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	Marina B. Blanco
Project title	Population and reproductive biology of *Microcebus* and *Cheirogaleus* in the eastern rain forests of Madagascar
RSG reference	21.07.06
Reporting period	09/03/06 to 05/31/07 originally, extended to 05/31/08
Amount of grant	£4980
Your email address	mbblanco@anthro.umass.edu
Date of this report	05/23/08

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
Intense trapping of *Cheirogaleus* and *Microcebus* at three locations			X	Preliminary trapping of *Cheirogaleus* in 2006 yielded a small number of individuals, especially at the continuous forest site at Tsinjoarivo; we significantly increased samples sizes at both locations during our 2007-08 expedition. We successfully trapped *Microcebus* at Tsinjoarivo and Ranomafana National Park
First description of two sympatric *Cheirogaleus* populations at Tsinjoarivo			X	Initial morphological and dental analyses of captured *Cheirogaleus* at Tsinjoarivo (continuous and fragmented forests) confirm earlier suspicions that there are two sympatric species. Genetic analysis are pending, see more below
Characterization of the reproductive biology of *Cheirogaleus* and *Microcebus*		X		Detailed reproductive profiles based on direct observations and fecal hormonal analysis were obtained for *Microcebus* females trapped at Ranomafana National Park, where many individuals are frequently captured and released soon after identification and handling, see below
Effects of forest fragmentation and disturbance on the cheirogaleid populations		X		Analyses of "edge-effects" on *Cheirogaleus* are pending; initial data indicate that, contrary to published reports, at least some *Cheirogaleus* (i.e., those in the fragments at Tsinjoarivo) are edge-tolerant, as they are captured in greatest density in edge habitats. However, this may reflect shrinking available space and may actually hinder reproductive success. Only long-term research on reproductive success will allow us to determine which the better explanation is.

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

Trapping of cheirogaleids was generally successful. However, during the rainy season (January and February), trapping success decreased significantly at Ranomafana, to the point that no *Cheirogaleus* and only 3 *Microcebus* were trapped.

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

- Discovery of two sympatric species of *Cheirogaleus* at Tsinjoarivo. Morphological and dental analyses of three dwarf lemur populations (Vatateza, Tsinjoarivo; Andasivodihazo, Tsinjoarivo; Talatakely, Ranomafana National Park) demonstrate greater diversity than previously reported. Results of our morphometric analyses have been submitted for publication. Genetic analysis has been initiated.

- Data outcome on growth, reproductive and dental development of *Cheirogaleus* at Tsinjoarivo collected during the reproductive season of 2006 and November 2007- March 2008. Virtually nothing is known on life history strategies of wild populations of eastern dwarf lemurs; our preliminary results suggest that Cheirogaleus in the east grow in a fashion similar to that reported for the western species, *C. medius*, in that females may not be reproductively mature until they reach 3 years. We also obtained additional details on dental development and hibernation habits. We expect to submit these results for publication in the next few months.

- Reproductive profiles of female mouse lemurs derived from direct observations, vaginal smears and fecal hormonal analysis employing non-invasive techniques. Although these techniques have been successfully applied to other lemur species, they had not been tested in wild populations of nocturnal lemurs, where individuals need to be frequently trapped and quickly released. We were able to develop a technique that can be employed in wild mouse lemurs. Results of this study have been submitted for publication.

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

At both Ranomafana National Park and Tsinjoarivo, we employed local research assistants to help us conduct field research on cheirogaleids. At both locations we also trained Malagasy students in field techniques, animal handling and data analysis. Our results contributed significantly to the efforts initiated by Dr. Mitchell Irwin and Jean-Luc Raharison to make Tsinjoarivo a protected area. This forest has an outstanding biogeographic value. Continued monitoring of fragmented forest species is imperative if we are to test the effects of forest fragmentation, or alternatively, the potentially positive effects of increased public awareness.

5. Are there any plans to continue this work?

I am planning to continue to study *Cheirogaleus* at Tsinjoarivo, both in the continuous and fragmented forests. Our preliminary results of the first survey of cheirogaleids at this location have surpassed our initial expectations.

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

We have submitted 2 articles for publication and we have one in preparation.
We have presented initial results of this project at several national and regional meetings, see below.

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

The project covered two reproductive seasons, almost a 2-year period. We requested a year extension because the notification of the award was received when I was already in Madagascar, in November 2006.

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
Transportation-airfare	£1,726	0	+£1,726	Monies transfer to Transportation-internal facilitation-I was already in Madagascar when I received the award
Transportation: internal facilitation including hotel, groceries, taxi-brosse, etc.	0	£715	-£715	Originally devoted to airfare
Living expenses for field crew, station fees at Ranomafana and Tsinjoarivo	£2,254	£1,000	+£1254	No station fees needed to be paid at Tsinjoarivo
Equipment (antenna, receiver, transmitters)	0	£860	-£860	Originally devoted to airfare-used during extension period
Supplies 1: inc. tents, tarps, sleeping gear, rain gear, flashlights, etc.	£1,000	£1,550	-£550	Additional tents and raingear need to be purchased
Supplies 2: laboratory items including RIA kits for fecal hormonal analysis		£845	-£845	Although originally included in the budget, we underestimated the amount

				of RIA kits needed for the analysis
TOTAL	**£4980**	**£4970**	**£10**	

Exchange rate 1U$ dollar = 1.964 £ [I understand the exchange rate I used between **£ sterling and USD** may not be the same as 2006 or 2007; there was also variation in exchange rates between Malagasy ariary and USD]

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

After the initial description of the two *Cheirogaleus* spp. captured at Tsinjoarivo, an ecological and biological characterization of these populations is necessary in order to assess population dynamics and establish a conservation strategy.

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?

RSGF was publicly recognized at a session of the 77th Annual Meeting, American Association of Physical Anthropologists, Columbus, OH.

Blanco MB, Godfrey LR, Rakotondratsima M, Rahalinarivo V, Samonds K, Raharison J-L and Irwin MT. 2008. Discovery of sympatric *Cheirogaleus* species in the high-altitude rainforest of Tsinjoarivo, eastern central Madagascar: implications for biogeography and conservation.

The RSGF was also recognized at a session of the 48th Annual Meeting, Northeastern Anthropological Association. Amherst, MA.

Blanco MB, Godfrey LR, Rakotondratsima M, Samonds K, Raharison J-L and Irwin MT. 2008. Clinging to the edge: diversity of the genus *Cheirogaleus* in the high-altitude forests of Tsinjoarivo.

RSGF has been explicitly acknowledged in the following papers:
2008 Blanco MB, Godfrey LR, Rakotondratsima M, Samonds KE, Raharison J-L and Irwin MT (submitted) Discovery of sympatric dwarf lemur species in the high-altitude rainforest of Tsinjoarivo, eastern Madagascar: Implications for biogeography and conservation. Folia primatologica

2008 Blanco MB and Meyer JS (submitted) Assessing reproductive profiles in female brown mouse lemurs (*Microcebus rufus*) from Ranomafana National Park, southeast Madagascar, using non-invasive techniques. American Journal of Primatology

2008 Blanco MB, Godfrey LR, Rakotondratsima M, Samonds KE, Raharison J-L and Irwin MT. Discovery of sympatric *Cheirogaleus* species in the high-altitude rainforest of Tsinjoarivo, eastern central Madagascar: implications for biogeography and conservation. American Journal of Physical Anthropology Suppl. 46:69. Abstract.