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# Range extension of *Diclidurus scutatus* (Chiroptera, Emballonuridae) to southwestern Amazonia

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**ABSTRACT**

*Diclidurus scutatus* is an aerial insectivore bat endemic of South America and considered rare throughout its distribution range. We present the first record of this species in Rondônia State, northern Brazil, expanding its distribution more than 1000 km into southwestern Amazonia. Including this record, *D. scutatus* is known for 20 localities from eight countries (Brazil, Colombia, Ecuador, French Guiana, Guyana, Peru, Suriname, Venezuela), and two biomes—Amazonia and Atlantic Forest.

**KEYWORDS:** distribution, lesser ghost bat, western Amazon, Rondônia

# Extensão da distribuição de *Diclidurus scutatus* (Chiroptera, Emballonuridae) para o sudoeste da Amazônia

**RESUMO**

*Diclidurus scutatus* é um morcego insetívoro aéreo, endêmico da América do Sul e considerado raro em toda sua área de distribuição. Apresentamos o primeiro registro dessa espécie para o estado de Rondônia, norte do Brasil, expandindo sua distribuição em mais de 1000 quilômetros para o sudoeste da Amazônia. Incluindo o presente registro, *D. scutatus* é conhecido para 20 localidades em oito países (Brasil, Colômbia, Equador, Guiana Francesa, Guiana, Peru, Suriname, Venezuela) e dois biomas—Amazônia e Mata Atlântica.

**PALAVRAS-CHAVE:** Amazônia ocidental, distribuição, morcego, Rondônia

The determination of a taxon's distribution is important to understand evolutionary and biogeographic processes, and provides information about the ecology and natural history of a species (Whittaker *et al*. 2005). Studies that contribute to the knowledge of the distributional limits of a species, especially rare ones, are also important for conservation biology initiatives (Teixeira *et al*. 2014).

The bat genus *Diclidurus* Wied-Neuwied, 1820 has four species, all endemic to the Neotropics (Simmons 2005). They are insectivorous bats with fast flight ability that forage at great heights in the forest canopy, open areas and above water courses (Kalko *et al*. 1996; Lim *et al*. 1999). *Diclidurus* species are rare in inventories due to the difficulty in capturing the animals using traditional mist-net methodology, and most of their records come from manual capture, collection with firearms, and mist-nets placed in the forest canopy or near foraging areas, such as lampposts (Handley 1976; Dalponte and Aguiar 2009; Escobedo and Velazco 2012; Ferreira *et al*. 2013).

The lesser ghost bat, *Diclidurus scutatus* Peters, 1869, is an endemic bat from South America, with widespread occurrence in the Amazon and a single record for the Atlantic Forest in southeastern Brazil (Sodré and Uieda 2006; Escobedo and Velazco 2012). As conventional methods have small capture success for this species, the distribution limits of *D. scutatus* are not well established (Sampaio *et al*. 2016). We report the first record of *D. scutatus* in Rondônia State and present a distribution review of this species.

Bats were sampled between January and February 2014 in forest areas around the locality of Vila Tabajara, Machadinho D'Oeste Municipality, Rondônia State, Brazil (08º56'S, 62º03'W, 82 m). Vila Tabajara is a small village on the margin of the Machado River. The local vegetation is classified as open ombrophilous forest, within the Amazonian domain (IBGE 2012).

On February 5, 2014 a group of bats, easily distinguished due to their white coloration, were seen foraging around a lamppost in an open area nearby the village. The capture of a *D. scutatus* non-reproductive adult female (Figure 1) happened around 01:45 am using a mist-net (6 x 3 m, 20 mm mesh), which was manually launched on the foraging bats. This specimen was identified according to characters supported by the literature (Jones and Hood 1993; Lim and Engstrom 2001): general white coloration; unicolored ventral fur; forearm 54.2 mm; greatest length of skull 15.0 mm; large palatine foramina that is confluent with posterior palatal emargination; and no space between the premolars (Figure 2). The specimen was incorporated into the mammal collection of São Paulo University [Museu de Zoologia da Universidade de São Paulo] (MZUSP 35681).

