The first record of *Diclidurus ingens* Hernandez-Camacho, 1955 (Emballonuridae) in Central Brazil

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***Abstract*:** Species of sheath-tailed bats in the family Emballonuridae are pantropical in distribution. Ghost bats in the genus *Diclidurus* (Wied-Neuwied, 1820) comprehend four species that occur in the Neotropical regions of Central and South America. However, distributional records are sparsely documented across this vast area. The objective of this study is to report the first occurrence of *D. ingens* in Central Brazil, representing a range extension of 850 kilometers.
Keywords*: Chiroptera, Mato Grosso State, geographic distribution, greater ghost bat.*

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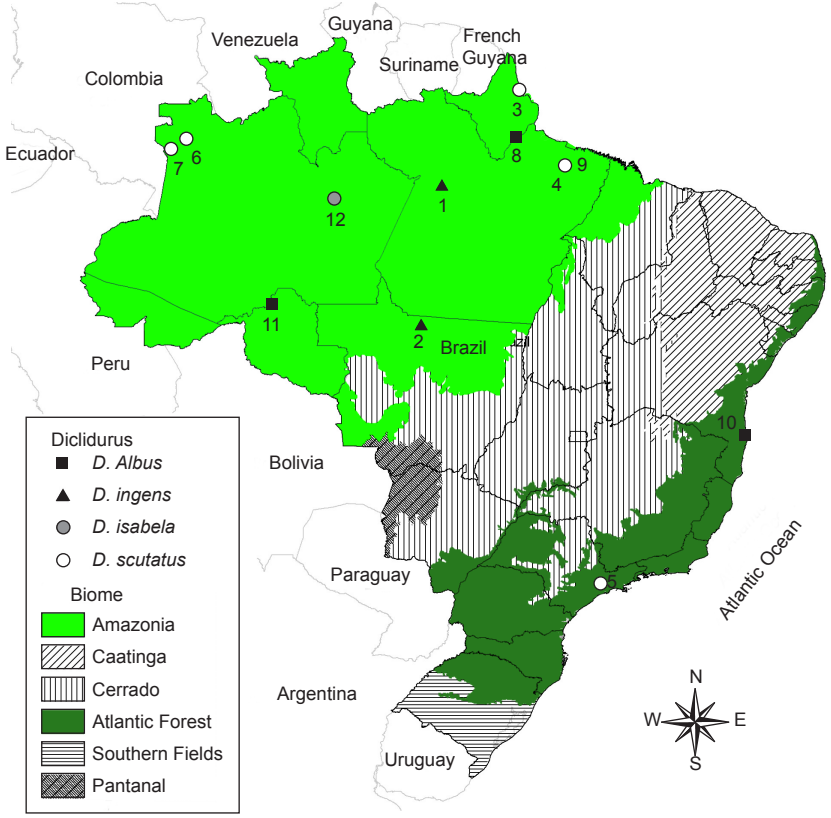
***Resumo*:** Espécies de morcegos da familia Emballonuridae são pantropicais. No gênero *Diclidurus* (Wied-Neuwied, 1820) quatro espécies tem ocorrência nas Américas Central e do Sul. Os registros de ocorrências dessas espécies são esparsamente documentados ao longo dessa vasta distribuição. O objetivo desse estudo é comunicar a primeira ocorrência de *D. ingens* para o Brasil Central, representando uma extensão de 850 quilômetros na distribuição de *D. ingens* para o sul do país.
***Palavras-chave:** Chiroptera, Mato Grosso, distribuição geográfica, morcego, insetívoro.*

Introduction

Species of sheath-tailed bats in the family Emballonuridae are pantropical in distribution, occurring in Africa, the Arabian Peninsula, the Indian subcontinent, Asia, Australian region, and the New World where they are distributed from northern Mexico through Central America into South America to southern Brazil (Jones & Hood 1993, Hood & Gardner 2007). There are eight genera and 22 species in the monophyletic Neotropical tribe Diclidurini (Lim 2007). This phylogenetic hypothesis is supported by biochemical data (Robbins & Sarich 1988), hyoid morphology (Griffiths & Smith 1991), and molecular sequence data (Lim et al. 2008). Therefore, the unique nasal depressions uniting *Diclidurus* and *Cyttarops* are considered a derived morphological synapomorphy within the tribe Diclidurini and not as a separate subfamily as suggested by Jones & Hood (1993) and Hood & Gardner (2007).

