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SHORT COMMUNICATION

First record of the gray-legged tinamou, *Crypturellus duidae*, and other poor-soil specialist birds from peatlands in the Putumayo River basin, Loreto, Peru

Francisco A. VÁSQUEZ-ARÉVALO[1*], Ricardo ZÁRATE-GÓMEZ[2], Jacob B. SOCOLAR[3], Juan DÍAZ-ALVÁN[4], Pedro E. PÉREZ-PEÑA[5]

[1] Universidad Nacional de la Amazonía Peruana (UNAP). Facultad de Ciencias Biológicas. Pebas 5ta Cuadra, Iquitos, Maynas, Loreto, Peru

[2] Instituto de Investigaciones de la Amazonía Peruana (IIAP), Programa de Investigación en Cambio Climático Desarrollo Territorial y Ambiente, Av. A. Quiñones km 2.5 (Iquitos), San Juan Bautista, Maynas, Loreto, Peru

[3] Norwegian University of Life Sciences, Universitetstunet 3, 1430 Ås, Norway

[4] Universidad Científica del Perú (UCP), Av. A. Quiñones km 2.5 (Iquitos), San Juan Bautista, Maynas, Loreto, Peru

[5] Instituto de Investigaciones de la Amazonía Peruana (IIAP), Programa de Investigación en Biodiversidad Amazónica, Av. A. Quiñones km 2.5 (Iquitos), San Juan Bautista, Maynas, Loreto, Peru

* Corresponding author: fvasquezare@gmail.com; https://orcid.org/0000-0002-8177-0757

ABSTRACT

Crypturellus duidae (Tinamidae) is a poor-soil specialist with isolated populations in Amazonia, and is considered restricted to white-sand forest habitats. We report the first record of *C. duidae* in a peatland forest in northern Peru, in the Putumayo River basin. Our record extends the known distribution of *C. duidae* between two disjoint areas of occurrence in Peru and Colombia, and shows its presence in peatland forest, another forest type on nutrient-poor soils. Additionally, we report the presence of other poor-soil specialist bird species that were previously registered in peatlands. Together with the new record of *C. duidae*, these bird records provide evidence of the diversity of poor-soil specialists in peatland forests.

KEYWORDS: *Mauritia flexuosa,* palm swamps, white-sand forests, Amazonia

Primer registro de la perdiz de pata gris, *Crypturellus duidae*, y otras aves especialistas de suelos pobres en turberas en la cuenca del Río Putumayo, Loreto, Perú

RESUMEN

Crypturellus duidae (Tinamidae) es considerada un ave especialista de suelos pobres, con poblaciones aisladas y restrictas a bosques sobre arena blanca en Amazonía. En este trabajo reportamos el primer registro de *C. duidae* en un bosque de turbera al norte de Perú, en la cuenca del Río Putumayo. Nuestro registro extiende la distribución conocida de *C. duidae* entre dos áreas de ocurrencia disjunta entre Perú y Colombia, y muestra su presencia en bosques de turbera, otro tipo de bosque sobre suelos pobres en nutrientes. Adicionalmente reportamos la presencia de otras aves especialistas de suelos pobres anteriormente registradas en turberas. En conjunto con el nuevo registro de *C. duidae*, esos registros de aves proporcionan evidencia de la diversidad de especialistas de suelos pobres en bosques de turberas.

PALABRAS-CLAVE: *Mauritia flexuosa*, pantanos de palmeras, bosque sobre arena blanca, Amazonía

In the Loreto region, in the northern Peruvian Amazon, white-sand forests are a distinctive collection of forest types characterized by high stem densities (roughly 1000 stems > 10 cm DBH per hectare), a canopy as low as 5 m (García-Villacorta *et al.* 2003), and a distinctive floristic assemblage dominated by specialist trees (Zárate *et al.* 2015). The avifauna is also distinctive and includes a variety of specialist species such as *Polioptila clementsi* Whitney and Álvarez, 2005, *Neopelma chrysocephalum* Pelzelm, 1868, *Zimmerius villarejoi* Álvarez and Whitney, 2001, among others (Álvarez *et al.* 2012; Álvarez *et al.* 2013; Borges *et al.* 2016; Díaz-Alván *et al.* 2017; Socolar *et al.* 2018).

The gray-legged tinamou, *Crypturellus duidae* J.T. Zimmer, 1938 (Tinamidae) is a poorly known species distributed disjunctly on nutrient-poor white-sand forests across northern South America (Schulenberg *et al.* 2010; BirdLife

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International 2017; Borges *et al.* 2017). In Peru, the species is known exclusively from white-sand forests in the Nanay and middle Tigre river basins (Álvarez and Whitney 2003; Díaz-Alván *et al.* 2017). The species is apparently absent from extensive white-sand forests along the Morona River and south of the Amazonas River (O'Shea *et al.* 2015; Schmitt *et al.* 2017).

