Project Update: August 2023

Progress during period:

Outreach programmes

The sensitisation of local communities, NGOs and government officials was conducted during the timeframe of project. In the programmes the information about the ecological and economic significance of Bengal monitor lizard (*V. bengalensis*) was dissipated among the participants through posters, pamphlets and PowerPoint presentations.

The conducted programmes were interactive, and I could record a lot of locally known information regarding monitor lizards. In Terai Arc Landscape, India there is presence of three monitor lizards namely Bengal monitor, yellow monitor and rarely seen desert monitor, the local community has different theory and perception regarding each species. It is very interesting to note that locally juveniles of Bengal monitor have different name, *bis-kopda*, however adult is known as *Goh*.

In between interactive session I tried to impart the conservation status and ecological benefits of Bengal monitor lizard which was positively received by many. Few locals were negating the scientific facts and persistent regarding the misconceptions.

Following are the glimpse of awareness programme conducted:

A. One-Week Special Course in Wildlife Protection, Law and Forensic Science for Officer Trainees of Indian Revenue Service (Customs & Indirect Taxes) Group- 'A', 73rd Batch' (October 2022)

Fig1. Listing the traded item to officials which was confiscated from airport.

Fig2. Listing the traded item to officials which was confiscated from Southern India.

B. Three-day course on Wildlife Conservation, Identification of Wildlife Part and Forensic Investigation for Customs Officers from National Academy of Customs, Indirect Taxes & Narcotics (NACIN), Jaipur at Wildlife Institute of India, and Dehradun from (December 2022)

Fig3. Explaining the extend of leather industry of monitor lizards.

Fig4. Use of monitor lizard skin for making of musical instrument "Ghummat".

C. Three-day course on Wildlife Conservation, Identification of Wildlife Part and Forensic Investigation for Customs Officers from National Academy of Customs, Indirect Taxes & Narcotics (NACIN), Jaipur at Wildlife Institute of India, and Dehradun from (March 2023).

Fig5. Awareness regarding different extant species of monitor lizard in India.

Fig6. Interactive session with Government officials.

D. Capacity building for Nature guides of Nandhaur Wildlife Sanctuary, Uttarakhand

Fig7. Training session for nature guides of Nandhaur Wildlife sanctuary regarding the ecological benefits of monitor lizards.

E. To **s**tudy the preserved specimen of Monitor lizards visited the reptile collection section at Zoological Survey of India Headquarter Kolkata & Regional center Dehradun.

Fig8. Specimen study at ZSI Dehradun. **Fig9**. Specimen study at ZSI Kolkata.

F. The frequency of poaching activity of monitor lizard in West Bengal, India is increasing hence officers of Sajnekhali, Sundarban Tiger Reserve, West Bengal requested for the awareness material and workshop in their area hence an awareness programme was conducted with the help of assistants for capacity building (January 2023)

Fig10. Mr. Amrit Balan and Mr. Asim explained the conservation status of monitor lizards in West Bengal

Fig11. Mr. Amrit Balan and Mr. Asim conducting awareness program.

G. Presented ongoing work in 17th Uttarakhand State Science and Technology Congress (2022-23). The congress was a gathering of professors, teachers, NGOs, government officials and students from various backgrounds. It was a podium from where I could showcase the pressing need to understand the pressure of poaching and hunting of monitor lizards while listing the management actions.

Fig12. Explaining the condition of injured yellow monitor lizard. **Fig13**. Elucidating the Conservation status of Bengal monitor lizard.

H. Drawing completion was arranged for school children in the village Nathuakhan, Nainital district of Uttarakhand (April 2023). The students were actively involved in the drawing activities and interested in knowing about the behavior of monitor lizards. Prizes and refreshments were distributed after the completion of the programme. The programme was held to build a sense of awareness about monitors among the students.

Fig14. Participants of drawing competition.

Fig15. Explaining the exploitation scenario of Monitor lizard.

Fig16. Explaining the ecological benefits of Bengal monitor Lizard.

