



Annotated list and online catalog of type specimens in the Mammal collection of Instituto de Investigación de Recursos Biológicos Alexander von Humboldt (IAvH-M), Colombia

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Resumen

Se presenta el catálogo de ejemplares tipo de la colección de Mamíferos del Instituto de Investigación de Recursos Biológicos Alexander von Humboldt (IAvH-M). Este incluye tres paratipos y un neotipo, que representan cuatro especies nominales. Correcciones, adiciones y actualización de la información en las descripciones originales son incorporadas para cada especie nominal. Se presenta una galería de fotografías de los tipos de cada especie nominal. Una versión electrónica de este catálogo con las fotografías originales en alta definición está disponible en <http://colecciones.humboldt.org.co/especimenes-tipo/catalogomamiferos>

Palabras clave: Nomenclatura zoológica, Tipo nomenclatural, Sintipo.

Abstract

We present the catalog of type specimens Mammal's Collection of the Instituto Humboldt (IAvH-M). This includes three paratypes and a neotype which represent four nominal species. Corrections, additions, and information updating the original descriptions are incorporated for each nominal species. A photo gallery of the types is presented. An electronic version of this catalog with the originals photography in high definition is available at <http://colecciones.humboldt.org.co/especimenes-tipo/catalogomamiferos>

Key words: Zoological nomenclature, Nomenclatural type, Syntype.

The biological collections of the Instituto Humboldt were founded in 1971 at the Instituto Nacional de los Recursos Naturales Renovables y del Ambiente (INDERENA) by Jorge Ignacio Hernández Camacho (Maldonado et al. 2007; DoNascimento et al. 2016; Córdoba-Córdoba et al. 2018). After the creation of the Ministerio de Ambiente in 1993, the collections were transferred to the Instituto de Investigación de Recursos Biológicos Alexander von Humboldt, also called Instituto Humboldt (Rodríguez-Becerra 1994) and moved in 1995 from Bogotá to its current location in the Claustro San Agustín at Villa de Leyva, Department of Boyacá, Colombia (DoNascimento et al. 2016; Córdoba-Córdoba et al. 2018).

Mammal's Collection of the Instituto Humboldt (IAvH-M) houses 11025 specimens, cataloged in the Specify Software®, this represents 351 species, 64% of the 543 known to occur in Colombia (Lozano-Flórez et al. 2020; Ramírez-Chaves et al. 2021). A total of 14 orders and 51 families are represented in the collection, being Primates the best-

represented order, with 34 out of 38 species reported for Colombia (Lozano-Flórez et al. 2020; Ramírez-Chaves et al. 2021). Furthermore, the mammal collection is experiencing rapid expansion due to an active schedule of collecting expeditions throughout the country. Newly added specimens consistently include frozen tissue samples deposited in the Instituto Humboldt Tissue Collection (IAvH-CT).

The first catalog of type specimens was Carl von Linnaeus's 'Prodomus,' published in 1760. Over time, numerous collections worldwide have published catalogs of type specimens for various groups, with a more common occurrence in insects and plants (Peters and Donoso-Barros 1970; Angulo et al., 2015; Fernández-Fernández et al., 2015; Córdoba, 2019). In Colombia, several collections have published catalogs of their type specimens. However, it is noteworthy that only a few mammal collections have these sources (Andrade and Lynch 2007; Ramírez Chaves, 2011; DoNascimento et al. 2016; Córdoba-Córdoba et al. 2018). In this publication, we present an annotated list of nomenclatural types housed in the IAvH-M collection, accompanied by corresponding images that align with the online catalog, adhering to the Guidelines outlined in Article 72 of the International Code of Zoological Nomenclature (ICZN, 1999).

The information for each nominal species included the original name of the taxon, original publication, catalog number, sex, locality (or localities), collector (or collectors), date of collection, preservation method, and remarks as show in other works (Cadena and Muñoz-Saba, 2007; Ramírez-Chaves, 2011). The information was contrasted and complemented with the original publication and the original specimens label, and for the localities, the imprecise ones were adjusted. The specimens were photographed in different views and in high resolution with a Canon EOS 5D Mark II camera. For skulls and small skins (bats), a lightbox (Ortech Professional Lighting by MK Digital Direct) was used. For larger skins, photographs were taken using natural noonday light with two reflectors to minimize shadows. In all cases, a 100 mm ruler served as a scale reference, and no color palette was utilized. The catalog includes four type specimens: one neotype and three paratypes, representing four nominal species. All IAvH-M types are housed in a sliding mobile cabinet intended for its storage, separate from the rest of the general collection specimens (Figure 1) facilitating access to the material and preventing mechanical damage caused by contact with other specimens.



