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Filling gaps between museum and society: An illustrated catalog of the primary type specimens of Squamata housed in the Museu Nacional, Rio de Janeiro, Brazil

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Abstract

Scientific collections constitute an impressive record of life on Earth and therefore play a key role for documentation of the historical spatiotemporal patterns of changes in biodiversity. The Museu Nacional/UFRJ in Rio de Janeiro, Brazil, houses collections dating back to the to the mid-19th Century. In order to maximize preservation and management of the Museu Nacional's herpetological collections, the digitization process began with priority given to the primary type specimens. We provide an illustrated catalog based on right-resolution 2D images with purpose to make the collection of primary type specimens of Squamata housed at the Museu Nacional more accessible, facilitating taxonomic research and scientific dissemination to society. A total of 63 primary types (55 holotypes, 5 syntypes, 2 lectotypes, and 1 neotype) were photographed; these species are allocated in 16 families and 34 genera, geographically concentrated in Brazil. In addition, the Museu Nacional/UFRJ houses another 702 secondary types of reptiles (all paratypes) classified in 16 families and 37 genera, geographically concentrated in South America, including two Testudines species. We discussed the relevance of collections housed in natural history museums, highlighting that they represent essential tools for both short-term and long-term studies on biodiversity, including species that are already extinct in the nature. In addition, we noted that digitization process of preserved specimens and their metadata allow broader remote access information and, as an indirect consequence, it helps to preserve the physical specimens by reducing the need of direct handling, increasing the longevity of the samples for the future generations.

Key words: Scientific collections, 2D digitization, extended specimen concept, curatorial management, amphisbaenians, chelonians, lizards, snakes, historical samples, open science, taxonomy

Introduction

The genesis of the term species goes back to its own etymology (Είδος from the Greek). Such taxonomic category was first employed by Plato and later by Aristoteles in a typological context, representing a class of immutable things in which the variants of this class would be imperfect manifestations of their essence (= *Eidos*). Based on classical works of Greek philosophers, naturalists from the beginning of 17th to the mid-19th centuries made use of this typological concept to describe both biota and inanimate objects in the natural world (Mayr 2004). However, in the absence of a standardized classification system encompassing objective set of rules, botanists and zoologists made scientific contributions without any guidance in the establishment of new names (Minelli 2008). Carl von Linné (1707–1778; henceforward Linnaeus), following the Aristotelian logical system, consolidated the consistent use of binomial nomenclature (Linnaeus 1758), even though he was not the first author to employ such a system (Choate 1912). Linnaeus, in his famous *Systema Naturae* (1735–1770), classified the natural world (plants, animals, and minerals) through the unique combination of generic and specific names. The *Systema Naturae* over time underwent several revisions and expansions, making it grow from a work with only 10 pages to a series with 13 editions and thousands of published pages, improving organization through the systematic employment of fully hierarchical classification system (Winsor 2003).

Darwin (1859) promoted a revolutionary shift on the central paradigm from the field of Biological Sciences (see Woodfield 1973), incorporating the premise of population variability as driving force for diversification of organisms. Darwin observed the variations of individuals from the study of natural and captive populations, documenting differences in survival between individuals as a result of the process of Natural Selection. In this way, Darwin established a mechanism for the evolution of biota occurring through a slow and gradual process by accumulation of small modifications favored in certain stochastic scenarios (Dobzhansky 1970; Mayr 1999). Darwin (1859) also incorporated the concept of common ancestry and reinforced that all living species share ancestors at some level of phylogeny, therefore embracing the concept that no species is immutable and all of them undergo changes accumulated over time, generating branches in the tree of life through the speciation events (Gould 2002). Thus, naturalists at the beginning of the 20th century, through theoretical and conceptual scientific advances (see Simpson 1944), gradually abandoned the typological concept of species, as evidence accumulated that species were generated by the combination of natural processes (i.e., anagenesis and cladogenesis) (Hennig 1966). Anyway, Linnaeus (1758) consolidated a nomenclaturally flexible framework that proved adequate to manage a vast body of knowledge about biodiversity and Darwin (1859) provided a first model to understand evolution and classifying nature (Gould 2002).

The International Code of Zoological Nomenclature (ICZN 1999; hereafter *The Code*), establishes a set of rules

for applying animal names to fossil and extant species from the familial to subspecific ranks. Along the chapter 16, *The Code* presents provisions for description of types in the group of species. One of the main requirements is that each onomatophore (*sensu* Dubois *et al.* 2011), optimally, must have a physical type specimen associated with the name and a morphological diagnosis that allows its recognition (ICZN 1999; see Ceríaco *et al*. 2016 and Dubois 2017 for discussion on the inadequacy of photography-based taxonomy). Even though this concept has evolved with the addition of DNA sequences, aiding in the recognition of new lineages and delimitations of existing species (Giribet 2016; Hillis 2019) and, consequently, revealing cryptic diversity (Bickford *et al*. 2006; Struck *et al*. 2018), the morphological diagnosis of taxa continues to represent one of the paramount practices in taxonomy ensuring reproducibility (Rheindt *et al.* 2023; Braby *et al.* 2024). Also, according to chapter 16 of the ICZN (1999), authors must deposit type specimens in an institution that houses a research collection, with adequate facilities for its preservation, maintenance, and future studies by the scientific community (see Uetz *et al*. 2019 for global catalog of primary reptile type specimens).

Museums represent academic structures that carry the mission of collecting, exhibiting, preserving, classifying, and studying their collections, in order to investigate and clarify the history of humanity and the natural world from the view point of science and art (Günay 2012). Therefore, they constitute the main expression for cultural and scientific memory, being environments where research for the preservation of cultural and scientific heritage is carried out. According to the International Council of Museums, the definition of a museum is "a non-profit, permanent institution at the service of society that researches, collects, conserves, interprets and exhibits tangible and intangible heritage. Open to the public, accessible and inclusive, museums promote diversity and sustainability. They act and communicate ethically, professionally and with the participation of communities, offering varied experiences of education, fruition, reflection and knowledge sharing".

The Museu Nacional, Universidade Federal do Rio de Janeiro (hereafter MNRJ), and its comprehensive body of scientific collections and associated personnel, has contributed to scientific and humanitarian development since the 19th century, having actively participated of initiatives to create or strengthen various cultural and research institutions in Latin America (see Duarte 2019). However, on 02 September 2018, the World saw with dismay the Imperial Palace in Rio de Janeiro catch fire due to the lack of government investment in the maintenance of the Brazilian scientific and cultural heritage, resulting in the irreversible loss of more than 20,000,000 cultural artifacts and biodiversity elements carefully curated over two centuries (Zamudio *et al*. 2018). Although the zoological collections of vertebrates (including the amphibians and reptiles' collections), the central library, the herbarium, and some insects and marine invertebrate collections have not been directly affected, the losses resulting from this neglect represent the greatest tragedy for biodiversity in modern history. In fact, the loss of knowledge due to the neglect of government authorities or lack of sufficient policies to safeguard the Brazilian cultural heritage already caused countless tragedies, mostly frequently resulting from fire accidents, such as: the Museu de Arte Moderna in 1978, the Instituto Butantan in 2010, the Museu da Lingua Portuguesa in 2015, the Cinemateca Brasileira in 2016, unfortunately among many others tragedies outside Brazil.

The main objective of this study was to create an illustrated catalog of the primary type specimens of Squamata housed in the MNRJ, contemplating high-resolution images, detailing the collection and metadata organization. The purpose will be to serve as a reference for taxonomic studies on the referred species, in addition to assisting in the conservation of related specimens, reducing physical consultation to the material, providing wide dissemination of information, and ensuring the perpetuation of this information for future generations.

Material and Methods

The MNRJ houses three distinct herpetological collections with separate numbering, the amphibians and the reptiles' collections (MNRJ each with separate numerical sequence), and the Adolpho Lutz collection (AL-MN), which comprises amphibians and reptiles into a single numbering sequence. The last collection was started by Adolpho Lutz (1855–1940) in the Intituto Oswaldo Cruz and destined to Museu Nacional guard in the 1960's by efforts of his daughter, Bertha Lutz (1894–1976). The Adolpho Lutz collection has about 5,000 specimens of amphibians and reptiles and represents a historical collection that is no longer growing. Currently, the MNRJ's reptiles' collection contains more than 28,000 specimens preserved in wet (mostly) or dry conditions. The process of creating this

catalog began with a complete survey of the type specimens. Such specimens are stored in a separate room with respect to the main herpetological collection, and the primary types are stored in fireproof mobile cabinets near the emergency exit, since this material has a priority for rescue in case of incidents or the need to evacuate the building. The institution's cataloging method features a sequential numbering system, where each specimen receives a number preceded by the acronym 'MNRJ', thus generating a label that will be linked to the individual. All preparations (e.g., hemipenes, skulls, and tissue aliquots for DNA study) from the same specimen, as well as their metadata (e.g., photos, μCT scans, audio and video recordings) receive the same numbering and are grouped together in the MNRJ storage server.

After cataloging, each specimen is placed in glass vials with a sealing disc and/or plastic film in a 70º GL Ethanol Solution. The specimens are accommodated according to their own size and could be grouped in a single jar in case of more than one specimen of the given species collected in the same collection event. The label is made with information that accompanies that specimen related to the registration number and digital database. If it is from the collection of types, the label carries with it the category of the type material and, externally, the bottle was marked with a red ribbon to identify the primary types and yellow for the secondary types. We decided to include only the primary types (i.e., holotypes, lectotypes, syntypes, and neotypes) in the catalog, which corresponds to approximately 0.2% from the general MNRJ reptile collection and 12% considering the type collection. This decision is justified by the fact that they represent onomatophores (*sensu* Dubois *et al*. 2011), that is, those individuals who are definitely linked to a given specific epithet and who, therefore, have greater taxonomic and nomenclatural relevance. Nonetheless, we refer to Table 1 for the list of all type specimens of reptiles (primary and secondary ones) housed in the MNRJ to the mid-2025. The rationale of the MNRJ's illustrated types catalog is that this represents the version 1.0 and all updates, including the secondary types, will be included through Museu Nacional online portal currently under construction. In this way, each successive update version will be referenced based on the additions to present catalog and subsequent online updates and upgrades, eventually, including anatomical preparations (e.g., hemipenes and 3D μCT skeleton reconstructions) from the type and other relevant material (e.g., historical collections).

We photographed the body in dorsal and ventral views and head in ventral, dorsal, and lateral views of each of the 63 primary types housed in the MNRJ collections. We take digital photos using different means and equipment, according to the size of specimens. Among them, a Nikon D80 camera attached to a Benro Goplus Fgp28a (aluminum) tripod, with Nikon 105mm Macro lens; a Canon 6D Mark II camera attached to a photo station Atek AT682, with Canon 50 mm or 100 mm Macro lens; and a Leica\ M205C Stereoscope Microscope with movable axis coupled to a Leica DFC 45P camera. First, the specimens were separated by size, and animals with a head or with a total length up to 4 cm were photographed in the stereomicroscope, while those larger than 5 cm were photographed with the camera on a tripod or photo station. The photos in the self-assembly stereomicroscope were taken with the help of the Leica Application Suite Version 4.8.0 program on a computer with an NVIDIA Quadro K620 video card with 2 GB GDDR3 memory, generating images with automatic scaling and light regulation. This equipment allows the taking of images in several layers defined by the program or by the operator, in order to contemplate the different focal points of the specimen. After capturing the images, the program, through various algorithms, processes all the images with the purpose of allowing the depth plane of the specimens to be in focus in the two-dimensional image. The images of the larger specimens were captured using a manual camera attached to a photo station through Helicon Remote software running on the computer with Intel 2.1 GHz i7 processor and 32Gb RAM memory. This equipment also allows the taking of images in several layers defined by the program or by the operator, in order to enable focus on the different points of the specimen. The large animals were placed, one by one, together with a 15 cm ruler in a glass container with 70ºGL Ethanol to completely cover them. A black background was used, being placed under the container, helping to contrast the image. After capture, the images underwent edition in the Adobe Lightroom software, where the scales were created from the ruler images and the background was cleaned, without any editing of parameters from the photographed individuals (e.g., color tones and patterns). The final images were organized and labeled, and edited with scale and Museu Nacional watermark.

We organized the catalog following the taxonomic hierarchy based on Uetz *et al*. (2025) and, later following the alphabetical order inside families, genera, and species. All references pertaining to authority of primary types are included in the literature cited. However, for other taxa, the corresponding references may not be included. For each specimen, we gathered information about the taxon and its original authors, the catalog number, details about the

collection event and type locality, catalog information of the current location of type series (as accurate as possible), and also remarks on the onomatophore measurement [Snout-Vent Length (SVL hereafter)], specimens' preparations, tissue samples available for DNA study, and other relevant information. In the context of geographic coordinates, we specify whether these were provided by the collectors or inferred posteriorly on the basis of associated toponym of collection. We update the toponymic changes overtime, and provide approximate georeferenced spatial data (coordinates and elevation) refined with Google Earth software. On rare occasions, discrepancies were observed between the voucher metadata and the published information. In these instances, we emphasized the differences between our data and the original descriptions. To facilitate comparisons with the literature, there is a scale on each photo expressed in millimeters (= 1 mm) or centimeters (= 1 cm). The institutional abbreviations follow Sabaj (2020), except for the Museu de História Natural do Ceará Prof. Dias da Rocha (MHNCE-R), Pacoti, State of Ceará, Brazil that is lacking from this source.

Results

In this section, the checklist and 2D images portfolio of primary types of Squamata deposited in the MNRJ is presented. The holotypes of *Bothrops jararacussu* Lacerda, 1884, *Apostolepis rondoni* Amaral, 1925, and *Pseudoboa albimaculata* Mello, 1926, supposedly housed in the MNRJ, were not found along our detailed inventory. We believe that the specimen used by Lacerda (1844) in the original description was not preserved in the scientific collection, since he was in charge of a physiology laboratory in the MNRJ and his main interest was the study of venoms and the treatment of snake poisoning. On the other hand, the case of *Apostolepis rondoni* suggest that the specimen did not return to MNRJ after the Amaral's study (Amaral 1925), since many other specimens collected along the famous 'Comissão Rondon', catalogued in the MNRJ and cited by Amaral (1925), are also lacking from the main collection without a proper documentation of loan or donation. However, the matter about the 'Comissão Rondon' reptile's collection will be considered on separate study and deserve careful attention due to broad time lapse and several organization changes in the MNRJ facilities. Finally, a comprehensive search of the complete collections from MNRJ and AL-MN yielded no specimens that correspond to the original illustration by Mello (1926; fig. 12). Furthermore, we were unable to ascertain the location of this specimen within the AL-MN or MNRJ collections. Given that some specimens were apparently lost during the transfer of the AL-MN collection from Instituto Oswaldo Cruz to the Museu Nacional, it is plausible that the holotype of *Pseudoboa albimaculata* was among those missing specimens.

The Museu Nacional reptiles' collections (MNRJ + AL-MN) have 765 type specimens from 99 nominal species, as follows: 55 holotypes, 5 syntypes, 2 lectotypes, 1 neotype, and 702 paratypes (Table 1). These type specimens are distributed in 2 chelonians, 47 amphisbaenians, 177 snakes, and 539 "lizards". All 63 primary types (55 holotypes, 5 syntypes, 2 lectotypes, and 1 neotype) were photographed. These species are classified in 16 families and 37 genera, and are geographically concentrated in Brazil. In addition, the MNRJ houses another 702 secondary types (all paratypes). For 34 species, the collections have both primary and secondary types. Twenty-five of the species in the type collection are represented only by primary type specimens, and 40 species only by paratypes. These 40 species, excluding those from the same species in that the primary types are also in the MNRJ, are classified in an additional 2 families and 14 genera. Altogether, the primary and secondary type specimens represent 18 families and 51 genera of reptiles, geographically concentrated in Brazil, but also including other South American countries, as shown in the Table 1.

TABLE 1. List of the current status (organized in alphabetical order of genus and species, respectively) for type specimens of reptiles (primary and secondary) housed in the Museu Nacional/UFRJ to the date of publication of this paper. The symbols "-" and "√" represent absence or presence, respectively, of such specimen or data on the collections.

Current status	Original taxa	Primary types	Secondary types	Collection status	µCT Scans	Preparations	DNA samples	Type locality
Acanthochelys macrocephala	*Platemys macrocephala*	-	√	√	-	-	-	Brazil
Ameiva parecis	*Cnemidophorus parecis*	-	√	√	-	-	-	Brazil
Ameivula mumbuca	*Cnemidophorus mumbuca*	-	√	√	-	-	-	Brazil
Ameivula nativo	*Cnemidophorus nativo*	MNRJ 4698	√	√	-	Hemipenis	-	Brazil
Amerotyphlops illusorium	*Amerotyphlops illusorium*	-	√	√	√	-	-	Brazil
Amerotyphlops martis	*Amerotyphlops martis*	MNRJ 18744	√	√	√	√	√	Brazil
Amphisbaena acangaoba	*Amphisbaena acangaoba*	-	√	√	-	-	-	Brazil
Amphisbaena carioca	*Amphisbaena carioca*	MNRJ 18293	-	√	-	-	-	Brazil
Amphisbaena carli	*Amphisbaena carli*	MNRJ 19256	√	√	-	Hemipenis	-	Brazil
Amphisbaena carvalhoi	*Amphisbaena carvalhoi*	MNRJ 2095	√	√	-	-	-	Brazil
Amphisbaena mebengokre	*Amphisbaena mebengokre*	MNRJ 25189	√	√	-	-	√	Brazil
Amphisbaena munoai	*Amphisbaena munoai*	-	√	√	-	-	-	Uruguay
Amphisbaena nigricauda	*Amphisbaena nigricauda*	MNRJ 3305	-	√	-	-	-	Brazil
Amphisbaena persephone	*Amphisbaena persephone*	MNRJ 23581	√	√	-	Hemipenis	-	Brazil
Anolis neglectus	*Anolis neglectus*	MNRJ 26927	√	√	-	-	√	Brazil
Anolis phyllorhinus	*Anolis phyllorhinus*	MNRJ 1804	-	√	-	-	-	Brazil
Apostolepis assimilis	*Apostolepis parassimilis*	-	√	√	-	-	-	Brazil
Apostolepis freitasi	*Apostolepis freitasi*	MNRJ 6523	-	√	-	-	-	Brazil
Apostolepis rondoni	*Apostolepis rondoni*	Not catalogued	-	-	-	-	-	Brazil
Atractus akerios	*Atractus akerios*	-	√	√	√	-	-	Brazil
Atractus altagratiae	*Atractus altagratiae*	MNRJ 7888	-	√	√	Hemipenis	-	Brazil
Atractus boimirim	*Atractus boimirim*	-	√	√	√	Hemipenis	-	Brazil
Atractus caete	*Atractus caete*	MNRJ 16936	-	√	√	-	-	Brazil
Atractus dapsilis	*Atractus dapsilis*	MNRJ 14914	√	√	√	Hemipenis	√	Brazil
Atractus francoi	*Atractus francoi*	MNRJ 14914	√	√	√	Hemipenis	-	Brazil
Atractus pachacamac	*Atractus pachacamac*	-	√	√	√	Hemipenis	√	Ecuador
Atractus pantostictus	*Atractus pantostictus*	-	√	√	√	-	-	Brazil
Atractus ronnie	*Atractus ronnie*	MNRJ 14194	√	√	√	Hemipenis	-	Brazil

.....continued on the next page

TABLE 1. (Continued)

Current status	Original taxa	Primary types	Secondary types	Collection status	µCT Scans	Preparations	DNA samples	Type locality
Atractus savagei	*Atractus savagei*	-	√	√	√	Hemipenis	√	Ecuador
Atractus snethlageae	*Atractus flammigerus snethlageae*	-	√	√	√	Hemipenis	-	Brazil
Atractus spinalis	*Atractus spinalis*	-	√	√	√	Hemipenis	√	Brazil
Atractus stygius	*Atractus stygius*	MNRJ 26734	√	√	√	Hemipenis	-	Brazil
Atractus surucucu	*Atractus surucucu*	-	√	√	√	-	-	Brazil
Atractus tartarus	*Atractus tartarus*	MNRJ 16511	√	√	√	Hemipenis	√	Brazil
Atractus thalesdelemai	*Atractus thalesdelemai*	MNRJ 10052	√	√	√	Hemipenis	-	Brazil
Atractus trefauti	*Atractus trefauti*	MNRJ 26709	-	√	√	Hemipenis	√	French Guiana
Atractus ukupacha	*Atractus ukupacha*	-	√	√	√	Hemipenis	√	Ecuador
Basiliscus basiliscus	*Basiliscus basiliscus barbouri*	-	√	√	-	-	-	Colombia
Boa atlantica	*Boa atlantica*	MNRJ 27242	√	√	-	Hemipenis	√	Brazil
Boiruna sertaneja	*Boiruna sertaneja*	MNRJ 2384	√	√	-	-	-	Brazil
Bothrops jararacussu	*Bothrops jararacussu*	Not designated	-	-	-	-	-	Brazil
Bothrops lutzi	*Bothrops lutzi*	AL-MN 5337	-	√	-	-	-	Brazil
Bothrops muriciensis	*Bothrops muriciensis*	MNRJ 7036	-	√	-	-	-	Brazil
Bothrops oligobalius	*Bothrops oligobalius*	-	√	√	-	-	-	Brazil
Chironius brazili	*Chironius brazili*	MNRJ 17480	√	√	-	-	-	Brazil
Chironius dracomaris	*Chironius dracomaris*	MNRJ 27716	√	√	√	Hemipenis	√	Brazil
Chironius foveatus	*Chironius foveatus*	MNRJ 1840	√	√	√	-	-	Brazil
Chlorosoma dunupyana	*Chlorosoma dunupyana*	-	√	√	√	Hemipenis	√	Brazil
Cnemidophorus gaigei	*Cnemidophorus lemniscatus gaigei*	-	√	√	-	-	-	Colombia
Coleodactylus natalensis	*Coleodactylus natalensis*	MNRJ 7005	√	√	-	-	-	Brazil
Coleodactylus brachystoma	*Sphaerodactylus pfrimeri*	MNRJ 1443	-	√	-	-	-	Brazil
Colobosauroides carvalhoi	*Colobosauroides carvalhoi*	MNRJ 2565	-	√	-	-	-	Brazil
Copeoglossum oreades	*Copeoglossum oreades*	MNRJ 6012	√	√	√	-	√	Brazil
Dendrophidion atlantica	*Dendrophidion atlantica*	MNRJ 17018	√	√	-	Hemipenis	-	Brazil

.....continued on the next page

TABLE 1. (Continued)

Current status	Original taxa	Primary types	Secondary types	Collection status	µCT Scans	Preparations	DNA samples	Type locality
Dipsas bothropoides	*Dipsas bothropoides*	MNRJ 26377	-	√	√	-	-	Brazil
Dipsas indica	*Dipsas indica petersi*	-	√	√	√	-	-	Brazil
Dipsas lavillai	*Sibynomorphus lavillai*	-	√	√	-	-	-	Argentina
Dipsas sazimai	*Dipsas sazimai*	MNRJ 15136	√	√	√	Hemipenis	-	Brazil
Dryophylax phoenix	*Thamnodynastes phoenix*	-	√	√	-	-	-	Brazil
Epictia munoai	*Leptotyphlops munoai*	-	√	√	-	-	-	Uruguay
Erythrolamprus longiventris	*Liophis longiventris*	MNRJ 367	-	√	-	-	-	Brazil
Glaucomastix abaetensis	*Cnemidophorus abaetensis*	MNRJ 8616	√	√	-	Hemipenis	-	Brazil
Glaucomastix itabaianensis	*Glaucomastix itabaianensis*	-	√	√	-	Hemipenis	-	Brazil
Glaucomastix littoralis	*Cnemidophorus littoralis*	MNRJ 6536	√	√	-	Hemipenis	-	Brazil
Hydrodynastes gigas	*Hydrodynastes melanogigas*	-	√	√	-	-	-	Brazil
Leposoma baturitensis	*Leposoma baturitensis*	-	√	√	-	-	-	Brazil
Leposternon cerradensis	*Leposternon cerradensis*	-	√	√	-	-	-	Brazil
Leposternon kisteumacheri	*Leposternon kisteumacheri*	MNRJ 4041	√	√	-	Hemipenis, myological dissection	-	Brazil
Leposternon mineiro	*Leposternon mineiro*	MNRJ 16198	√	√	-	-	-	Brazil
Leptophis dibernardoi	*Leptophis dibernardoi*	-	√	√	-	Hemipenis	-	Brazil
Leptophis mystacinus	*Leptophis mystacinus*	-	√	√	-	-	-	Brazil
Loxopholis southi	*Leposoma southi*	-	√	√	-	-	-	Colombia
Lygodactylus neglectus	*Lygodactylus neglectus*	MNRJ 27809	√	√	√	-	√	Brazil
Mesobaena rhachicephala	*Mesobaena rhachicephala*	MNRJ 15324	√	√	-	Hemipenis	-	Brazil
Micrurus albicintus	*Micrurus albicintus*	MNRJ 376	-	√	-	-	-	Brazil
Micrurus anibal	*Micrurus anibal*	MNRJ 18191	√	√	-	Hemipenis; microscope slide	√	Brazil
Micrurus brasiliensis	*Micrurus frontalis brasiliensis*	-	√	√	-	-	-	Brazil
Micrurus carvalhoi	*Micrurus lemniscatus carvalhoi*	-	√	√	-	-	-	Brazil
Micrurus decoratus	*Elaps ezequieli*	AL-MN 5347	-	√	-	-	-	Brazil
Micrurus nattereri	*Micrurus surinamensis nattereri*	-	√	√	-	-	-	Venezuela

.....continued on the next page

TABLE 1. (Continued)

Current status	Original taxa	Primary types	Secondary types	Collection status	µCT Scans	Preparations	DNA samples	Type locality
Oxyrhopus rhombifer	*Oxyrhopus rhombifer septentrionalis*	MNRJ 444	-	√	-	-	-	Brazil
Placosoma limaverdorum	*Placosoma limaverdorum*	-	√	√	-	-	-	Brazil
Placosoma cordylinum	*Ecpleopus lutzae*	MNRJ 4953	-	√	-	-	-	Brazil
Phimophis guerini	*Rhinosimus amarali*	MNRJ 406	-	√	-	-	-	Brazil
Phyllopezus lutzae	*Bogertia lutzae*	MNRJ 1571, 7570–71, 19876–77, MCZ-R 46190–91	-	√	-	-	-	Brazil
Phrynonax sexcarinatus	*Natrix sexcarinatus*	MNRJ 20302	-	√	-	-	-	Brazil
Phrynops williamsi	*Phrynops williamsi*	-	√	√	-	-	-	Brazil
Pseudoboa nigra	*Pseudoboa albimaculata*	Not catalogued	-	-	-	-	-	Brazil
Pseudoboa serrana	*Pseudoboa serrana*	-	√	√	-	-	-	Brazil
Psilops seductus	*Psilops seductus*	MNRJ 19099	√	√	-	Hemipenis, Double-stained for cartilage and bone	√	Brazil
Rodriguesophis iglesiasi	*Rhinostoma bimaculatum*	AL-MN 5367	-	√	-	-	-	Brazil
Siagonodon cupinensis	*Leptotyphlops cupinensis*	MNRJ 387	-	√	-	-	-	Brazil
Siagonodon exiguum	*Siagonodon exiguum*	MNRJ 27562	√	√	√	Hemipenis	√	Brazil
Spilotes sulphureus	*Paraphrynonax versicolor*	MNRJ 405	-	√	-	-	-	Brazil
Tantilla melanocephala	*Tantilla marcovani*	MNRJ 6525	-	√	-	-	-	Brazil
Trilepida fuliginosa	*Leptotyphlops fuliginosus*	MNRJ 10034	√	√	√	Hemipenis	-	Brazil
Trilepida jani	*Tricheilostoma jani*	MNRJ 4263	-	√	-	-	-	Brazil
Tropidophis grapiuna	*Tropidophis grapiuna*	MNRJ 19593	-	√	√	-	-	Brazil
Tropidurus helenae	*Tapinurus helenae*	-	√	√	-	-	-	Brazil
Tupinambis palustris	*Tupinambis palustris*	-	√	√	-	-	-	Brazil
Tupinambis quadrilineatus	*Tupinambis quadrilineatus*	-	√	√	-	-	-	Brazil
Xenodon neuwiedii	*Xenodon hemileucurus*	MNRJ 404	-	√	-	-	-	Brazil

Species Accounts

Squamata Oppel, 1811

Amphisbaenidae Gray, 1844

***Amphisbaena carioca* Rocha, Barros-Filho & Sluys, 2023**
(Fig. 1)

Holotype. Adult male, MNRJ 18293, collected by Carlos Frederico Duarte da Rocha and Monique Van Sluys on 20 September 1997 at the Restinga de Grumari (23º05'S, 43º30'W [approximate]; sea level [approximate]), Municipality of Rio de Janeiro, State of Rio de Janeiro, Brazil.
Remarks. Holotype (100 mm SVL). No tissue samples available.

