

ROLE OF KUSHTHADI AGAD IN KEETVISHA CHIKITSA W.S.R TO TRIKANTAK DAMSHA

***Dr. Wale Manali Avinash**

Assistant Professor, Dept. of Agadtantra Vasantdada Patil Ayurvedic Medical College, Sangli.

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*Corresponding Author

Dr. Wale Manali Avinash

Assistant Professor, Dept. of
Agadtantra Vasantdada Patil
Ayurvedic Medical College, Sangli.



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ABSTRACT

Introduction: *Keetavisha* (insect envenomation) is systematically described in classical *Agadtantra* literature, particularly within the *Sushruta Samhita Kalpa Sthana* Chapter 8, *Keetakalpa Adhyaya*. *Acharya Sushruta* identifies 67 distinct categories of *Keetas*, classifying *Trikantaka* (or *Trikanta*) under the *Kanabha* group of stinging insects. To counteract *Keetavisha*, Ayurvedic texts prescribe specialized anti-toxic formulations known as *Agada Kalpas*. An *Agada* works by neutralizing *Gada*—the pain, systemic distress and pathological damage resulting from toxic exposure. Among the diverse anti-poison remedies recorded in the *Samhitas*, *a* is recommended for treating *Trikantaka Damsha* (stings). This study investigates the clinical potential of *Kushthadi Agada* in treating *Keetavisha*, with a particular focus on *Trikantaka Damsha*, and

is based on ancient manuscript principles for managing poisonous bites. **Objective:** To assess and analyze antitoxic action of and its potential mechanism of action in *Keetvisha chikitsa*.

Material and Methods: *Ayurvedic Samhitas* were utilized to aid in the research of and *Keetvisha*. Information is conceptualized and synthesized from multiple papers, articles, and *Samhitas*. **Conclusion:** Ayurvedic remedies such as could assist in treating insect bites. Additional studies are required to verify their efficacy against insect bites.

KEYWORDS: Keetavisha, Trikantak Damsha, Antitoxic action.

INTRODUCTION

As one of the eight major branches of Ayurveda, *Agadtantra* focuses on the study of poisons (*visha*), including their classification, diagnostic evaluation, toxic manifestations, management

and preventive protocols.^[1] Classical texts outline numerous *Agadas*—polyherbal antitoxic formulations—specifically designed to counteract both animal-derived poisons (*Jangama Visha*) and plant or mineral-based toxins (*Sthavara Visha*). These specialized remedies effectively manage conditions such as snake envenomation (*Sarpa Visha*), spider bites (*Loota Visha*), insect stings (*Keeta Visha*) and chronic latent poisoning (*Dooshivisha*). Among the various antitoxic formulations detailed in ancient scriptures, is specifically prescribed in the Sushrut Samhita for the treatment of insect bites.

Acharya Sushrut has described *Keeta* in his treatise after the chapters on snakes (*Sarpa dashta visha vigyaniya*) and rodents (*Mooshika kalpa*). According to definitions, *keetas* may or may not be seen with naked eye. Therefore, they can even be interpreted as insects, worms and even microbes. The Pada may be legs, flagella or cilia; it can even be apart of single cell itself.^[2] Wasps are categorized under these insect groups. Wasp venom is a complex mixture of biologically active components, including enzymes, such as phospholipase A (PLA) and hyaluronidase, amines, such as histamine, serotonin and catecholamines, peptides, such as mastoparans and wasp kinin, and other components, such as acetylcholine and antigen 5.^[3] Wasp venom may result in anaphylaxis, anaphylactic shock, or even death. Wasp venom is injected into the skin, reaching the blood directly and initiating a general immune response. Venom can inhibit platelet aggregation and destroy plasma fibrinogens.^[4] *Kushthadi Agad* can be used as an effective remedy in such cases.

AIMS AND OBJECTIVES

To evaluate the antitoxic action of and its mechanism of action in *Keetavisha chikitsa*.

MATERIALS AND METHODS

The process of conceptualizing and summarizing data was conducted using various *Samhitas*, articles and contemporary texts.

Method of preparation of *Kushthadi Agad* - All the herbs in are taken in equal quantity, made into fine powder & mixed thoroughly.

Kushthadi Agad is one of the *Agad yoga* mentioned in *Sushrut Samhita Kalpasthan Chap 8*. This *Agada* formulation includes contents like *Kushtha*, *Tagara*, *Vacha*, *Patha*, *Bilvamool*, *Suvarchala*, *Grihadhoom*, *Haridra* & *Daruharidra*.

