

Article

From XVI to XXI century: old and recent records of *Brachyteles arachnoides* (Primates, Atelidae) in the State of Rio de Janeiro

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ABSTRACT. Two mureiqui species are currently described in the literature: the southern mureiqui, *Brachyteles arachnoides* (E. Geoffroy, 1806) and the northern mureiqui, *Brachyteles hypoxanthus* (Kuhl, 1820). Nowadays, the distribution of the southern mureiqui is restricted to forest patches of the states of Rio de Janeiro, São Paulo and Paraná, while the northern mureiqui occurs in Espírito Santo, Bahia and Minas Gerais. Both are threatened species, but there are still many gaps in our knowledge of their occurrence, especially for southern mureiquis in the state of RJ. The purpose of this work is precisely to identify the primary areas of occurrence of the mureiqui in Rio de Janeiro through historical reports by naturalists, adventurers and others since the 16th century. Thus, allowing to assist in the establishment and conservation strategies of the species.

KEYWORDS. *Brachyteles*, Atlantic Forest, conservation, history.

RESUMO. Do século XVI ao XXI: registros antigos e recentes de *Brachyteles arachnoides* (Primates, Atelidae) no Estado do Rio de Janeiro. Existem duas espécies de mureiquis descritas atualmente na literatura: mureiqui do sul, *Brachyteles arachnoides* (E. Geoffroy, 1806) e mureiqui-do-norte, *Brachyteles hypoxanthus* (Kuhl, 1820). Atualmente, o mureiqui-do-sul tem sua distribuição restrita a fragmentos florestais dos estados do Rio de Janeiro, São Paulo e Paraná, enquanto o mureiqui do norte ocorre no Espírito Santo, Bahia e Minas Gerais. Ambas são espécies ameaçadas, mas ainda existem muitas lacunas no conhecimento de sua ocorrência, principalmente para os mureiquis-do-sul do estado do RJ. O intuito desse trabalho é justamente identificar as áreas primárias da ocorrência do mureiqui no Rio de Janeiro por meio de relatos históricos de naturalistas, aventureiros e outros desde o século XVI, permitindo assim, auxiliar no estabelecimento e estratégias de conservação da espécie.

PALAVRAS-CHAVE. *Brachyteles*, Mata Atlântica, conservação, história.

The genus *Brachyteles* Spix, 1823 includes *Brachyteles arachnoides* (E. Geoffroy, 1806) and *Brachyteles hypoxanthus* (Kuhl, 1820), which are known as the southern and the northern mureiqui, respectively. They are the largest Neotropical primates (NISHIMURA *et al.*, 1988) formerly found in the coastal areas which were covered by dense forests, according to VIEIRA (1944), from the Cape of São Roque in the state of Rio Grande do Norte to the state of Rio Grande do Sul. Nowadays, the southern mureiqui is restricted to the forest patches of the states of Rio de Janeiro, São Paulo and Paraná, while the northern mureiqui occurs in the states of Espírito Santo, Bahia and Minas Gerais. Both species are threatened with extinction according to the global red list of threatened species (IUCN, 2008) and the Brazilian red list (MMA, 2014; ICMBio, 2018). Furthermore, they are listed in the Appendix I of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES, 1975).

The records of mureiquis during the XVIII century did not have reliable information on where the specimens were originally found, such as those specimens found in Jamaica and London (BROWNE, 1756; EDWARDS, 1758). In Brazil, the localities of occurrence of mureiquis have been reported only from the XIX century onwards, by some “travelling naturalists” as SPIX (1823), WIED-NEUWIED (1826), BURMEISTER (1853), NATTERER (1883) and SPIX (1823), SPIX & MARTIUS (1981). These reports point out regions in the states of Rio de Janeiro, Bahia, São Paulo and Minas Gerais.

