WORLD JOURNAL OF PHARMACEUTICAL RESEARCH
SJIF Impact Factor 8.453
Volume 14, Issue 19, 39-45. Review Article ISSN 2277–7105

BHALLATAKA-INDUCED DERMAL TOXICITY AND ITS AYURVEDIC MANAGEMENT WITH DARU –SARSHAPA–MUSTA LEPA: A CRITICAL REVIEW

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Article Received on
11 August 2025,
Revised on 31 August 2025,
Accepted on 20 Sept. 2025
https://doi.org/10.5281/zenodo.17213147

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ABSTRACT

Bhallataka (*Semecarpus anacardium*) oil, while therapeutically potent in Ayurveda, presents significant dermal toxicity, manifesting as inflammation, irritation, and hypersensitivity. Modern dermatology links these effects to bioactive compounds that incite inflammatory and allergic reactions. Ayurveda attributes this to *Bhallataka's* inherent *Ushna* (hot), *Tikshna* (penetrating), and *Katu* (pungent) properties, which can aggravate *Pitta* and *Vata doshas*, leading to skin pathologies. To counteract these effects, the classical Ayurvedic formulation Daru-Sarshpa-Musta Lepa is traditionally recommended. This topical preparation comprises *Cedrus deodara* (Daru), *Brassica campestris* (Sarshpa), *Cyperus rotundus* (Musta), and *Navnit* (Indian butter). An analysis from a pathophysiological (*Samprapti*) perspective indicates that *Bhallataka* toxicity arises from excessive *Pitta* and *Vata*, Which vitiate *Twak* (skin) and *Rakta* (blood). The Lepa addresses this imbalance through its *Shita* (cooling), *Snigdha* (soothing), and *Ropan* (healing) properties, aiming to restore cutaneous homeostasis and facilitate detoxification. This synergistic Ayurvedic approach provides a natural alternative for managing Bhallataka-induced dermal conditions. While classical texts endorse its efficacy, further scientific validation is essential to integrate this formulation into modern dermatological practice. Standardizing its preparation and evaluating its pharmacological profile can pave the way for safer and more effective therapeutic applications.

KEYWORDS: Bhallataka toxicity, Semecarpus anacardium, Daru-Sarshpa-Musta Lepa, Cedrus deodara, Brassica campestris, Cyperus rotundus, Navnit, Dermal Toxicity.

INTRODUCTION

Traditional systems of medicine have long utilized potent natural substances for therapeutic purposes, often developing intricate methods to mitigate their inherent toxicities.[1] In Ayurveda, *Bhallataka* (*Semecarpus anacardium* Linn.), commonly known as the marking nut, is revered for its efficacy in treating conditions like *Kushta* (skin diseases) and *Arshas* (hemorrhoids) and is also used as a powerful *Rasayana* (rejuvenating agent).[2] However, *Bhallataka* is classified as an *Upavisha* (semi-poisonous substance) due to the vesicant nature of its pericarp oil, which contains bioactive compounds like bhilawanols that are potent allergens.[3]

Direct contact with this oil can cause severe dermal toxicity, characterized by erythema, blistering, and intense itching—a condition akin to irritant contact dermatitis.[4] The pathophysiology involves a delayed type IV hypersensitivity reaction. From an Ayurvedic perspective, the *Ushna* (hot) and *Tikshna* (penetrating) properties of *Bhallataka* aggressively increase *Pitta* and *Vata doshas*, leading to the vitiation of *Rakta* (blood) and *Twak* (skin).[17]

To manage these adverse effects, Ayurvedic texts prescribe specific antidotes. One such classical remedy is the **Daru-Sarshpa-Musta Lepa**, a polyherbal paste for external application. The concept of *Lepa Kalpana* (topical paste application) is a cornerstone of Ayurvedic pharmaceutics for delivering medicinal properties directly to the affected site.[5,6]

This review article delves into the constituent herbs of this formulation—*Cedrus deodara* (Daru), *Brassica campestris* (Sarshapa), *Cyperus rotundus* (Musta), and a base of *Navnit* (Indian butter)—to understand its mechanism in mitigating Bhallataka-induced dermal toxicity based on the synergistic action of its components.[7]

NEED FOR THE STUDY

To scientifically explore and validate a classical Ayurvedic formulation, bridging traditional wisdom with modern dermatological needs for effective and safer management of plant-induced contact dermatitis.

