

## The Rufford Foundation

### Final Report

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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](mailto:jane@rufford.org).

Thank you for your help.

**Josh Cole, Grants Director**

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Grant Recipient Details	
Your name	Dr Anicet Gbèblonoudo Dassou
Project title	Associating research to community education to conserve rare and threatened melliferous plants with high medicinal and food values in Benin (West Africa)
RSG reference	21955-1
Reporting period	May 2017 – May 2018
Amount of grant	£4850
Your email address	<a href="mailto:dassoua5@gmail.com">dassoua5@gmail.com</a>
Date of this report	July 2 <sup>nd</sup> , 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
<p>Organize exchanges with honey production farmers on their constraints in bee-keeping and forest management in order to identify with them threatened melliferous plants with high medicinal and food values in Benin</p>				<p>Considering the importance of melliferous plants for both men and bees in honey production, individual and focus group ethno-apicultural surveys were conducted with nearby beekeepers to identify the medicinal and food plants involved in the production of honey. Food and medicinal uses, the preferences of beekeepers in the choice of honey plants for the production of honey and the constraints of beekeepers related to the conservation of these honey and medicinal plants were also identified. The preferred plants by beekeepers are those that provide sweet, fragrant honey with a large volume of honey. It appears that honeys from 11 plant species are clearly recognised by beekeepers who are involved in the treatment of various diseases. The constraints hampering the management of these honey plants are extensive farming, animal husbandry, anarchic logging.</p>
<p>Assess their distribution and availability in their distributional area</p>				<p>From the ecological characterisation of habitats harbouring threatened melliferous plant species, a total of 225 plants species were recorded in study area. Among them, five threatened melliferous plant species with medicinal values (TMPS) were found. There are: <i>Azelia Africana</i> (UICN: VU; Benin: EN), <i>Borassus aethiopum</i> (Benin: VU), <i>Khaya senegalensis</i> (UICN: VU; Benin: EN), <i>Pterocarpus erinaceus</i> (Benin: EN) and <i>Vitellaria paradoxa</i> (UICN: VU;</p>

			<p>Benin: VU). Concerning an availability of threatened melliferous plant species, overall, densities of the species were: <i>Azelia Africana</i> (1.5 stem/ha), <i>Borassus aethiopum</i> (1.3 stem/ha), <i>Khaya senegalensis</i> (2.5 stems/ha), <i>Pterocarpus erinaceus</i> (5.2 stems/ha) and <i>Vitellaria paradoxa</i> (25.2 stems/ha). This obtained low density may be due to the deforestation of their habitats for the farming (cotton cropping). Percentages of mature plants were higher than that of saplings and seedlings in the two habitats. TMPS having lowest regeneration rate were <i>Azelia Africana</i>, <i>Borassus aethiopum</i>, <i>Khaya senegalensis</i> and <i>Pterocarpus erinaceus</i>. These rates were higher in woodlands savannahs than in the farmlands. Field observations showed that reasons for very poor regeneration in these habitats are over harvesting of mature seeds, grazing and mostly the disturbances due to pesticide usages in the study site that remains first cotton area of the country.</p>
<p>Initiate a program based on farmer community sensitisation for the honey production in neighboring of rare and threatened melliferous plants</p>			<p>Training and sensitisation workshops were carried out in study districts. These workshops included the extension agents, farmers, honey producers, honey processers, honey consumers, village heads. Five honey producers were trained in each study district, at total 25 honey producers in the study area. The training were on honey production constraints management and the choice of agroforestry melliferous plants for the medicinal and food honey production. At the end of the project, a sensitisation workshop was carried out at the Faculty of Sciences and Technologies of Dassa in order to share the findings of the project to domain stakeholders. At this workshop of project end, ONGs</p>

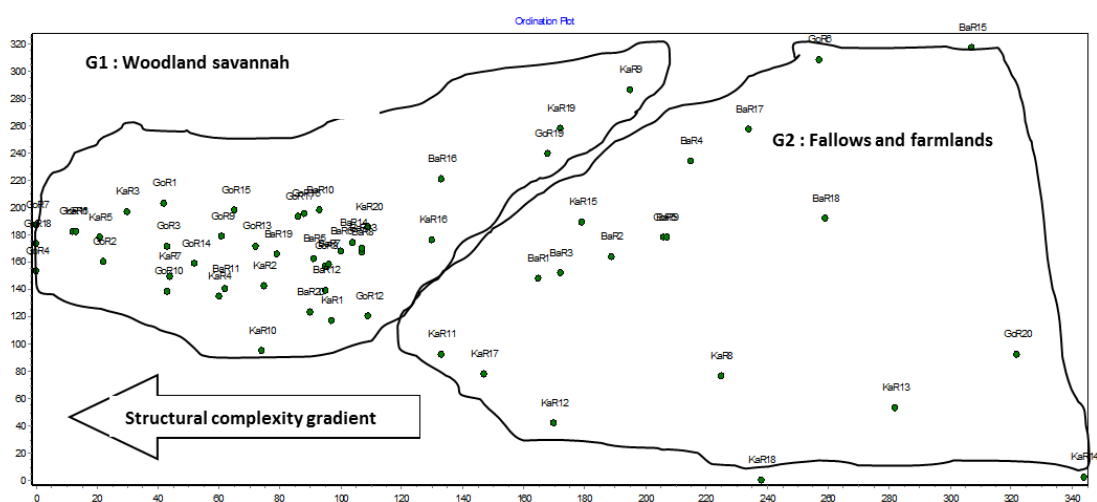
			<p>members (OBEPAB, FUPRO, IRDCAM, PAsciB), students and researchers have discussed on the importance to conserve the melliferous plants for the therapeutic and food honey production in order to combat the malnutrition and improve the food security in Benin.</p>
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**2. Please explain any unforeseen difficulties that arose during the project and how these were tackled (if relevant).**

