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Database of the occurrence of the species *Mesoclemmys perplexa*, *Mesoclemmys tuberculata*, and *Phrynops geoffroanus* in Brazil

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ABSTRACT

Databases provide organization and storage of information, whether biological or ecological, to facilitate access to data about species. Therefore, the objective of this study was to present a database on the distribution of *Mesoclemmys perplexa*, *M. tuberculata*, and *Phrynops geoffroanus*, which will be available to the scientific community. To build the database, initial searches were conducted in major online databases such as GBIF, ICMBio, and SpeciesLink, using filtering criteria and a priority order to select the information. Then, the data were organized in an Excel spreadsheet containing 11 columns with relevant information. The recognition of geographical gaps and the discrepancies in data from different sources found throughout this work highlight the importance of scientific collections, online databases, and publications as fundamental tools to expand knowledge about the distribution of these species and to develop management plans aimed at their conservation.

Keywords: Species distribution; Chelidae; Chelonians.

DATA IMPORTANCE

- It provides important information on the occurrence of the species *Mesoclemmys perplexa*, *Mesoclemmys tuberculata*, and *Phrynops geoffroanus*;
- Data to increase the knowledge of the areas in which the three species are found;
- It provides information on the occurrence of species in the country to aid in modeling, distribution, and conservation research.

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MATERIALS AND METHODS

Database construction

The initial search for information on the occurrence of the species *Mesoclemmys perplexa*, *M. tuberculata* and *Phrynops geoffroanus* was carried out using online databases: Global Biodiversity Information Facility - GBIF (http://www.gbif.org), Portal da Biodiversidade - ICMBio (http://www.portaldabiodiversidade.icmbio.gov.br) and Species Link (http://www.splink.cria.org.br). The information available in the databases was filtered and selected in order of priority:

I) voucher number or registration number of the zoological collection;

II) geographic coordinates (cases without coordinates were georeferenced using Google Earth® based on available locality information);

III) collection location (either locality or city). Records without a specific location were georeferenced using the centroid of the municipality;

IV) data from the above platforms were not included if they were identified by non-experts and did not meet the above requirements.

The initial search for information on the occurrence of the species *Mesoclemmys perplexa*, *M. tuberculata*, and *Phrynops geoffroanus* was done through the online database: Global Biodiversity. As a second approach, we sent a formal e-mail to the curators of zoological collections and reference museums: I) The e-mail requested data (coordinates) on the occurrence, in Brazil, of the species targeted by this study. The collections consulted were Museu de Zoologia da Universidade Estadual de Feira de Santana (MUEFS), Museu Paraense Emílio Goeldi (MPEG), Museu Nacional do Rio de Janeiro (MNRJ), Coleção Herpetológica da Universidade Federal de Pernambuco (CHUFPE), Coleção de Anfíbios e Répteis do Departamento de Zoologia da Universidade Federal do Rio Grande do Sul (CHUFRGS), Instituto Nacional de Pesquisa da Amazônia (INPA), and Coleção de História Natural da Universidade Federal do Piauí (CHNUFPI). II) After two formal requests by e-mail, the collections that did not respond were not included in the database.

The third and final approach was to search for the geographical coordinates of the three species in published studies, whether theses, dissertations or articles:

I) We used keywords such as: "*Phrynops geoffroanus*", "*Mesoclemmys perplexa*"; "*Mesoclemmys tuberculata*", "Cágado-de-barbicha", "Cágado-do-nordeste", "Cágado-goiano", "Herpetofauna", "Chelidae", "Testudines" and all Brazilian states in the main academic search platforms: Scielo, Periódicos CAPES, Google Acadêmico and the Brazilian Digital Library of Theses and Dissertations (BDBTD).

II) Articles and theses whose coordinates did not correspond to the locality described in the paper were thoroughly checked for the location of the species.

Examination, uniformity, and accuracy of coordinates

A detailed review of all the information collected was carried out. Biome information was assigned based on the boundaries mapped by IBGE (2019), as well as river basin data. For records without geographic coordinates, the centroid of the locality or city described in the record was used. Records whose location information was limited to the state where the specimen was collected, and occurrences from online databases that were not identified by experts were not used in this database. Records with incorrect geographic coordinates were also discarded.

