

***Ethnomedicinal use of different wild plants used by the folklore practitioners of Tripura in the treatment of Snake bite***

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**ABSTRACT**

Due to remoteness, inaccessibility and closed culture tradition, vast body of ethnobotanical knowledge has remained largely unexplored. The folklore practitioners of Tripura were studied for the use of different wild plant species in their herbal formulations for the treatment of snake bite. Snake bite is a global problem and more acute in the tropical region of the world including Tripura. Snake bite is a serious issue in rural health due to their high mortality. The venomous snakes are responsible for serious damage of local tissues and sometimes fatal in victims. The ethnomedicinal information includes the use of various wild plant species along with their mode of administration which is extensively used by the folklore practitioners of this region. The present investigation makes an effort to accumulate necessary information on ethnic plant species that are available in wild and used for snakebite treatment in Tripura. From continuous literature survey and on the basis of available information collected during the study have been compiled with emphasis on the plants, botanical name, family, parts used, mode of application, mode of treatment etc., which might be a platform for the budding stat ups working towards the modernization of traditional methodologies in health care to explore opportunities in synergy with advanced medicine delivery depending on the acquired knowledge.

**Keywords:** Folklore Practitioner, Snake bite, herbal formulation, Ethnomedicinal use, Wild plants, Tripura

**Introduction:**

India has a long history of using medicinal plants in traditional medicine systems. The traditional systems of Indian medicines depend solely on herbal and plant products of various forms such as powder, extracts, decoctions practiced since the Vedic period. The ancient Indian script the Atharvaveda (1600-1000 BC) describes various traditional herbal drugs. Apart from conventional traditional use, the importance of medicinal plants has increased tremendously in last few years throughout the world. Scientists realize its value in health sector and have

developed feasible protocol for identification of their bioactive components and technology for large scale synthesis suitable for modern pharmaceutical industry.

Tripura is bestowed with different agro-climatic zones and very rich in regards to its floral and faunal genetic resources which makes the region as one of the mega biodiversity hot spot in the country. At the same time due to the destructive activities of humans like rapid deforestation of these forests for urbanization, over exploitation of forest products, expansion of agricultural activity etc dramatically influenced the environment and these often create human animal conflict. Environmental issues are central to the political, social, economic and moral challenges of the 21<sup>st</sup> century; therefore, a complete knowledge about these issues is necessary for administrators as well as for the common man, not only for their proper understanding but also for the planning and sustainable development.

There are numerous species of venomous and non venomous snakes found in the forest as well as semi urban areas of Tripura. Snakebites represent a severe medical, social, and economic challenge in this region as there are large numbers of venomous snakes are found in the forest and mountain region where access to the treatment is limited. Folklore medicine practice is very popular among the ethnic people of Tripura for health care system including snake bite. The most common poisonous snakes are Keute saap (*Bungarus caeruleus*), Shankhamoni (*Bungarus fasciatus*), Fanok (*Ophiophagus hannah*), Jinlapura saap, Gokhera saap (*Naja naja*), Darash (*Ptyas mucosus*), Laudanga saap (*Trimeresurus albolabris*), etc. Venomous snake bites can cause local tissue injury, coagulopathy, cardiotoxicity, systemic paralysis, hemorrhage, renal damage and failure to the patient. Even venomous snake bites can be fatal if it is not treated immediately. The folklore practitioners are owned the knowledge on the use of various wildly available medicinal plants in the treatment of snakebite from their ancestor. They have a deep belief in their native traditional medicine for remedies and depend exclusively on their own herbal cure.

### **Methods and Methodology**

The study was conducted among the ethnic people of Tripura mainly inhabitant of Barmura hills and nearby area like Ampinagar, Taidu, Gamakupara village, Tetoibari, Karvu, Jantranapara, Baishamani. The length of Jampui hill is 74 k.m and the length of Barmura-Devatamura hill is 47 km. The main inhabitant of this area are Lushai tribes, Reang, Molsom, Debberma, Kaipeng, Chakma and Uchoi tribes.

