Rufford Small Grant

Project Update

Name: Alexandra Pineda-Muñoz

Project Tittle: Developing a Genetic Diversity Conservation Model for the Threatened Coral Acropora palmata in San Andres Island, Colombian Caribbean

Project ID: 46414-1

Date of This Report: September 29, 2025

Executive summary

This project will evaluate the genetic structure of Acropora palmata in San Andres Island and compare it with other Caribbean populations. It will identify resilient phenotypes and genotypes for conservation and restoration. A genetic diversity conservation protocol will be developed, alongside management strategies and educational awareness programs to engage stakeholders and promote coral reef conservation.

Project Updates:

1. Indicate the level of achievement of the project's original objectives (Key activities progress included in the comments).

Objective	Not achieved	Partially achieved	Fully achieved	Comments
Improve the understanding of the genetic diversity and structure of *Acropora palmata* populations in San Andres		X		**Key Activities:** **Collect tissue samples from *A. palmata* colonies across San Andres Island. (Completed: June)** **DNA extraction of samples collected. (Completed: July)** **Perform genetic analysis using SNP genotyping. (In progress: August – October)** **Compare genetic data with existing Caribbean *A. palmata* population**

				datasets. (Pending*:* November – December)
Identify resilient *Acropora palmata* phenotypes and genotypes for targeted restoration		**X**		**Key Activities:** **Assess colonies' tolerance and resistance to bleaching and disease. (In progress: April-December)** **Select and catalog resilient genotypes for restoration efforts. (Pending: December-January)**
Develop a conservation protocol for *Acropora palmata* in San Andres	**X**			**Key Activities:** **Synthesize genetic data and ecological assessments to create a conservation model. (Pending: January-February)** **Develop guidelines for integrating genetic diversity into restoration practices. (Pending: January-February)**
Increase local awareness and engagement in coral conservation efforts.		**X**		**Key Activities:** **Partner with the Raizal community to promote stewardship of coral reefs. (In progress: (July-December)** **Develop outreach materials, such as pamphlets and social media content, on coral conservation. (Pending: December-January)**

2. Describe the three most important outcomes of your project.

a). Population Status: We quantified the current population status and documented significant changes over time. This yielded estimates of current status of *Acropora palmata* population in San Andres Island and revealed temporal trends throughout the last decades, and allowed to identify resilient unknown and unmonitored reef patches of *Acropora palmata* in San Andres Island.

b). Genetic Sampling: In 4 reef patches of *Acropora palmata* in San Andres Island, over 100 colonies were tagged and sampled for genetic analysis. Samples were transported to Bogotá, Colombia and analyzed in the Genetic Institute of the National University of Colombia. DNA was extracted from 96 samples and then transported to AGROSAVIA, ThermoFisher representatives in Colombia, for sequencing.

c) Capacity Building: 3 fishermen and 5 dive instructors were trained for *Acropora palmata* population monitoring, including spawning monitoring at nights. Nets for spawning collection were created and spawning monitoring was then done at two reefs in San Andres during the species' reproductive widow, 12 after the full moon, during July, August and September.

3. Explain any unforeseen difficulties that arose during the project and how these were tackled.

The costs of sequencing the *Acropora palmata* tissue samples resulted to be over twice as much as originally stated with local Thermo Fisher representatives. We could not send samples abroad (USA Thermo Fisher) given that CITES permit to transport samples to another country has taken over 6 months with local environmental authority, and is still pending. We used local collecting permits which were given to the National University of Colombia for sample collecting, and authorization from the local Environmental Authority CORALINA for national transportation of the samples, in order to fulfil project goals with no further delay. As for costs, additional funding was received from the International Coral Reef Society through the Ruth Gates Fellowship to cover additional costs of sequencing.

4. Describe the involvement of local communities and how they have benefitted from the project.

Upto date, 3 local fishermen and 5 dive instructors have been trained and made a part of the project, engaging them in coral reef monitoring for *Acropora palmata* patches and for nightly monitoring of coral spawining.

We are planning additional work with local fishermen which include engaging them in the project objective of coral reef conservation, especially with *Acropora palmata*, though one-on-one interviews and a domino contest with coral reef conservation theme, this will take place in December.

5. Are there any plans to continue this work?

Yes. The project will continue until February next year, when objectives are expected to be completed.

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

Local newspaper, scientific papers and social media.

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

Apart from the projects goals that are pending to be completed, and the outcome expected, it is important to implement the results obtained in the genetic analysis in a conservation and restoration strategy, in order to safeguard the genetic diversity of the species. Such work will be carried on my the local environmental authority CORALINA, with the support of local NGOs Blue Indigo and Ecomares in their

ongoing restoration projects. Additionally, to involve schools and middleschool students in order to teach them the importance of coral reef conservation and species importance for the community.

8. 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?

Yes. Up to now, Rash Guards and microfiber towels were produced for all trainees (Fishers and Divers) as a uniform for project field work.

Publicity was done through social media and 1 news paper article:

https://www.instagram.com/p/DL6BhRwsyZh/?img_index=4&igsh=MWxncGk0bmhmaHFzbA==

https://www.instagram.com/p/DNOJw2YAoXF/?img_index=3&igsh=MTk4cnRtZTNhaXFueQ==

https://www.elisleño.com/index.php?option=com_content&view=article&id=31967%3A2025-08-19-18-05-49&catid=41%3Aambiental&Itemid=83&fbclid=IwdGRjcANHjyNleHRuA2FlbQIxMQABHhqYFprvDOeI5bXlNKGfHMMAjjGXoku-lqhfvjXcsiMHBNG14xWCvJ_Yy92-_aem_7_F_1yPyvCLaIoQoDIfSDA

9. Provide a full list of all the members of your team and their role in the project.

Alexandra Pineda – Principal Investigator

Miguel Hinestroza – Diver – Field Work Assistant

Luis Pamenio Suescun – Genetic Expert – DNA extractions

Natalia Chavez – Laboratory assistant – DNA extractions

Sammy Martinez – Photographer – Multimedia coverage and video production

David Pineda Correa – Graphic Designer and Publicist – Local community and social media campaign

Randy Blanco – Local Fishermen and Diver – Coral Reef Monitoring

Peter Freiler - Local Fishermen and Diver – *Acropora palmata* Spawning Monitoring

Kaliensky Batista - Local Fishermen and Diver – *Acropora palmata* Spawning Monitoring

Sebastian Charria – Diver – *Acropora palmata* Spawning

Samir Orellano – Diver – *Acropora palmata* Spawning

David Leonardo Zapata – Diver – *Acropora palmata* Spawning

Andres Talero – Diver – *Acropora palmata* Spawning

10. Any other comments?

Approximately 85% of the funds have been spent, primarily on fieldwork logistics, DNA extraction materials, sequencing, and community training activities. The remaining funds will be allocated to pending outreach activities.

11) Supporting photographs

These are the captions for the pictures that are attached:

1) Sample collecting of *Acropora palmata* tissues for DNA Extraction. Ph: Alexandra Pineda-Muñoz
2) Researchers in the Genetics Institute for DNA extraction. Ph: Team member
3) Laboratory work for DNA extractions. Ph: Alexandra Pineda-Muñoz
4) Fishermen and Divers trained in coral reef monitoring. Ph: Team member
5) Spawn collection net in colony during night monitoring of *Acropora palmata* spawning. Ph. Sammy Martinez
6) Fisherman with his project rash guard. Ph: Alexandra Pineda-Muñoz
7) Fishermen with his microfiber towel. Ph: Alexandra Pineda-Muñoz