

FIRST RECORD OF *Lasiurus blossevillii* LESSON & GARNOT, 1826 (CHIROPTERA: VESPERTILIONIDAE) IN THE STATE OF ACRE, SOUTHWEST OF THE AMAZON, BRAZIL

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ABSTRACT

We recorded two individuals of *Lasiurus blossevillii* for the State of Acre, in the municipality of Xapuri, boundary with Bolivia. Two adult specimens, a female and a male, were caught in the Agro-extractive Settlement Project Chico Mendes (PAECM) in August 2014 and December 2015, by using mist-nets installed at ground level. The morphometric characteristics are consistent with the literature, ensuring the precise taxonomic identification of the specimens. This study increases to five the number of records of this species to the legal Amazon.

Keywords: Amazon forest; bats; distribution.

The genus *Lasiurus* comprises 17 species with restricted distribution in the Americas (Simmons 2005, Gardner 2007) and, according to Nogueira *et al.* (2014), seven species of *Lasiurus* occur in Brazil: *L. blossevillii* Lesson & Garnot, 1826, *L. cinereus* Palisot de Beauvois, 1796, *L. ebenus* Fazzolari-Corrêa, 1994, *L. ega* (Gervais 1856), *L. egregius* (Peters 1870), *L. castaneus* Handley, 1960, and *L. salinae* Thomas, 1902. *Lasiurus blossevillii* occurs from Canada to South America, being recorded in all countries except Chile (Gardner 2007). In Brazil, this species has been previously registered in the States of Amapá, Amazonas, Ceará, Distrito Federal, Espírito Santo, Goiás, Mato Grosso, Mato Grosso do Sul, Minas Gerais, Pará, Paraná, Pernambuco, Piauí, Rio de Janeiro, Rio Grande do Sul, São Paulo, and Santa Catarina, occurring in the Amazon, Cerrado and Atlantic Forest biomes (Gardner 2007, Martins *et al.* 2006, Peters *et al.* 2006, Tavares & Gregorin 2008, Alho *et al.* 2011, Bernard *et al.* 2011, Rodrigues & Ribas 2011, Fischer *et al.* 2015, Oliveira *et al.* 2015, Soares *et al.* 2016).

Despite the widespread occurrence of *L. blossevillii* throughout Brazil, previous records are

rare and sporadic, hampering the design of the actual distribution of the species. Bernard *et al.* (2011) and Rodrigues & Ribas (2011) have commented on *L. blossevillii* records in the North region of Brazil, where they recognize only the records of Reis (1984) and Bernard & Fenton (2002) as incontestable to Brazilian Amazon. Here we report the first occurrence of *L. blossevillii* for the State of Acre, constituting the fifth record of the species in the Brazilian Amazon.

Samples were collected in the extreme southwest of Amazon, municipality of Xapuri, State of Acre, border with Bolivia (10°54'S; 68°21'W), in the Agro-extractive Settlement Project Chico Mendes (PAECM). The area has 24,898 ha and the predominant habitat types are open forest dominated by bamboos, open forest with palm trees and dense forest (Acre 2010). The climate of region according to Koppen is Af (hot and humid), with annual minimum temperature around 24°C with two distinct seasons: dry, which usually occurs between the months of May and September; and rainy, which usually occurs between the months October and April (Macedo *et al.* 2013). The site where the two

specimens were collected has as predominant vegetation type of open forest with palm trees, with the presence of a water body (stream).

The specimens of *L. blossevillii* were collected in August 2014 and December 2015, using mist nets (12 x 3 m, 19 mm mesh, Ecotone®) arranged at ground level of the sampled sites. The animals were euthanized with intramuscular administration of 100 mg/kg of hydrochloride of ketamine in combination with acepromazine 1%, in a ratio of 9:1. They were fixed in 10% formalin, and stored in 70% alcohol at the Zoological Collection of Mammals / Federal University of Acre (UFAC) with voucher numbers CZM-562 and CZM-707. Bats were captured under Biodiversity Information and Authorization System (SISBIO) No. 47377-1.

To confirm the identification of specimens, in addition to verify the age of the specimens by viewing the ossification of the third metacarpal epiphysis (Kunz & Anthony 1982, Kunz & Robson 1995), external body, cranial and dental measurements were taken: Weight; Forearm Length (CA) - distance from the ulna to the wrist including carpal; Overall Length (CT) - distance from the tip of the snout to the tip of the last caudal vertebra; Tibial Length (CTi) - distance from the proximal end of the tibia to the posterior base of the calcaneus; Ear Length (CO) - from the notch to the tip of the pinna; Tail length (CC) - distance from the dorsal flexure of the tail with the sacrum to the end of the last caudal vertebra; Maximum Skull Length (CMC) - the proximal point of the occiput to the distal point on the premaxilla (excluding the incisors); Zygomatic Width (LZ) - the largest distance between the zygomatic arches. Each morphological and cranial measurement was measured three times using a digital caliper with 0.01 mm precision, and then the mean was calculated. The identification was performed with the aid of identification keys of bats (Simmons 2005, Gardner 2007, Díaz *et al.* 2011), as well as comparisons with morphological and cranial measurements available in previous studies (*e.g.*, Rodrigues & Ribas 2011).

