

Legal International Trade in Live Neotropical Primates Originating from South America

Marcos de Souza Fialho, Gabriela Ludwig and Mônica Mafra Valença-Montenegro

Centro Nacional de Pesquisa e Conservação de Primatas Brasileiros – CPB/ICMBio, João Pessoa, Paraíba, Brazil

Abstract: Neotropical primates have fascinated Europeans since they first arrived in the Americas. Trade, shipping the monkeys back to Europe, began in the 16th century, and continues today, sending them to countries worldwide for zoos, privately owned pets, and for research. In this study, we characterize the legal trade of Neotropical primates from South America, with particular emphasis on Brazil, as evidenced in the CITES Trade Database website. Taking into account wild animals between 1977 and 2013, there were nearly 1,300 transactions, over half of which (60%) were reported to be commercial. Imports by zoos (10%) and for scientific purposes (6.5%) involved almost 90,000 primates. Sixty-three countries imported Neotropical primates and, with the exception of Ecuador, all South American countries exported live animals. The individual contribution of different countries to the trade fluctuated over the years. Only eight species showed numbers superior to 1% of the total number of exported primates. Considering captive animals, there were nearly 300 transactions, involving 4,827 individuals, with a smaller number of species and exporters. The amount of traded primates is relevant and deserves monitoring. Nevertheless, we noticed a trend towards stabilization of the numbers of species and total numbers of exported individuals over the last decade.

Key Words: Neotropical primates, CITES, legal trade, South America

Introduction

Neotropical primates have fascinated Europeans since they first arrived in the Americas over 500 years ago. Monkeys were shipped back to Europe mainly to serve as exotic pets for the nobles (Fragaszy *et al.* 2004; Urbani 2007). There are records of primates being taken from northeastern Brazil to the European continent dating back to 1511 (Urbani 1999). This trade continues; countries worldwide import these animals for zoos, privately owned exotic pets, and for scientific research (Mack and Mittermeier 1984).

The 1973 Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) was drafted as a result of a resolution adopted in 1963 at a meeting of members of IUCN. The text was agreed at a meeting of representatives of 80 countries in Washington, DC, on 3 March 1973. It entered into force on 1 July 1975, its aim being to regulate and promote the sustainability of wildlife trade, ensuring that the international trade in specimens of wild animals does not compromise the survival of natural populations to the point of their endangerment. When the government of a

State decides that it will be bound by the provisions of CITES, it can ‘join’ the Convention by making a formal declaration in writing to the Depositary Government (Switzerland). Once the document has been received, the Convention enters into force in 90 days. Each country that implements CITES is called a Party, and has to designate a Management Authority and Scientific Authority to carry out the treaty. Collectively, the member countries to CITES are referred to as the Conference of the Parties.

Currently there are 182 parties. The process of making a declaration to be bound by CITES is called ‘ratification,’ ‘acceptance,’ ‘approval’ or ‘accession.’ Ratification, acceptance and approval are legally equivalent actions but are only applicable in relation to the States that signed the Convention when it was open for signature (between 3 March 1973 and 31 December 1974). Acceptance and approval are the actions taken by certain States when, at national level, constitutional law does not require a treaty to be ‘ratified’. All States that had signed the Convention have now ratified, accepted or approved it. ‘Accession’ is used in relation to the States that did not sign the Convention (CITES 2015, for South America

Table 1. Countries which entered the process of making a declaration to be bound by the provisions of CITES, type and period of the process (CITES 2015).

Country	Type	Date of joining	Entry into force
Ecuador	Ratification	11/02/1975	01/07/1975
Chile	Ratification	14/02/1975	01/07/1975
Uruguay	Ratification	02/04/1975	01/07/1975
Peru	Ratification	27/06/1975	25/09/1975
Brazil	Ratification	06/08/1975	04/11/1975
Paraguay	Ratification	15/11/1976	13/02/1977
Guyana	Accession	27/05/1977	25/08/1977
Venezuela (Bolivarian Republic of)	Ratification	24/10/1977	22/01/1978
French Guiana	Approval	11/05/1978	09/08/1978
Bolivia (Plurinational State of)	Ratification	06/07/1979	04/10/1979
Suriname	Accession	17/11/1980	15/02/1981
Argentina	Ratification	08/01/1981	08/04/1981
Colombia	Ratification	31/08/1981	29/11/1981

see Table 1). CITES defines criteria and standards for transactions to be followed by the signatory countries that assumed responsibility for authorizing and registering the international trade in specimens, parts and derivatives, obtained from nature or not, by their national Management Authority.

