Villalba *et al.* (1995) indicated the possible natural occurrence of *Alouatta caraya* in northern Uruguay (31°00'S, 56°00'W) which, although not yet confirmed, is just a little north of the localities we have identified on the Rio Camaquã. The most southerly record for this species is the town of Canta Galo (31°10'S, 52°19'W), in the municipality of São Lourenço do Sul, Rio Grande do Sul, Brazil. This locality is also the new southern limit for all Neotropical primates.

We conclude that the key factors determining the distributional limits of primates in the south of South America are: 1) The seasonal inundation of rivers in the Camaquã basin; 2) the reduction in tree species diversity; 3) the gradual predominance of deciduous trees; and 4) the low temperatures during winter.

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Two Taxonomies of the New World Primates – A Comparison of Rylands *et al.* (2000) and Groves (2001)

Anthony B. Rylands

Two listings of the New World Primates were published recently. The first by Rylands *et al.* (2000) arose from a review of the species and subspecies during the workshop "Primate Taxonomy for the New Millennium", organized by the IUCN/SSC Primate Specialist Group (PSG) at the Disney Institute, Orlando, Florida, in February 2000. The second was published by Colin P. Groves of the Australian National University, Canberra, in his book *Primate Taxonomy*, published in April 2001 by the Smithsonian Institution Press, Washington, DC. Rylands *et al.* listed 110 species and 205 species and subspecies of New World primates. Groves also listed 110 species, but only 177 species and subspecies.

In this note, I point out and comment on the (minor) differences between these listings, the most significant of which is in the names used for the families and subfamilies. Rylands *et al.* opted for five families, using the traditional names, as follows: Callitrichidae (the marmosets and tamarins), Cebidae (capuchin monkeys and squirrel monkeys), Aotidae (night monkeys), Pitheciidae (sakis, uakaris and titi monkeys) and Atelidae (howling monkeys, spider monkeys, muriquis, and woolly monkeys). Groves followed a very similar arrangement, but defined the Cebidae differently, with three subfamilies: the marmosets and tamarins, the squirrel monkeys, and the capuchin monkeys (as proposed by Rosenberger in 1981). However, regarding the correct names of the family-groups, Groves, with the *International Code of Zoological Nomenclature* (2000) in hand, winkled out some synonyms and has suggested changes in some of the family and subfamily names (Table 1).

The first is his argument that the correct family-group name for the marmosets and tamarins is not Callitrichidae Thomas, 1903, but Hapalidae Gray 1821 (Hapalinae as a subfamily of the Cebidae). I quote his reasoning here verbatim (pp.126–127):

Table 1. Families and subfamilies of Platyrrhini according to Groves (2001).

Family/Subfamily	Genera
Cebidae Bonaparte, 1831	
Hapalinae Gray, 1825	*Cebuella, Mico, Callithrix, Callimico, Leontopithecus, Saguinus*
Chrysotrichinae Cabrera, 1900	*Saimiri*
Cebinae Bonaparte, 1831	*Cebus*
Nyctipithecidae Gray, 1870	*Aotus*
Pitheciidae Mivart, 1865	
Pitheciinae Mivart, 1865	*Pithecia, Cacajao, Chiropotes*
Callicebinae Pocock, 1925	*Callicebus*
Atelidae Gray, 1825	
Atelinae Gray, 1825	*Ateles, Lagothrix, Oreonax, Brachyteles*
Mycetinae Gray, 1825	*Alouatta*

"Callitrichinae Thomas, 1903, is a synonym. There are two reasons why the name Callitrichinae (and its coordinate Callitrichidae for those wishing to retain family-level status for the marmosets and tamarins) cannot be used.

First: Priority in the family-group is accorded not to the type genus but to the family-group name itself. The earliest family-group name given to marmosets is Harpalidae [sic] by Gray (1821), who misread *Hapale* Illiger, 1811, as *Harpale*. The current (fourth) edition of the *International Code of Zoological Nomenclature* (2000) states in Article 40:

(a) After 1960. When, after 1960, the generic name on which a valid family-group is based on is rejected as a junior synonym, that family-group name is to be replaced unless the conditions of Subsection (i) apply.

> (i) If the senior generic synonymy is itself the basis of a family-group name, or if a reclassification also involves other family group names, the Principle of Priority applies to all the family group names concerned.