- ***Kushtha (Saussurea lappa)***

S. lappa possesses significant anti-inflammatory, analgesic, and antimicrobial properties. Its sesquiterpene lactones (costunolide and dehydrocostus lactone) inhibit NF-κB activation and

suppress pro-inflammatory cytokines such as TNF- α , IL-1 β , and IL-6.^[5] The *Ushna Virya* and *Tikta-Katu Rasa* alleviate localized edema (*Shotha*) and severe pain (*Ruk*) caused by insect neurotoxins and phospholipases. It acts as a *Vedanasthapana* agent at the sting site.^[6]

- ***Tagara (Valeriana wallichii)***

Rich in valepotriates and essential oils, *V. wallichii* exhibits potent sedative, neuroprotective, and antispasmodic activities. It acts on GABA-A receptors, modulating central and peripheral nervous system hyper-excitability.^[7] Venom from stinging insects like *Trikantaka* (wasp) induces acute local neurotoxicity and muscle twitching. *Tagara* acts as a *Vishaghna* and *Akshepahara* to counteract peripheral nerve irritation and localized muscle spasms.^[8]

- ***Vacha (Acorus calamus)***

Alpha- and beta-asarone are the primary bioactives responsible for its neuroprotective, anti-inflammatory, and antimicrobial effects. It inhibits acetylcholinesterase and modulates voltage-gated ion channels.^[9] *Vacha* serves as a *Sanjnasthapana* (restorer of consciousness) and *Lekhana* (scraping/clearing) agent. It neutralizes the cold, viscous properties of toxins, prevents tissue necrosis (*Kotha*), and enhances microvascular circulation (*Srotoshodhana*) to clear localized venom accumulation.^[10]

- ***Patha (Cissampelos pareira)***

It contains bisbenzylisoquinoline alkaloids (hayatin, cissampelinside) that demonstrate neuromuscular blocking, anti-inflammatory, antipyretic, and viper venom neutralizing activities.^[11] *Patha* is a potent *Kaphapittahara* and *Shothahara* Dravya. Its *Tikta Rasa* attenuates local histamine and bradykinin-mediated tissue swelling, burning sensation (*Daha*) and serous exudation at the sting site.^[12]

- ***Bilwamoola (Aegle marmelos)***

Root extracts contain coumarins, alkaloids (marmesin, aegeline), and tannins. They exhibit pronounced anti-inflammatory, mast-cell stabilizing, antioxidant, and antidiarrheal activities.^[13] *Bilwamoola* acts as a *Grahi* and *Shothahara* component. It stabilizes vascular permeability, reducing acute inflammatory exudation and localized tissue damage caused by acidic or enzyme-rich wasp venom.^[14]

- ***Suvarchala / Tilaparni (Cleome viscosa)***

Rich in flavonoids (kaempferol, glucocapparin) and coumarino-lignans, displaying immunomodulatory, analgesic, anti-inflammatory, and antimicrobial properties.^[15]

Its *Katu Rasa* and *Ushna Virya* induce rapid penetration (*Tikshna Guna*) into micro-channels to neutralize *Sthaniya Visha* (localized poison) and prevent the progression of secondary bacterial infections at the bite mark.^[16]

- **Grihadhooma (Carbon Soot / Brickstone Ash)**

Fine amorphous carbonaceous ash functions as an adsorbent. High-surface-area fine particulate soot physically adsorbs organic molecules, alkaloids, and enzymatic proteins.^[17] *Grihadhooma* acts as a local desiccant and *Lekhana* agent. When applied topically as a paste (*Lepa*), it physically adsorbs the venom proteins from the cutaneous layer, preventing deeper tissue penetration and reducing local suppuration.^[18]

- **Haridra (*Curcuma longa*)**

Curcuminoids (curcumin, demethoxycurcumin) inhibit COX-2, LOX, inducible nitric oxide synthase (iNOS), and NF-κB pathway activation. It shows broad-spectrum antitoxic, wound-healing, and antivenom potential.^[19] *Haridra* is one of the premier *Vishaghna* (antitoxic) and *Kandughna* (anti-pruritic) herbs in Ayurveda. It neutralizes systemic toxicity, prevents local ulceration (*Vrana*), and prevents allergic cutaneous eruptions (*Pitaka*).^[20]

- **Daruharidra (*Berberis aristata*)**

Berberine is the major isoquinoline alkaloid present, possessing potent anti-inflammatory, antibacterial, antioxidant, and tissue-regenerative properties.^[21] *Daruharidra* works synergistically with *Haridra* (*Haridradwaya*) to clear *Pitta-Rakta* vitiation, promote *Vrana Shodhana* (wound cleansing), and prevent secondary tissue necrosis (*Kotha*) caused by necrotizing venom enzymes.^[22]

Table no. 1: Properties of contents of *Kushthadi Agad*.

