

## New distribution record of the brown sac-wing bat *Balantiopteryx infusca* in Colombia

## Nuevo registro de distribución del murciélago café de sacos alares *Balantiopteryx infusca* en Colombia

JOHN HAROLD CASTAÑO-SALAZAR<sup>1\*</sup>, AND BLAS ANTONIO CÁRDENAS-MOSQUERA<sup>2</sup>

<sup>1</sup>Grupo de investigación en Biología de la Conservación y Biotecnología, Corporación Universitaria Santa Rosa de Cabal-UNISARC. Km 4 vía Santa Rosa de Cabal. Risaralda, Colombia. E-mail: [jhcastano@gmail.com](mailto:jhcastano@gmail.com) (JHC-S).

<sup>2</sup>Asociación Amigos de la Fauna ASOFAFA, Consejo comunitario Santa Cecilia, Contratista CARDER. Corregimiento de Santa Cecilia, Colombia. E-mail: [blasantoniocardenas@gmail.com](mailto:blasantoniocardenas@gmail.com) (BAC-M).

\*Corresponding author

The brown sac-wing bat *Balantiopteryx infusca* (Thomas, 1897) is among the least known of South American bats. Is categorized as Vulnerable by the IUCN, since their description in 1897 was known only to occur in four localities; two from the northwestern Ecuador and two localities from southwestern Colombia. We observed a colony (6 individuals) and collected three adult female specimens in a hollow at c.a. 5 m high at the steep wall of a gorge formed by the Río Gitocito in Corregimiento de Santa Cecilia, municipality of Pueblo Rico, Department of Risaralda, Colombia. The vegetation in this area is dominated by rain forests. The characters that distinguish our vouchers from other Emballonurids, and from other *Balantiopteryx* are; glandular sac in the middle of the propatagium; rostrum bulbous anteriorly with lateral inflations extending forward over roots of canines; no sagittal crest; the inner margin of ear slightly concave; braincase elongate posteriorly; mesopterygoid fossa narrow. Our findings represent the northernmost distribution for *B. infusca* in the Chocó rain forest, extending 170 km north of the nearest record its distribution and filling gaps between known populations of the genus *Balantiopteryx*. This species endemic to the Chocó region of Colombia and Ecuador tends to be locally rare or hardly detected, more acoustic monitoring should be conducted in the Chocó rain forest to improve the knowledge about the distribution of this bat.

**Key words:** Choco/Darien; Emballonuridae; endemic bat; range extension; rain forest; rare bat; threatened bat.

El murciélago marrón de sacos alares *Balantiopteryx infusca* (Thomas, 1897) se encuentra entre los murciélagos sudamericanos menos conocidos. Está categorizada como Vulnerable por la UICN, desde su descripción en 1897 solo se conocía en cuatro localidades; dos del noroeste de Ecuador y dos localidades del suroeste de Colombia. Observamos una colonia (6 individuos) y colectamos tres hembras adultas en un hueco de aproximadamente 5 m de altura en la pared empinada del cañón formado por el Río Gitocito en el corregimiento de Santa Cecilia, municipio de Pueblo Rico, departamento de Risaralda, Colombia. La vegetación en esta área está dominada por los bosques lluviosos. Las características que distinguen nuestros ejemplares de otros Emballonuridos, y de otras especies en el género *Balantiopteryx* son; saco glandular en el medio del propatagio; rostro abultado anteriormente con crecimientos laterales que se extienden hacia adelante sobre las raíces de los caninos; sin cresta sagital; margen interno de la oreja ligeramente cóncavo; caja craneana alargada posteriormente; fosa mesopterygoidea estrecha. Nuestros hallazgos representan la distribución más septentrional de *B. infusca* en la selva tropical del Chocó, extendiéndose 170 km al norte del registro más cercano y llenando vacíos entre las poblaciones del género *Balantiopteryx*. Esta especie endémica de la región chocona de Colombia y Ecuador tiende a ser localmente rara o difícilmente detectada, se deben realizar más monitoreos acústicos en las selvas choconas para mejorar el conocimiento sobre la distribución de este murciélago.

**Palabras clave:** Chocó/Darién; Emballonuridae; especie amenazada; extensión de rango; murciélago endémico; murciélago raro; selva lluviosa.