The whitish fur pattern present in the majority of *Diclidurus* has given them the common name of ghost bats (Ceballos & Medellin 1988, Jones & Hoods 1993). All are aerial insectivores that hunt flying insects in open spaces, away from vegetation, in edge spaces near vegetation, or mainly over water (Jung et al. 2007). Within *Diclidurus* there are four species, namely *D. albus*, *D. ingens*, *D. isabellus* and *D. scutatus,* that occur South America, except for *D. albus*, which is also found in middle America (Jones & Hood 1993, Simmons 2005, Hood & Gardner 2007. Within Central Brazil there is only one record of *Diclidurus*, which was based on a photo and thus not properly identified to species-level (Bezerra & Cunha 2007). The objective of this study is to report the first occurrence and range extension of *D. ingens* in Central Brazil.



Localities:

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Diclidurus ingens

1. Pará, Alter do Chão (02° 30' S and 54° 57' W)

2. Mato Grosso, Alta Floresta (09° 52' 57.52" S and 56° 04' 42.84" W)

Diclidurus scutatus

3. Amapá, Colônia Torrão (02° 30' S and 50° 57' W)

4. Pará, Pará = Belém (01° 27' N and 48° 29' W)

5. São Paulo, São Paulo (23° 32' S and 46°37' W)

6. Amazonas, Taracuá = Taraquá (00° 06' N and 68° 28' W)

7. Amazonas, Juareté = Iuaretê 00° 36' N and 69° 12' W)

Diclidurus albus

8. Amapá, Tracajuba (01° 00' N and 51° 06' W)

9. Pará, Pará = Belém (01° 27' N and 48° 29' W)

10. Bahia, Canavieiras (15° 39' S and 38° 57' W)

11. Rondônia, Porto Velho (08° 46' S and 63° 54' W)

Diclidurus isabella

12. Amazonas, Manacapuru (03° 20' S and 60° 40' W)

Figure 1. Known distribution of Diclidurus species in Brazil, according to Hood & Gardner (2007). Solid triangles are records of *Diclidurus ingens*; white circles represent *Diclidurus scutatus* records; black squares are records of *Diclidurus albus*, and the gray circle represents the only known record of *Diclidurus isabella* in Brazil.

Figura 1. Distribuição geográfica de espécies de Diclidurus conhecida para o Brasil de acordo com Hood & Gardner (2007). Triângulos são registros de /*Diclidurus ingens*; círculos brancos representam registros de *Diclidurus scutatus*; quadrados representam registros de *Diclidurus albus*, e o cículo cinza representa o único registro de *Diclidurus isabella* no Brasil.

Material and Methods

The new occurrence area is Alta Floresta municipality, which was founded in 1976 in the State of Mato Grosso, Central Brazil. It is 830 km from Cuiabá, the state's capital. Alta Floresta covers 8,947.07 km² and has 47,236 in habitants, and is one of the cities that has undergone native vegetation modification for economic purposes in what is known as the Deforestation Arc in the Legal Amazon. The climate is tropical with a marked dry season, and daily mean temperature varies from 20 to 38 °C during the year. Total rainfall is high at 2,750 mm per year. Vegetation is composed of tropical humid rain forest, seasonal forest and cerrado. Urban areas have remnants of secondary non-flooded forest and seasonally flooded forest associated with small water courses.

Results and Discussion

The new record of *D. ingens* described herein is an adult female that was found dead on June 23, 2007 inside a garage in Alta Floresta (09° 52' 57.52"S e 56° 4' 42.84"W) (Figure 1). The specimen was collected in a suburban area located near a small fragment of remnant forest. It may have been attracted to roosting opportunities in the building, or to insects around the nearby street lamps. Indeed, previous research has found that some bat species thrive in urban areas (e.g., Furlonger et al. 1987, Mantilla-Meluk et al. 2009). The specimen is deposited at the University of Mato Grosso (number LMSA72).

