

Mammal collections in Peru: diagnosis and perspectives

Colecciones de mamíferos en el Perú: diagnóstico y perspectivas

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Abstract

Mammal collections play a pivotal role for society documenting the mammalian diversity of our planet and supporting the growth of various scientific disciplines. Despite Peru being recognized as the third most mammal-diverse country in the world, the number of institutions holding mammal collections in the country is limited. In addition, a thorough evaluation of their status and scientific role is lacking. To assess the status of the mammal collections in Peru, we contacted 16 collections recognized by SERFOR (Servicio Nacional Forestal y de Fauna Silvestre) and successfully obtained information from 13 of them (as of April 2022). These collections house approximately 84842 specimens, with 93% concentrated in two national institutions: MUSM (Museo de Historia Natural de la Universidad Nacional Mayor de San Marcos) and MUSA (Museo de Historia Natural de la Universidad Nacional de San Agustín), whereas the other collections (11) are considered small-sized collections. Also, it is a great concern that 16 of the 24 departments in Peru lack any mammal collections. Our data indicate that most records are represented by voucher specimens, and while all collections have digitized databases, the formats used are not standardized across institutions. Furthermore, most collections have their holdings unavailable online. Geographically, MUSM and MUSA have a national coverage, while the others, determined by holding size and scope, are considered regional. Considering the number of specimens, Rodentia and Chiroptera are the best represented orders, followed not even closely by the other orders. About species representation, it is a concern that 49 species are currently not represented in any Peruvian collection. On the other hand, 45 holotypes are housed in Peruvian collections. This study reveals that Peru houses an important volume of mammalian specimens; however, considering the high mammal diversity, these numbers are far from a good representation. The results highlight the urgent need for more field surveys and specimen collections to address the underrepresentation of Peruvian mammal diversity.

Resumen

Las colecciones de mamíferos desempeñan un papel fundamental en la documentación de la diversidad de mamíferos de nuestro planeta y en el apoyo al crecimiento de diversas disciplinas. Sin embargo, a pesar de que Perú es reconocido como el tercer país más diverso en mamíferos del mundo, el número de instituciones que albergan colecciones de mamíferos en el país es limitado. Además, no se ha realizado una evaluación detallada del estado y rol científico de dichas colecciones. Para evaluar las colecciones de mamíferos en Perú, contactamos 16 colecciones reconocidas por SERFOR (Servicio Nacional Forestal y de Fauna Silvestre) y obtuvimos con éxito información de 13 de ellas (hasta abril de 2022). Estas colecciones albergan aproximadamente 84842 especímenes, con el 93% de estos concentrados en dos instituciones nacionales: MUSM (Museo de Historia Natural de la Universidad Nacional Mayor de San Marcos) y MUSA (Museo de Historia Natural de la Universidad Nacional de San Agustín), mientras que las otras son consideradas colecciones pequeñas. Es de gran preocupación que 16 de los 24 departamentos no tengan ninguna colección de mamíferos. Nuestros datos indican que la mayoría de los registros están representados por especímenes, y aunque todas las colecciones tienen bases de datos digitalizadas, los formatos utilizados no son estándar entre las instituciones. Además, la mayoría de las colecciones no tiene sus bases disponibles en línea. La cobertura geográfica de MUSM y MUSA es nacional, mientras que las demás son regionales. En cuanto al número de especímenes, los órdenes Rodentia y Chiroptera son los mejor representados, seguidos, ni siquiera de cerca, por los demás órdenes. En cuanto a la representación de especies, es preocupante que 49 especies actualmente no están representadas en ninguna colección peruana. Por otro lado, 45 holotipos están depositados en alguna colección peruana. Este estudio revela que Perú alberga un volumen importante de especímenes de mamíferos, pero pocas colecciones. Sin embargo, considerando la alta diversidad de mamíferos, estos números están lejos de ser una buena representación. Los resultados destacan la urgente necesidad de realizar más encuestas y colecciones de especímenes para abordar la subrepresentación de la diversidad de mamíferos de Perú.

Keywords:

Biodiversity, conservation, databases, holotypes, natural history museum.

Palabras clave:

Biodiversidad, base de datos, conservación, museo de historia natural, holotipos.

Introduction

Natural history collections (NHC) serve as primary repositories for specimens and associated materials (e.g., tissues, cells in suspension, photographs, etc.), documenting the diversity of a region, and becoming an invaluable source of reference data for scientists, educators, governmental and non-governmental institutions (Pacheco 1990, Suarez & Tsutsui 2004, Bradley et al. 2014, Rivera-León et al. 2018, Johnson et al. 2023). Mammal collections hold immense value for various biological fields, including taxonomy, systematics, evolution, and biogeography (Pacheco 1990, Patterson 2002, Bezerra 2012, Chiquito et al. 2021, Johnson et al. 2023). They play a key role in society by providing valuable and reliable data related to health, agriculture, climate change, and other human-related challenges (Cook & Light 2019, Miller et al. 2020, Pacheco et al. 2021). Pacheco (1990) underscores that the growth, preservation, and research of NHCs must be a national priority in megadiverse countries like Peru.

Several studies worldwide have assessed and documented the status of mammal collections in the last century, including those in North America (Howell 1923, Douthett et al. 1945, Choate & Genoways 1975), the Western Hemisphere (Dunnum et al. 2018), Europe (de Marinis et al. 2007, Gippoliti et al. 2014, Hutterer & Kryštufek 2020, Mathias et al. 2024), and Asia (Fuwen 2021). In the Neotropics, Llorente-Bousquets et al. (1999) provided a diagnosis of biological collections in Mexico, while Bezerra (2012) and, more recently, Chiquito et al. (2021) presented an overview of the Brazilian collections. These studies highlighted the importance that other countries place on their collections. Unfortunately, a comprehensive diagnosis of mammal collections in Peru is still missing, limiting the understanding of the extent and diversity of these repositories and their current challenges.

Peru is one of the most diverse countries in the world (Morosini 2011, MINAM 2019) and ranks third in terms of mammal species diversity (Pacheco et al. 2021). The systematic development of the mammal collections has been crucial for generating information and enhancing our understanding of Peruvian diversity (Pacheco et al. 2009, 2020, 2021, 2024b; Medina et al. 2016). However, the number of institutions holding mammal collections reported in Peru remains limited. Dunnum et al. (2018)'s diagnosis identified only three collections: MUSM, MUSA, and CEBIOMAS, and later Hurtado-Castro (2022) listed three more (MUFV, MURP, and MUPRG), providing historical data.

Currently, an assessment to determine the holdings, locations, taxonomic representation, responsible personnel, challenges, and potential of the mammal collections is missing. This work aims to provide a qualitative and quantitative analysis of the mammal collections formally registered in Peru to address common issues, and propose potential solutions.

Material and methods

We conducted a survey using a detailed questionnaire sent to curators or collection managers of Peruvian mammal collections, recognized by SERFOR (Servicio Nacional Forestal y de Fauna Silvestre), from March to April 2022 via Google Forms (Google LLC®). SERFOR has registered 16 mammal collections, of which 13 responded to the survey (Appendix 1).

The questionnaire comprised 26 questions addressing several aspects of the collections, including details such as institutional name, acronym, person in charge, contact (address and e-mail), year of foundation, and kind of institution; as well information on the collection contents, such as type (those specimens used as physical reference of a formally recognized taxon) of material held, ancillary items (e.g., fresh tissues, karyotypes or suspended cells, photographs, and others), collection size, taxonomic scope (at the order level), geographic range (considering national if holdings are larger than 3000 specimens representing more than 50% of the departments), digitization, and dissemination processes (Appendix 2). We based the survey on the forms developed by Dunnum et al. (2018) and Chiquito et al. (2021), complemented with earlier protocols and methods by Pacheco-Acero and Pacheco (1993). The species lists followed Pacheco et al. (2021) and recent taxonomic changes (i.e., Voss et al. 2024, Barrio et al. 2024).

