

The Rufford Foundation

Final Report

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.

Thank you for your help.

Josh Cole, Grants Director

Grant Recipient Details	
Your name	Vahagn Hakobyan
Project title	Exploration and Identification of the New Habitants for Papilionaceae Endangered Species in Armenia
RSG reference	19450-1
Reporting period	From the end of June 2016 until the end of July 2017
Amount of grant	£3500
Your email address	vahagn.hakobian@gmail.com
Date of this report	July 2017

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
Exploration and distribution of four Papilionaceae endangered species in Yerevan floristic region				All known and new habitats of these plants in the floristic region of Yerevan were studied; the data are given in the tables of the supplementary report.
Identifying new locations				Seven new locations of <i>M. astroites</i> , one new location of <i>A. commixtus</i> and three new locations of <i>S.salsula</i> were found. For <i>A. holophyllus</i> new locations were not found. Moreover, from four known localities there is only one left.
Monitoring of the population state				The data are given in the tables of the supplementary report.
Collecting seeds				The collected seeds were transferred to Yerevan Botanical Garden. Since the habitat of <i>A. holophyllus</i> has been repeatedly grazed by sheep, it was impossible to collect their seeds.
Collecting plant samples for herbaria				The collected samples of plants were transferred to the herbarium of Yerevan Botanical Garden.
Taking photos of these plants				Photos of all plants are taken and are attached.
Raise local awareness				In all visited places, meetings were organised with the local population and the village authorities. They were informed about endangered species of their communities and they were urged to be attentive and try to not damage them. Despite positive outcome and promises of the negotiations, there is no certainty that suggestions will not be ignored, particularly in the Red mountain (near the village

				<p>Aygezard), which is the habitat for <i>A. holophyllus</i> and is at risk. It had been repeatedly grazed by sheep, thus, currently the plant is in a deplorable state. The village authorities were informed about this fact with a strong recommendation to not allow grazing in that location. In addition, all obtained data are sent to the Ministry of Nature Protection of Armenia.</p>
Exploration the distribution other endangered species of plants in Yerevan floristic region with the aim of identifying new locations				<p>Besides target plants, some new locations were found for other endangered species. The data are given in the Table 5 of the supplementary report</p>
Isolation of new strains of symbiotic nodule bacteria from target plants				<p>Besides above mentioned four plants, during the project, more than 26 strains of nodule bacteria from wild plants were isolated. Some of them have never been described before and some can be used as a selection material for agricultural purposes</p>

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

The main difficulties were related to *A. commixtus* research.

First of all, the appearance of the plant was unknown, the size of the plant varied from 1 to 3 cm and reached only 5-7 cm at the time of the fertilisation. Moreover, according to the data, the flowering of *Astragalus commixtus* occurs from March to April, but this year, spring in Armenia came with a delay of 1 month. As a result, during March-April months three expeditions on finding flowered plant of *Astragalus commixtus* were unsuccessful. Only in the middle of May, it was possible to find it. As a result, transportation costs slightly surpassed the expectations. Car rent and fuel cost for one extra day was £80.

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

During the project:

- The population state of surveyed plants were monitored, seeds and plant samples were collected.

- The distribution of target and other endangered plants in Yerevan floristic region were explored and new locations (11 new locations) for them were identified.
- Population of the villages was informed about endangered species of their communities. All data transferred to the Ministry of Nature Protection of Armenia.

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

The project does not envisage the involvement of local communities. One of the project challenges was to raise awareness of the population, which has been done. For details, see the table on "level of achievement of the project's original goals" and the supplementary report.

5. Are there any plans to continue this work?

As a result of the research, it was found that from *A. holophyllus* locations only one is preserved. There is a suggestion that this plant can also be found in the Khosrov Forest State Reserve (map 1, green perimeter line) and related trackless lane (map: 1, blue perimeter line). (The red line is our route)

Request for permission was sent to the Ministry of Nature Protection of Armenia for later research at Khosrov Forest State Reserve.

The area covered by the blue perimeter line is very limited, mainly due to fussiness and impassability. For this reason, it would be better to not focus on study of two species of these two areas, but to do a general survey of the area by hiking 4-5 days ranging from spring to late August.

