction

since the second individual was not carrying anything when it arrived.

On 22 March, we climbed up to the nest. The cavity entrance was 99.7 mm wide X 84.9 mm high. The cavity was 170 mm high X 67.2 mm deep (Fig. 3A). The internal material used in the bottom of the cavity was composed of dry vegetal fibers, moss, mammal and human hair, and fragments of snake and lizard skin (Fig. 3B), which is consistent with what we observed in the video data. Note: In addition to the materials described here, on 13 June 2009 in riparian forest



FIG. 2. Video screenshot of a Rufous Mourner bringing shed snakeskin to the nest cavity. The bird is highlighted in the purple oval; the entrance to the nest is outlined in blue.

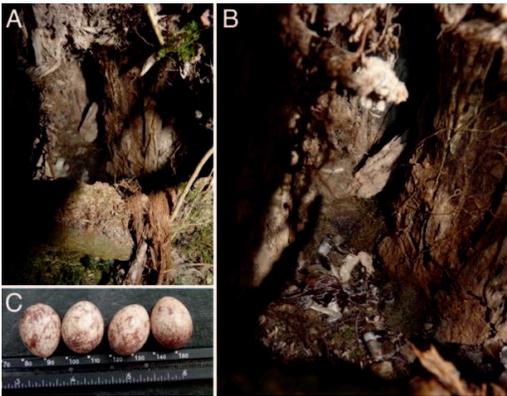


FIG. 3. The nest and eggs of the Rufous Mourner. A) The entrance of the nest cavity. B) View of the bottom of the nest; note reptile skin and mammal hair among the materials. C) All eggs from the clutch with caliper handle for scale.

habitat at Reserva El Copal, Jiménez, Cartago, Costa Rica ( $9^{\circ} 47' N$ ,  $83^{\circ} 45' W$ ;  $\sim 1,000$  m a.s.l.), the author LS observed an individual *R. h. holerythra* collect dry leaves on the ground and bring them to a nest.

On 2 April, we visited the nest again. During 2 hrs of observation (0705–0905) the individual inside the nest never departed. When we checked the nest, the individual inside flushed and perched  $\sim 3$  m in front of the nest entrance and sang twice. After the song, a second individual approached and perched  $\sim 2$  m from the first individual and  $\sim 4$  m from the nest entrance. Both individuals remained on their perches until we descended, at which time the first individual flew inside the nest again, and the other flew away. On this occasion, we observed three eggs inside.

On 9 April, we found four eggs, with one egg partially broken. On this occasion, the individual inside the nest again flushed but then silently perched  $\sim 3$  m from the nest entrance. The eggs, measured with a caliper rule (0.1-mm precision), were  $23.6 \times 19.1$  mm,  $24.0 \times 18.6$  mm,  $24.3 \times 18.8$  mm, and  $24.9 \times 18.2$  mm. They were cream-coffee colored, with sparse splotches of darker brown and thin strokes of brown distributed throughout the surface of the shell, but densest near the wider end (very similar to eggs of birds in the genus *Myiarchus*; Fig. 3C). On 23 April, we found the nest abandoned, without eggs, and with the floor of the cavity covered with wood debris.

## DISCUSSION

Our observations confirm the use of secondary cavities for nesting by Rufous Mourners (Howell and Webb 1995), and further support the assertion that nesting in Costa Rica occurs between March and June (Stiles and Skutch 1989, Scholes 2004b). Our observations may contribute also to our understanding of *Rhytipterna*'s taxonomic affinity. Morphological data have historically informed the genus *Rhytipterna*'s placement previously within Cotingidae and then variously within Tyrannidae (Ridgway 1907, Hellmayr 1929, Warter 1965, Ames 1971, Traylor 1977, Lanyon 1985). Recent molecular phylogenetic analysis now supports a four-taxon grouping within Tyrannidae, the “Myiarchini,” with the genera *Rhytipterna* + *Casiornis* being sister to *Sirystes*, and this clade being sister to the well-known genus *Myiarchus* (Tello et al. 2009, Ohlson et al. 2013). Though data are unavailable regarding the nesting materials or eggs for *Casiornis* and *Sirystes* beyond the use of cavities (Scholes 2004a, Lanyon and Fitzpatrick 1983, Lopes and Gonzaga 2016), our observations of the use of a secondary cavity lined with soft materials including vegetal fibers, moss, hair, and shed reptile skin in *R. h. holerythra* demonstrate that it shares many nesting traits that are considered typical of *Myiarchus* species (Joseph 2004). Similarly, the clutch size (four) we observed for Rufous Mourners was within the typical range for Myiarchine birds (Joseph 2004), and the coloration of the eggs was further reminiscent of that genus. These data provide important additional lines of evidence that affirm *Rhytipterna*'s position within Tyrannidae, and close to *Myiarchus*.