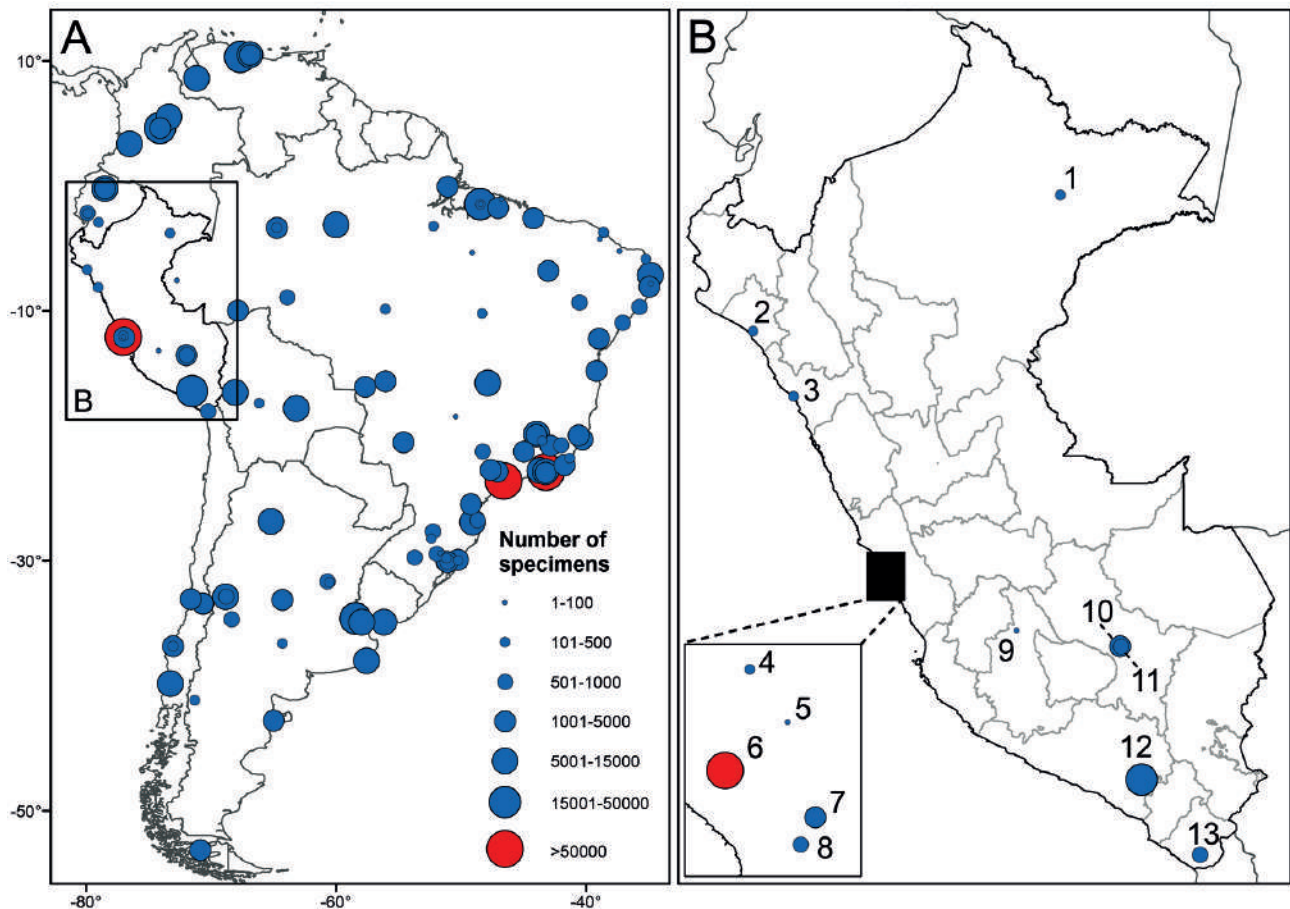
Results

Our database indicated that the 13 institutional collections recognized by SERFOR are distributed in eight departments: Arequipa (1), Ayacucho (1), Cusco (2), La Libertad (1), Lambayeque (1), Lima (5), Loreto (1), and Tacna (1) (Table 1, Fig. 1B); whereas 16 departments in Peru have no such collection of mammals. Seven of the recognized collections are placed on the coast, five in the Andean region, and only one is in the Peruvian Amazonia. Furthermore, the collections are housed in seven public universities: Universidad Nacional de San Agustín de Arequipa, Universidad Nacional de Trujillo, Universidad Nacional Federico Villarreal, Universidad Nacional Jorge Basadre Grohmann, Universidad Nacional Mayor de San Marcos, Universidad Nacional Pedro Ruiz Gallo, and Universidad Nacional San Antonio Abad del Cusco; one private university: Universidad Ricardo Palma; one public institution: Instituto de Investigaciones de la Amazonía Peruana; and four private institutions: Centro de Ecología y Biodiversidad, Centro de Ornitología y Biodiversidad, Museo de Biodiversidad del Perú, and Pro Fauna Silvestre (Table 1, Fig. 1B).

The total holdings of Peruvian mammal collections are estimated to be approximately 84842 specimens, with 56872 specimens (67.03%) housed at MUSM and 21990 specimens (25.92%) at MUSA. Among the other institutions, only two collections have a holding larger than 1000 specimens each, while nine collections have less than 1000 specimens each (Table 1). Additionally, some institutions - such as the Universidad Nacional de Cajamarca and the Universidad Nacional Agraria de la

Table 1. List of collections and institutions with a current estimate of their collection holding.

N°	Collection	Specimens	%	Holotypes
1	Museo de Historia Natural, Universidad Nacional Mayor de San Marcos, Lima (MUSM)	56872	67.03	38
2	Museo de Historia Natural, Universidad Nacional de San Agustín de Arequipa, Arequipa (MUSA)	21990	25.92	6
3	División de Mastozoología, Centro de Ornitología y Biodiversidad, Lima (CORBIDI)	1570	1.85	0
4	Museo de Historia Natural, Universidad Nacional San Antonio Abad del Cusco, Cusco (MHNC)	1003	1.18	0
5	Colección Biológica de Tacna, Universidad Nacional Jorge Basadre Grohmann, Tacna (CBT)	838	0.99	0
6	Museo de Biodiversidad del Perú, Cusco (MUBI)	680	0.80	0
7	Museo de Historia Natural "Vera Alleman Haeghebaert", Universidad Ricardo Palma, Lima (MURP)	570	0.67	0
8	Museo de Historia Natural "Víctor F. Baca Aguinaga", Universidad Nacional Pedro Ruiz Gallo, Lambayeque (MUPRG)	481	0.57	0
9	Colección de Mamíferos, Centro de Ecología y Biodiversidad, Lima (CEBIOMAS)	280	0.33	1
10	Colección Referencial de Biodiversidad, Instituto de Investigaciones de la Amazonía Peruana, Iquitos (CRBIIAP)	246	0.29	0
11	Museo de Zoología "Juan Ormea Rodríguez", Universidad Nacional de Trujillo, Trujillo (UNT)	171	0.20	0
12	Museo de Historia Natural, Universidad Nacional Federico Villarreal, Lima (MUFV)	88	0.10	0
13	Colección Científica, Pro Fauna Silvestre, Ayacucho (PFAUNA)	53	0.06	0
	Total	84842	100	45

**Figure 1.** Geographic distribution showing the location and size of mammal collections in A) South America, where the center of the circles indicates the location of a given collection, and its diameter is proportional to the size of the collection; B) in Peru, showing the location for 13 collections distributed in 8 departments. 1, CRBIIAP; 2, MUPRG; 3, UNT; 4, CEBIOMAS; 5, MUFV; 6, MUSM; 7, CORBIDI; 8, MURP; 9, PFAUNA; 10, MUBI; 11, MHNC; 12, MUSA; 13, CBT. See Table 1 for the meaning of the acronyms.

Selva, listed by Hurtado-Castro (2022) - along with individual biologists, maintain small collections that have not yet been recognized by SERFOR and are not treated in this assessment.

The oldest and biggest mammal collections in Peru are the Museo de Historia Natural de la Universidad Nacional Mayor de San Marcos, Lima (MUSM), established in 1918 (107 years ago), and the Museo de Historia Natural de la Universidad Nacional de San Agustín, Arequipa (MUSA), established in 1925 (100 years ago). Four additional collections (MHNC, MURP, MUPRG, and UNT) were established between the 1940s and 1990s, while the remaining seven collections are relatively recent, founded in the last three decades (Fig. 2).



Figure 2. Timeline of the creation of the 13 mammal collections from Peru recognized by SERFOR (Servicio Nacional Forestal y de Fauna Silvestre). * MHNC was said to be founded in 1925 but formally became active in 1964.

All collections house specimens such as skins, skulls, skeletons, and/or fluid-preserved organisms. All of them report storing tissue samples, gathering in total of 18973 tissue samples (muscle fixed in alcohol 96° freeze), whereas less than half of the collections report storing parasites, photographs, and karyotypes or cells in suspension (Fig. 3).

