

Collections-based data for conservation actions: engaging decision-making actors to save globally threatened epiphytes in Colombia

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Project lead organization: Fundación Jardín Botánico Joaquín Antonio Uribe de Medellín

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Narrative Early Progress report

Executive Summary

This project will contribute to the accomplishment of the policy frameworks in Colombia for conserving epiphytes and their floral visitors, which have identified the need to increase knowledge and assess the extinction risk of these groups of species. The analysis of information gaps and workflow, carried out in this project, has allowed us to build a preliminary checklist of epiphyte species for Colombia and assess the status of GBIF records, delimiting where data mobilization efforts should focus. In addition, meetings held with officials from the Colombian Ministry of the Environment, directors of the herbariums and specialists have allowed us to select the focused species groups where the greatest efforts will be made both in mobilization and extinction risk analysis. To monitor project progress, we have a weekly progress report meeting. Additionally, our work team records their progress weekly, thus allowing us to evaluate the goals and adjust details. At the moment, we do not detect changes that must be implemented, in general the execution process started a month late (October 2021).

Planning phase - User(s) consultation outcome(s)

Defining Data User Needs

This project will contribute to the accomplishment of the policy frameworks in Colombia for conserving epiphytes and their floral visitors, which have identified the need to increase knowledge and assess the extinction risk of these groups of species, specifically: The National Strategy for Plant Conservation and its associated Action Plan (2017, <http://repository.humboldt.org.co/handle/20.500.11761/32936>); and the Colombian Pollinators Initiative (2018, <http://repository.humboldt.org.co/handle/20.500.11761/35163>). These policies are a long term led by the Ministry of Environment and its associated institutes an environmental authority, who are the targeted users in this project.

In addition, a national norm dated from the 70s vanned all exploitation of epiphytes facing high levels of wild extraction, including orchids, bromeliads, mosses, and lichens. To comply with this norm, national and regional environmental authorities require that management actions for these groups of plants must be included in the environmental impact studies associated to any activity of infrastructure and mining that take place in the country; however, guidelines on the actions needed have been limited by the scarce knowledge and information available, resulting in the protection of common and widely distributed species. In this context, there is a need by both the environmental authorities and the private sector to access updated and comprehensive information regarding the distribution and conservation status of the group of species included in the 70s norm. This information will also constitute an input for the Ministry of Environment to update the norm, an initiative that is already ongoing and plans to be published in 2022.

Considering that the estimated number of species that are epiphytes is high (aprox. 7.000) and that for floral visitors there is not an estimated number available, it is necessary to prioritize groups of species for which projects activities will focus on. This groups will be prioritized considering the available data in collections, the participation of taxonomist on the project and the interest of the participation collections. In addition, meetings and a survey are planned to be conducted among environmental authorities, to receive their interests or needs in terms of the taxonomic groups and the regions of interest. Still, the initial analysis of data available at present in GBIF showed that the taxonomic and

geographic representation is intermediate and there's a need of information.

Defining Data Needs

The fundamental question we seek to contribute is what the conservation status of 400 species of epiphytes and lichens and 150 species of floral visitors is. This question will be answered based on occurrence data and extinction risk assessments of a set of species in three formats: occurrence records published in GBIF for a high number of species, extinction risk assessments to be published in SiB Colombia and submitted to the IUCN Red List for 550 species, and distribution models for 200 species published in the platform Biomodelos-SIB.

The user, Environmental Ministry of Colombia, needs species conservation status to be able to implement protection measures. Then, assessing extinction risk of the species is crucial. Geographical evidence of documented species occurrences from GBIF-mediated data and new mobilized data must be processed to contribute to the generation of species distribution maps, applying Criterion B of the Red List Criteria, which uses species distribution data for assessing extinction risk (IUCN 2019). In addition, information that is useful for the user is the species description, that will be published in SIB Colombia (<https://catalogo.biodiversidad.co/>).

To answer our fundamental question, we have first evaluated the list of epiphytes for Colombia and the status of the herbaria collections and records published in GBIF (Gap analysis document). The gap analysis has allowed us to understand where the data mobilization gaps were and guides us in directing the efforts of mobilization. Furthermore, this has allowed us to generate a preliminary checklist of epiphytes for Colombia, which could be an additional product of the project as a data paper. Our consolidated epiphyte species checklist includes 7.993 species, increasing the Catalog of flora of Colombian in more than 3.287 species. In addition, there are approximately 1.352 species, that were not in the list of epiphytic species of GBIF. Evidencing, the effort necessary to include them in the mobilization. This preliminary list of Colombian epiphyte species will be refined and verified with specialists, to corroborate the epiphytic habit, clarifying in which cases the growth on a host tree has been accidentally.

