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SHORT NOTE

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# FIRST RECORDS OF RHYNOCRYPTID UNDERSTORY BIRDS IN THE CANOPY OF CHILEAN TEMPERATE RAINFORESTS

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**Abstract** · We documented the first observations of rhinocryptid birds in the canopy of a temperate rainforest in southern Chile. In the Bosque Pehuén Park, located in the southern Chilean Andes (39°42'S, 71°75'W), we installed camera traps in six old *Nothofagus dombeyi* trees, one per tree between 12 and 21 m above the forest floor. Traps were active from January to April 2017. The camera traps recorded three species of rhinocryptids in the canopy, between 12 and 14 m, Black-throated Huet-Huet (*Pteroptochos tarnii*), Chucao Tapaculo (*Scelorchilus rubecula*), and Magellanic Tapaculo (*Scytalopus magellanicus*). These records of rhinocryptids are unexpected since these species are currently believed to inhabit only on the forest floor and in the understory. This new information indicates that the canopy could occasionally provide food, shelter and nesting places for these birds.

**Resumen · Primeros registros de rinocríptidos en el dosel de los bosques templados del sur de Chile**
En este trabajo documentamos las primeras observaciones de rinocríptidos en el dosel en los bosques templados del sur de Chile. En el parque Bosque Pehuén, en los Andes del sur (39°42'S, 71°75'W), se instalaron trampas cámara en seis árboles antiguos de *Nothofagus dombeyi*, una trampa por árbol, entre los 12 y los 21 m de altura. Las trampas estuvieron activas entre Enero y Abril de 2017. Las trampas cámara registraron tres especies de rinocríptidos entre los 12 y los 14 m de altura: Huet Huet (*Pteroptochos tarnii*), Chucao (*Scelorchilus rubecula*) y Churrín del sur (*Scytalopus magellanicus*). Estos registros de rinocríptidos son inesperados ya que estas especies se consideraban sólo como habitantes del suelo y del sotobosque. Esta nueva información indica que el dosel podría ocasionalmente proporcionar alimentos, refugio y lugares de anidación para estas aves.

**Key words:** Chile · Forest canopies · *Pteroptochos tarnii* · Rhinocryptidae · *Scelorchilus rubecula* · *Scytalopus magellanicus* · South American Temperate Rainforest · Understory birds

## INTRODUCTION

Rhinocryptidae is a unique family of birds endemic to Neotropical region, consisting of 12 genera and about 60 species, distributed between Costa Rica (10° N) and Cape Horn (56° S) (Fjeldså & Krabbe 1990, del Hoyo et al. 2003, Clements et al. 2017). Members of this family are part of the autochthonous and primary fauna of South America (Vuilleumier 1985). They are non-migratory species with little flight capacity, and all species are ground or dense understory dwellers (Fjeldså & Krabbe 1990, del Hoyo et al. 2003).

Five endemic species of rhinocryptids inhabit the South American Temperate Rainforests of southern Chile and western-most Argentina: Black-throated Huet Huet (*Pteroptochos tarnii*), Chestnut-throated Huet-Huet (*Pteroptochos castaneus*), Chucao Tapaculo (*Scelorchilus rubecula*), Magellanic Tapaculo (*Scytalopus magellanicus*), and Ochre-flanked Tapaculo (*Eugralla paradoxa*) (Fjeldså & Krabbe 1990, Willson et al. 2014). Although some of these individuals have occasionally been observed more than 4 m above the forest floor, climbing among the highest branches of the understory performing vocalizations, these species have generally been considered as terrestrial, strongly associated with the ground and the dense forest understory (Goodall et al. 1946, Fjeldså & Krabbe 1990, Reid et al. 2004, Willson et al. 2014). Accordingly, the presence of rhinocryptids in the forest canopy has not been previously recorded.

In this study, we report the first observations of rhinocryptids using the forest canopy of South American Temperate Rainforests. We analyzed the importance of tree crowns as habitat for these bird species in addition to the significance these observations have in order to understand how these species may use different forest strata as habitat.

