

First occurrences of the greater bonneted *Eumops perotis* (Molossidae) in the State of Paraná and synthesis of the known records for Brazil

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SUCKOW, U.M.S., BIANCONI, G.V., PAROLIN, L.C. & LIMA, I.P. **First occurrences of the greater bonneted *Eumops perotis* (Molossidae) in the State of Paraná and synthesis of the known records for Brazil.** *Biota Neotrop.* 10(3): <http://www.biotaneotropica.org.br/v10n3/en/abstract?short-communication+bn02310032010>.

Abstract: *Eumops perotis* has just a few confirmed records in South America and an uneven distribution throughout the continent. In this paper, we show the first occurrence of this molossid in the State of Paraná, Southern Brazil and summarize all the known localities for the country.

Keywords: *Chiroptera, Molossidae, distribution, new records, South America.*

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Resumo: *Eumops perotis* apresenta poucos registros confirmados para a América do Sul, distribuídos de forma desigual por quase todos os países do continente. Nesta comunicação, nós relatamos a primeira ocorrência deste molossídeo no Estado do Paraná, Sul do Brasil e sumarizamos as demais localidades conhecidas para o país.

Palavras-chave: *Chiroptera, Molossidae, distribuição, novos registros, América do Sul.*

Introduction

The genus *Eumops* was described by Miller (1906) in order to differentiate ten Chiropteran species that had been classified previously as *Molossus* Geoffroy, 1805 and *Promops* Gervais, 1856. The taxonomic record of the genus is complex and problematic; especially due disagreement regarding the patterns of craniodental measurements in the known forms (see Sanborn 1932, Eger 1977, Freeman 1981, Eger 2007, McDonough et al. 2008). Following the taxonomic review recommended by Simmons (2005), with the addition of the review of the South American forms summarized by Eger (2007) and contributions of Timm & Genoways (2004) and Baker et al. (2009), the *Eumops* genus is currently represented by fourteen species: *E. auripendulus* (Shaw, 1800); *E. bonariensis* (Peters, 1874); *E. dabbenei* Thomas, 1914; *E. delticus* Thomas, 1914; *E. glaucinus* (Wagner, 1843); *E. hansae* Sanborn, 1932; *E. nanus* (Miller, 1900); *E. patagonicus* Thomas, 1924; *E. perotis* (Schinz, 1821); *E. trumbulli* (Thomas, 1901); *E. maurus* (Thomas, 1901); *E. floridanus* (Allen, 1932); *E. underwoodi* Goodwin, 1940; and *E. wilsoni* Baker, McDonough, Swier, Larsen, Carrera and Ammerman, 2009. Only the latter three species do not have confirmed records in Brazil (Tavares et al. 2008; Eger 2007; Sodré et al. 2008).

Eumops perotis is widely distributed across the American continent (Sanborn 1932, Eger 1977, Koopman 1982, Eger 2007). It has been recorded in the United States, Mexico, Cuba, Venezuela, Colombia, Bolivia, Equator, Peru, Paraguay, Argentina and Brazil (Sanborn 1932, de la Puente 1951, Marinkelle 1968, Best et al. 1996, Barquez et al. 1999, Simmons 2005, Eger 2007) (Figure 1). This species is the largest among its congeners, with forearm length ranging from 73 to 83 mm (Eger 1977, Best et al. 1996, Gregorin & Taddei 2002). The ears are well-developed (from 36 to 47 mm), extending beyond the nose (Sanborn 1932, Eger 1977), and the lip is without cutaneous folds (Gregorin & Taddei 2002). Fur color ranges from light brown to dark gray, with a slightly paler abdomen and the wing membranes have a blackish tone (Best et al. 1996, Barquez et al. 1999). The cranium is robust and flat, and it has the largest measurements within the genus. The dental formula is 1/2, 1/1, 2/2, 3/3 × 2 = 30, presenting a small first premolar which is usually

displaced to the labial side of the maxillary tooth row; the first and the second molars are identical, with four comissures (Barquez et al. 1999). The third comissure of the third molar is one-quarter the length of the second comissure (Eger 1977). In this paper we report the first occurrence of *E. perotis* in the State of Paraná, Southern Brazil, and summarize the records of the species in the country.

