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SHORT NOTE

FIRST DESCRIPTION OF THE NEST, EGGS AND NESTLINGS OF THE BLACK-THIGHED PUFFLEG (*ERIOCNEMIS DERBYI*)

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Abstract · The Black-thighed Puffleg (*Eriocnemis derbyi*) is endemic to the north-central Andes of South America. The species is found in montane forests up to the treeline, from the Central Andes of Colombia to the Andes of northern Ecuador. The reproductive biology of this species is essentially unknown. Here, we describe for the first time the nest, eggs, and nestlings of *E. derbyi*. The nest was built atop a fern frond, in a dense strip of riparian vegetation, near a creek next to a rocky wall. It was cup-shaped, heavily covered with mosses and bromeliads, and made largely of moss. The nest contained two white eggs, both of which hatched, but nestlings were later found dead with no indication of predation. This report provides the first detailed account on the breeding biology of *E. derbyi*.

Resumen · Primera descripción del nido, huevos y pichones del zamarrito muslinegro (*Eriocnemis derbyi*). El zamarrito muslinegro (*Eriocnemis derbyi*) es endémico de los Andes centrales del norte de Suramérica. La especie se encuentra en bosques montanos hasta el límite arbóreo, desde los Andes centrales de Colombia hasta los Andes del norte de Ecuador. La biología reproductiva de esta especie es básicamente desconocida. Aquí, describimos el nido, huevos y pichones de *E. derbyi.* El nido estaba construido en la fronda de un helecho, en una densa franja de vegetación ribereña con abundante musgo y bromelias, cerca de un arroyo, junto a una pared rocosa. Tenía forma de taza, estaba cubierto densamente por musgo y bromelias, y estaba construido principalmente con musgo. El nido tenía dos huevos blancos que eclosionaron, pero los pichones luego fueron encontrados muertos sin rastros de depredación. Este reporte proporciona los primeros datos detallados sobre la biología reproductiva de *E. derbyi*.

Key words: Breeding biology · Ecuador · Hummingbirds · Nest · Trochilidae

INTRODUCTION

The genus *Eriocnemis* (Apodiformes: Trochilidae), with 11 known species, is the most speciose genus of Andean hummingbirds (McMullan 2016, Remsen et al. 2020). *Eriocnemis* hummingbirds are characterized by puffy plumose thighs and occur at 1000 –3850 m a.s.l. in subtropical and upper montane forests, forest edges, and elfin forests up to the treeline from western Venezuela to northwestern Argentina (Fjeldså & Krabbe 1990, Schuchmann et al. 2001, McMullan 2016). There is little information on the reproductive biology of the genus (Winkler et al. 2020): nest descriptions are available for only three species (Schuchmann 1988, Tye & Tye 1990, Juiña & Hickman 2019) and limited observations have been reported on nestlings, fledglings, and adults in breeding condition for four additional species (Gutiérrez et al. 2004, Toloza-Moreno et al. 2014).

The Black-thighed Puffleg (*Eriocnemis derbyi*) is endemic to the north-central Andes (Stattersfield et al. 1998). It has a discontinuous distribution from the departments of Tolima and Quindio in the Central Andes of Colombia south to the provinces of Carchi and Imbabura in Northern Ecuador (Hilty & Brown 1986, Ridgely & Cooper 2011). It occurs in upper montane forest and near the treeline, from 2800 to 3650 m a.s.l. in Colombia (McMullan et al. 2018) and from 3000 to 3500 m a.s.l. in Ecuador (Freile & Restall 2018), where it prefers forest borders, dense second-growth and forested ravines (Cresswell et al. 1999). It's considered uncommon to fairly common and local throughout its known range (BirdLife International 2020). Currently, *E. derbyi* is classified as Vulnerable in Ecuador (Freile et al. 2019) and Near Threatened globally (BirdLife International 2020).

The natural history of *E. derbyi* remains poorly known. It includes a few feeding records from flowers with mid-sized, tubular, and bright-colored corollas (Gutiérrez et al. 2004, Freile & Mazariegos 2006). The breeding biology of *E. derbyi* remains virtually undocumented, with a single record of a male in breeding condition collected in Puracé, Cauca department, Colombia (Hilty & Brown 1986), and observations of females with developed brood patches and juveniles in Galeras, Nariño department,

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Figure 1. Nest of the Black-thighed Puffleg (*Eriocnemis derbyi*), El Carmelo, Carchi Province, northeastern Ecuador. A) Lateral view, 9 March 2019. B) Adult female vigilant near the nest, 9 March 2019. C) Nest cup with two eggs, 9 March 2019. D) Incubating female, 15 March 2019. E) Recently hatched nestlings, 19 March 2019. F) Deceased nestlings and nest cup partially covered by mildew, 30 March 2019. Photos: A-E by Libardo Tello, F by William A. Arteaga-Chávez.

