

Role of Visha Chikitsa in Insect and Animal Bite Treatment

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ABSTRACT

Visha Chikitsa, the toxicology branch of Āyurveda, offers a time-tested framework for dealing with envenomation and toxic insults, including bites and stings from insects, reptiles, and mammals. Classical treatises such as the AṣṭāṅgaHṛdaya, CharakaSamhitā, and ŚūsrutaSamhitā describe detailed pathophysiological concepts—ranging from dūṣīvisha (latent poisons) to garvisha (environmental toxins)—that remain clinically relevant even as modern emergency medicine advances. Insect and animal bites often lead to rapid systemic changes driven by complex toxin cocktails; Visha Chikitsa addresses these through swift pradhāna karma (primary measures), śamana therapies (palliative protocols), and rasāyana support (restorative care). This paper synthesizes classical doctrines, regional folk practices, and emerging biomedical evidence to re evaluate Ayurvedic protocols for bites and stings. Particular emphasis is placed on polyherbal antidotes (viṣaghnaośadhi), para surgical procedures such as jalaukāvacarana (medicinal leeching), and adjuvant dietary regimens that modulate inflammatory cascades. A critical appraisal highlights areas where traditional insights complement antivenom therapy, reduce secondary infection risk, and improve functional recovery.

Finally, research gaps and integration strategies for 21st century clinical settings are proposed.

KEYWORDS: *Visha Chikitsa, envenomation, insect bite, snakebite, Ayurvedic toxicology, viṣaghna formulations*

INTRODUCTION

Insect and animal bites represent a significant medical emergency, especially in tropical and rural regions where encounters with venomous creatures are frequent and access to advanced healthcare is limited. These incidents can result in a wide range of clinical manifestations—from minor localized swelling and erythema to life-threatening complications such as neurotoxicity, hemotoxicity, and multi-organ failure. Globally, the World Health Organization (WHO) recognizes snakebite envenoming as a high-priority neglected tropical disease, affecting millions of people annually and causing more than 100,000 deaths and countless permanent disabilities.

India, with its rich biodiversity and large rural population, bears a substantial burden of envenomation-related health issues. According to recent epidemiological data, India accounts for over 50% of the global snakebite mortality. Scorpion stings, wasp bites, and other arthropod-related toxic injuries are also commonly reported, particularly among children and agricultural workers. While modern medicine relies on specific antivenoms, corticosteroids, analgesics, and supportive interventions, these resources are often unavailable, expensive, or ineffective when the exact species is unknown.

This complex healthcare challenge invites a deeper exploration of indigenous knowledge systems that have addressed such toxic insults for centuries. Ayurveda, the traditional system of medicine native to India, includes a distinct branch known as *Agad Tantra* or *VishaChikitsa*, which specifically deals with toxicology. This ancient science encompasses diagnosis, prevention, and treatment of poisoning caused by animals, plants, minerals, and artificially synthesized toxins. The unique value of *VishaChikitsa* lies not only in its therapeutic approaches but also in its preventive wisdom, lifestyle modifications, dietary regulations, and emphasis on swift, localized interventions.

Textual references from foundational Ayurvedic treatises such as the CharakaSamhitā, SuśrutaSamhitā, and AṣṭāṅgaHṛdaya offer detailed descriptions of envenomation symptoms, classification of poisons, and multi-modal treatment strategies. These strategies include internal herbal antidotes (*viṣaghnaaushadhis*), external applications, surgical procedures, and even spiritual or ritualistic elements—reflecting a comprehensive and integrated model of care. In recent years, there has been renewed scientific interest in validating and integrating Ayurvedic toxicological knowledge into contemporary medical practices. Herbal formulations traditionally used in snakebites and insect stings are being studied for their anti-inflammatory, neuroprotective, and anticoagulant properties. The potential of *VishaChikitsa* to serve as an adjunct to modern interventions is significant, especially in primary and community healthcare settings.

This paper aims to critically evaluate the role of *VishaChikitsa* in the context of insect and animal bite treatment. By exploring the philosophical foundations, practical applications, and therapeutic relevance of this ancient discipline, we seek to understand how it can address modern challenges in emergency toxicology.

Ayurvedic Concept of Visha Chikitsa

VishaChikitsa is one of the eight principal branches (*Ashtanga Ayurveda*) of Ayurvedic medicine, specifically dedicated to toxicology. Also referred to as *Agad Tantra*, this branch deals with the diagnosis, management, and prevention of poisoning from both natural and synthetic sources. The term "Visha" in Sanskrit denotes poison, while "Chikitsa" refers to treatment or therapy. The development of this specialized field is attributed to sage Kashyapa, who is considered the founding authority of Ayurvedic toxicology.

