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Documentation of the nest of the Greenish Tyrannulet *Phyllomyias virescens*

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SUMMARY.—Most species of the genus *Phyllomyias* either lack formal nest descriptions or their nests are little known, representing a significant knowledge gap among Neotropical tyrannids. Here we describe two nests of Greenish Tyrannulet *Phyllomyias virescens* in Brazil. The nests were open semi-spheres placed high in trees, quite different from the published nest description for this species as closed/spherical and sited low above the ground. Our data suggest that the single, previously described nest of Greenish Tyrannulet was misidentified.

As currently considered (e.g., Clements *et al.* 2023) the genus *Phyllomyias* comprises 14 species of small Neotropical forest tyrannids morphologically similar to the rather distantly related members of the genus *Phylloscartes*, with which they are often confused (Clay *et al.* 1998, Winkler 2020). The natural history of *Phyllomyias* is poorly known, particularly with respect to breeding, with three species (Plumbeous-crowned Tyrannulet *P. plumbeiceps*, Reiser's Tyrannulet *P. reiseri* and Ulrich's Tyrannulet *P. urichi*) lacking a nest description and two others (Sclater's Tyrannulet *P. sclateri* and Greenish Tyrannulet *P. virescens*) with only one published description each (Croزاریol 2016a,b, Winkler *et al.* 2020). As far as is known, *Phyllomyias* nests are lichen-covered open bowls sited on the upperside of branches or in forks of branches near the tops of trees: Gonzaga & Castiglioni (2007) described such a nest of Planalto Tyrannulet *Phyllomyias fasciatus*, the type species of the genus, and photos of two nests of *P. reiseri* in Bahia, Brazil (e.g., Wikiaves 2415535 and 3681227) also conform to this pattern. Among currently recognised species in the genus, only Grey-capped Tyrannulet *P. griseocapilla* departs from this general description, having well-documented, closed, globular nests (Croزاریol 2016a, Legal 2018).

Greenish Tyrannulet occurs in south-east and south Brazil, eastern Uruguay, eastern Paraguay and north-eastern Argentina (Sick 1997, Fitzpatrick 2020). The only nest reported was found in Argentina and was in a 1.5 m-tall bush growing on the bank of a small stream. It was 80 cm above the ground and constructed around a branch that hung vertically and served as a longitudinal axis, with other branches incorporated as structure for the walls of the nest, which was made entirely of moss. The nest was purse-shaped with an upper side entrance. Externally, it measured 40 cm tall, 10 cm wide and 3 cm in diameter (Castelino & Saibene 1989). As noted by Areta *et al.* (2021) in their description of nests of Rough-legged Tyrannulet *Phyllomyias burmeisteri*, this simple description did not provide documentation of adults at the nest or other data that could confirm identification of the species. Here we present the first documentation of the nest of Greenish Tyrannulet, which further suggests that the description of the nest in Argentina was based on a misidentification of (almost certainly) Mottle-cheeked Tyrannulet *Phylloscartes ventralis* as Greenish Tyrannulet.

On 6 December 2016, at c.14.00 h, BMW & FS heard the distinctive vocalisations of Greenish Tyrannulet and observed an adult (Fig. 1A; <https://macaulaylibrary.org/asset/488851>) carrying small pieces of lichen (Fig. 1B) to build a nest. Habitat at the site was mixed ombrophilous forest (22°41'24.31"S, 45°28'52.84"W; 1,525 m) in the public use



Figure 1. Adult Greenish Tyrannulet *Phyllomyias virescens* at N1; close to the nest (A), with small pieces of lichens to add to the nest (B) and settled in the nest (C) (Fabio Schunck). Video links in the text further document species identity and behaviours, including participation of both members of the pair in nest construction.

area of Campos do Jordão State Park—Horto Florestal, a reserve of 503 ha in the Serra da Mantiqueira, municipality of Campos do Jordão, eastern São Paulo, Brazil. This first nest (N1) was in a *Podocarpus lambertii* about 20 m tall at the forest edge, within a concentration of taller *Araucaria angustifolia* trees reaching heights of 25–30 m (Fig. 2). The nest was c.14 m above ground, on top of a branch about 7 cm in diameter and angled c.40° above the horizontal. It was an open semi-sphere or shallow cup with a low edge covered with lichens and was quite well camouflaged in the middle of a cluster of orchids (Orchidaceae), climbing ferns (*Microgramma* spp.) and mosses (Fig. 1C; <https://macaulaylibrary.org/asset/488847>). Both members of the pair participated in nest construction, and their behaviours indicated the nest was nearly complete. After taking lichens to the nest and working them into the nest rim, each of the adults spent 2–3 minutes forming the nest cup by shuffling in a circular arc, occasionally rearranging material in the rim or fine, grass-like fibres below the rim with the bill and settling briefly in the incubation position (<https://macaulaylibrary.org/asset/488847>).



