

The role of Zoological Collections Networks to enhance and fill taxonomic and geographic gaps in open access databases

Programme: CESP

Project ID: CESP2021-008

Project page: <https://www.gbif.org/project/CESP2021-008/filling-taxonomic-and-geographic-gaps-in-open-data-by-strengthening-skills-of-the-brazilian-zoological-collections-network>

Project lead organization: Brazilian Society of Zoology (Associação Brasileira de Zoologia)

GBIF Participant Represented: Nodo Brazil - SiBBr

Project implementation period: 1/8/2021 - 30/4/2023

Report approved: 12/7/2023

Narrative Final report

Executive Summary

All the proposed objectives were achieved. The activities had a great impact on the community. The webinars were successful and the audience was higher than expected. The final seminar (in person at that time) occurred on November 7-9th at Museu Paraense Emilio Goeldi, Belém and 22 researchers and curators attended. Professor Rui Figueira (GBIF Portugal) and Dr. Cleverton dos Santos (SiBBr) were responsible for the workshop: SPECIFY: MANAGEMENT AND PUBLICATION OF BIOLOGICAL COLLECTIONS DATA. Afterwards a forum was installed at SiBBr using the Webconf tool and from now on it will be used to exchange experiences about installing, importing and using the SPECIFY 6, as well as discussing the use of the Github. The interaction among curators and researchers from the collections of the Lusophone countries is growing and strengthening. It is important to notice that this Project was the beginning of a more comprehensive one on Brazilian Biological Collections. The diagnosis of the zoological collections was enlarged to all the collections in Brazil and It will bring more curators to the Specify community for sure. About the diagnosis of the zoological collections: 430 collections were contacted and 342 answered the questionnaire (80%). The collections belong to 116 institutions. The results will be published in a book with the support of the Ministry of Science, Technology and Innovations (MCTI). The MCTI will also give financial support to build a Power BI Plataform with the data obtained in the zoological collections diagnoses that will be at SiBBr plataform. Also, as a result of the project the document entitled: "Recommendations of Best Practices for Brazilian Biological Collections" is presented.

Report on Activities

Activity progress summary

1. Kick-off virtual meeting with project partners Meeting held on August 27, 2021 at 10:00 am EDT. In addition to the members from Brazil, Rui Figueira from GBIF Portugal; Abnilde Lima, Representative of São Tomé and Príncipe; Salomão Bandeira, Representative of Mozambique and Evandro Pires Lopes Representative - Cape Verde. There was a round of presentations so that all the participants could get to know each other, especially the representatives of each Portuguese-speaking country (Portugal, São Tomé e Príncipe, Mozambique and Cabo Verde). the integration of curators of biological collections from Portuguese-speaking countries for the discussion and exchange of experience on management, computerization and availability of information; - Train curators and technicians at Specify through virtual Webinars; - Encourage the qualification of available data. At the end, there was a dialogue about the expectations of the partner members and discussion of the project in order to create better strategies to address the issues raised by the different countries.

2. During the first six months of the project, a survey of Brazilian zoological collections was carried out in order to better know them and diagnose their situation. As the area of zoology is a very diverse area and trying to reach greater fidelity of data in the diagnosis, we invited representatives of scientific societies in Brazil to participate in the process. We organized a Working Group (WG) with representatives of scientific societies that work with zoological collections and taxonomy to prepare the questionnaire. Twelve scientific societies compose the GT: Brazilian Society of Zoology, Brazilian Society of Carcinology, Brazilian Society of Entomology, Brazilian Society of Herpetology, Brazilian Society of Ichthyology, Brazilian Society of Malacology, Brazilian Society of Mastozoology, Brazilian Society of Ornithology, Brazilian Society of Primatology, Brazilian Society for the Study of