***Amphisbaena carli* Pinna, Mendonça, Bocchiglieri & Fernandes, 2010**
(Fig. 2)

Holotype. Adult male, MNRJ 19256, collected by Adriana Bocchiglieri on 11 April 2009 at the Jatobá Farm (14°01'S, 45°54'W [approximate]; 910 meters [approximate] above sea level, asl hereafter), Municipality of Jaborandi, State of Bahia, Brazil.
Paratypes. CHUNB 51554, MNRJ 19257.
Remarks. Holotype (264 mm SVL), with prepared hemipenis kept inside a cryotube together with the specimen. No tissue samples available.

***Amphisbaena carvalhoi* Gans, 1965**
(Fig. 3)

Holotype. Adult male, MNRJ 2095, collected by Antenor Leitão de Carvalho on 06 September 1936 at Serra do Acahy [currently Serra do Açaí] (08°11'12"S, 36°42'18"W [approximate]; 1035 m asl [approximate]), Municipality of Poção [formerly District of the Municipality of Pesqueira], State of Pernambuco, Brazil.
Paratypes. MNRJ 1759, MNRJ 2093–2094, MNRJ 2096–2098, CAS-SUR 17289–17290.
Remarks. Holotype (129 mm SVL). Paratype MNRJ 2098 damaged, broken at midbody. No tissue samples available.

***Amphisbaena mebengokre* Ribeiro, Sá, Santos-Jr., Graboski, Zaher, Guedes, Andrade & Vaz-Silva, 2019**
(Fig. 4)

Holotype. Adult male, MNRJ 25189, collected by Jafi M. Carmo and Wilian Vaz-Silva on 22 November 2012 at the banks of the Caiapó River (16º27'25"S, 51º22'41"W [informed]; 464 m asl [informed]), near Santo Antônio do Caiapó Hydroelectric Power Plant, Municipality of Arenópolis, State of Goiás, Brazil.
Paratypes. MNRJ 25190–25198, MPEG 32205–32206, ZUFG 1193–1197, ZUFG 1200–12007.
Remarks. Holotype (159 mm SVL), with tissue samples available [not housed in the MNRJ].

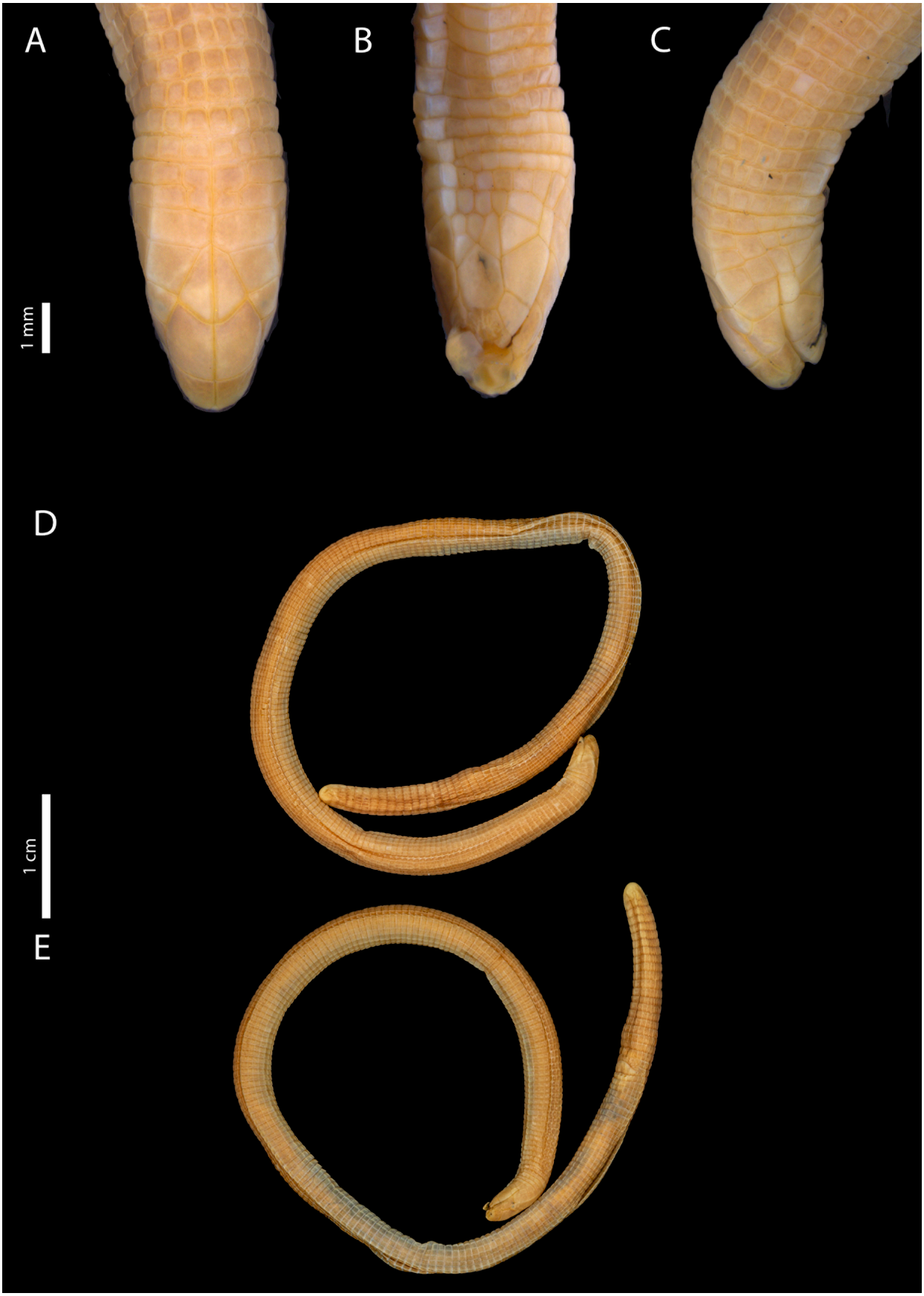

FIGURE 1. Dorsal (A), ventral (B), and lateral (C) views of head and dorsal (D) and ventral (E) views of body of the holotype of *Amphisbaena carioca* Rocha, Barros-Filho & Sluys, 2023.

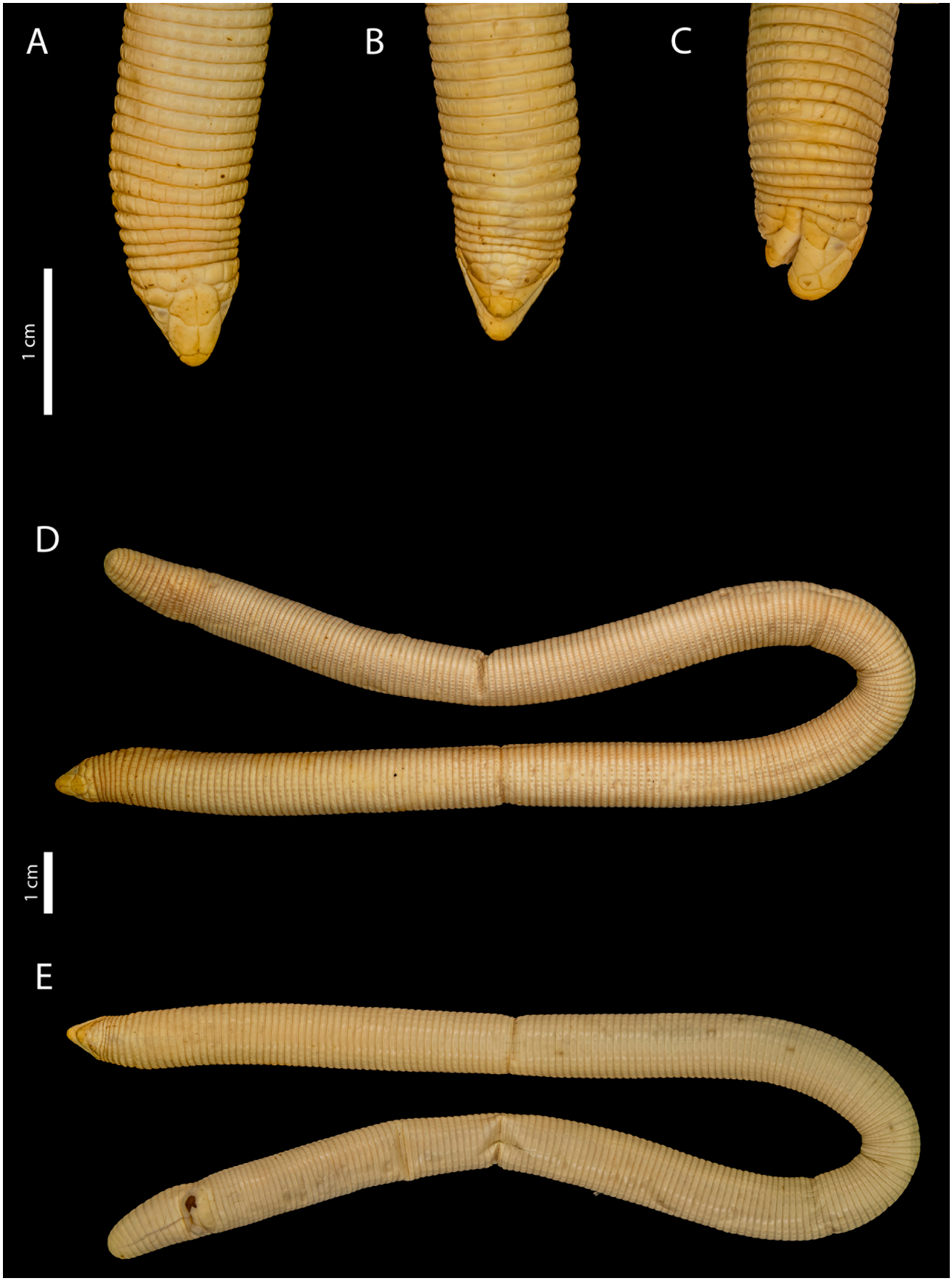

FIGURE 2. Dorsal (A), ventral (B), and lateral (C) views of head and dorsal (D) and ventral (E) views of body of the holotype of *Amphisbaena carli* Pinna, Mendonça, Bocchiglieri & Fernandes, 2010.

FIGURE 3. Dorsal (A), ventral (B), and lateral (C) views of head and dorsal (D) and ventral (E) views of body of the holotype of *Amphisbaena carvalhoi* Gans, 1965.

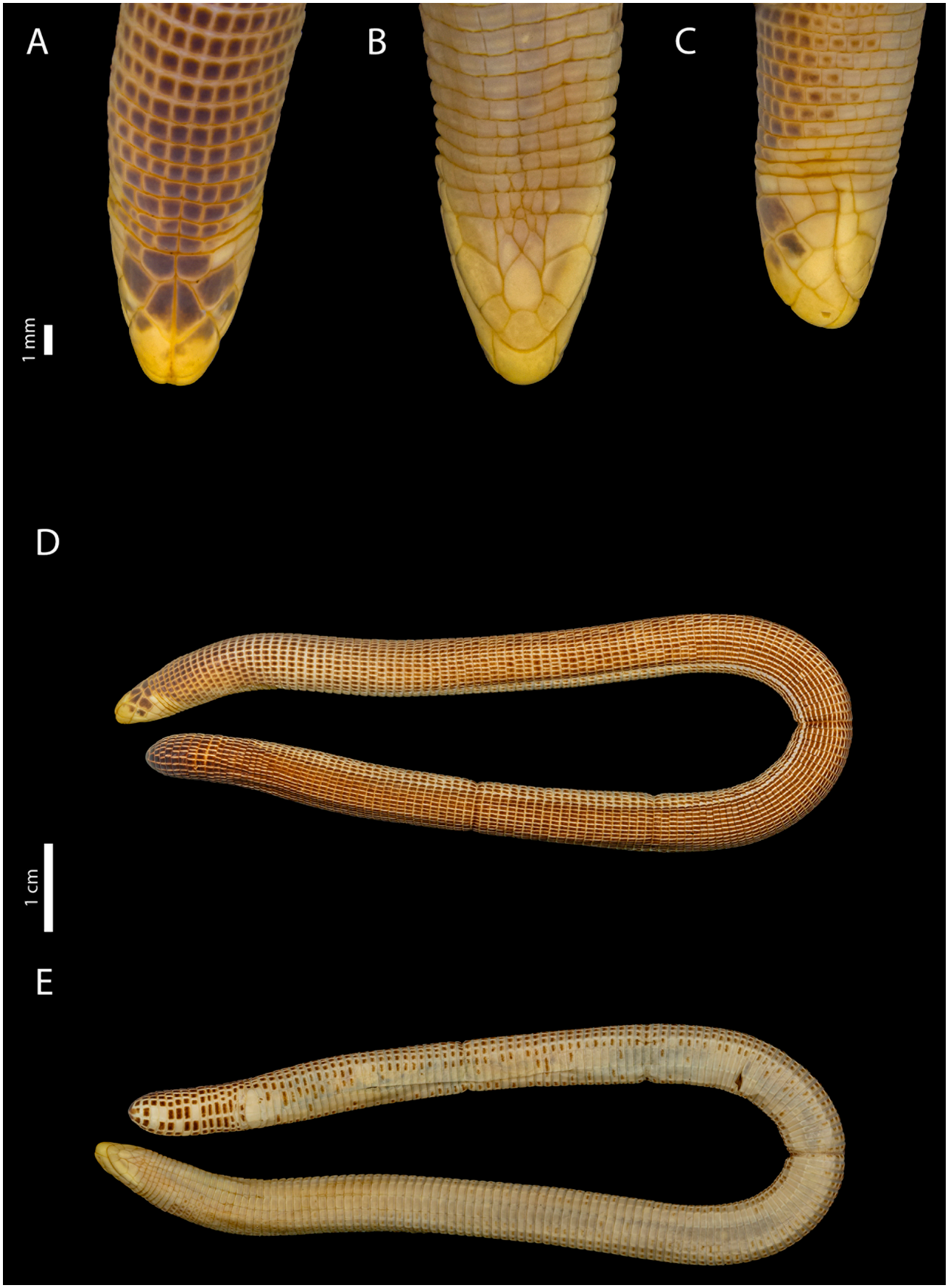

FIGURE 4. Dorsal (A), ventral (B), and lateral (C) views of head and dorsal (D) and ventral (E) views of body of the holotype of *Amphisbaena mebengokre* Ribeiro, Sá, Santos-Jr., Graboski, Zaher, Guedes, Andrade & Vaz-Silva, 2019.

***Amphisbaena nigricauda* Gans, 1966**
(Fig. 5)

Holotype. Adult female, MNRJ 3305, collected by F.M. Oliveira on 10 November 1964 at Sooretama Biological Reserve (19°03'24"S, 40°08'51"W [approximate]; 60 m asl [approximate]), Municipality of Sooretama [formerly Municipality of Linhares], State of Espírito Santo, Brazil.
Paratypes. AMNH 97205, FMNH 264973.
Remarks. The paratype FMNH 264973 was first catalogued in the Carl Gans personal collection (CG 3207) and then transferred to FMNH. No tissue samples available.

***Amphisbaena persephone* Pinna, Mendonça, Bocchiglieri & Fernandes, 2014**
(Fig. 6)

Holotype. Adult male, MNRJ 23581, collected by André F. Mendonça and Adriana Bocchiglieri on 19 November 2008 at the Jatobá Farm (13°53'S, 45°42'W [approximate]; 841 m asl [approximate]), Municipality of Jaborandi, State of Bahia, Brazil.
Paratypes. MNRJ 23582–23590.
Remarks. Holotype (144 mm SVL), with prepared hemipenis kept inside a cryotube together with specimen. No tissue samples available.

***Leposternon kisteumacheri* Porto, Soares & Caramaschi, 2000**
(Fig. 7)

Holotype. Adult male, MNRJ 4041, collected by Marcovan Porto in November 1989 at Mocambinho (14°47'S, 43°55'W [informed]; 440 m asl [approximate]), Municipality of Manga [currently Municipality of Matias Cardoso], State of Minas Gerais, Brazil.
Paratypes. MNRJ 4042–4045, FML 9421.
Remarks. Holotype (356 mm SVL). Paratype MNRJ 4044 with prepared hemipenis kept inside a cryotube together with specimen. Paratype MNRJ 4046 exchanged (FML 9421). No tissue samples available.

***Leposternon mineiro* Ribeiro, Silveira & Santos-Jr., 2018**
(Fig. 8)

Holotype. Adult female, MNRJ 16198, collected by Adriano Lima Silveira on 21 December 2007 at BR-040 Highway (17°45'47"S, 46°09'12"W [informed]; 863 m asl [informed]), Municipality of João Pinheiro, State of Minas Gerais, Brazil.
Paratypes. CHUNB 44482, MNRJ 15489–15490, MNRJ 15766, MNRJ 17795.
Remarks. Holotype (358 mm SVL). No tissue samples available.

***Mesobaena rhachicephala* Hoogmoed, Pinto, Rocha & Pereira, 2009**
(Fig. 9)

Holotype. Adult male, MNRJ 15324, collected by Emiliane Gonçalves Pereira on 23 November 2006 at Saracá-Taquera National Forest (01°50'S, 56°31'W [informed]; 83 m asl [informed]), Porto Trombetas, Municipality of Terra Santa [formerly Municipality of Oriximiná], State of Pará, Brazil.
Paratypes. MNRJ 15325, MPEG 24854.
Remarks. Holotype (245 mm SVL) with prepared hemipenis kept inside a cryotube together with specimen. Paratype MPEG 24854 is damaged, cut into two preserved pieces, but missing a middle part. No tissue samples available.

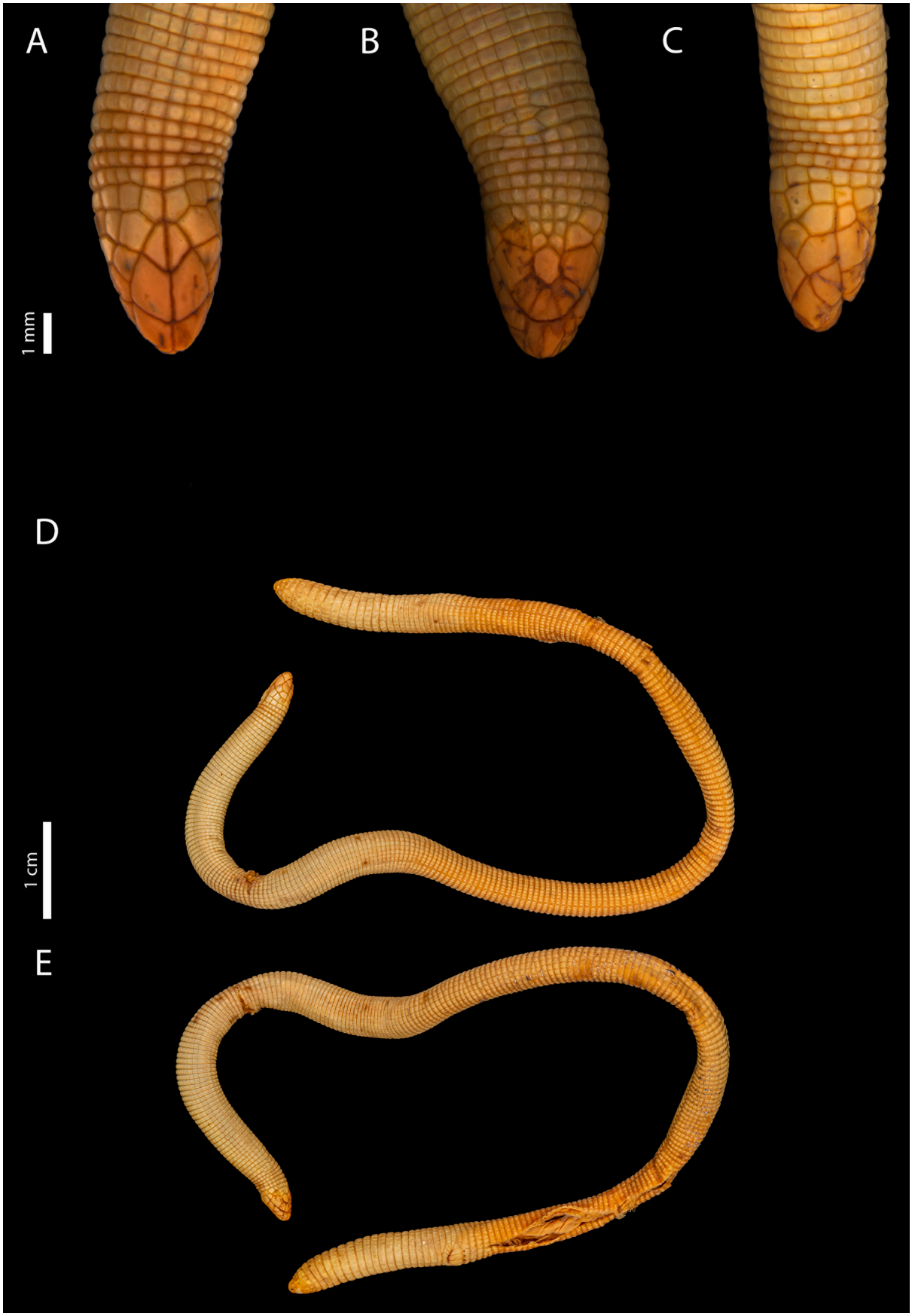

FIGURE 5. Dorsal (A), ventral (B), and lateral (C) views of head and dorsal (D) and ventral (E) views of body of the holotype of *Amphisbaena nigricauda* Gans, 1966.

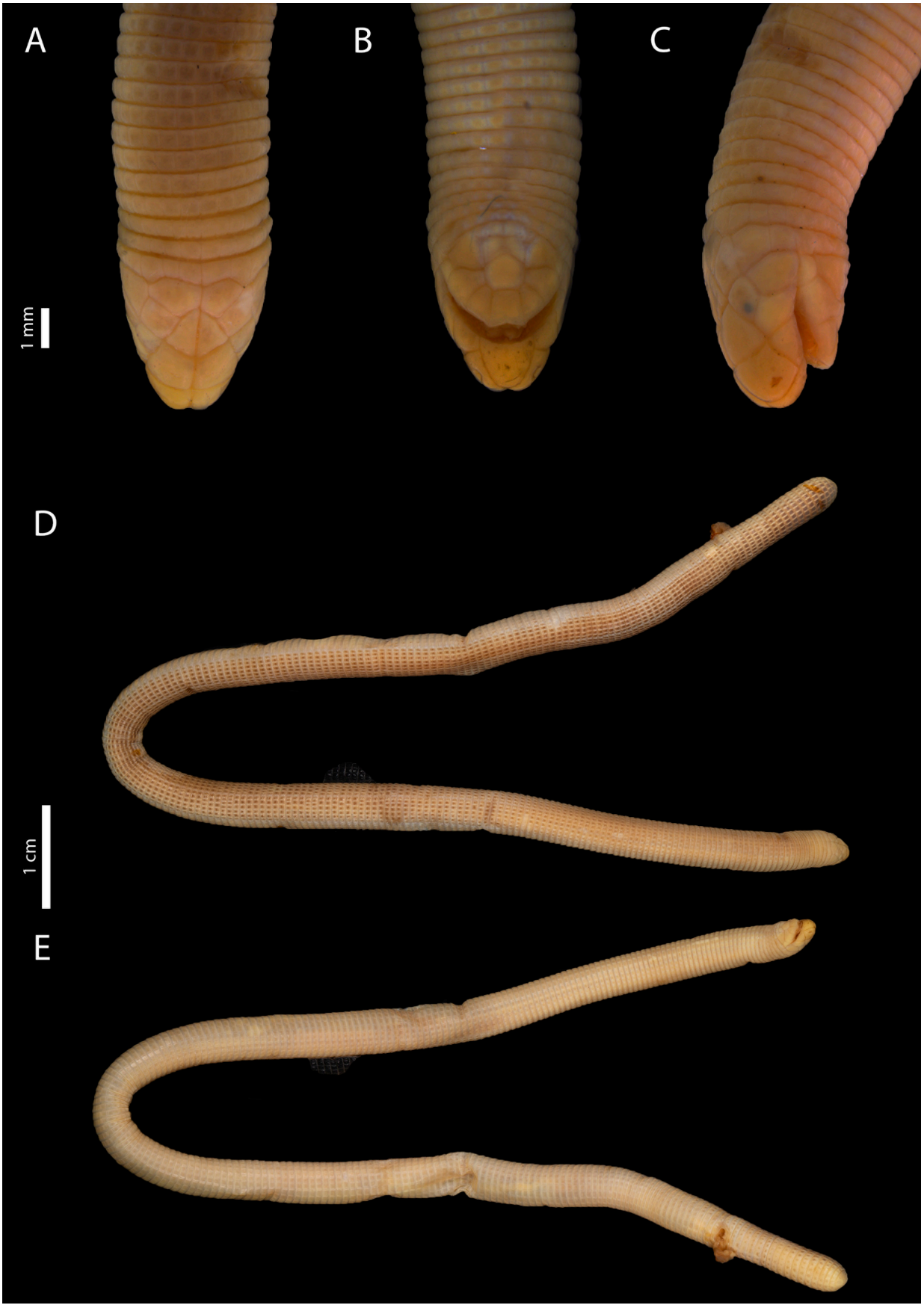

FIGURE 6. Dorsal (A), ventral (B), and lateral (C) views of head and dorsal (D) and ventral (E) views of body of the holotype of *Amphisbaena persephone* Pinna, Mendonça, Bocchiglieri & Fernandes, 2014.