The two specimens captured in Xapuri correspond to the first and second records for Acre. Our captures increase the number of records of *L.*

blossevillii for the Brazilian Amazon (Figure 1). The specimens of *L. blossevillii* correspond to a non-breeding female and male, caught between the first and second hour after sunset in a riparian zone. The habitat was characterized by the presence of a water body, trees of palm trees and a matrix composed of pasture and secondary forest.

These individuals had striking features of *Lasiurus*, such as reddish-brown dorsal pelage, pale belly in shades of yellow and rusty face, small ears, rounded and pink color, as well as the face, long tail completely contained in the membrane of uropatagium which is thick hair on the dorsal region, small eyes and long fur (Figure 2). First pair of upper premolars is tiny. The two individuals were adults and all external measurements, cranial and dental were compatible with measurements obtained in previous studies (Table 1).

The nearest record of *L. blossevillii* was made by Aguirre & Urioste (1994) in Arroyo Hermoso, Bolivia, which was located 100 km away from our record. The genus *Lasiurus* is widely distributed in the Neotropics, and comprises known migratory species in North America, but with little data on the species from South America (Gardner 2007). In Amazon, *L. blossevillii* was previously recorded in Bolivia (Aguirre & Urioste 1994, Anderson 1997), Colombia (Morales-Martínez & Ramírez-Chaves 2015), French Guiana (Simmons 1998), Guyana (Gardner 2007), Peru (Solari *et al.* 2006, Fernández-Arellano & Torres-Vásquez 2013) and Suriname (Gardner 2007).

The record of *L. blossevillii* in the State of Acre, though expected, fills a distribution gap in Brazil, where the records of the species are widely spaced, caused by the forage strategy of species and low rate of captures on studies with mist nets Shump & Shump (1982). According to Reid (1997), the activity of *L. blossevillii* is concentrated mainly in the first two hours after the sunset and have an association with riparian zones, foraging near streams, where the species actively search for insects near the water courses. We captured the two individuals of *L. blossevillii* two hours after the sunset with mist-nets placed near streams, in accordance with the preference of the species. Bats of family

Vespertilionidae are insectivores that normally forage in open areas or edges and because of this, species of genus *Lasiurus* have low capture rates in studies that use mist-nets (Kalko *et al.* 1996). Studies that use direct search on roosts, canopy nets or acoustic methods are more effective to maximize captures of Vespertilionid bats species, for example *L. blossevillii* (Portfors *et al.* 2000).

Thus, studies that aggregate results on Vespertilionid bats such as *L. blossevillii*, whether local or regional, most often result in increased knowledge of the occurrence and distribution of this species. Systematic data on environmental variables are also needed in order to understand the ecological factors that determine the distribution and abundance of this species.