Elasmobranchs, Brazilian Society for the Study of Chiroptera and Entomological Society of Brazil. There were several meetings during the months of October/2021 and November/2021 to prepare a questionnaire with questions covering the topics: IDENTIFICATION, CHARACTERIZATION, PHYSICAL INFRASTRUCTURE, STAFF INFRASTRUCTURE, ACCESS TO THE COLLECTION, DIGITALIZATION, COLLECTION QUALITY, MANAGEMENT, and for Finally, the PRIORITIZATION OF NEEDS. The questionnaire was then validated by some curators who responded randomly and was sent to all curators of zoological collections on January 28th. The curators will keep the questionnaire for a month when they will return it completed so that we can do the analysis. RESULTS: 430 collections were contacted to answer the questionnaire and 342 did it (almost 80%). The collections belong to 116 institutions. The results will be published in a book and in a Power BI platform with the support of the Ministry of Science, Technology and Innovations. The graphics with the results are in the document 02 (in Portuguese). The documents we have attached in the mid report we did not attach again in this final report.

3. The webinars were done on the dates: 30/09/2021; 29/10/2021; 25/11/2021; 15/12/2021; 11/12/2022; 01/04/2022; 27/05/2022.

The videos were edited and are available in the youtube channel: <https://www.youtube.com/user/SiBBR>

4. The final workshop was held on the 7th, 8th and 9th of November in Belém, Pará, at the Museu Paraense Emílio Goeldi. It was held together with the Symposium "Scientific Collections and the Construction of Knowledge". It was an event in which, in addition to the workshop, lectures on biological collections were given to several participants from several Brazilian cities. The results of the diagnosis of Brazilian zoological collections were presented. The event schedule can be found at the link: <https://colecoescientifica.wixsite.com/info>. The Final Workshop: SPECIFY: DATA MANAGEMENT AND PUBLICATION OF BIOLOGICAL COLLECTIONS – taught by Dr. Rui Figueira and by Dr. Cleverton Santos had the participation of 20 subscribers belonging to 16 institutions. The list of participants with the respective institutions can be found in the attached Document 1.

5. The number of data published was increased in SiBBR and GBIF and the collections are listed at <https://www.gbif.org/project/CESP2021-008/filling-taxonomic-and-geographic-gaps-in-open-data-by-strengthening-skills-of-the-brazilian-zoological-collections-network#datasets>.

6. A manual with the "Recommendations of Best Practices for Brazilian Biological Collections" was done and is attached in the end of the report.

Completed activities

Activity name: kick-off virtual meeting with project partners

Description: 1. Kick-off virtual meeting with project partners Meeting held on August 27, 2021 at 10:00 am EDT. In addition to the members from Brazil, Rui Figueira from GBIF Portugal; Abnilde Lima, Representative of São Tomé and Príncipe; Salomão Bandeira, Representative of Mozambique and Evandro Pires Lopes Representative - Cape Verde. There was a round of presentations so that all the participants could get to know each other, especially the representatives of each Portuguese-speaking country (Portugal, São Tomé e Príncipe, Mozambique and Cabo Verde). the integration of curators of biological collections from Portuguese-speaking countries for the discussion and exchange of experience on management, computerization and availability of information; - Train curators and technicians at Specify through virtual Webinars; - Encourage the qualification of available data. At the end, there was a dialogue about the expectations of the partner members and discussion of the project in order to create better strategies to address the issues raised by the different countries

Start Date - End Date: 27/8/2021 - 27/8/2022

Verification Sources: Document 03 attached

Activity name: Brazilian Zoological collections Network planning, organization and mobilization

