

NESTING AND FORAGING ECOLOGY OF THE RUFIOUS-CROWNED TODY-TYRANT (*POECILOTRICCUS RUFICEPS*) IN EASTERN ECUADOR

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Resumen. – Anidación y ecología de forrajeo del Tiranuelo de Corona Rufa (*Poecilotriccus ruficeps*) en el este de Ecuador. – Describimos el nido y los huevos del Tiranuelo de Corona Rufa (*Poecilotriccus ruficeps*), y describimos cuantitativamente su ecología de forrajeo en el este de los Andes Ecuatorianos (2100 m). Los nidos (n = 9) eran esféricos y construidos de musgos y hojas, y estaban suspendidos desde las puntas de los retoños de los bambúes (*Chusquea* sp.); la entrada era lateral con un techito. La altura promedio de los nidos sobre el suelo fue de 2.5 m. El tamaño de la nidada (n = 6) fue de 2 huevos. Los huevos eran de color blanco a salmón pálido, con salpicados dispersos café rojizo, más intensos alrededor del extremo más ancho, y medían 16.4 por 12.0 mm. El comportamiento reproductivo fue registrado desde abril a noviembre, siendo el éxito de nidificación de 38%. El Tiranuelo de Corona Rufa forrajaba en el estrato medio-bajo de la vegetación en áreas alteradas (e.g., bambúes en el borde del bosque), principalmente realizando salidas diagonales hacia arriba para atacar insectos en el envés de hojas vivas.

Abstract. – We describe the nest and eggs of the Rufous-crowned Tody-Tyrant (*Poecilotriccus ruficeps*), and quantitatively describe its foraging ecology at 2100 m on the east slope of the Ecuadorian Andes. All nests (n = 9) were moss and leaf balls, with a hooded side entrance, suspended from the tips of *Chusquea* sp. bamboo shoots. Average nest height was 2.5 m. Clutch size, determined at six nests, was two eggs. Eggs were white to pale salmon, with sparse red-brown flecking, heaviest around the larger end and measured 16.4 by 12.0 mm. Breeding behavior was recorded from April to November and nesting success was 38%. Rufous-crowned Tody-Tyrants foraged in the lower-mid strata of vegetation in disturbed areas (e.g., bamboo at forest borders), primarily by making upward-diagonal sally maneuvers to attack insects on the undersides of live leaves. *Accepted 1 July 2005.*

Key words: Andes, Ecuador, egg, foraging ecology, natural history, nest, *Poecilotriccus ruficeps*, Rufous-crowned Tody-Tyrant.

INTRODUCTION

The genus *Poecilotriccus*, originally comprised solely of the Rufous-crowned Tody-Tyrant (*Poecilotriccus ruficeps*), currently includes 11 species of small tyrant flycatchers (Dickinson 2003). Current taxonomy follows the transfer

of nine species from *Todirostrum* (Traylor 1977, Lanyon 1988), the removal of Black-chested Tyrant (*Taeniotriccus andrei*) (Ridgely and Tudor 1994, Dickinson 2003), and the recent description of Lulu's Tody-Tyrant (*Poecilotriccus luluae*) (Johnson & Jones 2001). The natural histories of all *Poecilotriccus* fly-

catchers are poorly known. Published information on behavior is limited to qualitative descriptions, which, while useful, are not suitable for comparative analysis or generalization. The only described nest for the genus is that of the Slate-headed Tody-Flycatcher (*P. sylvia*), which builds a pear-shaped or pyriform nest with a visored side entrance (Cherrie 1916, Skutch 1960).

The Rufous-crowned Tody-Tyrant ranges from northwestern Venezuela to northern Peru, primarily between 1500 and 2500 m on both slopes of the Andes (Ridgely & Tudor 1994). This inconspicuous species occurs in bamboo, second growth, and at forest edges, where it forages in bushes and small saplings, either alone or in pairs (Fjelds  & Krabbe 1990, Ridgely & Tudor 1994). Except for four individuals in breeding condition from Colombia in March to September (Hilty & Brown 1986), nothing has been published regarding its breeding behavior. Here we present observations of nine nests of the Rufous-crowned Tody-Tyrant, and quantitatively describe its foraging behavior and ecology in northeastern Ecuador.