Once CITES was instituted, the international trade in primates declined significantly (Fragaszy *et al.* 2004), and by 1981 all South American countries had become signatories (CITES 2015). Approximately 5,600 species of animals are, in principle, protected against legal overexploitation between countries by means of CITES. They are listed in three appendices, each defining different levels of protection from over-exploitation according to the degree of threat to which the trade subjects them (CITES 2015). All non-human primates are included in Appendices I or II of the Convention; their trade requires, therefore, the approval of CITES authorities from all the countries involved—origin and destination. Twenty-one of the 174 Neotropical primate species currently recognized by CITES are listed in Appendix I, the most restrictive Appendix, in which trade in specimens is permitted only in exceptional circumstances. The remaining species are included in Appendix II that includes species in which trade must be controlled in order to avoid utilization incompatible with their survival. Exceptional cases are listed in Appendix III (CITES 2015). Here we characterize the trade in Neotropical primates originating from South America between 1977 and 2013.

Methods

We obtained the report on legally traded Neotropical primates from the *CITES Trade Database* website (<<http://trade.cites.org/>>) (CITES 2015), following the *Guide to Using the CITES Trade Database* (UNEP and WCMC 2013). Data were available for the years 1977 to 2013.

We analyzed the annual numbers of live specimens traded by species and by country of origin and destination by consolidating the information reported by the traders—importers and/or exporters (gross import/export quantities, which included re-exports). We included animals originating from the wild (W), seized or confiscated (I), of unknown origin

(U) and from captive origin (codes C, F and R – see UNEP and WCMC 2013). When available, we used the numbers provided by the importing country; when lacking, we used the number declared by the exporter. When one of the parties informed more than one value for the same species and year, we considered the highest. We excluded data missing part of the transaction information, as well as records for which the taxonomic identity was above the level of genus.

Results

We recorded the trade of 89,358 primates, W, I or U (Table 2) belonging to at least 43 species (only *Ateles geoffroyi frontatus* was cited as a subspecies) originating from South America. Sixty-three countries imported Neotropical primates and, with the exception of Ecuador, all South American countries, including Chile that has no native species, exported live monkeys at a given point during the examined time frame. For those 36 years (1977–2013), the average of number of individuals per taxa traded between two countries was 70. The largest single transaction for a single taxon in a given year was 2,466 individuals of *Saimiri sciureus* exported by Guyana to the United States in 1986. However, we can see a gradual reduction in volume and number of species involved over the years (Figs. 1 and 2).

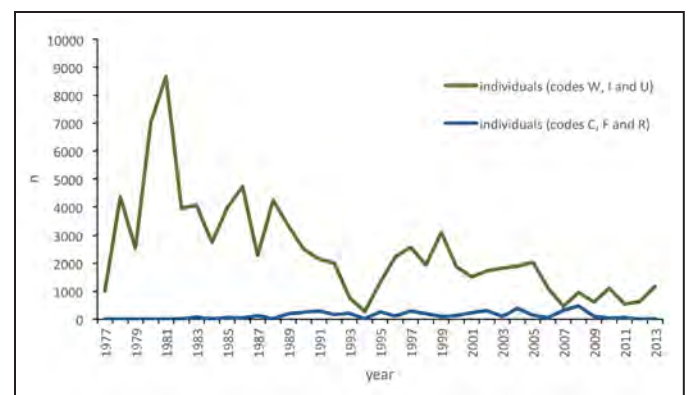


Figure 1. Number of live Neotropical primates exported from South America between 1977 and 2013.

