

Distribution and conservation of the bamboo rat *Kannabateomys amblyonyx* (Rodentia, Echimyidae) in Minas Gerais State, Brazil

Distribuição e conservação do rato-do-bambu *Kannabateomys amblyonyx* (Rodentia, Echimyidae) no Estado de Minas Gerais, Brasil

Fabiano Aguiar da Silva¹
biofaguiar@hotmail.com

Clodoaldo Lopes de Assis²
clodoassis@yahoo.com.br

Ricardo Aguiar da Silva³
raguiar.bio@gmail.com

Vanessa Cardoso Antunes⁴
vanessanx@yahoo.com.br

Gisele Lessa⁵
gislessa@yahoo.com.br

Fernando Marques Quintela⁶
fmquintela@yahoo.com.br

Abstract

This note reports data on occurrence of the echimyid *Kannabateomys amblyonyx* in Minas Gerais State, southeastern Brazil. Data were obtained from consult to 26 museums, bibliography search and field sampling. We found nine municipalities with species records, eight within the Atlantic Forest biome and one in the transitional area between the Atlantic Forest and Cerrado. Habitats occupied comprised bamboo groves in Montane Stational Semideciduous Forest, Submontane Stational Semideciduous Forest and bamboo patches located in middle of open area, originally covered by Submontane Stational Semideciduous Forest. Potential impacts detected were deforestation, fires, hunting and the presence of livestock and domestic dogs.

Key words: bamboo rat, Atlantic Forest, threats, records.

Resumo

Este trabalho apresenta dados sobre a ocorrência do equímido *Kannabateomys amblyonyx* no Estado de Minas Gerais, sudeste do Brasil. Dados foram obtidos a partir de consultas a 26 museus, pesquisa bibliográfica e de amostragens de campo. Encontramos nove municípios com registros da espécie, sendo oito inseridos no bioma Mata Atlântica e um em área de transição entre Mata Atlântica e Cerrado. Os habitats ocupados compreenderam bambuzais em Floresta Estacional Semidecidual Montana, Floresta Estacional Semidecidual Submontana e manchas de bambu localizadas em meio a áreas abertas, originalmente cobertas por Floresta Estacional Semidecidual Submontana. Os potenciais impactos detectados foram desmatamento, queimadas, caça e presença de gado e cães domésticos.

Palavras-chave: rato-do-bambu, Mata Atlântica, ameaças, registros.

¹ Curso de Ciências Biológicas, Faculdades Integradas de Cataguases, Rua Romualdo Menezes, 701, Bairro Menezes, 36773-084, Cataguases, MG, Brasil.

² Associação Regional de Proteção Ambiental (ARPA - Cataguases), Praça Manoel Inácio Peixoto, 96, Centro, 36770-073, Cataguases, MG, Brasil.

³ Agropecuária Santana do Deserto Ltda. Fazenda Santa Clara, estrada Mar de Espanha s/n, Sossego, Santana do Deserto, MG, Brasil.

⁴ AMBIOTECH Consultoria, Rua Desembargador Vieira Cavalcanti, 282 A, Curitiba, PR, Brasil

⁵ Universidade Federal de Viçosa, Departamento de Biologia Animal, Museu de Zoologia João Moojen. Vila Gianetti, casa 32, Campus Universitário, 36571-000, Viçosa, MG, Brasil

⁶ Programa de Pós-Graduação em Biologia Animal, Universidade Federal do Rio Grande do Sul. Av. Bento Gonçalves 9500, Bairro Agronomia, 91501-970, Porto Alegre, RS, Brasil.