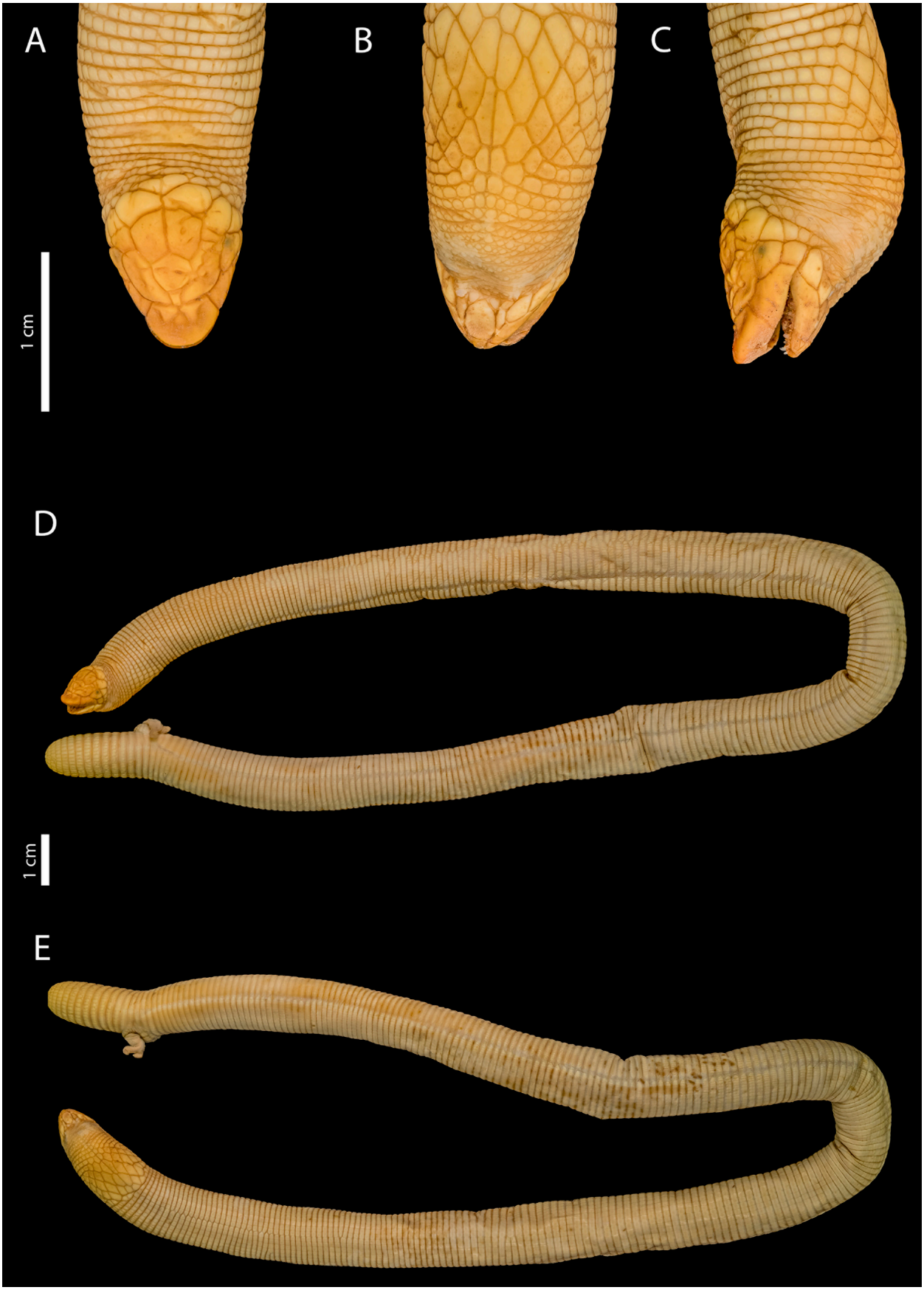

FIGURE 7. Dorsal (A), ventral (B), and lateral (C) views of head and dorsal (D) and ventral (E) views of body of the holotype of *Leposternon kisteumacheri* Porto, Soares & Caramaschi, 2000.

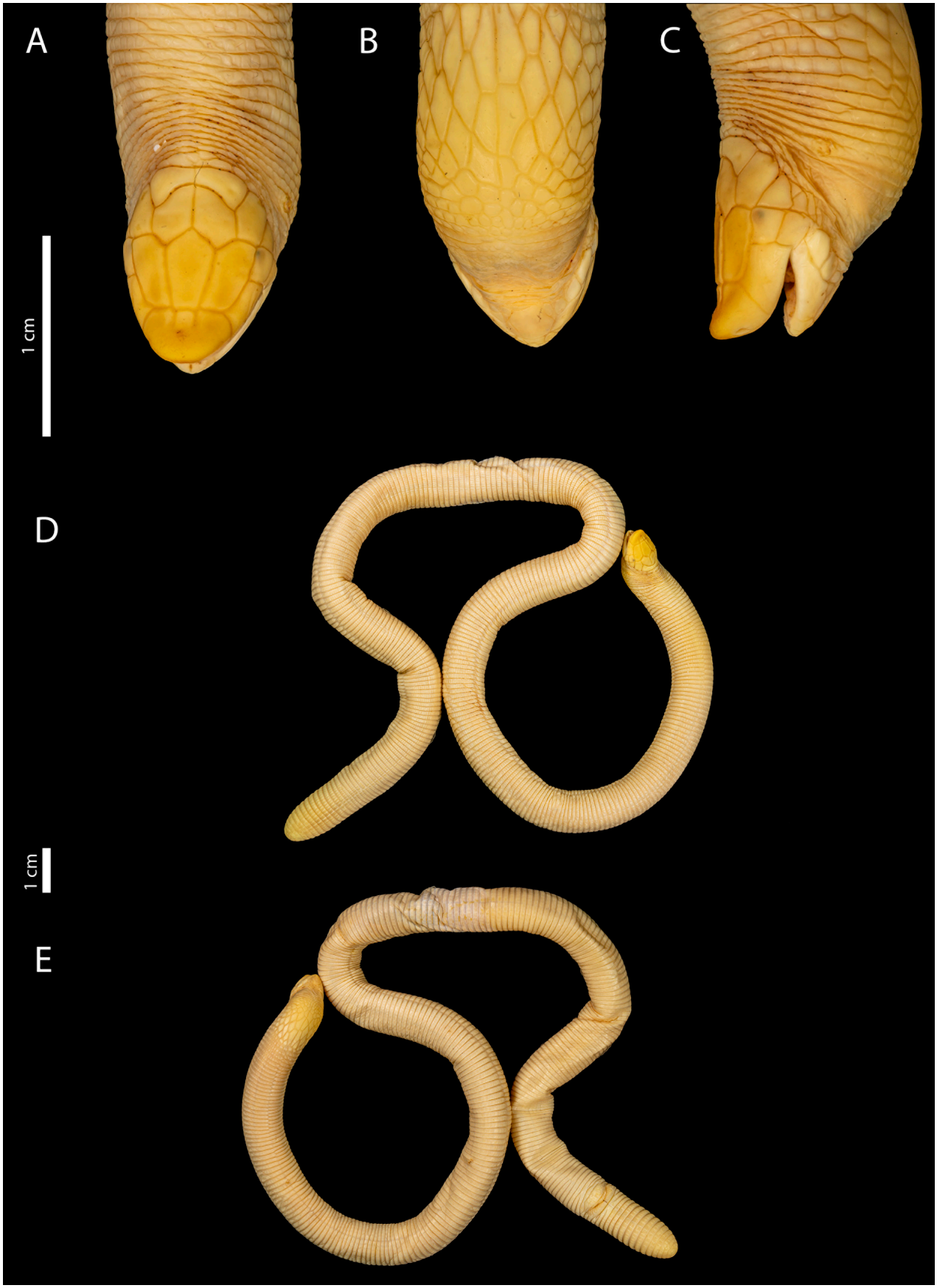

FIGURE 8. Dorsal (A), ventral (B), and lateral (C) views of head and dorsal (D) and ventral (E) views of body of the holotype of *Leposternon mineiro* Ribeiro, Silveira & Santos-Jr., 2018.

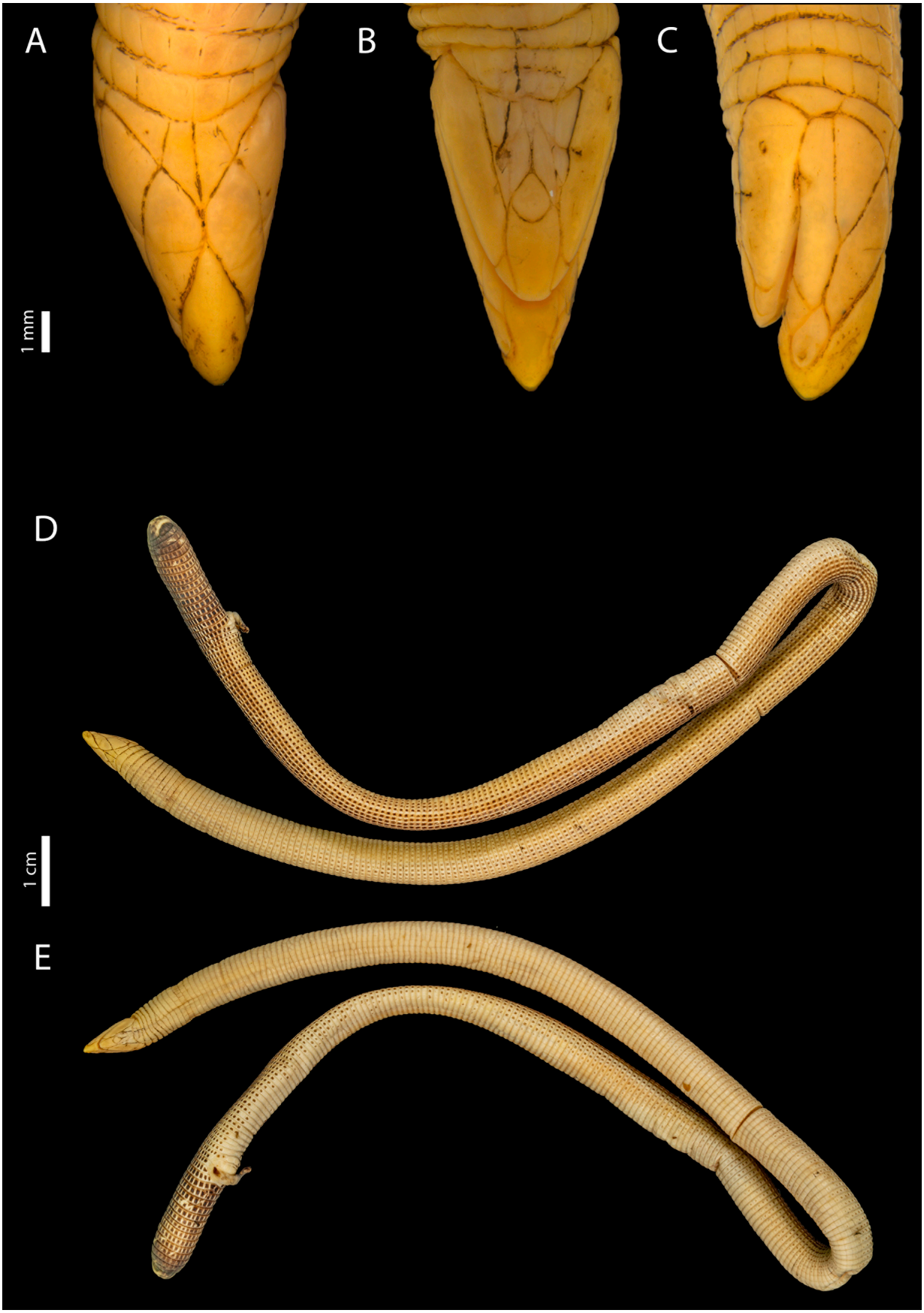

FIGURE 9. Dorsal (A), ventral (B), and lateral (C) views of head and dorsal (D) and ventral (E) views of body of the holotype of *Mesobaena rhachicephala* Hoogmoed, Pinto, Rocha & Pereira, 2009.

Anolidae Cocteau, 1836

***Anolis neglectus* Prates, Melo-Sampaio, De Queiroz, Carnaval, Rodrigues & Oliveira-Drummond, 2020**
(Fig. 10)

Holotype. Adult male, MNRJ 26927, collected by Leandro Oliveira Drummond, Paulo Roberto Melo-Sampaio, and Renata M. Pirani on 10 March 2015 at Serra dos Órgãos National Park (22°26'55.9"S, 42°59'09.9"W [informed]; 981 m asl [informed]), Municipality of Teresópolis, State of Rio de Janeiro, Brazil.
Paratypes. MNRJ 25116–25120, MNRJ 26928–26937.
Remarks. Holotype (53 mm SVL), with available tissue sample, as well as some of the paratypes [not housed in the MNRJ].

***Anolis phyllorhinus* Myers & Carvalho, 1945**
(Fig. 11)

Holotype. Adult male, MNRJ 1804, collected by Alexandre Parko on 14 June 1943 at rotten log in the surrounding of Borba Village [currently Municipality of Borba (04º23'16"S, 59º35'38"W [approximate]; 45 m asl [approximate])], lower Madeira River, State of Amazonas, Brazil.
Remarks. Holotype (73 mm SVL). No tissue sample available.

Boidae Gray, 1825

***Boa atlantica* Gonzalez, Lima, Passos & Silva, 2024**
(Fig. 12)

Holotype. Adult male, MNRJ 27242, collected by Sergeant Marco Aurélio da Silva on 13 September 2019 at the number 52 of the Paula Ramos Street (22º56'03.0"S [informed], 43º12'36.9"W; 93 m asl [informed]), Rio Comprido neighborhood, Municipality of Rio de Janeiro, State of Rio de Janeiro, Brazil.
Paratypes. CZGB 4862, IBSP 79063, MBML 2097, MNRJ 3940, MNRJ 6361–6362, MNRJ 9449, MNRJ 9565, MNRJ 10092, MNRJ 10117, MNRJ 11205, MNRJ 13111, MNRJ 14172, MNRJ 14200–14201, MNRJ 14238, MNRJ 14250, MNRJ 16922, MNRJ 17353, MNRJ 17547, MNRJ 19412, MNRJ 19564, MNRJ 19740, MNRJ 20700, MNRJ 22936, MNRJ 23144, MNRJ 23361, MNRJ 23573, MNRJ 23879, MNRJ 23882, MNRJ 24860, MNRJ 24903, MNRJ 25057, MNRJ 25413, MNRJ 25950, MNRJ 25952–25953, MNRJ 26213, MNRJ 26324, MNRJ 26350, MNRJ 26585, MNRJ 26589, MNRJ 26796, MNRJ 26802, MNRJ 26886, MNRJ 27243, MNRJ 27262.
Remarks. Holotype (2016 mm SVL) with prepared hemipenis kept inside a tube together with the specimen. Paratypes MNRJ 19740 and MNRJ 26802 with everted hemipenes. Holotype and paratypes MNRJ 11205; MNRJ 19412; MNRJ 19564; MNRJ 19740; MNRJ 20700; MNRJ 22936; MNRJ 23144; MNRJ 24860; MNRJ 25950; MNRJ 25952–53; MNRJ 26350; MNRJ 26585; MNRJ 26589; MNRJ 26796; MNRJ 26802; MNRJ 26886; MNRJ 27243 with available tissue samples. Holotype and paratypes MNRJ 19412; MNRJ 25950; MNRJ 25953; MNRJ 26802; MNRJ 27243; MNRJ 27262 were photographed when alive, images at MNFOTO collection. Paratype MNRJ 27243 is an adult female and was found copulating with the holotype.

FIGURE 10. Dorsal (A), ventral (B), and lateral (C) views of head and dorsal (D) and ventral (E) views of body of the holotype of *Anolis neglectus* Prates, Melo-Sampaio, De Queiroz, Carnaval, Rodrigues & Oliveira-Drumond, 2020.

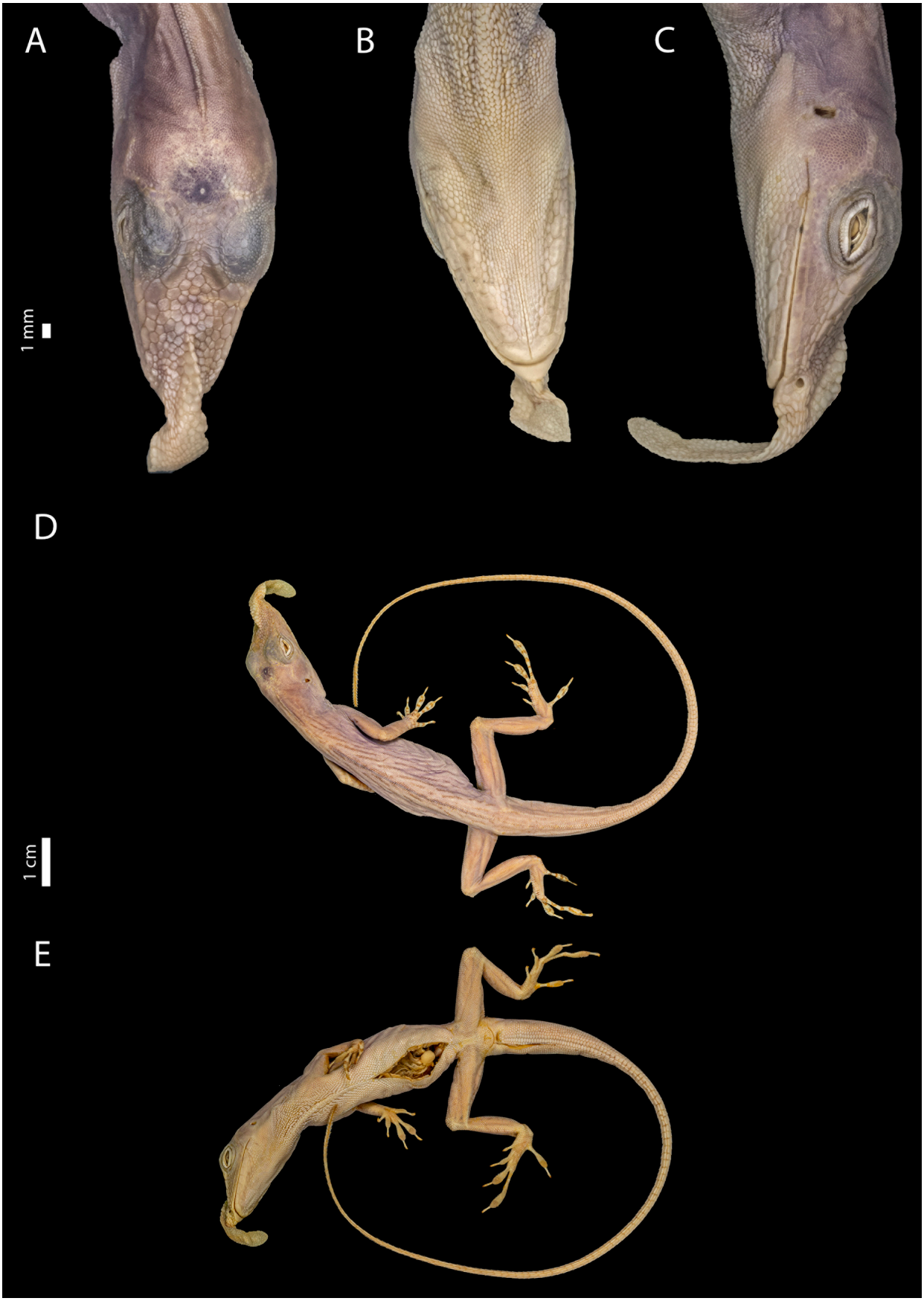

FIGURE 11. Dorsal (A), ventral (B), and lateral (C) views of head and dorsal (D) and ventral (E) views of body of the holotype of *Anolis phyllorhinus* Myers & Carvalho, 1945.

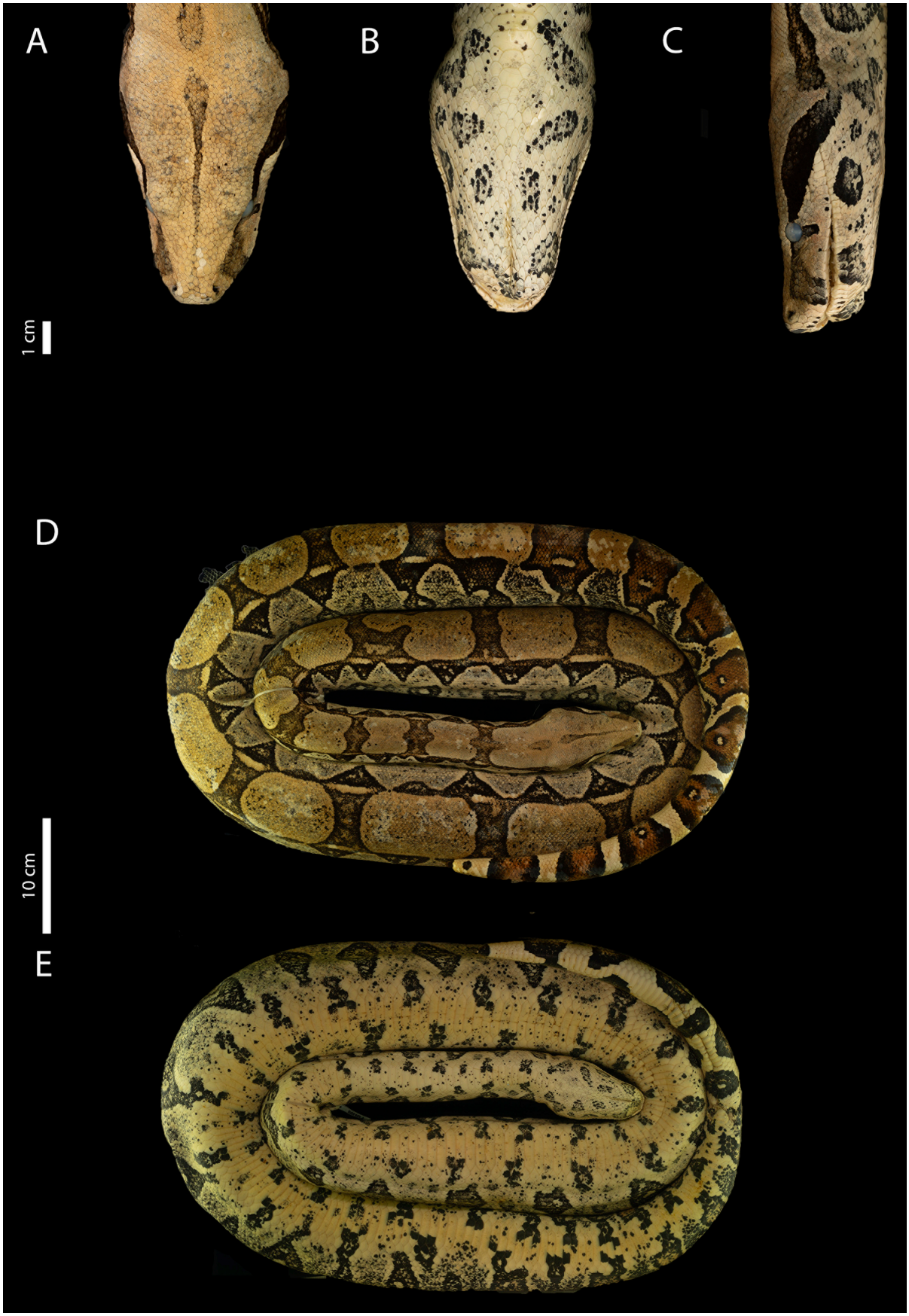

FIGURE 12. Dorsal (A), ventral (B), and lateral (C) views of head and dorsal (D) and ventral (E) views of body of the holotype of *Boa atlantica* Gonzalez, Lima, Passos & Silva, 2024.

Colubridae Oppel, 1811

***Chironius brazili* Hamdan & Fernandes, 2015**
(Fig. 13)

Holotype. Adult male, MNRJ 17480, collected by Aline C.A. Lopes in October 2008 at Reserva Particular do Patrimônio Natural (RPPN) Santuário Serra do Caraça (20°05'S, 43°29'W [approximate]; 1262 m asl [approximate]), Municipality of Catas Altas, State of Minas Gerais, Brazil.
Paratypes. CHUNB 19699, IVB 3290, IVB 3342, MCNR 2790, MCNR 3384, MCNR 4386, MNRJ 18936, MZUFBA 2448.

Remarks. Holotype (845 mm SVL). No tissue samples available.

***Chironius dracomaris* Sudré, Andrade-Junior, Folly, Azevedo, Ávila, Curcio, Nunes & Passos, 2024**
(Fig. 14)

Holotype. Adult male, MNRJ 27716, collected by Clécio Aragão on 11 January 1998 at Horto Florestal (04º13'23.9"S, 38º55'28.1W [informed]"; 800 m asl [informed]), Granja neighborhood, Municipality of Pacoti, State of Ceará, Brazil.
Paratypes. CHUFC 1389, CHUFC 1414, CHUFC 2383, CHUFC 2747, CHUFC 2751, CHUFC 2759, CHUFC 2840, CHUFC 3305, CHUFPB 17304, FUNED 1012, MHNCE-R 59, MHNCE-R 577, MHNCE-R 616, MNRJ 27717–27718, MNRJ 27803–27804.
Remarks. Holotype (652 mm SVL) and the paratypes MHNCE-R 59, MHNCE-R 577, and MNRJ 27803–27804) with tissue samples available [not housed in the MNRJ]. Paratypes (MNRJ 27717 and MNRJ 27804) with prepared hemipenes kept inside cryotubes together with specimens.

***Chironius foveatus* Bailey, 1955**
(Fig. 15)

Holotype. Adult male, MNRJ 1840, collected by V. Rosa on 10 August 1944 at Fortuna River (14°47'S, 39°02'W [approximate]; 52 m asl [approximate]), Municipality of Ilhéus, State of Bahia, Brazil.
Paratypes. MACN (two uncatalogued specimens), MNRJ 583, UMMZ 115648, MZUSP 675, MZUSP 679, MZUSP 1271, MZUSP 1272, MZUSP 1268.
Remarks. Holotype (1444 mm SVL). The paratype MNRJ 2889 was exchanged with UMMZ. No tissue samples available. All MZUSP paratypes were formerly catalogued as DZSP.

***Dendrophidion atlantica* Freire, Caramaschi & Gonçalves, 2010**
(Fig. 16)

Holotype. Adult male, MNRJ 17018, collected by Ubiratan Gonçalves on 05 December 2006 at Engenho Coimbra Forest (08°59'S, 35°53'W [informed]; 526 m asl [informed]), Municipality of Ibateguara, State of Alagoas, Brazil.
Paratypes. CHBEZ 853, CHBEZ 697, CHBEZ 2201–2202, MNRJ 17019–17021, MUFAL 327, MUFAL 2245, MUFAL 6064–6065.
Remarks. Holotype (595 mm SVL) with prepared hemipenis kept inside a cryotube together with specimen. No tissue samples available.

