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Annotated catalogue of primate type specimens in the mammal collection
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1. Abstract

For the first time an annotated catalogue of the primate type specimens in the mammal collection of the Naturhistorisches Museum Wien is presented. The nomenclatorial and taxonomic status of all traceable type specimens was evaluated. Altogether 110 type specimens (15 holotypes, 71 syntypes, 8 lectotypes, 1 paratype and 15 paralectotypes), representing 46 nominal taxa, could be encountered. A proposal for the designation of a lectotype for *Lepilemur mustelinus rufescens* is made. The nominal taxa *Cercopithecus toldti* and *Lasyopyga tantalus graueri* were found to be synonyms of *Chlorocebus tantalus* and *Chlorocebus cynosuros* respectively, contrary to previous presumptions. It is additionally shown that the names *Simia leukeurin*, *Macaco barriga* and *Simia polycomos* possess no nomenclatorial relevant status.

2. Introduction

The mammal collection of the Naturhistorisches Museum Wien (Museum of Natural History Vienna) belongs to the world's most important mammal collections especially due to its high historical significance, the diversity of its holdings and also, though not to that extent, in terms of number of specimens (ca. 2000 primate specimens, representing 150 species [applied taxonomy following GROVES 1993]) (cf. GENOWAYS & SCHLITTER 1981; HAFNER & al. 1997).

Up to now no comprehensive lists of type specimens in the NMW's mammal collection have been published. Therefore this work should act as a starting point in treating all type specimens of primates currently in this collection. Since primates are one of the less speciose orders, roughly including 380 species (GROVES 2005), of the class Mammalia and due to their high relevance in for example conservation biology, ethology, physiology and anatomy the level of knowledge on this group is relatively high compared with other groups of mammals. Crucial however for the future accessibility of past research is a detailed knowledge of the taxonomy and nomenclature of a taxon whereby commented lists of type specimens can contribute considerably (SMITH & BUERKLI 1969). The compilation of such exhaustive lists, covering primary and secondary type specimens and detailed background information, is time consuming (STEINHEIMER 2010) but the value for future taxonomic work is considerable.

2.1. Primate evolution and systematics

Despite intensive research the delimitation of primates within the class Mammalia is still controversially debated, particularly when extinct taxa are taken into consideration (e.g. SILCOX 2007). Hitherto only two potential, morphological autapomorphies of the primates, the possession of a petrosal bulla (WIBLE & COVERT 1987) and an orthomesometrial embryonic disc (LUCKETT & HARTENBERGER 1993; SHOSHANI & al. 1996), have been discovered. Unfortunately both features are hardly applicable to fossil specimens since even the presence of a petrosal bulla can only be confirmed by developmental evidence barely preserved in the fossil record (SILCOX 2007). Thus, a comprehensively practicable, apomorphy-based approach for the diagnosis of primates is not available to date. Alternatively, SILCOX (2007) proposed a "node-based approach" diagnosing primates (including the extinct Plesiadapiformes) as "the clade stemming from the most recent common ancestor of *Purgatorius* [Purgatoriidae, Plesiadapiformes] and Euprimates [= Primates s. str.]".

Also the position of the primates within the class Mammalia remains controversial. Morphological as well as molecular data broadly support an Euarchonta clade (WADELL & al. 1999) encompassing tree shrews (Scandentia), flying lemurs (Dermoptera) and primates. Within the Euarchonta molecular and recent morphological (on the problems of cladistic

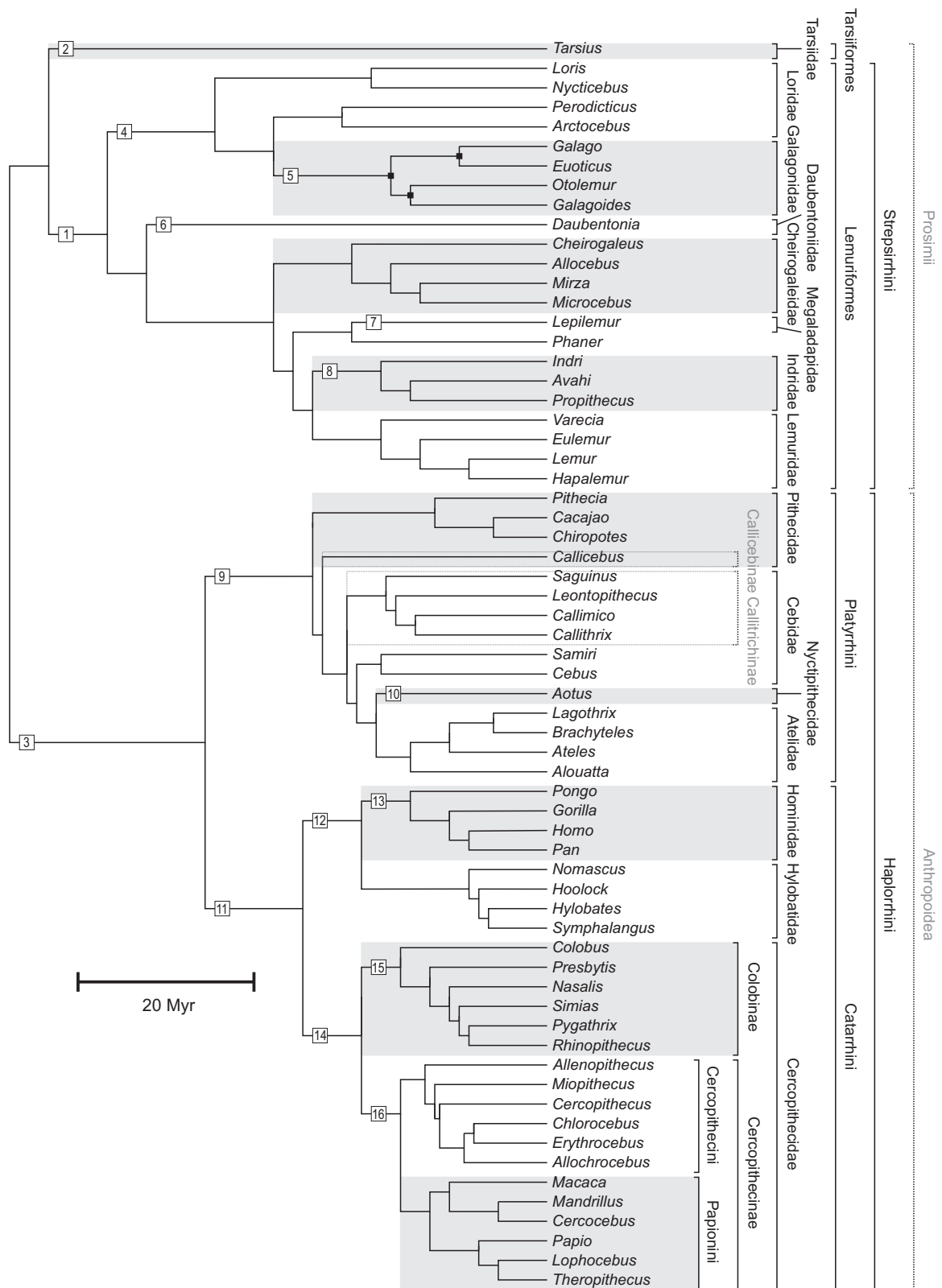
analysis of morphological data of higher mammal taxa cf. SPRINGER & al. [2007a]) analysis either indicate a sister group relationship between Primates and Scandentia (molecular data: LIU & MIYAMOTO 1999; LIU & al. 2001; MADSEN & al. 2001; MURPHY & al. 2001a, 2001b; SPRINGER & al. 2007b; morphological data: BLOCH & al. 2002; SARGIS 2007) or between Primates and Dermoptera (molecular data: JANEČKA & al. 2007; WADELL & al. 1999; morphological data: BEARD 1989, 1990, 1993a, 1993b).

The earliest known fossils of undoubted primates (excl. Plesiadapiformes) date back to the earliest Eocene, 54-55 Myr years ago (TAVARÉ & al. 2002). Based on the fragmentary fossil record of (e.g. MARTIN 1990) the time of origin the order is dated back to the later Cretaceous between 80 and 90 Myr years ago (TAVARÉ & al. 2002) which is roughly in accordance with the dates gained from the molecular clock (e.g. SPRINGER & al. 2003; BININDA-EMONDS & al. 2007). As these early fossils appear more or less synchronously in North America, Europe and Asia, it is unclear where primates actually evolved (reviewed in FLEAGLE & GILBERT 2006). Currently Asia, Europe and Africa are considered to be possible candidates as points of origin of the order (e.g. HEESY & al. 2006; FLEAGLE & GILBERT 2006), indeed prevailing hints point to Asia to date (BEARD 2002, 2006). The platyrrhines, now restricted to tropical Central and South America, supposedly dispersed there by rafting from Africa (HOFFSTETTER & LAVOCAT 1970, cit. in FLEAGLE & GILBERT 2006). Presently primates are largely restricted to tropical and subtropical regions of Africa, Asia and America (FLEAGLE 1999; FLEAGLE & GILBERT 2006). Noteworthy exceptions are the undoubtedly naturalized Barbary macaques (*Macaca sylvanus* (LINNAEUS, 1758)) of Gibraltar, Iberian peninsula (MASSETI & BRUNER 2009) and the Japanese macaques (*Macaca fuscata* (BLYTH, 1875)) (ENDO 2009), living in temperate climates.

Modern systematics divides the recent primates in Strepsirrhini and Haplorrhini, which diverged between 77 myr and 49 myr years ago (GOODMAN & al. 1998; CHATTERJEE & al. 2009; STEIPER & YOUNG 2006; JANEČKA & al. 2007; EIZIRIK & al. 2004). The monophyly of these groups is largely supported by morphological and molecular analyses (e.g. CHATTERJEE & al. 2009; SHOSHANI & al. 1996). Still controversial remains the position of the Tarsiiformes

→

Figure 1: Dendrogram of the extant primate genera largely inferred from a mtDNA supermatrix (modified from CHATTERJEE & al. 2009). Interrelationships within Galagonidae follow MASTERS & al. (2007) and within Cercopithecini TOSI & al. (2005). Not included in the mentioned studies were the genera *Pseudopotto* SCHWARTZ, 1996 (Lorisidae) and *Oreonax* THOMAS, 1927 (Atelidae). *Mico* LESSON, 1840, *Calibella* VAN ROOSMALEN & VAN ROOSMALEN, 2003 and *Cebuella* GRAY, 1866 were not considered to be generically distinct from *Callithrix* ERXLBEN, 1777 (Cebidae) by CHATTERJEE & al. (2009). Node heights (horizontal) representing mean divergence times estimates (after CHATTERJEE & al. 2009 and TOSI & al. 2005). All splitting events within Galagonidae were not dated according to the molecular clock (MASTERS & al. 2007) and are therefore marked with black squares. Higher taxonomic entities (above genus), not recognized by CHATTERJEE & al. (2009) are written in grey. Chosen apomorphies (open squares) for selected extant groups (if not otherwise stated after SHOSHANI & al. [1996]; FLEAGLE [1999] and GEISSMANN [2003]) are: [1] Mandibular tooth comb; epitheliochorial placenta (CHATTERJEE & al. 2009); oblique *Facies malleolaris lateralis* (Talus-Fibular-facet); *Musculus flexor hallucis longus* groove positioned lateral on the posterior talar trochlear. [2] Grooming claw on the second and third digit; dental formula 2.1.3.3/1.1.3.3. [3] Mandibular symphysis fused; uterus simplex; complete postorbital plate behind eye; spatulate incisors; no contact between mandibular condyle and the *Os zygomaticum*; *Facies malleolaris lateralis* does not reach the plantar side of the talus on the median side. [4] Second toe and digit reduced. [5] Elongated hind limbs and tarsus. [6] Reduced dentition, dental formula 1.0.1.3; rodent like, ever-growing incisors. [7] Lacking upper incisors; expanded mandibular condyles. [8] Mandibular tooth comb consisting of only four teeth; two premolars per quadrant. [9] Placental hematopoiesis; intraplacental maternal vessels; no contact between the *Os frontale* and the *Ala major* (alisphenoid) of the *Os sphenoidale*; hallucial tarsometatarsal joint. [10] Rudimentary or absent retinal fovea (cf. e.g. KIRK & KAY 2004). [11] Clearly delineated fossa genioglossi foramen. [12] Asymmetrical femoral condyles; round *Tuberositas deltoidea* of the humerus. [13] *Foramen obturatum* equally wide as Acetabulum; *Papillae fungiformes* restricted to the apex of the tongue; reduced (<200/cm²) hair density on the dorsum. [14] Bilophodont molars. [15] Stomach with three to four compartments. [16] Cheek pouches.



as a sister group to the Strepsirrhini or the Haplorrhini (e.g. YODER 2003). As, according to molecular data, the Tarsiiformes diverged shortly after the split between the Strepsirrhini and the Haplorrhini, they shared only little evolutionary history and could not evolve marked synapomorphies that connect them with either one of these groups (EIZIRIK & al. 2004). Similarly, the interrelationships of the new world monkeys (Platyrrhini) and the Colobinae are not fully resolved to date (e.g. CHATTERJEE & al. 2009). A recent classification of the primates, based on extensive molecular data, is shown in figure 1 (after CHATTERJEE & al. [2009]; TOSI & al. [2005] and MASTERS & al. [2007]).

2.2. Current primate taxonomy

Essential for the understanding of the taxonomy of a certain group of organisms is the awareness of the underlying working concept (i.e. species or subspecies concept) that the concerned taxonomists applied. Such differences may imply a considerable bias (ISAAC & al. 2004), especially, if species numbers are compared between taxonomic groups that are influenced by different “taxonomic cultures”. Unfortunately taxonomists often do not communicate this crucial information. Regarding primatology, the primarily applied species concept is, largely due to Colin P. Groves’ influential contributions (e.g. GROVES 2001, 2005), the Phylogenetic Species Concept (PSC) after CRACRAFT (1983). The PSC defines a species as “the smallest diagnosable cluster of individual organisms within which there is a parental pattern of ancestry and descent” (CRACRAFT 1983). In contrast to MAYR’s (1942) Biological Species Concept, which defines species as “groups of actually or potentially interbreeding natural populations which are reproductively isolated from other such groups” (MAYR 1942, p.120), the PSC has some major advantages in relying on the pattern resulting from speciation events rather than the process of speciation itself (e.g. GROVES 2001, 2004). These advantages, beyond others, are (after GROVES 2004): (1) It is objective in evaluating the diagnosability of species and is therefore falsifiable; (2) Allopatric taxa can be evaluated since interbreeding is not a criterion; (3) Species are recognized by fixed differences thus the amount or degree of difference, the mechanism of speciation and the time elapsed after speciation is not pivotal.

Primate taxonomists widely accept the subspecies as, at least, a tool to communicate the diagnosable distinctiveness of a certain collection of populations of a species, inhabiting a subdivision of the species’ range (MAYR 1963; PATTEN & UNITT 2002; GROVES 2001, 2004). Thus, recognized subspecies should be carefully evaluated regarding their diagnosability. Mean differences between two populations are not enough to claim subspecies status rather a certain proportion of the population, per convention 75%, has to be diagnosable (PATTEN & UNITT 2002).

2.3. History of Primate Taxonomy

Detailed outlines regarding the history of primate taxonomy and systematics can be found in GROVES’ books “Primate Taxonomy” (2001) and “Extended family” (2008). If not otherwise stated, the following account is based on these texts.

The starting point of current primate taxonomy is, as for all zoological taxonomy, the appearance of the tenth edition of LINNAEUS’ “Systema Naturae” in 1758. Linnaeus therein included four genera, *Homo*, *Simia*, *Lemur* and *Vespertilio*, in the order Primates, whereby the bats were soon excluded by subsequent scientists. Straight after Linnaeus new primate taxa were described only to a small extent. At the beginning of the 19th century, especially French scientists began to describe more and more new species that were brought to Europe mostly from colonies or other regions of major influence. Thus, the most lemur species were described by Étienne Geoffroy Saint-Hilaire of France. Also at that time, extensive expeditions to South and Central America were equipped to obtain new natural history specimens from

this large, widely unknown continent. Noteworthy are those of Alexander von Humboldt, Johann Baptist von Spix, Johann Centurius Hoffmann von Hoffmannsegg and Johann Natterer which resulted in the description of a large amount of newly recognized neotropical taxa (Fig. 2). Until the end of the century, new primate species from all over the world were continuously described by the curators of the major European museums.

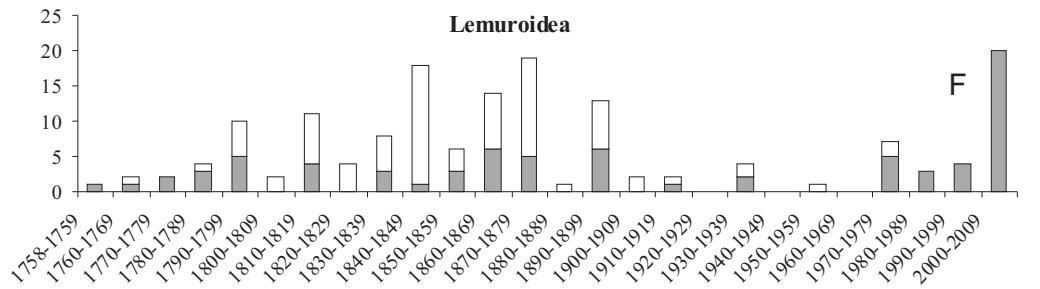
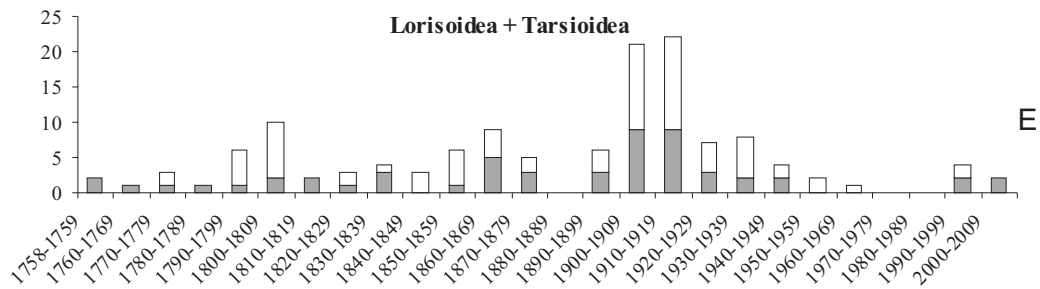
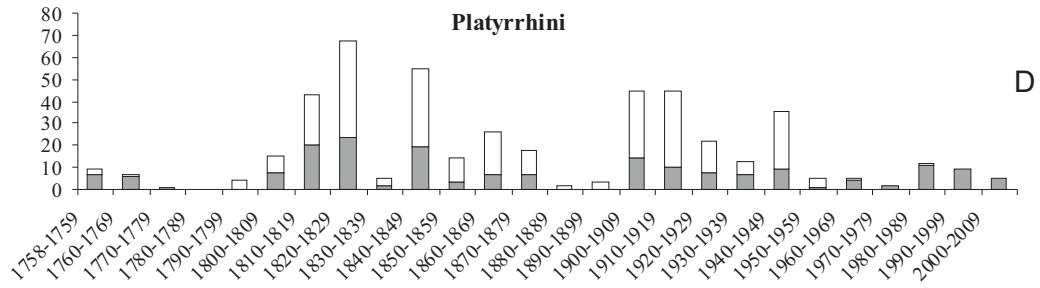
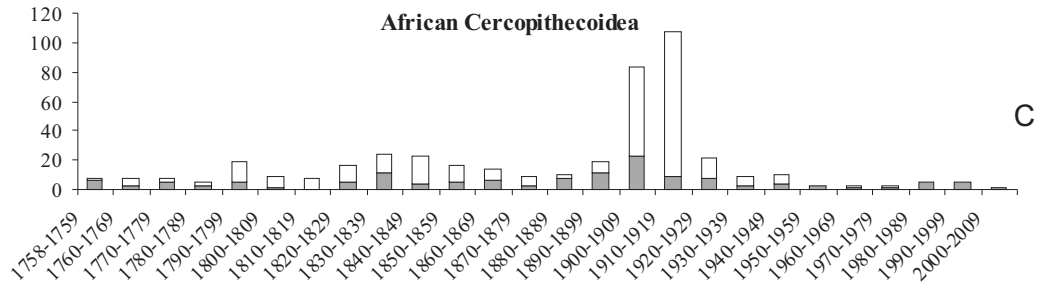
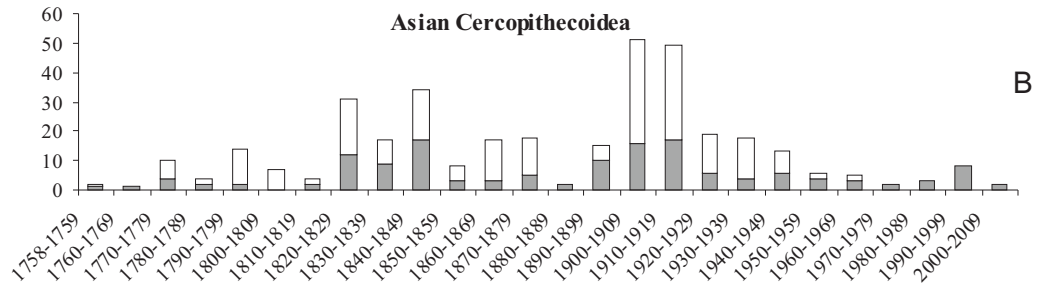
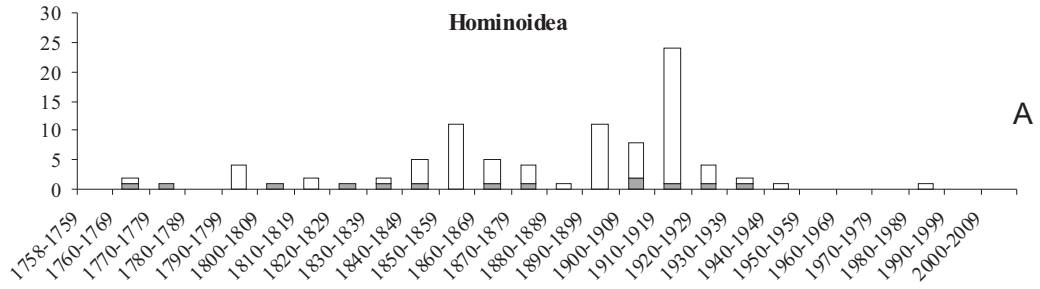
With the introduction of the subspecies in zoological taxonomy around 1880 (MALLETT 2001), a raft of new taxa had been introduced. This was further enhanced by expeditions that produced a lot of new specimens, especially from hitherto poorly known regions of Asia and Africa. The third factor that contributed thereto were the, often theoretically poor, concepts of species and subspecies, applied by some of the taxonomists of that time. Important representatives of this constellation were Daniel Giraud Elliot in America, Georg Friedrich Paul Matschie in Berlin, Ludwig Lorenz von Liburnau in Vienna and Einar Lönnberg in Stockholm. They were responsible for the description of numerous new primate taxa in the early 20th century but most of these are now considered to be synonyms (Fig. 2). Unequally more successful were two mammalogists that worked at the same time in Washington and London respectively. These were Gerritt S. Miller and M. R. Oldfield Thomas, who also described many new taxa but due to their competence had a far higher “hit rate” (GROVES 2008) than the former.

Thereafter most primate taxonomists did revisions of certain groups or concentrated on the higher rank order. Consequently, only very few new species or subspecies have been described around the middle of the 19th century. Only with the introduction and application of new methods such as karyology, biochemical and molecular analyses and ethology a, still continuing, revival of primate taxonomy occurred (Fig. 2). This is also depicted by the increasing number of newly recognized species, especially from taxonomically challenging groups.

