Publication status: Preprint has been published in a journal as an article
DOI of the published article: https://doi.org/10.46471/gigabyte.52

Online catalogue of the Coleção de Flebotomíneos (FIOCRUZ/COLFLEB), a biological collection of American sand flies (Diptera: Psychodidae, Phlebotominae) held at Fiocruz Minas, Brazil

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https://doi.org/10.1590/SciELOPreprints.3782

Submitted on: 2022-03-14
Posted on: 2022-03-16 (version 1)
(YYYY-MM-DD)

GigaByte

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DRR-202202-06 | Data Release

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Keywords: COLLECTION, DIPTERA, MEDICAL ENTOMOLOGY, TAXONOMY

Online catalogue of the Coleção de Flebotomíneos (FIOCRUZ/COLFLEB), a biological collection of American sand flies (Diptera: Psychodidae, Phlebotominae) held at Fiocruz Minas, Brazil

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ABSTRACT

The “Coleção de Flebotomíneos” (FIOCRUZ/COLFLEB) held at Fiocruz Minas is a curated biological collection comprised of approximately 80,000 individual specimens of 370 species of sand flies (Diptera: Psychodidae, Phlebotominae) mostly from the Americas collected over the last 80 years by entomologists interested in understanding and controlling the vector-borne disease leishmaniases. Since 2010, the metadata of each of the individual biological specimens held in FIOCRUZ/COLFLEB, including the back catalogue of those deposited in previous decades, has been digitized. Here, our resulting electronic catalogue, containing records for 72,624 of the specimens, including all of the available provenance information associated with each of them, is published online through the speciesLink network <http://www.splink.org.br/search?collectioncode=FIOCRUZ-COLFLEB&group=animais&lang=pt&action=openform> and the Sistema de Informação sobre a Biodiversidade Brasileira (SiBBr) <http://ipt.fiocruz.br/ipt/resource?r=fiocruz_colfleb>.

Research areas: Animal and Plant Sciences, Biodiversity, Taxonomy

Biological collections are repositories of biodiversity that house specimens, and information about those specimens, which can be used in various areas of scientific research [1], and are especially important for insects of medical and veterinary importance, where accurate taxonomic identification of the latter is necessary for understanding and intervening in the epidemiology of vector-borne diseases [2]. The “Coleção de Flebotomíneos” (the “Collection of Phlebotomines” as it is called in Portuguese) – held at the Instituto René Rachou, Fiocruz Minas (FIOCRUZ/COLFLEB), a federal public health research institution in the city of Belo Horizonte, in the state of Minas Gerais in Brazil – is a biological collection of sand flies (Diptera: Psychodidae, Phlebotominae): small insects of considerable medical and public health importance because their blood-feeding adult females transmit protozoan parasites of the genus *Leishmania*, the etiological agent of leishmaniases, in addition to other bacterial and viral pathogens, which infect both human and non-human

vertebrates [3]. The insect specimens deposited in FIOCRUZ/COLFLEB come from many different research projects carried out over the last 80 years or so in many different areas of disease transmission, and also from wild environments where there are no records of the disease. The deposited sand flies were usually collected in light traps and are identified by highly-trained specialists using the available taxonomic keys [2,4]. The specimens can support research in the areas of taxonomy and systematics [5,6,7], and the associated data can be used, for example, in ecological niche / species distribution modelling [8], among other applications [9].

The data set reported here are the metadata for each individual sand fly specimen deposited in FIOCRUZ/COLFLEB since 1953. Our dataset has 57 fields describing for each individual sand fly specimen their: (i) taxonomy (kingdom, phylum, class, order, family, genus, specificEpithet, infraspecificEpithet, scientificName, scientificNameAuthorship, taxonRank, vernacularName, typestatus), (ii) collection details, including the collectors (recordedBy), the collection date, trapping method, trap identification number, collection site description (occurrenceRemarks, eventDate, eventTime, habitat, samplingProtocol, samplingEffort, eventRemarks), (iii) geolocation data (country, countryCode, stateProvince, county, Island, waterbody, locality, locationRemarks, decimalLongitude, decimalLatitude, georeferenceRemarks), (iv) catalogue reference data (occurrenceID, catalogNumber, OtherCatalogNumbers). The associated data for each physical object in our collections has a paper card with many fields referring to specimen provider, location, quantity of specimens, etc.. The data from these cards have been digitized by a dedicated member of the collection staff since 2010. The data are provided in the Darwin Core format [10]. Our data is available in the Sistema de Informação sobre a Biodiversidade Brasileira (SiBBr), an online platform that integrates data and information about biodiversity and ecosystems and is the Brazilian Node of the Global Biodiversity Information Facility (GBIF) [11], an internationally-recognized resource for collation of biological occurrence data, where our data set has been submitted, and is publicly available for use by others at: https://doi.org/10.15468/sxcpfp.

CONTEXT

Phlebotomine sand flies are considered insects of medical importance because they are involved in the transmission of pathogens between human and non-human animals. Approximately 1,000 sand flies species have been described, of which 530 are known to occur in the Neotropical and Nearctic regions [12].

