

## Final Evaluation Report

---

Your Details	
<b>Full Name</b>	Gabriel Massaine Moulatlet
<b>Project Title</b>	Mapping the distribution of Ferns and lycophytes and its relation to other taxa along the Andean-Amazonian corridor
<b>Application ID</b>	28285-1
<b>Grant Amount</b>	£4,000
<b>Email Address</b>	<a href="mailto:mandaprogabriel@gmail.com">mandaprogabriel@gmail.com</a>
<b>Date of this Report</b>	07/5/2021

**1. Indicate the level of achievement of the project's original objectives and include any relevant comments on factors affecting this.**

Objective	Not achieved	Partially achieved	Fully achieved	Comments
1) fill the gap of information on pteridophyte diversity at the eastern flank of the Andes by making species inventories systematically on permanent plots already installed in the area				I sampled 23 plots of 250 x 2 m (total area of 11500 m <sup>2</sup> ). 548 specimens were sampled, in a total 210 species or morphotypes. Plots were installed in three remote areas in the Andes-Ecuador transition area: the Colonso-Chalupas Reserve, Sumaco Volcano and the surroundings of the Limoncocha Biological Reserve.
2) To improve SINMBio database by adding botanical information				Although the database of fern collections has been created, it has not been fully curated to the species level in order to be included in a national database. I still have not decided where to host the data. So far it is in a Google Drive folder.
3) to assess multi-taxa community's turnover along the Andean-Amazonian corridor, using information deposited in the SINMBio database and comparing with pteridophyte turnover.				I managed to obtain the turnover data of pteridophytes but never received the data on the other taxa to make a fair comparison. I was made comparing to trees community and presented in a session in a conference.

**2. Please explain any unforeseen difficulties that arose during the project and how these were tackled.**

The COVID-19 pandemic has had relevant impacts in Ecuador. On the 1st March 2020, all public institutions were closed. They were kept in this situation for several months and remain closed for students or are partially working nowadays. This include my own university, where my plant samples were kept and I could not access them, the national herbaria, where I had to go in order to identify the specimens, and the offices of the Environmental agency (Ministerio del Ambiente y Agua – MAAE), where I had planned to give workshops. Currently, the herbaria collections are not open for visitation and they recently started to receive new samples.

The MAAE went through a major reformulation, which included the fusion of the Environmental Ministry and the Water affairs secretary (SENAGUA). When that happened, several of the analysts and other stakeholders with whom I had my projects were relocated or fired. This transition made it complicated to get field permits and to start the network again.

In an email from June 14<sup>th</sup> 2019, the Rufford Foundation asked me details about the cost to produce the field guide. I had to change the initial plans because of the difficulties in species identification without being able to visit herbaria. Instead of design my own guide, I used the format of Field Guides from the Chicago Museum (<https://fieldguides.fieldmuseum.org>). These guides have no costs and the PDF, when approved will be distributed to local environmental agencies, universities, and communities. Unfortunately, there are some delays in the evaluation of the guide, as indicated in the letter from the Field Museum attached to this report.

A scientific article with the data produced in this project was submitted to the American Fern Journal but was rejected after one round of revision. I am working in a new submission right now.

### **3. Briefly describe the three most important outcomes of your project.**

- The submission of the first illustrated field guide of Ferns for the study area (currently in review).
- The submission of a book chapter titled: "Rethinking science-policy interface for sustainable future of the Andean environment and society - Learning from the diversity", to be published in a series of Coimbra books.
- The organisation of two webinars on the Diversity of the Colonso-Chalupas Reserve, where I managed to gather MAAE directors, researchers, local stakeholder, with the participation of 200 people in total.
- Soil analysis and sharing of the results with the MAAE, one of the few soil assessments made to the area.
- Organisation of a 3-hour workshop to the MAAE staff to share the results of this project.
- One scientific article to be submitted to an open access journal (in prep.).
- One undergraduate student thesis (in review).