© 2020 Asociación Mexicana de Mastozoología, [www.mastozoologiamexicana.org](http://www.mastozoologiamexicana.org)

The genus *Balantiopteryx* (Emballonuridae: Emballonurinae) contains three species (Simmons and Cirranello 2020), two of them (*B. io* and *B. plicata*), are fairly common cave-roosting bats found only in Middle America; the other species (*B. infusca*) is among the least known of South American bats (Arroyo-Cabrales and Jones 1987); it has an apparent rarity and restricted distribution (Lim et al. 2004).

The brown sac-wing bat (*B. infusca*) has been classified as Vulnerable by the IUCN (Tirira 2015). This status has been assigned because of the restricted range and limited knowledge of the species. Since their description in 1897 was known only to occur in four localities; two from the northwestern Ecuador, in the provinces of Esmeraldas

and Imbabura (McCarthy et al. 2000), and two localities from southwestern Colombia (Alberico et al. 2000; Solari et al. 2013; Mantilla-Meluk et al. 2014) in the department of Valle del Cauca, on the western versant of the Colombian Andes. This region faces forest degradation in both small-scale selective logging and firewood harvesting and large-scale tree removals for gold mining, settlements, and illegal logging (Meyer et al. 2019).

We report a new record locality for *B. infusca*. This represents the northernmost distribution of the species in the Chocó rain forest in Colombia, extending the geographic distribution for the species and filling gaps between known populations of the genus *Balantiopteryx*.

On October 30, 2018, at 11:21h, we observed a colony (6 individuals) in a hollow at c.a. 5 m high at the steep wall of a gorge formed by the Río Gitocito (Figure 1a), near to the point where this river drains into the Río San Juan, Corregimiento de Santa Cecilia, municipality of Pueblo Rico, Department of Risaralda (5° 20' N, 76° 11' W, 393 m; Figure 1b), the vegetation in this area is dominated by rain forests. Also, an adult female was captured with a hand net and photographed (not collected).

On May 15, 2019, at 12:11h, we observed a colony (6 individuals) at the same place, then we set a mist net (12 m in length, mesh diameter of 36 mm and height of 4 m above the ground) and we captured three adult female specimens. Another male escaped from the net.

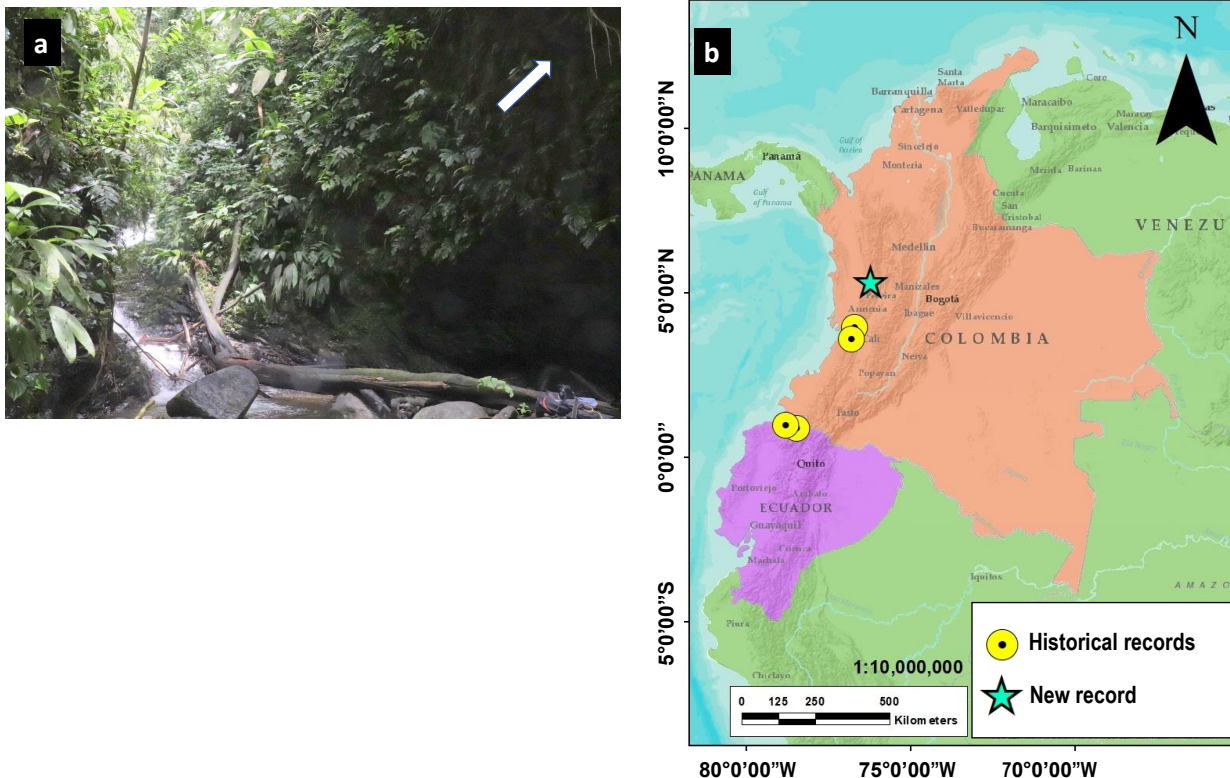
The specimens were collected following [Sikes et al. \(2011\)](#), euthanized and deposited in the Mammal Collection of the Laboratorio de Zoología Corporación Universitaria Santa Rosa de Cabal (CUS-M 469 nonparous female and CUS-M 470 pregnant female were preserved as skin and skeleton, and CUS-M 482 pregnant female was preserved in 70 % ethanol). Cranial and external measurements were taken in mm using a digital caliper (0.2 mm). The specimens were collected under permit CARDER (license number 2004 -September 2016).