The honey producers hesitated and refused to share their knowledge in the apiculture domain with us because they considered us as idea thieves. In this case, we discussed long time with the head of each village asking their help to convince the honey producers to interest to our study.

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

- ❖ From an ethno-apicultural investigation, 46 species of medicinal and food plants are known as melliferous, nine of which are newly added by this study to the list of melliferous plants in Benin. Most plants are both food and medicine. From the distribution study, Dendreted Corresponding Analysis discriminated two habitat types (**Figure 1**) and indicated that the threatened melliferous plant species TMPS are mostly distributed across woodland savannahs, and fallows and farmlands. *Vitellaria paradoxa* were the most common TMPS. *Borassus aethiopum* and *Khaya senegalensis* missed in the woodland savannahs while *Azelia Africana* and *Pterocarpus erinaceus* were absent in the fallows and farmlands.



**Figure 1.** Dendreted Corresponding Analysis showing the two habitat types in study areas

- ❖ David Ogoutchoro, Msc has been supervised and defended his Master subject on "Melliferous plant diversity and bee types associated in Northern Benin". I raised awareness about 400 farmers in the study zone and 20 honey producers were trained on the use and conservation of melliferous agroforestry plants with high medicinal and food values.
- ❖ The honey based on *Anacardium occidentale* and *Pterocarpus euriceus* were produced by honey producers as adoption of this new technology in apiculture in Benin.

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

Local communities highly participated to the project realisation. First, during the individual survey, we used a participative approach to exchange with each honey producer to understand the constraints in apiculture in Benin. Second, during the focus group survey, the same approach was used to discuss with farmers the major constraints in apiculture and their preferences criteria in terms of the choice of melliferous plants to set beehives. Third, trained honey producers took the responsibility to train their colleagues on the innovative findings developed in this project. In summary, honey producers identified with us the melliferous agroforestry plants with high medicinal and food values and understood the importance of their use in apiculture to improve the food security in Benin.

#### **5. Are there any plans to continue this work?**

Some plans to continue this work:

- ❖ Train and assist the honey producers of 77 districts of Benin in the choice of the best melliferous agroforestry plants for the quality honey production.
- ❖ Realise in laboratory the analyses of medicinal compositions including in the honey produced from medicinal melliferous plants.
- ❖ Train agricultural farmers on the conservation in situ of melliferous plants during the setting of agriculture fields especially cotton fields in northern Benin.
- ❖ Determine the impacts of chemical products use in agriculture on bee communities and the quality of honey produced in certain regions of Benin.
- ❖ Train honey producers on the reduction of chemical products use in agriculture for the bee communities conservation and the nutritional and therapeutic honey production.

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

Results were presented to students of the faculty of Sciences and Technology of Dassa and primary school students of study districts.

Two scientific articles are be preparing:

- ❖ Ethno-apicultural investigation to improve the conservation of threatened melliferous agroforestry plants with high medicinal and food values and bee types associated in Benin (To be submitted to Agroforestry systems).
- ❖ Diversity, abundance and distribution of melliferous plants and their relationship with bee communities in Northern Benin (To be submitted to Journal of biodiversity and conservation).

Results will be presented to the congress of University of Lomé (Togo / West Africa) in November 2018 and University of Abomey-Calavi (UAC), edition 2019.

**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 was expected to last from May 2017 to May 2018 based on my own agenda. I finished the last activities in May 2018 and in June wrote the report.