2.4. Importance of type specimens

At the ninth International Zoological Congress in Monaco (1913) the type method for species ranked taxa had been introduced ([ICZN] 1914); an adequate ruling at the genus level was decided already in 1907 (RICHTER 1943). As a result the type replaced the definition (sensu ICZN 1999, glossary: “A statement in words that purports to give those characters which, in combination, uniquely distinguish a taxon.”) as the basis of a nominal taxon (i.e. a taxon denoted by a name and based on a name-bearing type [ICZN 1999]) whereby a substantial improvement of nomenclatorial stability could be achieved. The quality of a taxon’s original description no longer formed the crucial point. As a description is inherently imperfect, solely since it can’t consider all possible relevant characteristics, it becomes useless if new features become relevant in the taxonomy of a group of organisms. Whereas type specimen(s) can be re-examined and re-described in respect to these, providing that the type specimen is principally suitable regarding the developmental stage or the preservation method (SIMPSON 1961; MAYR 1969). In some cases the application of new methods (e.g. genetic analyses [see e.g. PAYNE & SORENSON 2003; KRUCKENHAUSER & HARING 2010]) even allow the assignment of names, described on the basis of unsuitable specimens, to taxa currently recognized. For example extinct species of Mascarene Island giant tortoises (*Cylindraspis* spp.) described on the basis of shells lacking accurate locality data, could be assigned to taxa erected for subfossil material from various of these Islands through analyses of ancient mtDNA (AUSTIN & ARNOLD 2002).

Decisive for proper taxonomic work remains the exact knowledge on the function of the various kinds of types that are recognized by the International Commission on Zoological Nomenclature (ICZN 1999). According to the rules of the latter, the type series of a “nominal



species-group taxon consists of all the specimens included by the author in the new nominal taxon (whether directly or by bibliographic reference), except any that the author expressly excludes from the type series [...]” (ICZN 1999, art. 72.4.1.). Thus only one of these specimens can obtain a name-bearing function by initial (holotype) or subsequent (lectotype) designation. Solely the name-bearing type specimen necessarily and contingently belongs to its nominal taxon under every concept of the adjoining taxonomical taxa (SIMPSON 1940; cf. LEVINE 2001; LAPORTE 2003). Thereby for any taxonomic concept of a taxon (taxonomic taxon: i.e. “a taxon including whatever nominal taxa and individuals a zoologist at any time considers in his or her endeavor to define the boundaries of a zoological taxon” [ICZN 1999]) that includes the name-bearing type of a nominal taxon, the name of the latter has to be taken into consideration for its correct naming (SIMPSON 1940; RICHTER 1943). Consequently there is no need for a (name-bearing) type to be “typical” for a particular taxonomic taxon (SIMPSON 1940). Normally, quite the contrary is true, simply because at the time of the original description of a new species or subspecies mostly only the type specimen(s) is/are known and hence it is impossible to assess if this particular specimen is more or less typical in any trait.

All other specimens of the type series (i.e. paratypes, paralectotypes), beside the name-bearing type, fulfil no nomenclatorial function but can be otherwise valuable in two respects. These specimens form the basis of the original description of a presumably new taxon, the original “hypodigm” in SIMPSON’s (1940) terms, and are therefore essential for the understanding of the original author’s concept thereof (cf. SMITH & BUERKLI 1969). Furthermore, if the name-bearing type of a nominal species or subspecies gets lost, an eventual neotype shall possibly be designated from the paratypes or paralectotypes of the particular nominal taxon (ICZN 1999, recommendation 75A).

Beside their function in biological science, type specimens are also of value for historical sciences; for example in demonstrating the development of the taxonomy of higher taxa (e.g. JOHNSON 2005).

According to the high scientific value of type material, institutions are requested to label the type specimens in their possession and take precautions for their safe preservation. Furthermore the ICZN recommends institutions to make type material under their custody accessible for study and to publish lists of its (ICZN 1999, recommendations 72D.-72F.).

A world wide bibliographic compilation of published type lists is provided by JADWIGA & RYDZEWSKI (1991) and JURKOWSKA (2004). A list of catalogues dealing with primate type specimens is presented in appendix II.

2.5. History and Documentation of the collection

The beginnings of the NMW mammal collection date back to 1793 when Emperor Franz II (since 1804 Emperor Franz I of Austria) bought the collection of his falconer Joseph Natterer (sen.) (that contained specimens of native birds and mammals as well), for his private cabinet of natural history specimens in Vienna (FITZINGER 1868a).

Comprehensive works on the history of the collection were published by FITZINGER (1856, 1868a, b, 1880a, b) and PELZELN (1890). Major acquisitions of primate specimens, relevant for the present work, are mentioned in the following in chronological order.

←
Figure 2: Number of new species and subspecies described per decade between 1758 and 2009. **A:** Hominoidea. **B:** Asian Cercopithecoidea. **C:** African (incl. the Arabian peninsula) Cercopithecoidea. **D:** Neotropical Platyrrhini. **E:** Lorisioidea and Tarsioidea (worldwide). **F:** Malagasy Lemuroidea. Figures follow the number of names listed by GROVES (2005), supplemented by taxa described after the mentioned publication. Bars represent all new names introduced within a decade. Taxa currently recognized as valid (after GROVES 2005) are depicted in grey. Note the different scales.

Due to financial problems the popular British collector of naturals, Sir John Ashton Lever (1729-1788), was forced to dispose his huge collection of natural history specimens and ethnographical objects by lottery in 1786, since neither the Empress of Russia nor the Trustees of the British Museum were willing to buy the whole collection. Thus the “Leverian Museum” went on to James Parkinson who in turn could not sustain it for long and therefore sold all objects from the collection by auction in 1806 (WHITEHEAD 1978; LARGEN 1987). At this auction, lasting 64 days with at least 135 bidders, Leopold von Fichtel (1770-1810) obtained the second largest amount of specimens, including 82 mammals, of all purchasers for the NMW (LARGEN 1987; FITZINGER 1868a). Among these were highly important specimens described previously by distinguished British naturalists such as Thomas PENNANT (1726-1798) in his “Synopsis of Quadrupeds” (1771) and “History of Quadrupeds” (1781) as well as George SHAW (1751-1813) in the “Museum Leverianum” (1792) and the “General Zoology” (1800). As Pennant didn’t use scientific binomials his descriptions formed the basis of names assigned to them by other people like Eberhard August Wilhelm Zimmermann (1743-1815) and Robert Kerr (1757-1813) (ZIMMERMANN 1780; KERR 1792).

The second considerable increase in primate (type) specimens was due to Johann Natterer’s (1787-1843) stay in Brazil. In the course of the marriage of Princess Leopoldine with the Portuguese crown prince Dom Pedro an expedition to Brazil had been equipped and joined by Natterer. While most members of the expedition returned back to Austria within a few years, he stayed in Brazil for nearly 18 years collecting vast amount of, mainly zoological, material (Tab. 1; FITZINGER 1868b). Among others his collections contained about 270 primates (PELZELN 1883) that were mainly treated and described by the German Johann Andreas Wagner (1797-1861) in his works on Brazilian mammals (WAGNER 1842, 1848) and around 30 years later by August Pelzel von Pelzeln (1825-1891) (PELZELN 1883).

Between 1888 and 1922 Ludwig Lorenz von Liburnau (1856-1943) was curator of the mammal collection. He was by far the most prolific describer of new primate taxa at the NMW. Despite only one of the species and subspecies he described is considered to be valid (*Galago matschiei*) nowadays, he is still well known (e.g. COLYN 1991, 1993; GROVES 2001) for the first detailed analysis of the coat colour polymorphism of *Ptilocolobus foai* (LORENZ 1917). Around 1898 he managed to work on the mammals collected by Alfred Voeltzkow (1860-1947) in Madagascar and Zanzibar, including at least 106 primates (LORENZ 1898).

Table 1: Departure and arrival dates of Natterer’s shipments. Reconstructed from BLAAS (1976), FITZINGER (1868b, 1880a), PELZELN (1890) and SCHREIBERS (1820, 1822).

Shipment no.	Departure	Arrival	Number of mammal specimens
1	1.vi.1818	25.xi.1818	44
2	iii.1819	8.xi.1819	36
3	18.iv.1819	8.xi.1819	199
4	iv.1821	15.x.1821	14
5	v.1821	i.1822	?
6	12.x.1821	iii.1822	25
7		iii.1823	88
8		ix.1827	115
9		xi.1830	181
10		v.1831	79
11	ix.1835 (?)	1835	205
12	9.xi.1835	1836	160

Parts of this material were afterwards donated to the NMW by Voeltzkow whereas the remaining parts went to the SMF. The second largest collection of primates, obtained by the NMW, came from to the expedition of Rudolf Grauer (1870-1927), to what was at that time the Belgian Congo, from 1909 to 1911. This expedition was sponsored by the industrialist Philipp von Oberländer and yielded around 110 primates. Lorenz described several new species and subspecies of primates from this material in a series of articles between 1913 and 1915 and presented a comprehensive account, entitled “Beitrag zur Kenntnis der Affen und Halbaffen von Zentralafrika”, in 1917 (LORENZ 1913, 1914a, 1914b, 1914c, 1914d, 1915, 1917).

In addition to the above mentioned people, certain other collectors and scientists provided and described, partly simply renamed, specimens now in the collection of the NMW: Étienne Geoffroy Saint-Hilaire (1772-1844) (GEOFFROY SAINT-HILAIRE 1812), Karl Albert Haberer (1864-1941), Theodor von Heuglin (1824-1876) (HEUGLIN 1877), Carl Alexander Freiherr von Hügel (1796-1870), René Primevère Lesson (1794-1849) (LESSON 1840), Heinrich Friedrich Link (1767-1851) (LINK 1795), Adolf Bernhard Meyer (1840-1911) (MEYER 1896), Johann Christian Mikan (1769-1844) (MIKAN 1823), Heinrich Gottlieb Ludwig Reichenbach (1793-1879) (REICHENBACH 1862-1863), Hermann Schlegel (1804-1884) (SCHLEGEL 1876), Henry Smeathman (1742-1786)¹, Alfred Weidholz (1880-1945), Otto Wettstein von Westersheimb (1892-1967) (WETTSTEIN 1816, 1817).

Documentation: Due to the close personal connection of the collections of birds and mammals at the NMW the methods of documentation are very similar (cf. SCHIFTER & al. 2007). From 1806 up to 1915, provisionally even up to 1923, all specimens were recorded in the book of acquisitions (AV; bound folio ledgers, kept in the NMW’s mammal collection). These entries contain information on the source of the specimens, their initial identification and optionally collecting localities and other data. Usually every specimen or species originating from one source was registered under a unique tripartite number (i.e. acquisition number) formed by the year, the page and a running number (e.g. AV 1806/III/2). The acquisition number acted as inventory number until modern inventory numbers were introduced. This happened around 1908 under the curator ship of Lorenz von Liburnau. Initially one inventory book has been used to register new incomes but also to retrospectively record the holdings of the collection. In the early days of this system, different kinds of preparation (i.e. skin or skull) were entered as “a” or “b” under one number. Thus later on, two additional separate inventory books for skins and mounted specimens respectively (indicated with B respectively ST before the actual inventory number) were established. Considerable confusion arose because in several cases no cross references to the different parts of a specimen (e.g. skin and skull) was made in the different inventory books. Furthermore, specimens already registered under the old “a, b system”, occasionally were later re-inventoried. From 1961 onwards, only the initially established inventory book has been continued and it was begun in order to solve the previously accumulated confusion (pers. comm. K. Bauer i.2010). Today only the oldest inventory number assigned to a particular specimen is used and in the case of an additional B- or ST-number was assigned to it, this forms the second part of the number separated by a slash. For specimens bearing only B- or ST-numbers these are the valid inventory numbers. In the case of more than one number in one of the three inventory books being assigned to one specimen, the subsequent is cited in parenthesis in this catalogue.

Beside the mentioned numbering systems, two additional systems have been used over time. In the first half of the 19th century individual numbers have been assigned to some of the

¹ The British Naturalist Henry Smeathman collected naturals in Sierra Leone during his stay from 1771 to 1775 (DOUGLAS 2004, 2008). His specimens at the NMW represent the earliest existing example of mammals from this country (cf. JONES 1998).

specimens in the collection, probably by Johann Jakob Heckel (cf. AV 1866/X), but no corresponding catalogue is known.

A rather complex system of cataloguing specimens was used by the brothers Johann and Josef Natterer to record the material collected by the former in Brazil. They used a species based rather than a specimen based numbering system. Johann Natterer maintained some kind of field notes, containing various biological information that largely formed the basis of PELZELN's (1883) publication, within which he assigned different numbers to what he believed to represent distinct species. His brother Josef, who was in charge of the mammal collection at that time, recorded on separate paper sheets for every species (divided by sex and age) the number of specimens arriving at Vienna in course of the twelve shipments (Tab. 1) from Brazil (cf. GOODWIN 1963).

3. Methods

In the course of the preparation of the present catalogue, all primate specimens currently held by the NMW were checked due to their possible type status with the available taxonomic literature. Quite a number of type specimens have already been identified by employees of the mammal collection over time, thus in most cases a re-evaluation of the type status, according to the latest edition of the International Code of Zoological Nomenclature (ICZN 1999), was necessary.

Besides the cataloguing of the actually present type specimens, references from the literature to types in the NMW have been verified and wrong information is corrected at the end of the catalogue. Also, names, based on specimens in the NMW, viewed as available by modern taxonomists but in fact unavailable according to the ICZN (1999), are also listed and commented on the end of this work.

The taxonomy and linear arrangement of taxa follows GROVES (2005) if not otherwise stated.

In order to assess the status of the type specimens a number of data sources have been consulted. Primarily label data, especially from original labels, and the specimens themselves were compared with the original description to recognize concordances or possible discrepancies. If the specimen label indicated a particular type status (e.g. syntype, lectotype etc.) this was considered as evidence but never as confirmation of the same. Additional information originated from the book of acquisitions, wherein sometimes names are listed that afterwards were published (e.g. for Heuglin's *Cercopithecus poliophaeus* REICHENBACH, 1863), which was taken as evidence for the inclusion of the particular specimen into the type series.

Structure of the taxon accounts:

For every nominal taxon a standardized entry, largely following SCHIFTER & al. (2007), is presented. The following points are encompassed:

Taxon name taken from the original description in identical spelling also relating to the occasional capitalisation of the species epithet.

Author's name and year of publication

Locality as given in the original description (identical spelling). This does not necessarily represent the type locality that is fixed by the name bearing type (ICZN 1999, art. 76.1.).

Abbreviated citation of the original description. Only the pages and plates (figures) in fact containing the original description and not the whole articles are cited. For full citation see under "references".

Current status of the nominal taxon, principally follows GROVES (2005), if not otherwise stated. Afterwards, publications crucial for the understanding of the current status of the nominal taxon and the latest revision(s) of the whole genus are listed. In the case that the

taxon in question has been synonymised different from previous authors, a detailed explanation is given under “comments”.

Facultative a list of ms. names, junior synonyms and incorrect subsequent spellings is given, whereby the latter were not completely recorded but represent just an assemblage that came to the author’s knowledge during the preparation of this work².

List of all type specimens of the particular nominal taxon kept at the NMW. Types of different status (ICZN 1999, art. 72.1.1.-72.1.3.) are listed separately. The number of specimens per category is given in round brackets.

Data for every type specimen: If not otherwise stated the information stems from the original label or R. Grauer’s field notes in the case of the specimens having been collected by the latter. In the case of lacking or incomplete original labels, data were drawn from various other sources (AV or published sources). The alternative primary source (e.g. museum label, AV) is cited in square brackets at the end of a specimen’s entry. All other sources are cited in round brackets. Information not explicitly cited by the used sources but evidently from the known context is presented in square brackets.

Inventory numbers preceded by the museum acronym “NMW”. Numbers (facultative) mentioned afterwards in round brackets arose from double inventorying (see above).

Sex in standardized form as ♀ and ♂ respectively.

If the specimen does allow an age estimation the age divided in juv., (immat., subad.) and ad.

Method of preparation. If the skull was not removed from the skin, it is cited in round brackets as “(skull)”.

Collecting locality in identical spelling as given in the particular cited source.

Collecting date given in standardized form (e.g. 29.iv.1914).

Source (collector, donator, seller) with standardized indication of the acquisition mode (i.e. leg., don., vend., ded.). Field numbers are mentioned in round brackets following the collector.

For specimens collected by Johann Natterer, the shipment number is cited if ascertainable.

If an entry in the AV exists, it is mentioned in round brackets in identical spelling.

List of all type specimens of the particular nominal taxon kept at other institutions. Types of different status (ICZN 1999, art. 72.1.1.-72.1.3.) are listed separately. In parenthesis the number of specimens per category is given. The structure of these entries follows that of the NMW specimens.

Locality: Detailed information concerning the collecting localities of the type specimens is given. In the case of the type locality having been restricted subsequently due to the designation of a lectotype, the former is indicated as “[loc.typ.]”.

Comments

If skull measurements are presented, these have been taken with a digital Mitutoyo Absolute Digimatic caliper to the nearest 0,1 mm.

Museum abbreviations:

BMNH	Natural History Museum (formerly “British Museum [Natural History]”), London
HMUG	Hunterian Museum, University of Glasgow, Glasgow
IRSNB	Institut Royal des Sciences Naturelles de Belgique, Bruxelles

² As published incorrect spellings are included in comprehensive synonymies (cf. GARDNER & HAYSEN 2004) it was thought to be useful to include them in order to support future nomenclatorial and taxonomic works.

MNHN	Muséum National d’Histoire Naturelle, Paris
MTKD	Museum für Tierkunde, Dresden
NMB	Naturhistorisches Museum, Braunschweig
NMBE	Naturhistorisches Museum der Burggemeinde Bern
NMC	Naturkunde-Museum Coburg
NMW	Naturhistorisches Museum Wien, Vienna (sometimes also NHMW or NHM)
PCM	Powell-Cotton Museum of African and Asian Zoology and Ethnography, Birchington
RMCA	Royal Museum for Central Africa, Tervuren
RMNH	Naturalis (formerly “Rijksmuseum van Natuurlijke Historie”), Leiden
SSFG	Stiftung Schloss Friedenstein, Gotha
SMF	Senckenberg Naturmuseum, Frankfurt am Main
SMNG	Senckenberg Museum für Naturkunde, Görlitz
SMNS	Staatliches Museum für Naturkunde, Stuttgart
USNM	National Museum of Natural History (formerly “United States National Museum”); Smithsonian Institution, Washington, D. C.
ZMB	Museum für Naturkunde (also “Zoologisches Museum der Humboldt-Universität Berlin”), Berlin

Other abbreviations used:

ad.	adult
ap.	apud; after
AV	Akquisitionsverzeichnis; book of acquisitions
coll.	collection
ded.	dedit; given (in course of an exchange)
don.	donatus; donated
ICZN	International Commission on Zoological Nomenclature
immat.	immature
juv.	juvenile
leg.	leget; collected by
loc.typ.	locus typicus; type locality
ms.	manuscript (unpublished)
n.loc.	not located
subad.	subadult
USBGN	United States Board on Geographic Names
vend.	venditus; sold
vol.	volume

4. Catalogue of type specimens

4.1. Megaladapidae FORSYTH MAJOR, 1893

Lepilemur I. GEOFFROY SAINT-HILAIRE, 1851

L[epidolemur]. mustelinus rufescens LORENZ, 1898 (Ambundubé)

Abh. senckenb. naturforsch. Ges. 21 (3), 446-447, Pl. XXX and XXXI, Fig. 4a, b
 Now *Lepilemur edwardsi* (FORSYTH MAJOR, 1894). See RUMPLER (1975), RUMPLER & ALBIGNAC (1978) and PETTER & al. (1977). Recently the number of recognized, morphological more or less cryptic, and largely parapatric species in the genus *Lepilemur* greatly increased (questioned by TATTERSALL 2007 and ZINNER & al. 2007) primarily due to the extensive application of molecular analyses (e.g. LOUIS & al. 2006; ANDRIAHOLOINIRINA & al. 2006; CRAUL & al. 2007; ZINNER & al. 2007). The lack of molecular data of the type material currently does not permit a definitive assignment of *L. mustelinus rufescens* to *L. edwardsi* although the collecting locality lies within the present distribution of the latter.

Syntypes (3): NMW 893/B 4005 ♀ ad., skull, study skin (ex-mount?): Ambunduli; i.1892; [A.] Völtzkow (no.91, 31) [leg. et don.] (AV 1899/II/5 *Lepilemur mustelinus rufescens*); NMW 894 ♂, skull: Ambunduli; i.1892; [A.] Völtzkow (no.89, 25) [leg. et don.] (AV 1899/II/5 *Lepilemur mustelinus rufescens*); NMW B 3900 ♀, study skin: Ambundube; [i.1892]; Dr. Foeltzkow [no.90,] [leg. et don.] (AV 1899/II/5 *Lepilemur mustelinus rufescens*) [NMW label].

Partial syntypes in other institution (2): SMF 922A ♀ ad., skull: Ambunduli; i.1892; Dr. Voeltzkow (no.90) [leg. et don. (12.x.1900)]; SMF 922B ♂, skin: [Ambondrobe]; [i.1892]; Voeltzkow (no.89) [leg. et] don. (12.x.1900) (pers. comm. K. Krohmann xii.2009). Locality: Ambunduli / Ambundubé = Ambondrobe, 15°38'S, 46°24'E, Boeny, Mahajanga, Madagascar (THALMANN & GEISSMANN 2000).

Comments: LORENZ's (1898) description of *L. m. rufescens* based on three specimens (skin and skull each) collected by Alfred Voeltzkow in Ambondrobe. According to the AV for 1899 (AV 1899/II/5) one skin and one skull were returned to A. Voeltzkow after Lorenz's examination. In 1900 Voeltzkow presented the mentioned skin as well as the skull to the SMF where they were inventoried under the number SMF 922 despite their different field numbers and sex indications (pers. comm. K. Krohmann xii.2009). This would rather argue in favour of the fact that the skin and the skull in the SMF originate from different animals and belong to the skin (NMW B3900) and the skull (NMW 894) respectively in the NMW. The data of the specimens in both museums fit together uncontradicted (see above) and therewith only one male specimen as mentioned by LORENZ (1898) would be represented in the type series.

MERTENS (1925) designated the composed "specimen" in the SMF as the lectotype which was followed by subsequent authors (e.g. HILL 1953; PETTER & al. 1977). Due to the reasons explained above no particular syntype was unambiguously selected as lectotype by MERTENS (1925) and subsequent authors and therefore all potential previous lectotype designations have to be considered as invalid (ICZN 1999, art. 74.5). To avoid future confusion arising from the older literature and in accordance with the recommendations of the ICZN (1999, art. 74.7 and recommendations 74B-D), the specimen NMW 893/B4005 that was depicted in the original description should be designated as the lectotype³.

Contrary to the reference in the original description (LORENZ 1898), figure 3a, b, c, on plate XXXI depicts the skull of the syntype NMW 893/B4005 of *L. m. rufescens* whereas the cited figure 4a, b, depicts the skull of a juvenile "*L[epidolemur]. mustelinus typicus*" (pers. comm. K. Bauer xii.2009).

The meaning of the additional numbers written on the labels (listed above as second number after the field number) remains unclear.

TATTERSALL (1982) erroneously indicated all type specimens to be kept in the "MB" (= ZMB).

4.2. Indridae BURNETT, 1828

Avahi JOURDAN, 1834

A[vahis]. laniger occidentalis LORENZ, 1898 (Ambundubé)

Abh. senckenb. naturforsch. Ges. 21 (3), 452

Now *Avahi occidentalis* (LORENZ, 1898). See RUMPLER & al. (1990), THALMANN & GEISSMANN (2000), ZARAMODY & al. (2006) and ANDRIANTOMPOHAVANA & al. (2007).

³ This will be done in a subsequent publication.

The correct generic name *Avahi*, following JOURDAN's (1834) original spelling, has been reintroduced by SCHWARZ (1931a).

Lectotype: NMW 4400/B 3997 (7129) ♀ ad., skull, study skin: Ambundubi, Westmadagascar; i.1892; Dr. Foeltzkow (NMW label) (no.92, 26) [leg. et don.] (AV 1899/II/10 *Avahis laniger occidentalis*).

