

# Record of alopecia in the bat *Artibeus jamaicensis* in Córdoba, Veracruz, México

## Registro de alopecia en el murciélago *Artibeus jamaicensis* en Córdoba, Veracruz, México

ITANDEHUI HERNÁNDEZ-AGUILAR<sup>1\*</sup>, CONSUELO LORENZO<sup>2</sup>, JORGE BOLAÑOS-CITALÁN<sup>2</sup>, GLORIA TAPIA-RAMÍREZ<sup>2</sup>, AND JESÚS R. HERNÁNDEZ-MONTERO<sup>3</sup>

<sup>1</sup>Laboratorio de Ecología Animal, Centro Interdisciplinario de Investigación para el Desarrollo Integral Regional, Unidad Oaxaca, Instituto Politécnico Nacional, C. P. 71230. Santa Cruz Xoxocotlán, Oaxaca, México. E-mail: [itandehui0901@gmail.com](mailto:itandehui0901@gmail.com) (IH-A).

<sup>2</sup>Departamento de Conservación de la Biodiversidad, El Colegio de la Frontera Sur. Carretera Panamericana y Periférico Sur s/n, C. P. 29290, Barrio María Auxiliadora. San Cristóbal de Las Casas. Chiapas, México. E-mail: [clorenzo@ecosur.mx](mailto:clorenzo@ecosur.mx) (CL); [jbolanos@ecosur.mx](mailto:jbolanos@ecosur.mx) (JB-C); [tapiaramglo@gmail.com](mailto:tapiaramglo@gmail.com) (GT-R).

<sup>3</sup>Zoological Institute and Museum, Greifswald Universität. Loitzer Str. 26, P. C. 17489, Greifswald, Germany. E-mail: [jesus.hdez-montero@gmail.com](mailto:jesus.hdez-montero@gmail.com) (JRH-M).

\*Corresponding author

Alopecia is the partial or total loss of hair in a mammal. This condition has been reported in 38 species of bats from 6 families. This report documents the presence of alopecia in an individual of *Artibeus jamaicensis* in the state of Veracruz, southeastern México. On September 25, 2022, during a field trip as part of a project to assess areas of zoonotic risk in the Mexican Neotropics, rodents and bats were captured in a medium semi-evergreen forest with shaded coffee plants in the peri-urban town of Berlín, municipality of Córdoba, Veracruz, México. Forty bats of different species were captured, including 1 adult male of *A. jamaicensis* with no evidence of reproductive activity and with alopecia in the head, neck, right shoulder, and chest. The area of the chest with alopecia also had a gelatinous lesion with a yellowish crust at the edges. This report represents the first record of alopecia in bats in Veracruz and the second for *A. jamaicensis* in México. In the *A. jamaicensis* individual examined, alopecia probably occurred as a result of a thoracic injury that spread to other parts of the body, likely due to a bacterial or fungal infection.

**Key words:** Chiroptera; hair loss; injury; Phyllostomidae.

La alopecia es la pérdida parcial o total del pelo de un mamífero. Esta condición ha sido reportada en 38 especies de murciélagos de 6 familias. El objetivo de este reporte es documentar la presencia de alopecia en un individuo de *Artibeus jamaicensis* en el estado de Veracruz, sureste de México. El 25 de septiembre de 2022, durante una salida de campo, dentro de un proyecto para evaluar áreas de riesgo zoonótico en el Neotrópico mexicano, se capturaron roedores y murciélagos en la selva mediana subperenifolia con cafetal bajo sombra en la localidad periurbana de Berlín en el municipio de Córdoba, Veracruz, México. Se capturaron 40 murciélagos de distintas especies, de ellos, un *A. jamaicensis* macho adulto sin evidencia de actividad reproductiva presentó alopecia en la zona de la cabeza, cuello, hombro derecho y tórax. El área del tórax con alopecia estaba acompañada de una lesión de aspecto gelatinoso que en su margen presentaba una costra de color amarillento. Este reporte representa el primer registro de alopecia en murciélagos en Veracruz y el segundo de *A. jamaicensis* en México. Es probable que la alopecia en el individuo *A. jamaicensis* se haya presentado como consecuencia de una lesión en el tórax que se extendió a otras partes de su cuerpo; también es posible que se deba a una infección bacteriana o fúngica.

