

# Update on the distribution of *Peropteryx leucoptera* Peters, 1867 (Mammalia, Chiroptera, Emballonuridae): First record for the state of Sergipe, northeastern Brazil

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**ABSTRACT:** Three female specimens of *Peropteryx leucoptera* were collected in the Refúgio da Vida Silvestre Mata do Junco, a fragment of Atlantic Forest located in the state of Sergipe, northeastern Brazil. These specimens represent the first record of the species for Sergipe, increasing to 44 the number of bat species recorded in this state. A summary of locality records for *P. leucoptera* indicates a disjunct distributional pattern for this species, with the majority of the records concentrated in the northern South America and a separate population in the Atlantic Forest of northeastern Brazil.

The doglike bats of the genus *Peropteryx* Peters, 1867 are small to medium-sized emballonurines (head and body 45–55 mm; forearm 38–54 mm), whose the distribution is restricted to the Neotropics (Lim *et al.* 2010; McDonough *et al.* 2011; Suarez-Castro *et al.* 2012). They can be further recognized by the following set of characters: dorsal pelage ranging from dark buffy brown to blackish brown; underparts paler than dorsum; wing sac small, located near the anterior border of the antebrachial membrane, and opening distally; wing membranes (plagiopatagium) attached to the leg at the distal end of the tibia; skull with expanded rostrum, distinct angle between rostrum and forehead, relatively short postorbital processes, and undivided basisphenoid pit (no median septum); and spicule-like anterior upper premolar (Jones and Hood 1993; Hood and Gardner 2008). These bats also present sexual dimorphism in size, with females being larger than males (Hood and Gardner 2008), and are insectivorous, feeding preferentially on small beetles and flies (Bradbury and Vehrencamp 1976; Reis and Peracchi 1987).

Currently, five species of *Peropteryx* are recognized (Lim *et al.* 2010): *P. kappleri* Peters, 1867; *P. leucoptera* Peters, 1867; *P. macrotis* (Wagner, 1843), *P. trinitatis* Miller, 1899, and *P. pallidoptera* (Lim, Engstrom, Reid, Simmons, Voss & Fleck, 2010). All these species occur in Brazil (Peracchi *et al.* 2011; Castro *et al.* 2012). *Peropteryx leucoptera* was originally described from a specimen collected in Suriname. Subsequently, this species was classified in its own subgenus *Peronymus* (Peters, 1868), which was later recognized as a genus (Miller 1907; Sanborn 1937; Corbet and Hill 1991). However, recent evidence shows that this taxon forms a monophyletic group with other *Peropteryx* (Lim *et al.* 2008), which supports the recognition of *Peronymus* as a junior synonym (Jones and Hood 1993; Simmons 2005; Hood and Gardner 2008; Lim *et al.* 2010). *Peropteryx leucoptera* is found in French Guiana, Guyana,

Suriname, Venezuela, Colombia, Peru, Brazil, and Ecuador (Hood and Gardner 2008; Lim *et al.* 2010; McDonough *et al.* 2010). In Brazil, this species occurs in the Amazon and Atlantic Forest biomes (Paglia *et al.* 2012), but few records are available, all from the states of Amazonas (Reis and Peracchi 1987; Sampaio *et al.* 2003), Pará (Vieira 1942, 1955; Bernard 1999; Bernard *et al.* 2001; Bernard and Fenton 2002; Marques-Aguiar *et al.* 2002), Pernambuco (Guerra 1980; Silva and Guerra 2000), and Paraíba (Feijó and Langguth 2011).

During a bat survey at the Refúgio da Vida Silvestre Mata do Junco (RVS-Mata do Junco) (10°32' S, 37°03' W), a 894 ha state reserve located in the municipality of Capela, state of Sergipe, northeastern Brazil (Figure 1), three adult *P. leucoptera* were collected (license number: 2009.05.0603/00105-03). These bats were caught during the day, in their shelter, using hand nets. Mata do Junco is an area of open rainforest, with numerous tree fall gaps and surrounded by an anthropogenic matrix that includes sugar cane (*Saccharum* spp.) plantations.

The specimens of *P. leucoptera* are preserved in 70° alcohol, with skulls removed, and were deposited in the Adriano Lúcio Peracchi Collection, at the Instituto de Biologia of the Universidade Federal Rural do Rio de Janeiro, under the numbers ALP 9730, 9731, and 9732. The specimens were identified according to the descriptions of Hood and Gardner (2008) and Lim *et al.* (2010). External and cranial measurements were obtained using callipers (0.02 mm precision) following the criteria described by Taddei *et al.* (1998).

