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Traditional herbal drugs - Commonly used in Snake bite Management - An Update

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ABSTRACT

Due to the advent of modern technologies and methodologies, the lineage of practitioners has been discontinued for the present and upcoming generations, as a result of which the ancient knowledge is at the verge of extinct. Thereby, resulting in loss of sacred ancient knowledge of *Visha Chikitsa,* which was formulated and passed on to several generations by our ancient researchers. As the folklore practitioners failed in documenting the theories due to illiteracy, modern era has failed in gaining the precious sacred knowledge. Need for documentation and setting a medical standard to these practices is high, to give a dignified touch to the practices. Herbal drugs are to be made available in the modernized capsule, tablets or powder form with more palatability, easy availability, and long shelf life. So that victims at any corner of the world can make the best use of it and attain the profit to the maximum extent. Resources for the preparation of medicaments are at the verge of extinct due to deforestation, natural calamities and modernized polluted environment. Government should take up the responsibility to nurture, promote and propagate the ideas and medications in order to make the best use of naturally available healing techniques.

Key words: Snake bite, toxicology, folk medicine, traditional medicine, Ayurveda

INTRODUCTION

Most snake bites are inflicted on the lower limbs of farmers, plantation workers, herdsmen and hunters. Usually, the snake is trodden on at night or in undergrowth. Snakes do not bite without provocation, but there may be an inadvertent tread or touch. Seasonal peaks in the incidence of snake bite are associated with agricultural activities, such as ploughing, or to fluctuation in the activity or populations of venomous snakes. Severe flooding, by concentring the human and snake populations, has given rise to epidemics of snake bite in Colombia, Pakistan, India, Bangladesh and Vietnam. Penetration of jungle areas during construction of new highways, and irrigations and hydroelectric schemes may also be other cause.

There are more than 2000 species of snakes in the world and about 216 species in India; of which, about 50 are poisonous. Global estimates suggest that 30,000 - 40,000 persons die each year from venomous snake bite, but this range is likely an under estimated because of incomplete reporting.[1]

SNAKE VENOM

Venom is the saliva of the snake. Cobra venom is faint transparent yellow and is slightly viscous. Venoms of different species of poisonous snakes vary in toxicity, composition and antigenic structure. It is basically a mixture of toxalbumins and enzymes in varying proportions. The enzymatic component cause local and systemic effects and the non-enzymatic compounds provide lethality.

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Toxic enzymes like Proteolytic, Fibrin, Neurotoxins, Cholinesterase, Haemolysins, Cardiotoxin, Cytolysins, Agglutinins, Lecithinases, Phospholipase, Phosphotidase, Proteinases, Hyaluronidase, Protease, Ophioxidase, Protease, Biological amines, Enzymes, Peptides and Polypeptides are commonly found in snake venom.[2]

Antivenom types

They are basically classified as;

1. Monovalent type - when they are effective against a given species venoms.
2. Polyvalent type - when they are effective against a range of species or several different species at the same time.[3]

Adverse reaction of Anti Venom Therapy

1. Anaphylactic reaction (difficulty in breathing and swallowing, Redness of skin, Swelling of eyes and face, unusual tiredness or weakness).
2. Serum sickness (Enlargement of lymph gland, Fever, Inflammation of joints).
3. Pyrogen reaction - Due to increased concentration of non-immunoglobulin proteins available as hyperimmune antivenom.[4]

Herbal antidote for snake bite

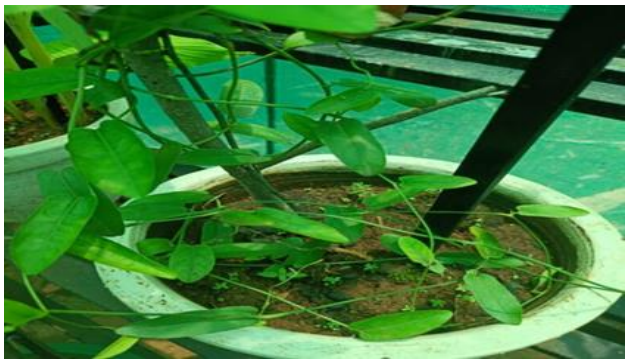
1. *Ishwari*

Botanical name - *Aristolochia indica*

Family - Asteraceae

Common name - *Ishwari*

Figure 1: *Aristolochia indica*



Part used - Root

Uses - Blood purification, Diuretics.

