

# Digitization, georeferencing, and mobilization of Philippine Chiroptera and associated, ectoparasites and pathogens from the University of the Philippines Los Baños Museum of Natural History

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**Programme:**BIFA

**Project ID:** BIFA6\_026

**Project lead organization:**UNIVERSITY OF THE PHILIPPINES LOS BAÑOS MUSEUM OF NATURAL HISTORY

**Project implementation period:**1/1/2022 - 31/3/2023

**Report approved:** 26/5/2023

## Narrative Final report

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### Executive Summary

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The project ran from January 1, 2022 until March 31, 2023. This was extended from the original project end on February 2023. The project's achievements include the publication of 4 datasets in GBIF that covers the Chiropteran order with their associated taxa. We have published a total of 3,700 occurrence records in GBIF which have been georeferenced with a few uncertainties. The project has also successfully conducted the Biodiversity Data Mobilization Workshop last March 23-24, 2023. This event was able to introduce GBIF to potential stakeholders, provided a demonstration of how to publish their data on the GBIF website, as well as showed examples of what a published dataset will look like under the GBIF website.

Evaluation of the project implementation is yet to be done by the project staff together with the project lead. As such, we will conduct a post project presentation to all stakeholders for final evaluation of the project achievements in due time.

As in many cases, the COVID-19 pandemic had an impact on how the project was implemented. There were delays when it came to the project implementation due to the delayed reports of the previous project (BIFA5\_021). Personnel transition and development during the project implementation were affected by both of these factors, and we could only start around the halfway point of 2022.

All activities and deliverables were completed within the project duration with the help of a one-month extension approved by GBIF. As the mobilization workshop concluded, we envision other stakeholders to be in contact with GBIF with their respective data mobilization projects. We also envision a network of digitization throughout museums and higher institutions throughout the Philippines.

### Progress against milestones

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**Has your project completed all planned activities?: Yes**

**Has your project produced all deliverables?: Yes**

### Report on Activities

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#### Activity implementation summary

The proposed timeline for BIFA6\_026 has been significantly affected due to our funding support being on hold until the previous BIFA-funded project handled by the museum (BIFA5\_021) complied with the submission of the final narrative and financial report. Without our funding support,

the project has no capability to provide salaries and honoraria to our staff and assistants as well as procurement of necessary equipment needed for digitization.

However, since the midterm reporting was fast approaching, we have decided to push through with the hiring of project staff and assistants despite not having the funds yet. The leveling-off and planning workshop was conducted last May, 13, 2022 immediately after the hiring of project members. The meeting was held via Zoom web conferencing and was attended by ten UPLB Museum of Natural History staff. During the meeting, the attendees were oriented about the project overview, deliverables and timeline, payment schedule and terms, project members and their roles, budget, and activities. Last June 10, 2022, all project appointments for the project leader, staff, and assistants were already submitted to UPLB Foundation Inc. (UPLBFI) and was approved last June 24, 2022. UPLBFI acknowledged the receipt of the fund transfer from BIFA last August 4, 2022, and immediately started managing the financial aspect of the project.

Digitization of the Zoological and Wildlife Museum new series Chiroptera collection started immediately after the leveling-off and planning workshop. The dataset has undergone data capture and data management and was published last July 31, 2022. Major flags addressed during the midterm report such as the missing event dates, continent, geodetic datum, and institution ID were already corrected by Mr. Garcia as of March 31, 2023. We would like to thank Lily Shrestha for dedicating time to help us with data cleaning and reminding us about the corrections.

For the DS Rabor Chiroptera Collection, 100% of the target specimens were encoded in the Darwin Core Format. After data capture, the dataset underwent data cleaning and was published last December 15, 2022. Some flags like the missing wrong or missing event dates were already corrected by Mr. Lumibao last January 27, 2023.