The specimens examined present measurements within or very close to the variation reported for *P. leucoptera* (Table 1) and have translucent white dactylopatagium, but dark brown propatagium and plagiopatagium. Their ears are connected by a low band of skin across the forehead, and pterygoid pits are large and deep (Figure 2). This

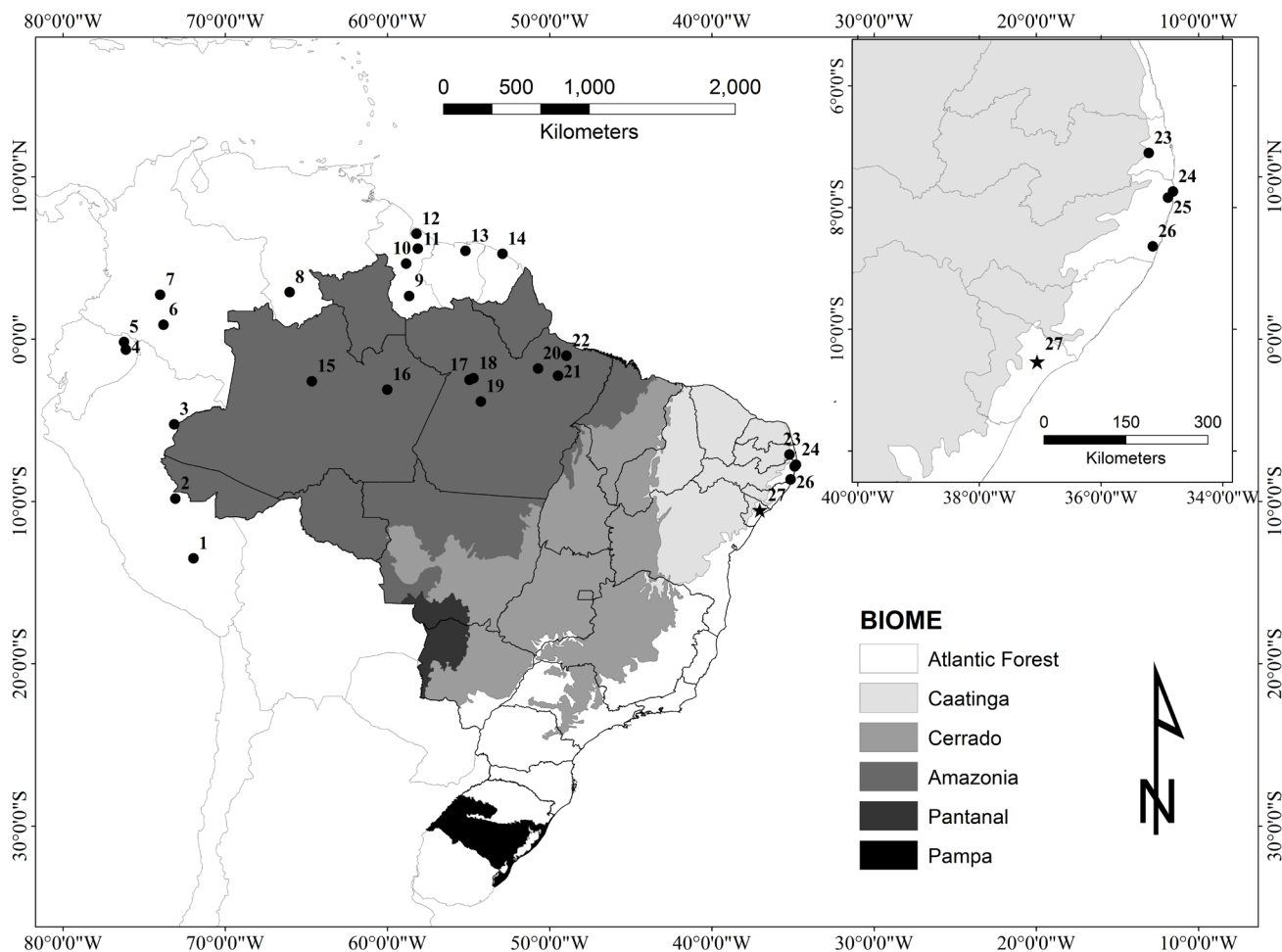
**TABLE 1.** Selected measurements of *Peropteryx leucoptera* from Refúgio da Vida Silvestre Mata do Junco, Sergipe, northeastern Brazil<sup>1</sup>, French Guiana<sup>2</sup>, Ecuador<sup>3</sup>, and Colombia<sup>4</sup>.