Anti-venom activity - Root extracts contains aristolochic acid, which contains strong gelatinolytic, collagenase, peroxidase and nuclease activities together with l - aminoacid oxicides and protease inhibitory potencies. Presence of starch branching enzymes is the major constituent of the extract. It produces no acute and sub chronic toxicity in animal at lower doses, but causes liver and kidney damage in high doses. Strong inhibition of L -aminoacid oxidase may give partial relief from snake bite after topical application of the extracts.[5]

2. *Bhoonimba*

Botanical name - *Andrographis paniculate*

Family - *Acanthaceae*

Common name - *Kalamegha*

Figure 2: *Andrographis paniculate*

Part used - whole plant

Uses - Blood purification*, Kaphapittahara , Krimighna, Kushtaghna*, depigmentation of skin, activates liver.

Antivenom activity - It provides some protection against the lethal dose of venom. Certain naturally occurring substances such as sitosterol, Pentacyclic terpines, nitro compounds, cinnamic acid derivatives, Curcuminoids, polyphenolic compounds and flavonoids are known compounds possessing protein binding and enzyme inhibiting properties. The leaf of this plant contains andrographolide, the active

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constituent of which is diterpene and is responsible for ASV property by modifying the actions of proteins and enzymes also inhibit snake venom phospholipase A_2 activites.[6]

3. *Shigru*

Botanical name - *Moringa oleifera*

Family - *Moringaceae*

Common name - *Nugge soppu*

Figure 3: *Moringa oleifera*

Part used - Leaf, fruit

Uses - Blood purifier, *Kushtaghna, Krimighna*

Anti-venom activity - It contributes to the neutralizing effect of snake venom action. Alkaloids and flavonoids have inhibitory effects of snake venom toxins. Direct interaction with catalytic sites of enzymes or with metal ions which are essential for enzymes activities may be involved. Ethanol extracts of this plants has antivenom properties by the pathologies induced by N. nigricolis venom.

This plant can be used as first aid treatment or in combination with antivenom for the treatment of snake bites. Active compounds of this plant are responsible for their mechanism of action.[7]

4. *Lajjalu*

Botanical name - *Mimosa pudica*

Family - *Leguminaceae*

Common name - *Nachike mullu*

Figure 4: *Mimosa pudica*

Part used - Root, whole plant

Uses - Wound healing, reduces swelling, diuretic.

Antivenom activity - Mahanta M conducted research on dried root extracts of *Mimosa pudica* to show the antivenom property. The result shows that it has the ability to inhibit the myotoxicity due to Naja kaouthia venom. Aqueous root extract of *Mimosa pudica* dose dependently inhibited the hyaluronidase and protease activities of Indian snake venom. Aqueous and alcoholic extracts of dried roots of *Mimosa pudica* were tested for their inhibitory activity on lethality, myotoxicity and toxic enzymes of Naja kaouthia venom. The aqueous extract, particularly the normal water extract, shows significant, inhibitory effect on the lethality, myotoxicity and tested enzyme activities of venom compared with alcoholic extracts. The present findings suggest that an aqueous extract of *Mimosa pudica* root possesses compounds, which inhibit the activity of cobra venom.[8]

5. *Paatha*

Botanical name - *Cyclea peltate*

Family –*Menispermaceae*.

Common name – Padavali

Part used - Root, stem

Uses - Detoxification, anti-poisonous, wound healing, Medicine against insect bite.

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Anti-venom activity - Root extracts of this plant where efficiently deactivated the venom lethality of N. naja and effective dose remained to be 7.24 mg/3LD_{50} of N. naja venom it is effective in counter acting all the lethal effects of venom. The compounds such as tetra decanoic and octadecadienoic acid have neutralizing properties on N. naja venom. The result from ex-vivo and in-vivo analysis indicates that it possesses above compounds, which can counter act the toxins present in naja venom.[9]

Figure 5: *Cyclea peltate*

6. *Sarpagandha*

Botanical name - *Rauwolfia serpentina*

Family - *Apocynaceae*

Common name - Sarpagandha

Figure 6: *Rauwolfia serpentina*

Part used - Root

Uses - Reduces blood pressure, induces sleep, wound healing property, Reduces anxiety

7. *Saarvathi*

Botanical name - *Cordia macleodii*

Family - *Boraginaceae*

Common name - Bili challe

Figure 7: *Cordia macleodii*

Part used - Root

Uses - Wound healing, activates liver.

Anti-venom activity - Flavonoids have anti-inflammatory, anti-histaminic, anti-bradykinin and anti-serotonin properties. It provides protectives effect shown by this plant against snake venom poisoning through its above properties. Bark is being successfully used for the treatment of snake bite in some part of India.[10]

CONCLUSION

Several medical emergencies like snake bite can be dealt with pharmacological investigations of the folklore medicines. WHO documented that 80% of the world population rely on plant based medicines for their primary health care. If the tribal sacred knowledge of plants are utilized scientifically, mankind will be benefited. Many countries have started documentation, cultivation scientific evaluation and sustainable utilization of medicinal flora used by traditional people. It is high time for us to exercise and

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propagate our ethnic knowledge against human mortality and morbidity.

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