

Distribution extension of *Ametrida centurio* Gray, 1847 (Chiroptera, Phyllostomidae): First record in the Brazilian Atlantic Forest

Emmanuel Messias Vilar^{1, 2*}, Hannah Nunes^{1, 2}, Jorge Luiz do Nascimento³ and Pedro Cordeiro-Estrela^{1, 2}

1 Universidade Federal da Paraíba, Campus I, Centro de Ciências Exatas e da Natureza, Departamento de Sistemática e Ecologia, Laboratório de Mamíferos. CEP 58059-900, João Pessoa, PB, Brazil

2 Universidade Federal da Paraíba, Campus I, Programa de Pós-Graduação em Zoologia, CEP 58059-900, João Pessoa, PB, Brazil

3 Instituto Chico Mendes de Conservação da Biodiversidade (ICMBio), Reserva Biológica Guaribas, CEP 58280-000, Caixa Postal 9, Mamanguape, PB, Brazil

* Corresponding author. E-mail: messiashp@gmail.com

Abstract: This study reports the first record of *Ametrida centurio* in the Atlantic Forest, including its occurrence in the state of Paraíba, which extends the known distribution for this species ca. 1,500 km from its easternmost locality. The record was made in the Guaribas Biological Reserve, state of Paraíba, northeastern Brazil.

Key words: Guaribas Biological Reserve, biogeography, canopy, Paraíba, Little White-shouldered Bat

Ametrida Gray, 1847 is a monotypic genus with *Ametrida centurio* as the type species, whose holotype correspond to a specimen from the state of Pará (Brazil) deposited at the Natural History Museum, London (Peterson 1965). This small fruit-eating bat is endemic to the Neotropics, occurring in Trinidad and Tobago, Netherland Antilles, Panama, Venezuela, Guyana, Surinam, French Guiana and Brazil (Husson 1962; Gardner 2008; Miller *et al.* 2008). In Brazil, its known distribution is limited to the Amazon basin and has been recorded only in the states of Amapá (Peracchi *et al.* 1984; Silva *et al.* 2013), Pará (Gray 1847), Amazonas (Bernard 2001), and Mato Grosso (Pine *et al.* 1970). Herein, we present the first record of *Ametrida centurio* in the Atlantic Forest biome, extending the range of the species in approximately 1,500 km from its previously known easternmost locality.

The record was made during a campaign within the project Rede BioM.A. Inventários (MCT/CNPq no. 35/2012; belonging to the Programa de Pesquisa em Biodiversidade, PPBIO) in the Guaribas Biological Reserve (GBR), located in the municipality of Mamanguape, state of Paraíba, northeastern Brazil (Figure 1). The area is located within the Atlantic Forest biome and is composed of a mosaic of seasonal semi-deciduous forests and typical savanna formations on sandy soils, with an average annual rainfall and temperature of 1,700 mm and 24°C–26°C, respectively (Barbosa *et al.* 2011). This reserve, established in 1990, comprises 4,054 ha divided into three fragments: Sema 1 (710 ha), Sema 2 (2,982 ha) and Sema 3 (362 ha) and holds some of the last remaining native vegetation within

the Pernambuco Center of Endemism. This biogeographical sub-region of Atlantic Forest has been under long and intense fragmentation scheme, with only 12% of the original vegetation range remaining (Ribeiro *et al.* 2009). A severe process of extinction of vertebrates has been documented in the northeastern Atlantic Forest, and most species have survived only in legally protected areas (Canale *et al.* 2012).