Locality: Ambundubi / Ambundubé = Ambondrobe 15°38'S, 46°24'E, Boeny, Mahajanga, Madagascar (THALMANN & GEISSMANN 2000).

Comments: LORENZ (1898) described *Avahis laniger occidentalis* on the basis of MILNE-EDWARDS & GRANDIDIER's (1875a, b) "*Avahis laineux occidental*" and the specimen collected by Voeltzkow but did not designate a holotype. Thus all specimens including that included by MILNE-EDWARDS & GRANDIDIER (1875a, b) represent syntypes (ICZN 1999, arts. 72.4.1. & 73.2.). On the occasion of a partial revision of the genus *Avahi* (THALMANN & GEISSMANN 2000, 2005) none of the material MILNE-EDWARDS & GRANDIDIER (1875a, b) had at hand for their description of "*Avahis laineux occidental*" could be identified in various museums (RMNH, BMNH, NMW, MNHN), wherefore the specimen from "Ambundubé" (NMW 4400/B3997) has been designated as the lectotype by THALMANN & GEISSMANN (2000). This was necessary because the type series of MILNE-EDWARDS & GRANDIDIER possibly contained specimens of the north-western species *Avahi unicolor* THALMANN & GEISSMANN, 2000 (THALMANN & GEISSMANN 2000). Thereby the multiple mentioned type locality "Ambundubé" (e.g. HILL 1953; TATTERSALL 1982; JENKINS 1987) – probably all following SCHWARZ (1931a) – subsequently became validated (THALMANN & GEISSMANN 2000). Previous designations of a lectotype (SCHWARZ 1931a) or a neotype (by J.-J. Petter [RUMPLER & al. 1990]) do not fulfil the requirements of the ICZN (1999) (TATTERSALL 1982; THALMANN & GEISSMANN 2000).

A photograph of the lectotype's facepattern was published by THALMANN & GEISSMANN (2000).

4.3. Loridae GRAY, 1821

Perodicticus BENNETT, 1831

Perodicticus nebulosus LORENZ, 1917 (Ukaika)

Ann. Naturhist. Mus. Wien 31, 239

Now *Perodicticus potto ibeanus* (THOMAS, 1910). See SCHWARZ (1931b), STUMP (2005) and BUTYNSKI & DE JONG (2007).

Holotype: NMW ST 595 ♂ ad., mount: Ukaika; i.1911; R. Grauer (no.355) leg., P.v. Oberländer don.

Locality: Ukaika, 00°45'N, 28°45'E, 900 m, Ituri (Orientale), Democratic Republic of the Congo (DAVIS & MISONNE 1964).

Comments: Holotype fixed by monotypy (ICZN 1999, art. 73.1.2.). According to Rudolf Grauer's field notes the skeleton was also collected, but it was neither mentioned by LORENZ (1917) nor is it traceable in the mammal collection of the NMW.

4.4. Galagonidae GRAY, 1825

Galago É. GEOFFROY SAINT-HILAIRE, 1796

Galago matschiei LORENZ, 1917 (Moëra)

Ann. Naturhist. Mus. Wien 31, 237-238

Now *Galago (Euoticus) matschiei* LORENZ, 1917. See OLSON (1979, 1986), NASH & al. (1989), GROVES (2001) and MASTERS & al. (2007).

Syntypes (3): NMW 318/B 3516 ♂ ad., skull, partial skeleton, skin: Moera; viii.1910; R. Grauer (no.139) leg., P.v. Oberländer don.; NMW 319/ST 584 (4383) ♂ ad., skull, mount: Moera; viii.1910; R. Grauer (no.140) leg., P.v. Oberländer don.; NMW 320/B 3515 (4382) ♂ ad., skull, partial skeleton, skin: Moera; viii.1910; R. Grauer (no.141) leg., P.v. Oberländer don.

Locality: Moëra = Mbau, 0°39'N, 29°30'E, 1000-1100 m, Nord-Kivu, Democratic Republic of the Congo (DAVIS & MISONNE 1964; HAYMAN & al. 1966).

Comments: Cranial measurements, partly supplementing LORENZ's (1917) description are given in table 2. The measurements of the type series generally fit well to (1) that presented by MASTERS & BRAGG (2000), on a series of 14 *G. matschiei* skulls, (2) that given in SCHWARZ (1930), of the holotype of *Galago senegalensis inustus* SCHWARZ, 1930 from Djugu (01°55'N, 30°30'E, Democratic Republic of the Congo [JENKINS 1987]) and (3) that

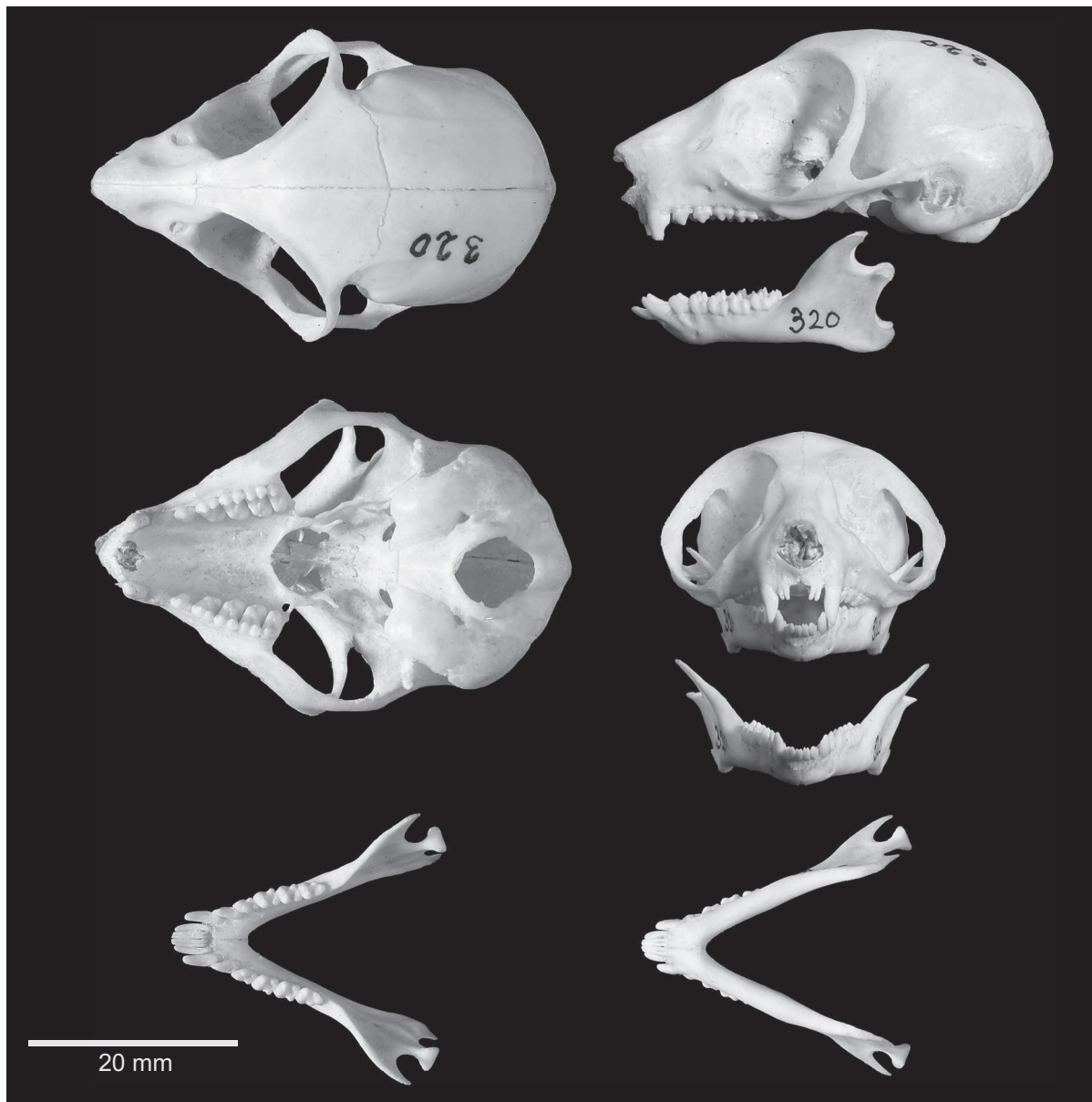


Figure 1: Dorsal, ventral, frontal and left lateral view of the skull and the mandible of a syntype (NMW 320/B 3515) of *Galago matschiei* LORENZ, 1917.

Table 2: Cranial measurements (in mm) of the type specimens of *Galago matschiei* LORENZ, 1917. For definitions of the measurements see MASTERS & LUBINSKY (1988) and (indicated with an asterisk) MASTERS & BRAGG (2000).

	NMW 318/B 3516	NMW 319/ST 584	NMW 320/B 3515	arithmetic mean
maximum skull length *	42,9	45,0	44,6	44,2
mastoid with	23,3	23,7	23,2	23,4
width of temporal constriction	19,4	18,4	18,5	18,8
zygomatic breadth	26,8	29,1	28,6	28,2
width of interorbital constriction	4,8	5,3	5,0	5,0
breadth of bony palate at M ²	13,7	14,0	14,1	13,9
basal length	31,6	33,8	33,2	32,9
palat length	15,3	16,2	16,1	15,9
snout depth (anterior)	6,6	6,8	6,9	6,8
height of mandibular ramus	10,5	12,9	12,4	11,9
length of mandible	23,1	24,9	24,7	24,2
upper toothrow (PM ¹ -M ³) crown length	12,2	12,6	12,3	12,4
lower toothrow (PM ₁ -M ₃) crown length	13,5	14,4	14,2	14,0
length of nasals	11,5	12,2	12,0	11,9
width of single orbit	15,1	16,2	15,6	15,6
breadth across the orbits *	-	31,5	30,3	30,9
breadth of M ²	3,3	3,2	3,5	3,3
upper canine length	3,7	3,9	3,8	3,8
upper canine width	2,0	2,1	2,4	2,2
snout width	7,9	8,0	8,2	8,0

presented by HAYMAN (1937) of a skull from Lesse (00°45'N, 29°48'E, Democratic Republic of the Congo [JENKINS 1987]) (BMNH ZD.1984.179 [JENKINS 1987]). All type specimens show a yellowish tinge at the shoulders and the outer side of the hind limbs (cf. SCHWARZ 1930; NASH & al. 1989).

4.5. Tarsiidae GRAY, 1825

Tarsius STORR, 1780

***Tarsius sangirensis* MEYER, 1896** (insulis Sangi; Siao und [...] Gross Sangi, “Sangi”)

Abh. Ber. zool. anthrop.-ethnol. Mus. Dresden (1896/1897) 6(6), 9

Now ***Tarsius sangirensis* MEYER, 1896**. See FEILER (1990), SHEKELLE & al. (1997), GROVES (1998, 2003) and SHEKELLE (2003, 2008a, 2008b).

Paralectotype: NMW B 3784 skull, study skin: Tabukan, Groß Sangi, Sangi-I[nseln].; 1870 (SHEKELLE & al. 2008); [coll.] Dr. [A.B.] Meyer, [ex. coll. MTKD (no. B496)] ded. (AV) (AV 1879/XII/1 *Tarsius spectrum*) [MTKD ? label] (FEILER 1979, 1990, 1999; pers. comm. T. Diekmann i.2010).

Lectotype in other institution: MTKD B497 (2243) mount: Tabukan, Groß Sangi; 1870 (SHEKELLE & al. 2008); A.B. Meyer leg. et don.

Paralectotypes in other institutions (3): MTKD B321 skull [the study skin mentioned on the adjoining label apparently got lost]; Siao, Sangi; 1870 (SHEKELLE & al. 2008); A.B. Meyer leg. et don. (belongs to *Tarsius tumpara* after SHEKELLE & al. 2008, see below) (FEILER 1990, 1999; pers. comm. T. Diekmann i.2010); NMB N14028 ♀, skull, study skin: Gross-Sangir [supposedly near Manganitu; cf. BLASIUS 1888]; 18.vi.1886; Carl Constantin

Platen leg., Adolph Nehrkorn don. (pers. comm. M. Forthuber iii.2010; not mentioned by HEVERS 2005); RMNH 28641 ♀, skull, mount: Sanghir; 6.i.1866; Dirk Samuel Hoedt leg. (SCHLEGEL 1876, p.333 no. 8; JENTINK 1892, p.81 g.; SMEENK in prep.).

Localities: Tabukan = Tabukanlama, 3°41'N, 125°33'S, Pulau Sangihe Besar, Kepulauan Sangihe, Sulawesi Utara, Indonesia (LAMBERT & RASMUSSEN 1998; GROVES 2005). Tabukan (also spelled Toboekan [SCHIFTER 1990]) was the primary collecting locality of Meyer on Pulau Sangihe Besar (e.g. MEYER 1885, 1887).

Siao = Pulau Siau, 2°42'N, 125°24'E, Kepulauan Sangihe, Sulawesi Utara, Indonesia. Manganitu, 03°33'N, 125°30'E, Pulau Sangihe Besar, Kepulauan Sangihe, Sulawesi Utara, Indonesia (USBGN 1968).

Sangi, (Gross-)Sangir, and Sangihe are alternate spellings of Sangihe (SHEKELLE 2003, 2008a).



Figure 2: Dorsal, ventral, frontal and lateral (skull: right lateral; mandible: left lateral) view of the skull and the mandible of NMW B 3784, a paralectotype of *Tarsius sangirensis* MEYER, 1896.

Comments: MEYER's (1896) description based on six specimens from Pulau Sangihe Besar and Pulau Siau, two of which are housed in the MTKD and the remaining four scattered over the RMNH, ZMB (?), NMB, and NMW. According to the footnote (p. 9) therein, A.B. Meyer studied the specimens in Berlin and Leiden at the respective museums (ZMB, RMNH) however the other specimens from NMW and NMB were sent to him in Dresden (in a letter dated 12.vi.1896 A.B. Meyer requested L. Lorenz to send the specimen from the NMW to the MTKD [facsimile in SCHIFTER (1990), original in the bird collection of the NMW]). The specimen from Berlin could not be localized definitely. Indeed there is one *Tarsius* from Sangihe (ZMB 5129: skull, skeleton; "Sangi Insel"; bought from Gerrard's in London; pers. comm. F. Mayer xii.2009), this is presumably not identical with the animal seen by MEYER (1896) since he stated explicitly that the specimen in Berlin originated from his own collection.

The lectotype designation for *T. sangirensis* presumably based on a misinterpretation of FEILER's (1990) statement "Von den damals [1896] von Meyer genannten Exemplaren von *Tarsius sangirensis* ist nur der Typus [MTDK B497] erhalten geblieben", by GROVES (1998). FEILER (1990) referred in the mentioned article only to the specimens from the MTKD rather than to the whole type series thus not selecting a particular specimen out of the whole series. Obviously he just didn't assign the second specimen in the MTKD (B321) to the type series, which becomes even clearer when he cited both type specimens as syntypes in 1999 (FEILER 1999). Via generalizing this to "FEILER (1990) briefly described the type of *Tarsius sangirensis* MEYER, 1895 [sic], from the Sangihe Islands north of Sulawesi [...]", GROVES (1998) validly designated the lectotype (ICZN 1999, 74.5.) merely unintentionally but in accordance with the recommendations 74a, b, d, and e (illustrations of the specimen MTDK B497 have been published by MEYER 1899 and FEILER 1979; the MTDK keeps the largest number of types of this taxon; the specimen bears exact locality data), of the ICZN (1999). Before FEILER (1990), another, potential lectotype designation was published by HILL (1955) by stating: "*Type locality*: Great Sangir island. Type in Dresden Museum". Since it remains unclear whether he referred to *the* type or *a* type, this designation is not unambiguously and is therefore treated as invalid. The plate to the description has been published by MEYER only in 1899 (Pl. 3, Fig. 3; reproduction in MUSSER & DAGOSTO 1987). A detailed characterization of the syntypes in the MTKD was given by FEILER (1990) wherein he also clarified the misinterpretations of MEYER's (1896) description regarding the ventral scales on the tail of this species by NIEMITZ (1984) and MUSSER & DAGOSTO (1987).

Skull measurements of NMW B 3784 (for definitions of the measurements see MUSSER & DAGOSTO 1987): Zygomatic breadth: 28,0 mm, breadth across the orbits: 29,7 mm, breadth of a single orbit: 16,5 mm, length of nasals: (7,6 mm), breadth of bony palate at M³: 14,8 mm, length of auditory bulla: 11,4 mm, breadth of auditory bulla: 5,4 mm, length of upper toothrow: 13,5 mm, length of lower toothrow: 14,0 mm, length of M¹: 2,6 mm, breadth of M¹: 3,7 mm, length of M₁: 2,6 mm, breadth of M₁: 2,2 mm. The dimensions of the bulla and of the first upper molar of the NMW's specimen fit well to the measurements reported by SHEKELLE & al. (2008) for *T. sangirensis*. The close inspection of the dental morphology the skull of NMW B 3784 revealed that the shape of the third and fourth upper premolar markedly differ from the only *T. spectrum* (PALLAS, 1778) s.l. specimen (NMW 321/ST 585 ♀, skull, mount: Sulawesi; bought from Verreaux in 1865) in the NMW and from drawings in the literature (cf. THENIUS 1989, Fig. 241; SWINDLER 2002, Pl. 17; with restrictions also Fig. 9 in MUSSER & DAGOSTO 1987). The posterior margins of these teeth are markedly concavely angulated in the paralectotype specimen of *T. sangirensis* (Fig. 2) while they are only slightly curved or nearly straight in the specimen and drawings used for comparison. Possibly the angulated state is plesiomorph since *T. syrichta* (LINNAEUS, 1758) also exhibits a similar pattern, especially in the P³, (cf. MAIER 1980, Fig. 42) while in *T. spectrum* s.l. the

posterior margin of P³⁻⁴ seems to be nearly straight or only slightly curved. This would be in accordance with SHEKELLE's (2003) findings, based on mtDNA, indicating that *T. sangirensis* represents the oldest branch within the *T. spectrum* group.

4.6. Cebidae BONAPARTE, 1831

Mico LESSON, 1840

Hapale chrysoleucos WAGNER, 1842 (Borba)

Arch. Naturgesch. 8 (1), 357

M[ico]. chrysoleucus REICHENBACH, 1863 (p. 6). Incorrect subsequent spelling.

Now *Mico chrysoleuca* (WAGNER, 1842). See SCLATER (1871c), VIVO (1991) and RYLANDS & al. (2009).

Syntypes (4): NMW B 3456 (no.106) ♂, (skull), study skin: Borba; 24.xii.1829; [coll. Joh. Natterer] (no.127); 10th shipment; NMW B 3455 (no.108) ♂, (skull), study skin: Borba; 8.vi.1830; [coll. Joh. Natterer (no.127)]; 12th shipment; NMW B 3457 (no.109) ♂, (skull), study skin: Borba; 22.i.1830; [coll. Joh. Natterer] (no.127); 10th shipment; NMW ST 970 ♂, (skull), mount: Borba, Brasilien; 19.i.1830; [coll. Joh. Natterer (no.127)] [NMW label].

Syntypes in other institutions (3): ZMB 3191 ♂, skull, study skin: Borba; 1830; coll. Joh. Natterer (no.127), ex. coll. NMW ded. (pers. comm. N. Lange iii.2010); BMNH 1870.3.10.3 [no.103] ♂, study skin: Borba; coll. Joh. Natterer [no.127], ex. coll. NMW (NAPIER 1976; pers. comm. P. Jenkins ii.2010); RMNH 39099 ♀, (skull), mount: Borba (SCHLEGEL 1876); xii.1829-vi.1830 (PELZELN 1883); coll. Joh. Natterer [no.127], ex. coll. NMW (SCHLEGEL 1876, p.278 no.1; JENTINK 1892, p.59 a.; SMEENK in prep.).

Locality: Borba, 04°24'S, 59°35'W, Amazonas, Brazil (VANZOLINI 1993).

Comments: Johann Natterer sent seven specimens, six ♂♂ and one ♀ (Josef Natterers handwritten notes), to the NMW between 1831 and 1836 (PELZELN 1890), which are considered to be syntypes. Three of these specimens later came to other museums: Around 1856, according to an exchange (?) list, of J. Heckel of the NMW kept at the RMNH (dated 5.xii.1855) (SMEENK in prep.), the only ♀ collected by Johann Natterer was obtained by the RMNH (SCHLEGEL 1876; JENTINK 1892). A male specimen (ZMB 3191, pers. comm. N. Lange iii.2010) came in exchange to the ZMB in 1866 (AV 1866/X/4 [Heckel No. 110 (?)]); mentioned by SCLATER 1870a). In 1869 (?) another male specimen was obtained by Philip Lutley Sclater possibly in course of an exchange (AV 1869/IX [no specimens provided by the NMW are listed]; SCLATER 1870a), which was then purchased by the BMNH from E. Gerrard in the same year (GRAY 1870; NAPIER 1976; pers. comm. P. Jenkins ii.2010).

Leontopithecus LESSON, 1840

Jacchus chrysopygus MIKAN, 1823 (Ypanema Capitaniae St.Paulo)

Del. Flor. Faun. Brasil., [fasc. 3, 33-34, Pl. 16]

Hapale chrysopyga Natterer ms. ap. PELZELN (1883, p.26).

L[eontideus]. chrysopigus MELO CARVALHO, 1971 (p. 66). Incorrect subsequent spelling.

Now *Leontopithecus chrysopygus* (MIKAN, 1823). See ROSENBERG & COIMBRA-FILHO (1984), MITTERMEIER & al. (1988) and PEREZ-SWEENEY & al. (2008).

Syntypes (5): NMW B 3766 ♀, skull, ex-mount: Ypanema; 25.iii.1819; coll. Joh. Natterer (no.32); NMW B 3781 ♀ (pedestal label) [presumably ♂, see below], skull, ex-mount: Ypanema, [Bra]sil.; viii.1819 [presumably iii.1819, see below]; coll. Joh. Natterer (no.32) [old NMW label]; NMW B 3762 ♂, ex-mount: Ypanema; 5.ix.1819; coll. Joh. Natterer (no.32) [old NMW label]; NMW ST 937 ♀, (skull), mount: Varge Grande, Brasilien;

28.i.1819; coll. Joh. Natterer (no.32) [old NMW label]; NMW ST 1577 ♀, mount: Ypanema, Brasilien; 6.vi.1819; coll. Joh. Natterer (no.32) [old NMW label].
Syntype in other institution: RMNH 39100 ♀, (skull), mount: Ipanema; [presumably 5.ix.1819, see below]; coll. Joh. Natterer [no.32], ex. coll. NMW ded. (SCHLEGEL 1876, p.255 no.2; JENTINK 1892, p.55 b; SMEENK in prep.).
Localities: Ypanema = Ipanema, 23°26'S, 47°36'W, São Paulo, Brazil. Varge Grande = Varga Grande, 23°37'S, 47°01'W, São Paulo, Brazil (VANZOLINI 1993).
Comments: HERSHKOVITZ (1977) lists at least six “cotypes”, of which two males and two females (all of 19.iii.1822) should be in the NMW as well as a male and a female (both of vi.1822) in the RMNH. According to Josef Natterer’s notes on the specimens collected by Johann Natterer in Brazil, six specimens (two ♂♂, four ♀♀) of *L. chrysopygus* came to the NMW with the third shipment, that arrived at Vienna in November 1819, from the Brazilian Expedition (i.e. Johann Natterer). Further below on this document is written “[♀] N3 an Temminck gegeben”, clearly indicating that only one of the specimens that Mikán actually could have had at hand for his description, came to the RMNH (supposedly 1821 in exchange since a list of material received by the RMNH lists a “Hapale chrysopygos Natt.” [SMEENK in prep.] and a corresponding entry on an exchange with this museum can be found in the NMW’s AV for 1821 [AV 1821/LV]). In the collection of the NMW are indeed two specimens (NMW B 3450 (no.125) ♂, (skull), study skin; NMW B 3452 ♀, (skull), study skin: Ypanema; 19.iii.1822; coll. Joh. Natterer (no.32)) with such collecting dates, but they are only topotypes since the labels of both are overwritten with “12”, which indicates that they arrived with the 12th shipment (Tab. 1). This shipment arrived at Vienna in 1836 (PELZELN 1890), 13 years after Mikán’s description. Since these topotypes are the remaining ones of the specimens listed in Josef Natterer’s notes, the male in the RMNH (RMNH 39100) possibly never came to the NMW but was rather retained by Johann Natterer for private exchange.

