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PENSOFT

Range extensions of two species of *Odontophorus* (Galliformes, Odontophoridae) in the Eastern Colombian Andes

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Abstract
Odontophorus hyperythrus Gould, 1858 and *Odontophorus strophium* (Gould, 1844) are endemic to Colombia. The species *O. hyperythrus* is distributed on both the slopes of the Western and Central Andes, and in the southern part of the Eastern Andes' eastern slope, in the Huila, Cauca, and Caquetá departments. *O. strophium* is distributed on the western slope of the Eastern Andes, in the Santander and Cundinamarca departments. This study reports new records of the two species in the *Odontophorus* genus in the Boyacá department, which represents an extension if its distribution range.

Key words
Distribution; Boyacá; *Odontophorus hyperythrus*; *O. strophium;* Gorgeted Wood-Quail; Chestnut Wood-Quail.

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Introduction

The genus *Odontophorus* contains 15 species (Galliformes, Odontophoridae) and is distributed in Central and South American tropical forests (Skutch 1947, Carroll 1994, Bonaccorso and Barreto 2002, Sarria 2003, Hilty and Brown 2009, del Hoyo et al. 2014, Remsen et al. 2016). These birds are known as wood quails, due to their forest-dwelling, ground-based, granivorous habits (Hilty and Brown 2009). They tend to hide, preferring to nest on the ground, and live in family groups without a dominance hierarchy; females exclusively incubate the eggs. They probably defend group territories or activity areas through agonistic behaviors, of which duets or coordinated choruses stand out (Skutch 1947, Flieg 1970, Schwartz and Lentino 1984, Mcdonald and Winnett-Murray 1989, Stiles and Skutch 1989, Roberts et al. 2000, Hale 2004, Fierro and Franco 2006, Hilty and Brown 2009).

Gorgeted Wood-Quail, *O. strophium* (Gould, 1844) and Chestnut Wood-Quail, *O. hyperythrus* Gould, 1858, are endemic to Colombia. Their altitudinal ranges vary between 1500–2500 m and 1600–2,700 m, respectively. The altitudinal intervals are highly affected by deforestation. *Odontophorus strophium* is distributed on the western slope of the Eastern Andes in the Santander and Cundinamarca departments (Collar et al. 1992, Sarria and Álvarez 2002, Hilty and Brown 2009, Carroll and Kirwan

Figure 1. *Odontophorus strophium*, male; Municipality of Campohermoso, Boyacá department, Colombia.

2016). Records also exist of their presence on the eastern flank of the Eastern Andes, in the Boyacá department (Laverde and Gómez 2016), and in the Cundinamarnca department (Álvarez-Rebolledo 2016).

Odontophorus hyperythrus is distributed on both slopes of the Western and Central Andes, and in southern Colombia on the eastern slope of the Eastern Andes, in the Huila and Caquetá departments (Salaman et al. 1999, Fierro and Franco 2006, Hilty and Brown 2009, Birdlife international 2016, Carroll et al. 2016).

Both species inhabit humid mountain forests, often populated by Colombian oaks, *Quercus humboldtii* Bonpl. Due to factors such as hunting, deforestation, and the expansion of agricultural borders, natural populations of these oaks are declining. This has led to of the assessment of *O. strophium* as Endangered, both nationally and globally (Renjifo et al. 2014, Birdlife international 2016, IUCN, 2016). *Odontophorus hyperythrus* is globally Near Threatened (Birdlife International 2016, IUCN 2016), but with the status of Least Concern within Colombia.

Based on new field observations, we report extend the range of *O. strophium* and *O. hyperythrus* in the Eastern Andes (Boyacá department). These records are of interest, as document populations and broaden our knowledge of the natural history and ecology of these species. These records may form the basis for new projects oriented toward the conservation of both species.

