

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	N’Golo Abdoulaye KONE
Project title	Raising awareness for sustainable harvesting of <i>Termitomyces</i> mushrooms in central Côte d’Ivoire (West Africa)
RSG reference	10452-1
Reporting period	22th June 2012
Amount of grant	£5506
Your email address	ngolo197804@yahoo.fr
Date of this report	9 th January 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
Generating quantitative data on their actual diversity, abundance, distribution and habitats characteristics			x	Quantitative data was generated on the actual diversity and abundance of the extend fructification zone of <i>Termitomyces</i> in Côte d'Ivoire (extend savannah-forest boundaries, from the eastern to the western part of the country). However, our field observations revealed that there are threats pending upon the symbiotic fungi of the forest dwelling termites (e.g. <i>Acanthotermes acanthotorax</i> and <i>Macrotermes subhyalinus</i>). We should also especially work in the primary forest habitats in south and the west of the country.
Identifying human pressure through land use intensification and harvesting methods			X	The current excessive deforestation and the subsequent conversion of the extend savannah-forest boundaries to agricultural land further threaten this symbiosis. Deforestation was identified as the main threat pending the diversity and abundance of <i>Termitomyces</i> species. However, their intensive and uncontrolled harvest for consumption and trade, the collection of queens and sexual (alates) of the host termites and the resulting destruction of their nest also have a negative impact on the establishment of mature fungus-growing termites' colonies.
Elaboration of collaboration strategies for <i>Termitomyces</i> species, host termites and their habitats		X		These strategies were elaborated for the extend fructification zone of <i>Termitomyces</i> sporophores. However, in the rain forest zone new strategies must be elaborated according the future studies in these areas. Indeed, exportation crops (cocoa, coffee, palm tree...) and their subsequent deforestation are privileged.
Raising public awareness through campaigns through pupils, collectors,		x		This objective was fully achieved in our study area with the campaigns undertaken through this project. However, the results of this objective

sellers and purchasers of these mushrooms				need to be evaluated at the next fructification period of <i>Termitomyces</i> sporophores (February-May 2013). That could be done by the ministry of environment or through another project or permanent educational activities and awareness campaigns.
Analysing option for production in disturbed habitats and promoting the consumption of other successful domesticated edible species as alternative		X		The option of the production of <i>Termitomyces</i> sporophores under controlled conditions is just at the beginning. We are actually working on newly founded colonies of fungus growing termites in the laboratory. The promotion of other successful domesticated edible species as an alternative will be done through the training of rural people of some selected villages (via another project) on the cultivation of <i>Pleurotus spp</i> and <i>Volvariella spp</i> which are with <i>Termitomyces</i> species, the most consumed fungal sporophores in the country.

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

	Problems encountered	Solutions used
1	We did not include the budget for repairing the car if needed. We have got some mechanical problems with the vehicle during the field works which needed to be solved.	The funds were provided from the numeric camera and the portable electricity generator budgets.
2	All the project sites were not accessible by car. We were then forced to use two rented motorbikes.	The funds for renting out the motorbikes were provided from the correspondences budget. Part of the budget devoted to transport, field trips and awareness campaigns was used to buy fuel to feed these motorbikes.

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

The three most important outcomes of our project were:

1. The effective implication of rural people and our ministry of environment in the execution and popularisation of the awareness campaign
2. The awareness of rural people for sustainable and long-lasting use of fungus-growing termites and their symbiotic fungi. Most of them did not know that *Termitomyces* sporophores' were cultivated by termites and that their persistence is related to that of these host termites and the good conservation of their habitats.

3. Important quantitative and qualitative data obtained on the diversity and abundance of *Termitomyces* from the extend savannah-forest boundaries of Côte d'Ivoire. This outcome will allow establishing the first monograph of edible mushrooms of this country. A checklist for *Termitomyces* of Côte d'Ivoire is been prepared and a red list will be prepared soon using IUCN criteria like Extinct, Critically Endangered, Endangered, Vulnerable, Near Threatened and Data Deficient. Finally, proposals for protection of rare and threatened *Termitomyces* in the country will be determine in the near future.