Sex	Present study <sup>1</sup>			Lim et al. (2010) <sup>2</sup>	McDonough et al. (2011) <sup>3</sup>	Suaréz-Castro et al. (2012) <sup>4</sup>
	Females			Males	Females	Males
Variables	ALP 9730	ALP 9731	ALP 9732			
Weight	8.40	8.20	9.00	4.00 – 8.50	5.50 – 8.50	–
Tail length	13.41	14.41	14.80	5.00 – 17.00	12.00 – 17.00	11.00 – 17.00
Hind foot length	7.52	6.70	8.48	7.00 – 10.00	7.00 – 10.00	7.00 – 9.00
Ear length	17.59	14.49	14.25	13.00 – 20.00	15.00 – 18.50	13.00 – 18.00
Forearm length	42.88	43.50	44.10	41.00 – 46.00	42.00 – 45.00	39.90 – 44.30
Greatest skull length	15.70	15.46	15.74	14.90 – 15.16	15.80	15.10 – 16.10
Condylolincisive length	14.88	14.20	14.72	13.90 – 14.10	14.80	13.80 – 14.70
Upper toothrow length	6.24	6.42	6.36	6.10 – 6.20	6.50	6.30 – 6.60
Breadth across upper canines	4.28	4.26	4.18	–	–	–
Postorbital breadth	3.26	3.62	3.28	3.10 – 3.30	3.40	3.30 – 3.60
Breadth across upper molars	7.24	7.12	7.24	6.70 – 7.00	7.40	6.90 – 7.50
Braincase breadth	7.30	7.46	7.32	7.00 – 7.30	7.10	6.80 – 7.40
Zygomatic breadth	9.92	9.98	9.52	9.30 – 9.60	10.20	9.50 – 10.10
Mastoid breadth	8.14	8.06	8.18	7.60 – 8.00	7.90	7.70 – 8.00
Mandible length	11.26	11.14	11.24	–	–	–
Lower toothrow length	6.56	6.40	6.56	–	–	–

<sup>2</sup>N = 14 males and 7 females (external measurements); 4 males (cranial measurements)

<sup>3</sup>N = 9 females (external measurements); 1 female (cranial measurements)

<sup>4</sup>N = 3 males and 2 females (external measurements); 2 males and 1 female (cranial measurements)



**FIGURE 1.** Geographic distribution of *Peropteryx leucoptera* and the new records (star) in the Refúgio da Vida Silvestre Mata do Junco, in the state of Sergipe, northeastern Brazil. For numbers of localities, see Table 2.

