NOTES

Mammalogy Notes ISSN 2382-3704
https://doi.org/10.47603/mano.v8n2.262

Distribution extension

First Record of *Vampyrum spectrum* (Chiroptera: Phyllostomidae) in Valle del Cauca, Colombia

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Abstract

There is little information on the ecology and geographic distribution of the rare species *Vampyrum spectrum* due to its low abundance and the paucity of records in Colombia. In a field trip to the Reserva Natural Bosque de Yotoco, Valle del Cauca, we captured a female *Vampyrum spectrum* in a mist net. It constitutes the first verified record of the species in Valle del Cauca, thus updating the geographic distribution of the species in the country, filling the information gap on the species for this zone and highlighting the importance of the Yotoco Forests as an area of interest for the conservation of the biological diversity of the region.

Key words: Yotoco, Great False Vampire Bat, geographic distribution.

Resumen

Existe poca información sobre la ecología y distribución geográfica de la especie rara *Vampyrum spectrum* debido a su baja abundancia y a los escasos registros de la especie en Colombia. En una salida de campo a la Reserva Natural Bosque de Yotoco, Valle del Cauca, se capturó en redes de niebla una hembra de *Vampyrum spectrum* que corresponde al primer registro comprobado de la especie en el departamento del Valle del Cauca, lo que permite una actualización de la distribución geográfica de la especie en el país, llenando el vacío de información de la especie para esta zona y resaltando la importancia de los Bosques de Yotoco como un área de interés para la conservación de la diversidad biológica de la región.

Palabras clave: Yotoco, Falso Vampiro, distribución geográfica

Vampyrum spectrum (Linnaeus 1758) is the largest bat species reported for the Neotropics (Acosta & Azurduy 2006; Esquivel & Rodríguez-Bolaños 2018). It occurs in well-preserved forests and uses tree holes as shelters (Goodwin & Greenhall 1961; Esquivel et al. 2020). It is a top predator among bats (Esquivel et al. 2020) and its diet includes birds, rodents, and other bats (Gardner 1977; Navarro & Wilson 1982; Nunes et al. 2005; Esquivel & Rodríguez-Bolaños 2018). Despite the ecological importance of *V. spectrum*, many aspects of its natural history, population ecology, and current distribution remain poorly known (Esquivel et al. 2020), partially because it is seldom recorded in inventories (Greenhall 1968;

Solari 2018; Esquivel et al. 2020). In the case of Colombia, no more than 37 valid records have been confirmed since 1952 (Esquivel et al. 2020). The known distribution of this species in the country extends across several ecosystems such as montane, humid and dry forests, xerophytic scrub, and savannas, and includes all six biogeographic regions of the country. This limits the assessment of the conservation status of this bat species. In Colombia, *V. spectrum* is not included in any conservation plan or policy or the red book of threatened species (Esquivel et al. 2020), although it is globally categorized as near threatened (NT) in the IUCN Red List.

On a field trip to the Reserva Natural Bosque de Yotoco (RNBY), we captured an individual belonging to the *V. spectrum* species in a mist net during a bat population ecology study, which had a total sampling effort of 18427,5 m-red/h. The mist net was 12 x 2,5 m, placed at a height of 2 m from the ground; it was opened from 17:30 to 00:00 and was checked every 30 minutes. The adult female (Figure 1, Table 1) was captured on January 30th, 2020, at 22h30 (coordinates: 3,87538, -76,43678, 1621 MASL), in Valle del Cauca department, Colombia (Figure 2, WGS84, ArcGIS v.10.4.1). This is only the 38th record of the species for the country.