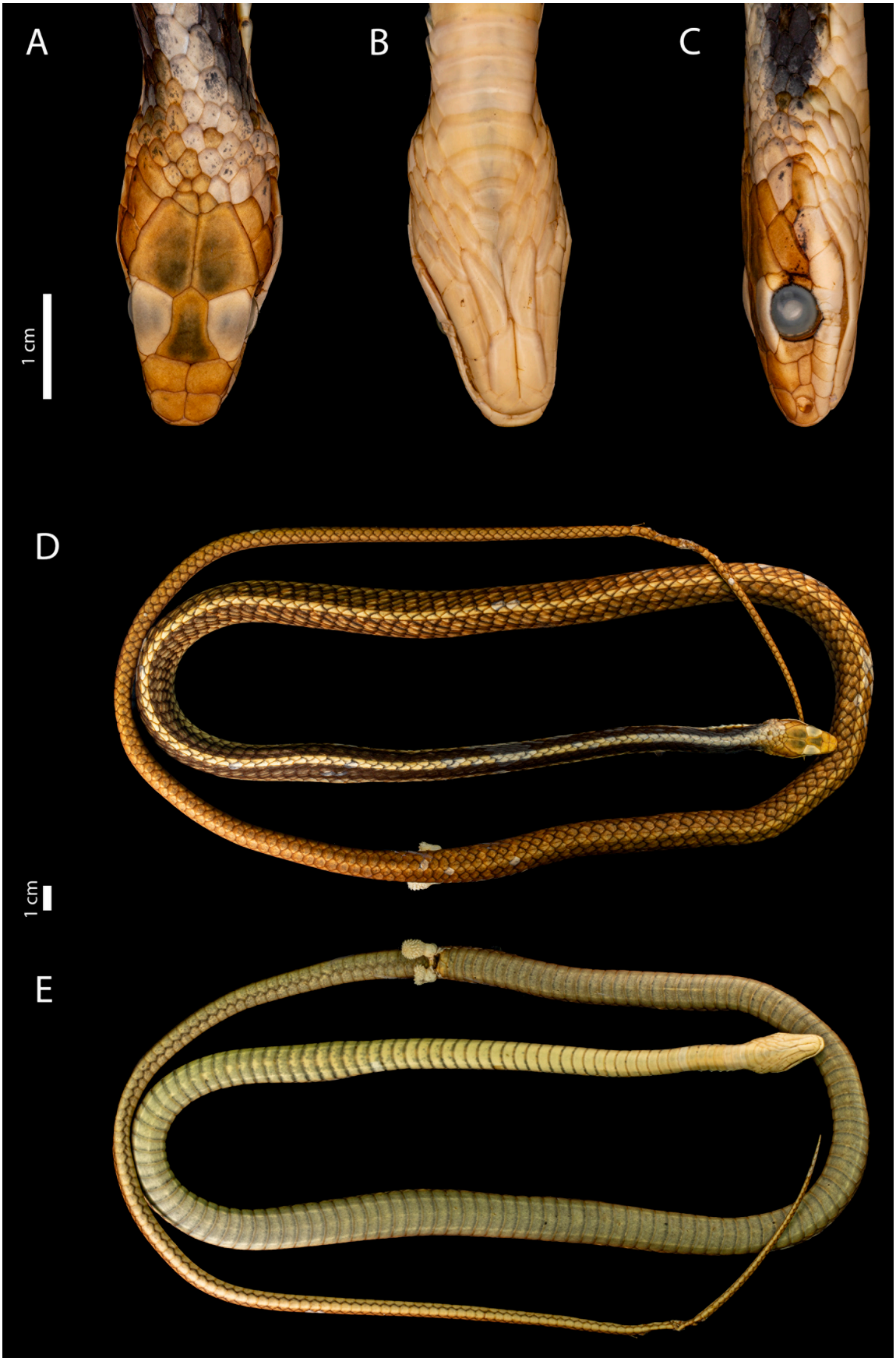

FIGURE 13. Dorsal (A), ventral (B), and lateral (C) views of head and dorsal (D) and ventral (E) views of body of the holotype of *Chironius brazili* Hamdan & Fernandes, 2015.

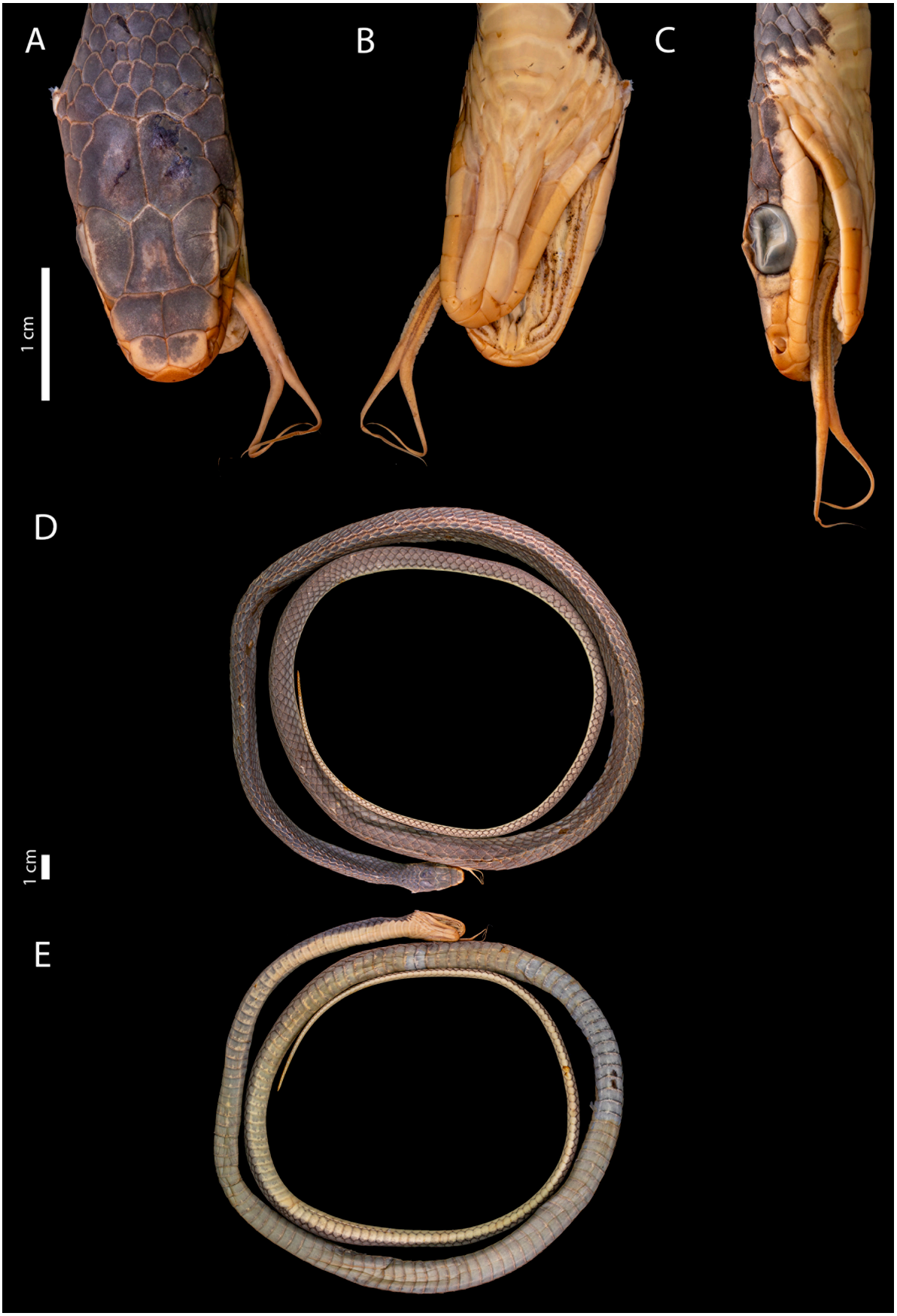

FIGURE 14. Dorsal (A), ventral (B), and lateral (C) views of head and dorsal (D) and ventral (E) views of body of the holotype of *Chironius dracomaris* Sudré, Andrade-Júnior, Folly, Azevedo, Ávila, Curcio, Nunes & Passos, 2024.

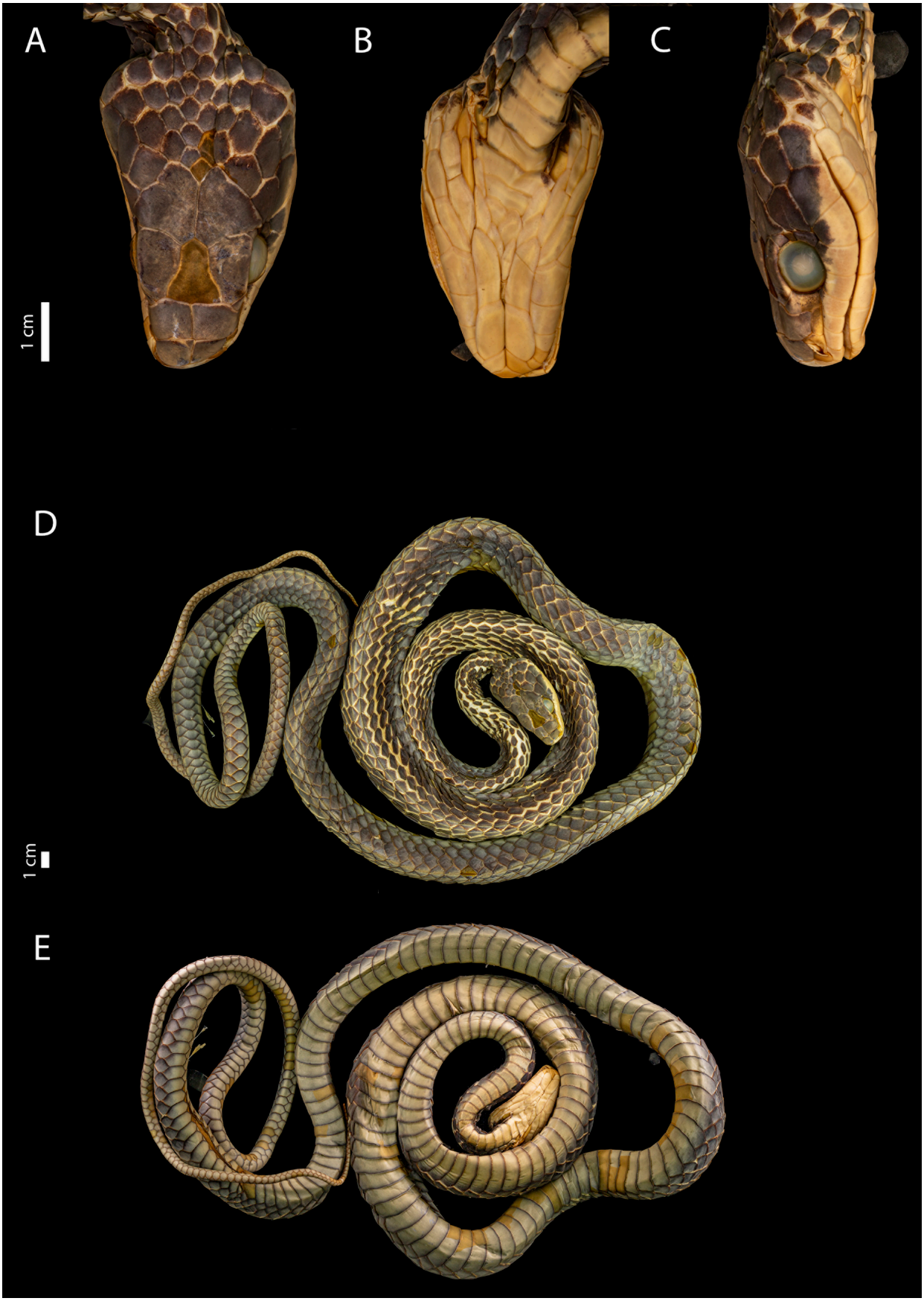

FIGURE 15. Dorsal (A), ventral (B), and lateral (C) views of head and dorsal (D) and ventral (E) views of body of the holotype of *Chironius foveatus* Bailey, 1955.

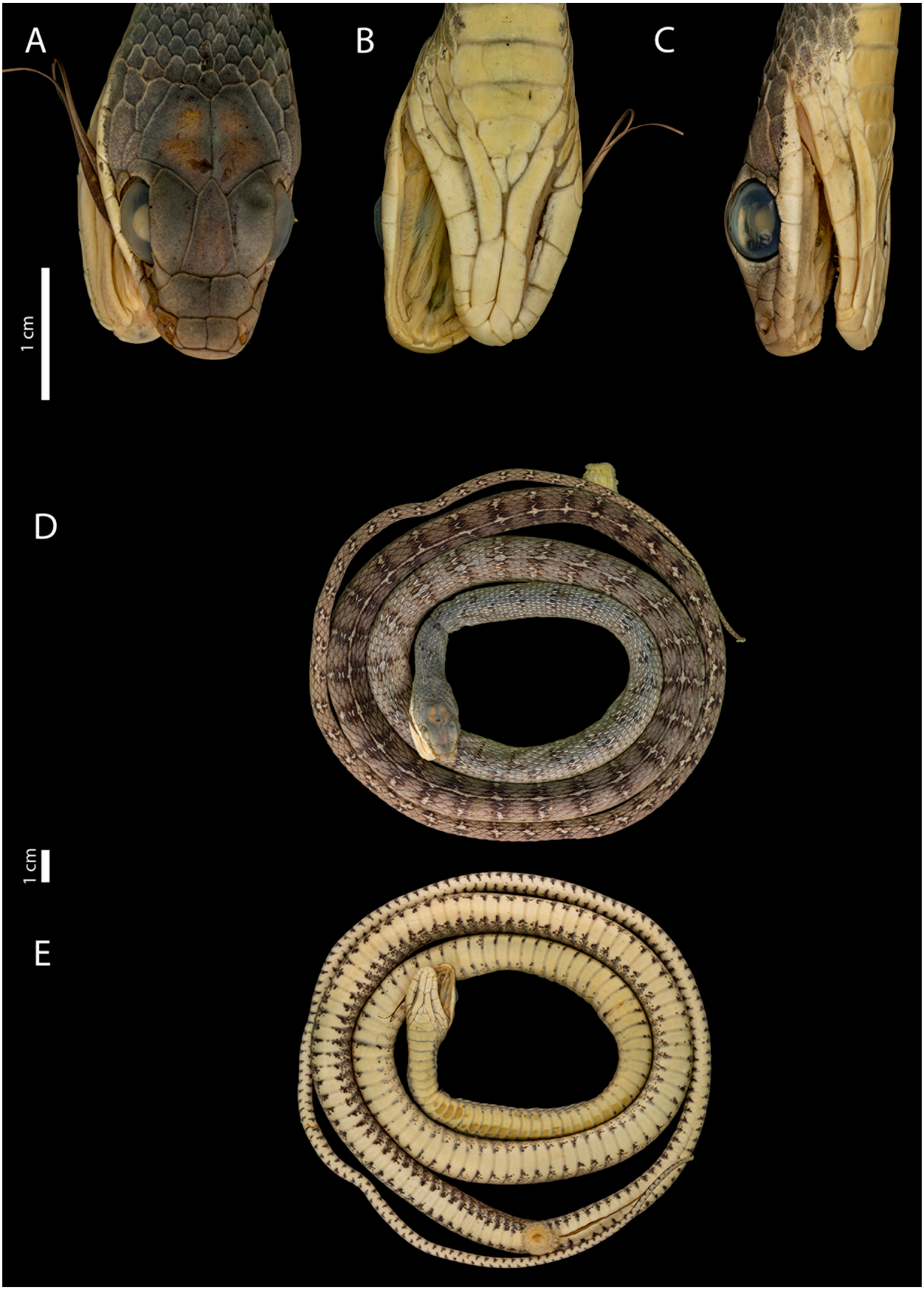

FIGURE 16. Dorsal (A), ventral (B), and lateral (C) views of head and dorsal (D) and ventral (E) views of body of the holotype of *Dendrophidion atlantica* Freire, Caramaschi & Gonçalves, 2010.

***Natrix sexcarinata* Wagler, 1824**
(Fig. 17)

Current combination. *Phrynonax sexcarinatus* (Wagler, 1824).
Neotype. Adult female, MNRJ 20302, collected by Emiliane Gonçalves Pereira and team between 13 November and 08 December 2006 at Porto Trombetas (01°28'01.3"S [informed], 56°22'46.0"W; 40 m asl [informed]), Municipality of Oriximiná, State of Pará, Brazil.
Remarks. Neotype (1128 mm SVL) designated by Lopes & Passos (2023). No tissue samples available.

***Paraphrynonax versicolor* Lutz & Mello, 1922a**
(Fig. 18)

Current status. *Spilotes sulphureus* (Wagler, 1824). Synonymy after Amaral (1929a).
Holotype. Adult male, MNRJ 405, from the Municipality of Cataguases (21°23'17"S, 42°41'57"W [approximate]; 183 m asl [approximate]), State of Minas Gerais, Brazil.
Remarks. Holotype (952 mm SVL). No tissue samples available.

***Tantilla marcovani* Lema, 2004a**
(Fig. 19)

Current status. *Tantilla melanocephala* (Linnaeus, 1758). Synonymy after Mata-Silva & Wilson (2016).
Holotype. Adult male, MNRJ 6525, collected by Marcovan Porto on 14 May [April as informed by the author] 1990 at Pico do Jabre Mountain Range (7°11'10"S, 37°25'53"W [approximate]; 1090 m asl [approximate]), at 50 Km southwest from the city of Teixeira [as informed by the author], Municipality of Maturéia, State of Paraíba, Brazil.
Remarks. Holotype (239 mm SVL) with prepared hemipenis kept inside a cryotube together with specimen. No tissue samples available.

Dipsadidae Bonaparte, 1838

***Apostolepis freitasi* Lema, 2004b**
(Fig. 20)

Current status. *Apostolepis cearensis* Gomes 1915. Synonymy after Ferrarezzi *et al*. (2005).
Holotype. Young male, MNRJ 6523, collected by local people in July 1991 at Tanque do Aragão (11°08'S, 42°06'W [approximate]; 715 m asl [approximate]), Municipality of Central, State of Bahia, Brazil.
Remarks. Holotype (166 mm SVL). Lema & Renner (2007) cited the specimen MNRJ 6525 as the holotype of *Apostolepis freitasi,* but MNRJ 6525 is the holotype of *Tantilla marcovani* Lema, 2004a. No tissue samples available.

***Atractus altagratiae* Passos & Fernandes, 2008**
(Fig. 21)

Holotype. Adult male, MNRJ 7888, collected by Helmut Sick in July 1957 at Upper Cururú River (07°12'S, 58°04'W [approximate]; 127 m asl [approximate]), a tributary of the Teles Pires River, Municipality of Jacareacanga [Municipality of Itaituba and ca. 44 m asl as informed by the authors], State of Pará, Brazil.
Remarks. Holotype (240 mm SVL) with prepared hemipenis kept inside a cryotube together with specimen. No tissue samples available.

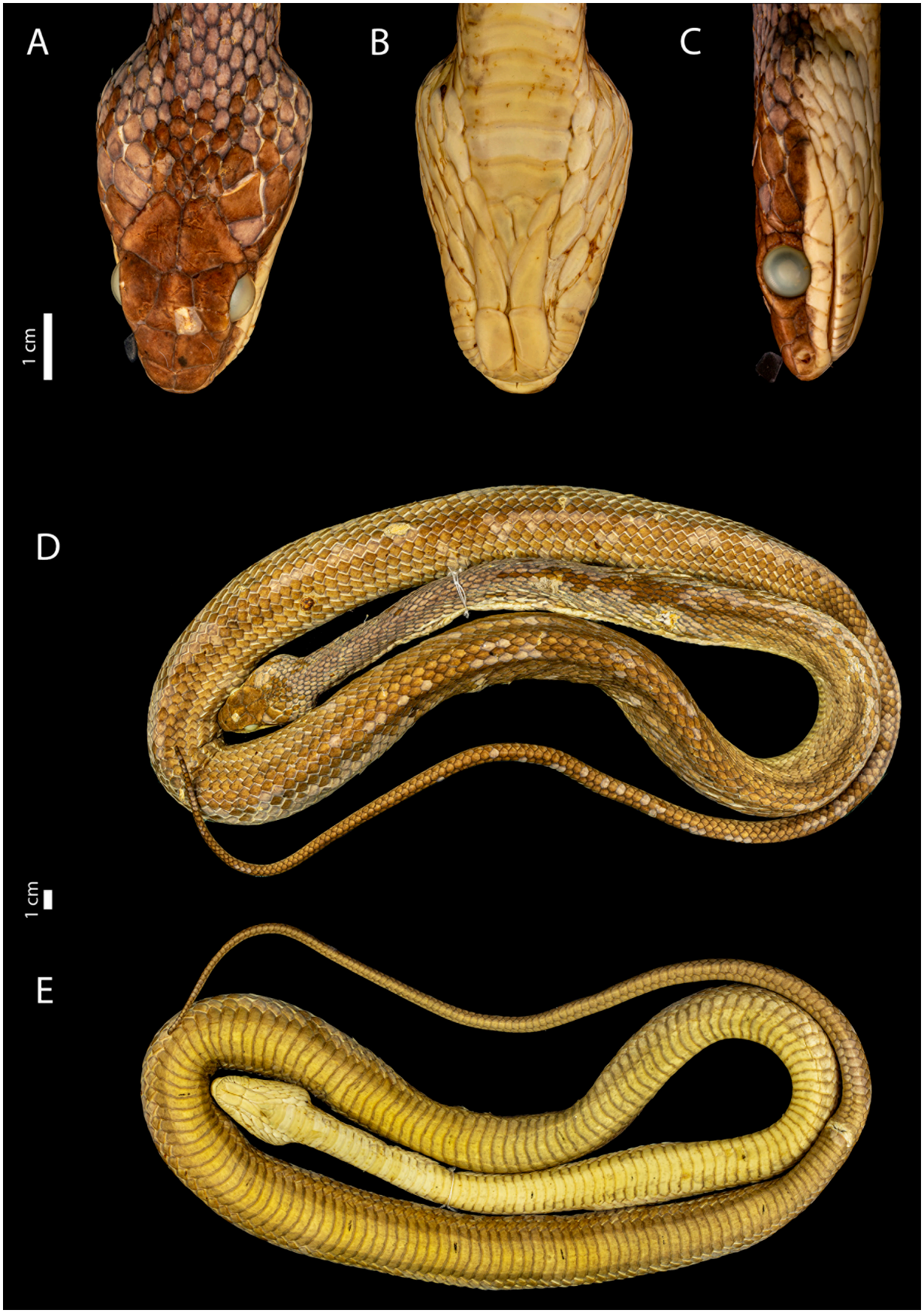

FIGURE 17. Dorsal (A), ventral (B), and lateral (C) views of head and dorsal (D) and ventral (E) views of body of the neotype of *Natrix sexcarinata* Wagler, 1824 [= *Phrynonax sexcarinatus* (Wagler, 1824)].

FIGURE 18. Dorsal (A), ventral (B), and lateral (C) views of head and dorsal (D) and ventral (E) views of body of the holotype of *Paraphrynonax versicolor* Lutz & Mello, 1922a [= *Spilotes sulphureus* (Wagler, 1824)].

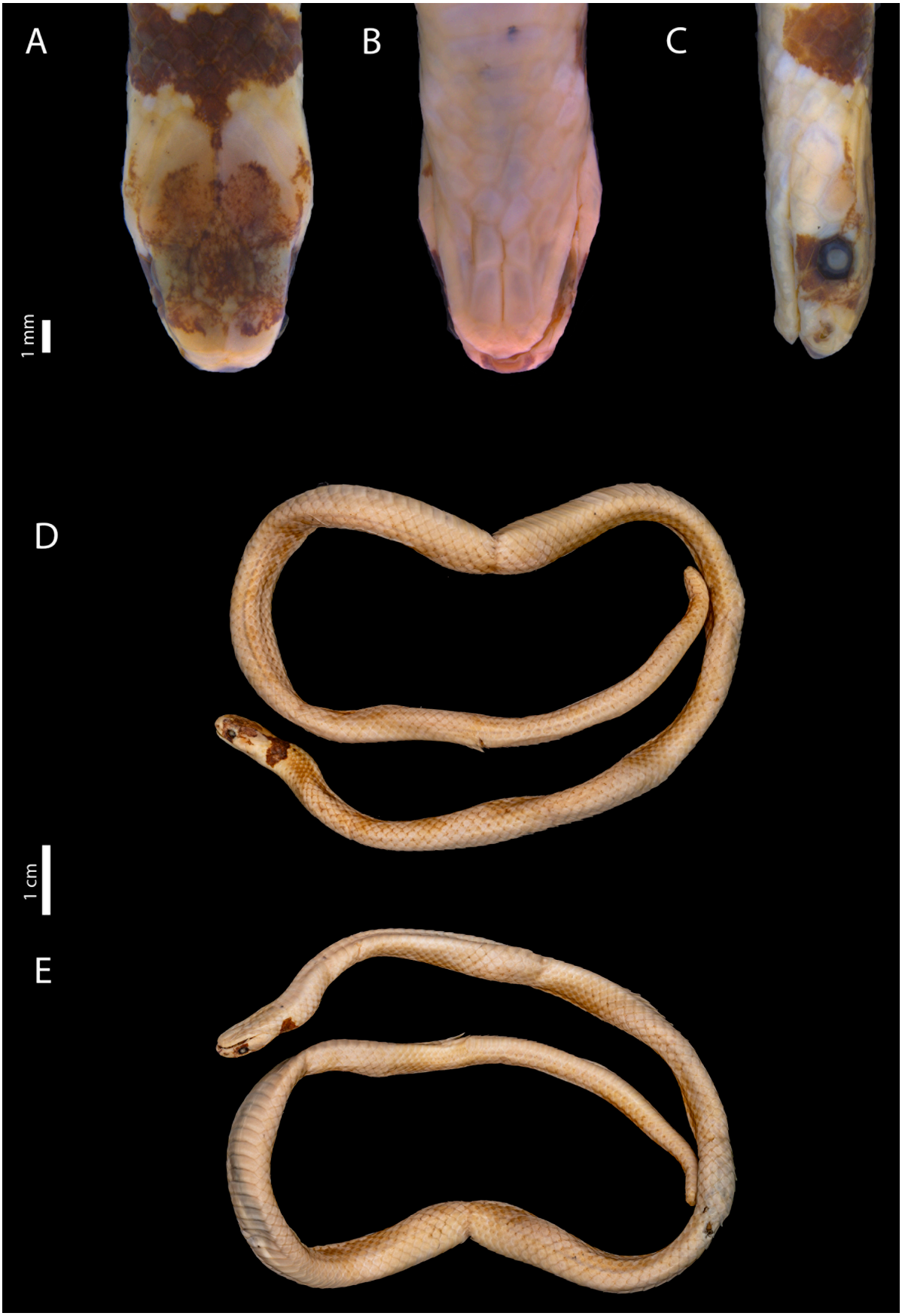

FIGURE 19. Dorsal (A), ventral (B), and lateral (C) views of head and dorsal (D) and ventral (E) views of body of the holotype of *Tantilla marcovani* Lema, 2004a [= *Tantilla melanocephala* (Linnaeus, 1758)].

FIGURE 20. Dorsal (A), ventral (B), and lateral (C) views of head and dorsal (D) and ventral (E) views of body of the holotype of *Apostolepis freitasi* Lema, 2004b [= *Apostolepis cearensis* Gomes, 1915].

***Atractus caete* Passos, Fernandes, Bérnils & Moura-Leite, 2010**
(Fig. 22)

Holotype. Adult female, MNRJ 16936, collected by Anibal Melgarejo in 1986 at the Municipality of Quebrangulo (09°19'S, 36°28'W [approximate]; 360 m asl [approximate]), State of Alagoas, Brazil.
Remarks. Holotype (376 mm SVL) donated by Instituto Vital Brazil (formerly IVB 2983). No tissue samples available.

***Atractus dapsilis* Melo-Sampaio, Passos, Fouquet, Prudente & Torres-Carvajal, 2019**
(Fig. 23)

Holotype. Adult male, MNRJ 14914, collected by Emiliane Gonçalves Pereira and team on 01 February 2007 at Teófilo Plateau, Saracá-Taquera National Forest (01º42'51.6"S, 56º 24'34"W [informed]; 97 m asl [informed]), Municipality of Oriximiná, State of Pará, Brazil.
Paratypes. IBSP 49430, IBSP 87633, INPA-H 18466, INPA-H 31489, INPA-H 32271, INPA-H 32348, MNRJ 14910–14913, MNRJ 14915, MNRJ 16794–16804, MNRJ 17953–17954, MPEG 17495, MPEG 16803, MPEG 17426–17427, MPEG 17539, MPEG 17568, MPEG 20782, MPEG 21569–21570, MPEG 21712–21713, MPEG 23505, MPEG 23759, MPEG 23760, MZUSP 3713, MZUSP 8659, MZUSP 9501.
Remarks. Holotype (307 mm SVL) and paratypes MNRJ 14911–14912, MNRJ 16804 with prepared hemipenes kept inside cryotubes together with each distinct jar of specimens. Paratypes MNRJ 16794, MNRJ 16796, MNRJ 16802 with tissue samples available.