**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
Digital Camera 12 Megapixel	100	100	0	No comment
Video projector	125	125	0	No comment
Field assistants/Interpreters (70 man-days X £10 man-day)	700	600	-100	We worked during 60 days with field assistants instead 70 days
Papers, pens, CD, external hard disk of 500 GB, memory stick	150	150	0	No comment
Local people sensitization	580	530	-50	The sensitization asked for less money than expected
Local transportation (2500 km X £0.50/km)	1375	1375	0	No comment
Traditional beehives	600	600	0	No comment
Trainings of honey production farmers	750	800	50	The trainings asked for more money than expected especially with the purchasing of t-shirts
Local communication	70	70	0	No comment
Workshop	400	500	100	Workshops asked for more money than expected especially with the purchasing of t-shirts
<b>Total</b>	4850	4850	0	

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

The cotton is main crop cultivated in Benin. The setting of its fields needs many spaces and leads farmers to destroy the natural landscape, especially many agroforestry plant species. In this case, the cotton production in northern Benin poses two major problems in conservation. First, the loss of melliferous plant agroforestry species constitute the main problem due to the agriculture. Urgent actions must be taken to sensitise farmers to conserve in cotton cropping systems the 46 melliferous agroforestry plants identified in our study zone. Second, in northern Benin, regions producing high honey quantities, cotton cropping systems consume many chemical products as fertilisers and pesticides which constitute the menace for bee communities. Urgent actions must be taken to sensitise farmers to reduce chemical products use to conserve bee communities.

**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?**

Yes, the Rufford Foundation logo was used on the Master thesis of David Ogoutchoro and also during the defence of his Master. We used it on t-shirts distributed to participants during trainings and sensitization workshops. We will use it during the next congress.

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

- ❖ **Anicet G. Dassou, Ph.D**, investigator of the project, conducted ethnobotanical investigation surveys, melliferous plant distribution and trainings-sensitization workshops. He prepared the articles for the publication.
- ❖ **David Ogoutchoro, Msc**, participated to ethnobotanical investigation surveys and trainings-sensitization workshops.
- ❖ **Jeremie Doko, Bsc**, participated to ethnobotanical investigation surveys and trainings-sensitization workshops.
- ❖ **Gaston Lay, Bsc**, participated to trainings-sensitization workshops.
- ❖ **Fifanou Vodouhè, PhD**, conducted socioeconomic studies on the therapeutic honey production.

**12. Any other comments?**

I am grateful to the Rufford Foundation (United Kingdom) for funding this project. The project allowed us to exchange with honey farmers and understand their difficulties in the domain. This will allow us to know how to help them to improve honey production systems to produce therapeutic honey for food security in Benin.





Habitat of study area.

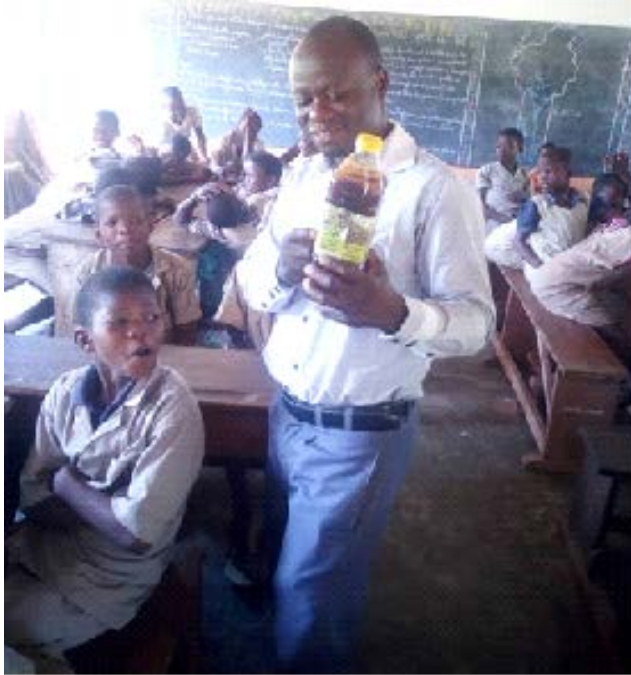


Sensitisation of stakeholders (researchers, extension agents, ONG agents & students) on the conservation of melliferous plants for the sustainable production of therapeutic honey.



Dr Gbaguidi was enjoying the taste of the *Anacardium occidentale* based therapeutic honey.





Sensitisation of primary school students about medicinal and food utilities of the therapeutic honey.



Dr Anicet G. Dassou explaining to primary school students the importance of conservation of melliferous plants to produce the therapeutic honey.



The *Pterocarpus erinaeus* and *Anacardium occidentale* based therapeutic honey produced by honey farmers trained in the Rufford project.





Sensitisation of honey farmers on the conservation of melliferous plants for the sustainable production of therapeutic honey: case of *Pterocarpus erinaeus* and *Anacardium occidentale* in Benin.



The stakeholders (researchers, extension agents, ONG agents & students) were enjoying the taste of therapeutic honey.





Stakeholders (researchers, extension agents, ONG agents & students) accepted to share with local populations the information on the conservation of melliferous plants.