
The primate collection at the Natural Science Museum of Barcelona (Spain)

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Abstract

The primate collection at the Natural Science Museum of Barcelona (Spain).— The Natural Science Museum of Barcelona (MCNB) houses a total of 309 specimens of non–human primates. The collection comprises 102 stuffed animals, 33 skins, 73 skeletons, 24 postcranial skeletons, eight mounted skeletons, 54 skulls, three whole animals in alcohol, and 31 other samples (bones and other). Over the last two years the collection has been completely reviewed and reorganized. The collection contains 39 genera and includes a wide range of extant non–human primates. It houses specimens from Africa, Asia and South and Central America, with 10.26% of samples being Strepsirrhines, 26.92% New World monkeys and 62.18% Old World monkeys. The Museum houses some endangered or rare species. In this work we present the contents of the recent review with new and updated taxonomic attributions together with a complete list of samples that includes information on age, class and preservation status for each specimen.

Key words: Naturalistic collection, Primates, Review.

Resumen

La colección de primates del Museo de Ciencias Naturales de Barcelona (España).— El MCNB conserva un total de 309 ejemplares de primates no humanos. La colección consta de 102 ejemplares disecados, 33 pieles, 73 esqueletos, 24 esqueletos postcraneales, ocho esqueletos montados, 54 cráneos, 3 animales enteros en alcohol, y 31 muestras de otro tipo (huesos y otros). En los últimos dos años se ha llevado a cabo una revisión completa y una reorganización de la colección. Con 39 géneros, la colección incluye una amplia gama de primates no humanos. Contiene muestras de África, Asia y América del Sur y Central, el 10,26% son estrepsirrinos, el 26,92% monos del Nuevo Mundo y el 62,18% del Viejo Mundo. El Museo alberga algunas especies en peligro de extinción o raras. En este trabajo se presentan los resultados de la revisión taxonómica con resultados actualizados de las determinaciones llevadas a cabo, con una lista completa de las muestras incluyendo información sobre la edad, la clase y el tipo de muestra.

Palabras clave: Colección de Ciencias Naturales, Primates, Revisión.

Resum

La col·lecció de primats del Museu de Ciències Naturals de Barcelona (Espanya).— L'MCNB conserva un total de 309 exemplars de primats no humans. La col·lecció consta de 102 exemplars dissecats, 33 pells, 73 esquelets, 24 esquelets postcranials, vuit esquelets muntats, 54 cranis, tres animals sencers en alcohol i 31 mostres d'altres tipus (ossos o altres). Els darrers anys s'ha portat a terme una revisió completa i una reorganització de la col·lecció. Amb 39 gèneres, aquesta inclou una àmplia gamma de primats no humans. Conté mostres d'Àfrica, Àsia i Amèrica del Sud i Central, el 10,26% són estrepsirins, el 26,92% micos del Nou Món i el 62,18% micos del Vell Món. El Museu conserva algunes espècies en perill d'extinció o rares. En aquest treball es presenten els resultats de la revisió taxonòmica amb resultats actualitzats de les determinacions portades a terme, amb una llista completa de les mostres que inclou informació sobre l'edat, la classe i el tipus de mostra.

Paraules clau: Col·lecció de Ciències Naturals, Primats, Revisió.

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Introduction

The primate collection at the Natural Science Museum of Barcelona (MCNB) (fig. 1) is one of the most important in Spain. It includes a total of 328 samples belonging to 309 nonhuman primate specimens. Most part of the material belongs to the osteological collection (73 complete skeletons, 24 postcranial skeletons, eight mounted skeletons, 54 skulls and 23 other bones). Skins are preserved as stuffed (102) (fig. 2) or as study skins (33). Several samples of bones and skin fragments are also preserved. Three whole animals and 8 other samples (some mold and replica, and a head) are stored / conserved. Some years ago the Museum also started a new collection, the tissue bank, which is now composed of 25 primate samples conserved in alcohol. The scientific value of the collection is testified to by the range of primate variability and the fact that many of the samples were free-ranging animals collected several decades ago. Barcelona Zoo provided 128 samples that are in a good state of preservation. In 2008, a complete review of the collection was begun. The taxonomic attributions were newly assessed and updated, the preservation status of the entire collection was monitored. This paper presents the results of this work and gives a complete list of samples including information on age, class and preservation status for each specimen.