MATERIALS AND METHODS

We made observations from September 2000 to June 2004 at the Andean Biodiversity Research Center on the private reserves of Caba as San Isidro, Yanayacu Biological Station & Center for Creative Studies (00 35.95S, 77 53.40W), and SierrAzul Research Station. These reserves include over 4000 ha of undisturbed montane cloud forest interspersed with pastures and large tracts of naturally occurring *Chusquea* sp. bamboo. This area is located 3–14 km west of Cosanga in the Napo province of northeastern Ecuador, with the centrally located Yanayacu Station being 5 km west along the Las Caucheras road. All observations occurred between 2000

and 2100 m in elevation. We measured nest height to the nearest 10 cm, nest dimensions to the nearest 1 cm, and eggs to the nearest 0.1 mm.

One of us (RCD) recorded foraging behavior and microhabitat use of Rufous-crowned Tody-Tyrants during the periods of April 2002, January–February 2003, and July–August 2003. For each bird observed, at the time of the first attack observed, the observer estimated the bird’s height above the ground and the average canopy height within 3 m of the bird. The observer recorded attack maneuvers (usually 1–5 per bird) and associated prey substrates, following Remsen & Robinson (1990). Definitions of attack maneuvers discussed in this paper are as follows: glean, in which a bird picks prey from a substrate while perched; sally-strike (includes sally-strike and sally-glide of Remsen & Robinson 1990), in which a bird captures prey during direct flight; sally-hover (includes sally-hover and sally-stall of Remsen & Robinson 1990), in which a bird captures prey during sustained hovering or weak hovering (“stalling”); and sally-pounce, in which a bird flies directly to a perch close to prey and immediately gleans the prey upon landing. The observer also estimated and recorded sally angle and sally distance for many sally-type maneuvers and, when possible, leaf type, leaf size, and leaf surface attacked.

RESULTS

Nests. All nests were hanging from the delicate tips of *Chusquea* sp. bamboo shoots, in areas of heavy *Chusquea* growth. They were on the edge of large patches of bamboo, or within large clumps of bamboo, in situations that placed the nests at least 1.5 m from surrounding vegetation. Average nest height (\pm SD) was 2.5 ± 0.4 m (range 2–3.1 m; $n = 9$). Nests were loosely woven balls of moss and dead leaves (predominantly of *Chusquea* sp.), sus-



FIG. 1. Nest of the Rufous-crowned Tody-Tyrant (*Poecilatriccus ruficeps*) with two nestlings ready to fledge. November 2002, Yanayacu Biological Station, Ecuador. Photo H. F. Greeney.

pended by a single bamboo shoot (Fig. 1). An inverted "tail" of material was piled on top and twisted around the supporting stem, giving the nests an overall pear or teardrop

shape. Often a loose skirt or tail of material hung below the nest ball, but this was never well defined. The small side entrances were centrally located and hooded by a slight over-

hang. Nests were neatly lined with pieces of bamboo leaves. Average measurements were: nest ball outside, 12 cm tall by 9 cm wide; inverted "tail," 13 cm tall; opening overhang, 4 cm; opening width, 3.5 cm; opening height, 2.5 cm; inside chamber, 6 cm tall; egg cup, 4.5 cm wide by 3.5 cm deep.

Eggs. Eggs measured (mean \pm SD) 16.4 ± 0.3 by 12.0 ± 0.3 mm ($n = 8$). Eggs were white or slightly salmon colored, with fine red-brown speckling, usually forming an indistinct ring around the larger end. Eggs varied in the degree of markings around the smaller end, but were always more heavily marked at the large end. Clutch size, determined at six nests, was two eggs.

Breeding season and nest success. We found nests with eggs in April (1), May (2), June (2), July (1), and September (1). Two nests, each containing two nestlings, were found in October. Adults with begging juveniles were seen in July (1) and November (2). From these dates we estimate breeding to occur in the area from at least April to November, but possibly year round. These dates coincide with the second half of the wet season and the first half of the drier season (Greeney unpubl.). We determined the final outcome for eight nests. Three nests fledged two young each and five failed, resulting in a nest success of 38%. Rufous-crowned Tody-Tyrants produced 0.75 fledglings per nest, and 2 fledglings per successful nest. Of those that failed, two nests were torn down, presumably by predators, and three were abandoned for unknown reasons. In each of the latter, the eggs were slightly cracked but not eaten.

Behavior and foraging ecology. We observed Rufous-crowned Tody-Tyrants in naturally occurring and human-caused disturbed areas, primarily in *Chusquea* bamboo at forest borders and in second growth. Rufous-crowned

Tody-Tyrants foraged alone and in pairs, with (or near) and away from mixed-species understory flocks. The species' association with mixed-species flocks appears to be opportunistic and variable, and pairs appeared to forage with or near flocks only when a flock moved through their territories.