Our vouchers of *B. infusca* have the set of characters that distinguish this genus from other in the family Emballonuridae, such as glandular sac in the middle of the propatagium that opens proximally (Figure 2b); rostrum bulbous anteriorly with lateral inflations extending forward

over roots of canines, and no sagittal crest (Figure 2c; [Gardner 2007](#); [Diaz et al. 2016](#)). The characters that distinguish our vouchers from other *Balantiopteryx* are the inner margin of ear slightly concave (Figure 2a); braincase elongate posteriorly (Figure 2c), resembling the condition in *B. plicata* and less rounded than in *B. io*; moderate frontal depression; rostrum inflated both anteriorly and posteriorly; mesopterygoid fossa narrow as in *B. plicata* ([Arroyo-Cabrales and Jones 1987](#)). The measure ranges of two voucher specimens are (in mm): total length 55 to 62; tail length 12 to 15; foot 8 to 9; ear 9 to 12; length of forearm 39.5 to 40.5; greatest length of skull, 13.0 to 13.1; zygomatic breadth, 8.3 to 8.3; postorbital constriction, 3.1 to 3.5; breadth of braincase, 6.7 to 6.9; mastoid breadth 7.5 to 7.5; length of maxillary tooththrow 4.7 to 5.0.

We report a new record locality representing the northernmost record for *B. infusca* confirming their geographic distribution in the Chocó rain forest, extending 560 km range distribution respect to the type locality in Río Cachaví, province of Esmeraldas, Ecuador, and 170 km respect to the northernmost Colombian distribution in Río Chanco, department of Valle del Cauca; also this are the first records of the species for the department of Risaralda ([Castaño et al. 2018a](#)) and for the Amurrapá Important Area For Bat Conservation ([Castaño et al. 2018b](#)).

