

NOTES ON GEOGRAPHIC DISTRIBUTION

Mammalia, Chiroptera, Phyllostomidae, *Platyrrhinus recifinus*: first record in the state of Paraná, Southern Brazil

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The most recent revision of the genus *Platyrrhinus* Saussure, 1860 (Velazco 2005) recognized 14 species in the genus, most of them frugivorous. Five species are recorded in Brazil (Peracchi et al. 2006; Zortéa 2007): *Platyrrhinus brachycephalus* (Rouk and Carter 1972), *P. helleri* (Peters 1866), *P. infuscus* (Peters 1880), *P. lineatus* (E. Geoffroy 1810) and *P. recifinus* (Thomas 1901). *Platyrrhinus recifinus* is endemic to eastern Brazil, with its type locality in the city of Recife, state of Pernambuco, and also recorded in the states of Paraíba, Alagoas, Bahia, Espírito Santo, Minas Gerais, Rio de Janeiro, and São Paulo (Figure 1) (Zortéa 2007).

Almost nothing is known about the natural history of *P. recifinus*, but it is probably a frugivorous bat with habits similar to other congeneric species (Zortéa 2007). *Platyrrhinus recifinus* is found mainly in moist forests, such as primary and secondary forests in the Atlantic Forest (e.g. Peracchi and Albuquerque 1993, Dias et al. 2002, Tavares et al. 2007, Dias and Peracchi 2008), and the humid vegetation enclaves (*brejos de altitude*) in the Caatinga domain (Souza et al. 2004). The species is listed as “Vulnerable” on the Brazilian Threatened Species List, mainly due to destruction or fragmentation of its habitat (Machado et al. 2005).

Recently, however, *P. recifinus* appeared in the “Least Concern” category of the World Threatened Species List, because it has been

captured in disturbed habitats, and thus is not considered to be a particularly threatened species (IUCN 2008). *Platyrrhinus recifinus* was not yet recorded in the state of Paraná (Reis et al. 2008), nor in any other state in southern Brazil (Peracchi et al. 2006). Therefore, the goal of the present study is to report the first record of this species to Paraná, thereby extending southward its known geographical distribution.

During a bat inventory study at *Reserva Natural Morro da Mina* (RNMM), an Atlantic Forest area in Paraná, five adult specimens of *P. recifinus* were collected, all of which were adults (completely ossified metacarpal epiphyses and phalanxes). Four bats were netted in tree-fall gaps from the understory to the canopy (about 20 m above the ground), on the trail known as *Trilha da Samambaia*, in Submontane Forest, and one was captured on the forest edge next to RNMM center. The nets were opened after sunset and kept opened until dawn. All collected individuals were preserved in 70 % alcohol and were deposited in the Mastozoological Collection of the *Museu de História Natural Capão da Imbuia* (MHNCI), in Curitiba, Paraná.

The *Reserva Natural Morro da Mina*, a Natural Patrimony Private Reserve, comprises an area of 3,400 ha and is located in the Antonina and Morretes municipalities (25°21' and 25°25' S, and 48°46' and 48°51' W; Figure 1). The reserve neighbors the Environmental Protection Areas of

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the Serra do Mar and Guaraqueçaba, on the largest contiguous remnants of Atlantic Forest in Brazil (SOS Mata Atlântica and INPE 2008). The principal vegetation types, according to the classification of Veloso et al. (1991), are pioneer formations under marine and river-flooding influence, and the subformations of lowland, submontane, and dense, moist forests (Ferretti and Brites 2006). Systems of secondary vegetation occur as well. Thus, the reserve is now represented by a mix of initial, middle and advanced states of succession (M. Borgo personal communication). Following Köppen's classification, the climate of the region is Cfa, or mesothermic subtropical humid. The average annual temperature is between 20.8 and 22 °C, with more than 2,000 mm of precipitation each year, falling principally from January to March (Ferretti and Brites 2006). The average air humidity is 85 %.

The first specimen (MHNCI 6098), a female, was captured on May 21st 2008, at 21:56 h, one meter above the ground. On May 23rd, 2008, two more females were captured: one (MHNCI 6099) at

18:10 h, one meter above the ground, and the other (MHNCI 6100) at 00:30 h, eight meters above the ground. An additional female (MHNCI 6101) was captured on June 25th, 2008, at 03:08 h, 16 m above the ground. The fifth individual (MHNCI 6102), a male, was captured on July 16th, 2008, at 00:05 h, six meters above the ground in a mist net placed in front of opened flowers of *Pseudobombax grandiflorum* (Cav.) A. Robins (Malvaceae), in a Submontane forest area, next to the Reserva center and highway PR-340. None of the individuals presented evidence of reproductive activity.