Colombia (Gutiérrez et al. 2004). In this note, we provide the first description of the nest, eggs, and nestlings, along with observations of nest attendance, obtained during occasional visits to a nesting site in northeastern Ecuador between 09 and 30 March 2019.

On 09 March 2019, we found an active *E. derbyi* nest at 2920 m a.s.l. in El Duende-La Vieja ravine (0°39'19.87"N, 77° 36'14.76"W) near El Carmelo, northeastern Carchi, Ecuador. The nesting habitat was a narrow strip (c. 25 m wide) of montane forest surrounded by cattle-grazing fields. The nesting area was a deep creek near a small waterfall and the nest was placed in dense riparian vegetation, composed by ferns, small trees, and bushes, next to a 10 m rocky wall cov-ered by mosses and bromeliads. The nest was located 2 m above the stream.

The nest was placed deep on the underside of a fern frond and covered from above by the leaves of the fern and dry leaves of neighboring plants (Figure 1A). The nest was a rounded cup built with fresh and dry mosses tightly interwoven in the outer lining, attached with sparse spiderweb, and a few rootlets and small dry leaves. On the "back", mosses overhung beyond the bottom of the nest as seen from the front. These external features provided great camouflage. The inner lining of the nest was mostly composed of vegetal wool and pubescence from undetermined Asteraceae species (Figure 1B). The following measurements were taken, after nest monitoring, with a manual caliper (0.1 mm precision): 5.3 cm long on the anterior side, 7.3 cm long on the posterior side, 4.3 x 6.2 cm external cup diameter, 3.9 x 3.2 cm internal cup diameter in cross-section, and 3.5 cm cup depth.

When found, an adult female flew from the nest and perched 4 m from it. It appeared anxious, moving the head sideways before fleeing (Figure 1B). Approximately 12 min

later, the female came back and perched c. 4 m from the nest for a few seconds before flying straight into the nest cup. The nest contained two white eggs (Figure 1C). On 15 March 2019, we visited the nest again and found the female still incubating (Figure 1D). On 19 March, both eggs had hatched. Nestlings had a yellow bill base and dark tip, their eyes were closed, their skin was dusky on the head and pale brownish on the dorsum, and both were only sparsely covered in brown down on their mantle and rump (Figure 1E). We estimated nestlings to be one to two days old following Ortiz-Crespo (2011). The female fed both nestlings once and brooded them for 1 min during our 30 min visit after we inspected the nest.

On 23 March, at 07:47 h, both nestlings were actively begging. Their skin was darker and the down was longer on the mantle. On 30 March, the nestlings were found dead; one of them was partially covered with white mildew that sprouted from the inner cup of the nest (Figure 1F). Nestlings were already decomposing, but neither one had wounds or ectoparasite markings on the cloacae, eyes or other body parts. The nest did not show signs of damage that might suggest a predation attempt. We failed to determine the cause of death.

The nest structure, composition and measurements were similar to previous descriptions for other *Eriocnemis* species (Schuchmann 1988, Tye & Tye 1990, Juiña & Hickman 2019). Similarly, congeners for which nesting habitats are known select similar steep rocky walls and crevices (Schuchmann 1988, Tye & Tye 1990, Juiña & Hickman 2019). Nest material and selection of nesting sites are suggested as strategies of Andean hummingbirds to protect their brood from wind and rain (Ortiz-Crespo 2011). Clutch size was also similar to congeners and other Andean hummingbirds in general, but the entire nestling growth process remains undocumented for the genus as a whole (Winkler et al. 2020).

Anecdotal evidence on breeding seasonality in Colombia suggests that *E. derbyi* breeds during February–July, which corresponds to the rainy season (Hilty & Brown 1986, Gutiérrez et al. 2004). The nest we report contained a complete clutch by early March, suggesting that the breeding season might be similar to that in Colombia. Additional field information is needed to better understand the breeding biology of *E. derbyi* and other Andean hummingbirds throughout their geographic range.

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