INTRODUCTION

The mortality rate associated with snake bite is quite high in certain regions of the world. The poisonous group of snakes includes Ophiophagus Hannah (king cobra), Naja naja (spectacled cobra), Daboia russelli (Russell’s viper), and Caryophis caeruleus (common krait) and Echiscarinatus (saw-scaled viper).¹ The present article is a review on snake venom, snake bite management, anti venom types, side effects of serum therapy and herbal antidote.

Snake venom

Snake venom is highly modified saliva containing zootoxins used by snakes to immobilize and digest prey or to serve as a defence mechanism against a potential predator or other threat. The venom produced by the snake’s venom gland apparatus is delivered by an injection system of modified fangs that enable the venom to penetrate into the target.²,³ The glands that secrete the zootoxins are a modification of the parotid salivary gland found in other vertebrates and are usually situated on each side of the head, below and behind the eye and encapsulated in a muscular sheath. The glands have large alveoli in which the synthesized venom is stored before being conveyed by a duct to the base of channelled or tubular fangs through which it is ejected.⁴,⁵

Snake Bite Treatment

Two important aspects in snake bite management

1. Proper first aid,
2. Anti venom serum therapy

Proper first aid using herbal formula can effectively reduce the fatalities due to snake bites.

Anti venom Types

Anti venoms basically classified as

- Monovalent type (when they are effective against a given species’ venom)
- Polyvalent type (when they are effective against a range of species or several different species at the same time)¹

Side Effects of Antivenom Therapy

- anaphylactic reaction (difficulty in breathing and swallowing; itching; redness of skin; swelling of eyes and face; unusual tiredness or weakness),
- serum sickness (enlargement of lymph glands; fever; inflammation of joints),
- pyrogen reaction due to increased concentration of non-immunoglobulin proteins available as hyper-immune antivenom.⁶

Anti venom for different species of snake

Herbal Antidote

Anti venom activity in herbal plants

Turmeric

Scientific name: Curcuma longa
Family: Zingiberaceae
Common name: curcuma, ukon, kunir
English name: Turmeric
Parts used: Root, Rhiz
Uses: skin cancer, Rheumatoid arthritis, Hepatitis

Antivenom Activity

Ferreira conducted a research on a potent antivenom against snake bite. The fraction consisting of ar-turmerone, isolated from C.longa L., has the ability to neutralise both the hemorrhagic activity and lethal effect of venom in mice. The result of the study shows ar-turmerone was capable of abolishing the hemorrhagic activity of Bothrops venom and about 70% of the lethal effect of Crotilus venom. Ar-turmerone can act as an enzymatic inhibitor in case of venom enzymes, with proteolytic and hemorrhagic activities.⁷
ANACARDIUM OCCIDENTALE
Scientific name: Anacardium occidentale
Family: Anacardiaceae
Common name: cashew apple
English name: cashew-nut
Parts used: nut
Uses: anti-diarrhoeal, anti-fungal activity

Antivenom Activity
Sampath Ushanandini research shows the ability of bark extract of Anacardium occidentale to neutralize enzymatic as well as pharmacological effects induced by Vipera russellii venom. The bark extract neutralizes the viper venom by hydrolytic enzymes such as phospholipase, protease and hyaluronidase in a dose dependent manner. These enzymes are responsible for both local effects of envenomation. It can be used as an alternative to serum therapy.8

AZADIRACHTA INDICA
Scientific name: Azadirachta indica
Family: Meliaceae
Common name: lilac, neem, neem chal
English name: Margosa tree
Parts used: Leaves, Flowers, Seed
Uses: anti-diabetic, anti-bacterial-anti-viral activity, It has blood purifying property..

Antivenom Activity
Mukherjee AK did a research on mentholic leaf extract of Azadirachta indica the findings had shown significant inhibition of PLA2 enzymes of cobra and Russell’s viper venom.s

ECHINACEAE PURPUREA
Scientific name: Echinaceae purpurea
Family: Asteraceae
Common name: Eastern purple coneflower, purple coneflower, Echinacea, snake root
Parts used: Roots, Seeds, Flowers
Uses: anti-microbial, anti-fungal, anti-viral, anti-inflammatory action

Antivenom Activity
Rucavado.A conducted research on aqueous extract of Echinaceae purpurea when treated with aqueous extract of root act as an adjuvant during immunisation. During first immunisation, the venom injected sub cutaneously(sc) (20g in 100l PBS) emulsified in an equal volume of Freunds complete adjuvant(FCA). Following the first immunisation, at two weeks intervals, sc injections of increased amounts of venom (20,40 and 60g each diluted in 100l PBS) using as adjuvants either an equal amount of sodium alginate or Echinacea root extract. From the first immunisation until the first bleeding, it was injected with 100g of Echinacea extract. Later, Echinacea dose was increased to 200g of extract.11
Uses:
Antivenom Activity

**PHYLLANTHUS EMBLICA**
Scientific name: *Phyllanthus emblica*
Family: Euphorbiaceae
Common name: amla, emblic, gooseberry, malacca tree
Parts used: fruit
Uses: In diabetes, lowering cholesterol, joint pain, obesity

Antivenom Activity
Mors research on antivenom activity showed the pentacyclic triterpenes (free of glycosides) are found in *Aegle marmelos* which provides nearly 20% protection against snake venom. Alam MI research proves that the plant extract neutralize the defibrinogenating and inflammatory activity of Viper russellii snake venom.

**MIMOSA PUDICA**
Scientific name: *Mimosa pudica*
Family: Mimosoideae
Common name: sensitive plant, shameful plant, humble plant
English name: Touch-me-not plant
Parts used: Roots, Leaves, Flowers
Uses: In leprosy, uterine complaints, dysentery

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.

The aqueous root extract of *Mimosa pudica* dose dependently inhibited the hyaluronidase and protease activities of Indian snakes (Naja naja, Vipera russelii, and Echis carinatus) 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 a 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 compound(s), which inhibit the activity of cobra venom.

**CONCLUSION**
The Herbal plants have antivenom activity which has minimal side effects than the serum therapy and can be considered as an effective alternative to mammalian antibody production for the treatment of snakebite envenomation. The proper first aid with these plants decreases the mortality rate against snake bite.

**REFERENCES**