



**FIRST RECORD OF *Uroderma magnirostrum* DAVIS, 1968
(CHIROPTERA: PHYLLOSTOMIDAE) IN THE NORTHEASTERN
ATLANTIC FOREST OF BRAZIL**

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Abstract: *Uroderma magnirostrum* Davis, 1968 (Chiroptera: Phyllostomidae) is distributed from Mexico to the southeastern coast of Brazil. Here we report the first record in the Northeastern Atlantic Forest of Brazil, based on the capture of one adult female in an urban forest fragment in the state of Paraíba. Morphological features and morphometric data of our specimen fall within the range described previously for the species. The present record extends the known species distribution *ca.* 450 km to the Northeast from the closest locality in Sergipe state. *Uroderma magnirostrum* is currently recorded in 23 localities from 15 states in Brazil, in the Amazonia, Cerrado, Caatinga and Atlantic Forest biomes. Additionally, our record updated the bat list of the Paraíba state to 62 bat species.

Keywords: geographical distribution; Paraíba state; Stenodermatinae; urban areas

The genus *Uroderma* Peters, 1865 currently includes five species of medium-sized frugivorous bats (*sensu* Mantilla-Meluk 2014): *U. bilobatum* Peters, 1866; *U. magnirostrum* Davis, 1968; *U. convexum* Lyon, 1902; *U. bakeri* Mantilla-Meluk, 2014, and *U. davisii* Baker & Mc-Daniel, 1972. The brown tent-making bat *U. magnirostrum* (Chiroptera: Phyllostomidae) is known to occur from Mexico and Central America to the southeastern coast of Brazil (Gardner 2007). It is distributed within all major Brazilian biomes, in Amazon (Bernard & Fenton 2002, Bernard *et al.* 2011), Cerrado (Pine *et al.* 1970, Silva & Anacleto 2011),

Caatinga (Mares *et al.* 1981, Rocha *et al.* 2011), and Atlantic Forest (Nogueira *et al.* 2003, Oprea *et al.* 2009; Table 1 and Figure 1). This species is often associated with humid lowland areas and seems to have some level of tolerance to environmental changes due to its occurrence in anthropogenic landscapes, such as urban areas, pastures, orchards, and croplands (Handley 1976, Nunes *et al.* 2017).

Here we report the first record of *U. magnirostrum* for the northeastern Atlantic Forest of Brazil, more precisely in the Pernambuco Endemism Center (*sensu* Silva & Casteleti 2003),

Table 1. Locality records of *Uroderma magnirostrum* (Chiroptera: Phyllostomidae) in Brazil. Asterisk indicates the new record in the state of Paraíba, Northeast of Brazil. The code numbers correspond to the records indicated in the Figure 1.