FIGURA 1. Sliding mobile cabinet intended for storage of type specimens.

CATALOG OF TYPE SPECIMENS

ORDER CHIROPTERA

Family Phyllostomidae

Vampyressa sinchi Tavares, V. D. C., Gardner, A. L., Ramírez-Chaves, H. E., & Velazco, P. M. 2014. **Paratype** IAvH-M-2282. Adult male. Colombia, Huila, Acevedo, Parque Nacional Natural Cueva de Los Guacharos, "roof" area of Guacharos cave (1°38' N, 75°58' W, 1900 m). Thomas O. Lemke. 30 August 1976, Skin and skull (Figure 2).

Remarks. The locality of the specimen was adjusted from the original publication and the original specimen label. The specimen was affected by mechanical damage but was restored by the collection technician Socorro Sierra, and currently is in optimal conditions. The holotype specimen is housed in the Field Museum of Natural History, Chicago, Illinois (FMNH 114028).

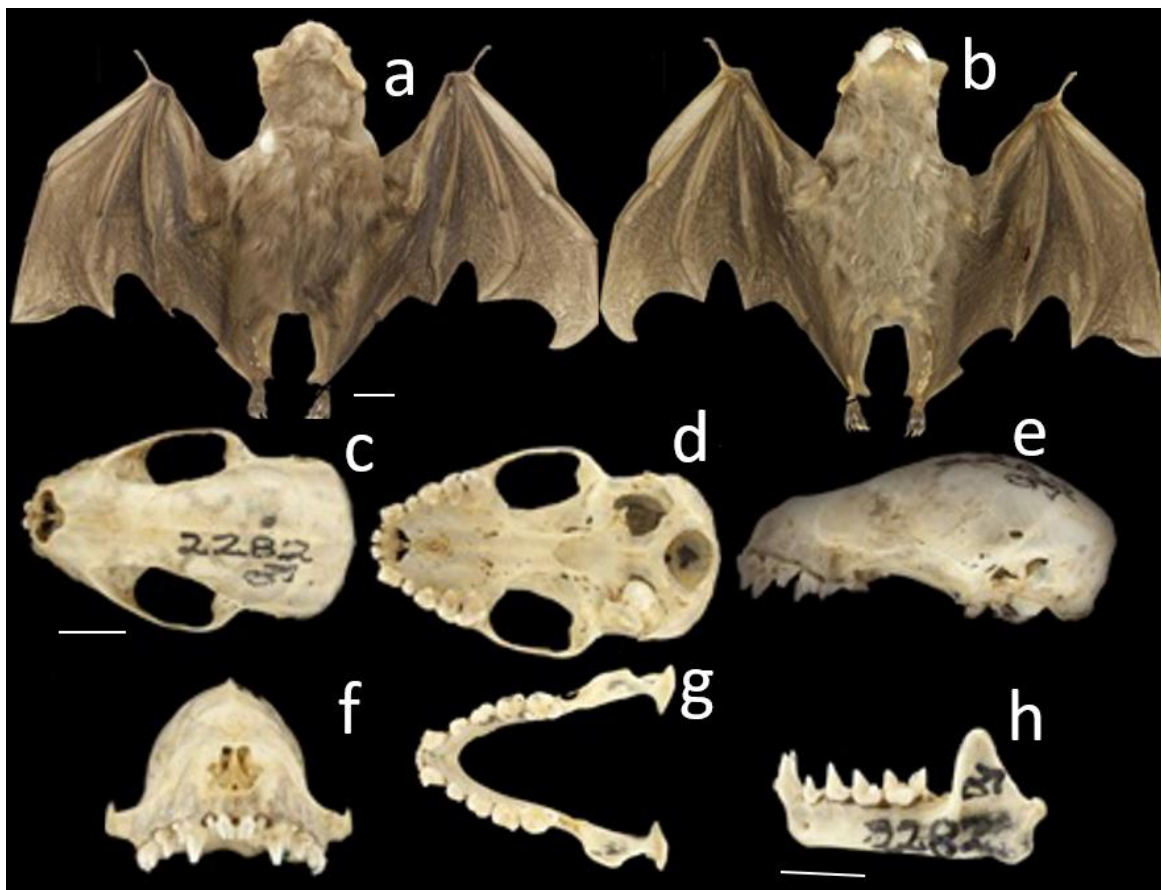


FIGURE 2. The IAvH-M-2285 Paratype *Vampyressa sinchi* a= Dorsal view of the skin; b= Ventral view of the skin, c= Dorsal view of the skull; d= Ventral view of the skull; e= Left lateral view of the skull; f= Frontal view of the skull; g= Dorsal view of the jaw; h= Left lateral view of the jaw. Scale bar for skin views=10mm; scale bar for skull views=5mm

Family Phyllostomidae

Vampyressa voragine Morales-Martínez, D., Rodríguez-Posada, M. E., & Ramírez-Chaves, H. E. 2021. **Paratype** IAvH-M-6761. Adult male. Colombia, Norte de Santander, Parque Nacional Natural Tamá (7°06'N, 72°13'W, 1600 m). Yaneth Muñoz-Saba (YMS 920). 28 September 1999, Skin and skull with skeleton (Figure 3).

