

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	Onja H. Razafindratsima
Project title	A multidimensional evaluation of the conservation implications of the invasive strawberry guava in Madagascar
RSG reference	21446-D
Reporting period	July 2017 – June 2018
Amount of grant	£10,000
Your email address	onja@ricealumni.net
Date of this report	July 2018

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
Determine how animal-mediated seed dispersal contributes to the spread of <i>Psidium cattlianum</i> (strawberry guava) in tropical forests				We have: (1) collected field data on the potential seed dispersers of this invasive species and the microhabitats where seeds are dispersed; and (2) conducted experiments to assess the germination capabilities of seeds dispersed by frugivores. Preliminary analyses of the data show that certain lemur species (both small- and large-sized) and birds largely contribute to the dispersal of the seeds of invasive strawberry guava. Further in-depth analyses are currently being conducted.
Determine how the invasion of <i>P. cattlianum</i> alters native plant community diversity and structure				We established two new 1 ha plots in invaded areas in addition to two pre-established 1 ha plots in non-invaded areas, and surveyed all woody plant species. We also established and surveyed small plots (5 x 5 m) around 20 randomly selected guava stands. Surveying these plots took longer than we anticipated; strawberry guava stands were highly clustered in the forest, making it difficult to navigate and survey species within the plot. We have collected leaf samples for DNA extraction and sequencing to reconstruct the phylogenetic relationships of plant species in the area. DNA extractions and sequencing are currently in progress.
Determine how the invasion of <i>P. cattlianum</i> alters the diversity of animal-frugivore assemblages				We have surveyed animal composition within each plot. We are currently in the process of analysing data for this component.

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

The main challenge to our field data collection effort was the highly dense and clustered structure of forest areas invaded by strawberry guavas. This often made surveying plants and animals within plots extremely difficult and time consuming. Adjustment of our sampling and surveying protocols was required to accommodate these difficulties.

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

- 1) Provide insights that would help find solutions to manage the ongoing invasion of *P. cattlenianum* in the tropical forests of Madagascar.
- 2) Contribute to our understanding of the mechanisms and impacts of biological invasions.
- 3) Provide educational development and training opportunities for underprivileged locals in a conservation hotspot.

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

This project involved a Malagasy graduate student who was trained in various aspects of scientific research. The student has also developed her own independent project in line of the current topic, under the supervision and guidance of the PI. Six local research technicians were also trained, and engaged in collecting data for this project. They are familiar with the forest and the local flora and fauna within RNP. They provided valuable help in identifying species, collecting scientific data, conducting vegetation surveys, and navigating the forest. They also benefited from this project through research training and professional development.

5. Are there any plans to continue this work?

Yes. Immediate plans are underway to conduct lab work and analyse the collected fieldwork data. We also plan to expand on this project by examining the spread of this invasive plant species across the entire island. We also hope to be able to incorporate information on the interactions between strawberry guava and humans into this project. We will continue to contribute to local conservation outreach and the education of local communities.

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

The results of this project will be shared through scientific publications in peer-reviewed journals in conservation and/or ecology; presentations in international and national meetings, conferences, and seminars. The results will also be made available to forest managers and policy makers in Madagascar through technical reports in French/Malagasy to park managers in Madagascar. The findings of this

project will also be broadly communicated to local stakeholders and the general public through interviews with the local media and workshops for Malagasy students.

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 RSG was used for 12 months, representing 50% of the actual length of the project.

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. Exchange rate: 1MGA = £0.00023

Item	Budgeted Amount	Actual Amount	Difference	Comments
Airfare	3520	1599	1921	Alternate funding was partially used for airfare.
Local transportation and travel while in Madagascar (car rental and fuel)	600	782	- 182	Change in the gas price.
Porters (carrying equipment and food supplies to /from field sites) and other transportation needs	200	271	- 71	More porters were required than anticipated.
Lodging, subsistence and station fees	1000	997	3	Fluctuating exchange rates.
Camping food expenses for everyone on camp	800	1150	- 350	Increase in food price. Larger research group than anticipated.
Compensation for Malagasy research technicians, local guides, expedition cook and student	2080	3213	- 1133	Larger research group and longer field research period than initially planned.
Fees for the preparation of several permits related to the project	160	273	-113	Unanticipated misc. fees.
Field equipment and supplies	920	921	-1	
Park entrance tickets, camping fees and other administrative fees	640	694	-54	Unanticipated misc. fees.
Communications and	80	85	-5	

documentation				
Medical supplies for the team on camp		18	-18	Necessary to ensure the health and well-being of the research team.

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

- Finishing molecular lab work.
- Analysing the collected field work data.
- Writing reports for park managers.
- Writing manuscripts to be submitted in a peer-reviewed journal.
- Publicising the findings of the project to local stakeholders and the public.

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

We have not produced any materials related to this project to date.

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

Dr Daniel Park, a postdoctoral research fellow at Harvard University and the University of Arizona, played a pivotal role in the design and implementation of this project as well as in training students working on this project. He also brings in a wealth of skills in data analyses.

Camille DeSisto, an undergraduate student at Harvard University, made a great contribution in training local technicians, in collecting field data and in conducting DNA extractions and any lab component of this project. Camille is also currently developing ideas to implement the human dimension component into the project.

Veronarindra Ramananjato, a graduate student at the University of Antananarivo, made a great contribution in training and leading local technicians, in collecting field data from direct observations and experiments.

Local research technicians and para-ecologists: **Neree Beson, Jean-Claude Ramanandraibe, Jean-Claude Rakotonirina, Leontine Hanitrinala Nirinasoa, Tolojanahary Maminiana Ramanantsoa, and Henri Rakotozafy**. They aided in all aspects of data collection efforts and in species identification.