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RESEARCH ARTICLE

Updated list of bats (Mammalia: Chiroptera) from the state of Minas Gerais, southeastern Brazil, including new records

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ABSTRACT. The knowledge of the bat fauna from Minas Gerais, the largest state in southeastern Brazil, has greatly changed in recent years due to increased sampling and taxonomic revisions with reports of range extension and/or new species descriptions. The first annotated list of bats for the state dates to over 10 years ago. Our study aimed to update it by incorporating new localities sampled since then and by adding new species records to the list. We also conducted a comprehensive review of the literature and museum databases and analyzed 691 specimens collected in the state from all mesoregions and ecosystems deposited in collections. We documented the occurrence of 99 bat species from nine families, distributed in 181 municipalities, covering all mesoregions and biomes of the state. This is an increment of 30% in bat richness and of 241% in locality sites with bat records in Minas Gerais, when compared with the previous compilation. We report two previously unrecorded species for the state, the phylostomids *Rhinophylla pumilio* Peters, 1865 and *Trinycteris nicefori* (Sanborn, 1949). The mesoregions with the largest number of bat collection localities were "Metropolitana" (46), "Zona da Mata" (26), and "Norte de Minas" (21). The Atlantic Forest had the largest number of collection sites compared to the other biomes present in the state (102). There are a lot of sampling gaps in the state, and most of the conservation areas have not yet been sampled for bats. In face of that and based on the recent findings of several new species and records as a result of sampling and revisionary efforts, we suggest the implementation of rapid survey programs accompanied by taxonomic studies within the conservation units of Minas Gerais. Long-term monitoring programs, including bats, are also completely missing in the state.

KEY WORDS. Atlantic Forest, Cerrado, checklist, distribution, review, Southeastern Brazil.

INTRODUCTION

Chiroptera is the second order of mammals in the number of species (Wilson and Mittermeier 2019), particularly speciose in the three megadiverse South American countries of Colombia (217 species; Ramírez-Chaves et al. 2021), Peru (191 species; Velazco 2021), and Brazil (181 species; Garbino et al. 2022). Despite the high diversity of bats already known to occur in Brazil, this is still underestimated, with numerous sampling gaps and under-sampled areas (Tavares et al.

1999, Bernard et al. 2011, Delgado-Jaramillo et al. 2020). The taxonomy of several taxa occurring in Brazil remains unresolved, as demonstrated by recent taxonomic revisions that revalidated, synonymized, or described new taxa distributed in the country (Velazco et al. 2014, Feijó et al. 2015, Moratelli and Dias 2015, Moras et al. 2016, Gregorin et al. 2016, Loureiro et al. 2018, 2020b, Garbino et al. 2020). Updating the national and state checklists of Brazil's fauna and flora has become a critical activity, given that these lists play a pivotal role in conducting regular assessments of the regional and local conservation status of these taxa, employing IUCN criteria as a basis (COPAM 2010, MMA 2022, IUCN 2022).

With an area of 586,513 km^2, Minas Gerais is the fourth largest state in Brazil and the largest in southeastern Brazil (IBGE 2022). Due to its latitudinal and altitudinal amplitude, Minas Gerais has great climatic and relief variations distributed in gradients. Most of Minas Gerais is covered by the Cerrado and Atlantic Forest biomes, with a small area comprising the semi-arid Caatinga biome in the north (IEF 2020). Within the Atlantic Forest and Cerrado, in addition to the expected phytophysiognomies such as grasslands, cerrado sensu stricto, evergreen, semi-deciduous, and deciduous forests, there are several associated ecosystems such as Campos Rupestres (rocky open highlands), moist formations in grassland known as "Veredas", and karstic areas. Karstic areas and caves compose an essential part of the life cycle of several bat species (Torquetti et al. 2017). Frequently, the Cerrado, Caatinga, and Atlantic Forest are organized in spatial mosaics, creating a wide variety of micro-habitats that support distinct bat species within Minas Gerais (Tavares et al. 2010, Genelhú et al. 2022).

The earliest records of bats in Minas Gerais date from the first half of the 19th century, coinciding with the arrival of European naturalists and collectors (Vanzolini 2004). From 1836 to 1846, the Danish naturalist Peter Wilhelm Lund lived in the region of Lagoa Santa, in the center of eastern Minas Gerais, where he collected both fossil and recent mammal material. Lund documented approximately 150 species of recent mammals (Cartelle 2002). Throughout Lund's stay, other European naturalists came to visit him and collect material. Based on material collected in Lagoa Santa, the German naturalist Carl Hermann Conrad Burmeister described the bat *Dysopes temminckii* [= *Molossops temminckii* (Burmeister, 1854)]. Some species described by Lund are currently *nomina nuda*, such as *Phyllostoma dorsale* (= *Chiroderma doriae* Thomas, 1891) (Garbino et al. 2020). Noteworthy are also the travels of Prince Maximilian von Wied in southeastern and northeastern Brazil, including Minas Gerais. During his exploration, he documented various bat species from the adjacent states of Bahia, Espírito Santo, and Rio de Janeiro (Hershkovitz 1987). In the 20th century, Carlos O. da Cunha Vieira, in his monographic study of Brazilian bats, reported several new records from Minas Gerais during that time (Vieira 1942).

Pioneering scientific publications on the ecology of bats in Minas Gerais include early studies on pollination ecology conducted in the Serra do Cipó National Park, municipality of Jaboticatubas, center-eastern Minas Gerais (e.g., Sazima and Sazima 1975, Sazima et al. 1978). Studies of bats from the Serra do Cipó in the late 1970s led to the description of the globally threatened *Lonchophylla bokermanni* Sazima, Vizotto & Taddei, 1978 (Sazima et al. 1978, IUCN 2022). Glass and Encarnação (1982) made the first bat inventory in the western region of Minas Gerais, and since then a slow but steady increase in studies about the occurrence and distribution of bats in Minas Gerais can be observed (e.g., Stallings et al. 1990, Aguiar et al. 1995, Pedro and Taddei 1997, Tavares and Anciães 1998, Tavares et al. 1999, 2007, Stutz et al. 2004, Nobre et al. 2009, Moras et al. 2013, Novaes et al. 2014, Falcão et al. 2014, Loureiro and Gregorin 2015, Gregorin et al. 2017, Xavier et al. 2018 Dias-Silva et al. 2019, Laurindo et al. 2020, Genelhú et al. 2021, Genelhú et al. 2022).

The first comprehensive checklist of bats from the state documented by vouchered material was produced over a decade ago with a list of 77 species (Tavares et al. 2010). Since then, new localities have been sampled, yielding many new records, and there have been published descriptions of previously unrecognized taxa and taxonomic novelties resulted from revisionary work, suggesting that an updated list of bats from Minas Gerais state is warranted. We herein provide a revised list of bats of Minas Gerais with an update on the distribution of sampling localities by biomes and mesoregions of the state.

MATERIAL AND METHODS

Dataset

We collected data from literature, museum specimens, and museum databases. We included original data from inventories independently conducted by us in the Minas Gerais state between 2011 and 2023.

Specimens analyzed

We analyzed 691 specimens (Appendix 1) housed in the folowing collections: Natural History Museum, London,

UK (BMNH); Coleção de Mamíferos do Centro de Coleções Taxonômicas da Universidade Federal de Minas Gerais, Belo Horizonte, Minas Gerais, Brazil (CCT-UFMG); Coleção de Mamíferos da Universidade Federal de Lavras, Lavras, Brazil (CMUFLA); Coleção de Mamíferos do Museu de Zoologia João Moojen, Viçosa, Brazil (MZUFV); Universidade Estadual Paulista, São José do Rio Preto, Brazil (DZSJRP—This collection is currently located in the Museu de Zoologia da Universidade de São Paulo - MZUSP); Royal Ontario Museum, Toronto, Canada (ROM); and National Museum of Natural History, Washington, DC, USA (USNM). We also obtained records from the online database of the Museu de Ciências Naturais, Pontifícia Universidade Católica de Minas Gerais, Belo Horizonte, Brazil (MCN PUC-MG). The identification of the bats was based on the keys available in Gardner (2008) and on additional taxonomic literature (i.e., Wilson and Mittermeier 2019).

Literature review

We conducted searches for articles and books addressing the bat fauna from the state of Minas Gerais on Google Scholar (https://scholar.google.com.br/?hl=pt), and Scielo (https://scielo.org/), using the following keywords: "morcegos", "bats", "Minas Gerais", "new record", "novo registro", "quiróptero", and "Chiroptera", alone and in combinations.

Our starting point was the bat species list from Minas Gerais published by Tavares et al. (2010). We used the species names from that list and "Minas Gerais" as keywords to obtain new localities for the bat species recorded in the state. Subsequently, we conducted searches to obtain information on newly added species for the state using the keywords: "new record", "novo registro", "Minas Gerais", "bat" and "morcegos". From the new records obtained, we searched for new localities of them using the species name and "Minas Gerais". The taxonomy and nomenclature followed Wilson and Mittermeier (2019) and Garbino et al. (2022), except for the Neotropical species of *Eptesicus*, currently allocated to the newly described genus *Neoeptesicus* (Cláudio et al. 2023).

We reanalyzed part of the museum material for the new occurrences after Tavares et al. (2010) that we were able to locate, and only records associated with a voucher were included in the list. The single exception was the inclusion of *Pteronotus* sp. based on a photographic record (Bruno and Falcão 2022). We have decided to consider this record at the generic level because there are two large species of *Pteronotus* in Brazil, and without a voucher, it is not possible to verify the cranial characters useful to distinguish both species.

Distribution of records

We used the software QGis Firenze 3.28.3 to create maps featuring all sampled localities across the state and heatmaps to visually represent bat richness. We grouped the localities around the nearest municipality to standardize the data distribution, and herein the localities mean municipalities. For the heatmap, we used the kernel density tool, which provides estimates of the intensity of bat occurrences by area value. Kernel density estimates have been used to access vertebrate distribution to identify, for example, diversity hotspots (Hassan et al. 2021). For the kernel density, we considered the richness per mesoregion inserting points equivalent to the richness in the centroid of each mesoregion. Then, we plotted the municipality records on the heatmap for better understanding of the results.

To build the protected areas map we used the database from IDE – Sisema available at https://idesisema.meioambiente.mg.gov.br/webgis.

RESULTS

We compiled evidence for the records of a total of 99 species belonging to 52 genera and nine families of bats in Minas Gerais (Table 1, Appendix 1). Compared to previous compilations (Tavares et al. 2010), we removed one species, *Molossus currentium* (Temminck, 1838), and added a total of 23 newly recorded species to the list of Minas Gerais, including the first records of *Rhinophylla pumilio* Peters, 1865 and *Trinycteris nicefori* (Sanborn, 1949) for the state and two recently described species, *Eumops chimaera* Gregorin et al., 2016 and *Thyroptera wynneae* Velazco, Gregorin, Voss & Simmons, 2014. In addition, four species had their scientific names changed due to new taxonomic arrangements. The taxon previously known as *Lasiurus cinereus* (Gervais, 1856) occurring in Minas Gerais may now be recognized as *Lasiurus villosissimus* (É Geoffroy, 1806); *Molossus rufus* E. Geoffroy, 1805 should be recognized as *Molossus fluminensis* Lataste, 1891; and *Tonatia saurophila* Koopman & Williams, 1951 as *Tonatia maresi* Williams, Willig & Reid, 1995. We also reidentified *Saccopteryx bilineata* (Temminck, 1838) as *Saccopteryx leptura* (Schreber, 1774).

Rhinophylla pumilio (UFMG7514) was recorded in Mata do Passarinho, Macarani (Appendix 1). This species may be identified based on the dorsal and ventral hairs bicolored, uropatagium narrow and naked, tail absent, first upper incisor notched and much larger than the second upper incisor, forearm 34.12 mm, greatest length of the skull 18.55 mm, and condyloincisive length 17.33 mm. The specimen of

Table 1. Families, subfamilies, and species of bats from the state of Minas Gerais. Source corresponds to the earliest record of the species in the State. Taxonomic nomenclature follows Wilson and Mittermeier (2019), except for the newly described *Neoeptesicus* (Cláudio et al. 2023). Order Chiroptera: nine families, 52 genera, 99 species.

