Antivenom Herbal Plants Used in Ayurvedic System for The Snakebite, Scorpion Bite & Other Venomous Creatures

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***Abstract*—Snakebite, scorpion stings and other venomous creatures envenoming remains a serious global health issue, especially in rural areas with limited access to medical care. Anti-venom serum therapy is the primary treatment to neutralize venom and prevent fatal complications, but delays in reaching healthcare facilities often worsen outcomes. Medicinal plants and herbal formulations have shown anti-venom and supportive effects, reducing tissue damage, inflammation, and systemic toxicity. Certain plant extracts inhibit venom enzymes, suggesting their potential as adjunct therapies. Combining traditional knowledge with modern treatments could improve snakebite management, offering safer, affordable, and locally accessible options, particularly in resource-limited regions.**

***Index Terms*—Snake bite, Scorpion sting, Anti-venom, Herbal plants, Rural healthcare.**

I. INTRODUCTION:

Since ancient times, snakes have been revered, feared, and detested. Unfortunately, they continue to be a major threat in the daily lives of millions of villagers. Although antivenom is manufactured in sufficient quantities by several public and private organizations, many snake bite victims still lack access to adequate medical facilities. Consequently, both illness and death rates caused by snakebites remain high. The neglected condition of snakebite envenomation has been increasing recognized, yet it continues to display all the features of an overlooked tropical disease. The review focuses on summarizing and discussing the epidemiology, clinical, characteristics, diagnosis, and treatment of snakebite envenomation in India (Kamal RK at el, 2014)

Anti-venom are biological products which are used to supress the toxic effect venom of snakes, scorpions, spiders, or other venomous creatures. Plants such as Rauvolfia serpentina, Aristolochia indica, Hemidesmus indicus, Vitex negundo, Azadirachta indica, Abrus precatorius, Allium cepa, Citrus limon, Curcuma longa, and Mimosa pudica have been reported for their venomneutralizing or protective effects. These herbal remedies are being investigated for their bioactive compounds, may act as potential sources for developing safer and more easily available antivenom treatments. (KhokharA et al,2022)

II. SNAKE BITE

A snake bite is an injury that usually results in puncture wounds from the snake's fangs and occasionally envenomation. About 15% of the 3000 known species of snakes are venomous, although the majority are nonvenomous and kill their victims via constriction rather than venom. poisonous and present in all continents with the exception of Antarctica.

SNAKE VENOM: Snake venom is produced in specialized glands and injected into the victim's tissues through the fangs. Snake venom, which may be yellow, green, or colorless, is a viscous fluid mainly composed of toxic proteins, including neurotoxins, cardiotoxins, clotting and bleeding toxins along with more than 50 enzymes.

ENVENOMATION: Not every snakebite results in envenomation. Venomous snakes are capable of delivering a dry bite, where no venom is injected, and

this occurs in nearly one out of five cases. The quantity of venom released also differs widely between species for example,the Gaboon viper delievers the largest known dose, averaging 450–600 mg per bite.

Fig 01: King Cobra (https://www.smithsonianmag.com/smart-news/deadly-snake-venom-is- no-match-forthisnewsynthetic-antibody-180983873/)

SRN	Plant Species & family	Common Names & Parts used	Direction of Use & Administration	References
1	Aeschynomene indica (Fabaceae)	Kat sola (Leaf)	Decoction made with Andrographis paniculata, Thespesia populnea roots, and Strychnos nux-vomica bark; taken for 40 days	Deepa M et al,.2016
2	Acacia leucophloea (Mimosaceae)	White Bark- Bark	Applied externally as paste for about one week	Deepa M et al,.2016
3	Achillea millefolium (Asteraceae)	Mountain Arrow-Whole Plant	Paste applied topically for six days	Deepa M et al,.2016
4	Achyranthes aspera (Amaranthaceae)	Nayuruvi (Leaf)	External paste application for approximatally three weeks	Deepa M et al,.2016
5	Acorus calamus (Araceae)	Vasambo (Rhizomes)	External paste application for approximatally 7 days	Deepa M et al,.2016
6	Aerva lanata (Amaranthaceous)	Poolapo (Rizomes)	Taken orally for nearly eleven days	Deepa M et al,.2016
7	Alangium salvifolium (Alangiaceae)	Alangi (Root Bark)	Decoction taken twice daily for four days	Deepa M et al,.2016
8	Allium cepa (Liliaceae)	Venkayam Skin Bulb	External paste application for 5 days	Kadali VN et al,.2015
9	Amaranthus dubius (Amaranthaceae)	Gusanito (Leaves, root,seed)	Oinment applied externally	Kadali VN et al,.2015
10	Andrographis paniculata (Acanthaceae)	Periyananghai (whole plant)	Decoction or paste for external use of 5 to 14 days	Kadali VN et al,.2015
11	Argemone mexicana (Papaveraceae)	Barahmanthandu (Leaf,seed)	Decoction for oral use for 7 days	Kadali VN et al,.2015
12	Aristolochia indica (Aristolochiaceae)	Birthwort (Wholeplant,root extract)	Paste for external use for 1 week	Kadali VN et al,.2015
13	Azadirachta indica (Meliaceae)	Neem,Wimpu (Flower)	Decoction for oral use for 7 days	Kadali VN et al,.2015
14	Cassio Tora (Caesalpiniaceae)	Tagarai (Leaf)	Decoction for topical use for 14 days	Kadali VN et al,.2015