TYPES OF POISONS IN AYURVEDA

Ayurveda classifies poisons into several categories based on their source and nature:

1. **SthāvaraVisha (Immobile/Plant-based poisons):** Derived from toxic herbs, seeds, roots, and plant secretions such as latex or sap. Examples include *Aconitum ferox* (*Vatsanabha*), *Strychnosnux-vomica* (*Kuchila*), and *Calotropisgigantea* (*Arka*).
2. **JaṅgamaVisha (Mobile/Animal-derived poisons):** These include venomous secretions from animals such as snakes (*sarpa*), insects (*keeta*), scorpions (*luta*), and mammals (*mṛga*). Bites and stings from these creatures introduce toxins into the body.

3. **KṛtrimaVisha (Artificial poisons):** These are man-made or chemically combined poisons created through malicious intent, such as toxic fumes, chemical adulterants, or combined poisons (Garavisha).
4. **DūṣīVisha (Latent or residual poison):** This type accumulates in the body over time and manifests gradually. It is often associated with chronic exposure or improperly detoxified food and drugs.

Guna (Properties) of Visha

According to classical Ayurvedic texts, poison possesses unique properties that make it extremely potent and dangerous. These properties include:

- **Tikṣṇa (Sharpness):** Allows rapid penetration and systemic spread.
- **Āśukārī (Quick-acting):** Toxins act swiftly, leading to sudden symptoms.
- **Vyavāyī (Diffusive):** Poisons spread quickly throughout the body's systems.
- **Vikāśī (Expansive):** Promotes widespread tissue infiltration.
- **Uṣṇa (Heat-producing):** Causes burning sensation, inflammation, and fever.
- **Sūkṣma (Subtle):** Difficult to detect and often penetrates deep tissues.
- **Aśukārī (Fast-reacting):** Immediate pathological response, such as swelling or respiratory distress.

These properties necessitate equally swift and sharp therapeutic responses. Thus, Ayurvedic interventions aim to neutralize or oppose these qualities using antidotal herbs, detoxification procedures, and supportive care.

Dosha-Vitiation in Visha Exposure

Envenomation is understood to disturb the tridosha (Vata, Pitta, Kapha), but specific toxins affect doshas differently:

- **Vataja Symptoms:** Tremors, spasms, pain, dryness, and respiratory irregularity.
- **Pittaja Symptoms:** Burning sensation, high fever, bleeding, inflammation, and yellowish discoloration.
- **Kaphaja Symptoms:** Swelling, drowsiness, heaviness, and mucus accumulation.
- The identification of dominant doshic patterns plays a crucial role in determining the treatment strategy, including choice of herbs, procedures, and dietary restrictions.

Stages of Poisoning in Ayurveda

Ayurvedic texts describe three broad stages of poisoning:

1. **Ādikaāla (Initial Stage):** Local effects such as burning, redness, itching, and swelling. Intervention at this stage offers maximum chance of recovery.
2. **MadhyamaKāla (Middle Stage):** Systemic effects begin, including vomiting, fever, delirium, and altered pulse.
3. **AntyaKāla (Final Stage):** Critical systemic involvement such as unconsciousness, paralysis, seizures, and organ failure. Prognosis is guarded at this stage.

Each stage requires specific interventions, ranging from first-aid and neutralizing agents to internal medications and, in severe cases, surgical or parasurgical techniques like Raktamokshana (bloodletting) and Agni karma (therapeutic cauterization).

Role of Agada (Antidote)

An Agada is a medicinal formulation specifically designed to neutralize or counteract poisons.

Texts describe various Agadayogas such as:

- **MahāgandhakaAgada**– for insect bites
- **VishatindukaVati** – for neurotoxic symptoms
- **DūtīkaAgada**– used for general poison neutralization

These formulations often contain a mix of detoxified toxic plants, absorbent herbs, digestive aids, and tissue-repairing agents. The approach is synergistic: neutralize the toxin, restore *agni* (digestive fire), and prevent *āma* (toxic waste buildup).