Methods

This investigation was conducted in the municipalities of Campohermoso (Macanalito, 05°03′46.74″ N, 073°08′47.88″ W, elev. 1990 m), Macanal (Agua Blanca Chiquita, 04°57′39.10″ N, 073°14′05.17″ W, elev. 1671 m), and Santa María (Caño negro, 04°53′08. 45″ N, 073°16′49.06″ W, elev. 1546 m), on the eastern slope of the Eastern Andes, in Boyacá department. Elevations varied between 1017 m and 2214 m. The climate of study area exhibits between 2200 mm and 2500 mm of precipitation per year, and temperatures range from 13 °C to 24 °C.

Field observations were made from May to September 2015. In addition, 77 camera traps (25 in Macanal, 26 in Santa María, and 26 in Campohermoso) were used to record ground species. The trap activation period was 30 days per locality.

The study area is located between the Sub-Andean and Andean life region of the Colombian Eastern Andes. It has tropical humid forests in various degrees of conservation, from small fragments to large and extensive areas, dedicated to productive activities such as agriculture and livestock production. The forest fragments have closed canopies, and are dominated by *Hedyosmum* spp., *Clusia* sp., *Cyathea* sp., *Protium* sp., *Myrsine* sp., *Alchornea* sp., *Clethra* sp., *Weinmannia* sp. *Eschweilera* sp., *Guarea* sp., *Ceroxylum quindiuense*, and *Podocarpus oleifolius*, as well as *Bejaria mutis*, *Bocconia* sp., *Brunellia* sp.,

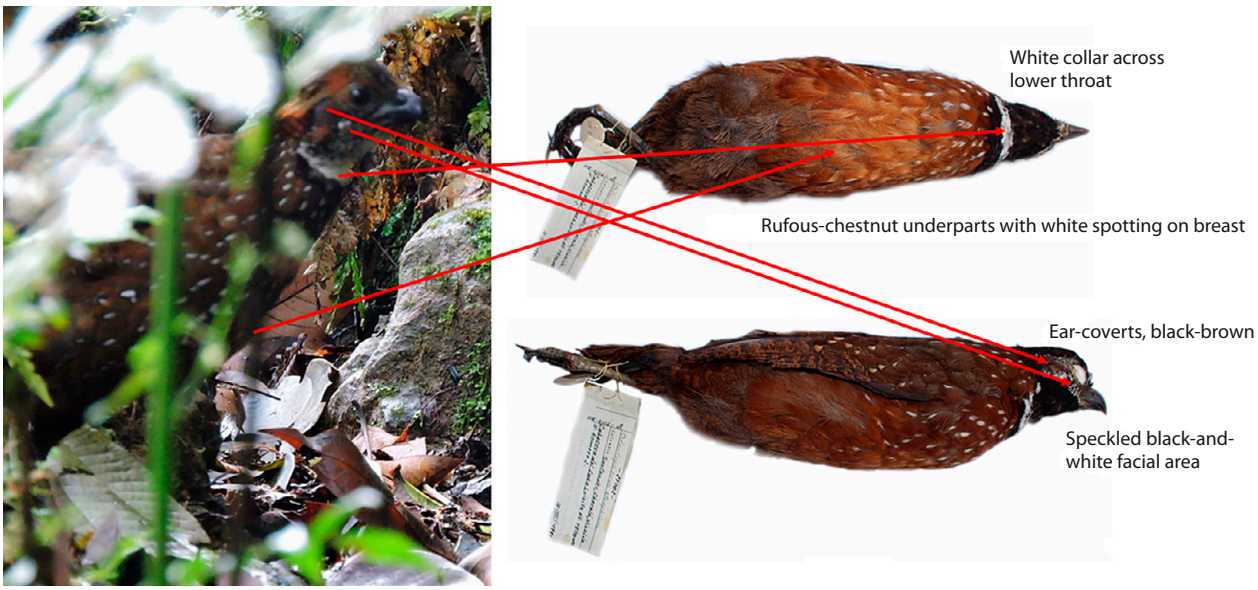

Figure 2. Diagnostic characters of *Odontophorus strophium*. Left: Specimen observed in field. Right: specimen of the collection of birds of the Instituto de Ciencias Naturales-Universidad Nacional de Colombia.