15	Citrus limon (Rutaceae)	Elumichai (Ripe skin)	Paste externally use for 3 days	Kadali VN et al,.2015
16	Ehretia bifolia (Ehretiaeceae)	Thelchedi (Root)	Paste external use for 7 days	Kadali VN et al,.2015
17	Gymnema sylvestre (Asclepiadaceae)	Gurmarbuti (Root)	Tincture orally for 4 days	Makhija IK et al,.2010
18	Hemidrsmus indicus (Asclepiadaceae)	Anantamul (Root)	Decoction orally for 7 days	Makhija IK et al,.2010
19	Madhuca longifolia (Sapotaceae)	Satthikai (Nut)	Paste externally for 2 to 3 days	Makhija IK et al,.2010
20	Moringa oleifera (Moringaceae)	Murunghai (Bark,Root)	Tincture externally for 3 days	Makhija IK et al,.2010
21	Morus alba (Moraceae)	Mulberry (Leaf)	Juice orally for 3 weeks	Makhija IK et al,.2010
22	Ocimum sanctum (Lamiaceae)	Tulasi (Leaf)	Juice orally for 8 days	Kavya Y et al,.2022
23	Ophiorrhiza mungos (Rubiaceae)	Napali (Root)	Juice orally twice a day for 6 days	Kavya Y et al,.2022
24	Terminalia arjuna (Combretaceae)	Marutham (Bark)	Paste externally for 5 days	Kavya Y et al,.2022
25	Wedelia calendulae (Asteraceae)	Karisilangkanni (Leaf)	Juice taken internally for 14 days	Kavya Y et al,.2022

Table 01: - Antivenom Drugs for Snakebite.

III. SCORPION BITE

Most of India's rural populations face a serious, time-sensitive medical emergency when they are stung by scorpions. There aren't many trustworthy statistics on this frequent rural mishap. India reported 3-22% case mortality rates among youngsters hospitalised for scorpion bites. Of India's 86 species of scorpions,Mesobuthus tamulus and Palamneus swammerdami are important for medicine. After an Indian red scorpion (Mesobuthus tamulus) sting, the effects on the heart are most noticeable. Clinical symptoms following a scorpion bite include pain in and around the sting site, neurologic symptoms including encephalopathy, convulsions, and coma, and florid autonomic signs such pulmonary oedema, tachycardia,hypertension, and hypotension, which are rarely seen. Clinical characteristics of scorpion-stung patients are typically abnormalities that point to changes in key
body systems, such as the heart, lungs, autonomic nervous system, and metabolism. Multisystem failure kills the majority of patients. (Bahekar S et al,.2012)

Fig 02. Bark Scorpion (Centruroides sculpturatus) (Waghmode A et al.2025)

SR. NO	PLANT SPECIES & FAMILY	COMMON NAMES & PARTS USED	DIRECTION OF USE & ADMINISTRATION	REFERENCES
1	Aloevera L. (Liliaceae)	Kathalai	Whole plant juice is used both orally and externally	Bahekar S et al,.2012
2	Andrographis paniculata (Acanthaceae)	Kalmegh	Ethanol extract of aerial parts is used for venom treatment	Bahekar S et al,.2012
3	Anisomeies malabarica	Peimiratti	Whole plant paste is taken orally	Bahekar S et al,.2012

