



Nota

FIRST RECORD OF *Molossus coibensis* (CHIROPTERA: MOLOSSIDAE) IN THE BRAZILIAN AMAZON

Lanna Jamile Corrêa da Costa¹, Fernanda Atanaena Gonçalves de Andrade², Wilson Uieda³, Renato Gregorin⁴, and Marcus Emanuel Barroncas Fernandes¹

¹ Departamento de Biologia, Laboratório de Ecologia de Manguezal, Instituto de Estudos Costeiros, Universidade Federal do Pará – Campus de Bragança, Av. Leandro Ribeiro s/n, 68600-000 Bragança, PA, Brasil [Correspondence: lannacorrea@yahoo.com.br].

² Instituto Federal de Educação, Ciência e Tecnologia – Campus de Tucuruí, Rua Porto Colombo, 12, Vila Permanente, 68455-695 Tucuruí, PA, Brasil.

³ Departamento de Zoologia, Instituto de Biociências, Universidade Estadual Paulista, 18618-970 Botucatu, SP, Brasil.

⁴ Departamento de Biologia, Universidade Federal de Lavras, Caixa Postal 3037, 37200-000 Lavras, MG, Brasil.

ABSTRACT. This study reports on the occurrence of *Molossus coibensis* J. A. Allen, 1904, in the Brazilian Amazon and the second record of this species from Brazil. It also presents a comparative analysis with other two small-bodied *Molossus* species that occur in Brazil: *M. molossus* (Pallas, 1766) and *M. aztecus* Saussure, 1860. The report is based on 8 females captured in urban areas of the city of Bragança, in the northern Brazilian state of Pará. Morphometric data and the qualitative comparison of morphological features permitted the identification of the specimens as *M. coibensis*, hitherto known only in Tapirapoan, in the southwestern state of Mato Grosso, west-central Brazil.

RESUMO. Primeiro registro de *Molossus coibensis* (Chiroptera: Molossidae) na Amazônia brasileira. Este estudo relata o primeiro registro de *Molossus coibensis* J. A. Allen, 1904 para a Amazônia brasileira e o segundo para o Brasil. Ele também apresenta uma análise comparativa com outras duas espécies de *Molossus* de pequeno porte no Brasil: *M. molossus* (Pallas, 1766) e *M. aztecus* Saussure, 1860. O estudo é baseado em oito fêmeas capturadas em áreas urbanas da cidade de Bragança, no norte do estado do Pará. Dados morfométricos e comparação qualitativa de características morfológicas permitem a identificação dos espécimes como *M. coibensis*, até então conhecido apenas em Tapirapuã, no sudoeste do estado de Mato Grosso, Centro-Oeste do Brasil.

Key words: Coiban mastiff bat. New record. Northern Brazil.

Palavras chave: Molossídeo de Coiba. Norte do Brasil. Novo registro.

The bats of the genus *Molossus* Geoffroy, 1805 have an essentially Neotropical distribution, with a total of 7 or 8 species, depending on the taxonomic arrangement (Simmons, 2005; Eger, 2007). Six species are known to occur in Brazil: *M. coibensis* J. A. Allen, 1904; *M. currentium*

Thomas, 1901; *M. molossus* (Pallas, 1766); *M. pretiosus* Miller, 1902; *M. rufus* E. Geoffroy, 1805, and *M. aztecus* Saussure, 1860, which was recently recorded in southern Minas Gerais state (Gregorin et al., 2011). Of these species, *M. currentium* has been recorded in Manaus,

in the state of Amazonas (López-González and Presley, 2001), although this record is based on a juvenile specimen which was considered uncertain by Eger (2007). Prior to the present study, the only record of *M. coibensis* from Brazil was a specimen collected at Tapirapoan, in the state of Mato Grosso, which consists only of a preserved skin, given that the skull has been lost (Dolan, 1989; Eger, 2007).

