

Mammalia, Chiroptera, Phyllostomidae, *Vampyroides caraccioli* (Thomas, 1889): Range extension and revised distribution map

Paúl M. Velazco^{1*}, Caroline C. Aires², Ana Paula Carmignotto³ and Alexandra M. R. Bezerra⁴

1 American Museum of Natural History, Department of Mammalogy, Central Park West at 79th Street, New York, NY, 10024, USA.

2 Universidade de São Paulo, Museu de Zoologia, Laboratório de Mastozoologia, Avenida Nazaré, 481, Ipiranga, CEP 04263-000. São Paulo, SP, Brazil.

3 Universidade Federal de São Carlos, Campus Sorocaba, Rodovia João Leme dos Santos, Km 110 – SP-264. Bairro do Itinga, CEP 18052-780. Sorocaba, SP, Brazil.

4 Universidade de Brasília, Instituto Central de Ciências, Departamento de Zoologia, Coleção de Mamíferos, Asa Norte, CEP 70910-900. Brasília, DF, Brazil.

* Corresponding author. E-mail: pvelazco@amnh.org

ABSTRACT: The present note reports the first record of the bat *Vampyroides caraccioli* (Thomas, 1889) for the state of São Paulo, southeastern Brazil, based on the collection of one adult specimen in Núcleo São Sebastião, Parque Estadual da Serra do Mar, at the Atlantic Forest domain.

Vampyroides is a monotypic genus of leaf-nosed bats with two subspecies recognized: *V. caraccioli caraccioli* (Thomas, 1889) and *V. c. major* Allen, 1908. *V. c. caraccioli* occurs in Trinidad and Tobago and Venezuela, with its type locality in “Trinidad” (Thomas 1889; Gardner 2007). The other subspecies, *V. c. major*, is distributed from southern Mexico southward to Bolivia, Brazil, Colombia, Ecuador, French Guiana, Peru, Surinam, and Venezuela; the type locality for *major* is “San Pablo, Isthmus of Panama,” Canal Zone, Panama (Allen 1908; Gardner 2007). Thomas (1924) described *Vampyroides ornatus* using a specimen from “San Lorenzo, Rio Marañon, nearly opposite mouth of Huallaga. Alt. 500’ Loreto, Peru, but Handley (1966) treated *ornatus* as a junior synonym of *major*.

Bats of the genus *Vampyroides* are frugivores and are found mainly in moist and wet forests throughout its distribution (Handley 1967; Gardner 1977, 2007; Solari *et al.* 2006). In Brazil, *Vampyroides* is rare, and has been reported only from a few localities in four states (Table 1; Figure 1). The Brazilian specimens are deposited in the following collections: Adriano Lúcio Peracchi collection at the Instituto de Biologia, Universidade Federal Rural do Rio de Janeiro, Rio de Janeiro, Brazil (ALP); Departamento de Zoologia, Universidade Estadual Paulista, São José do Rio Preto, São Paulo, Brazil (DZSJRP); Field Museum of Natural History, Chicago, USA (FMNH); Museu Nacional, Rio de Janeiro, Brazil (MN); Museu de Zoologia da Universidade de São Paulo, São Paulo, Brazil (MZUSP); Universidade Estadual de Santa Cruz, Ilhéus, Bahia, Brazil (UESC); and United States National Museum, Smithsonian Institution, USA (USNM).

This monotypic genus is listed as Least Concern by the IUCN (Miller *et al.* 2008), because it is widely dispersed, tolerant of a range of habitats and is unlikely to be declining at a rate which would include the species in a threatened category. Nonetheless, decades of continuous bat research in Brazil have produced few records of *Vampyroides*, which suggests it may warrant inclusion in regional lists of

threatened or vulnerable species. It seems to be rare in lower latitudes, therefore it is important to preserve its southernmost populations.

Vampyroides caraccioli has not been recorded in the state of São Paulo (Zortéa 2007). Therefore, the goal of the present study is to report the first record of this species for the state of São Paulo, thereby extending southward its known geographical distribution (Figure 1).