The Entomological Museum's Ectoparasite Collection started the digitization process last September 2023 and was published on March 31, 2023. The dataset contains 827 occurrences of ectoparasites from bats as well as additional 119 occurrences of the bat host species. The dataset had a resource relationship extension to match occurrence IDs of the ectoparasites and bats. The digitization process took a lot of time which is why the publication of this deliverable did not meet the expected project end date which was on February 28, 2023

The Philippine bat virus and pathogens dataset started the process last October and was published on March 30, 2023. We opted to publish this dataset as occurrences rather than a simple checklist since we have data on locality and date from the publications. Mr. Lumibao also added bat host occurrences since the number of bat viruses from the publications of our Japanese partners did not reach the expected amount which is 100.

Lastly, one of the reasons we applied for the extension of the project end date is to accommodate the conduct of the Biodiversity Data Mobilization Workshop. The team simply ran out of time to organize the workshop in February due to the delays we had at the start of the project. We were able to conduct the workshop last March 23 & 24, 2023 online via Zoom where 22 people from various Higher Education Institutions (HEIs), museums, government-funded projects, and NGOs were able to attend the event.

### Completed activities

#### **Activity name: Levelling-off and planning workshop**

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**Description:** This activity shall orient all stakeholders on the implementation and timeline of the project.

**Start Date - End Date:** 13/5/2022 - 13/5/2022

**Verification Sources:** [https://gbif.fluxx.io/s3/model\\_doc/7602/9679193](https://gbif.fluxx.io/s3/model_doc/7602/9679193)

[https://gbif.fluxx.io/s3/model\\_doc/7602/9679194](https://gbif.fluxx.io/s3/model_doc/7602/9679194)

[https://gbif.fluxx.io/s3/model\\_doc/7602/9679200](https://gbif.fluxx.io/s3/model_doc/7602/9679200)

#### **Activity name: Hiring of Research Associate and project assistant**

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**Description:** Once we are informed of the approval of the proposal. We shall start searching for a researcher to be hired. This staff will focus on the implementation of the project. We will also hire an assistant that will take care of other administrative processes and also assist in digitization activities.

**Start Date - End Date:** 3/1/2022 - 13/5/2022

**Verification Sources:** [https://gbif.fluxx.io/s3/model\\_doc/7602/9679200](https://gbif.fluxx.io/s3/model_doc/7602/9679200)

[https://gbif.fluxx.io/s3/model\\_doc/7602/9679216](https://gbif.fluxx.io/s3/model_doc/7602/9679216)

#### **Activity name: Digitizing MNH Chiropteran Collection**

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**Description:** We transcribed and standardized existing catalogs of bats. We will also image representative specimens of a bat species from specific localities. This were done for the new series Zoological and Wildlife Museum Chiroptera Collection and DS Rabor Chiroptera Collection datasets.

**Start Date - End Date:** 13/5/2022 - 31/3/2023

**Verification Sources:** [https://gbif.fluxx.io/s3/model\\_doc/7602/9679453](https://gbif.fluxx.io/s3/model_doc/7602/9679453)  
[https://gbif.fluxx.io/s3/model\\_doc/7602/9691520](https://gbif.fluxx.io/s3/model_doc/7602/9691520)

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### **Activity name: Digitizing MNH bat ectoparasites collection.**

**Description:** Slides bat ectoparasites were be massed scan. The data will be transcribed. Automated text recognition will be used if available. Representative specimens of a species from a specific locality will be imaged in a digital microscope.

**Start Date - End Date:** 1/9/2022 - 31/3/2023

**Verification Sources:** [https://gbif.fluxx.io/s3/model\\_doc/7602/9679185](https://gbif.fluxx.io/s3/model_doc/7602/9679185)

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### **Activity name: Databasing Philippine Bat pathogen data**

**Description:** All data derived on bat pathogens derived from MNH and its collaborators projects were compiled from genbank and other databases as well as previous publications. These were compiled in one dataset.