In addition, this year's samples, seeds and bacteria have already been used in research and have great scientific research plans are connected with them.

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

Two presentations are already being done: one in the Ministry of Nature Protection of Armenia, second one in the SPC "Armbiotechnology" NAS RA.

The results of the project are going to be in the IV International Scientific Conference of Young Researchers "Biotechnology: Science and Practice" that will take place in the SPC "Armbiotechnology" NAS RA, Yerevan (Armenia) from 28th to 30th September 2017. They will be published in the abstract book. Few scientific articles are preparing for the publishing.

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 programme was designed to be implemented from July 2016 to the end of July 2017. In essence, the project was done in mention period. On the one hand, of course, it was possible to apply to the fund earlier and to start a research in the spring for a period of 7-8 months. But on the other hand, in 2016-2017 visiting of *A. holophyllus* habitats twice allowed to fix the facts of grazing and damage.

In addition, it was possible to visits villages, to negotiate with the population and to raise awareness.

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 - Nikon D3300	315	377	+62	It was planned to buy a digital camera - Nikon D3200 for 315 £, but at that time the store had only a D3300 version for 377 £
GPS unit	140	146	+6	Local price
Small flags (4)	12	0	-12	They were created by team members
Field backpacks (2) mini shovel (2) mini pickaxe (2) compass containers and plastic bags for samples (200) measuring tape cartridge A4 size paper (2) blank data forms (1per occurrence), clipboard and pencils etc.	403	403	0	By plan
Rent a driver and off-road car, Consumption of diesel fuel in a smooth and rough roads and also food for three persons (by plan for 27 days expedition)	2100	2180	+80	(Total 28 days). Due to additional expedition for 1 day it was spent 80 £. The difference we took from "Other direct costs"
Hall rentals for presentation (projector, water, coffee break, and	200	200	0	By plan

other)				
Preparation of information materials for guests, including pens, notebooks	50	50	0	By plan
Other direct costs	280			136 GBP was spent more than planned, the amount was deducted from the amount intended for other direct costs.
Totals	3500	3356	-144	144 GBP - unused balance
<p>As of June 2016 - 1GBP = 681 AMD, 1 dollar = 470 AMD, 1GBP = 1, 45 dollar. As of July 2017 - 1GBP = 622 AMD, 1 dollar = 480 AMD, 1GBP = 1, 3 dollar. We believe that it is a great luck that the money was sent in dollars! We received 4760 dollars (17.06.2016). A copy of the bank account statement is attached. According to the plan, the total road should had been 5350 km, but in fact it was more than 6500 km.</p>				

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

Besides environmental activities, the next step should carry out restoration work as well. For instance, for *S. salsula* seeds can be grown in seedlings and in greenhouses for several years and then will move to the nature. The plant is very beautiful and due to continue flowering, it could be successfully used for cities landscaping. This will lead to preservation of the plant.

There is still little information about *A. commixtus* and *A. holophyllus*, so they need to be studied in more details during further steps.

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?

In two presentations The Rufford Foundation logo was showed and the role of the foundation has been highlighted.

The Rufford Foundation logo will be used in upcoming publications as well.

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

Monitors - Vahagn Hakobyan, Astgik Papikyan, Ani Poghosyan

Vahagn Hakobyan – PhD, microbiologist, biophysicist, biotechnologist, since 2017 Head of Laboratory of Agricultural Biotechnology at the Institute of Microbiology of SPC “Armbiotechnology” SNPO NAS RA (National Academy of Sciences of Republic

of Armenia). Before that, Head of Laboratory of Nitrogen-Fixing Microorganisms at the same Institute.

Astgik Papikyan - postgraduate student, botanist, palaeontologist, works at the Institute of Botany of NAS RA, researcher.

Ani Poghosyan - postgraduate student, ecologist, biophysicist, works at the Institute of Geological Sciences, NAS RA, and researcher.

Team members took part in all research stages, starting from campaigns to outcomes, discussions and summaries. The professional skills of team members are in different areas, thereby, the research work was very productive and comprehensive.

12. Any other comments?