

Final Evaluation Report

Your Details	
Full Name	Sydney Thony Ndolo Ebika
Project Title	Assessing the need for wild edible mushrooms' conservation actions in the Republic of Congo
Application ID	32997-1
Grant Amount	£5,966
Email Address	ndoloicpc@gmail.com
Date of this Report	17 December 2021

1. 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
Document importance of fungi by interviewing retailers, wholesalers and harvesters				
Conduct intensive fieldwork to measure productivity and assess the threats to the mushrooms in the different habitats				Measurement of productivity of mushrooms required to spend more time in the locality to meet the collectors and establish a plan with them to start monitoring the area before the mycological season begins.

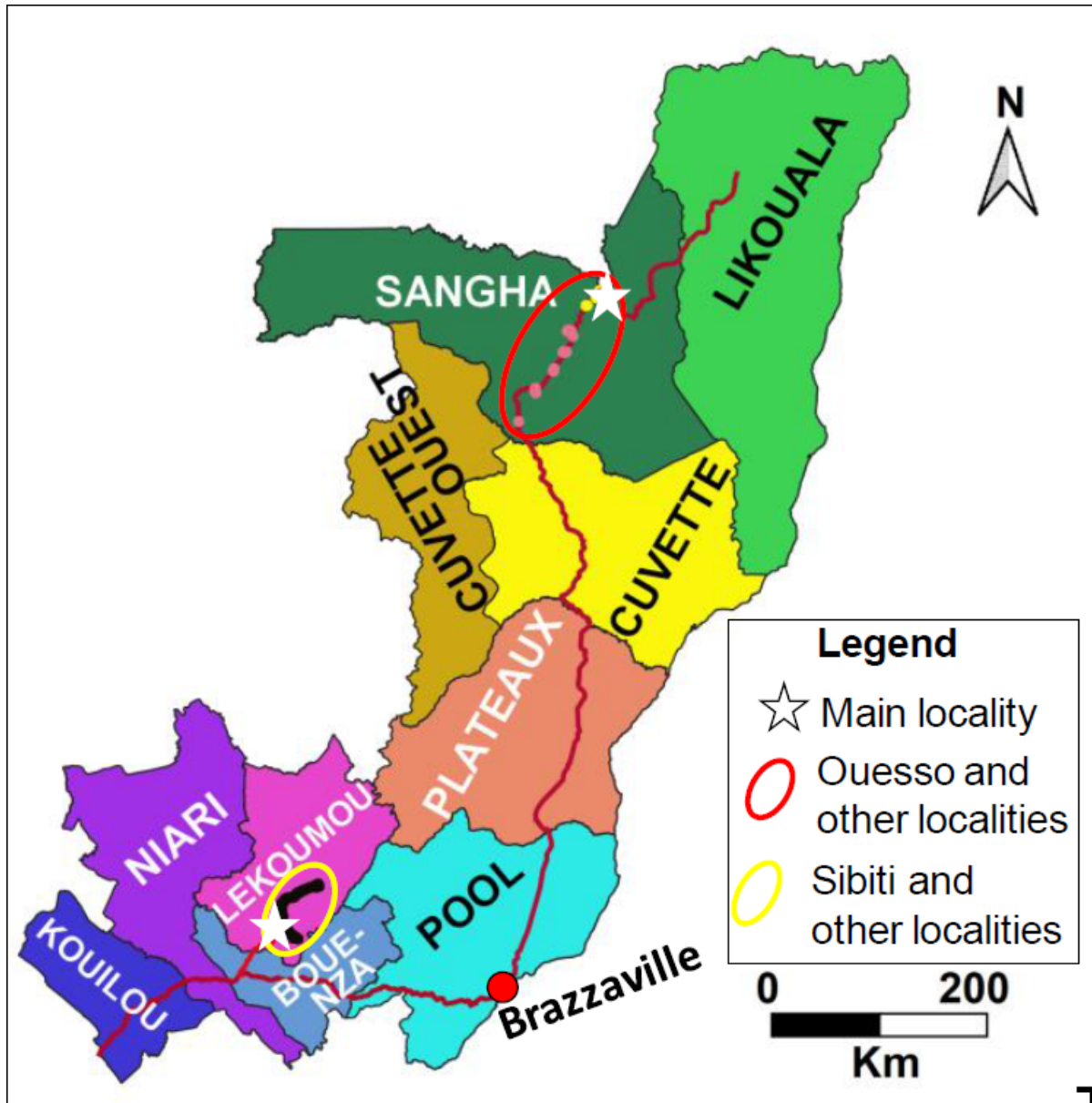
2. Please explain any unforeseen difficulties that arose during the project and how these were tackled.