The identification of the collected individuals was based principally on the revision by Velasco (2005), which provided measurements and new useful characters for species differentiation. Identification was also aided by Sanborn (1955), Willig and Hollander (1987), Ferrel and Wilson (1991). For each specimen studied, we obtained six external measurements and 13 skull measurements (in mm) using a caliper of 0.02 mm precision and criteria proposed by Taddei et al. (1998).

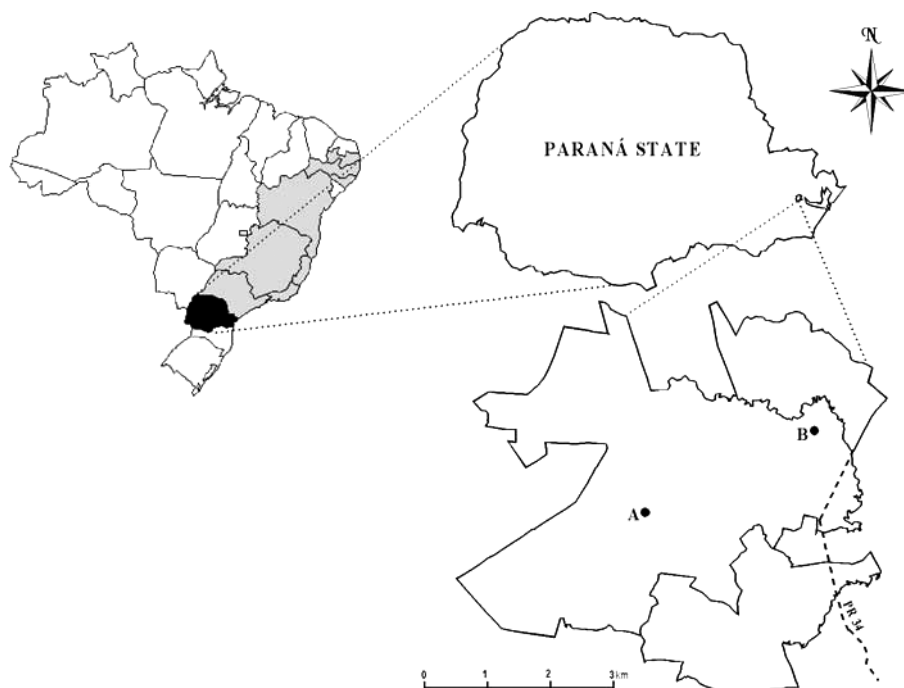


Figure 1. Map showing the *Reserva Natural Morro da Mina* and its location in the state of Paraná (black), and the currently known records (gray) for *Platyrrhinus recifinus* in the Brazil. (A) Submontane Forest where four *P. recifinus* were captured. (B) Edge of the forest where one individual was captured. Highway PR-340 next to the reserve in dotted line.

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All specimens reported in this paper have the diagnostic features proposed by Velazco (2005) to *P. recifinus*: interramal vibrissae absent; dorsal fur tetracolored; a deep fossa in the hypoconal basin of the second upper premolar (P4) and a stylid cusp absent between the metaconid and the protoconid of first lower molar (m2). The specimens also have the features that distinguish *P. recifinus* from *P. lineatus* (Velazco 2005): third metacarpal longer than the fifth; postorbital and paraoccipital processes poorly developed; stylar cusp in lingual cingulum on the base of the first upper molar (M1) metacone absent, and first lower molar (m1) metaconid absent. *Platyrrhinus lineatus*, the other species in the genus recorded in Southern Brazil (Zortéa 2007; Weber et al. 2006), has one interramal vibrissae, dorsal fur tricolored, a shallow fossa on the hypoconal basin of P4, a stylid cusp present between the metaconid and the protoconid of m2, the fifth metacarpal longer than the third, postorbital and paraoccipital processes well developed, stylar cusp in lingual cingulum on the base of the M1 metacone present, and m1 metaconid present and well developed (Velazco 2005).

Carter and Dolan (1978), Willig and Hollander (1987), and Ferrel and Wilson (1991) mentioned trilobate lower incisors as an important character to separate *P. recifinus* from *P. lineatus* (bilobate incisors). In the specimens of *P. recifinus* from RNMM, the lower incisors are small, separated by gaps, and with the upper margin nearly smooth, with two or three rudimentary lobes. In *P. lineatus* the lower incisors are robust and clearly bilobate, with deep notches (D. Dias personal observation). According to Sanborn (1955) and Velazco (2005), size and disposition of the central upper incisors do not constitute good diagnostic characters, because a large degree of individual variation is present. Three specimens analyzed have the central upper incisors robust and separate from each other, and two have robust incisors connected on the extremity.

