Final Evaluation Report

Your Details	
Full Name	Diego Esperanza de Pedro
Project Title	Evaluation of different diversity measures of bees in a Baja California desert, a biodiversity hotspot
Application ID	34755-1
Date of this Report	April 10, 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
Samplings and determinations			■	Samplings were carried out on time. The determination of specimens was completely concluded during the visit to the US National Pollinating Insect Collection in February 2023.
Niche modelling			■	Niche models and distribution maps were made and are included in the second scientific manuscript.
Communities' description and functional diversity		■		Ecological analyses are going to be published in the second scientific manuscript.
Phylogenetic diversity		■		The objective changed to only evaluate the phylogenetic diversity of the genus *Anthophora* since the results are more relevant in this way.
Conservation plans		■		We have proposed plans for the conservation of bees and their host plants; however, these plans are in the process of being established.
Scientific outreach			■	We launched an Instagram account in August 2022 and has been useful for sharing curious facts about native bees and for promoting the scientific outreach events in which we have participated. We have also participated in several scientific outreach events.
Publishing plan: Magazine article			■	We published the article: An Approach to Ensenada Native Bees in the Volume 6, Issue 23 of Mediterranews.
Publishing plan: Field book for the identification of Baja California bees			■	The field guide is completed and currently we are sharing it with general population.
Publishing plan: Two scientific manuscripts		■		Scientific manuscripts are in process of being published.

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

a). We have increased the number of listed species of the Baja California peninsula from 426 to 698 (de Pedro et al., 2023, manuscript in preparation).

b). We also were able to participate in four different forums of scientific outreach generating great acceptance and interest from the public. The Pétalos y Miel hiking group was trained in the identification, importance and biology of Baja California's native bees.

c). We collaborated with Jorge Mérida of the Colegio de la Frontera Sur and bee photographer Diana Caballero for the elaboration of the "Field identification manual of native bees of Baja California".

During this work we have reported 78 new species records for the Baja California Peninsula, of which 48 are new to Mexico. This is the largest increase in species recorded by a study for Mexican bee fauna since 1996. Only records that have not previously been reported in digital databases or scientific journals are considered new.

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

Due to the Covid-19 pandemic, the establishment of links with institutions of other nationalities was hindered and it was not until the end of 2022 that we were able to visit them.

To continue the work during 2021 and early 2022 we established more relationships with Mexican working groups and maintained close digital contact with foreign groups.

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

We have been able to visit localities and farmers that we had not been in contact with previously. We have been able to talk to their members explaining the importance of bee conservation and offering them feasible strategies for their conservation without having negative impacts on their productive activities.

5. Are there any plans to continue this work?

Yes! This project has been instrumental in establishing a working group at the Baja California Arthropod Museum focused on native bees. We want to monitor native bee populations and communities in the deserts of Baja California. In addition, we would like to continue the conservation efforts by establishing norms and conservation plans with protected area coordinators.

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

We are currently sharing our field guide and we want to continue participating in science outreach events. We have opened the doors of the museum to the public by making small exhibition rooms inside the institute. Finally, we are planning to exhibit a part of the specimens permanently at the El Caracol museum in Ensenada along with the photos taken during this project.

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

Having a reference collection and a better knowledge of the diversity of bees in Baja California, it is necessary to start monitoring populations. In addition, continue with scientific dissemination and the formal establishment of conservation plans.

In order to more actively involve the general population and farmers, one of our next goals is to conduct identification and photography workshops in the field.

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, the logo was used in the field guide and on posters produced for outreach events.

It was always mentioned with the public and other institutions that this project was funded by The Rufford Foundation.

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

PhD Student Diego Esperanza de Pedro:
Team leader
Scientific manuscripts writing
Statistical analysis
Field guide writing and editing
Sampling, photography and determination of bee specimens
Collection curation
Generation of links with other institutions
Coordination and planning of scientific outreach events

PhD Sara Ceccarelli
Dissertation advising
Proofreading of scientific manuscripts
Coordinator of fieldwork

Oc. Eulogio López
Fieldwork logistics
Bee specimen sampling
Linkage with farmers

PhD Student Alejandra Castañeda
Bee specimen sampling
Bee determinations
Coordination and planning of scientific outreach events

Biology Bachelor student Heryen Collins
Bachelor dissertation "*Plant-pollinator interactions of Bombus (Apidae: Bombini) in the southwestern California Floristic Province*"
Sampling of bee specimens
Bee specimen mounting, labeling and determination.

Heriberto Murillo
Bee specimen sampling

Biology Bachelor student Diego Maldonado
Speaker at outreach events
Bee mounting and labeling.

MSC Luz Abril Garduño
Bee specimen sampling
Bee photography
Proofreading of field guide

MSC student Roberto Suárez
Speaker at outreach events

MSC student Melissa Álvarez
Speaker at outreach events

PhD student Daniel Rivera Mendoza
Speaker at outreach events

PhD Jorge Mérida
Institution: El Colegio de la Frontera Sur, San Cristóbal de Las Casas
Bee photography

Philippe Sagot
Institution: El Colegio de la Frontera Sur, San Cristóbal de Las Casas
Sampling, mounting and determination of bee specimens.
Proofreading of scientific manuscripts

Diana Caballero
Specimen sampling
Bee photography

10. Any other comments?

I would like to thank the members of The Rufford Foundation for their accessibility and attention to the project.