Fig17. Teaching the Key morphological features to identify the monitors.

Fig18. Participants of awareness program

The interactive sessions with children regarding the importance of Bengal monitor lizard in ecosystem and the current threats this animal is facing due to poaching and hunting lead village children to open up regarding amazing information about this lizard. These are following:

1. Bengal monitor is majorly confused with chameleon.
2. Participants has only heard about the animal and never seen in wild or nearby area.
3. They reognise the picture of "Hemipenis" in the poster and explained the presence of that material in forest areas.

Children took me to forest and we searched for the material for hours and I found that locals get confused between hemipenis of monitor lizards with the species of fungus i.e. *Morchella esculenta* which is locally known as *Gucchi*. *Gucchi* is known to be one of the most expensive mushrooms, with only 500gm of it costing up to Rs. 18,000 ($217). This fungus is costly due to its presence in only wild areas and it cannot be cultivated. It is picked up by locals and dried for longer shelf life and being sold. The dried *Gucchi* looks like hemipenis of Bengal monitor lizard and there is a chance of selling it in the mixed bag of expensive fungus.

Fig19. *Morchella esculenta* found with the help of children which is being confused with the Hemipenis of monitors

Genetic Sampling

Table 1. Sample location

| S.no.	ID	State	Latitute	Longitute
1	UKVR19	Uttarakhand	30.302281	77.955938
2	UKVR20	Uttarakhand	30.292963	77.953763
3	UKVR21	Uttarakhand	30.306365	77.952397
4	UKVR22	Uttarakhand	30.319691	77.930759
5	UKVR23	Uttarakhand	30.279579	77.973089
6	UKVR25	Uttarakhand	30.281144	77.974791
7	UPVR32	Uttar Pradesh	28.490477	80.647514
8	UPVR33	Uttar Pradesh	28.460769	80.738226
9	UPVR34	Uttar Pradesh	28.489331	80.646927
10	BRVR5	Bihar	27.332678	83.981489
11	BRVR6	Bihar	27.322764	84.013675
12	BRVR7	Bihar	27.320839	83.964236

**Fig20.** Bengal monitor lizards during field survey.

DNA Extraction:
Tissue collected from individuals was stored in 70% ethanol in field. The samples were chopped finely for lysis procedure followed by extraction through Qiagen Blood and tissue kit. The extracted DNA was then quantified through gel electrophoresis.
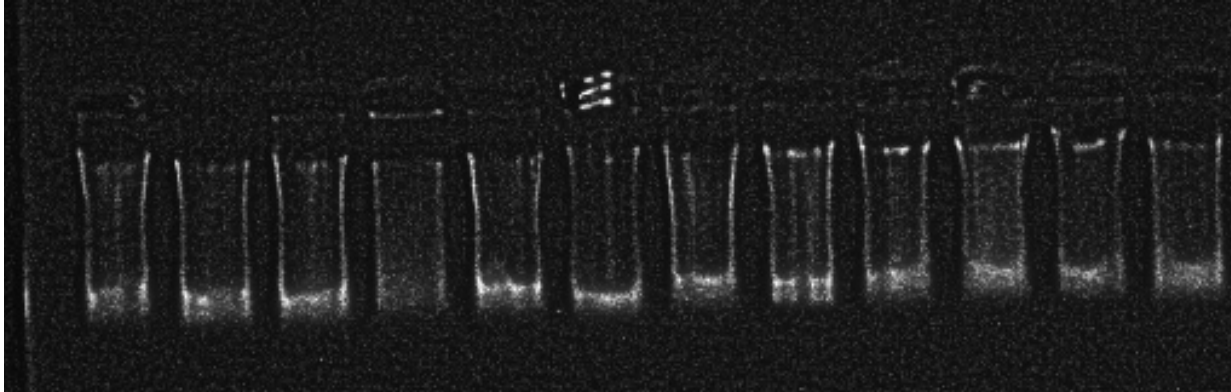
Fig21. Gel image of DNA.