Introduction

Kannabateomys amblyonyx is a large echimyid rodent, distributed from southeastern Brazil to southeastern Paraguay and northern Argentina. It inhabits coastal Atlantic Forest, inland rainforests and wet gallery forests, mainly in waterside bamboo groves (Emmons and Feer, 1997). It has nocturnal and arboreal habits, lives in small family groups and defends a territory through vocalization. *Kannabateomys amblyonyx* is a species closely associated with bamboos, feeds mainly on young shoots and nests in the middle of bamboo groves (Kierulff *et al.*, 1991; Silva, 1993, 2005; Stallings *et al.*, 1994; Oliveira and Bonvicino, 2006; Silva and Vieira, 2006; Silva *et al.*, 2008). In Brazil, records of *K. amblyonyx* are restricted to the southeast and southern States (from Espírito Santo to Rio Grande do Sul) of the Atlantic Forest (Oliveira and Bonvicino, 2006; Bonvicino *et al.*, 2008). In relation to Minas Gerais, the previous authors mentioned a “probable occurrence” of the species in the eastern part of this state. The *Livro Vermelho das Espécies da Fauna Ameaçada de Extinção de Minas Gerais* (Red Book of Threatened Fauna of Minas Gerais), where *K. amblyonyx* is listed as vulnerable (Rylands, 1998), points out three localities with species occurrence in the state, based on unpublished technical reports. In all, consistent information is lacking on the localities and habitats of occurrence of this species, which distribution in Minas Gerais State is poorly known. Aiming to contribute to the knowledge on the distribution and conservation of *K. amblyonyx*, we present new occurrence sites and summarize the available data on the species distribution, potential threats and habitat occupancy in Minas Gerais.

Material and methods

Data on localities were obtained from field notes and labels from specimens

conserved in museums, bibliography information, field sampling, observations and photographic records. Mammalian collections of the following institutions were consulted: Universidade Federal de Minas Gerais, Belo Horizonte (CDMZ-UFMG), Fundação Zoobotânica de Belo Horizonte, Belo Horizonte (FZB-BH), Museu de Ciências Naturais - Pontifícia Universidade Católica de Minas Gerais, Belo Horizonte (MCN-PUCMG), Museu de Zoologia João Moojen-Universidade Federal de Viçosa, Viçosa (UFV), Universidade Federal de Lavras, Lavras (UFLA), Universidade Federal de Ouro Preto, Ouro Preto (UFOP), Museu de Biologia Professor Mello Leitão, Vitória (MBML), Universidade Federal do Espírito Santo, Vitória (UFES), Museu de Zoologia-Universidade Federal da Bahia, Salvador (UFBA), Universidade Federal da Paraíba, João Pessoa (UFPB), Universidade Estadual de Santa Cruz, Santa Cruz (UESC), Museu de Zoologia da Universidade Estadual de Campinas (Unicamp) (ZUEC-MAM), Universidade Federal de São Carlos, São Carlos (UFSCar), Universidade Estadual Paulista, Rio Claro (UNESP), Universidade de São Paulo, São Paulo (USP), Museu Nacional, Rio de Janeiro (MN), Universidade do Estado de Mato Grosso, Nova Xavantina (UNEMAT), Universidade Federal de Goiás, Goiânia (UFG), Universidade de Brasília, Brasília (UNB), Universidade Federal de Santa Catarina, Florianópolis (UFSC), Universidade Federal do Paraná, Curitiba (UFPR), Museu de História Natural Capão do Imbuia, Curitiba (MCI), Fundação Zoobotânica do Rio Grande do Sul, Porto Alegre (FZB-RS), Museu de Ciências Naturais-Universidade Luterana do Brasil, Porto Alegre (MCNU-ULBRA), Pontifícia Universidade Católica do Rio Grande do Sul (PUCRS), Universidade de Blumenau, Blumenau (FURB) and Museu Paraense Emílio Goeldi (MPEG), Belém. Whenever possible, data on geographic coordinates, altitude, habitat features

and potential risks to populations of the occurrence sites were collected.

Results

We identified nine municipalities with *K. amblyonyx* records in Minas Gerais State, eight of them in Atlantic Forest domains and one in a transitional area between Atlantic Forest and Cerrado biomes, according to IBGE (2009) (Figure 1). Types of records and available data on geographic coordinates, altitude and habitat on each locality are shown in Table 1.

On 7 April 2009 at around 4 p.m., an individual was photographed by RAS (Figure 2) in a locality known as *Fazenda Santa Clara* (21°53'17"S, 43°10'32"W; 473m a.s.l.), municipality of Santana do Deserto, Atlantic Forest (IBGE, 2009). The individual was photographed on the ground, crossing a short paving stone (ca. 20m long) between two bamboo groves located in the middle of grassland. In this same area, individuals were often sighted with nocturnal activity. This locality was originally covered by Submontane Semidecidual Stational Forest (Veloso *et al.*, 1991), which was partially cleared over the past century for coffee cultivation and livestock. The current physiognomy is characterized by remaining fragments in a field matrix, where bamboo groves are found in the middle of open formations and in the inner and border of forest fragments.