Coiban Mastiff Bat, *M. coibensis* (Fig. 1), was first described from the Island of Coiba in Panama by Allen (1904). The known geographic distribution of this species (Fig. 2) includes the whole of Central America, in particular the Pacific coast, extending between Chiapas (Mexico) and northern South America (Ecuador, Colombia, Venezuela, Peru, and Guiana), it is noteworthy that French Guiana is the type locality of *Molossus barnesi*, considered by some as synonymous of *M. coibensis* (Eger, 2007). Its distribution also extends to southwestern Brazil (Dolan, 1989). Paglia et al. (2012) included the geographic range of *M. coibensis* in both the Brazilian Amazon and Cerrado biomes, although the only Brazilian locality for this species, Tapirapoan (14°85' S, 57°75' W), is located in the municipality of Barra do Bugres in southwestern Mato Grosso, within the Cerrado savanna, but close to its limits with the Amazon and Pantanal biomes (Paglia et al., 2012: fig. 6).

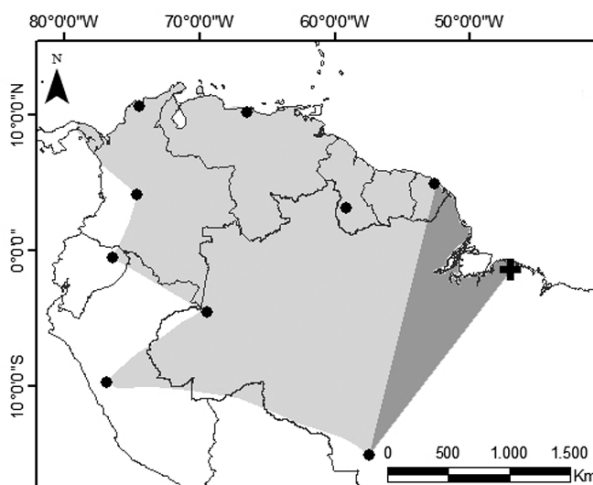
As the diversity of *Molossus* in South America is still poorly understood and the sampling of some species is scarce, the present record of *M. coibensis* was confirmed through comparisons with other specimens of the same species from Central America, and other small-bodied species, which confirmed the identity of the specimens and the occurrence of *M. coibensis* in northern Brazil.



Fig. 1. Adult female *Molossus coibensis* captured in the town of Bragança, in the northern Brazilian state of Pará.

Six adult and two juvenile female individuals of *M. coibensis* were collected during an inventory of the bat fauna at Bragança, in the Brazilian state of Para (01°03'13" S, 46°45'56" W), carried out between August, 2007, and August, 2008. The bats were captured in the roofs of houses covered with cement-fiber tiles in the center of the town. Each specimen was measured (external dimensions and cranial/dental features) and weighed, and its age and sex were determined. Biometric parameters were based on those analyzed by Dolan (1989) and Gregorin et al. (2011) – total length of the cranium (TLC), condylo-incisor length (CIL), upper tooth row length, from the canine to the last molar (C-M), brain case breadth (BCW),

Fig. 2. Outlying localities (dots) of the geographic distribution of *Molossus coibensis* in South America. The cross corresponds to the new recording locality reported in this paper and the dark gray shaded area represents the likely eastern boundary of the species in Brazil.



breadth of the post-orbital constriction (POC), maximum breadth across the upper molars (M-M), maximum breadth across the upper canines (C-C). The specimens were fixed in 10% formalin and preserved in 70% ethanol prior to being deposited in the Coleção de Zoologia da Universidade Federal do Pará Campus de Bragança (LJCC – field number) and the Coleção de Mamíferos da Universidade Federal de Lavras em Minas Gerais (CMUFLA). For the comparative analysis, specimens were examined in the collections of the American Museum of Natural History (AMNH) in New York, the US Natural History Museum (USNM) at the Smithsonian Institution in Washington D.C., The Field Museum (FMNH) in Chicago, and the Museum of Comparative Zoology (MCZ) at Harvard University (**Appendix**).