Diclidurus ingens is by far the largest species of the genus with a forearm measuring 70-73 mm. This size character is sufficient to distinguish *D. ingens* from its congenerics (Ceballos & Medellin 1988, Eisenberg 1989, Peracchi & Nogueira 2007). The fur of *D. ingens* is white, long and silky. The dorsal fur has no color variation between basal and distal hair extremities, whereas the ventral fur has grayish brown bases that contrast with the otherwise pure white hair (Figure 2). Long white hairs occur on the ventral side of the forearm and on the dorsal side of the wing at the base of first digit. Wings are pinkish due to the blood vessels in the skin membrane. Specimen measurements are presented in Table 1.

Figure 2. Lateral view of *Diclidurus ingens*, specimen (LMSA72 number), an adult female from Alta Floresta, Mato Grosso (09° 52' 57.52" S and 56° 04' 42.84" W), Brazil.

Figure 2. Vista lateral de uma fêmea adulta de *Diclidurus ingens*, (number LMSA72) capturada em Alta Floresta, Mato Grosso (09° 52' 57.52" S e 56° 04' 42.84" W), Brasil.

Table 1. Measurements of an adult female *Diclidurus ingens* from Alta Floresta, Mato Grosso (09° 52' 57.52" S and 56° 04' 42,84" W), Brazil.

Table 1. Medidas de corpo e crânio de uma fêmea adulta de *Diclidurus ingens* capturada em Alta Floresta, Mato Grosso (09° 52' 57.52" S e 56° 04' 42,84" W), Brasil.

Character	Measurements
Total length	102.0 mm
Length of head + body	76.8 mm
Length of tail vertebrae	25.2 mm
Length of ear from notch	20.6 mm
Total length of tragus	7.2 mm
Forearm	70.3 mm
Length of hind foot	11.9 mm
Wingspread	322.5 mm
Greatest length of skull	20.0 mm
Upper tooth row	8.7 mm
Weight (empty stomach)	16.5 g

The known distribution of *D. ingens* Hernandez-Camacho 1955 includes its type locality in Puerto Leguizano, Colombia (Jones & Hood 1993), as well as localities in Venezuela (Ojasti & Linares 1971, Handley 1976, Linares & Rivas 2004), Colombia (Mantilla-Meluk et al. 2009) and Guyana (Eisenberg 1989, Jones & Hood 1993, Lim et al. 1999). Pacheco et al. (1995) cite the species in Peru, but with no indication of voucher specimens. In Brazil, this species was previously known from one individual captured in a forest fragment in Alter do Chão, Tapajós River, State of Pará, Central Amazon (Bernard & Fenton 2002). Thus, our specimen represents the second record of this species in Brazil, and the first occurrence of *D. ingens* for the State of Mato Grosso, Central Brazil. This specimen extends the distribution of *D. ingens* nearly 850 kilometers southwards, to the southern limit of the Amazon.

The limited information on *D. ingens* suggests that this species is associated with mature evergreen forest near moist areas and urban areas (Handley 1976, Mantilla-Meluk et al. 2009). In the Brazilian Central Amazon, *D. ingens* was collected in a fragment of tropical forest surrounded by savanna habitat in the county of Alter do Chão (Bernard & Fenton 2002). *Diclidurus ingens* is sparsely represented in museums collections (Jones & Hood 1993).

Globally, species of *Diclidurus* are considered of Least Concern or Data Deficient by the International Union for the Conservation of Nature (CSG – IUCN 2007). *Diclidurus ingens* in Brazil is known from two records, with one found in an urban area and the other in a fragment of Amazon forest. Therefore, given the paucity of records, *D. ingens* should be considered as Data Deficient or Least Concern in accordance with IUCN guidelines (CSG – IUCN 2007). Further survey work will probably move the species out of the Data Deficient category.

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