Table 2. Number of live Neotropical primates exported by genus and country from South America between 1977 and 2013, only animals originating from the wild, apprehended or of unknown origin (codes W, I and U) (AR = Argentina, BO = Bolivia, BR = Brazil, CL = Chile, CO = Colombia, GF = French Guiana, GY = Guyana, PE = Peru, PY = Paraguay, SR = Suriname, UY = Uruguay, VE = Venezuela).

Genus	AR	BO	BR	CL	CO	GF	GY	PE	PY	SR	UY	VE	Total
<i>Aotus</i>		1368			109			1,817	174				3,468
<i>Ateles</i>		36			1		47	1		14		22	121
<i>Cacajao</i>		4	4										8
<i>Alouatta</i>	69	90	6		1		171	1	36	2		12	388
<i>Callicebus</i>		181	2					18					201
<i>Callimico</i>		27			1			5					33
<i>Callithrix</i> ¹	3	691	523		14			307	385	32	2		1,957
<i>Cebus</i> ²	95	654	54	38	2		7,058	38	259	558	2	8	8,766
<i>Chiropotes</i>		6					126			4			136
<i>Lagothrix</i>		80	12		38			6					136
<i>Leontopithecus</i>	2		33					1					36
<i>Pithecia</i>							300			2			302
<i>Saguinus</i> ³		5353	24	1	8		3,522	3,153		1,062		2	13,125
<i>Saimiri</i>	12	14,454	6	2	84	33	37,862	2750		5,476		2	60,681
Total	181	22,944	664	41	258	33	49,086	8,097	854	7,150	4	46	89,358

¹Includes *Callibella*, *Cebuella*, *Mico*. ²Includes *Sapajus*. ³Includes *Leontocebus*.

Of almost 1,281 recorded transactions (defined as the movement of one taxon between two countries in a given year), over half (60%) were categorized as commercial, followed by imports by zoos (10%) and for scientific purposes (6.5%).

The individual contribution of different countries to this trade fluctuated over the years (Fig. 3). Bolivia was the main primate-exporting country from 1978 to 1983, peaking in 1981, with the export of a little more than 7,000 monkeys, very largely *Saimiri* and *Saguinus*. Bolivia almost ceased its legal exports in 1987. Guyana was the principal exporter from 1984, gradually increasing its numbers from 1977 to 1988, peaking in 1986 (4,024 individuals) and in 1988 (3,747), but dropping to 1,659 by 1991. Guyana's exports dropped in 2007, averaging 602 from 2007 to 2013. Squirrel monkeys, *Saimiri*, comprised the majority of its exports (2,562) from 2007 to 2013. Significant numbers of monkeys (6,971) were also exported from Suriname between 1995 and 2013. Between 1977 and 2004, Peru exported between 60 and 920 primates per year, peaking in 1987. From 2005 to 2013 numbers were minimal.

Historically, Guyana accounts for 54.9% of all exported primates and only Bolivia, Peru and Suriname, following this order, exhibit percentages higher than 1%. The principal importers were the United States and Japan, accounting for almost 70% of all traded primates; the United States alone for nearly half of all imports (49.7%). During the 36-year period we studied, Brazil legally exported 664 primates (0.7%).

Only eight species (of five genera) showed export numbers superior to 1% of the total number of exported primates (Fig. 4). The most frequently recorded taxon was *Saimiri sciureus*, including Bolivian squirrel monkeys that currently are classified as *S. boliviensis*, corresponding to 59,982, or 67.1% of all individuals, followed by *Cebus* (= *Sapajus*) *apella* (6,547: 7.3%), *Saguinus labiatus* (5,227: 5.8%), *Saguinus midas* (4,608: 5.2%), *Aotus trivirgatus* (2,694: 3%) (undoubtedly

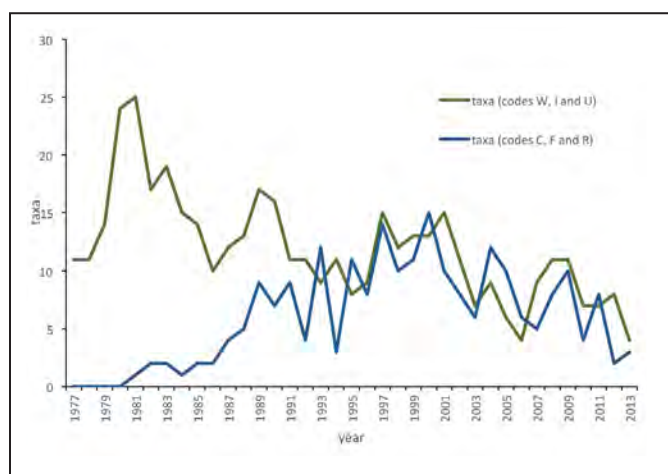


Figure 2. Number of Neotropical primate species (taxa) exported by South American countries between 1977 and 2013.

