

The Rufford Foundation Final Report

Congratulations on the completion of your project that was supported by The Rufford Foundation.

We ask all grant recipients to complete a Final Report Form that helps us to gauge the success of our grant giving. The Final Report must be sent in **word format** and not PDF format or any other format. We understand that projects often do not follow the predicted course but knowledge of your experiences is valuable to us and others who may be undertaking similar work. Please be as honest as you can in answering the questions – remember that negative experiences are just as valuable as positive ones if they help others to learn from them.

Please complete the form in English and be as clear and concise as you can. Please note that the information may be edited for clarity. We will ask for further information if required. If you have any other materials produced by the project, particularly a few relevant photographs, please send these to us separately.

Please submit your final report to jane@rufford.org.

Thank you for your help.

Josh Cole, Grants Director

Grant Recipient Details	
Your name	Daniel Adolfo Cáceres González
Project title	Diversity, distribution and conservation status of the Bromeliaceae in Azuero Peninsula.
RSG reference	13722-1
Reporting period	15 July 2013 – 5 October 2015
Amount of grant	£5794
Your email address	dcaceres.brom@gmail.com consultoria.caceres@gmail.com
Date of this report	5 October 2015.

1. Please 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
Obtain the permits to collect bromeliads specimens from Panama in the National Environmental Authority (ANAM).			X	The permits to collect bromeliads specimens from Panama in the ANAM have been obtained, a few months later than originally planned due to changes in environmental regulations.
Determinate the distribution of the Bromeliads species with the visit of 14 places (made in four excursions) in the Azuero Peninsula.		X		11 of the 14 sites listed in the Azuero Peninsula were visited. Excursions to Caña Island Reserve, Iguana Island Reserve and Cerro Quema could not be made due to bad weather conditions and inaccessibility of the area in this moment.
Documented the coordinates by GPS for every bromeliad specimen collected.			X	All specimens of bromeliad have been collected with the coordinates in UTM System and using a GPS Garmin E-Trex 30.
Determinate the specimens and examination in the laboratory of the herbarium, using literature.			X	
Analysis and publish the results in two posters and an article in a scientific journal.		X		Instead of the posters, I presented the results in two Scientific Congresses at the University of Chiriqui (UNACHI) in October 2013 and November 2014. A Manuscript is in process to be submitted to a scientific journal.

2. Please explain any unforeseen difficulties that arose during the project and how these were tackled (if relevant).

We encountered some difficulties in the proposed methodology: a) For the epiphytic bromeliads the use of free-climbing technique and a tree climbing equipment to reach the

material was very complicated, because some trees are very tall and I needed a lot of time to prepare and organise the collection in these places. b) The permits to collect bromeliads specimens in Panama from the ANAM have been obtained with some months delay. c) I have not been able to visit some places due to bad weather conditions. I therefore extended the other excursions in terms of time and effort.

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

From the obtained data, it was possible to establish priority levels for the whole area, based on ecological importance of the places to bromeliads species from Azuero Peninsula.

Before this fieldwork, the total number of bromeliads species reported for Azuero Peninsula did not exceed 22 species, and after this investigation the total number of bromeliad species reported has more than doubled (47 species of bromeliads reported). The expectation of this research to increase the number of bromeliad species reported for the Azuero Peninsula has been fulfilled.

With this research, the number of specimens and species of bromeliads collected in Azuero Peninsula has therefore increased significantly, and this represents the largest data and specimen collection of bromeliads from Central Panama (Azuero Peninsula) and one of the most important collections for the whole country.



Pitcairnia chiriquensis L.B. Sm. is an endemic bromeliad species from Panama and has now been reported for the first time in the Azuero Peninsula. With this new report, the distribution of this species is extended. Photo: D. Cáceres 2013, Azuero Peninsula.

Tillandsia ellongata Kunth, a new record of this species for Azuero Peninsula. Photo: D. Cáceres 2014, Azuero Peninsula.



4. Briefly describe the involvement of local communities and how they have benefitted from the project (if relevant).

Some recommendations for the National Environmental Authority (ANAM, today MIAMBIENTE) in the Azuero Peninsula region are: the preservation of the existing protected areas is a priority, but it is highly desirable to expand it. Another recommendation is to create new PAs to cover hitherto unprotected areas in Azuero Peninsula, and make more scientific research in the region.



On the picture you can see some people from nearby communities in Cerro Hoya who were hired to provide services and help as field guides. Foto: Automatic of Canon 2013, Azuero Peninsula.

The Azuero Peninsula is the most ecologically degraded area of Panama; some places of this region are strongly affected by human impact, especially through agricultural and livestock production.



On the pictures you can see an example of the expansion of the agricultural barrier, where the natural habitat of species of bromeliad is destroyed (on the picture *Bromelia pinguin*). Foto: D. Cáceres, 2013. Azuero Peninsula.