In Rio de Janeiro, despite the reports mentioned above and recent ones, knowledge gaps regarding the biology and the geographic distribution of mureiquis are still of concern. The greatest contribution to our knowledge on *B. arachnoides* in the state was made in 1971 by Álvaro Coutinho Aguirre from the Brazilian Academy of Sciences. In this work Aguirre prepared a map of the distribution of *Brachyteles*. Since then,

only occasional contributions have added to the knowledge on southern mureiqui in the state of Rio de Janeiro (COIMBRA-FILHO, 1972; ÁVILA PIRES & GOUVEA, 1977; CÂMARA, 1995; VAZ, 1998b; MARROIG & SANT'ANNA, 2001; CUNHA, 2003; GARCIA & ANDRADE FILHO, 2002; GARCIA, 2005; LORETTO & RAJÃO, 2005; PISSINATTI, 2005; BREVES *et al.*, 2009, 2012; BREVES, 2010; CUNHA *et al.*, 2009; BREVES & PISSINATTI, 2013).

Intensification of human sprawl in the state of Rio de Janeiro and the continuous pressure on Atlantic Forest patches (DEAN, 1995), which are remnant areas for the species, show the urgency for more studies. The historical rescue of *Brachyteles* records and the areas of occurrence are especially important to support the planning of effective actions for the species conservation in Rio de Janeiro.

Here we aim to identify the areas of occurrence of mureiquis in the state of Rio de Janeiro based on the historical records regardless of whether the original locality is explicit or not, also we identify the main regions where the species may currently persist.

MATERIAL AND METHODS

The localities of occurrence, registration or citation of the species were obtained from historical reports, scientific articles, specialized books and through field work, in addition to sparse more current observations *in loco*. Databases available online and in rare works libraries were consulted, such as: Internet Archive, Gallica BnF, Google books, Brasiliana, USP Library, Biodiversity Heritage Library, National Library of Portugal, Unicamp's Digital Library, Curt Nimuendajú Digital Library, Brazil's National Library Digital. For occurrences of species, the information was collected from the online database, Smithsonian National Museum of Natural History. Books from the Library of the Primatology Center of Rio de Janeiro/INEA, Library of the Oswaldo Cruz Foundation and others are from the author's private collection were consulted.

Reports were organized chronologically, starting from the first record, seeking maximum precision regarding the area of occurrence and the identification of the species, despite the difficulties to obtaining them.

The occurrence of the presence of the southern mureiqui in Rio de Janeiro was established mainly from the consolidation organized by AGUIRRE (1971) and its original map, kindly provided by the Brazilian Academy of Sciences. To it were added recent data obtained from the literature and original fieldwork data collected by the author's team since her training for a master's degree in 2008 and other field trips originating some articles and Congresses' presentations.

RESULTS

So far, the the first report on the genus *Brachyteles* was the description of the species made by Edward Geoffroy in 1806, which was based on the reports of George Edwards

(1758) in London with those of Patrick Browne (1756) in Jamaica. These accounts will be explained further below to maintain chronological order.

However, we found an earlier report of mureiquis by the catholic friar André Thevet, who arrived in the state of Rio de Janeiro at the end of 1555 as a member of the expedition of Nicolas Durand de Villegaignon, in the unusual attempt to set up a French colony in the state. Despite the short time that Thevet stayed in Brazil, his many records correspond to the great richness of information about the country and its inhabitants. In his book "The Universal Cosmography of André Thevet", there is an noteworthy description of a great yellow monkey that cries like a child, has a very long tail, is hard to catch due to its extreme lightness and is called *Moritolyf* (THEVET, 1575). Thevet's description is the oldest and the clearest about mureiquis, since he mentioned remarkable and unmistakable characteristics of the species. MUSSA (2009), who researched and translated words in Tupi language from Thevet's manuscripts, mentioned the word "moritoly". According to Mussa, this word is unfeasible, because the Tupi spelling does not contain the f and l consonants, suggesting "myryqui-oryb", which means "happy mureiqui".

In another manuscript, Thevet described a large monkey that jumps between trees and carries its young, which has never been seen in Asia or Africa and is known as "muriphgy". According to PAPAVERO & TEIXEIRA (2014), the word "muriphgy" is also a reference to mureiquis. Hence, it is worth noting that Thevet used two different words to refer to mureiquis (THEVET, 1575).