Material and Methods

We evaluated eight adult samples of the genus *Eumops* from three towns in the State of Paraná: Londrina (23° 19' S and 51° 10' W), one male caught in August, 2004; Maringá (23° 24' S and 51° 57' W), one female caught in October, 2007 and another one in July, 2009; and Três Barras do Paraná (25° 25' S and 53° 10' W), four females and two males caught in November, 2008. The latter seven specimens were sent to the "Laboratório Central do Estado" (Secretaria de Estado da Saúde do Paraná) and diagnosed as rabies-negative. Later, they were preserved in alcohol at the Museu de História Natural Capão da Imbuia, Brazil, with the numbers CTX 8679, CTX 8680, CTX 8681, CTX 8682, CTX 8683, CTX 8684, CTX 8685, CTX 8686, respectively. The specimens had their skulls removed (they were all very damaged with the basicranium broken) and linear measurements (mm) of total length, tail length, ear length, forearm length, greatest length of skull, condyloincisive length, zygomatic breadth, postorbital constriction, maxillary tooththrow length, breadth across molars and breadth across canines.

Results and Discussion

The morphological measurements we obtained are within the range described for *E. perotis* in South America (e.g. Eger 1977, Barquez et al. 1999) (Table 1). The records known for Brazil come from the States of Amazonas, Pará (Piccinini 1974), Maranhão, Piauí (Eger 1977), Mato Grosso (Escarlate-Tavares & Pessoa 2005), Minas Gerais (Eger 1977, Falcão et al. 2003, Stutz et al. 2004), Rio de Janeiro (Schinz 1821 – type locality: "Campo dos Goytacazes, Villa São Salvador"; Eger 1977), São Paulo (Sodré & Uieda 2001, Breviglieri et al. 2004, Uieda & Chaves 2005), and Rio Grande do Sul (Pacheco & Freitas 2003). Fossils of this species dated from the

Table 1. Measurements of the seven samples of *E. perotis* caught in the cities of Londrina (August, 2004), Maringá (October, 2007) and Três Barras do Paraná (November, 2008) in the State of Paraná, Brazil, compared to those ones taken by Eger (1977) and Barquez et al. (1999) for Argentina, Bolivia, Brazil (States of Goiás, Maranhão, Minas Gerais, Piauí and Rio de Janeiro), Equator, Paraguay, Peru and Venezuela. Abbreviations: TL - Total length; T - Tail length; E - Ear length; FA - Forearm length; GLS - Greatest length of skull; CIL - Condyloincisive length; ZB - Zygomatic breadth; PC - Postorbital constriction; MTL - Maxillary tooththrow length; BAM - Breadth across molars; BAC - Breadth across canines.

Measure (mm)	State of Paraná, Brasil				Argentina, Bolivia, Brasil, Equator, Paraguay, Peru and Venezuela		Argentina
	Londrina	Maringá	Três Barras		Eger (1977)		Barquez et al. (1999)
	1 male	females	4 females	2 males	females	males	females and males
TL	-	168 – 180 (n = 2)	169 – 173	173 – 175	-	-	180.8 ± 6.45 (n = 15)
T	-	60.1 – 70.1 (n = 2)	62.7 – 66.4	59.2 – 61.1	-	-	62.3 ± 4.02 (n = 15)
E	-	44.7 – 44.9 (n = 2)	39.9 – 42.1	40.9 – 41.7	-	-	45.9 ± 4.66 (n = 15)
FA	79.1	73.8 – 80.9 (n = 2)	77.6 – 81.3	78.3 – 79.1	78.56 ± 0.35 (n = 33)	80.22 ± 0.49 (n = 21)	78.3 ± 2.33 (n = 17)
GLS	-	33.2 (n = 1)	-	-	32.52 ± 0.11 (n = 27)	33.67 ± 0.17 (n = 13)	31.5 ± 0.75 (n = 13)
CIL	-	32.2 (n = 1)	-	-	31.03 ± 0.11 (n = 27)	32.12 ± 0.17 (n = 13)	30.5 ± 0.76 (n = 15)
ZB	-	18.9 – 19.6 (n = 2)	18.1 – 18.7	18.3 – 18.6	18.41 ± 0.08 (n = 29)	19.04 ± 0.13 (n = 15)	19.0 ± 0.45 (n = 17)
PC	-	5.5 – 5.9 (n = 2)	5.4 – 5.8	5.5 – 5.8	5.35 ± 0.04 (n = 28)	5.49 ± 0.05 (n = 15)	5.5 ± 0.18 (n = 18)
MTL	-	12.7 – 13.2 (n = 2)	-	-	12.18 ± 0.05 (n = 29)	13.14 ± 0.11 (n = 16)	12.8 ± 0.27 (n = 18)
BAM	-	12.5 – 13.4 (n = 2)	12.9 – 13.2	12.9 – 13.3	-	-	13.2 ± 0.26 (n = 18)
BAC	-	8.1 – 8.6 (n = 2)	7.7 – 8.1	7.8 – 8.4	-	-	8.6 ± 0.19 (n = 18)