We did a special analysis of records published in GBIF on focused groups (vascular epiphytes: Cyclanthaceae, Araceae, Gesneriaceae, Piperaceae and ferns Dryopteridaceae, Lomariopsidaceae, Oleandraceae and Polypodiaceae), and lichens: (Hygrophoraceae, and Lobariaceae -now Peltigeraceae-). For this focused groups, a total of 74.099 records with coordinated have been obtained, and 41.743 without coordinates. For lichens, there were 251 records (just 3 records with coordinates). Information with coordinates will be used in the risk assessments to be published in SiB Colombia and submitted to the IUCN Red List, and distribution models for 200 species published in the platform Biomodelos.

In addition, it is evident the effort necessary to include in the mobilization the species of which (1) there are few or no records or (2) are endemic of Colombia. The mobilization efforts with partner herbaria have emphasized on these focused plant and lichen families. According to the status of the systemization of each herbarium, mobilization has been prioritized for those families with little or no systematization (Gap analysis document). The preliminary status of the mobilization of the records in the partner herbaria showed different scenarios, from herbaria with a high number of records already mobilized like COL and MEDEM) to those with and intermediate effort (HUA, CUCV) and those which this effort would be the first mobilization like JAUM (Method of Georeferencing and Data Quality document). Each herbarium will maintain its ownership of the data, and the project team will facilitate the process to be made public through SIB Colombia.

The time to process the data is realistic and according to our planning it is feasible to achieve the results, however some closings of the herbariums on the end of the year holidays, will slow down the process a bit. Our team have previous experiences in systematizing herbarium records, database management, coordinate reconstruction and database cleaning.

References

IUCN Standards and Petitions Committee. 2019. Guidelines for Using the IUCN Red List Categories and Criteria. Version 14. Prepared by the Standards and Petitions Committee. Downloadable from <http://www.iucnredlist.org/documents/RedListGuidelines.pdf>.

Planning Phase Outcomes

Our activities are maintained according to the initial plan, with a delay in the first month of execution, however there are no major changes at a general level. Some of the personnel hiring processes have been delayed two months due to the signing of the agreement between the IAVH and BGM, which will result in a delay of two months to start activities by IAVH (projected start date November 2021,

expected date January 2022).

Our planning phase that has included a meeting with environmental ministry officials has allowed us to include their observations in our planning. On the other hand, our information gaps analysis had allowed us to evaluate the status of the information both in the herbaria and in GBIF, allowing us to define the route to optimize the systematization and cleaning data process for each herbarium and museum. Based on this approach we had created the workflow, which included five phases: preparation, planning of new mobilized data systematization, monitoring and publishing (workflow document). Mobilized data have included in workflow and indicators for the monitoring of species in Colombia such as BioModelos (<http://biomodelos.humboldt.org.co/>) and BioTablero (<http://biotablero.humboldt.org.co/>).

We have created a preliminary document that systematizes all the errors found in each database by herbarium (Method of Georeferencing and Data Quality document), which will allow herbarium coordinators to minimize or recognize the most common errors in the future and implement measures to mitigate this will be the base to the first guidelines to promote further data mobilization and update information resources developed by the National Epiphytes Consortium.

Report on Activities

Activity progress summary

Regarding with activity 1. (Analysis of the information resources required to address the policy framework and decision need to protect epiphyte) and activity 2. (To assess which biodiversity data could become accessible through this project) a gap analysis and method of georeferencing and data quality have been done (Gap analysis and Method of georeferencing and data quality documents). The gap analysis has allowed us to understand where the data mobilization gaps were and guides us in directing the efforts of mobilization. Also, according with the status of the systemization of each herbarium, mobilization has been prioritized for those families with little or no systematization and the cleaning of the databases following the directives to effectively publish the data (Gap analysis document). On the other hand, as part of activity 2. we had created a workflow, which included five phases: preparation, planning of new mobilized data systematization, monitoring and publishing (workflow document).

Regarding to activity 3. (A data mobilization phase) we start by requesting to herbarium of JAUM, HUA and CUVC databases to begin the cleaning process. With this information, it was possible to verify the quality of the data, and we evaluate if it was incomplete, or need to be reconstructed (coordinates and localities). Up to now, the JAUM and HUA databases (11.900 and 16.000 records, respectively) have been cleaned up in for these families: Araceae, Bromeliaceae, Cyclanthaceae, Dryopteridaceae, Gesneriaceae, Lomariopsidaceae, Oleandraceae, Orchidaceae, Piperaceae, Polypodiaceae, Hygrophoraceae, Peltigeraceae, Lobariaceae. Currently we are in the phase of verification and reconstruction of coordinates and locations.