***Atractus francoi* Passos, Fernandes, Bérnils & Moura-Leite, 2010**
(Fig. 24)

Holotype. Adult male, MNRJ 17537 (formerly ZUFRJ 1742), collected by Marion Cony Carlo on 17 July 2006 at Recanto Farm, Serra do Piloto (22°57'S, 44°02'W [approximate]; 600 m asl [approximate]), Municipality of Mangaratiba, State of Rio de Janeiro, Brazil.
Paratypes. IBSP 53924, IBSP 72654, IBSP 74648, IBSP 74723–74724, IBSP 53924, MNRJ 17536.
Remarks. Holotype (420 mm SVL) and paratype (IBSP 72654) with prepared hemipenes. Hemipenis of the holotype kept inside cryotube together with specimen. The paratypes from the IBSP were not affected by the 2010 fire accident because they were on loan to MNRJ. No tissue samples available.

***Atractus ronnie* Passos, Fernandes & Borges-Nojosa, 2007**
(Fig. 25)

Holotype. Adult female, MNRJ 14194 (formerly CHUFC 3501), collected by Diva Maria Borges-Nojosa on 10 April 1998 at Granja (04°10'S, 38°55'W [approximate]; 800 m asl [approximate]), Serra de Baturité, Municipality of Pacoti, State of Ceará, Brazil.
Paratypes. CHUFC 1396, CHUFC 2481, CHUFC 2578, CHUFC 2598, CHUFC 2641, CHUFC 2645–2649, CHUFC 2651–2654, CHUFC 2658, CHUFC 2675–2676, CHUFC 2678, CHUFC 2733, CHUFC 3500, CHUFC 3502, MNRJ 14195–14197 (formerly CHUFC 1397, CHUFC 2470, and CHUFC 3503, respectively).
Remarks. Holotype (275 mm SVL). The paratype MNRJ 14196 with prepared hemipenis kept inside a cryotube together with specimen. No tissue samples available.

FIGURE 21. Dorsal (A), ventral (B), and lateral (C) views of head and dorsal (D) and ventral (E) views of body of the holotype of *Atractus altagratiae* Passos & Fernandes, 2008.

FIGURE 22. Dorsal (A), ventral (B), and lateral (C) views of head and dorsal (D) and ventral (E) views of body of the holotype of *Atractus caete* Passos, Fernandes, Bérnils & Moura-Leite, 2010.

FIGURE 23. Dorsal (A), ventral (B), and lateral (C) views of head and dorsal (D) and ventral (E) views of body of the holotype of *Atractus dapsilis* Melo-Sampaio, Passos, Fouquet, Prudente & Torres-Carvajal, 2019.

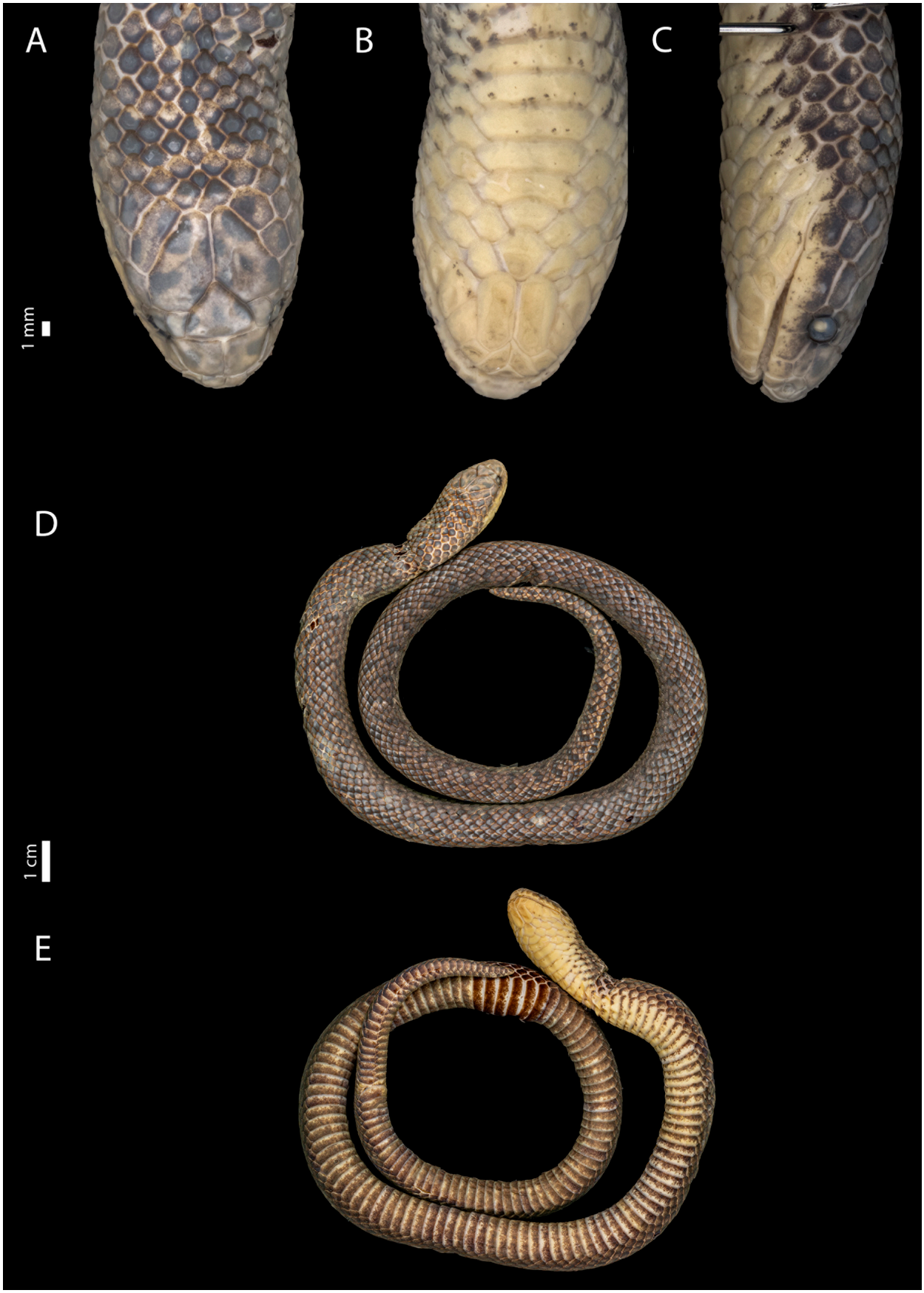

FIGURE 24. Dorsal (A), ventral (B), and lateral (C) views of head and dorsal (D) and ventral (E) views of body of the holotype of *Atractus francoi* Passos, Fernandes, Bérnils & Moura-Leite, 2010.

FIGURE 25. Dorsal (A), ventral (B), and lateral (C) views of head and dorsal (D) and ventral (E) views of body of the holotype of *Atractus ronnie* Passos, Fernandes & Borges-Nojosa, 2007.

***Atractus stygius* Passos, Azevedo, Nogueira, Fernandes & Sawaya, 2019**
(Fig. 26)

Holotype. Adult male, MNRJ 26734 (formerly UFMT 8139), collected by Universidade Federal de Mato Grosso team in 2009 at Bocaiúva (12°29'50"S, 57°52'30"W [informed]; 312 m asl [informed]), Craveri River, Municipality of Brasnorte, State of Mato Grosso, Brazil.
Paratypes. MNRJ 26735 (formerly UFMT 9024), MNRJ 28144 (formerly UFMT 8138), MNRJ 28145 (formerly UFMT 9116), MZUSP 20667, UFMT 3949, UFMT 8137, UFMT 8140–8142.
Remarks. Holotype (295 mm SVL) and paratype UFMT 8138 with prepared hemipenes. Holotype hemipenis kept inside cryotube together with specimen. No tissue samples available.

***Atractus tartarus* Passos, Prudente & Lynch, 2016**
(Fig. 27)

Holotype. Adult male, MNRJ 16511, collected by Renato Silveira Bérnils, Henrique Wogel, and P. S. Abe on 07 February 2008 at Palestina Village (04°40'S, 47°56'W [approximate]; 200 m asl [approximate]), Municipality of Rondon do Pará, State of Pará, Brazil.
Paratypes. CHUFC 1386, IBSP 47078, MNRJ 18035, MNRJ 18039, MNRJ 24363, MNRJ 24364, MPEG 336, MPEG 12373, MPEG 22991, MPEG 23929–23931, MUFAL 10445, MUFAL 10447, MUFAL 10462.
Remarks. Holotype (322 mm SVL) and paratype MNRJ 24363 with prepared hemipenes kept inside cryotubes together with each distinct jar of specimens. The paratypes MPEG 23928 and MPEG 23931 with tissue samples available.

***Atractus thalesdelemai* Passos, Fernandes & Zanella, 2005**
(Fig. 28)

Holotype. Adult male, MNRJ 10052 (CRUPF 692), collected by Noeli Zanella on 30 January 2001 at Military Brigade Farm (28°14'30"S, 52°21'27"W [informed]; 687 m asl [informed]), Municipality of Passo Fundo, State of Rio Grande do Sul, Brazil.
Paratypes. CRUPF 172, CRUPF 405, CRUPF 801, MNRJ 10053 (formerly CRUPF 841), MNRJ 10054 (formerly CRUPF 861), MNRJ 10081 (formerly CRUPF 950) MNRJ 10082 (formerly CRUPF 717).
Remarks. Holotype (265 mm SVL) with both prepared hemipenes kept inside cryotubes together with specimen.

***Atractus trefauti* Melo-Sampaio, Passos, Fouquet, Prudente & Torres-Carvajal, 2019**
(Fig. 29)

Holotype. Adult male, MNRJ 26709, collected by Antoine Fouquet, E. Courtois, and M. Dewynter on 18 December 2012 at Route de l'Est N2 (4º29'19.7"N, 52º21'01.4"W [informed]; 43 m asl [informed]), Roura, French Guiana.
Paratypes. MNHN 2015.56, MPEG 16382, MPEG 25788, MPEG 21354–21355.
Remarks. Holotype (235 mm SVL) with prepared hemipenis kept inside cryotube together with specimen. Tissue sample available [housed not in MNRJ].

***Boiruna sertaneja* Zaher, 1996**
(Fig. 30)

Holotype. Adult male, MNRJ 2384, collected by Antenor Leitão de Carvalho and Joseph Randle Bailey on 25 March 1942 at the Municipality of Barreiras (12°09'10"S, 44°59'24"W [approximate]; 454 m asl [approximate]), State of Bahia, Brazil.
Paratypes. IBSP 49434, IBSP 51263, MNRJ 2382.
Remarks: Holotype (1120 mm SVL). No tissue samples available.

FIGURE 26. Dorsal (A), ventral (B), and lateral (C) views of head and dorsal (D) and ventral (E) views of body of the holotype of *Atractus stygius* Passos, Azevedo, Nogueira, Fernandes & Sawaya, 2019.

FIGURE 27. Dorsal (A), ventral (B), and lateral (C) views of head and dorsal (D) and ventral (E) views of body of the holotype of *Atractus tartarus* Passos, Prudente & Lynch, 2016.

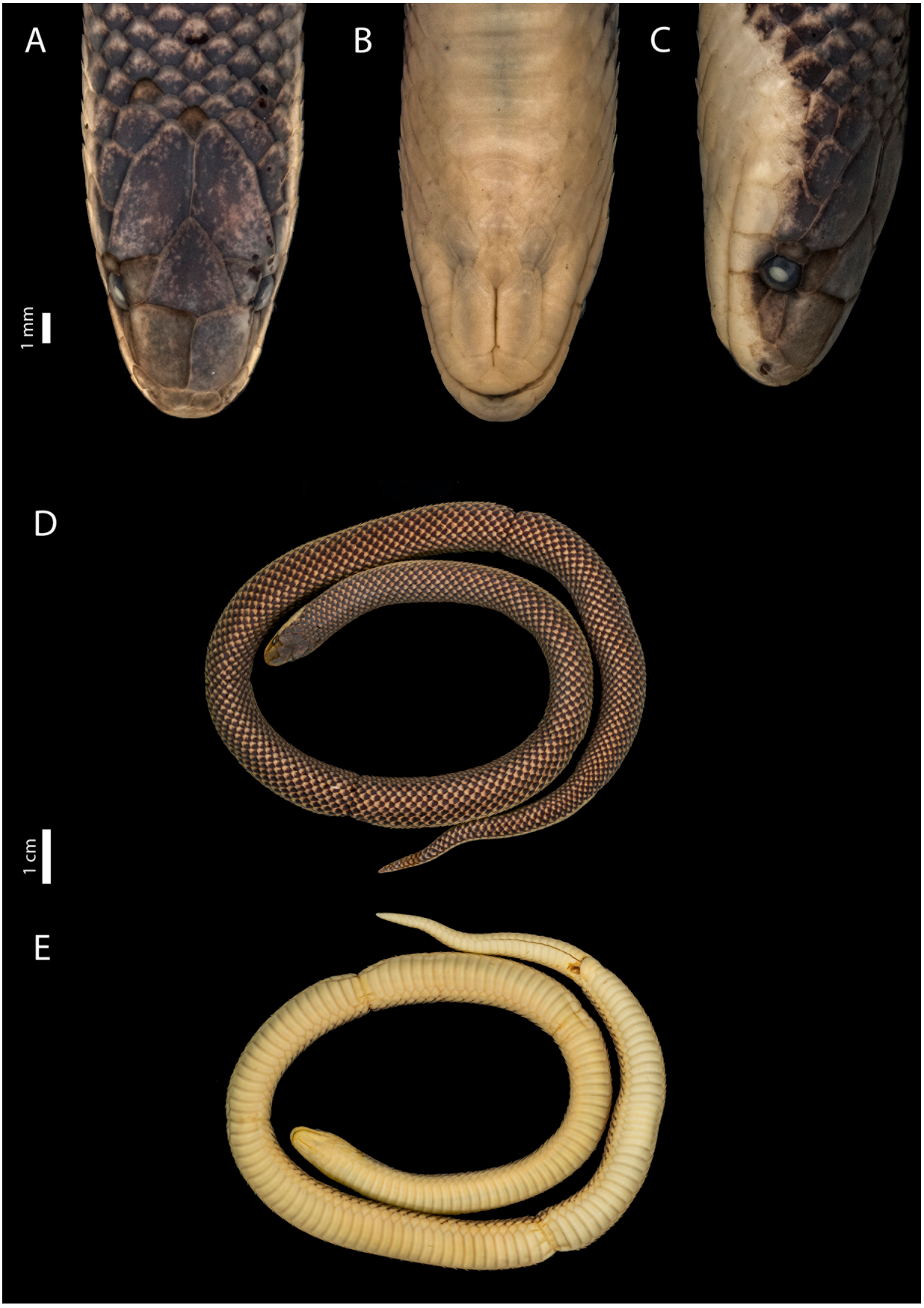

FIGURE 28. Dorsal (A), ventral (B), and lateral (C) views of head and dorsal (D) and ventral (E) views of body of the holotype of *Atractus thalesdelemai* Passos, Fernandes & Zanella, 2005.

FIGURE 29. Dorsal (A), ventral (B), and lateral (C) views of head and dorsal (D) and ventral (E) views of body of the holotype of *Atractus trefauti* Melo-Sampaio, Passos, Fouquet, Prudente & Torres-Carvajal, 2019.

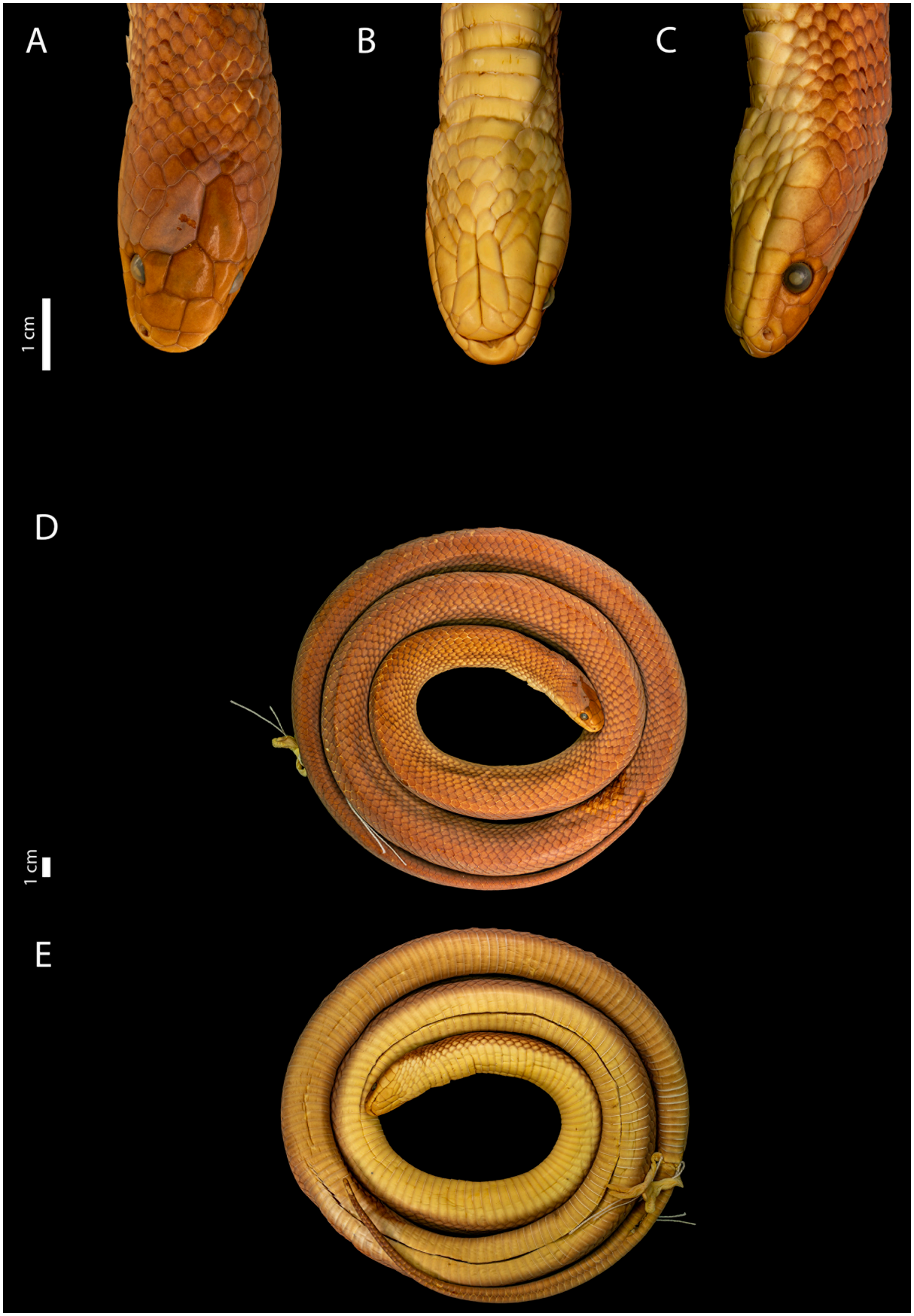

FIGURE 30. Dorsal (A), ventral (B), and lateral (C) views of head and dorsal (D) and ventral (E) views of body of the holotype of *Boiruna sertaneja* Zaher, 1996.

***Dipsas bothropoides* Mebert, Passos, Fernandes, Entiauspe-Neto, Queiroz-Alvez, Machado & Lopes, 2020**
(Fig. 31)

Holotype. Adult female, MNRJ 26377, collected by Daniel S. Fernandes and Luciana Barreto Nascimento on 08 January 2004 [08 November as given by authors] at Duas Barras Farm (16°25'0.00"S, 40°02'60.00"W [informed]; 800 m asl [informed]), District of Talimã, Municipality of Santa Maria do Salto, State of Minas Gerais, Brazil.
Paratype. MZUESC 15828.
Remarks. Holotype (420 mm SVL). The paratype MZUESC 15828 with prepared hemipenis and tissue sample available.

***Dipsas sazimai* Fernandes, Marques & Argôlo, 2010**
(Fig. 32)

Holotype. Adult male, MNRJ 15136, collected by Mara Cintia Kiefer and Carla da Costa Siqueira on 30 October 2005 at Morro de São João (22°25'27"S, 41°59'42"W [approximate]), Municipality of Casimiro de Abreu, State of Rio de Janeiro, Brazil.
Paratypes. IBSP 69143, IBSP 77835, MNRJ 19275, MZUESC 6134, MZUESC 7848, MZUESC 7988, MZUESC 8199, MZUESC 8466, MZUFBA 1800.
Remarks. Holotype (498 mm SVL) with prepared hemipenis kept inside cryotube together with specimen. No tissue samples available.

***Liophis longiventris* Amaral, 1925**
(Fig. 33)

Current status. *Erythrolamprus breviceps* (Cope, 1860). Synonymy after Fernandes *et al*. (2002).
Holotype. Adult male, MNRJ 367, collected by 'Comissão Rondon' (see Amaral 1925), date unknown, in the North portion of the State of Mato Grosso, Brazil.
Remarks: Holotype (417 mm SVL). The type locality likely refers to the region of the current State of Rondônia without further details. No tissue samples available.

***Oxyrhopus rhombifer septentrionalis* Vellard, 1943**
(Fig. 34)

Current status. *Oxyrhopus rhombifer* Duméril, Bibron & Duméril, 1854. Synonymy after Cei (1993).
Holotype. Subadult female, MNRJ 444, collected by Jean Vellard in September 1938 at "Campos de Vilhena, State of Mato Grosso", currently Municipality of Vilhena (12°44'S, 60°08'W [approximate]; 594 m asl [approximate]), State of Rondônia, Brazil.
Remarks. Holotype (357 mm SVL). No tissue samples available.

***Rhinosimus amarali* Mello, 1926**
(Fig. 35)
Current status. *Phimophis guerini* Duméril, Bibron & Duméril, 1854. Synonymy after Peters & Orejas-Miranda (1970).
Holotype. Adult female, MNRJ 406, collector unknown, from Beltrão (18°4'27"S, 44°31'52"W [approximate]; 530 m asl [approximate]), Municipality of Corinto, State of Minas Gerais, Brazil
Remarks. Holotype (987 mm SVL). No tissue samples available.

FIGURE 31. Dorsal (A), ventral (B), and lateral (C) views of head and dorsal (D) and ventral (E) views of body of the holotype of *Dipsas bothropoides* Mebert, Passos, Fernandes, Entiauspe-Neto, Alves, Machado & Lopes, 2020.

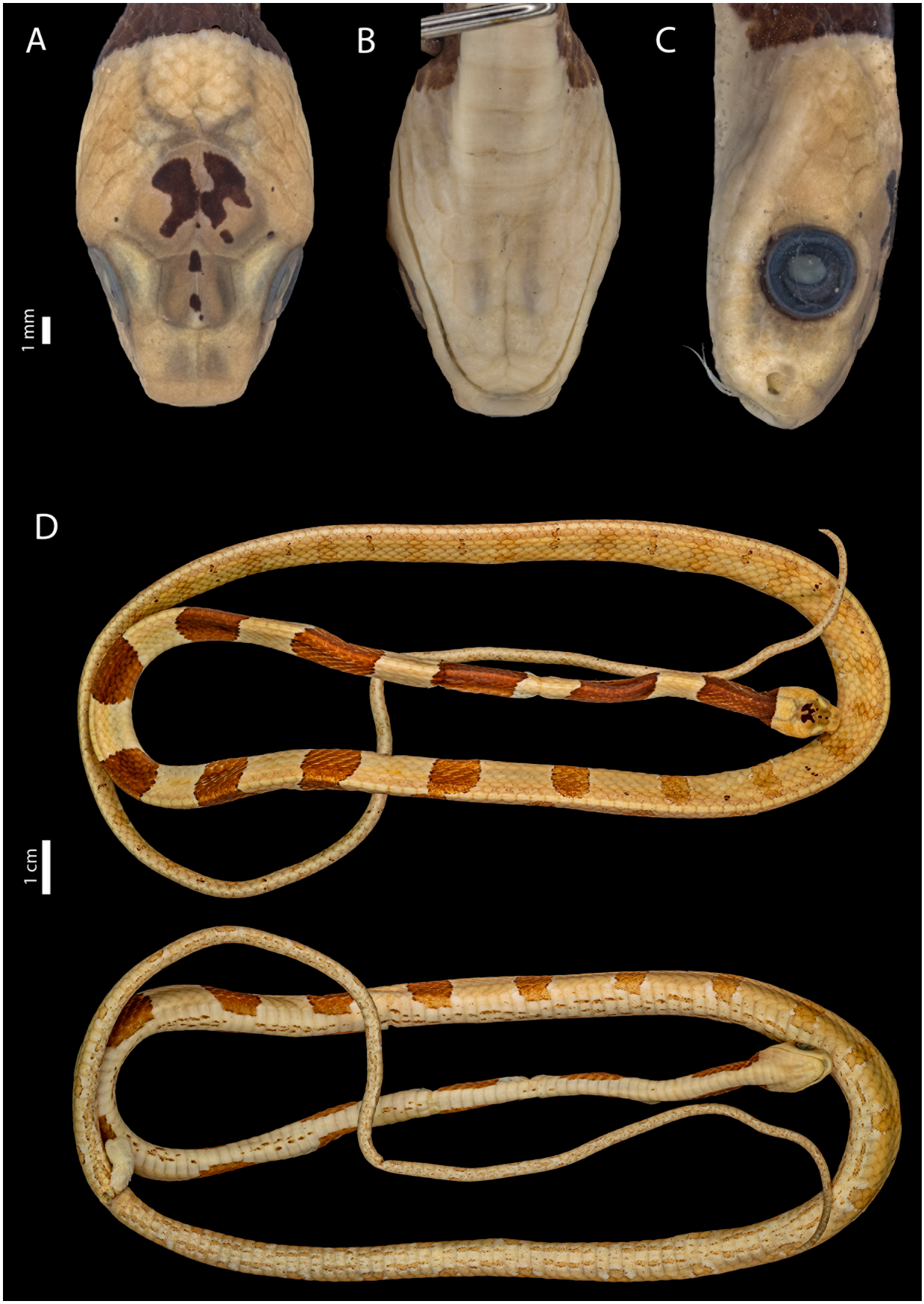

FIGURE 32. Dorsal (A), ventral (B), and lateral (C) views of head and dorsal (D) and ventral (E) views of body of the holotype of *Dipsas sazimai* Fernandes, Marques & Argôlo, 2010.

