

## Final Evaluation Report

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Your Details	
<b>Full Name</b>	Hicham El Zein
<b>Project Title</b>	Determination of the floral diversity and conservation value of the Valleys of Hell with focus on the range restricted endemic <i>Jacobaea mouterdei</i> (Asteraceae)
<b>Application ID</b>	32258-1
<b>Grant Amount</b>	£4500
<b>Email Address</b>	hichamelzzein@gmail.com
<b>Date of this Report</b>	24-12-2021

**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
Determining the floral diversity and endemism rate of the Valleys of Hell (Wadi Jahannam) by carrying out extensive fieldwork with focus on several endemic species, especially the range restricted <i>Jacobaea mouterdei</i> .				Many observations were collected about the flora and their associated habitats during extensive and fruitful fieldwork, thanks to the extension of the project duration.
Addressing the gap of knowledge on the local flora and publishing the collected dataset online.				The data are still being analysed. As soon as the analyses are done, the proposal for a management plan will be written as a paper and will be published, then the raw data will be shared on GBIF.
Assessing the vulnerability of understudied endemic species using the guidelines of IUCN Red List.				The data collected about endemic species present in Wadi Jahannam was used to assess their conservation value.
Writing a proposal for a management plan describing the conservation value of the Valleys of Hell to advocate the creation of a protected area in the future.				The management plan is developed by the data analysis and will constitute the subject of the peer-reviewed paper.

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

Besides the Covid-19, which rendered fieldwork complicated during 2020, the country was paralysed by an unprecedented socio-economic-political crisis that has been worsening from October 2019 until now. All the bank accounts were blocked by Lebanese banks until now, preventing everyone to have access to their possessions. The unstoppable collapse of the national currency put a stop on the

importation of basic goods, from food to medicine, resulting in a massive shortage and a steep rise of the prices. Starting from May 2021, petrol and fuel oil were also almost not available preventing people from moving by car, electricity from being produced and water from being transported to houses. Partial blackouts gave a paralysis rhythm to the country during all summer until October 2021 when power was partially restored by giving private generators access to fuel oil again but at prices 10 times higher as before.

This affected my work in the sense that it was often impossible for me to move around and to reach the study site. The valleys are located in the north of Lebanon, in Akkar District, 3 hours driving from Beirut. Sometimes, I bought petrol on the black market at 10 times the actual price just for being able to move. Working on my laptop was almost impossible as it was not charged by battery, so it was directly depending on the electricity network.

The rise of the price of the fuel oil caused another predictable consequence that negatively impacted the environment of Lebanon doubly: massive movement of illegal loggers and charcoal makers besieging the woodlands of the country in all regions and at all altitudes. People anticipating that they won't be able to afford fuel for heating in winter decided to rely on wild wood resources for their needs. Uncountable numbers of trees were cut down, including old individuals. Inexperienced loggers, unaware of security measures when making charcoal in dry forests during summertime, caused forest fires all around the country, breaking records of area of burned forests in Lebanon. The ravages lasted until November 2021 until the first rains cooled down the atmosphere. Forest fires happened three times in the Valleys of Hell in 2021, burning large areas of pristine forests where I already surveyed many plots. The biological losses were inestimable.

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

**Addressing the gap of knowledge on the local flora:** 63 days of fieldwork were carried out, that is almost twice the amount of time estimated during the project proposal. 234 plots were surveyed in 2020 and 2021, yielding more than 5000 botanical observations within an area of 30 km<sup>2</sup>.

**Assessing the vulnerability of understudied endemic species using the guidelines of IUCN Red List:** Additional data about the ecology of endangered *Jacobaea mouterdei* allowed to better estimate its distribution, population size and the threats affecting it. The project also contributed to the assessments of eight other endemic species with data collection: *Berberis libanotica*, *Crepis robertioides*, *Helichrysum virgineum*, *Melissa officinalis* subsp. *inodora*, *Rosularia kesrouanensis*, *Silene astartes*, *Silene grisea* and *Stachys hydrophila*. Two were classified under the category least concern, four vulnerable and two endangered. Threats were updated regarding the consequences of the economical situation of the country. Some of the assessments were already displayed on the IUCN Red List website in December 2020.

**Determining the floral diversity and endemism rate of the Valleys of Hell (Wadi Jahannam):** The exploration also resulted into the rediscovery of the one rare Euxinian element, *Daphne pontica*, nationally assessed under the category critically

endangered and previously considered as *Daphne libanotica*, an endemic species to Lebanon. It also contributed to the collection of additional data about the occurrence of two other new species, *Atropa belladonna*, and *Euonymus latifolius*, both assessed as nationally critically endangered. A paper regarding these new occurrences was published in March 2021 (<https://doi.org/10.15560/17.2.655>).