Family and Subfamily	Species	Source
Emballonuridae		
Emballonurinae		
	Peropteryx kappleri Peters, 1867	Trajano and Gimenez (1998)
	Peropteryx macrotis (Wagner, 1843)	Trajano and Gimenez (1998)
	Rhynchonycteris naso (Wied, 1820)	Nogueira and Pol (1998)
	Saccopteryx leptura (Schreber, 1774)[2]	Garbino (2011)
Phyllostomidae		
Micronycterinae		
	Micronycteris megalotis (Gray, 1842)	Tavares et al. (2010)
	Micronycteris microtis Miller, 1898[1*]	Moras et al. (2015)
	Micronycteris minuta (Gervais, 1856)	Glass and Encarnação (1982)
	Micronycteris sanborni Simmons, 1996[1*]	Nogueira et al. (2015)
	Micronycteris schmidtorum Sanborn, 1935	Tavares and Taddei (2003)
Desmodontinae		
	Desmodus rotundus (É. Geoffroy, 1810)	Lima (1926)
	Diaemus youngii (Jentink, 1893)	Uieda and Araújo (1987)
	Diphylla ecaudata (Spix, 1823)	Uieda (1992)
Lonchorhininae		
	Lonchorhina aurita Tomes, 1863	Tavares et al. 2010
Phyllostominae		
	Chrotopterus auritus (Peters, 1856)	Stallings et al. (1990)
	Gardnerycteris crenulata (É. Geoffroy, 1803)	Mares et al. (1989)
	Lophostoma brasiliense Peters 1867	Tavares et al. (2010)
	Lophostoma carrikeri (Allen, 1910)[1*]	Oliveira et al. (2021)
	Macrophyllum macrophyllum (Schinz, 1821)	Linares (1966)
	Mimon bennettii (Gray, 1838)	Almeida et al. (2002)
	Phylloderma stenops Peters, 1865	Trajano and Gimenez (1998)
	Phyllostomus discolor Wagner, 1843	Pedro and Taddei (1998)
	Phyllostomus hastatus (Pallas, 1767)	Stallings et al. (1990)
	Tonatia bidens (Spix, 1823)	Trajano and Gimenez (1998)
	Tonatia maresi Williams, Willig & Reid, 1995[1*]	Nogueira et al. (2015)
	Trachops cirrhosus (Spix, 1823)	Tavares (1999)
Glossophaginae		
	Anoura caudifer (É. Geoffroy, 1818)	Dobson (1878)
	Anoura geoffroyi Gray, 1838	Sazima & Sazima (1975)
	Choeroniscus minor (Peters, 1868)	Aguiar et al. (1995)
	Dryadonycteris capixaba Nogueira, Lima, Peracchi & Simmons, 2012[1*]	Gregorin et al. (2017)
	Glossophaga soricina (Pallas, 1766)	Taddei (1975)
Lonchophyllinae		
	Lionycteris spurrelli Thomas, 1913	Trajano and Gimenez (1998)
	Lonchophylla bokermanni Sazima, Vizotto & Taddei, 1978	Sazima et al. (1978)
	Lonchophylla dekeyseri Taddei, Vizotto & Sazima, 1983	Taddei et al. (1983)
	Lonchophylla mordax Thomas, 1903[1*]	Nascimento et al. (2016)
	Xeronycteris vieirai Gregorin & Ditchfield, 2005[1*]	Nogueira et al. (2014)
Carolliinae		
	Carollia brevicauda (Schinz, 1821)	Tavares et al. (2010)
	Carollia perspicillata (Linnaeus, 1758)	Dobson (1878)
Glyphonycterinae		
	Glyphonycteris behnii (Peters, 1865)[1*]	Peracchi and Albuquerque (1985)
	Glyphonycteris sylvestris Thomas, 1896	Tavares et al. (2010)
	Trinycteris nicefori (Sanborn, 1949)[1*]	This study
Rhinophyllinae		
	Rhinophylla pumilio Peters, 1865[1*]	This study
Stenodermatinae		
	Artibeus cinereus (Gervais, 1856)[1*]	Bolzan (2011)
	Artibeus fimbriatus Gray, 1838	Stallings et al. (1990)
	Artibeus gnomus Handley 1987[1*]	Redondo et al. (2008)
	Artibeus lituratus (Olfers, 1818)	Andersen (1908)
	Artibeus obscurus (Schinz, 1821)	Taddei et al. (1998)
	Artibeus planirostris (Spix, 1823)	Sazima and Sazima (1975)

Continues

Family and Subfamily	Species	Source
	Chiroderma doriae Thomas, 1891	Thomas (1891)
	Chiroderma villosum Peters, 1860	Tavares (1999)
	Platyrrhinus incarum (Thomas, 1912)	Pedro and Taddei (1998)
	Platyrrhinus lineatus (É. Geoffroy, 1810)	Pelzeln (1883)
	Platyrrhinus recifinus (Thomas, 1901)	Aguiar and Marinho-Filho (2004)
	Pygoderma bilabiatum (Wagner, 1843)	Isaac-Júnior and Sábato (1994)
	Sturnira lilium (É. Geoffroy, 1810)	Dobson (1878)
	Uroderma bilobatum Peters, 1866	Tavares et al. (2010)
	Uroderma magnirostrum Davis, 1968	Nogueira et al. (2003)
	Vampyressa pusilla (Wagner, 1843)	Grelle et al. (1997)
Mormoopidae		
	Pteronotus sp.	Bruno and Falcão (2022)
Noctilionidae		
	Noctilio albiventris Desmarest, 1818	Pedro and Taddei (1998)
	Noctilio leporinus (Linnaeus, 1758)	Stallings et al. (1990)
Furipteridae		
	Furipterus horrens (Cuvier, 1828)	Tavares et al. (2010)
Thyropteridae		
	Thyroptera wynneae Velazco, Gregorin, Voss & Simmons, 2014*	Velazco et al. (2014)
Natalidae		
	Natalus macrourus (Gervais, 1856)	Trajano and Gimenez (1998)
Molossidae		
Molossinae		
	Cynomops abrasus (Temminck, 1826)	Pedro and Taddei (1997)
	Cynomops planirostris (Peters, 1866)	Pedro and Taddei (1997)
	Eumops auripendulus (Shaw, 1800)	Eger (1974)
	Eumops bonariensis (Peters, 1874)	Stutz et al. (2004)
	Eumops chimaera Gregorin et al., 2016*	Gregorin et al. (2016)
	Eumops glaucinus (Wagner, 1843)	Pedro and Taddei (1998)
	Eumops perotis (Schinz, 1821)	Falcão et al. (2003)
	Molossops neglectus Williams & Genoways, 1980[1*]	Gregorin and Loureiro (2011)
	Molossops temminckii (Burmeister, 1854)	Pedro and Taddei (1997)
	Molossus aztecus Saussure, 1860[1*]	Gregorin et al. (2011)
	Molossus coibensis Allen, 1904[1*]	Loureiro et al. (2018)
	Molossus fluminensis Lataste, 1891[3]	Vieira (1942)
	Molossus molossus (Pallas, 1766)	Grelle et al. (1997)
	Molossus pretiosus Miller, 1902[1*]	Nogueira et al. (2008)
	Nyctinomops aurispinosus (Peale, 1848)	Tavares et al. (2010)
	Nyctinomops laticaudatus (É. Geoffroy, 1805)	Pedro and Taddei (1998)
	Nyctinomops macrotis (Gray, 1840)	Lima (1926)
	Promops nasutus (Spix, 1823)	Stutz et al. (2004)
	Tadarida brasiliensis (I. Geoffroy, 1824)	Falcão et al. (2003)
Vespertilionidae		
Vespertilioninae		
	Neoeptesicus brasiliensis (Desmarest, 1819)	Lima (1926)
	Neoeptesicus chiriquinus (Thomas, 1920)[1*]	Gregorion and Loureiro (2011)
	Neoeptesicus diminutus (Osgood, 1915)	Pedro and Taddei (1997)
	Neoeptesicus furinalis (d'Orbigny & Gervais, 1847)	Pedro and Taddei (1997)
	Histiotus montanus (Philippi &Landbeck, 1861)[1*]	Carvalho et al. (2013)
	Histiotus velatus (I. Geoffroy, 1824)	Vieira (1942)
	Lasiurus blossevillii ([Lesson, 1826])	Lima (1926)
	Lasiurus ega (Gervais, 1856)	Glass and Encarnação (1982)
	Lasiurus villosissimus (É Geoffroy, 1806)[3]	Pedro and Taddei (1998)
	Rhogeessa hussoni Genoways & Baker, 1996	Tavares et al. (2010)
Myotinae		
	Myotis albescens (É. Geoffroy, 1806)	Tavares and Anciães (1998)
	Myotis izecksohni Moratelli, Peracchi, Dias & Oliveira, 2011[1*]	Dias et al. (2015)
	Myotis lavali Moratelli, Peracchi, Dias & Oliveira, 2011[1*]	Nogueira et al. (2015)
	Myotis levis (I. Geoffroy, 1824)	Bergallo et al. (2003)
	Myotis nigricans (Schinz, 1821)	La Val (1973)
	Myotis riparius Handley, 1960	La Val (1973)
	Myotis ruber (É. Geoffroy, 1806)	Lima (1926)

[1]Range extension. [2]Previously identified as *S. bilineata*. [3]New taxonomic arrangement. * New Records.

T. nicefori (CMUFLA1896) was recorded in Parque Estadual do Rio Doce (Appendix 1) and was identified based on its four-banded dorsal pelage with the pale median dorsal stripe evident on the lower back, pointed ears measuring 15.96 mm, forearm 36.58 mm, calcar shorter than foot, and upper incisors not chisel-shaped and projected forward.

A total of 1,663 specimen records were obtained from 181 municipalities distributed along the 12 mesoregions of the state (Figs 1, 2, Appendix 2). The number of sampled localities in Minas Gerais has significantly increased over the last 13 years, ranging from 53 (Tavares et al. 2010) to 181 municipalities with bat species sampled (Fig. 2A, B, Appendix 3). Considering the absolute number of localities, the most sampled mesoregions were "Região Metropolitana de Belo Horizonte", "Zona da Mata", and "Norte de Minas" (Fig. 1). However, when considering the relative number of sampled localities for each mesoregion, the "Norte de Minas" mesoregion has only approximately 23% of its municipalities sampled for bats (Fig. 1). Also, "Norte de Minas" exhibited the smallest rates of increment in the number of sampled localities compared to the survey performed by Tavares et al. (2010) (7 to 21; Appendix 3). In contrast, the "Região Metropolitana de Belo Horizonte" mesoregion had the largest increase rate of localities sampled for bats (11 to 46) (Fig. 2). The mesoregions "Vale do Mucuri", "Campo das Vertentes", and "Oeste de Minas" have been scarcely sampled and are represented by less than seven sampled localities (Figs 1, 2B).

The mesoregion with the largest number of known bat species is "Norte de Minas", with 67 species recorded, followed by "Região Metropolitana de Belo Horizonte" with records of 64 species, and "Vale do Rio Doce", with 62 bat species recorded (Figs 1, 3).

Sampled site localities for bats are distributed in the three biomes present in the state, totaling 102 in the Atlantic Forest, 71 in the Cerrado, and eight in the Caatinga (Fig. 2B). Among the 619 protected areas in the state of Minas Gerais, 33 have been sampled for bats, distributed in 32 municipalities (Table 2), and representing nearly 5.33% of the total of protected areas in Minas Gerais (IDE-SISEMA 2010, IEF 2021) (Fig. 4).

DISCUSSION

Over the last 13 years of bat sampling collection in the state of Minas Gerais, we encountered an impressive number of new records of bat species (N = 23), representing an increment of approximately two newly added bat species per year for the state. The 99 bat species with confirmed occurrence in the Minas Gerais state correspond to approximately 55% of the Brazilian bat fauna, placing Minas Gerais as the most

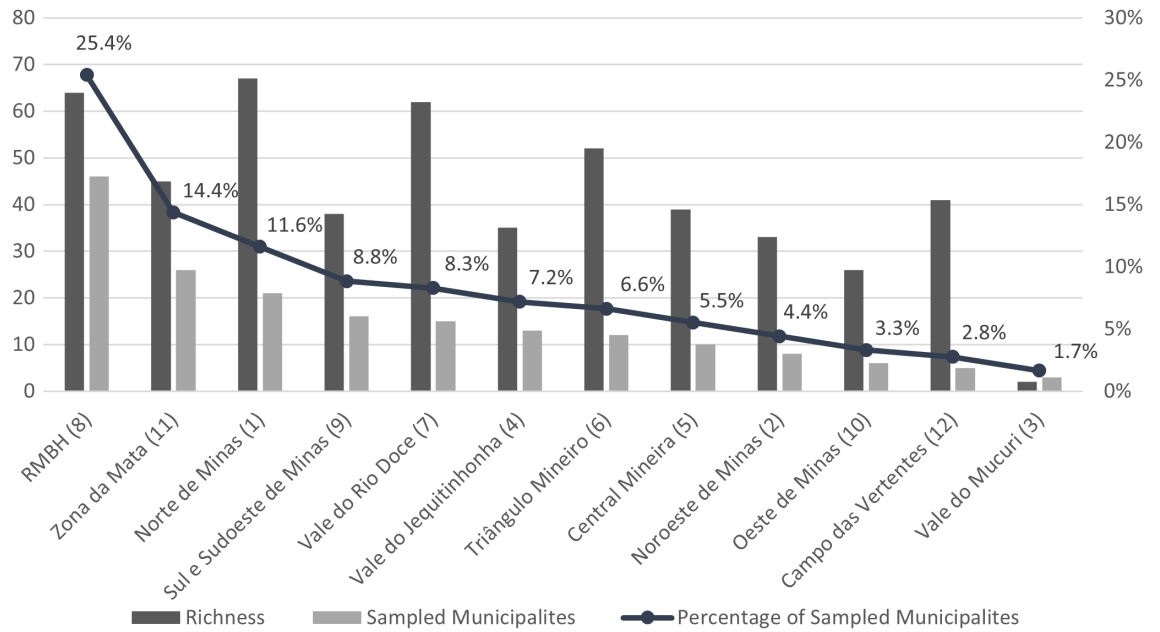

Figure 1. Bat species richness, sampled municipalities and percentage of sampled municipalities for each mesorregion of the state of Minas Gerais, Brazil. RMBH: Região Metropolitana de Belo Horizonte. The numbers in parenthesis correspond to the numbers of the mesoregions used in the maps of Fig. 2.

