Final Evaluation Report

Your Details	
Full Name	Bich-Thao Thi Vo
Project Title	The distribution of Endangered yellow tail brook barb *Poropuntius deauratus* (Valenciennes, 1842) from coastal river drainages in Central Vietnam
Application ID	27610-1
Grant Amount	£4,995
Email Address	bichthao0504@gmail.com
Date of this Report	30 June 2020

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
Providing information on ecology and environmental parameters of *P. deauratus*			■	Individuals of *Poropuntius* spp. were found in lotic habitats of main streams. Our study recorded *Poropuntius* spp. occurred in riffles, runs, and pools with a water temperature of 22–26°C, pH of 6.5–7.2, DO of 80.0–88.6%, conductivity of 1–10 µS.cm^{-1}, and flow velocity of 0.17–0.67 m/s. They feed on algae and insects. They share their habitats with *Glyptothorax* sp., *Sewellia* sp., *Schistura* sp., and *Rasbora* spp.
Determining the yellow tail brook barb *P. deauratus* by DNA barcoding combining with morphology approaches			■	We surveyed distribution of yellow tail brook barb *P. deauratus* in the Gianh, Con, Ô Lâu, Bồ, Hương, Thu Bồn, Trà Khúc, Côn, Ba, Khế, Cái and Lũy drainages of coastal Central Vietnam. A total of 203 specimens belonging to genus *Poropuntius* were collected and examined morphological characteristics: three individuals in juvenile stage (3.0–3.5 cm), and 200 individuals in adult stage (10.7–32.4 cm). The pelvic fin clips of 148 specimens were stored in 95% ethanol for DNA extraction. The characters of *Poropunitus* spp. belong to two morphotypes: group A with bright yellow caudal fin, 25–28 scales in lateral line, and 11–14 gill rakers on the first gill arch; and group B with pale yellow caudal fin, 30–36 scales in lateral line, and 11–14 gill rakers on the first gill arch). Following the descriptions in Serov et al. 2006, Roberts 1998, and Rainboth 1996, *Poropuntius* spp. of group A can be identified as *Poropuntius cf. normani* and group B can be *Poropuntius*

				deauratus. All COI sequences of specimens from group A and group B matched 99-100% with COI sequences of *Poropuntius* cf. *normani* from Cambodia (Genbank accession: MK116345), *Poropuntius* cf. *normani* from Laos (Genbank accession: KY319985) and *Poropuntius* cf. *normani* from Thailand (Genbank accession: MK448168). This result supports that the specimens of group A and B are the same species. Thus, *Poropuntius deauratus* and *Poropuntius* cf. *normani* are the same species. *Poropuntius deauratus* was described by Valenciennes (1842) earlier than *Poropuntius cf. normani* was described by Smith (1931). Therefore, *Poropuntius cf. normani* should be junior synonym of *Poropuntius deauratus* (Morphological characters: bright or pale yellow caudal fin with black submarginal stripes, 25–36 scales in lateral line, and 11–14 gill rakers on the first gill arch).
Mapping the *P. deauratus'* distribution areas in Central Vietnam				We provide the distribution map of *Poropuntius deauratus* in central Vietnam (see Figure in the end of this report "Fig. The distribution map of yellow tail brook barb *Poropuntius deauratus* from coastal river drainages in Central Vietnam"): from the Gianh River (Quảng Bình Province) to the Lũy River (Bình Thuận Province). The distribution range of this species in central Vietnam has been extended than the record of Serov et al. 2006. Besides, the results of genetic comparison show that *P. deauratus* is not restricted in Central Vietnam but also in Cambodia, Thailand, and Laos.

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

Field survey was more difficult in the rainy season. In Thua Thien-Hue province, the roads to entrance the survey areas were muddy and slippery to go by motorbike. We had to walk and carry research equipment and food. The field survey at main streams must be conducted quickly because water level rise when there is heavy rain.