A number of eight type specimens was mentioned by COIMBRA-FILHO & MITTERMEIER (1972) (followed by e.g. COIMBRA-FILHO 1976 and RYLANDS & al. 2002a) probably relying on PELZELN’s (1883) account on the whole collection of Johann Natterer. Overall the whole type series of six specimens was localized and no indication for a type specimen kept “in Russia” as, stated by COIMBRA-FILHO & MITTERMEIER (1972), could be found.

Johann Natterer’s field notes contain the following list of *L. chrysopygus* specimens collected by him in 1819: “1 ♀ Varg. grand. 28 Jäner 19. / 1 ♀ Yp. 25 März 19. / 1 ♀ Yp. 6 Juny 19 / 1 ♂ 1 ♀ Yp. 5 Septb. 19. / 1 ♂ Yp. März 1819”. All ♀♀ except for the one collected on the 5.ix.1819 could be identified unambiguously, due to the label data, in the NMW collection. Since one ♀, according to Josef Natterer’s notes, came to the RMNH in exchange it can be deemed that this was the ♀ collected on the 5.ix.1819. To fit the list of Johann Natterer NMW B3781 should represent the ♂ collected in March 1819 which can not be ruled out based on the specimen.

HERSHKOVITZ (1977) designated the “animal in the Vienna Museum figured by MIKÁN” as the lectotype, which is not followed here since the illustration can not unambiguously be assigned to a specimen of the type series and further it can not be ruled out that the plate shows a idealized animal based on the whole type series. Therefore all type specimens have to be considered as syntypes. The type locality has been restricted to Ipanema by VIEIRA (1955) which was followed by subsequent authors (e.g. RYLANDS & al. 2002b).

Confusion about the date of the original description of *Jacchus chrysopygus* (e.g. 1822 in COIMBRA-FILHO & MITTERMEIER [1973]) arose because the front page of MIKÁN’s (1820) publication is only dated with 1820; the launch of the first part. The whole book appeared in four fascicles between 1820 and 1825, whereof the third, with the description of *J. chrysopygus*, has been released between July and October 1823 (a reproduction of the plate can be found in COIMBRA-FILHO & MITTERMEIER, 1972) (WETMORE 1925; STEARN 1956).

PELZELN (1883) gave the collecting site of NMW ST937 more precisely as “Varge grande, Weg von Cutia” [Varga Grande, way from Cotia (Cotia, 23°25’S, 46°56’W, São Paulo, Brazil)].

Ipanema, one of the type localities (“Floresta Nacional de Ipanema, 20 km NW Sorocaba, São Paulo, Brazil”, 23°26’S, 47°37’W, 550-970 m) is now protected as a national forest (EMMONS & al. 2002) but no other, more recent records of *L. chrysopygus* are known from there (RÖHE & al. 2003).

[Hapale] [(Leontopithecus)] ater LESSON, 1840 (forêts Brésil, capitainerie de St.-Paul)

Spec. Mamm. Bim. Quadrum., 203-204

Now *Leontopithecus chrysopygus* (MIKAN, 1823). See LESSON (1840), HERSHKOVITZ (1977) and PEREZ-SWEENEY & al. (2008).

Syntypes (6): All syntypes of ‘*Jacchus chrysopygus* MIKAN, 1823’; see there.

Comments: A nomen novum for *Jacchus chrysopygus* MIKAN, 1823 (ICZN 1999, art. 72.7.).

Accordingly all type specimens listed for *J. chrysopygus* MIKAN, 1823 belong to the type series of this nominate taxon (ICZN 1999, art. 72.4.1.) and alike they have the same name-bearing type (ICZN 1999, art. 72.7.).

LESSON (1840) placed his subgenus *Leontipithecus* [sic] as early as 1840 within the genus *Hapale* and not until 1842 in his ‘Nouveau tableau du règne animal’ (LESSON 1842) as stated by HERSHKOVITZ (1977).

Saguinus HOFFMANNSEGG, 1807

M[idas]. erythrogaster REICHENBACH, 1862 (Brasilien)

Vollständ. Naturgesch. Affen., 14, Pl. 36, Fig. 488

Hapale erythrogaster Natterer ms. ap. PELZELN (1883, p.24).

Now *Saguinus labiatus rufiventer* (GRAY, 1843). See PELZELN (1883), HERSHKOVITZ (1977) and RYLANDS & MITTERMEIER (2009).

Holotype: NMW ST 97 [♂] ad., mount: Lago do Joanacan am Solimoes; i.1833; Luiz leg., coll. Joh. Natterer (no.150) [PELZEN 1883 ap. Joh. Natterer’s field notes].

Paratype: NMW ST 967 ♂, (skull), mount: Joanacan Lagono, Solimões; i.1833; Luiz leg. (PELZEN 1883 ap. Joh. Natterer’s field notes), [coll.] Joh. Natterer (no.150).

Locality: Lago do Joanacan / Joanacan Lagono = Lago Janauacá, 03°28’S, 60°17’W, Rio Solimões, Amazonas, Brazil (USBGN 1963).

Comments: REICHENBACH (1862) did not indicate how many specimens he had at hand for the description of *M. erythrogaster*. As he adopts the ms. name of Joh. Natterer, all specimens assigned to this name by the latter represent the type series (ICZN 1999, art. 72.4.1.). On the basis of the old file cards of Josef Natterer, in the NMW, it can be assumed that the two specimens listed above were the only ones obtained by Johann Natterer and therefore the whole type series is still kept at the NMW. According to the ICZN (1999, arts. 73.1.1. & 73.1.4.) H.G.L. Reichenbach designated the holotype by referring to the depicted specimen as the “Original exemplar” – a term equivalent to “type”. Since the specimen NMW ST97 resembles closely the (not very accurate [see HERSHKOVITZ 1977]) drawing by T.F. Zimmermann in REICHENBACH’s (1862) work (cf. Fig. 3), this specimen is deemed to be the holotype.



Figure 3: Type specimens of *Midas erythrogaster* REICHENBACH, 1862. **A:** Holotype (NMW ST 97). **B:** Paratype (NMW ST 967; tail broken) showing an old pedestal label at the wooden base, which contains the scientific binomial (“*Midas labiatus* E. GEOFFR[OY SAINT-HILAIRE].”), the German name (“Bras[ilianischer]. Rothbauch Tamarin”), a sex indication (“m[as].” [the Latin word for male]) and the collector’s name (“[Johann] Natt[erer].”). **C:** Dorsal view of the holotype showing the well developed Y-shaped marking at the frontal region.

GROVES (2001, 2005) recognized three subspecies of *S. labiatus* (É. GEOFFROY SAINT-HILAIRE, 1812) whereof *S. l. labiatus* and *S. l. rufiventer* are distributed between the Rio Solimões in the north and the Rio Acre in the south. These subspecies meet approximately at the Rio Ipixuna. Since GROVES (2001) had not seen the type of *M. erythrogaster* he provisionally placed this name in the synonymy of *S. l. labiatus*. However the well developed Y-shaped red marking at the frontal region as well as the collecting locality, which lies well within the distributional range of *S. l. rufiventer*, clearly assign it to the latter subspecies.

Cebus ERXLBEN, 1777

Cebus nigrivittatus WAGNER, 1848 (am oberen Rio branco)

Abh. bay. Akad. Wiss. 5(2), 430-432

Now *Cebus olivaceus* SCHOMBURGK, 1848. See CABRERA (1917), HERSHKOVITZ (1949), HUSSON (1957, 1978), GROVES (2001) and RYLANDS & MITTERMEIER (2009).

Lectotype: NMW ST 1460 ♂ immat., mount: San Joaquim am oberen Rio Branco; 4.ix.1834; coll. Joh. Natterer (no.154).

Paralectotypes (2): NMW ST 1472 ♂ ad., (skull), mount: Brasilien [old NMW 1.]; NMW ST 1435 (no.154) immat, (skull), mount: probably Brazil (PELZELN 1883); 1830-1835 (PELZELN 1883); coll. Joh. Natterer [old NMW 1.].

Locality: San Joaquim am oberen Rio Branco [loc.typ.] = Forte de São Joaquim do Rio Branco, 03°01N, 60°28'W, Roraima, Brazil (VANZOLINI 1993).

Comments: The lectotype has been designated by VIEIRA (1955), by restricting the type locality to “São Joaquim, alto Rio Branco, Amazonas”.

In 1848 J.A. WAGNER described this species as *Cebus nigrivittatus* WAGNER, 1848 whereas R. SCHOMBURGK (1848) introduced the name *C. olivaceus* SCHOMBURGK, 1848 for it. HERSHKOVITZ (1949) followed CABRERA (1917) and opted with reservation for *C. nigrivittatus* that he regarded as the earliest available name (HERSHKOVITZ 1955). However HUSSON (1957, 1978) showed that the use of the name *C. nigrivittatus* WAGNER, 1848 is invalid (criticised by HERSHKOVITZ 1958, 1959) because PUSCH (1941) united the genera *Cebus* and *Saimiri*, whereby *C. nigrivittatus* WAGNER, 1848 became a secondary homonym of *Chrysothrix nigrivittatus* WAGNER, 1848 (= *Saimiri sciureus* [LINNAEUS, 1758]) (RYLANDS & al. 2000). According to the ICZN (1999, art. 59.3.) a junior homonym replaced before 1961 is permanently invalid. Indeed *C. olivaceus* was also a secondary homo-

nym since FISCHER (1829) included *Gastrimargus olivaceus* SPIX, 1823 in his concept of the genus *Cebus*. Thus SCHOMBURGK's name would only be permanently rejected if an "author before 1960 had rejected *C. olivaceus* SCHOMBURGK, 1848, on that account, but no such action appears to have been taken" (GROVES 2001).

Johann Natterer received the male NMW ST1472 via the "Mutter des Commandanten" from the "Wilden Porocotos" (a tribe of indigenous South-American people, that inhabited the source region of the Rio Branco [NOWOTNY 1949]) in "Barra do Rio Negro" (= Manaus, 03°08'S, 60°01'W, Amazonas). It died, but not until he reached Pará (= Belém, 01°27'S, 47°29'W, Pará) on grounds of ill health, thus living supposedly at least a few weeks in captivity (WAGNER 1848; PELZELN 1883; cf. VANZOLINI 1993).

4.7. Pitheciidae MIVART, 1865

Callicebus THOMAS, 1903

***Callithrix brunea* WAGNER, 1842** [no locality given]

Arch. Naturgesch. 8 (1), 357

***Callithrix brunnea* WAGNER, 1848** (Rio Madeira, Westgränze des mittleren Brasiliens)

Abh. bay. Akad. Wiss. 5 (2), 455-457

Now ***Callicebus brunneus* (WAGNER, 1842)**. See HERSHKOVITZ (1988, 1990), ROOSMALEN & al. (2002) and RYLANDS & MITTERMEIER (2009).

Lectotype: NMW 775/B 3454 (no.61) ♂, skull, study skin: Cachoeira da bananeira; 4.ix.1829; [coll. Joh. Natterer] (no.124), 12th shipment.

Paralectotypes (2): NMW B 3453 (no.59) ♀, (skull), study skin: Cachoeira da bananeira; 3.ix.1829; [coll. Joh. Natterer] (no.124); NMW ST 122 (no.7) [♀] mount: Cachoeira da Bananeira; 4.ix.1829 (NMW label); coll. Johann Natterer (no.124) [PELZELN 1883].

Paralectotype in other institution: ZMB 3190 ♀, mount: Cachoeira da Bananeira; 2-3.ix.1829; coll. Joh. Natterer (no.124), ex. coll. NMW ded. (pers. comm. N. Lange iii.2010).

Locality: Cachoeira da Bananeira, 10°36'S, 65°25'W, Rio Mamoré, Rondônia, Brazil (VANZOLINI 1993).

Comments: *Callithrix brunnea* WAGNER, 1848 is an unjustified emendation of *C. brunea* WAGNER, 1842 (HERSHKOVITZ [1963] supposed a typographical error in the original description, wherefore no cogent indication has been found) in terms of the ICZN (1999, art. 33.2.1.). Though, the former is in prevailing usage and attributed to WAGNER 1842 (e.g. WAGNER 1843, 1848; PELZELN 1883) it is deemed to be justified (ICZN 1999, art. 33.2.3.1.).

According to Josef Natterer's catalogue of the specimens obtained by the NMW from Johann Natterer, seven specimens of *C. brunnea*, two ♂♂, four ♀♀ (10th shipment), and one ♂ (12th shipment), have been acquired until 1836. Yet in 1848 WAGNER mentioned only four specimens (two ♀♀ and two ♂♂) to be kept at the NMW and it is presumed that he only had these at hand for his description in 1842. Thereof one specimen, a study skin, possessing the old NMW number 63 (referred to as "Heckel Numer" in the AV [AV 1866/X]) came in exchange to the ZMB (AV 1866/X/3a), where it was mounted (pers. comm. N. Lange iii.2010). Consequently HERSHKOVITZ's (1963, 1990) mentioning of four type specimens in the NMW is incorrect. Supposedly he did not examine the specimens in the public exhibition during his stay at the NMW in 1985, since contrary to his statement only one mount (NMW ST 122), instead of two mentioned (HERSHKOVITZ 1990), was shown there at that time.

The lectotype has been designated by ELLIOT (1913; cf. ICZN 1999, art. 74.5.). However, also the specimen in the ZMB (ZMB 3190) bears a syntype label with "Lectotyp." added

subsequently by an unknown hand (pers. comm. N. Lange iii.2010). Since Daniel Giraud Elliot visited the ZMB as well as the NMW during the preparation of his “Review of the primates”, wherein he explicitly described a specimen from the NMW as the (lecto)type of *C. brunneus* (ELLIOT 1913), ZMB 3190 undoubtedly represents a paralectotype.

***Callithrix caligata* WAGNER, 1842** (Borba et Rio Solimoëns)

Arch. Naturgesch. 8 (1), 357

Now ***Callicebus caligatus* (WAGNER, 1842)**. See HERSHKOVITZ (1988, 1990), ROOSMALEN & al. (2002) and RYLANDS & MITTERMEIER (2009).

Lectotype: NMW B 3738 ♂, (skull), study skin: Borba; 24.v.1830; [coll. Joh. Natterer] (no.162), 10th shipment.

Paralectotype: NMW 7596/ST 112 (no.3) ♂ (Jos. Natterer’s notes) ad., skull, mount: Manaqueri am Rio Solimoës; xii.1832; coll. Joh. Natterer (no.162), 11th shipment (Jos. Natterer’s notes) [PELZELN 1883].

Localities: Borba [loc.typ.], 04°24’S, 59°35’W Rio Madeira, Amazonas, Brazil (for details on this collecting point see below). Manaqueri am Rio Solimoës = Lago Manaquiri at the Rio Solimões, 03°29’S, 60°01’W, Amazonas, Brazil (VANZOLINI 1993).

Comments: HERSHKOVITZ (1990; followed by ROOSMALEN & al. 2002), who examined the NMW’s collection of neotropical primates in 1985, lists the lectotype (“skin with skull from Borba”) and two paralectotypes (“1 skin only (NHMW) from Borba, [...] one skin and skull (NHMW 7546/112) from Manaquiri”). In fact there are only two *C. caligatus* specimens from the Collection of Johann Natterer in the NMW and no indications could be found (e.g. WAGNER 1848; PELZELN 1883; Johann & Josef Natterer’s handwritten notes) that more have been obtained.

The lectotype was designated by THOMAS (1908), by restricting the type locality to Borba (JONES & ANDERSON 1978). Whereas only one specimen from this locality is part of the type series, this constitutes an unambiguous designation (ICZN 1999, art. 33.2.3.1.).

Due to the lack of more recent evidence for the presence of *C. caligatus* from between the Rio Purús and the Rio Madeira and because only *Callicebus cinerascens* (SPIX, 1823) occurs east of the latter, HERSHKOVITZ (1963, 1990) questioned the correctness of the reported collecting locality of the lectotype. Since M.G.M. van Roosmalen discovered *C. caligatus* in the lower Rios Purús / Solimões / Madeira interfluvium south as far as the Rio Ipixuna (ROOSMALEN & al. 2002), it seems likely that Johann Natterer in fact collected the specimen on the left bank of the Rio Madeira in the vicinity of Borba.

4.8. Atelidae GRAY, 1825

***Ateles* É. GEOFFROY SAINT-HILAIRE, 1806**

***Ateles variegatus* WAGNER, 1840** [no locality given]

Die Säugth. Suppl. 1, 313

Now ***Ateles belzebuth belzebuth* É. GEOFFROY SAINT-HILAIRE, 1806**. See KELLOG & GOLDMAN (1944) and COLLINS (2008).

Syntypes (4): NMW ST 676 (no.13) ♀ ad., mount: Cocuy am Rio Negro; 5-10.ii.1831 (VANZOLINI 1993); coll. Joh. Natterer (no.143) [PELZELN 1883]; NMW ST 683 (no.3) ♂ [?] ad., mount: Cocuy am Rio Negro; 5-10.ii.1831 (VANZOLINI 1993); coll. Joh. Natterer (no.143) [PELZELN 1883]; NMW ST 1528A ♀ ad., mount: Cocuy am Rio Negro; 5-10.ii.1831 (VANZOLINI 1993); coll. Joh. Natterer (no.143) [PELZELN 1883]; NMW ST

1528B ♀ juv., mount: Cocuy am Rio Negro; 5-10.ii.1831 (VANZOLINI 1993); coll. Joh. Natterer (no.143) [PELZELN 1883].

Syntype in other institution: BMNH 1871.12.29.8 ♀ ad., skin: Cocuy, upper Rio Negro; 9.ii.1831; coll. Joh. Natterer, ex. coll. P.L. Sclater ex. coll. NMW ded., Gerrard don. (NAPIER 1976; pers. comm. P. Jenkins ii.2010)

Locality: Cocuy = Pé do Cucuí, 01°12'N, 66°50'W, Amazonas, Brazil (VANZOLINI 1993).

Comments: Despite the fact that WAGNER's (1840) original description was largely based on an old female (WAGNER 1853) all specimens collected by Johann Natterer in Pé do Cucuí came to Vienna in the course of the eleventh transport in 1835 (PELZELN 1890; BLAAS 1976; Josef Natterer's handwritten notes) so they were certainly known to Wagner and therefore represent the type series. As WAGNER (1840) did not designate a holotype, according to my grasp, under the terms of the ICZN (1999, arts. 72.4.6., 73.1.1.-73.1.3., cf. re-comm. 72B.), these have to be deemed as syntypes. The designation of the specimen BMNH 1871.12.29.8 as a paratype (NAPIER 1976) is therefore incorrect.

According to the notes of Jos. Natterer, the NMW received only four ♀♀ (one of them young) specimens of *A. variegatus*. However SCLATER (1870b, 1871c), based on information he received from A. v. Pelzeln (curator of the NMW mammal collection at that time) mentioned five specimens (1 ♂, 3 ♀♀, 1 juv.). One of these specimens was sent in exchange to Philip Lutley Sclater in December 1870 (AV 1871/IX; SCLATER 1871b, 1871c) and obtained in 1871 by the BMNH from Gerrard's.

The name *A. variegatus* WAGNER, 1840 is preoccupied, and therefore as a secondary homonyme not available (ICZN 1999, art. 57.3.), by [*Simia*] *Sapajus variegatus* KERR, 1792, a nomen dubium based on PENNANT's (1781) "Antigua Monkey", which represents an unidentifiable spider monkey (KELLOG & GOLDMAN 1944).

***Ateles chuva* SCHLEGEL, 1876 [see below]**

Mus. Hist. Nat. Pays-Bas, vol. 7, (monogr. 40), 175-178

Now ***Ateles belzebuth belzebuth* É. GEOFFROY SAINT-HILAIRE, 1806**. See PELZELN (1883), KELLOG & GOLDMAN (1944) and COLLINS (2008).

Syntypes (4): NMW ST 676, NMW ST 683, NMW ST 1528A & NMW ST 1528B, see under '*Ateles variegatus* WAGNER, 1840'.

Syntypes in other institutions (>4): BMNH 1871.12.29.8, see under '*Ateles variegatus* WAGNER, 1840'; BMNH 1867.9.16.1 ♂, ad., skull, skin: Xeberos [= Jeberos], Upper Amazon, E. Peru; E. Bartlett leg., P. Higgens don. (holotype of *Ateles bartletti* GRAY, 1867) (GRAY 1867; NAPIER 1976; pers. comm. P. Jenkins ii.2010); RMNH 31771 ♀ subad., skull, mount: Perú; acquired 1875 (SCHLEGEL 1876, pp.177-178 no.2; JENTINK 1887, p.37 b, 1892, p.42 a; SMEENK in prep.); RMNH [no number] ♀ subad., mount: acquired 1875 (SCHLEGEL 1876, p.177 no.2; JENTINK 1892, p.42 i; SMEENK in prep.); additional types supposedly in the USNM (cf. SLACK 1862).

Comments: This name based on the descriptions of "Le chuva de Bracamorros" (HUMBOLDT 1812), *Ateles variegatus* WAGNER, 1840, "Sapajou Geoffroyi" (SLACK 1862, partim), *Ateles bartletti* GRAY, 1867 and two mounted female specimens in the RMNH (SCHLEGEL 1876). All specimens that form the basis of the mentioned descriptions constitute the type series of *A. chuva* (ICZN 1999, art. 72.4.1.; cf. KELLOG & GOLDMAN 1944; HILL 1962; for *A. bartletti* cf. also GRAY 1867, 1868, SCLATER 1871a and NAPIER 1976).

The type locality includes all localities mentioned by the authors of the names on which Hermann Schlegel based *A. chuva*. Additionally he lists the collecting locality of one specimen in the RMNH as "Pérou".

***Ateles braccatus* PELZELN, 1883** (Cocuy am Rio negro)

Verh. d. K.-K. zool.-bot. Ges. 33 (Beiheft), 9

Now ***Ateles belzebuth belzebuth* É. GEOFFROY SAINT-HILAIRE, 1806**. See PELZELN (1883), GROVES (2001) and COLLINS (2008).

Arguably syntypes (4): NMW ST 676, NMW ST 683, NMW ST 1528A & NMW ST 1528B, see under '*Ateles variegatus* WAGNER, 1840'.

Syntypes in other institutions: BMNH 1871.12.29.8, see under '*Ateles variegatus* WAGNER, 1840'

Comments: *Ateles braccatus*, a ms. name of Johann Natterer, was introduced by PELZELN (1883) as an older synonym of *Ateles variegatus* WAGNER, 1840 and is therefore available under the rules of the ICZN (1999, art. 11.6.1.) under the authorship of PELZELN. Since PELZELN (1883) gave a characterization of the taxon, extracted primarily from Joh. Natterer's field notes, as well as a bibliographic indication to the description of *A. variegatus*, this name does not represent a nomen nudum as assumed by URBANI & HERZIG-STRASCHIL (2005; cf. ICZN, arts. 12.1. & 12.2.).

According to the ICZN (1999, art. 72.4.3.), all specimens mentioned under a name published as a younger synonym constitute the type series. As PELZELN (1883) only summarily referred to three exemplars, despite four specimens from "Cocuy" collected by Johann Natterer are kept in the NMW, and no other evidence for the identification of syntypes could be found (ICZN 1999, arts. 72.4.1.1.), all specimens in the NMW (see under '*Ateles variegatus* WAGNER, 1840') have to be considered as arguably syntypes.