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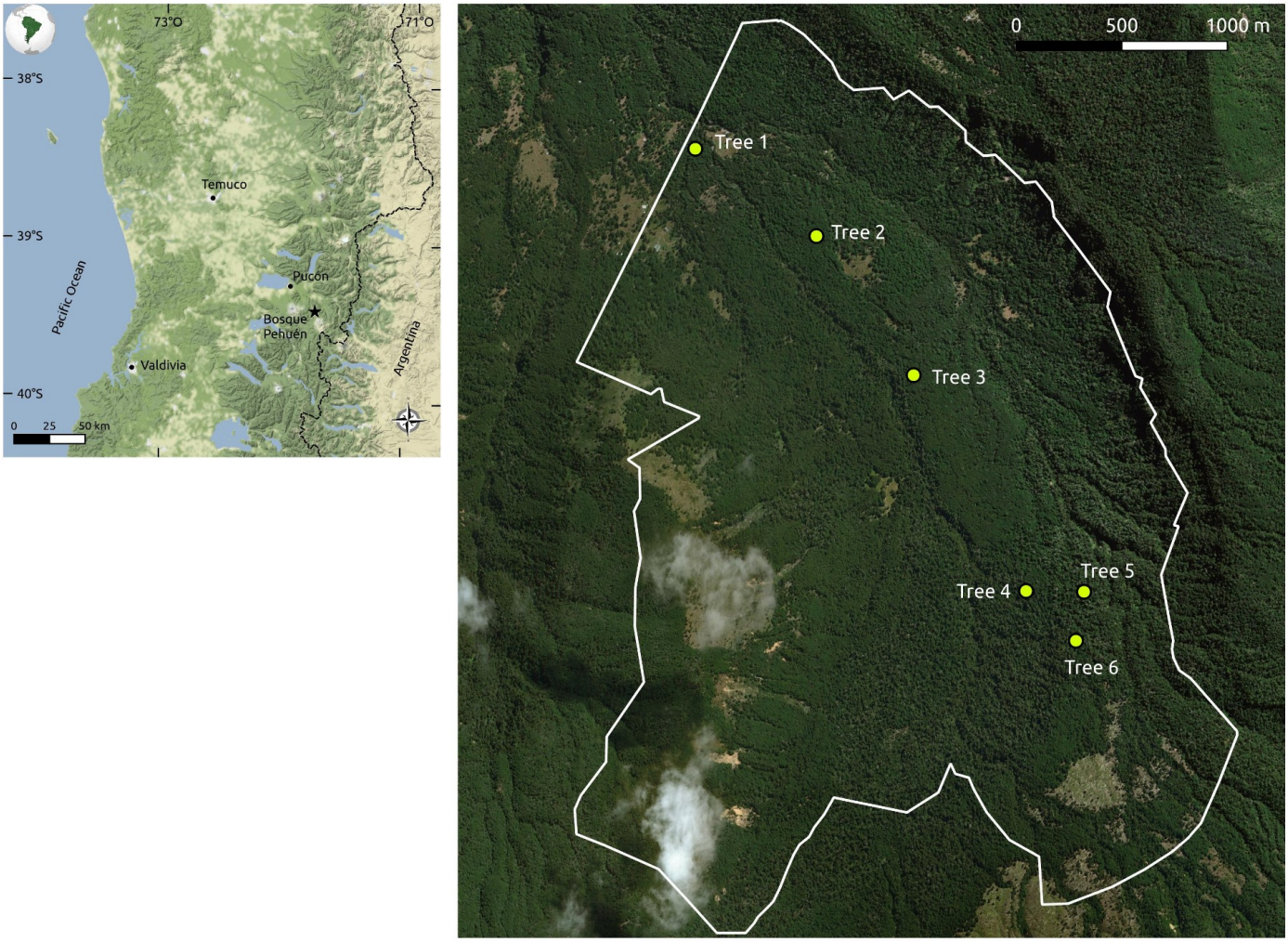


**Figure 1.** Location of the Bosque Pehuén Park and spatial distribution of research trees in the Andes of southern Chile.