One specimen of *Ametrida centurio* was captured (SISBIO license number: 41683-1) in Sema 2 (06°43'44.9"S, 35°08'22.4"W), on 31 May 2014 at 19:30 h in a mist-net (3.0 m × 2.5 m) placed at canopy level (8.3 m height) during a new moon night with a total sampling effort of 12,450 m²·h (10 nights for all the campaign). The individual was an adult male with testes descended and presents all the diagnostic features listed for *A. centurio* in the literature according to the descriptions of Peterson (1965) and Gardner (2008). The dental formula of the specimen is 2/2, 1/1, 2/2, 3/3 × 2 = 32. Its eyes are relatively large in comparison to other members of the subfamily Stenodermatini, with a swollen pad under each eye and a yellowish iris (Figure 2a). The noseleaf is yellowish and positioned against the face without any spacing (Figure 2b). It has two conspicuous symmetric white spots on each shoulder and two on each side of the neck. The specimen collected also presents pelage previously undescribed for *A. centurio*: two white spots at the mediolateral portion of the thorax and a semicircular spot around the penis (Figure 2c). The individual presented two chest glands and two glands close to the axillae, which have been previously mentioned in the literature (Dobson 1878; Peterson 1965; see Figure 2b). The dorsal fur is composed of hairs with three distinctly colored bands from the base to the tip: brown, white and brown. The skull has a distinctive short rostrum and a rounded cranium (Figure 3). Cranial and external measurements were taken with a digital caliper to the nearest (0.01 mm) and are provided in a comparative table (Table 1). The specimen was prepared as a standard skin and skull voucher and associated tissue samples were deposited in the Collection of Mammals at the Federal University of Paraíba (tissue number: UFPB 9154).