Further, our observations may contribute to our understanding of the evolution of nesting behavior in Tyrannidae. *Myiarchus* species, for which data are available, are widely known to frequently include bits of shed reptile skin in the lining of their nest, a behavior often considered diagnostic of the genus (Lanyon 1985). This curious and specialized behavior has now been documented only twice within Tyrannidae and outside of *Myiarchus* – once in the Rufous Mourner (this report) and once in the cavity-nesting species *Ramphotrigon ruficauda* (Tostain 1989). Molecular data suggest that *Ramphotrigon* is sister to the clade formed by the Myiarchini and the Tyrannini,

a diverse, mostly open-cup-nesting clade that includes the genus *Tyrannus* (Fitzpatrick 2004, Tello et al. 2009, Ohlson et al. 2013). This suggests the intriguing possibility that the incorporation of shed reptile skin in the lining of the nest (in addition to perhaps cavity-nesting itself; Lago-Paiva 1996) may be plesiomorphic with respect to the group, and conserved within Myiarchini. Elucidation of the pattern and history of the use of reptile skin will hinge on future observations of *Sirystes* and *Casiornis*.

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## High Rates of Nest Usurpation by Grayish Baywings (*Agelaioides badius*) in Active Nests of House Wrens (*Troglodytes aedon*) in Central Andes

María Natalia Luchesi<sup>1</sup> and Andrea Astié<sup>1,2</sup>

**ABSTRACT.**—Nest usurpation is a behavior where one individual takes over the active nest of another individual of the same or a different species. The Grayish Baywing (*Agelaioides badius*) has been reported as an occasional inter-specific nest usurper. In previous studies, researchers have reported usurpation of nests of House Wrens (*Troglodytes aedon*) by Grayish Baywings. In this paper, we report that nest usurpation by Grayish Baywings is the second cause of breeding failure in a population of House Wrens in the Central Andes. Received 9 August 2016. Accepted 4 January 2017.

**Key words:** *Agelaioides badius*, Grayish Baywing, House Wren, nest usurpation, *Troglodytes aedon*.

Nest usurpation or nest piracy is a nesting strategy in which individuals of the same or different species take over active nests of other individuals for breeding purposes (Favaloro 1942, Robinson 1985, Lindell 1996) and it often involves agonistic interactions (Lindell 1996, Botero-Delgado et al. 2015). Aggressive behaviors to take over an active nest suggest that the resource is scarce or valuable enough to risk a physical contest (Lindell 1996).

Secondary cavity nesters (birds that depend on existing holes produced by other birds, insects, or decay) are especially competitive for nest sites (Ricklefs 1969, Newton 1994). This high, and sometimes fierce, competition has been explained by the low number of cavities (Newton 1994, Lindell 1996) and high quality of the resource, as cavity nesters experience relatively low nest

predation rates compared to open-cup nesting species (Martin and Li 1992, Lindell 1996). In concordance with these observations, both interference competition and nest usurpation are usually higher in habitats where secondary cavity availability is reduced (Lindell 1996, Botero-Delgado et al. 2015). Lindell (1996) found that >90% of usurpation cases reported in different works occurred in cavity nests, far out of proportion to the percentage of species that use cavities for nesting.

Grayish Baywings (*Agelaioides badius*) rarely build their nests, but they frequently breed in deserted or usurped nests built by other species, mostly furnariids such as Rufous Hornero (*Furnarius rufus*), Firewood-gatherer (*Anumbius anumbi*), and Brown Cacholote (*Pseudoseisura lophotes*) (Friedmann 1929; Fraga 1988, 2011). They also may use nest boxes (Fraga 2011). The House Wren (*Troglodytes aedon*) has been reported as a circumstantial victim of Grayish Baywing usurpation (de Mársico et al. 2010), but rates and costs of this interaction are unknown. In this work, we present evidence of frequent usurpation by Grayish Baywings in a population of House Wrens breeding in nest boxes. The study was conducted in Uspallata (32° 34' 60" S, 69° 19' 60" W), Mendoza, Argentina, during the House Wrens' breeding season (Oct–Feb) from 2008–2011. Uspallata is located in the foothills of the central Andes, at 1,800 m a.s.l. In the study area, both Grayish Baywings and House Wrens occupy anthropomorphized landscapes, mostly poplar plantations. The study area was a 5-ha field developed as a plantation of poplars (*Populus alba*). Prior to the first breeding season, we established 100 nest boxes on the poplar trunks, 2 m high and 25–50 m apart. Nest boxes, made of

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