

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	Robert Vargovitch
Project title	Diversity and conservation of the North-West Caucasian cave-dwelling invertebrate fauna
RSG reference	17638-1
Reporting period	June 2015 – June 2016
Amount of grant	£5000
Your email address	arete@izan.kiev.ua
Date of this report	23 th June 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
Preliminary estimating of NW Caucasian invertebrate cave fauna biodiversity based on original observation			yes	20 caves of Abkhazia and region of Sochi have been investigated during August-September 2015 expedition. Invertebrates of the following taxonomic groups were sampled: Turbellaria, Oligochaeta, Hirudinea, Mollusca, Diplopoda, Chilopoda, Aranei, Acari, Opiliones, Pseudoscorpiones, Palpigradi, Copepoda, Isopoda, Amphipoda, Decapoda, Collembola, Diplura, Thysanura, Ephemeroptera, Lepidoptera, Orthoptera, Coleoptera, Diptera. In general, cave fauna of visited caves could be characterised as quite diverse, with high portion of troglobionts and endemics
Outlining of local biodiversity hotspots of troglobiont fauna in frame of studied area			yes	According to invertebrate biota of caves, investigated in the frame of the project, several local/cluster hotspots of cave biodiversity could be recognised: Arabika cluster, Novy Afon cluster, Gumista cluster, Tsebelda cluster and Otap cluster in Abkhazia and Alek cluster in the region of Sochi
Assessment of the conservation status for some group of troglobiont species			yes	Conservation status for several troglobiont species from three taxonomic groups have been assessed: crustaceans, springtails and beetles. Lists of potentially endangered species are provided to local authorities for their further including in the local red lists.
Estimation of anthropogenic			yes	Three of 20 visited caves are partly used as show touristic objects

<p>suppression and condition of corresponding habitats (caves)</p>				<p>(Novoafonskaya, Abrskila, Golova Otapa). Suppressed influence of anthropogenic factor both on habitats and inhabitants has been observed: bats and invertebrates are rare to be meet here whereas before human activity they were numerous. Ecosystems of show parts of these caves are definitely affected. Use of wooden material (bridges along the stream, etc.) leads to biological pollution, introduction of alien microflora, fungi, bacteria.</p> <p>In some non-show caves near settlements e.g. Mikhailovskaya Cave, the signs of vandal human behaviour along with pollution have been observed. Some caves have been partly cleaned of trash.</p> <p>Conversely, wild caves difficult of access, are in quite good condition and this condition should be preserved.</p>
<p>Taxonomic study of selected material with emphasis on classis Collembola</p>			<p>yes</p>	<p>Two new troglobiont species of springtails from the family Arrhopalitidae have been described, the paper has been submitted to journal <i>Zootaxa</i>. The paper on another new troglomorphic species and genus of family Onychiuridae is to be finished soon. Several specimens of other invertebrate groups have been passed to relevant specialists.</p>

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

The convenient train to the starting place of the project activity Kiev-Adler was cancelled (possibly due to political crisis), so I had to travel much longer and much more expensive way through St. Petersburg.

One of the caves planned for visiting near Sukhum (Mikhailovskaya Cave) was suspected to be mined during the war of 1992-1993. We were kindly supported by

local authorities and accompanied by the Halo Trust mine clearing expert officer for the safe visit of this cave.

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

1) General impression on NW Caucasian cave biodiversity was obtained in practice: 20 caves of six karst massifs of Abkhazia and Sochi have been investigated (see in update file to the project); invertebrates of 23 orders were collected; six local biodiversity hotspots/clusters have been recognised (Arabika cluster, Novy Afon cluster, Gumista cluster, Tsebelda cluster and Otap cluster in Abkhazia and Alek cluster in the region of Sochi).

2) Factors of anthropogenic influence to ecosystems of three show caves have been estimated, areas of strict protection with unaffected fragments of cave ecosystem in these caves have been outlined. A list of endangered invertebrates of some groups (Crustacea, Collembola and Coleoptera) in the frame of investigated during the project areas have been elaborated and suggested to the local nature-protection organisations for including these species in the local red lists.

3) Taxonomic novelty: two new springtail species of the genus *Pygmarrhopalites* (Collembola, Arrhopalitidae) have been described (article submitted in journal *Zootaxa*), also the description of a new genus and a new springtail species of the family Onychiuridae will be finished soon (see file update 2 to the project). Several other groups are under study by other taxonomists.

