









Conservation status of egg-brooding frogs of the genus *Cryptobatrachus* (Hemiphractidae): species delimitation and geographic distribution

MBZ Project ID: 162514563

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SUMMARY

Our project's main focus is to evaluate the taxonomic status of *Crytobatrachus* frogs, identifying their current distributional range and the major threats for each species and their habitats, and based on this information assess their conservation status following the guidelines of the IUCN Red List. Fieldwork has been carry out in several localities, working closely with the community in order to spread the conservation message to protect natural forests and the amphibians that live there. During fieldwork, we recorded four species of the genus *Cryptobatrachus*: *C. boulengeri*, *C. fuhrmanni*, *C. pedroruizi*, and *C*. aff. *ruthveni*. In addition to egg-brooding frogs, we registered other 48 amphibian species presents in the study area, some of them threatened by the IUCN. For each of the target species of this project, we compiled distributional data as a first approach of their current distribution. This information will be used to create maps of the potential distribution using ecological parameters and to identify priority areas for the conservation of species in this genus. We experienced some delays in the project mainly due to environmental factors (heavy rains) and public order (presence of armed groups in some areas of interest for this species); consequently, these localities are pending to visit, however, we hope to accomplish our project goals.

SUMMARY OF SPECIFIC OBJECTIVES, ACTIVITIES, AND OUTPUTS

- **Objective 1**

Determine species diversity of *Crytobatrachus* frogs, based on morphological and molecular data.

Activity 1: Field surveys

To date, we are expended 42 days on 6 field trips (Fig. 1). The species has been recorded in three of these localities. Because the low encounter rate of specimens, we only collected two specimens from each locality for taxonomic identification, DNA tissue sampling, and as voucher specimens. We did not find the species in three historical localities. In these areas, the habitat for the species has been highly modified: forest has been converted into coffee plantations and waterflow of the streams has been heavy altered by the construction of artisanal dams for

collect water for community aqueducts. Thus, we suspect that the species has been lost in such localities. The presence of armed groups in three localities has been delayed our fieldwork in these areas.

Activity 2: Taxonomic identification of specimens and revision of natural history collections

Identification of the recorded species has been carry out based on molecular (12S, 16S, and CO1 genes) and morphological data. We revised the specimens deposited in the herpetological collection of Universidad Industrial de Santander. In the next months (August to September), we will visit the herpetological collections of the Universidad de Antioquia and Universidad del Magdalena. Lastly, we are managing our visit to the amphibian collection of Universidad Nacional de Colombia.

Forthcoming activities planned

Completing all pending activities related with this objective. These activities include the completion of our fieldwork, as well as the processing of the samples for molecular analyses, complete our visits to natural history collections, and perform the statistical analysis for morphological data.

❖ **Objective 2**

Estimate the current geographic distributional range of each species based on species distribution models (SDM).

Activity 1: Modeling species distribution

To modeling the current distribution of *Cryptobatrachus* frogs, we compiled the historical distributional data as a first approach of their current distribution. This information has been complemented with information from our fieldwork, including new un reported localities and excluding localities were the species or their habitats are currently lost. Once finished our fieldwork, we will use this data to create maps of the potential distribution using ecological parameters.

Forthcoming activities planned

Complete our locality database based on the results from fieldwork and modeling the distributional range of the target species.

❖ **Objective 3**

Evaluate the presence of the amphibian chytrid fungus *Batrachochytrium dendrobatidis* (Bd) in populations of *Crytobatrachus* frogs.

Activity 1: Detection of the amphibian chytrid fungus (Bd)

Initially, the proposed budget covered laboratory costs for the detection of Bd; however, this budget was modified according to the funds approved for this project by the board of the Mohamed Bin Zayed.

Forthcoming activities planned

Search of additional funding to complete this objective.

❖ **Objective 4**

Assess the conservation status of each species following the IUCN Red List guidelines.

Activity 1: Assess the conservation status of each species

For complete this goal, we need first during fieldwork collect new data each species. Thus, this assessment will be carry out once completed the first and third objectives of this project.

Activity 2: Identify priority areas for the conservation of species in this genus

This objective depends of the results of all previous activities of the project. Thus, the identification of priority areas will be carry out once these activities are finalized.

Forthcoming activities planned

Finalize the collection data to assess the conservation status for the target species of this study, following the IUCN Red List guidelines and identify priority areas for the conservation of species in this genus.

- **Objective 5**

Increase public awareness about the importance of conserving forested areas for biodiversity conservation and for the human well-being.

Activity 1: Project socialization

We have been socialized our project with the community of the surveyed areas, especially with community leaders, NGOs, farmers, and students. This activity has enabled us to obtain support (logistic and in-kind contribution) from Asociación Colombia Endémica, Fundación Iguaque, and Reserva Santalibrada). We also socialized our project with some universities in the study areas (e.g., Universidad de La Paz, Universidad de Antioquia, Universidad del Magdalena) and was presented in a workshop at Universidad de La Paz (Santander department). Overall, these activities are aimed at reaching the proposed objective.

Forthcoming activities planned

Design, printing and distribute didactic educational materials showing our results for the local stakeholders. Communicate our partial results via online social networks, TV broadcast, newspaper article and online bulletin to talk about the project in general, our findings, our experience with the community, the scientific and social impacts of the project as well as our future plans for the conservation of frogs genus *Cryptobatrachus*.