We recorded 90 foraging events for 38 Rufous-crowned Tody-Tyrants. Mean (\pm SD) foraging height was 3.8 ± 1.6 m (range 1.2–7.6 m; $n = 38$) and mean canopy height above foraging birds was 11.3 ± 5.9 m (range 3.0–27.4 m; $n = 38$). Mean relative height of foraging Rufous-crowned Tody-Tyrants in the vegetation (bird height/canopy height) was 0.40 ± 0.21 (range 0.1–0.9). All Rufous-crowned Tody-Tyrant attacks observed were directed at arthropod prey, primarily small insects. Birds mainly used the sally-strike maneuver (84%) to attack prey, but also employed sally-hover (8%), sally-pounce (7%), and glean (1%) maneuvers ($n = 90$). Prey substrates were primarily live leaves (91%), but also included *Chusquea* bamboo stalks (5%), leaf petioles (2%), a dead leaf (1%), and the air (1%) ($n = 89$). Where the type of live leaf was classified ($n = 56$), 46% were *Chusquea* bamboo leaves (mean dimensions: 1.6 x 12.6 cm) and 54% were unidentified broad leaves (mean dimensions: 7.0 x 14.0 cm). Of attacks where leaf surface was identified ($n = 42$), 79% were directed at the undersides of leaves. Of 89 sally-type attack maneuvers observed, 76% were upward-diagonal, 19% were horizontal, and 5% were vertically upward. Mean sally distance was 67.4 ± 42.3 cm (range 15–150 cm; $n = 54$).

DISCUSSION

The nests and eggs described here resemble those described for the only other species of *Poecilatricus* with a described nest, the Slate-headed Tody-Flycatcher (Cherrie 1916, Skutch 1960). Unlike the nests of Black-

headed (*Todirostrum nigriceps*), Spotted (*T. maculatum*), Yellow-browed (*T. chrysocrotaphum*), and Common (*T. cinereum*) tody-flycatchers, which tend to have a long narrow tail (Todd & Carriker 1922, Skutch 1960, Haverschmidt 1968, Hilty & Brown 1986, Greeney pers. observ.), the nest of the Rufous-crowned Tody-Tyrant is usually tailless or with only a poorly defined “skirt.” The nest of the Slate-headed Tody-Flycatcher, though the descriptions of Skutch (1960) and Cherrie (1916) are a bit unclear, also appears to lack a well defined narrow tail, and thus more resembles that of the Rufous-crowned Tody-Tyrant. Egg coloration of the Rufous-crowned Tody-Tyrant also most closely resembles that of Slate-headed Tody-Flycatcher, rather than the all white or weakly marked eggs of *Todirostrum* (Cherrie 1916, Skutch 1960, Haverschmidt 1968).

Behavior and foraging ecology of the Rufous-crowned Tody-Tyrant appears to be very similar to its sister species, the recently described Lulu’s Tody-Tyrant. Like the Rufous-crowned Tody-Tyrant, Lulu’s Tody-Tyrant occurs almost exclusively in disturbed areas dominated by bamboo and associates with flocks only when flocks pass through their territories. Although no quantitative data are available, Lulu’s Tody-Tyrant primarily attacks insects on the undersides of live leaves by upward sally-strikes, and occasionally makes sally-strikes to small branches, bamboo stalks, and aerial insects, or gleans from a perched position (T. J. Davis in Johnson & Jones 2001). The Spotted Tody-Flycatcher, although not a congener under current classification, is the only closely related species for which quantitative data are available. Like the Rufous-crowned Tody-Tyrant, the Spotted Tody-Flycatcher is also relatively specialized in its foraging behavior and also characterized by upward-directed sally-strike attacks for insects on live foliage (Fitzpatrick 1980). This low-elevation species, however, may attack aerial insects and consume fruits more often

than the Rufous-crowned Tody-Tyrant (see Fitzpatrick 1980).

Once more natural history work has been completed, similarities and differences in nesting and foraging ecology of *Poecilotriccus* and *Todirostrum* may provide further insight into their phylogenetic relationships, and the use of ecological and behavioral traits as phylogenetic characters in general (Zyskowski & Prum 1999). We hope this note encourages further observations on such poorly known aspects of these and other tropical birds.

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