

Project Update: September 2023

During the last months, significant progress was made towards achieving our research goals related to the ecology of amphibians in the Atlantic Forest biome. The activities undertaken during this phase can be summarized as follows:

Data Collection:

Fieldwork was conducted to collect primary data in 10 different remnants of the Atlantic Forest in the southeastern regions of Brazil.

The RAPELD model, involving standardised 250 m transects, was implemented for active amphibian sampling, with meticulous recording, photographing, and taxonomic identification of encountered individuals.

A comprehensive database of amphibian ecology in the Atlantic Forest was initiated through the collection of primary data, which currently stands at 50% completion due to the extensive scope of the studies involved.

Additionally, data from existing studies in the literature were compiled, encompassing species composition, richness, abundance, and ecological aspects.

Results Dissemination:

International outreach was achieved through a presentation titled "Living in the forest: conservation of the biodiversity of the Atlantic Forest" delivered to postgraduate students at the Lizard Laboratory, Macquarie University, Australia, showcasing preliminary project findings.

Two scientific manuscripts arising from the project were authored and submitted for publication in international journals, namely *Austral Ecology* and *Wildlife Research*.

One scientific articles related to the project was published during this phase. In July 2023, the article "Water conditions influence the detectability of *Crossodactylus gaudichaudii* (Anura, Hylodidae) in streams of the Atlantic Forest" was published in *Austral Ecology*.

Scientific Dissemination:

In addition to traditional academic avenues, we made concerted efforts to disseminate our research findings to a broader audience. Scientific dissemination included the creation of accessible materials in the form of infographics and simplified language summaries for the general public.

We employed social media platforms for engaging and visually appealing communication of our results to reach a wider audience.

Furthermore, we produced a poster in Portuguese with user-friendly illustrations and language, which was distributed to the research department of the State Institute of

Environment and Water Resources (Figure 1). The research department subsequently disseminated this material to the management and staff of the conservation unit where the research was conducted, as well as to local schools through digital channels.



CONDIÇÕES DA ÁGUA INFLUENCIAM A DETECTABILIDADE DA RÃZINHA-DE-RIACHO (*CROSSODACTYLUS GAUDICHAUDII*) EM RIACHOS DA MATA ATLÂNTICA

Pereira-Ribeiro et al. 2023. Water conditions influence the detectability of *Crossodactylus gaudichaudii* (Anura, Hylodidae) in streams of the Atlantic Forest. *Austral Ecology*.



ANFÍBIOS QUE VIVEM NOS RIACHOS

Amfíbios que vivem em riachos dependem da água durante toda a sua vida. Isso os torna bem sensíveis a mudanças no ambiente aquático.



Fatores como luz, pH, temperatura e turbidez da água são muito importantes para a sobrevivência e reprodução deles. Por isso, a detecção desses bichinhos nos riachos pode mudar dependendo das condições do habitat.

PRAZER, RÃZINHA-DE-RIACHO

A rãzinha-de-riacho (*Crossodactylus gaudichaudii*) habita estritamente riachos rochosos na Mata Atlântica. Apesar de não estar ameaçada, essa espécie precisa de cuidado por causa de poluição e outros estresses ambientais. A rãzinha-de-riacho é ativa o ano todo e sua dieta inclui artrópodes, como larvas de insetos e formigas.



O QUE FIZEMOS?

Nós analisamos como o ambiente afeta a detecção da rãzinha-de-riacho. Fizemos coletas na Reserva Biológica Duas Bocas, e medimos temperatura da água, umidade do ar e pH da água em cada ocasião. Depois, estimamos os efeitos dessas variáveis na detecção da espécie usando um método chamado modelagem de ocupação.

O QUE DESCOBRIMOS?

24°C - 26°C



pH scale



↑ **DETECTABILIDADE**

Descobrimos que a detecção da espécie aumentou durante ocasiões com **temperaturas mais altas da água (24-26°C)** e **níveis mais baixos de pH (5.0-5.5)**.

E POR QUE ISSO É IMPORTANTE?

Esses resultados são super importantes porque nos **ajuda a entender melhor a rãzinha-de-riacho** e sua relação com o ambiente onde vive. Essas informações são cruciais para protegê-la de ameaças como poluição, degradação do habitat e mudanças climáticas.