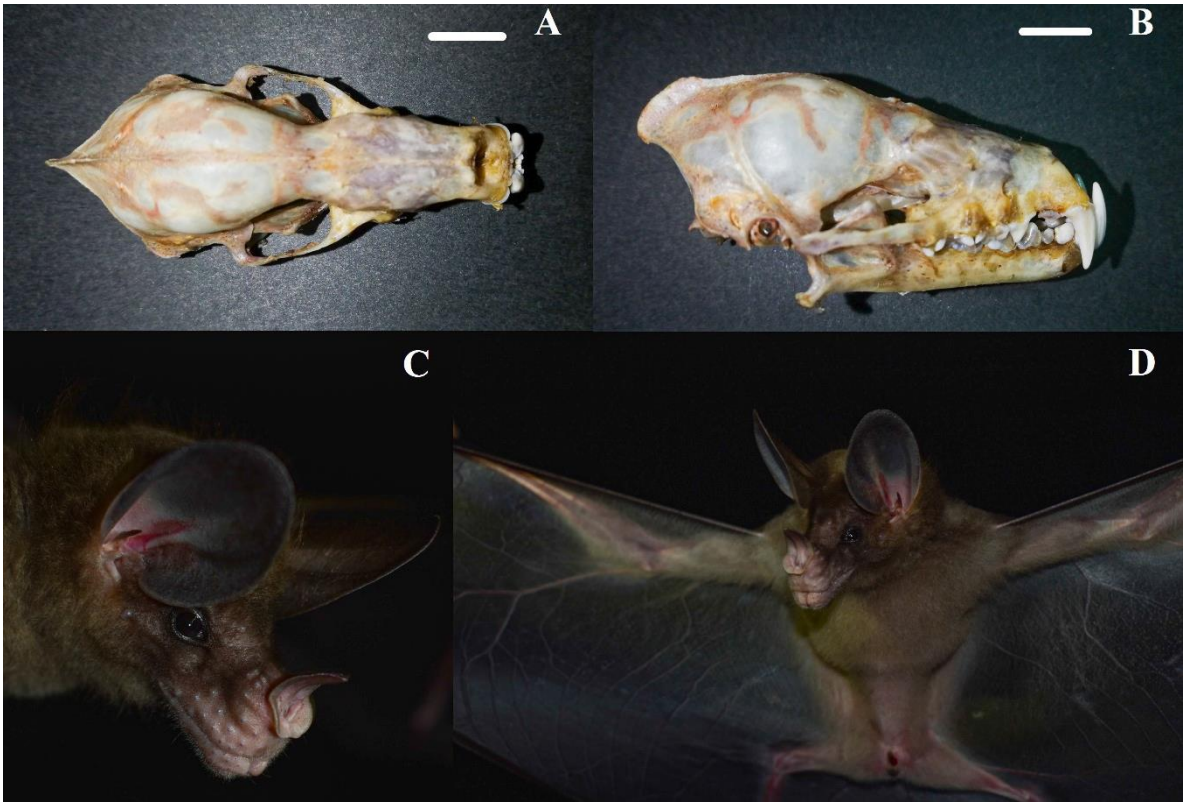

FIGURE 1. Dorsal view (A) and lateral view (B) of the skull of the *V. spectrum* specimen reported in this note. Also, lateral view of the head (C) and first photographic record of the individual at Reserva Natural Bosque de Yotoco, Valle del Cauca, Colombia (D) (taken with a Nikon D3500 camera and Huawei P20 Lite cellphone).

The reserve comprises 559 ha. It is located in a premontane humid forest (Holdridge 1978) and has an average monthly temperature of 21°C and approximately 75% relative humidity. Due to the construction of the Loboguerrero-Buga road, the reserve has two fragments. The largest and most well-preserved fragment is in the southern part of the reserve,

whereas the smallest fragment, where the *V. spectrum* specimen was captured, is located in the north of the reserve and is covered by secondary forest next to active and passive restoration areas. Around the reserve, some ecosystems have been transformed into pastures and agricultural fields (Escobar 2001).

The individual was preserved in 96 % alcohol, the skull was subsequently extracted, and morphometric measurements were taken using a Uyustools brand caliper (Figure 1, Table 1). The specimen will be housed in the Alberto Cadena García Mammal Collection of the Instituto de Ciencias Naturales, Universidad Nacional de Colombia, under provisional field number VPO-010. The specimen was collected under a permit granted to Universidad Nacional de Colombia (ANLA Resolution No. 0255 dated March 14th, 2014).