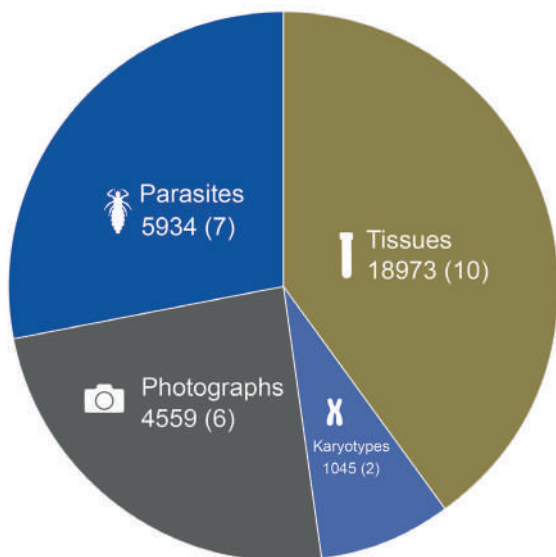


Figure 3. Representativeness of the ancillaries housed in Peruvian mammal collections. The numbers on the left represent the total number of vouchers with ancillaries, and the numbers in parentheses represent the number of collections that house the material.

Several specimens remain uncatalogued in all collections, and some collections (CBT, MHNC, MUBI, MUFV, MUPRG, MURP, MUSA, MUSM, and PFAUNA) receive specimens from environmental consulting. In addition, three collections gather important type material (45 holotypes, Table 2), representing about 7.65% of the current Peruvian mammalian diversity (588 spp., Pacheco et al. 2024b). By institution, MUSM holds 38 holotypes, MUSA holds six, and CEBIOMAS holds one (Table 2).

All collections indicated that they have digitized catalogs, usually in Excel format, but no one is available online or in repositories, except MUFV (<https://repositorio.unfv.edu.pe/handle/20.500.13084/8698>). Access to the collection data is obtained through direct request to the curator or technician. Each collection also has its own catalog format. MUSM has its database in Claris FileMaker Pro, version 19. Similarly, a collection of digital images of specimens is missing.

Regarding the geographic range coverage, most collections have regional coverage, and only MUSM and MUSA have nearly complete national coverage. The departments of Cusco, Loreto, Madre de Dios, and Huánuco have more than 230 species each and are also the most represented departments in terms of number of voucher specimens housed in collections (Fig. 4). In contrast, the departments of Tacna, Apurímac, Ica, Huancavelica, and Moquegua house fewer than 50 species each and are the least represented in number of vouchers housed in collections (Fig. 4).

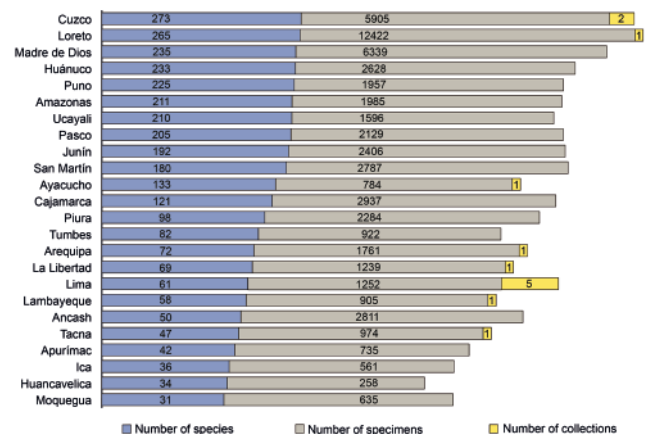


Figure 4. Number of mammal species reported per department (lilac bar), number of mammal specimens housed in Peruvian collections per department (gray bar), and number of collections per department (yellow bar). The bars are $\log_{10}$ -transformed data. Note that almost all departments are poorly represented in collections, and that 16 departments have no scientific collection.

Considering the taxonomic representation, Rodentia and Chiroptera (in all collections) are the best-represented orders, followed by Carnivora (in 12 collections), with other orders being much less represented. Eulipotyphla is the least represented order (available only in two collections), whereas Paucituberculata and Perissodactyla are represented in only four collections. Unfortunately, Sirenia is not represented in any Peruvian collection (Fig.

5). Rodentia and Chiroptera are the most common orders in collections, comprising 52.14% and 40.75% of all specimens respectively (Fig. 5). Furthermore, at least 49 species of mammals known in Peru are not represented in any Peruvian collection, approximately 8.33% of our mammal diversity (Table 3).

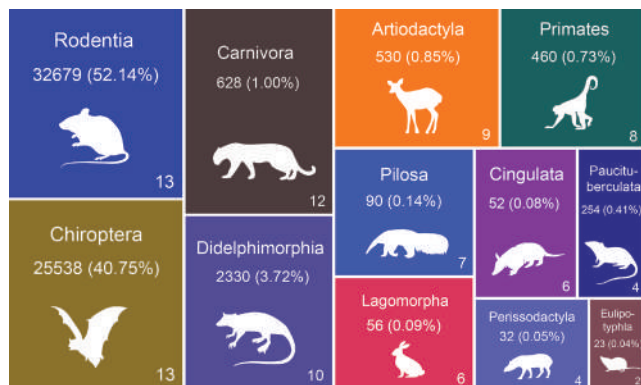


Figure 5. Chart of the number of vouchers accessioned in Peruvian collections for the mammalian orders. Boxes show the total number of vouchers available per order, their percentages in parentheses, and the number of collections (in the lower right corner) that house the specimens. The box size mirrors the number of collections. This chart used data provided by all collections (except MUSA and UNT whose data by order were not available).

Discussion

Our analysis provides the first overview of mammal collections from Peru in different aspects, such as size, management, and taxonomic and geographic coverage. Dunnum et al. (2018) included only three collections from Peru (MUSM, MUSA, and CEBIOMAS) in their survey of Western Hemisphere collections, even though at that time, at least eight were already established. This limited representation was likely due to inaccurate contact information and language barriers. In Peru, biological collections must be officially recognized by SERFOR. Our study successfully contacted 13 of the 16 registered collections, ensuring a strong national representation and nearly complete information on size, location, persons in charge, funding, holotype holding, and taxonomic and geographic coverage.

Considering the geographical distribution of the collections, it was expected that most collections (7) would be placed on the coast, where major cities and universities are located. It was not surprising to find that five collections are in Lima city, the capital of Peru. However, it is a big concern that only one collection (CRBIIAP) is in the Peruvian Amazonia, a region with the largest Peruvian diversity of mammals (326 species, Pacheco et al. 2024a). Furthermore, it is also a concern that 16 out of the 24 departments (Fig. 4) lack a mammal collection. Several of them, like Madre de Dios, Huánuco, Puno, Amazonas, Ucayali, and Pasco departments, are among the most diverse regions of Peru, each with a species richness of over 200 species (Pacheco et al. 2021). Other departments without a collection of mammals, like Ancash, Apurímac, and Moquegua, are the center of some

of the largest mine companies in Peru (Mining Technology 2024), which are required to conduct environmental impact studies and biodiversity monitoring. These activities often generate specimens that could contribute to build regional collections. These large companies are Antamina (<https://www.antamina.com>) in Ancash, Las Bambas (<https://www.lasbambas.com/es>) in Apurímac, and Quellaveco (<https://peru.angloamerican.com/quellaveco.aspx>) in Moquegua. The lack of collections in those departments limits local researchers' ability to study their own fauna, forcing them to travel to Lima or Arequipa to access larger collections, thus contributing to the centralization of research resources.

About the nature of the collections, our data showed that public universities play a central role in maintaining collections. These collections are CBT, MHNC, MUFV, MUPRG, MUSA, MUSM, and UNT. The MURP is the only collection run by a private university, while CRBIIAP is the only collection run by a public research institution. In addition, 4 private collections (CEBIOMAS, CORBIDI, MUBI, and PFAUNA) are also important, considering the significant cost of maintaining a collection. We highlight that the largest and oldest collections (MUSM and MUSA) are housed in public universities. The academic environment of university museums has been instrumental in promoting science and conservation, and the establishment of a good number of museums and collections; after all, this is part of the university's mission. However, it is concerning that Peru still lacks a national museum with direct government support dedicated to exhibiting and studying our megadiversity. A national museum is still badly and uncomprehensible missing. Universities, institutions, and NGOs have limited resources and can hardly support the future demand for space and personnel to run their collections adequately.