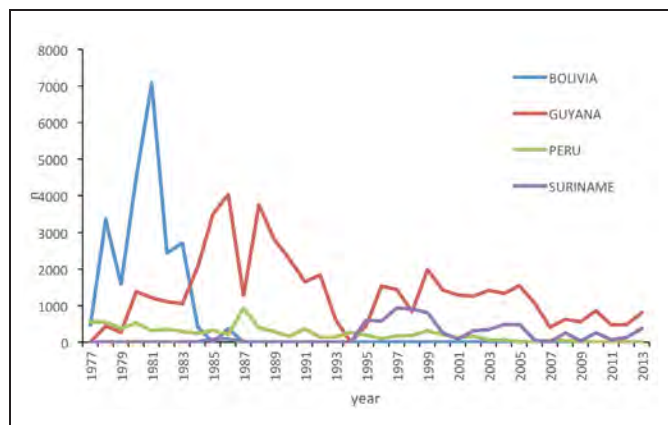


Figure 3. Number of live Neotropical primates exported by the four most important South American countries (>1% in total number) between 1977 and 2013, only animals originating from the wild, apprehended or of unknown origin (codes W, I and U).

a mix of the currently recognized species), *Saguinus mystax* (2,111; 2.4%), *Cebus olivaceus* (1,363; 1.5%), and *Callithrix jacchus* (1,221; 1.4%). In most recent years, there was a notable peak in trade in *Callithrix (Cebuella) pygmaea* originating from Peru, *Cebus (= Sapajus) apella*, *Cebus olivaceus*, *Chiropotes chiropotes (= C. satanas)*, and *Saguinus midas* from Guyana, and *Saimiri sciureus* from Guyana as well as Suriname.

In South America's export trend, *Saimiri* is the main genus exported (60,681; 67.9%), with *Saguinus* being a rather distant second (13,125; 14.7%). Brazil is slightly distinct from the overall pattern, *Callithrix jacchus* accounted for more than two-thirds of all transactions (450; 67.8%), mostly in 1979–1980. It was followed by *Cebus (= Sapajus) apella* (54; 8.1%) and *Callithrix geoffroyi* (38; 5.7%).

The trade of captive animals (codes C, F and R) was considerably lower than the trade of W, I and U animals. It involved less specimens (4,827), taxa and countries (Table 3, Fig. 1), although the number of species exported annually

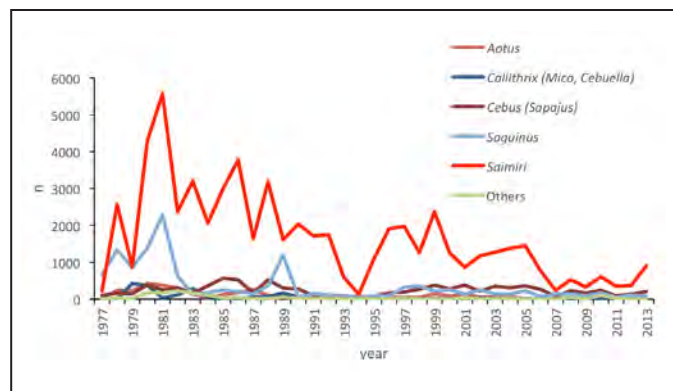


Figure 4. Number of live Neotropical primates by genus exported from South America between 1977 and 2013, only animals originating from the wild, apprehended or of unknown origin (codes W, I and U).