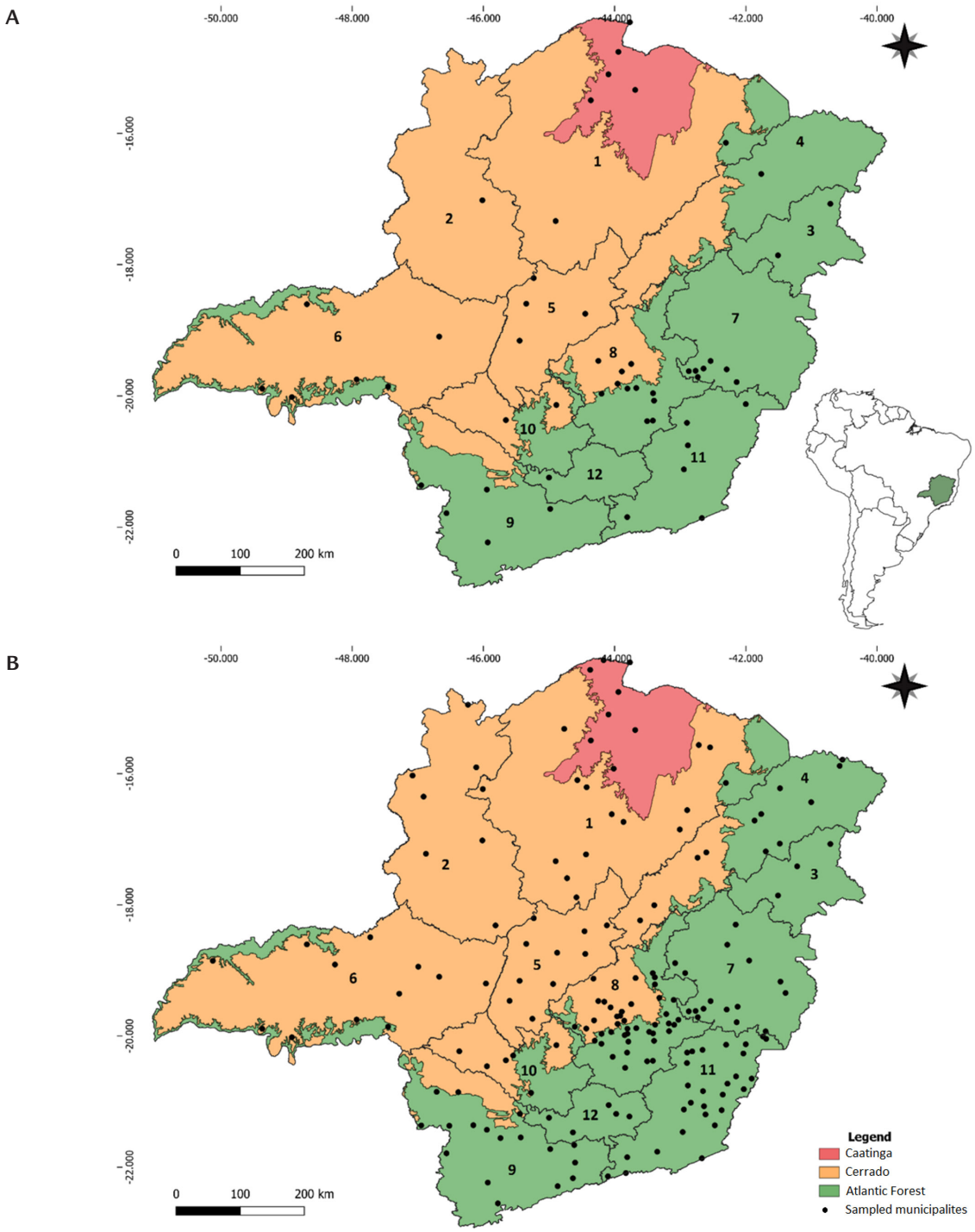

Figure 2. Localities where at least one bat was sampled in Minas Gerais State until 2010 (A) and after 2010 (B). The dots represent the centroid of each municipality. Numbers correspond to the mesoregions as follow: 1) Norte de Minas; 2) Noroeste de Minas; 3 Vale do Mucuri, 4) Vale do Jequitinhonha, 5) Central Mineira, 6) Triângulo Mineiro/Alto Parnaíba, 7) Vale do Rio Doce, 8) Metropolitana de Belo Horizonte, 9) Sul e Sudeste de Minas, 10) Oeste de Minas, 11) Zona da Mata, 12) Campo das Vertentes.

Table 2. Protected areas sampled for bats in the state of Minas Gerais, Brazil.

Protected area	Municipality
Área de Proteção Ambiental do Carste de Lagoa Santa	Lagoa Santa
Área de Proteção Ambiental Rio Pandeiros	Bonito de Minas
Área de Proteção Ambiental Vargem das Flores	Betim/Contagem
RPPN Rosendo Netto de Souza Andrade	Carrancas
Estação de Pesquisa e Desenvolvimento Ambiental Galheiro	Perdizes
Estação Ecológica de Fechos	Nova Lima
Estação Ecológica da UFMG	Belo Horizonte
Estação Ecológica Pirapitinga	Morada Nova de Minas
Monumento Natural Lapa Vermelha	Pedro Leopoldo
Parque Ambiental Alcoa	Poços de Caldas
Parque Estadual da Mata Seca	Manga/Bonito de Minas
Parque Estadual da Serra do Brigadeiro	Ervália
Parque Estadual da Serra do Papagaio	Aiuruoca
Parque Estadual da Serra do Rola Moça	Nova Lima
Parque Estadual do Ibitipoca	Lima Duarte
Parque Estadual do Rio Doce	Marliéria
Parque Estadual do Rio Preto	São Gonçalo do Rio Preto
Parque Estadual Lapa Grande	Montes Claros
Parque Estadual Serra Negra da Mantiqueira	Rio Preto
Parque Muncipal da Sapucaia	Montes Claros
Parque Municipal das Mangabeiras	Belo Horizonte
Parque Nacional Cavernas do Peruaçu	Itacarambi
Parque Nacional da Serra da Canastra	São Roque de Minas
Parque Nacional Serra do Cipó	Jaboticatubas
Reserva Biológica Serra Azul	Jaíba
Reseva Biológica de Acauã	Leme do Prado
RPPN Fazenda da Lagoa	Monte Belo
RPPN Feliciano Miguel Abdalla	Caratinga
RPPN Guilman Amorim	Antônio Dias
RPPN Mata do Passarinho	Bandeira
RPPN Mata do Sossego	Simonésia
RPPN Peti	São Gonçalo do Rio Abaixo
RPPN Santuário do Caraça	Santa Bárbara/Catas Altas

RPPN: Private Natural Heritage Reserve.

bat-speciose state in southeastern Brazil, followed by Espírito Santo with 86 species (Abreu et al. 2021; Vela-Ulian et al. 2021), São Paulo with 81 species (Garbino 2016, Garbino et al. 2021), and Rio de Janeiro (n = 77; Peracchi and Nogueira 2010). This diversity is in part related to the state size, and if we correct the bat richness by state area (IBGE 2022), Espírito Santo stands out with more species per km² than Minas Gerais.

The megadiversity of bats in Minas Gerais can also be explained by several aspects, such as its environmental complexity, which is characterized by the presence of several biomes and ecosystems along with their gradients. The landscape forms a typical mosaic of phytophysiognomies with diverse features, from humid lowlands forests to savannah and semi-arid formations and including climate latitudinal and altitudinal gradients. Furthermore, Minas Gerais boasts one of the highest densities of karstic areas in Brazil (CANIE 2019), and caves are a fundamental part of the life cycle of several cave bat species (Trajano 2000, Torquetti et al. 2017). Two of the main karstic regions of Brazil are in Minas Gerais (Travassos et al. 2008), including a vast part of the Bambuí formation, and the area is protected by Parque Nacional Cavernas do Peruaçu. Both regions feature hundreds of limestone caves, contributing significantly to the diversity and ecological complexity of bat habitats in the state (Tavares et al. 2010, Pinto et al. 2010, Monte and Bichuette 2020).

We report the first records of *R. pumilio* and *T. nicefori* for Minas Gerais state. *Rhinophylla pumilio* was recorded in

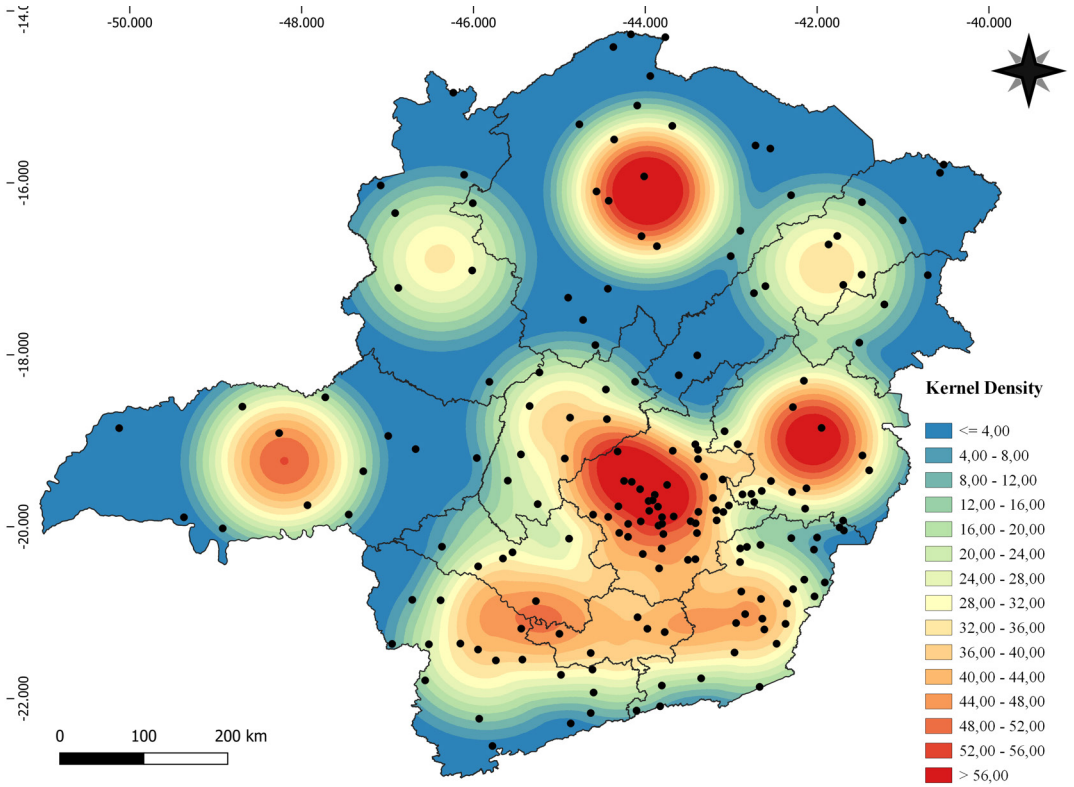

Figure 3. Heatmap of the distribution of records in the Minas Gerais state showing the bat richness distribution indicating areas of high richness of species in red (greater kernel density).

Mata do Passarinho, Macarani, situated on the border of Bahia and Minas Gerais states, within the Atlantic Forest domain. This extends its known range approximately 193 km west from its nearest location in Ilhéus, Bahia state (Faria et al. 2006). *Trinycteris nicefori* is widely distributed throughout the Neotropical Region but is known only from 26 locations in Brazil and is apparently absent from the drier Cerrado and Caatinga domains (Silva et al. 2020). We recorded *T. nicefori* in the Parque Estadual do Rio Doce (PERD), Marliéria (42º43'55" W; 19º42'48" S). This record of *T. nicefori* extends its distribution by 263 km west from the nearest location in Linhares, Espírito Santo state (Peracchi and Albuquerque 1993) and increases the richness of the PERD to 54 bat species (Tavares et al. 2007, Gregorin et al. 2022).

Some changes in the Minas Gerais list resulted from revisionary work conducted in the last decade. Such is the case of *M. currentium*, which had been reported for the cities of Jaíba and Manga in northern Minas Gerais (Tavares et al. 2010) and was revised and reidentified by Loureiro et al. (2018) as *M. molossus*. Loureiro et al. further restricted the occurrence of *M. currentium* to western Mato Grosso state. We recognized the stripe-headed round-eared bat occurring in the state as *T. maresi* instead of *T. saurophila*, following Basantes et al. (2020). We followed the revisions of Loureiro et al. (2020b) and Baird et al. (2015) and considered, respectively, the names *M. fluminensis* and *L. villosissimus* instead of the names *M. rufus* and *L. cinereus* as previously listed in Tavares et al. (2010).