(b) Before 1961. If a family group name has been replaced before 1961 because of such synonymy, and the replacement name has one general acceptance, it is to be maintained.

In this case Thomas (1903) discovered that the generic name *Callithrix* Erxleben, 1777, referred to marmosets, not to titis as had been previously assumed, and took three actions: 1) he replaced the commonly used name *Hapale* Illiger, 1811, with *Callithrix*, 2) he replaced the family name Hapalidae with Callithricidae (recte Callitrichidae), and 3) he gave the titis a new generic name *Callicebus*. The first and third of these actions were justified; the second, admittedly retroactively, was not. But the Code must be followed. The provisions of article 40(b) apply: the family-group name was replaced before 1961, but the replacement name cannot be said to have "won general acceptance," by virtue especially of the continued use of Hapalidae in W. C. O. Hill's influential monograph series *Primate: Comparative Anatomy and Taxonomy*.

Second: Because the name *Callithrix* was long used, incorrectly, for the titis (as just discussed) family group names for the marmoset/tamarin group were understandably based on what was thought to be the correct name. Gray (1821) misread the name as *Callitrix* and based the family name Callitricidae on it. This might, at a pinch, be taken as effectively a different name, but the same cannot be said of Callitrichina Gray, 1825 (during the intervening four years, he had corrected his misspelling). This means that Callitrichinae/-idae Thomas 1903, for the marmosets and tamarins is preoccupied by the same name of Gray, 1825, for the titis.

The first point is difficult, but arguable. The second point is fundamental, not arguable. The correct name for the subfamily containing marmosets is therefore not Callitrichinae Thomas, 1903, as listed by Simpson (1945, as Callithricidae) or Napier and Napier (1967), or Hershkovitz (1977)."

Groves also argued that: the subfamily name of the squirrel monkeys, Saimiriinae Miller, 1924 (used by Hershkovitz, 1977) is a synonym of Chrysotrichinae Cabrera, 1900 (p.156); the family-group name Aotidae/Aotinae Poche, 1908 (used by Hershkovitz, 1977 and Hill, 1960) is a synonym of Nyctipithecidae Gray, 1870; and that the subfamily name Alouattinae Elliot, 1904 (used by Hershkovitz, 1977 and Hill, 1960) is a synonym of Mycetinae Gray, 1825. Groves attributes the authorship of the family-group name Cebidae to Bonaparte, 1831. The name was assigned to Swainson, 1835, by Hill (1960), but Groves argued that Bonaparte clearly intended the name Cebina to be a family-group suffix and is therefore the original author. Table 1 shows the families/subfamily arrangement according to Groves (2001).

Regarding the list of species, those in the Callitrichidae/Hapalinae, are identical except for the addition of three marmosets by Rylands *et al.*: *Mico saterei* (Silva, Jr. and Noronha, 1998), and *Mico manicorensis* and *Mico acariensis*, both described (under the genus *Callithrix*) by Van Roosmalen *et al.* (2000), the descriptions of which had not been published when Groves' book was in press. Groves gave subgeneric classifications to the marmosets, subgenus *Mico* Lesson, 1840, for the Amazonian marmosets, and *Callithrix* Erxleben, 1777, for the "Jacchus" group marmosets of eastern and south-eastern Brazil. Rylands *et al.* went the whole hog in assigning all the Amazonian marmosets to the genus *Mico*.

The genus *Cebus* presents some discrepancies in the continued listing of numerous, often poorly defined, subspecies by Rylands *et al.* In his research, however, Groves whittled them down considerably. *C. capucinus limitaneus* Hollister, 1914, *C. capucinus imitator* Thomas, 1903, and *C. capucinus curtus* Bangs, 1905, listed by Rylands *et al.*, are considered synonyms by Groves. They were listed by Hershkovitz (1949) who, as pointed out by Groves, even then doubted their validity, and Hernández-Camacho and Cooper (1976) also found that the pelage characters

used to distinguish them were too variable to allow for the recognition of distinct subspecific forms.

