

The Rufford Small Grants Foundation

Final Report

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

We ask all grant recipients to complete a Final Report Form that helps us to gauge the success of our grant giving. 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. 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	Dr Manju Vasudevan Sharma
Project title	Diversity and functional roles of arthropod fauna across agricultural landscapes, Nilgiri Biosphere Reserve, Western Ghats, India
RSG reference	11676-1
Reporting period	15 months
Amount of grant	£5970
Your email address	mann.vasu@gmail.com
Date of this report	21 st September 2013

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
Assessing pollination efficiency in coffee and mustard			*	The work on mustard could not compare chemical and organic farms since the marginalised farming community in Hasanur district are organic farmers.
Classification of insects into the 3 functional guilds			*	The pitfall traps that sample ground arthropods are still being sorted for identification and this trapping method has captured the third functional guild – i.e. of detritivores or decomposers. We have Order level data available as of now, but until we can identify Families, their feeding habit and functions cannot be determined.
Comparison of arthropod diversity in wet versus dry forests		*		The forest type classification being dry and wet evergreen forests did not have strong floral compositional differences as expected. Nevertheless this categorisation will be assessed for insect composition differences for the peer reviewed journal paper that is being conceived.
Comparison of arthropod diversity in organic and chemical coffee farms		*		The comparison includes samples of flying insects from two types of traps. Detritivores have been compared from a few pit falls only. The rest are in the process of being identified and hence this report only presents part of the results.
Insect displays for field centres		*		Insects are being oven dried and mounted for the second insect display by an internee at the collaborator's laboratory.
Learning module on functions of insects for children			*	The PDF beings shared with this report. They will be distributed through the Nilgiri Natural History Society and to the four field centres of Keystone across the Nilgiri Biosphere Reserve (NBR) in the following weeks.

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

Delayed summer rains delayed flowering in coffee sites and thus an unexpected delay in pollination observations and in identifying the arthropods captured during the flowering phase was encountered. Insects from each of the sampling sites amount to thousands of samples and the data sorted so far is a mere tip of the iceberg. When the entomology intern was recruited, she sorted insects until Order level and then quit the project to pursue a PhD. The second intern too quit after 2

months of work to get married. The consultant entomologist who is now working on existing samples is Dr Palatthy A. Sinu, Asst. Professor at the Central University of Kerala, and is juggling time between teaching, his own research and samples from this study.

Only a small proportion of the entire sampling have been identified – flying insects from malaise traps of organic and chemical sites in dry and wet forests, and detritivores from pit falls of chemical and organic sites near dry forests alone. After the flying insects from all sites are identified, we will begin sorting the pitfalls. When the work is complete, a more detailed report will be shared with Rufford. He is also keen to publish a paper in a peer reviewed journal since this is an entirely new question for the region.

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

When completed, this may be first comprehensive record of arthropod functional diversity in an agro-forestry landscape in the Western Ghats. The findings on parasitoid wasps, a critical category of predators of pests, has presented a strong case against chemical farms since they do not appear to support as much diversity as organic farms.

Apart from the scientific contribution of the study, the insect displays and learning material will reach out to urban and school children across NBR, to indigenous farmers and big estates, as well as to a range of visitors to the bee museum.

The information on biodiversity in indigenous farms (which was shared through meetings in two villages) is of great value to organic farmers, particularly with regard to their participation in the Participatory Guarantee System. More diversity on their farms would mean more value to their crop produce.

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

A result dissemination workshop is to be held in two of the indigenous communities (where the study was conducted) to discuss the role of the various arthropods in their farm. This is planned for 29th and 30th September 2013. Children participated in the learning module and recollected insect capturing techniques. Two of the indigenous community members were trained in insect trapping techniques during the study and are now part of other similar projects that run through Keystone.

5. Are there any plans to continue this work?

There are ideas being discussed within the conservation and livelihoods teams at Keystone about how to further the work that was carried out this year. One of the thoughts is to assess the densities of solitary bees since most of the work at Keystone has focussed on honey bees; this could be done by setting up 'trap nests' fabricated with reeds of varying diameters, an approach not tried anywhere in India. For 2 years now, we have been nurturing the idea of organising a field pollination course to be taught by Prof Amots Dafni, University of Haifa. Funding has been the main constraint and I am considering applying for a second Rufford grant to be able to accommodate a training course in spring 2014. Before applying, I am keen to complete the current insect identification process and get the scientific paper published, and this might take up to 4-6 months.

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

A scientific paper is being written to share the results with the research community. The learning module prepared in English will soon be translated to Tamil the local language for better outreach, The report written in less technical format has been sent out to the coffee estates that showed an interest in recording the biodiversity on their estates, some for their own record, others for presenting to the Rainforest Alliance of which they are part. A popular article has been contributed to the newsletter of the Nilgiri Natural History Society's December edition.

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

The Grant was requested for a period of 12 months, although the actual length of the project was 15 months, including the report writing period.

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
Equipment	860	400	460	Some items and chemicals were purchased from another project.
Expendable supplies	890	520	370	This was done partly to free up some amount to pay the consultancy fee for the insect taxonomist. Also plant press and sticky traps were not purchased since the revised methods did not require them.
Books and communications	220	180	40	
Jeeps	2100	2150	-50	
Travel to research partners' labs and food and accommodation during field work	780	640	140	
Field Assistant	480	500	-20	
Consultancy for Insect taxonomist	0	1270	-1270	
Learning module	640	300	340	It was decided not to print posters and to focus on the insect learning guide in non-technical language.
TOTAL	5970	5960		

* exchange rate used: 1GBP= INR 88

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

It would be crucial to incorporate a large part of the findings into the Participatory Guarantee System (PGS) that has been initiated by Keystone in some of the indigenous farming communities. Maintaining high diversity in organic farms not only ensures a balanced crop system but also gives the farmer additional scoring points for supporting biodiversity on the farm. It is important to secure pollinator nesting sites that lie in the forest adjacent to these crops.

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

The outreach material, books purchased and some of the equipment (such as malaise trap and insect display boxes) carry the RSGF logo. Five coffee estates across the Nilgiris are now aware that international funding agencies such as Rufford willingly support research on biodiversity of not just charismatic species but equally important microfauna in forested as well as semi-natural ecosystems.