The total holding of Peruvian mammal collections was estimated to be approximately 84842 specimens, and it would likely reach 100000 specimens when the uncatalogued material is included. However, in comparison with other megadiverse countries this number is not adequately representing the Peruvian diversity of mammals. Chiquito et al. (2021) indicated that 372200 specimens are housed in Brazilian collections, a country with at least 770 species of mammals (Abreu et al. 2021). Similarly, mammal collections in Mexico house 512000 specimens (Dunnum et al. 2018), a country with around 564 species of mammals (Sánchez-Cordero et al. 2014, Ramirez-Pulido et al. 2014).

Considering collection size (following Dunnum et al. 2018), MUSM is in the category of a large-sized collection (those with > 50000 specimens), MUSA in the mid-sized category (over 20000 specimens); whereas the other collections (11) are considered small-sized collections (Fig. 2A). Within this last group, eight collections are even much smaller with holding fewer than 1000 specimens (Table 1). Nonetheless, all are important because they represent different regions of the country. In Dunnum et al. (2018), only one Brazilian collection (MNRJ) was considered a large-sized collection. After Chiquito et

Table 2. List of holotypes of species of mammals housed in Peruvian collections.

N°	Species	Holotype
Didelphimorphia (4)		
1	<i>Marmosops (Marmosops) soinii</i> Voss, Fleck & Jansa, 2019	MUSM 13284
2	<i>Monodelphis (Microdelphys) gardneri</i> Solari, Pacheco, Vivar & Emmons, 2012	MUSM 24216
3	<i>Monodelphis (Mygalodelphys) handleyi</i> Solari, 2007	MUSM 15991
4	<i>Monodelphis (Mygalodelphys) ronaldi</i> Solari, 2004	MUSM 17027
Eulipotyphla (2)		
5	<i>Cryptotis evaristoi</i> Zeballos, Pino, Medina, Pari & Ceballos, 2018	MUSA 7427
6	<i>Cryptotis peruviansis</i> Vivar, Pacheco & Valqui, 1997	MUSM 8373
Primates (2)		
7	<i>Cheracebus aquinoi</i> Rengifo, D'Elía, García, Charpentier & Cornejo, 2023	MUSM 50736*
8	<i>Callicebus urubambensis</i> Vermeer & Tello-Alvarado, 2015	MUSM 42398
Rodentia (25)		
9	<i>Akodon josemariarguedasi</i> Jiménez, Pacheco & Vivas, 2013	MUSM 22754
10	<i>Akodon kotosh</i> Jiménez & Pacheco, 2016	MUSM 18950
11	<i>Calomys achaku</i> Zeballos, Palma, Marquet & Ceballos, 2014	MUSA 8274
12	<i>Calomys chinchilico</i> Zeballos, Palma, Marquet & Ceballos, 2014	MUSA 7341
13	<i>Cuscomys ashaninka</i> Emmons, 1999	MUSM 12715
14	<i>Eremoryzomys mesocaudis</i> Uturunco & Pacheco, 2017	MUSM 41463
15	<i>Isothrix barbarabrownae</i> Patterson & Velazco, 2006	MUSM 16819
16	<i>Neacomys macedoruizi</i> Sánchez-Vendizú, Pacheco & Vivas-Ruiz, 2018	MUSM 45053
17	<i>Neacomys rosalingdae</i> Sánchez-Vendizú, Pacheco & Vivas-Ruiz, 2018	MUSM 44963
18	<i>Neacomys vargasillosai</i> Hurtado & Pacheco, 2017	MUSM 35069**
19	<i>Nephelomys ricardopalmai</i> Ruelas, Pacheco, Inche & Tinoco 2021	MUSM 46989
20	<i>Oecomys galvez</i> Voss, Fleck & Giarla, 2024	MUSM 13320
21	<i>Oecomys makampi</i> Voss, Fleck & Giarla, 2024	MUSM 15335
22	<i>Oecomys nanus</i> Voss, Fleck & Giarla, 2024	MUSM 23815
23	<i>Oxymycterus willkaurco</i> Zeballos, Medina, Rico-Cernohorska & Salazar-Bravo, 2021	MUSA 4192
24	<i>Phyllotis occidens</i> Rengifo & Pacheco, 2015	MUSM 547
25	<i>Phyllotis pearsoni</i> Pacheco, Rengifo & Vivas, 2015	MUSM 17431
26	<i>Rhagomys longilingua</i> Luna & Patterson, 2003	MUSM 17013
27	<i>Scolomys ucayalensis</i> Pacheco, 1991	MUSM 5474
28	<i>Thomasomys antoniobrachi</i> Ruelas & Pacheco 2021	MUSM 23757
29	<i>Thomasomys apeco</i> Leo L. & Gardner, 1993	MUSM 7197
30	<i>Thomasomys lojapiuranus</i> Pacheco & Ruelas, 2023	MUSM 23758
31	<i>Thomasomys onkiro</i> Luna & Pacheco, 2002	MUSM 13064
32	<i>Thomasomys pagaibambensis</i> Pacheco & Ruelas, 2023	MUSM 40986
33	<i>Thomasomys shallqukucha</i> Pacheco & Ruelas, 2023	MUSM 46875
Chiroptera (10)		
34	<i>Anoura javieri</i> Pacheco, Sánchez-Vendizú & Solari, 2018	MUSM 6736
35	<i>Carollia manu</i> Pacheco, Solari & Velazco, 2004	MUSM 8802
36	<i>Eptesicus (Histiotus) mochica</i> Velazco, Cunha, Cláudio, Giménez & Giannini, 2021	CEBIOMAS 227
37	<i>Eumops chiribaya</i> Medina, Gregorin, Zeballos, Zamora & Moras, 2014	MUSA 8493
38	<i>Hsunnycteris dashe</i> Velazco, Soto-Centeno, Fleck, Voss & Simmons, 2017	MUSM 15206
39	<i>Hsunnycteris pattoni</i> (Woodman & Timm, 2006)	MUSM 24350
40	<i>Lasiurus arequipae</i> Málaga, Diaz, Arias & Medina, 2020	MUSA 21058
41	<i>Micronycteris (Micronycteris) matses</i> Simmons, Voss & Fleck, 2002	MUSM 15231
42	<i>Platyrrhinus alberticoi</i> Velazco, 2005	MUSM 19149
43	<i>Platyrrhinus ismaeli</i> Velazco, 2005	MUSM 4946
Artiodactyla (2)		
44	<i>Mesopodion peruvianus</i> Reyes, Mead & van Waerebeek, 1991	MUSM 1146
45	<i>Pudella carlae</i> Barrio, Gutiérrez & D'Elía, 2024	MUSM 55639

*The holotype of *Cheracebus aquinoi* was reported to be MUSM 59736 (Rengifo et al. 2023: 10); however, this is considered a typo because the holotype was catalogued as MUSM 50736.

**The holotype of *Neacomys vargasillosai* was stated to be an adult male, skin and skull, collected on 9th May 2010 by Carlos Jiménez, original number 463 (Hurtado & Pacheco 2017: 418). However, the holotype (MUSM 35069) is a male specimen preserved in alcohol with skull removed, collected on the 10th May 2010 by Carlos Jiménez, original number 472.

Table 3. List of Peruvian species not represented by a voucher in any Peruvian collection.