PCR amplification:
Mitochondrial gene Cytochrome *b* (Cyt *b*) and Cytochrome c oxidase subunit *I* (CO*I*) were successfully amplified on a few samples.
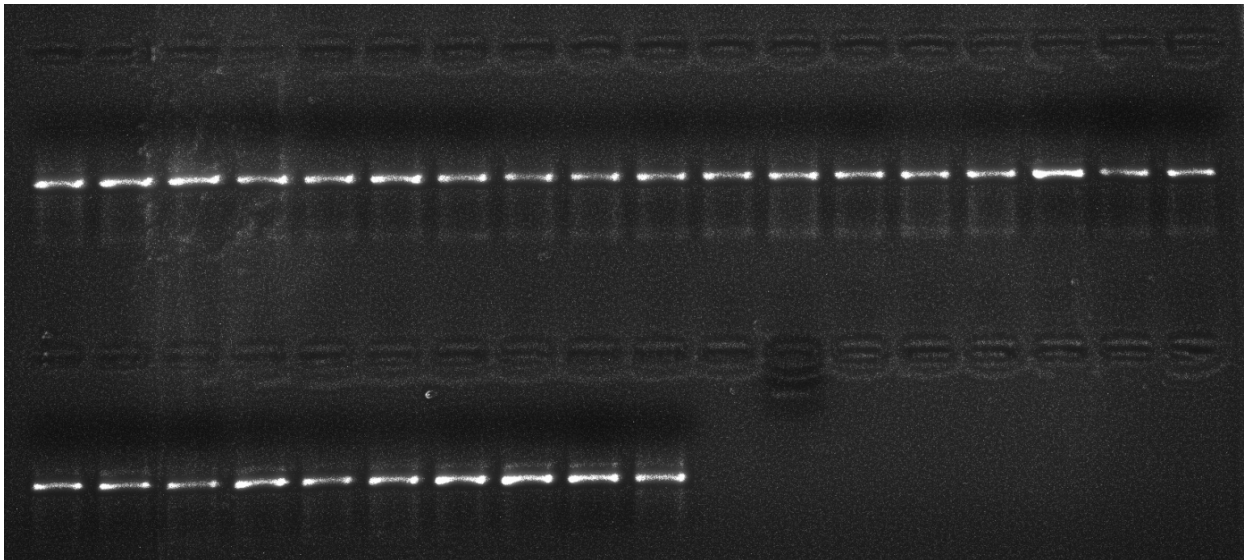
Fig22. Gel image of amplicons