Some historical notes about the Collection

The Museum of Zoology, now The Natural Science Museum of Barcelona, was founded in 1882 by a bequest from the estate of Mr. Francesc Martorell Peña. The collection is the result of contributions from expeditions (fig. 3), donations and purchases from all



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Fig. 1. A primate exhibition hall with the showcase exhibited until May 2010.

Fig. 1. Exposición de primates en una de las vitrinas de la exposición permanente del Museo hasta Mayo de 2010.



Fig. 2. Stuffed primates in the storeroom.

Fig. 2. Sala de reserva de primates dissecados.

over the world since that time. Joan Baptista Aguilar-Amat (1881–1936) was a scientist and the curator of vertebrates at the Museum of Natural Science of Barcelona; in 1929 he participated in a six-month expedition to Indochina organized by the naturalist Emili Juncadella. This trip started in Barcelona, crossed through France and reaching India before ending in Indochina. Study skins of birds and also mammals were brought back, including the two specimens of *Loris tardigradus* collected in Colombo (Sri Lanka). The oldest primates of the collection are three specimens received in 1888 from the Antiga College, a private college in Barcelona. At that time, the Museum purchased many specimens from private taxidermists and collectors who were very common in Barcelona at the end of 19th century. For instance, six animals were purchased from the Casa Darder (1883–1890) and others from the seller Lluís Soler Pujol. The Museum also purchased animals from dealers Unlauff in Germany and Rowland in England. In the 1940s and 50s the museum purchased a collection of ten primates from Leopoldo Gomez Alonso, a collector who travelled in Ecuador. In the last decades of the 20th century the Museum also received several donations from private religious schools. The Salesians (Salesian Society) donated two specimens and the Jesuitas (Society of Jesus) donated 12 specimens in 1999. These schools often purchased animals from the Casa Soler Pujol of Barcelona or collected animals at their overseas missions. In most cases they did not record the geographical origins of the animals. A good exception, however, is the collection of 13 primates donated by the Order of Friars Minor Capuchin that operated in the Colombian



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Fig. 3. *Loris tardigradus* (Linnaeus, 1758): some of the oldest specimens in the collection, collected in Sri Lanka during the expedition to Indochina in 1929.

Fig. 3. Loris tardigradus (Linnaeus, 1758): unos de los especímenes más antiguos de la colección, recolectados en Sri Lanka durante la expedición hacia Indochina en 1929.

Amazon. All of these specimens have the exact site of collection noted. The Museum also received 128 specimens from the Barcelona Zoo with which it has collaborated since 1888. Some of these specimens belong to the Zoo's early years (1888–1935), while others are from the last several decades. Collaboration with the Zoo allowed the Museum to collect a good representation of primate taxa. The Museum has its own taxidermy department (fig. 4) and its own scientific collection, consisting of both osteological specimens and skins and tissues.

It is unfortunate that the heterogeneous provenance and lack of historical data available for many specimens prevents us from generating a complete dataset for each exemplar. We do not know, the dates of arrival for some 139 specimens, for example, though we do know they were received before 1935; for this reason we consider them part of the old collection of the first epoch of the MCNB. At the same time, the Museum has an historic archive that has only been partially studied; further studies will allow better documentation of the history of the collection. The collection is fully computerized. Primates with recollection information are also available at GBIF (Global Biodiversity Information Facility). At the time of preparing this paper, consultation and loan are closed due to the remodeling project presently underway at the Museum. Scientific consultation and loan, however, remain available to the scientific community at all times.