Description: During the first six months of the project, a survey of Brazilian zoological collections was carried out in order to better know them and diagnose their situation. As the area of zoology is a very diverse area and trying to reach greater fidelity of data in the diagnosis, we invited representatives of scientific societies in Brazil to participate in the process. We organized a Working Group (WG) with representatives of scientific societies that work with zoological collections and taxonomy to prepare the questionnaire. Twelve scientific societies compose the GT: Brazilian Society of Zoology, Brazilian Society of Carcinology, Brazilian Society of Entomology, Brazilian Society of Herpetology, Brazilian Society of Ichthyology, Brazilian Society of Malacology, Brazilian Society of Mastozoology, Brazilian Society of Ornithology, Brazilian Society of Primatology, Brazilian Society for the Study of Elasmobranchs, Brazilian Society for the Study of Chiroptera and Entomological Society of Brazil. There were several meetings during the months of October/2021 and November/2021 to prepare a questionnaire with questions covering the topics: IDENTIFICATION, CHARACTERIZATION, PHYSICAL INFRASTRUCTURE, STAFF INFRASTRUCTURE, ACCESS TO THE COLLECTION, DIGITALIZATION, COLLECTION QUALITY, MANAGEMENT, and for Finally, the PRIORITIZATION OF NEEDS. The questionnaire was then validated by some curators who responded randomly and was sent to all curators of zoological collections on January 28th. The curators will keep the

questionnaire for a month when they will return it completed so that we can do the analysis. RESULTS: 430 collections were contacted to answer the questionnaire and 342 did it (almost 80%). The collections belong to 116 institutions. The results will be published in a book with the support of the Ministry of Science, Technology and Innovations. At the moment the WGs are reviewing the chapters and the publishing is planned for April, 2023. The graphics with the results are in the document 02 (in Portuguese). The documents we have attached in the mid report we did not attach again in this final report.

Start Date - End Date: 21/8/2021 - 1/8/2022

Verification Sources: Document 02 attached

Activity name: Montly webinars

Description: From September 2021 to May 2022 seven webinars were presented. It was a huge success with towsendes of viewers. The dates that the webinars occur are the following The webinars were done on the dates: 30/09/2021; 29/10/2021; 25/11/2021; 15/12/2021; 11/12/2022; 01/04/2022; 27/05/2022.

Start Date - End Date: 30/9/2021 - 27/5/2022

Verification Sources: <https://www.youtube.com/user/SiBBr>

Activity name: Zoological Collections Workshop: data management and data publication

Description: The final workshop was held on the 7th, 8th and 9th of November in Belém, Pará, at the Museu Paraense Emílio Goeldi. It was held together with the Symposium "Scientific Collections and the Construction of Knowledge". It was an event in which, in addition to the workshop, lectures on biological collections were given to several participants from several Brazilian cities. The results of the diagnosis of Brazilian zoological collections were presented. The event schedule can be found at the link: <https://colecocientifica.wixsite.com/info>. The Final Workshop: SPECIFY: DATA MANAGEMENT AND PUBLICATION OF BIOLOGICAL COLLECTIONS – taught by Dr. Rui Figueira and by Dr. Cleveson Santos had the participation of 20 subscribers belonging to 15 institutions. The main topics covered were Collection management tools – SPECIFY. Methodologies and tools for publishing biodiversity data through GBIF Quality control and data cleaning. The list of participants with the respective institutions can be found in the attached Document 1.

Start Date - End Date: 7/11/2022 - 11/11/2022

Verification Sources: Document 01 attached

Activity name: Increase of registers of zoological collections and data in SiBBr and GBIF

Description: During the period of the project 402.679 new registers on zoological information were added to SiBBr and GBIF. The tables of the collections were completely reformulated to Darwin Core and checked to arrange all the information at the columns in the right way (including lat and long).

Start Date - End Date: 1/8/2022 - 1/5/2023

Verification Sources: <https://www.gbif.org/project/CESP2021-008/filling-taxonomic-and-geographic-gaps-in-open-data-by-strengthening-skills-of-the-brazilian-zoological-collections-network#datasets>

Report on Deliverables

Deliverables progress summary

All the deliverables proposed were achieved and done. In this final report we are uploading the document "Recommendations of Best practices to Brazilian Biological Collections" that will be available at the page of SiBBr and SBZ. This document, written in Portuguese, will be useful to all the collections of the lusophone countries and it countais, not only guidelines regarding the publication of biodiversity data, but also in all the activities related to the collections. Collections that were not at SiBBr or GIBF are now part of the community according to the information at <https://www.gbif.org/project/CESP2021-008/filling-taxonomic-and-geographic-gaps-in-open-data-by-strengthening-skills-of-the-brazilian-zoological-collections-network#datasets>. The documents of Specify translated to Portuguese are at <https://github.com/GBIFPortugal/specify6-help-SpecifyHelp> Till the dead line of the project, 402.679 new registers on zoological information were added to SiBBr and GBIF. Still, we will be including data from other biological collections till reach the amount of 500 thousand registers as we said we would.

