DISTRIBUTION AND VULNERABILITY TO CLIMATE CHANGE OF AQUATIC MACROINVERTEBRATES IN THE CANARY ISLANDS: THE BIOACUANA PROJECT

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Introduction and framework

Freshwater biodiversity is disappearing at an accelerated rate as a result of human pressures. This situation is especially relevant in oceanic islands, where native communities are not only characterized by high levels of endemicity, but also high vulnerability to human impacts. Considering this it is possible that many undescribed freshwater species will be lost in the next decades.

Why is there high vulnerability in freshwater species among Canary Islands?

Biogeographical issues

Volcanic origin, which means they have never had physical contact with any continent and increases the isolation of species.

Subtropical climate, with warm temperatures and little seasonal variation.

High altitude gradients.

Influence of trade winds and relict laurel forests.

Low rainfall and soils and bedrock high permeability do not favor the presence of surface

Human pressures

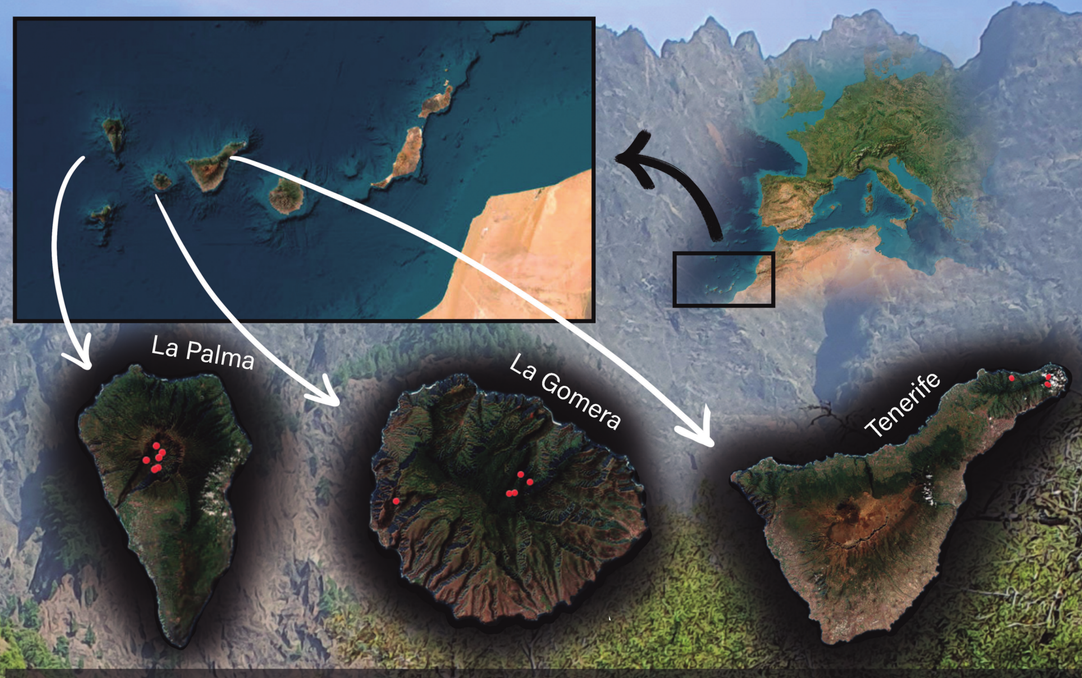
Deforestation alters the important moisture condensation processes favored by the "sea of clouds" typical of Canarian forests.

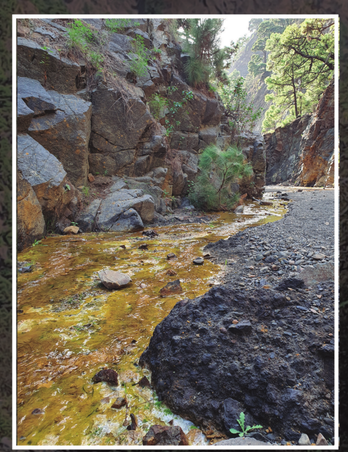
Severe water scarcity associated to climate change and a strong human water demand.