DATA DESCRIPTION

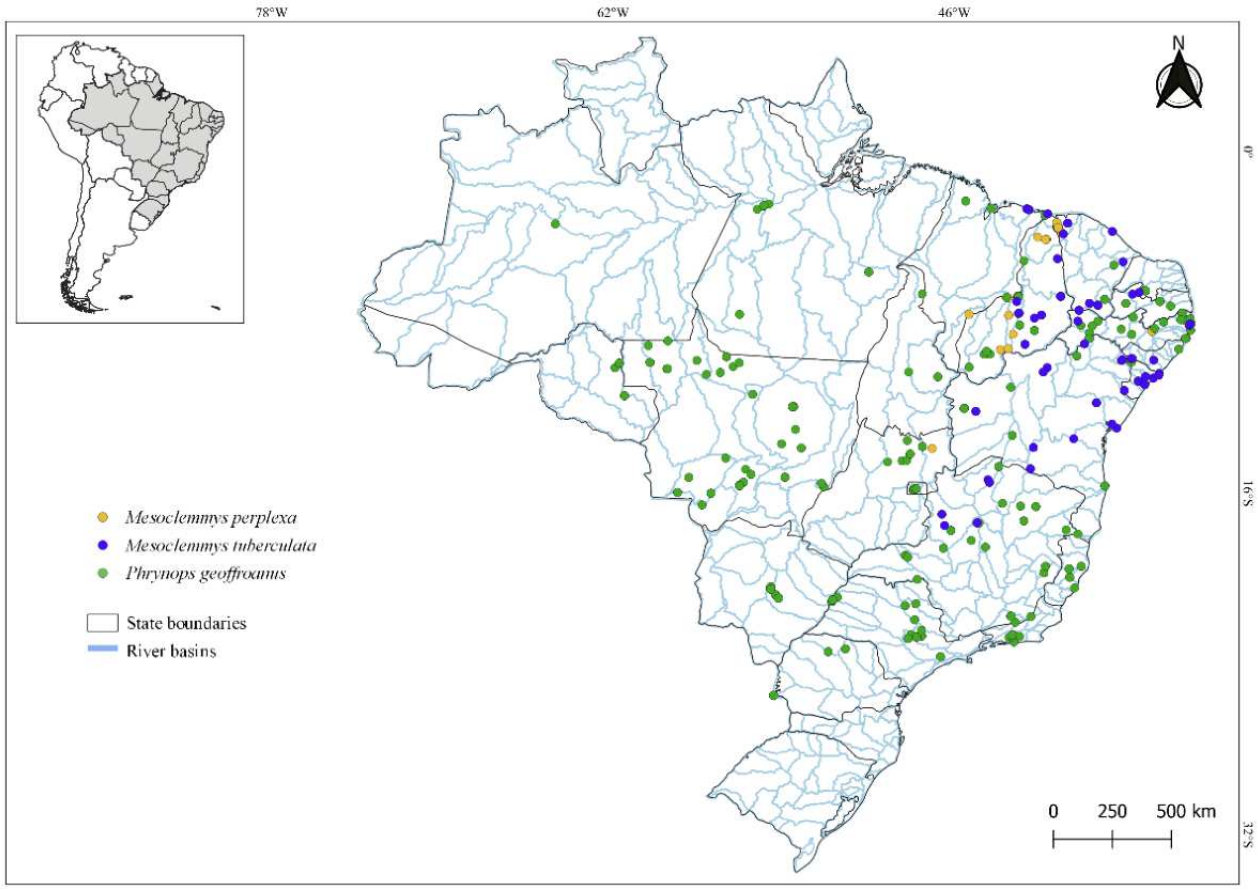
A total of 599 records of occurrence in Brazil were compiled: 42 of *Mesoclemmys perplexa*, 76 of *Mesoclemmys tuberculata* and 481 of *Phrynops geoffroanus* (Fig. 1). Of these, 254 are from zoological collections, 232 from online databases and 113 from publications (articles, theses and dissertations). The data shows the highest number of records for the northeastern region, while the north and south have less information on the occurrence of the species.

The species *P. geoffroanus* is found in all regions (RHODIN et al., 2021; GUEDES et al., 2022), however, there is no published data on its occurrence in the states of Rio Grande do Sul, Santa Catarina, Acre, Amapá, and Roraima.

Mesoclemmys tuberculata has the highest number of records in the northeastern states (n=70). However, there are occurrence data for the southeastern region, in the state of Minas Gerais, where seven records were found: one in Buritizeiro, two in João Pinheiro, one in Bonito de Minas, one in Paracatu, and two in Januária.

Mesoclemmys perplexa also has the highest number of records in the Northeast region (n=45), but there is one record in Nova Roma, State of Goiás, Cerrado biome, in the Midwest region. Two records were found in the Southeast region, in the city of Pirapora, Cerrado biome, State of Minas Gerais, configuring a new record of the species for the state.

Figure 1.- Map showing the occurrences of *Mesoclemmys perplexa*, *M. tuberculata* and *Phrynops geoffroanus* in Brazil.



Dataset

The basic information used to create the database was organized in a spreadsheet with 11 columns in the following order:

- Species: morphologically and genetically identical organisms capable of reproduction (MOREIRA, 2014). In this column, we classified the individuals into the three species targeted in this study;
- State: the Brazilian federative units corresponding to the occurrence of the record;
- Municipality: the municipality to which the record corresponds;
- Locality: if the record was described for a specific geographic area, usually near a city, where the species was found;
- Latitude and longitude in DMS (degrees, minutes and seconds): refers to the coordinates in degrees, minutes and seconds used to specify the location of the record;
- Latitude and Longitude in DD (Decimal Degrees): refers to the geographic coordinate format used to construct the maps;
- River Basin: if the record was made near a water resource. In cases where the coordinates were not close to a watercourse, up to 50 m from the nearest watershed was considered;
- Biome: Biome where the record was made. The boundaries of the biomes mapped and made available by IBGE were used;
- Data source: the origin of the information with citation or DOI (Digital Object Identifier), if applicable;
- Data source: the origin of the information with citation or DOI (Digital Object Identifier), if applicable;
- Voucher number: catalog number of zoological collections;
- Collection: full names of institutionalized collections.

SUPPLEMENTARY MATERIALS

Repository name: Mendely Data
DOI dos dados (quando disponível): http://doi.org/10.17632/rgby35488c.1
Link de acesso aos dados: https://data.mendeley.com/datasets/rgby35488c/1

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