Scientific name
Didelphimorphia (1)
1 <i>Marmosa (Micoureus) parda</i> Tate, 1931
Sirenia (1)
2 <i>Trichechus inunguis</i> (Natterer, 1883)
Primates (6)
3 <i>Aotus azarae</i> (Humboldt, 1811)
4 <i>Aotus vociferans</i> (Spix, 1823)
5 <i>Callimico goeldii</i> (Thomas, 1904)
6 <i>Pithecia irrorata</i> Gray, 1843
7 <i>Pithecia isabela</i> Marsh, 2014
8 <i>Pithecia napensis</i> Lönnberg, 1938
Rodentia (11)
9 <i>Akodon fumeus</i> Thomas, 1902
10 <i>Akodon mimus</i> (Thomas, 1901)
11 <i>Cuscomys oblativus</i> (Eaton, 1916)
12 <i>Dactylomys dactylinus</i> (Desmarest, 1817)
13 <i>Dasyprocta punctata</i> Gray, 1842
14 <i>Galenomys garleppi</i> (Thomas, 1898)
15 <i>Melanomys robustulus</i> Thomas, 1914
16 <i>Punomys lemminus</i> Osgood, 1943
17 <i>Rhipidomys latimanus</i> Toms, 1860
18 <i>Toromys albiventrus</i> Emmons & Fabre, 2018
Chiroptera (8)
19 <i>Cynomops abrusus</i> (Temminck, 1827)
20 <i>Cynomops milleri</i> (Osgood, 1914)
21 <i>Diclidurus isabella</i> (Thomas, 1920)
22 <i>Eumops nanus</i> (Miller, 1900)
23 <i>Eptesicus (Histiotus) laeophotis</i> (Thomas, 1916)
24 <i>Lonchophylla orienticollina</i> Dávalos & Corthals, 2008
25 <i>Lonchorhina inusitata</i> Handley & Ochoa, 1997
26 <i>Sturnira nana</i> Gardner & O'Neill, 1971
Carnivora (5)
27 <i>Arctocephalus philippii</i> (Peters, 1866)
28 <i>Chrysocyon brachyurus</i> (Illiger, 1815)
29 <i>Mustela africana</i> Desmarest, 1818
30 <i>Speothos venaticus</i> (Lund, 1842)
Artiodactyla (19)
31 <i>Balaenoptera bonaerensis</i> Burmeister, 1867
32 <i>Balaenoptera borealis</i> Lesson, 1828
33 <i>Balaenoptera physalus</i> (Linnaeus, 1758)
34 <i>Blastocerus dichotomus</i> (Illiger, 1815)
35 <i>Eubalaena australis</i> (Desmoulins, 1822)
36 <i>Feresa attenuata</i> Gray, 1874
37 <i>Globicephala melas</i> (Traill, 1809)
38 <i>Kogia sima</i> (Owen, 1866)
39 <i>Lissodelphis peronii</i> (Lacépède, 1804)
40 <i>Megaptera novaeangliae</i> (Borowski, 1781)
41 <i>Mesoplodon grayi</i> Von Haast, 1876
42 <i>Orcinus orca</i> (Linnaeus, 1758)
43 <i>Peponocephala electra</i> (Gray, 1846)
44 <i>Pseudorca crassidens</i> (Owen, 1846)
45 <i>Sotalia fluviatilis</i> (Gervais y Deville, 1853)
46 <i>Stenella attenuata</i> (Gray, 1846)
47 <i>Stenella coeruleoalba</i> (Meyen, 1833)
48 <i>Stenella longirostris</i> (Gray, 1828)
49 <i>Steno bredanensis</i> (G. Cuvier in Lesson, 1828)

al. (2021), the MZUSP also reached this category. In this work, MUSM is identified as a large-sized collection, the third largest collection in South América, and one of the largest in the Western Hemisphere.

In addition to size, the existence of in-country type material shows the degree of institutional development of mammal collections in Peru, also revealing and serving as important tools to boost research. Currently, 45 holotypes (Table 2) are in a Peruvian collection, about 7.65% of the current Peruvian mammalian diversity (588 spp., Pacheco et al. 2024b). The first holotypes, housed in a Peruvian collection, were reported in 1991: the Ucayali spiny mouse *Scolomys ucayalensis* (Pacheco 1991) and the Peruvian beaked whale *Mesoplodon peruvianus* (Reyes et al. 1991). The trend of growth in the number of holotypes has been impressive. In less than 40 years, this number has increased to 45 holotypes, and it is expected to increase considering the dynamic activity of several research groups working with Peruvian specimens.

Several collections of mammals in Peru were created in the last two decades, probably concerning the general awareness that collections are needed for comparisons in environmental impact studies and monitoring assessments, as well as for studies of climate change and other anthropogenic activities that are reducing biodiversity. In Brazil, Chiquito et al. (2021) reported a similar trend, where the number of Brazilian collections had a noticeable increment in the first decade of the 21st century (2000–2010), when 35 collections were established. However, Dunnum et al. (2018) found an opposite trend, where a significant number of collections in the Western Hemisphere (mostly from the United States and Canada) were closed or transferred.

Regarding accessibility, most collections indicated that they are only partially digitalized, and none have their catalogue data available online, except the MUFV, limiting greatly their potential use. In addition, vertebrate catalogs for two collections have been published: MUPRG (Odar-Falla & Gutiérrez-Ramos 2017) and UNT (Gutiérrez-Ramos 2014). However, although they represent valuable examples, their collections comprise less than 800 specimens. The UNT is also exceptional in having several historical information published (Gutiérrez-Ramos 2014, 2015, 2017; Gutiérrez-Ramos & Ramírez-Viena 2021; Gutierrez-Ramos & Rodríguez-Rodríguez 2023). Nowadays, technological advances in digitization (Hedrick et al. 2020), isotopic analysis (Tejada et al. 2020), genomic techniques (Abreu et al. 2020), and collectomics (Sigwart et al. 2025) are amplifying how collections can be used, expanding the possibilities of museum collections in the study and evolution of emerging diseases, monitoring and environmental impact, and conservation by providing updated lists of endemic and threatened species; legislation through identification of confiscated specimens; and education by increasing curiosity about nature and science. Unfortunately, limited resources and little institutional support limit the growth of the collections.

One way to empower scientific collections is by developing alliances with state institutions such as SERFOR and SERNANP (Servicio Nacional de Áreas Naturales Protegidas por el Estado). Poo et al. (2022) recently highlighted that these alliances are uncommon. Specimens found dead by guard parks in protected areas by illness, accidents, road kills, or fires are occasionally donated to a collection, a practice that should be established in protocols for all cases. Similarly, alliances with zoos, fauna refugees, and similar institutions are informal or missing; as a result, valuable material ends up burnt or buried, apparently for sanitary reasons or as food for carnivore species (V. Pacheco, pers. comm.). Therefore, better integration between mammal collections and other institutions is needed. Collections should prioritize their growth in the numbers of taxa, specimens, and habitat representations; at the same time, producing new information necessary for the conservation of our biodiversity, as suggested by Pacheco (1990) for Peru and recently D'Elia (2024) for Chile.

In addition to the recognized collections, there are some collections housed in some universities and personal collections that are not yet recognized by SERFOR. There is no information on the size and representation of those collections. We highly recommend that these collections apply for a SERFOR registration so their holding and associate information could be available to society.

This diagnosis represents the first comprehensive assessment of mammal collections in Peru and likely the first of its kind for any vertebrate group in the country. Overall, our findings indicate that the remarkable diversity of Peruvian mammals remains significantly underrepresented in national collections. To address this gap, there is a critical need for the establishment of additional natural history collections and the incorporation of a substantially larger number of voucher specimens. We have also identified geographic regions where mammal collections are urgently needed, as well as species that have no representation in any Peruvian collection that warrant immediate attention. Furthermore, considering the accelerating habitat loss, global environmental change, and our still-incomplete understanding of Peru's mammalian biodiversity, we argue that the responsible collection of voucher specimens and associated data, housed in natural history collections, is more essential now than ever before.

