Final Evaluation Report

Your Details	
Full Name	Roy Francisco Saravia Sánchez
Project Title	Implementation of molecular markers for the identification of billfishes distributed in the Tropical Eastern Pacific
Application ID	35816-1
Date of this Report	1-24-2023

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
Design RFLP-type markers and species-specific primers by PCR-Multiplex based on sequences of cytochrome oxidase I (COI) and the control region (D-Loop).			■	We end up creating two molecular tools that can identify between the species in this study.
Evaluate the use of molecular tools designed for the species under study.			■	We were able to test each molecular tool with tissue from the species.
Test the designed tool on samples obtained in different markets.		■		The tools were tested in tissue from different markers from La Paz, BCS, Mexico. We want to increase the number of samples to achieve fully this objective.

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

a). We design two molecular tools to identify six billfish species. One of the tools is based on restriction enzymes and the second tool is based on PCR-Multiplex by creating species-specific primers.

b). We were able to see how the tool work with the species in studies by doing digestions with restriction enzymes and by doing Multiplex-PCR. These techniques can discriminate between the different species.

c). These tools can be used in different countries where it's considered necessary to adequate inspection of landings and compliance with laws regarding commercial regulation of billfish.

The most significant achievement of this work is that we were able to identify six species of billfishes using fast, robust, and easy to apply molecular techniques that can be used in different countries with the purpose of allow the authorities to make a safe identification of the species that generate some doubt about their identity and thus avoid any attempt to export protected species.

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

The only difficulties that we experienced during this project was DNA extraction with some of the samples. This was because this samples were old, and it was quite

difficult to have high quality DNA. These was tackled by eliminating those samples that were causing problems and we increase the number of samples we went to a sport fishing tournament where we were able to collect more samples and add them to the analysis.

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

The communities have been very useful for this project since it is thanks to them that the samples used for the analyses carried out in this project were collected. These communities, dedicated to activities where the species of this project are used, will benefit from this project because the tool will help with the species-specific information of the species, as well as help with the legislations in charge of protecting these species and increase conservation efforts for the species under study.

5. Are there any plans to continue this work?

Yes, the idea is to test the molecular tools in other fish markets in other countries in the region.

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

The idea is to publish the information in journals with a significant impact and relevance so that the information is available to the entire scientific community.

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

The next step is to redact the scientific paper to share the information generated in this project with the scientific community; also there are plans to present this results in different congresses and symposia. It is very important for us to share the results obtained so that analyses can be carried out in other countries in the region and increase conservation efforts for these species.

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?

The logo of the organisation was placed in presentations made at the institution where the project was carried out, since every 6 months it was mandatory to present the progress of the work in seminars organised by the research department.

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

Dr. Francisco Javier García Rodríguez: researcher and professor at the Centro Interdisciplinario de Ciencias Marinas (CICIMAR) in charge of directing the project and the laboratory where the analyses were carried out.

Dr. Sebastian Hernández: faculty member at Veritas University in San José, Costa Rica, also in charge of directing this investigation.

Roy Saravia Sánchez: in charge of carrying out DNA extractions, PCR's, interpretation of results as well as the development of the scientific article to be published.

10. Any other comments?

I would like to thank the organisation for giving me the opportunity to have access to the amount granted and thus be able to carry out the research in the best possible way.