## METHODS

This study was conducted in the Bosque Pehuén Park, a privately protected 880 ha area located at 860 m a.s.l. in the Andes of southern Chile (39°42'S, 71°75'W) (Figure 1). The climate is temperate with a mean annual temperature of 10°C and an annual rainfall of 2300 mm (Agromet-INIA 2012). The park is covered by old-growth and second-growth forests of *Nothofagus dombeyi* and *Nothofagus alpina* (Nothofagaceae) (Díaz et al. 2017). The understory is composed of shrubs, saplings, and bamboo thickets of *Chusquea culeou* up to 4 m high (Díaz et al. 2017). We selected six large, old *N. dombeyi* trees (over 200 years old) between 80 and 200 cm DBH and between 26 and 29 m tall, all of which were at least 250 m from one another along a trail more than 3 km long (Figure 1). The sampled trees were located in both secondary forests at 860, 940, and 968 m a.s.l., and in old-growth forests at 1050, 1100, and 1190 m a.s.l. (Figure 1). All trees were located in areas with gentle slopes and with sparse bamboo understory less than 4 m high, far below from the canopy. This avoided any possible physical proximity between the ground or the understory and the tree crowns. All sampled trees were among the largest in the area. In the secondary forests, selected trees corresponded to large individuals that were not harvested by loggers, representing biological legacies from the original forests. In the old -growth forest, selected trees were among the largest trees present. We climbed each tree using arborist techniques (Perry 1978), and installed a single camera trap per tree (Bushnell Trophy Cam, Bushnell Corporation, Overland Park, KS, USA) between 12 and 21 m above the forest floor, inside the tree crowns. Each camera trap was aimed at a large nearby branch (1.5 to 2 m from the camera), where a small wooden platform with oatmeal was placed in an attempt to attract small mammals. Each camera trap was programmed to work 24 hours per day and take photos when any nearby movement occurred (Oliveira-Santos et al. 2008). Camera traps were active in the canopy from 19 January to 12 April 2017, during the Southern Hemisphere's summer and fall.

## RESULTS AND DISCUSSION

Three species of rhinocryptids were recorded in the canopy (Table 1, Figures 2b–d). The Black-throated Huet-Huet was the most frequently recorded species, with records 12.3–14.4 m above the forest floor, in three different trees (Table 1). Magellanic Tapaculo and Chucao Tapaculo were also recorded 12.3 m above the forest floor in the same tree (Table 1). All observations occurred in January and February, at 07:00 h, 10:00 h, 19:00 h, and 20:00 h (Table 1), at the end of the nesting season. In the study species, breeding commonly starts between September and October, and young abandon the nests at the end of January (Fjeldså & Krabbe 1990, Willson et al. 2014).

The three species of rhinocryptids detected are the only three ones that inhabit our study area (Díaz et al. unpubl.

**Table 1.** Records of rhinocryptids in the tree canopy at Bosque Pehuén Park, southern Chile. For each observation date, time, height (m) of the camera trap, species, number of individuals (N), and tree number are provided.