**Figure 1.** Specimen of *Diclidurus scutatus* (MZUSP 35681) from Machadinho D'Oeste, Rondônia, Brazil (Credit: Roberto Leonan Morim Novaes). This figure is in color in the electronic version.

**Figure 2.** Skull (lateral, dorsal, and ventral profiles) and mandible (lateral and dorsal profiles) of *Diclidurus scutatus* (MZUSP 35681) from Machadinho D'Oeste, Rondônia, Brazil (Credit: José Eduardo Serrano Villavicencio). Scale bar = 10 mm. This figure is in color in the electronic version.

With this record, *Diclidurus scutatus* has been recorded in 20 locations in eight South American countries, in Brazil, Colombia, Ecuador, French Guiana, Guyana, Peru, Suriname and Venezuela (Figure 3, Table 1). Geographical coordinates in Table 1 were recovered directly from the studies used in the distribution review or from the gazetteer available in Gardner (2008). *D. scutatus* has now been registered in five Brazilian states: one in the Atlantic Forest (São Paulo) and four in the Amazon (Amapá, Amazonas, Pará and Rondônia). Our record from Rondônia represents the southernmost occurrenc of the species in the Amazon, extending its known distribution range by more than 1000 km in southwestern direction.

*Diclidurus scutatus* is known from only a few records but is unlikely to suffer a fast population decline, considering its wide distribution range and variety of environments occupied (Sampaio *et al*. 2016). The species is classified as of Least Concern in the IUCN Red List of Threatened Species (2017).

Our fieldwork efforts support the conclusion of Escobedo and Velazco (2012) in that the application of unusual sampling methodologies in bat surveys, such as active search and manual capture, canopy nets, and acoustic monitoring, are necessary to improve the knowledge about this species.