On 23 March 2007 an individual was photographed by CLA (Figure 2) in a locality known as *Sapocado* (21°14'12"S, 42°44'00"W; 771m a.s.l.), municipality of Cataguases, Atlantic Forest (IBGE, 2009). The individual was found around 10 p.m. in a bamboo grove in the inner of a Montane Semidecidual Stational Forest fragment (Veloso *et al.*, 1991). This area was impacted by wood removal for timber and coal production and prescribed fires for agriculture and livestock expansion, which ended about 45 years ago. The current principal impacts include the

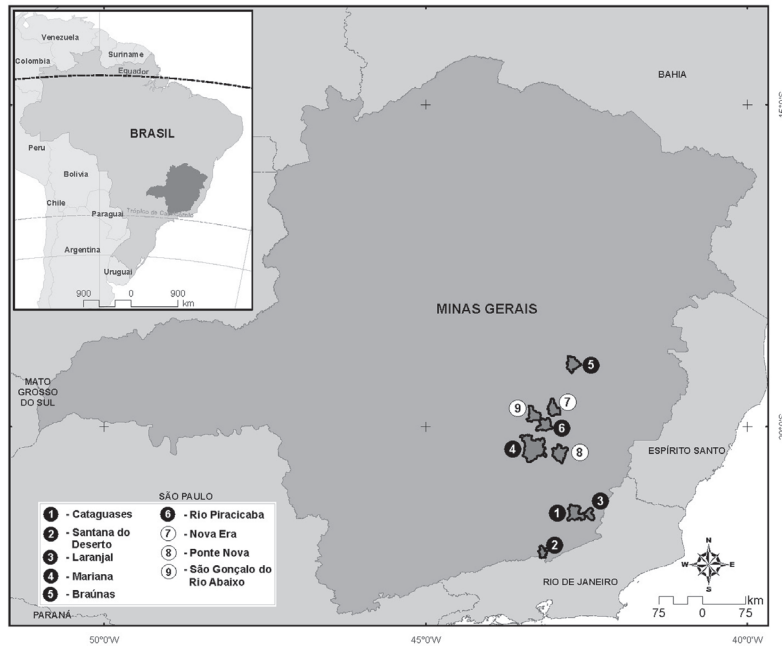


Figure 1. Municipalities with records of *Kannabateomys amblyonyx* in Minas Gerais State. Full circles indicate the municipalities with records confirmed by collected specimen or photography of living animal while empty circles indicate the localities cited by Rylands (1998).

presence of livestock and domestic dogs in the inner and outer border of fragments and predatory hunting.

On 13 January 2010 an individual was donated to FAS in a locality known as Sinimbu (21°20'20"S, 42°45'45"W; 301m a.s.l.), municipality of Cataguases, Atlantic Forest (IBGE, 2009). According to the donors, the individual was active in a bamboo grove on the border of a forest fragment around 21h that same night. The specimen, a juvenile male, is deposited in the mammalian collection of Museu de Zoologia João Moojen of Universidade Federal de Viçosa, Viçosa municipality, Minas Gerais (MZUFV-CM 3328) (Figure 3). The area is characterized as a Submontane Stational Semidecidual Forest fragment (Veloso *et al.*, 1991), which had been deforested over the past 70 years for hardwood exploitation and charcoal production.

Table 1. Summary of records of *Kannabateomys amblyonyx* in Minas Gerais, southeastern Brazil (?=data not available).