**Palabras clave:** Lesión; pérdida de pelo; Phyllostomidae; quiróptero.

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Alopecia, or alopecic syndrome, is defined as partial or total hair loss in mammals ([Corrales-Escobar and Saavedra-Rodríguez 2020](#)). This condition has been reported in several species of domestic mammals such as dogs and cats ([Mecklenburg 2006](#)), captive mammals such as the spectacled bear, *Tremarctos ornatus*, and the pronghorn antelope, *Antilocapra americana* ([Barbon 2013](#); [Velez et al. 2018](#)), and wild mammals such as the ring-tailed coati, *Nasua nasua*, and the kinkajou, *Potos flavus* ([Grajales-Suaza et al. 2023](#)). The causes of alopecia can be intrinsic to the affected individual (e.g., reproductive condition, hormonal fluctuations) or extrinsic (e.g., environmental conditions, environmental stress, natural infections, and ectoparasites; [Olsson and Barnard](#)

[2009](#)). Alopecia has been reported in 38 bat species of the families Pteropodidae, Emballonuridae, Molossidae, Vespertilionidae, Phyllostomidae, and Mormoopidae ([Martin-Regalado et al. 2022](#); [Hernández-Aguilar et al. 2023](#)).

The Mexican fruit bat, *Artibeus jamaicensis*, is a phyllostomid species distributed from Sinaloa, Michoacán, and Tamaulipas, México, to northwest Colombia, Major and Minor Antilles (south of Granada), and southern Bahamas ([Miller et al. 2016](#)). There are reports of *A. jamaicensis* with alopecia in the Lesser Antilles and México. Chronologically, the first record of *A. jamaicensis* with alopecia was reported on Nevis Island, the Lesser Antilles ([Pedersen et al. 2003](#)); subsequently, in St. Martin and St. Maarten, the

**Table 1.** Records of alopecia reported in *Artibeus jamaicensis* in the Lesser Antilles and México. n. d.: data not available; M: male; F: female.

State, Country	Sex		Affected area	Possible cause	Reference
	M	F			
Nevis, Antillas Menores	0	3	Chest, abdomen and chin	n. d.	Pedersen <i>et al.</i> (2003)
Saint Martín, Saint Maarten, Antillas Menores	0	1	Chest, abdomen and chin	Lactation	Genoways <i>et al.</i> (2007)
Tabasco, México	73, n. d.		Chest, abdomen and head	Endocrine or nutritional deficiencies	Bello-Gutiérrez <i>et al.</i> (2010)
Montserrat, Antillas Menores	434, n. d.		Head, neck, abdomen, back	Ingestion of volcanic ash, zinc deficiency, physiological stress and parasitism	Pedersen <i>et al.</i> (2012)
Veracruz, México	1	0	Chest, neck, head and right shoulder	Injury, possible fungal or bacterial infection	This study

Lesser Antilles, alopecia was again recorded in this species (Genoways *et al.* 2007). Alopecia was also reported in 73 individuals of *A. jamaicensis* on Villahermosa City, Tabasco, México (Bello-Gutiérrez *et al.* 2010) and in 434 individuals on Montserrat Island, Lesser Antilles (Pedersen *et al.* 2012; Table 1). This report documents the presence of alopecia in an individual of *A. jamaicensis* captured in the state of Veracruz, southeastern México.

During a field trip that was part of a project to assess areas of zoonotic risk in the Mexican Neotropics, rodents and bats were captured in a medium semi-evergreen forest with shaded coffee plants in Córdoba city and the Porvenir and Berlín peri-urban towns, municipality of Córdoba, Veracruz. Berlín is located at 882 m above sea level and has approximately 942 inhabitants (INEGI 2020). On September 25, 2022, 4 mist nets measuring 2 m x 12 m were placed in a shaded coffee plantation with medium semi-evergreen forest (18° 55' 11.05" N, 96° 55' 0.26" W, 923 m) from 17:00 hr to 22:30 hr. The sampling site was located approximately 100 m from a cave that probably serves as a shelter for the captured bats (Figure 1). Each captured bat was weighed (W, in g), and conventional body metrics (in mm) were recorded: total length (LT), tail length (LC), right leg length (LP), right ear length (LO), and forearm length (LA). The reproductive status and age were also recorded. Bats were identified at the species level using the keys of Medellín *et al.* (2007) and Álvarez-Castañeda *et al.* (2017); additionally, the article by Wilson and Mittermeier (2019) was reviewed for recent taxonomic changes. Afterward, the bats were released at the capture site. All specimens were collected under scientific collection license FAUT-0143 from C. Lorenzo, provided by SEMARNAT.

