

Final Evaluation Report

Your Details	
Full Name	Ngan Thi Lu
Project Title	Study on diversity and conservation of fern species on limestone karsts and caves in Vietnam. (Phase 2. Endangered, rare species of ferns in Hagiang & Hoa Binh)
Application ID	37132-2
Date of this Report	March 6th 2023

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
Field investigations: - Investigate the new distribution of the endangered species <i>Cyrtomium hemionitis</i> . - Collecting specimens, DNA materials and spores				- Three field trips were carried out in Ha Giang, Cao Bang and Hoa Binh provinces: + About 82 specimens of Dryopteridaceae were collected from eight research routes in Ha Giang, Cao Bang and Hoa Binh province, along with morphological, ecological and conservation status information. + We found other distribution areas of endangered species <i>Cyrtomium hemionitis</i> , which are in Du Gia National Park/ Du Gia Special Use Forest (Ha Giang province) and Hang Kia-Pa Co Nature Reserve (Hoa Binh province). As a result of this study, two new distribution sites of <i>Cyrtomium hemionitis</i> were added.
Endangered Species Conservation				- Interviewed local people about factors affecting the studied species, and forest used. - Evaluation of the number of species, population size. - Conservation output with the participation of the Forest Management Board and local people. - Proposed conservation methods.
Conservation training course focused on endangered species				- A training course took place in Du Gia Commune, Bac Me District, Ha Giang Province. - The project organised a training course on conservation for local people and rangers, zoning protected areas and proposed the conservation methods with the participation of local people and Du Gia Special Use Forest management board.

2. Describe the three most important outcomes of your project.

- a). We found two additional distribution areas of endangered species *Cyrtomium hemionitis*, which are in Du Gia National Park (Ha Giang province) and Hang Kia-Pa Co Nature Reserve (Hoa Binh province).
- b). Assessed the current status of *Cyrtomium hemionitis* and proposed a reasonable conservation solution that is in-situ conservation with the participation of local people and nature reserve staff.
- c). Trained local people, foresters with increased awareness about protecting these species and forest conservation.
- d). Endangered species *Cyrtomium hemionitis* data and wood-fern species were studied and recorded.

3. Explain any unforeseen difficulties that arose during the project and how these were tackled.

- This time, we selected mountainous areas such as Yen Minh, Bac Me, and Vi Xuyen in Ha Giang Province to study *Cyrtomium hemionitis*. However, after many days of searching, no individual of *C. hemionitis* were found. Our team and Du Gia Special Use Forest management board discussed and considered extending the search to buffer zone limestone regions and eventually *C. hemionitis* was discovered.
- We did not detect *C. hemionitis* in Cao Bang province. Although, we have selected areas with topography similar to the distribution area of *C. hemionitis* but we were not as lucky as in Ha Giang and Hoa Binh provinces.
- Growing: Although we tried various ways to grow *Cyrtomium hemionitis* from its spores but failed. The reason may be that *C. hemionitis* lives on limestone peaks, often covered by fog, so it has a special adaptation mechanism, for example, pinnae are often very thick and brittle, so spores can have an adaptive structure to limestone conditions as a thick spore wall, making it difficult for spores to germinate. In this case, in vitro culture should be attempted.

4. Describe the involvement of local communities and how they have benefited from the project.

People live in the mountains and most of their lives rely on the forest resources. However, they consume forest products and medicines without considering the negative effects. We held a training course with the participation of community members and rangers; the purpose of the training course was to collect products based on sustainable development principles. For example, when collect medicinal plants or forest products, use only parts that do not affect the entire plant and avoid uprooting the entire plant. Harvesting with protection and planting makes sustainable development.

We also presented the government decree on the management of endangered, precious and rare species to the local people. When biodiversity is protected, endangered species are protected, nature in that area is of great value, and local people benefit from the future value that biodiversity will bring.

Endangered fern specimen collections, geographic coordinates, photographs, and identification guidelines can be used for forest management and further research.

5. Are there any plans to continue this work?

Yes, I would like to continue this work.

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

- Specimen collections are deposited in VNMN herbaria for further research and specimen loans.
- Reported documents will be sent to Center for Nature Conservation and Development (CCD).
- Information about locations, geographical coordinates, and species will be shared to management board of Du Gia Special Use Forest and Hang Kia-Pa Co Nature reserve.

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

We want to continue this project because the next steps are important for the following reasons:

- Results from the 1st & 2nd Rufford Small Grants have shown that the number of endangered *Cyrtomium hemionitis* is very small in Ha Giang province. While in Hoa Binh province, the number of individuals is double but *C. hemionitis* is distributed in the limestone area close to the eco-tourism area where the cement step passes. In the future, *C. hemionitis* is very likely to lose its habitat if the ecotourism area is expanded. Therefore, besides the in-situ conservation orientation, ex-situ conservation should be considered as high priority in future for long-term conservation. In future work, in vitro culture should be attempted to conserve the endangered ferns.
- In addition, I would like to continue to identify unidentified specimens collected by the 1st and 2nd Rufford Small Grant projects.
- Expand the research area of endangered species, *C. hemionitis* to other provinces with limestone topography like Ha Giang and Cao Bang.
- Study the process of proposal provisional conservation status for other fern species which do not appear on the IUCN Red List because conservation is not only about conservation species known to be in danger of extinction, but

also having a plan and direction for the conservation of endangered and species have yet to be assessed but are thought to be threatened.

8. 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?

Yes, the logo was used for training course banners/posters in Hagiang province and report documents.

9. Provide a full list of all the members of your team and their role in the project.

Dr. Nguyen Quoc Binh: Field investigation and plant identification.

Dr. Luu Dam Ngoc Anh: Studied references about IUCN list, conservation and made conservation plan (proposed conservation methods based on recent surveys, helped in training course guideline).

Dr. Do Van Truong: Field work, training course and connected/discussed the work with the management board of the national parks and nature reserves.

Ms. Dinh Dieu Thuy: Fieldwork, training course and connected/interviewed local people and studying specimens.

10. Any other comments?