In the case of Medellín, HUA has a good systematization of vascular plants and lichens, and the prioritized groups are complete to date, except for fern families. The JAUM herbarium have a larger database of record of lichens, Gesneriaceae and Orchidaceae. Other plant families as a low number of systematizations such as Cyclanthaceae, Araceae, Bromeliaceae and Piperaceae. During this project so far, Cyclanthaceae have been systematized and Araceae is in process in the JAUM and the Fern families in the CUVC, for a total of 848 records so far (one person during two months in JAUM, and three weeks in CUVC). In January, the systematization will begin in HUA with ferns and continue with Bromeliads in JAUM.

Progress on activities

Activity: Analysis of the information resources required to address the policy framework and decision need to protect epiphytes

Description: The researcher leading the project in the Medellín Botanical Garden and the Humboldt Institute organize a meeting with the Ministry of Environment to socialize the project and informing the interest of receiving feedback

Start Date - End Date: 1/11/2021 - 31/12/2021

Verification Sources: Gap of analysis (uploaded)

Activity: To assess which biodiversity data could become accessible through this project

Description: Assessment of which primary biodiversity data is already freely accessible (through

GBIF), and which data could become accessible through a process of targeted data mobilization have done during this activity

Start Date - End Date: 1/10/2021 - 31/12/2021

Verification Sources: Gap analysis and Method georeferencing and data quality documents (uploaded)

Activity: A data mobilization phase

Description: Digitization and database cleaning have started in HUA, JAUM and CUCV herbaria

Start Date - End Date: 1/11/2021 - 31/12/2021

Verification Sources: Workflow document (uploaded)

Report on Deliverables

Deliverables progress summary

In the planning phase, information sources analyses to address policy framework and decisions needed to protect epiphytes based on data availability, taxonomic scope, access, data gaps and data quality have been done. It has to be discussed in the first months of 2022 with the project team and partners of the project, and presented in workshops to validate and complement.

The registry mobilization process advances by 20%. Up to now, the JAUM and HUA databases have been cleaned up for the main epiphyte families (11.900 and 16.000 records, respectively). Currently we are in the phase of verification and reconstruction of coordinates and locations. During this project so far, Cyclanthaceae have been systematized and Araceae is in process in the JAUM and the Fern families in the CUVC, for a total of 848 records so far (one person during two months in JAUM, and three weeks in CUVC).

For the evaluation phase, the communication teams have worked during December 2021 in the strategy of communication.

Progress towards deliverables

Deliverables - Project planning phase

Information sources analyses to protect epiphytes in Colombia

Description: Information sources analyses required to address policy framework and decisions needed to protect epiphytes based on data availability, taxonomic scope, access, data gaps, data quality, and relationships to other environmental data.

% complete: 70%

Status update: information sources analyses to address policy framework and decisions needed to protect epiphytes based on data availability, taxonomic scope, access, data gaps and data quality. It has to be discussed in the first months of 2022 with the project team and partners of the project, and presented in workshops to validate and complement.

Sources of verification: Gap analysis (uploaded)

Deliverables - Project data mobilization phase

Epiphytes of Colombia: Collection-based data for science and conservation

Dataset type: Occurrences

Dataset scope: Description: approx. 18,500 records in a dataset of undigitized collections (or digitalized by not following Darwin Core (DW) requirements deposited in key herbaria and published in the Colombia Biodiversity Information National Facility (SiB).

Number of records: 18,500

Data holder: Herbariums

Data host institution: Herbariums

% complete: 20%

Status update: The mobilization process advances by 20%. Up to now, the JAUM and HUA databases have been cleaned up for the main epiphyte families (11.900 and 16.000 records, respectively). Currently we are in the phase of verification and reconstruction of coordinates and locations. During this project so far, Cyclanthaceae have been systematized and Araceae is in process in the JAUM and the Fern families in the CUVC, for a total of 848 records so far (one person during two months in JAUM, and three weeks in CUVC).

DOI:

Expected date of publication: 2021-05-03

Epiphytes and Floral visitors of Colombia: Collection-based data for science and conservation

Dataset type: Occurrences

Dataset scope: Description: approx. 1,500 records in a dataset of undigitized collections (or digitalized by not following DW requirements)

Number of records: 1,500

Data holder: Alexander von Humboldt Institute

Data host institution: Alexander von Humboldt Institute

% complete: 5%

Status update: The state of the collection and the database have been reviewed (it is expected in January to start the hiring of the personnel who will carry out this work)

DOI:

Expected date of publication:

Deliverables - Project evaluation phase

GBIF leads the Biodiversity Information for Development (BID), a programme funded by the European Union. The programme provides supplementary support for activities addressing the needs of regional researchers and policymakers through mobilization and use of biodiversity data.