Proliferation of invasive species brought by humans.

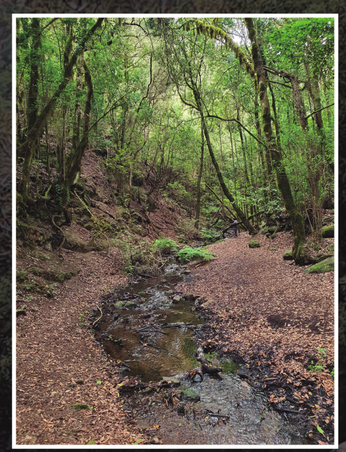
Study site

We are sampling 17 subcatchments covering a wide range of hydrological conditions in three of the Canary Islands; La Palma, La Gomera and Tenerife.





Barranco Santo del Agua, La Palma
Parque Nacional de la Caldera de Taburiente



Barranco del Cedro, La Gomera
Parque Nacional de Garajonay



Barranco de Igueste, Tenerife
Parque Rural de Anaga

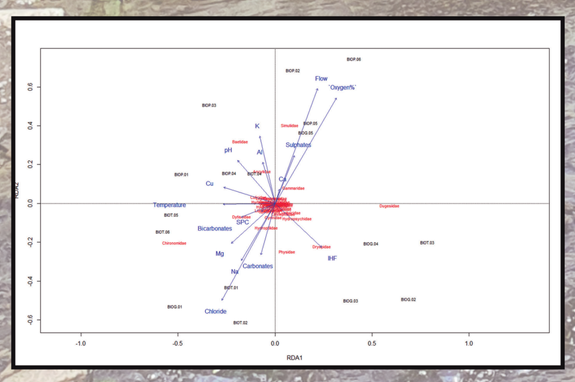
Goals of the project

1. Hydrologically characterize the sampled streams of the islands
2. Produce basic information on the taxonomic and genetic diversity of aquatic macroinvertebrate
3. Determine the vulnerability the species to global change.
4. Identify priority areas for biodiversity conservation using systematic planning tools.

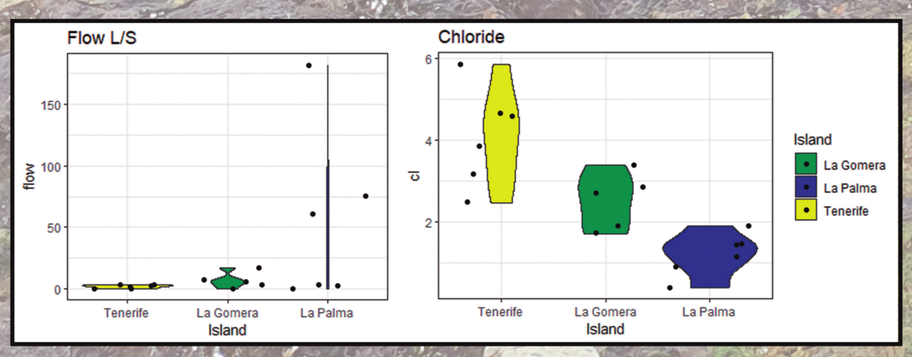
MARXAN conservation solutions



Preliminary results



Redundancy analysis (RDA) considering the environmental variables and the species from the study. BIOT: Tenerife, BIOP: La Palma, BIOG: La Gomera.



Violin plots with the two main significant variables that explain better the community. assembly.

- **Main drivers of communities are stream flow (hydrology) and chloride.**
- **Description of the female form of the endemic species *Polycentropus tenerifensis* (Trichoptera).**
- **46 different taxa found until the moment. Baetidae and Chironomidae the most abundant families**
- **New species records:**

1) First Canary Islands record for *Pericoma* (Diptera)

2) First La Gomera Island record for *Tonnoiriella mollis* (Diptera)

3) First La Palma Island record for *Molophilus*, *Cardiocladius*, *Parametriocnemus* (Diptera) and *Dugesia* (Tricladida).

Conclusions

- **Broad hydrological variability**
- **Wide environmental variability**
- **New species' distributions**

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funded by BBVA