

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	Kunal Arekar
Project title	Species delimitation of Himalayan langur using integrative taxonomy and its conservation implications
RSG reference	18855-1
Reporting period	1 year
Amount of grant	£5000
Your email address	Kunal.cyan@gmail.com
Date of this report	01-09-2017

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
Intensive literature survey and systematic sampling across the Himalayas to collect faecal samples				<p>This was the first step in this project. We managed to sample two states i.e Himachal Pradesh and Sikkim (P.S – 2nd point); we partially covered Uttarakhand. We were mostly successful in sampling according to our design, but some places were not accessible given the heterogeneous topography of the Himalayas.</p> <ul style="list-style-type: none"> • Samples are yet to be collected from some states where these langurs are found.
Species delimitation using integrative taxonomy				<p>Molecular markers have been sequenced for the samples so far collected. We also managed to get some morphological data from the photographs of the langurs. However, ecological data collection is pending as building a niche model requires data points across the distribution range.</p> <ul style="list-style-type: none"> • Ecological and morphological data collection is pending for some samples.
Pictorial field guide and Dissemination of information to various stakeholders.				<p>We have started working to put together the information regarding south Indian langurs. As soon as some concrete results for our Himalayan langur project are out, we will start the work for publishing the guide and also disseminate the information to public and the government officials.</p> <ul style="list-style-type: none"> • This work is pending as we have not yet generated enough data to complete this goal.

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

1. Obtaining collection permits for some states was difficult. We still did not receive the permit for the state of Jammu & Kashmir (J&K). Another issue with sampling in J&K is the current hostile political situation there, some of the areas are heavily militarised. This is also one of the reasons for delay in getting collection permits.
2. My visit to Sikkim to collect samples was not successful. I spent close to 1 month there, but I did not encounter a single langur. We believe this could be because of low numbers of these langurs in Sikkim. We have applied to the Sikkim forest department for an extension of the collection permit.
3. Traveling was not possible during some seasons of the year like monsoon, when there are very frequent landslides which blocks the road and winters when there is quite a bit of snow. Access to some areas is partially or sometimes completely cut off.
4. This is a personal problem, but nevertheless it affected my work. I had to undergo a knee surgery after an accident during a sports event. Because of this I could not travel for sample collection. It took almost 6-7 months to recover.

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

1. To understand the true species diversity of the Himalayan langur and to delineate species boundaries.
2. Fill the gaps regarding langur diversity in Indian subcontinent.
3. Publishing pictorial guide and outreach material for raising awareness among the local communities for the conservation of Himalayan langur. Also, disseminating information to the forest departments which will help them in making meaningful conservation policies.

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

The local communities were helpful during sample collection as many of them accompanied me as a local guide to search for these animals and collect samples. We did survey some of the locals for their perception about these langurs; most of them had positive attitudes towards these animals with a few hostile opinions. The attitude of people depends on the level of nuisance and damage caused by the langurs. Villages which experienced high amount of damage to their crops and houses were more hostile towards these langurs. This is just a preliminary data from the survey; a complete survey across all the communities will give us a better picture. This work is still ongoing.

5. Are there any plans to continue this work?

Yes. Once after this project is completed, we will have a complete understanding of the species diversity of langurs in Indian subcontinent. There are many species of langurs in India which have overlapping distributions where these species are believed to hybridise, a fine scale population genetic study will help identify any hybrid population present; what are the two parent species involved and when did the hybridisation took place. Hybridisation can occur naturally or could be the result of anthropogenic activities. Identifying and conserving the hybrid species is also necessary, for e.g. – If the two parent species are occurring in a protected area but the hybrid species is not, then the hybrid species is more at risk; this makes it very important to identify and protect the hybrid zone and the hybrid species. It will also bring clarity to the results obtained from studies which use langurs as model system like in the field of biomedical science, behaviour, ecology, and many more.

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

We will publish field guides and outreach material for local communities and forest department officials. This was one of our objectives. Apart from this we will partner with local NGOs to conduct awareness programmes for local communities and local schools and colleges to inculcate the idea and importance of conservation of Himalayan langurs and also other species found in the area. Other than this, the results of our work will be published in peer reviewed journals which will reach out to the global scientific community.

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 grant period was for 1 year, from May 2016 to April 2017. I was not able to utilise the complete grant as I have not completed the sampling yet (due to difficulties mentioned in Point 2). Although, I have already started working on the samples I collected till now. Some of my study sites are very close to international borders and the political situation there makes it even more difficult to carry out sample collection in these areas. I am planning to finish sampling by early to mid-2018.

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
Field Assistants Salary (GBP 4.95/day for 100 days)	495	90.7	404.3	I did not hire a field assistant till now, however local assistants were hired and paid through funds

				from this head. Sometimes I also paid driver's salaries from this head.
Food and Lodging (For team members and field/local assistants)	1485	253.96	1231.04	In most of the places, I stayed in the forest department guest houses which are reasonably priced; this reduced the cost of lodging considerably. But a few places I needed to check-in in a hotel or lodge.
Travel (From Bangalore to field sites and back)	500	120.93	379.07	This was mostly air travel from Bangalore to the nearest airport from the field sites.
Local Travel	1600	302.33	1297.67	I hired cars from local travel agencies. Sometimes due to tourist season the hiring rate were high. Many times I travelled through local transport, wherever possible, to save on hiring cost.
Fuel cost (During local travel)	500	108.84	391.16	Fuel for the local travel was purchased
Booklet designing and printing (100 copies, GBP 4.2/copy)	420	0	420	Printing will be started as soon as some data is generated.
TOTAL	5000	876.76	4123.24	

***Note** – As the sampling is not yet complete, most of the funds have not been utilised.

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

The first objective is to complete the sampling by early 2018, and then finish data generation and analysis before 2018 year end. After this the next important thing would be to create awareness among the locals about the conservation of the Himalayan langur through local NGOs. It is also important to educate the forest department about the diversity of Himalayan langur and accordingly design conservation action plans which are species specific. It can help mitigate the human animal conflict as these langurs are known for crop raiding.

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?

Not yet, but I will be presenting my work at an international conference (IBS 2017) in the month of September 2017.

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

Team Members –

Kunal Arekar – This project is a part of my PhD. I am responsible for sample collection, data generation, data analysis and report writing

Dr Chetan Nag – He have previously worked on systematics of langurs in south India. His expertise in morphological taxonomy and ecological niche modelling will be very helpful for morphological and ecological data analysis.

Dr Praveen Karanth – He is molecular phylogeneticist interested in understanding species diversity and distribution of Indian biota by using phylogenetic tools. His PhD work was on the systematics of langurs and leaf monkeys of Asia. He helped with study design and getting the permits.

12. Any other comments?

We are extremely grateful to the Rufford Foundation for the financial support they have provided and the patience they have shown towards us during the course of the project.