Hans Staden was a German adventurer who wrecked on the coast near Itanhaém in the state of São Paulo, during his second visit to Brazil on his way back from Santa Catarina to São Vicente. He survived and the Portuguese handed him over the custody of the Bertioga Fort (STADEN, 1930). The word "Bertioga" derives from "Buriquioca", which means house of "buriquis", a kind of monkey according to the "Memories for the History of the Captaincy of St. Vincent", written by the friar MADRE DEUS (1797). According to the friar, the name "Buriquioca" was given by indigenous people to the hill with many "buriquis" monkeys. One morning, Hans Staden left the fort and Tupinambá people captured and took him to the village of Ubatuba ("Uwattibi"), between the municipalities of Angra dos Reis and Mangaratiba in the state of Rio de Janeiro. This village was located in front of the main island named "Ipaum-guaçú", which is the Tupi name for Ilha Grande in Rio de Janeiro. At that time, another village in São Paulo was also known as "Uwattibi", and is currently known as Ubatuba (STADEN, 1930). After managing to escape and return safely to his homeland, Hans Staden published a book in 1557 that became an important cultural document about Brazil. In this book, Hans Staden depicted some animals from Brazil and correlated them to their names in the Tupi language. According to Theodoro

de Sampaio, who published a book about Hans Staden's journey to Brazil (SAMPAIO, 1901), Hans Staden related the word "Pricki" from Tupi "Buriki" to a red primate species. It is worth mentioning that "Buriki" is related to the word "Buriquioca," which was modified to "Bertioga" by friar Gaspar da Madre Deus.

When Hans Staden met the chief of Tupinambás named *Konian bebe*, another interesting fact regarding the words used for muriquis must be highlighted. They met each other in a village named "Ocarasu" (Big Village), currently named Cairucu das Pedras in Paraty, state of Rio de Janeiro (R. Monge, unpubl. data). According to SILVA (1988), Cairucu is another word for muriquis, which means big monkey (cai= monkey, ruçu= big). Someone reading Hans Staden's reports will find no evidence of visual sightings of muriquis. However, in the book of the friar Gaspar da Madre Deus, a great connoisseur on Staden's manuscripts, the word *Brikioka* is translated as the house of muriquis, as mentioned above, pointing out that the place is well known by hunters. Another interpretation suggested by the friar was the comparison made by indigenous people among the light hair of the Europeans and the fur of the muriquis. Teodoro Sampaio, in his review of Hans Staden's work, attested that Bertioga is a word modified from Birati-oca, or rather, from Pirati-oca, which meant the area of mullets (SAMPAIO, 1901). According to NEIVA (1940), Theodoro Sampaio misinterpreted this word when he related Bertioga to Paraty. Neiva himself, in his book "Studies on the national language" mentions that Bertioga is a modified word from Beriguioca, a reference to Biriqui, the popular name of Brazilian blood-fed insects belonged to the genus *Flebotomus*.

In "Tratados da terra e gente do Brasil", the Jesuit priest Fernão Cardim reported knowledge about the Brazilian land and people between 1583 and 1601, also mentioning the word "Buriquioca" as monkey pits ("cova dos bogios") when referring to the same locality of Bertioga (CARDIM, 1925). It is known that Portugal referred to the various species of primates as "bogio" in the XVI century (SEIXAS, 2003).

Joseph Anchieta was another Jesuit priest who greatly contributed to the knowledge on Brazilian natural history when he was in Brazil in 1553. In one of his several books, Anchieta depicted some animals, highlighting the diversity of primates and reporting incredible facts he experienced. While watching a crowd of monkeys, he described an interesting characteristic of the largest individual of the group: "a kind of a group guide bending and holding branches with his tail and feet and others with his hands, which makes him a kind of bridge that gives passage to others in the group (ANCHIETA, 1799). During his visit to Rio de Janeiro, Anchieta comments on the bugios and monos of the São Barnabé forests, according to the manuscript "Vida do Venerável Padre Joseph Anchieta", written by the priest VASCONCELLOS (1672). In another observation of a great mono by Anchieta close to the village of Barnabé in Itaboraí, interpretations diverge among authors. Some authors only mention a great mono (ROSIGNOLI, 1723;

ODDI, 1824), while others refer to a primate from the genus *Alouatta* (the howler monkey, locally known as bugio or guariba) (RODRIGUES, 1897; FRANCO, 1898).