Remarks. The holotype specimen is housed in the Colección de Mamíferos "Alberto Cadena García" del Instituto de Ciencias Naturales of the Universidad Nacional de Colombia (ICN 21938) and the description mentions another two specimens as paratypes, deposited on the same collection (ICN 21936, ICN 24768).



FIGURE 3. The IAvH-M- 6761 Paratype of *Vampyressa voragine*, a= Dorsal view of the skin; b= Ventral view of the skin, c= Dorsal view of the skull; d= Ventral view of the skull; e= Left lateral view of the skull; f= Frontal view of the skull; g= Left lateral view of the jaw; h= Dorsal view of the jaw. Scale bar for skin views=10mm; scale bar for skull views=5mm

ORDER PRIMATES

Family Cebidae

Aotus hershkovitzi Ramirez-Cerquera 1983 **Paratype** IAvH-M-4140, Subadult female. Colombia, Boyacá, Pajarito, Corinto (05°17'39" N, 72°42'22" W). Jaime Umaña; Jairo. Ramirez-Cerquera; INS. Captured 13 December 1981; died in captivity 22 September 1983, Skin and skeleton on ethanol. (Figure 4)

Remarks. The original specimen label belongs to the Instituto Nacional de Salud (INS). Posteriorly, the specimen was deposited at the INDERENA by Jaime Umaña and Jairo Ramirez-Cerquera. Finally, as all the INDERENA collections, it became part of the Instituto Humboldt Collections-. The known publication for this species is published in the memories of the IX Latin American Zoology Congress, but Jairo Ramirez-Cerquera later died in the avalanche of Armero (Tolima – Colombia, 1985) and due to this natural disaster, the new species description was never published in a journal. Nevertheless, it has a holotype assigned (ICN-8880). Defler et al. (2001) in their review, considered that the holotype (ICN-8880) and the paratype (IAvH-M-4140) do not differ from *Aotus lemurinus lemurinus*, currently *A. hershkovitzi* is considered a synonym of *A. lemurinus*.



FIGURE 4. The IAvH-M-4140 paratype of *Aotus hershkovitzi*; a= Dorsal view of the skin; b= Dorsal view of the skin; c= Skeleton on ethanol. Scale bar for all views=100mm

Family Cebidae

Cebus albifrons albifrons Defler & Hernández-Camacho 2002 **Neotype** IAvH-M-2844. Adult male. Colombia, Department of Vichada, El Tuparro National Park, About 10 km north of Maypures, 200 m north of the Cerro Rocosó. Thomas R. Defler. 30 January 1978. Skin and skull (Figure 5).

Remarks. The locality of the specimen was completed from the original publication and the original specimen label, this specimen was collected with another two specimens (IAvH-M-2839 and IAvH-M-2843) and cataloged as TOPOTIPOS (topotypes) but these types are not recognized by the nomenclatural code as nomenclatural types.