Code number	Coordinates		State	Locality	Reference
	Latitude	Longitude			
1	07°36'36"S	72°39'00"W	Acre	Cruzeiro do Sul	Taddei <i>et al.</i> (1990)
2	08°48'36"S	72°56'24"W	Acre	Parque Nacional da Serra do Divisor, Marechal Taumaturgo	Nogueira <i>et al.</i> (2003)
3	08°48'36"S	63°56'24"W	Rondônia	Porto Velho	Tavares <i>et al.</i> (2017)
4	03°22'48"N	61°40'48"W	Roraima	Ilha de Maracá	Taddei & Reis (1980)
5	03°1'48"S	60°00'00"W	Amazonas	Colônia de Santo Antonio, Manaus	Reis & Peracchi (1987)
6	03°49'48"S	56°15'00"W	Pará	Parque Nacional da Amazônia	Reis & Schubart (1979)
7	02°30'00"S	55°57'00"W	Pará	Alter do Chão	Bernard & Fenton (2002)
8	03°30'00"S	52°23'60"W	Pará	Altamira	Voss & Emmons (1996)
9	01°08'24"S	49°30'00"W	Pará	Ilha de Marajó	Marques-Aguiar <i>et al.</i> (2002)
10	00°40'48"N	51°25'48"W	Amapá	Colônia Agrícola de Matapi	Peracchi <i>et al.</i> (1984)
11	05°05'24"S	42°47'60"W	Piauí	BR316, KM18, Teresina	Mares <i>et al.</i> (1981)
12	07°22'48"S	40°12'36"W	Ceará	Chapada do Araripe	Novaes & Laurindo (2014)
13	07°29'24"S	39°43'48"W	Pernambuco	Exu	Rocha <i>et al.</i> (2011)
14*	07°10'12"S	34°49'12"W	Paraíba	Horto Florestal Municipal Cidade Verde, João Pessoa	This study
15	09°57'36"S	37°51'36"W	Sergipe	Serra da Guia, Poço Redondo	Rocha <i>et al.</i> (2011)
16	10°52'35"S	38°01'10"W	Sergipe	Serra dos Macacos, Tobias Barreto	Soares <i>et al.</i> (2018)
17	19°08'60"S	40°03'36"W	Espírito Santo	Reserva Natural do Vale, Linhares	Peracchi <i>et al.</i> (2011)
18	22°58'48"S	43°21'36"W	Rio de Janeiro	Parque Arruda Câmara, Rio de Janeiro	Nogueira <i>et al.</i> (2003)
19	22°57'36"S	43°15'36"W	Rio de Janeiro	Jardim Botânico do Rio de Janeiro	Nogueira <i>et al.</i> (2003)
20	19°28'48"S	42°27'36"W	Minas Gerais	Parque Estadual do Rio Doce, Marliéria	Nogueira <i>et al.</i> (2003)
21	15°15'00"S	43°51'00"W	Minas Gerais	Morro Solto, Jaíba	Nogueira <i>et al.</i> (2003)
22	14°39'00"S	52°19'48"W	Mato Grosso	Nova Xavantina	Silva & Anacleto (2011)
23	12°29'24"S	51°27'36"W	Mato Grosso	Serra do Roncador	Pine <i>et al.</i> (1970)

