

## ARTÍCULO/ARTICLE

The nest, eggs, and nestling of Coopmans's Elaenia *Elaenia brachyptera* (Tyrannidae)Harold F. Greeney<sup>1\*</sup>, Kimberly S. Sheldon<sup>1,2</sup><sup>1</sup>Yanayacu Biological Station & Center for Creative Studies, km 5, vía Las Caucheras, Cosanga, Napo, Ecuador.<sup>2</sup>Department of Ecology and Evolutionary Biology, 569 Dabney Hall, University of Tennessee, Knoxville, TN 37996, USA.\* Corresponding author, email: [antpittanest@gmail.com](mailto:antpittanest@gmail.com)

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## Resumen

Proporcionamos las primeras descripciones del nido, huevos y pichón de la Elenia de Coopmans *Elaenia brachyptera* provenientes de las estribaciones del noreste de Ecuador. Describimos 7 nidos activos, 10 huevos y un polluelo de mediana edad. Los nidos son tazas abiertas, tejidas de fibras y raicillas pálidas y flexibles, decoradas externamente con varios materiales, organizados flojamente. Los nidos se ubicaron en pequeños retoños dentro de llanuras aluviales planas y rocosas. La colocación y la arquitectura del nido hacen que sea difícil diferenciarlos de materiales acumulados de forma natural por las inundaciones periódicas. El tamaño de puesta varió de 1–2 huevos y estimamos que el periodo de incubación duró 15–16 días. Los huevos son típicos del género, blanco-cremosos con pequeñas manchas canela y púrpura pálido (lavanda) concentradas en el extremo más grande. Proporcionamos también una revisión exhaustiva de la literatura publicada sobre los nidos, huevos o ecología reproductiva del género *Elaenia*, lo cual incluye estudios sobre 30 de los 46 taxones actualmente reconocidos.

**Palabras clave:** Biología reproductiva, estribaciones andinas, historia natural, Passeriformes.

## Abstract

We provide the first descriptions of the nest, eggs, and nestling of Coopmans's Elaenia *Elaenia brachyptera* from the foothills of northeastern Ecuador. We describe 7 active nests, 10 eggs, and 1 mid-aged nestling. Nests are open cups, woven of flexible, pale fibers and rootlets, externally decorated with various loosely-arranged materials. They are placed in small saplings within flat, rocky, river floodplains. Nest placement and architecture make nests difficult to distinguish from naturally accumulated materials left behind by periodic flooding. Clutch size ranged from 1–2 eggs and we estimate incubation to last 15–16 days. Eggs are typical of the genus, buffy to creamy white with small cinnamon and lavender spots and blotches concentrated at the larger end. We also provide a comprehensive review of published literature on the nests, eggs, and breeding ecology for the genus *Elaenia*, including studies on 30 of the 46 currently recognized taxa.

**Keywords:** Andean foothills, breeding biology, natural history, Passeriformes.

## INTRODUCTION

The genus *Elaenia* contains between 19 and 22 species (Lanyon, 1988; del Hoyo & Collar, 2016; Remsen *et al.*, 2018), encompassing up to 46 subspecies, that are distributed from Mexico and the Caribbean to the southern tip of South America (del Hoyo *et al.*, 2018b). Compared to many groups of Neotropical flycatchers (Heming *et al.*, 2013), the breeding biology of *Elaenia* is fairly well known, with descriptions of the nests and eggs available for 16 of the 19 species recognized by Banks *et al.* (1998) and Remsen *et al.* (2018). Coopmans's Elaenia *Elaenia brachyptera*, although described more than 100 years ago, has long been considered a subspecies of Lesser Elaenia *E. chiriquensis* (Cory & Hellmayr, 1927; Hilty & Brown, 1986; Ridgely & Tudor, 2009). Previously known as Short-winged Elaenia (Cory & Hellmayr, 1927), its new English name honors the late Paul Coopmans (Kirwan & Freile, 2008; Krabbe, 2008). Differences in vocal (Ridgely & Greenfield, 2001; Boesman, 2016), genetic (Rheindt *et al.*, 2008, 2015), and plumage characters (Dickinson & Christidis, 2014; del Hoyo & Collar, 2016) support its elevation to species status. Coopmans's Elaenia occurs in the Andean



foothills (700–2800 m elevation), favoring semi-open woodland, river edges, and clearings (del Hoyo *et al.*, 2018a). Its known distribution range includes southwest Colombia to northwest Ecuador and, separately, the foothills and adjacent lowlands of eastern Ecuador (Rheindt *et al.*, 2015). Along with Brownish Elaenia *E. pelzelni* and Great Elaenia *E. dayi*, Coopmans's Elaenia has no published breeding information (del Hoyo *et al.*, 2018b). Here, we provide the first description of the nest, eggs, and nestling of this poorly studied species.