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

a) **Information on ecology, environmental parameters of *P. deauratus*:** We provided information on water temperature, pH, DO, conductivity, flow velocity, diet and fish species which shared their habitats with *Poropuntius* spp. to local managers. This background information is very important for the local managers to establish appropriate approaches for in situ conservation. Through information on the ecology of *P. deauratus*, local communities have gained a better understanding of the importance and urgency of species conservation. Local people realized the value of this yellow tail brook barb *P. deauratus* as an additional food source and preserve this fish meaning conserving freshwater water resource available as well.

b) **COI database of *P. deauratus*:** We analysed the mitochondrial gene COI of 148 samples of *Poropuntius* spp. has been collected from river drainages in Central Vietnam. We are going to publish *P. deauratus* COI gene data on Boldsystem and Genbank for identifying to species level exactly. Database of COI gene will serve phylogenetic studies of species belong to genus *Poropuntius*.

c) ***Poropuntius deauratus*' distribution map:** Combining of information on *Poropuntius* spp. survey sites and accurate *P. deauratus* identification, the distribution of this species from coastal river drainages in central Vietnam was mapped. The results show that the distribution of *P. deauratus* is not restricted in central Vietnam: from the Gianh River (Quảng Bình province) to the Lũy River (Bình Thuận province) but also in Cambodia, Thailand, and Laos. This information is very helpful for local managers to determine conservation priority areas for *P. deauratus.*

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

Local people support in field guide, contacting fishermen and collecting *Poropuntius* spp. During the fieldwork, they were trained in fish identification and collecting water environment parameters. Mr. Nguyen Duy-Thuan (team member) is a local person who was shared information on ecology and distribution of *P. deauratus*. At each province, field surveys were also supported by local youth (18 – 22 years old) who will become the ambassadors to improve the awareness of their friends and family.

During the fieldwork, we stayed at the local ranger stations or the local fishermen's houses and had a good relationship with them. Project managers and fishermen who supported the project have a better understanding of the role of *P. deauratus* in their area. They shared information promoting the communities to become effective managers to protect *P. deauratus'* habitat. Fishermen were recommended to catch individuals of *Poropuntius* spp. when they are in the adult stage.

5. Are there any plans to continue this work?

The *Poropuntius deauratus* conservation project in central Vietnam is planned to proceed in the following four steps:

Step 1: Determining the distribution of *P. deauratus* from river drainages in central Vietnam, understanding basic ecological information.

Step 2: Identifying threats effect to *P. deauratus* in the wild, understanding role of *P. deauratus* and other endemic species to the local communities.

Step 3: Establishing programs to conserve and sustainably develop indigenous fish resources.

Step 4: Evaluating effect of *P. deauratus* conservation programmes in local communities.

For this project, we have completed step 1 and we look forward to getting support from the fund in the next steps of *P. deauratus* conservation project.

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

We have shared the information on ecology and distribution of *P. deauratus* for local managers in the survey areas to establish in situ conservation activities. This information was shared to participants in the Rufford Small Grants Conference – Penang, Malaysia 2020. We designed the poster to introduce about *P. deauratus* and other indigenous fish in Vietnam. This poster was presented in Science Gate program organised by the University of Science – Vietnam National University - Ho Chi Minh City. The information about *P. deauratus* attracted the attention of many students.

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 from May 2019 to June 2020. We proposed to conduct this project from June 2019 to May 2020. The Rufford Foundation supported our project in May 2019. So, our project started in May 2019 and was expected to finish in April 2020. But some sites in the project were not completed survey because of Covid-19 pandemic so the project finished in June 2020 (2 months later than expected).

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
DNA Tests (£7/specimen/site/ season * 3 specimens * 23 sites * 2 seasons)		1036	+1036	We got more specimens than expected.
Fish specimens in local markets (£10/site/season * 23 sites * 2 seasons)	60	480	+420	We got more fishes than expected.
Stipends for local people: guide way and collect sample (£7/person/day * 1 person * 84 days)	588	588		
Equipment for field work (map, sample bag, stationery, chemical)	80	60	-20	We need less field expenses than proposed
Food (£4/person/day * 3 persons * 84 days)	1008	1008		
Lodging (£5/person/day * 3 persons * 78 days)	1170	1170		
Vehicle fuel (£2/motorbike/day * 2 motorbikes * 84 days)	504	504		
Vehicle rental (£3/motorbike/day * 2 motorbikes * 84 days)	840	840		
Bus ticket from Gia Lai to Ho Chi Minh (8.0£/person/time * 3 persons * 2 times)	48	48		
Bus ticket from Kon Tum to Gia Lai province (£2.3/person/time * 3 persons * 2 times)	14	14		
Bus ticket from Ho Chi Minh to Kon Tum province (£8.4/person/time * 3 persons * 2 times)	50	50		
Bus ticket from Binh Thuan to Ho Chi Minh (£4.1 / person/time * 3 persons * 2 times)	25	25		
Bus ticket from Ninh Thuan to	28	28		