Given the marked sexual dimorphism in *Molossus* (Dolan, 1989) and the fact that all the specimens collected in the present study were females, morphometric analyses included only adult females. The only male specimens examined in this study were the holotypes of *M. cherriei* (= *M. coibensis*) and *M. coibensis*, which were included in the analysis of qualitative variables.

The *M. coibensis* specimens presented here were identified based on the diagnosis of Dolan (1989) and comparisons with specimens from Panama, close to the type locality (Coiba Island). The diagnostic characteristics of the specimens were (1) small forearm (**Table 1**), (2) short cranium with more convex brain case (**Table 1; Figs. 3 and 4**), (3) upper incisors short and convergent or blade-like (**Fig. 3**),

Table 1

Morphometric parameters for adult female of *Molossus coibensis* (northern Brazil and Panama), *M. aztecus* (Mexico), and *M. molossus* (northern Brazil). The variables are described in the text. Mean ± standard deviation in millimeters, range of values and sample size (n).

Parameter	<i>M. coibensis</i> (Bragança, Brazil)	<i>M. coibensis</i> (Panama)	<i>M. aztecus</i> (Mexico)	<i>M. molossus</i> (Para, Brazil)
Length of forearm	34.3 ± 0.4 33.5-34.7 (6)	34.9 ± 1.3 32.8-37.5 (11)	36.1 ± 0.5 35.5-36.7 (6)	40.9 ± 1.3 38.5-43.6 (23)
Cranium length	15.8 ± 0.2 15.5-16.1 (7)	15.8 ± 0.6 15.1-17.2 (12)	16.5 ± 0.1 16.3-16.6 (6)	16.7 ± 0.3 16.2-17.6 (24)
Condyllo-incisor length	14.6 ± 0.3 14.3-15.1 (7)	14.8 ± 0.5 14.0 ± 15.8 (12)	15.3 ± 0.2 15.0-15.6 (6)	15.9 ± 0.5 14.3-16.8 (23)
Length of upper tooth row	5.9 ± 0.2 5.7-6.1 (7)	5.9 ± 0.2 5.7-6.2 (12)	6.2 ± 0.1 6.1-6.4 (6)	6.3 ± 0.1 6.1-6.6 (24)
Brain case breadth	8.8 ± 0.2 8.6-9.0 (7)	8.7 ± 0.2 8.3-9.2 (12)	8.8 ± 0.2 8.7-9.1 (6)	9.0 ± 0.4 8.5-10.7 (24)
Maximum breadth between upper molars	7.5 ± 0.2 7.2-7.8 (7)	7.5 ± 0.3 7.2-8.1 (12)	7.9 ± 0.3 7.6-8.4 (6)	7.8 ± 0.3 7.4-9.1 (24)
Breadth of the post-orbital constriction	3.9 ± 0.1 3.7-4.0 (7)	3.6 ± 0.1 3.4-3.9 (12)	3.7 ± 0.1 3.7-3.8 (6)	3.7 ± 0.2 3.4-4.1. (22)
Maximum breadth across the upper canines	4.6 ± 0.2 4.3-5.0 (7)	4.1 ± 0.1 3.9-4.4 (15)*	4.5 ± 0.1 4.4-4.5 (2)**	4.1 ± 0.1 4.1-4.2 (3)**

* Data compiled from Dolan (1989);