We also followed Garbino (2011) who reidentified a specimen numbered MZUSP 5830 as *S. leptura*, disregarding the occurrence of *S. bilineata* as indicated by Vieira (1955) as we could not locate a voucher for this record in the MZUSP collections. We consider it necessary to reassess the material attributed to *Choeroniscus minor* (Peters, 1868) in Minas Gerais but have not yet had the opportunity to examine the vouchers, which were identified by V. A. Taddei, prior to the description of the morphologically similar *Dryadonycteris capixaba* Nogueira, Lima, Peracchi & Simmons, 2012. However, the presence of *C. minor* in Minas Gerais cannot be ruled out, as it has been confirmed to occur in Espírito Santo (Vela-Ulian et al. 2021). Hintze et al. (2020) recorded calls of *Promops centralis* Thomas, 1915 in several locations

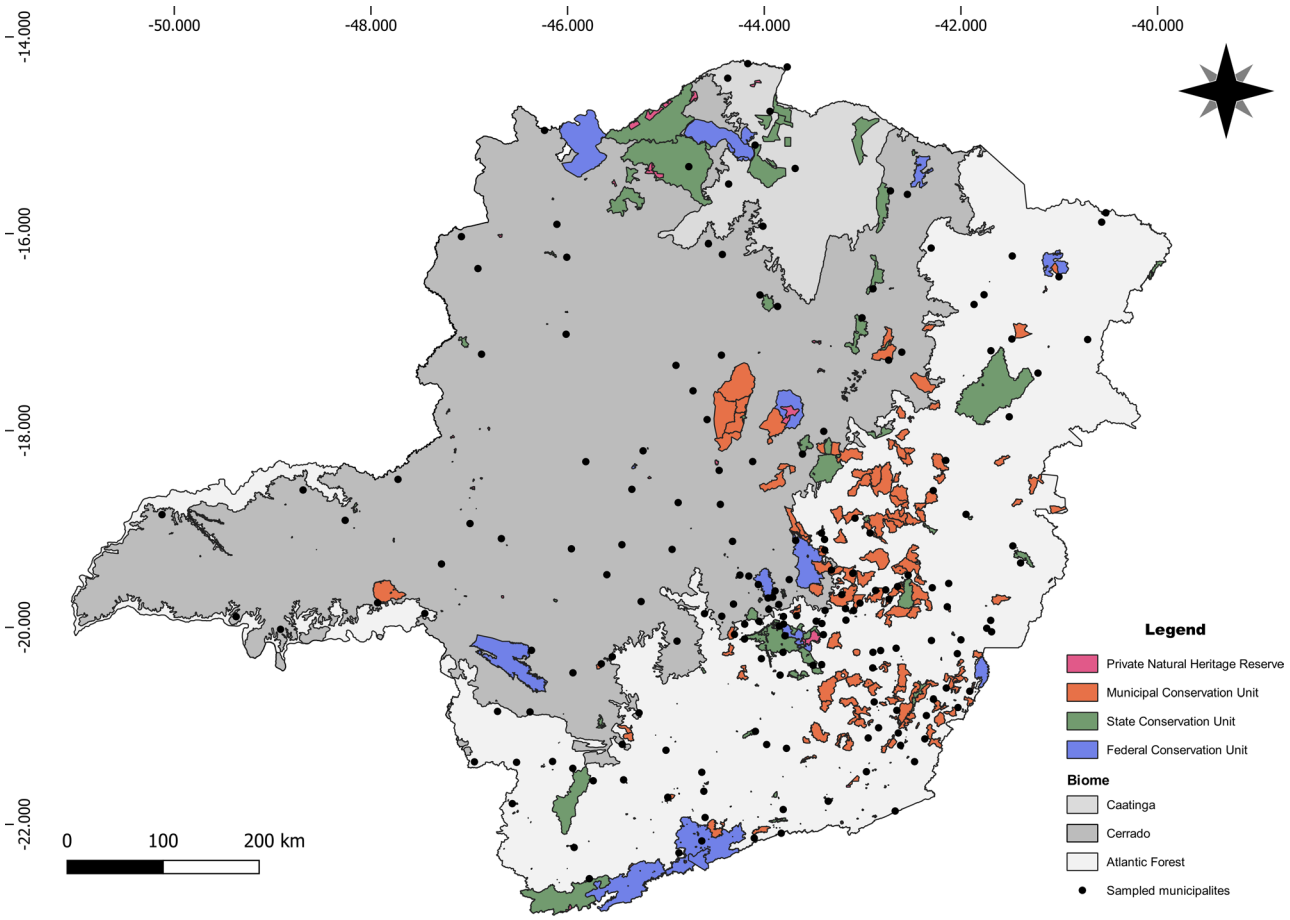

Figure 4. Distribution of the sampled municipalities for bats on Protected areas in the state of Minas Gerais.

in southeastern Brazil, including two of them in Minas Gerais. Despite this, we have not included this species in our updated list due to the absence of a housed voucher and because the distribution of *P. centralis* is currently restricted to the Amazon Forest. Nevertheless, we did not discard the possibility of the occurrence of this and other molossid species in Minas Gerais and understand that these bats are challenging to capture in mist-nets due to their usual foraging behavior at great heights. Even so, we encourage efforts to capture bats in future acoustic research surveys for an accurate identification of the bat species.

Of the 23 species newly added to our list, three had already been reported to the state prior to Tavares et al. (2010) but they were not included in that list because the authors were unable to locate and/or to verify the vouchers at that time. *Glyphonycteris behnii* (Peters, 1865) was recorded in Parque Nacional Serra da Canastra (Perrachi and Albuquerque, 1985), which also has unpublished records in the state that we were able to examine, *Molossus pretiosus* Miller, 1902 in Jaíba (Nogueira et al. 2008), and *Artibeus gnomus* Handley 1987 in Brasilândia de Minas (Redondo et al. 2008). Recently, other inventories and reviews have confirmed *M. pretiosus* for Jaíba (Nogueira et al. 2015, Loureiro et al. 2018, 2020a) and *G. behnii* in Pains (Genelhú et al. 2022).

The type-localities of five valid species are situated in Minas Gerais: *Micronycteris minuta* (Gervais, 1856) (Capela Nova), *L. bokermanni* (Jabuticatubas, Serra do Cipó), *C. doriae* (Minas Geraes = Minas Gerais), *M. temminckii* (Lagoa Santa), and *E. chimaera* (Parque Estadual do Rio Doce) (Burmeister 1854, Gervais 1856, Thomas 1891, Sazima et al. 1978, Gregorin et al. 2016). Also, the two paratypes of *T. wynneae* are from Parque Estadual do Rio Doce (Velazco et al. 2014).

The high diversity of bats in the eastern Minas Gerais Atlantic Forest emphasizes the importance of employing combined sampling techniques to effectively assess the biodiversity of bats (Gregorin et al. 2022). This approach

is further strengthened by concurrent taxonomic revisions accompanying surveys. The significance of the eastern Minas Gerais Atlantic Forest rare remnants, exemplified by sites such as the Parque Estadual do Rio Doce (PERD—Tavares et al. 2007; Gregorin et al. 2017) cannot be understated. Notably, the PERD stands out as one of the largest inland Atlantic Forest remnants in Brazil and the largest in Minas Gerais (Latini and Petrere 2004).

Two nectar-feeding bats occurring in Minas Gerais are globally classified as Endangered in the IUCN Red List, *L. bokermanni* and *Lonchophylla dekeyseri* Taddei, Vizotto & Sazima, 1983; twelve species are classified as "data deficient", *Tonatia bidens* (Spix, 1823), *D. capixaba*, *Xeronycteris vieirai* Gregorin & Ditchfield, 2005, *G. behnii*, *Vampyressa pusilla* (Wagner, 1843), *T. wynneae*, *Cynomops abrasus* (Temminck, 1826), *Molossops neglectus* Williams & Genoways, 1980, *Histiotus velatus* (I. Geoffroy, 1824), *Lasiurus egregius* (Peters, 1870), *Rhogeessa hussoni* Genoways & Baker, 1996, and *Myotis izecksohni* Moratelli, Peracchi, Dias & Oliveira, 2011; and three as near threatened, *Lonchophylla mordax* Thomas, 1903, *Natalus macrourus* (Gervais, 1856), and *Myotis ruber* (É. Geoffroy, 1806) (IUCN 2022). In Brazil, *L. dekeyseri* is listed as Endangered and three species are listed as Vulnerable, *L. bokermanni, Furipterus horrens* (Cuvier, 1828), and *N. macrourus* (MMA 2022), all of them are cave bats occurring in Minas Gerais. At the state level, nine bat species have been included in threatened categories (COPAM 2010); five classified as endangered, *C. minor*, *Lionycteris spurrelli* Thomas, 1913, *L. bokermanni*, *L. dekeyseri*, and *Phylloderma stenops* Peters, 1865; and four as vulnerable, *Diaemus youngii* (Jentink, 1893), *G. behnii*, *Glyphonycteris sylvestris* Thomas, 1896, and *X. vieirai*. The Brazilian list was recently updated (MMA 2022) but the Minas Gerais state list was last updated more than a decade ago (COPAM 2010).

In the time interval of 13 years, the number of municipalities with bat records in the state rose from 53 to 181, an increase of 241.5% when compared to Tavares et al. (2010). Most of the sampling was concentrated in the Atlantic Forest, including 71 new sampled municipalities, making up a total of approximately 56% of the total sampled in the state. Sampling in the Cerrado, which occupies most of the state's area, increased with the addition of 54 municipalities, totaling 39% of the total accounted for the state. For the Caatinga, which covers a relatively small area of the state, there was an increase of three new municipalities, in ca. 4.5% of the total number of municipalities sampled in the state. However, if considering the relative number of sampled municipalities for each biome, the Atlantic Forest has only 17.8% of its municipalities sampled, Cerrado has 27.8%, and Caatinga has 32%. Although the Caatinga in Minas Gerais has been the target of recent bat inventories and ecological studies (Pinto et al. 2010, Dias et al. 2013, Nogueira et al. 2015, Falcão et al. 2014, 2018, Monte and Bichuette 2020), no new municipalities within its realm in Minas Gerais have been added for collecting bats.

The most extensively sampled mesoregion in the state, "Metropolitana de Belo Horizonte", concentrates the main research centers and universities, which, allied with the availability of resources and the facilitation of access, favor inventories in nearby areas, including sampling for iron mining licensing processes in the "Quadrilátero Ferrífero". The three most speciose mesoregions are, respectively, "Norte de Minas", "Metropolitana de Belo Horizonte", and "Vale do Rio Doce".

"Norte de Minas" and "Vale do Rio Doce" are poorly sampled compared to "Metropolitana de Belo Horizonte" suggesting that the richness is not necessarily related to the most sampled areas, as demonstrated by the heatmap (Fig. 3). Hypotheses on why this remarkable diversity of bat species occurs in the "Vale do Rio Doce, especially the Rio Doce State Park, include, perhaps, many synergistic factors: 1) this is a large protected area with 30,000 ha of forest, including portions of pristine vegetation; 2) moist and humid environment provides favorable conditions for diverse bat communities; 3) the continuity of bat inventories in PERD since the 1980s has contributed to a cumulative dataset and comprehensive understanding of the bat fauna in the region; and 4) of great relevance, recent studies employing a variety of methods for assessing the diversity, including canopy nets, bioacoustics, roost active searches, and ground-level mist-nets, have played a crucial role in accessing and documenting this high diversity (Gregorin et al. 2022).

Yet the high number of species in the Norte de Minas region may be explained by the ecotones and mosaics formed there with three ecosystems: the Caatinga, Cerrado, and Atlantic Forest. In the largest and historically poor sampled "Norte de Minas" mesoregion there has been a sampling increase in the last years (Nogueira et al. 2008, 2015) as well as studies carried out in the Parque Nacional Cavernas do Peruaçu and vicinity (Trajano and Gimenez 1998, Pinto et al. 2010). It is noteworthy that the Caatinga of northern Minas Gerais and the ecotonal area present in the "Triângulo Mineiro" in the western region of the state, despite being less sampled, demonstrate relevant species richness.

The protected areas are important to the maintenance of the fauna (Henry-Silva 2005), only 5.33% of them are included in the bat inventories of Minas Gerais state (IDE-SISEMA

2010). Two endangered species, *C. minor* and *X. vieirai*, are categorized as threatened in the state list (COPAM 2010). Additionally, the recently discovered species, *E. chimaera* and *T. wynneae*, were exclusively documented within protected areas or their vicinity. This underscores the significance of these areas for bat conservation. The state still has several sampling gaps, and the increase in sampling and revisionary studies, mainly in Cerrado and Caatinga, will allow baseline knowledge to support the proposition of new conservation units for the protection of the bat fauna of Minas Gerais state.

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Appendix 1. Examined bat specimens from Minas Gerais state (Brazil), arranged by municipality in alphabetical order. For collection acronyms see Materials and Methods.

Anoura caudifer (total 14) – Areado: CMUFLA2899 (♀). Barão de Cocais: CMUFLA2821 (♂), CMUFLA2840 (♀). Brumadinho: CMUFLA917 (♀), CMUFLA 912 (♂). Caratinga: MZUFV3205 (♀). Nova Lima: CMUFLA2237 (♀), CMUFLA2240 (♀), CMUFLA2236 (♂). Ubá: MZUFV357 (♀), MZUFV375 (♀), MZUFV376 (♀), MZUFV377 (♀), MZUFV381 (♀).

Anoura geoffroyi (total 12) – Brumadinho: CMUFLA2092 (♂). Caratinga: MZUFV3192 (♀), MZUFV3197 (♂), MZUFV3198 (♀), MZUFV3200 (♂), MZUFV3228 (♂), MZUFV3229 (♂). Igarapé: CMUFLA2464 (♂). Ipatinga: CMUFLA444 (♀). Minduri: CMUFLA3022 (♂), CMUFLA3025 (♂); CMUFLA3026 (♂).

Artibeus cinereus (total 07) – Conceição do Mato Dentro: CMUFLA1760 (♂). Grão Mogol: CMUFLA1098 (♀), CMUFLA1124 (♂). Januária: CMUFLA706 (♂), CMUFLA707(♂). Uberaba: CMUFLA403 (♂), CAUMFLA404(♂).

Artibeus fimbriatus (total 14) – Caeté: CMUFLA337 (♂); CMUFLA338 (♀), CMUFLA339 (♂). Coqueiral: CMUFLA152 (♀), CMUFLA152 (♀), CMUFLA153 (♀), CMUFLA157 (♀). Mariana: CMUFLA1429 (♂), CMUFLA1451 (♀). Viçosa: MZUFV1527 (♂), MZUFV1529 (♂), MZUFV2543 (♂), MZUFV2548 (♀), MZUFV2598 (♀).

Artibeus gnomus (total 01) - Brasilândia de Minas: BREJ10.

Artibeus lituratus (total 15) – Brasilândia de Minas: MZUFV3483 (♀),MZUFV3752 (♀). Caeté: CMUFLA367 (♂). Caratinga: MZUFV2430 (♂), MZUFV2431 (♀), MZUFV3097 (♂), MZUFV3108 (♀), MZUFV3109 (♂), MZUFV3115 (♀), MZUFV3118 (♂), MZUFV3124 (♂), MZUFV3125 (♀), MZUFV3126 (♂). Uberaba: DZSJRP11702. Manga: MNRJ42743.