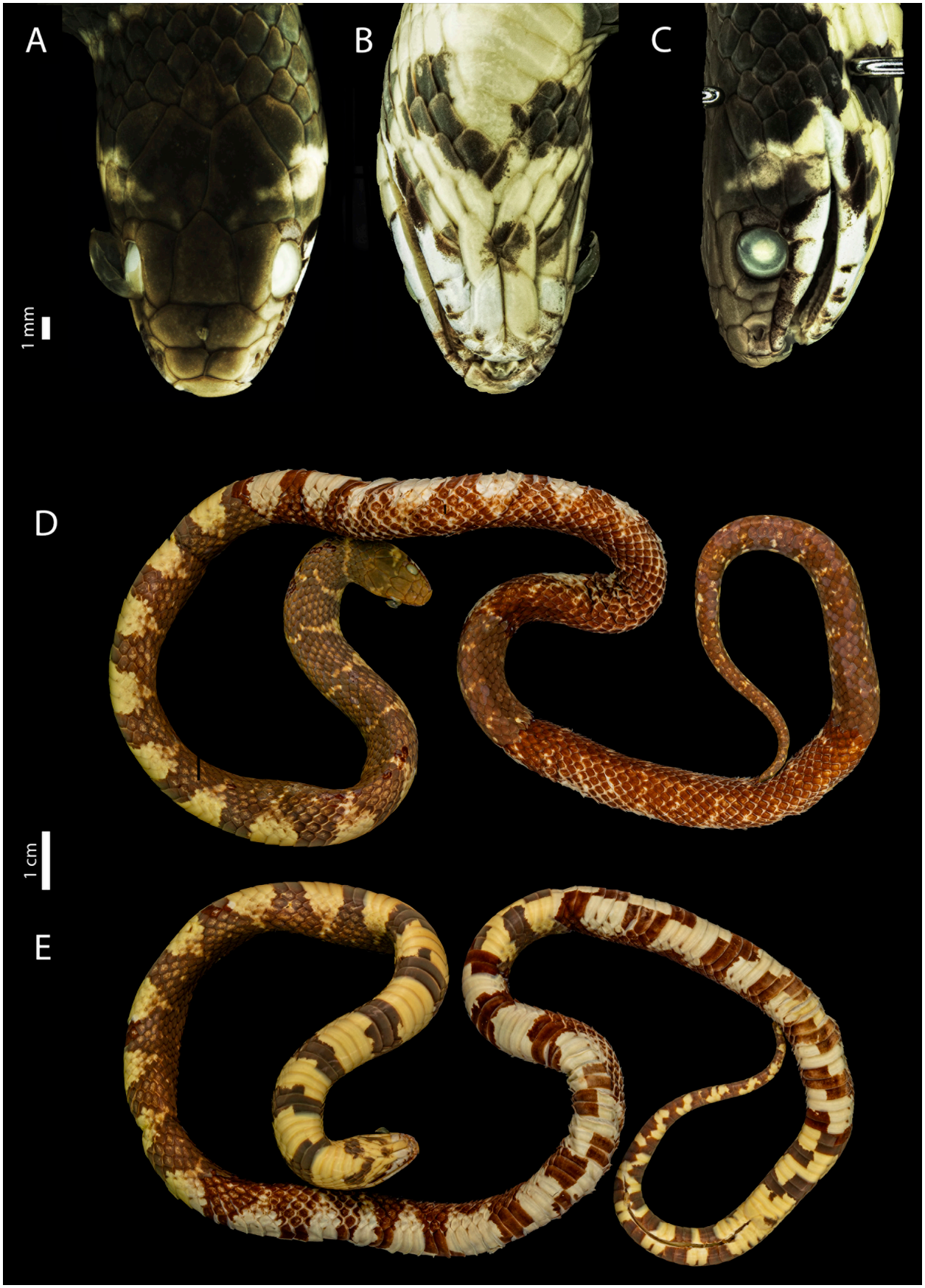

FIGURE 33. Dorsal (A), ventral (B), and lateral (C) views of head and dorsal (D) and ventral (E) views of body of the holotype of *Liophis longiventris* Amaral, 1925 [= *Erythrolamprus breviceps* (Cope, 1860)].

FIGURE 34. Dorsal (A), ventral (B), and lateral (C) views of head and dorsal (D) and ventral (E) views of body of the holotype of *Oxyrhopus rhombifer septentrionalis* Vellard, 1943 [= *Oxyrhopus rhombifer* Duméril, Bibron & Duméril, 1854].

FIGURE 35. Dorsal (A), ventral (B), and lateral (C) views of head and dorsal (D) and ventral (E) views of body of the holotype of *Rhinosimus amarali* Mello, 1926 [= *Phimophis guerini* Duméril, Bibron & Duméril, 1854].

***Rhinostoma bimaculatum* Lutz & Mello, 1922b**
(Fig. 36)
Current status. *Rodriguesophis iglesiasi* (Gomes, 1915). Synonymy after Bailey (1967) and recombination after Grazziotin *et al.* (2012).
Holotype. Adult male [in the original description the authors identified as likely female], AL-MN 5367, collector unknown, from the Municipality of Pirapora (17º20'42"S, 44º56'31"W [approximate]; 472 m asl [approximate]), State of Minas Gerais, Brazil.
Remarks. Holotype (435 mm SVL). No tissue sample available.

***Xenodon hemileucurus* Lutz & Mello, 1922a**
(Fig. 37)
Current status. *Xenodon neuwiedii* Günther, 1863. Synonymy after Amaral (1929b).
Lectotype. Adult female, MNRJ 404, Theophilo Theotonio leg., from the Municipality of São Simão do Manhuassú, currently Municipality of Simonésia (20º07'26"S, 42º00'03" [approximate]; 580 m asl [approximate]) State of Minas Gerais, Brazil.
Remarks. Lectotype (636 mm SVL), no tissue samples available. Three syntypes are mentioned in the original description, but two of them are apparently lost. The MNRJ 404 was designated lectotype by Soares & Fernandes (2001) because it was the only specimen from the original type series found at that time in the MNRJ collection. The two remain specimens (unknown numbers, since cataloging started only at 1940's), if located, are paralectotypes.

Elapidae Boie, 1827

***Elaps ezequieli* Lutz & Mello, 1922b**
(Fig. 38)
Current status. *Micrurus decoratus* (Jan, 1858). Synonymy after Amaral (1926).
Holotype. Adult male [in the original description the authors identified as likely female], AL-MN 5347, collected by native people in 1919 at Municipality of Caxambu (21º58'37"S, 44º55'58"W [approximate]; 895 m asl [approximate]), State of Minas Gerais, Brazil.
Remarks. Holotype (624 mm SVL). No tissue samples available.

***Micrurus albicinctus* Amaral, 1925**
(Fig. 39)
Holotype. Adult male, MNRJ 376, collected by 'Comissão Rondon' (see Amaral, 1925), date unknown, in the North portion of the State of Mato Grosso, Brazil.
Remarks. Holotype (412 mm SVL). The type locality likely refers to the region of the current State of Rondônia without further details. No tissue samples available.

***Micrurus anibal* Nascimento, Graboski, Silva-Jr. & Prudente, 2024**
(Fig. 40)
Holotype. Adult male, MNRJ 18191, collected by Angele Reis Martins in April 2009 at the Núcleo Experimental de Iguaba Grande, Universidade Federal Fluminense, Municipality of Iguaba Grande (22º51'00.7"S, 42º11'35.3"W [informed]; 18 m asl [informed]), State of Rio de Janeiro, Brazil.
Paratypes. MNRJ 4900, MNRJ 8232, MNRJ 19013–19014.
Remarks. Holotype (620 mm SVL) with prepared hemipenis kept inside tube together with specimen. Holotype previously dissected for reproductive study, with microscope slides prepared. No tissue samples available.

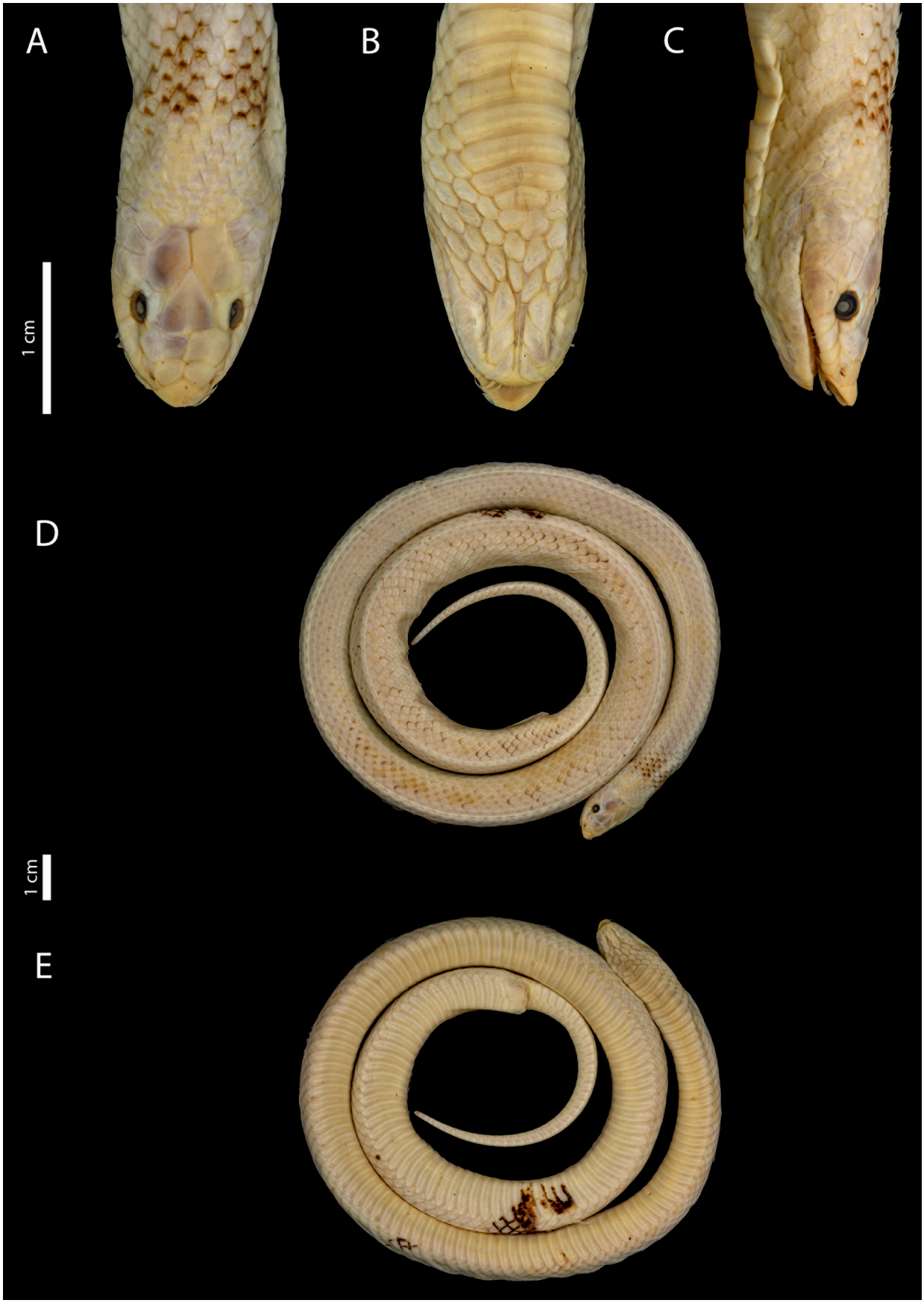

FIGURE 36. Dorsal (A), ventral (B), and lateral (C) views of head and dorsal (D) and ventral (E) views of body of the holotype of *Rhinostoma bimaculatum* Lutz & Mello, 1922b [= *Rodriguesophis iglesiasi* (Gomes, 1915)].

FIGURE 37. Dorsal (A), ventral (B), and lateral (C) views of head and dorsal (D) and ventral (E) views of body of the lectotype of *Xenodon hemileucurus* Lutz & Mello, 1922a [= *Xenodon neuwiedii* Günther, 1863].

FIGURE 38. Dorsal (A), ventral (B), and lateral (C) views of head and dorsal (D) and ventral (E) views of body of the holotype of *Elaps ezequieli* Lutz & Mello, 1922b [= *Micrurus decoratus* (Jan, 1858)].

FIGURE 39. Dorsal (A), ventral (B), and lateral (C) views of head and dorsal (D) and ventral (E) views of body of the holotype of *Micrurus albicinctus* Amaral, 1925.

FIGURE 40. Dorsal (A), ventral (B), and lateral (C) views of head and dorsal (D) and ventral (E) views of body of the holotype of *Micrurus anibal* Nascimento, Graboski, Silva-Jr. & Prudente, 2024.

Gekkonidae Gray, 1871

***Lygodactylus neglectus* Ceríaco & Passos, 2023**
(Fig. 41)
Holotype. Adult male, MNRJ 27809, collected by John Casper Branner in 1876 at Fernando de Noronha Island (03º51'13"S, 32º25'25"W [approximate]; sea level [approximate]), State of Pernambuco, Brazil.
Paratypes. MNRJ 27806–27808, MNRJ 27810–27857.
Remarks. Holotype (26.5 mm SVL). No fresh tissue samples available, but hDNA was successfully extracted from the paratype MNRJ 27808. Paratype MNRJ 27837 with partially everted hemipenis in the specimen. There are a lot comprising nine eggs (MNRJ 27816), one of them with embryo.

Gymnophthalmidae Fitzinger, 1826

***Colobosauroides carvalhoi* Soares & Caramaschi, 1998**
(Fig. 42)
Holotype. Adult male, MNRJ 2565, collected by Antenor Leitão de Carvalho and Joseph Randle Bailey on 22 March 1942 at the Municipality of Barreiras (12°09'10"S, 44°59'24"W [approximate]; 452 m asl [approximate]), State of Bahia, Brazil
Paratypes. MNRJ 2566–2568.
Remarks. Holotype (37 mm SVL). No tissue samples available.

***Ecpleopus lutzae* Loveridge, 1944**
(Fig. 43)
Current status. *Placosoma cordylinum* Tschudi, 1847. Synonymy after Uzzell (1959).
Lectotype. Adult male, MNRJ 4953, collected by Bertha Lutz and Joaquim Venâncio in January 1937 from bromeliads at Beija-Flor River (22°24'S, 42°57'W [approximate]; 1,100 m asl [approximate]), Municipality of Teresópolis, State of Rio de Janeiro, Brazil.
Paralectotype. MCZ-R 46991.
Remarks. This individual was designated lectotype by Soares & Fernandes (2001) because it was the only specimen from the original type series found in the MNRJ collection at that time. However, Loveridge (1944) described the species based on two syntypes, one not catalogued at MNRJ (currently MNRJ 4953, lectotype) and another one (MCZ-R 46991), which became a paralectotype following the above designation.

***Psilops seductus* Rodrigues, Recoder, Teixeira-Jr., Roscito, Guerrero, Nunes, Freitas, Fernandes, Bocchiglieri, Vechio, Fortes, Nogueira, Damasceno, Pellegrino, Argôlo & Amaro, 2017**
(Fig. 44)
Holotype. Adult male, MNRJ 19099, collected by Adriana Bocchiglieri and Daniel S. Fernandes on 06 June 2008 at Jatobá Farm (13°53'S, 45°42'W; 840 m asl), Municipality of Jaborandi, State of Bahia, Brazil.
Paratypes. MNRJ 19097–19098, MNRJ 19100–19105, MNRJ 19417–19418.
Remarks. Holotype (32 mm SVL) with prepared hemipenis kept inside cryotube together with specimen. The paratype MNRJ 19105 with tissue samples available. The paratype MNRJ 19418 was double stained for cartilage and bone.

Leptotyphlopidae Stejneger, 1844

***Leptotyphlops cupinensis* Bailey & Carvalho, 1946**
(Fig. 45)
Current status. *Siagonodon cupinensis* (Bailey & Carvalho, 1946). Recombination after Adalsteinsson *et al*. (2009).

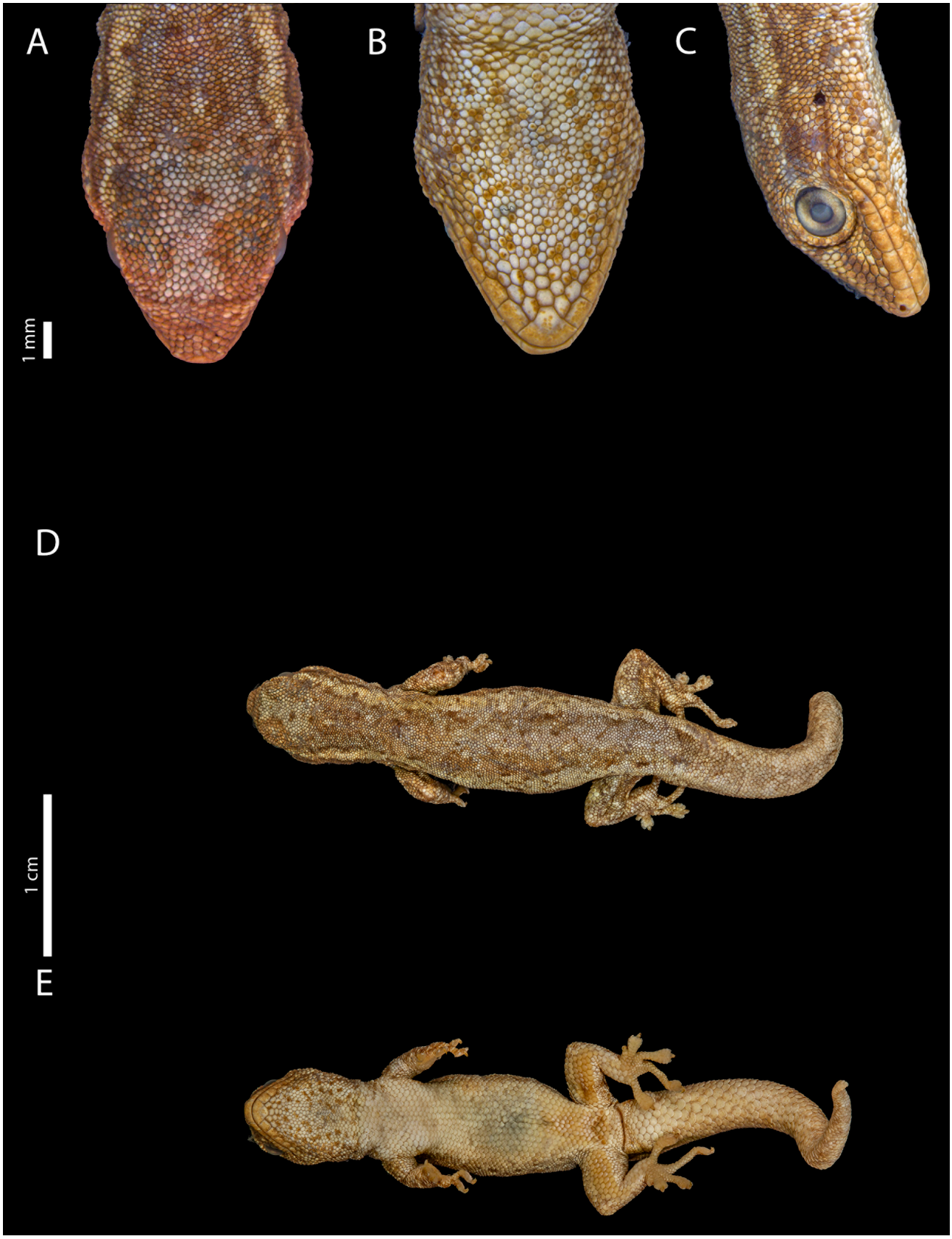

FIGURE 41. Dorsal (A), ventral (B), and lateral (C) views of head and dorsal (D) and ventral (E) views of body of the holotype of *Lygodactylus neglectus* Ceríaco & Passos, 2023.

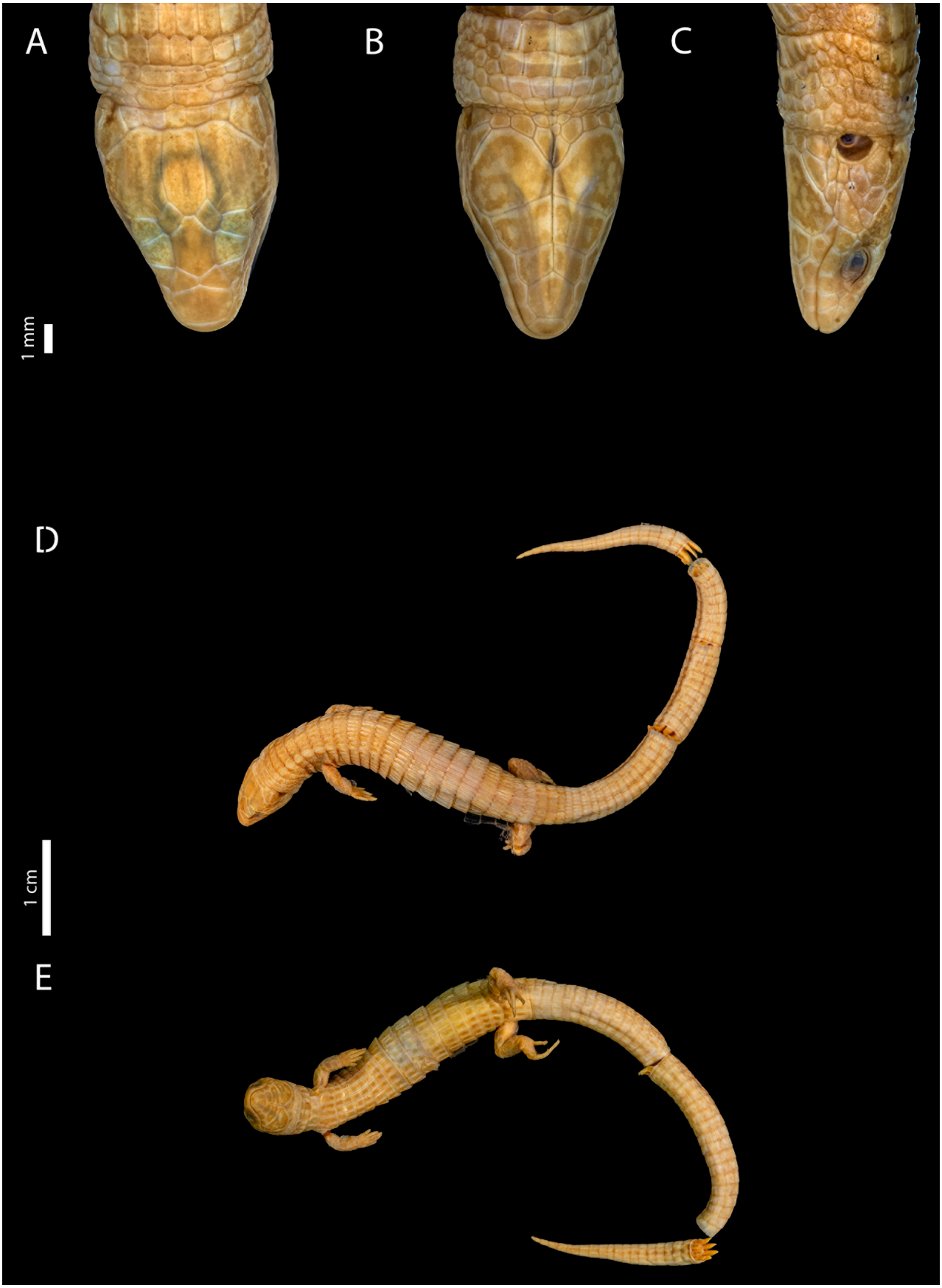

FIGURE 42. Dorsal (A), ventral (B), and lateral (C) views of head and dorsal (D) and ventral (E) views of body of the holotype of *Colobosauroides carvalhoi* Soares & Caramaschi, 1998.

FIGURE 43. Dorsal (A), ventral (B), and lateral (C) views of head and dorsal (D) and ventral (E) views of body of the lectotype of *Ecpleopus lutzae* Loveridge, 1944 [= *Placosoma cordylinum* Tschudi, 1847].

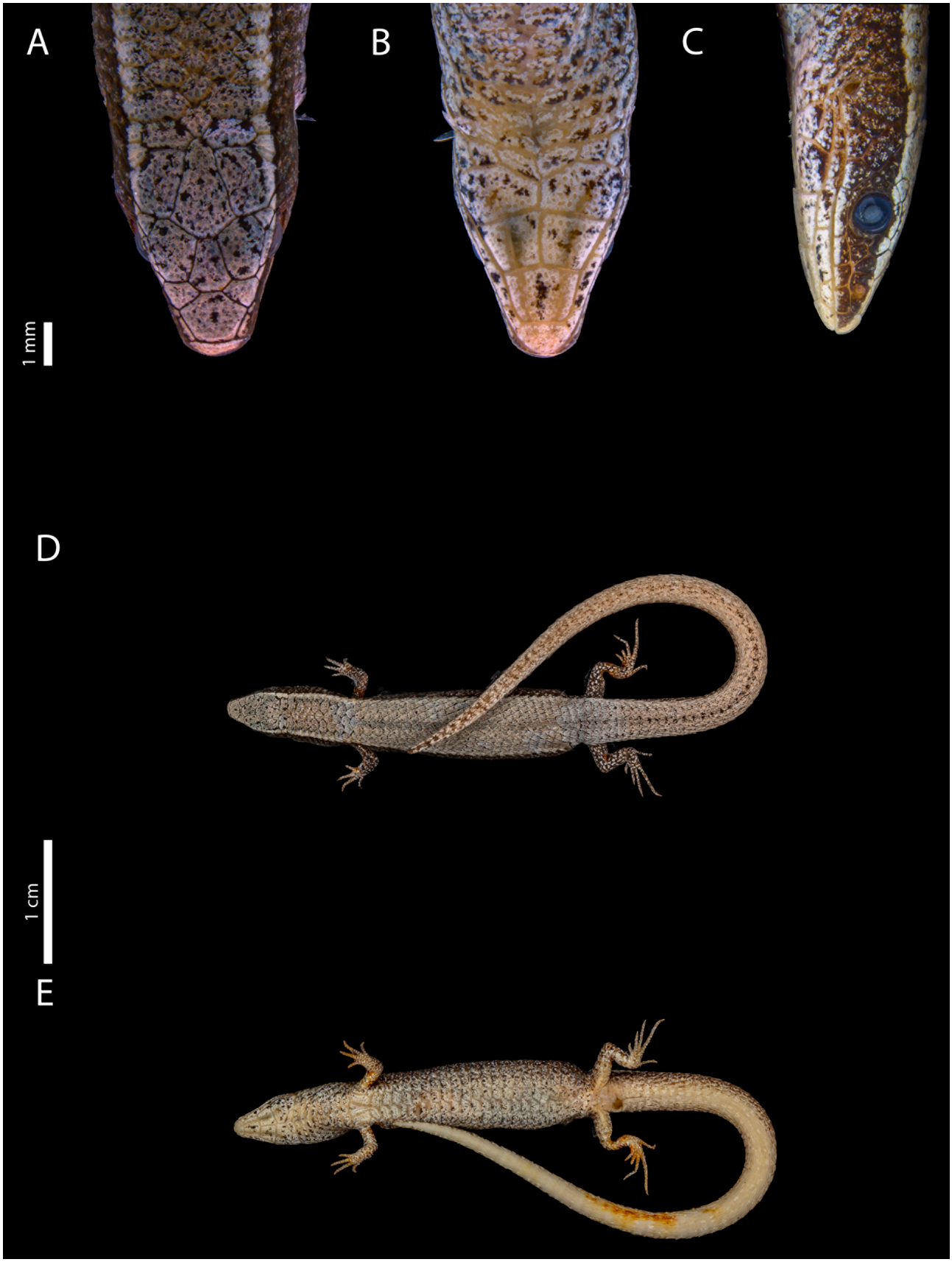

FIGURE 44. Dorsal (A), ventral (B), and lateral (C) views of head and dorsal (D) and ventral (E) views of body of the holotype of *Psilops seductus* Rodrigues, Recoder, Teixeira-Jr., Roscito, Guerrero, Nunes, Freitas, Fernandes, Bocchiglieri, Vechio, Leite, Nogueira, Damasceno, Pellegrino, Argôlo & Amaro, 2017.