Table 3. Number of live Neotropical primates exported by genus and country from South America between 1977 and 2013, only animals originating from captivity (codes C, F and R) (AR = Argentina, BO = Bolivia, BR = Brazil, CL = Chile, CO = Colombia, GF = French Guiana, GY = Guyana, PE = Peru, SR = Suriname, VE = Venezuela).

Genus/Country	AR	BO	BR	CL	CO	GF	GY	PE	SR	VE	Total
<i>Alouatta</i>	32		3							26	61
<i>Aotus</i>								918			918
<i>Ateles</i>							4	9		10	23
<i>Callimico</i>									3		3
<i>Callithrix</i> ¹	25		1472		2			231			1730
<i>Cebus</i> ²	86	1	113	64			120	18		14	416
<i>Lagothrix</i>			3					6			9
<i>Leontopithecus</i>			95		1		14				110
<i>Pithecia</i>								2			2
<i>Saguinus</i> ³			51		4		50	63	9		177
<i>Saimiri</i>	13					539	416	324	86		1378
Total	156	1	1737	64	7	539	604	1571	98	50	4827

¹Includes *Callibella*, *Cebuella*, *Mico*. ²Includes *Sapajus*. ³Includes *Leontocebus*.

from the 90's is very similar between both types of trend (Fig. 2). *Saimiri* remains as one of the main genera involved, but *Callithrix* is the principal export.

Although Brazil's participation in the trade of animals from the wild was minimal, it is the main source of animals that come from captivity considering the period analyzed, with a small, but constant volume over the years— mostly *Callithrix* (85%).

Discussion

Records from the CITES Trade Database have known limitations (Mack and Mittermeier 1984; UNEP and WCMC 2013). We here highlight two that surfaced during our analyses, but which we believe did not compromise the patterns we report: a trade may be registered twice in two consecutive years, either by the exporter, or the importer; and a group of animals may be identified as a given taxon by the exporter and as another by the importer.

The numbers of traded primates is relevant and deserves monitoring. Nevertheless, we noticed a trend towards stabilization of the species richness and total number of exported individuals over the last decade. Exceptionally high figures were registered for 1964 and 1980, when over half a million specimens, approximately 60% of them *Saimiri*, were taken from South America (notably Peru and Colombia) into the United States (Mack and Mittermeier 1984). CITES was in the early stages of implementation in 1977, and many countries had yet to become signatories.

Until 1973, Peru and Colombia were the principal suppliers to the United States, the main Neotropical primate importer. After these countries banned the commercial export of primates, Bolivia and Guyana became the major exporters to the United States (Mack and Mittermeier 1984), with high numbers of primates exported during the 1980s by these

countries between 1977 and 2013. In the late 1980s, Guyana replaced Bolivia as the principal New World primate exporter, because the latter stopped exporting the Bolivian squirrel monkey (Abee 2011). This explains the peak in *Saimiri* trade between Guyana and the United States observed in 1986. In 2013, Guyana was the fifth most important provider of primates to the United States (IPPL 2015). The lack of trade originating from Ecuador is a consequence of the countries' stricter legislation.

Saimiri was also the taxon most traded prior to CITES and the Brazilian, Peruvian and Colombian legislation restricting primate exports (Mack and Mittermeier 1984). Although most exports are listed as commerce, scientific testing is likely to be the true driver behind the majority of the primate trade. That is certainly the case for the squirrel monkey (*Saimiri*), which is the most extensively used Neotropical taxon in scientific and biomedical research (Abee 2011), as well as the main target for the pet trade (Mack and Eudey 1984).

The United States is not only the largest importer of South American primates, as shown in our analyses, but also of primates worldwide (IPPL 2015). In 2013, the country imported 18,934 primates, 97.7% of which were reported bred in captivity and 98.5% from Asian countries (IPPL 2015), primarily China (Hsu 2011). The United States is also the country with the highest use of Neotropical primates in experimental (biomedical) research, where squirrel monkeys (*Saimiri*), owl monkeys (*Aotus*), marmosets (*Callithrix jacchus*), and tamarins (*Saguinus mystax*) are the main taxa (Abee 2011).