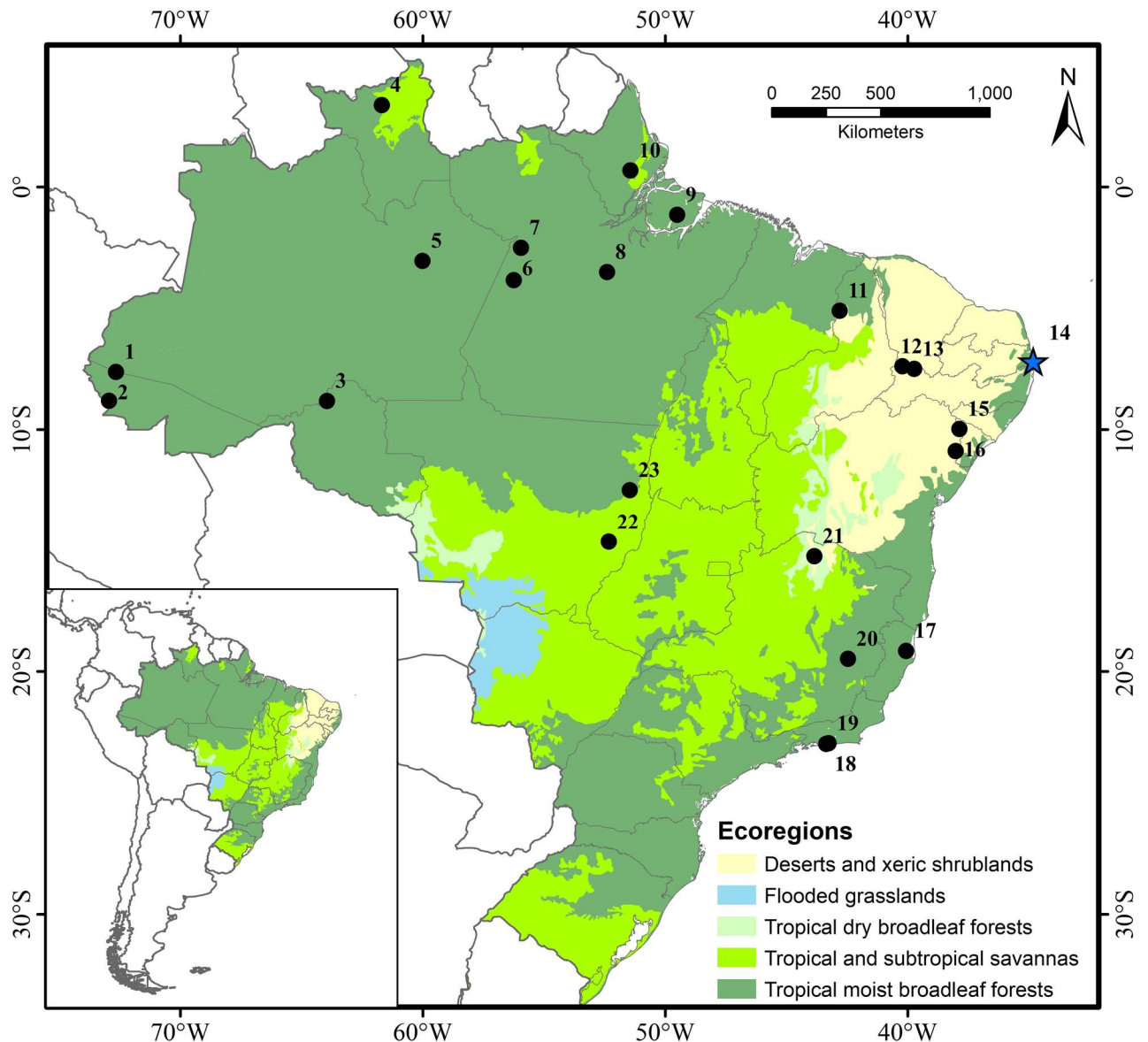


Figure 1. Geographic distribution of *Uroderma magnirostrum* (Chiroptera: Phyllostomidae) in Brazil. Star: new record in the state of Paraíba, Northeast of Brazil. Black circles: previous records. The numbers correspond to the records indicated in the Table 1.

one of the most threatened areas of tropical forest in the world (*ca.* 12% left and 1% legally protected), located north of the São Francisco River (Ribeiro *et al.* 2009). Our specimen was captured during a bat survey carried out in five Atlantic Forest fragments and in residential areas within the Metropolitan Region of João Pessoa (MRJP), state of Paraíba, Brazil (Figure 1). Total sampling effort was 55,580 m².h, 10,500 m².h for each forest fragment and 3,080 m².h for residential areas, calculated following Straube & Bianconi (2002). The *U. magnirostrum* specimen was captured in the Horto Florestal Municipal Cidade Verde (HFCV;

07°10'21.1"S, 34°49'23.2"W, *datum* WGS 84), an Atlantic Forest fragment with *ca.* 22 ha surrounded by an urban matrix. Local vegetation is made up by a secondary-growth semi-deciduous Atlantic Forest and Northeastern Tabuleiro, which is a savanna-like area common to coastal ecosystems, mainly characterized by the presence of small-sized trees and shrubs in sandy soils (Oliveira-Filho & Carvalho 1993). The climate is categorized as Tropical As, in Köppen's classification (Alvares *et al.* 2013), with an annual rainfall ranging from 1,500 to 1,700 mm and an average temperature from 22°C to 26°C (Feliciano & Melo 2003).

On April 24, 2015 a non-reproductive adult female of *U. magnirostrum* (Figure 2) was caught in the HFCV with a mist-net (9 m x 2.5 m, 20 mm mesh) set at ground level and opened during five consecutive hours after sunset (17:00 h). This specimen was fixed in 10% formaldehyde and preserved in 70% ethanol, with subsequent extraction of the skull. External and cranial measurements (Table 2) were taken with digital caliper to the nearest 0.01 mm following Vizotto & Taddei (1973). The specimen and its tissue samples were incorporated into the Collection of Mammals of the Federal University of Paraíba in the municipality of João Pessoa (UFPB 9823). Data collection was conducted under the authorization of the Chico Mendes Institute for Biodiversity Conservation (SISBIO license number: 45168-3) and animal procedures were approved by the Ethics Committee on Animal Use of the Federal University of Paraíba (CEUA/UFPB number 027/2016).