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

The awareness campaign was done by some actors the harvest and collect chain of *Termitomyces* sporophores (commercial and subsistence harvesters, small and wholesalers of *Termitomyces* fruits bodies). We previously trained them and during the awareness campaign we used them as technicians to educate the rural people in their respective mother taught on the necessity to sustainably use the *Termitomyces* sporophores and their host fungus-growing termites.

5. Are there any plans to continue this work?

It is absolutely important and fundamental to continue this work by extending the study area. For the ecological survey, there is need have an inventory and a long-term monitoring in the forest zones (West and South of the country) and the Soudano-Zambesian woodlands in the east to produce an accurate, comprehensive and useful red list for the *Termitomyces* species of Côte d'Ivoire. Fructification periods were found differing from a *Termitomyces* species to another on one hand and from an area to another on the other hand. Hence, there is a need to carry out a national ecological survey of the macro-fungi in general and *Termitomyces* particularly as a prelude to conservation of these organisms in this country. Furthermore, there is a need of establishing a permanent educational activities and awareness campaigns on the diversity and sustainable use of edible fungi in general.

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

We plan to share the results of our work with others through publications. We already made a publication in a national bimonthly agricultural magazine (*Le Planteur*) for the general public and stakeholders of our country. We also plan to analyse some of the important results obtained during this work and published them in a scientific peer review journal of biodiversity conservation. Furthermore, in order to maintain people awareness on the necessity of sustainably using *Termitomyces* sporophores and their host termites, scientific review for general people such as topic in the future edition of the biodiversity atlas of Côte d'Ivoire, will also be written with the rest of the results.

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

The project was executed from January to December 2012. The grants will be use until the end of January 2013, though the project is still ongoing as data analysis is still been done for the ecological diversity study (morphological identification, writing scientific publication, and review for general people). We received funds on October 2011 and the project started on 01st January 2012.

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
Video projector + accessories	940	900	-40	
Digital photo camera Canon EOS 1000D + supplementary batteries, tripod...	900	650	-250	We bought a Canon EOS 1000D instead of Canon EOS 50D
Electricity generator + fuel for awareness campaign in villages without electricity	665	550	-115	This remaining money was used to repair car during the field work.
Office and informatics automation	200	200	0	
Printing of posters, brochures, Conservation manual...	500	505	+5	
Specimens collecting and conservation material	300	397	+97	Funds were needed to for chemical reagents (Congo red Melzer's) used for the identification of fungus sporophores and CTAB (Cethyl Trimethyl Ammonium Bromide) used for the good conservation for future molecular analyses (if relevant).
Transport	1351	1655	+304	Motorbikes were rented out for field works in inaccessible work sites. In addition, fuel for the vehicle was underestimated.
Salaries of local guides and technicians	500	595	+95	
Correspondences	150	145	-5	
TOTAL	5506	5597	+91	The local exchange rate is: £1 = 741 XOF

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

The important next steps are:

- (i) Improve our comprehension of the fructification of the symbiotic *Termitomyces* in the fungus growing termites' colonies by modelling developmental stages within these colonies under laboratory conditions. The aims of these studies will be the determination of the relationship between the life cycle of fungus growing termites and the seasonal fructification of their symbiotic fungus in incipient colonies under laboratory conditions. Modelling

- colonies growth in fungus termites will be an innovative work on the way of understanding the fructification of the symbiotic fungus in this symbiotic relationship.
- (ii) The promotion of other successful domesticated edible species as an alternative for the sustainable management of *Termitomyces* sporophores will be done through the training of rural people of some selected villages (via another project) on the cultivation of *Pleurotus* spp and *Volvariella* spp. This kind of project could help reducing the threats pending upon the *Termitomyces* species. Furthermore, these edible fungal cultivation activities could represent another source of income for rural people and reducing by the way the pressure on habitats of *Termitomyces*.
 - (iii) Institute permanent awareness campaign of biodiversity conservation and the management of natural resources

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 RSGF logo was used in all the oral communications of the awareness campaigns intended to raise awareness for the sustainable management and harvest of the edible mushrooms of the genus *Termitomyces*. I will also use the RSGF logo in the presentation of the oral defence of my PhD thesis which planned for the 31th January 2013.