4.9. Cercopithecidae GRAY, 1821

***Cercocebus* É. GEOFFROY SAINT-HILAIRE, 1812**

***Cercocebus oberlaenderi* LORENZ, 1915** (Ituri-Urwald bei Mawambi)

Anz., Math.-Naturw. Kl., K. Akad. Wiss. Wien 52 (14), 172-173

Cercocebus oberländeri LORENZ, 1917 (p.230). Incorrect subsequent spelling.

Now ***Cercocebus agilis* MILNE-EDWARDS, 1886**. See ALLEN (1925) and GROVES (2001).

Lectotype: NMW 4422/ST 624 ♂ ad., skull, mount: Mawambi; xi.1910; R. Grauer (no.230) leg., P.v. Oberländer don.

Paralectotypes (2): NMW 4424/B 5795 ♀ ad., skull, skin: Mawambi; xi.1910; R. Grauer (no.231) leg., P.v. Oberländer don.; NMW 4480 ♂ juv. ("Junges von" [R. Grauer's field notes] NMW 4424/B5795), skull: Mawambi; xi.1910; R. Grauer (no.232) leg., P.v. Oberländer don.

Locality: Ituri-Urwald bei Mawambi = Ituri Forest near Mawambi, ca. 01°03'N, 28°36'E, Ituri (Orientale), Democratic Republic of the Congo (DAVIS & MISONNE 1964).

Comments: The lectotype was designated by HILL (1974; ICZN 1999, art. 74.5.).

Lorenz must have had the skin of NMW 4480 at hand since he presented corresponding measurements (LORENZ 1917). During the present survey this skin could not be traced.

All three specimens originate out of one flock (LORENZ 1917). Illustrations (Pl. 15, Figs 5,6) and measurements of the specimen's skulls are given by LORENZ (1917).

***Cercopithecus* LINNAEUS, 1758**

***Lasyopyga schmidti montana* LORENZ, 1914** (Gebirgsurwald westlich des Tanganyika, Gebiet der Wabembe im Nordwesten des Tanganyikasees)

Anz. K. Akad. Wiss., Math.-Naturw. Kl. 51 (17), 357-358

Now *Cercopithecus ascanius schmidti* MATSCHIE, 1892. See SCHOUTEDEN (1944), HADDOW (1952), GROVES (2001) and SARMIENTO & al. (2001). Due to the different appearance of the facial pattern GROVES (2001, 2006) suspected that this taxon could obtain specific status, also supported by chromosomal data (MOULIN & al. 2008).

Lectotype: NMW 4497/B 3917 ♂ ad., skull, skin: Urwald hinter den Randbergen des Nordwestufers des Tanganika-Sees; iii.1910; R. Grauer leg. (no.55), P.v. Oberländer don.

Paralectotypes (4): NMW 4484 ♂ ad., skull: Urwald hinter den Randbergen des Nordwestufers des Tanganika; iv.1910; R. Grauer (no.64) leg., P.v. Oberländer don.; NMW 4485/B 5797 ♂ ad., skull, skin: Urwald hinter den Randbergen des Nordwestufers d[es]. Tang[anika].; iv.1910; R. Grauer (no.68) leg., P.v. Oberländer don.; NMW 4478/B 3943 ♂ ad., skull, skin: Urwald hinter den Randbergen des Nordwestufers des Tanganika; iii.1910; R. Grauer (no.57) leg., P.v. Oberländer don.; NMW 4504/B 3912 ♂ ad., skull, skin: Urwald hinter d[en]. Randbergen des Nordwestufers d[es]. Tanganika; ii.1910; R. Grauer (no.39) leg., P.v. Oberländer don.

Locality: Gebiet der Wabembe im Nordwesten des Tanganjika-Sees [territory of the “Wabembe”⁴ northwest of Lake Tanganyika] (LORENZ 1917), Sud-Kivu, Democratic Republic of the Congo. The specimens NMW 4497/B 3917, NMW 4478/B 3943, NMW 4484, and NMW 4485/B 5797 were collected at an elevation of ca. 2000m (R. Grauer, field notes).

Comments: The lectotype was designated by LORENZ (1917; ICZN 1999, art. 74.5.).

In the original description LORENZ (1914a) mentioned six skins (i.e. specimens) from the mountain forest west of Lake Tanganyika, in contrast to his subsequent publication (LORENZ 1917) wherein he cited only the five specimens mentioned above. It can not be ruled out that a sixth specimen was lost during that time. The skin of the specimen NMW 4484 that was mentioned by LORENZ still in 1917 could not be located in the course of the present survey.

An illustration (Pl. 15, Fig. 3) and measurements of the specimen’s skulls are given by LORENZ (1917).

Lasyopyga schmidti ituriensis LORENZ, 1914 (Ituri-Urwald bei Beni und Mawambi)

Anz. K. Akad. Wiss., Math.-Naturw. Kl. 51 (17), 357-358

Now *Cercopithecus ascanius schmidti* MATSCHIE, 1892. See LORENZ (1917), LÖNNBERG (1917), SCHOUTEDEN (1944), GROVES (2001) and SARMIENTO & al. (2001). Presumably representing a separate species (cf. under ‘*Lasyopyga schmidti montana* LORENZ, 1914’).

Lectotype: NMW 4511/ST 586 ♂ ad., skull, mount: Mawambi; xii.1910; R. Grauer (no.274) leg., P.v. Oberländer don.

Paralectotypes (3): NMW 4510/B 3911 ♂ ad., skull, skin: Beni; ix.1910; R. Grauer (no.170) leg., P.v. Oberländer don.; NMW 7118/B 3919 ♂ ad., skull, skin; Beni; vii.1910; R. Grauer (no.99) leg., P.v. Oberländer don.; NMW 4477/B 3988 ♂ juv., skull, skin: Beni; vii.1910; R. Grauer (no.97) leg., P.v. Oberländer don.

Localities: Mawambi [loc.typ.], 01°03’N, 28°36’E, Ituri (Orientale), Democratic Republic of the Congo. Beni = Old Beni or Fort Beni, 00°26’N, 29°35’E, 850 m, Nord-Kivu, Democratic Republic of the Congo (DAVIS & MISONNE 1964).

Comments: The lectotype was designated by LORENZ (1917) himself (ICZN 1999, art. 74.5.), though he erroneously indicated the specimen to originate from Ukaika, contrary to the original description (LORENZ 1914a) and R. Grauer’s field notes.

⁴ “Wabembe” (= Wa-Bembe) is a Bantu language group spoken in a wider area of the SE Democratic Republic of the Congo, but supposedly LORENZ (1914a, 1917) referred to the ethnic group of the Bembe inhabiting a rather narrow area NW of Lake Tanganyika (cf. DERKINDEREN 1955).

An illustration (Pl. 15, Fig. 1) and measurements of the specimen's skulls are given by LORENZ (1917).

***Cercopithecus schmidti rutschuricus* LORENZ, 1917** (östl. Randberge der Rutschuru-Ebene [...] 1600m)

Ann. Naturhist. Mus. Wien 31, 228-229, Pl. XV, Fig. 2

Cercopithecus schmidti rutshuricus SARMIENTO, STINER & BROOKS, 2001 (p.22). Incorrect subsequent spelling.

Now ***Cercopithecus ascanius schmidti* MATSCHIE, 1892**. See SCHWARZ (1928a), SCHOUTEDEN (1944), HADDOW (1952), GROVES (2001) and SARMIENTO & al. (2001). Presumably representing a separate species (cf. under '*Lasyopyga schmidti montana* LORENZ, 1914').

Holotype: NMW 4507/ST 587 ♂ ad., skull, mount: östl. Randberge der Rutshuru-Ebene; vi.1910; R. Grauer (no.86) leg., P.v. Oberländer don.

Locality: östl. Randberge der Rutschuru-Ebene = mountains bounding the east side of the Rutshuru Plain, 1600 m, border region of the present Democratic Republic of the Congo (Nord-Kivu) and SW-Uganda, south of Lake Edward, within the former Belgian Congo (LORENZ 1917).

Comments: Holotype fixed by monotypy (ICZN 1999, art. 73.1.2.).

***Cercopithecus pulcher* LORENZ, 1915** (Kamerun)

Anz., Math.-Naturw. Kl., K. Akad. Wiss. Wien 52 (14), 171

Now ***Cercopithecus cephus cephus* (LINNAEUS, 1758)**. See SCHWARZ (1928a), HILL (1966) and GROVES (2001).

Arguable syntypes (2): NMW B 3351, skin: Kamerun; 1912; Dr. [K.A.] Haberer [leg. et don.] (AV 1912/II/c 4 Meerkatzen (Rotschnäutziige)) [NMW label]; NMW B 3347, skin: Kamerun; 1912; Dr. [K.A.] Haberer [leg. et don.] (AV 1912/II/c 4 Meerkatzen (Rotschnäutziige)) [NMW label].

Locality: Kamerun = Cameroon. According to the AV for 1912 K.A. Haberer resided in Douala (04°04'N, 09°43'E, Littoral, Cameroon). Possibly he acquired the specimens from the proximity of this town.

Comments: Of the five *C. cephus* skins from Cameroon, donated by Karl Albert Haberer in 1912 (B3351, B3344, B3345, and B3347) and 1907 (B3946) to the NMW non is labelled as type but only the two skins mentioned above show roughly the same measurements as given in LORENZ's original description. Thus, only these are considered to be arguable type specimens. It remains unclear why LORENZ (1915) only mentioned two out of the four specimens recorded together in the AV for 1912.

***L[asiopyga]. leucampyx sibatoi* LORENZ, 1913** (Gebirgsurwald im Nordwesten des Tanganjikasees von einer Höhe von zirka 2000m [...] das im Bereich des Häuptlings Sibatoi gelegene Gebiet)

Anz. K. Akad. Wiss., Math.-Naturw. Kl. 50 (26), 439-440

Now ***Cercopithecus doggetti* POCOCC, 1907**. See SCHWARZ (1928a, 1928b) and GROVES (2001).

Holotype: NMW 4496/ST 591 ♀, skull, mount (mounted by F. Wald): Bambuswald hinter den Randbergen des Nordwestufers des Tanganika; iv.1910; R. Grauer (no.61) leg., P.v. Oberländer don.

Locality: Bambuswald [bamboo forest at] Sibatoi = Sibatawa, c.a. 03°50'S, 28°55'E, 2200m-2300 m, Sud-Kivu, Democratic Republic of the Congo (USBGN 1964; LORENZ 1917; R. Grauer's field notes).

Comments: Holotype fixed by monotypy (ICZN 1999, art. 73.1.2.). In the original description erroneously indicated as ♂ (LORENZ 1917). An illustration (Pl. 14, Fig. 6) and measurements of the specimen's skull are given by LORENZ (1917).

***Cercopithecus thomasi rutschuricus* LORENZ, 1915** (waldbedeckte östliche Randberge der Rutschuruebene (1600m))

Anz., Math.-Naturw. Kl., K. Akad. Wiss. Wien 52 (14), 172

Cercopithecus thomasi rutshuricus GROVES, 2001 (p.218). Incorrect subsequent spelling.

Now ***Cercopithecus lhoesti* SCLATER, 1899**. See LORENZ (1917), LÖNNBERG (1919) and GROVES (2001). Chromosomal and molecular data do not support the monophyly of the genus *Cercopithecus* as recognize by e.g. GROVES (1989, 2001, 2005), instead the *lhoesti*-group forms a separate clade together with the genera *Chlorocebus* GRAY, 1870 and/or *Erythrocebus* TROUËSSART, 1897 (LEDBETTER 1981; DUTRILLAUX & al. 1988; DISOTELL 2000; GAUTIER & al. 2002; TOSI & al. 2002, 2003, 2004, 2005; XING & al. 2007; TOSI 2008; MOULIN & al. 2008; CHATTERJEE & al. 2009) and should therefore be separated as a distinct genus *Allochrocebus* ELLIOT, 1913 to prevent paraphyly (MOULIN & al. 2008).

Holotype: NMW 4502/ST 625 ♂ ad., skull, mount: Urwald der östl[ichen]. Randberge der Rutschuru-Ebene; VI.1910; R. Grauer (no.87) leg., P.v. Oberländer don.

Locality: östliche Randberge der Rutschuru-Ebene, unweit des damaligen belgischen Grenzpostens [mountains bounding the east side of the Rutshuru Plain, near the former Belgian border post] Schambo (LORENZ 1917) = Nyakashuli (Shambo), 0°43'S, 29°45'E, 1600 m, Kanungu District, Uganda (Carte Politique de l'Etat Indépendant du Congo, 1907, 1:4.000.000; USBGN 1976; pers. comm. W. Bodenstern iii.2010).

Comments: Holotype fixed by monotypy (ICZN 1999, art. 73.1.2.).

An illustration (Pl. 15, Fig. 4) and measurements of the specimen's skull are given by LORENZ (1917).

***Chlorocebus* GRAY, 1870**

***Lasiopyga (Cercopithecus) weidholzi* LORENZ, 1922** (Ägypten)

Ann. Naturhist. Mus. Wien 36, 1-2, Pl. 1

Now ***Chlorocebus aethiops* (LINNAEUS, 1758)**. See SCHWARZ (1926) and GROVES (2001).

Holotype: NMW 2864/B 3896 ♀ ad., skull, skin: 24.v.1930; [A.] Weidholz don. (via the Rudolfspital) [original NMW label].

Locality: Ägypten = Egypt. The potential note on the type locality in the original description ("der Angabe nach von einem Reisenden aus Ägypten nach Wien gebracht" [LORENZ 1922]) is inconclusive and permits two interpretations: Either the traveller came from Egypt or the monkey was brought from Egypt by him. Due to reasons mentioned below neither one of these options can be rejected whereby the type locality remains unclear.

Comments: Holotype fixed by monotypy (ICZN 1999, art. 73.1.2.).

Concerning the type locality of *L. (C.) weidholzi* it has to be stated that no actual or historic, autochthonous occurrence of *Chlorocebus aethiops* within the present territory of Egypt is known (HOATH 2003; OSBORN & HELMY 1980; MASSETI & BRUNER 2009 with further sources). However it can not be ruled out, that the species was distributed as far North as South-Eastern Egypt until the near past (cf. MASSETI & BRUNER 2009). On the other hand Lorenz possibly referred with the denomination "Ägypten" to the wider territory

of the former Anglo-Egyptian Sudan within which the species still can be found (e.g. KINGDON 1997; GROVES 2001). Additionally *C. aethiops* was traded and kept as a pet since ancient times in Egypt (HILL 1966; MASSETI & BRUNER 2009). Therefore it also seems possible that this animal originated from a captive population of unknown provenance. Hence the locus typicus remains dubious (ICZN 1999, art.76.1.1.).

The animal was obtained in 1921 by Alfred Weidholz for his private collection of living primates in Pressbaum, Lower Austria (LORENZ 1922; SCHIFTER 2007) but came afterwards, possibly in exchange, to the Menagerie Schönbrunn, Vienna (ANTONIUS 1929). After its death the specimen was obtained by the NMW from the Rudolfsplatz (a hospital in Vienna) where it was brought supposedly for the autopsy.

***Lasyopyga tantalus graueri* LORENZ, 1914** (Baraka am Nordwestufer des Tanganjikasees)

Anz. K. Akad. Wiss., Math.-Naturw. Kl. 51 (17), 358-359

Now ***Chlorocebus cynosuroides* (SCOPOLI, 1786)**. See below.

Holotype: NMW 4503 ♀ ad., skull, mount: Baraka; II.1910; R. Grauer (no.20) leg., P.v. Oberländer don.

Locality: Baraka, 04°05'S, 29°05'E, 800 m, Sud-Kivu, Democratic Republic of the Congo (DAVIS & MISONNE 1964).

Comments: In his revision of the *Chlorocebus aethiops* group, SCHWARZ (1926) ascribed this form to his concept of *Cercopithecus aethiops centralis* NEUMANN, 1900, wherein he intermingled forms that belong, to what is now considered to be, *Chlorocebus tantalus* (OGILBY, 1841) and *Ch. pygerythrus* (F. CUVIER, 1821) (DANDELLOT 1959, 1974). In all subsequent revisions *L. t. graueri* was synonymised with either one of these two latter forms (e.g. HILL 1966; DANDELLOT 1974; GROVES 2001, 2005). The situation was further complicated due to the fact, that until this registration the skin of the holotype was considered to be lost. Since R. Grauer's field notes contained a later added note, that the skin was mounted, all unlabelled, mounted, specimens in the collection of the NMW matching LORENZ's (1914a, 1917) descriptions were checked. Only one specimen properly corresponded to the descriptions and furthermore the making of the mount closely resembled that of the other mounts, prepared from primate skins collected by R. Grauer and kept at the NMW. Therefore this specimen (Fig. 4) is tentatively considered to be the missing skin of NMW 4503.

Comparison with the descriptions given for *Ch. tantalus* and *Ch. pygerythrus* (e.g. HILL 1966; GROVES 2001; DANDELLOT 1959, 1974) showed that the specimen doesn't belong to either one of these species but has to be assigned to *Ch. cynosuroides*. The following characteristics of the holotype were found to be decisive: The black tail tip, the lack of a white paracaudal tuft, the pale, dusky face without a chin spot as well as lacking separation of the whiskers from the frontal band by tufts of black hair and lacking sharp demarcation of the less prominent whiskers from the crown distinguish it from *Ch. tantalus* (Fig. 4). In contrast to *Ch. pygerythrus* the specimen shows a paler face, only little darker hands and feet compared to the coloration of the limbs (cf. HILL 1966) and conspicuously depigmented naked parts, especially callosities (Fig. 4). Noteworthy no red hairs at the root of the tail are present; solely at the superior, and less prominent, the inferior margin of the callosities reddish hairs are visible. However, already SCHWARZ (1926) noticed the lack of such paracaudal reddish hairs in some *Ch. cynosuroides* specimens.

According to the few available records of *Ch. cynosuroides* in the Democratic Republic of the Congo, the occurrence in Baraka, where it presumably meets with *Ch. pygerythrus rufoviridis* (I. GEOFFROY SAINT-HILAIRE, 1843) (cf. map in DANDELLOT 1959), represents the



Figure 4: Holotype (NMW 4503) of *Lasyopyga tantalus graueri* LORENZ, 1914. **A:** Close up of the head region. Clearly visible are the pale, dusky face and the lacking sharp demarcation of the less prominent whiskers from the crown. **B:** Lateral view.

north eastern most occurrence of this species (SCHOUTEDEN 1944; HILL 1966).

Holotype fixed by monotypy (ICZN 1999, art. 73.1.2.). Measurements of the specimen's skull are given by LORENZ (1917).

***Lasyopyga tantalus beniana* LORENZ, 1914 (Beni)**

Anz. K. Akad. Wiss., Math.-Naturw. Kl. 51 (17), 357

L[asyopyga]. tantalus beniana HILL, 1966 (p.550). Incorrect subsequent spelling.

Now ***Chlorocebus tantalus budgetti* (POCOCK, 1907)**. See HILL (1966) and GROVES (2001, 2005).

Syntypes (2): NMW 4482 ♂ immat., skull: Beni; vii.1910; R. Grauer (no.98) leg., P.v. Oberländer don.; NMW 4494/ST 634 ♂ ad., skull, mount (mounted by Friedrich Kerz, Stuttgart): Beni; vii.1910; R. Grauer (no.100) leg., P.v. Oberländer don.

Locality: Beni = Old Beni or Fort Beni, 00°26'N, 29°35'E, 850 m, Nord-Kivu, Democratic Republic of the Congo (DAVIS & MISONNE 1964).

Comments: The specimens whereon LORENZ's (1914a) description of *L. t. beniana* is based originate from Beni, within the hybrid zone of *Chlorocebus tantalus budgetti* and *Ch. pygerythrus rufoviridis* (I. GEOFFROY SAINT-HILAIRE, 1843) (DANDELLOT 1959; GROVES 2001). Possibly thus DANDELLOT (1974) synonymised the name, without examining the type material, with *Cercopithecus tantalus budgetti* as well as *C. pygerythrus centralis* NEUMANN, 1900 (*Ch. p. rufoviridis*, partim). On the basis of the mounted skin NMW 4494/ST634 no features that would indicate hybrid origin (according to DANDELLOT 1974) or question the affiliation to *Ch. t. budgetti* were found. The skin of NMW 4482 that must have been existent at the time of the original description could not be located during the present survey.

Measurements of the skull of NMW 4494/ST634 are given by LORENZ (1917).

***Cercopithecus (Chlorocebus) toldti* WETTSTEIN, 1916** (Gebel Rihal bei Kadugli, Südkordofan, Nuba-Berge; 4 Kamelrittstunden südl. v. Kadugli)

Anz., Math.-Naturw. Kl., K. Akad. Wiss. Wien 53 (18), 189-190

Now ***Chlorocebus tantalus* (OGILBY, 1841)**. Currently the intraspecific division of *C. tantalus* (especially when taking into account the populations in the Sudan) is in urgent need of a revision wherefore an attribution to one of the three recognized subspecies (GROVES 2001, 2005; GRUBB & al. 2003) seems rather unreasonable and is therefore omitted; but see below.

Syntypes (2): NMW 4483/B 3989 ♀ juv., skull, skin: Khor El Affin (WETTSTEIN 1917), 1. Resthaus 4 Kamelrittstunden südl[ich]. von Kadugli, Süd-Kordofan; 30.iii.1914; O.v. Wettstein (no.62) [Kordofan-Expedition 1914 leg.]; NMW B 6295 ♀ (pregnant) ad., skin; Gebel Rihal bei Kadugli, Süd-Kordofan; 29.iv.1914; O.v. Wettstein (no.61) [Kordofan-Expedition 1914 leg.].

Locality: Khor el Affin = Khawr ‘Afin, 10°44’N, 29°55’E, Southern Kordofan, Sudan (GEONET NAMES SERVER 2009). Gebel/Jebel Rihal = Rihāl, c.a. 11°01’N, 29°43’E, Southern Kordofan, Sudan (USBGN 1962, WETTSTEIN 1917).

Comments: Since the first revision of the whole genus *Chlorocebus* after WETTSTEIN’s (1916) description, *C. (C.) toldti* was considered to be a junior synonym of *Chlorocebus aethiops* (L., 1766) s. str. (e.g. SCHWARZ 1926, 1928a; HILL 1966; GROVES 2001, 2005). SETZER (1956) in his work on the mammals of the Sudan also accepted this view but without examining (topotypic) specimens from the Nuba Mountains. Thus on the basis of the distinguishing traits between *C. aethiops* and *C. tantalus* (DANDELLOT 1959, 1974) the type specimens of *C. toldti* clearly belong to the latter. Particularly both skins show longer orange hair around the genital area. Due to the heavily damaged head of the adult (NMW B6295) only in the juvenile specimen the typical facial pattern with the long black hair bordering the white brow band and absent white moustache can clearly be recognized.

The synonymisation of *C. toldti* with *C. tantalus* is further consistent with recent reviews (e.g. KINGDON 1997, 2004; GROVES 2001, 2005) that consider the White Nile to represent the borderline between the range of the parapatric distributed *C. aethiops* and *C. tantalus* in the central Sudan, although it remains unknown if this stream in fact acts as dispersal barrier between the two species (LERNOULD 1988).

Erythrocebus TROUËSSART, 1897

***Cercopithecus*. *poliophaeus* REICHENBACH, 1863** (Fazoglo, Ketsch-Negerlande von Behr el Abiad)

Vollständ. Naturgesch. Affen., 122-123, Pl. 21 Fig. 309

Cercopithecus. *poliophaeus* HEUGLIN, 1861 (p.13). Nomen nudum (ICZN 1999, art.12.).

Now ***Erythrocebus patas* TROUËSSART, 1897**. See POCOCK (1907), GROVES (2001) and GRUBB & al. (2003).

Lectotype: NMW 743/ST 1567 ♂ ad., skull, skeleton, mount: Fazoglo, Africa (REICHENBACH 1863); T.v. Heuglin leg. et vend. (AV 1856/III/1 *Cercopithecus poliophaeus*) [AV].