## METHODS

From August 2006 to May 2007, during four visits made every 2–3 months, we encountered nests at two localities along the Baeza-Lago Agrio road in the province of Napo, northeastern Ecuador: Río Salado bridge (-0.20555, -77.69055; 1290 m) and Río Malo bridge (-0.15388, -77.6425; 1270 m). We measured nest dimensions to the nearest 0.1 cm, supporting stem diameter to the nearest 0.1 mm, and nest and substrate height to the nearest 0.1 m. All means are given with  $\pm$ SD.

## RESULTS

### Nests

We found seven active nests (Table 1) and an additional seven inactive nests that we suspect belonged to this species, based on their similarity in placement, form, and composition, and through elimination of other potential species building open cup nests in our study region, relying on the first author's experience with the nesting avifauna of this area. The nests (Figs. 1-2) were loosely woven open cups, composed predominantly of long, flexible pale fibers and rootlets. Although the nests lacked a well-differentiated internal lining, the fibers used for the interior of the cup tended to be slightly thinner and more tightly woven than material used for the exterior. Externally, the nests were lightly and loosely decorated with a wide variety of materials, including dead grasses, grass inflorescences, dead dicot leaves, small pieces of green moss, plastic string, spider egg sacs, and lepidopteran cocoons. Silk from these latter two items appeared to be used to help attach external decorations as well as to bind the nest together, especially along the rim and at points of attachment to the substrate. All nests were built in young saplings growing on flat, rocky, river islands or on similar floodplains adjacent to the river. The saplings used as substrates belonged to one of three genera: *Tessaria* ( $n = 5$ , Asteraceae), *Baccharis* ( $n = 5$ , Asteraceae), *Myrica* ( $n = 4$ , Myricaceae). Along with *Piper* (Piperaceae), these were the most common saplings growing in the frequently-flooded areas where we encountered nests. Nests were built into upright forks of 2–6 thin branches ( $n = 14$  nests; mean =  $3.7 \pm 1.1$  supports/nest), with branches measuring 0.5–17.1 mm in diameter ( $n = 51$  supporting branches; mean diameter =  $3.6 \pm 2.6$  mm). The nests were tightly attached to their substrate saplings by flexible fibers woven around the supporting stems as well as with small amounts of spider and lepidopteran silk. Nest height ranged from 0.5 m–1.7 m ( $n = 14$ ; mean =  $1.1 \pm 0.4$  m), and substrate saplings were 0.7–2.5 m tall ( $n = 14$ ; mean =  $1.5 \pm 0.5$  m). Mean dimensions of the seven active nests were:  $7.9 \pm 0.4$  cm outer diameter;  $6.2 \pm 0.4$  cm outer height;  $5.3 \pm 0.1$  cm inner diameter;  $4.1 \pm 0.4$  cm inner depth. Because of the composition, loose external attachment of material, and placement in riverside saplings, the nests of *E. brachyptera* had an overall appearance that was very similar to the many naturally-accumulated clumps of detritus left behind after flooding (Fig. 2).

Table 1. Nests of Coopmans's Elaenia *Elaenia brachyptera* found in the province of Napo, northeastern Ecuador, August 2006 through May 2007.

Date	Location	Contents	Comments
22 Oct	Río Salado	1 developing egg	8 Nov, 1 nestling, 12.6 g, primary pin feathers ruptured 0.5–2.5 mm
22 Oct	Río Salado	1 developing egg	
22 Oct	Río Salado	2 developing eggs	8 Nov, empty, cup slightly disturbed
8 Nov	Río Salado	2 developing eggs	
8 Nov	Río Salado	2 developing eggs	
9 Nov	Río Malo	1 undeveloped egg	23 Nov, 2 developed eggs, 1 pipped
20 Feb	Río Salado	empty but complete, adult adding moss	





Figure 1: Nests of Coopmans's Elaenia *Elaenia brachyptera*, province of Napo, Ecuador (H. F. Greeney).