This study extends the distribution of the species and

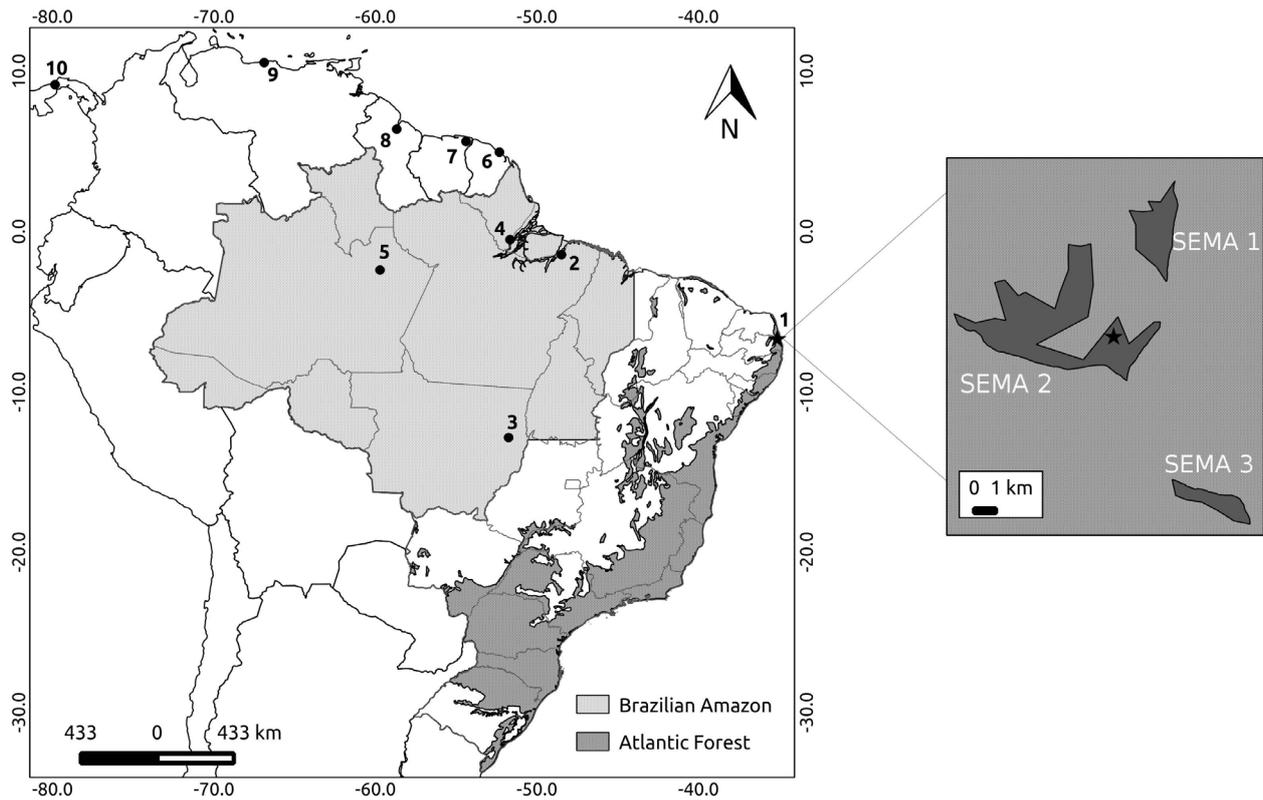


Figure 1. Marginal Localities reported to *Ametrida centurio*, including the new record for the Atlantic Forest in the state of Paraíba (star): (1) Guaribas Biological Reserve, Mamanguape, Paraíba (present study); (2) Belém, Pará (Brazil), type locality (Gray 1847); (3) Serra do Roncador, Mato Grosso (Pine *et al.* 1970); (4) Santa Luzia do Pacuí, Macapá, Amapá (Peracchi *et al.* 1984); (5) 80 km north of Manaus, Amazonas (Bernard 2001); (6) Cayenne, French Guiana (Brosset and Charles-Dominique 1991); (7) Moengo, Surinam (Gardner 2008); (8) Kartabo, Guyana (Gardner 2008); (9) Distrito Federal, Pico Avila, 5 Km NNW Caracas, Venezuela (Gardner 2008); (10) Barro Colorado Island, Canal Zone, Panama (Reid 1997).