Traditional uses of ethno botanical plants information was obtained by oral interviews from folklore practitioners of the study area. A total of 15 selected folklore practitioners were interviewed, 13 were male and 2 female. The age of the healers was between 50 - 90 years. The plant specimens were identified according to different references concerning the medicinal plants

of Tripura and North East India and further confirmed by the taxonomist from Botany Department of Assam down town University.

## Result and Discussion

This investigation will help students, future researchers to understand various approaches to treat snakebites. Data obtained from the present study are recorded in Table: 1. A total of 29 wild plant species are belonging to 17 families have been reported and documented for the treatment of snakebite. However, this effort applies only an attempt to compile the important medicinal plants which are available in wild and are frequently used in the treatment of snakebite poisoning in Tripura. Acoraceae, Fabaceae, Liliaceae, Aristolochiaceae, Meliaceae, Asclepiadaceae, Caesalpiniaceae, Vitaceae, Zingiberaceae, Araceae, Solanaceae, Liliaceae, Lamiaceae, Musaceae, Apocynaceae, Piperaceae, Euphorbiaceae, Verbenaceae are the most significant families from where the plants were reported during the study. The folklore practitioners used to apply paste of these medicinal plants on the injured area or oral application of plant extracts and leaves juice as an antidote to the patient.



Fig: Interaction with the Folklore practitioners



Fig: Interaction with the village people



Fig: Study area

**Table I: List of indigenous plants used in the treatment of snake bite**

<i>Serial No.</i>	<i>Botanical Name</i>	<i>Family</i>	<i>Parts used</i>	<i>Mode of Treatment</i>	<i>Mode of Application</i>
1	<i>Acorus calamus</i> Linn	Acoraceae	Rhizome	External	Paste
2	<i>Adhatoda vasica</i>	Acanthaceae	Inflorescence	External/ Internal	Paste/ Juice
3	<i>Albizia chinensis</i> (Osbeck)Merr	Fabaceae	Bark	External	Paste
4	<i>Aloe vera</i> L.	Liliaceae	Whole Plant	Internal	Juice
5	<i>Andrographis paniculata</i> (Burm F) Wall.	Acanthaceae	Leaves	External	Decoction
6	<i>Aristolochia indica</i> L	Aristolochiaceae	Leaves	External	Paste
7	<i>Azadirachta indica</i> A. Juss.	Meliaceae	Flower	Internal	Decoction
8	<i>Bombax ceiba</i> Linn.	Bombacaceae	flowers/fruits/ leaves	External	Paste
9	<i>Calotropis gigantea</i> L.R.Br	Asclepiadaceae	Roots	Internal and External	Paste
10	<i>Cassia fistula</i> Linn	Caesalpiniaceae	Bark, Leaves	External	Paste
11	<i>Cassia tora</i> L.	Caesalpiniaceae	Seeds	Internal	Decoction
12	<i>Cissus quadrangularis</i> L.	Vitaceae	Leaves	Internal	Paste
13	<i>Curcuma angustifolia</i> Roxb	Zingiberaceae	Rhizome	External	Paste
14	<i>Colacasia</i>	Araceae	Stem	Internal	Juice
15	<i>Datura metel</i> L.	Solanaceae	Roots	Internal	Paste
16	<i>Gloriosa superba</i> L	Liliaceae	Tuber	External	Paste
17	<i>Hemidesmus indicus</i> L.	Asclepiadaceae	Root	Internal	Juice
18	<i>Homalomena aromatica</i>	Araceae	Root /Leaves	Internal	Juice
19	<i>Leucas aspera</i> (Willd) Link.	Lamiaceae	Leaves	Internal	Juice
20	<i>Moringa oleifera</i> Lam	Moringaceae	Bark, Root	Internal and External	Extracts
21	<i>Musa paradisiaca</i> Linn.	Musaceae	Whole plant	Internal	Extract
22	<i>Nerium oleander</i> L.	Apocynaceae	Seeds	External	Paste