Completed deliverables

Title: Increased number of collections and registers at SiBBr and GBIF

Type: Documentation

Description: The register of the collections at SiBBr happened as follows: December/2020 – 306 collections at SiBBr; December/2021 – 378 collections at SiBBr; December/2022 - 450 collections at

SiBBR. The number of registers in SiBBR and GBIF increased in 402.679 specimens.

Sources of verification: <https://collectory.sibbr.gov.br/collectory/>

<https://www.gbif.org/project/CESP2021-008/filling-taxonomic-and-geographic-gaps-in-open-data-by-strengthening-skills-of-the-brazilian-zoological-collections-network#datasets>

Title: Workshop: SPECIFY: DATA MANAGEMENT AND PUBLICATION OF BIOLOGICAL COLLECTIONS

Type: Training Workshop

Description: The main topics covered were Collection management tools – SPECIFY. Methodologies and tools for publishing biodiversity data through GBIF Quality control and data cleaning.

Sources of verification: Document 01 <https://colecoescientifica.wixsite.com/info>

Title: Webinars

Type: Other

Description: From September 2021 to May 2022 seven webinars were presented. The dates that the webinars occur are the following The webinars were done on the dates: 30/09/2021; 29/10/2021; 25/11/2021; 15/12/2021; 11/12/2022; 01/04/2022;27/05/2022.

Sources of verification: Webinar 1: <https://youtu.be/AtXAOGZbaoo> Webinar 2:

<https://www.youtube.com/watch?v=lstA02yTkHI&t=55s> Webinar 3: <https://www.youtube.com/watch?v=Y78e9PD6RfM> Webinar 4: <https://www.youtube.com/watch?v=rXv78JyIK9I&t=314s> Webinar 5:

<https://www.youtube.com/watch?v=9oYzT5G3mVk&t=4529s> Webinar 6:

<https://www.youtube.com/watch?v=LPCIGi59gi8&t=4750s> Webinar 7:

<https://www.youtube.com/watch?v=NC1q1btJph0&t=3096s>

Title: Documentation translated

Type: Documentation

Description: Documentation of SPECIFY was translated from English to Portuguese: PickList; Overview; NewDataSet; Intro; ImportXLS; ImportData; ImportCSV; DataSetOverview; DataExporter; CreateDSfromRS. It is going to be available at the websites of SiBBR and SBZ and also at the Forum of curators and researchers.

Sources of verification: <https://github.com/GBIFPortugal/specify6-help-SpecifyHelp>

Title: Diagnosis and survey of the Brazilian Zoological Collections

Type: Documentation

Description: A survey of Brazilian zoological collections was carried out in order to better know them and diagnose their situation.

Sources of verification: Document 02

Title: Recommendations of Best Practices to Brazilian Biological Collections

Type: Documentation

Description: A complete document with best practices in biological collections was done and it is available to the Lusophone community.

Sources of verification: Document uploaded. The document is going to be available on line at SiBBR and SBZ pages.