**Start Date - End Date:** 1/10/2022 - 30/3/2023

**Verification Sources:** [https://gbif.fluxx.io/s3/model\\_doc/7602/9691519](https://gbif.fluxx.io/s3/model_doc/7602/9691519)

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### **Activity name: Dataset processing and publication**

**Description:** This activity will cover datasets cleaning and processing and publication in GBIF.

**Start Date - End Date:** 13/5/2022 - 31/3/2023

**Verification Sources:** <https://doi.org/10.15468/yd3up5>

<https://doi.org/10.15468/m899kg>

<https://doi.org/10.15468/r623m6>

<https://doi.org/10.15468/5a7mg3>

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### **Activity name: Biodiversity Data Mobilization Workshop**

**Description:** We have invited participants from various higher learning institutions, museums & non-profits to learn about planning, data cleaning, data management and publishing through the GBIF platform. Participants were encouraged to publish their data through the platform and were invited to take the biodiversity data mobilization course to supplement the workshop.

**Start Date - End Date:** 23/3/2023 - 24/3/2023

**Verification Sources:** <https://mnh.uplb.edu.ph/news/mnh-holds-biodiversity-data-mobilization-workshop/?fbclid=IwAR3tzmhpiliKNmkRHdyTGI2W7XYJi6D0ugpMgjqWT-iepWCFVy-6UxcV15Q>

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### **Activity name: georeferencing occurrence records**

**Description:** All geographic information in the datasets will be georeferenced through the help of GIS experts.

**Start Date - End Date:** 7/7/2022 - 29/3/2023

**Verification Sources:** Uploaded spreadsheets as source of verification (see below)

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### **Activity name: Monthly monitoring meeting**

**Description:** Based on targets set during the levelling-off and planning workshop, progress of project personnel will be presented and evaluated during the meeting. This will be done on the last friday of every month from February 2022.

**Start Date - End Date:** 27/5/2022 - 31/3/2023

**Verification Sources:** none

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## **Report on Deliverables**

### **Production of Deliverables - Summary**

The first deliverable completed under the project is the Zoology and Wildlife Museum new series Chiroptera collection with a total of 1,118 occurrences published and registered through GBIF Asia IPT by Mr. Jezryl Jaeger Garcia last July 31, 2022. Specimen preparation was facilitated by Mr. Edison A. Cosico, one of the project staff and collections manager of UPLB MNH wildlife collection. Ms. Lily Shrestha. provided assistance and advice on data cleaning and IPT creation. Major flags from the midterm report such as missing event dates were already corrected by Mr. Garcia. Correction of other flags such as the geodetic datum, institution match and continent are already corrected but are not yet reflected in the dataset as of March 31, 2023. Photographs of the specimens will be included after project implementation.

The DS Rabor Chiroptera collection boasts 1,500 occurrences of Philippine bats from collections dating back to the 1940s. Digitization of the specimens was completed and was published and registered through GBIF last December 15, 2022. Photographs of the specimens are yet to be included after the project as the chiropteran skins are to be cleaned and selected with care with consideration on Museum protocols on handling skin specimens.

As for the UPLB MNH Bat ectoparasite collection, the publication exceeded the original project end date (Feb. 28, 2023). It was published and registered to GBIF on March 31, 2023 (during the extension period), with a total of 946 occurrences (827 ectoparasites and 119 host bats). The overall digitization process simply took longer than expected in addition to the delays we had during the start of the project.

The Philippine bat viruses and pathogens dataset was published and registered through GBIF last March 30, 2023 which was during the extension period as well. It was originally planned to be published as a checklist only but since there is available locality and date, the team opted to publish it as an occurrence dataset. The dataset contains 136 occurrences, 68 occurrences are from the bat viruses and another 68 for bat host species. The dataset took some time since we have to collaborate with the dataholders to be able to use the data for GBIF and this took some time.