### **4. Briefly describe the involvement of local communities and how they have benefitted from the project.**

- I was helped by local students from the Ikiam University in both fieldwork and data curation. One undergraduate thesis was written with the data collected in this project.
- I hired a local professional, Mrs Lizbeth Andi, to be in charge of all the logistics. Later, she was hired by the Ikiam University as lab technician and assisted in the soil analysis.
- Several field guides were hired in this project. They were always people living closer to the forest plots.

- A copy of the fern field guide was shared with Tourism association of the Pacto Sumaco Community, the association in charge of the organisation of the field trips to the Sumaco Volcano.
- Copies of the fern guide were left and presented to the staff of the local Office of MAAE.

**5. Are there any plans to continue this work?**

I would like to keep working on the identification of all the specimens collected. This would require a long work. I am sure there are new species to science. Moreover, other scientific questions are generated from the preliminary data analysis.

**6. How do you plan to share the results of your work with others?**

- Open access scientific publications.
- Delivery of all plant material collected to the two national herbaria: QCNE (already done) and UTCEC (samples are being revised).
- Delivery of soil data to the MAAE.

**7. Timescale: Over what period was the grant used? How does this compare to the anticipated or actual length of the project?**

The project was longer than planned. It was planned to end in November 2020. However, the final reported is just being submitted now. The grant has been used over all the period of activity of this project.

**8. Budget: Provide a breakdown of budgeted versus actual expenditure and the reasons for any differences. All figures should be in £ sterling, indicating the local exchange rate used. It is important that you retain the management accounts and all paid invoices relating to the project for at least 2 years as these may be required for inspection at our discretion.**

Item	Budgeted Amount	Actual Amount	Difference	Comments
Publication and dissemination of results	1000		-1000	All the publication and dissemination were made online and without costs. Because of the covid-19, presential workshops initial planned had to be cancelled. The only presential workshop was made following covid-19 protocols and did not include coffee break costs.
Logistic of field trips	3000	1801	-1199	Field work was done in

				collaboration with other projects. As such, some expenses planned in this project (hiring of 4x4 wheel cars) are covered by other Ikiam projects.
Soil analysis		1081	+1081	On 12 <sup>th</sup> November I made the query to use the remaining budget for soil analysis, which was accepted by Rufford.
CEDIA fees		171	+171	Cedia is the institution who administrate the budget of this project
<b>Total</b>	<b>4000</b>	<b>3053</b>	<b>-549</b>	<b>Exchange rate of 1 US\$ = 0.72 GDP</b>

**9. Looking ahead, what do you feel are the important next steps?**

I have been investigating on the of the most species diverse and less studied area of the tropical Andes. New projects in the area would certainly be beneficial for the understanding of such high diversity.

**10. Did you use The Rufford Foundation logo in any materials produced in relation to this project? Did the Foundation receive any publicity during the course of your work?**

The logo was used in the letters, presentations, flyers related to this project.

**11. Please provide a full list of all the members of your team and briefly what was their role in the project.**

**Dr. Karolina Riaño** – researcher. Participated in the field work, in species identification and is co-author of the manuscript we had in preparation.

**Dr. Mariana Capparelli** – researcher. Photographed and edited the photos of the species that were included in the field guide, co-author in the book chapter.

**Juan Ponce** and **Cielo Montenegro** – Ikiam students. Participated in the field work and in the data curation.

**Lizbeth Andi** – lab member. Participated in the field work, was in charge of the Logistic and assisted in the soil analysis.

**Johanna Toivonen, Carlos Inca** and **Matti Salo** – co-authors of the book chapter

**12. Any other comments?**

First of all, I would like to thank Rufford Foundation for the great communication and to quickly reply my emails when needed. Soil and plant data can be found at [this repository](#). There are 549 £ to be used still. I would like to inquiry if this budget can be

used to buy acid-free paper to both herbaria where the samples will be deposited, QCNE and UTCEC. This is actually a request of the herbaria and I did not plan to include this in my initial budget.