### Eggs

Of the six nests we observed during incubation, two contained one egg and four contained two eggs. Eggs were pale buff to off-white with cinnamon and lavender spotting and blotching, usually concentrated into an indistinct ring or cap at the larger end (Fig. 3). Ten eggs varied in length from 19.9–20.5 mm and in width from 14.6–15.1 mm (mean:  $20.1 \pm 0.2 \times 14.9 \pm 0.2$  mm). One fresh egg weighed 2.29 g ( $20.0 \times 14.6$  mm), and one well-developed egg weighed 2.08 g ( $20.5 \times 14.9$  mm). One nest contained a single, undeveloped egg on 9 November (Table 1), that we marked with a permanent marker. Upon our return on 23 November, this egg was pipped, and would likely have hatched the following day. From this we estimate an incubation period of 15–16 days.





Figure 2: Nests of Coopmans's Elaenia *Elaenia brachyptera*, province of Napo, Ecuador (above). Naturally accumulated clumps of detritus that are scattered throughout the nesting habitat of Coopmans's Elaenia (below) (H. F. Greeney).

### Nestling

We examined only a single, approximately half-grown nestling (Table 1, Fig. 4). Its eyes were fully opened, its primary feathers had emerged 0.5–2 mm from their sheaths, and contour feathers had ruptured their sheaths on all feather tracts. Feathers on the capital tract were the least developed, those on the crown and nape were just beginning to rupture from their sheaths, while those on the forecrown were unbroken. The tail feathers had emerged 1–3 mm from their sheaths. The emerging feathers of the greater and lesser wing coverts were whitish, but distinctly tinged with yellow. This suggests that immature birds can likely be distinguished from adults by their yellowish (rather than clean white) wing bars. The feathers of the upperparts were dull olive, becoming slightly warmer and browner towards the rump. The lower throat and upper breast feathers were dull olive, fading to yellow on the breast and then to white on the flanks and belly. Although difficult to tell at this age, we



suggest that immature birds will differ from adults in having a darker and more extensive olivaceous wash to the upper breast. The maxilla was dull brownish, dull yellow along the tomia and at the base of the culmen, and still bore a small white egg tooth. The mandible was similar, but overall paler, washed with yellow. The rectal flanges were inflated and bright yellow, while the mouth lining was dull yellow, slightly tinged with orange.