We were mainly confronted with the Covid-19 restrictions and measures put in places in the two countries where the project had to be carried out. In Congo, all travellers had to show a certificate test of the less than 76 hours on the travelling date when leaving or come into the country. In Benin, however, nevertheless what the traveller had as certificate test result, the individual had to do another test when arriving at the airport in Benin and also when leaving the country. Since the three team members (Dr Awah, Ms. Obindi and Mr Atikani) were going to attend a workshop, we used some money from the Rufford project to cover the costs for Covid tests.

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

The three most important outcomes of the project are presented as follow.

(a) Finding how rhizomorphs (thick hyphae) of *Termitomyces* cf. *fuliginosus* Heim grow and how they are harvested. It was fascinating to know that these edible filamentous fungal are only occur in the Lekoumou department (Map 1) and probably in the neighbouring department Niari (according to informant in Brazzaville). The filaments are harvested from a depth of 25 to 45 cm (fig.1a) in an underground termite nest and resemble cables of a cell phone company that are installed underground (fig.1b). They are sold in packs (instead of heaps or boots for other species having a stipe and a cap) in local market of Sibiti (fig. 1c).



Map of the prospected sites.

(b) Monitoring of markets in Brazzaville. The increase of the number of investigators and that of the surveyed markets (both from two in our previous studies to seven in this study) brought new information in terms of the edible species sold and harvested areas. The number of harvesting areas reached 40 vs 08 in the previous study. Six species namely *Cantharellus* spp., *Marasmius* cf. *buzungolo*, *Termitomyces fuliginosus* Heim, *T. microcarpus* (Berk. & Br.) Heim, *T. reticulatus* Van der Westhuizen & Eicker and *Russula* sp. were recorded on market stands for the first time. More interestingly, *Termitomyces reticulatus* (fig. 2) was described from South Africa by Van der Westhuizen & Eicker in 1990* and is recorded for the first time in the Republic of Congo.

* Van der Westhuizen G. C. A. and Eicker A. (1990). Species of *Termitomyces* occurring in South Africa. *Mycological Research* 94 (7): 923-937

(c) Conservation strategy vs threats of fungi. It was interesting to see the contrast in conservation politics in Sangha department (Ouessou and surroundings) compared to Lekoumou department (Sibiti and its small villages). In the Sangha, a tree species belonging to the Leguminosae-Caesalipinioideae, *Gilbertiodendron dewevrei* (De Wild.) J. Léonard is known to form monodominant forest along rivers sometimes up to 5 km long. Although this tree species is not logged by timber companies present in the area (CIB-Olam, IFO), we were astonished to find during our prospection that *Gilbertiodendron* forest was cleared in favour of agricultural activities (fig. 3) in Mbalouma village (4 km Southwest from Ouesso on the National Road). In Northwest of Ouesso towards Maboko camp, the town expansion has entirely replaced *Gilbertiodendron dewevrei* forest on a distance of about 4 km. The tree being an ectomycorrhizal species which is associated to fungal partners (e.g., *Bolet* s.l., *Cantharellus*, *Russula*), this means that destruction of its individuals will also lead to disappearance of the associated fungi many of which are edible species (e.g., *Cantharellus* spp. and *Russula* spp.).





Figure 1: Rhizomorphs of *Termitomyces* cf. *fuliginosus* (a) located at 45 cm below ground [Tala village], (b) as they form a network underground [Ingolo 1 village], (c) sold at the market [Sibiti]. January and March 2021.



Figure 2: *Termitomyces reticulatus*. (a) boots displayed on a stand at Dragage market, (b) weighing of basidiomata (value in g), (c) basidiomata detail. Brazzaville, March 2021.



Figure 3: Clearing of a Gilbertiodendron forest to meet the agricultural needs. Mbalouma, September 2021.

In contrast, sustainable management of fungal rhizomorphs in the surrounding localities of Sibiti is based on personal occupancy of special forest zone. In Tala village (17 Km southeast of Sibiti), for example, places where the filamentous fungi grow are owned by member of special families. Nobody else can go and harvest fungi in those areas without obtaining permit from the owner. It will be interesting to spend more time in such a locality to find out more about their conservation strategy and what benefit they get from that kind of management.

4. What do you consider to be the most significant achievement of this work?

5. Briefly describe the involvement of local communities and how they have benefitted from the project.

Local communities were involved in this project as investigators, informants and guides to take us through the forest in their locality. Members who surveyed the markets were mainly PhD students and Research professional. They received certificates which will improve their curriculum vitae. Apart from the certificates, all members involved in field activities and monitoring of the markets received a per diem to compensate their time and energy put into the project.

