

**The Rufford Foundation  
Final Report**

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<b>Grant Recipient Details</b>	
<b>Your name</b>	WUIBE WOUBASSI Ulrich Sidoine
<b>Project title</b>	On the poorly-known millipedes from the protected Bouda Ndjida National Park (Northern Cameroon) with implications for conservation
<b>RSG reference</b>	39627-1
<b>Reporting period</b>	1/3/2023 - 1/3/2024
<b>Date of this report</b>	23/5/2024

**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
Document the composition, and occurrence of millipede found in the different habitat types			X	A total of 121 individuals were collected in all habitats. they belonged to Family Spirotreptidae. Within this family, we had six species, <i>Kartinikus laevis</i> (Voges, 1878), <i>Telodeinopus canaliculatus</i> (Porat, 1894), <i>Remulopygus neglectus</i> (Carl, 1909), <i>Telodeinopus sulcatus</i> (Voges, 1878), <i>Treptogonotreptus sinuaticollis</i> (Porat, 1894) and <i>Spirotreptus elongatus</i> (Porat, 1894). The first two species were found in all the habitats except gallery savannah. The third and fourth species were found in grassy and wooded savannah while the fifth species was found in tree savannah and the sixth in shrub savannah.
Assess the influence of habitat types and seasonality on millipede diversity			X	A total of five habitats were found in the park: shrub savannah, tree savannah, wooded savannah, grassy savannah and gallery savannah. Talking of millipede diversity, we noted a higher number of specimens in shrub savannah than other habitats. From the survey, we noticed a significant gap between the two seasons in terms of species number - 101 during the rainy season as against 26 in the dry season.
Investigate on the status		X		Almost all the encountered species

and distribution preferences of the threatened and endemic species			have not yet received a protected status while they are highly endangered and threatened by anthropogenic activities. The distribution of threatened ones is more noticeable since they are found in just one habitat while the distribution of endemic species has no delimited zone.
Develop conservation measures to preserve threatened species and/or habitat		X	This project enables us to understand factors influencing millipede occurrence and distribution, which are crucial for appropriate and valuable conservation action plans. Considering all these results and findings, concrete and urgent actions must be taken by nature and wildlife conservation organisations and authorities to strengthen conservation strategies in Cameroon to preserve the target species.

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

During this project, we faced many unforeseen difficulties:

-The first was the time spent to obtain the research permit from MINFOF which delayed by 3 months and, to tackle this, we had to extend our fieldwork for 2 additional months and also add a second assistant to catch up with the sampling.

-The second was the flooded bridge during the rainy season which stopped us exploring some of the habitats to sample.

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

**a). A list of millipede species was established for the first time in the surveyed areas.**

A total of 127 individuals of millipedes belonging to seven genera and one family (Spirostreptidae) were collected in the Bouba Ndjida National Park. The Family

Spirostreptidae had six species, *Kartinikus laevis*, *Telodeinopus canaliculatus*, *Remulopygus neglectus*, *Telodeinopus sulcatus*, *Treptogonotreptus sinuaticollis* and *Spirotreptus elongatus*. Those species were found in different habitats. *Kartinikus laevis* and *Telodeinopus canaliculatus* were found in four savannah types (grassy, shrub, wooded and tree), *Spirotreptus elongatus* was found only in shrub savannah, *Treptogonotreptus sinuaticollis* in tree savannah, *Remulopygus neglectus* and *Telodeinopus sulcatus* in both grassy and wooded savannah. The most abundant and most frequent species was *Kartinikus laevis*. The most abundant habitat was wooded savannah (36.92 %), followed by shrub savannah (29.23 %), grassy savannah (26.15 %) and tree savannah (7.69 %). All the specimens were identified during the study period.