Literature cited

- Abreu EF Jr, Pavan SE, Tsuchiya MTN, Wilson DE, Percequillo AR, Maldonado JE. 2020. Museomics of tree squirrels: A dense taxon sampling of mitogenomes reveals hidden diversity, phenotypic convergence, and the need of a taxonomic overhaul. *BMC Evolutionary Biology* 20(77): 1–25. <https://doi.org/10.1186/s12862-020-01639-y>
- Abreu EF, Casali DM, Costa-Araújo R, Garbino GST, Libardi GS, Loretto D, Loss AC, Marmontel M, Moras L, Nascimeto MC, Oliveira M, Pavan S, Tirelli FP. 2021. Lista de Mamíferos do Brasil (2021-2). <https://doi.org/10.5281/zenodo.5802047>.
- Barrio J, Gutiérrez EE, D'Elia G. 2024. The first living cervid species described in the 21st century and revalidation of *Pudella* (Artiodactyla). *Journal of Mammalogy* 105(3): 577–588. <https://doi.org/10.1093/jmammal/gyae012>
- Bezerra AM. 2012. Coleções Científicas de Mamíferos. I – Brasil. *Boletim da Sociedade Brasileira de Mastozoologia* 65: 19–25.
- Bradley RD, Bradley LC, Garner HJ, Baker RJ. 2014. Assessing the value of natural history collections and addressing issues regarding long-term growth and care. *BioScience* 64(12): 1150–1158.
- Chiquito E, Caccavo A, Santos C, Semedo T, Costa-Pinto AL, As-túa D, Bezerra AM, Silva CR, Guerra E, Gonçalves P, Althoff SL. 2021. Mammal collections in Brazil: overview and database. *Brazilian Journal of Mammalogy* (e90): e90202105. <https://doi.org/10.32673/bjm.vie90.5>
- Choate JR, Genoways HH. 1975. Collections of recent mammals in North America. *Journal of Mammalogy* 56(2): 452–502. <https://doi.org/10.2307/1379374>
- Cook JA, Light JE. 2019. The emerging role of mammal collections in 21st century mammalogy. *Journal of Mammalogy* 100(3): 733–750. <https://doi.org/10.1093/jmammal/gvy148>
- D'Elia G. 2024. Las colecciones biológicas de Chile deben potenciarse. *Anales del Instituto de la Patagonia* 52: 1–12. <https://doi.org/10.22352/AIP202452002>
- de Marinis AM, Cagnin M, Cagnolaro L. 2007. A survey of recent mammal collections in Italy. *Hystrix* 18(2): 137–156.
- Doutt JK, Howell AB, Davis WB. 1945. The mammal collections of North America. *Journal of Mammalogy* 26(3): 231–272. <https://doi.org/10.2307/1374819>
- Dunnum JL, McLean BS, Dowler RC. 2018. Mammal collections of the Western Hemisphere: a survey and directory of collections. *Journal of Mammalogy* 99(6): 1307–1322. <https://doi.org/10.1093/jmammal/gvy151>
- Fuwen WEI. 2021. Mammal specimen collection in China. *Acta Theriologica Sinica* 41(5): 614–616. <https://doi.org/10.16829/j.slx.150603>
- Gippoliti S, Amori G, Castiglia R, Colangelo P, Capanna E. 2014. The relevance of Italian museum collections for research and conservation: the case of mammals. *Rendiconti Lincei* 25: 351–357. <https://doi.org/10.1007/s12210-014-0304-2>
- Gutierrez-Ramos JN. 2013. La colección de vertebrados del Museo de Zoología Juan Ormea Rodríguez de la Universidad Nacional de Trujillo (Trujillo–Perú, 1995). *Sciéndo* 16(2): 101–143.
- Gutierrez-Ramos JN. 2015. Reseña biográfica de Juan Ormea Rodríguez (1893-1971), creador del Museo de Zoología de la Universidad Nacional de Trujillo. *Rebiol* 35(2): 129–135.
- Gutierrez-Ramos JN. 2017. Los paradigmas del Museo de Zoología Juan Ormea Rodríguez (1938-2015): Hacia el Museo de Historia Natural en la Universidad Nacional de Trujillo (Trujillo–Perú). *Sagasteguiana* 5(1): 17–28.
- Gutierrez-Ramos JN, Ramirez-Viena L. 2021. La taxidermia en la Universidad Nacional de Trujillo: En lo académico y en el Museo de Zoología. *Sagasteguiana* 9(1): 29–44.
- Gutierrez-Ramos JN, Rodríguez-Rodríguez EF. 2023. Juan Esteban Ormea Rodríguez (Lima, 30 de agosto de 1883; Trujillo, 21 de octubre de 1971) creador del Museo de Zoología de la Universidad Nacional de Trujillo, Perú: Aportes a su biografía. *Sagasteguiana* 11(1): 59–66.

- Hedrick BP, Heberling JM, Meineke EK, Turner KG, Grassa CJ, Park DS, Kennedy J, Clarke JA, Cook JA, Blackburn DC, Edwards SV, Davis CC. 2020. Digitization and the future of natural history collections. *BioScience* 70(3): 243–251. <https://doi.org/10.1093/biosci/biz163>
- Howell AB. 1923. The mammal collections of North America. *Journal of Mammalogy* 4(2): 113–120. <https://doi.org/10.2307/1373543>
- Hurtado N, Pacheco V. 2017. Revision of *Neacomys spinosus* (Thomas, 1882) (Rodentia: Cricetidae) with emphasis on Peruvian populations and the description of a new species. *Zootaxa* 4242(3): 401–440. <https://doi.org/10.11646/zootaxa.4242.3.1>
- Hurtado-Castro H. 2022. Orígenes de los museos universitarios del Perú. *Gestiones, tensiones y motivaciones fundacionales. Devenir-Revista de estudios sobre patrimonio edificado*, 9(17): 27–42. <https://doi.org/10.21754/devenir.v9i17.1034>
- Hutterer R, Kryštufek B. 2020. A history of mammal research in Europe. *Mammals of Europe-Past, Present, and Future*: 9–30. https://doi.org/10.1007/978-3-030-00281-7_5
- Johnson KR, Owens IF, Global Collection Group. 2023. A global approach for natural history museum collections. *Science* 379(6638): 1192–1194. <https://doi.org/10.1126/science.adf643>
- Llorente-Bousquets J, Koleff-Osorio P, Benítez-Díaz H, Lara-Morales L. 1999. Síntesis del estado de las colecciones biológicas mexicanas. Resultados de la encuesta “Inventario y Diagnóstico de la actividad taxonómica en México” 1996-1998. Comisión Nacional para el Conocimiento y Uso de la Biodiversidad, México. 143 pp.
- Mathias MDL, Monarca RI, Neves T, Tapisso JT, Alves MJ, Ramalhinho MDG. 2024. Mammals in the Collection of the National Museum of Natural History and Science (University of Lisbon, Portugal): A Contribution to Research and Conservation. *Diversity* 17(1): 1–23. <http://dx.doi.org/10.3390/d17010001>
- Medina CE, Medina YK, Pino K, Pari A, López E, Zeballos H. 2016. Primer registro del ratón colombiano del bosque Chicomys instans (Cricetidae: Rodentia) en Cajamarca: actualizando el listado de mamíferos del Perú. *Revista peruana de biología* 23(3): 315–320. <http://dx.doi.org/10.15381/rpb.v23i3.12868>
- Miller SE, Barrow LN, Ehlman SM, Goodheart JA, Greiman SE, Lutz HL, Misiewicz TM, Smith SM, Tan M, Thawley CJ, Cook JA, Light JE. 2020. Building natural history collections for the twenty-first century and beyond. *BioScience* 70(8): 674–687. <https://doi.org/10.1093/biosci/biaa069>
- MINAM (Ministerio del Ambiente). 2019. Sexto informe nacional sobre diversidad biológica. La biodiversidad en cifras. Acceso 03/07/2024. <https://www.gob.pe/institucion/minam/informes-publicaciones/281709-sexto-informe-nacional-sobre-diversidad-biologica>
- Mining Technology. 2024. The five largest copper mines in operation in Peru. Acceso 23/12/2024. <https://www.mining-technology.com/marketdata/five-largest-copper-mines-peru/>
- Morosini P. 2011. Perú, líder mundial de la biodiversidad. *Estrategia* 6: 1–24.
- Odar-Falla AJ, Gutiérrez-Ramos JN. 2017. La colección de vertebrados del Museo de Historia Natural Víctor Baca Aguinaga de la Universidad Nacional Pedro Ruiz Gallo (Lambayeque, Perú). *Revista Científica de la Facultad de Ciencias Biológicas* 37(1): 46–60.
- Pacheco-Acero C, Pacheco V. 1993. Manejo de Colecciones Científicas: Propuesta para un catálogo computarizado. *Boletín de Lima* 88: 87–95.
- Pacheco V. 1990. ¿Por qué mantener colecciones científicas de historia natural?. *Boletín del Museo de Historia Natural Universidad Nacional Mayor de San Marcos, nueva serie*, 2: 1–2.
- Pacheco V. 1991. A new species of *Scolomys* (Muridae: Sigmodontinae) from Peru. *Publicaciones del Museo de Historia Natural, UNMSM (A)* 37: 1–3.
- Pacheco V, Cadenillas R., Salas E, Tello C, Zeballos H. 2009. Diversidad y endemismo de los mamíferos del Perú. *Revista peruana de biología* 16(1): 5–32. <https://doi.org/10.15381/rpb.v16i1.111>
- Pacheco V, Graham-Angeles L, Diaz S, Hurtado CM, Ruelas D, Cervantes K, Serrano-Villavicencio J. 2020. Diversidad y distribución de los mamíferos del Perú I: Didelphimorphia, Paucituberculata, Sirenina, Cingulata, Pilosa, Primates, Lagomorpha, Eulipotyphla, Carnivora, Perissodactyla y Artiodactyla. *Revista peruana de biología* 27(3): 289–328. <http://dx.doi.org/10.15381/rpb.v27i3.18356>
- Pacheco V, Diaz S, Graham-Angeles L, Flores-Quipe M., Calizaya-Mamani G, Ruelas D, Sánchez-Vendizú P. 2021. Lista actualizada de la diversidad de los mamíferos del Perú y una propuesta para su actualización. *Revista peruana de biología* 28(4): e21019. <https://dx.doi.org/10.15381/rpb.v28i4.21019>
- Pacheco V, Martínez-Altamirano JL, Mena JL, Diaz S, Sánchez-Vendizú P, Arana A, Salinas L, Arana C, Arakaki M, Tobler MW, Watsa M. 2024a. Disproportion between the Peruvian Amazonian megadiverse mammalian fauna and the available molecular information. *Zoologia* 41: e23110. <https://doi.org/10.1590/S1984-4689.v41.e23110>
- Pacheco V, Sánchez-Vendizú P, Diaz S, Cairampoma R, D'Elía G. 2024b. Primer registro de *Abrothrix olivacea* (Waterhouse, 1837) en Perú basado en material histórico de Tacna. *Revista peruana de biología* 31(3): e28882. <https://doi.org/10.15381/rpb.v31i3.28882>
- Patterson BD. 2002. On the continuing need for scientific collecting of mammals. *Mastozoología neotropical* 9(2): 253–262.
- Poo S, Whitfield SM, Shepack A, Watkins-Colwell GJ, Nelson G, Goodwin J, Bogisich A, Brennan PLR, D'Agostino J, Koo MS, et al. 2022. Bridging the research gap between live collections in zoos and preserved collections in natural history museums. *BioScience*, 72(5): 449–460. <https://doi.org/10.1093/biosci/biac022>
- Ramírez-Pulido J, González-Ruiz N, Gardner AL, Arroyo-Cabrerales J. 2014. List of recent land mammals of Mexico, 2014. Special Publications, Museum of Texas Tech University 63: 1–76.
- Rengifo EM, D'Elía G, García G, Charpentier E, Cornejo FM. 2023. A new species of titi monkey, genus *Cheracebus* Byrne et al., 2016 (Primates: Pitheciidae), from Peruvian Amazonia. *Mammal Study* 48(1): 3–18. <https://doi.org/10.3106/ms2022-0019>
- Reyes JC, Mead JG, Van Waerebeek K. 1991. A new species of beaked whale *Mesoplodon peruvianus* sp. n. (Cetacea: Ziphiidae) from Peru. *Marine Mammal Science* 7: 1–24. <https://doi.org/10.1111/j.1748-7692.1991.tb00546.x>