Fig. 4. Preparation of a *Gorilla gorilla* male received from the Barcelona Zoo.

Fig. 4. Preparación de un macho de *Gorilla gorilla* procedente del Zoo de Barcelona.

Materials and methods

The systematic reference originally adopted for the mammal collection at MCNB was that of Honacki et al. (1982). As mammal classification has been modified in recent years by a large number of studies, the collection is now classified in accordance with the most recent works of Wilson & Reeder, (2005). As a general reference for primates, taxonomy follows Groves (2001, 2005) supplemented by Rylands et al. (2000), Grubb et al. (2003), Brandon–Jones (2004), and Mittermeier et al. (2008). Taxon recognition is based upon morphological keys for taxonomic rank in accordance with the descriptions available in the literature (Auricchio, 1995; Rowe, 1996; Swindler, 2002; Walker & Molur 2007; Mittermeier et al., 2008; Kingdon, 2004; Defler, 2004).

Morphological analysis

In assessing the taxon we considered the following aspects: 1. Sex; 2. Estimated age; 3. Data of capture and possible fur and skin colour alteration due to light exposure; and 4. Diagnostic keys of the taxon considered.

Provenance and geographic distribution:

Information on the exact provenance of the specimens was often unknown (see table 1). Thus for precise identification priority was given to specimen morphology rather than to geographic provenance. In some cases a cross reference reconstruction was made considering the collectors, the year of collection and also the origin of other animals gathered from the same source. We indicated the subspecies only when the provenance was known or when the taxon was easy to identify.

Table 1. List of the genera: N. Number of specimens.
 Tabla 1. Lista de los géneros: N. Número de especímenes.

Genus	N	Genus	N
<i>Eulemur</i>	7	<i>Ateles</i>	7
<i>Lemur</i>	3	<i>Lagothrix</i>	4
<i>Varecia</i>	2	<i>Cercocebus</i>	13
<i>Avahi</i>	1	<i>Cercopithecus</i>	23
<i>Indri</i>	1	<i>Chlorocebus</i>	8
<i>Propithecus</i>	2	<i>Erythrocebus</i>	10
<i>Loris</i>	2	<i>Macaca</i>	33
<i>Nycticebus</i>	1	<i>Miopithecus</i>	4
<i>Perodictus</i>	3	<i>Mandrillus</i>	18
<i>Galago</i>	8	<i>Papio</i>	11
<i>Otolemur</i>	2	<i>Colobus</i>	11
<i>Callithrix</i>	12	<i>Ptilocolobus</i>	1
<i>Mico</i>	3	<i>Semnopithecus</i>	1
<i>Cebuella</i>	4	<i>Hylobates</i>	4
<i>Leontopithecus</i>	5	<i>Nomascus</i>	1
<i>Saguinus</i>	11	<i>Gorilla</i>	23
<i>Cebus</i>	17	<i>Pan</i>	15
<i>Saimiri</i>	5	<i>Pongo</i>	8
<i>Cacajao</i>	1	Primates	2
<i>Pithecia</i>	5	Cercopithecidae	6
<i>Alouatta</i>	8	Hominidae	3

Taxonomic notes to annex 1

We follow Groves (2001) who uses the genus *Galago* for all bush-babies although Grubb et al. (2003) placed all the smaller *Galago* members' of the *demidovii*, *orinus*, *zanzibaricus* and *granti* groups in the *Galagoides*, leaving the *senegalensis* group in *Galago* while the *alleni* group is assigned to *Sciurocheirus*. The genus *Galagoides* includes small forest species with a body mass of less than 200 g, and with shorter limbs and lighter build than the *Galago sensu stricto*.

We retain the genera *Mico* and *Cebuella* as indicated by Rylands et al. (2000), although Groves (2001) and Groves (2005) consider them as subgenera.

Saguinus: we follow Groves (2001) and Groves (2005) who considered *S. graellsii* as a full species, while Rylands et al. (2000) consider it a subspecies of *S. mystax*.