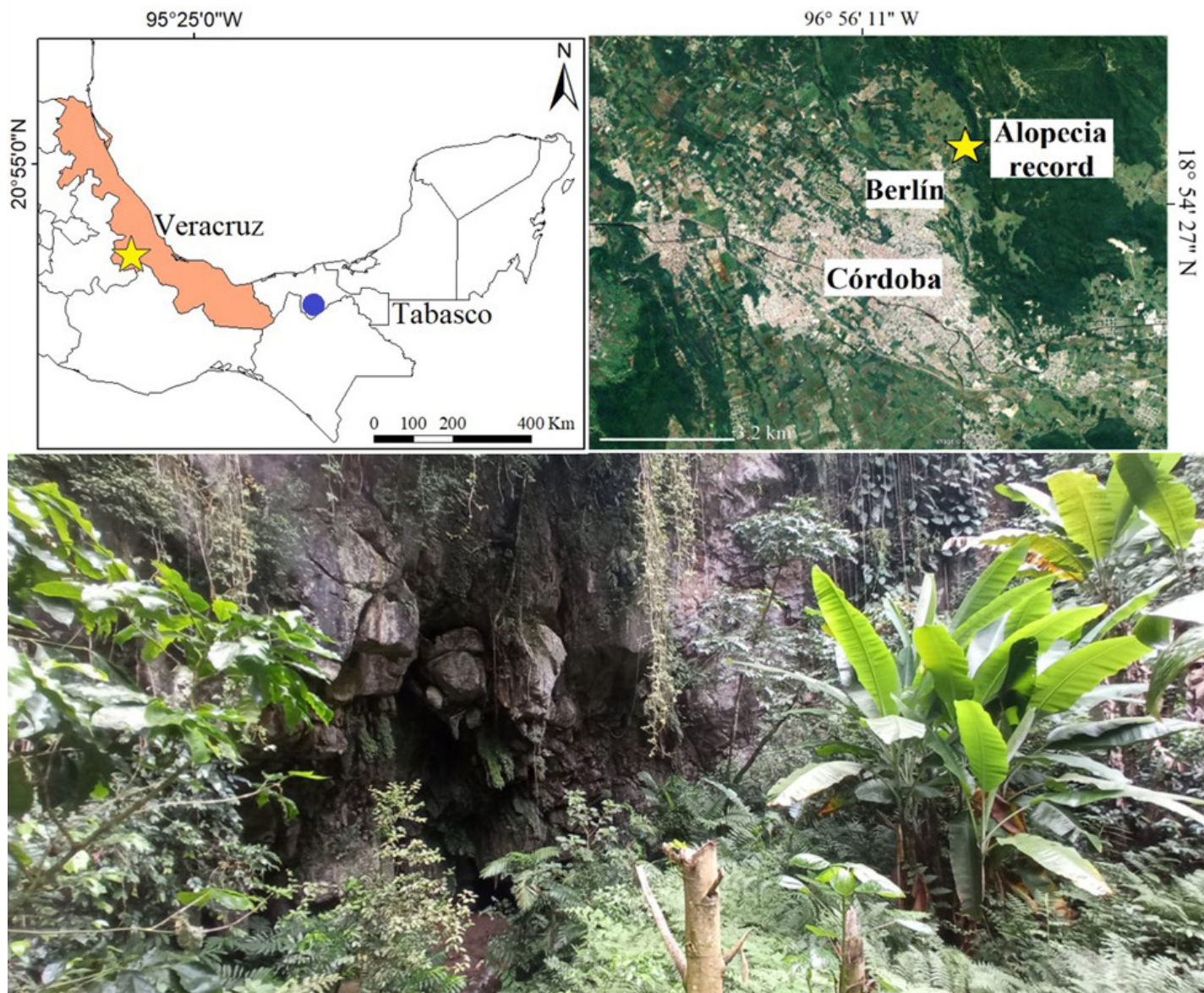
Forty bats belonging to 7 species were captured: *Artibeus jamaicensis* (n = 11), *A. phaeotis* (n = 3), *A. lituratus* (n = 2), *Carollia sowelli* (n = 5), *Choeroniscus godmani* (n = 2), *Platyrrhinus helleri* (n = 1), and *S. parvidens* (n = 16). Of the 11 *A. jamaicensis* individuals captured (3 males with descended testicles, 2 pregnant females, 5 males and 1 female with no signs of reproductive activity), 1 had alopecia. The alopecic individual was an adult male with no evidence of reproductive activity and with hair loss in the chest, head, neck, and

right shoulder (Figure 2). The area of the chest with no hair showed a gelatinous injury with a yellowish crust at the edges. The hairless skin in the chest, head, and neck areas was reddened. The remaining areas of the skin and hair appeared normal. The alopecic bat had body weight and size within the range reported for the species according to Wilson and Mittermeier (2019): LT = 81, LC = 0, LP = 16, LO = 15.3, LA = 60.2, and W = 30. Because the bat with alopecia had an active injury in the chest and could pose a risk of contagion for other members of his resting group, the alopecic individual was sacrificed and deposited in the Mammal Collection of El Colegio de la Frontera Sur, San Cristóbal de las Casas, Chiapas, México (ECO-SC-M 10238).