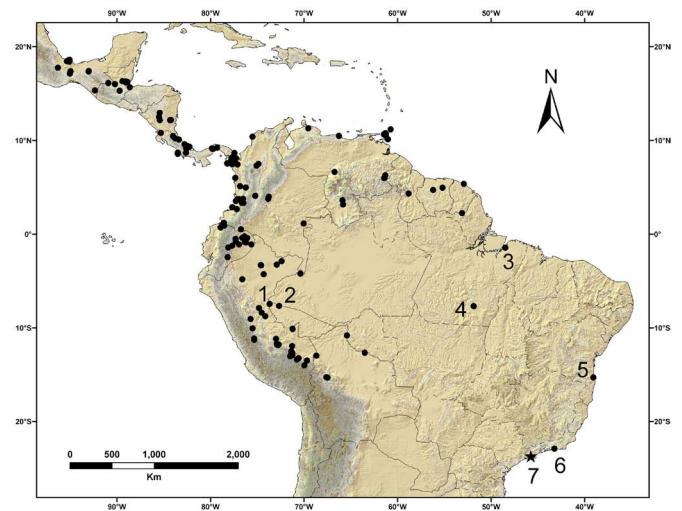


FIGURE 1. Geographic distribution of *Vampyroides caraccioli* and the new record (star) in the state of São Paulo, southeastern Brazil. Numbers indicate Brazilian records presented in Table 1.

During a bat inventory at Núcleo São Sebastião, Parque Estadual da Serra do Mar, an Atlantic Forest area in São Paulo (23°43'32" S, 45°45'11" W, 411 m), one adult specimen of *V. caraccioli* was collected with a mist-net on the ground in a primary forest, classified as “Floresta Ombrófila Densa Submontana” (Veloso *et al.* 1991) on the slopes of the Serra do Mar mountain range. The specimen was deposited in the mammal collection of Museu de Zoologia, Universidade de São Paulo (MZUSP), in São Paulo, Brazil.

The Parque Estadual da Serra do Mar, one of the largest continuous areas of Atlantic forest, comprised of 315,000 ha, is located in the southeast of the state of São Paulo. The following species were also netted during this inventory in the same locality as the *Vampyrodes*: *Desmodus rotundus* (Geoffroy St.-Hilaire, 1810), *Anoura caudifer* (Geoffroy St.-Hilaire, 1818), *Glossophaga soricina* (Pallas, 1766), *Carollia perspicillata* (Linnaeus, 1758), *Chrotopterus auritus* (Peters, 1856), *Micronycteris megalotis* (Gray, 1842), *Glyphonycteris sylvestris* Thomas, 1896, *Mimon bennettii* (Gray, 1838), *Tonatia bidens* (Spix, 1823), *Trachops cirrhosus* (Spix, 1823), *Artibeus fimbriatus* Gray, 1838, *A. lituratus* (Olfers, 1818), *A. obscurus* (Schinz, 1821), *Dermanura cinerea* Gervais, 1856, *Platyrrhinus recifinus* (Thomas, 1901), *Sturnira lilium* (Geoffroy St.-Hilaire, 1810), and *S. tildae* de la Torre, 1959.

The specimen (MZUSP 34655; Figure 2), a female, 35 g, was captured on 12 March 2005, 2 meters from the ground. The identification of the individual was based on the characteristics described by Gardner (2007) and Velazco (2005): the forearm length (FA: 54.03 mm) is within the range of the species (46.8-56.7 mm, Gardner 2007); the dorsal pelage is pale to gray-brown; presence of a prominent white dorsal stripe and conspicuous white facial stripes; the supraorbital stripes extend from the lateral margin of the noseleaf to the top of the head between the ears; shorter white malar stripes extend from the corner of the mouth to the base of the ears; absence of a sulcus on the anterior face of P4, presence of two upper molars; absence of the lingual cingulum at the base of the metacones of M1 and M2; absence of the lingual cingulid of