Localities: Fazogl/Fazoglo [loc.typ.] = Fāzūghlī, 11°17’N, 34°46’E, Blue Nile, Sudan. Bahr-el-abiad/Behr el Abiad = Al Bahr al Abyad, Sudan. Ketsch-Negerlande = region at the Al Bahr al Abyad in the (?) Jonglei Province and the Upper Nile Province (USBGN 1962; cf. HEUGLIN 1869).

Comments: The original description of REICHENBACH (1863) based on three specimens obtained by Theodor v. Heuglin: A male from “Fazoglo” [Fāzūghlī] (depicted on Pl. 21, Fig. 309 in REICHENBACH 1863), a skin from the “Ketsch-Negerlande von Behr el Abiad”, and a male from “Bahr-el-abiad” bought in Cairo (REICHENBACH 1863; FITZINGER 1866). Merely the male from Fāzūghlī (NMW 743/ST 1567) can be traced today whereas the other specimens seem to be lost, are not documented, or were not preserved. Enquiries, concerning these specimens, to other museums (NMBE, NMC, SSFG, SMNG, SMNS) that received material from Heuglin’s travels (cf. ANONYMUS 1862) provided no further information.

The specimen in the NMW was designated as the lectotype (ICZN 1999, art. 74.5.) by MATSCHIE (1905, p.271: “das Original-Exemplar im Wiener Museum aufbewahrt”).

Confusion arose regarding the life history of the lectotype probably because of a misunderstanding of the original sources by HILL (1966). Contrary to the latter, the animal was obtained sometime between 1852 and 1855 at a presumed age of four years by Heuglin and then kept alive, possibly in Khartoum where he was stationed, another five months (REICHENBACH 1863; FITZINGER 1866; SCHMID 2005).

***C[ercopithecus]. poliolophus* HEUGLIN, 1877** (Fazogl, Ebenen zwischen dem Kir und Kosanga-Fluß)

Reise i. N.-O. Afr., 5-6

Now ***Erythrocebus patas* TROUSSERT, 1897**. See POCOCK (1907), GROVES (2001) and GRUBB & al. (2003).

Lectotype: NMW 743/ST1567; see under '*C[ercopithecus]. poliophaeus* HEUGLIN, 1863'

Comments: In his 1877 book "Reise in Nordost-Afrika", HEUGLIN proposed *C. polilophos* as a new name for *C. poliophaeus* because he considered the former to be unsuitable. This name therefore constitutes a nomen novum⁵ and the lectotype of *C. poliophaeus* acts as name bearing type also for this name (ICZN 1999, art.72.7.). Since HEUGLIN (1877) apparently included more than one specimen in his concept of *C. poliolophus* the specimen NMW 743/ST1567 has to be designated as the lectotype of this taxon to fulfil the requirements of the ICZN (1999, art. 72.7.).

***Macaca* LACÉPÈDE, 1799**

***Simia Ferox* SHAW, 1792** (East Indies [...] Island of Ceylon [...] also said to be found in the interior parts of Africa)

Mus. Lev., no. 1, 69-72, Pl. opposite of p. 71

Now ***Macaca silenus* (LINNAEUS, 1758)**. See SHAW (1792), FOODEN (1975) and GROVES (2001, 2005). A detailed account on the confusing taxonomy of this species is also given by FOODEN (1975).

Syntype: NMW ST 1560 (skull), mount: Ostindien (pedestal label); before or in 1792 (because of SHAW's 1792 publication); purchased by L.v. Fichtel at the Leverian Museum sale for 3 guineas (AV 1806/III/4: *Simia ferox*) [AV].

Locality: The distribution of *Macaca silenus* is restricted to the Western Ghats in the South-western Indian states of Karnataka, Kerala and Tamil Nadu (FOODEN 1975; GREEN & MINKOWSKI 1977; KURUP 1978; ALI 1985; EASA & al. 1997; KUMARA & SINHA 2009). Consequently, it can be presumed that the specimen in the NMW originated from there. The, supposedly later added, inscription "Ostindien" on the pedestal label is certainly wrong.

Comments: SHAW (1792) based his *Simia ferox* on a specimen in the Leverian Museum as well as descriptions of other authors, namely that of *Simia silenus* LINNAEUS, 1758, the "Ouanderou"⁶ of BUFFON (1766, pp. 169-175, Pl. 18), and the "lion tailed monkey [variety α]" of PENNANT (1771, p. 109, Pl. 13A, Fig. 1). According to articles 72.4.1. and 72.4.4. of the ICZN (1999) all specimens included by the mentioned authors in their concepts of these

⁵ Towards HEUGLIN's (1877, p.5) possibly misleading statement "Ihr [*C. poliophaeus*] wurde die unpassende Benennung *Cercopithecus poliophaeus* beigelegt. Dieselbe muss in *C. poliolophus* umgeändert werden [...]" this constitutes a new replacement name rather than an emendation (cf. ICZN, arts. 33.2, 72.7), since he changed the second part of the species epithet from phaeus (derived from the Greek Φαίος: blackish, dull, dark) to lophos (derived from the Greek Λόφος: neck, throat; elevation of elongated single components) rather than modified the spelling of the name (WERNER 1956; RAMSHORN 1857).

⁶ In fact referring to "Wanderoo", the Sinhala word for langur (GREEN & MINKOWSKI 1977).

names are part of the type series. LINNAEUS (1758) based his *Simia silenus* on a description by ALPINI (1735), which he indicates as doubtful with a question mark, as well as possibly a characterization of a monkey from Ceylon by RAY (1693) (on *Trachypithecus vetulus* [ERXLEBEN, 1777], FOODEN 1975), although he does not cite the latter account in the description (FOODEN 1975). Eight years later BUFFON (1766) published his description of the “Ouanderou” largely on the basis of an animal showed at a fair in France (designated as the neotype of *M. silenus* LINNAEUS, 1758 by FOODEN 1975) but also citing the accounts by KNOX (1681) (presumably on *Trachypithecus vetulus*, see FOODEN 1975; GROVES 2008), RAY (1693), and ALPINI (1735) as well as field notes taken by the missionary Père Vincent Marie in SW-India (footnote on pp. 171-172 in BUFFON 1766). The last bibliographic source mentioned by SHAW (1792) is PENNANT’S (1771) description of the ‘lion tailed monkey [variety α]’ (since SHAW (1792) cites PENNANT’S description as follows “Lion-tailed baboon Pennant. Quadr. p.” it remains unclear if he actually referred to the “Synopsis of Quadrupeds” [PENNANT 1771] or the “History of Quadrupeds” [PENNANT 1781] whereas the latter seems more likely as herein the term “baboon” instead of “monkey” is used for this taxon) who included in his concept of the species only with certainty the “Ouanderou” of BUFFON (1766) and an animal shown in London around 1768 (cf. PENNANT 1771). Supposedly the animal mentioned at last is identical with the specimen from the Leverian Mu-

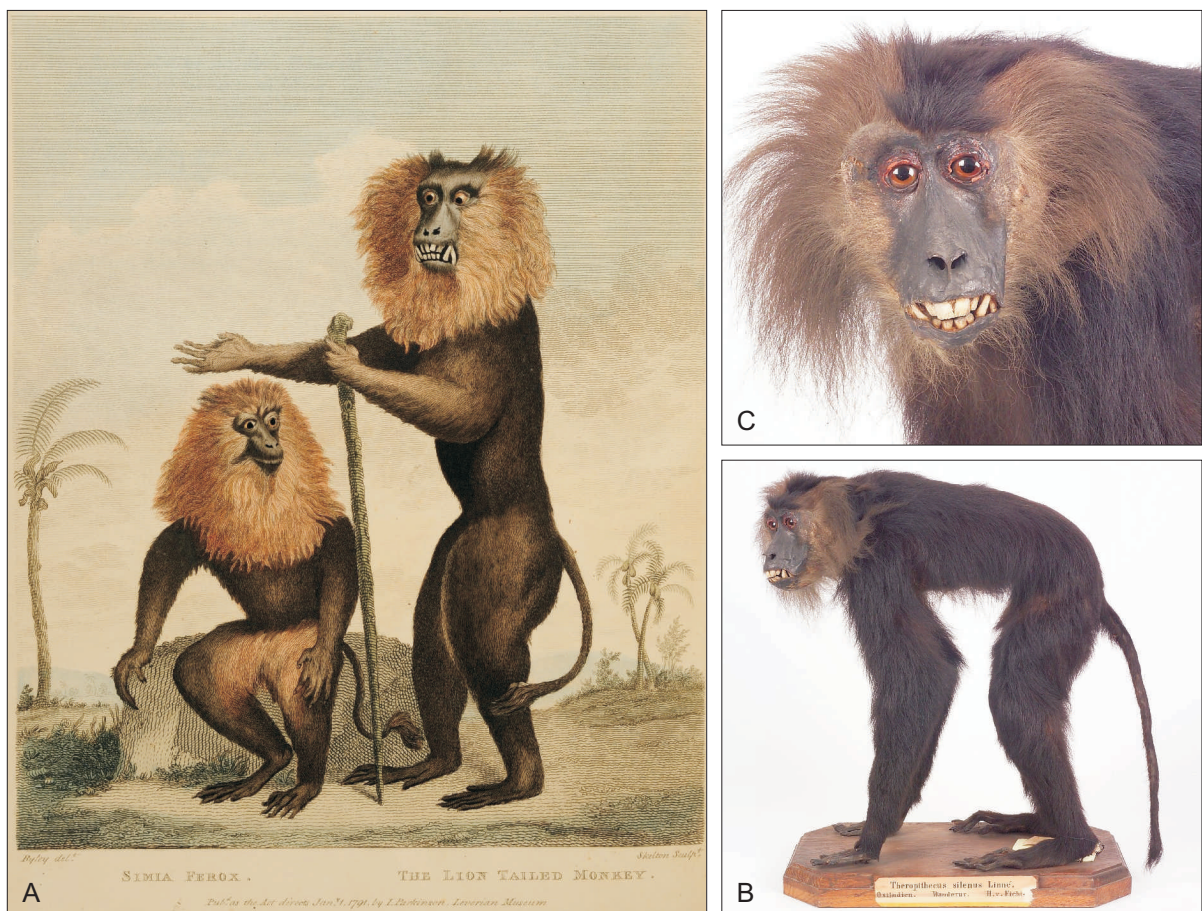


Figure 5: The syntype (NMW ST1560) of *Simia ferox* SHAW, 1792 (B, C) compared to the plate in SHAW’S (1792, plate opposite of p. 71) description (A). The animal depicted on the right in Shaw’s plate fits well to the specimen in the NMW, particularly due to the appearance of the teeth and the nostrils as well as the accurate depiction of the “beard”. Whereas the second animal resembles closely the one shown in BUFFON (1766, Pl. 18) but with certain modifications like the intact tail and the “beard” encircling the whole face.

seum (cited also by PENNANT [1781] and SIBLY [1795]) which SHAW (1792) had at hand for his description.

In the sales catalogue of the Leverian Museum two specimens of “*Simia ferox*” are mentioned, one of them bought by L.v. Fichtel (16.v.1806, 11th day of sale, lot no. 1274 [ANONYMUS 1979]) the other by Laskey for the HMUG. The animal at the NMW very closely resembles the one depicted in SHAW (1792), particularly due to the visible teeth of the mounted specimen (Fig. 5) and it is therefore deemed as a syntype.

***S[imia]. [(Cercopithecus)] silenus albibarbatus* KERR, 1792** (Ceylon and the rest of India)
Anim. Kingd., 74, Pl. 54, Fig. 61

Now ***Macaca silenus* (LINNAEUS, 1758)**. See KERR (1792), FOODEN (1975) and GROVES (2001, 2005). For details regarding the taxonomic history of this species see FOODEN (1975).

Arguably syntype: NMW ST 1560; see under ‘*Simia Ferox* SHAW, 1792’.

Comments: The description of *Simia (Cercopithecus) silenus albibarbatus* KERR, 1792 based supposedly solely on accounts from the literature, namely the descriptions of *Simia silenus* LINNAEUS, 1758, the “Ouanderou” of BUFFON (1766), the “lion tailed monkey [variety α]” of PENNANT (1771), and a characterization of *Presbytis senex* by RAY (1693) (FOODEN 1975). As for *Simia ferox*, SHAW 1792 the type series encompasses all specimens included by the mentioned authors in their concepts of these taxa (ICZN 1999, arts. 72.4.1. & 72.4.4.).

In the case that the specimen from the Leverian Museum obtained by the NMW in 1806 is actually identical with the animal mentioned by PENNANT (1771, 1781; cf. under ‘*Simia Ferox* SHAW, 1792’), the specimen NMW ST 1560 represents a syntype of *Simia (Cercopithecus) silenus albibarbatus* KERR, 1792.

***Papio* ERXLEBEN, 1777**

Contrary to authors who classified the five traditionally recognized baboon types as separate species (e.g. GROVES 2001, 2005; GRUBB & al. 2003), here is followed recent studies of the cranial morphology and mitochondrial DNA (FROST & al. 2003; ZINNER & al. 2009) that argue in favour of a classification as subspecies of *Papio hamadryas* (LINNAEUS, 1758). Reviews of this long lasting dispute can be found in the works of JOLLY (1993) and HILL (1970). Furthermore the molecular (mtDNA) data seem to support the previously (JOLLY 2003) expressed view that the recognition of just five or respectively six morphologically defined allotaxa (GRUBB 1999), does not reflect the complex “biological reality” in this genus (JOLLY 2003; ZINNER & al. 2009). According to an unpublished survey of Clifford Jolly and Andrew S. Burrell (cit. in JOLLY 2003) at least 18, probably diagnosable, allotaxa can be recognized.

***Papio graueri* LORENZ, 1917** (Rutschuru-Ebene)

Ann. Naturhist. Mus. Wien 31, 236-237

Now ***Papio hamadryas anubis* (LESSON, 1827)**. See ALLEN (1925), HILL (1970) and GROVES (2001).

Holotype: NMW 7135/ST 638 ♀ ad., skull, mount: Rutschuru-Ebene; vi.1910; R. Grauer (no.91) leg., P.v. Oberländer don.

Locality: Rutschuru-Ebene = Rutshuru plain, 0°37’S to 1°10’S, 29°19’E to 29°33’E, Nord-Kivu, Democratic Republic of the Congo (CHAPIN 1954).

Comments: The collecting locality of the holotype lies within the range of the “central olive” mtDNA-haplogroup of *P. h. anubis* (ZINNER & al. 2009), which contingently corresponds to *Papio tessellatum* ELLIOT, 1909 described from Mulema (00°56'S, 30°56'E, 1500m; DAVIS & MISONNE 1964) in Uganda (ELLIOT 1909).

July 1910 was erroneously cited as the collecting date by HILL (1970).

Holotype fixed by monotypy (ICZN 1999, art. 73.1.2.).

***Papio silvestris* LORENZ, 1915** (Ituri-Urwald bei Mawambi)

Anz., Math.-Naturw. Kl., K. Akad. Wiss. Wien 52 (14), 173-174

P[apio]. a[nubis]. silvestris HILL, 1967 (p. 8). Incorrect subsequent spelling.

Now ***Papio hamadryas anubis* (LESSON, 1827)**. See LÖNNBERG (1919), ALLEN (1925), HILL (1970) and GROVES (2001).

Holotype: NMW B 3936 ♂, skin: Mawambi; xi.1910; R. Grauer (no.198) leg., P.v. Oberländer don.

Locality: Ituri-Urwald bei Mawambi = Ituri Forest near Mawambi, ca. 01°03'N, 28°36'E, Ituri (Orientale), Democratic Republic of the Congo (DAVIS & MISONNE 1964).

Comments: Similarly as for the former the collecting locality of the holotype lies within the range of the “central olive” mtDNA-haplogroup of *P. h. anubis* (ZINNER & al. 2009; also see above).

Holotype fixed by monotypy (ICZN 1999, art. 73.1.2.).

***Papio wernerii* WETTSTEIN, 1916** (Gebel Talodi bei Talodi, Südkordofan)

Anz., Math.-Naturw. Kl., Kais. Akad. Wiss. Wien 53 (18), 190-191

Now ***Papio hamadryas anubis* (LESSON, 1827)**. See HILL (1970) and JOLLY (1993).

Holotype: NMW 428 ♀ ad., skull: Jebel Talodi bei Talodi, S-Kordofan; 4.IV.1914; O.v. Wettstein / Kordofan-Expedition 1914 leg. [WETTSTEIN 1916, 1917].

Locality: Gebel/Jebel Talodi = Jabal Talawdī, 10°38'N, 30°20'E, Southern Kordofan, Sudan (USBGN 1962).

Comments: Holotype fixed by monotypy (ICZN 1999, art. 73.1.2.).

Previous authors (e.g. ALLEN 1925; SETZER 1956) placed the form within *Papio anubis heuglini* MATSCHIE, 1898, a little-known taxon, known from Southern Sudan and Southwest Ethiopia, differing noticeable from typical *P. h. anubis* in external traits (HILL 1970; JOLLY 1993). Currently molecular data of animals from the known range, which could help clarifying the taxonomic position of this taxon, are largely missing (ZINNER & al. 2009).

The skull of the holotype is largely damaged due to the fall down of the shot animal (WETTSTEIN 1916) and, although stuck together accurately, does not allow taking most measurements exactly; moreover a few fragments are missing.

***Colobus* ILLIGER, 1811**

***Colobus occidentalis ituricus* LORENZ, 1914** (sowohl am Ostrande des Urwaldes als im Innern in der Umgebung von Mawambi)

Anz. Österr. Akad. Wiss., Math.-Naturw. Cl. 51 (22), 508-509

Now ***Colobus guereza occidentalis* (ROCHEBRUNE, 1887)**. See LORENZ (1917), SCHWARZ (1929), POCOCK (1935), ICZN (1956), GROVES (2007) and TING (2008).

Syntypes (9): NMW 4429/ST 1667 ♀ ad., skull, mount: Moera; viii.1910; R. Grauer (no.126) leg., P.v. Oberländer don.; NMW 4436/B 5792 ♀, skull, skin: Mawambi; xi.1910; R. Grauer (no.225) leg., P.v. Oberländer don.; NMW 4439/B 5788 ♀ juv., skull, skin:

Moera; vii.1910; R. Grauer (no.112) leg., P.v. Oberländer don.; NMW 4445/B 5790 ♂ juv. (“Junges von” NMW 4436/B 5792), skull, skin: Mawambi; xi.1910; R. Grauer (no.226) leg., P.v. Oberländer don.; NMW 7108/B 5469 ♂ ad., skull, skin: Moera; viii.1910; R. Grauer (no.129) leg., P.v. Oberländer don.; NMW 7110/B 5787 ♂, skull, skin: Moera; vii.1910; R. Grauer (no.108) leg., P.v. Oberländer don.; NMW 7111/B 5468 ♂, skull, skin: Ukaika; xii.1910; R. Grauer (no.256) leg., P.v. Oberländer don.; NMW 7114/B 5481 ♀ ad., skull, skin: Moera; viii.1910; R. Grauer (no.127) leg., P.v. Oberländer don.; NMW 7116/B 5791 ♂, skull, skin: Mawambi; xi.1910; R. Grauer (no.234) leg., P.v. Oberländer don.

Localities: Moera = Mbau, 0°39’N, 29°30’E, 1000-1100 m, Nord-Kivu, Democratic Republic of the Congo. Mawambi, 01°03’N, 28°36’E, Ituri (Orientale), Democratic Republic of the Congo. Ukaika, 00°45’N, 28°45’E, 900 m, Ituri (Orientale), Democratic Republic of the Congo (DAVIS & MISONNE 1964, HAYMAN & al. 1966).

Comments: A primary junior homonym (ICZN 1999, arts.53.3., 57.2.) of *Colobus (Guereza) matschiei ituricus* MATSCHIE, 1913 described on specimens from the Ituri region in the RMCA and PCM (LORENZ 1917; MATSCHIE 1913; NAPIER 1985). Since no lectotype is designated the type locality, despite other statements (e.g. SCHWARZ 1929), encompasses Mbau, Mawambi, and Ukaika (ICZN 1999, art.76.1.).

Measurements of some of the specimen’s skulls are given by LORENZ (1917).

***Colobus occidentalis rutschuricus* LORENZ, 1914** (vom Sassaflusse, am nordöstlichen Rande der Rutschuruebene (südöstlich vom Albert-Edwardsee))

Anz. Österr. Akad. Wiss., Math.-Naturw. Cl. 51 (22), 508

Now ***Colobus guereza occidentalis* (ROCHEBRUNE, 1887)**. See SCHWARZ (1929), POCOCK (1935), ICZN (1956), GROVES (2007) and TING (2008).

Holotype: NMW 4454/B 5470 ♀ skull, skin: Sassa-Fluß in der Rutschuru-Ebene; vi.1910; R. Grauer (no.90) leg., P.v. Oberländer don.

Locality: Sassa-Fluß in der Rutschuru-Ebene [at the Rutshuru plain] = Ishasha River, ca. 00° 28’ S, 29° 39’ E (GROVES 2001; USBGN 1964). The Ishasha River nowadays represents a section of the border between the Democratic Republic of the Congo (Nord-Kivu) and SW-Uganda. Since the expedition of R. Grauer nearly reached the border of the former Belgian Congo (LORENZ 1917) which at that time spawned east of the actual run at 30°00’E (JENTGEN 1953), the country wherefrom the specimen originates can not be determined with certainty.

Comments: Holotype fixed by monotypy (ICZN 1999, art. 73.1.2.). Measurements of the specimen’s skull are given by LORENZ (1917).

***Cebus Polykomos* ZIMMERMANN, 1780** (Gujana)

Geograph. gesch. Menschen u. vierf. Thiere, vol. 2, 202

Simia polycomos SCHREBER, 1798 (Pl. 10D). Incorrect subsequent spelling; see below.

Now ***Colobus polykomos* (ZIMMERMANN, 1780)**. See GROVES (2007) and TING (2008).

Colobus polycomos (actually referred to as *Simia polycomos* SCHREBER) is the type species of the genus *Colobus* ILLIGER, 1811 by subsequent designation of I. GEOFFROY SAINT-HILAIR (1851; ALLEN 1920, 1925).

Holotype: NMW ST 1488 ♀ (pedestal label), (skull), mount: Sierra Leone (pedestal label); [1771-1775] (DOUGLAS 2004, 2008); purchased by L.v. Fichtel at the Leverian Museum sale for 6 guineas (AV 1806/III/2 *Simia comosa*) [AV].

Locality: The originally mentioned type locality “Gujana” probably resulted from a misreading; but see below. According to Henry Smeathman’s hitherto known collecting areas (Fig. 7), the type specimen presumably originated from Western Sierra Leone (DOUGLAS



Figure 6: Holotype (NMW ST 1488) of *Cebus Polykomos* ZIMMERMANN, 1780. A: Lateral view. The white painted wooden base bears a label containing the scientific binomial (“*Colobus polykomos*”), the German name (“Kragen-Stummelaffe”), the collecting locality (“Sierra Leone”) and a sex indication (“Weibchen”). The blue stripe at the bottom possibly constitutes a kind of geographical colour code (blue signifies Africa; cf. LICHTENSTEIN 1816) indicating the African origin of the specimen. B: Dorsal view showing the extensive moth damage. C: Close up of the head. The eyes of the mount are made of painted glass spheres rather than mouth-blown glass eyes used in later times. Also the contours of the inbuilt skull are clearly recognizable.

2004, 2008). GROVES (2007) supposed Sherbro Island, Sierra Leone to be the collecting locality without mentioning any further sources concerning this matter.