- Rivera-León VE, Hortelano-Moncada Y, Cervantes FA. 2018. Health level of a mammal collection. *Revista mexicana de biodiversidad* 89(2): 402–411. <https://doi.org/10.22201/ib.20078706e.2018.2.2339>
- Sánchez-Cordero V, Botello F, Flores-Martínez JJ, Gómez-Rodríguez RA, Guevara L, Gutiérrez-Granados G, Rodríguez-Moreno Á. 2014. Biodiversity of Chordata (Mammalia) in Mexico. *Revista Mexicana de Biodiversidad* 85: S496–S504. <https://doi.org/10.7550/rmb.31688>
- Sigwart JD, Schleuning M, Brandt A, Pfenninger M, Saeedi H, Borsch T, Häfner E, Lücking R, Güntsch A, Trischler H, Töpfer T, Wesche K, Collectomics Consortium. 2025. Collectomics – towards a new framework to integrate museum collections to address global challenges. *Natural History Collections and Museomics* 2: 1–20. <https://doi.org/10.3897/nhcm.2.148855>
- Suarez AV, Tsutsui ND. 2004. The value of museum collections for research and society. *Bioscience*, 54(1), 66–74. [https://doi.org/10.1641/0006-3568\(2004\)054\[0066:TVOMCF\]2.0.CO;2](https://doi.org/10.1641/0006-3568(2004)054[0066:TVOMCF]2.0.CO;2)
- Tejada JV, Flynn JJ, Antoine PO, Pacheco V, Salas-Gismondi R, Cerling TE. 2020. Comparative isotope ecology of western Amazonian rainforest mammals. *Proceedings of the National Academy of Sciences* 117(42): 26263–26272. <https://doi.org/10.1073/pnas.2007440117>
- Voss RS, Fleck DW, Giarla TC. 2024. Mammalian diversity and masts ethnomammalogy in amazonian Peru Part 5. *Rodents. Bulletin of the American Museum of Natural History* 446: 1–179. <https://doi.org/10.1206/0003-0090.466.1>
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- Conflicto de intereses / Competing interests:**
The authors declare no conflict of interest.
- Rol de los autores / Authors Roles:**
VP: Conceptualization, Funding acquisition, Data curation, Investigation, Methodology, Writing – original draft, Writing – review and editing.
SD: Data curation, Investigation, Validation, Visualization, Writing – review and editing.
GA-A, RB, JB, PC, VD, GG-U, GH-J, JI, RM-C, CEM, DM, EP, AP: Validation, Writing – review and editing.
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- Aspectos éticos / legales; Ethics / legals:**
Authors declare that they did not violate or omit ethical or legal norms in this research.

Appendix 1. Directory of Peruvian mammal collections containing 13 accounts.

AREQUIPA

Museo de Historia Natural, Universidad Nacional de San Agustín de Arequipa (MUSA)

Address: Av. Alcides Carrión s/n, Cercado de Arequipa, Arequipa 04001

E-mail: mhn.musa.contacto@gmail.com

Contact: Horacio Zeballos, Curator (horaciozeballos@gmail.com)

Additional contacts: César Medina, Co-Curator (cmedinap@unsa.edu.pe)

Type of collection: voucher specimens (skins, skeletons, and/or fluid)

Website: <https://www.facebook.com/mhn.musa>

Data availability: digitized collection database; data catalog

Holdings: 21990 specimens; 6 type specimens

Taxonomic range: Artiodactyla, Carnivora, Chiroptera, Cingulata, Didelphimorphia, Eulipotyphla, Lagomorpha, Paucituberculata, Perissodactyla, Pilosa, Primates, Rodentia

Geographic range: National

AYACUCHO

Colección Científica, Pro Fauna Silvestre (PFAUNA)

Address: Jr. José Santos Flores, Mz. A1 Lt.9, Urb. Las Américas, San Juan Bautista, Ayacucho 05002

E-mail: pfaunayacucho@gmail.com

Contact: Vladimir Diaz Vargas, Curator (valfar.dv@gmail.com)

Additional contacts: none

Type of collection: voucher specimens (skins, skeletons and/or fluid)

Website: <https://sites.google.com/view/profaunasilvestre-ayacucho>

Data availability: digitized collection database; data catalog

Holdings: 53 specimens; 0 type specimens

Taxonomic range: Chiroptera, Carnivora, Primates, and Rodentia

Geographic range: Regional

CUSCO

Museo de Biodiversidad del Perú (MUBI)**Address:** Urb. Mariscal Gamarra A-61, Cusco 08003**E-mail:** contacto@mubi-peru.org**Contact:** Gabriela Herrera-Juárez, Curator (gabriela.herrera@mubi-peru.org)**Additional contacts:** Juan Chaparro, Director (juan.chaparro@mubi-peru.com)**Type of collection:** voucher specimens (skins, skeletons, and/or fluid)**Website:** <https://mubi-peru.org>**Data availability:** digitized collection database; data catalog**Holdings:** 680 specimens; 0 type specimens**Taxonomic range:** Artiodactyla, Chiroptera, Carnivora, Didelphimorphia, Paucituberculata, and Rodentia**Geographic range:** Regional**Museo de Historia Natural de la Universidad Nacional San Antonio Abad del Cusco (MHNC)****Address:** Plaza de Armas de Cusco S/N (Local Central UNSAAC - Paraninfo Universitario), Cusco 08000**E-mail:** munsaac@hotmail.com**Contact:** Alejandro Portillo, Curator (aportilloguizado@gmail.com)**Additional contacts:** Rocío Orellana, Curator (rocio.orellana@unsaac.edu.pe)**Type of collection:** voucher specimens (skins, skeletons and/or fluid)**Website:** none**Data availability:** digitized collection database; data catalog**Holdings:** 1003 specimens; 0 type specimens**Taxonomic range:** Artiodactyla, Carnivora, Chiroptera, Cingulata, Didelphimorphia, Lagomorpha, Perissodactyla, Pilosa, Primates, and Rodentia**Geographic range:** Regional