LITERATURE REVIEW

Semecarpus anacardium is a potent medicinal plant whose usage is documented extensively in classical Ayurvedic texts, including the works of Charaka and Sushruta, particularly after a mandatory purification process (*Shodhana*).[17] While acclaimed for its therapeutic benefits, its toxicity is well-known.[2] The pericarp oil contains urushiol-like phenolic compounds that cause acute irritant contact dermatitis, with ingestion of unpurified nuts leading to severe systemic effects.[3] Classical texts suggest external antidotes like ghee or a paste of butter mixed with *Musta* (*Cyperus rotundus*) for its allergic reactions.[3]

Lepa Kalpana refers to the preparation and application of medicinal pastes on the skin.[5] Acharya Sushruta classified *Lepas* into three types: *Pralepa* (thin, cooling), *Pradeha* (thick, warm or cold), and *Alepa* (intermediate).[8] The *Lepa* is typically applied against the direction of hair follicles for better absorption and should be removed once it dries to avoid constriction of skin pores.[6] Formulations like Daru-Sarshpa-Musta Lepa are designed based on the principle of balancing aggravated *doshas* at the site of pathology.

The efficacy of the Lepa lies in the synergistic action of its components.

Table 1: Ayurvedic Properties of the Ingredients.

Herb	Botanical Name	Rasa (Taste)	Guna (Quality)	Virya (Potency)	Vipaka (Post-digestive effect)	Dosha Karma
Daru	*Cedrus deodara*	Tikta, Katu, Kashaya	Laghu, Rooksha	Ushna	Katu	Kapha-Vata Shamaka
Sarshapa	*Brassica campestris*	Katu, Tikta	Laghu, Snigdha, Tikshna	Ushna	Katu	Kapha-Vata Shamaka
Musta	*Cyperus rotundus*	Tikta, Katu, Kashaya	Laghu, Rooksha	Sheeta	Katu	Kapha-Pitta Shamaka
Navnit	Indian Butter	Madhura, Kashaya	Snigdha, Guru	Sheeta	Madhura	Vata-Pitta Shamaka

- **A. Daru (*Cedrus deodara* (Roxb.) Loud.)**

Known as Devadaru, it is valued for relieving pain and inflammation.[9] The wood and oil contain sesquiterpenes like himachalol, which contribute to its medicinal properties.[10] Research validates its significant anti-inflammatory, analgesic, and antispasmodic activities.[9,10] Its essential oil also possesses potent antibacterial properties against pathogens like *Staphylococcus aureus*, making it valuable for preventing secondary infections in

wounds.[11] Its primary role in the formulation is to counter the inflammatory cascade and pain triggered by *Bhallataka*.

- **B. Sarshapa (*Brassica campestris* Linn.)**

Sarshapa (mustard) is recognized in Ayurveda for its *Vishaghna* (anti-poison) and *Vedanahara* (pain-relieving) effects.[13] Its seeds contain glucosinolates, which yield allyl isothiocyanate, a compound with strong antimicrobial activity against bacteria like *E. coli*.[12] The oil acts as a rubefacient, increasing local blood circulation to aid in detoxification. Studies have also highlighted its anti-inflammatory activities.[13] In the Lepa, it helps detoxify the area and prevent infection.