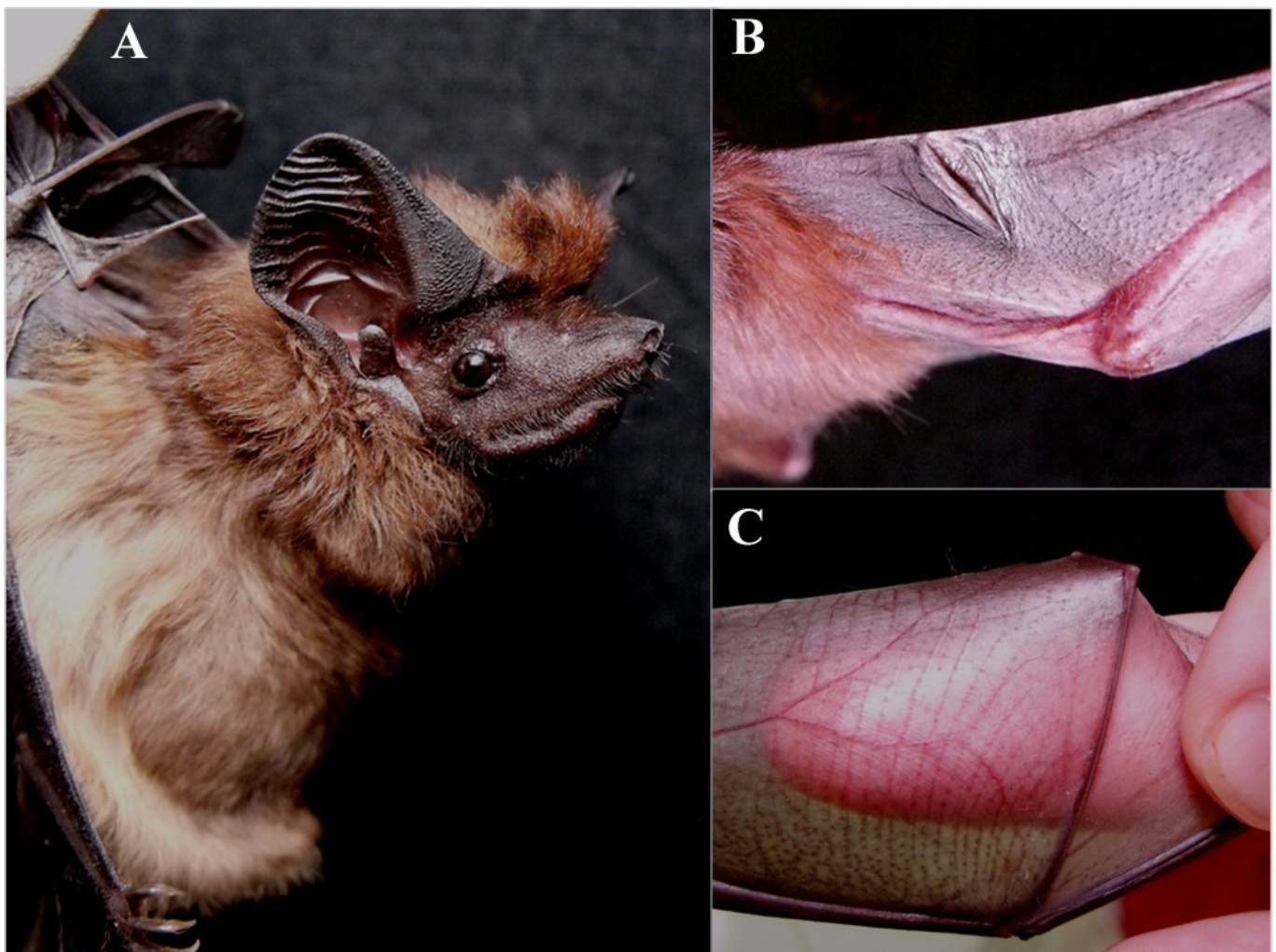
combination of morphological characters is diagnostic for *P. leucoptera* (Hood and Gardner 2008; Lim et al. 2010). The recently described *P. pallidoptera*, recorded in Brazil based on a female collected in the state of Pará (Castro et al. 2012), also has pale or white wings beyond the forearm. However, in *P. pallidoptera* the propatagium and plagiopatagium are also translucent. Furthermore, this species has ears separated on the forehead and a skull with shallow pterygoid pits separated by a mesopterygoid extension and positioned anterolaterally to the basisphenoid pit (Lim et al. 2010).

*Peropteryx leucoptera* inhabits mainly primary and secondary rainforests (Simmons and Voss 1998; McDonough et al. 2011), but can also be found in dry open formations adjacent to riparian forests, agricultural areas, and pastures (Suaréz-Castro et al. 2012). Most available records were assigned based on individuals captured in roosts (e.g., hollow trees, cavities, under tree roots on the banks of rivers, under fallen tree trunks, dark spaces under tree leaves), although ground-level mist-nets have also been useful for capturing this species (Brosset and Charles-Dominique 1990; Simmons and Voss 1998; McDonough et al. 2011). Our specimens, three lactating

females, two of which carrying young, were all collected inside a hollow tree (*Eschweilera* sp). This reinforces the importance of sampling bat refuges, especially considering that emballonurids are difficult to be captured in mist-nets set in the understory (Simmons and Voss 1998).

The locality records available for *P. leucoptera* (Table 2 and Figure 1) indicate a disjunct pattern of geographic distribution for this species, with populations located in the northern South America and in the Atlantic Forest of northeastern Brazil. These populations seem to be morphologically similar, based on the mensural data analyzed here, but larger samples and diverse data sets should be considered in further taxonomic assessments.

The specimens collected here represent the first record of *P. leucoptera* for the state of Sergipe, where 43 species of bats have been recorded (Mikalauskas 2005; Feijó and Nunes 2010; Rocha et al., 2010, 2011a, 2011b; Mikalauskas et al. 2011; Brito and Bocchiglieri 2012; Leal et al. 2013). This record indicates the need for further sampling efforts in this region, in order to obtain a better understanding of the diversity, distribution patterns, and natural history of the bats, as well as their functional roles in the local ecosystems.