**b). This study recorded several threats to millipede species.**

During the study period, many threats due to anthropogenic activities led to the degradation of the prospected area of Bouba Ndjida National Park that has a significant negative effect on the millipede populations. They included burning, slash-and-burn agriculture practices, wood exploitation, harvesting of tree products and implantation of camps. The chemical burn or slash-and-burn agriculture is a common practice in the northern region of Cameroon, where most of the local population depends solely on this practice which seriously affects *Kartinikus laevis*, *Telodeinopus canaliculatus*, *Telodeinopus sulcatus* and *Remulopygus neglectus*. They cut down trees and set them on fire to establish plots of maize, groundnuts, and soya beans and this affects all species and mostly *Treptogonotreptus sinuaticollis* and *Spirotreptus elongatus*. On the other hand, the chemical burn consists of using chemicals to burn grasses and trees for the same purpose which also affects *Kartinikus laevis*, *Telodeinopus canaliculatus* and *Remulopygus neglectus*. The use of fire or chemicals results in the destruction of soil organic matter. Consequently, there is a decrease in the productivity of the vegetation and the crops planted on the burnt plot as well as millipedes and their habitats. In this case, most millipede species which generally have low dispersal ability and a high level of endemism would likely perish during these activities. The harvesting of tree products mainly for construction or medicinal purposes is also a cause of deforestation and canopy degradation due to unsustainable harvesting techniques.

The most significant of these activities are large-scale deforestation, the disappearance of certain animal and plant species, and the degradation of surface water resources and soil through the overuse of chemicals and fire burn.

**c). Millipedes recorded during this study have NO?? special conservation concern and on the IUCN red list**

This study is the first of its kind in the surveyed area. It gives the first list of endemic millipede species such as *Treptogonotreptus sinuaticollis* and *Spirotreptus elongatus* which were found in tree and shrub savannah respectively. This survey on their habitat preference, distribution, and conservation status according to IUCN criteria is an important step for the consideration of these species in future conservation programs at the national, regional, and global levels.

Regarding the management plan for these target species, some proposals for better conservation actions of millipede are:

- Keep sensitising communities about the benefits of millipedes in our ecosystem.
- Stop starting bush fires during the dry season to clear the soils because it destroys the environment and the millipedes on site.
- Stop exploiting the soil for agricultural purposes and rocks for construction because such direct anthropogenic threats expose millipedes, make them to migrate and kill them and destroy their habitats.
- Control and monitor animals found in the park so they can stop killing millipedes and have a good cooperation with those ladders.
- Identify threatened species and register them in the IUCN so they can officially belong to the IUCN Red List.
- Encourage the consideration of these species in large projects which generally focus on birds, mammals, amphibians, and reptiles.
- Regroup all the millipede's species found on the site and provide them with a conditioned environment for their breeding and their preservation.
- Advocate for climate change which increasingly affects fauna and millipedes most specifically.

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

The local communities involved in this project included all the social strata such as indigenous, farmers, freshers, field assistants, local authorities, students. Some indigenous people were receptive while some weren't; those receptive helped us to introduce to the local authorities and by providing information on the best targets for educational activities aiming at sensitisation of the local population. Farmers were one of the targets we sensitised about our project; the same as freshers who were people not from the area. We had to reward them with money to get more information and guidance. Local authorities like chiefs of the village and their assistants have helped us to reach people including those who were confused about our study and convinced them to cooperate with us while local organisations helped us to have access in school to sensitise students about the project and The Rufford Foundation. Our field assistant and guide were very active in helping us to

collect species and to conduct educational campaign of local people using local and national languages which led to their training in the methodology to collect data and can therefore help with long-term monitoring and increase the conservation of these target species.

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

Yes, there are plans to continue this work. The long-term plan is to gather enough information for it to be useful in conservation strategies that will protect Cameroon's Sudano-Sahelian protected areas. The current project just gathers data from one of the seven protected areas of the Sudano-Sahelian zone in Cameroon. The remaining protected area in northern region is not yet studied and needs to be investigated. The species found in BBNP are different from those found in Cameroon's rainforest though most belong to the Family Spirotreptidae. All these species from BBNP seem new to science although there are few studies. The results gained are considered as baseline data for further research studies in the Sudano-Sahelian zone of the country and the other parks deserve to be explored.

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

The results of this project will be shared during national and international conferences and dropped in the university platform. To reach a wide audience, we expect to publish the findings of this study in peer reviewed journals.