We initially had doubts about the identification of one individual (MHNCI 6099), which has forearm length measuring 45.96 mm, a value higher than the superior limit usually reported for *P. recifinus*, and inside the variation of *P. lineatus* (43.7 to 50.1 mm, Sanborn 1955). Analyses of the qualitative somatic and craniodental characters, however, confirm the identification of this specimen as *P. recifinus*. Because overlap of cranial measurements with *P. lineatus* has been reported in the literature (Dias et al. 2002; Velazco 2005; Dias and Peracchi 2008), these species are more easily distinguished by qualitative morphological characters.

There is little published measurement data for *P. recifinus* (Carter and Dolan 1978; Dias et al. 2002; Velazco 2005; Dias and Peracchi 2008). These specimens from Paraná reported herein are, in general, larger than the holotype from Pernambuco and specimens from the states of São Paulo and Rio de Janeiro, which may be related to a clinal variation (Table 1). Additional samples, however, are needed in order to obtain solid conclusions.

The specimens reported in this paper represent the first record of *P. recifinus* in Paraná and extend the known austral limit of the species' distribution. With this record, the bat list for Paraná is now represented by 61 species, complementing the most recent compilation published by Reis et al. (2008). However, present knowledge about the bat fauna of this state is far from being satisfactory. According to Miretzki (2003), about two thirds of the territory of Paraná is still insufficiently sampled. Although the *Reserva Natural Morro da Mina*, where the specimens of *P. recifinus* were captured, is located in a region considered of low priority for bat inventories (Miretzki 2003), our results come to reinforce others studies (e.g., Miranda et al. 2006, Gazarini and Bernardi 2007) that clearly indicate the need for continuing sampling efforts in this area.

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Table 1. Selected measurements of *Platyrrhinus recifinus* from the *Reserva Natural Morro da Mina*, *Reserva Biológica do Tinguá*, *Parque Estadual Pedra Branca*, localities in the state of São Paulo and from the holotype. Min = minimum; Max = maximum; N = number of specimens. Acronyms of measurements: total length of body (TL); ear length (EL); hind foot length (HL); length of forearm (FA); greatest length of skull, including incisors (GLS); condyloincisive length (CIL); basal length, including incisors (BL); palatal length, including incisors (PL); length of maxillary tooththrow (MAXT); breadth across upper canines (BAC); breadth across upper molars (BAM); postorbital breadth (PB); zygomatic breadth (ZB); breadth of braincase (BB); mastoid breadth (MB); mandibular length (ML); and length of mandibular tooththrow (MANT). Localities: ¹ present study, ² Velazco (2005), ³ Dias and Peracchi (2008), ⁴ Dias et al. (2002), ⁵ Carter and Dolan (1978).

Characters	Reserva Natural Morro da Mina (Paraná) ¹	São Paulo ²	Reserva Biológica do Tinguá (Rio de Janeiro) ³	Parque Estadual da Pedra Branca (Rio de Janeiro) ⁴	Holotype (Pernambuco) ⁵
	(Min-Max) (N = 1 ♂; 4 ♀)	(Min-Max) (N = 6)	(Min-Max) (N = 3 ♂; 6 ♀)	(Min-Max) (N = 2 ♂)	
TL	57.92 - 64.38	89.00 - 93.00	54.14 - 59.12	50.20 - 58.30	-
EL	15.30 - 16.86	18.00 - 20.00	16.1 - 16.90	14.00 - 16.40	-
HL	11.84 - 13.44	11.00 - 13.00	10.5 - 13.54	9.20 - 10.50	-
FA	42.64 - 45.96	42.00– 43.00	41.66 - 43.54	41.70 - 42.00	40.20
GLS	24.56 - 25.50	23.03 - 23.76	23.50 – 25.24	23.90 - 24.20	24.10
CIL	22.36 - 23.42	21.99 – 22.61	22.04 - 22.98	21.60 - 22.00	21.70
BL	19.92 - 20.84	-	19.84 - 20.66	19.40 - 19.80	-
PL	11.88 - 12.76	-	11.74 - 12.40	11.30 - 11.60	-
MAXT	9.20 - 9.72	8.62 – 9.39	9.00 - 9.56	8.70 - 8.80	8.90
BAM	10.72 - 11.44	9.90 – 10.71	10.28 - 10.98	10.20 - 10.40	10.50
BAC	6.28 - 6.70	-	6.00 - 6.44	6.00 - 6.10	6.40
PB	5.84 - 6.02	5.46 – 6.10	5.54 – 6.24	5.50 - 5.70	5.60
ZB	14.58 - 14.98	13.55 - 14.45	13.74 - 14.64	13.80 - 14.10	14.00
BB	10.50 - 11.22	10.18 – 10.80	10.20 - 10.74	10.30 - 10.50	10.30
MB	12.08 - 12.60	11.57 – 12.41	11.76 - 12.12	11.70 - 12.30	11.70
ML	16.18 - 17.20	-	16.20 - 16.96	15.60 - 16.00	15.30
MANT	9.62 - 10.48	-	9.54 - 10.26	9.50 - 9.50	9.50

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