**FIGURE 2.** Live view of an adult female *P. leucoptera* collected at Refúgio da Vida Silvestre Mata do Junco, municipality of Capela, state of Sergipe, northeastern Brazil (A) (Photo by P. A. da Rocha), with details of the glandular pouch on propatagium (B) and white transparent wing membranes (C).



**TABLE 2.** Locality records for *Peropteryx leucoptera* in Brazil and in other South American countries. The code numbers refer to the points shown in Figure 1.

COUNTRY/ POINT	COORDINATES		LOCALITY	REFERENCE
<b>PERU</b>				
1	13°30' S	71°58' W	Madre de Dios- Cusco	Solari et al. (2006)
2	9°49' S	73°5' W	Ucayali, Tushemo(type locality of <i>Peronymus cyclops</i> O. Thomas)	Thomas (1924)
3	5°14' S	73°9' W	Loreto- Nuevo San Juan	Lim et al. (2010)
<b>ECUADOR</b>				
4	0°38' S	76°8' W	Orellana -Province Tiputini Biodiversity Station	Rex et al. (2008)
5	0°10' S	76°15' W	Suriname	McDonough et al. (2011)
<b>COLOMBIA</b>				
6	0°54' N	73°49' W	Caquetá	Marin-Vasquez and Aguilar-González (2005)
7	2°45' N	74°1' W	Meta - Campamento Chamusa	Lemke et al. (1982)
<b>VENEZUELA</b>				
8	2°54' N	66°2' W	Rio Casiquiare	GBIF - coletados por Olalla AMNH 78419
<b>GUYANA</b>				
9	2°40' N	58°40' W	Upper Essequibo-Upper Takutu	Lim et al. (2010)
10	4°40' N	58°51' W	Potaro-Siparuni- Iwokrama Forest Field Station	Lim et al. (2010); Lim and Engstrom (2001)
11	5°35' N	58°8' W	Upper Demerara-Berbice-Bada Creek	Lim et al. (1999)
12	6°30' N	58°13' W	Demerara-Mahaica-Ceiba Biological Center	Lim et al. (2010)
<b>SURINAM</b>				
13	5°27' N	55°12' W	Zanderij	Genoways et al. (1981)
<b>FRENCH GUIANA</b>				
14	5°16' N	52°55' W	Paracou	Simmons and Voss (1998)
<b>BRAZIL</b>				
15	2°35' S	64°40' W	Reserva de Desenvolvimento Sustentável Amanã-AM	Ramos et al. (2010)
16	3°6' S	60°1' W	Manaus-AM	Reis (1984); Sampaio et al. (2003); Bernard et al. (2001)
17	2°30' S	54°57' W	Alter do Chão-PA	Bernard and Fenton (2002); Bernard (1999)
18	2°24' S	54°42' W	Santarém-PA	Bernard et al. (2001)
19	3°50' S	54°15' W	Parque Nacional da Amazônia-PA	Reis and Schubart (1979)
20	1°48' S	50°43' W	Estação Científica Ferreira Penna- município de Melgaço- PA	Marques-Aguiar et al. (2003)
21	2°15' S	49°9' W	Cometé-PA	Sanborn (1937)
22	1°1' S	48°58' W	Cachoeira, Ilha de Marajó-PA	Vieira (1942); Vieira (1955)
23	7°6' S	35°13' W	Sapé-PB	Feijó and Langguth (2011)
24	7°44' S	34°49' W	Itamaracá-PE	Monteiro da Cruz et al. (2002)
25	7°50' S	34°54' W	Refúgio Ecológico Charles Darwin / Iguarassu-PE	Silva and Guerra (2000)
26	8°38' S	35°9' W	Estação Experimental de Saltinho-Rio Formoso-PE	Guerra (1980)
27	10°32' S	37°3' W	RVS Mata do Junco- Capela	This study

**ACKNOWLEDGMENTS:** We are thankful to CAPES and CNPq for graduate scholarships to PAR and JSM, respectively; to the Secretary of Environment and Water Resources (SEMARH) for logistical support; to Marcelo José Silva (“Guigó”), for invaluable help during field work; and to Stephen Ferrari and Sidclay Calças Dias for revision of the text.

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RECEIVED: September 2013

ACCEPTED: March 2014

PUBLISHED ONLINE: May 2014

EDITORIAL RESPONSIBILITY: Marcelo R. Nogueira