The collection was officially started in 1953, as part of the work of Professor Amilcar Vianna Martins and Alda Lima Falcão, in collaboration with the technician João Evangelista da Silva, who participated in all fieldwork [13]. The number of specimens in the collection increased considerably during the 1960s and 1970s, and during the last 20 years fossil specimens, as well as voucher specimens from DNA-based barcoding studies and other epidemiological studies involving fieldwork, are still being deposited in the collection [7,14].

FIOCRUZ/COLFLEB contains 922 type specimens belonging to 151 species, including holotypes, allotypes, paratypes, plesiotypes, cotypes, topotypes, homeotypes, syntypes and neotypes. COLFLEB also has a diverse collection of fossil species of Neotropical sand flies, currently consisting of 47 ambers from the Dominican Republic, within which 162 sand flies of 9 species are preserved. Additionally, FIOCRUZ/COLFLEB has in its collection over 700 voucher specimens deposited from on-going DNA barcoding studies.

Since 2010, the metadata of the biological specimens held in FIOCRUZ/COLFLEB is being digitized, and, among the various biological collections of Fiocruz [15], it has the most published online data. Our online catalogue is also integrated into the the speciesLink network <http://www.splink.org.br/search?collectioncode=FIOCRUZ-COLFLEB&group=animais&lang=pt&action=openform> and the Sistema de Informação sobre a Biodiversidade Brasileira (SiBBr) <http://ipt.fiocruz.br/ipt/resource?r=fiocruz_colfleb>.

METHODS

The sand flies held in FIOCRUZ/COLFLEB are adults and were collected using a variety of diverse methods, including resting collection from artificial and natural surfaces using either mechanical or

manual aspirators ("pooters"), human-landing capture, unbaited and CO_2-baited CDC-like light traps, and Shannon traps, operated in different environments, ranging from the domestic and peridomestic (e.g., houses and their surroundings in urban, suburban and rural areas) to the relatively undisturbed sylvatic and wild (e.g., remote forest areas). Our specimens are from 20 different countries in the Americas and all 27 states of Brazil are represented.

The live-caught insects are permanently mounted on glass microscope slides and preserved in either Berlese medium or Canada Balsam, while the fossil specimens are kept in plastic vials. All types are labelled with colour-coded labels.

DATA VALIDATION AND QUALITY CONTROL

Insects were identified by keys available in the literature (Galati 2003; Young and Duncan 1994) by experienced taxonomists.

The dataset is in Darwin Core format 57 terms are available. All mandatory fields are present and have gone through screening in the FIOCRUZ IPT, metadata fields are also available on the online pages.

RE-USE POTENTIAL

The data associated with the biological specimens deposited in FIOCRUZ/COLFLEB are of importance because they describe the distribution of sand flies in different parts of Brazil and have a good temporal coverage since some specimens' date back from 1939 and the last deposit was recorded in 2021. The data can be used for many different applications, from different research areas (taxonomy and systematics [5,6,7], ecological niche modelling [8], among other applications [9]) to vector control activities [16,17].

DATA AVAILABILITY STATEMENT

Declarations (https://gigabytejournal.com/data-release-description)

RESOURCE CITATION

Andrade-Filho et al. (2022). Fiocruz/COLFLEB - Coleção de Flebotomíneos. Version 1.50. FIOCRUZ - Oswaldo Cruz Foundation. Occurrence dataset https://doi.org/10.15468/sxcpfp accessed via GBIF.org on 2022-02-24.

Data published through GBIF: http://ipt.fiocruz.br/ipt/resource?r=fiocruz_colfleb

GBIF UUID 2a629a9a-38d1-496b-afbf-b4ff3b8fae60

https://doi.org/10.15468/sxcpfp

COMPETING INTERESTS

The author(s) declare that they have no competing interests.

FUNDING

FIOCRUZ/COLFLEB is maintained and funded by the Fundação Oswaldo Cruz. JDAF received research fellowships from CNPq (302701/2016-8) and funding from the Fundação de Amparo à Pesquisa do Estado de Minas Gerais (FAPEMIG; PPM-00792-18). PHFS received a research grant from FAPEMIG (PPM-00676-18).

AUTHORS' CONTRIBUTIONS

JDAF: collection curator, provision of resources, revision of the manuscript.

ASR: data curation.

CCM: data curation.

PHFS: collection curator, preparation of the manuscript.

ACKNOWLEDGEMENTS

We would like to thank: the Vice-Presidência de Pesquisa e Coleções Biológicas/Fundação Oswaldo Cruz (VPPCB) for technical and financial support; Dr. Manuela da Silva and Aline da Silva Soares Souto (VPPCB). Juliana Xavier Faustino for technical support between 2013 to 2018; all the past and present students and researchers, that in various ways contributed to the formation, expansion and maintenance of the collection since its inception in the 1960s; and Luke Baton for his comments on

131 draft versions of this manuscript.

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