The manuscript "Coisas Notáveis do Brasil" was written in the XVI century, particularly between 1591-1596 by an anonymous Jesuit, and was only published in the XX century by the Brazilian Historical and Geographic Institute Journal in 1923 and by the National Book Institute in 1966. LEITE (1938), when recovering this manuscript from the Coimbra Library, attributed the text to the Jesuit priest Francisco Soares (SOARES, 1966). The manuscript proved to be an important contribution about the administrative and religious history of Brazil, containing issues between settlers and indigenous people and, above all, a wide description of the Brazilian flora and fauna. Particularly, the manuscript mentions animals, mainly from Rio de Janeiro. In the chapter related to fauna, Soares described some primates and compared them to blond boys who don't know how to speak. Besides reporting the long tail and long arms, Soares highlights a characteristic of mutual help between these primates. He also writes they are large and gorgeous and calls them "Beriquis".

In "Vocabulário na Língua Brasileira", wrote by AYROSA (1938) and based on "Manuscrito Português -Tupi do século XVII", acquired by PACHECO (1935), many indigenous words are analyzed as an example: *cagui, caguiuba, cai, caguaçu, biriggui, aquigquig, caguaçu*.

In the novel letters of the priest Joseph de Anchieta, published by MELLO (1876-1877), the word Beriguioca was once more mentioned. The muriqui was already known as "beriqui" since the XVI century (SOARES, 1966), as recorded in "De algumas cousas mais notáveis do Brasil". Many authors (SAMPAIO, 1901; AYROSA, 1938; NEIVA, 1940) gave other meanings to the word, and various interpretations emerged as described in the paragraphs above. Despite many proposals for the word Bertioga, it is known that muriqui groups still survive in an area located in Bertioga, namely *Parque das Neblinas*, next to Serra do Mar State Park (JERUSALINSKY *et al.*, 2011).

When describing the natural history of Jamaica, BROWNE (1756) mentions an unexpected episode about a primate similar to the muriqui, which would have been taken from the American continent. The primate stood out for his brown coat, tetradactyl limbs and prehensile tail, on which he depended for his main actions. Another unexpected episode was found in the volumes of the British Natural History written by EDWARDS (1758), which reveals a primate kept at a house in London, that was thought to be a spider monkey. Despite knowing that it could be the spider monkey (*Ateles* sp.) which was more common at the time, this primate was confirmed by Geoffroy in 1806 to be a muriqui.

Undoubtedly, the first reports on muriquis in Jamaica and England in the XVIII century are due to the traffic of several Brazilian species to Europe (SOUTHEY, 1819; DEAN, 1995), and the other reports are sporadic.

In 1769, Joseph Barboza de Sáa mentions Guariba or Boriqui as the largest ones among primates of Mato Grosso, and which grows like a median-bodied man (PAPAVERO *et al.*, 2009).

In 1783, the naturalist Alexandre Rodrigues Ferreira arrived in Brasil aiming to collect study and depict the fauna, flora, minerals and civilizations in the state of Pará, more specifically the dry lands of Rio Negro, and in the state of Mato Grosso, in Cuiabá. This expedition lasted 10 years and was entitled “Viagem Filosófica”, resulting in a very rich legacy on the Brazilian biodiversity. The collection was sent and deposited in Museu d’Ajuda in Portugal (VANZOLINI, 1996).

In 1806, Etienne Geoffroy Saint Hilaire described the muriqui and named him *Ateles arachnoides*, based only on the reports by EDWARDS (1758).

Later, GEOFFROY SAINT- HILAIRE (1807) related Edwards’ reports in London to Browne’s in Jamaica and explained the relevance of giving a new name to the primate, without any material record of the species or personal analysis.