6. Are there any plans to continue this work?

Yes, we plan to conduct long-term field-based research in Ouessou, Sibiti and Ile Mbamou to document the use of fungi by local population and estimate natural production of fungi the ecosystem. This will involve Master's students who will spend at least 6 months in the field to convert whole mushroom periods in each locality.

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

Two articles will be produced from the results of this project.

The article will deal with taxonomy of the genus *Termitomyces* in the Republic of Congo, given this genus is the most sold in the markets and the more diverse in terms of species sold. We will target Mycological research or Mycotaxon to submit the first paper.

The second paper will treat the commercial aspect of edible species mainly from Brazzaville. This paper will be submitted either to the review Bois et Forêt des Tropiques or to the Economic Botany.

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

The project was conducted in the same timescale proposed in the proposal submitted when applying for the grant. Activities were conducted from January to December 2021.

9. Budget: 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. It is important that you retain the management accounts and all paid invoices relating to the project for at least 2 years as these may be required for inspection at our discretion.

Item	Budgeted Amount	Actual Amount	Difference	Comments
Food	450	446	-4	
Accommodation	450	389	-61	
Equipment	770	475	-295	
Local travel	320	881	+561	
Subsistence payments for local team (for interviews and fieldwork)	2500	2420	-80	
Printing interview and fieldwork sheets	50	44	-6	
Costs for monitoring of markets	500	289	-211	
Data and specimen management	250	423	-173	

Management overheads	500	499	-1	
Bank percentage for account management (2 % of the total)	176	176	+76	
Grand total	5966	6042	+76	The exchange rate used when the money was paid into the bank account is 1 GBP=709.85 XAF

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

Based on results from this project and all information gathered in those localities, we aim to continue investigations on the following points: documentation of the use of fungi by local population; and estimation of natural production of fungi in the ecosystem. A permanent presence in the locality will allow us to identify the harvesters of the locality prior the mycological season, to select the areas that they regularly go harvesting and be ready with the harvesters to move around and receive the wholesalers. In the case of the filamentous fungi, we will be interested in regularly monitoring the harvesting points in order to make direct link between the filamentous form and the full basidiomata having a stipe and cap. Harvesting points being far from the village, this will require camping in the forest for some period.

We would also aim at participating Master's students in the study so they will have data for their thesis and also prepare next generation of mycologists in Congo. From the results they will get, it will be possible to continue with them towards PhD studies.

11. Did you use The Rufford Foundation logo in any materials produced in relation to this project? Did the Foundation receive any publicity during the course of your work?

Yes, the Rufford Foundation logo was used in two materials: an introduction to the second part of project related to data to be collected during interviews and the certificate given to investigators who surveyed markets. Original of the materials are attached to the email.



**Suivi des marchés (Phase 2):
Septembre-Décembre 2021**



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

Full name	Function in the project	Locality	Role in the project
Sydney Thony Ndolo Ebika	Principal Investigator	Brazzaville	Planning and supervision of the activities, training, execution of fieldwork in Sibiti and Ouessou
Nelly Josiane Lekaka Niebi Épouse Awah	Co-PI	Brazzaville	Supervision of the activities and training
Gallion Berdol Atikani	Investigator	Brazzaville	Execution of fieldwork in Sibiti and surroundings; Monitoring of markets in Sibiti and Brazzaville (Kintele)
Isis Gloria Mienandi	Investigator	Brazzaville	Execution of fieldwork in Sibiti and surroundings; Monitoring of markets in Sibiti and Brazzaville (Total 1)
Gracia Marodrée Obindi Gath	Investigator	Brazzaville	Data and specimens' management; Monitoring Dragage market in Brazzaville
Chrichina MBON NGUEKOU	Investigator	Brazzaville	Monitoring Texaco market in Brazzaville
Armani Gambou	Investigator	Brazzaville	Monitoring Moukondo market in