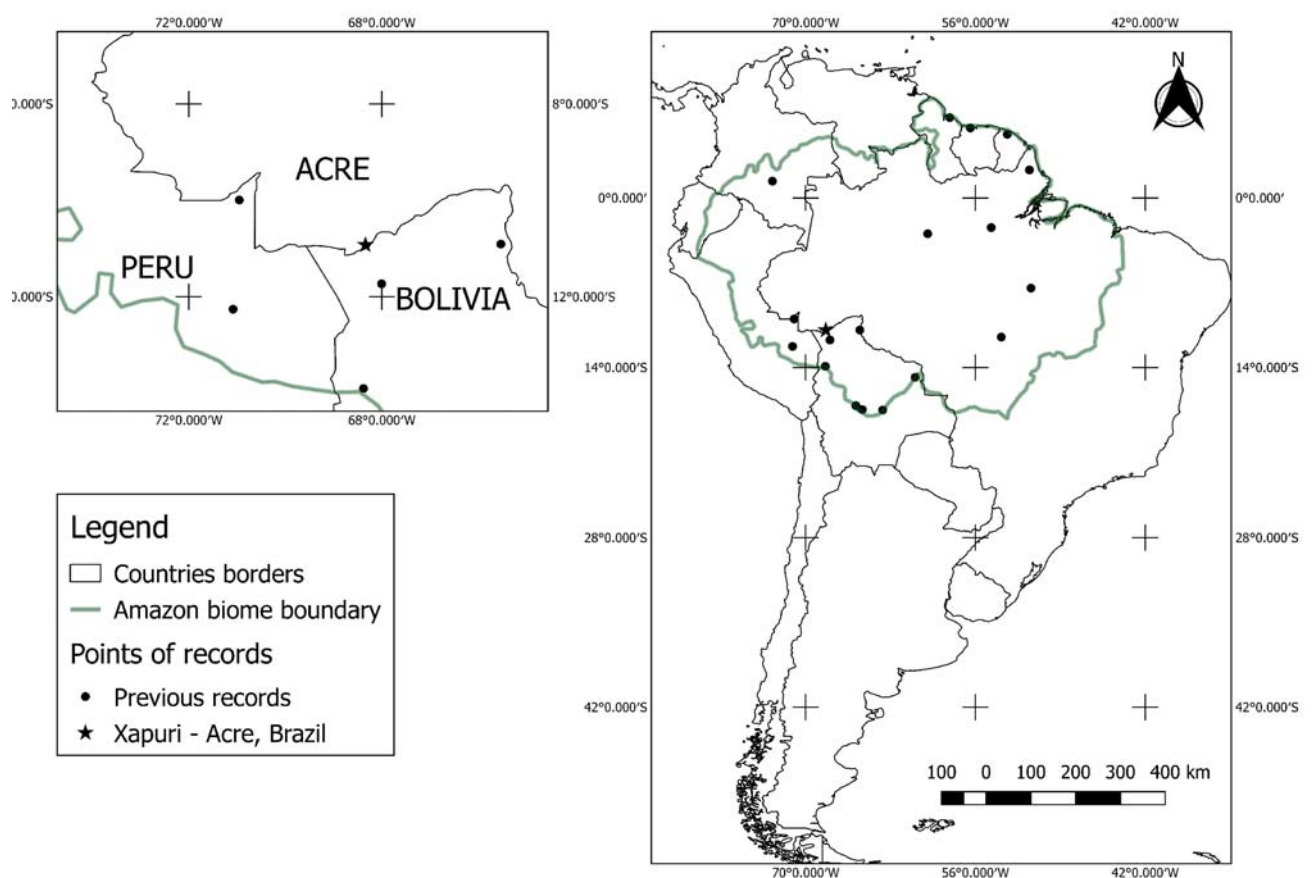


Figure 1. Distribution of *Lasiurus blossevillii* in the Amazon. The star represents the specimens collected in the Municipality of Xapuri, Acre, Brazil. Circular points represent the current distribution for Amazon with the localities: [1] Colombia, Caquetá, Florencia (Morales-Martínez & Ramírez-Chaves 2015), [2] Guyana, Demerara, Demerara-Mahaica (Gardner 2007), [3] Suriname, Coronie, Paramaribo (Gardner 2007), [4] French Guiana, Sinnamary, Paracou Research Station (Simmons & Voss 1998), [5] Brazil, Amapá (Martins *et al.* 2006), [6] Brazil, Manaus (Reis 1984), [7] Brazil, Santarém Alter do Chão (Bernard & Fenton 2002), [8] Brazil, Santarém City (Rodrigues & Ribas 2011), [9] Brazil, São Félix do Xingu, Kayapó Indigenous Area (Peters *et al.* 2006), [10] Peru, Uyacali, Rio Curanja (Fernández-Arellano & Torres-Vásquez 2013), [11] Brazil, Acre, Xapuri (Present Study), [12] Bolivia, Beni, Guayaramarin (Anderson 1997), [13] Bolivia, Santa Cruz, Aserradero Moira (Anderson 1997), [14] Bolivia, Santa Cruz, Cerro Itahuaticua (Anderson 1997), [15] Bolivia, Cochabamba, Incachaca (Anderson 1997) [16] Bolivia, Cochabamba, Tinkusiri (Anderson 1997), [17] Bolivia, La Paz, Sayanani (Aguirre & Urioste 1994), [18] Bolivia, Pando, Arroyo Hermoso (Aguirre & Urioste 1994), [19] Peru, Madre de Dios, Manu National Park (Solari *et al.* 2006), Bolivia, Santa Cruz City (Anderson 1997).