CITES tends to adopt a conservative taxonomy, as nomenclatural changes can disrupt and confuse the provision of permits and other processes, which incurs significant delays in its implementation. Primate nomenclature follows Wilson and Reeder (2005), with several additions concerning individual species or genera. Once every three years CITES evaluates the utility of updating its nomenclature at its Conference of the Parties. Despite this, given the increase in taxonomic studies of primates, resulting in the continual updating and changes in taxonomic lists (see Groves 2005; Rylands and Mittermeier 2008, 2014; Rylands *et al.* 2012), we here highlight the need for systematic updates in the CITES checklist. Considering their prominence in the primate trade, it is urgently necessary to incorporate revisions in the taxonomies of the squirrel monkeys *Saimiri* (see Lynch Alfaro *et al.* 2015) and capuchin monkeys, the latter now divided into two distinct genera (Lynch Alfaro *et al.* 2012a, 2012b)—*Cebus* for the gracile, untufted capuchins and *Sapajus* for the robust, tufted capuchins (Lynch Alfaro *et al.* 2012b; Boubli *et al.* 2012). Trade records for *Saimiri sciureus* and *Cebus apella* undoubtedly comprise now other recognized species—notably, for the former, the distinct *Saimiri boliviensis* from Bolivia—and some of them may be threatened. Having a more discerning taxonomy will better allow for the tracking of records of species exported from countries where they are not native, although they could be re-exportations, as is the case for the small numbers exported from Uruguay and Chile, which have no wild primate populations.

Since the last global assessment of the primate conservation status by IUCN, only one taxon categorized as threatened was involved in trade, in this case, *Ateles paniscus*, considered Vulnerable (VU).

The limitations of the report made available by the CITES Trade Database are already acknowledged in the user guide provided by UNEP and WCMC (2013). We highlight here, in addition to the outdated taxonomy, that a trade could be registered twice in two consecutive years, either by the exporter, or the importer, and that a group of animals could be identified as a given taxon by the exporter and as another by the importer.

Finally, another important issue is the fact that Guyana and Suriname, the two main exporters of primates in South America, do not have a list of threatened species, although the commonly exported taxa are not currently listed as threatened on the IUCN Red List of Threatened Species (IUCN 2015).

Literature Cited

- Abee, C. 2011. New World primates in research. In: *Animal Research in a Global Environment: Meeting the Challenges. Proceedings of the November 2008 International Workshop*, National Research Council of the National Academies, pp. 227–230. The National Academies Press, Washington, DC.
- Boubli, J. P., A. B. Rylands, I. P. Farias, M. E. Alfaro and J. Lynch Alfaro. 2012. *Cebus* phylogenetic relationships: a preliminary reassessment of the diversity of the untufted capuchin monkeys. *Am. J. Primatol.* 74: 381–93.
- CITES. 2015. Convention on International Trade in Endangered Species of Wild Fauna and Flora. Website: <<https://cites.org>>. Accessed: 1 September 2015.
- Fragaszy, D., L. Fedigan and E. Visalberghi. 2004. *The Complete Capuchin: The Biology of the Genus Cebus*. Cambridge University Press, New York.
- Groves, C. P. 2005. Order Primates. In: *Mammal Species of the World: A Taxonomic and Geographic Reference*, 3rd Edition, Volume 1, D. E. Wilson and D. M. Reeder (eds.), pp.111–184. Johns Hopkins University Press, Baltimore, MD.
- Hsu, C. K. 2011. China as a Resource for NHP. In: *Animal Research in a Global Environment: Meeting the Challenges. Proceedings of the November 2008 International Workshop*, National Research Council of the National Academies, pp. 223–226. National Academies Press, Washington, DC.
- IPPL. 2015. *U.S. Primate Import Statistics for 2013*. International Primate Protection League (IPPL), Somerville, SC. Website: <www.ippl.org/gibbon/u-s-primate-import-statistics-2013>. Accessed: 1 September 2015.
- IUCN. 2015. The IUCN Red List of Threatened Species. 2015.4. International Union for Conservation of Nature (IUCN), Species Survival Commission (SSC), Species Programme, Gland, Switzerland, and Cambridge, UK.