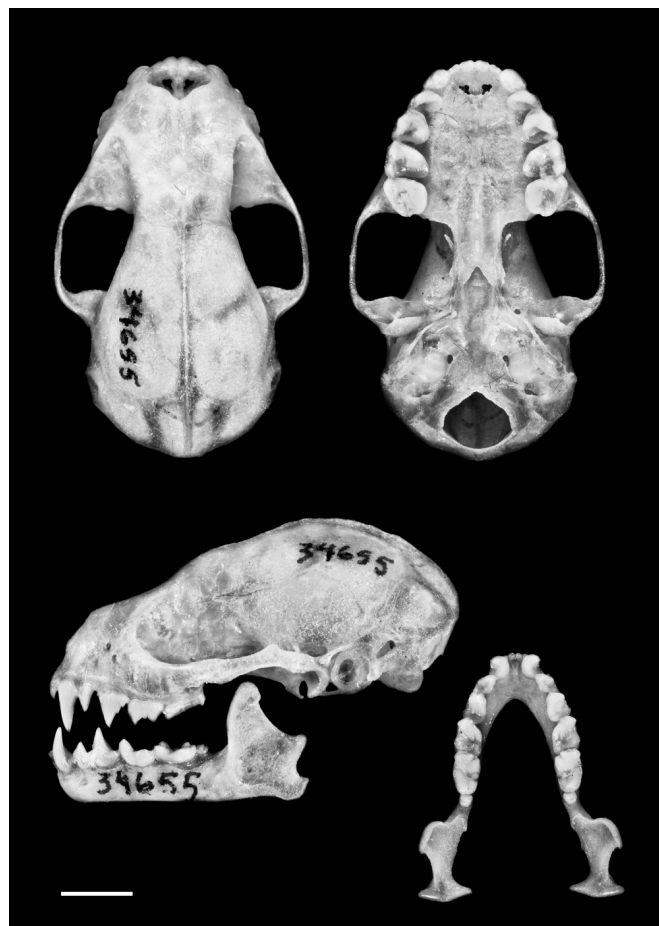


Figure 2. Dorsal, ventral, and lateral views of the skull and also dorsal and lateral views of the mandible of *Vampyrodes caraccioli* (MZUSP 34655). Picture: M.V. Brandão-Oliveira. See Table 2 for measurements. Scale bar = 5 mm.

TABLE 1. Locality records of *Vampyrodes caraccioli* in Brazil.

Specimen	Sex	Locality	Coordinates	Reference
ALP 7089, 7094, 7102	F	Acre: Parque Nacional da Serra do Divisor, foot of the Serra da Jaquirana ¹	7°27' S, 73°41' W	Nogueira et al. 1999, 2004
DZSJRP 13028	F	Acre: Seringal Lagoinha, Rio Juruá, approx. 30 km E of Cruzeiro do Sul ²	7°40' S, 72°40' W	Taddei et al. 1990
UESC	F	Bahia: Una ⁵	15°18' S, 39°04' W	Faria et al. 2006, Faria and Baumgarten 2007
FMNH 126599	F	Pará: Belém, Utinga ³	1°27' S, 48°29' W	FMNH
FMNH 126598; ?	M	Pará: Belém, Utinga ³	1°27' S, 48°29' W	FMNH; Thomas 1920
USNM 393019-20, 393024, 460114, 460116-17, 460120	F	Pará: Belém, Mocambo ³	1°27' S, 48°30' W	USNM
USNM 393021-23, 460115, 460118-19, 460121, 460123	M	Pará: Belém, Mocambo ³	1°27' S, 48°30' W	USNM
USNM 361711, 460122	M	Pará: Belém ³	1°26' S, 48°28' W	USNM
USNM 390516	-	Pará: Belém ³	1°26' S, 48°28' W	USNM
USNM 361712	M	Pará: Belém, Fazenda Velha ³	1°26' S, 48°28' W	USNM
MZUSP 29149, 34709, 34710	F	Pará: Ourilândia do Norte, Área Indígena Kayapó ⁴	7°41' S, 51°52' W	Peters et al. (2006)
MZUSP 34711	M	Pará: Ourilândia do Norte, Área Indígena Kayapó ⁴	7°41' S, 51°52' W	Peters et al. (2006)
MN 43101-02	F	Rio de Janeiro: Rio de Janeiro ⁶	22°54' S, 43°14' W	Bezerra et al. 2004; MN
MZUSP 34665	F	São Paulo: Parque Estadual da Serra do Mar, Núcleo São Sebastião ⁷	23°43'32" S, 45°45'11" W	This study

m1; absence of a stylid cusp on the anterior face of the m1 protoconid. Measurement of this new record along with the measurements of the holotypes of *caraccioli*, *major* and *ornatus* are given in Table 2.

The specimen reported in this paper represents the first record of *V. caraccioli* in São Paulo and extends the known austral limit of the species distribution by 92 km (Figure 1). Thus, the bat diversity of the state of São Paulo is increased to 76 species (Tavares et al. 2008).