TABLE 1. External and cranial morphometric measurements (in millimeters) of the *V. spectrum* specimen found in the Reserva Natural Bosque de Yotoco, following Simmons & Voss 1998 and Esquivel et al. 2020.

External and cranial characters	Measurements (mm)
E - Ear length	42,00
HF - Hind foot length	31,00
FA - Forearm length	107,84
TL - Total length	144,00
GLS - Greatest length of the skull	50,76
CIL - Condyloincisive length	43,90
CCL - Condylocanine length	41,43
ZB - Zygomatic breadth	23,91
MTRL - Maxillary toothrow length	20,77
MANDL - Mandibular toothrow length	22,84
PB - Postorbital breadth	7,85
BB - Braincase breadth	15,55
BH - Braincase height, without the sagittal crest	18,13
PL - Palatal length	24,53
C-C - Canine-Canine breadth	9,24
SCL - Superior Canine length	7,68
ICL - Inferior Canine length	8,12

Although ecological niche modeling predicted the distribution of *V. spectrum* in Valle del Cauca (Esquivel et al. 2020), there were no records of voucher specimens in any biological collection, nor published papers on the distribution of this bat species in the region. This note constitutes the first physical record of the species *V. spectrum*, not only in Valle del Cauca but also in the Geographical Valley of the Cauca River. Besides this record of geographical distribution, this finding supports the suggestions by Esquivel et al. 2020 that forest cover is a crucial factor in the distribution of this species, with mosaics being the preferred habitat for *V. spectrum.*

Furthermore, this report is the most recent record of the species, and as is the case with other occurrences records from the last ten years (Esquivel et al. 2020), we found this species in a well-conserved forest patch surrounded by a transformed landscape. It is important to generate strategies for the conservation of both the species and its ecosystems, including the maintenance of protected areas where *V. spectrum* habitat is preserved, such as around the Yotoco forest and in the Valley of the Cauca River where much of the original vegetation cover, such as Tropical Dry Forest, has been drastically reduced due to strong anthropic activity such as sugarcane cultivation (Alvarado-Solano & Otero 2015; Esquivel et al. 2020).