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

The members of the local community that were involved are villagers of Qemmamin that are involved into the association Wadi ez-Zouhour. They were not physically involved into the fieldwork as it is not always positively considered. The connection with the organisation Wadi ez-Zouhour constitutes invaluable help to disseminate and convey ideas within the local community about the importance of preserving their natural environment. They raise awareness among some of the villagers about the necessity of protecting the yet preserved environment in the valleys around the village.

Other villagers met during the expeditions were very interested while interacting with me and some friends about the necessity of conserving the nature in the valleys. They were comforted in the fact that they live in one of the last pieces of heaven of the country and that something has to be done urgently. However, they lost hope into the government and don't imagine any conservation actions being implemented by the authorities. The community and coming generations will definitely benefit of the project if a protected area is created.

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

The creation of a protected area is the ultimate goal of all the projects aiming at studying the diversity of the Valleys of Hell. The knowledge about the natural richness of the valleys is still in progress and much more had to be discovered. One of the three valleys was poorly surveyed. In parallel, it is time to work with the locals and stakeholders as soon as possible about the creation of a protected area that will prevent these pristine ecosystems from being destroyed.

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

Publication of all the analyses will be publicly available online as well as the botanical collected data that will be published on GBIF.

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

The grant was used between September 2020 and September 2021. The project began in spring 2020 but at the project manager own expenses. Then in August 2020, the fund was granted, and I asked The Rufford Foundation Trustees if it was possible to extend the project until September 2021 so that I could carry out as much fieldwork as possible during the flowering season of 2021. My request was granted, and I finally almost doubled the days spent in the field compared to the original

estimation (63 days instead of 35) but it was worth scientifically for the quality of the data collected and the area explored. The delay for the fund to be granted was due to the fact that one of the referees was not reachable during a while.

**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
Institutional fees of the association to manage the transfer of the fund	287	500	+213	The association had more administrative fees and I decided to support them.
Accommodation in the surrounding villages in a guest house (40\$/night) for 12 nights	390	400	+10	Mostly when accompanied. I rather camp when being alone.
Camera (rugged camera with macro mode)	330	346	+16	Olympus Tough TG-6
Tent (two persons)	80		80	No tent was bought.
External Disk (2 TB)	100	89	+11	Seagate
Sleeping bag	50	65	+15	Decathlon Mummy 0 degree
Backpack	100	133	+33	Deuter 60+15 Litres
Food supplies: (20\$/day) for 35 days	575	940	+365	I spent 63 days of fieldwork in the Valleys of Hell.
Transportation to site: fuel (40\$/day) for 35 days	1151	1878	+727	I spent 63 days of fieldwork in the Valleys of Hell.
Transportation to site: car rental (50\$/day) for 35 days	1437	2348	+911	I spent 63 days of fieldwork in the Valleys of Hell.
<b>Total</b>	<b>4500</b>	<b>6699</b>	<b>+2199</b>	Personal expenses

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

Collected data have to be thoroughly analysed and exploited to produce the best guidelines as possible to encourage the creation of a protected area in Wadi Jahannam.

**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 guidelines in which was published the first paper (<https://doi.org/10.15560/17.2.655>) didn't allow the use of logos, but of course the Rufford Foundation was acknowledged for having funded the research study.

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

**Jonas Dupoint:** Accompanying some of the fieldwork expeditions and providing logistic help.

**Amalric Pouzoulet:** Accompanying some of the fieldwork expeditions and providing logistic help.

**Tom Mirkou:** Accompanying some of the fieldwork expeditions and providing logistic help.

**Josie Darbi:** Accompanying some of the fieldwork expeditions and providing logistic help.

**Mariam Matou:** Accompanying some of the fieldwork expeditions and providing logistic help.

**Carla Khater:** Support at different stages of the project.

**Mohammad Zahed Taleb:** Head of the association Wadi ez-Zouhour, facilitating transfer to the bank account of the association.

**12. Any other comments?**

The expenditure was more than expected, but it is totally normal regarding the fact that I asked for an extension and ended up doubling the amount of fieldwork. Regardless of that, I am very happy that The Rufford Foundation helped me for this project. The financial aspect was essential to carry out the project. Moreover, the consideration given by the trustees and the trust they put in this project by funding it powered my motivation during the hard times that we went through in Lebanon.