This report is the first record of alopecia in *A. jamaicensis* in the state of Veracruz and the second in México, after those reported by Bello-Gutiérrez *et al.* (2010). Several factors that can cause alopecia in animals have been mentioned. In captive bats, this condition can be caused by injuries, malnutrition, contamination, and poor ventilation in resting rooms. In captive bats, alopecia can be treated by cleaning and ventilating resting rooms or with a supplemented diet (Olsson and Barnard 2009). In free-living bats, alopecia may be related to mycosis or fungal infections (De Souza-Suguiura *et al.* 2023), ectoparasites (Corrales-Escobar and Saavedra-Rodríguez 2020), environmental stress associated with urbanization (Acosta 2016; Martin and Wolters 2022), hormonal fluctuations related to reproduction (Haarsma and Van Alphen 2009; Hernández-Aguilar *et al.* 2023), and even to the intake of volcanic ash (Pedersen *et al.* 2012).

Pedersen *et al.* (2003) described the diversity of bats on Nevis Island, Lesser Antilles, and briefly reported having captured 3 individuals of *A. jamaicensis* with alopecia but did not explain the causal agent of this condition. Genoways *et al.* (2007) also described the diversity of bats on St. Martin and St. Maarten Island, Lesser Antilles, and reported that a lactating female of *A. jamaicensis* had alopecia in the chest, abdomen, and chin. Subsequently, Bello-Gutiérrez *et al.* (2010) captured 73 *A. jamaicensis* individuals with alopecia in the chest, abdomen, and head in Villahermosa City, Tabasco, México; these authors concluded that this condition may be caused by endocrine or nutritional deficiencies





**Figure 1.** Geographic location of the new record of alopecia in *Artibeus jamaicensis* in Veracruz, México (yellow star), and the previous record reported in México (blue dot). The bottom image shows the vegetation at the sampling site. Photograph: J. Bolaños-Citalán.

associated with urbanization. On Montserrat Island, Less Antilles, [Pedersen et al. \(2012\)](#) captured 344 *A. jamaicensis* bats with mild alopecia (absence of hair in small patches on the head and chest) and some individuals with almost 100 % alopecia in the body (the only hair in the animal were small patches between the shoulders or head); these authors concluded that this condition was probably related to volcanic ash ingestion, zinc deficiency, physiological stress, and parasitism (Table 1). At the time of the capture of *A. jamaicensis* with alopecia in Veracruz, we did not have the material and equipment required to take a sample for a histopathological study or fungal and bacterial cultures; therefore, we were unable to identify the etiological agent of hair loss. However, since the hairless area also showed a lesion in the center of the chest, alopecia was probably secondary to this lesion and spread to other adjacent areas of the body of *A. jamaicensis*; furthermore, since the lesion

had a gelatinous appearance, it is also possible that alopecia was due to a bacterial or fungal infection.

The body areas frequently affected by alopecia in *A. jamaicensis* are the chest, abdomen, head, chin, neck, and dorsum ([Pedersen et al. 2003, 2012](#); [Genoways et al. 2007](#); [Bello-Gutiérrez et al. 2010](#)). This could indicate that *A. jamaicensis* has areas of the body that are more susceptible to hair loss, probably because the hair follicles in these areas are less resistant than in other areas.

Specific studies are needed to search for bats with alopecia to help better understand the etiological agents involved in this condition. This is suggested because most of the literature reports have been incidental observations in studies not focused on alopecia, so researchers generally do not have the material and equipment required to perform histopathological studies or fungal, bacterial, and parasitic cultures when bats with alopecia are captured.





**Figure 2.** Alopecia in an adult male of *Artibeus jamaicensis* (ECO-SC-M 10238) captured in Ejido Berlín, municipality of Córdoba, Veracruz, México. Alopecia affected a) and b) the chest and neck, and c) the head and right shoulder. Photographs: J. Bolaños-Citalán, I. Hernández-Aguilar.

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