PROBLEMS ENCOUNTERED AND POTENTIAL SOLUTIONS

Finding egg-brooding frogs in the field has been difficult, in some cases we spent many days and were only able to find a few specimens; whereas in other cases we did not find specimens, especially in historical localities where forested areas has been transformed into cultures and

grazing, and where the waterflow of the streams has been heavy altered by the construction of artisanal dams for collect water for community aqueducts. These factors probable lead to local extinction of the species in these areas. In general, it appears that the species occurs in streams in pristine forested areas of difficult access. Unfortunately, this kind of streams are scarce because the human intervention in the Andes mountains, which indicate that these species are more threatened that we suspected. Because of this, we contacted research from several areas of Colombia asking for unreported localities for these species and include some of these in our fieldwork schedule. In addition, the presence of armed groups in three historical localities has been delayed our fieldwork in these areas. Sometimes, during the development of the project we had to reschedule some activities, especially field surveys, due to public order and environmental phenomena (heavy rains), both of which affected negatively our work because heavy rains produce landslides on ways difficulting the access to some areas and because armed groups impedes the entrance of researchers to areas under their control.

FIGURES

Figure 1. Survey localities during fieldwork. Green points indicate areas where the species was found. White points indicate historical localities where the species was not found. Red points indicate historical localities with presence of armed groups.

Figure 2. Community work. Meetings with family members and communities from the study region.

Figure 3. Community work. Meetings with members of the communities from the study region.

Figure 4. Amphibian conservation workshop in Universidad de La Paz (Santander, Colombia).

Figure 5. Some photographs of the areas where fieldwork was carried out by our team during the project.

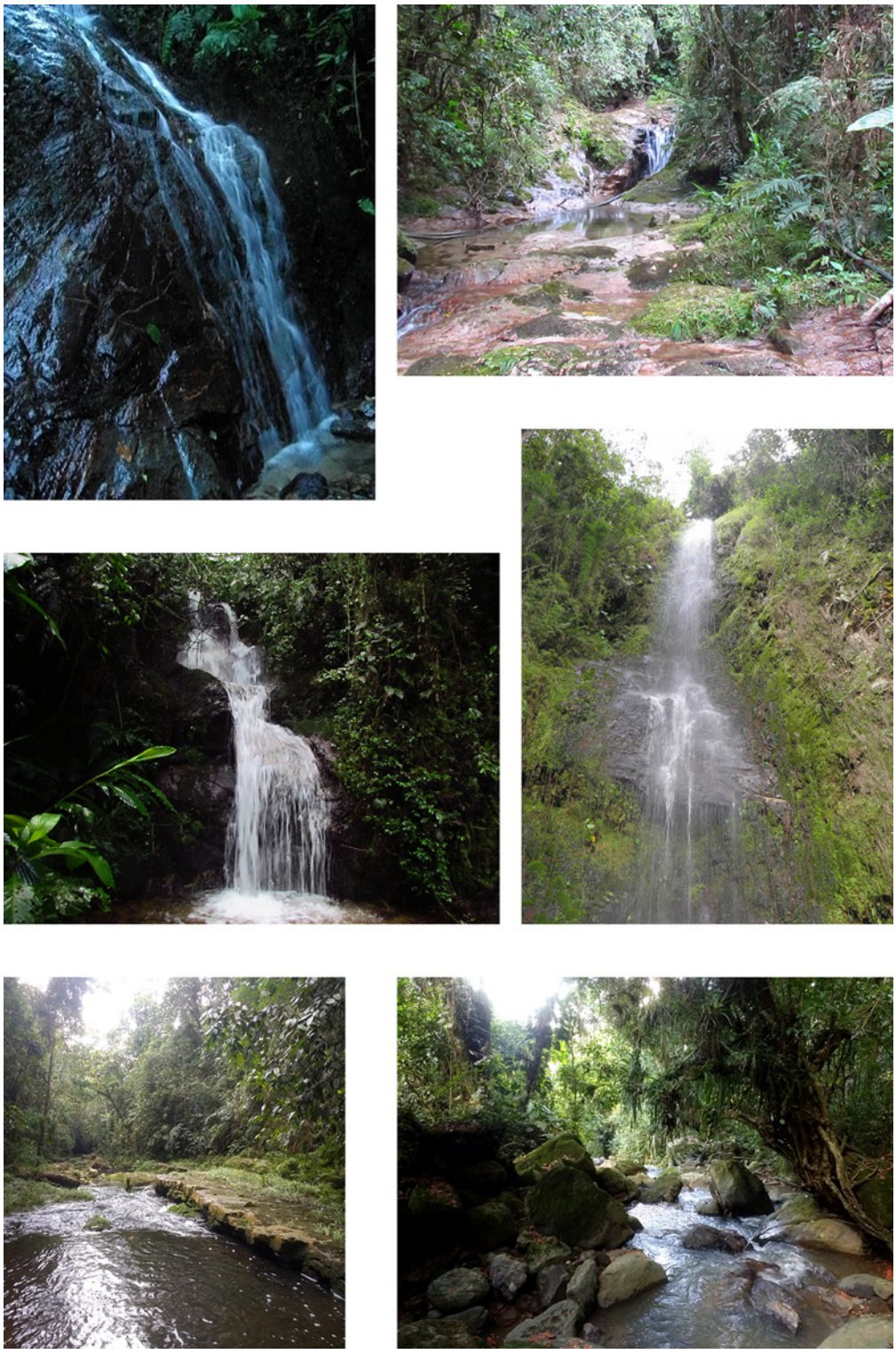

Figure 6. Some photographs of the fieldwork carried out by our team during the project.