Artibeus obscurus (total 13) – Marliéria: CMUFLA1159 (♂), CMUFLA1793 (♂), CMUFLA1796 (♀), CMUFLA1823 (♂), CMUFLA1853 (♂). Salinas: CMUFLA1062 (♂). Viçosa: MZUFV2756 (♂), MZUFV4926 (♀), MZUFV4927 (♀), MZUFV4928 (♀), MZUFV4929 (♂), MZUFV4930 (♀), MZUFV4931 (♀).

Artibeus planirostris (total 11) – Ipatinga: CMUFLA437(♀), CMUFLA449(♂). Januária: CMUFLA1580(♂), CMUFLA1581(♀), CAUMFLA 1601(♂), CMUFLA1689(♀), MZUFV2481 (♂), MZUFV2493 (♂). São Roque de Minas: CMUFLA27 (♀), CMUFLA28 (♂), CMUFLA41 (♀).

Carollia brevicauda (total 04) – Itabira: CMUFLA1625 (♂). Minduri: CMUFLA122 (♂), CMUFLA138 (♂), CMUFLA281 (♀).

Carollia perspicillata (total 10) – Bonito de Minas: MZUFV3083 (♂). Brumadinho: CMUFLA911 (♀), CMUFLA2086 (♀). Carrancas: CMUFLA1165 (♂), CMUFLA 1173 (♀), CMUFLA1178 (♀). Itamonte: CMUFLA2342 (♂). Lavras: CMUFLA185 (♀), CMUFLA535 (♂), CMUFLA3312 (♀).

Chiroderma doriae (total 08) – Coqueiral: CMUFLA163 (♂). Felixlândia: CMUFLA1415 (♂). Itambé do Mato Dentro: MZUFV4162 (♂). João Monlevade: CMUFLA965 (♀). João Monlevade: CMUFLA965 (♀). Marliéria: CMUFLA1157 (♀). Monte Belo: CMUFLA2076 (♀). Pains: CMUFLA3329 (♂).

Chiroderma villosum (total 12) – Caratinga: MZUFV3100 (♀), MZUFV3119 (♂). Ipatinga: CMUFLA465 (♀). Januária: CMUFLA907 (♂), CMUFLA1532 (♀), CMUFLA1533 (♀), CMUFLA1534 (♀). Marliéria: CMUFLA1834 (♀), CMUFLA1836 (♂), CMUFLA1840 (♀). Pains: CMUFLA3330 (♂), CMUFLA3339 (♂).

Choeroniscus minor (total 10) – Caratinga: DZSJRP (field numbers) LMSA 003, 029, 042, 075, 106, 108, 123, 125, 130, 203.

Chrotopterus auritus (total 08) – Caratinga: MZUFV3199(♀). Carrancas: CMUFLA1172 (♂). Itamonte: CMUFLA2316 (♂). Januária: CMUFLA697 (♂), CMUFLA698 (♂). Mariana: CMUFLA1439 (♂). Minduri: CMUFLA124 (♂), CMUFLA129 (♀).

Cynomops abrasus (total 01) – Salinas: CMUFLA1392 (♀).

Cynomops planirostris (total 04) – Lavras: CMUFLA396 (♂), CMUFLA508 (♀), CMUFLA2249 (♂), CMUFLA2251 (♂).

Desmodus rotundus (total 13) – Brumadinho: CMUFLA915 (♂). Caeté: CMUFLA350 (♀), CMUFLA351 (♀), CMUFLA375 (♂). Coqueiral: CMUFLA145 (♂), CMUFLA146 (♂). Lavras: CMUFLA196 (♀), CMUFLA197 (♂), CMUFLA201 (♀). São Gonçalo do Abaeté: CMUFLA1349 (♂), CMUFLA1350 (♀), CMUFLA 1351 (♂). Ervália, Parque Estadual Serra do Brigadeiro: MZUFV4891 (♂)

Diaemus youngii (total 02) – Conceição do Mato Dentro: CMUFLA2134 (♂). Viçosa: MZUFV112 (♀)

Diphylla ecaudata (total 08) – Caeté: CMUFLA348 (♂). Grão Mogol: CMUFLA1099 (♂). Januária: CMUFLA1657 (♂), CMUFLA1658 (♀), CMUFLA2673 (♂), CMUFLA2674 (♀), CMUFLA2675 (♀), CMUFLA2681 (♂).

Dryadonycteris capixaba (total 03) – Marliéria: CMUFLA1516, CMUFLA1517, CMUFLA1887 (♂).

Eumops auripendulus (total 10) – Lima Duarte: CMUFLA1034 (♂), CMUFLA 1035 (♀), CMUFLA 1036 (♂), CMUFLA1038 (♀). Minduri: CMUFLA143 (♀), CMUFLA295 (♂), CMUFLA327 (♂), CMUFLA 329 (♀). Viçosa: MZUFV160 (♂), MZUFV5033 (♀).

Eumops bonariensis (total 01) – Carinhanha (border between Minas Gerais and Bahia states): MN 3736.

Eumops chimaera (total 01) – Marliéria: CMUFLA1889 (♂).

Eumops glaucinus (total 03) – Lavras: CMUFLA398 (♂), CMUFLA871 (♀). Marliéria: CMUFLA1953 (♂).

Eumops perotis (total 08) – Campo Belo: CMUFLA3270 (♀). Lavras: CMUFLA330 (♂), CMUFLA 537 (♂), CMUFLA865 (♂), CMUFLA1348 (♂). Minduri: CMUFLA3281 (♂). Muzambinho: CMUFLA3268 (♀), CMUFLA3269 (♀).

Furipterus horrens (total 06) – Caraí: CMUFLA2727 (♀), CMUFLA2728 (♀). Grão Mogol: CMUFLA1089 (♀). Januária: CMUFLA266 (♂), CMUFLA2667 (♂), CMUFLA1531 (♀).

Gardnerycteris crenulata (total 03) – Bonito de Minas: MZUFV2733 (♀). Marliéria: CMUFLA1153 (♂), CMUFLA2002 (♀).

Glossophaga soricina (total 11) – Areado: CMUFLA2906 (♀), CMUFLA2907 (♂), CMUFLA2910 (♀). Barão de Cocais: CMUFLA2089(♂), CMUFLA2844(♂). Carrancas: CMUFLA1189 (♀), CMUFLA 1190 (♂), CMUFLA1191 (♂). Nova Lima: CMUFLA2232 (♀), CMUFLA2233 (♀), CMUFLA2234 (♂).

Glyphonycteris behnii (total 03) – Barão de Cocais: CMUFLA2826 (♀), CMUFLA2830 (♀). Montes Claros: CMUFLA2951 (♀).

Glyphonycteris sylvestris (total 01) – Mariana: CMUFLA3246 (♂).

Histiotus montanus (total 01) – Minduri: CMUFLA3024 (♂).

Histiotus velatus (total 19) – Itamonte: CMUFLA2327 (♂). Lavras: CMUFLA 2617 (♂), CMUFLA2618 (♀), CMUFLA2619 (♀). Minduri: CMUFLA3250 (♀). Muzambinho: CMUFLA2782 (♀), CMUFLA3116 (♂). Viçosa: MZUFV1389 (♀), MZUFV1423 (♀), MZUFV1424 (♂), MZUFV1425 (♂), MZUFV1563 (♂), MZUFV172 (♀), MZUFV173 (♀), MZUFV174 (♂), MZUFV175 (♂), MZUFV2755 (♀). Monte Belo: CMUFLA3119 (♀).

Lasiurus blossevillii (total 14) – Caeté: CMUFLA2346. Ervália, Parque Estadual Serra do Brigadeiro: MZUFV4879 (♂), MZUFV4982 (♂). Lavras: CMUFLA2056 (♀), CMUFLA2612 (♀), CMUFLA2613 (♀), CMUFLA2614 (♂),CMUFLA2615 (♀). Montes Claros: CMUFLA2953 (♀), CMUFLA2954 (♀), CMUFLA2955 (♂). Viçosa: MZUFV1399 (♂), MZUFV1400 (♂), MZUFV176 (♂).

Lasiurus ega (total 06) – Arinos: MZUFV3443 (♂), Bonito de Minas: MZUFV2734 (♂). Lavras: CMUFLA407 (♀), CMUFLA2055 (♂), CMUFLA2610 (♂). Januária: MZUFV2492 (♂).

Lasiurus villosissimus (total 01) – Uberlândia: UFMG 5491

Lionycteris spurrelli (total 08) – Igarapé: MZUFV4178 (♂). Januária: CMUFLA1662 (♂), CMUFLA1703 (♂), CMUFLA1712 (♀), CMUFLA1718 (♀). Salinas: CMUFLA1063 (♀), CMUFLA1387 (♀), CMUFLA1388 (♀).

Lonchophylla bokermanni (total 02) – Itambé do Mato Dentro: MZUFV3532 (♂). Diamantina: CMUFLA1004 (♂).

Lonchophylla dekeyseri (total 11) – Januária: CMUFLA1652 (♂), CMUFLA1654 (♀), CMUFLA1655 (♀), CMUFLA1661 (♀), CMUFLA1663 (♂), CMUFLA1701 (♀). Salinas: CMUFLA1066 (♀). Unaí: CMUFLA2999 (♀), MZUFV3533 (♂), MZUFV3534 (♂), MZUFV3535 (♂).

Lonchophylla mordax (total 16) – Conceição do Mato Dentro: CMUFLA2142 (♂), CMUFLA2133 (♂), CMUFLA2135 (♂), CMUFLA2140 (♂). Itambé do Mato Dentro: MZUFV4166 (♀). Januária: CMUFLA1656 (♀), CMUFLA1697 (♂), CMUFLA1717 (♀), CMUFLA1660 (♂), MZUFV2484 (♂), MZUFV2486 (♂), MZUFV2487 (♀), MZUFV2497 (♀), MZUFV3325 (♂). Montes Claros: CMUFLA2952 (♀). Salinas: CMUFLA1395 (♂).

Lonchorhina aurita (total 01) – Ipatinga: MZUSP 5829.

Lophostoma brasiliense (total 04) – Brasilândia de Minas: MZUFV3758 (♂). Marliéria: CMUFLA1151 (♂), CMUFLA1890 (♀). São Gonçalo do Abaeté: CMUFLA1355 (♀).

Lophostoma carrikeri (total 01): Grão Mogol: UFMG 6829 (♀).

Macrophyllum macrophyllum (total 11) – Marliéria: CMUFLA2004 (♂), CMUFLA2012 (♀), CMUFLA2013 (♀), CMUFLA2014 (♀), CMUFLA2015 (♀), CMUFLA 2016 (♀). Timóteo: CMUFLA1739 (♀), CMUFLA1741 (♂), CMUFLA1742 (♂), CMUFLA1743 (♂), CMUFLA1744 (♂).

Micronycteris megalotis (total 12) – Igarapé: MZUFV3134 (♂). Itambé do Mato Dentro: MZUFV4157 (♂). Lavras: CMUFLA172 (♀). Mariana: CMUFLA3138 (♂). Minduri: CMUFLA118 (♂), CMUFLA119 (♂), CMUFLA271, CMUFLA274 (♀), CMUFLA280 (♂). São Roque de Minas: CMUFLA15 (♀). Viçosa: MZUFV114 (♂), MZUFV115 (♀).

Micronycteris microtis (total 10) – Alagoa: CMUFLA2735 (♀). Além Paraíba: CMUFLA3350 (♂), CMUFLA3351 (♂). Barão de Cocais: CMUFLA2825 (♂), CMUFLA2827 (♂), CMUFLA2828 (♂). Grão Mogol: CMUFLA1075 (♂), CMUFLA1107 (♂). Marliéria: CMUFLA1969 (♀), CMUFLA1970 (♀).

Micronycteris minuta (total 13) – Januária: CMUFLA1779 (♀). Marliéria: CMUFLA1880 (♀), CMUFLA1906 (♂), CMUFLA1979 (♀), CMUFLA1905 (♂), CMUFLA1907 (♀), CMUFLA1974 (♀), CMUFLA1975 (♀), CMUFLA 1976 (♀), CMUFLA1980 (♀). Mariana: CMUFLA3219 (♀). Viçosa: MZUFV114 (♂), MZUFV115 (♀).

Micronycteris sanborni (total 08) – Igarapé: MZUFV4179 (♂). Januária: CMUFLA1538 (♂), CMUFLA1539, CMUFLA1540 (♂), CMUFLA1541 (♂), CMUFLA1542 (♀), CMUFLA1543 (♀), CMUFLA1545 (♀).

Micronycteris schmidtorum (total 03) – Conceição do Mato Dentro: CMUFLA2141 (♀). Januária: CMUFLA1546 (♀). Marliéria: CMUFLA1546 (♀).

Mimon bennettii (total 10) – Além Paraíba: CMUFLA3346 (♂). Barão de Cocais: CMUFLA2822 (♂), CMUFLA2823 (♂), CMUFLA2824 (♂). Januária: CMUFLA700 (♂), CMUFLA701 (♂), CMUFLA702 (♂), CMUFLA703 (♂), CMUFLA705 (♀). Salinas: CMUFLA1064 (♀).

Molossops neglectus (total 06) – Brazil – Minas Gerais: Areado: CMUFLA3140 (♀). Lavras: CMUFLA511 (♀), CMUFLA513 (♀). Muzambinho: CMUFLA3142 (♀), CMUFLA3143 (♀), CMUFLA3156 (♀).

