

## **The Rufford Small Grants Foundation**

### **Final Report**

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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](mailto:jane@rufford.org).

Thank you for your help.

**Josh Cole, Grants Director**

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<b>Grant Recipient Details</b>	
<b>Your name</b>	Yara Tibiriçá
<b>Project title</b>	Diversity and conservation of nudibranchs as a tool to create environmental awareness of tidal reefs and micro-life.
<b>RSG reference</b>	17191-1
<b>Reporting period</b>	May 2015 – April 2017
<b>Amount of grant</b>	£4939
<b>Your email address</b>	yara@zavoralab.com
<b>Date of this report</b>	29. April.2016

**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
Assessment and description of new species of nudibranchs contributing for the global knowledge of this group.			X	280 species of nudibranchs have been catalogued, as well as, 32 species of bubble snails. The nudibranch assessment is part of my PhD thesis, and will be the main chapter/article. However, as the number of species is too high, it will take a bit longer to review all the species for correct identification and publication. I believe the assessment will be published and available for the public in 2017 or 2018. Despite the main nudibranch list has not been published yet, two scientific articles have already been accepted (waiting final review) for publication as a result from this project: one on bubble snail diversity and a description of a new species: <i>Doris ananas</i>
Creation of nudibranchs and tidal reef underwater slates /guides raising the interest in marine invertebrates by local communities and visitors.			X	Over 100 people have participated along the year in rock pool activities learning through the guide and informal field lectures; many of them did not even know about the existence of nudibranchs and were fascinated by the biodiversity of the area. Moreover I conducted oral presentations at least twice a month for a wide range of public to raise awareness about the marine biodiversity of Mozambique.
Reduction of left-over fishing nets on the shallow and tidal reefs with participation of local communities to raise environmental awareness of these ecosystems and reduce impacts from unsustainable fisheries		X		Our regular underwater clean up had a significant impact on the reef by drastically reduce ghost nest. Nets was removed from an average of 24 corals each time we did a clean up. A total of 25 clean ups were conducted. However, despite of our actions and regular environmental education efforts, people in the area are extremely poor and fishing with nets still happening. Few years and more law enforcement will be needed to fully achieve this goal.
Raise general interest in tidal reefs and marine			X	It is difficult to know exactly the dimension of it. Nevertheless, this project has unquestionably

invertebrates				raised general interest in the marine invertebrates. For example, nudibranchs have been included in the review of marine ecosystem of Mozambique and pictures have been exposed in governmental meetings.
Recommend to the Government of Mozambique and stakeholders police for sustainable use of tidal/shallow reefs.		X		Recommendations have been provided through reports and oral presentations, however the government still need to take actions to protect the tidal reefs, particularly in non-protected areas, where fishing patrolling and law enforcement is almost inexistent

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

Assessment and description of new species of nudibranchs contributing for the global knowledge of this group – The lack of resources in Mozambique to conduct part of the taxonomic work (e.g. the electronic microscope not working) was the main difficulty, as I needed to dislocate to Spain to do it. The number of species we found is very high and many species were “problematic species”, therefore the writing and review are taking longer than expected. For some species, we will need to do molecular analysis as part of the identification or description process. I have already started with the *Chromodoris* and *Halgerda* complex, but the final assessment should be only done by middle 2017. My deadline to submit finish the PhD is middle of 2017, not giving me enough time to describe all new species or solve complex of species found during this study, nevertheless I am hoping to continuous working with these species for few more years.

Creation of nudibranchs and tidal reef underwater slates/guides raising the interest in marine invertebrates by local communities and visitors - the type of material we had innitially planned to print the underwater slates (laminated PVC) could not be found in Mozambique and logistically it was too complicated, costly and time consuming to make them overseas, thus we printed in a different material (strong paper and lamination) which unfortunately is less durable.

During the time I was in Spain I asked other person (Jon Wright) to coordinate the underwater clean up.

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

**1) Increase interest about the marine invertebrates of Mozambique and general marine biodiversity.** After public presentations about the nudibranchs and the current knowledge on the marine biodiversity of Mozambique, I was contacted by several national organisations about the topic and the nudibranchs were included in the review of marine ecosystem of Mozambique, as well

as been used as an example in several meeting as a group which is highly diverse and often overlooked.