** Data compiled from Dolan (1989) for the southernmost locality analyzed by this author (El Salvador).

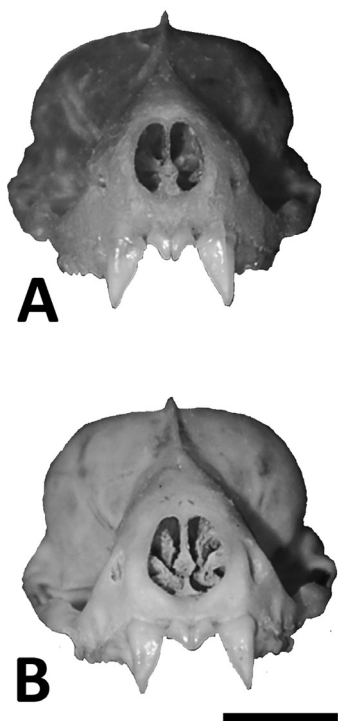


Fig. 3. Frontal view of the skull of (A) *Molossus molossus* (CMUFLA 1049) and (B) *M. coibensis* (CMUFLA 1211). Note the blade-like incisors, external opening of the infraorbital foramen, and the more robust rostrum in *M. coibensis*. Scale bar = 4 mm.

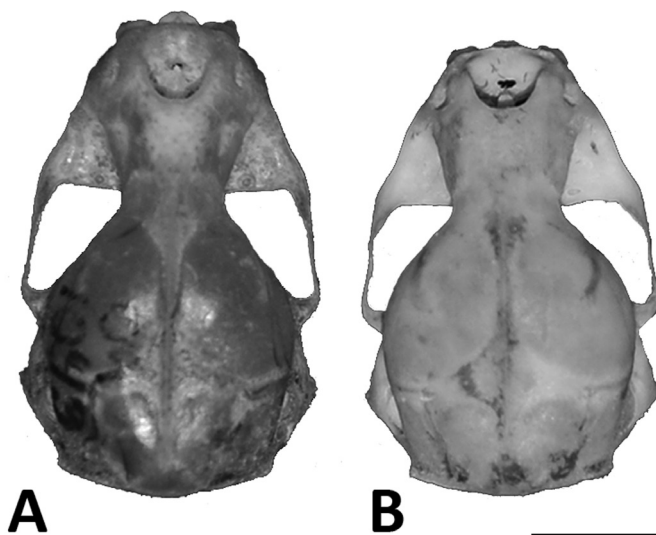


Fig. 4. Dorsal view of the skull of (A) *Molossus molossus* (CMUFLA 1049) and (B) *M. coibensis* (CMUFLA 1211). Note the considerably broader brain case and external opening of the infraorbital foramen in *M. coibensis*. Scale bar = 4 mm.

(4) infraorbital foramen opening more laterally than frontally (Figs. 3 and 4; see Gregorin et al., 2011), (5) blackish pelage, with short (2.3-3.7 mm) dorsal hairs around the shoulders, and (6) hairs with grayish basal third, resulting in a weak contrast with the apical band (Dolan, 1989).

Of these characters, 2 and 6 are shared by *M. coibensis*, *M. aztecus*, *M. pretiosus*, and *M. rufus*, and distinguish these species clearly from *M. molossus*. In fact, the pelage of *M. molossus* is typically chestnut, with relatively long hairs characterized by a white basal band which contrasts distinctly with the apical band; the rostrum in *M. molossus* is narrower, with a proportionately narrow brain case (Table 1); the upper incisors are elongated with parallel (pincer-like) tips (Fig. 3), distinct of blade-like upper incisors of *M. coibensis*. In comparison with *M. aztecus*, a closely-related small-bodied species, *M. coibensis* is differentiated by much smaller external measurements and cranial/dental parameters (Table 1).

The occurrence of *M. coibensis* in the Brazilian Amazon basin would be expected from its distribution in northern South America, including the Guianas, Colombia, Venezuela, and Peru (Eger, 2007), although the only previous record from Brazil, at Tapirapoan in Mato Grosso, was from the Cerrado savanna. The only Brazilian specimen available prior to the present study (AMNH 36699) now consists only of the skin, given that the skull was lost. This specimen is the holotype of *M. cherriei*, described by Allen (1916), which was subsequently synonymized with *M. coibensis* by Dolan (1989). The characteristics of this specimen, which include a short forearm (33.8 mm),

gray-blackish pelage, and short dorsal hairs with a grayish base and weak banding, are clearly consistent with the diagnostic traits of *M. coibensis*.