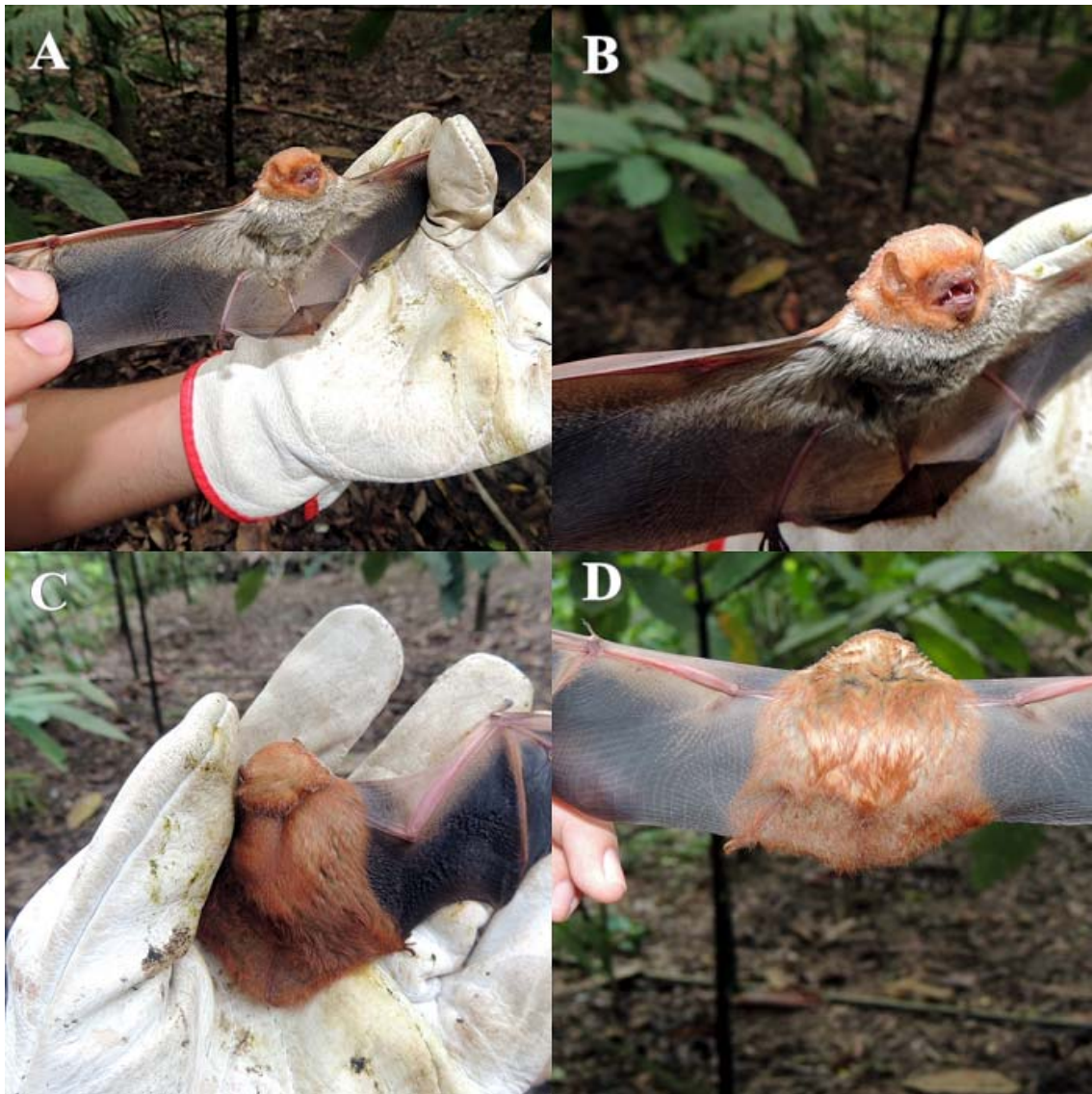


Figure 2. Specimens of *Lasiurus blossevillii*, female (CZM-707, A and B) and male (CZM-562 C and D), collected in the area of the Agro-extractive Settlement Project Chico Mendes (PAE Chico Mendes), Municipality of Xapuri, State of Acre, Brazil.

Table 1. Morphological and cranial measurements of the *Lasiurus blossevillii* specimens from Xapuri, AC (CZM-562, CZM-707), Santarém, PA (LR-896; Rodrigues & Ribas, 2011), Espírito Santo (MBML-1107; Vieira et al. 2009), and French Guiana (MNHN-1995,936; Simmons & Voss 1998). Legend: CA = Forearm Length; CT = Overall Length; CTi = Tibial Length; CO = Ear Length; CC = Tail length; CMC = Maximum Skull Length; CDM = dental-jaw series length; LZ = Zygomatic Width; LMo = Width between molars.

	CZM-562	CZM-707	LR-896	MBML-1107	MNHN-1995, 936
	♂	♀	♀	♀	♀
Weight (g)	8	13	8	8	8.2
CA (mm)	40.42	39.21	39.2	41,7	40.6
CT (mm)	94.53	96.48	112	88	109
CTi (mm)	20.25	19.36	22	-	-
CO (mm)	9.06	10.85	9	10	10
CC (mm)	46.39	46.71	51	54	53
CMC (mm)	13.44	13.67	12.49	-	11.46
CDM (mm)	-	-	4.03	-	4.02
LZ (mm)	7.58	7.75	8.88	-	8.74
LMo (mm)	-	-	5.62	-	5.53

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