Escallonia mutis, *Heliocarpus* sp., and *Caladium bicolor* (Fernández-Alonso 2009). The precipitation regime is bimodal-tetraseasonal (Rangel-Ch. 1997).

To identify *Odontophorus* species, the publications of Hilty and Brown's (2009) as well as Del Hoyo et al. (2014) were used. In addition, both species were confirmed by experts (Frank Garfield Stiles, Institute of Natural Sciences, Universidad Nacional de Colombia; Andrés Cuervo and Sergio Córdoba, Alexander von Humboldt Institute). We also reviewed the collections at the Alexander von Humboldt Institute and consulted Romero-Zambrano (1983), Fierro and Franco (2006), and Carroll and Kirwan (2016). Among the diagnostic characters taken into account to determineor is : so? complement the information documented bye "documentos especializados"? the species, for adult males from the *O. strophium* group, we used those provided by Romero-Zambrano (1983) and for *O. hyperythrus,* those from Hilty & Brown (2009).

Results

We recorded five (5) individuals of *O. strophium* (Figs 1, 2) on a road in the Macanalito countryside in the municipality of Campohermoso (at 16:30 hours) and one (1) in Santa Maria (at 6:30 hours). For *O. hyperythrus*, we recorded two (2) individuals by camera trap (10:30 hours), located inside a forest in the Agua Blanca Chiquita countryside, in the municipality of Macanal (Fig. 3), and two (2) individuals in Santa Maria (8:30 hours), in the Los Túneles sector of Vereda Caño Negro. Individuals of *O. strophium* were distinguished by presented the mottled back with fine white stripes, the posterior part of the darker pile (from coffee to blackish); the neck is chestnut with narrow bands of black color, the list of superciliary is flocked of black, white and yellowish brown and the sides of the neck were greyish. The individuals of *O. hyperythrus* were distinguished by presented the following characters: the ocular area nude with a whitish list behind the eye, the upper parts are vermiculite brown, large black spots on the scapulars and some gray marks on the nape and wings. The sides of the head and the lower parts are chestnut colored. The results show that the *O. strophium* species exhibited an extension south of its known distribution, establishing it in the department of Boyacá, on the eastern slope of the Cordillera Oriental, increased its distribution range by approximately 107 km and *O. hyperythrus* increased its distribution range by approximately 309 km. In addition these records complements those of Laverde and Gómez

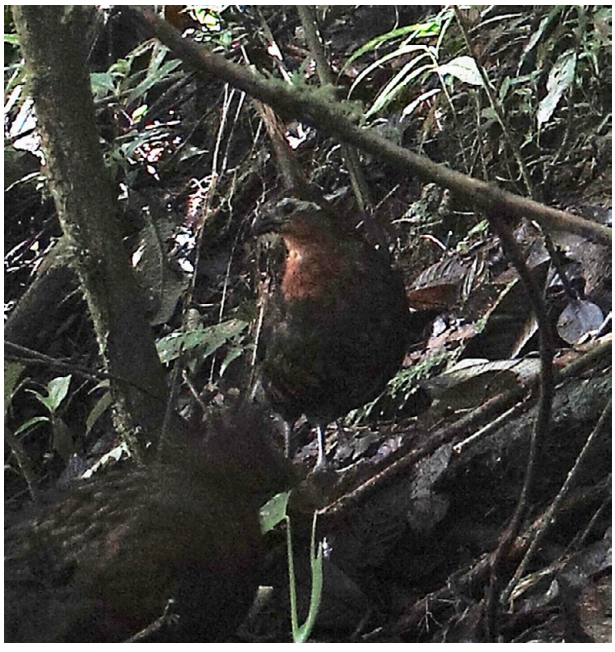

Figure 3. *Odontophorus hyperythrus*, female, (note the white line above its eyes); Municipality of Macanal, Boyacá department, Colombia. Image captured in a camera trap.