The arrival of the royal family in Brazil in 1808, fleeing from the Napoleonic armies, brought some habits of the Portuguese court and, among them, the habit of inviting naturalists and artists to depict the richness of natural resources. Among the most important naturalists by that time were Spix and Martius, Wied, Castelnau, Isidore Geoffroy Saint-Hilaire and Deville, Langsdorff, and Natterer, all of whom were interested in the scientific knowledge (VANZOLINI, 1996). It is worth noting that, as usual, most of the collected material was sent to the naturalists’ countries of origin or to major European museums.

The interest in the colonies’ natural resources and the relevance of conserving them in the main museums are explicit by the fact that when the Napoleonic troops invaded Portugal, they were accompanied by “naturalists”. Aside from being a custom at that time, this investment unveils that Napoleon had other interests in addition to his main interest in ancient relics, as revealed in Egypt in 1798 (BURLEIGH, 2008).

Etienne Geoffroy Saint-Hilaire was the naturalist who accompanied the Napoleonic troops that invaded Portugal and was responsible for plundering the rich materials of the Museu d’Ajuda (VANZOLINI, 1996). Among them was a primate carcass, which GEOFFROY SAINT-HILAIRE (1809) described in detail as *Ateles arachnoides*. Until that time, the origin of this primate was limited exclusively to Browne’s report in Jamaica, who attributed the animal to “the great continent”, undoubtedly America. It was only after learning this information from the director of collections of Museu d’Ajuda, M. Vandelli, that Geoffroy Saint-Hilaire could attribute the origin of *Ateles arachnoides* to Brazil. Therefore, the type locality was not described in his original article.

Although Alexandre Ferreira had not collected animals in the regions of occurrence of *Brachyteles*, PAPAVERO *et al.* (2009), when transcribing some sections related to the

animals, he highlighted the report on the muriqui by José Barboza de Sáa, in his writings on the fauna of Mato Grosso.

HILL (1962) also reported that the carcass that GEOFFROY SAINT-HILAIRE (1809) used to describe the muriqui (*Ateles arachnoides*) was the same collected by Alexandre Ferreira Rodrigues. According to some authors, Alexandre Ferreira Rodrigues had only collected in Amazonia and Mato Grosso (CORREA FILHO, 1939; VANZOLINI, 1996). However, the biography of Joseph Barboza de Sáa reports the presence of *Brachyteles* in the state of Mato Grosso, the sampling area of Alexandre Ferreira.

A big issue in the first naturalists’ collections was the specimen’s tags, which had no detailed information on date and site of collection. There is evidence that Alexandre Ferreira cared about tagging details, but the tags have vanished (VANZOLINI, 1996). Therefore, we cannot exclude that the muriqui carcass deposited in the Museu d’Ajuda, described by Geoffroy Saint-Hilaire, was the one collected by Alexandre Ferreira. Geoffroy himself does not report the origin, only indicating it as having come from Brazil. Following this tag issue, VAZ (1998a) was reorganizing the collection of the Rio de Janeiro National Museum in 1998 when he found two boxes tagged as Guariba. However, when examining the primate skulls and skeletons of such boxes, he concluded they belonged to *Brachyteles* and not *Alouatta*. The tag numbers were the same as AGUIRRE (1971) reported in his article on muriquis collected in Mambucaba, Angra dos Reis in 1942. In 2013, a former employee of the Research Section of the former Division of Hunting and Fishing of the Brazilian Ministry of Agriculture, who had worked with Alvaro Aguirre, mentioned it was very common to hunt muriquis in the Mambucaba region (Paula Breves, pers. commun.).

Reports with information on the collection sites can be found only after 1815. The first report belongs to Prince Wied-Neuwied during his journey to Brazil (1815-1817), and is based on the fur offered by an Italian hunter in Campos Novos, municipality of Cabo Frio in the state of Rio de Janeiro, currently known as São Pedro D’Aldeia (WIED-NEUWIED, 1826). Despite the effort to record the primate in the wild, the prince only sighted muriquis later on. In his report, Wied mentioned that the muriqui was known by local people as mono, “miriki” or “muriki” and “Kupó” by indigenous people known as Botocudos. In another report, during a meeting with the indigenous people “Puris” in São Fidélis, Wied mentioned the several ornaments made by muriqui fur. During his journey, which ended in Bahia, Wied hunted many muriqui specimens. According to Olivério Pinto in 1940, Wied wrote that the muriqui occurred with relative frequency in the eastern large forests (WIED-NEUWIED, 1940). According to DEAN (1995), the eastern large forests are related to a complex of forest types, often latifoliate, pluvial and from tropical to subtropical regions. They were found between 8° and 28° south latitude, and extended about

a hundred kilometers from the coast in the north to the inland, and continued over five hundred kilometers to the south.