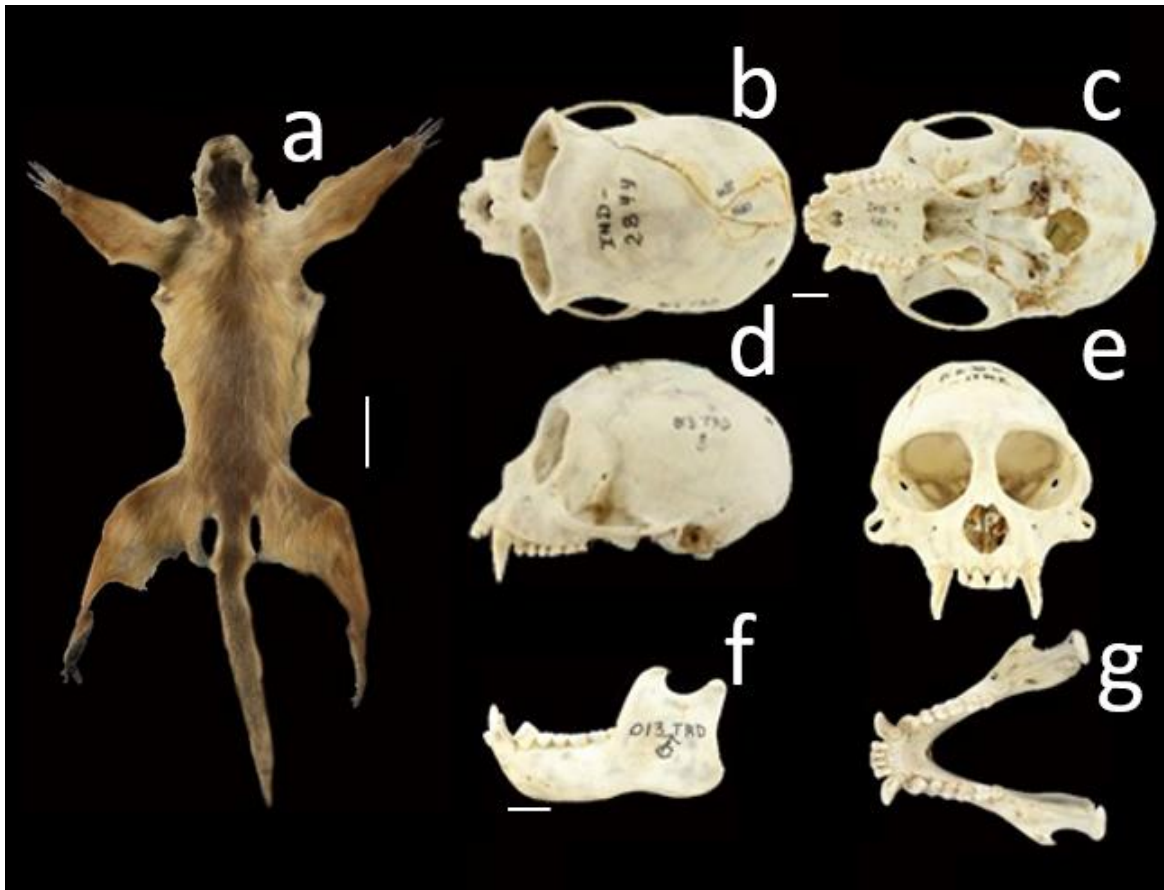


FIGURE 5. The IAvH-M-2844 neotype of *Cebus albifrons albifrons* a= Dorsal view of the skin; b= Dorsal view of the skull; c= Left lateral view of the skull; d= Ventral view of the skull; e= Frontal view of the skull; f= Dorsal view of the jaw; g= Right lateral view of the jaw. Scale bar for skin view=100mm; scale bar for skull views=10mm

Type specimens constitute the physical basis for taxonomic descriptions, a key aspect in classifying, studying, and understanding nature (e.g., Rogers et al., 2017). Providing the correct curation, storage, and information management for type specimens is fundamental to ensuring the development of biological sciences (Simmons & Muñoz-Saba, 2005). In this regard, the mammal collection at the Humboldt Institute makes various efforts, such as having trained personnel for physical curation and associated data, ample space, and conducting expeditions to different sites to collect specimens with fresh tissue. Additionally, it makes all its specimens physically and virtually accessible to any researcher interested in them. All of these initiatives provide optimal conditions for storing delicate

and invaluable specimens, such as nominal types, with sufficient space and curatorial capacity to expand the collection of type specimens.

Even though *A. herskovitzi* is not a valid species and has been synonymized with *A. lemurinus*, the specimen is included in this study because the original label bears the annotation "paratype." According to the Code of Zoological Nomenclature, Article 61 stipulates that these data should not and cannot be removed under any circumstances. This ensures the integrity of the information associated with these specimens. Topotypes are used to reference specimens collected in the same locality as the holotype or, in this case, the neotype. However, it is important to note that, according to the nomenclature code, this designation is not recognized as type material. Despite this specification, throughout the manuscript, Defler and Hernández-Camacho (2002) provide detailed descriptions and comparisons of these specimens (IAvH-M-2839 and IAvH-M-2843) as if they were paratypes. It is worth emphasizing that conducting additional taxonomic evaluation would be necessary to consider a change in the nomenclatural type designation for these specimens.

The digitization of specimens in collections is a growing trend, enabling improved access to all the material within them (Beaman & Cellinese, 2012; Nelson & Elis, 2017). That's why we have placed all the information detailed earlier in an online catalog, allowing initial access to these specimens. Furthermore, ongoing efforts are being made to digitize images of all materials in the collection and create 3D models of these nomenclatural types.

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