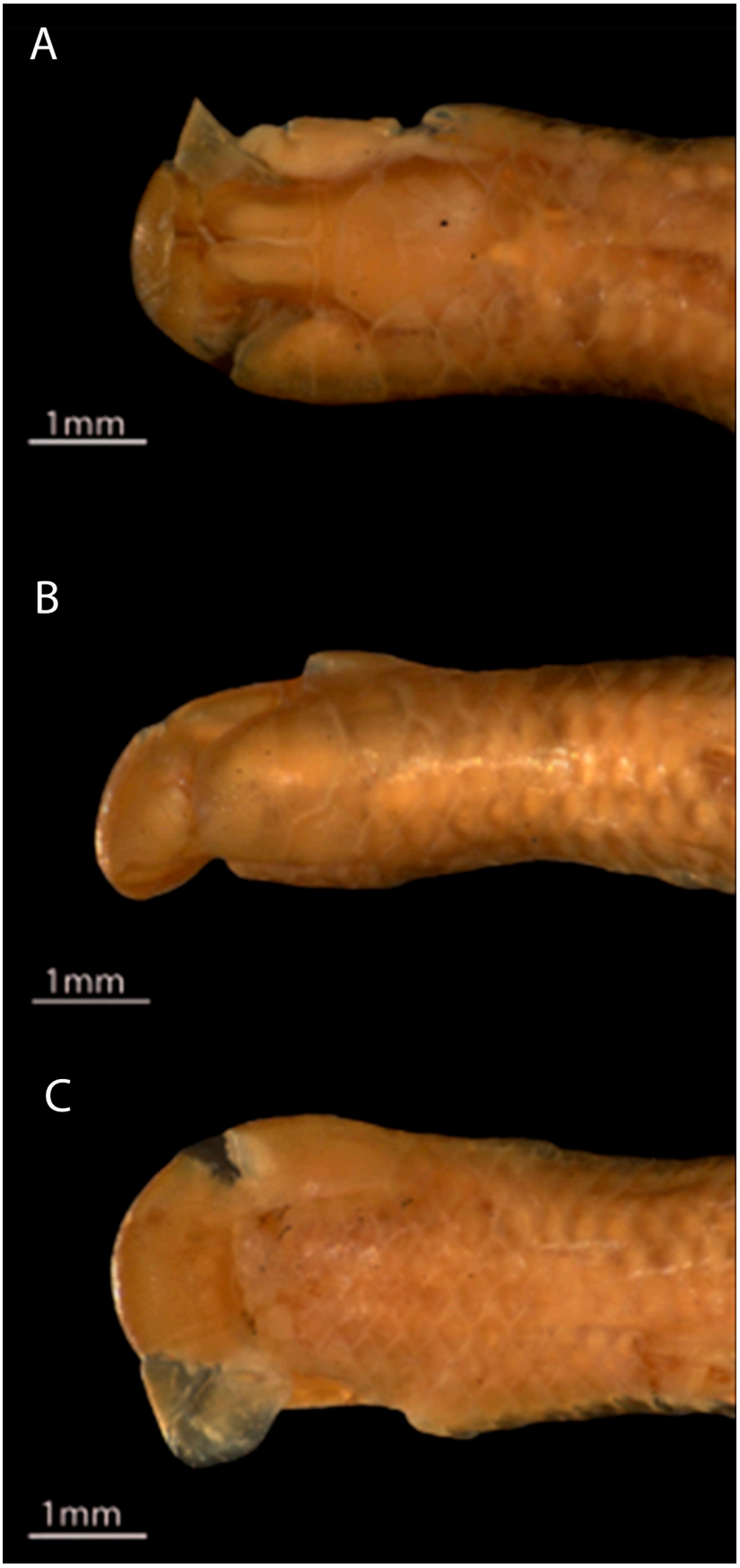

FIGURE 45. Dorsal (A), lateral (B), and ventral (C) views of head of the holotype of *Leptotyphlops cupinensis* Bailey & Carvalho, 1946 [= *Siagonodon cupinensis* (Bailey & Carvalho, 1946)].

Holotype. Adult female, MNRJ 387, collected by Antenor Leitão de Carvalho in January 1940 at Tapirapé River (10º40'S, 50º36'W [approximate]; 186 m asl [approximate]), tributary of the Araguaia River, Municipality of Barra do Tapirapé, State of Tocantins, Brazil.
Remarks. Holotype (~124 mm SVL) broken and severely damaged. No tissue samples available.

***Leptotyphlops fuliginosus* Passos, Caramaschi & Pinto, 2006**
(Fig. 46)
Current status. *Trilepida fuliginosa* (Passos, Caramaschi & Pinto, 2006). Recombination after Hedges (2011).
Holotype. Adult female, MNRJ 10034, collected by Ronald Carvalho Jr. on 18 July 2003 at Preto River during the fauna rescue of the Queimados Hydroelectric Power Plant, between the Municipalities of Luziânia (16°15'S, 46°57'W [approximate]), State of Goiás, and Unaí (16°21'S, 46°54'W [approximate]; 640 m asl [approximate]), State of Minas Gerais, Brazil.
Paratypes. CHUNB 6055–6056, CHUNB 6101, CHUNB 6998, CHUNB 11538, CHUNB 12014, CHUNB 12550, CHUNB 15123, CHUNB 18319, CHUNB 18320, CHUNB 20348, CHUNB 21854, CHUNB 21955, CHUNB 30892, CHUNB 32869, CHUNB 33439, IBSP 56732–56734, IBSP 64368, IBSP 65050–65055, IBSP 65358, IBSP 65365, IBSP 65371, IBSP 65581–65583, IBSP 66101–66102, IBSP 66168, MNRJ 10686, MZUSP 11017, MZUSP 11018, MZUSP 11020, MZUSP 11039–11040.
Remarks. Holotype (256 mm SVL). No tissue samples available for the type series housed in the MNRJ. The paratype with prepared hemipenis IBSP 64368 was apparently lost in the Instituto Butantan fire accident.

***Siagonodon exiguum* Martins, Folly, Ferreira, Silva, Koch, Fouquet, Machado, Lopes, Pinto, Rodrigues & Passos, 2023**
(Fig. 47)
Holotype. Adult female, MNRJ 27562, collected by Guilherme Ferreira on 08 December 2020 at Monte Branco Plateau (01°37'56.99"S, 56°33'29.03"W; 195 m asl), Saracá-Taquera National Forest, Porto Trombetas, Municipality of Oriximiná, State of Pará, Brazil.
Paratypes. MNHN-RA-2023.0001, MNRJ 27557–27561.
Remarks. Holotype (178 mm SVL). The paratype MNRJ 27560 with prepared hemipenis kept inside cryotube together with the remain paratypes. The holotype and paratypes (MNHN-RA-2023.0001, MNRJ 27557) with tissue samples available [not housed in MNRJ].

***Tricheilostoma jani* Pinto & Fernandes, 2012**
(Fig. 48)
Current status. *Trilepida jani* (Pinto & Fernandes, 2012). Recombination after Hedges (2011).
Holotype. Adult male, MNRJ 4263, collected by Geraldo Kisteumacher in 1985 at Mangabeiras City Park (19°55'S, 43°56'W [approximate]; 1000 m asl [approximate]), Municipality of Belo Horizonte, State of Minas Gerais, Brazil.
Paratypes. MCNR 1912, MCNR 3647, MZUSP 7583–7584, MZUSP 8055, MZUSP 18526–18537, UFMG 245–247, ZUEC 1227.
Remarks. Holotype (187 mm SVL). The paratype MZUSP 7583 with prepared hemipenis. No tissue samples available.

Phyllodactylidae Gamble, Bauer, Greenbaum & Jackman, 2008

***Bogertia lutzae* Loveridge, 1941**
(Fig. 49)
Current status. *Phyllopezus lutzae* (Loveridge, 1941). Recombination after Gamble *et al*. (2012).

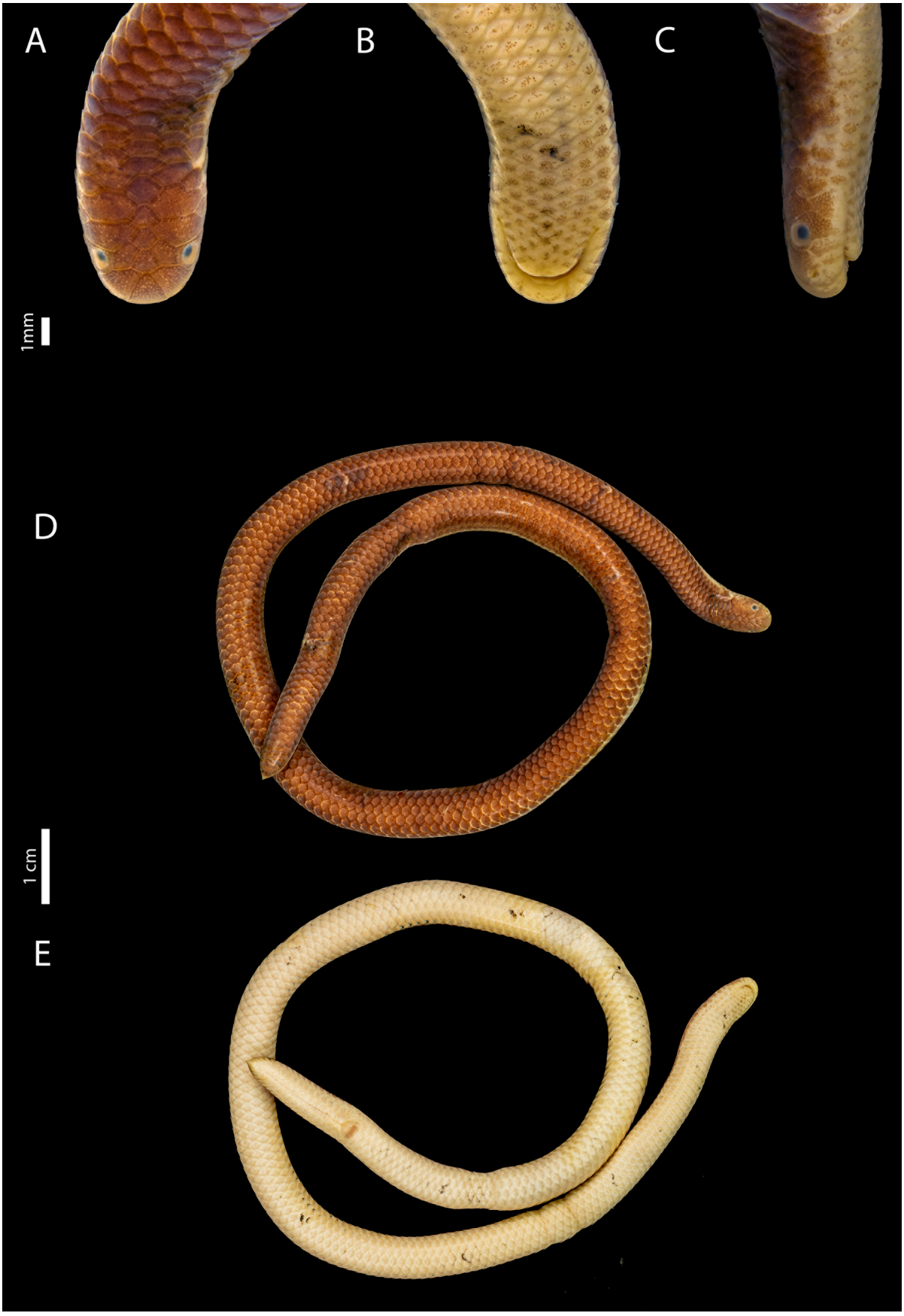

FIGURE 46. Dorsal (A), ventral (B), and lateral (C) views of head and dorsal (D) and ventral (E) views of body of the holotype of *Leptotyphlops fuliginosus* Passos, Caramaschi & Pinto, 2006 [= *Trilepida fuliginosa* (Passos, Caramaschi & Pinto, 2006)].

FIGURE 47. Dorsal (A), ventral (B), and lateral (C) views of head and dorsal (D) and ventral (E) views of body of the holotype of *Siagonodon exiguum* Martins, Folly, Ferreira, Silva, Koch, Fouquet, Machado, Lopes, Pinto, Rodrigues & Passos, 2023.

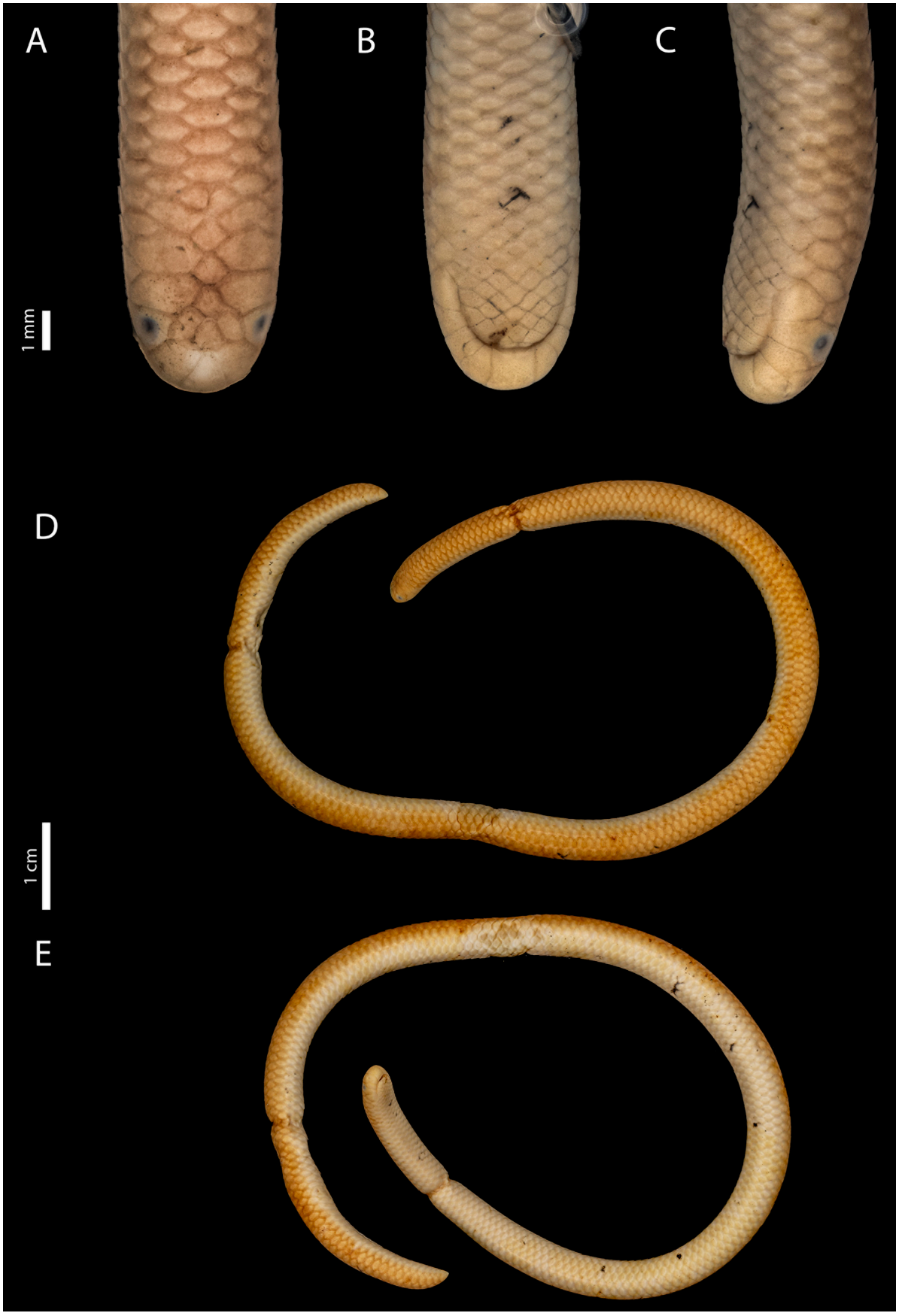

FIGURE 48. Dorsal (A), ventral (B), and lateral (C) views of head and dorsal (D) and ventral (E) views of body of the holotype of *Tricheilostoma jani* Pinto & Fernandes, 2012 [= *Trilepida jani* (Pinto & Fernandes, 2012)].

FIGURE 49. Dorsal (A), ventral (B), and lateral (C) views of head and dorsal (D) and ventral (E) views of body of the syntype of *Bogertia lutzae* Loveridge, 1941 [= *Phyllopezus lutzae* (Loveridge, 1941)].

Syntypes. MCZ-R 46190–46191, MNRJ 1571, MNRJ 7570–7571, MNRJ 19876–19877, collected by Bertha Lutz on 20 May 1941 from bromeliads at Pituba neighborhood (12°59'S, 38°27'W [approximate]; sea level [approximate]), Municipality of Salvador, State of Bahia, Brazil.
Remarks. Syntypes MNRJ 7570–7571 with broken tails. No tissue samples available. Soares & Fernandes (2001) did not refer the MCZ specimens as syntypes.

Scincidae Oppel, 1811

***Copeoglossum oreades* Ferreira-Junior, Vrcibradic, Sudré & Passos, 2025**
(Fig. 50)
Holotype. Adult male, MNRJ 6012, collected by Nelson Jorge da Silva and other collaborators as part of Lobo Guará rescue operation in 1997 at the Serra da Mesa Hydroelectric Power Plant (13º50'03"S, 48º18'16"W [approximate]; 454 m asl [approximate]), Municipality of Minaçu, State of Goiás, Brazil.
Paratypes. MNRJ 5111–5135, MNRJ 5910–5920, MNRJ 5922–5923, MNRJ 5925–5941, MNRJ 5943–5964, MNRJ 5966–5970, MNRJ 5972–5973, MNRJ 5975, MNRJ 5977–5978, MNRJ 5980–6011, MNRJ 6013–6015, MNRJ 6017–6020, MNRJ 6022–6024, MNRJ 6027–6028, MNRJ 6030, MNRJ 6032, MNRJ 6034–6045, MNRJ 6047–6048, MNRJ 6050, MNRJ 6052–6064, MNRJ 6066–6073, MNRJ 6076–6077, MNRJ 6079–6086, MNRJ 6088, MNRJ 6091–6093, MNRJ 6095–6098, MNRJ 12695–12696, MNRJ 26876.
Remarks. Holotype (89.4 mm SVL). Tissue samples available to paratype MNRJ 12969.

Teiidae Gray, 1827

***Cnemidophorus abaetensis* Dias, Rocha & Vrcibradic, 2002**
(Fig. 51)
Current status. *Glaucomastix abaetensis* (Dias, Rocha & Vrcibradic, 2002). Recombination after Goicochea *et al.* (2016).
Holotype. Adult male, MNRJ 8616, collected by Eduardo José dos Reis Dias and Marta Muniz Freire Vargens on 25 March 2000 at Abaeté City Park (12°57'S, 38°22'W [approximate]; sea level), Municipality of Salvador, State of Bahia, Brazil.
Paratypes. MNRJ 8617–8695, MNRJ 9300–9301.
Remarks. Holotype (67 mm SVL). No tissue samples available.

***Cnemidophorus littoralis* Rocha, Araújo, Vrcibradic & Costa, 2000**
(Fig. 52)
Current status. *Glaucomastix littoralis* (Rocha, Araújo, Vrcibradic & Costa, 2000). Recombination after Goicochea *et al*. (2016).
Holotype. Adult male, MNRJ 6536, collected by Carlos Frederico Duarte da Rocha and team on 05 February 1995 at the Restinga de Barra de Maricá (22°57'S, 43°50'W [approximate]; sea level), Municipality of Maricá, State of Rio de Janeiro, Brazil.
Paratypes. CHUNB 3230, CHUNB 3232, CHUNB 3235–3236, CHUNB 3238, CHUNB 3241, CHUNB 3245, CHUNB 3249, CHUNB 3251, CHUNB 3254, CHUNB 3257, CHUNB 3259, MNRJ 6537–6641.
Remarks. Holotype (75 mm SVL). No tissue samples available.

***Cnemidophorus nativo* Rocha, Bergallo & Peccinini-Seale, 1997**
(Fig. 53)
Current status. *Ameivula nativo* (Rocha, Bergallo & Peccinini-Seale, 1997). Recombination after Harvey *et al*. (2012).

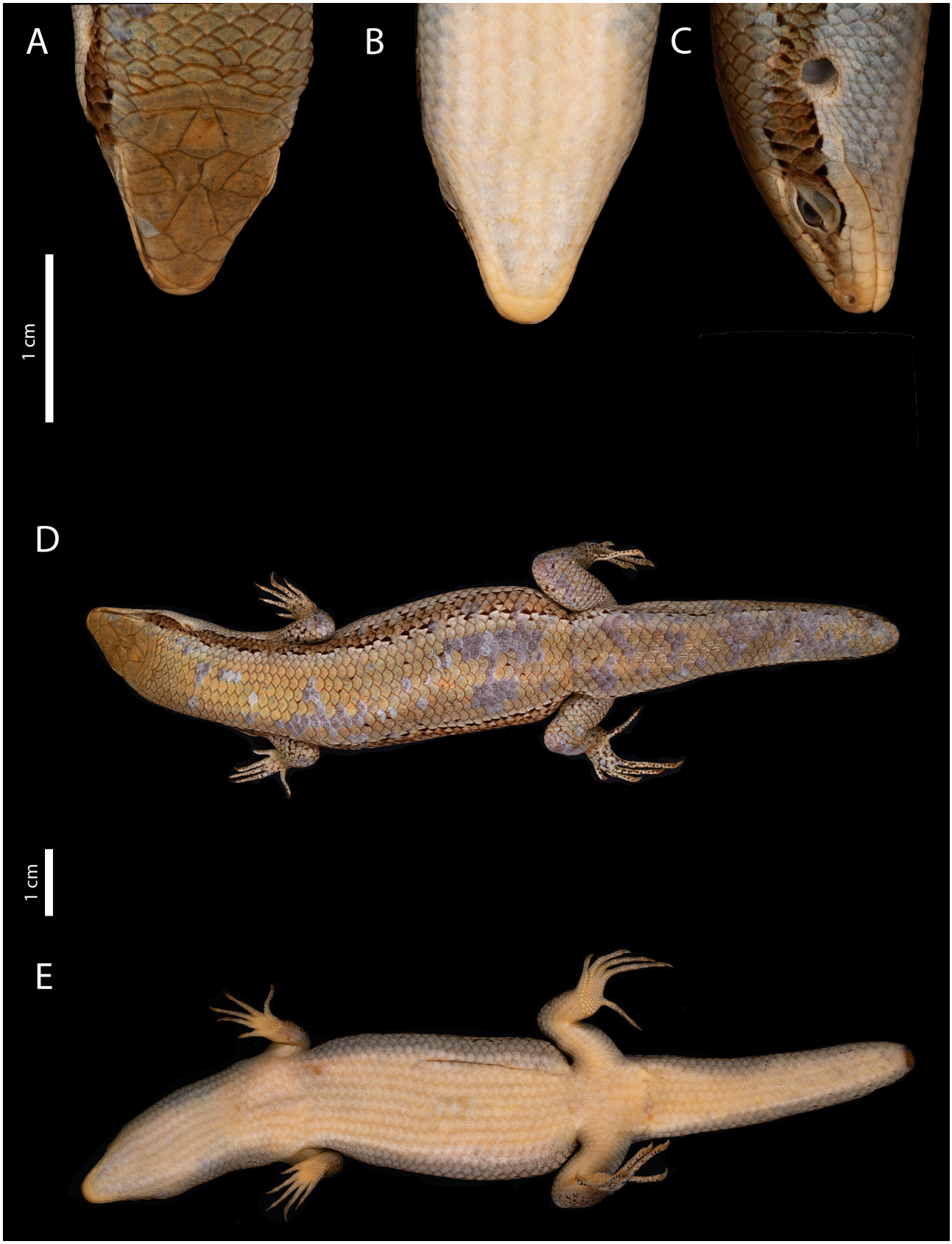

FIGURE 50. Dorsal (A), ventral (B), and lateral (C) views of head and dorsal (D) and ventral (E) views of body of the holotype of *Copeoglosum oreades* Ferreira-Junior, Vrcibradic, Sudré & Passos, 2025.

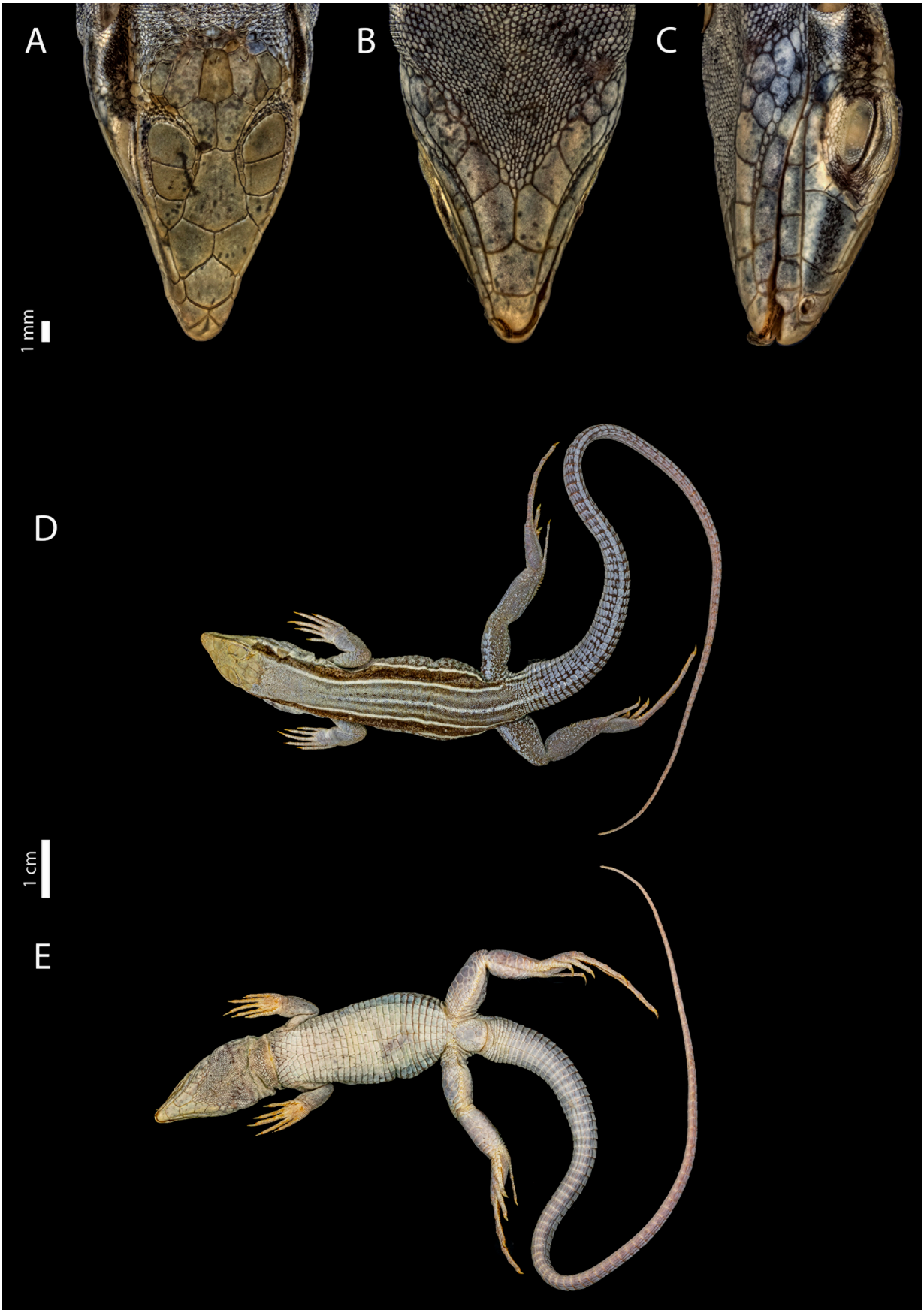

FIGURE 51. Dorsal (A), ventral (B), and lateral (C) views of head and dorsal (D) and ventral (E) views of body of the holotype of *Cnemidophorus abaetensis* Dias, Rocha & Vrcibradic, 2002 [= *Glaucomastix abaetensis* (Dias, Rocha & Vrcibradic, 2002)].

