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**PROPOSAL FOR STUDY OF ANTI-SNAKE VENOM SERUM REQUIREMENTS AND ASSOCIATED
SCIENTIFIC, RESEARCH AND HUSBANDRY CONSIDERATIONS IN THE INDIAN SNAKEBITE TREATMENT
CONTEXT**

Time frame:

This study will be carried out over a period of four months. The final report will be submitted one month after completion of the study.

Scope:

The scope of this study, as understood by us, is as follows:

- Current production statistics of polyvalent anti-snake venom serum (ASV) in India
- Current polyvalent anti-snake venom serum (ASV) requirements in India
- Review standard snake husbandry protocols
- Population distribution of medically important snakes in India
- Prevailing methods of capture of these snake species
- Analyze results and methodologies for release and post-release monitoring of snakes
- Literature searches and analysis of recommendation for effective use of polyvalent anti-snake venom serum (ASV)
- Review of practices of storage and handling of venom samples as well as polyvalent antisnake venom serum (ASV)
- A region-wise overview of the snakes of medical importance in India
- Humane and effective capture, husbandry, extraction, and release protocols/techniques
- Venom extraction methods to maximize yield and minimize discomfort to the snakes
- Literature review and summary of the status of snake catching communities in India
- Suggestions and recommendations for further research required

Methodology:

1. Questionnaires to be sent to anti-snake venom serum (ASV) producers to ascertain production statistics, venom requirements.
2. Semi structured interviews with venom producers to collect information on venom production statistics, husbandry practices currently in use, venom extraction methods in use, and prevailing practices for capture, venom processing, storage and transport.
3. Literature reviews and consulting with experts in the field to compile and analyze best practices of venom extraction and storage, snake husbandry, and clinical protocols for the effective use of anti-snake venom serum (ASV).
4. Collect and collate data, via indirect methods (email, internet, etc.), of snake populations and bite statistics in India, use data to create a map of region-wise incidence of snakebite in this country.

5. Direct interview with researchers who have published reports and papers on the status of snake catching communities in India.
6. Interviews and data collection from international experts on post-release monitoring strategies such as radio-telemetry and mark-recapture techniques in order to assess the impact of collecting snakes for venom extraction and to formulate a set of best practices specifically tailored for the Indian context.
7. Basic market research into the anti-venom industry in India with specific reference to conservation implications

Deliverables:

The deliverables, to be finalized and submitted one month after the completion of the study, will be a comprehensive report covering:

1. Current status of venom and anti-snake venom serum (ASV) production in India with analysis and recommendations for the current requirements of anti-snake venom serum (ASV) in India and the corresponding amount of venom required to be produced
2. Best practices for venom extraction to maximize yield and minimize stress to the animal
3. International snake husbandry techniques specific to the Indian context that will help reduce mortality and morbidity of snakes in captivity
4. Protocols for venom storage, processing and transport that will ensure effective maintenance of venom enzymes and proteins and prevent breakdown of vital components.
5. Map of region-wise incidence of snakebite in India
6. A review and statistical analysis of region-wise snake rescues in India, by species, state and medical significance.
7. Compilation of best practices for the clinical use of anti-snake venom serum (ASV) that will promote judicious use of anti-snake venom serum (ASV) in the clinical setting to help reduce acute and chronic anaphylactic reactions which are currently a serious concern in India.
8. Overview of the status of snake catching communities in India with regard to their economic status, expertise, and the potential for their involvement in the scientific extraction of venom for the production of anti-snake venom serum

BUDGET ESTIMATE

Budget Item	Total Cost (INR)	CZA Contribution Requested
Salary	120,000.00	120,000.00
Travel	109,000.00	109,000.00
Accommodation	37,500.00	37,500.00
Communications and services	10,000.00	10,000.00
Printing and publishing	8,000.00	8,000.00
Misc and contingency	10,000.00	10,000.00
TOTAL	284,500.00	284,500.00
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Budget Notes:

Salary:

Salary for researcher = Rs. 30,000/month x 4 months

Sub Total for Salary: Rs. 120,000

Travel:

Travel = 1. Travel to venom producers in Tamil Nadu (Rs. 5000 – train)

2. Travel to venom producers in Madhya Pradesh (Rs. 15,000 – air + train)

3. Travel to antivenom producers in Mumbai (Rs. 10,000 – air + train)

Hyderabad (Rs. 12,000 – air + taxi)

Pune (Rs. 15,000 air + taxi)

Calcutta (Rs. 17,000 air + train)

4. Travel to Delhi to evaluate situation of snake charmers by interviews = Rs. 15,000 (air + taxi)

5. Local transport= Rs 20,000

Sub Total for Travel – Rs. 109,000.00

Accommodation and food:

Rs. 1,500 per day x 25 days = Rs. 37,500

Communications and services:

Costs of fax, internet and printing for project = Rs. 10,000

Printing and publishing:

Cost of printing and publishing report in soft copy with 10 hard bound copies = Rs. 8,000

ANNEXURE I – BUDGETARY JUSTIFICATION

Salary:

Principal Investigator – Samir Whitaker

Consultant – Romulus Whitaker

Qualifications of the PI and Consultant

Principal Investigator - Samir Whitaker:

Samir Whitaker has a Bachelor's of Biotechnology from Griffith University in Australia, and a Master's Degree in toxicology. He is currently Technical Advisor the Irula Snake Catchers Industrial Cooperative Society (ISCICS), Tamil Nadu and has published in peer reviewed journals on the subject of snakebite in India. Samir is currently field and technical advisor to the British Broadcasting Corporation (BBC) for their documentary on snakebite prevalence and treatment in India and is currently co-authoring a paper for the World Health Organization (WHO) on the need for geographically specific antivenom serums in India.

Consultant - Romulus Whitaker:

Romulus Whitaker has authored numerous peer reviewed scientific papers on snakebite treatment, antivenom production and snake husbandry in the Indian context. He set up, ran and then advised the ISCICS, the most successful Indian venom producer since its inception in 1978.

Travel, Accomodation and other Services:

Travel, accommodation and other expenses are forecasted based on current market rates – all airfares are for economy class tickets and all train fares are either for A/C chair car and/or 2-Tier A/C.