Events

SPECIFY: DATA MANAGEMENT AND PUBLICATION OF BIOLOGICAL COLLECTIONS

Dates: 7/11/2022 - 11/12/2022

Organizing institution: Brazilian Society of Zoology and Museu Paraense Emilio Goeldi

Country: Brazil

Number of participants: 22

Comments:

Website or sources of verification: <https://colecoescientifica.wixsite.com/info/programacao>

Events

Webinar 1

Dates: 30/9/2021 - 30/9/2021

Organizing institution: SBZ, GBIF Portugal, SiBBR, Angola e Moçambique

Country: Brazil

Number of participants: 500

Comments: Webinar 1 Apresentação do Projeto CESP 2021 GBIF/SBZ, introdução ao GBIF e atividade dos Nós nacionais (Angola, Brasil e Portugal). <https://www.youtube.com/watch?v=AtXAOGZbaoo>

Website or sources of verification: <https://sibbr.gov.br/page/cesp/cesp-2021.html>

Events

Webinar 2

Dates: 29/10/2021 - 29/10/2021

Organizing institution: SBZ, GBIF Portugal, SiBBR e MPEG

Country: Brazil

Number of participants: 600

Comments: Webinar 2 <https://www.youtube.com/watch?v=IstA02yTkHI&t=250s> Introdução às funcionalidades do Specify

Website or sources of verification: <https://www.sibbr.gov.br/page/cesp/cesp-2021.html>

Events

Webinar 3

Dates: 25/11/2021 - 25/11/2021

Organizing institution: SBZ, GBIF Portugal, SiBBR, Angola e Moçambique

Country: Brazil

Number of participants: 500

Comments: Webinar 3 Uso do Specify 6 e requisitos de infraestrutura informática <https://www.youtube.com/watch?v=Y78e9PD6RfM>

Website or sources of verification: <https://www.sibbr.gov.br/page/cesp/cesp-2021.html>

Events

Webinar 4

Dates: 15/12/2021 - 15/12/2021

Organizing institution: SBZ, GBIF Portugal, SiBBR e MPEG

Country: Brazil

Number of participants: 500

Comments: Webinar 4 Preparação e importação de dados para o Specify 6. Youtube: <https://www.youtube.com/watch?v=rXv78JyIK9I>

Website or sources of verification: <https://www.sibbr.gov.br/page/cesp/cesp-2021.html>

Events

Webinar 5

Dates: 11/2/2022 - 11/2/2022

Organizing institution: SBZ, GBIF Portugal, SiBBR e MPEG

Country: Brazil

Number of participants: 500

Comments: Webinar 5 Publicação de dados para utilizadores avançados de Specify 6 Youtube: <https://www.youtube.com/watch?v=9oYzT5G3mVk>

Website or sources of verification: <https://www.sibbr.gov.br/page/cesp/cesp-2021.html>

Events

Webinar 6

Dates: 1/4/2022 - 1/4/2022

Organizing institution: SBZ, GBIF Portugal, SiBBR e MPEG

Country: Brazil

Number of participants: 500

Comments: Webinar 6 Estado-da-arte das coleções brasileiras

Website or sources of verification: <https://www.sibbr.gov.br/page/cesp/cesp-2021.html>

Events

Webinar 7

Dates: 27/5/2022 - 27/5/2022

Organizing institution: SBZ, GBIF Portugal, SiBBR e MPEG

Country: Brazil

Number of participants: 500

Comments: Webinar 7 Outras iniciativas nacionais e internacionais em coleções biológicas - compartilhamento de experiências. Youtube: <https://www.youtube.com/watch?v=NC1q1btJph0>

Communications and visibility

It is essential to give visibility to the project. For this, all information, course material, videos and results are being disseminated through SiBBR on the project page <https://www.sibbr.gov.br/page/cesp/cesp-2021.html>. It is possible to access the content of each webinar, download the presentations and view the video. From the face-to-face course, it is also possible to download the material used and the exercises. We have additional content on how to install the virtual machine with specify and other information on recommended data cleaning tools like OpenRefine. On the SiBBR YouTube channel <https://www.youtube.com/@SiBBR/videos>, it is also possible to access the different tutorials on data publication and all the webinars held during the project implementation. In addition, from the main interface of SiBBR, in the "About" section, in the "News and Outreach" menu, it is possible to access the Specify Community, which, upon prior registration, will allow access to the rest of content about specify and to recorded meetings. Our goal is to maintain the community and continue organizing courses and webinars as well as supporting the rest of the collections.