### Production of deliverables

#### **Title: UPLB Museum of Natural History Zoological and Wildlife Museum New Series Chiroptera Collection**

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**Type:** Dataset

**Status update:** The occurrence dataset is already published in GBIF.org website.

**Dataset scope:** New series Chiroptera (Bats) collection of the UPLB Museum of Natural History Zoological and Wildlife Museum for the past 30 years.}

**Expected number of records:** 1118

**Data holder:** UPLB Museum of Natural History

**Data host institution:** GBIF Asia

**Sampling method:** Specimens preserved in alcohol are tagged with museum accession numbers prior to digitization. These accession numbers will be the unique occurrence identifiers used in publishing the dataset to GBIF

**% complete:** 100

**DOI:** <https://doi.org/10.15468/yd3up5>

**Expected date of publication:**

#### **Title: UPLB Museum of Natural History DS Rabor Chiroptera Collection**

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**Type:** Dataset

**Status update:** The occurrence dataset is already published in GBIF.org website.

**Dataset scope:** Dataset will include historical data of Philippine Chiroptera from the 1940's up to the 1980's.}

**Expected number of records:** 1500

**Data holder:** UPLB Museum of Natural History

**Data host institution:** GBIF Asia

**Sampling method:** Chiropteran skin specimens will be imaged together with their respective tags. The tags are to be digitized and a QR identifier for the specimens will be attached after digitization

**% complete:** 100

**DOI:** <https://doi.org/10.15468/m899kg>

**Expected date of publication:**

#### **Title: UPLB Museum of Natural History Bat Ectoparasite Collection**

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**Type:** Dataset

**Status update:** The occurrence dataset is already published in GBIF.org website.

**Dataset scope:** Bat ectoparasites deposited in the Entomological Museum of the UPLB Museum of Natural History}

**Expected number of records:** 946

**Data holder:** UPLB Museum of Natural History

**Data host institution:** GBIF Asia

**Sampling method:** Accession numbers were attached to the slides and information indicated in the slides about the ectoparasites and their hosts were digitized.

**% complete:** 100

**DOI:** <https://doi.org/10.15468/r623m6>

**Expected date of publication:**

## Title: Philippine Bat Viruses and Pathogens

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**Type:** Dataset

**Status update:** The occurrence dataset is already published in GBIF.org website.

**Dataset scope:** Philippine bat viruses and pathogens detected in voucher specimens deposited in the UPL Museum of Natural History Zoological and Wildlife Museum}

**Expected number of records:** 136

**Data holder:** Tokyo University of Agriculture and Technology and Okayama University of Science

**Data host institution:** GBIF Asia

**Sampling method:** Data from publication papers were digitized together with the host information.

**% complete:** 100

**DOI:** <https://doi.org/10.15468/5a7mg3>

**Expected date of publication:**

## Impact of COVID-19 pandemic on project implementation

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COVID-19 has had a significant impact in our project implementation, and foremost of this was that several members of the project team got infected and were debilitated from conducting project activities (as well as in other duties). Mssrs. Phillip Alviola and Jezryl Jaeger Garcia who were actively involved as main point persons in project implementation, were afflicted with COVID-19. This has caused significant delays in museum specimen and database preparation, digitization activities, as well communication with partners and BIFA Coordination Team.

## Events

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### Leveling-off and Planning Workshop

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**Dates:** 2022-05-13 - 2022-05-13

**Organizing institution:** UPLB Museum of Natural History

**Country:** Philippines

**Number of participants:** 10

**Comments:**

**Website or sources of verification:** photodocumentation and minutes of the meeting

## Events

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### Biodiversity Data Mobilization Workshop

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**Dates:** 2023-03-23 - 2023-03-24

**Organizing institution:** UPLB Museum of Natural History

**Country:** Philippines

**Number of participants:** 20

**Comments:** Comprised of 4 modules: Planning, Data Capture, Data Management, & Publishing. Please see the powerpoint presentations in the attachments.

**Website or sources of verification:** <https://mnh.uplb.edu.ph/news/mnh-holds-biodiversity-data-mobilization-workshop/?fbclid=IwAR3tzmhpilIKNmKRHdyTGI2W7XYJi6D0ugpMgjqWT-iepWCFVy-6UxcV15Q>

## Communications and visibility

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For the communications of the project, the team has done several steps to publicize our initiatives to the general public. We have presented the midterm status of our GBIF BIFA-funded project during the museum's 46th anniversary (on September 30, 2022), an event that is highly anticipated and will be attended by museum staff, curators, university students, and faculty.