Type of record	Locality; municipality	Latitude; longitude	Altitude	Biome	Habitat
collected specimen MCN-M 1726	?; Rio Piracicaba	19°55'47"S; 43°13'36"W	868	Atlantic Forest	Montane Semidecidual Stational Forest
collected specimen CMDZ-UFGM 2290	Usina Hidrelétrica de Fumaça; Mariana	?	?	Atlantic Forest	?
collected specimen CMDZ-UFGM 2484	Usina Hidrelétrica de Braúnas; Braúnas	?	?	Atlantic Forest	?
collected specimen CMDZ-UFGM 2485	Usina Hidrelétrica de Braúnas; Braúnas	?	?	Atlantic Forest	?
collected specimen MZUFV-CM 3328	Sinimbu; Cataguases	21°20'20"S; 42°45'45"W	301	Atlantic Forest	Submontane Semidecidual Stational Forest
photography	Sapecado; Cataguases	21°14'12"S; 42°44'00"W	771	Atlantic Forest	Montane Semidecidual Stational Forest
collected specimen MN 42846	?; Santana do Deserto	?	?	Atlantic Forest	?
photography	Fazenda Santa Clara; Santana do Deserto	21°53'17"S; 43°10'32"W	473	Atlantic Forest	bamboo patch in open area, originally Submontane Semidecidual Stational Forest
photography	Usina Hidrelétrica Barra do Braúna; Laranjal	21°23'39"S ; 42°31'01"W	167	Atlantic Forest	bamboo patch in open area
data compilation (Rylands 1998)	Reserva Peti; São Gonçalo do Rio Abaixo	?	?	Atlantic Forest/ Cerrado transition	?
data compilation (Rylands 1998)	RPPN Guilman-Amorin; Nova Era	?	?	Atlantic Forest	?
data compilation (Rylands 1998)	Usina Hidrelétrica de Baú; Ponte Nova	?	?	Atlantic Forest	?



Figure 2. Individuals of *Kannabateomys amblyonyx* photographed in Minas Gerais state: (A) locality of *Fazenda Santa Clara*, Santana do Deserto municipality, R.A. Silva, (B) locality of *Sinimbu*, Cataguases municipality, F.A. Silva, (C) locality of *Sapocado*, Cataguases municipality, C.L. Assis.

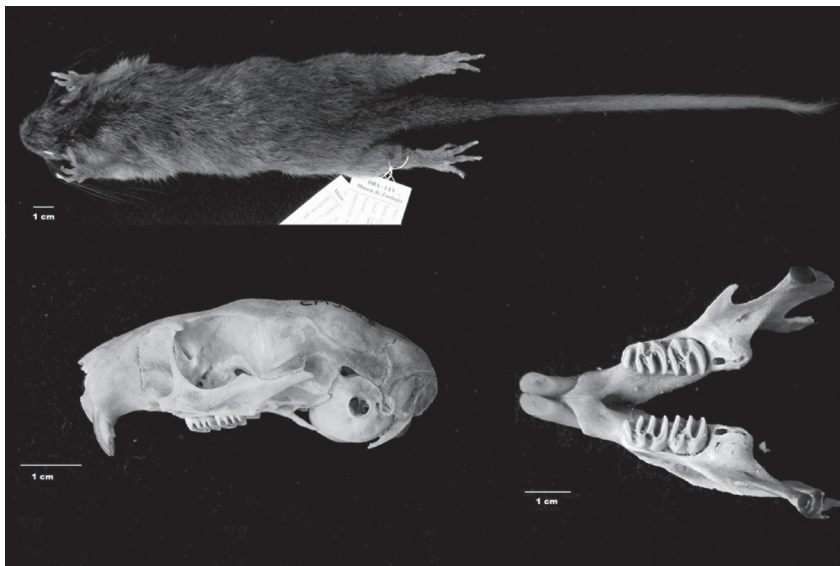


Figure 3. *Kannabateomys amblyonyx* specimen (MZUFV-CM 3328) collected in the locality of *Sinimbu*, Cataguases municipality, Minas Gerais State, southeastern Brazil.

On 19 November 2010 an individual was photographed by FAS in an area which belongs to Barra do Braúna Power Plant (21°23'39"S, 42°31'01"W; 167m a.s.l.), municipality of Laranjal, Atlantic Forest (IBGE, 2009). The individual was found at 3:55 p.m. in a bamboo grove

in an open area, near to Submontane Semidecidual Stational Forest fragment (Veloso *et al.*, 1991). Potential impacts observed in the area included cattle grazing and trampling and the exploitation of bamboo groves by a stick factory.