| Date | Time | Height (m) | Common name | Scientific name | N | Tree number |
|---|---|---|---|---|---|---|
| 19 Jan 2017 | 10:41 | 12.3 | Magellanic Tapaculo | *Scytalopus magellanicus* | 1 | Tree 1 |
| 3 Feb 2017 | 19:57 | 12.3 | Black-throated Huet-Huet | *Pteroptochos tarnii* | 1 | Tree 1 |
| 3 Feb 2017 | 19:57 | 12.3 | Black-throated Huet-Huet | *Pteroptochos tarnii* | 1 | Tree 1 |
| 3 Feb 2017 | 19:58 | 12.3 | Black-throated Huet-Huet | *Pteroptochos tarnii* | 1 | Tree 1 |
| 3 Feb 2017 | 19:58 | 12.3 | Black-throated Huet-Huet | *Pteroptochos tarnii* | 1 | Tree 1 |
| 3 Feb 2017 | 19:59 | 12.3 | Black-throated Huet-Huet | *Pteroptochos tarnii* | 2 | Tree 1 |
| 11 Feb 2017 | 20:46 | 12.3 | Chucao Tapaculo | *Scelorchilus rubecula* | 1 | Tree 1 |
| 18 Feb 2017 | 07:53 | 12.5 | Black-throated Huet-Huet | *Pteroptochos tarnii* | 1 | Tree 2 |
| 22 Feb 2017 | 07:19 | 14.4 | Black-throated Huet-Huet | *Pteroptochos tarnii* | 1 | Tree 4 |