The specimen was identified by the presence of all four lower incisors in contact with each other and distinctly bifid and parallel upper internal incisors, features that distinguishes the genus *Uroderma* from other stenodermatines (Gardner 2007). However, in our specimen the upper incisors are separated by greater gaps and the lateral incisors are more reduced in size, in comparison with specimens illustrated in Rocha *et al.* (2011) and Mantilla-Meluk (2014). Also, our specimen presents the outermost of the ear pinna brownish and its basal portion slightly yellowish, rather than concolor as described by Davis (1968) and Nogueira *et al.* (2003). Despite this, the specimen has all the diagnostic characters previously provided for *U. magnirostrum* (Davis 1968, Nogueira *et al.* 2003, Gardner 2007, Rocha *et al.* 2011, Mantilla-Meluk 2014), such as narrow facial stripes which are in accordance with the less developed or prominent pattern described in the literature, pale-brownish fur color, borders of the

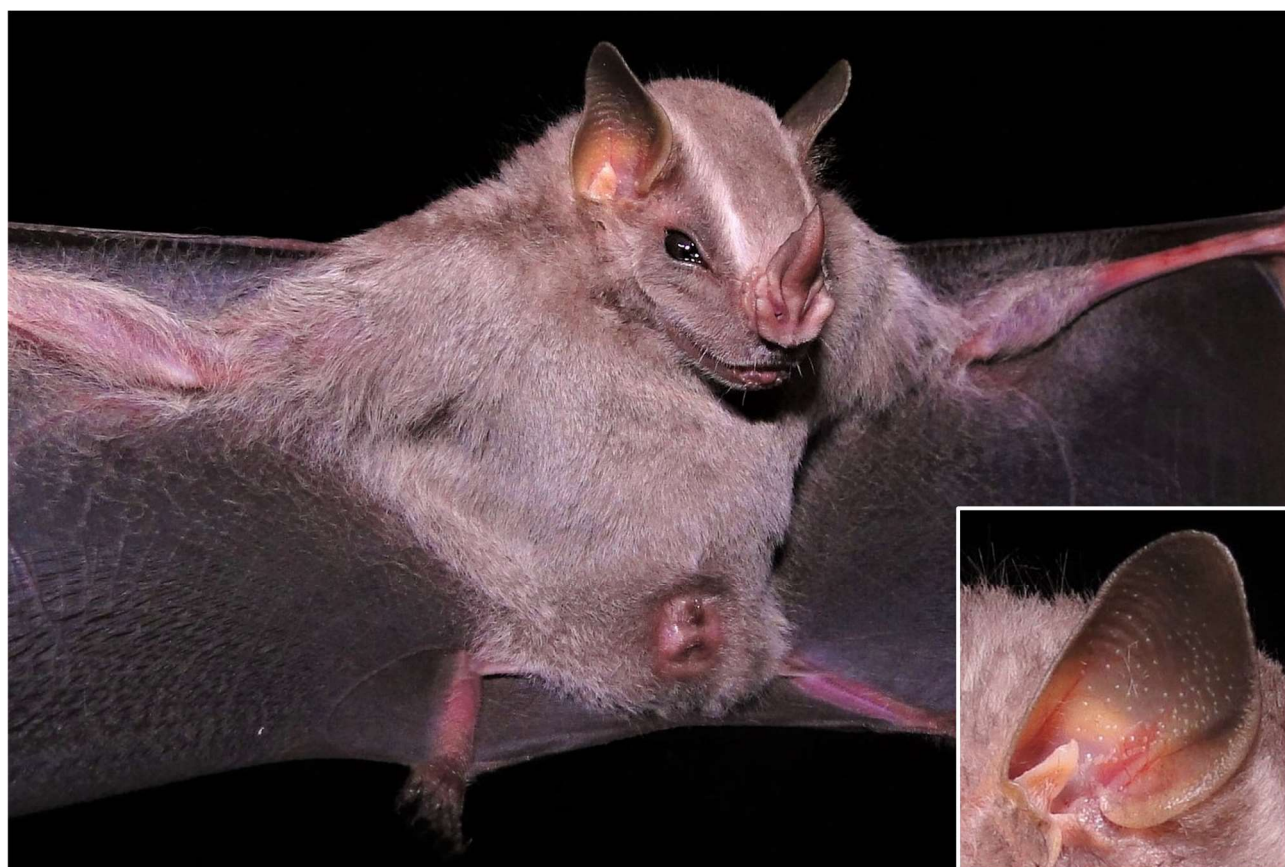


Figure 2. Adult female of *Uroderma magnirostrum* (Chiroptera: Phyllostomidae) from the municipality of João Pessoa, state of Paraíba, Brazil (UFPB 9823). The insert on the bottom right highlights the lack of a distinctive whitish or yellowish edge on the ear and its naked border. Photo: Hannah Nunes.

Table 2. Measurements (in millimeters) and body mass (in grams) of *Uroderma magnirostrum* (Chiroptera: Phyllostomidae) specimens from Northeastern Brazil reported in the present study from the state of Paraíba and its closest records in the state of Sergipe (Rocha *et al.* 2011).

Measurements	Present study (♀ UFPB 9823)	Rocha <i>et al.</i> 2011 (1♂; 1♀)
Body mass	19.00	-
Body length	62.00	-
Hind foot length without claws	8.00	-
Hind foot length with claws	10.00	-
Ear length	14.00	-
Forearm length	40.00	-
Greatest length of skull	22.68	22.84 – 23.30
Condylbasal length	21.48	21.15 – 21.59
Mastoid breadth	10.80	10.75 – 10.92
Zygomatic breadth	-	12.52
Breadth of braincase	9.23	9.23 – 9.66
Postorbital constriction	5.82	5.64 – 5.86
Breadth across upper canines	5.08	5.20 – 5.31
Breadth across upper molars	8.74	8.66 – 9.01
Length of maxillary toothrow	8.06	7.26 – 8.30
Length of mandible	15.74	15.04 – 15.54