We have also submitted three abstracts to the Annual Philippine Biodiversity Symposium (APBS) of the Biodiversity Conservation Society of the Philippines (BCSP), all of which were approved for oral presentation. The APBS is a three-day (December 6-9, 2023) symposium attended by local international academics, scientists, conservationists, and advocates for Philippine Biodiversity. The three oral presentations related to the project are as follows:

1. Digitization and georeferencing of the UPLB MNH new series Chiroptera holdings presented by Mr. Garcia
2. Status of the University of the Philippines Los Baños Museum of Natural History's D.S. Rabor Memorial Wildlife Collection presented by Mr. Lumibao
3. University of the Philippines Los Baños-Japan Philippine Bat-borne Virus Project (2007–2022) presented by Mr. Alviola

Lastly, we have also conducted the Biodiversity Data Mobilization Workshop last March 23 & 24, 2023 where we showcased our published datasets to our attendees from different academic institutions, museums, government-funded projects, and NGOs.

## Monitoring and evaluation

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### Final Evaluation

The project was severely handicapped due to its very late implementation start. This was brought about by the delays in the completion of the previous BIFA05 project under UPLB MNH, and this has resulted in several constraints to this BIFA06 project namely: (1) a five-month delay in signing of Grant Letter as well as in fund download, and (2) hiring and approval of project staff appointments. As such, virtually all activities listed in this project (BIFA06) were squeezed within 10 months instead of the agreed-upon 15 months (including a one-month extension). In addition, except for the Project Assistant (Mr. J. Garcia), all staff involved in the project are also employed in various institutions in the University and as such the work devoted to the BIFA06 project was not fully rendered.

Nevertheless, the BIFA06 project managed to complete all its target goals within 10 months, albeit a few days beyond the agreed completion date. In addition, Msrs. Garcia and Lumibao, both of whom worked in the digitization of the target data sets, displayed admirable devotion to the completion of the project.

### Best Practices and Lessons Learned

The project benefitted as the team is well-versed in collection-based research, particularly on bats, and the project lead also had extensive and active research on bat-borne viruses. The team's close familiarity with bat and ectoparasite specimens data and virus information enabled a relatively faster process of digitization. In addition, the UPLB MNH bat and ectoparasite specimen holdings were for the most part adequately organized such that needed information for data capture was readily available.

On the other hand, most of the project staff were only working part-time in the digitization (being employed full-time in UPLB MNH) and thus resulting in minor delays in the implementation of targeted activities.

### Post Project Activity(ies)

Several activities are envisioned after this project. These are (1) specimen imaging from published data sets, (2) continuation of data mobilization workshops in various institutions, and (3) grant application for digitization of other UPLB MNH bat specimens. The current staff of UPLB MNH has the expertise to conduct the post activities. In addition, these activities can be designated as a key target area of UPLB MNH annual plans and budget allocation.

## Sustainability plans

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Specimen digitization has been identified as one of the key areas that are currently being implemented by UPLB MNH. The BIFA projects have contributed significantly to the mandate of UPLB MNH, and technical expertise in specimen digitization has been gained by its staff. Post activities identified (from previous section) include specimen imaging and data mobilization workshops, and these can be done by drafting proposals and submitted to various grant agencies. The University of the Philippines Los Baños has several grants that can cater to information digitization such as the UPLB Basic Research, and the Enhanced Creative Writing and Research Grants, among others. There are also various grant facilities under various government agencies that can also provide funding for information digitization (i.e. Philippine Department of Science and Technology, through Grants-in-Aid program among others). As such, these activities can be incorporated into the UPLB MNH Annual Strategic Work Plan for

GBIF leads the Biodiversity Information Fund for Asia (BIFA), a programme funded by the Ministry of the Environment, Government of Japan. The programme provides supplementary support for activities addressing the needs of regional researchers and policymakers through mobilization and use of biodiversity data.