Molossops temminckii (total 14) – Bonito de Minas: MZUFV2732 (♀), MZUFV3072 (♂), MZUFV3095 (♂), MZUFV3096 (♂). Januária: CMUFLA713 (♂), CMUFLA714 (♀), CMUFLA715 (♂), CMUFLA716 (♂), CMUFLA717 (♀), CMUFLA718 (♂), CMUFLA 719 (♂). São Gonçalo do Abaeté: CMUFLA1369 (♀), CMUFLA1370 (♀), CMUFLA1377 (♂).

Molossus aztecus (total 13) – Lavras: CMUFLA3274 (♂), CMUFLA3316 (♀), CMUFLA399 (♂), CMUFLA400 (♂), CMUFLA536 (♀), CMUFLA693 (♂), CMUFLA2247 (♂). Marliéria: CMUFLA1971 (♀), CMUFLA1981 (♀), CMUFLA1983 (♀), CMUFLA2018 (♂), CMUFLA 2019 (♂). Varginha: CMUFLA2267 (♀).

Molossus coibensis (total 02) – Belo Horizonte: UFMG 3350. Três Marias: UFMG 3411.

Molossus fluminensis (total 13) – Caratinga: MZUFV3203 (♂). Jaíba: MZUFV1566 (♀). Marliéria: CMUFLA1815 (♀), CMUFLA1876 (♂), CMUFLA1926 (♀), CMUFLA1927 (♂), CMUFLA2017 (♀). Viçosa: MZUFV1412 (♂), MZUFV1413 (♀), MZUFV1461 (♀), MZUFV1462 (♀), MZUFV1463 (♀), MZUFV1502 (♀), MZUFV155 (♂), MZUFV74 (♂).

Molossus molossus (total 13) – Caratinga: MZUFV3202 (♀), MZUFV3208 (♂). Ipatinga: CMUFLA420 (♂). Lavras: CMUFLA356 (♂), CMUFLA414 (♂), CMUFLA2169 (♀), CMUFLA2170 (♂). Marliéria: CMUFLA1930 (♀), CMUFLA2711 (♂). Muzambinho: CMUFLA3115 (♂). Uberaba: MZUFV1751 (♀), MZUFV1752 (♂), MZUFV1760 (♀).

Molossus pretiosus (total 11) – Jaíba: ALP 6875, 6896, 6911, 6912, 6914, 6915, 6943 – 6946, 6963.

Myotis albescens (total 07) – Conceição do Mato Dentro: CMUFLA1754 (♂). Mariana: CMUFLA3135 (♀). Muzambinho: CMUFLA2488 (♂), CMUFLA2489 (♂). Ipatinga: CMUFLA431 (♀), CMUFLA459 (♀), CMUFLA461 (♀).

Myotis izecksohni (total 01) – Mariana: CMUFLA3157 (♀).

Myotis lavali (total 03) – Muzambinho: CMUFLA2917 (♂), CMUFLA2918 (♂). Viçosa: MZUFV1415 (♂)

Myotis levis (total 04) – Mariana: CMUFLA3134 (♂), CMUFLA3137 (♂). Marliéria: CMUFLA1949 (♀). Prados: CMUFLA3267 (♂).

Myotis nigricans (total 10) – Areado: CMUFLA3141 (♂). Barão de Cocais: CMUFLA2831 (♀). Caeté: CMUFLA2302 (♀), CMUFLA2303 (♂), CMUFLA2304 (♂). Igarapé: CMUFLA2360 (♀). Mariana: CMUFLA3158 (♂). Marliéria: CMUFLA1857 (♂). Muzambinho: CMUFLA2485 (♂), CMUFLA2487 (♂).

Myotis riparius (total 06) – Barão de Cocais: CMUFLA2832 (♂), CMUFLA2033 (♀), CMUFLA2834 (♀), CMUFLA2835 (♀). Mariana: CMUFLA3276, CMUFLA3136 (♂).

Myotis ruber (total 06) – Caratinga: MZUFV3191 (♀). Mariana: CMUFLA1420 (♀), CMUFLA3247 (♂). Minduri: CMUFLA3305 (♀). Muzambinho: CMUFLA2486 (♀). Viçosa: MZUFV2646 (♀).

Natalus macrourus (total 04) – Grão Mogol: CMUFLA1122 (♂). Januária: CMUFLA1530 (♀), CMUFLA2668 (♂), CMUFLA709 (♂).

Neoeptesicus brasiliensis (total 10) – Caeté: CMUFLA2298 (♀), CMUFLA2445 (♂). João Monlevade: CMUFLA956 (♀), CMUFLA968 (♀), CMUFLA969 (♂), CMUFLA970 (♀). Lima Duarte: CMUFLA1026 (♂), CMUFLA1040 (♀). Marliéria: CMUFLA1892 (♀). Minduri: CMUFLA3354 (♂).

Neoeptesicus chiriquinus (total 01) – Lavras: CMUFLA510 (♂).

Neoeptesicus diminutus (total 04) – Belo Horizonte: CMUFLA1131 (♂). Lavras: CMUFLA173 (♀), CMUFLA2175 (♀). Mariana: CMUFLA3117 (♂).

Neoeptesicus furinalis (total 11) – Caeté: CMUFLA2345 (♀). Conceição do Mato Dentro: CMUFLA1629 (♂). Lavras: CMUFLA175 (♀), CMUFLA176 (♀), CMUFLA509 (♂), CMUFLA 534 (♂). Monte Belo: CMUFLA 2077 (♀). Paraguaçu: CMUFLA3271 (♀). São Gonçalo do Rio Abaixo: MZUFV4873 (♂). São Roque de Minas: CMUFLA20 (♀). Uberaba: MZUFV1762 (♀).

Noctilio albiventris (total 04) – Jaíba (MZUFV 1565), Januária (MZUFV 2731), P.E. do Rio Doce, Ipatinga (MZUFV 1416), UHE Volta Grande, Uberaba (MZUFV 1744)

Noctilio leporinus (total 08) – Pains: USNM 391025. Marliéria: USNM 391025, USNM 341449–50, USNM 391025, USNM 541448, ROM 70939, USNM 78017, USNM 91162.

Nyctinomops aurispinosus (total 02) – Lavras: CMUFLA 4049. Viçosa: MZUFV5182 (♂).

Nyctinomops laticaudatus (total 11) – Itamonte: CMUFLA2326 (♀). Muzambinho: CMUFLA2482 (♂). Marliéria: CMUFLA1141 (♀), CMUFLA1142 (♀), CMUFLA1147 (♀), CMUFLA1148 (♂), CMUFLA1149 (♂), CMUFLA1150 (♂), CMUFLA1819 (♂), CMUFLA1820 (♀), CMUFLA1821 (♂).

Nyctinomops macrotis (total 03) – Lavras: CMUFLA3973. Mariana: MZUSP 1750. Viçosa: MZUFV159 (♀).

Peropteryx kappleri (total 04) – Januária: CMUFLA708 (♂), MZUFV2502 (♀), MZUFV2503 (♀), MZUFV2727 (♂).

Peropteryx macrotis (total 11) – Lavras: CMUFLA333 (♀), CMUFLA388 (♀), CMUFLA332 (♀), CMUFLA387 (♀), CMUFLA2248 (♀). Nova Lima: CMUFLA226 (♀), CMUFLA2227 (♂). Padre Paraíso: CMUFLA2732 (♀), CMUFLA2733 (♂), CMUFLA2734 (♀). Unaí: CMUFLA3100 (♀).

Phylloderma stenops (total 01) – Januária: CMUFLA695 (♀).

Phyllostomus discolor (total 09) – Lagoa Santa: MZUFV3952 (♂), MZUFV3958 (♀), MZUFV4086 (♂), MZUFV4087 (♂), MZUFV4088 (♂). Monte Belo: CMUFLA2075 (♀). São Gonçalo do Abaete: CMUFLA1367 (♂). São Gonçalo do Rio Abaixo: MZUFV4874 (♂). Uberaba: CMUFLA402 (♂).

Phyllostomus hastatus (total 10) – Ipatinga: CMUFLA440 (♀). Januária: CMUFLA2687 (♂), CMUFLA2688 (♂), CMUFLA2689 (♂), CMUFLA2690 (♂), CMUFLA2691 (♂), CMUFLA2682 (♂), CMUFLA2893 (♂). Lavras: CMUFLA483 (♀), CMUFLA984 (♀).

Platyrrhinus incarum (total 01) – Conceição do Mato Dentro: CMUFLA2138 (♂).
Platyrrhinus lineatus (total 11) – Caeté: CMUFLA340 (♀), CMUFLA341 (♂), CMUFLA385 (♀), CMUFLA386 (♂). Carrancas: CMUFLA1183 (♀), CMUFLA1188 (♂). Coqueiral: CMUFLA112 (♂), CMUFLA113 (♂), CMUFLA114 (♀), CMUFLA115 (♂). Ervália, Parque Estadual Serra do Brigadeiro: MZUFV4983 (♀).
Platyrrhinus recifinus (total 16) – Além Paraíba: CMUFLA3347 (♂). Areado: CMUFLA2898 (♀). Caeté: CMUFLA384 (♀), CMUFLA549 (♀). Carrancas: CMUFLA1181 (♂). Conceição do Mato Dentro: CMUFLA1762 (♂). Ervália, Parque Estadual Serra do Brigadeiro: MZUFV4875 (♂). Ipatinga: CMUFLA441 (♂), CMUFLA445 (♂). Itamonte: CMUFLA2334 (♂). João Monlevade: CMUFLA957 (♂), CMUFLA966 (♂). Viçosa: MZUFV1520 (♂), MZUFV2529 (♂), MZUFV2530 (♀). Mariana MZUFV4882 (♂).
Promops nasutus (total 13) – Coqueiral: CMUFLA162 (♂). Lavras: CMUFLA65 (♀), CMUFLA328 (♂), CMUFLA954 (♀), CMUFLA64 (♀), CMUFLA66 (♀). Marliéria: CMUFLA1946 (♀), CMUFLA1954 (♀). Viçosa: MZUFV1500 (♂), MZUFV1567 (♀), MZUFV169 (♂), MZUFV170 (♀), MZUFV171 (♀).
Pygoderma bilabiatum (total 11) – Brumadinho: CMUFLA910 (♂), CMUFLA927 (♀). Caeté: CMUFLA2296 (♀). Carrancas: CMUFLA1170 (♂). Lavras: CMUFLA3001 (♂), CMUFLA182 (♀), CMUFLA184 (♂). Minduri: CMUFLA2704 (♀), CMUFLA3043 (♂), CMUFLA282 (♂), CMUFLA309 (♂).
Rhinophylla pumilo (total 01) – Mata do Passarinho, Bandeira (in the border of Minas Gerais with Bahia): UFMG7514 (♂).
Rhogeessa hussoni (total 01) – Marliéria: CMUFLA1155 (♀).
Rhynchonycteris naso (total 11) – Marliéria: CMUFLA1752 (♂), CMUFLA 1783 (♂), CMUFLA1808 (♀), CMUFLA1960 (♀), CMUFLA1962 (♂), CMUFLA2001 (♀), CMUFLA1753 (♂), CMUFLA1782 (♂), CMUFLA1799 (♀), CMUFLA1809 (♀), CMUFLA1959 (♂).
Saccopteryx leptura (total 01) – Marliéria: MZUSP5830 (♀).
Sturnira lilium (total 14) – Conceição do Mato Dentro: CMUFLA1761 (♂), CMUFLA2131 (♂). Coqueiral: CMUFLA158 (♀), CMUFLA159 (♀), CMUFLA160 (♀), CMUFLA161 (♂). Igarapé: CMUFLA2465 (♀). Ipatinga: CMUFLA426 (♀), CMUFLA428 (♂), CMUFLA434 (♂), CMUFLA438 (♂), CMUFLA450 (♀), CMUFLA456 (♂). Ervália, Parque Estadual Serra do Brigadeiro: MZUFV4876 (♀).
Tadarida brasiliensis (total 10) – Lavras: CMUFLA2061 (♀), CMUFLA2065 (♀), CMUFLA2176 (♀), CMUFLA2196 (♀), CMUFLA2201 (♀), CMUFLA2225 (♀), CMUFLA500 (♀), CMUFLA861 (♀), CMUFLA862 (♀). Lima Duarte: CMUFLA1093 (♂).
Thyroptera wynneae (total 02) – Marliéria: CMUFLA694 (♂), CMUFLA1160 (♂).
Tonatia bidens (total 03) – Igarapé: MZUFV4177 (♀). Pains: CMUFLA3335 (♂), CMUFLA3341 (♂).
Tonatia maresi (total 03) – Jaíba: ALP 6817 (♂), ALP 6854, 6855(♀).
Trachops cirrhosus (total 06) – Ipatinga: CMUFLA436 (♂), CMUFLA442. Marliéria: CMUFLA986 (♂), CMUFLA1844 (♂), CMUFLA1845 (♂). Novo Oriente de Minas: CMUFLA2738 (♂).
Trinycteris nicefori (total 01) – Marliéria: CMUFLA1896 (♂).
Uroderma bilobatum (total 01) – Caratinga: MZUSP (field number) ADD 382.
Uroderma magnirostrum (total 02) – Caratinga: MZUFV2437 (♂). Marliéria: CMUFLA1958 (♀).
Vampyressa pusilla (total 13) – Coqueiral: CMUFLA165 (♀), CMUFLA166 (♂), CMUFLA 167 (♂). Conceição do Mato Dentro: CMUFLA2132 (♀), CMUFLA1755 (♂), CMUFLA1756 (♀). Ervália, Parque Estadual Serra do Brigadeiro: MZUFV5063 (♂), MZUFV5064. (♀). Januária: CMUFLA1523 (♂), CMUFLA 1524 (♂), CMUFLA1525 (♀), CMUFLA 1526 (♀), CMUFLA 1527 (♂).
Xeronycteris vieirai (total 01) - Jaíba: ALP6824 (♀).