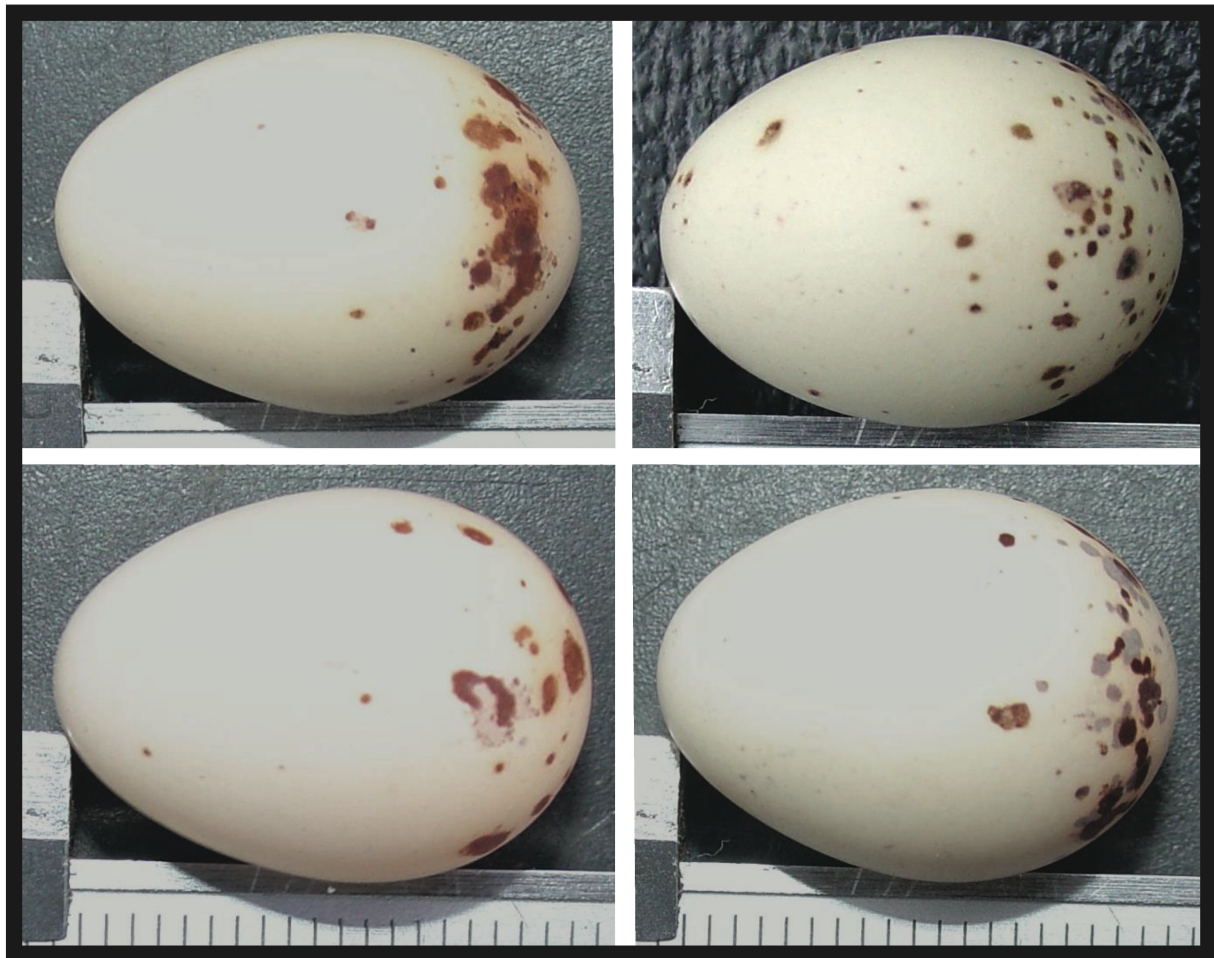


Figure 3: Eggs of Coopmans's Elaenia *Elaenia brachyptera*, province of Napo, Ecuador (H. F. Greeney).

## DISCUSSION

Descriptions are now available for the nests, eggs, or breeding ecology of 17 of the 19 species, and 31 of the 46 currently recognized taxa of *Elaenia* (Banks *et al.*, 1998; del Hoyo & Collar, 2016; Remsen *et al.*, 2018). The published literature includes data for the following taxa: Rufous-crowned Elaenia *E. ruficeps* (Tostain, 1988; Tostain *et al.*, 1992); Plain-crested Elaenia *E. cristata cristata* (von Berlepsch & Hartert, 1902; Cherrie, 1916; Haverschmidt, 1950; Hoffmann *et al.*, 2009; Marini *et al.*, 2009; Borges & Marini, 2010; Lopes *et al.*, 2013); Mottle-backed Elaenia *E. gigas* (Stawarczyk *et al.*, 2009; Greeney *et al.*, 2010); two subspecies of Highland Elaenia: *E. obscura obscura* (Hartert & Venturi, 1909; Smyth, 1928; Narosky & Salvador, 1998; de la Peña, 2001) and *E. o. sordida* (Nehrkorn, 1899; von Ihering, 1900; Lopes *et al.*, 2013); Slaty Elaenia *E. strepera* (Hartert & Venturi, 1909; Narosky & Salvador, 1998; de la Peña, 1999; Auer *et al.*, 2007); four subspecies of Yellow-bellied Elaenia: *E. flavogaster flavogaster* (Euler, 1867, 1900; Sclater & Salvin, 1879; Wells, 1886; Nehrkorn, 1899; von Ihering, 1900; von Berlepsch & Hartert, 1902; Hartert & Venturi, 1909; Chubb, 1910; Cherrie, 1916; Bond, 1928; Smyth, 1928; Snelhage, 1935; Belcher & Smooker, 1937; Hellebrekers, 1942; Miller, 1963; Snow & Snow, 1964; Haverschmidt, 1968; Oniki, 1986; ffrench, 1991; Davis, 1993; de Andrade, 1996; Narosky & Salvador, 1998; Chatellenaz & Ferraro, 2000; Buzzetti & Silva, 2008; Pereira & Melo, 2009; Lopes *et al.*, 2013; Hayes, 2014); *E. f. subpagana* (Cherrie, 1890; Carriker, 1910; Peck, 1910; Stone, 1918; Hallinan, 1924; Skutch, 1950, 1951, 1953; Amadon & Eckleberry, 1955; Skutch, 1960, 1985; Howell & Webb,