5. Are there any plans to continue this work?

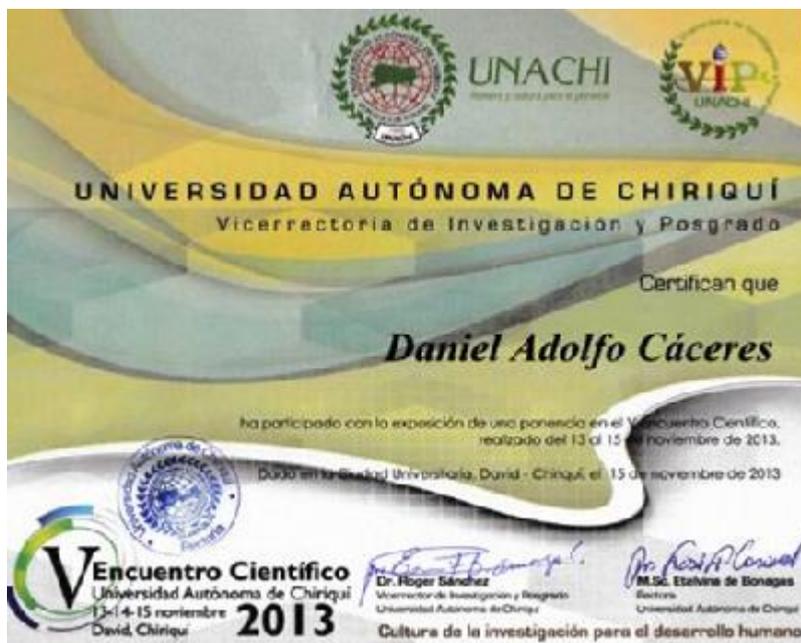
Of course. I would like to continue this work in Eastern Panama (Darién province). The Darién province is one of the least studied areas in Panama for historical and socio-political reasons (violence, guerrilla activity), and its inaccessibility. These reasons coupled with: the relatively good state of preservation of the vegetation; a considerable percentage of Protected Areas; the presence of Life Zones usually characterised by high bromeliad

diversity; and the area being two of the hotspots of biodiversity in the Neotropics, make Darien a province with high potential for finding new bromeliad species for Panama and for the World.

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

I presented the (preliminary) results of my work in a Scientific Congress at the University of Chiriquí (UNACHI) in October 2013 and in a scientific meeting in November 2014. In the next picture, you can see the certificate of participation for the Scientific Congress.

I am currently working on a manuscript, which I plan to submit to a scientific journal, in order to make the results of this investigation known to a wider audience.



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

The Rufford Foundation grant has been used between June 2013 and July 2014. The main reasons for the delay were: the permits to collect bromeliad specimens from Panama from the ANAM have been obtained later than originally planned; there was a delay in the fieldwork due to unstable weather conditions and the inaccessibility of many areas, which made it difficult to stick to the original schedule; and for the preparation of the manuscript and the publication, I need more time than scheduled.

8. Budget: Please 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.

Item	Budgeted Amount	Actual Amount	Difference	Comments
Medical insurance for research staff.	424	500	-76	
Scientific permits to collect bromeliads specimens by National Environmental Authority in Panama (Autoridad Nacional del Ambiente, ANAM) and to access the protected areas. Including David-Panama City roundtrip flight.	220	250	-30	
Basic security tree-climbing equipment.	165	177	-12	
Long-handled pruner (necessary for collection).	125	136	-11	
Local guides.	310	356	-46	
Lodging in communities and hamlets.	175	230	-55	
Rental of four-wheel drive car and transportation costs (fuel).	1605	1750	-145	
Food for field trips.	490	550	-60	
Hiring of one field assistant.	490	530.50	-40.50	
Purchase of camping equipment (backpacks, raincoats, field tents and hiking stoves).	325	300	+25	
Digital camera.	130	140	-10	
GPS (Garmin).	260	280	-20	
Purchase of material and equipment for fieldwork and work in the laboratory of the herbaria UCH (maps, batteries, boots, machetes, bags, plastic tags, secateurs and thorn-proof gloves, silica gel, professional plant press, botanical corrugated ventilators, alcohol, newsprint, herbarium mounting paper and photocopies of scientific papers and booklets).	390	460.25	-70.25	
Elaboration of two posters (one for ANAM and one for UCH).	455	300	+155	
Publication of results in a scientific journal.	230	180	+50	
Total	5,794.00	6,139.75	-345.75	

Note: Exchange rate: 1 £ sterling= USD 1.5328 (according to www.oanda.com accessed 11.10.2015).

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

I think it is very important to share the results of my work with a wider audience. As mentioned, I am therefore planning to publish an article in a scientific journal. This will officially increase the total number of bromeliad specimen reported for the Azuero Peninsula from 22 to 47. As some places could no be visited during the course of this project, more research is needed in these areas. I think there is still potential to find bromeliads, which so far have not been reported for Azuero Peninsula. Visiting some of the places in other times of year, might also increase the knowledge.

Additionally, I think it is very important to expand this work to other areas of Panama, which so far have been very poorly studied as far as bromeliads are concerned. A place with a very high potential to find new reports or even new bromeliad species is Darien, as mentioned above.



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

Yes, I used the logo in the acknowledgement given at the presentation in October 2013. I also mentioned the name of Rufford to the local population as well as when talking to colleagues about my work.

11. Any other comments?

Guzmania cerrohoyaensis H. Luther, is an endemic bromeliad species from Panama and is located today only in Cerro Hoya in Azuero Peninsula.