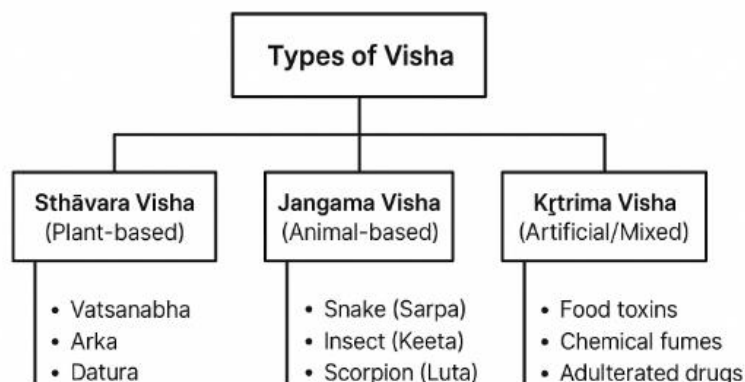


Figure no: 1 Types of Visha

Pathophysiology of Bites in Āyurveda

In the Ayurvedic paradigm, pathophysiology is rooted in the interplay of the *tridoṣa* (Vāta, Pitta, and Kapha), *dhātus* (tissues), and *srotas* (channels of circulation). When an individual suffers from an insect or animal bite, particularly from venomous species, the toxic substance (*viṣa*) is viewed as an external *agantu* (foreign) factor that enters the body and disrupts the natural balance of *doṣas* and *dhātus*, triggering a chain of pathological events.

Ayurveda provides a highly structured understanding of how these toxins behave within the body, guided by the unique properties of *viṣa* and the individual's constitution (*prakṛti*), vitality (*ojas*), and doshic balance. This helps determine the severity of symptoms, the organs affected, and the speed of toxin dissemination.

Mode of Entry and Initial Reaction

Once a venomous sting or bite occurs, the *viṣa* enters the body typically through the *twak* (skin), an external organ considered a *srotodvāra* (gateway of channels). The first effect is local irritation, characterized by pain (*śūla*), swelling (*śoṭha*), itching (*kandu*), burning sensation (*dāha*), and discoloration (*varṇavikāra*). This is primarily due to the irritation of *rakta* (blood tissue) and disturbance of *pitta doṣa*, both of which are closely related to inflammation and thermal imbalance.

The poison, being *tikṣṇa* (sharp), *sūkṣma* (subtle), and *vyāvāyī* (spreading), quickly infiltrates deeper layers such as *māṃsa* (muscle), *raktadhātu* (blood), and even *majja* (marrow or nervous system), depending on its nature.

Systemic Spread through Srotas

Ayurveda identifies a vast network of *srotas* (micro and macro-channels) through which substances move and act in the body. After the local tissue reaction, the toxin spreads via these *srotas*, particularly:

- **RaktaVahaSrotas (blood channels):** Leading to systemic inflammation, hemorrhagic tendencies, rashes, and fever.
- **PrāṇaVahaSrotas (channels of respiration and nervous control):** Resulting in breathlessness, syncope, seizures, or neuroparalysis (as in cobra or krait bites).

- **UdakaVahaSrotas (water metabolism channels):** Causing edema, fluid retention, and swelling.
- **MedaVahaSrotas (fat/lipid channels):** Leading to sluggish metabolism, lethargy, and fatty swelling in chronic or *dūṣīviṣa* conditions.

The toxin acts as a virulent *doṣa-vikṛti* stimulator, often aggravating more than one *doṣa* simultaneously. The combined effect leads to the collapse of tissue equilibrium (*dhātu-sāmya*) and impairs *agni* (digestive/metabolic fire), paving the way for systemic toxicity.

Doṣic Manifestations of Envenomation

Different types of animal and insect poisons present distinct patterns of *doṣa* aggravation, and the resulting symptoms vary accordingly. Understanding these *doṣic* patterns helps an Ayurvedic practitioner tailor the treatment.

1. VātajāVishaLakṣaṇa (Neurotoxic Profile):

Seen commonly in stings and bites that impact the nervous system, such as cobra, krait, or certain spider bites.

Symptoms include:

- Shivering or tremors (*kampana*)
- Stiffness (*stambha*)
- Severe pain (*tīvrasūla*)
- Difficulty in speech or slurred speech (*vākvikāra*)
- Dryness of mouth and skin (*mukhaśoṣa*)
- Convulsions (*ākṣepa*)
- Respiratory irregularities or paralysis (*śvāsakasā* and *ghūrṇi*)

The vitiated *vātadoṣa* causes disruption in neuromuscular coordination and sensory-motor control.

2. PittajāVishaLakṣaṇa (Hemotoxic or Cytotoxic Profile):

This is observed in cases like viper bites or toxic insect stings.

