

Distributional extension of *Molossops neglectus* (Chiroptera, Molossidae) into southeastern Brazil

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Although Freeman (1981) and Koopman (1993) included up to four subgenera (*Cynomops*, *Molossops*, *Cabreramops*, and *Neoplatymops*) within *Molossops*, there is strong morphological, chromosomal, and molecular data that suggests these four taxa are separate divergent lineages worthy of full generic status

(Peters *et al.* 2002). Within *Molossops sensu stricto*, there are two well-defined species, *M. temminckii* and *M. neglectus*. The former species is relatively common and has a broad geographic distribution in South America, occurring from Colombia and Venezuela in the north to Peru, Bolívia, Paraguay,

Argentina, Uruguay, and Brazil in the south (Koopman 1993). More recently, this species has been documented from Guyana (Parker *et al.* 1993) and Ecuador (Reid *et al.* 2000). *Molossops neglectus* is slightly more enigmatic having only been described 20 years ago (Williams and Genoways 1980). This species was known to occur in northern South America from Surinam, northern Brazil, and northern Peru (Ascorra *et al.* 1991). Recently, it has been recorded from eastern Venezuela (Ochoa *et al.* 1993), Guyana, and southern Colombia (Lim & Engstrom 2001). There was also a disjunct population reported from Parque Nacional Iguazu in Misiones, Argentina (Barquez *et al.* 1993, 1999). Prior to this study, only 28 specimens of *M. neglectus* were known (Lim & Engstrom 2001).

A study of the molossid bats deposited at the Museu de Zoologia, Universidade de São Paulo, and recent collecting in the state of São Paulo has revealed the presence of *Molossops neglectus* in southeastern Brazil. This represents a major range extension for this species, which was previously known only from scattered localities in Amazonia and extreme northeastern Argentina. Herein, we provide some quantitative comparisons between *M. neglectus* and *M. temminckii*, and discuss sexual dimorphism and geographic variation between Atlantic Forest and Amazonian populations.

Examined material are or will be housed at the Museu de Zoologia, Universidade de São Paulo, São Paulo (MZUSP), Laboratório de Chiroptera, Universidade Estadual Paulista, São José do Rio Preto (DZSJRP), Royal Ontario Museum, Toronto (ROM), and United States National Museum of Natural History, Smithsonian Institution, Washington, DC (USNM). Recently collected material from Caetetus Ecological Station has their field numbers (F) reported pending their eventual deposition in one of the institutions listed previously. Most specimens are in alcohol, with their skulls removed, and some are dry skins with skulls or skeletons. Data for the examined material includes (if available) country, state, collecting locality (with latitude and longitude), catalogue number, sex, collectors, and date collected (Fig. 1).

The following seven standard cranial and external measurements (abbreviations in parentheses) were recorded: length of forearm (FAL); greatest length of skull (GLS); condylo-incisive length (LCI); breadth of braincase (BBC); breadth across upper molars (BUM); length of maxillary toothrow (LMT); and length of mandible (LMA). Ascorra *et al.* (1991) furnished a detailed description of the distribution of *M. neglectus*, known at that time to occur at only four localities; near Powaka in northern Surinam (type locality), Belém in northern Brazil, and Oxapampa and Requena, central and northern Peru, respectively (Fig. 1). Since then, it has been reported from Imataca Forest Reserve in eastern Venezuela (Ochoa *et al.* 1993), Puerto Leguizamo in southern Colombia, and three localities in Guyana (Lim & Engstrom 2001). Recently, Barquez *et al.* (1993, 1999) reported a range extension to the northern border of the province of Misiones in northeastern Argentina. Other than the type locality, which was savannah with secondary forest (Williams & Genoways 1980), subsequent records show that the species primarily inhabits forested regions: Amazonian rainforest in northern South America and semi-deciduous forest in northern Argentina. With our records, *Molossops neglectus* is now known from southeastern Brazil, some six hundred kilometres northeast of the previously known locality in Argentina. In Brazil, the species also is found in forested habitats, occurring in the humid coastal Atlantic forest (Paulo de Frontin and Salesópolis) and drier semi-deciduous interior forest (Caetetus and Itu), all in the southeastern uplands. Apparently, *Molossops neglectus* is absent in the large, open areas of southeastern South America, such as the drier Cerrado, Caatinga and Chaco, and the wetter Pantanal.