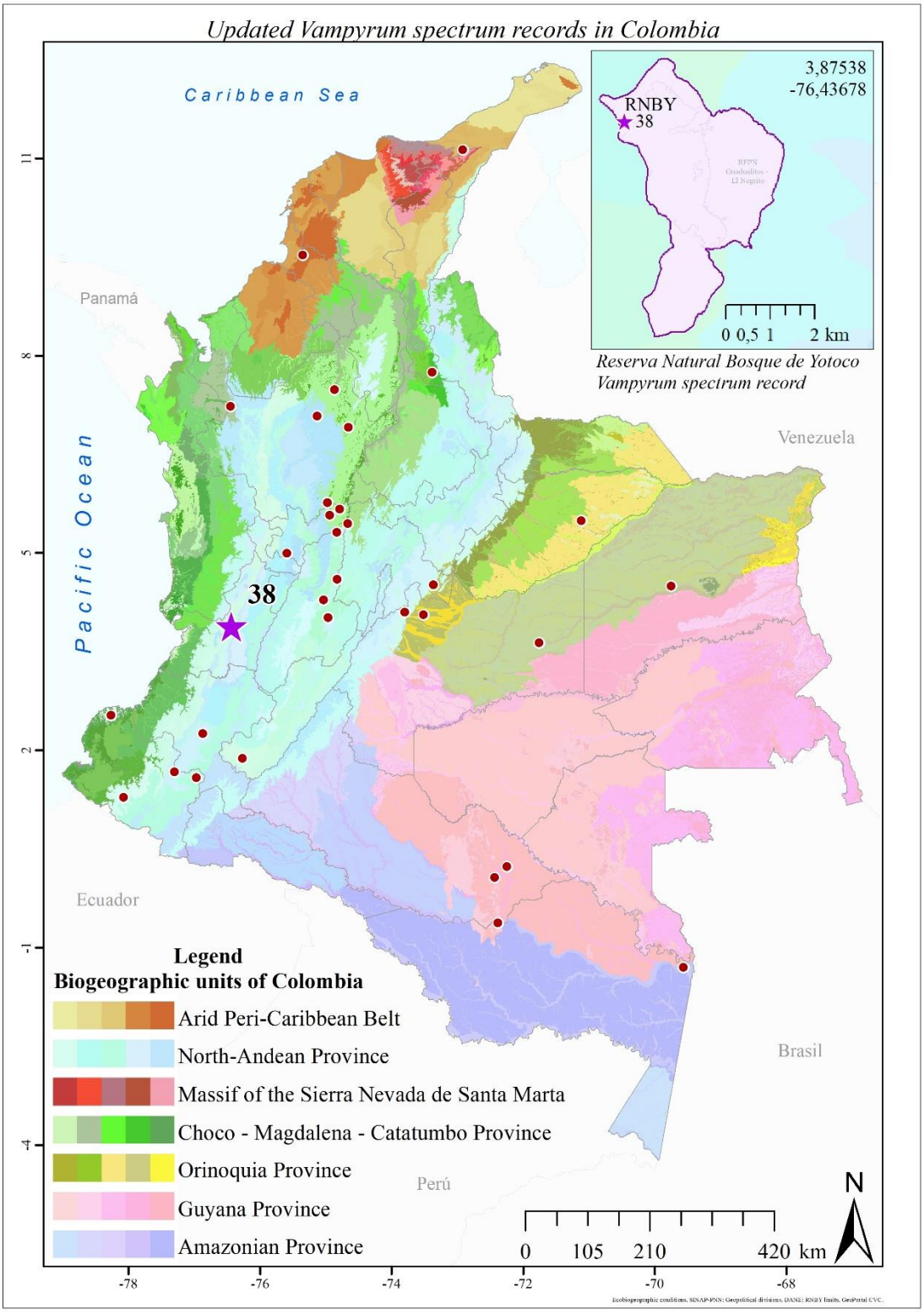

FIGURE 2. The purple star shows the location of the latest *V. spectrum* record in the Reserva Natural Bosque de Yotoco, Valle del Cauca, Colombia (this note). The red circles show the previous *V. spectrum* records based on Esquivel *et al.* 2020. The upper right part of the map shows the exact location of the *V. spectrum* record at RNBY.

It is worth mentioning that in order to trap this and other high-flying species in the field, it is necessary to implement sampling methods that use nets placed at an appropriate height. They must also be made of resistant materials given that large individuals can break the nets. The implementation of conventional methods can decrease the probability of capture.

Acknowledgments

We thank all the people who work at the Reserva Natural Bosque de Yotoco, especially its director, Carlos Jaramillo, for allowing the study to be carried out there and Valentín Hidalgo, Cristóbal Córdoba, and Nancy Valencia for their constant attention, guidance, and support during our stay. We also thank Professor Olga Montenegro, Ph. D. for her collaboration throughout the process, Hugo Mantilla Meluk, Ph.D. for resolving our doubts and Lauren Raz, Ph.D. for reviewing the translation of the document. We are grateful to the Alberto Cadena García Mammal Collection of the Instituto de Ciencias Naturales, Universidad Nacional de Colombia, for receiving the specimen. Field work for this study was conducted under the auspices of the project "Population Ecology of Bats at Reserva Natural Forestal Bosque de Yotoco" (Ecología poblacional de muciélagos en la Reserva Natural Bosque de Yotoco) identified with number 46488 in HERMES (research information system, Universidad Nacional de Colombia, authorized by Resolution 013 of 2007, emitted by the Vice-Rector of Research).

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Editor: Diego J. Lizcano
Recibido: 2021-06-28
Revisado: 2022-07-20
Aceptado: 2022-09-13
Publicado: 2023-01-12