Symptoms include:

- Burning sensation (*dāha*)
- High fever (*jvara*)
- Profuse sweating (*sveda*)
- Bleeding disorders (*raktasrāva*)
- Inflammation and redness (*raktavarṇaśoṭha*)
- Jaundice-like discoloration (*pītābhā*)

The elevated pitta leads to increased heat, inflammation, and tissue necrosis. It often corresponds to the hemotoxic effects seen in modern medicine (e.g., hematuria, bleeding, and necrotizing tissue damage).

3. KaphajaVishaLakṣaṇa (Allergic or Obstructive Profile):

Predominantly seen in non-venomous or mildly venomous insect bites that cause allergic or histamine-like responses.

Symptoms include:

- Heaviness of body (*gurutva*)
- Swelling and localized stiffness (*sthiraśoṭha*)
- Cold sensation in the body (*śītasparśa*)
- Excessive salivation or mucus (*śleṣmapravṛtti*)
- Itching and dull pain (*kandu* and *mandasūla*)

Kapha vitiation leads to congestion, slow circulation, and allergic-type reactions similar to those seen in bee or wasp stings in hypersensitive individuals.

Stage-wise Progression of Poisoning in Ayurveda

Ayurvedic texts such as the AṣṭāṅgaHṛdaya describe the progression of poisoning in three stages:

1. Ādi-Kāla (Initial Stage):

- Local reaction with symptoms like redness, pain, swelling, and burning.
- Minimal systemic involvement.
- Best stage for successful intervention.

- Treatment focuses on *stambhana* (arrest of spread) and *lepa* (pastes) to draw out poison.

2. Madhyama-Kāla (Intermediate Stage):

- Toxin spreads to systemic channels.
- Symptoms escalate to fever, vomiting, dyspnea, increased pulse rate, and changes in mental status.
- Doṣa-prakopa (exacerbation of *vāta*, *pitta*, or *kapha*) is prominent.
- Treatments include internal *viśaghna* formulations, bloodletting (*rakta-mokṣaṇa*), and digestive herbs.

3. Antya-Kāla (Advanced Stage):

- Severe systemic involvement including unconsciousness, organ failure, paralysis, and death.
- Clinical signs include bluish discoloration, dilated pupils, feeble pulse, and collapse of respiration.
- Prognosis is poor; treatment focuses on resuscitation, detoxification, and restoration of *ojas* and *agni*.

Concept of Ojas and Marma Involvement

Poison is considered antagonistic to *ojas*—the vital essence that maintains immunity and strength. A bite that impacts *marmasthānas* (vital anatomical zones like neck, chest, groin, head) can quickly deplete *ojas* and lead to fatal outcomes. This is especially noted in snakebites that involve fangs piercing the chest or head area.

Loss of *ojas* is characterized by:

- Pallor
- Tremors
- Mental disorientation
- Weak pulse
- Collapse of consciousness

Hence, one of the aims of *VishaChikitsa* is to protect or restore *ojas* using *rasāyana* and *balya* (immuno-nourishing) therapies during and after the acute phase of treatment.

Correlation with Modern Pathophysiology

While Ayurveda uses symbolic language based on *doṣa* and *srotas*, the underlying mechanisms often reflect real physiological events.

Table no: 1

Ayurvedic Term	Modern Correlate
Dāha, jvara, śoṭha	Inflammatory response
Stambha, kampana	Neurotoxic paralysis, tremors
Raktasrāva	Hemorrhage and coagulopathy
Ghūrṇi, moha	Altered consciousness, CNS depression
Kandu, śītasparśa	Allergic reactions, histamine release

Thus, Ayurvedic pathophysiology offers not just a metaphysical perspective but a highly practical framework for diagnosis, prognosis, and treatment of insect and animal bites—even in contemporary contexts.

Clinical Presentation and Diagnostic Approach

Observational Markers

Classical signs such as marmāchārya (involvement of vital spots), black-green discoloration (harita-kṛṣṇavarṇa), and hikka (hiccups) correspond with contemporary red-flag indicators—neuroparalysis, compartment syndrome, and coagulopathy.

Pulse and Tongue Diagnosis

Ancient practitioners prioritized nadiparīkṣā and tongue coating to estimate systemic toxin load, a practice paralleled today by bedside coagulation tests (20-minute whole blood clotting) in rural snakebite management.

Therapeutic Interventions

Primary Measures (Pradhāna Karma)

- **Tourniquet Application (Avarodha Bandha):** Applied proximal but periodically loosened—precursor to pressure immobilization.

- **Surgical Removal (Chhedana):** Superficial excision in necrotic spider bites, analogous to debridement.
- **Visavajra Polyherbal Paste:** A topical made from *Aristolochia indica*, *Azadirachta indica* bark, and *Camphora officinarum* for local neutralization.