23	<i>Piper nigrum L.</i>	Piperaceae	Seeds	Internal	Juice
24	<i>Rauvolfia serpentina L.</i>	Apocynaceae	Roots	External	Paste
25	<i>Rauvolfia tetraphylla</i>	Apocynaceae	Fruits	External	Paste
26	<i>Ricinus communis L.</i>	Euphorbiaceae	Seeds	Internal	Paste
27	<i>Salvia officinalis L</i>	Lamiaceae	Flower	External	Paste
28	<i>Typhonium trilobatum</i>	Araceae	Leaves	Internal	Juice
29	<i>Vitex trifolia L.F</i>	Verbenaceae	Leaves	Internal	Juice

### **Conclusion:**

We reported - species namely *Acorus calamus*, *Adhatoda vasica*, *Albizia chinensis*, *Aloe vera*, *Andrographis paniculata*, *Aristolochia indica*, *Azadirachta indica*, *Bombax ceiba*, *Calotropis gigantean*, *Cassia fistula*, *Cassia tora*, *Cissus quadrangularis*, *Curcuma angustifolia*, *Colacasia sps*, *Datura metal*, *Gloriosa superb*, *Hemidesmus indicus*, *Homalomena aromatic*, *Leucas aspera*, *Moringa oleifera*, *Musa paradisiacal*, *Nerium oleander*, *Piper nigrum*, *Rauvolfia serpentine*, *Rauvolfia tetraphylla*, *Ricinus communis*, *Salvia officinalis*, *Typhonium trilobatum*, *Vitex trifolia* etc which are used in the treatment of snake bite. The present paper deal with the ethnomedicinal information includes 29 wild plants, useful parts of plants and mode of administration practiced by the folklore practitioners. Many people still depend on herbal formulations and relay on folklore practitioners for the cure of snake bite poisoning and hardly consult a physician or a recognised Practitioner. But the folklore practitioners are on the decline because the younger members of the tribe have started moving towards the urban areas and are not willing to practice this form of medicine. There is danger that the knowledge of these wild medicinal plants will also die with them. It is therefore, necessary to document the plants and take efficient steps to conserve them. The budding start ups can take it to the lab testing and explore if the chemical compound of the plans is efficient enough to treat snake bite patients and establish as an alternative or main stream medicine to cure snake bite patients.



A



B



C



D



E



F



G



H



I



J



K



L

(A. Inflorescence of *Musa paradisiaca* B. Leaves of *Centella asiatica* C. Flowers of *Adhatoda vasica* D. Fruits of *Piper nigrum* E. Stem of *Andrographis paniculata* F. Stem of *Alocasia* G. *Typhonium trilobatum* plant H. *Rauvolfia serpentina* plant I. *Acorus calamus* plants J. Rhizomes of *Gloriosa superba* K. Fruits of *Rauvolfia tetraphylla* L. *Homalomena aromatica* plants)

## **Acknowledgements**

I am very much grateful to Assam down town University, Panikhaiti, Guwahati, Assam and State Drug Testing Laboratory, AYUSH, Govt. of Assam and Govt. Ayurvedic College, for providing necessary laboratory facilities for carrying out this research work.

## **Conflict of Interest**

Authors declare that they do not have any conflicts of interest.