Rylands *et al.* continued to follow Hershkovitz (1949) in listing 11 poorly defined subspecies of *Cebus albifrons*, while Groves reduced the number to six: *C. albifrons albifrons* (Humboldt, 1812); *C. albifrons unicolor* Spix, 1823; *C. albifrons cuscinus* Thomas, 1901, *C. albifrons trinitatis* Von Pusch, 1941, *C. albifrons aequatorialis* Allen, 1914, and *C. albifrons versicolor* Pucheran, 1845 (see Table 2). Rylands *et al.* did not list *C. albifrons unicolor* on the advice of Thomas Defler, whose investigations had led him to argue cogently that it is a synonym of *C. albifrons albifrons* (see Defler and Hernández-Camacho, in press). Rylands *et al.* also maintained

Table 2. A summary of the taxonomic differences between the listings of the Platyrrhini by Rylands *et al.* (2000) and Groves (2001).

Rylands *et al.* (2000)	Groves (2001)
Mico saterei (Silva, Jr. & Noronha, 1998)	Mentioned (p.131), but description not published when Groves (2001) was in press.
Mico manicorensis (Van Roosmalen, Van Roosmalen, Mittermeier & Rylands, 2000)	Description not published when Groves (2001) was in press.
Mico acariensis (Van Roosmalen, Van Roosmalen, Mittermeier & Rylands, 2000)	Description not published when Groves (2001) was in press.
Cebus capucinus capucinus (Linnaeus, 1758)	*Cebus capucinus* monotypic
Cebus capucinus limitaneus Hollister, 1914	Synonym of *Cebus capucinus*
Cebus capucinus imitator Thomas, 1903	Synonym of *Cebus capucinus*
Cebus capucinus curtus Bangs, 1905	Synonym of *Cebus capucinus*
Synonym of *C. albifrons albifrons* (Humboldt, 1812) (see Defler *et al.*, in press)	*Cebus albifrons unicolor* Spix, 1823
Cebus albifrons cesarae Hershkovitz, 1949	Synonym of *Cebus albifrons versicolor* Pucheran, 1845
Cebus albifrons leucocephalus Gray, 1865	Synonym of *Cebus albifrons versicolor* Pucheran, 1845
Cebus albifrons yuracus Hershkovitz, 1949	Synonym of *Cebus albifrons cuscinus* Thomas, 1901
Cebus albifrons adustus Hershkovitz, 1949	Synonym of *Cebus albifrons versicolor* Pucheran, 1845
Cebus albifrons malitiosus Elliot, 1909	Synonym of *Cebus albifrons versicolor* Pucheran, 1845
Cebus olivaceus olivaceus Schomburgk, 1848	*Cebus olivaceus* monotypic
Cebus olivaceus apiculatus Hershkovitz, 1949	Synonym of *Cebus olivaceus*
Cebus olivaceus brunneus Allen, 1914	Synonym of *Cebus olivaceus*
Cebus olivaceus castaneus I. Geoffroy, 1851	Synonym of *Cebus olivaceus*
Cebus olivaceus kaapori Queiroz, 1992	Listed as *Cebus kaapori*
Saimiri boliviensis pluvialis Lönnberg, 1940	Synonym of *Saimiri boliviensis boliviensis* (I. Geoffroy & de Blainville, 1834)
Saimiri boliviensis jaburuensis Lönnberg, 1940	Synonym of *Saimiri boliviensis boliviensis* (I. Geoffroy & de Blainville, 1834)
Pithecia monachus napensis Lönnberg, 1938	Not listed
Callicebus personatus (É. Geoffroy, 1812)	*Callicebus personatus* with four subspecies
Callicebus nigrifrons (Spix, 1823)	Subspecies of *Callicebus personatus*
Callicebus melanochir (Wied-Neuwied, 1820)	Subspecies of *Callicebus personatus*
Callicebus barbarabrownae Hershkovitz, 1990	Subspecies of *Callicebus personatus*
Alouatta palliata palliata (Gray, 1849)	*Alouatta palliata* monotypic
Alouatta palliata mexicana (Merriam 1902)	Synonym of *Alouatta palliata*
Alouatta palliata aequatorialis (Festa, 1903)	Synonym of *Alouatta palliata*
Alouatta coibensis coibensis Thomas, 1902	*Alouatta coibensis* monotypic
Alouatta coibensis trabeata Lawrence, 1933	Synonym of *Alouatta coibensis*
Alouatta seniculus ssp. (formerly *straminea*; see Rylands and Brandon-Jones, 1998)	*Alouatta macconnelli* Elliot, 1910
Alouatta seniculus amazonica Lönnberg, 1941	Synonym of *Alouatta seniculus juara* Elliot 1910
Alouatta seniculus puruensis Lönnberg, 1941	Synonym of *Alouatta seniculus juara* Elliot 1910
Alouatta seniculus insulanus Elliot, 1910	Synonym of *Alouatta macconnelli*
Alouatta belzebul belzebul (Linnaeus, 1766)	*Alouatta belzebul* monotypic
Alouatta belzebul discolor (Spix, 1823)	Synonym of *Alouatta belzebul*
Alouatta belzebul ululata Elliot, 1912	Synonym of *Alouatta belzebul*
Ateles hybridus hybridus (I. Geoffroy, 1829)	*Ateles hybridus* monotypic
Ateles hybridus brunneus Gray, 1872	Synonym of *Ateles hybridus*
Ateles geoffroyi fusciceps Gray, 1866	Listed as *Ateles fusciceps fusciceps* Gray, 1866
Ateles geoffroyi rufiventris Allen, 1914	Listed as *Ateles fusciceps rufiventris* Allen, 1914
Ateles geoffroyi panamensis Kellogg & Goldman, 1944	Synonym of *Ateles geoffroyi ornatus* Gray, 1870
Ateles geoffroyi azuerensis (Bole, 1937)	Synonym of *Ateles geoffroyi ornatus* Gray, 1870
Ateles geoffroyi frontatus (Gray, 1842)	Synonym of *Ateles geoffroyi geoffroyi* Kuhl, 1820