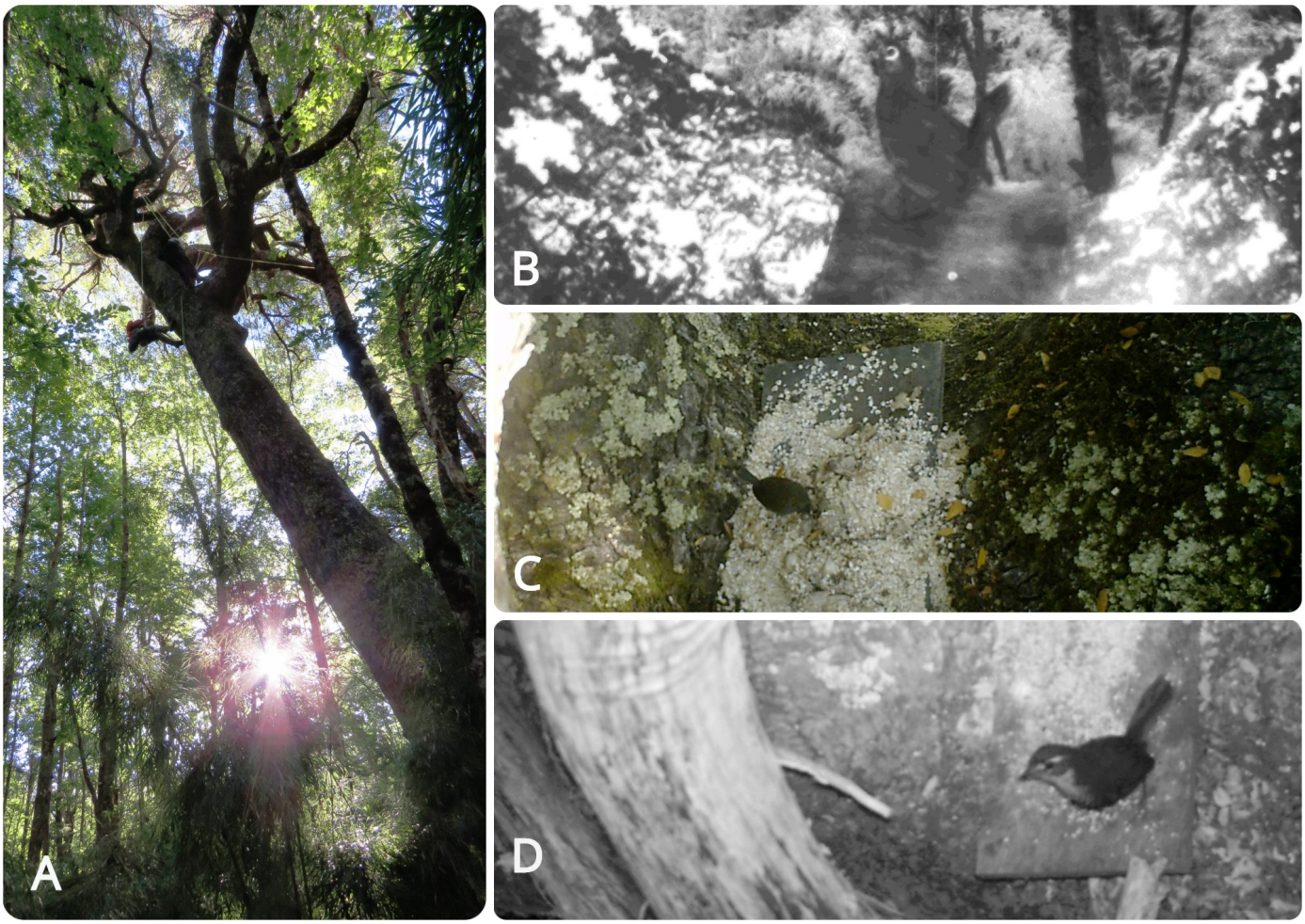


**Figure 2.** (A) Authors ascending to one of the studied *Nothofagus dombeyi* trees; (B) Black-throated Huet-Huet (*Pteroptochos tarnii*); (C) Magellanic Tapaculo (*Scytalopus magellanicus*); (D) Chucao Tapaculo (*Scelorchilus rubecula*). Photo A is a courtesy of Felipe González; photos B, C, and D were captured by camera traps in tree crowns of large trees in Bosque Pehuén Park, southern Chile.

data). Our records appear to be occasional because few were obtained in a four-month period; however, camera traps recorded only a single branch of each tree, excluding the rest of the tree crown. Our records could, therefore, underestimate the frequency of rhinocryptid visits. Furthermore, although our accounts may appear to have recorded an accidental visit of a single individual, this may not be the case since one tree was visited by all three rhinocryptid species, while in other tree sampled, two Black-throated Huet-Huet were recorded in the same photo (Table 1). The bait remained on the platforms for varying time periods among trees. However, no longer than three weeks after installation, since birds, such as the Chimango Caracara (*Phalcoboenus chimango*, Falconidae) consumed all of the bait during this time. Therefore, we believe that the bait had no direct effect on the presence of rhinocryptids in the canopy, although it may attract insects, and could thus indirectly have attracted the rhinocryptids.

Chilean species of rhinocryptids have always been considered terrestrial birds (Fjeldså & Krabbe 1990, Hoyo et al. 2003, Reid et al. 2004, Willson et al. 2014). The lack of research at the canopy level in South American Temperate

Rainforest may explain the lack of observations of these species in tree crowns. Nonetheless, Goodall et al. (1946) reported two Black-throated Huet-huet nests 10 and 15 m above the forest floor, while Willson et al. (2014) observed some Chucao Tapaculo nests between 4 and 10 m high, in places where abrupt slopes allowed some tree branches to be close to the ground. These observations were ground based and distances were visually estimated, and could therefore be over or under-estimated. However, no other author has previously recorded a single rhinocryptid using the canopy. The observations of Goodall et al. (1946) and Willson et al. (2014) complement our records, suggesting that rhinocryptids could use tree crowns more frequently than expected.

The bamboo understory is the main habitat of rhinocryptids in South American Temperate Rainforests (Reid et al. 2004, Willson et al. 2014). However, tree-tops could also provide resources and shelter. Clement et al. (2001), Díaz et al. (2012) and Ortega-Solís et al. (2017) have documented an abundant and diverse community of invertebrates in the canopy of the South American Temperate Rainforest, which could represent a food supply for rhinocryptids. Cavities in old trees or snags found in the canopy could also represent a suitable refuge or nesting site (Ellinger et al. 2001, Cornelius et al. 2008), only previously documented for the Black-throated Huet-Huet (Goodall et al. 1946). Our records raise new questions about the true presence of rhinocryptids in the canopy. It is essential to continue exploring the biology and canopy use of rhinocryptids, since tree crowns may be more important for the conservation of this and other understory bird species.

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