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

First, the work on the project would be much more difficult without cooperation and all-round support from local authorities, Institute of Ecology Abkhazian Academy of Sciences and Sochi National Park. Some representatives of these organisations were involved into the project activity. These institutions benefitted from the project by obtaining the reports with information on biodiversity on some groups of cave fauna of corresponding territories, as well as by consultations and suggestions on nature-conservative measures.

Second, local speleologists helped us considerably in searching of poorly known or hard of access caves. Those who participated with us had opportunity to become more familiar with subterranean animals.

Third, we often met with the hospitality and help of local people, some of them accompanied us in particular stages of expedition and were involved in the project activities (transportation, visiting caves, collecting samples, etc.).

5. Are there any plans to continue this work?

Yes. Indeed, I have marked the objectives as achieved, but it concerns only current project with aims to outline or estimate something only initially and results from only single expedition. This is very far from potentially awaited results of the topic in general (just a drop in the ocean). The topic deserves further efforts and development: involving of more caves and more karst regions; taxonomic and ecological study of cave invertebrates, many of which remain even unidentified and undescribed. Besides, steps towards conservation of Caucasian cave biota should be intensified and strategies have to be elaborated. Obviously, these tasks require financial support. Anyway, I would like to continue this work.

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

The results will be shared through scientific and popular publications (some are in press, others in preparation), reports, oral presentations (one was done for colleagues in Institute of Zoology) and via Internet resources.

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 project continued for 1 year from June 2015 till June 2016. It included three main stages: preparing and planning the expedition, fieldwork (45 days expedition) and further laboratory work. Generally, actual length corresponds to the anticipated length of the project, however, laboratory work and preparing/publishing papers will be continued for some more months.

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
Waterproof Photo camera Pentax WG-3 + case + 2 additional batteries	300	300		

GPS navigator Garmin Oregon 650 + maps + additional batteries	450	450		Instead of initially claimed Garmin Montana 650T I chose another model because of the same functionality but lesser weight and size.
Flashlights: Nitecore HC-50, Nitecore MH-20, Dragon Eye and Tikka XP2 + batteries (18650 (10), AA (40) and AAA(40)) + chargers (Nitecore D2 and Opus BT- C3100 V2.2)	350	350		All these items were chosen instead of initially claimed single headlamp Petzl Ultra Vario . The reason to change is better and wider functionality due to new technologies.
Caving equipment (helmet, croll, head ascender, karabiners, rope, caving clothing overall, etc.)	500	650	+150	More equipment than initially planned were needed for expedition.
Digital microscope camera Sigeta Ucmos 14000 14.0MP C-Mount + adapter Sigeta Ucmos AMA050	500	500		Initially claimed Levenhuk C1400 NG was absent in sale and was replaced by analogical model.
Stuff for sampling and mounting (different tubes, boxes, slide glasses, cover glasses, slide holders, instruments and chemicals for slide mounting, fixing liquids etc.)	300	350	+50	Some items were more expensive than expected
Field expenses (food, gas, accommodation)	700	700		
Transport expenses (trains, buses, fuel for rented cars)	1400	1350	-50	
Brochure printing	500	300	-200	print run was reduced
Money transfer taxes		50	+50	Bank commission for money transfer was 1% of grant sum
Total	5000	5000	0	

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

1) Expending investigations. New expeditions, new material, new discoveries: many white spots remain untouched by biospeleologists, much more Caucasian caves and karst massifs, in fact biological islands, have to be investigated.

2) Preserve and protect. Most Caucasian troglobionts have very restricted distribution and cave ecosystems are very fragile. That is why protection of these unique organisms is critically actual. Unfortunately, we can lose them even before we see them. This is not acceptable – we have to save them.

3) New territories. Similar work should be expended into important cave areas of Ukraine: east Carpathians, Podolia and mountainous Crimea.

10. 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?

The logo was used in produced information brochure and was shown during oral presentation. Results of expedition organized with RSGF support were reported as a presentation in Department of Invertebrate Fauna and Systematics at Institute of Zoology (Kiev).

11. Any other comments?

In the time of current crisis and scarce financing of scientific activity for Ukrainian zoologists, RSGF is a hopeful chance for us to be more effective in fields of study and protection of nature.

Great respect and cordial thankfulness to Rufford Foundation!