1995; de Andrade, 1996); *E. f. pallidodorsalis* (Stone, 1918; Wetmore, 1972; Ricklefs, 1976) and *E. f. semipagana* (Taczanowski, 1884); *E. parvirostris* (Barrows, 1883; von Berlepsch & Hartert, 1902; Hartert & Venturi, 1909; Cherrie, 1916; Serié & Smyth, 1923; Smyth, 1928; de la Peña, 1987, 1999; Darrieu *et al.*, 1988; Narosky & Salvador, 1998; Buzzetti & Silva, 2008; Hayes, 2014); Large Elaenia *E. spectabilis* (Schönwetter, 1967; de la Peña, 1987, 1995; Narosky & Salvador, 1998; Chatellenaz & Ferraro, 2000; di Giacomo, 2005; Hoffmann & Krügel, 2007); Noronha Elaenia *E. ridleyana* (Oren, 1982); two subspecies of Lesser Elaenia: *E. chiriquensis chiriquensis* (Skutch, 1945, 1951; Blake, 1956; Skutch, 1960; Dickerman, 1971; Ricklefs, 1976, 1977) and *E. c. albivertex* (von Berlepsch & Hartert, 1902; Belcher & Smooker, 1937; Munves, 1975; French, 1991; Narosky & Salvador, 1998; Medeiros & Marini, 2007; de Paiva, 2008; Pereira & Melo, 2009; Borges & Marini, 2010; Lopes *et al.*, 2013); Coopmans's Elaenia *E. brachyptera* (this study); Olivaceous Elaenia *E. mesoleuca* (Nehrkorn, 1899; von Ihering, 1900; Hartert & Venturi, 1909; Narosky & Salvador, 1998; Hayes, 2014); Sierran Elaenia *E. pallatangae intensa* (Taczanowski, 1884; Londoño, 2014); three subspecies of White-crested Elaenia: *E. albiceps albiceps* (Allen, 1893; Schönwetter, 1979); *E. a. chilensis* (Oustalet, 1891; von Ihering, 1900; Oates & Reid, 1903; Gibson, 1918; Smyth, 1928; Hellmayr, 1932; Reynolds, 1934; Johnson, 1965; Johnson & Goodall, 1967; Schönwetter, 1979; de la Peña, 1987; Narosky & Salvador, 1998; Ojeda & Trejo, 2002; Willson *et al.*, 2005; Mella & Loutit, 2007); and *E. a. modesta* (Taczanowski, 1884; Nehrkorn, 1899); three subspecies of Mountain Elaenia: *E. frantzii frantzii* (Skutch, 1951; Blake, 1956; Skutch, 1967); *E. f. pudica* (Sclater & Salvin, 1879; Oates & Reid, 1903; Miller, 1963; Calderón-Leytón, 2002) and *E. f. ultima* (Howell & Webb, 1995); five subspecies of Caribbean Elaenia: *E. martinica martinica* (Verrill, 1892; Oates & Reid, 1903; Bond, 1941); *E. m. caymanensis* (Diamond, 1980); *E. m. riisii* (Schönwetter, 1979); *E. m. barbadensis* (Schönwetter, 1979) and *E. m. remota* (Howell & Webb, 1995); and two subspecies of Greater Antillean Elaenia *E. fallax fallax* (Bond, 1943; Schönwetter, 1979) and *E. f. cherriei* (Bond, 1943).

With respect to basic nest form (open-cup), as well as egg form and coloration, information provided herein for *E. brachyptera* is clearly well-aligned with previous descriptions for the genus (see above). Similarly, a mean clutch size of 1.7 ( $n = 6$  clutches; Table 1) follows general latitudinal trends towards reduced clutch size nearer the equator both within the genus *Elaenia* and for birds in general (Patten, 2007; Jetz *et al.*, 2008). The resemblance of nests to flood-accumulated detritus has not been remarked upon for other species of *Elaenia*, and it is not known if the nesting of *E. brachyptera* is restricted to river floodplains. We encourage additional nest descriptions for this species, whose breeding remains unknown from other portions of its range (del Hoyo *et al.*, 2018a). Testing the validity and effectiveness of this interesting form of mimetic nest crypsis will no doubt provide interesting insights into the species' natural history.



Figure 4: Mid-aged nestling of Coopmans's Elaenia *Elaenia brachyptera*, 8 November 2006, province of Napo, Ecuador (H. F. Greeney).



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