Esse conhecimento também nos permite planejar estratégias de **monitoramento mais eficientes** e **avaliar os possíveis impactos** em caso de desastres, como ruptura de barragens e poluição de rios.



Com esses conhecimentos valiosos, podemos desenvolver **estratégias de conservação mais eficazes** e garantir que a rãzinha-de-riacho continue cantando nos riachos da Mata Atlântica por muitos e muitos anos!




Figure 1. Dissemination materials for the *Crossodactylus* article in simplified language and accessible format (in Portuguese).



WATER CONDITIONS INFLUENCE THE DETECTABILITY OF *CROSSODACTYLUS GAUDICHAUDII* (BRAZILIAN SPINYTHUMB FROG) IN ATLANTIC FOREST STREAMS

Pereira-Ribeiro et al. 2023. Water conditions influence the detectability of *Crossodactylus gaudichaudii* (Anura, Hylodidae) in streams of the Atlantic Forest. *Austral Ecology*.



AMPHIBIANS THAT LIVE IN STREAMS

Amphibians that live in streams depend on water for their entire lives. This makes them very sensitive to changes in the aquatic environment.



Factors such as light, pH, temperature and water turbidity are very important for their survival and reproduction. Therefore, the detection of these animals in streams can change depending on habitat conditions.

NICE TO MEET YOU, I'M *CROSSODACTYLUS GAUDICHAUDII*

The Brazilian Spinythumb Frog (*Crossodactylus gaudichaudii*) strictly inhabits rocky streams in the Atlantic Forest. Although not endangered, this species needs care because of pollution and other environmental stresses. The brook frog is active year-round and its diet includes arthropods such as insect larvae and ants.



WHAT DID WE DO?

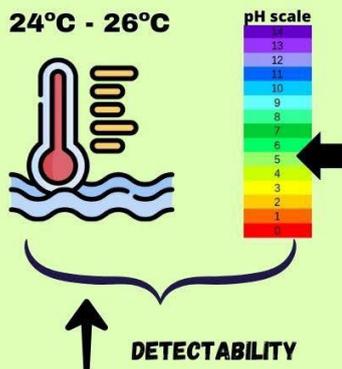
We analyzed how the environment affects the detection of this frog in streams. We collected samples at the Duas Bocas Biological Reserve, and measured water temperature, air humidity and water pH on each occasion. We then estimate the effects of these variables on species detection using a method called occupancy modeling.



WHAT DID WE DISCOVER?



AND WHY IS THIS IMPORTANT?



We found that species detection increased during occasions with **higher water temperatures** (24-26°C) and **lower pH levels** (5.0-5.5).

These results are super important because they **help us better understand this species and its relationship with the environment where it lives**. This information is crucial to protecting it from threats such as pollution, habitat degradation and climate change.

This knowledge also allows us to plan more **efficient monitoring strategies and assess possible impacts** in case of disasters, such as dam failure and river pollution.



With this valuable knowledge, we can develop **more effective conservation strategies** and ensure that the *Crossodactylus gaudichaudii* continues to sing in the streams of the Atlantic Forest for many, many years to come!



Figure 2. Dissemination materials for the *Crossodactylus* article in simplified language and accessible format (in English).

FUTURE PERSPECTIVES

Despite encountering challenges during this phase, the commitment to overcoming them remains unwavering as we look ahead to the next cycle of this project. The prospects and goals for the future include:

Completion of the Database:

Continuation of primary data collection in the field and the compilation of information from scientific literature to finalise the comprehensive database on amphibian ecology in the Atlantic Forest.

Advanced Analyses:

Utilisation of the complete database to conduct more detailed and extensive analyses, employing hierarchical models and advanced statistical techniques to deepen our understanding of amphibian communities in the Atlantic Forest.

Enhanced Scientific Outreach:

Expansion of efforts in scientific dissemination to reach a broader audience, including local communities and conservation stakeholders, ensuring that our findings have a positive impact on biodiversity preservation.

Publication of Scientific Articles:

A dedicated focus on publishing the research results in renowned scientific journals, further contributing to the body of knowledge on amphibians in the Atlantic Forest. We remain eager to confront these challenges and explore new opportunities as we progress with the project. Our dedication and collaborative efforts are poised to make significant contributions to the understanding and conservation of amphibians in the Atlantic Forest.



Crossodactylus gaudichaudii.