Another great contribution to the knowledge of Brazilian biodiversity is the collection composed by the naturalist Johann Natterer between 1817 and 1835. Some specimens of muriquis were highlighted among his collections in the current Ipanema National Forest, in the state of São Paulo (NATTERER, 1883).

During his scientific expedition around the world and funded by king Louis XVIII and the Academy of Sciences, the Commander Louis de Freycinet in 1824 reported an observation of muriquis during his visit to Rio de Janeiro, naming Serra dos Órgãos as the “home of muriquis” (FREYGINET, 1824). He mentioned the muriqui call and its ability of moving between trees. In 1934, based on travellers reports on the fauna of Rio de Janeiro, MELLO (1934) highlighted the passage of Freycinet.

BURMEISTER (1853) found a group of muriquis during his journey to Brazil, in the north of Juiz de Fora in the state of Minas Gerais. In Rio de Janeiro, people informed him that a southern muriqui was found dead in Nova Friburgo region, where 48 years later PINTO (1902) collected a female in Serra de Macaé and sent it to the Smithsonian Institution in USA.

GOELDI (1893), in his book “Mamíferos do Brasil”, mentioned that the muriqui occurred in the forests of Corcovado and Tijuca in Rio de Janeiro.

In Serra dos Órgãos region (Teresópolis), SCHIRCH (1932) found muriquis in the highland forests, “in groups and couples”.

In 1944, Vieira attested that the *Brachyteles* described by GEOFFROY SAINT- HILAIRE (1809) was originally from Rio de Janeiro, because the vegetation by that time was comprised of a dense forest, a typical habitat of muriquis. COIMBRA-FILHO & MAGNANINI (1968) reported the continuous reduction of muriquis in the state. AGUIRRE (1971) listed all the specimens in several world museums in “O mono”. This list included animals collected in Rio de Janeiro between 1915 and 1968, in the municipalities of Angra dos Reis, Casemiro de Abreu, Itatiaia, Magé, Parati and Teresópolis. Based on his intensive fieldwork, Aguirre assessed a population of 700 muriquis in Rio de Janeiro, distributed in Angra dos Reis, Cachoeiras de Macacu, Campos, Magé, Nova Friburgo, Resende, Santa Maria Madalena, São Fidelis, Silva Jardim and Teresópolis and prepared a map of the distribution of *Brachyteles* in which we added recent data (Fig. 1).