Sequencing:
The amplicons were then used for sequencing through ABI 3500XL. Electropherograms of few samples are attached below-
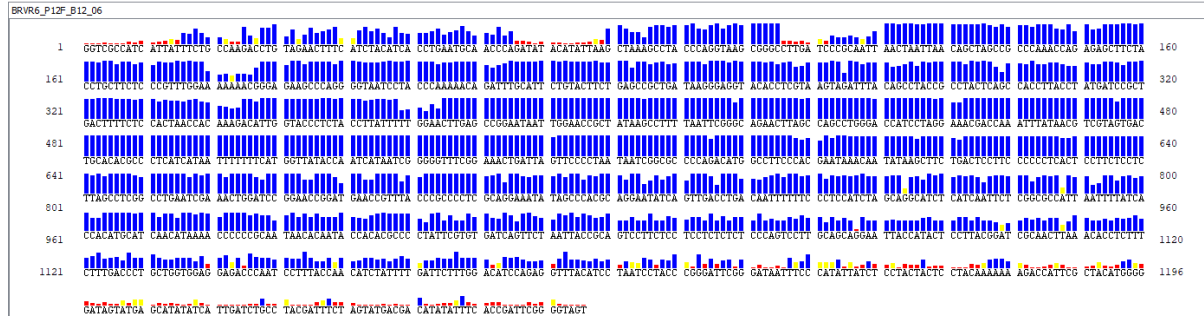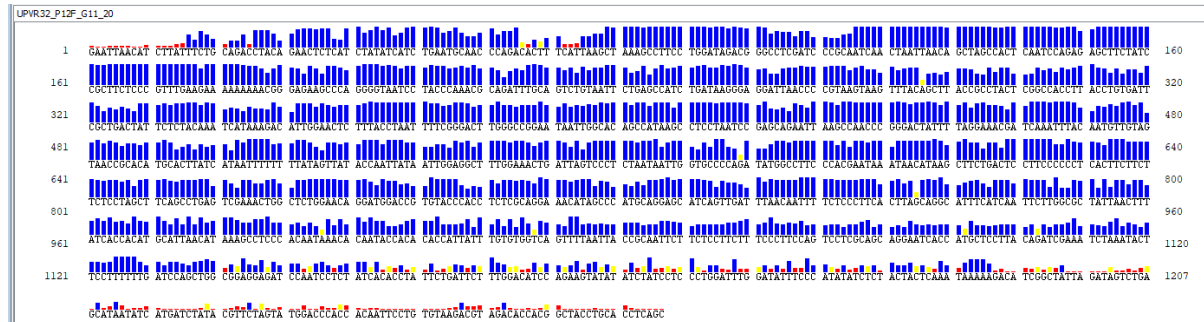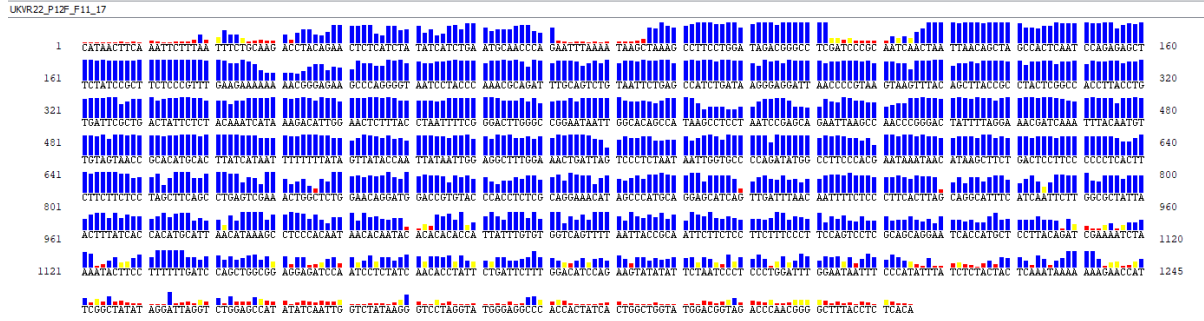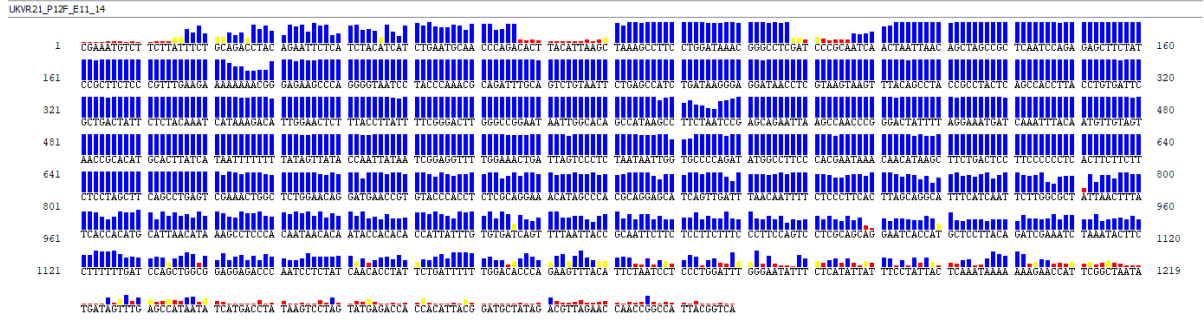
Fig23. Data Analysis: Ongoing