**2) Description of new species** one species has been described and is under final review and another 5 species are in process of description and should be sending to publication this year. This contribution has a global impact and together with the species assessment are important to understand marine biogeography and centres of biodiversity distribution - two very important topic in conservation biology.

**3) Assessment of nudibranchs and sea slugs of Mozambique** we provide the first assessment of sea slugs of Mozambique in a new publication with 22 new records of bubble snail to the country and I am busy working on the nudibranch assessment which reveals more than 200 species not recorded to Mozambique before and few new species to science.

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

Local kids and visitors were involved in the underwater clean up and informal marine diversity field lessons, learning about animals that many had no idea it exists. We believe that these activities have raised their curiosity and interest about nature and may have a great impact in how these participants will interact with nature in future. However this benefit is something we are only able to see in one generation. Other benefits are indirect but relevant, such as our contribution to improve baseline knowledge on the local biodiversity and the impact of the scientific articles for science and conservation biology.

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

Yes, I have moved to the north of Mozambique last month, where I am planning to continuous assess the diversity of nudibranchs as much as possible, now more focused on the tropical side, which is so far under-sampled. I should finish my thesis by middle 2017, however I plan to work with the material collected during this project for many other years.

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

**Scientific community, government and decision makers** – through scientific article and oral exposition.

**General public and local community** – informal lectures, short awareness movie, news using social media and photo exposition. Species published will be also added to an online database created by us using the global interactive database i-naturalist.

After finish my PhD, I am planning to apply for funding to write a guidebook on the nudibranchs of Mozambique.

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

From May 2015 to February 2016. The grant cover great part of the project until now, however the length of the project was longer than anticipated due the high diversity of species found. At least one more year will be needed in order to fully complicate the goals (until publication).

**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
Scuba diving survey	1175	1175	0	
Use of the electronic microscope SEM	392	1024	+632	We needed much more hours than I expected (38 hours), the only available electronic microscope in Mozambique was not broken. The solution would be to go to South Africa or to Spain. Due the high number of radulas to photograph and comparing travelling costs, the most economical solution was to go from Mozambique to Spain to do the photos as my supervised had hours credit available to use the electronic microscope. Therefore, the remain funding was used to cover part of the travel expenses to take the photos and do part of the molecular work
Underwater clean up	200	200	0	
Conservation events	800	1000	+200	Costs slightly higher than expected to print the photos
Activities with the local kids	900	600	-300	Food and drinks were partially donated by local business
Underwater slates	1500	900	-600	Different material than planned as we were not able to find PVC printer in Inhambane

Pots for specimens	30	0	-30	It was donated by my supervisor when I went to the university in Spain
Ethanol	40	40	0	
<b>TOTAL</b>	4939	<b>4939</b>	0	

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

To complete the nudibranch assessment including the tropical part, to finish the writing part and to continuous work with local communities to raise interest in marine biology and conservation.

**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?**

Yes, we included the RSGF as a donor in our website and in all the times we did an oral presentation. We also include RSGF in the acknowledgements of our publications.

**11. Any other comments?**

I am grateful to Rufford Foundation to support this project, without it I would not be able to conduct it and an important part of the biodiversity of Mozambique would had remain unknown. Despite of our project being on nudibranchs, we are confident that the results of this project goes beyond it, by highlight and raise public awareness of how little we know of Mozambique diversity. In all presentations we have shown that we are loosing unknown biodiversity, which is likely to have an impact for the future generations.

The following publication is already accepted and a result of this project:

Tibirica, Y.; Malaquias, M. A. E. (In Press) "The bubble snails (Gastropoda, Heterobranchia) of Mozambique: an overlooked biodiversity hotspot". Marine Biodiversity  
Lima, P. O. V.; Tibiriçá, Y.; Simone, L. R. (under last review). A new large and common species of Doris (Gastropoda, Nudibranchia) from the Western Indian Ocean. Journal of Conchology.

At least more two articles should be published in the following 2 years as a result of this project.