Binh Thuan province (£4.7/person/time * 3 persons * 2 times)				
Bus ticket from Khanh Hoa to Ninh Thuan province (£4.1/person/time * 3 persons * 2 times)	25	25		
Bus ticket from Phu Yen to Khanh Hoa province (£5.7/person/time * 3 persons * 2 times)	34	34		
Bus ticket from Binh Dinh to Phu Yen province (£5.1/person/time * 3 persons * 2 times)	30	30		
Bus ticket from Quang Ngai to Binh Dinh province (£5.4/person/time * 3 persons * 2 times)	33	33		
Bus ticket from Quang Nam to Quang Ngai province (£5.0/person/time * 3 persons * 2 times)	30	30		
Bus ticket from Ho Chi Minh to Quang Nam province (£14.1/person/time * 3 persons * 2 times)	85	85		
Bus ticket from Thua Thien–Hue to Ho Chi Minh (£18.2/person/time * 3 persons * 2 times)	109	109		
Bus ticket from Quang Tri to Thua Thien–Hue province (£4.7/person/time * 3 persons * 2 times)	28	28		
Bus ticket from Quang Binh to Quang Tri province (£4.7/person/time * 3 persons * 2 times)	28	28		
Bus ticket from Ha Tinh to Quang Binh province (£5.4/person/time * 3 persons * 2 times)	33	33		
Bus ticket from Nghe An to Ha Tinh province (£3.4/person/time * 3 persons * 2 times)	20	20		
Bus ticket from Ho Chi Minh to	125	125		

Nghe An province (£20.8/person/time * 3 persons * 2 times)				
Totals	**4995**	**6431**	**+1436**	**£1,436 from Laboratory of Zoology**

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

Although *P. deauratus* is assessed as Endangered on global scale, some local people have not changed awareness in the conservation of this species due to pressures related to population growth and economic benefits. This species is seriously threatened by hydroelectric dam and overexploitation that is taking place in provinces in the central Vietnam. The success of *P. deauratus* conservation project depends on the direct involvement of the local communities. So, the next step, we will determine the threats, find out the role and value of *P. deauratus* and other endemic species for the local communities to propose appropriate conservation plans.

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 the map which will be donated to National Parks and Nature Reserves in Central Vietnam. We used the logo for our presentation "The distribution of Endangered yellow tail brook barb *Poropuntius deauratus* (Valenciennes, 1842) from coastal river drainages in Central Vietnam" in Rufford Small Grants Conference – Penang, Malaysia 2020 that was mentioned above. The logo was used in the poster to introduce about *P. deauratus* and other indigenous fish in Vietnam to students that was mentioned above.

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

Bich-Thao Thi Vo (team leader) prepares administrative formalities and connects to authorities in Central Vietnam, *P. deauratus* sampling, morphological and molecular taxonomy, data analysis and report writing.

Duy Thuan Nguyen (local people) contacts to local people and collects fish specimens in the rivers and local markets.

Minh Phong Le collects fish specimens, records the geographic coordinate and takes photos of *P. deauratus*.

Duy Thinh Tran supports to collect fish specimens and morphological taxonomy.

Assoc. Prof. Huy Duc Hoang (University of Science, VNU-HCM) is my supervisors in this project who guided me about sampling design, strategic planning for conservation and quality assurance for this project. Undergraduate students at University of Science - VNUHCM assisted in morphological measurement and identification.

12. Any other comments?

We would like to express grateful to The Rufford Foundation for supporting our research in the first step of the *P. deauratus* conservation project in central Vietnam. This project is very significant for local communities in my hometown. Yellow tail brook barb *Poropuntius deauratus* would be pride and potential being flagship species together with other endemic species for local communities. I am preparing proposal for next step to understand the role of *P. deauratus* for the local communities and determine the threats effect to this species. I hope to continue having support from the Fund in the next project to conserve this species.

Figure below: The distribution map of yellow tail brook barb *Poropuntius deauratus* from coastal river drainages in Central Vietnam

0 100 200
km

Võ Thị Bích Thảo
Phòng thí nghiệm Động Vật, Bộ môn Sinh thái và Sinh học Tiến hóa
Trường Đại học Khoa học Tự nhiên Tp. Hồ Chí Minh
bichthao0504@gmail.com