Museum consults allowed the lo-

calization of five specimens, being CMDZ-UFGM 2290 from Usina Hidrelétrica de Fumaça (Fumaça Power Plant), municipality of Mariana, Atlantic Forest (IBGE, 2010), CDMZ-UFGM 2484 and CDMZ-UFGM 2485 from Usina Hidrelétrica de Braúnas (Braúnas Power Plant), Braúnas municipality, Atlantic Forest (IBGE, 2009), MN 42846 from Santana do Deserto municipality, Atlantic Forest (IBGE, 2009) and MCN-M 1726 from Rio Piracicaba municipality, Atlantic Forest (IBGE, 2009).

In the consulted bibliography, the only reference for the species occurrence in Minas Gerais State was found in *Livro Vermelho das Espécies da Fauna Ameaçada de Extinção de Minas Gerais* (Red Book of Threatened Fauna of Minas Gerais) (Rylands, 1998), where they make mention of three localities: Private Reserve of Natural Patrimony (RPPN) Guilman-Amorim, municipality of Nova Era, Atlantic Forest (IBGE, 2009); Usina Hidrelétrica de Baú, municipality of Ponte Nova, Atlantic Forest (IBGE, 2009); Reserva Peti, municipality of São Gonçalo do Rio Abaixo, transitional area between Atlantic Forest and Cerrado (IBGE, 2009). The two first references are based on unpublished technical reports while the third corresponds to author's personal observations. No specimen from these localities was found in the consulted collections.

Discussion

Kannabateomys amblyonyx specimens from Minas Gerais had a little representation in the consulted collections, which may be a consequence of at least two main factors. First, this may represent a sub-sampled species, with few captures and efforts applied in bamboo patches (the main habitat occupied by *K. amblyonyx*) as compared to other sampled vegetal formations during mammalian surveys. Added to this, once the species feeds exclusively on bamboo stems, twigs

and leaves (Silva, 2005), it is not captured in baited traps commonly used in small mammal sampling such as *sherman* and *tomahawk* live traps (Kierulff *et al.*, 1991). Appropriated methods for the species record such as double entry traps installed on artificial bamboo bridges (Kierulff *et al.*, 1991), active search and listening efforts (Olmos *et al.*, 1993) are generally not applied in mammalian inventories. Second, this may represent a less abundant species, with isolated populations or meta-populations restricted to the forest fragments which host bamboo areas with the capacity to provide spatial and feeding resources needed for maintaining such populations. In this context, Rylands (1998) points to a possible genetic constraint due to insularization of populations, which can be even more aggravated due to the species low reproductive fitness (Silva 1993; Oliveira and Bonvicino, 2006).

Available data from field sampling and stored specimens show the occurrence of *K. amblyonyx*, em Minas Gerais, in two forest types (Montane Stational Semidecidual, Submontane Stational Semidecidual) (Veloso *et al.*, 1991) and bamboo patches located in middle of open areas, originally covered by Submontane Stational Semidecidual Forest. The most inland occurrence site determined in the present study, Reserva Peti, is inserted in a transitional area between Atlantic Forest and Cerrado biomes, with the forest formations in the area composed by gallery forest and secondary forest (originally Seasonal Tropical Forest, inland Atlantic Forest) (Paglia *et al.*, 2005). Gallery forests represent forest formations in the middle of Cerrado savanna (Ribeiro and Walter, 1998), and it is possible that inward from these transitional areas, the species may occur in gallery forest stretches of Cerrado biome. According to Emmons and Feer (1997), *K. amblyonyx* occurs in wet gallery forests and bamboo patches between fields. The possible occur-

rence of *K. amblyonyx* in Cerrado physiognomies, however, needs to be elucidated.

It is worth noting that most of the localities with known records comprise unprotected private areas. In some of these localities (Santana do Deserto, Laranjal and Cataguases municipalities) potential impacts such as deforestation, fires, hunting and the presence of livestock and domestic dogs were detected. In order to preserve the *K. amblyonyx* populations and key habitat features, the establishment of private reserves in these areas is strongly recommended. In this context, it is also worth mentioning that a mammalian survey performed in the protected area of *Reserva Peti* (Paglia *et al.*, 2005) did not detected the species, which was previously reported for this locality by Rylands (1998).

We have presented a first approach on the distribution of the bamboo rat *Kannabateomys amblyonyx* in Minas Gerais State. However, more sampling and observation effort is needed for a better understanding on biogeography and ecology of the species in the region, mainly in the limits of Atlantic Forest and adjacent Cerrado areas.

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