	(Lamiaceae)			
4	Argemone mexicana Linn (Papaveraceae)	Perammathandu, (Bilayat)	Yellow latex taken orally;root paste applied externally	Bahekar S et al,.2012
5	Aristolochia Bracteolata Lam (Aristolochiaceae)	Aduthinnapalai	Leaf paste applied externally	Bahekar S et al,.2012
6	Aristolochia indica (Aristolochiaceae)	Eswaramooligai	Leaf juice taken;root paste applied on sting	Bahekar S et al,.2012
7	Azadirachta indica (Meliaceae)	Neem	Whole plant except root	Bahekar S et al,.2012
8	Barringtonia acutangular (Lecythidaceae)	Hijol	Plant extract is taken orally	Bahekar S et al,.2012
9	Biophytum candolleanum (Oxalidaceae)	Perumani vaatti	Leaf powder is taken orally	Waghmode A et al,.2025
10	Blepharis maderaspatensis (Acanthaceae)	Naikalli	Leaf juice is taken orally	Waghmode A et al,.2025
11	Calotropis procera (Asclepiadaceae)	Safed Rui,Mhatari Rui	Latex applied externally	Waghmode A et al,.2025
12	Cassia alata Caesalpiniaceae)	Semaiagatti	Leaf juice taken orally	Waghmode A et al,.2025
13	Centratherum anthelminticum (Asteraceae)	Kali-zeeri	Seeds used medicinally	Waghmode A et al,.2025
14	Eclipta alba (Asteraceae)	Karisilanganni	Leaf juice taken orally	Waghmode A et al,.2025
15	Eclipta prastrata (Asteraceae)	Karisilanganni	Leaf extract applied externally	Waghmode A et al,.2025
16	Ficus benghalensis (Moraceae)	Wad,Wat	Paste of tender leaves applied locally	Waghmode A et al,.2025
17	Gloriosa superba (Liliaceae)	Kalapaih,Kilangu	Tuber and root paste applied externally	Waghmode A et al,.2025
18	Grewia gamblei Drumm (Tiliaceae)	Karadi kasavu	Leaf juice and root bark taken orally	Laddimath A,.2020
19	Helianhus annus (Asteraceae)	Suriyakanthi	Seed oil applied externally	Laddimath A,.2020
20	Madhuca indica Gmel (Sapotaceae)	Mahuwa	Seeds oil applied externally	Laddimath A,.2020
21	Neanotis monosperma (Wt.& Arn) (Rubiaceae)	Kodi urinchi	Leaf,root,stem powder applied externally	Laddimath A,.2020
22	Nerium indicum Mill. (Apocynaceae)	Kanher	Root paste applied locally	Laddimath A,.2020
23	Ocimum sanctum L(Lamiaceae)	Tulsi	Whole plant and root used for scorpion sting	Laddimath A,.2020
24	Pouzolzia indica Gaud (Urticaceae)	Visha karappan	Powder of leaf,stem,bark and flowers applied locally	Laddimath A,.2020
25	Rhinacanthus nasutus Kurz (Acanthaceae)	Nagamalli	Leaf paste of the plant applied externally	Laddimath A,.2020

Table 02: - Antivenom Drugs for Scorpion bite.

IV. SPIDER BITE

Spider bites are injuries brought on by a spider's bite, and depending on the species, they may induce systemic envenomation, allergic reactions, or local discomfort Some spiders, such as Black widow spider contain strong venom that can cause serious medical issues, even though the majority of spider bites are innocuous and merely cause slight pain or redness. Only a small percentage of the more than 45,000 known species of spiders are thought to be harmful to people. There are many misconceptions regarding the potential health benefits of spiders, and they are a source of both fascination and terror.

Fig 03 & Fig 04 Female black widow Spider, L. mactans. (Shackelford R et al,.2015)

SPIDER VENOM: Spider venom is a complicated fluid that is delivered by hollow fangs and manufactured in modified salivary glands. It is made up of a range of physiologically active substances that can impact tissues, blood, or the nervous system, such as proteins, peptides, and enzymes. (Rahmani et al,.2014)

SR. NO	PLANT SPECIES & FAMILY	COMMON NAMES & PARTS USED	DIRECTION OF USE & ADMINISTRATION	REFERENCES
1	Aerva lanata (Amaranthaceae)	Bui (Root)	Root paste applied topically to reduce itching and inflammation.	Rahmani et al,.2014
2	Andrographis paniculata (Acanth aceae)	Kalmegh (Whole plant)	Decoction taken orally (10–15 ml twice daily) to reduce systemic toxicity.	Rahmani et al,.2014
3	Boerhavia diffusa (Nyctaginaceae)	Punarnava (Root)	Root extract taken orally (10 ml/day) for detoxification.	Rahmani et al,.2014
4	Cassia occidentalis (Fabaceae)	Kasondi (Leaf)	Leaf paste applied on bite site for swelling reduction.	Rahmani et al,.2014
5	Cissus quadrangularis (Vitaceae)	Hadjod (Stem)	Stem paste used externally to relieve local pain.	Rahmani et al,.2014
6	Clerodendrum inerme (Verbenaceae)	Garden Glory Bower (Leaf)	Leaf paste used topically for biterelated infections.	Rahmani et al,.2014
7	Crotonbonplandianum (Euphorbiaceae)	Croton (Leaf)	Leaf juice applied externally for insect and spider bites.	Rahmani et al,.2014
8	Eclipta prostrata (Asteraceae)	Bhringraj (Leaf)	Fresh leaf extract applied topically for anti-inflammatory effect.	Shackelford R et al,.2015
9	Euphorbia hirta (Euphorbiaceae)	Dudhi (Whole plant)	Latex applied externally for local pain relief.	Shackelford R et al,.2015
10	Gymnema sylvestre (Asclepiadaceae)	Gurmar (Leaf)	Leaf extract used externally as antiseptic for bite wounds.	Shackelford R et al,.2015
11	Hemidesmus indicus (Apocynaceae)	Anantamul (Root)	Decoction taken orally for blood purification and detoxification.	Shackelford R et al,.2015
12	Hygrophila auriculata (Acanthaceae)	Kokilaksha (Root)	Root decoction taken internally to reduce systemic toxicity.	Shackelford R et al,.2015
13	Leucas aspera (Lamiaceae)	Dronapushpi (Leaf)	Leaf juice mixed with honey, taken orally or applied topically for inflammation.	Shackelford R et al,.2015
14	Mimosa pudica (Fabaceae)	Lajjalu / Touchmenot (Root)	Root decoction taken orally for detoxification; crushed leaves applied externally to soothe wounds.	Shackelford R et al,.2015
15	Pergularia daemia (Asclepiadaceae)	Utaran (Leaf)	Leaf paste applied locally to neutralize venom.	Shackelford R et al,.2015