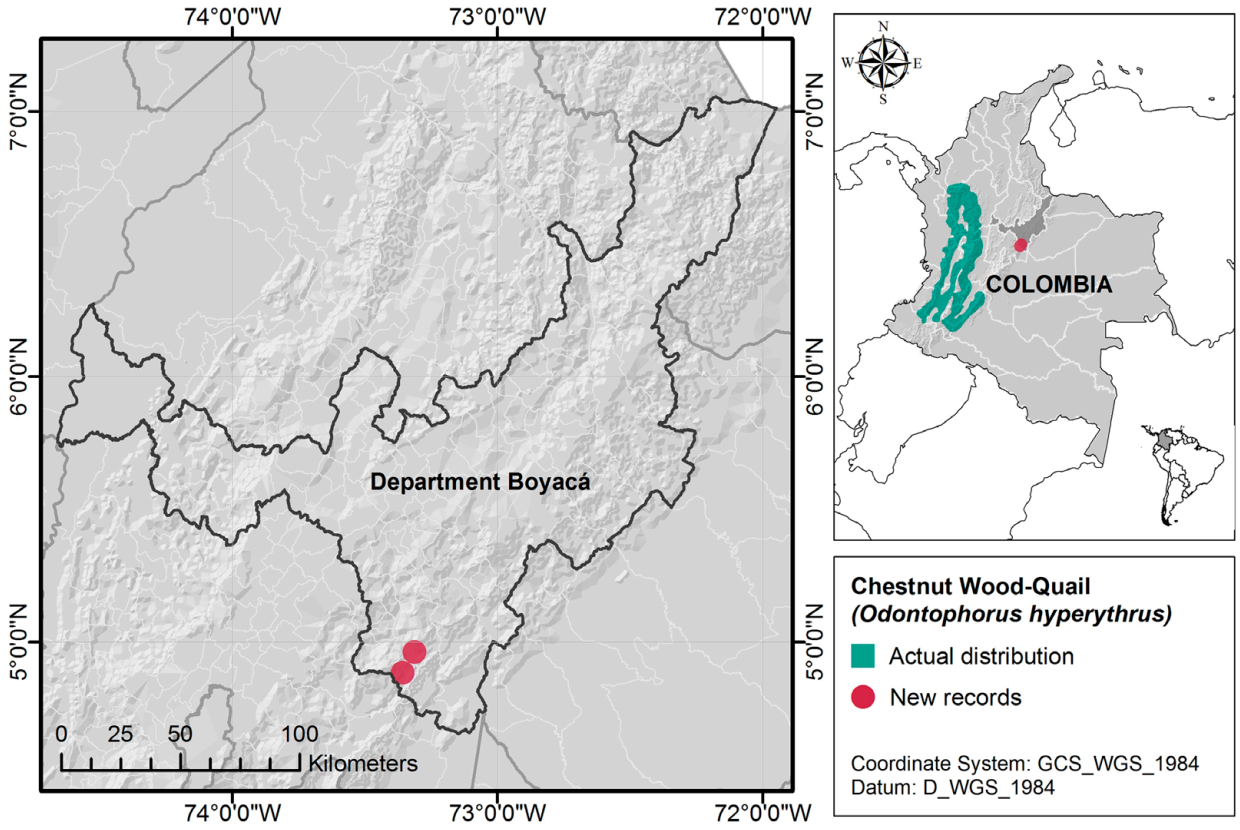

Figure 4. Known distribution (green) and new records (red) of *Odontophorus hyperythrus* in the Eastern Cordillera, Boyacá department, Colombia.