Comments: Holotype fixed by monotypy (ICZN 1999, art. 73.1.2.). ZIMMERMANN (1780) described *C. polykomos* based on manuscript notes, on a specimen kept at the Leverian Museum, sent to him by the British naturalist Thomas Pennant, which is why his description could antedate those of PENNANT (1781; as full-bottom monkey) by one year (cf. ALLEN 1902, 1920). Supposedly due to a misreading of the collecting locality of the holotype, potentially named Guinea in Pennant’s notes, ZIMMERMANN (1780) accepted “Gujana” (= Guyana) as the type locality, contrary to a subsequent letter from Pennant, also cited by ZIMMERMANN, wherein he stated that the specimen came from Sierra Leone (ZIMMERMANN 1780: “Er bewohnt Gujana, so meldete mir Herr Pennant zuerst, nachmals schrieb er, Sierra Liona in Afrika; ich glaube das erstere.”). In the third volume of the “Geographische Geschichte ...” ZIMMERMANN (1783, p.170) corrected his previous belief and cited Africa as the homeland of *C. polykomos*.

Henry Smeathman, who is mentioned as the collector of the specimen by PENNANT (1781), collected natural history specimens in Sierra Leone from 1771 to 1775 (DOUGLAS 2004, 2008). Evidently he obtained the holotype of *C. polykomos* during that time and presented it to Sir Ashton Lever the owner of the Leverian Museum (PENNANT 1781). In 1806 the whole museum was auctioned and among others the *C. polykomos* specimen was acquired (28.v.1806, 21st day of sale, lot no. 2457 [ANONYMUS 1979]) by Leopold von Fichtel for the “Vereinigte K.-K. Naturalien-Cabinete” the precursor of the NMW (FITZINGER 1868a; WHITEHEAD 1978). Since then the specimen was, against a contrary statement by PELZELN (1890), thought to be lost (e.g. ALLEN 1925; O’LEARY 2003).

S[imia]. [(Cercopithecus)] regalis KERR, 1792 (forests of Sierra Leone in Guinea)
Anim. Kingd., 74, Pl. 54, Fig. 61

Now ***Colobus polykomos (ZIMMERMANN, 1780)***. See ALLEN (1895), GROVES (2007) and TING (2008).

Holotype: NMW ST 1488; see under ‘*Cebus polykomos ZIMMERMANN, 1780*’.

Comments: KERR’s (1792) description based on the “full-bottom monkey” of PENNANT (1781, p.197, Pl. 24) and therefore does not compromise a nomen novum (ICZN 1999, art. 72.7.) of *Cebus polykomos ZIMMERMANN, 1780*. The animal depicted on plate 24 in PENNANT’s (1781) work, doubtless shows the specimen NMW ST1488 (Fig. 6) which at that time was part of the Leverian Museum (PENNANT 1781, SIBLY 1795).

Holotype fixed by monotypy (ICZN 1999, art. 73.1.2.). On the nomenclatorial availability of KERR’s ‘Animal Kingdom’ see ALLEN (1895), KUHN (1966), and ICZN (1969).

S[imia]. Tetradactyla LINK, 1795⁷ [no locality given]

Beytr. Naturgesch. 2, 62

Now ***Colobus polykomos (ZIMMERMANN, 1780)***. See ROCHEBRUNE (1886), ALLEN (1920), GROVES (2007) and TING (2008).

Holotype: NMW ST 1488; see under ‘*Cebus polykomos ZIMMERMANN, 1780*’.

Comments: Based solely on the “Guenon à camail” of BUFFON (1789, p.65) which in turn is based on PENNANT’s (1781) “full-bottom monkey” (cf. entry of ‘*S[imia]. [(Cercopithecus)] regalis KERR, 1792*’). Hence not a nomen novum (ICZN 1999, art. 72.7.) for *Cebus polykomos ZIMMERMANN, 1780*.

Holotype fixed by monotypy (ICZN 1999, art. 73.1.2.).

Simia Comosa SHAW, 1800 (Sierra Leona)

Gen. zool. 1 (1) Mamm., 59, Pl. 24

Now ***Colobus polykomos (ZIMMERMANN, 1780)***. See SHAW (1800), GROVES (2007) and TING (2008).

Holotype: NMW ST 1488; see under ‘*Cebus polykomos ZIMMERMANN, 1780*’.

Comments: Described on the basis of the “Guenon à camail” of BUFFON (1789, p.65) and PENNANT’s (1781) “full-bottom monkey”, respectively SCHREBER’s (1798) “*Simia polycomos*” all based on the above mentioned specimen from the Leverian Museum. Thus *Simia comosa* SHAW, 1800 represents a nomen novum – if *Simia polycomos* SCHREBER, 1798 is regarded as an incorrect subsequent spelling of Zimmermann’s *C. polykomos* as shown below – for ‘*Cebus polykomos ZIMMERMANN, 1780*’ (ICZN 1999, art. 72.7.).

Holotype fixed by monotypy (ICZN 1999, art. 73.1.2.).

Piliocolobus (ROCHEBRUNE, 1877)

The taxonomy of the genus is still, certainly in part due to the lack of comprehensive molecular studies, not very well understood. In the latest taxonomic review of the whole genus, GROVES (2007), on the basis of the Phylogenetic Species Concept (cf. GROVES 2001, 2004), recognized not less than 16 distinct species. Additionally he classified the hybridogene “*P. ellioti* (DOLLMAN, 1909)” as a separate entity, representing a hybrid swarm of *P. langi*

⁷ The author of this taxon was the German professor (at that time in Rostock) Heinrich Friedrich Link (1767-1851), not to be confused with the pharmacist and collector of natural history specimens Johann Heinrich Linck Jr. (1734-1807) from Leipzig (POMMER 2008; SEIFERT 1935).

(ALLEN, 1925), *P. oustaleti* (TROUSSERT, 1906), and *P. parmentieri* (COLYN & VERHEYEN, 1987).

Other important contributions to the understanding of the diversity of *Piliocolobus* on the basis of coat colour pattern, cranial morphology, and mtDNA data came from COLYN (1991, 1993), CARDINI & ELTON (2009) and TING (2008). See also the account on taxonomy in STRUHSAKER (2010).

***S[imia]. [(Cercopithecus)] badius* KERR, 1792 [no locality given]**

Anim. Kingd., 74

Now ***Piliocolobus badius badius* (KERR, 1792)**. See ALLEN (1895), GROVES (2007) and STRUHSAKER (2010). *Piliocolobus badius* represents the type specimen of the genus *Piliocolobus* ROCHEBRUNE, 1887 due to subsequent designation by ALLEN (1920) (ICZN 1999, art. 69.1.).

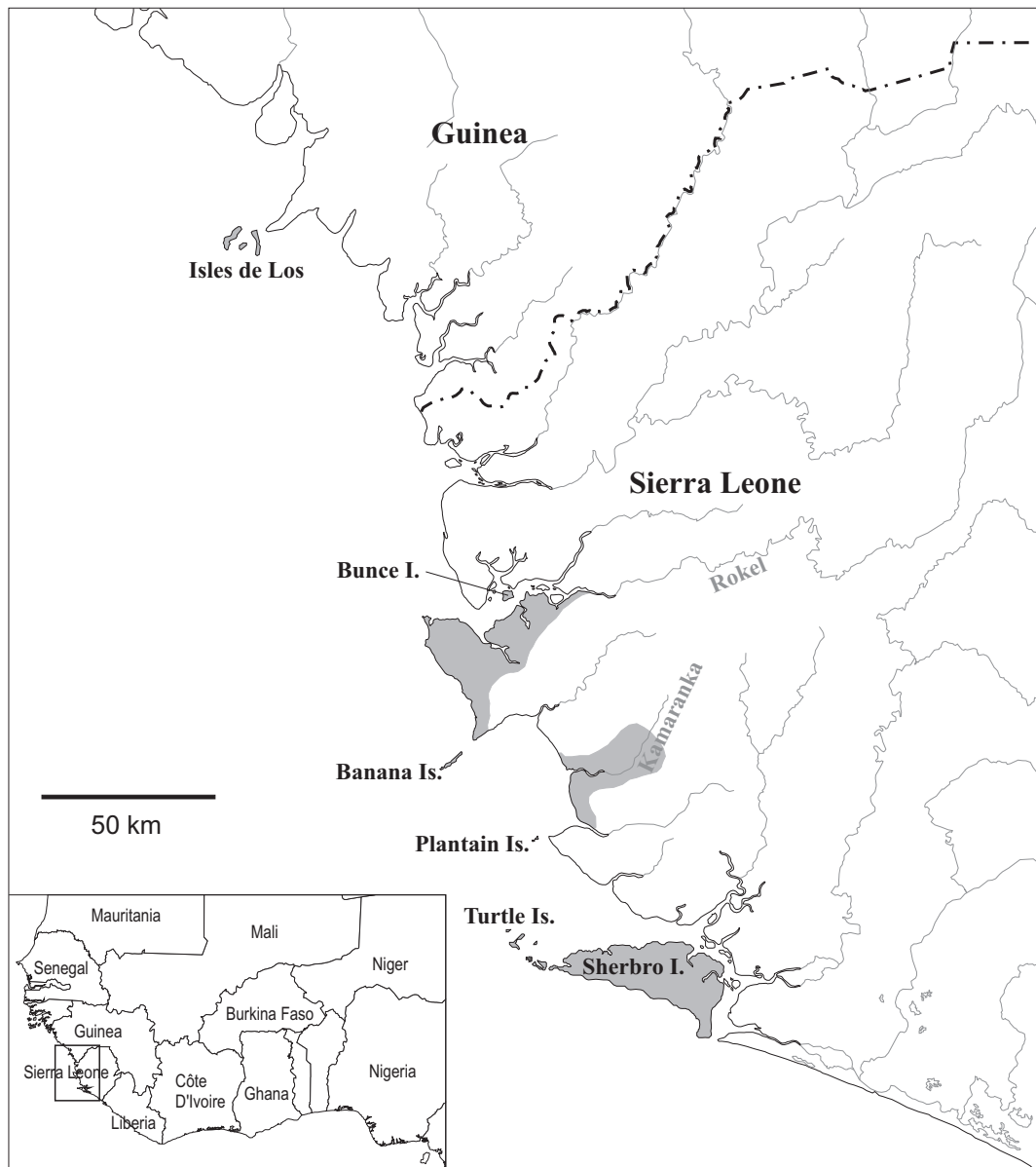


Figure 7: Known collecting areas (shaded) of Henry Smeathman during his stay in Sierra Leone. Modified from DOUGLAS (2004).

Holotype: NMW ST 1489 ♀ (pedestal label), (skull), mount: Sierra Leone (pedestal label); [1771-1775] (DOUGLAS 2004, 2008); purchased by L.v. Fichtel at the Leverian Museum sale for 6 guineas, (AV 1806/III/29 Bay Monkey of Penn.) [AV].

Locality: Since the holotype was also collected by H. Smeathman (PENNANT 1781, SIBLY 1795) it probably, like the holotype of ‘*Cebus polykomos* ZIMMERMANN, 1780’, originated from Western Sierra Leone (DOUGLAS 2004, 2008). In turn GROVES (2007) supposed Sherbro Island, Sierra Leone to be the collecting locality without mentioning any further sources concerning this matter.

Comments: KERR’s (1792) description based on PENNANT’s (1781, p.198) ‘bay monkey’ described by the latter on a specimen in the Leverian Museum collected by H. Smeathman. This specimen was obtained, as the holotype of ‘*Cebus polykomos* ZIMMERMANN, 1780’, by L.v. Fichtel at the sale of the Leverian Museum (10.vi.1806, 31st day of sale, lot no. 3628 [ANONYMUS 1979]) (cf. the remarks mentioned under ‘*Cebus polykomos* ZIMMERMANN, 1780’). As for the holotype of the former this specimen was thought to be lost (e.g. ALLEN 1925; O’LEARY 2003).

On the nomenclatorial availability of KERR’s “Animal Kingdom” see ALLEN (1895), KUHN (1966), and ICZN (1969). Holotype fixed by monotypy (ICZN 1999, art. 73.1.2.).

***Simia ferruginea* SHAW, 1800** (Sierra Leona)

Gen. zool. 1 (1) Mamm., 59-60

Now ***Ptilocolobus badius badius* (KERR, 1792)**. See ALLEN (1895), GROVES (2007) and STRUHSAKER (2010).

Holotype: NMW ST 1489; see under ‘*S[imia]*. [(*Cercopithecus*)] *badius* KERR, 1792’.

Comments: The original description of SHAW (1800) based solely on PENNANT’s (1781) “bay monkey” and therefore does not represent a nomen novum (ICZN 1999, art.72.7.) for *Simia (Cercopithecus) badius* KERR, 1792 (ALLEN 1920).

Holotype fixed by monotypy (ICZN 1999, art. 73.1.2.).

***Colobus ferruginosus* É. GEOFFROY SAINT-HILAIRE, 1812** (Guinée)

Ann. Mus. d’Hist. Nat. Paris 19, 92

Now ***Ptilocolobus badius badius* (KERR, 1792)**. See ALLEN (1895), GROVES (2007) and STRUHSAKER (2010).

Holotype: NMW ST 1489; see under ‘*S[imia]*. [(*Cercopithecus*)] *badius* KERR, 1792’.

Comments: This name represent an unjustified emendation (ICZN 1999, art.33.2.3.) of *Simia ferruginea* SHAW, 1800 since Étienne GEOFFROY SAINT-HILAIRE (1812) cited SHAW’s *Simia ferruginea*. Therefore *Colobus ferruginosus* constitutes an objective synonym of *Ptilocolobus badius badius* (KERR, 1792) (ICZN 1999, art.33.2.3.).

***Colobus [(Tropicolobus)] multicolor* LORENZ, 1914** (Mawambi am Ituri)

Anz. Österr. Akad. Wiss., Math.-Naturw. Cl. 51 (18), 385-386

Now ***Ptilocolobus foai ellioti* (DOLLMAN, 1909)**. See LÖNNBERG (1919), GROVES (2001, 2005, 2007), GRUBB & al. (2003) and STRUHSAKER (2010).

Holotype: NMW 4443/ST 648 ♂ ad., skull, mount: Mawambi; xi.1910; R. Grauer (no.197) leg., P.v. Oberländer don.

Locality: Mawambi, 01°03’N, 28°36’E, Ituri (Orientale), Democratic Republic of the Congo (DAVIS & MISONNE 1964).

Comments: An illustration (Pl. 12, Fig. 6) and measurements of the specimen's skull are given by LORENZ (1917). Holotype fixed by monotypy (ICZN 1999, art. 73.1.2.).

***Colobus [(Tropicolobus)] variabilis* LORENZ, 1914** (Gebiete des Ituri-Urwaldes)

Anz. Österr. Akad. Wiss., Math.-Naturw. Cl., 51 (18), 383-386

Now *Piliocolobus foai ellioti* (DOLLMAN, 1909). See LORENZ (1917), GROVES (2001, 2005, 2007) and GRUBB & al. (2003).

Syntypes (34): NMW 338 ♂ ad., skull: Moera; vii.1910; R. Grauer (no.104) leg., P.v. Oberländer don.; NMW 339 ♂ ad., skull: Moera; vii.1910; R. Grauer (no.113) leg., P.v. Oberländer don.; NMW 4437/B 5486 ♂ juv., skull, skin: Moera; viii.1910; R. Grauer (no.143) leg., P.v. Oberländer don.; NMW 4440/B 5502 ♂ juv. ("iuv. zu" 7098/B 3961), skull, skin: Mawambi; xi.1910; R. Grauer (no.211) leg., P.v. Oberländer don.; NMW 4444 ♂ juv. ("junges v." NMW 4452/B 5500'), skull: Moera; vii.1910; R. Grauer (no.106) leg., P.v. Oberländer don.; NMW 4447/B 5493 ♀ ad., skull, skin: Moera; viii.1910; R. Grauer (no.144) leg., P.v. Oberländer don.; NMW 4448/B 5491 ♀ ad., skull, skin: Mawambi; xi.1910; R. Grauer (no.205) leg., P.v. Oberländer don.; NMW 4449/B 3960 ♀ ad., skull, skin: Mawambi; xi.1910; R. Grauer (no.204) leg., P.v. Oberländer don.; NMW 4450/B 5501 ♀ ad., skull, skin: Moera; vii.1910; R. Grauer (no.115) leg., P.v. Oberländer don.; NMW 4451/B 5499 ♀ ad., skull, skin: Moera; vii.1910; R. Grauer (no.109) leg., P.v. Oberländer don.; NMW 4452/B 5500 ♀ ad., skull, skin: Moera; vii.1910; R. Grauer (no.105) leg., P.v. Oberländer don.; NMW 4453/B 5489 ♂ ad., skull, skin: Moera; viii.1910; R. Grauer (no.151) leg., P.v. Oberländer don.; NMW 4455/B 5485 ♂ immat., skull, skin: Moera; viii.1910; R. Grauer (no.152) leg., P.v. Oberländer don.; NMW 4456/B 5497 ♂ ad., skull, skin: Moera; viii.1910; R. Grauer (no.145) leg., P.v. Oberländer don.; NMW 4457/B 5495 ♂ ad., skull, skin: Mawambi; xi.1910; R. Grauer (no.235) leg., P.v. Oberländer don.; NMW 4459/B 5794 ♂ juv., skull, skin: Moera; vii.1910; R. Grauer (no.111) leg., P.v. Oberländer don.; NMW 4460/B 5490 ♂ ad., skull, skin: Ukaika; xii.1910; R. Grauer (no.246) leg., P.v. Oberländer don.; NMW 4461/B 5492 ♂ ad., skull, skin: Moera; vii.1910; R. Grauer (no.118) leg., P.v. Oberländer don.; NMW 4462/B 5487 ♂ ad., skull, skin: Moera; viii.1910; R. Grauer (no.137) leg., P.v. Oberländer don.; NMW 4463 ♂ ad., skull: Moera; viii.1910; R. Grauer (no.132) leg., P.v. Oberländer don.; NMW 4464/B 5482 ♂ ad., skull, skin: Moera; vii.1910; R. Grauer (no.117) leg., P.v. Oberländer don.; NMW 7096/B 4020 ♀ ad., skull: Moera; viii.1910; R. Grauer (no.135) leg., P.v. Oberländer don.; NMW 7098/B 3961 ♀ ad., skull (sagittally sawn), skin: Mawambi; xi.1910; R. Grauer (no.213) leg., P.v. Oberländer don.; NMW 7099/B 5484 ♀ ad., skull, skin: Ukaika; xii.1910; R. Grauer (no.249) leg., P.v. Oberländer don.; NMW 7100/B 3959 ♀ ad., skull (sagittally sawn), skin: Moera; vii.1910; R. Grauer (no.114) leg., P.v. Oberländer don.; NMW 7102/B 4019 ♂ ad., skull, skin: Mawambi; xi.1910; R. Grauer (no. 214) leg., P.v. Oberländer don.; NMW 7103/B 4022 ♀ immat., skull, skin: Ukaika; xii.1910; R. Grauer (no. 248) leg., P.v. Oberländer don.; NMW 7104/ST 651 ♂ ad., skull (sagittally sawn), mount: Moera; viii.1910; R. Grauer (no.133) leg., P.v. Oberländer don.; NMW 7105/B 3962 ♂ ad., skull, skin: Ukaika; xii.1910; R. Grauer (no.247) leg., P.v. Oberländer don.; NMW 7106/B 5483 ♂ ad., skull (sagittally sawn), skin: Mawambi; xi.1910; R. Grauer (no.227) leg., P.v. Oberländer don.; NMW 7107/B3 978 ♂ ad., skull, skin: Mawambi; xi.1910; R. Grauer (no.233) leg., P.v. Oberländer don.; NMW B 5488 ♀ ad., skull (mandibel only), skin: Moera; viii.1910; R. Grauer (no.138) leg., P.v. Oberländer don.; NMW B 5498 ♂ ad., skull, skin: Moera; viii.1910; R. Grauer (no.134) leg., P.v. Oberländer don.; NMW B 4021 ♂ ad., skull (mandibel only): Moera; viii.1910; R. Grauer (no.131) leg., P.v. Oberländer don.

Localities: Moera = Mbau, 0°39'N, 29°30'E, 1000-1100 m, Nord-Kivu, Democratic Republic of the Congo. Mawambi, 01°03'N, 28°36'E, Ituri (Orientale), Democratic Republic

of the Congo. Ukaika, 00°45'N, 28°45'E, 900 m, Ituri (Orientale), Democratic Republic of the Congo (DAVIS & MISONNE 1964; HAYMAN & al. 1966).

Comments: The exact number of syntypes which LORENZ (1914b) had at hand remains unclear since he only stated that he based this new taxon on a series of more than 30 specimens while in his subsequent publication (LORENZ 1917) he listed 34 specimens. Two specimens of *Piliocolobus foai ellioti* collected by R. Grauer in Mbau, were sent already in 1912 to the RMCA in Tervuren (RMCA 1211 and RMCA 1212, both erroneously labelled to originate from “Beni”) and these do not appear in any of Lorenz’s publications. No other published or unpublished indication (original labels seem to be lost) that would indicate them as syntypes could be found (e.g. SCHOUTEDEN 1944; pers. comm. Wim Wendelen ii.2010) and they are therefore not considered to possess any type status.

Illustrations (Pls 11-13) of 17 and cranial measurements of 27 syntypes’ skulls are given by LORENZ (1917).

Semnopithecus DESMAREST, 1822

Semnopithecus jubatus WAGNER, 1839 (aus dem südlichen Theile Indiens)

Die Säugth. Suppl. 1, 305-306

Now *Semnopithecus johnii* (FISCHER, 1829). See ANDERSON (1881), BRANDON-JONES (1995) and GROVES (2001). Molecular data (mtDNA, Y chromosomes, and retroposon integrations) allocate *Trachypithecus (Kasi) johnii* J. FISCHER, 1829 as closest related to “*Semnopithecus entellus*” from Southern India, hence *T. johnii* should be included within the genus *Semnopithecus* DESMAREST, 1822 (OSTERHOLZ & al. 2008; CHATTERJEE & al. 2009), which is followed here.

Syntypes (2): NMW ST 1586 ♀, (skull), mount; Bombay [AV]; 1832-1833 (HÜGEL 1838, STAGL 2003); [C.A.v.] Hügel [leg. et vend.], (AV 1839/VII/3 *Semnopithecus jonii*) [pedestal label]; NMW ST 1596 ♂, mount; Bombay [AV]; 1832-1833 (HÜGEL 1838, STAGL 2003); [C.A.v.] Hügel [leg. et vend.], (AV 1839/VII/3 *Semnopithecus jonii*) [pedestal label].

Locality: In the course of his journeys between 1830 and 1836, Carl Alexander von Hügel visited the SW part of India from 1832 to 1833. There his travels led him from Mysore to the Nilgiri Hills – where he spent three weeks in March 1833 (not 1832 as given by BAIKIE [1834; cf. STAGL 2003]) – and further via Coimbatore, Palakkad, and Thrissur to Kochin on the Malabar Coast and along the same to Kanniyākumāri (Cap Comorin) where he entered a ship to Sri Lanka (HÜGEL 1838). A restriction of the type locality to the Nilgiri Hills by means of the species known distribution (BRANDON-JONES 1995) is therefore not assured, thus it is not unlikely. On the other hand it is in that case hardly understandable why BAIKIE (1834), with whom Hügel was in contact, in his account on the zoology of the Nilgiri Hills does not mention any monkeys.

If the collecting locality “Bombay” (= Mumbai) as given in the AV (followed by PELZELN 1890) is correct, it can be supposed that Hügel bought captive animals there.

Comments: Supposedly due to the inexact statement of WAGNER (1839) that the “großen Eckzähne erweisen, daß die eben beschriebenen Thiere alt und ausgefärbt sind”, BRANDON-JONES (1995) assumed, both syntypes to be males. Only the mount NMW ST 1596 possesses visible, but not markedly elongated canines and can therefore be recognized as female, which is in accordance with the label and the entry in the AV. The second specimen (NMW ST 1586) lacks a skull but is a male according to the AV.

In the AV for 1839, both specimens are additionally listed under the numbers 479 and 480 and references to the numbers 19 and 20 (“gelbe Numer”) are made; the meaning of which remains unclear.