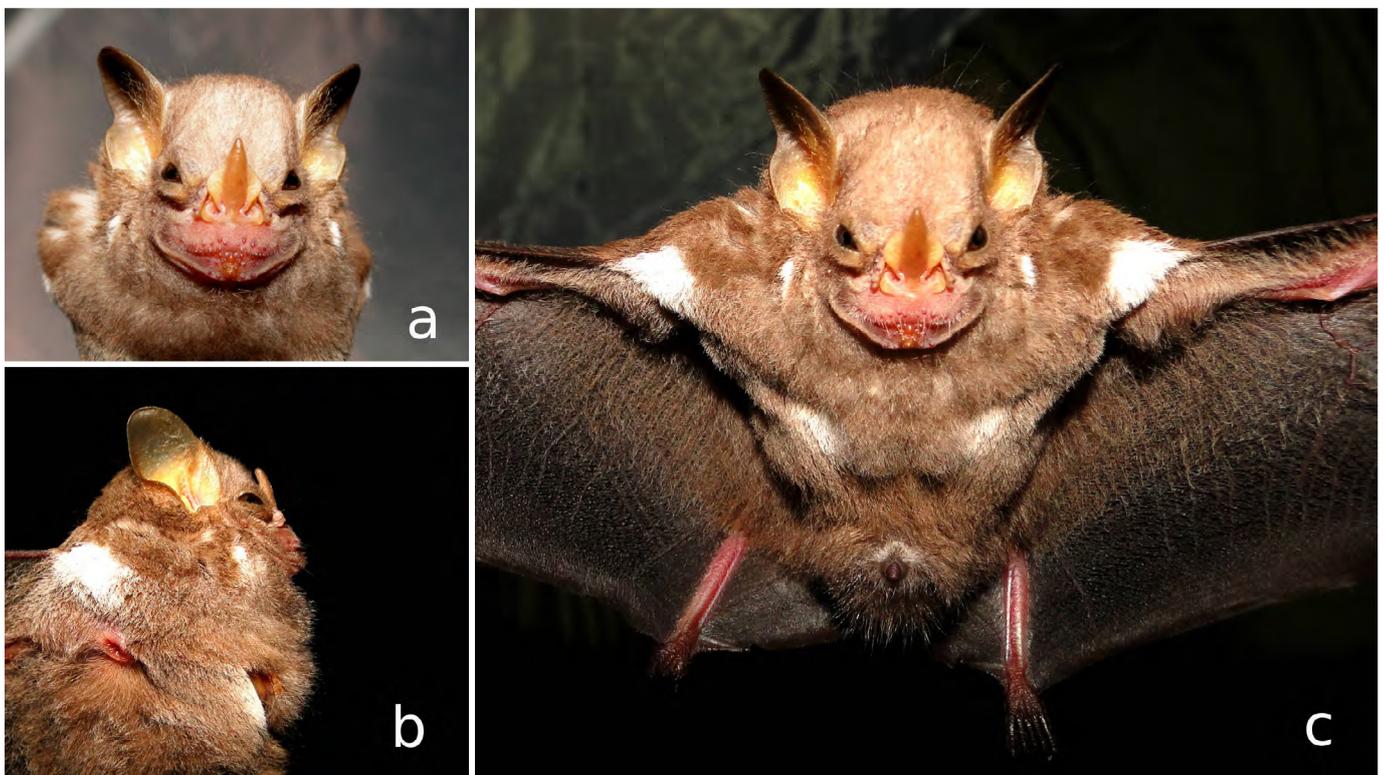


Figure 2. Adult male of *Ametrida centurio* (UFPB 9154) from Guaribas Biological Reserve, municipality of Mamanguape, state of Paraíba, northeastern Brazil (a) Detail of the face, especially the yellowish iris (b) Lateral view, highlighting the glands below the armpits (c) Frontal view, especially the white spots on the shoulders, chest and the semi-circular spot around the penis. The left foot was not properly lit to appear in image c. (Photos by E. M. Vilar).



Figure 3. Skull of *Ametrida centurio* (UFPB 9154) on lateral dorsal and ventral views and mandible on lateral view.

Table 1. External and cranial measurements (in grams [Body mass] and millimeters) of the *Ametrida centurio* collected in the Atlantic Forest, compared with measurements provided by Peterson (1965), N (sample size).

Measurements	Present study (♂UFPB 9154)	Mean ± SD, Range (N)	
		Peterson, 1965	
		Males	Females
Body mass	8	7.8 (1)	10.1 (2)
Total length	44	40, 35–46 (3)	47, 40–53 (4)
Hind foot length	8	—	—
Ear length	15	13, 11–15 (5)	13.7, 11.5–15 (7)
Tragus length	5	—	—
Calcaneus length	5	4.8, 4.3–5.1 (8)	4.8, 3.5–5.5 (10)
Forearm length	25.5	25.4±0.5, 24.6–26.5 (12)	32.1±0.8, 29.8–33.2 (13)
Greatest length of skull	14.65	15±0.3, 14.5–15.7 (11)	16.2±0.3, 15.6–17.1 (10)
Condylobasal length	11.90	12.0±0.2, 11.8–12.7 (11)	13.5±0.1, 13.2–13.6 (9)
Height of braincase	9.13	—	—
Breadth of braincase	8.52	8.3±0.1, 8.1–8.5 (9)	8.7±0.3, 8–9.1 (10)
Mastoid breadth	8.8	8.9±0.1, 8.8–9.2 (8)	9.7±0.2, 9.2–10.1 (8)
Zygomatic breadth	10.34	10.4±0.2, 10.1–10.8 (11)	11.3±0.2, 10.8–11.7 (13)
Postorbital constriction	3.66	3.3±0.08, 3.2–3.5 (9)	4.2±0.1, 3.8–4.5 (11)
Palate length	5.8	—	—
Palate breadth (M3–M3)	4.95	—	—
Palate breadth (M1–M1)	3.92	7.2±0.08, 7.1–7.4 (11)	7.8±0.2, 7.6–8.3 (13)
Breadth across upper canines	4.17	—	—
Breadth across upper molars	7.25	—	—
Length of maxillary tooththrow	4.48	4.3±0.08, 4.2–4.4 (9)	4.7±0.1, 4.5–5.2 (11)
Length of mandible	8.38	—	—
Length of mandibular tooththrow	4.74	—	—
Coronoid process height	3.29	—	—