- Website: <<http://www.iucnredlist.org>>. Accessed: 15 September 2015.
- Lynch Alfaro, J.W., J. P. Boubli, L. E. Olson, A. Di Fiore, B. Wilson, G. A. Gutiérrez-Espeleta, K. L. Chiou, M. Schulte, S. Neitzel, V. Ross, D. Schwochow, M. Nguyen, I. Farias, C. Janson and M. E. Alfaro. 2012a. Explosive Pleistocene range expansion leads to widespread Amazonian sympatry between robust and gracile capuchin monkeys. *J. Biogeog.* 39: 272–288.
- Lynch Alfaro, J. W., J. S. Silva Jr. and A. B. Rylands. 2012b. How different are robust and gracile capuchin monkeys? An argument for the use of *Sapajus* and *Cebus*. *Am. J. Primatol.* 74: 273–286.
- Lynch Alfaro, J. W., J. P. Boubli, F. P. Paim, C. C. Ribas, M. N. F. da Silva, M. R. Messias, F. Röhe, M. P. Mercês, J. S. Silva-Júnior, C. R. Silva, G. M. Pinho, G. Koshkarian, M. T. T. Nguyen, M. L. Harada, R. M. Rabelo, H. L. Queiroz, M. E. Alfaro and I.P. Farias. 2015. Biogeography of squirrel monkeys (genus *Saimiri*): south-central Amazon origin and rapid pan-Amazonian diversification of a lowland primate. *Mol. Phylogenet. Evol.* 82: 436–454.
- Mack, D. and A. Eudey. 1984. A Review of the U.S. Primate Trade. In: *The International Primate Trade*, D. Mack, and R. A. Mittermeier (eds.), pp. 91–101. Traffic USA (Program), World Wildlife Fund US, and IUCN/SSC Primate Specialist Group, Washington, DC.
- Mack, D. and R. A. Mittermeier (eds.). 1984. *The International Primate Trade*. Traffic USA (Program), World Wildlife Fund US, and IUCN/SSC Primate Specialist Group, Washington, DC.
- Rylands, A. B. and R. A. Mittermeier. 2008. The diversity of the New World primates: an annotated taxonomy. In: *South American Primates: Comparative Perspectives in the Study of Behavior, Ecology, and Conservation*, P. A. Garber, A. Estrada, J. C. Bicca-Marques, E. W. Heymann and K. B. Strier (eds.), pp.23–54. Springer, New York.
- Rylands, A. B. and R. A. Mittermeier. 2014. Primate taxonomy: species and conservation. *Evol. Anthropol.* 23: 8–10.
- Rylands, A. B., R. A. Mittermeier and J. S. Silva Jr. 2012. Neotropical primates: taxonomy and recently described species and subspecies. *Int. Zoo Yearb.* 46: 11–24.
- UNEP and WCMC. 2013. A Guide to Using the CITES Trade Database. Version 8. United Nations Environment Programme (UNEP) and World Conservation Monitoring Centre (WCMC), Cambridge, UK. 21pp. Website: <http://trade.cites.org/cites_trade_guidelines/en-CITES_Trade_Database_Guide.pdf>. Accessed: 1 September 2015.
- Urbani, B. 1999. Nuevo Mundo, nuevos monos: sobre primates neotropicales en los siglos XV y XVI. *Neotrop. Primates* 7: 121–125.
- Urbani, B. 2007. Further information on Neotropical monkeys reported in the XVI century. Part 2. *Neotrop. Primates* 14: 144–145.
- Wilson, D. E. and D. M. Reeder (eds.). 2005. *Mammal Species of the World. A Taxonomic and Geographic Reference*, 3rd edition, 2 vols. Johns Hopkins University Press, Baltimore, MD.

Authors' address:

Marcos de Souza Fialho, Gabriela Ludwig and Mônica Mafra Valença-Montenegro, Centro Nacional de Pesquisa e Conservação de Primatas Brasileiros – CPB/ICMBio; Praça Antenor Navarro, 05, Varadouro, João Pessoa 58010-480, Paraíba, Brazil. E-mail of first author: <marcos.fialho@icmbio.gov.br>.

Received for publication: 22 March 2016

Revised: 14 June 2016