Bakala			Brazzaville
Aurèle Nzoutou Loubondo	Investigator	Brazzaville	Monitoring Total 2 market in Brazzaville
Dody Jeaverlyne Nithou Loubayi	Investigator	Brazzaville	Monitoring Total 3 market in Brazzaville
Albert Etou	Informant and guide	Sibiti	Provide information on the localities and facilitate administration introduction as well as interactions with the retailers in the market
Freddy Dzoulou	Informant and guide	Brazzaville to Tala village (Sibiti)	Coming from Brazzaville with the PI, he facilitated introduction to local authorities as well as interactions harvesters in the field
Marie Tso	Informant and guide	Ingolo 1 (Sibiti)	Guide in the field and show techniques for collecting filamentous fungi
Chavely Ndongui	Informant and guide	Ingolo 1 (Sibiti)	Guide in the field and show techniques for collecting filamentous fungi
Jean Pouongui's Family	Owner of the harvesting area	Ingolo 1 (Sibiti)	Provide permit to access the area their own and guide through the area
Jean-Paul Tsoumou	Driver	Sibiti – Ingolo 1	Drive the rented car for the round trip Sibiti-Ingolo 1-Sibiti
Faustin Mabounda	Informant and guide	Tala (Sibiti)	Guide in the field and show techniques for collecting filamentous fungi
Samuel Louma	Informant and guide	Tala (Sibiti)	Guide in the field and show techniques for collecting filamentous fungi
Paul Mpassi	Informant and guide	Tala (Sibiti)	Guide in the field and show techniques for collecting filamentous fungi
Jean Kambou	Informant and guide	Tala (Sibiti)	Guide in the field and show techniques for collecting filamentous fungi
Larissa Kifouni	Investigator	Ouesso	Monitoring of Ouesso's market
Christian Ndzai	Guide	Ouesso-surroundings	Guide during the fieldwork
Marius Ngassaki	Guide	Ouesso-surroundings	Guide during the fieldwork
Jean Ndambio	Guide	Ouesso-surroundings	Guide during the fieldwork
Darion Mekoum	Guide	Ouesso-surroundings	Guide during the fieldwork
Cédard Mboko	Guide	Ouesso-surroundings	Guide during the fieldwork

Ghislain Ekanga	Driver	Ouesso-surroundings	Drive the rented car for daily trips between Ouesso and the small localities.
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13. Any other comments?

On behalf of the team members, I would like to thank The Rufford Foundation for the priceless financial support provided for this first project. It has been a long journey since my first rejected application (12339-1) in 2012 but we keep looking ahead and in 2020 we obtain the grant. The grant allowed us to visit some localities for the first time, to understand different strategies put in place by local communities to manage fungi and also to depict threat that fungi are facing in some localities. It was also interesting to act and exchange with all members of this project who did they best to get as many information as they could for the success of this project. We cannot forget to be grateful to Jane Raymond for her availability to provide an answer or feedback to any email that we sent in the course of this project.

It was a positive experience with The Rufford Foundation, and I am looking forwards to continue in the next step.



ATTESTATION DE PARTICIPATION

Certificate of Participation



Nous soussignés, Dr Sydney T. NDOLO EBIKA (Coordonnateur de l'ONG Initiative des Champignons et des Plantes du Congo (ICPC) et Enseignant-chercheur à la Faculté des Sciences et Techniques de l'Université Marien NGOUABI) et Dr Nelly J. LEKAKA NIEBI épouse AWAH (Enseignante-chercheuse à ladite Faculté), attestons que :

We undersigned, Dr Sydney T. NDOLO EBIKA (Coordinator of the NGO Initiative des Champignons et des Plantes du Congo (ICPC) and Lecturer at the Faculty of Sciences and Techniques of Marien NGOUABI University) and Dr Nelly J. LEKAKA NIEBI spouse AWAH (Lecturer at the Faculty), certify that :

NZOUTOU LOUBONDO Aurèle

a activement participé au suivi de la vente des champignons comestibles sur les marchés de Brazzaville de mars à avril 2021 puis de septembre à novembre de la même année.

actively took part to the monitoring of edible mushrooms selling in markets of Brazzaville from March to April 2021 and from September to November of the same year.

Cette activité a été organisée dans le cadre du projet «Evaluation des besoins pour des actions de conservation des champignons sauvages comestibles en République du Congo» avec l'appui financier de Rufford Foundation.

This activity was organized as part of the project «Assessing the need for wild edible mushrooms' conservation actions in the Republic of Congo» with financial support from the Rufford Foundation.

En foi de quoi, la présente attestation lui est délivrée pour servir et valoir ce que de droit.
In witness whereof, this certificate is issued to serve and assert that of right.



Fait à Brazzaville, le 04 décembre 2021

Done in Brazzaville, 4th December 2021



Dr Sydney T. NDOLO EBIKA

Les Formateurs/ Trainers

Dr Nelly J. LEKAKA NIEBI épouse AWAH



Suivi des marchés (Phase 2): Septembre-Décembre 2021



Remplissage des fiches d'enquête



FICHE D'ENQUETE DES DETAILLANTS DES CHAMPIGNONS

Enquêteur :; Numéro de collection:; Date :

Ville/Village:.....; Marché :; GPS :N/S.....E/W

Nom scientifique:

Nom local/langue:

✓ Numéro de collection :

- fiche (fiche 1, 2, 3, etc.) de préférence. *Chaque journée doit avoir ses fiches.*
- récolte (si possible).

