

Final Project Evaluation Report

Your Details	
Full Name	Korana Kocic
Project Title	Biodiversity Assessment and Conservation Status of Specialized Aphid/Parasitoid Trophic Associations in Endangered Coniferous Forests of Serbia
Application ID	24838-2
Grant Amount	£5,000
Email Address	koranabg@yahoo.com
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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
Collect samples and gather precise and complete data for these unique communities				We effectively collected samples from all coniferous tree species (except <i>Picea omorika</i>) and gathered precise data for these tritrophic associations.
Determine the state of undisturbed aphid and parasitoid populations				We successfully determined the state of coniferous forests and their populations of aphids and aphid parasitoids.
Create a checklist of poorly investigated and strictly specialized parasitoids that parasitize exclusively conifer aphids restricted to this kind of ecosystem				We created a checklist for all designated mountain locations. As elaborated in the fourth update, we have very interesting and valuable data that sheds a new light on elusive coniferous parasitoid species.
Raise awareness within the public and local communities				We held workshops for elementary school and faculty students. On the fieldtrips, we presented our project to the park management, park rangers and local communities.

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

Fortunately, we didn’t have any serious unforeseen difficulties. On several occasions, the weather was bad with 3-4 rainy days in a row, which is highly unsuitable for sample collection, because once transferred into plastic containers, wet plant and aphid samples are susceptible to mould. On these occasions, we coated the surface of the plastic containers with paper towels, in order to eliminate the excess moist. However, several samples were ruined.

Furthermore, the vehicle that can go on almost all rough fieldwork terrain was borrowed from the Faculty of Biology. However, for our second fieldtrip, the car was unavailable, so we had to use a private small car. As a result, we got stuck twice in muddy terrain, but in the end managed to pull the car out.

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

There are numerous outcomes of our project, but three most important ones are:

1. We collected many samples of the rare and un-investigated tritrophic parasitoid-aphid-plant associations of coniferous forests. The results of analyses yielded several important findings, such as the report of two species previously unknown for Serbia, where one of them is known only from a few specimens from Finland. Furthermore, we discovered nine species of *Pauesia* genus, while there are only five reported for this region.
2. We estimated the state of tritrophic interactions in undisturbed and disturbed areas. The results of our project show that where the forests are on their ecological maximum and where there is no human impact, the diversity of the parasitoid species is highest.
3. The third outcome is as important as the first two: raising awareness among the local people and public communities. We held several workshops for different target groups (elementary school children, faculty students) and presented our Rufford project and importance of preserving the habitat to the local community, park management and park rangers. All were very interested and aware that nature is the most valuable resource that is in urgent need of protecting.

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

Local communities showed great interest and helped us in all locations during the fieldwork sampling. On Mokra Gora Mt. we talked to the police officers who instructed us that we need experienced local guides if we want to go to our target locations, which are in the ground safety zone on borders with Kosovo and Montenegro. The friendly rangers from forestry management offered to accompany us to the sampling sites. Furthermore, on Murtenica Mt. we also had help from park rangers who drove us to the locations and showed us the last 10 trees of *Pinus heldreichii*. We met many people, forest rangers and locals, who are really dedicated to preserving the natural habitat of Serbian mountains. Several years ago, a big project was approved by the government that plans the construction of a large number of mini hydro power plants. Numerous experts, non-government organisations and local communities actively defend the mountain rivers from the power plant constructions, since it is proven that they have an enormous negative impact on flora and fauna of the mountains. We believe that our project represents additional evidence on how rich in diversity and unique this habitat is and that there is urgent need in stopping the further degradation by building large urban tourism centres and constructions such as mini hydro power plants.

5. Are there any plans to continue this work?

We plan to continue our work in the seasons to come. We believe there are still some sites which are important to cover, but were not planned in our project, due to already many locations. Furthermore, we still have to identify the species of *Pauesia* genus. Since there are no identification keys for this genus, after the identification of our samples we plan to make one.

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

We already presented our preliminary results at the XII Symposium of Entomologists of Serbia. However, the genus *Pauesia* is still a work in progress. In order to establish what exact species we collected and if there are any species new to science in our samples, we need to acquire and examine all available material. The results of this study could possibly be very interesting and will be published in international peer-reviewed journals. Also, aside from the work on *Pauesia* genus, we plan to report all of the gathered data from two Rufford small grants in a Serbian national peer-reviewed journal.

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

The grant funds were used from June 2018 up to September 2018. The timescale of the project was in concordance with the planned timescale, with the exception that it was prolonged for four months due to a huge amount of data that needed to be identified and analysed.

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
GoPro Hero4Black camera for making the short movie about our project research	300	329	+29	As planned, we recorded every step of our project.
Daily allowance (food and drinks) for two persons for 42 days (42 x 2 x 15£)	1,260	1,230	-30	We spent on food and drinks as expected.
Accommodation including tourists' taxes (42 days, two persons)	1,440	1,288	-152	On two occasions we found cheaper accommodation than expected.
Fuel and road tolls	1,300	1,420	+120	We spent more on fuel since we returned to our sites on Golija and Tara.
Entomological nets and handles (10£ x 2 + 10£ x 2)	40	96	+54	Instead of two, we bought three entomological nets, and the price was higher than expected.
Tweezers x 6 (Dumont company, if we buy a pack	200	210	+10	The price was a bit higher, since we had to buy

of 6 tweezers, the price is the same as for 4 that are sold separately)				tweezers from the legal representative of CarlRoth in Serbia who takes provision.
Disposable equipment (500 x tubes for aphid and parasitoid samples; some number of tubes remained from our previous project); 96% alcohol; plastic containers for live aphid samples)	100	107	+7	The price for disposable equipment was as anticipated.
Project promotional material (T-shirts, badges, posters and writing pens with the Rufford Foundation logo)	360	350	-10	We printed t-shirts and posters, made badges and key chains (key chains instead of writing pens since pens are disposable).
Totals:	5,000	5,030	+30	

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

1. Identifying all samples of the genus *Pauesia* to species level.
2. Making an identification key for the genus *Pauesia*.
3. Expanding our research area outside state borders to investigate the potential range of *E. koponeni*.
4. Re-visiting our high mountain sampling sites during the next years in order to establish the fluctuations and stability of trophic associations.
5. Ongoing education of public community and biology students on the importance of conservation of coniferous forest habitats, especially in the light of recent forest fires in Serbia

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 Rufford Foundation logo was used in all promotional material (posters, t-shirts, keychains, badges) as well as in presentations and workshops. The foundation was promoted and received publicity in every step of the project. Furthermore, the RF will be acknowledged in all the publications that will come out of this project.

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

Our team had two members, Korana Kocić and Jelisaveta Črkić. Both team members equally participated in all project activities, from gathering the equipment and going to fieldtrips to identification of collected samples and data analyses.

12. Any other comments?

We would like to express our gratitude to the Rufford Foundation for the financial support which made this project possible. The samples and the data we collected are rare and unique and represent the first step towards understanding of this special and endangered trophic community.