Recent work in Loreto has documented extensive peatland forests in swampy river floodplains (Draper *et al.* 2014). Forests that receive floodwaters are frequently dominated by the palm *Mauritia flexuosa* L.f., while domed ombrotrophic peatland swamps, that receive water and nutrients only from precipitation, and not through connections with water currents, such as minerotrophic peatlands (Lähteenoja *et al.* 2009), resemble white-sand forests in several important ways, including severe nutrient limitation, stunted physiognomy, and low epiphyte loads (Draper *et al.* 2014). Moreover, while these forests are severely depauperate in tree species, the few that are present are often shared with white-sand forests and include white-sand specialists (Zárate *et al.* 2013; Draper *et al.* 2018). The avifauna of ombrotrophic peatlands also shows clear white-sand affinities. For example, recent records indicate that peatlands along the lower Tigre River, in Loreto-Peru, harbor white-sand specialists (Díaz-Alván *et al.* 2017).

Here, we report a record of *Crypturellus duidae* from a peatland forest in the Putumayo River basin in Loreto, Peru. In addition to being the first record of *C. duidae* from a peatland forest, this is the first record of the species in Peru far from white sand and its known occurrence areas in the upper Nanay River basin in Peru and in the Chiribiquete region of Colombia (Álvarez *et al.* 2003).

From 14 August to 11 September 2017 we surveyed bird communities in peatlands and *terra firme* forests dominated by the palms *Mauritia flexuosa* and *Oenocarpus bataua* Mart., respectively, along the upper Putumayo River, Loreto, Peru. In the vicinity of our sampling site, we assessed habitat in 20 x 50 m tree plots (Stohlgren *et al.* 1995; Judd *et al.* 1999). On 1 September 2017, near the town of Santa Rita, on the Yubineto River, we recorded the distinctive song of *Crypturellus duidae* from a peatland dominated by *M. flexuosa* (1°00′02.12″S, 74°19′39.35″W; Figure 1). The song was recorded at 07;25 a.m.using an LG H502 smartphone and the RecForce II application for Android system. The voice-recording is diagnostic for *C. duidae* and is available in the Xeno Canto library (XC429170, www.xeno-canto.org). In addition to the voice-recorded individual, we detected two further individuals vocalizing nearby.

Habitat at the site consisted of palms with scattered dicot trees growing on waterlogged substrate. The canopy height varied roughly between 12 to 19 m, with emergent trees and palms as tall as 25 m. Stem densities (≥ 10 cm DBH) varied between 78 and 96 stems per 0.1 ha, of which 17 to 23 stems

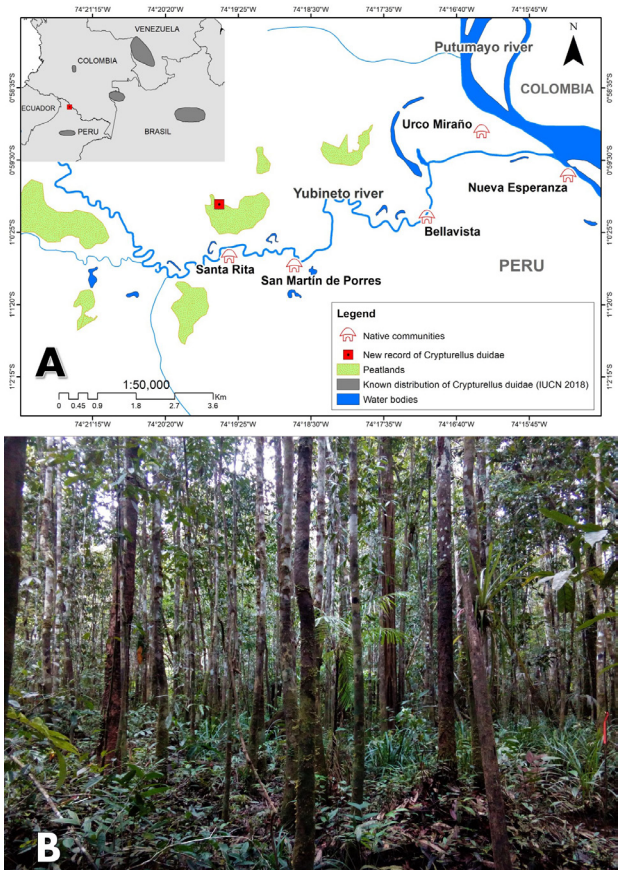

Figure 1. A – Location of the record of the gray-legged tinamou, *Crypturellus duidae* in the Yubineto River drainage, Putumayo, Loreto Peru. The inset shows the global range of *C. duidae* (based on BirdLife International). B – Image of the habitat in which the gray-legged tinamou was recorded. This figure is in color in the electronic version.

involved the dominant palm *M. flexuosa*. Other common tree species included *Oxandra euneura* Diels, *Euterpe precatoria* Mart., *Cynometra spruceana* Benth., *Virola pavonis* (A. DC.) A.C. Sm., among others.