LA LIBERTAD

Museo de Zoología “Juan Ormea Rodríguez”, Universidad Nacional de Trujillo**Address:** Jr. San Martín 368, Trujillo 13001**E-mail:** museo_zoologia@unitru.edu.pe**Contact:** César Medina-Tafur, Director (cmedinae@unitru.edu.pe)**Additional contacts:** none**Type of collection:** voucher specimens (skins, skeletons and/or fluid)**Website:** <http://www.museozoo.unitru.edu.pe>**Data availability:** digitized collection database; data catalog**Holdings:** 171 specimens; 0 type specimens**Taxonomic range:** Artiodactyla, Carnivora, Chiroptera, Cingulata, Didelphimorphia, Pilosa, Primates, Rodentia**Geographic range:** Regional

LAMBAYEQUE

Museo de Historia Natural “Víctor F. Baca Aguinaga”, Universidad Nacional Pedro Ruiz Gallo (MUPRG)**Address:** Calle Juan XXIII 391, Lambayeque 14013**E-mail:** mhn.unprg@unprg.edu.pe**Contact:** Roger Barboza, Curator (rbarbozac@unprg.edu.pe)**Additional contacts:** Jorge Fupuy, Director (jfupuy@unprg.edu.pe)**Type of collection:** voucher specimens (skins, skeletons and/or fluid)**Website:** <https://www.facebook.com/MHNVBA.UNPRG/>**Data availability:** digitized collection database; data catalog**Holdings:** 481 specimens; 0 type specimens**Taxonomic range:** Artiodactyla, Carnivora, Chiroptera, Cingulata, Didelphimorphia, Lagomorpha, Paucituberculata, Pilosa, Primates, Rodentia**Geographic range:** Regional

LIMA

Colección de Mamíferos, Centro de Ecología y Biodiversidad (CEBIOMAS)**Address:** Los Olivos 186–301, La Molina vieja, La Molina 15024**E-mail:** none**Contact:** Erika Paliza, Curadora (erikaceae@gmail.com)**Additional contacts:** none**Type of collection:** voucher specimens (skins, skeletons and/or fluid)**Website:** https://www.facebook.com/CEBIO.Peru/?locale=es_LA**Data availability:** digitized collection database; data catalog**Holdings:** 280 specimens; 0 type specimens**Taxonomic range:** Chiroptera and Rodentia**Geographic range:** Regional

División de Mastozoología, Centro de Ornitología y Biodiversidad (CORBIDI)**Address:** Calle Santa Rita 105, Urb. Huertos de San Antonio, Santiago de Surco, Lima 15023**E-mail:** info@corbidi.org**Contact:** Javier Barrio, Director (javbar@corbidi.org)**Additional contacts:** none**Type of collection:** voucher specimens (skins, skeletons and/or fluid)**Website:** <http://www.corbidi.org>**Data availability:** digitized collection database; data catalog**Holdings:** 1570 specimens; 0 type specimens**Taxonomic range:** Artiodactyla, Carnivora, Chiroptera, Cingulata, Didelphimorphia, Pilosa, Primates, Rodentia**Geographic range:** Regional**Museo de Historia Natural, Universidad Nacional Federico Villarreal (MUFV)****Address:** Jr. Río de Chepén 290, Urb. Villa Hermosa Bravo Chico, El Agustino, Lima 15007**E-mail:** none**Contact:** José Iannacone, Curator (jiannacone@unfv.edu.pe)**Additional contacts:** none**Type of collection:** voucher specimens (skins, skeletons and/or fluid)**Website:** <https://repositorio.unfv.edu.pe/handle/20.500.13084/8666>**Data availability:** digitized collection database; data catalog**Holdings:** 88 specimens; 0 type specimens**Taxonomic range:** Artiodactyla, Carnivora, Chiroptera, Pilosa, Primates, and Rodentia**Geographic range:** National**Museo de Historia Natural, Universidad Nacional Mayor de San Marcos (MUSM)****Address:** Av. Arenales 1256, Jesús María, Lima 15072**E-mail:** mastozoologia.mhn@unmsm.edu.pe**Contact:** Víctor Pacheco, Curator and Professor (vpachecot@unmsm.edu.pe)**Additional contacts:** Dennisse Ruelas, Professor (druelasp@unmsm.edu.pe)**Type of collection:** voucher specimens (skins, skeletons, and/or fluid)**Website:** <https://museohn.unmsm.edu.pe>**Data availability:** digitized collection database; data catalog**Holdings:** 56872 specimens; 38 type specimens**Taxonomic range:** Artiodactyla, Carnivora, Chiroptera, Cingulata, Didelphimorphia, Eulipotyphla, Lagomorpha, Paucituberculata, Perissodactyla, Pilosa, Primates, Rodentia**Geographic range:** National**Museo de Historia Natural, Universidad Ricardo Palma (MURP)****Address:** Av. Benavides 5440, Santiago de Surco, Lima 15039**E-mail:** mhn@urp.edu.pe**Contact:** Patricia Chang, Technician (patricia.chang@urp.edu.pe)**Additional contacts:** Mercedes González, Director (mercedes.gonzales@urp.edu.pe)**Type of collection:** voucher specimens (skins, skeletons and/or fluid)**Website:** <https://www.mhnurp.com>**Data availability:** digitized collection database; data catalog**Holdings:** 570 specimens; 0 type specimens**Taxonomic range:** Artiodactyla, Carnivora, Chiroptera, Didelphimorphia, Lagomorpha, Perissodactyla, Primates, and Rodentia**Geographic range:** Regional

LORETO**Colección Referencial de Biodiversidad, Instituto de Investigaciones de la Amazonía Peruana (CRBIIAP)****Address:** Av. Quiñones Km 2.5, San Juan Bautista, Iquitos 22200**E-mail:** none**Contact:** Giuseppe Gagliardi Urrutia (ggagliardi@iiap.gob.pe)**Additional contacts:** none**Type of collection:** voucher specimens (skins, skeletons and/or fluid)**Website:** <https://www.gob.pe/iiap>**Data availability:** digitized collection database; data catalog**Holdings:** 246 specimens; 0 type specimens**Taxonomic range:** Carnivora, Chiroptera, Didelphimorphia, and Rodentia**Geographic range:** Regional

TACNA

Colección Biológica de Tacna, Universidad Nacional Jorge Basadre Grohmann (CBT)**Address:** Av. Miraflores s/n, Tacna 23000**E-mail:** colbiotacna21@gmail.com**Contact:** Ruth Mamani-Contreras, Curator (ruthmcontreras88@gmail.com)**Additional contacts:** Giovanni Aragon-Alvarado, Professor (gioralva@gmail.com)**Type of collection:** voucher specimens (skins, skeletons and/or fluid)**Website:** none**Data availability:** digitized collection database; data catalog**Holdings:** 838 specimens; 0 type specimens**Taxonomic range:** Carnivora, Chiroptera, Didelphimorphia, and Rodentia**Geographic range:** Regional**Appendix 2.** Questionnaire for the survey of Peruvian mammal collections.

1. Name of the person who answered the survey
2. Name of the collection
3. Acronym of the collection
4. Type of institution that houses the collection
5. Year the collection was created
6. Address of the collection
7. Coordinates of the collection
8. Website of the collection
9. Name of the curator or person in charge of the collection
10. Email of the person listed above
11. How many cataloged specimens does the collection house?
12. How many species does the collection house?
13. Approximately how many uncataloged specimens does the collection have?
14. Does the collection house type material? If so, please indicate the number and list of holotypes, neotypes, syntypes, and/or lectotypes
15. Does the collection receive material from environmental consultancy? If so, approximately how many specimens does it receive annually?
16. How many specimens have tissue samples?
17. Type of preserved tissue
18. Type of tissue preservation
19. How many parasite samples does the collection house?
20. How many photographic records does the collection house?
21. How many karyotypes and/or suspended cells does the collection house?
22. Does the collection have a digital version of the catalog? If so, what type of file is it?
23. Is the catalog accessible online to the public?
24. Is the database integrated into a larger database? If so, which one?
25. Which orders do the specimens in the collection belong to?
26. What is the geographic range of the collection?