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Salamander Species Involved: Himalayan Newt (*Tylotriton verrucosus* Anderson)

Background

Although India has a rich diversity of amphibians across a variety of ecological habitats, it presents a rather unusual counter intuitive picture of displaying only a single species of salamander– the *Tylotriton verrucosus*. It is however rather surprising, that in spite of its inclusion in the Schedule I of the Indian Wildlife (Protection) Act of 1972, very little is known about its ecology, biology and conservation status of this rare amphibian (Sinha, 2001). Ozoll and Wake (1969), based on the muscle and skeletal studies found the fossil of this genus present in the Mesozoic rock strata, and thus, this species could be considered as a living fossil (Dasgupta, 1992). This study on Himalayan Newt is aimed at answering some evolutionary, behavioral and distributional questions and forming conservation strategies for this endangered species.



One of the most healthy population of Himalayan Salamander found in Darjeeling at Margarate Hope lake.

Objectives

The proposed study has the following broad objectives:

1. To map the distribution of Himalayan salamander and identify the ecological niche of its species
2. To study the ecology of Himalayan salamander in the Eastern Himalayas
3. To assess the genetic variability in Himalayan salamander and develop phylogenetic association with other global salamanders.
4. To assess the threats and develop conservation strategies for the conservation of Himalayan Salamander in the Eastern Himalayas.

Expected outputs

- Identification of probable habitat sites of the Himalayan salamander using Ecological Niche Models.
- Development of phylogenetic association of the Himalayan salamander with other species of salamanders
- Baseline information on abiotic and limnological variables within spawning grounds used by salamanders.
- Information on reclaiming of amphibian spawning sites that have become degraded.
- Awareness about conserving local water reserves, also called “stows” or “Dynamic ecological sites” or known locally as “sims” and other natural resources, amongst the resident local communities.
- Based on the variability patterns, efforts will be made to formulate appropriate conservation strategy for *in situ* and *ex situ* conservation of Himalayan salamander.

Field Methods and analysis: Following methods will be used for sampling of the amphibians. a) Visual Encounter Surveys (VES) and b) Patch sampling and Random quadrat sampling. The data collected from the field will also be used to identify the ecological niche using the Ecological niche models (ENM) such as GARP, DIVA-GIS etc. The data generated during the study will be analyzed using different computer packages and statistical software such as R, Biodiversity Pro, EstimateS 7.0 and Microsoft excel. Appropriate statistical tests be used.

Budget

S N	Items	Amount USD	Remarks
1	Field expenses/ Transportation	400	Includes travel, daily allowances and all other expenses during the field work
2	Workshops, trainings and meetings	200	
3	Field supplies (note book, data sheets, paper, herbarium sheet, blotting paper, field guides and reference materials, leech guards, Photo films and processing, batteries)	300	Field equipment if any
4	Publication of educational materials	100	
5	Contribution from other sources if any	1000	ATREE conservation genetic lab (for genetic work)

Proposed Activities

Work/ Months	1	2	3	4	5	6	7	8	9	10	11	12
Preliminary survey and selection of sampling sites	*											
Regular field sampling		*	*	*	*							
Workshops and awareness						*	*					
Ex - situ conservation planning								*	*			
Data analysis and report preparation										*	*	
Report submission												*

Barkha Subba: Worked as Research Fellow from 2007 to 2009 at Padmaja Naidu Himalayan Zoological Park, in a project “Standardization of Records Keeping in Indian zoos and marking animals for Identification” and also did a preliminary habitat study of the Himalayan salamander during the same period for their efficient ex- situ conservation.