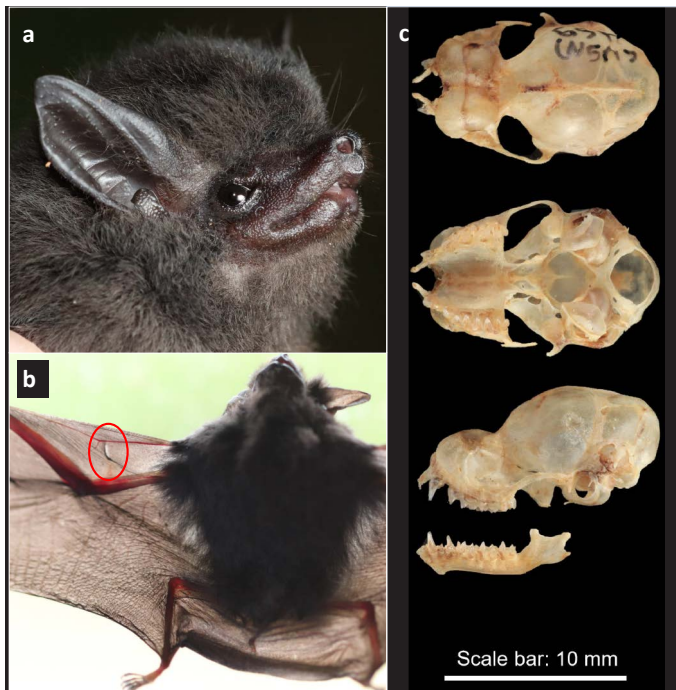
These records reduce the considerable hiatus between known populations of the sister species *B. io* in Costa Rica and *B. infusca* in Colombia, supporting the hypothesis that; *B. infusca* and *B. io* speciated allopatrically in the Pacific ver-



**Figure 1.** a) Habitat and hollow at the steep wall of a gorge formed by the Río Gitocito, the arrow indicates the place where the bats were resting. Photography by J. H. Castaño-Salazar. b) Records of the presence of *Balantiopteryx infusca*. Yellow circles indicate historical records. The blue star indicates the new record in department of Risaralda, Chocó rain forest, Colombia. Elaborated by V. Botero.

sant of Colombia and northwestern Ecuador, and in the wet Atlantic versant of southern México and northern Central America, respectively, prior to the present land connection between North and South America (Lim et al. 2004).

According to our observations, *B. infusca* tends to be locally rare or hardly detected by capture methods. Although in the Corregimiento de Santa Cecilia, there were several systematic bat studies using mist net and capture in caves, and there are more than 250 specimens (17 spp.) registered, this is the first report of *B. infusca* (Carranza-Quiceno et al. 2018). More acoustic monitoring should be conducted in the Chocó rain forest to improve the detectability and knowledge about the distribution of the brown sac-wing bat.



**Figure 2.** *Balantiopteryx infusca*. a) Face. b) Glandular sac in the middle of the propagium. c) Dorsal, ventral, and lateral views of cranium, and lateral view of lower jaw (CUS-M 469, ♀) from Corregimiento de Santa Cecilia, municipality of Pueblo Rico. Photographs by J. H. Castaño-Salazar.

Besides, the colony size (6 individuals) of *B. infusca* roosted inside this hollow suggests that the colony size of this species was shorter than colonies of *B. plicata* and *B. io* which can range from 100 to 1,000 individuals (McCarthy et al. 2000). Our small sample represented by 3 females and one male suggest that adult female *B. infusca* may outnumber, these results are in accordance with the findings in Ecuador (McCarthy et al. 2000). The cranial and external measure ranges of our vouchers are similar to those presented by Arroyo-Cabrales and Jones (1987).

## Acknowledgements

We thank to V. Botero for the map elaboration, to D. Torres for improving the quality of this manuscript. To C. Bota, A. Arredondo, D. Montenegro, D. Ospina, V. Pineda, S. Trejos, I. Pareja for their assistance in the field. To the Santa Cecilia Community Council for permission to access their ter-

ritories. This work was supported in part by Corporación Autónoma Regional de Risaralda (CARDER), and Corporación Universitaria Santa Rosa de Cabal UNISARC.