Chlorocebus: Groves (2001) and Groves (2005) recognizes this genus while Grubb et al. (2003) maintain it in the genus *Cercopithecus*.

Cercopithecus roloway is now considered a full species by Groves (2005).

Semnopithecus aches is raised to the rank of full species by Walker & Molur (2007) It is synonymous with *S. dussumieri* in Groves (2001). Groves (2005) considers all the taxa of *Semnopithecus* as a subspecies of *Semnopithecus entellus*.

Nomascus: we follow the work of Mootnick & Groves (2005) who consider this a full genus.

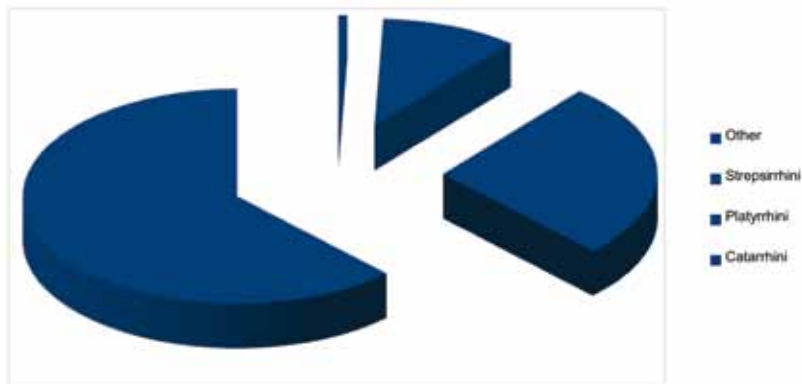


Fig. 5. Percentage of the groups of primates in the collection.

Fig. 5. Porcentaje de los diferentes grupos de primates en la colección.

Results and discussion

As the result of the review a total of 57 primates were identified to family, genera or species level. The exhaustive work done during the review has led to many new determinations for several specimens (see annex 1).

The MCNB primate collection houses 347 samples which correspond to 309 specimens. The specimens belong to 11 different families and 39 genera, so the whole series well represents the variability of extant non-human primates containing specimens from Africa, Asia and South and Central America. Due to the unknown provenance of many specimens and to the change in their colouration, a few specimens remain without certain identification.

The Strepsirrhini suborder represents a minor part of the collection (ca. 10%), with 32 specimens (fig. 5). Most of these belong to the Galagidae and Lemuridae families. Most notable is a specimen we assigned provisionally to *Avahi cleesei* (fig. 6), a species recently described by Thalman & Geissman (2005). Its geographical range is still unclear but it seems to have a restricted distribution in Madagascar and it is very likely to be Endangered or Critically Endangered. We do not know the exact site of origin of our specimen so other analyses are needed to confirm this taxonomic identification. The five specimens of *Galago (galagoides) demidoff* from Cameroon are in a good state of preservation, with skin and complete skull.

The variety of the Neotropical primates is well represented in the collection with 83 specimens accounting for 27% of the entire collection, *Cebus*, *Callithrix* and *Saguinus* being the best represented genera. The collection houses 13 specimens from *La Chorrera*, a locality in the Andean region of Colombian Amazon (latitude: 0° 43' 60" S, longitude: 70° 1' 0" W). These were donated to the museum by the Order of Friars Minor Capuchin and all include the exact place of collection.

Old world monkeys represent the largest section (62%) of the collection, with Cercopithecidae being the best-represented group in the collection, largely account of the high prevalence of *Cercopithecus*, *Macaca* (fig. 7) and *Mandrillus* specimens. There are 16 Colobinae specimens, one from the Asian clade and 15 from the African clade. For historical reasons many of these old world monkeys were collected in Equatorial Guinea, a former Spanish colony. In 1919 the Board of the Natural Science Museum in Barcelona decided to support the proposal of Manuel Martínez de la Escalera and his son Fernando Martínez de la Escalera about an expedition



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Fig. 6. Specimen of an adult male of *Avahi cleesei* from Madagascar purchased by the Museum in 1883.