The occurrence of *M. coibensis* at such widely separated localities in Brazil indicates that this species is likely also found throughout much of the Brazilian Amazon basin, and possibly also in the Pantanal wetlands. The paucity of records of this species within Brazilian territory is probably due to the general lack of data on molossids in most regions, and the difficulties in identifying the species of this group.

Acknowledgments. We are grateful to the curators of the museums visited – Don E. Wilson and Alfred L. Gardner (USNM), Nancy B. Simmons (AMNH), Bruce D. Patterson (FMNH), and Judith Chupasko (MCZ), and to Maura E. M. Sousa for her assistance with the maps. This study was financed partly by the Brazilian National Research Council (CNPq) and FAPEMIG through the Biota Minas Project (to RG).

APPENDIX

Examined material

Molossus aztecus – MEXICO, Nayarit, Estanzuela USNM 508982-508985, 508990, 508991. *Molossus coibensis* – BRAZIL, Mato Grosso, Tapirapoan (= Tapirapuã) AMNH 36669 (holotype of *Molossus cherriei* Allen, 1916); Para, Bragança CMUFLA 1211, 1212; LJCC 13, 14, 16, 18, 19, 20 (Field number). PANAMA, Barro Colorado USNM 296277-296280, 304931; Chira Chira, Zona do Canal USNM 317672, 317673, 317676, 317677; Coiba, Chiriqui AMNH 18731 (holotype of *Molossus coibensis*); Curundu, Zona do Canal USNM 302468, 302469. *Molossus molossus* – BRAZIL, Para, Itacoatiara FMNH 20150-20153; Pinhý (Rio Tapajós) MCZ 30396, 30398, 30400, 30404, 30405, 30407, 30410, 30412, 30415, 30416; Taporó (Rio Xingu) AMNH 96037, 96038, 96040, 96041, 96043-96048. Piauí, Serra da Jitirana, São João do Piauí, CMUFLA 1050, 1054, 1049.

LITERATURE CITED

- ALLEN JA. 1904. New bats from tropical America, with note on species of *Otopterus*. Bulletin of the American Museum of Natural History 20:227-237.
- ALLEN JA. 1916. New mammals collected on the Roosevelt Brazilian Expedition. Bulletin of the American Museum of Natural History 27:523-30.
- DOLAN PG. 1989. Systematics of Middle American matiff bats of the genus *Molossus*. Special Publications, Museum Texas Tech University 29:1-71.
- EGER JL. 2007. Family Molossidae. P. Gervais 1856. Pp. 399-440, in: Mammals of South America (AL Gardner, ed.). Volume I. Chicago: University Chicago Press.
- GREGORIN R, AS TAHARA, and DF BUZZATO. 2011. *Molossus aztecus* and other small *Molossus* (Chiroptera: Molossidae) in Brazil. Acta Chiropterologica 13:311-317.
- LÓPEZ-GONZÁLES C and SJ PRESLEY. 2001. Taxonomic status of *Molossus bondae* J. A. Allen, 1904 (Chiroptera: Molossidae), with description of a new subspecies. Journal of Mammalogy 82:760-764.
- PAGLIA AP et al. 2012. Lista Anotada dos Mamíferos do Brasil / Annotated Checklist of Brazilian Mammals. 2ª Edição / 2nd Edition. Occasional Papers in Conservation Biology, No. 6. Conservation International, Arlington, VA, 76 p.
- SIMMONS NB. 2005. Order Chiroptera. Pp. 312-529, in: Mammal species of the world: A taxonomic and geographic reference (DE Wilson e DM Reeder, eds.). Volume I. Baltimore: Johns Hopkins University Press.