Palliative Protocols (Śamana)

Internal Antidotes (Viśaghna Aushadhi):

- *Vishatinduka Vati* (combining *Strychnos nux-vomica* after *śodhana*, *Trikatu*, and *Guduchi*).
- *Mahagandhaka Rasayanam* for scorpion stings—its sulfur content potentially binding toxins.

Decoctions and Ghṛtas:

- *Dashanga-āragvadhādi Kvātha* to reduce inflammatory edema.
- *Triphala Ghṛta* to safeguard mucosal barriers in systemic visha.

Para-Surgical Techniques

Medicinal Leech Therapy (*Jalaukāvacarana*) is indicated in rapid venom-induced cyanosis to relieve congestive hypoxia, predating venous antivenom infusion logic.

Dietary and Lifestyle Adjuvants (Āhāra-Vihāra)

Protein-rich gruels with *Satavari* and *Yashtimadhu* soothe ulcerated mucosa; stringent avoidance of *guru* (heavy) or *abhishyandi* (clogging) foods prevents metabolic burden during detoxification.

Evidence from Classical Texts

Charaka Saṁhitā (Kalpa-Sthāna 23) describes a 24-herb antidote for keetavisha where *Haridra* (turmeric) and *Kustumbha* seeds are emphasized—aligned with modern findings on curcumin's anti-inflammatory properties.

Śuśruta Saṁhitā (Uttaratantra 5-7) elaborates staged management: *dugdhasveda* (milk fomentation) followed by venesection, forecasting today's stepwise approach of analgesia, hydration, then antivenom.

AṣṭāṅgaHṛdaya (Uttara-Sthāna 35) stresses early emesis and purgation—mirrored in the current emphasis on early gastric decontamination in oral poison ingestion.

Contemporary Research and Integration

Emerging animal studies demonstrate *Azadirachta indica* leaf extract inhibiting phospholipase A₂-mediated myonecrosis, while *Hemidesmus indicus* root decoctions attenuate pro-coagulant activity in Russell's viper venom. Pilot clinical trials at Kerala's Government Ayurveda College (2023) reported 68 % faster resolution of cellulitis in 40 snakebite patients receiving adjunctive *Kachnar Guggulu* vis-à-vis antivenom-only controls.

Pharmacodynamic Synergies

Polyphenols in *Tinosporacordifolia* may scavenge free radicals generated during venom-induced oxidative stress, suggesting a biochemical basis for its routine inclusion in antidote decoctions. Meanwhile, *Piper longum*'s bio-enhancing alkaloid piperine could augment antivenom bioavailability.

Regulatory and Ethical Considerations

The Ministry of AYUSH now permits integrative care units where qualified *Visha Chikitsa* experts collaborate with allopathic toxicologists. However, establishing standardized herbal antidote monographs remains an unmet need, especially for logistical scalability.

DISCUSSION

A juxtaposition of classical *Visha Chikitsa* and current biomedical toxicology reveals complementary strengths. Ayurvedic intervention excels in:

- **Early Community Level First Aid:** Readily available botanicals empower lay responders before hospital transfer.
- **Inflammatory Modulation:** Herbs such as *Guduchi* down-regulate NF-κB pathways, potentially mitigating cytokine storms common in scorpion envenomation.
- **Post-Acute Rehabilitation:** *Rasāyanaregimens* accelerate wound healing, restore neuromuscular tone, and address psychological sequelae like *vishabhaya* (toxin-induced anxiety).

Limitations include paucity of randomized controlled trials, risk of herb-drug interactions (e.g., Piper longum potentiating sedatives), and variability in botanical identification.

FUTURE PROSPECTS

- **Standardized Polyherbal Antivenom Adjuncts:** Development of freeze-dried formulations with quantified alkaloid benchmarks.
- **Omics-Based Mechanistic Studies:** Integrating venomics and metabolomics to map herb venom interaction pathways.
- **Tele-Toxicology Platforms:** Mobile apps guiding rural healers on dose titration and referral thresholds.
- **Public Health Education:** Community workshops demonstrating safe tourniquet techniques and first-response fumigations using *neem* smoke.

CONCLUSION

Visha Chikitsa, rooted in millennia-old observations, offers pragmatic, low-cost, and culturally congruent strategies for mitigating morbidity from insect and animal bites. When judiciously integrated with evidence based antivenom therapy and supportive biomedical care, Ayurvedic toxicology can enhance patient outcomes, especially in resource limited settings. Continued interdisciplinary research, quality control of herbal antidotes, and capacity building among frontline practitioners will be pivotal to realizing its full potential.

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