Monitoring and evaluation

Monitoring, evaluation and lessons learned

Final Evaluation:

The project brought great results. Firstly, the survey of information on the state-of-the-art of Zoology Collections and the level of digitalization helped to understand the needs and priorities of Zoological Collections in Brazil. Interest in the Specify Software was repeated in most forms from institutions and collections. The organization of online webinars in addition to the face-to-face course allowed reaching a greater number of participants. These webinars, about the use and installation of Specify, lasting 1-2 hours, are all available on the SiBBR website and on the SiBBR Youtube Channel. Before each webinar, the team and project partners gathered to prepare a few questions on a form that was distributed before the webinar to better understand the expectations of the participants. Once the forms were evaluated, the programming was defined. This process was repeated during all webinars and allowed aligning knowledge and needs among all participants. For approximately one year, seven webinars were held, which more than 600 views each. Later, a face-to-face course was also held with the presence of 20 researchers, technicians and curators from Brazil. During three days there was an exchange of experiences and knowledge about collection data management software, as well as data quality and data publishing tools such as IPT. All participants and curators defended the need to create a Specify Community to continue with the activities and doubts about how to organize the information in Specify. New zoology collections were registered through SiBBR, SiBBR and GBIF were disseminate as a national and international biodiversity data platform and networks, and a space for dialogue was created between zoology collections, with Brazilian Society of Zoology and Partnerships were established with Portuguese-speaking countries, especially with Portugal. The manual with recommendations of best practices to biological collections will be helpful not only to the Brazilian curators but also to the curators of the Lusophone countries.

Best Practices and Lessons Learned:

Periodic meetings of the organizers, the selection of key stakeholders in Brazil to participate in the organization and participation of the webinars and the elaboration of forms regarding the diagnosis of the collections as well as the expectations forms of each webinar allowed a greater engagement of the participants. The possibility of manifesting through anonymous forms allowed for a more active participation during all virtual events and with more questions during the webinars. The support of SiBBR team preparing a virtual machine with specify installed was essential to gain time in the data management webinar on Specify. Before each webinar, support materials were disclosed, as well as the schedule and objectives. With the involvement of the Brazilian Society of Zoology and one of the largest museums of natural history in Brazil, the Goeldi Museum and the support of the Brazilian node - SiBBR was essential to reach the largest number of people in Brazil and also in Portugal and the rest of Portuguese-speaking countries that, although their participation could have been more active, will have many documents and videos in Portuguese for later viewing. Smaller institutions and collections were accounted for and included in the Brazilian context, and many registered with SiBBR and began their process of publishing data, some using Specify and others in spreadsheets. Finally, we believe that this project was the starting point for a better understanding of the difficulties and challenges of the zoology collections and, above all, it was important because, for the first time, zoology collections began to organize themselves as a robust network, as has been done for some time with the herbaria.

Post Project Activity(ies):

We are now planning to continue with the activities of the Forum of curators, to add more specimens data in SiBBR and GBIF, to publish a book and to build a Power BI platform with the results of the diagnosis of the zoological collections. All of them with resources from the Ministry of Science, Technology and Innovations.

Sustainability plans

The maintenance of the Specify Community and the replication of the face-to-face course are fundamental for the sustainability of the project. It is necessary to provide all collections with the necessary infrastructure to install and use Specify. SiBBr and the Brazilian Society of Zoology will evaluate on demand the need to install specify in the cloud (RNP) to support all collections. Course participants will also be expected to train other people. The partnership with the Portuguese node was very enriching with many new ideas for future projects and other participations.

Impact of COVID-19 pandemic on project implementation

Conducting online webinars has been a great strategy to hold periodic events during the project year. These types of meetings are the result of 2 years of the pandemic. Although restrictions were relaxed at the end of 2021 and beginning of 2022, it was not possible to organize the event in 2021, leaving the event for November 2022. However, it did not require many changes in terms of project activities and deliveries. In this way, the project went as planned and all deliveries and events were carried out successfully.

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