ears naked and lacking a distinctive whitish or yellowish edges (Figure 2), skull with a flattened dorsal profile, a deep rostrum, and a wide nasal septum with a mesethmoid laterally expanded forming a shield-like structure (Figure 3).

The present record expands the species known distribution towards the Northeast by 450 km from the nearest existing record in the semi-arid Caatinga biome of the state of Sergipe (Rocha *et al.* 2011). Rocha *et al.* (2011) suggested that *U. magnirostrum* and *U. bilobatum* exhibit a disjunct distribution in the Northeastern region of Brazil, the former inhabiting only the semi-arid Caatinga and the latter the Atlantic Forest. However, our present record in the Atlantic Forest indicates that this expected previous scenario was probably a reflection of lack of studies than a true tolerance or preference for specific habitats by *Uroderma magnirostrum*. In fact, both species are also sympatric in Northeast of Brazil, as in great part of their South America distribution (Davis 1968).

Considering this new record, *U. magnirostrum* has been reported in 23 localities from 15 Brazilian states (Table 1). Despite the wide distribution, *U. magnirostrum* seems to be a locally rare species as

suggested previously by Nogueira *et al.* (2003) and Rocha *et al.* (2011). In the present study, although the substantial sampling effort carried out (over 3,400 individuals captured in the MRJP), we captured only one individual in a single locality.

Based on our record and the fact that *U. magnirostrum* was already reported in other urban forest fragments in Brazil (*e.g.*, Nunes *et al.* 2017), forested areas in urbanized landscapes appear to play a significant role in the maintenance of this species. In spite of the environmental and social importance of the HFCV, soon after the completion of our fieldwork, a relevant part of this studied area was deforested in order to construct houses by the Paraíba State Government. The impact of urbanization on the associated bat fauna is still poorly understood, but it is important to highlight that Atlantic Forest fragments within cities are known to provide refuge for bats that probably are less prone to explore the urban matrix (Araújo & Bernard 2015).