Table 03: - Antivenom Drugs for Spider bite.

V. INSECT BITES

Insect stings and bites, also known as "bug bites," can cause a variety of clinical symptoms. Redness, swelling, papules, and urticarial eruptions on the skin are common responses. Venom injections can occasionally result in serious systemic side effects such neurotoxicity, organ failure, or autonomic disorders. Anaphylaxis and other acute allergic reactions can appear rapidly and frequently cause angioedema or circulatory collapse. Insects are also important in medicine since they are important carriers of many bacterial, viral, and protozoal illnesses. (Guillet C et al,.2021)

Fig 05 Red wood ant (Formica rufa) Fig 06 Pale giant horse-fly

Sr. No	Plant Species & family	Common Names & parts used	Direction Of Use & Administration	References
1	Maksika (honey bee)	Itching,swelling,bu rning and pain. Sthalik and kasayi types may cause skin eruptions and fever.	Paste of black mud and cow dung (gomutra)is applied to reduce pain and swelling.Herbs like tagara,nagara and and nageshakera are also used externally to destroy bee poison	Kumar P et al,.2022
2	Pipilika (ants)	Swelling and burning at bitten area	Paste of black mud and cow dung is applied to remove the poison effect.	Kumar P et al,.2022
3	Kanabha (wasp)	Severepain,swellin g,body aches and heaviness.The bitten area turns black.	A mixture of kutsha,vakra,vacha,paths,bilva root suvarchika,gradhuma,and the two types of haridra forms an effective antidote for wasppoison.Sitalavana,Asitalava na,Maricha,and nagara when combined with phanijaka juice also help neutralize wasp venom	Kumar P et al,.2022
4	Satapadi (centipede)	Results in swelling pain burning sensation and the appearance of white eruptions on the skin.	A paste made from Kumkuma, Tagara, Sugandha, Pad maka,and Rajani,is applied to treat centipede bites.	Kumar P et al,.2022
5	Manduka (frog)	Leads to itching,burning sensation yellow front coming from mouth and vomiting	Sirisa seeds soaked in cow's milk (shuk kshira0 are applied to the affected area	Kumar P et al,.2022
6	Grhagodhika (Lizard)	Causing burning,sneezing,s weating,and feeling of heat in the body.	An herbal paste (Agada) made from kapittaha seeds,aksipidaka,trikatu,karanja, and two types of haridra is applied to remove the effects of lizard poison	Kumar P et al,.2022
7	Luta (spider)	Produces round rashes that may appear white,black,red,yell ow or blue.The area becomes soft,raised and painful.	A paste made from Sirisa,Katabi,Selu, and the bark of Kisirivriksha and arjuna is used. Decoction powder is poured on the wound to help heal and draw out the poison.	Kumar P et al,.2022

Table 04: - Antivenom Drugs for Insect bite.

VI. CONCLUSION

For many years, snake, scorpion, and other poisonous animal bites and stings have been treated with Indian medicinal plants. These plants include organic substances that lessen the harmful effects of several venoms, as well as pain and inflammation. Herbal medicines continue to be very valuable, especially in

rural areas, even if modern antivenoms are still the principal treatment for envenomation. To confirm their safety, standardise dosages, and assess their therapeutic effectiveness, more scientific study is necessary. Future plant-based antivenom treatments may be safer, more effective, and less expensive if traditional knowledge and contemporary scientific methods are combined.

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