## **Reference**

1. A. Dey and J. N. de, "Phytopharmacology of antiophidian botanicals: A review," *International Journal of Pharmacology*, vol. 8, no. 2, pp. 62–79, 2012.
2. A. Jain, S. S. Katewa, S. K. Sharma, P. Galav, and V. Jain, "Snakelore and indigenous snakebite remedies practiced by some tribals of Rajasthan," *Indian Journal of Traditional Knowledge*, vol. 10, no. 2, pp. 258–268, 2011.
3. Asuzu IU, Harvey AL. The Anti-snake venom activities of Parkiabiglobosa (Mimosaceae) stem bark extract. *Toxicon*. 2003; 42:763-8
4. Balakrishnan V, Prema P, Ravindran C, Philip Robinson J. Ethnobotanical studies among villagers from Dharapuramtaluk, Tamil Nadu, India. *Global J Pharmacol*. 2009; 3(1):8-14.
5. Basha SK, Sudarsanam G. Traditional use of plants against snakebite in Sugali tribes of Yerramalais of Kurnool district, Andhra Pradesh, India. *Asian Pac J Trop Biomed*. 2012; 2(2):575-579.
6. C. P. Kala, "Herbal treatment for snakebites in Uttarakhand state of India," *Indian Journal of Natural Products and Resources*, vol. 6, no. 1, pp. 56–61, 2015
7. J. Boldrini-Franc,a, C. Correa-Netto, M. M. S. Silva et al., "Snake ^ venomics and antivenomics of Crotalus durissus subspecies from Brazil: Assessment of geographic variation and its implication on snakebite management," *Journal of Proteomics*, vol. 73, no. 9, pp. 1758–1776, 2010.
8. K. S. Murthy, P. C. Sharma, and P. Kishore, "Tribal remedies for snakebite from Orissa," *Ancient Science of Life*, vol. 6, no. 2, pp. 122-123, 1986

9. M. S. Santhosh, M. Hemshekhar, K. Sunitha et al., "Snake venom induced local toxicities: plant secondary metabolites as an auxiliary therapy," *Mini-Reviews in Medicinal Chemistry*, vol. 13, no. 1, pp. 106–123, 2013
10. M. A. Butt, M. Ahmad, A. Fatima et al., "Ethnomedicinal uses of plants for the treatment of snake and scorpion bite in Northern Pakistan," *Journal of Ethnopharmacology*, vol. 168, pp. 164–181, 2015.
11. M. H. H. B. Asad, M. T. Razi, Durr-e-Sabih et al., "Anti-venom potential of Pakistani medicinal plants: inhibition of anticoagulation activity of *Naja naja karachiensis* toxin," *Current Science*, vol. 105, no. 10, pp. 1419–1424, 2013.
12. M. Prabu and R. Kumuthakalavalli, "Folk remedies of medicinal plants for snake bites, scorpion stings and dog bites in Eastern Ghats of Kolli Hills, Tamil Nadu, India," *International Journal of Research in Ayurveda and Pharmacy*, vol. 3, no. 5, pp. 696–700, 2012
13. M. N. Hasan, M. N. K. Azam, M. N. Ahmed, and A. Hirashima, "A randomized ethnomedicinal survey of snakebite treatment in southwestern parts of Bangladesh," *Journal of Traditional and Complementary Medicine*, vol. 6, no. 4, pp. 337–342, 2015
14. N. Thangavel and J. K. Gupta, "Anti-inflammatory and antisnake venom activity of *Andrographis stenophylla* leaf," *Asian Journal of Chemistry*, vol. 19, no. 2, pp. 1307–1312, 2007.
15. P. J. Houghton and I. M. Osibogun, "Flowering plants used against snakebite," *Journal of Ethnopharmacology*, vol. 39, no. 1, pp. 1–29, 1993.
16. P. A. Shenoy, S. S. Nipate, J. M. Sonpetkar, N. C. Salvi, A. B. Waghmare, and P. D. Chaudhari, "Anti-snake venom activities of ethanolic extract of fruits of *Piper longum* L. (Piperaceae) against Russell's viper venom: characterization of piperine as active principle," *Journal of Ethnopharmacology*, vol. 147, no. 2, pp. 373–382, 2013
17. S. Sarkhel, "Ethnobotanical survey of folklore plants used in treatment of snakebite in Paschim Medinipur district, West Bengal," *Asian Pacific Journal of Tropical Biomedicine*, vol. 4, no. 5, pp. 416–420, 2014.
18. WHO, *Guidelines for the Production, Control and Regulation of Snake Antivenom Immunoglobulins*, WHO Press, Geneva, Switzerland, 2010.

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