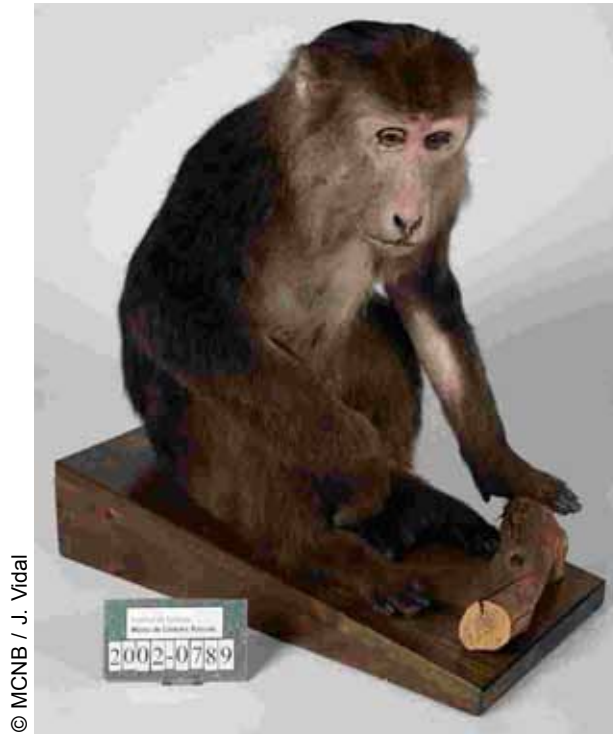
Fig. 6. Especimen de un macho adulto de *Avahi cleesei* procedente de Madagascar, comprado por el Museo en 1883.

to Equatorial Guinea to collect wild animal specimens for the Museum of Natural Science of Barcelona. In this expedition both invertebrates and vertebrates were collected and brought back to the Museum. Of particular interest is a specimen of *Ptilocolobus pennanti* (fig. 8) which is stuffed and in good condition. It was probably collected on Bioko Island.

The five specimens in the Hylobatidae family represent the genera *Hylobates* and *Nomascus*. The Hominidae family is represented by 57 specimens.

The presence of many specimens of *Gorilla gorilla*, members of the “Copito de Nieve” family group, donated by the Barcelona Zoo, is especially noteworthy.

Many specimens are included in the Critically Endangered IUCN Categories (IUCN, 2010); these include *Varecia variegata* (Kerr, 1792), *Ateles fusciceps* Gray, 1866, *Saguinus oedipus* (Linnaeus, 1758), *Ptilocolobus pennantii* (Waterhouse, 1838), *Pongo abeli*, Lesson 1827, *Gorilla gorilla* (Savage, 1847).



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Fig. 7. *Macaca thibetana* received from the Barcelona Zoo.
Fig. 7. *Macaca thibetana* procedente del Zoo de Barcelona.



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Fig. 8. *Ptilinopus pennantii* from Bioko Island.
Fig. 8. *Ptilinopus pennantii* procedente de la Isla de Bioko.

Conclusion

The scientific value of the collection has increased since the review. A total of 83 taxa are represented in the primatological collection of the Natural Science Museum of Barcelona. Although the individual groups have yet to be studied specifically our work can help support the Museum's educational and scientific commitments. The Primate Collection is, in fact, one of the collections at the MCNB most commonly used by researchers in biology, palaeontology, anthropology and medicine (Gibert et al., 2007; Galbany et al., 2004; Potau et al., 2007).

As stressed by many authors (Capanna, 1996; Bullini 2004; Gippoliti, 2005), modern biological collections play a vital role in biodiversity studies. Historical collections have great importance for understanding present and former diversity at population and species level. Moreover, The materials housed at the NSMB and their fascinating histories connected to zoologists, animal sellers and explorers considerably enhance the history of this wonderful city.

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