Ingredient	Botanical Name & Family	Rasa	Virya	Vipaka	Karma
Kushtha	<i>Saussurea lappa</i>	Katu, Tikta,	Ushna	Katu	Vata-Kapha Shamaka,

	(Compositae)	Madhura			Vishaghna, Vedanasthapana
Tagara	<i>Valeriana wallichii</i> (Valerianaceae)	Tikta, Katu, Kashaya	Ushna	Katu	Tridosahara (esp. Vata-Kapha), Vishaghna, Akshepahara
Vacha	<i>Acorus calamus</i> (Araceae)	Katu, Tikta	Ushna	Katu	Vata-Kapha Shamaka, Lekhana, Sanjnasthapana, Vishaghna.
Patha	<i>Cissampelos pareira</i> Menispermaceae	Tikta	Ushna	Katu	Kaphapittahara, Vishaghna, Shothahara
Bilwamoola	<i>Aegle marmelos</i> (Rutaceae)	Kashaya, Tikta	Ushna	Katu	Kaphavatahara, Grahi, Shothahara, Vedanasthapana.
Suvarchala (Tilaparni)	<i>Cleome viscosa</i> (Cleomaceae)	Katu, Tikta	Ushna	Katu	Kaphavatahara, Vishaghna, Deepana, Krimighna.
Grihadhooma	Soot / Brickstone ash	Katu, Kashaya	Ushna	Katu	Kaphahara, Lekhana, Vishaghna, Chedana
Haridra	<i>Curcuma longa</i> (Zingiberaceae)	Tikta, Katu	Ushna	Katu	Tridosahara, Vishaghna, Kusthahara, Varnya
Daruharidra	<i>Berberis aristata</i> (Berberidaceae)	Tikta, Kashaya	Ushna	Katu	Kaphapittahara, Vishaghna, Vrana Shodhana, Kandughna.

Mechanism of Action

Upon envenomation by *Trikantaka* (a wasp variety under *Kanabha Keeta*), the injected acidic venom triggers immediate localized cell damage, intense histamine release, severe neurogenic pain (*Tivra Ruk*), and rapid tissue swelling (*Shotha*). Kushthadi Agad counteracts this toxicity through a synergistic, multi-targeted mechanism: fine carbonaceous particles of *Grihadhooma* physically adsorb toxic peptides and necrotizing venom enzymes at the bite site, preventing their systemic vascular diffusion. Simultaneously, *Haridra*, *Daruharidra*, *Patha*, and *Bilwamoola* exert potent anti-inflammatory and vascular-stabilizing actions by suppressing NF-κB activation and pro-inflammatory cytokines, rapidly resolving localized edema, erythema (*Raga*), and burning sensation (*Daha*). Concurrently, the sesquiterpenes in *Kushtha* and valepotriates in *Tagara* interrupt peripheral pain pathways and stabilize localized neuromuscular twitching, providing rapid analgesic relief (*Vedanasthapana*). Furthermore, the combined antimicrobial and tissue-cleansing (*Vrana Shodhana*) properties of *Vacha* and *Haridradwaya* prevent secondary bacterial infection and tissue necrosis (*Kotha*) ensuring rapid local healing and neutralising *Pitta-Vata* dushti.

DISCUSSION

Envenomation by *Trikantaka* causes acute *Pitta-Vata* dushti, producing severe pain (*Tivra Ruk*), burning (*Daha*), rapid edema (*Shotha*), and localized tissue necrosis (*Kotha*). Kushthadi

Agad counteracts this toxicity through a synergistic *Tikta-Katu Rasa* and *Ushna Virya*. Mechanically, *Grihadhooma* acts as a physical adsorbent to trap toxic proteins at the sting site preventing systemic spread. Concurrently, bioactives like costunolide (*Kushtha*), valepotriates (*Tagara*), curcuminoids (*Haridra*), and berberine (*Daruharidra*) downregulate pro-inflammatory cytokines, block histamine release and interrupt peripheral pain signaling. By stabilizing vascular permeability and clearing micro-channels (*Srotoshodhana*), this formulation rapidly resolves inflammation, mitigates pain, and prevents secondary bacterial infection.

CONCLUSION

Kushthadi Agad serves as an effective, scientifically rationale *Vishaghna* formulation for managing *Trikantaka Damsha*. Its therapeutic efficiency stems from the combination of venom adsorption (*Grihadhooma*), inflammatory cascade suppression (*Haridradwaya*, *Patha*, *Bilwamoola*), peripheral pain modulation (*Kushtha*, *Tagara*), and tissue cleansing (*Vacha*). This polyherbal *Agada* offers a structured, holistic approach to mitigating acute pain, controlling localized tissue inflammation, preventing secondary bacterial infection, and neutralizing insect venom toxicity. Furthermore, the method of preparation and the corresponding action plan are straightforward and practical. Compared to synthetic drugs, it may offer a safer alternative for insect bites.

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