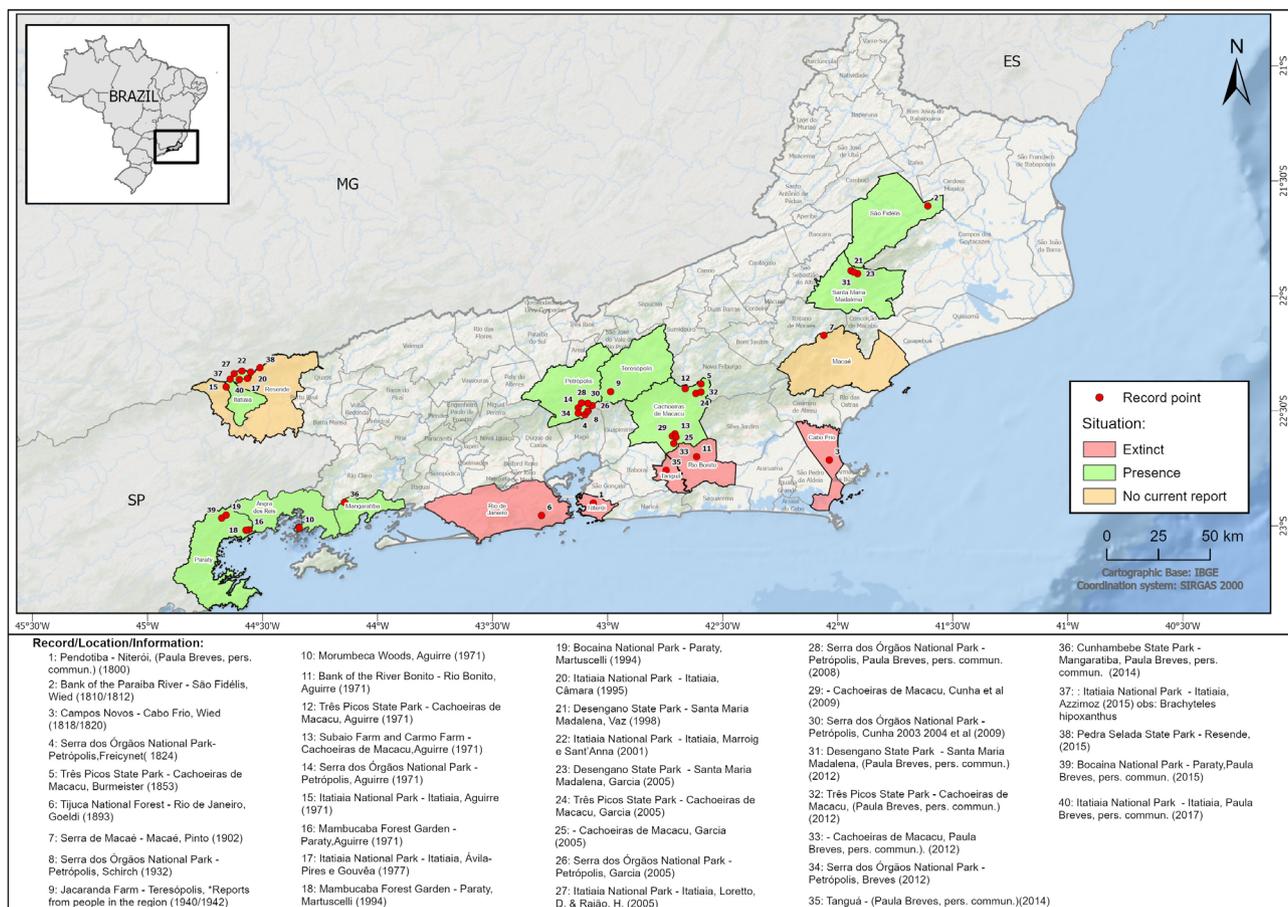


Fig. 1. Map of the distribution of *Brachyteles* sp. in Rio de Janeiro collected from records from the 16th century to the present day and with adaptations from data from Aguirre (1971).

AGUIRRE (1971) mentioned the Rio Bonito region, in the Fluminense coastal plains, as an area of occurrence of murequius.

Three localities in the state of Rio de Janeiro are named Muriqui. One is in the district of the municipality of Mangaratiba, in the coastal region of the metropolitan area of Rio de Janeiro. In one of our expeditions to Cunhambebe state park, in Mangaratiba, we confirmed with former residents that the Muriqui name is due to the primate. The other two localities are in Niterói, in the Pendotiba region and in the municipality of Tanguá, in the Fluminense coastal plains. At both sites, we have confirmed with former residents that the murequi once existed in adjacent forests (Paula Breves, pers. commun.).

In 1982, participants of an international symposium in Houston, Texas, USA, recognized the relevance of *Brachyteles* to the tropical forests (MITTERMEIER *et al.*, 1983). In Rio de Janeiro, the existence of a Primatological Center in the natural habitat of murequi, allowed for an important captivity program that has been the subject of several studies (COIMBRA-FILHO *et al.*, 1993; PISSINATTI *et al.*, 1994, 1997; ZIEGLER *et al.*, 1997; PISSINATTI, 2005).

MARTUSCELLI *et al.* (1994) reported murequi hunting in the Serra da Bocaina National Park and in the environmental protection area of Cairuçu (Paraty).