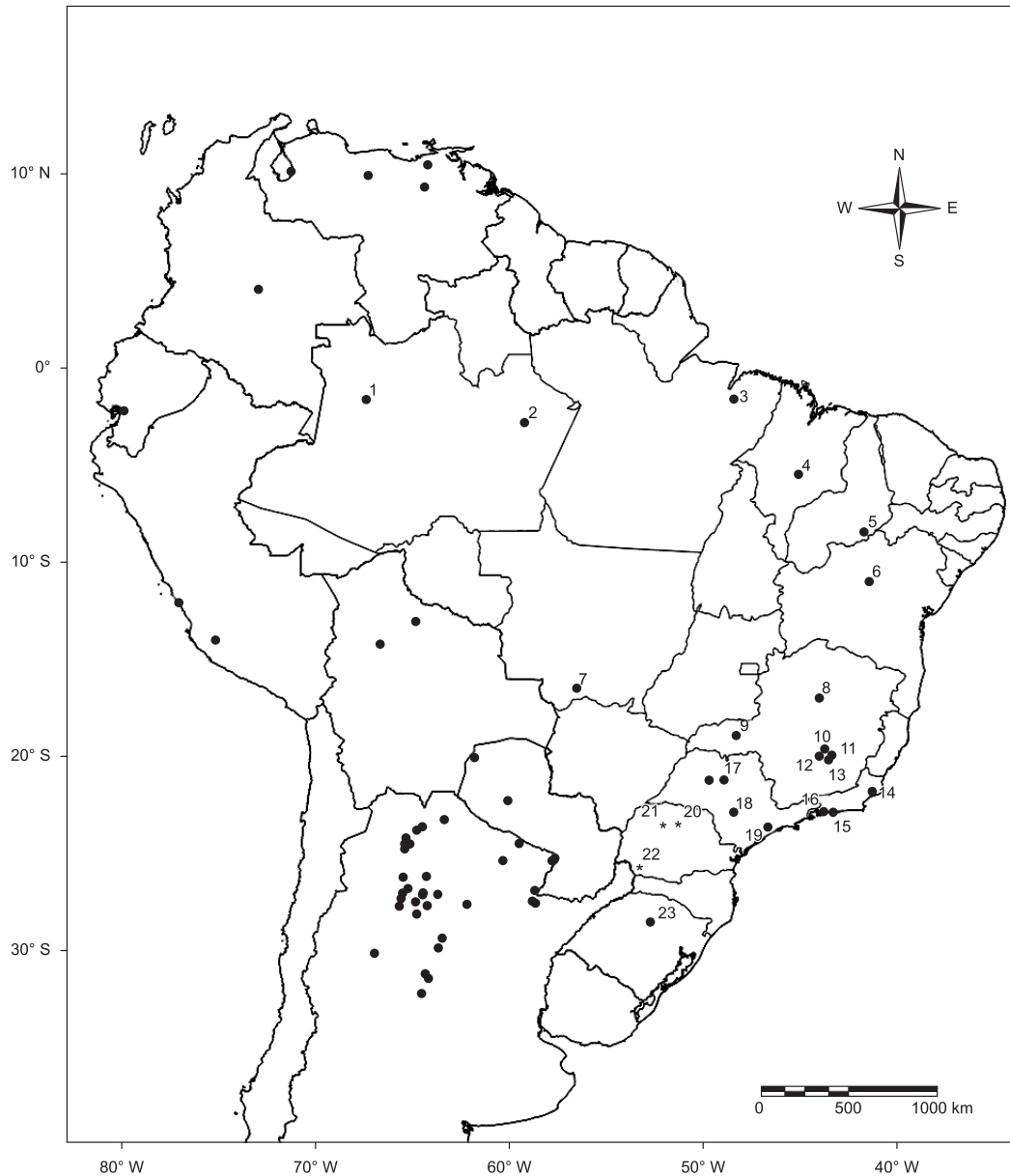
First occurrences of *Eumops perotis*

Figure 1. Distribution of the *E. perotis* in South America (Venezuela, Colombia, Bolivia, Equator, Peru, Paraguay and Argentina), with summary records confirmed for Brazil. 1) Paranã do Manhana, Amazonas (approach point 1° 50' S and 67° W) (Eger 1977 corrected); 2) "Rodovia Estadual AM-010" (Manaus – Itacoatiara), Amazonas, (approach point 2° 57' S and 59° 15' W) (Piccinini 1974); 3) Belém, Pará, (1° 28' S and 48° 26' W) (Piccinini 1974); 4) Barra do Corda, Maranhão (5° 30' S and 45° 05' W) (Eger 1977); 5) Sete Lagoas, Piauí (08° 27' S and 41° 42' W) (Eger 1977); 6) Morro do Chapéu, Bahia, (11° S and 41° 25' W) (Czaplewski & Cartelle 1998); 7) Barão de Melgaço, Mato Grosso (16° 30' S and 6° 30' W) (Escarlate-Tavares & Pessoa 2005); 8) Rio Velhas, Minas Gerais, (17° S and 44° W) (Eger 1977); 9) Uberlândia, Minas Gerais (18° 55' S and 48° 17' W) (Stutz et al. 2004); 10) Lagoa Santa, Minas Gerais (19° 39' S and 43° 44' W) (Eger 1977); 11) Rio Velhas, Minas Gerais (20° S and 44° W) (Eger 1977); 12) Mariana, Minas Gerais (20° S and 43° 25' W) (Eger 1977); 13) Serra do Caraça, Minas Gerais (20° 05' S and 43° 29' W) (Falcão et al. 2003); 14) Campos dos Goitacazes, Rio de Janeiro (21° 49' S and 41° 16' W) (type locality – Schinz 1821); 15) Rio de Janeiro, Rio de Janeiro (22° 53' S and 43° 17' W) (Eger 1977); 16) Seropédica, Rio de Janeiro (22° 51' S and 43° 47' W) (Eger 1977); 17) Pindorama, São Paulo (21° 13' S and 48° 56' W) (Breviglieri et al. 2004); 18) Botucatu, São Paulo (22° 52' S and 48° 26' W) (Uieda & Chaves 2005); 19) São Paulo, São Paulo (23° 28' S and 46° 38' W) (Sodré & Uieda 2001); 20) Londrina, Paraná (new record 23° 19' S and 51° 10' W); 21) Maringá, Paraná (new record 23° 24' S and 51° 57' W); 22) Três Barras do Paraná, Paraná (new record 25° 25' S and 53° 10' W); 23) Victor Graeff, Rio Grande do Sul (28° 33' S and 52° 44' W) (Pacheco & Freitas 2003).

Quaternary have also been found in the North East of Brazil, State of Bahia (Czaplewski & Cartelle 1998).

According to Eger (1977), there is a *E. perotis* male preserved in alcohol at the *Institut Royal des Sciences Naturelles de Belgique* (IRSNB), attributed to a location in the State of Goiás named "Parano do Manhana" (*sic*). We have investigated the origin of this specimen