Apart from *Crypturellus duidae*, we recorded in the upper Putumayo study area a number of other bird species with white-sand forest affinity in peatlands, *terra firme* forests, and non-peatland floodplain forest (Table 1). Our records represent a new habitat and an extension of the known distribution range of *C. duidae* in Peru. Amazonian peatlands are geologically ephemeral formations, with radiocarbon dates for the onset of peat accumulation generally of a few thousand years ago (Lähteenoja *et al.* 2012; Roucoux *et al.* 2013). Thus, the ocurrence of *C. duidae* on isolated peatlands in northern Loreto, coupled with the presence of a variety of poor-soil specialist species in the surrounding *terra firme*, suggests that *C. duidae* might maintain low-density populations across a vast forest area between known populations near Iquitos, Peru and in Chiribiquete, Colombia.

Table 1. Poor-soil specialist birds (Álvarez et al. 2013; Borges *et al.* 2016) registered in the Putumayo River basin in Loreto, Peru. Habitat codes: F = floodplain forest; P = peatland; T = terra firme forest. Previous peatland record = Species was previously registered in peatland forests according to Díaz-Alván *et al*. (2017).

Species	Family	Common name	Habitat	Previous peatland record
Nyctibius bracteatus	Nyctibiidae	Rufous Potoo	F	
Trogon rufus	Trogonidae	Black-throated Trogon	P, T	X
Galbula dea	Galbulidae	Paradise Jacamar	T	X
Northarchus ordii	Bucconidae	Brown-banded Puffbird	T	X
Megastictus margaritatus	Thamnophilidae	Pearly Antshrike	T	X
Hypocnemis hypoxantha	Thamnophilidae	Yellow-browed Antbird	F, T	
Sclerurus rufigularis	Furnariidae	Short-billed Leaftosser	T	X
Deconychura longicauda	Furnariidae	Long-tailed Woodcreeper	T	
Lepidocolaptes duidae	Furnariidae	Duida Woodcreeper	T	X
Lophotriccus galeatus	Tyrannidae	Helmeted Pygmy-Tyrant	T	X
Conopias parvus	Tyrannidae	Yellow-throated Flycatcher	F, T	X
Ramphotrigon ruficauda	Tyrannidae	Rufous-tailed Flatbill	F, P, T	X
Attila citriniventris	Tyrannidae	Citron-bellied Attila	F, P, T	X
Heterocercus aurantiivertex	Pipridae	Orange-crowned Manakin	F, P, T	X
Dixiphia pipra	Pipridae	White-crowned Manakin	T	X

While peatland pole forest (a type of ombrotrophic peatland different in physiognomy and composition of plant species than peatland dominated by *M. flexuosa*; Draper *et al.* 2014, 2017) is known to harbor a variety of white-sand specialist birds (Díaz-Alván *et al.* 2017), our records of *C. duidae* and other poor-soil specialist species recorded on peatlands are the first from peatlands dominated by *M. flexuosa* (peatland palm swamp) (Draper *et al.* 2014, 2017). Because *M. flexuosa* palm swamps dominate a vast area of northern Peru (Draper *et al.* 2014), these records suggest that some of these species might be more widely distributed than previously thought.

The mechanisms governing habitat selection for *C. duidae* and other white-sand specialists are not well known. It is perhaps noteworthy that the vast majority of *C. duidae* records from the Nanay basin are from white-sand forests on waterlogged substrates with a deep layer of organic humus ("varillal humedo"; J. Socolar, personal observation), which may affect the foraging or nesting ecology of *C. duidae*. On white-sand, *C. duidae* is often associated with dense understory stands of the palm *Euterpe catinga* Wallace, which do not exist at the Putumayo site, though its congener *E. precatoria* is relatively common. It is also possible that *C. duidae* is a dietary specialist on fruit or invertebrate resources that are restricted to moist poor-soil forests.

As in Peru, in other countries, *C. duidae* is considered an indicator species of white-sand forest (Hurd *et al.* 1995; Borges *et al.* 2016, 2017). However, there is a previous record of *C. duidae* within the Chiribiquete National Park, in a flooded forest with a structure similar to forests that grow on poor soils (Álvarez *et al.* 2003). Although it is known that there are peatlands in the Guayana Highland landscape (including the Serranía de Chiribiquete) (Zinck and Huber 2011), it is not known whether the record of *C. duidae* was related to a peatland forest. The presence of species with isolated populations, such as *C. duidae* and other poor-soil specialist birds in the upper Putumayo region suggests the existence of previously unrecognized poor-soil bird assemblages across northernmost Peru, which possibly afford connectivity between populations on the Guianan shield and populations near Iquitos (Socolar *et al.* 2018).

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