WAGNER's description appeared in the issues ("Hefte") 90–94 (containing the pages 1 to 320) of the 'Säugethiere. Supplement 1' which were already issued until October 1839 (WAGNER 1841; POCHE 1911).

4.10. Hominidae GRAY, 1825

Pan OKEN, 1816

***Anthropopithecus steindachneri* LORENZ, 1914** (Ituri-Urwald [...] bei dem Dorfe Moëra, 6 Wegstunden nördlich vom Posten Beni)

Anz. Österr. Akad. Wiss., Math.-Naturw. Cl. 51 (18), 550-551

Now ***Pan troglodytes schweinfurthii* (GIGLIOLI, 1872)**. See ALLEN (1925), SCHWARZ (1934), JONES & al. (1996) and GROVES (2001).

Holotype: NMW 3105/ST663 ♂ ad., skull, complete skeleton, mount: Moera, Ituri-Urwald, Belgisch Kongo; xiii.1910; R. Grauer (no.124) leg., P.v. Oberländer don.

Locality: Moëra = Mbau, 0°39'N, 29°30'E, 1000-1100 m, Nord-Kivu, Democratic Republic of the Congo (DAVIS & MISONNE 1964, HAYMAN & al. 1966).

Comments: Only the left Os coxae is present and erroneously labelled as No.432. The skull is depicted in LORENZ (1917; Pl. 7 Fig. 1 and Pl. 8 Fig. 1) and extensive measurements are given. Holotype fixed by monotypy (ICZN 1999, art. 73.1.2.).

4.11. Names erroneously considered being available

***Simia leukeurin* PELZELN, 1883**

Verh. d. K.-K. zool.-bot. Ges. 33 (Beiheft), 23-24

Now ***Mico melanurus* (É. GEOFFROY SAINT-HILAIRE, 1812)**. See PELZELN (1886), HERSHKOVITZ (1977), VIVO (1991), GROVES (2001) and RYLANDS & al. (2009).

Comments: The older ms. name (afterwards he used "*Hapale melanura*"; PELZELN 1883) of Johann Natterer, *Simia leukeurin*, has first been introduced by PELZELN (1883) as a younger synonym of "*Hapale melanura* (GEOFFR.)". Although Pelzeln didn't cite the year of publication of É Geoffroy Saint-Hilaire's paper no indication can be found that he assumed Natterer's name antedating it and therefore constituting an older synonym. To become available the ICZN would require that the name has either been treated as an older synonym or adopted as the name of a taxon before 1961 (ICZN 1999, art. 11.6.1.) but no such action appears to have been taken to the author's knowledge and therefore it is considered to be unavailable. Despite some authors (e.g. HERSHKOVITZ 1977; GROVES 2001, 2005) listed *Simia leukeurin* as available synonym of *Mico melanurus*.

***Macaco barriga* PELZELN, 1883**

Verh. d. K.-K. zool.-bot. Ges. 33 (Beiheft), 6-7

Now ***Lagothrix cana* (É. GEOFFROY SAINT-HILAIRE, 1812)**. See PELZELN (1886), FOODEN (1963) and RYLANDS & al. (2009).

Comments: The same as mentioned above for *Simia leukeurin* (see there) holds true for this name. It was also introduced by PELZELN (1883) as a younger synonym and not made available under the terms of the ICZN (1999, art. 11.6.1.). Additionally PELZELN (1883) published fragments of Johann Natterer's expedition diary wherein the name *Macaco barriga* also appears (p. 129). However PELZELN added ("*Lagothrix cana* Geoffr.)" immediately thereafter and indicated with this that he didn't adopt it as the taxon's name.

Subsequent authors occasionally listed *Macaco barriga* as available synonym of *Lagothrix cana* (e.g. FOODEN 1963) or erroneously *Lagothrix lagotricha* (HUMBOLDT, 1912) (e.g. GROVES 2001, 2005).

***Simia polycomos* SCHREBER, 1798**

Die Säugth. 1, Pl. 10D

Now ***Colobus polykomos* (ZIMMERMANN, 1780)**. See ALLEN (1920) and GROVES (2007).

Comments: This name has certainly to be regarded as an incorrect subsequent spelling (ICZN 1999, art. 33.3.) of ZIMMERMANN's (1780) *C. polykomos* (also supposed by GROVES [2007]). Indeed WAGNER (1840) who authored the text to the description did not cite Zimmermann, in contrast to PENNANT (1781) and BUFFON (1789), but rather ascribed the name *Simia polycomos* to Schreber. Thus in the original plate of SCHREBER (1798) Zimmermann is quoted as the author of the name (cf. ALLEN 1920, 1925). This seems all the more plausible since E.A.W. Zimmermann, at least occasionally, corresponded with J.D.C. Schreber (FEUERSTEIN-HERZ 2006). Accordingly this does not constitute an available name (ICZN 1999, art. 33.3.) although it has been used as such in later synonymies of the genus *Colobus* (e.g. DANDELLOT 1974; NAPIER 1985; GROVES 2001, 2005, 2007).

Since SHERBORN (1892), 1800 has widely been accepted as the publication date of plate 10D of SCHREBER's (1774-1837) "Säugthiere" (ALLEN 1925). According to a circular inbound in the copy of SCHREBER's (1774-1837) "Säugthiere" in the NMW, the plate 10D with the copy of PENNANT's (1781) illustration of the "full-bottom monkey" was issued together with "Theil V, Heft 57" that appeared between the 29th September 1797 and Easter 1798 (POCHE 1911). Therefore 1798 has to be adopted as publication date (ICZN 1999, art. 21.3.).

4.12. Type specimens erroneously mentioned to be at the NMW

***Theropithecus obscurus* HEUGLIN, 1863**

Nova Acta Acad. Caesar. Leop. Carol. 30, Abh. 2 (Nachtrag), 10-14

Theropithecus obscurus HEUGLIN, 1862 (p.427-428). Nomen nudum (ICZN 1999, art.12.2.).

Now ***Theropithecus gelada obscurus* HEUGLIN, 1863**. See GIPPOLITI (in press).

Comments: HILL (1970), relying on SCHLEGEL (1876), listed all specimens mentioned by the latter as types, but erroneously stated that they are preserved at the NMW. In fact there are no *Theropithecus* specimens collected by T.v. Heuglin kept at the NMW beside one (NMW ST 1519 ♂, mount: "Abyssinien"; T.v. Heuglin leg. et vend., AV 1854/IV/1: *Macacus gelada*, adult) that has been collected in 1852 or 1853 (cf. HEUGLIN 1857; SCHMID 2005) well before Heuglin discovered *Theropithecus obscurus* (cf. HEUGLIN 1862, 1863) and therefore certainly doesn't belong to the type series. Syntypes of this taxon are kept at the RMNH (RMNH 39130; RMNH 39131; RMNH 39132; RMNH 39133; RMNH 39134) (SCHLEGEL 1876, p.108; JENTINK 1887, p.25 a-e, 1892, pp.29-30 a-d; SMEENK in. prep.) and the SMNS (SMNS 1032; SMNS 1033; SMNS 1034) (pers. comm. D. Mörrike ii.2010).

Table 3: Synopsis of primate types, housed in the mammal collection of the NMW, currently considered representing valid taxa.

Valid name	Originally published as	Type specimen(s)	Type locality	Reference
<i>Avahi occidentalis</i>	<i>Avahi laniger occidentalis</i>	Lectotype: NMW 4400/B3997 (skull, skin)	Ambondrobe, Mahajanga, Madagascar	LORENZ L., 1898: Abh. senckenb. naturforsch. Ges. 21: 452.
<i>Galago matschiei</i>	<i>Galago matschiei</i>	Syntypes: NMW 318/B3516; NMW 320/B3515 (skull, part. skeleton, skin); NMW 319/ST584 (skull, mounted skin)	Mbau, Nord-Kivu, Democratic Republic of the Congo	LORENZ L., 1917: Ann. Naturhistor. Mus. Wien 31: 237–238.
<i>Tarsius sangirensis</i>	<i>Tarsius sangirensis</i>	Lectotype: MTKD B497 (2243) (mounted skin) Paratypes: NMW B3784 (skull, skin); MTKD B321 (skull)	Tabukanlama, Pulau Sangihe Besar, Sulawesi Utara, Indonesia	MEYER A.B., 1896: Abh. Ber. Zool. Anthropol.-Ethnol. Mus. Dresden (1896/1897) 6(6): 9.
<i>Mico chrysoleuca</i>	<i>Hapale chrysoleucos</i>	Syntypes: ZMB 3191 (skull, skin); NMW B3456; NMW B3455; NMW B3457; BMNH 1870.3.10.3 (skin); NMW ST970; RMNH 39099 (mount)	Borba, Amazonas, Brazil	WAGNER [J.]A., 1842: Arch. Naturgesch., 8(1), 357.
<i>Leontopithecus chrysopygus</i>	<i>Jacchus chrysopygus</i>	Syntypes: NMW B3766; NMW B3781 (skull, skin); NMW B3762 (skin); NMW ST937; NMW ST1577; RMNH 39100 (mount)	Ipanema & Varga Grande, São Paulo, Brazil	MIKAN J.C., 1823: Del. Flor. Faun. Brasil., [fasc. 3], [33–34], [Pl. 16].
<i>Callicebus brunneus</i>	<i>Callithrix brunea</i>	Lectotype: NMW 775/B3454 (skull, skin) Paratypes: NMW B3453 (skin) NMW ST122; ZMB 3190 (mount)	Cachoeira da Bananeira, Rio Mamoré, Rondônia, Brazil	WAGNER [J.]A., 1842: Arch. Naturgesch., 8(1), 357.
<i>Callicebus caligatus</i>	<i>Callithrix caligata</i>	Lectotype: NMW B3738 (skin) Paratype: NMW 7596/ST112 (skull, mount)	“Borba”, Rio Madeira, Amazonas, Brazil	WAGNER [J.]A., 1842: Arch. Naturgesch., 8(1), 357.
<i>Colobus polykomos</i>	<i>Cebus polykomos</i>	Holotype: NMW ST1488 (mount)	Sierra Leone	ZIMMERMANN E.A.W., 1780: Geograph. gesch. Menschen u. vierf. Thiere, vol. 2, 202.
<i>Ptilocolobus badius badius</i>	<i>Simia (Cercopithecus) badius</i>	Holotype: NMW ST1489 (mount)	Sierra Leone	KERR R., 1792: Anim. Kingd., 74.

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7. Zusammenfassung

Der namenstragende Typus einer Art fungiert als dauerhafter und bindender Bezugspunkt in der Taxonomie. Er gewährleistet, zusammen mit den verbindlichen Regeln der Internationalen Kommission für Zoologische Nomenklatur (ICZN), auf lange Sicht die Stabilität in der Anwendung von wissenschaftlichen Namen. Typen leisten somit einen wesentlichen Beitrag zur Dauerhaftigkeit Taxon bezogener Forschungsergebnisse. Oft wurden Typusbelege in den jeweiligen Originalarbeiten nicht angeführt und müssen daher heute auf Basis zusätzlicher Hinweise zugeordnet werden. Um in vollem Ausmaß nutzbar zu sein, bedarf es zusätzlich möglichst umfassender Begleitdaten wie Herkunft, Sammler etc. sowie einer gesicherten Zuordnung zu einer von der ICZN anerkannten Typenkategorie.

Die vorliegende Arbeit gibt einen vollständigen Überblick über den Bestand an Primatentypen in der Säugetiersammlung des Naturhistorischen Museums Wien (NMW). Dazu wurden alle potentiell in Frage kommenden Belege anhand ihrer Begleitdaten sowie mit Hilfe der Literatur auf einen möglichen Typenstatus hin überprüft. Zusätzlich wurden zu jedem Beleg alle verfügbaren Daten zusammengestellt und kommentiert. Ebenso erfolgte eine Zuordnung zu einer der fünf offiziellen Typenkategorien der ICZN (Holotypen, Syntypen, Paratypen, Lectotypen, Paralectotypen).

Insgesamt konnten 110 Typusexemplare (15 Holotypen, 71 Syntypen, 8 Lectotypen, ein Paratypus und 15 Paralectotypen) in der Sammlung gefunden werden. Diese gehören zu 46 nominalen Taxa, von denen neun (*Avahi occidentalis*, *Galago matschiei*, *Tarsius sangirensis*, *Mico chrysoleuca*, *Leontopithecus chrysopygus*, *Callicebus brunneus*, *Callicebus caligatus*, *Colobus polykomos*, *Ptilocolobus badius badius*) heute als gültig anerkannt werden.

Die nominalen Taxa *Cercopithecus toldti* und *Lasyopyga tantalus graueri* wurden anhand des Typenmaterials neu synonymisiert mit *Chlorocebus tantalus* beziehungsweise *Chlorocebus cynosuros*. Für *Leontopithecus chrysopygus* wurde die bisher als gültig erachtete Lectotypdesignations verworfen. Da kein Exemplar der Typenserie gut mit der Abbildung in der Originalbeschreibung übereinstimmt, kann nicht ausgeschlossen werden, dass es sich hierbei um eine idealisierte Darstellung auf Basis der gesamten Serie handelt. Die verworrene Situation innerhalb der Typenserie von *Lepilemur mustelinus rufescens* konnte weitgehend aufgelöst werden, ein vollständig im NMW (NMW 893/B4005) verbliebener Typusbeleg wurde als günstiger Kandidat für eine Lectotypdesignations ermittelt.

Von drei bisher als gültige Synonyma verwendeten Namen (*Simia leukeurin*, *Macaco barriga* und *Simia polykomos*) konnte gezeigt werden, dass sie im Sinne der Internationalen Nomenklaturregeln nicht verfügbar sind.

Appendix I: Geographical origin of the primate type specimens in the mammal collection of the NMW. Linear arrangement within countries follows GROVES (2005). Taxa recognized as valid (after GROVES 2005) are marked with an asterisk. ¹ Type locality lies either in the Democratic Republic of the Congo or in Uganda. ² Objective junior synonyms, for further explanation see under the adjoining nominal taxon accounts.

Brazil

Hapale chrysoleucos WAGNER, 1842 *
Jacchus chrysopygus MIKAN, 1823 *
Hapale (Leontopithecus) ater LESSON, 1840 ²
Midas erythrogaster REICHENBACH, 1862
Cebus nigrivittatus WAGNER, 1848
Callithrix brunnea WAGNER, 1842 *
Callithrix caligata WAGNER, 1842 *
Ateles variegatus WAGNER, 1840
Ateles chruva SCHLEGEL, 1876
Ateles braccatus PELZELN, 1883 ²

Democratic Republic of the Congo

Periodicticus nebulosus LORENZ, 1917
Galago matschiei LORENZ, 1917 *
Cercocebus oberlaenderi LORENZ, 1915
Lasyopyga schmidti montana LORENZ, 1914
Lasyopyga schmidti ituriensis LORENZ, 1914
Cercopithecus schmidti rutschuricus LORENZ, 1917 ¹
Lasiopyga leucampyx sibatoi LORENZ, 1913
Lasyopyga tantalus graueri LORENZ, 1914
Lasyopyga tantalus beniana LORENZ, 1914
Papio graueri LORENZ, 1917
Papio silvestris LORENZ, 1915
Colobus occidentalis ituricus LORENZ, 1914
Colobus occidentalis rutschuricus LORENZ, 1914 ¹
Colobus (Tropocolobus) multicolor LORENZ, 1914
Colobus (Tropocolobus) variabilis LORENZ, 1914
Anthropopithecus steindachneri LORENZ, 1914

India

Semnopithecus jubatus WAGNER, 1839
Simia ferox SHAW, 1792

Indonesia

Tarsius sangirensis MEYER, 1896 *

Kamerun

Cercopithecus pulcher LORENZ, 1915

Madagascar

Lepidolemur mustelinus rufescens LORENZ, 1898
Avahis laniger occidentalis LORENZ, 1898 *

Sierra Leone

Cebus polykomos ZIMMERMANN, 1780 *
Simia (Cercopithecus) regalis KERR, 1792 ²
Simia tetradactyla LINK, 1795 ²
Simia comosa SHAW, 1800 ²
Simia (Cercopithecus) badius KERR, 1792 *
Simia ferruginea SHAW, 1800 ²
Colobus ferruginosus É. GEOFFROY, 1812 ²

Sudan

Cercopithecus (Chlorocebus) toldti WETTSTEIN, 1916
Cercopithecus poliophaeus REICHENBACH, 1863
Cercopithecus poliophus HEUGLIN, 1877 ²
Papio werneri WETTSTEIN, 1916

Uganda

Cercopithecus schmidti rutschuricus LORENZ, 1917 ¹
Cercopithecus thomasi rutschuricus LORENZ, 1915
Colobus occidentalis rutschuricus LORENZ, 1914 ¹

Unknown origin

Lasiopyga (Cercopithecus) weidholzi LORENZ, 1922

Appendix II: Other type catalogues dealing with type specimens of extant primates.

Acronym	Institution	References
AMNH	American Museum of Natural History, New York	GOODWIN G.G., 1953: Catalogue of the type specimens of recent mammals in the American Museum of Natural History. – <i>Bulletin of the American Museum of Natural History</i> 102: 207-411. LAWRENCE M.A., 1993: Catalog of recent mammal types in the American Museum of Natural History. – <i>Bulletin of the American Museum of Natural History</i> 217: 1-200.
ANSP	Academy of Natural Sciences, Philadelphia	KOOPMAN K.F., 1977: Catalog of type specimens of recent mammals in the Academy of Natural Sciences at Philadelphia. – <i>Proceedings of the Academy of Natural Sciences of Philadelphia</i> 128: 1-24.
BMNH	Natural History Museum, London	NAPIER P.H., 1976: Catalogue of primates in the British Museum (Natural History). Part I: families Callitrichidae and Cebidae. – <i>British Museum (Natural History)</i> , London, 121 pp. NAPIER P.H., 1981: Catalogue of primates in the British Museum (Natural History) and elsewhere in the British Isles. Part II: family Cercopithecidae, subfamily Cercopithecinae. – London, <i>British Museum (Natural History)</i> , 203 pp. NAPIER P.H., 1985: Catalogue of primates in the British Museum (Natural History) and elsewhere in the British Isles. Part III: family Cercopithecidae, subfamily Colobinae. – London, <i>British Museum (Natural History)</i> , 111 pp. JENKINS P.D., 1987: Catalogue of primates in the British Museum (Natural History) and elsewhere in the British Isles. Part IV: suborder Strepsirrhini, including the subfossil Madagascan lemurs and family Tarsiidae. – <i>British Museum (Natural History)</i> , London, 189 pp. JENKINS P.D., 1990: Catalogue of primates in the British Museum (Natural History) and elsewhere in the British Isles. Part V: the apes, superfamily Hominoidea. – <i>British Museum (Natural History)</i> , London, 137 pp.
CMZ	University Museum of Zoology, Downing Street, Cambridge	NAPIER 1981: see under BMNH
FMNH	Field Museum of Natural History, Chicago	SANBORN C.C., 1947: Catalogue of type specimens of mammals in Chicago Natural History Museum. – <i>Fieldiana Zoology</i> 32: 207-293.
MCZ	Museum of Comparative Zoology, Harvard University, Harvard	ALLEN G.M., 1931: Type specimens of mammals in the Museum of Comparative Zoölogy. – <i>Bulletin of the Museum of Comparative Zoölogy</i> 71: 229-289.
MNCN	Museo Nacional de Ciencia Naturales, Madrid	CABRERA A., 1912: Los tipos de mamíferos del Museo de Ciencias Naturales. – <i>Trabajos del Museo de Ciencia Naturales</i> 3: 16-32.
MNHNP	Muséum National d'Histoire Naturelle, Paris	RODE P., 1938: Catalogue des types de mammifères du Muséum National d'Histoire Naturelle. Ordre des primates, sous-ordre des simiens. – <i>Bulletin du Muséum National d'Histoire Naturelle</i> (2 ^e Série) 10: 202-251. RODE P., 1939: Catalogue des types de mammifères du Muséum National d'Histoire Naturelle. Ordre primates B – Sous-ordre des lémuriens. – <i>Bulletin du Muséum National d'Histoire Naturelle</i> (2 ^e Série) 11: 434-449.
MSNG	Museo Civico di Storia Naturale “G. Doria”, Genova	DORIA G. & GIPPOLITI S., 2006: La collezione dei primatologica del Museo Civico di Storia Naturale “G. Doria” di Genova. – In: BRUNER E. & GIPPOLITI S. (eds): <i>Le collezioni primatologiche italiane</i> . – Istituto Italiano di Antropologia, Roma, pp. 77-88.
MSNM	Museo Civico di Storia Naturale, Milano	CAGNOLARO L., 1976: Catalogo dei tipi del Museo Civico di Storia Naturale di Milano. III. I tipi dei Mammiferi, con un profilo storico sulla collezione mammalogica. – <i>Atti della Società Italiana di Scienze Naturali e del Museo Civico di Storia Naturale di Milano</i> 117: 85-108.
MSNT	Museo Regionale di Scienze Naturali, Torino	ARDITO G. & BIGATTI M.P., 2006: Le collezioni primatologiche torinesi. – In: BRUNER E. & GIPPOLITI S. (eds): <i>Le collezioni primatologiche italiane</i> . – Istituto Italiano di Antropologia, Roma, pp. 191-205.

MSUM	University of Michigan Museum of Zoology, Ann Arbor	HOOPER E.T., 1977: Type specimens of recent mammals in the Museum of Zoology, the University of Michigan. – Occasional Papers of the Museum of Zoology University of Michigan 680: 1-22.
MTKD	Museum für Tierkunde, Dresden	FEILER A., 1999: Ausgestorbene Säugetiere, Typusexemplare und bemerkenswerte Lokalserien von Säugetieren aus der Sammlung des Staatlichen Museums für Tierkunde Dresden. – Zoologische Abhandlungen aus dem Staatlichen Museum für Tierkunde Dresden 50: 401-414.
MZUF	Museo di Storia Naturale dell'Università di Firenze	AGNELLI P., 2006: La collezione primatologica del Museo di Storia Naturale dell'Università di Firenze (sezione di zoologia "La Specola"). – In: BRUNER E. & GIPPOLITI S. (eds): Le collezioni primatologiche italiane. – Istituto Italiano di Antropologia, Roma, pp. 111-122.
PCM	Powell-Cotton Museum of African and Asian Zoology and Ethnography, Birchington	NAPIER 1981, 1985; JENKINS 1990: see under BMNH
RMNH	Naturalis, Leiden	SMEENK C., in prep.: Type-specimens of recent mammals in the National Museum of Natural History, Leiden.
RSM	Royal Scottish Museum, Edinburgh	JENKINS 1987: see under BMNH
SMF	Senckenberg Naturmuseum, Frankfurt am Main	MERTENS R., 1925: Verzeichnis der Säugetier-Typen des Senckenbergischen Museums. – Senckenbergiana 7: 18-37.
SMNS	Staatliches Museum für Naturkunde, Stuttgart	DIETERLEN F., TURNI H. & MARQUART K., in prep.
USNM	National Museum of Natural History; Smithsonian Institution, Washington, D. C.	WARD M.W. Jr. & OSGOOD W.H., 1909: Catalogue of the type-specimens of mammals in the United States National Museum, including the Biological Survey Collection. – United States National Museum Bulletin 62: 1-325. POOLE A.J. & SCHANTZ V.S., 1942: Catalog of the type specimens of mammals in the United States National Museum, including the Biological Surveys collection. – United States National Museum Bulletin 178: 1-705.
ZSI	Zoological Survey of India, Calcutta	KHAJURIA J., CHATURVEDI Y. & GHOSHAL D.K., 1977: Catalogue Mammaliana. An annotated catalogue of the type specimens of mammals in the collections of the Zoological Survey of India. – Records of the Zoological Survey of India. Miscellaneous Publication. Occasional Paper 7: 1-44.
ZSM	Zoologische Staatssammlung, Munich	KRAFT R., 1983: Die von J. B. von Spix beschriebenen neotropischen Primaten und Chiropteren. – Spixiana (Supplement) 9: 429-441.

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