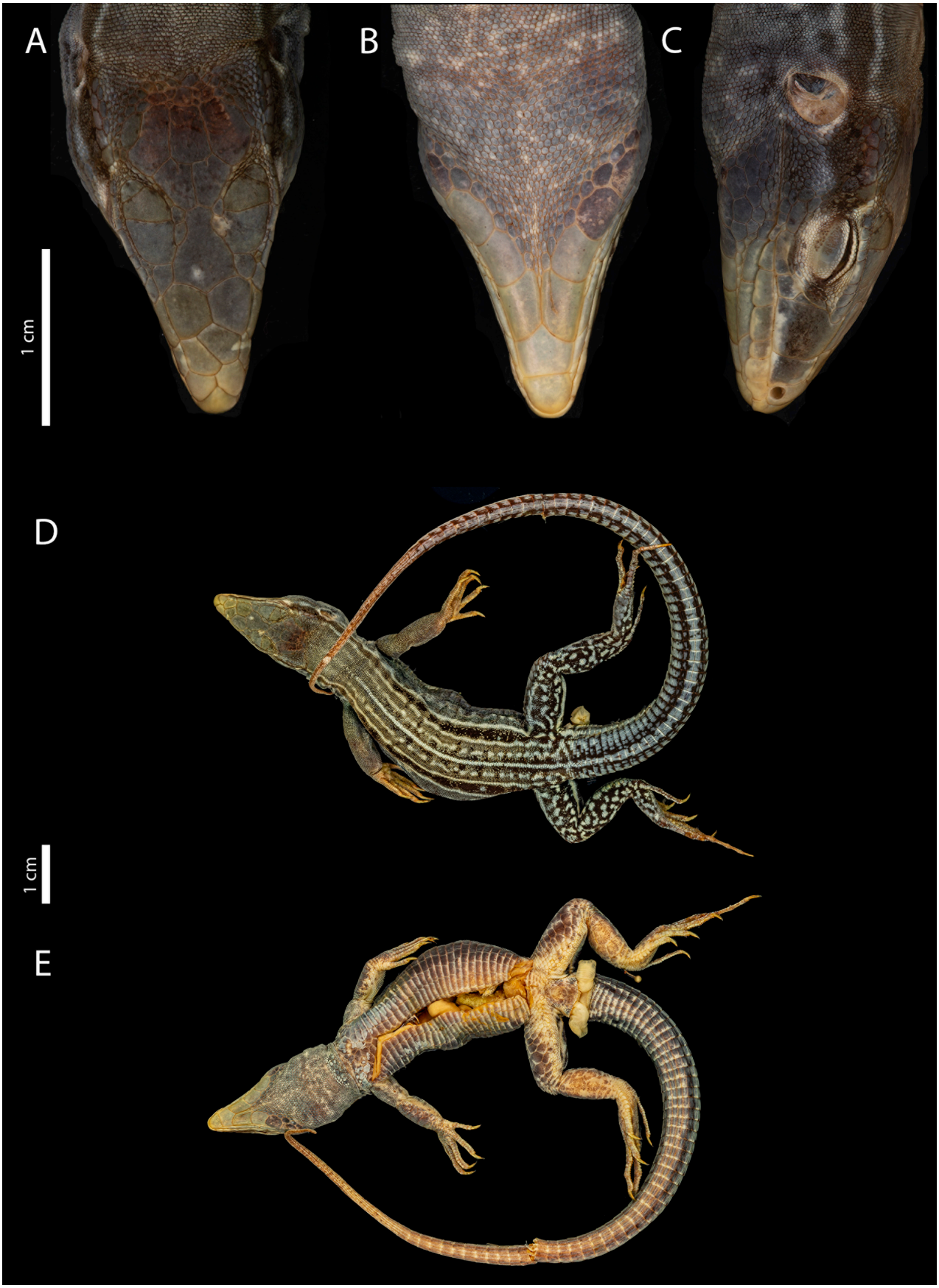

FIGURE 52. Dorsal (A), ventral (B), and lateral (C) views of head and dorsal (D) and ventral (E) views of body of the holotype of *Cnemidophorus littoralis* Rocha, Araújo, Vrcibradic & Costa, 2000 [= *Glaucomastix littoralis* (Rocha, Araújo, Vrcibradic & Costa, 2000)].

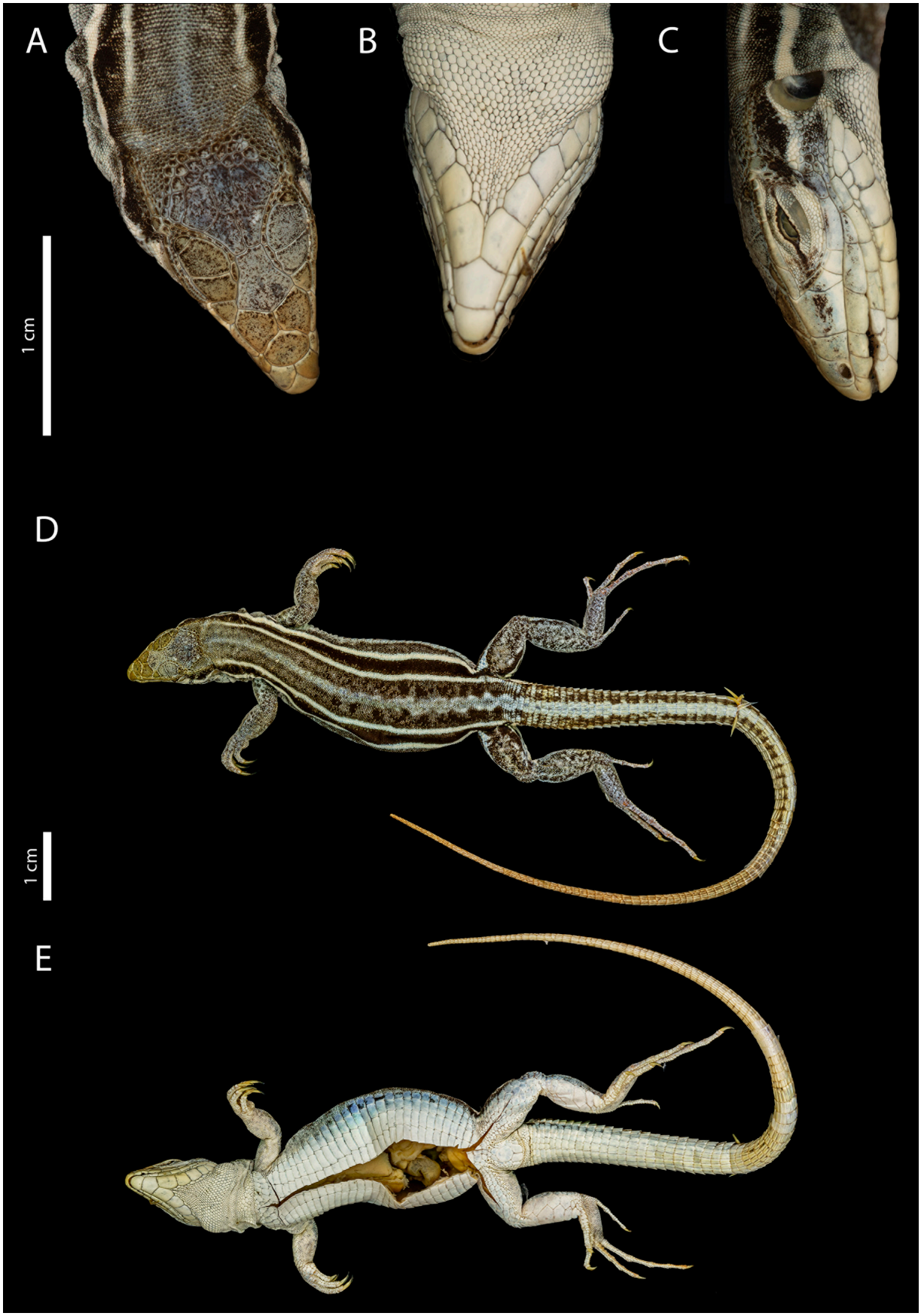

FIGURE 53. Dorsal (A), ventral (B), and lateral (C) views of head and dorsal (D) and ventral (E) views of body of the holotype of *Cnemidophorus nativo* Rocha, Bergallo & Peccinini-Seale, 1997 [= *Ameivula nativo* (Rocha, Bergallo & Peccinini-Seale, 1997)].

Holotype. Adult female, MNRJ 4698, collected by Carlos Frederico Duarte da Rocha on 06 April 1995 at Nativo do Paraju (19°18'S, 40°19'W [approximate]; sea level [approximate]), Vale do Rio Doce Forest Reserve, Municipality of Rio Bananal [Municipality of Linhares as informed by authors], State of Espírito Santo, Brazil.
Paratypes. MNRJ 4699–4719, MNRJ 4722–4737.
Remarks. Holotype (62 mm SVL). No tissue samples available.

Sphaerodactylidae Gamble, Bauer, Greenbaum & Jackman, 2008

***Coleodactylus natalensis* Freire, 1999**
(Fig. 54)
Holotype. Adult male, MNRJ 7005, collected by Eliza Maria Xavier Freire on 26 February 1998 at Coastal Dunes (05°48'S, 35°12'W [approximate]; sea level), Municipality of Natal, State of Rio Grande do Norte, Brazil.
Paratypes. CHUFPB 1356–1358, CHUFPB 1379, CHUFPB 1493, CHUFPB 1495, CHUFPB 1508, CHUFPB 1511, CHUFPB 1522, CHUFPB 1524–1525, CHUFPB 1623, CHUFPB 1687, CHUFPB 1688, CHUFPB 1697, MNRJ 7006–7015, MUFAL 48–50, MUFAL 2278–2282.
Remarks. Holotype (20 mm SVL). No tissue sample available.

***Sphaerodactylus pfrimeri* Miranda-Ribeiro, 1937**
(Fig. 55)
Current status. *Coleodactylus brachystoma* (Amaral, 1935). Synonymy after Vanzolini (1957).
Holotype. Adult male, MNRJ 1443, collected by Rudolph Pfrimer, date unknown, at Palma River (12°36'48"S, 47°53'19"W [approximate]; 270 m asl [approximate]), Municipality of Paranã, State of Tocantins, Brazil
Remarks. Holotype (23 mm SVL). No tissue sample available.

Tropidophiidae Brongersma, 1951

***Tropidophis grapiuna* Curcio, Nunes, Argôlo, Skuk & Rodrigues, 2012**
(Fig. 56)
Holotype. Adult female, MNRJ 19593 (formerly CZGB 3820), collected by José R. Martins on 15 June 1995 at Pedra Lascada Mountain Range (14°46'S, 39°32'W [approximate]; ca. 700 m asl [approximate]), Municipality of Barro Preto [Municipality of Itajuípe as informed by authors], State of Bahia, Brazil.
Paratype. MZUESC 8153.
Remarks. Holotype (289 mm SVL). No tissue sample available.

Typhlopidae Merrem, 1820

***Amerotyphlops martis* Graboski, Arredondo, Grazziotin, Guerra-Fuentes, Silva, Prudente, Pinto, Rodrigues, Bonatto & Zaher, 2022**
(Fig. 57)
Holotype. Adult male, MNRJ 18744, collected by Ana Carolina Calijorne Lourenço and Délio Baêta in 02–08 September 2009 at Neves Beach (21°16'45.59"S, 40°57'47.86"W [informed]; sea level), Municipality of Presidente Kennedy, State of Espírito Santo, Brazil.
Paratypes. MNRJ 18743, MNRJ 18745, MNRJ 18747.
Remarks. Holotype (170 mm SVL) with prepared hemipenis kept inside cryotube together with specimen. Tissue samples available for paratype MNRJ 18745 and a topotype MNRJ 18746.

FIGURE 54. Dorsal (A), ventral (B), and lateral (C) views of head and dorsal (D) and ventral (E) views of body of the holotype of *Coleodactylus natalensis* Freire, 1999.

FIGURE 55. Dorsal (A), ventral (B), and lateral (C) views of head and dorsal (D) and ventral (E) views of body of the holotype of *Coleodactylus pfrimeri* Miranda-Ribeiro, 1937 [= *Coleodactylus brachystoma* (Amaral, 1935)].

FIGURE 56. Dorsal (A), ventral (B), and lateral (C) views of head and dorsal (D) and ventral (E) views of body of the holotype of *Tropidophis grapiuna* Curcio, Nunes, Argôlo, Skuk & Rodrigues, 2012.

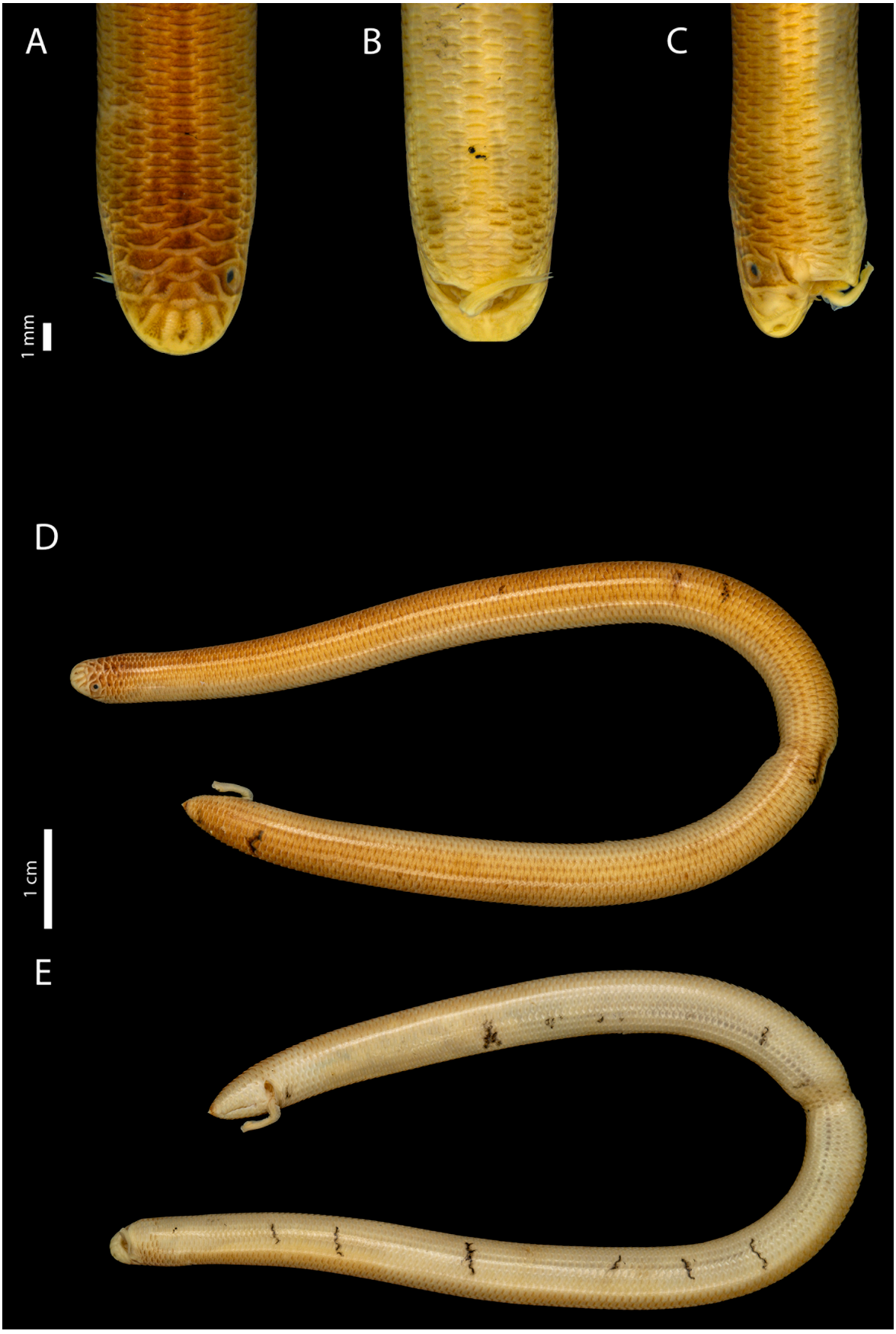

FIGURE 57. Dorsal (A), ventral (B), and lateral (C) views of head and dorsal (D) and ventral (E) views of body of the holotype of *Amerotyphlops martis* Graboski, Arredondo, Grazziotin, Guerra-Fuentes, Silva, Prudente, Pinto, Rodrigues, Bonatto & Zaher, 2022.

FIGURE 58. Dorsal (A), ventral (B), and lateral (C) views of head and dorsal (D) and ventral (E) views of body of the holotype of *Lachesis lutzi* Miranda-Ribeiro, 1915 [= *Bothrops lutzi* (Miranda-Ribeiro, 1915)].

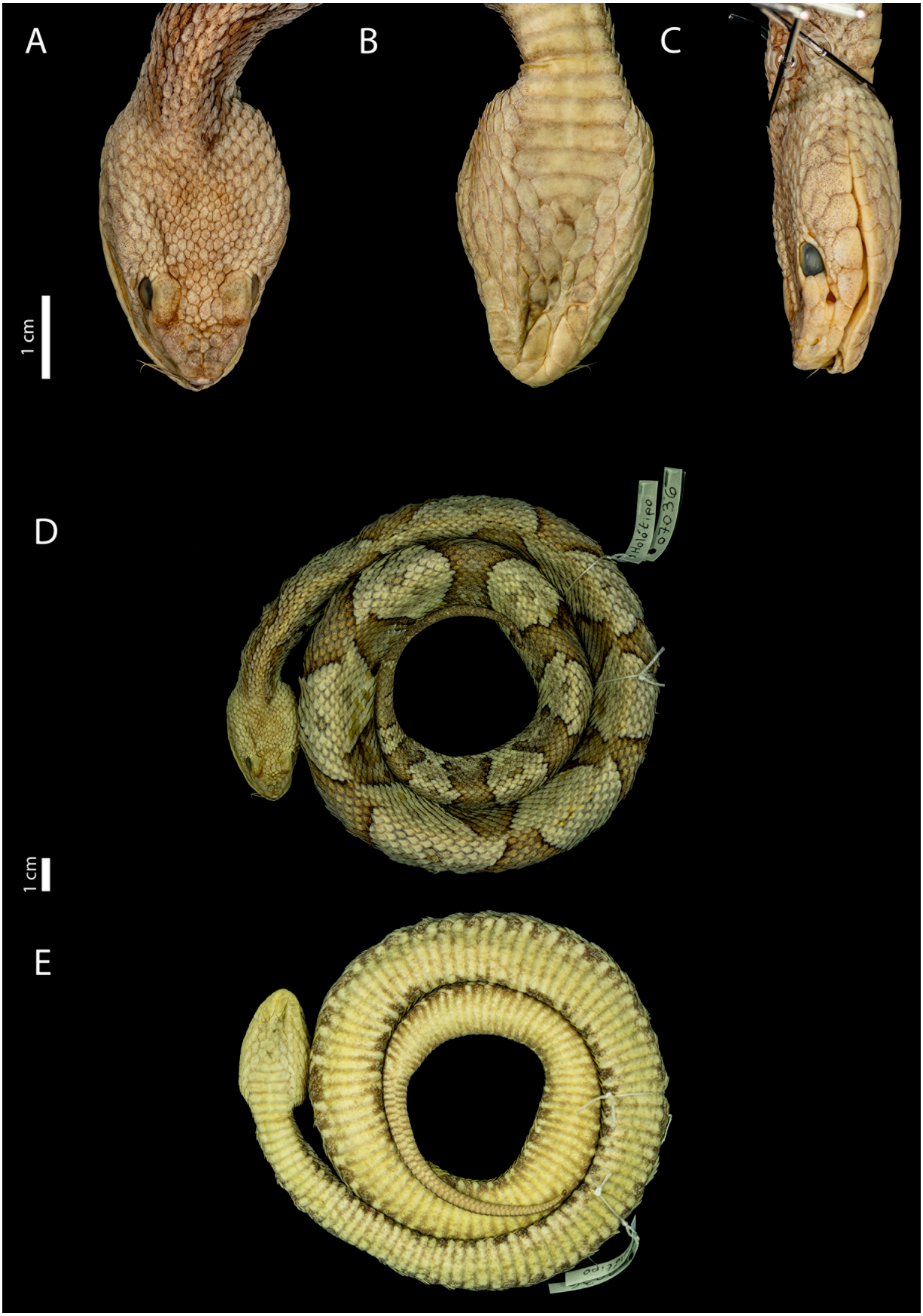

FIGURE 59. Dorsal (A), ventral (B), and lateral (C) views of head and dorsal (D) and ventral (E) views of body of the holotype of *Bothrops muriciensis* Ferrarezzi & Freire, 2001.

Viperidae Laurenti, 1768

***Lachesis lutzi* Miranda-Ribeiro, 1915**

(Fig. 58)

Current status. *Bothrops lutzi* (Miranda-Ribeiro, 1915). Recombination after Amaral (1929c) and revalidated status after Silva & Rodrigues (2008).

Holotype. Adult female, AL-MN 5337, collected by Adolpho Lutz in 1912 at Corrente River, Municipality of Santa Maria da Vitória (13º23'52"S [approximate], 44º11'52"W; 436 m asl [approximate]), State of Bahia, Brazil.

Remarks. Holotype (614 mm SVL). No tissue samples available.

***Bothrops muriciensis* Ferrarezzi & Freire, 2001**

(Fig. 59)

Holotype. Adult female, MNRJ 7036 (formerly MUFAL 378), collected by Selma T. Silva on 20 April 1995 at Bananeira Farm (09°14'S, 35°51'W [approximate]; 640 m asl [approximate]), Municipality of Murici, State of Alagoas, Brazil.

Paratypes. MNRJ 7037 (formerly MUFAL 380), MUFAL 379.

Remarks. Holotype (540 mm SVL). No tissue samples available.

Discussion

The Importance of Scientific Collections

Scientific collections represent an impressive record of life on Earth with billions of preserved specimens and therefore hold significant historical records with unique spatiotemporal memory (Holmes *et al*. 2016; Ellwood *et al*. 2020). They are essential in the study of ecology, systematics, biogeography, and evolutionary research (Miller *et al*. 2020). Historical collections are of fundamental value in assessing the diversity of a particular taxonomic group and reconstructing the phylogeny of many organisms, aiding in the understanding of biota evolution along the planet (Holmes *et al*. 2016). Historical series also have great relevance in preserving the memory of the occupation of original environments that have been modified over time by human action, serving as valuable resources for studying the effects of global changes and human impact on the natural environment in several timescales (Hoeksema *et al*. 2011). The availability of representative samples also allows prediction of future issues in natural resource management (Shultz *et al*. 2020).

Additionally, they serve as a source of past information regarding the occurrence and spatiotemporal distribution of life on our planet (Suarez & Tsutsui 2004). These preserved samples may wait for decades or even centuries to be properly studied (e.g., Koch *et al*. 2019; see Guedes *et al*., 2020 for a synthesis of factor that boost discovery of global reptiles), resulting in the recognition of new species collected in different scenarios of environmental degradation (Fontaine *et al*. 2012). The emblematic case of the recent discovery of a new species of dwarf-gecko (*Lygodactylus neglectus*; Ceríaco & Passos, 2023) from Fernando de Noronha archipelago, supposedly extinct into colonial times, reinforces the great relevance of preserving historical samples in scientific collections. Such material was collected by the 'Comissão Geológica do Império' in 1876, and there is no subsequent record of this species in other collections or in the literature accounts of other naturalists visiting the archipelago. This species is currently target of a project to confirm its supposed extinction status, recover its phylogenetic relationships on the basis of historical DNA, and perform μCT scan to describe its embryology and natural history. In this regard, we anticipate that, in the worst scenario, historical samples preserved in the MNRJ collection will allow to know more of the biology, anatomy, and phylogeny of *Lygodactylus neglectus* than many other extant lizard species occurring in the Neotropics.

The Extended Specimen Concept, current paradigm to Natural History Museums

Extended specimens refer to the combination of specimen's preparations and data types that collectively capture the broadest multidimensional phenotype of an individual, as well as its genotype and the context of the biological community from which it was sampled (Webster 2017). Through digitalization, the physical specimen and its digital

record provide a rich resource of genetic, phenotypic, behavioral, geographic, and environmental data (Miller *et al*. 2020). When a substantial portion or the entire genome of historical samples is available, it opens doors to new avenues and possibilities for research (Watanabe 2019; Ellwood *et al*. 2020). The digitalization of specimens is a significant step towards inventorying the planet's vast biodiversity, a process that has been leveraged in the past two decades (Watanabe 2019; Lendemer *et al*. 2020). When linked to environmental datasets, research is enhanced and enriched, aiding in the understanding of anthropogenic impacts on other living organisms (Ellwood *et al*. 2020). The metadata associated with a physical object exponentially increases the value of the physical sample (Hedrick *et al*. 2020), as they are used to study fundamental questions in biogeography, systematics, and conservation. In addition to directly presenting potential for studying evolution and biodiversity by comparing phenotypic and genotypic changes in populations over time (Holmes *et al*. 2016). Historical collections often contain samples from the same locations at different timescale. Thus, specimens and their associated data are increasingly becoming the cornerstone of biodiversity studies (Watanabe 2019; Ellwood *et al*. 2020).

Digitization of collections improves researcher diversity through an additional avenue, bringing multiple collections together through open bioinformatic aggregation portals (Drew *et al*. 2017; Miller *et al*. 2020). Digitizing collections provides access to global biodiversity data regardless of means, physical location, or ability status, and visitation to global portals indicates that such platforms are reaching a global audience (Drew *et al*. 2017). These digital data are increasingly available online, leading to the development of cyber-infrastructure capable of storing, disseminating, and conducting new research (Ellwood *et al*. 2020). Some collections also provide links to digitized field notes, audiovisual recordings, photographs, and increasingly genetic data via GenBank (Holmes *et al*. 2016). Technology now allows photogrammetry, laser scanning, and computed microtomography, creating much richer digital representations than those visualized by macroscopic or standard microscopy methods. Thus, samples at risk of degradation and candidate type specimens are high-priority targets for digitization (Hedrick *et al*. 2020). Therefore, scientists are able to access both the physical specimens and the metadata that document past and present biodiversity (Ellwood *et al*. 2020), and they can even predict future events based on the study of expanded current samples (Holmes *et al*. 2016).

The collections of natural history museums are the cornerstone in various areas of science, as they are essential for both short-term and long-term studies and enable the study of biodiversity, also including species that are already extinct in the wild (Ceríaco & Passos 2023). Therefore, the maintenance and preservation of the billions of specimens stored around the world are of utmost importance, and this includes the digitization of relevant parts of the preserved collections in Natural History Museums (NHM's). Digitization is a method of preserving specimens and their metadata by transcribing samples into databases, allowing more people to remotely access maximum information about a particular individual and/or population (Miller *et al*. 2020), representing also critical resources for contemporary and future studies on urban evolution (see Shultz *et al*. 2020). In fact, NHM's form the science infrastructure necessary to support society-wide global solutions for the XXI century and beyond (see Johnson *et al*. 2023)

Acknowledgments

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