## Literature cited

- ALBERICO, M., A. CADENA, J. HERNÁNDEZ-CAMACHO, AND Y. MUÑOZ-SABA. 2000. Mamíferos (Synapsida: Theria) de Colombia. *Biota Colombiana* 1:43–75.
- ARROYO-CABRALES, J., AND J. K. JONES. 1987. *Balantiopteryx io* and *Balantiopteryx infusca*. *Mammalian Species* 313:1–3.
- CARRANZA-QUICENO, J. A., G. GONZÁLEZ, D. Y. TAPASCO, S. CORTES-BEDOYA, J. C. MANTILLA, I. M. PAREJA, J. E. PAYAN, M. MONTOYA, J. R. HENAO, S. QUINTERO-GARCÍA, A. M. LÓPEZ-BARRERA, J. RIVERA-GÓMEZ, B. A. CÁRDENAS, M. Y. MATURANA, A. MARTÍNEZ, Y. MACHADO, J. H. CASTAÑO, AND L. H. MUÑOZ. 2018. Biodiversidad en el área de manejo especial étnico alto Amurrapá, Santa Cecilia, Risaralda. Pp. 147–184 in *Diversidad Biológica y Cultural del pacífico Risaraldense* (Carder, IIAP, PNNC, and Unisarc, eds.). IIAP, CARDER, UNISARC. Pereira, Colombia.
- CASTAÑO, J. H., D. A. TORRES, V. ROJAS-DÍAZ, C. A. SAAVEDRA-RODRÍGUEZ, AND J. PÉREZ-TORRES. 2018a. Mamíferos del departamento de Risaralda, Colombia. *Biota Colombiana* 18:239–254.
- CASTAÑO, J. H., D. TORRES-ARBOLEDA, AND S. ESTRADA-VILLEGAS. 2018b. Amurrapá - AICOMs - Colombia - Base de Datos. <https://www.relcomlatinoamerica.net/qué-hacemos/conservacion/aicoms-sicoms/aicoms-sicoms-buscador/ad/aicoms/1/amurrapa/4.html>. Accessed on 8 May, 2020.
- DÍAZ, M., S. SOLARI, L. AGUIRRE, L. AGUILAR, AND R. BARQUEZ. 2016. Clave de Identificación de los Murciélagos de Sudamérica. *Publicación Especial N° 2, PCMA* (Programa de Conservación de los Murciélagos de Argentina). Tucumán, Argentina.
- GARDNER, A. L. 2007. *Mammals of South America, Volume 1: Marsupials, Xenarthrans, Shrews, and Bats: Marsupials, Xenarthrans, Shrews, and Bats*. Page (Gadner, A. L., ed.). First edition. The University of Chicago Press. Chicago, U.S.A.
- LIM, B. K., M. D. ENGSTROM, N. B. SIMMONS, AND J. M. DUNLOP. 2004. Phylogenetics and biogeography of least sac-winged bats (*Balantiopteryx*) based on morphological and molecular data. *Mammalian Biology* 69:225–237.
- MANTILLA-MELUK, H., H. E. RAMÍREZ-CHAVES, A. M. JIMÉNEZ-ORTEGA, AND M. E. RODRÍGUEZ-POSADA. 2014. Emballonurid bats from Colombia: Annotated checklist, distribution, and biogeography. *Therya* 5:229–255.
- MCCARTHY, T. J., L. ALBUJA V., AND I. MANZANO. 2000. Rediscovery of the Brown Sac-Wing Bat, *Balantiopteryx infusca* (Thomas, 1897), in Ecuador. *Journal of Mammalogy* 81:958–961.
- MEYER, V., S. SAATCHI, A. FERRAZ, L. XU, A. DUQUE, M. GARCÍA, AND J. CHAVE. 2019. Forest degradation and biomass loss along the Chocó region of Colombia. *Carbon Balance and Management* 14:1–15.
- SIKES, R. S., W. L. GANNON., AND THE ANIMAL CARE AND USE COMMITTEE OF THE AMERICAN SOCIETY OF MAMMALOGISTS. 2011. Guidelines of the American Society of Mammalogists for the use of wild mammals in research. *Journal of Mammalogy* 92:235–253.
- SIMMONS, N. B., AND A. L. CIRRANELLO. 2020. *Bat Species of the World: A taxonomic and geographic database*. <https://bat-names.org/>. Accessed on 7 May, 2020.

- SOLARI, S., Y. MUÑOZ-SABA, J. V. RODRÍGUEZ-MAHECHA, T. R. DEFLER, H. E. RAMÍREZ-CHAVES, AND F. TRUJILLO. 2013. Riqueza, endemismo y conservación de los mamíferos de Colombia. *Mastozoología Neotropical* 20:301–365.
- TIRIRA, D. 2015. *Balantiopteryx infusca* (errata version published in 2016). *In*: The IUCN Red List of Threatened Species 2015. [www.iucnredlist.org](http://www.iucnredlist.org). Downloaded on 29 July, 2020.

*Associated editor: Tamara M. Rioja-Paradela*

*Submitted: June 28, 2020; Reviewed: August 29, 2020.*

*Accepted: September 4, 2020; Published on line: September 14, 2020*