Appendix 2. Gazetteer of bat collecting localities in Minas Gerais, Brazil, arranged in alphabetical order of the source.

Locality	Coordinate	Author
2 km S of Sete Lagoas	-19.43333; -44.18333	Tavares et al. (2010)
Abaeté	-19.15000; -45.43333	Tavares et al. (2010)
Aiuruoca	-21.97075; -44.59703	This study
Alfenas	-21.41667; -45.93333	Tavares et al. (2010)
Alpinópolis	-20.85597; -46.40282	This study
APA Lagoa Santa - Lagoa Santa	-19.54083; -43.99017	This study
APA Rio Pandeiros – Bonito de Minas	-15.64619; -44.67427	Nascimento et al. (2016)
APA Vargem das Flores - Betim	-19.88472; -44.17444	This study
APA Vargem das Flores - Contagem	-19.83639; -44.11861	This study
APE Fechos – Nova Lima	-20.08240; -43.96861	This study
Arceburgo	-21.36667; -46.96667	Tavares et al. (2010)
Arcos	-20.29128; -45.54769	This study
Areado	-21.39556; -46.19333	Gregorin et al. (2020)
Arinos; Urucuia	-15.93222; -45.78000	Stumpp et al. (2016)
Arinos; Urucuia	-16.08111; -45.85028	Stumpp et al. (2016)
Baixo Rio Piraciba - Parque Estadual do Rio Doce - Marliéria	-19.49222; -42.51556	Aires et al. (2016)
Barão de Cocais	-19.87639; -43.46333	Moras et al. (2015)
Barão de Cocais	-19.88278; -43.47139	Moras et al. (2015)
Barão de Cocais	-19.87722; -43.43667	This study
Barão de Cocais	-19.88528; -43.48694	This study

Continues

Locality	Coordinate	Author
Barão de Cocais	-19.89083; -43.46222	This study
Barbacena	-21.23639; -43.74868	This study
Bela Lorena - Formoso	-15.21562; -46.03114	This study
Bela Vista de Minas	-19.78881; -43.18540	This study
Belisário – Muriaé	-20.88488; -42.45390	This study
Belo Horizonte	-19.91667; -43.91667	Tavares et al. (2010)
Belo Horizonte	-19.93157; -43.89793	This study
Belo Horizonte - Parque Municipal das Mangabeiras	-19.94980; -43.90917	This study
Benjamin Constant	-21.95000; -42.88333	Tavares et al. (2010)
Betim	-19.96667; -44.18333	Tavares et al. (2010)
Betim	-19.90167; -44.15944	This study
Bom Despacho	-19.72197; -45.29840	This study
Brazilândia de Minas	-16.87528; -46.17333	Stumpp et al. (2016)
Brazilândia de Minas	-17.02833; -46.08361	Stumpp et al. (2016)
Brumadinho	-20.11328; -44.10622	This study
Cachoeira Casca D'Anta; Parque Nacional da Serra da Canastra - São Roque de Minas	-20.24528; -46.36583	This study
Cachoeira da fada - Airuoca	-22.08028; -44.64639	Dias et al. (2015)
Cachoeirinha - Airuoca	-22.06583; -44.60833	Dias et al. (2015)
Campolina	-19.70000; -42.50000	Velazco et al. (2014)
Caratinga	-19.78972; -42.14194	Taddei (1975)
Catas Altas	-20.07734; -43.37067	This study
Caverna do Carimbado - São Tomé das Letras	-21.71667; -44.98333	Tavares et al. (2010)
Caverna Olhos D'água - Parque Nacional Cavernas do Peruaçu - Januária	-15.11361; -44.16944	Monte and Bichuette (2020)
Caverna Olhos D'água - Parque Nacional do Peruaçu - Itacarambi	-15.11667; -44.16667	Tavares et al. (2010)
Caverna Olhos D'água -Parque Nacional Cavernas do Peruaçu - Itacarambi	-15.11370; -44.16960	This study
Chalé	-20.03499; -41.75122	This study
Chapada do Abanador - Minduri; Carrancas	-21.58333; -46.55000	Moras et al. (2013)
Chapada do Abanador - Minduri	-21.59417; -44.56778	Gregorin et al. (2020)
Complexo da Lapinha - Lagoa Santa	-19.56219; -43.96028	This study
Conceição do Ipanema	-19.98663; -41.71731	This study
Conceição do Mato Dentro	-19.00863; -43.39244	This study
Conselheiro Pena	-19.49022; -41.51456	This study
Contagem	-19.88056; -44.11778	This study
Cordisburgo	-19.12528; -44.32250	Almeida et al. (2002)
Coroaci	-18.65924; -42.24463	This study
Curvelo	-18.74917; -44.44667	Almeida et al. (2002)
Curvelo	-19.81667; -43.95000	Tavares et al. (2010)
Curvelo	-18.75639; -40.43083	This study
Descoberto	-21.45000; -42.96667	Esbérard et al. (2011)
Diamantina	-18.26972; -43.38444	Almeida et al. (2016)
Diamantina	-18.38333; -44.01667	Dias et al. (2013)
Distrito de Antônio dos Santos - Caeté	-19.70250; -43.55972	This study
Distrito de Nova Esperança - Montes Claros	-16.73222; -43.93722	Oliveira et al. (2019)
Distrito de Palmital de Minas - UHE Queimado - Cabeceira Grande	-16.20501; -47.30607	This study
Distrito de Posses, UHE Irapé - Leme do Prado	-17.03628; -42.78306	This study
Divino	-20.54552; -42.09396	This study
Divinópolis	-20.13333; -44.88333	Tavares et al. (2010)
Dores de Guanhães	-19.03687; -42.89655	This study
EPTEA Mata do Paraíso - Viçosa	-20.79972; -42.86306	Nascimento et al. (2013b)
EPTEA Mata do Paraíso - Viçosa	-20.80278; -42.85722	Nascimento et al. (2013b)
Esmeraldas	-19.76556; -44.28556	Uieda (1993)
Espera Feliz	-20.65962; -41.92954	This study
Estação de Pesquisa e Desenvolvimento Ambiental de Peti - Santa Bárbara	-19.95944; -43.41523	This study
Estação de Pesquisa e Desenvolvimento Ambiental Galheiro - Perdizes	-19.20407; -47.14737	This study
Estação de Piscicultura - Rio São Francisco - Três Marias	-18.20000; -45.23333	Tavares et al. (2010)
Estação Ecológica da UFMG – Belo Horizonte	-19.87366; -43.97255	This study

Continues

Locality	Coordinate	Author
Estação Ecológica de Fechos - Nova Lima	-20.06667; -43.95000	Talamoni et al. (2013)
Estação Ecológica de Pirapitinga – Morada Nova de Minas	-18.39758; -45.25714	This study
Estação Ecológica de Pirapitinga – Três Marias	-18.36411; -45.32439	This study
Estação Ecológica Pirapitinga – Morada Nova de Minas	-18.33333; -45.33333	Bolzan (2011)
Estância Serra Negra – Patrocínio	-18.86778; -46.84917	This study
Estrada entre Januária e Itacarambi – Vale do Peruaçu	-15.48333; -44.35000	Tavares et al. (2010)
Faria Lemos	-20.73965; -41.94885	This study
Fazenda Agroecológica Izabela Hendrix - Sabará	-19.88611; -43.83806	Oliveira et al. (2019)
Fazenda Agropeva - Jaíba	-15.42960; -43.91820	This study
Fazenda Baroneza - Santa Luzia	-19.76972; -43.85139	This study
Fazenda Bethânea - Montalvânia	-14.29579; -44.40799	This study
Fazenda Bethânea - Juvenília	-14.39882; -44.26215	This study
Fazenda Brejão - Brasilândia de Minas	-17.03333; -45.83333	Tavares et al. (2010)
Fazenda Cauaia – Matozinhos	-19.46667; -44.00000	Talamoni et al. (2013)
Fazenda Corinto - Corinto	-18.35217; -44.42900	This study
Fazenda Corrente - Várzea da Palma	-17.59806; -44.73083	This study
Fazenda Curral Velho - 28km a leste de Grão Mogol - Grão Mogol	-16.55944; -42.88972	This study
Fazenda Esmeralda - Rio Casca	-20.07121; -42.73618	This study
Fazenda Experimental Agroecológica Isabela Hendrix, Roça Grande - Sabará	-19.88861; -43.83833	This study
Fazenda Fortaleza de Santa Terezinha - Jequitaí	-17.18333; -44.54389	This study
Fazenda Macaúbas – Patrocínio	-19.00611; -47.23083	This study
Fazenda Macedônia - Ipatinga	-19.45860; -42.42973	This study
Fazenda Moeda - Itapagipe	-19.90000; -49.36667	Tavares et al. (2010)
Fazenda Moinho - Lagoa Santa	-19.66826; -43.83026	This study
Fazenda N.S. Aparecida; 3 Km de Rio Grande - Uberaba	-19.73333; -47.91667	Tavares et al. (2010)
Fazenda Paraopeba - Barra do Paraopeba	-19.30000; -44.43333	Tavares et al. (2010)
Fazenda Pedras - Sete Lagoas	-19.46583; -44.24667	This study
Fazenda Prata - Além Paraíba	-21.11667; -42.13333	Tavares et al. (2010)
Fazenda São Francisco - Lassance	-17.88667; -44.57750	This study
Fazenda São Lourenço	-16.24778; -44.46899	This study
Fazenda Vargem Grande - Ponte Nova	-20.06667; -42.15000	Tavares et al. (2010)
Fechos	-19.91667; -43.91667	Tavares et al. (2010)
Felixlândia	-18.72321; -44.93024	This study
Fervedouro	-20.61992; -42.33250	This study
Florestal	-19.88370; -44.41705	This study
Foz do Rio Itacambiruçu - Grão Mogol	-16.56666; -42.74091	This study
Frutal	-20.01667; -48.93333	Tavares et al. (2010)
Furna Misteirosa - Sete Lagoas	-19.09250; -44.34944	Tejedor (2011)
Grupiara	-18.45053; -47.75073	This study
Gruta Abrigão das Cerâmicas - Prudente de Morais	-19.48002; -44.09289	This study
Gruta Brega (Caverna Brega I)	-20.43056; -45.75528	This study
Gruta da Fazenda Saco dos Cochos - Cordisburgo	-19.12500; -44.32083	This study
Gruta da Lapinha - Lagoa Santa	-19.63333; -43.88333	Tavares et al. (2010)
Gruta da Lapinha - Lagoa Santa	-19.63333; -43.88333	Tavares et al. (2010)
Gruta das Janelas - Prudente de Morais	-19.48552; -44.08816	This study
Gruta do Salitre - Diamantina	-18.27849; -43.53628	This study
Gruta Fazenda da Pia - Prudente de Morais	-19.48414; -44.11229	This study
Gruta Isaías - Pains	-20.36806; -45.65778	This study
Gruta Morrinho das Pedras (Caverna Torre) - Pains	-20.35694; -45.66472	This study
Gruta Santuário (Caverna Brega II) - Pains	-20.42056; -45.77389	This study
Inhapim	-19.41750; -42.01139	This study
Inhotim - Brumadinho	-20.11667; -44.21667	Talamoni et al. (2013)
Ipatinga	-19.48333; -43.53333	Tavares et al. (2010)
Itabira	-19.66583; -43.21222	Silva et al. (2005)

Continues

Locality	Coordinate	Author
Itabira	-19.65667; -43.31694	This study
Itabirito	-20.41811; -43.73843	This study
Itacarambi	-15.17229; -44.19584	This study
Itambé do Mato Dentro	-19.41028; -43.34944	Nascimento et al. (2013a)
Itinga	-16.63472; -41.84833	Almeida et al. (2016)
Itinga - Santana do Araçuaí	-18.80000; -41.41667	Tavares et al. (2010)
Jaíba (Riacho Mocambinho)	-15.09694; -44.03444	Nogueira et al. (2015)
Jaíba (Mocambinho)	-15.09083; -44.01889	Nogueira et al. (2015)
Jaíba (Lagoa do Sossego)	-15.07750; -44.00917	Nogueira et al. (2015)
Jaíba (Campus Avançado de Monitoramento)	-15.10139; -44.02028	Nogueira et al. (2015)
Jaíba (Reserva da Fazenda Yamada - Mata da Agroceres)	-15.07167; -43.99556	Nogueira et al. (2015)
Jaíba (Dreno Jaíba)	-15.09972; -43.99000	Nogueira et al. (2015)
Jaíba (Fazenda Solagro)	-15.08472; -43.94194	Nogueira et al. (2015)
Jaíba (Área B)	-15.17806; -43.97056	Nogueira et al. (2015)
Jaíba (Área F)	-15.13861; -43.93611	Nogueira et al. (2015)
Jaíba (Área C2)	-15.07194; -43.84528	Nogueira et al. (2015)
Jaíba (Reserva Biológica do Jaíba)	-15.06861; -43.76028	Nogueira et al. (2015)
Jaíba (Fazenda Serra Azul)	-15.22056; -43.90167	Nogueira et al. (2015)
Jaíba	-15.33333; -43.66667	Tavares et al. (2010)
Jequitaí	-17.00000; -44.65000	This study
Jequitinhonha	-16.42816; -41.02942	This study
Juiz de Fora	-21.76667; -43.36667	Esbérard et al. (2011)
Lagoa dos Martins - Piumhi	-20.34396; -45.94702	This study
Lagoa Santa	-19.63361; -43.88361	Winge (1893)
Lagoa Santa	-19.68846; -43.87955	This study
Lagoa Santa	-19.10000; -43.15000	Tavares et al. (2010)
Lapa do Marimbondo - Brasília de Minas	-16.23555; -44.49178	This study
Lapa Pedra Escrita - Brasília de Minas	-16.23555; -44.49178	This study
Lapa Sem Fim - Luislândia	-16.14839; -44.62722	This study
Lavras	-21.24583; -44.99972	Gregorin and Loureiro (2011)
Lavras	-21.11667; -44.93333	Tavares et al. (2010)
Lima Duarte	-21.83333; -43.80000	Esbérard et al. (2011)
Lima Duarte	-21.88333; -43.70000	Tavares et al. (2010)
Machacalis	-17.06667; -40.75000	Tavares et al. (2010)
Manga	-14.75694; -43.94194	Avila-Cabadilla et al. (2007)
Manga	-15.33333; -43.66667	Tavares et al. (2010)
Manhuaçu	-20.19256; -42.08244	This study
Mariana	-20.36667; -43.40000	Tavares et al. (2010)
Mariana	-20.17444; -43.44861	This study
Mariana	-20.17944; -43.47028	This study
Mariana	-20.17139; -43.43167	This study
Mariana	-20.13694; -43.40583	This study
Mariana	-20.16000; -43.42944	This study
Mariana	-20.15083; -43.41194	This study
Mata do Passarinho – Bandeira, Minas Gerais / Macarani, Bahia	-15.79161; -40.52447	This study
Matozinhos	-19.56389; -44.06083	Oliveira et al. (2019)
Matozinhos	-19.54339; -44.07518	This study
Matutina	-19.21973; -45.87675	This study
Medina	-16.22250; -41.47667	Silveira et al. (2015)
Mina de Paulina - Caeté	-19.88333; -43.65000	Tavares et al. (2010)
Minas Novas	-17.21861; -42.59028	This study
Miradouro	-20.84810; -42.40315	This study
Moeda	-20.33806; -43.93500	Moras et al. (2015)
Moeda	-20.33306; -43.94417	Moras et al. (2015)
Monjolos	-18.32677; -44.12034	This study