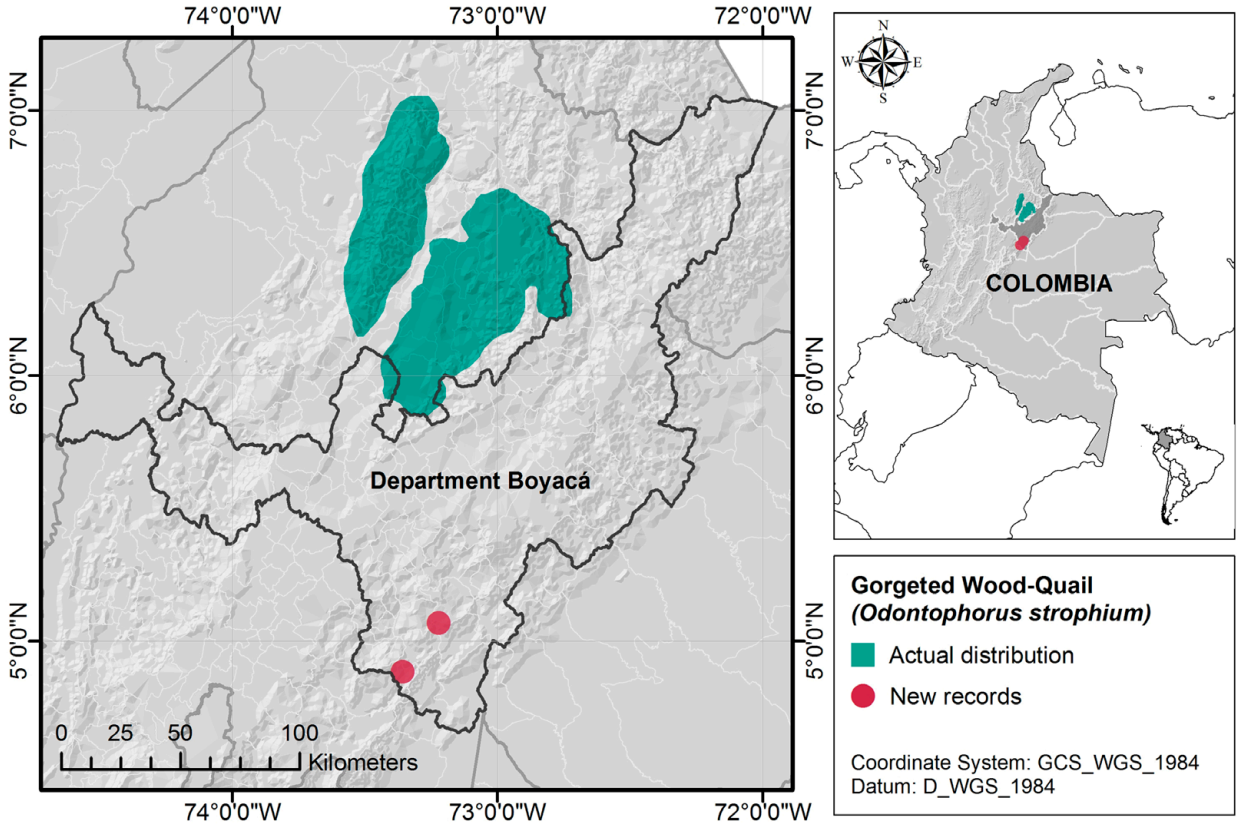

Figure 5. Known distribution (green) and new records (red) of *Odontophorus strophium* in the Eastern Cordillera, Boyacá department, Colombia.

(2016) with documented information (photographs and coordinates).

Discussion

Finding these 2 species in the Boyacá department extends the range to the north of their known distribution range in Colombia (Figs 4, 5).Our records of both species of *Odontophorus* were collected within the standard altitudinal interval and within the known vegetation types (Hilty and Brown 2009). However, these records extend the known distributions of both species (Figs 4, 5). For *O. strophium*, a more southern distribution (by ca 146 km), toward the eastern flank of the Eastern Andes, was identifiedHowever, Álvarez-Rebolledo (2016) has an auditory record for the municipality of Medina (Cundinamarca), which, as suggested by Stiles (pers. comm. 2017), must use cautiously given the similarity of the song of *O. Strophium* with other species of the genus. *Odontophorus hyperythrus* was recorded further to the north than previously known (by ca 309 km).

These range extensions are important records for Boyacá, because they imply the presence of 2 more bird species in that department. There is a lack of bird studies in this department. Such studies are necessary for the conservation, because these birds there are threatened by habitat fragmentation and loss due to agricultural expansion and livestock farming. In addition, important threats to populations of birds are intensive hunting (Birdlife 2016).

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Authors' Contributions

GPD and BHC collected the data, GPD, BHC, JCC and HA wrote the text. GPD and JCC made the analysis.

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