The bat fauna from Paraíba has received increasing research attention in the last few years. Since the study of Feijó & Langguth (2011), which compiled records for 53 bat species in this state,

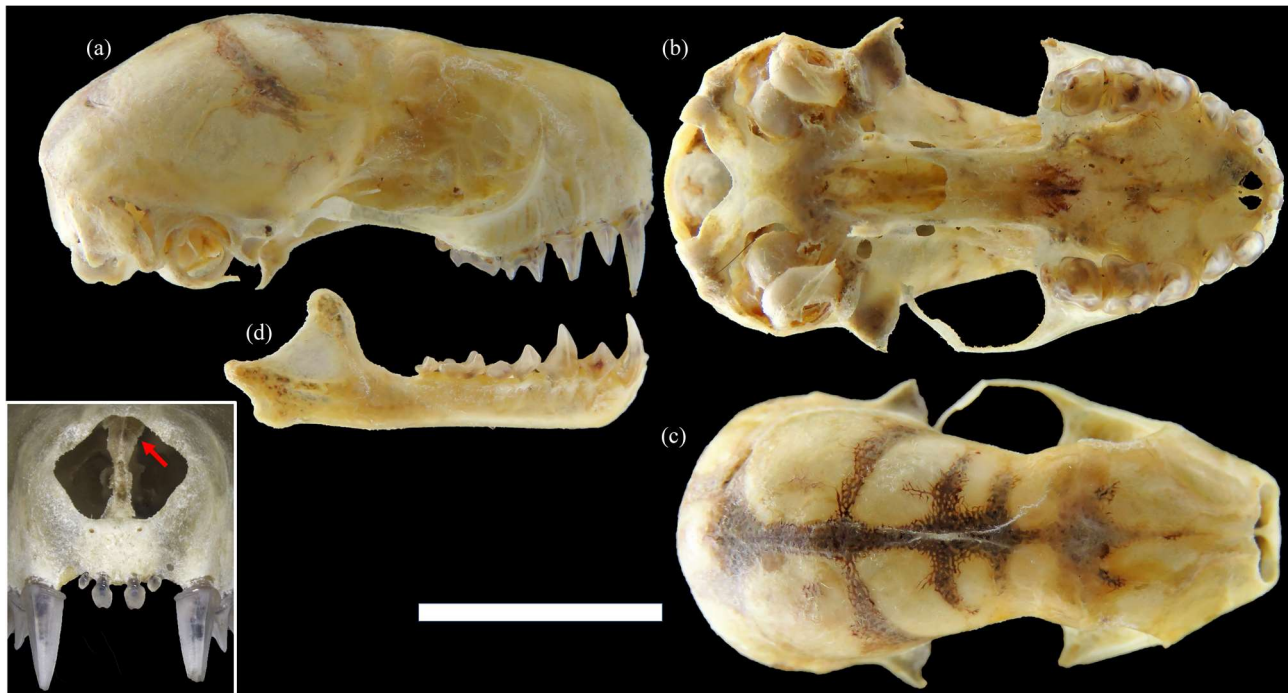


Figure 3. Lateral (a), ventral (b), and dorsal (c) views of the skull, and lateral view of the mandible (d) of *Uroderma magnirostrum* (Chiroptera: Phyllostomidae; UFPB 9823) from the state of Paraíba, Brazil. The insert on the bottom left shows the mesethmoid bone (indicated by the arrow) as well as the parallel and bilobate inner upper incisors (Scale bar = 10 mm).

eight new species were added to the list, including the description of *Histiotus diaphanopterus* Feijó, Rocha & Althoff, 2015 (Chiroptera: Vespertilionidae) (see Ferreira *et al.* 2013, Nunes *et al.* 2013, Leal *et al.* 2014, Feijó *et al.* 2015, Vilar *et al.* 2015, Zeppelini *et al.* 2016, 2017, Rocha *et al.* 2017). These new occurrences aforementioned were mainly a result of bat surveys in unexplored sites using diversified capture techniques, such as canopy mist-nets. Our record of *U. magnirostrum* updated the bat list of the state of Paraíba to 62 species. However, so far, only two studies were conducted in urban areas in this Brazilian state (Percequillo *et al.* 2007; present study). We therefore emphasize the need for future studies to take into account bats in urbanized environments to improve the knowledge of the regional bat fauna and the effects of urban expansion on these species.

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