Molossops neglectus is distinguished from its sister species, *M. temminckii*, by dark brown dorsal hairs with the bases distinctly white, slightly darker ventral pelage, and larger size. There is only slight overlap in size between the two species with MZUSP 5847 having a small condylo-incisive length and breadth across upper molars (Table 1). Within *M. neglectus*, Ascorra *et al.* (1991) compared the sexes and concluded that



FIG. 1. — Map showing the known localities for *Molossops neglectus*. ARGENTINA (Barques *et al.* 1993, 1999); 1, Misiones; Parque Nacional Iguazú. BRAZIL; 2, Pará; Belém (1°27'S, 48°29'W), USNM 335843; 3, Rio de Janeiro; Paulo de Frontin (22°32'S, 43°41'W), MZUSP 5847, male, collected in 1926; 4, São Paulo; Caetetus Ecological Station (22°23'S, 49°40'W), F46079, female, collected by B. K. Lim and W. A. Pedro on 30 November 1999, and F46102, male, collected by B. K. Lim and W. A. Pedro on 2 December 1999; 5, Itú (23°17'S, 47°18'W), Pau d'Alho farm, MZUSP 15411, male, collected by U. R. Martins on 18 March 1962; 6, Salesópolis (23°38'S, 45°52'W), Boracéia Biological Station, MZUSP 15410, juvenile male, collected by L. Travassos Filho on 31 August 1967. COLOMBIA (Lim and Engstrom 2001); 7, Putumayo; Puerto Leguizamo (0°12'N, 74°46'W). GUYANA (Lim and Engstrom 2001); 8, Upper Demerara-Berbice; Arampa (5°31'N, 58°18'W); 9, Kamakabra (5°28'N, 58°16'W); 10, Potaro-Siparuni; Iwokrama Forest, 38-Mile Camp (4°22'N, 58°51'W). PERU (Ascorra *et al.* 1991); 11, Loreto; Requena (4°58'S, 73°50'W); 12, Pasco; Oxapampa (10°34'S, 75°24'W). SURINAM (Williams and Genoways 1980); 13, Surinam; Powaka (5°27'N, 55°5'W), type locality. VENEZUELA (Ochoa *et al.* 1993); 14, Bolívar; Imataca Forest Reserve (8°0'N, 61°18'W).

the species is sexually dimorphic with males larger than females. This was also true for specimens from Venezuela (Ochoa *et al.* 1993) and Guyana (Lim and Engstrom 2001). For our specimens from southeastern Brazil, females average slightly smaller with no overlap in two of the measurements. For *M. neglectus*, the three adult males reported herein from southeastern Brazil are much smaller than males from Guyana, with only 1 of 7 measurements overlapping, and they are also slightly smaller than females from Guyana (Table 1).

The female from southeastern Brazil averages smaller than specimens from Guyana and there is no overlap in range for four measurements. Based on our limited sample size and known sexual dimorphism in *N. neglectus*, we considered this difference in body size between populations from the Atlantic Forest and those in Amazonia to represent either extreme geographic variation within a single species, or two distinct allopatric species. Morphological, chromosomal, and molecular differences need to be analysed in a phylogenetic context

TABLE 1. — Measurements taken from specimens of *Molossops neglectus* from southeastern Brazil. Data from *M. temminckii* are furnished for comparison. For abbreviations of measurements, see the text. Age: Ad, Adult; SA, Subadult; Juv, Juvenile.