Figure 2. Approximate location of the nest site (N1) of Greenish Tyrannulet *Phyllomyias virescens* (white ellipse) near Campos do Jordão, São Paulo, Brazil (Fabio Schunck)



Figure 3. Nest site (N2) of Greenish Tyrannulet *Phyllomyias virescens* (red circle) in Santa Catarina, Brazil (Tony Bichinski)

org/asset/488849, <https://macaulaylibrary.org/asset/488850>). This behaviour was repeated several times at 3–7-minute intervals until 16.00 h, when the authors left the site. FS returned 35 days later (10 January 2017). There was no sign of the nest or the birds, which was not unexpected given that the combined extremes ascribed to tyrannids for incubation (16 days) and fledging (17 days) is 33 days (Winkler *et al.* 2020).

A second nest (N2) was found by TB on the edge of a roughly 85-ha fragment of mixed ombrophilous forest (26°48'54"S, 51°34'16"W; 1,304 m) in the municipality of Água Doce, northern Santa Catarina state, Brazil. The site had a high diversity of trees of the family Lauraceae with emergent *Araucaria angustifolia* and a canopy height of c.13–15 m. On 1 October 2015, at about 09.30 h, an adult Greenish Tyrannulet was observed carrying material to construct a nest about 11 m above ground inside a cluster of small branches of an *Ocotea porosa* tree about 18.5 m tall (Fig. 3). The nest was an open semi-sphere (cup) composed of lichens, mosses and spider webs which the bird brought at intervals of 2–10 minutes, occasionally vocalising during the process. The material was placed after the bird settled inside the structure and rotated on the horizontal axis, arranging the edges and interior of the nest, which was judged to be in the final stages of construction. Activities were monitored until 11.00 h, when the bird stopped visiting the nest. No photographic or audio documentation was made at this nest (N2), and it was not possible to return to the site in the following days.

The two observed nests differ markedly from that described by Castelino & Saibene (1989) in at least three characteristics: tree height (20 m for N1 and 18.5 m for N2 vs. 1.5 m for the previously described nest); distance above ground (14 m for N1 and 11 m for N2 vs. 80 cm); and nest architecture (open semi-sphere/cup for N1 and N2 vs. closed/elongated/lateral according to Crozariol 2016a). Somewhat similar confusion has surrounded the nest of Grey-capped Tyrannulet, the first of which was described as cup-shaped (a semi-sphere) by Traylor (1977) and later nests as closed/spherical (Piato *et al.* 2015, Legal 2018). Recent studies (T. Bichinski & D. Buzzetti pers. obs.) indicate that Grey-capped Tyrannulet occupies abandoned nests of other birds, especially species that build closed nests, partially covering only the egg chamber. Due to the similarity of birds of the genus *Phyllomyias* to other syntopic tyrannids, such as Mottle-cheeked Tyrannulet, which builds a generally low (<4 m above ground), closed/spherical nest with moss (Narosky & Salvador 1998; see Fig. 4; BMW pers. obs.), the description published by Castelino & Saibene (1989) appears to involve an identification error. In other words, in the genus *Phyllomyias*—as currently defined (which will require significant revision; see Fig. 1 of Harvey *et al.* 2020 and the informative discussion in Areta *et al.* 2021)—only Grey-capped Tyrannulet uses closed, spherical nests (notwithstanding these being adapted nests of other species of birds).

Finally, we note that Areta *et al.* (2021) suspected that von Ihering's (1900) description of a nest attributed to *P. burmeisteri*, which they judged to closely match their descriptions of that species in several respects including specific nest-lining material, might actually pertain to *P. virescens* as a result of taxonomic confusion. However, exactly as is the case with the probably misidentified nest described by Castelino & Saibene (1989), lack of independently verifiable documentation of the adults involved prevents reliable identification among multiple syntopic species of these tyrannulets. As such, the burden of proof must (continue to) lie with clearly disproving von Ihering's (1900) description as pertaining to *P. burmeisteri* (or proving that the correct identification as *P. virescens*). This carries over to von Ihering's (1902) description of a different nest with an egg but, in this case, it may eventually be possible to confidently identify the species by matching his detailed description of the egg to one or the other of several small tyrannulets' eggs that are as yet undescribed.



Figure 4. Typical nest of Mottle-cheeked Tyrannulet *Phylloscartes ventralis*, consisting mostly of mosses in a closed/spherical and suspended architecture, with an adult perched at the opening feeding nestlings, Pirai do Sul, Paraná, Brazil (24°35'S, 49°47'W; 1,033 m) (Tony Bichinski)

Natural history studies, including those focused on breeding, are essential to obtain data on bird species that remain poorly known, such as Greenish Tyrannulet. Thus, it is necessary to invest in basic field studies of Neotropical birds to acquire data that expand existing knowledge and support conservation actions.

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