**7. Timescale: Over what period was The Rufford Foundation grant used? How does this compare to the anticipated or actual length of the project?**

Period	Activities	localities	Status
March, 1/2023 – July, 31/2023	-Licence introduction  -1 <sup>st</sup> trip to BBNP  -1 <sup>st</sup> trip to the North Regional delegation of Forestry and Wildlife  -Follow-up of licence	Yaounde  BBNP (8° 35'25''N;14°39' 24''E) Garoua  Yaounde	Achieved

Aug, 1/2023 – Oct, 30/2023	-Trip to the North Regional delegation of Forestry and Wildlife -Trip to BBNP -Launching meeting with local population, village chiefs and authorities -Field research with pre-educational phase (rainy season)	Garoua  BBNP (8° 35'25''N;14°39'24''E)  BBNP (8° 35'25''N;14°39'24''E)	Achieved
Nov 1/2023 – Nov, 9/2023	Lab work with pre-educational phase	University of Yaounde I	Achieved
Nov, 13/2023 – Dec, 22/2023	Field research with pre-educational phase (dry season)	BBNP (8° 35'25''N;14°39'24''E)	Achieved
Jan, 3/2024 – Jan, 7/2024	Lab work	University of Yaounde I	Achieved
Jan, 9/2024 – Feb, 29/2024	Field research with pre-educational phase (dry season)	BBNP (8° 35'25''N;14°39'24''E)	Achieved
March, 4/2024 – March, 8/2024	Lab work	University of Yaounde I	Achieved
April, 1/2024 – May, 3/2024	Last field research with pre-educational phase (dry season)	BBNP (8° 35'25''N;14°39'24''E)	Achieved
May, 6/2024 – May, 7/2024	Talked with some local authorities	BBNP (8° 35'25''N;14°39'24''E)	Achieved
May, 9/2024 – May, 14/2024	Labwork	University of Yaounde I	Achieved
May, 16 2024	Analyze data	University of Yaounde I	Achieved

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

In the perspective next step, field surveys are necessary to continue monitoring the health and threats of the Sudano-Sahelian ecosystems and with the experience acquired during this project, it's important to promote and enhance the millipede

survey in the Cameroon Sudano-Sahelian zones which seems to have a great diversity. This will allow us to develop a conservation strategy of millipedes based on long-term studies. Another plan is to continue the conservation education of the local population and train personnel in the field for follow-up. Conservation interventions of this nature depend a lot on community involvement and cooperation to build a strong educational component aimed at building awareness of the advantages to the population of being involved in the management of their aquatic and forest resources.

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

Yes, I have used the Rufford Foundation logo in my educational materials produced for this project, during fieldwork while sensitising communities and will I acknowledge the support of the RF in all of the resulting publications in a peer-reviewed journal, scientific meetings at national (Cameroon Biosciences Society, seminars) and international levels (Myriapodology Society Group, African Wildlife Conservation Professionals).

**10. Provide a full list of all the members of your team and their role in the project.**

**Mr. WUIBE Woubassi Ulrich Sidoine** is the principal investigator of this project. He is a PhD student enrolled to the University of Yaoundé 1, Faculty of Science, in the laboratory of Zoology working on taxonomy and invertebrates' conservation focusing his research on the conservation biology of millipedes in Sudano Sahelian zone of Cameroon.

**Pr. MBENOUN MASSE Paul Serge** is my PhD supervisor and the coordinator of this project. He was responsible for the experimental design and contributed a lot in this project. His experience was of a great importance.

**Mr. MAKON Samuel Didier** is a senior, research assistant and currently a PhD candidate at the University of Yaoundé1, Cameroon. He received his Master's and Bachelor's degree in the same university and He helped in the identification, data entry and coordination of the work in the laboratory.

**Mr. MBALLA** is a senior and currently a PhD candidate at the University of Yaoundé1, Cameroon. He received his Master's and Bachelor's degree in the same university and he has completed bunch of research in entomology. He helped in many aspects such as data entry and coordination of the work in the laboratory.

**Local guide and field assistant (BADAWE, SOULEY)** have served as excellent facilitators and guides because of their experience of the study site. They have also served as translators during talks with farmers and shepherds.

**11. Any other comments?**



We are grateful to The Rufford Foundation for granting us such an opportunity to carry out this project and contribute to species conservation in Cameroon particularly in one of the important protected ecological of the Sudano-Sahelian zone. The project helped to establish important links with traditional and administrative authorities around the localities and to get deeper experience conservation action plan and also stimulate local development. We have collected millipedes from Sudano-Sahelian ecosystem in Cameroon using materials inherited from the Rufford project.



Figures : a) *Spirotreptus cameroonensis* ; b) Research field assistant proceeding to hand collection; c) Millipedes conservation education with acknowledgement of Rufford Foundation to Terminale D students ; d) Identification of species ; e) Principal investigator crossing the Senaroua mayo bridge; and f) Local guide at the South camp entrance of BBNP