Photos sur le marché



- ✓ Prendre beaucoup de photos
- ✓ Inclure les étiquettes dans les photos (si possible)
- ✓ Se faire photographier

Photos au Labo



✓ Mettre les échantillons en ordre par rapport aux fiches

✓ Remettre le numéro de la fiche/récolte sur la face interne du papier

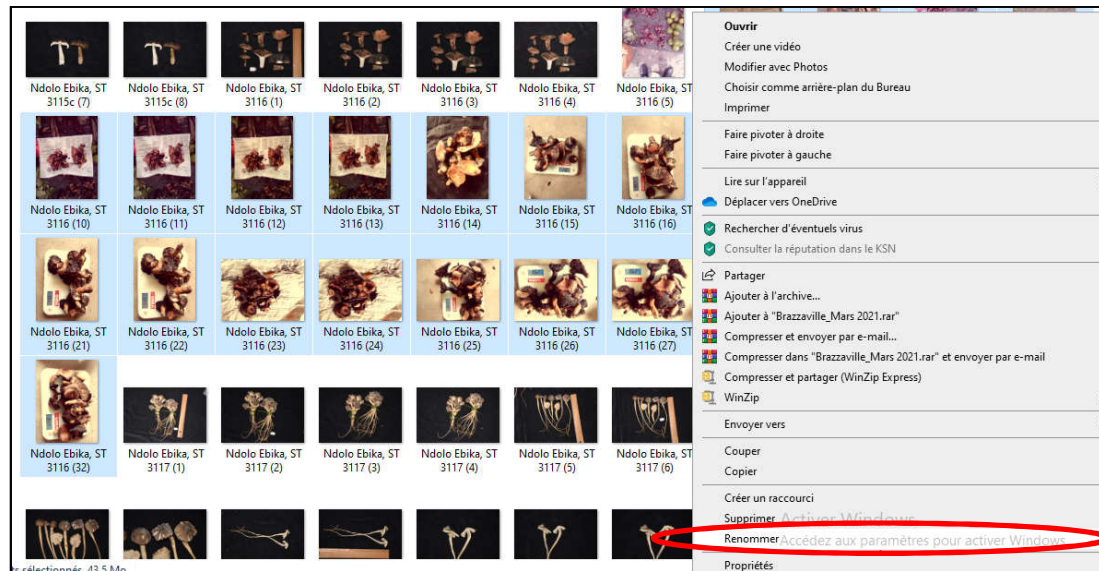
✓ Espacer les spécimens et placer une règle

pour faire des photos détaillées



✓ Peser les tas

Renommer les Photos





✓ Sélectionner toutes
les photos de la
même fiche ou du
même numéro


✓ Clique-droit puis
écrire votre code-
numéro de la
fiche/récolte-date

✓ Appuyer sur la
touche Entrer

Remplissage des reçus

		INITIATIVE DES CHAMPIGNONS ET DES PLANTES DU CONGO (ICPC)	<u>Montant/</u> <u>Amount:</u>
<i>Montant:</i>	82, rue Oboko, Terminus Ngamakosso, B.P. 2300, Brazzaville, République du Congo Tél. : (+242) 06 498 29 93 ; Email : icpcngoinfos@gmail.com		
<i>Reçu de M.</i>	<i>ONG à caractère scientifique, Récépissé n° 234/013/MID/DGAT/DER/SAG</i>	<i>Reçu de M.</i>	
<i>Somme :</i>	<i><u>Receipt of</u></i>	<i>Somme :</i>	
	<i><u>Sum</u></i>		
<i>Motif:</i>	<i>Motif :</i>		
<i><u>Date :</u></i>	<i><u>Reason</u></i>		
	<i>Signature</i>	_____, le/on _____	

Remplissage des reçus



**Initiative des Champignons
et des Plantes du Congo
(ICPC)**

B.P. 2300, Brazzaville
R.D. du Congo
Tél : (+242) 66 498 29
Email : icpc@icpc.org

_____, le/on _____

FACTURE/ INVOICE N° _____

Nom/Name: _____

Quantité Quantity	Item	Prix unitaire Unit Price	Total
Total			

Divers

- ✓ Questions ?
- ✓ Autres préoccupations