together with the curator of the IRSNB (*G. Lenglet in litt.*), and have corrected its provenance to "Paraná do Manhana", a locality in the high Amazon River where the Hungarian naturalist Carl Lako worked and gathered *naturalia* starting in the 1920s, when he stayed in the state of Amazonas, Brazil (*v. Keve & Samuél 1969, Hershkovitz 1985, 1987, Gutsche et al. 2007*). In the registers of the IRSNB (original

label 1449) the specimen appears as caught in July 1930, bought to Mr. Flemming, and entered the museum in 1936 (*G. Lenglet in litt.*). Its occurrence in the northwestern region of Brazil is a second example of apparent sympatry of *E. perotis* and *E. trumbulli*, as already determined by collection records of both species in northern Bolivia (Eger, 2007).

Thus, we are reporting the first records of *E. perotis* for the State of Paraná, in Southern Brazil. The absence or very few records of this and other molossid bats in vast geographical areas of Brazil is probably due to the methods generally used in inventories and/or the lack of effort to capture them. In Brazil, the State Health Departments access a large number of bats annually in order to diagnose the rabies virus. This material, which has a singular scientific value, can be utilized through partnerships with researchers to increase the knowledge of species which are difficult to sample by traditional methods.

Acknowledgements

We are indebted to the Divisão de Vigilância em Zoonoses e Intoxicações (Secretaria de Estado da Saúde do Paraná) for access to study material and Marcelo Alejandro Villegas Vallejos for reviewing this paper. We also thank Enrico Bernard and Suely A. Marques-Aguiar, curator of the Mammals Division of the Museu Paraense Emílio Goeldi, for information on the species in the states of Amazonas and Pará, George Lenglet, curator of the *Institut Royal des Sciences Naturelles de Belgique*, for information sent concerning the species label of "Paraná do Manhã", and especially to Fernando Costa Straube for his valuable literature review on the life of Carl Lako in Brazil and Judith Eger for additional suggestions that improved the manuscript.

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Received 12/04/2010

Revised 26/07/2010

Accepted 30/07/2010