provide the first record for the Atlantic Forest. Because *Ametrida centurio* is a rare species where it occurs (Peterson 1965; Lee and Dominguez 2000), some comments must be made on this extension of its distribution, first about the biogeographical significance of the finding, secondly about the landscape characteristics where it was collected, the historical sampling effort in the area, and finally about the stratum where it was collected. These comments are intended to evaluate whether this unexpected record is due to the rarity of this species or due to the lack of knowledge regarding the bat fauna from northeast Brazil considering the scarcity of studies that used mist nets placed in different vegetation strata.

The finding of a predominantly distributed Amazonian species in northeastern Brazil is not a surprise since other mammals with a similar geographic distribution are found within the Atlantic Forest of northeastern Brazil: the primate *Alouatta belzebul* (Linnaeus, 1766) (Gregorin 2006; Nascimento *et al.* 2008), the carnivore *Potos flavus* (Schreber, 1774) (Sampaio *et al.* 2013) and the anteater *Cyclopes didactylus* (Linnaeus, 1758) (Hayssen *et al.* 2012; Miranda and Superina 2010). The connection between the two main forested biomes of South America has already been suggested through two routes (Costa *et al.* 2003, one via the northeast of the Atlantic Forest and another one through its southwest Steiner-Souza *et al.* 2008; Percequillo *et al.* 2011). Thus the finding of *A. centurio* supports the existence of a connection between the two major Neotropical rainforests. However, two aspects of this occurrence make it unexpected, the landscape context in which the specimen was collected and the sampling intensity to which the area has been subject to.

The landscape context of the occurrence of *A. centurio* in the Atlantic forest of northeastern Brazil is singular since the region is very fragmented, with few large and many isolated remnants. The GBR was greatly affected by human activities before becoming a protected area. From the 1950s to the 1980s it was subjected to selective logging of hardwoods (especially Brazil wood, *Caesalpinia echinata* Lam.), was used for crop plantation (corn, pineapples, cassava, beans, pumpkins), horse breeding around some human settlements with intense hunting activity (one of the symbols of the Reserve, the primate *Alouatta belzebul*, went extinct before its creation and has since been reintroduced).

The finding of *A. centurio* would be less significant had the area been poorly sampled which is not the case, and reinforces the fact that sampling bats with understory mist nets result in subsamples. For Atlantic Forest regions the minimal effort recommended to sample the majority of phyllostomid species for a site is around 1,000 captures (Bergallo *et al.* 2003). In the Guaribas Biological Reserve (GBR) about 4,000 captures of bats have been made over less than a decade (unpublished data from field notebooks, research reports, and voucher specimens at the collection of mammals of the Universidade Federal da Paraíba).

The finding of *A. centurio* within a fragmented landscape and within a relatively well sampled area might be explained by its capture in the upper canopy stratum. The importance of the upper forest strata to the Neotropical bat communities has been discussed in some studies (*e.g.*, Bernard 2001; Pereira *et al.* 2010; Carvalho *et al.* 2013). However, assessments of the

importance of sampling these strata for estimates of richness and bat community composition have been seldom conducted. The present report reinforces recent findings of two species of aerial insectivorous bats, *Molossops temminckii* (Burmeister, 1854) and *Diclidurus albus* (Wied-Neuwied, 1820), recorded in the same conservation unit for the first time to the state of Paraíba, due to captures at canopy level (Ferreira *et al.* 2013; Nunes *et al.* 2013). Based on these observations, the occurrence of *A. centurio* in the GBR confirms the increasing need to sample in canopies and highlights the regional importance of the GBR at a regional scale in the national system of conservation units of Brazil.

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