Final Evaluation Report

Your Details	
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Project Title	The Transcarpathian Natural Forest Ecosystems: Ichneumonid Parasitoids Diversity and Conservation Status
Application ID	21822-2
Grant Amount	£4300
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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
Scientific investigation of the Carpathian ichneumonid parasitoids communities				Field work organised in 2017-2019 resulting in a large number of samples collected. Most of the samples were processed and results partly published.
Training for staff of nature protection areas, foresters, students				Field training was organised in forests on the territory of the Carpathian Biosphere Reserve and Gorgany Nature Reserve.
Preparation of publicity and advisory materials				At the moment, only numerous research papers are published based on results of the project.
Monitoring network development				Field training helped to understand how the protected ichneumon wasp species can be more or less easily recognised in their natural habitats. It provided a background for future monitoring these species in the Carpathian Biosphere Reserve.

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

Because of the large size of samples, I finished processing data much later than expected. This is the main reason of delay with the final report.

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

The main outcomes are based on field investigation of the ichneumon wasp fauna of the Carpathian region:

1. The new localities of the distribution of the red listed *Megarhyssa perlata* were found in the beech forests of Transcarpathia (Varga, in press).

2. All the available museum materials concerning red databook ichneumonids were re-examined: as a result, numerous mistakes in species identification were found which makes questionable the conservation status and distribution of three vulnerable species in Ukraine. Now we understand that we know almost nothing about the real distribution of the protected species in Ukraine and further investigation is needed. In addition, four ichneumon wasp species were proposed to be included into the next edition of the Red Databook of Ukraine (Varga, 2018). The

well-illustrated identification key to vulnerable species (including proposed ones) is prepared (Varga, in press).

3. Carpathians and Ukraine in general were found as biodiversity rich territory:
A small forest patch (approx. 250 ha) of the Ukrainian Carpathian forest revealed an unexpected diversity of ichneumonid parasitoids: 95 species of Pimplinae, Poemeniinae and Rhyssinae), comprising approximately 39 % of the total number of European species. This is the highest local species richness of the group ever recorded in Europe and one of the highest in the world. These results were obtained due to the use of a long-term multi-method sampling programme. Being extremely diverse and highly specialized ichneumonids (saproxylic parasitoids especially) are relatively vulnerable to habitat destruction and endangered because of deforestation. This is important for conservation of natural Carpathian forests and understanding the requirements for further study and estimation of the studied group species richness (Varga, 2019a). We found 12 species of the genus *Astiphromma* Förster, 1869 in the Ukrainian Carpathians, eight of which are new records for Ukraine (Varga, 2019b). The data on the ichneumonid parasitoid wasps of the subfamily Pimplinae from Ukraine were summarised. The fauna of the Ukrainian pimplines numbers 35 genera and 146 species equivalent to almost 63% of European fauna. Twenty-four species are recorded from Ukraine for the first time. *Pimpla femorella* Kasparyan, 1974 is a first record for Western Palaearctic. The highest species richness (91–94 spp.) occurs in Ivano-Frankivsk and Transcarpathian Regions situated mostly in the Carpathian Mountains basin. The Carpathian montane forests were found to be the most species rich (112 species) of the six ecoregions present in Ukraine. The flight period of Pimplinae wasps in Ukraine lasts 9 months with a maximum number of species collected in June and genera in July respectively (the results published as a monograph in: Varga, 2019c).

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

No local communities were involved

5. Are there any plans to continue this work?

I found new potential candidates for inclusion in the Red Databook of Ukraine, but the investigation was carried on only in Carpathians and no data available from the rest of the country. I published some results of the re-inventory of the Red Databook species and found, that museum materials contain numerous incorrect data. Thus, I have in plans to organise further investigation of both types of species (already included into the Red Databook and proposed for inclusion) on whole territory of Ukraine to improve our knowledge on the ecology and distribution of the Ukrainian vulnerable ichneumon wasps before the next edition of the Red Databook of Ukraine will be published.

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

The experience I obtained of carrying out training will, I hope, help me to more effectively provide new training in the other nature protection areas of Ukraine,

which I planned to visit next field season. The materials of re-inventory of the Ukrainian protected ichneumon wasp species will be used on future conferences to show how important the scientific investigation of the taxonomically difficult organisms before it will be protected. The identification key to protected species (in prep.) will help foresters and citizen scientists to recognize the species and provide observations data useful for monitoring.

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

The project period was planned from June 2017 until the end of 2018. After finishing 2018 I still had some money and decided to change the budget amount of some items to cover partly also the field season of 2019.

8. 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
Contingency (including 1.5% bank commission for money transfer)	120		-120	1.5% bank commission for money transfer was covered by RSG
Stationery (paper and inks for printer, etc) and printing/ publishing booklets, books	300	100	-200	
Accommodation	80		-80	
Equipment: travel (tent, backpack, boots, sleeping bag, etc)	800	800		
Equipment: field (yellow pan traps, entomological nets, lab dishes, etc)	200	200		
Field (travel) expenses (basically fuel and foodstuff), car renting, payment for driver	2800	3200	+400	Some extra money from other items were used to partly cover field season of 2019
TOTAL	**4300**	**4300**		

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

The most important now to try to investigate the distribution of the red listed Ukrainian ichneumon wasp species (and proposed ones) not only in Carpathians, but on whole territory of Ukraine, and thus to get reliable data before the next edition of the Red Databook of Ukraine will be published.

10. 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?

The RF support was acknowledged in a research paper published.

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

I worked alone; the only driver was involved in the field work on some stages.