the subspecies of *Cebus olivaceus* recognized by Hershkovitz (1949) under the species name of *nigrivittatus* Wagner, 1848 (see Rylands, 1999). Groves placed them all as synonyms of *C. olivaceus*. Rylands *et al.* listed the form *kaapori* Queiroz, 1992, as a subspecies of *C. olivaceus*, whereas Groves (2001) maintained it as a distinct species as described by the author. Rylands *et al.* adopted Groves' taxonomy for the tufted capuchin monkeys of the *Cebus apella* group.

The taxonomies of *Saimiri* are the same except that Rylands *et al.* listed the two forms, *pluvialis* Lönnberg, 1940 and *jaburuensis* Lönnberg, 1940, mentioned in a footnote by Hershkovitz (1987). Groves listed them both as synonyms of *S. boliviensis boliviensis*.

Rylands *et al.* followed Groves on the taxonomy of the Pitheciidae except in giving all the Atlantic forest titis the status of species, as recommended by Kobayashi and Langguth (1999) in their description of *Callicebus coimbrai*. Rylands *et al.* also listed a third subspecies of *Pithecia monachus*. Based on his examination of specimens in the British Museum (Natural History), Peter Grubb argued that *P. monachus napensis* Lönnberg, 1938, is a distinct and valid subspecies (pers. comm., February, 2000).

The final two genera which present discrepancies are *Alouatta* and *Ateles*. Groves did not recognize the subspecies of *Alouatta palliata*, *A. coibensis* and *A. belzebul* listed by Rylands *et al.* (see Table 2). Whereas Rylands *et al.,* were not prepared to designate a subspecific name to the Guianan red howler (see Rylands and Brandon-Jones, 1998), Groves listed it as *Alouatta macconnelli* Elliot 1910. Groves synonymized *Alouatta seniculus amazonica* Lönnberg, 1941 and *Alouatta seniculus puruensis* Lönnberg, 1941, with *Alouatta seniculus juara* Elliot 1910, and the Trinidad howling monkey, *Alouatta seniculus insulanus* Elliot, 1910 with *A. macconnelli*.

Rylands *et al.* followed Collins and Dubach (2000) in placing the brown-headed spider monkey, and the Colombian black spider monkey, as subspecies of *A. geoffroyi*: *A. geoffroyi fusciceps* Gray, 1866 and *A. geoffroyi rufiventris* Allen, 1914, respectively, whereas Groves maintained them as subspecies of *A. fusciceps*. Groves did not recognize *Ateles hybridus brunneus* Gray, 1872, and also synonymized *Ateles geoffroyi panamensis* Kellogg and Goldman, 1944 and *Ateles geoffroyi azuerensis* (Bole, 1937) with *Ateles geoffroyi ornatus* Gray, 1870. Lastly, he considered *Ateles geoffroyi frontatus* (Gray, 1842) to be a synonym of *Ateles geoffroyi geoffroyi* Kuhl, 1820.

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