TABLE 2. Measurements of the new record of *Vampyroides caraccioli* from the state of São Paulo, Brazil (MZUSP), and the holotypes of the named forms in the genus. All measurements in millimeters (mm), taken to the nearest 0.01 mm.

	MZUP 34655	<i>V. caraccioli</i> BMNH 89.6.10.2	<i>V. major</i> MCZ 6756	<i>V. ornatus</i> BMNH 24.3.1.63
Characters	♀	-	♀	♀
FA	54.03	49.70	55.35	53.45
GLS	28.30	-	27.74	26.50
CIL	25.83	-	25.61	24.75
CCL	25.17	-	24.80	23.90
BB	10.98	-	12.00	11.30
ZB	17.79	-	18.36	16.65
PB	6.55	6.10	7.14	6.30
C-C	6.70	6.30	7.00	6.90
PL	14.14	12.45	14.25	13.25
MTRL	10.37	9.50	10.43	10.10
MLTRL	8.88	7.85	8.50	8.30
M1-M1	12.26	11.00	12.63	11.65
M2-M2	12.71	11.20	12.58	11.80
DENL	19.32	17.35	19.38	18.10
MANDL	11.45	10.50	11.44	-

FA = forearm length; GLS = distance from the posterior-most point of the occiput to the anterior-most point of the premaxilla (excluding incisors); CIL = distance between a line connecting the posterior-most margins of the occipital condyles and the anterior-most surface of the upper incisors; CCL = distance between a line connecting the posterior-most margins of the occipital condyles and a line connecting the anterior-most surface of the upper canines; BB = greatest breadth of the braincase, excluding mastoid and paraoccipital processes; ZB = greatest breadth across zygomatic arches; PB = breadth at the postorbital constriction; C-C = least width across palate between bases of upper canines; PL = distance between posterior palatal notch to anterior border of the incisive alveolus; MTRL = distance from the anterior-most edge of the upper canine crown to the posterior-most edge of the crown on M3; MLTRL = posterior border of M3 alveolus to anterior border of P3; M1-M1 = greatest width of palate across M1s; M2-M2 = greatest width of palate across M2s; DENL = midpoint of mandibular condyle to anterior-most point of dentary; MANDL = distance from the anterior-most surface of the lower canine to the posterior-most surface of m3.

Museum acronyms: British Museum of Natural History, London, UK (BMNH), Museum of Comparative Zoology, Cambridge, Massachusetts, USA (MCZ) and Museu de Zoologia, Universidade de São Paulo, São Paulo, Brazil (MZUSP).

ACKNOWLEDGMENTS: We are grateful to Renato Gregorin, Kerry Kline, Marcelo R. Nogueira, Bruce D. Patterson, and Miguel Pinto for comments on an earlier draft of this manuscript; to Alessandra Higa and Marcos Gerales for the support in the field work; to Juliana Gualda-Barros, Stella Maris, Leandro Salles, and Mario de Vivo for access to the MN and MZUSP collections; to IBAMA and IF for the license to survey the areas of the Parque Estadual da Serra do Mar and the specimens of Chiroptera.