Species	Sex	FAL	GLS	LCI	BBC	BUM	LMT	LMA
¹ <i>M. neglectus</i>	1 ♂ – Juv	34.9	14.2	13.9	6.6	5.6	5.2	10.0
² <i>M. neglectus</i>	1 ♂ – Ad	36.7	15.8	14.3	7.8	6.4	5.6	11.2
³ <i>M. neglectus</i>	1 ♂ – Ad	36.9	16.4	15.6	-	7.1	6.1	-
⁴ <i>M. neglectus</i>	1 ♂ – Ad	36.6	16.6	-	8.2	7.4	5.9	12.7
⁵ <i>M. neglectus</i>	1 ♀ – Ad	36.0	15.5	14.8	8.2	7.2	5.9	12.0
⁶ <i>M. neglectus</i>	1 ♀ – Ad	35.1	17.1	15.4	8.8	7.7	6.3	12.2
⁷ <i>M. neglectus</i>	3 ♂ ♂ – Ad	38.0-40.0	18.6-19.8	17.0-18.2	8.4-8.6	7.9-8.4	6.9-7.3	12.5-13.2
⁷ <i>M. neglectus</i>	7 ♀ ♀ – Ad	36.0-39.0	16.7-17.9	15.7-16.8	8.0-8.4	7.5-8.0	6.4-6.8	11.5-12.5
⁸ <i>M. temminckii</i>	8 ♂ ♂ – Ad	30.3 ± 1.33	14.0 ± 0.3	13.5 ± 0.34	7.2 ± 0.1	-	5.18 ± 0.11	9.4 ± 0.21
		28.6-32.4	13.5-14.6	13.2-14.3	7.1-7.3	-	5.0-5.3	9.1-9.8
⁸ <i>M. temminckii</i>	8 ♀ ♀ – Ad	30.0 ± 0.49	13.5 ± 0.17	13.5 ± 0.17	6.88 ± 0.07	-	5.18 ± 0.09	9.3 ± 0.11
		29.3-30.6	13.8-14.2	13.3-13.8	6.8-7	-	5.0-5.3	9.2-9.5
⁹ <i>M. temminckii</i>	1 ♂ – SA	32.0	14.5	13.6	7.6	6.4	5.4	9.7
⁹ <i>M. temminckii</i>	1 ♂ – Ad	32.0	14.4	13.8	7.5	6.3	5.5	10.0
⁹ <i>M. temminckii</i>	2 ♀ ♀ – Ad	33.0, 31.0	14.8, 13.9	14.0, 13.1	7.0, 7.1	6.5, 6.0	5.4, 4.8	9.9, 9.2

¹MZUSP 15410; ²MZUSP 5847; ³MZUSP 15411; ⁴F66102; ⁵F46079; ⁶Measurements taken from the original description of the holotype (Williams and Genoways, 1980); ⁷For specimens from Guyana reported in Lim and Engstrom (2001); ⁸Samples from Northwestern São Paulo (DZSJR 2989, 3247, 3248, 3278, 3279, 3294, 3296, 3307, 3308, 10942, 10943, 12497, 16501, 16619, 16719, and 16764); ⁹For specimens from Ecuador reported in Reid et al. (2000).

before taxonomic changes can be recommended. A similar distributional disjunction was found between *Vampyressa p. pusilla* and *V. p. thyone*, and analysis of diverse data sets warranted their separation into two species (Lim et al. 2003).

The only previous documentation of *M. neglectus* in Brazil was based on a juvenile male from the Amazonian forest of Belém (Ascorra et al. 1991). Although there were no comparisons with *M. temminckii*, given the geographic variation in *M. neglectus*, verification of the species identification of the previously reported juvenile specimen from Belém was problematic. The specimens recorded herein of *M. neglectus* from the state of São Paulo were directly compared with those of *M. temminckii* from the same state, and corroborated the specific status of each and the confirmation of the juvenile specimen from Belém as *M. neglectus* (five) improve the collections in museums by adding to the previously known 28 specimens (Lim & Engstrom 2001).

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