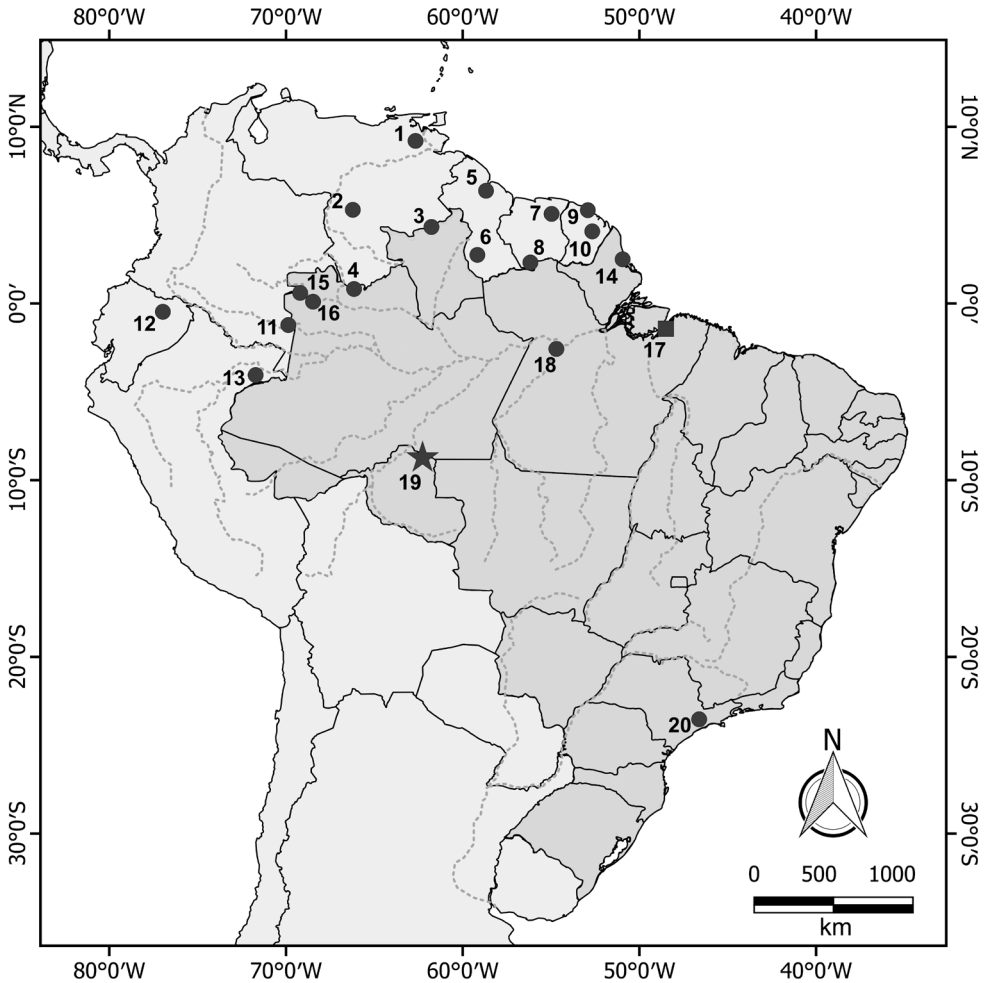


**Figure 3.** Distribution of *Diclidurus scutatus* (dots), including the type locality (square) and a new record for Machadinho D'Oeste, Rondônia, Brazil (star; this study). For more details, see Table 1. This figure is in color in the electronic version.

**Table 1.** Locality records for the lesser ghost bat, *Diclidurus scutatus*.

| Map | Locality | Coordinates | Author |
|---|---|---|---|
| 1 | Laguna Guasacónica, Monagas, Venezuela | 09º12'N, 62º40'W | Linares and Rivas (2004) |
| 2 | Río Manapiare, San Juan, Amazonas, Venezuela | 05º18'N, 66º13'W | Handley (1976) |
| 3 | Icabarú, Bolívar, Venezuela | 04º20'N, 61º46'W | Handley (1976) |
| 4 | Cerro Neblina Base Camp, Amazonas, Venezuela | 00º49'N, 66º09'W | Gardner (1988) |
| 5 | Cuyuni River, Kartabo Point, Cuyuni-Mazaruni, Guyana | 06º23'N, 58º41'W | Escobedo and Velazco (2012) |
| 6 | Marurawaunawa Village, UpperTakutu-UpperEssequibo, Guyana | 02º45'N, 59º10'W | Escobedo and Velazco (2012) |
| 7 | Brokopondo, Brokopondo, Suriname | 05º04'N, 54º58'W | Husson (1978) |
| 8 | Alalapadu, Suriname | 02º19'N, 56º10'W | Escobedo and Velazco (2012) |
| 9 | Paracou, Sinammary, French Guiana | 05º17'N, 52º55'W | Simmons and Voss (1998) |
| 10 | Les Nouragues, Régina, French Guiana | 04º05'N, 52º40'W | Brosset and Charles-Dominique (1991) |
| 11 | Lower Río Apaporis, Yay Gojes, Colombia | 01º13'S, 69º52'W | Escobedo and Velazco (2012) |
| 12 | Coca, Orellana, Ecuador | 00º28'S, 76º58'W | Albuja (1999) |
| 13 | Río Yavari, mouth of Lago Preto, Loreto, Peru | 04°03'S, 71°43'W | Escobedo and Velazco (2012) |
| 14 | Colônia Torrão, Calçoene, Amapá, Brazil | 02º30'N, 50º57'W | Piccinini (1974) |
| 15 | Rio Negro, Taracuá, Amazonas, Brazil | 00º06'N, 68º28'W | Vieira (1942) |
| 16 | Rio Uaupés, Jauareté, Amazonas, Brazil | 00º36'N, 69º12'W | Piccinini (1974) |
| 17 | Belém, Pará, Brazil (type locality) | 01º27'S, 48º29'W | Peters (1869) |
| 18 | Rio Tapajós, Piquiatuaba, Santarém, Pará, Brazil | 02º34'S, 54º42'W | Escobedo and Velazco (2012) |
| 19 | Vila Tabajara, Machadinho D'Oeste, Rondônia, Brazil | 08º56'S, 62º03'W | Present study |
| 20 | São Paulo, São Paulo, Brazil | 23º32'S, 46º37'W | Sodré and Uieda (2006) |

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