GARCIA (2005) found 55 murequius in the municipalities of Teresópolis, Guapimirim, Cachoeiras de Macacu, Santa Maria Madalena, São Fidélis, Campos and Paraty between 1999 and 2003. In 2008, we received information about the presence of murequi in Mangaratiba and Paraty. CUNHA *et al.* (2009) observed 51 individuals in Teresópolis, Guapimirim and Cachoeiras de Macacu.

BREVES *et al.* (2010) reported a group of 40-50 murequius in Paqueta region, in Teresópolis. During an expedition to the region of Cairuçu Mountain Peak (Juatinga Ecological Reserve, Paraty) in 2011, we heard from elderly residents about a murequi 'trophy hunt' that would have happened until the early 1990s. Also in 2011, we found murequi's feces in the Paraíso State Ecological Reserve in Guapimirim, near several hunting camps (Paula Breves, pers. commun.).

In 2014, F. Brandão (unpubl. data) photographed and filmed a group of 15 murequius in the Serra da Bocaina National Park. In 2015, we also sighted a group of murequius in this park. Unfortunately, illegal hunting is still intense in this region, which threatens the populations of murequius and other game species.

Nowadays, we may find murequius in only eight legally-protected areas in Rio de Janeiro: Serra dos Órgãos, Bocaina and Itatiaia National Parks; Três Picos, Desengano and Cunhambebe State Parks, Juatinga State Ecological Reserve, and Guapimirim Ecological Reserve, APA Cairuçu. We have also heard of them in the Tinguá Biological Reserve and Pedra Selada State Park (Paula Breves, pers. commun.).

We also highlight the importance of the presence of a population of northern murequius in the Itatiaia National Park (AZIMOFF, 2015). Thus, Rio de Janeiro is the only Brazilian state harbouring both species of *Brachyteles*. This is an extraordinary fact, but little encouraged by public conservation actions.

The mapping of historical records of the southern murequi in Rio de Janeiro State, since the XVIII century, indicates their sparse distribution, mainly concentrated in the mountain regions, as stated by AGUIRRE (1971) among others, who describe their area of occupancy associated to areas near mountains and above 500 m.a.s.l. Nevertheless, WIED-NEUWIED (1826) reports a group of murequi near Campos Novos, municipality of São Pedro D'Aldeia, below 350 m.a.s.l. These discrepancies reinforce the needs and gaps related to the autoecology of the species. Although the long history of human presence in the Lake Region (Região dos Lagos) in Rio de Janeiro, it is possible that this large area of plateau forests (Florestas de Tabuleiro) was occupied by murequius at least seasonally (LAMEGO, 1950; DEAN, 1995; ABREU, 2000).

The reports with data on the sites of sightings of murequius started in the XIX century, leaving an enormous gap of knowledge on murequius since the Portuguese arrival in Brazil.

DISCUSSION

From the important reports of naturalists and adventurers since the 16th century in Brazil, we can learn about the presence and occurrence of species of fauna and flora, some extinct or endangered, with the aim of establishing strategies for conservation and management of natural resources.

Recent studies reinforce the importance of research and monitoring of populations of free-living murequius (STRIER *et al.*, 2017; CHAVES *et al.*, 2019).

A relevant conservation action to protect the murequius was the approval of an important research in the Rio de Janeiro State in 2013, and published in the State Official Report. This research, entitled "Conservation Project Muriqui (*Brachyteles* spp.) in Rio de Janeiro: Diagnosis of Species Status to the Elaboration of the State Action Plan" (P. Breves, unpubl. data), was crucial to determine the conservation status of the species in the Rio de Janeiro, i.e., how many and where are the remaining population of the species? What are the population size and the age and sex proportion in the population? What are the ecological conditions of their habitat and what threats they face?) to elaborate an action plan to their conservation in the Rio de Janeiro. Unfortunately, due to logistic and financial limitations the project was not conducted, since then the project was modified and waits for implementation.

An effective and efficient plan to the protection of the species needs this sort of data to be made. Nonetheless, the local conditions must be taken into account and the plan must stimulate pro-action, preventive and subsidiary actions to cope with the loss of biodiversity and vegetation cover in the areas of occupancy of the species. We must clearly consider that conservation actions must be based on science, but not replaced by it.

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