LITERATURE CITED

- Allen, G.M. 1908. Notes on Chiroptera. *Bulletin of the Museum of Comparative Zoology* 52 (3): 25-62.
- Bezerra, A.M.R., M. Baptista, S.M. Franco and J.A. Oliveira. 2004. A coleção de mamíferos preservados em meio líquido do Museu Nacional. *Publicações Avulsas do Museu Nacional* 101: 1-11.
- Faria, D. and J. Baumgarten. 2007. Shade cacao plantations (*Theobroma cacao*) and bat conservation in southern Bahia, Brazil. *Biodiversity and Conservation* 16: 291-312.
- Faria, D., B. Soares-Santos and E. Sampaio. 2006. Bats from the Atlantic rainforest of southern Bahia, Brazil. *Biota Neotropica* 6 (2): 1-13.
- Gardner, A.L. 1977. Feeding habits; p. 293-350. In R.J. Baker, J.K. Jones Jr. and D.C. Carter (ed.). *Biology of bats of the New World family Phyllostomatidae. Part II*. Lubbock: Texas Tech University.
- Gardner, A.L. 2007. Genus *Vampyroides* O. Thomas 1900; p. 355-357. In A.L. Gardner (ed.). *Mammals of South America. Marsupials, xenarthrans, shrews, and bats*. Chicago: University of Chicago Press.
- Handley Jr., C.O. 1966. Checklist of the mammals of Panama; p. 753-795. In: R.L. Wenzel and V.J. Tipton (ed.). *Ectoparasites of Panama*. Chicago: Field Museum of Natural History.
- Handley Jr., C.O. 1967. Bats of the canopy of an Amazonian forest. *Atas do Simpósio sobre a Biota Amazônica* 5 (Zoologia): 211-215.
- Miller, B., F. Reid, J. Arroyo-Cabrales, A.D. Cuarón and P.C. de Grammont. 2008. *Vampyroides caraccioli*. In IUCN 2009. *IUCN Red List of Threatened Species. Version 2009.1*. <www.iucnredlist.org>. Captured on 06 October 2009.
- Nogueira M.R., S.P. de Fabio and A.L. Peracchi. 2004. Gastrointestinal helminth parasitism in fruit-eating bats (Chiroptera: Stenodermatinae) from western Amazonian Brazil. *Revista de Biología Tropical* 52 (2): 387-392.
- Nogueira, M.R., A. Pol and A.L. Peracchi. 1999. New records of bats from Brazil with a list of additional species for the chiropteran fauna of the state of Acre, western Amazon basin. *Mammalia* 63 (3): 363-368.
- Peters, S.L., J.R. Malcolm and B. Zimmerman. 2006. Effects of Selective Logging on Bat Communities in the Southeastern Amazon. *Conservation Biology* 20(5): 1410-1421.
- Solari, S., V. Pacheco, L. Luna, P.M. Velazco and B.D. Patterson. 2006. Mammals of the Manu Biosphere Reserve; p. 13-22. In Patterson, B.D., D.F. Stotz and S. Solari (ed.). *Mammals and birds of the Manu Biosphere Reserve, Peru. Fieldiana - Zoology, new series* 110.
- Taddei, V.A., I.M. de Rezende and D. Camora. 1990. Notas sobre uma coleção de morcegos de Cruzeiro do Sul, Rio Juruá, estado do Acre (Mammalia, Chiroptera). *Boletim do Museu Paraense Emílio Goeldi, Série Zoologia*, 6 (1): 75-88.
- Tavares, V.C., R. Gregorin and A.L. Peracchi. 2008. A diversidade de morcegos no Brasil: lista atualizada com comentários sobre distribuição e taxonomia; p. 25-58. In Pacheco, S., M. Fabián and C. Esbérard (ed.). *Morcegos no Brasil: Biologia, Sistemática, Ecologia e Conservação*. Porto Alegre: Armazém Digital.
- Thomas, O. 1889. Description of a new stenodermatous bat from Trinidad. *Annals and Magazine of Natural History* 6 (4): 167-170.
- Thomas, O. 1920. On mammals from the lower Amazons in the Goeldi Museum, Para. *Annals and Magazine of Natural History* 9 (6): 266-283.
- Thomas, O. 1924. On a collection of mammals made by Mr. Latham Rutter in the Peruvian Amazons. *Annals and Magazine of Natural History* 9 (13): 530-538.
- Velazco, P.M. 2005. Morphological phylogeny of the bat genus *Platyrrhinus* Saussure, 1860 (Chiroptera: Phyllostomidae) with description of four new species. *Fieldiana, Zoology*, new series, 105: iv + 53.
- Veloso, H.P., A.L.R. Rangel Filho, and J.C.A. Lima. 1991. *Classificação da vegetação Brasileira, adaptada a um sistema universal*. Rio de Janeiro: MEFP/IBGE/DRNEA. 123 p.
- Zortéa, M. 2007. Subfamília Stenodermatinae; p. 107-128. In Reis, N.R., A.L. Peracchi, W.A. Pedro and I.P. Lima (ed.). *Morcegos do Brasil*. Londrina: Editora da Universidade Estadual de Londrina.

RECEIVED: NOVEMBER 2009

REVISED: JANUARY 2010

ACCEPTED: JANUARY 2010

PUBLISHED ONLINE: FEBRUARY 2010

EDITORIAL RESPONSIBILITY: MARCELO RODRIGUES NOGUEIRA