Continues

Locality	Coordinate	Author
Montes Claros	-16.73500; -43.86194	Carneiro et al. (2009)
Montes Claros	-16.72864; -43.85821	This study
Montes Claros	-16.75894; -43.85625	This study
Monumento Natural Lapa Vermelha - Pedro Leopoldo	-19.61327; -43.99829	This study
Morada Nova de Minas	-18.33333; -45.28333	This study
Morro do Imperador - Juiz de Fora	-21.75750; -43.36667	Barros et al. (2006)
Morro do Pilar	-19.21350; -43.37144	This study
Muzambinho	-21.35250; -46.52333	Gregorin et al. (2020)
Nova Lima	-20.12056; -43.97528	Moras et al. (2015)
Nova Lima	-20.13500; -43.98028	Moras et al. (2015)
Nova Lima	-20.18194; -43.97417	This study
Ouro Preto	-20.38333; -43.50000	Tavares et al. (2010)
Ouro Preto	-20.21668; -43.51524	This study
Ouro Preto	-20.27722; -43.50389	This study
Pains	-20.06667; -45.11667	Tavares et al. (2010)
Pains	-20.32037; -45.66974	This study
Pains	-20.35560; -45.60443	This study
Pará de Minas	-19.86851; -44.57515	This study
Paracatu de Baixo - Mariana	-20.31851; -43.23951	This study
Parque Ambiental Alcoa - Poços de Caldas	-21.79208; -46.50828	This study
Parque do Museu Mariano Procópio - Juiz de Fora	-21.74667; -43.36083	Barros et al. (2006)
Parque Estadual da Lapa Grande - Montes Claros	-16.70819; -43.94283	This study
Parque Estadual da Mata Seca	-14.83204; -49.99020	Falcão et al. (2014)
Parque Estadual Serra do Brigadeiro - Ervália	-20.86666; -42.52361	This study
Parque Estadual da Serra do Papagaio - Itamonte	-22.14111; -44.72667	Carvalho et al. (2013)
Parque Estadual de Grão Mogol - Grão Mogol	-16.60743; -42.94028	This study
Parque Estadual do Ibitipoca - Lima Duarte	-21.85000; -43.80000	Esbérard et al. (2011)
Parque Estadual do Ibitipoca - Lima Duarte	-21.66667; -43.91667	Nobre et al. (2013)
Parque Estadual do Ibitipoca - Lima Duarte	-21.88333; -43.70000	Tavares et al. (2010)
Parque Estadual do Ibitipoca - Lima Duarte	-21.70357; -43.89367	This study
Parque Estadual do Rio Doce - Marliéria	-19.80500; -42.47167	Oliveira (2013)
Parque Estadual do Rio Doce - Marliéria	-19.80000; -42.46667	Stallings et al. (1990)
Parque Estadual do Rio Doce – Marliéria	-19.51667; -42.53333	Tavares et al. (2010)
Parque Estadual do Rio Doce - Marliéria	-19.71667; -42.65000	This study
Parque Estadual do Rio Preto - São Gonçado do Rio Preto	-18.10897; -43.34637	This study
Parque Estadual do Rio Preto - São Sebastião do Rio Preto	-18.12083; -43.34333	Oliveira et al. (2019)
Parque Estadual Serra do Rola-Moça - Nova Lima	-20.01667; -43.96667	Talamoni et al. (2013)
Parque Municipal da Sapucaia - Montes Claros	-16.74394; -43.90349	This study
Parque Nacional Cavernas do Peruaçu - Itacarambi	-15.10998; -44.24011	This study
Parque Nacional Cavernas do Peruaçu - Januária	-15.11667; -44.26667	Pinto et al. (2010)
Parque Nacional da Serra do Cipó	-19.51361; -43.74472	This study
Parque Nacional da Serra do Cipó - Jaboticatubas	-19.51361; -43.74472	This study
Parque Nacional Serra do Cipó - Jaboticatubas	-19.34944; -43.61806	Oliveira et al. (2019)
Parque Nacional Serra do Cipó - Jaboticatubas	-19.50000; -43.73333	Tavares et al. (2010)
Paruqe Estadual da Lapa Grande – Montes Claros	-16.70222; -43.91583	Oliveira et al. (2019)
PCH Varginha - São José do Mantimento	-20.03499; -41.75122	This study
Pedreira de Salinas - Salinas	-16.12972; -42.27365	This study
Pedreira; Vale da Escalada, Serra do Cipó - Santana do Riacho	-19.30000; -43.60000	This study
Pirapanema - Muriaé	-21.05252; -42.48194	This study
Pirapora	-17.35000; -44.95000	Tavares et al., (2010)
Pirapora	-17.42108; -44.93431	This study
Poços de Caldas	-21.13333; -46.10000	Tavares et al. (2010)
Pompéu	-19.21960; -45.03449	This study
Ponte Nova	-20.06667; -42.15000	Tavares et al. (2010)
Pouso Alegre	-22.23333; -45.95000	Tavares et al. (2010)

Continues

Locality	Coordinate	Author
Pouso Alegre	-22.20139; -45.33222	This study
Prudente de Morais	-19.47035; -44.14730	This study
Refúgio da Vida Silvestre Rio Pandeiros - Januária	-15.66667; -44.63306	This study
Reserva Biológica de Acauã (Estação Ecológica de Acauã) - Leme do Prado	-17.08873; -42.72274	This study
Reserva Biológica Serra Azul - Mocambinho - Jaíba	-14.73333; -44.05000	Tavares et al. (2010)
Riachinho	-16.15139; -45.76194	Stumpp et al. (2016)
Riachinho	-16.29167; -45.89833	Stumpp et al. (2016)
Riacho Mocambinho - Jaíba	-15.09694; -44.03444	Dias et al. (2013)
Rio Acima	-20.11179; -43.72900	This study
Rio Acima	-20.07278; -43.81028	This study
Rio das Velhas - Jaguaraçú	-19.08333; -42.11667	Tavares et al. (2010)
Rio Matipó	-19.55000; -42.55000	Tavares et al. (2010)
Rio Pardo de Minas	-15.60113; -42.55680	This study
Rio Piracicaba	-19.94916; -43.20110	This study
Rio Preto	-22.01667; -43.86667	Esbérard et al. (2011)
Rio São Francisco - São Roque de Minas	-20.34889; -46.07500	This study
RPPN Fazenda da Lagoa - Monte Belo	-21.41139; -46.26472	Souza et al. (2011)
RPPN Feliciano Miguel Abdalla - Caratinga	-19.72722; -41.82139	Tavares et al. (2010)
RPPN Guilman Amorim - Antônio Dias	-20.25000; -43.08333	Tavares et al. (2010)
RPPN Mata do Sossego - Simonésia	-20.18333; -42.01667	Tavares et al. (2010)
RPPN Peti - Santa Bárbara	-19.95000; -43.40000	Tavares et al. (2010)
RPPN Santuário do Caraça - Catas Altas	-20.09694; -43.48833	This study
RPPN Santuário do Caraça - Santa Bárbara	-20.09750; -43.48833	This study
RPPN Serra do Caraça - Catas Altas	-20.08333; -43.48333	Tavares et al. (2010)
RPPN Serra do Caraça - Santa Bárbara	-20.08333; -43.48333	Tavares et al. (2010)
Sabará	-19.90000; -43.96667	Tavares et al. (2010)
Sacramento	-19.88333; -47.45000	Tavares et al. (2010)
Salinas	-16.16667; -42.28333	Tavares et al. (2010)
Salinas	-16.12531; -42.28094	This study
Santa Cruz de Monte Alverne - Miradouro	-20.83051; -42.42581	This study
Santa Maria de Itabira	-19.40584; -43.17112	This study
Santa Rita do Itueto	-19.27686; -41.37694	This study
Santa Rita do Jacutinga	-22.09056; -44.16056	Dias et al. (2015)
Santa Vitória	-18.87347; -50.34863	This study
São Gonçalo - Espera Feliz	-20.56244; -42.02930	This study
São Gonçalo do Rio Abaixo	-19.88167; -43.42778	This study
São Gonçalo do Rio Abaixo	-19.79640; -43.36582	This study
São João da Ponte	-16.01740; -43.70448	This study
São João do Norte - Divino	-20.54552; -42.09396	This study
São José da Lapa	-19.71222; -43.94222	Torquetti et al. (2013)
São José da Lapa	-19.45860; -42.42973	This study
São Sebastião da Vargem Alegre	-21.02393; -42.56495	This study
Senhora do Porto	-19.02404; -42.92790	This study
Serra da Moeda - Moeda	-20.33306; -43.94417	This study
Serra de Pirapanema - Miraí	-21.09129; -42.50216	This study
Serra do Carrapato	-21.32944; -45.67694	Loureiro and Gregorin (2015)
Serra do Salitri	-19.10000; -46.68333	Tavares et al. (2010)
Serra do Sapo - Conceição do Mato Dentro	-18.92822; -43.41949	This study
Serra Negra - Rio Petro	-22.02944; -43.87528	Nobre et al. (2009)
Serra Negra - Santa Bárbara do Monte Verde	-21.97250; -43.83500	Nobre et al. (2009)
Serro	-18.59620; -43.36908	This study
Sete Lagoas	-19.06667; -44.05000	Tavares et al. (2010)
Sítio do Mato - Santana do Sobradinha - Carinhanha	-14.30000; -43.75000	Tavares et al. (2010)
Sítio Monjolinho - Dores do Indaiá	-19.46426; -45.57822	This study

Continues

Locality	Coordinate	Author
Sítio Serrinha divisa dos municípios de Paraisópolis e Brazópolis	-22.87417; -46.17250	This study
Teófilo Otoni	-17.85000; -41.50000	Tavares et al. (2010)
Três Marias	-18.22328; -45.24741	This study
Tupaciguara	-18.58333; -48.70000	Tavares et al. (2010)
Turmalina	-17.11552; -42.96509	This study
Ubá	-21.01667; -43.03333	Tavares et al. (2010)
Uberlândia	-21.41139; -46.26500	Novaes et al. (2014)
Uberlândia	-18.91444; -48.27528	Olímpio et al. (2018)
Uberlândia	-18.92583; -48.28278	Oliveira et al. (2019)
Uberlândia	-18.91667; -48.28333	Stutz et al. (2004)
UHE Batalha - Paracatu	-17.32583; -47.43040	This study
UHE Bibocas - Rio Doce	-20.22938; -42.79530	This study
UHE Irapé - Grão Mogol	-16.64546; -42.71702	This study
UHE Retiro Baixo - Pompéu	-18.87786; -44.77857	This study
UHE Travessão	-19.85776; -41.81617	This study
Unaí	-16.39583; -46.90250	Olímpio et al. (2018)
Unaí	-16.21590; -47.29082	This study
Vargem Alegre	-20.31667; -44.16667	Tavares et al. (2010)
Vespasiano	-19.71416; -43.91494	This study
Viçosa	-20.75000; -42.86667	Tavares et al. (2010)
Visconde do Rio Branco	-21.01028; -42.84056	This study

Appendix 3. Richness, sampled municipalities until 2010 and sampled municipalities after 2010 for each mesoregion of the Minas Gerais state.

Mesoregion	Richness	Sampled municipalities	
		Until 2010	After 2010
Norte de Minas	67	7	21
RMBH	64	11	46
Vale do Rio Doce	62	7	15
Triângulo Mineiro	50	6	12
Zona da Mata	45	6	26
Campo das Vertentes	41	1	5
Central Mineira	39	4	10
Sul e Sudoeste de Minas	38	5	16
Jequitinhonha	35	1	13
Noroeste de Minas	33	1	8
Oeste de Minas	26	2	6
Vale do Mucuri	2	2	3
State of Minas Gerais	99	53	181