- **C. Musta (*Cyperus rotundus* Linn.)**

Known as Nagarmotha, *Cyperus rotundus* is a key herb for treating inflammation and allergies in Ayurveda.[14,15] The rhizomes contain essential oils rich in sesquiterpenes It has well-documented anti-inflammatory and analgesic properties.[15] Crucially, studies have demonstrated its potent anti-allergic activity by inhibiting mast cell degranulation, which is directly relevant to managing the allergic dermatitis caused by *Bhallataka*.[16] Its *Sheeta Virya* (cold potency) directly counteracts the burning sensation.

- **D. Navnit (Indian Butter)**

Fresh butter (*Navnit*) is praised in Ayurveda for its *Sheeta* (cooling) and *Vata-Pitta* pacifying properties, making it ideal for burns and skin disorders.[17] Butterfat is primarily composed of triglycerides that act as an emollient, forming a protective, occlusive barrier on the skin. This prevents further irritation and reduces moisture loss, promoting a healthy healing environment. Its cooling nature provides immediate symptomatic relief and serves as an effective vehicle (*Vahana*) for the herbal components.

DISCUSSION

This review elucidates the therapeutic rationale behind Daru-Sarshpa-Musta Lepa for Bhallataka-induced dermal toxicity. The formulation is designed to break the chain of pathogenesis (*SamraptiVighatana*) at multiple levels. The primary impact from *Bhallataka* is its intense heat and penetrating quality, leading to acute *Pitta* and *Vata* aggravation.

Cedrus deodara and *Cyperus rotundus* provide a powerful anti-inflammatory and analgesic backbone.[9,14] The most critical component is arguably *Cyperus rotundus*, whose scientifically validated anti-allergic properties directly address the hypersensitivity reaction.[16] *Brassica campestris* helps in detoxification and provides an antimicrobial defense against secondary infections.[12] The inherent heat of mustard is balanced by the cooling effect of both *Musta* and the *Navnit* base. *Navnit* acts as an active component, providing immediate soothing relief and a protective lipid barrier essential for healing compromised skin.

Compared to conventional treatment with topical corticosteroids, which can have side effects like skin thinning, this Ayurvedic formulation offers a holistic approach.[20] It aims not just to suppress inflammation but to actively heal the tissue (*Ropana*), pacify the imbalanced *doshas*, and provide symptomatic relief.[19] The need for a standardized, safe, and effective formulation is paramount, and further research is essential.[7] Subsequent human clinical trials could establish its place as a validated, evidence-based therapy.

The following table outlines the integrated mechanisms through which the key herbal ingredients exert their therapeutic effects—bridging classical Ayurvedic rationale with modern pharmacological correlates.

Table 2: Mechanism of Action.

Mechanism of Action	Contributing Ingredients	Ayurvedic Rationale	Modern Pharmacological Correlation
Neutralization of Inflammatory Response	*Cedrus deodara*, *Cyperus rotundus*	Pacification of aggravated *Pitta* and *Vata* (*Pitta-Vata Shamana*).	Inhibition of inflammatory mediators and analgesic effects.
Anti-Allergic and Mast Cell Stabilization	*Cyperus rotundus*	*Vishaghna* (anti-toxic) action.	Inhibition of histamine release from mast cells, mitigating Type IV hypersensitivity (16).
Soothing and Cooling Effect	*Cyperus rotundus*, *Navnit*	*Sheeta Virya* (cold potency) counteracts the *Ushna Guna* (hot quality) of *Bhallataka*.	Provides immediate symptomatic relief and forms a protective emollient layer.
Wound Healing and Skin Repair	*Cedrus deodara*, *Cyperus rotundus*, *Navnit*	*Ropana* (healing) and *Sandhaniya* (tissue regenerating) properties.	Promotes re-epithelialization and collagen synthesis, supported by a nourishing lipid base (19).
Antimicrobial Protection	*Cedrus deodara*, *Brassica campestris*	*Krimighna* (antimicrobial) action to prevent secondary infections.	Antibacterial properties of essential oils and isothiocyanates prevent infection in blisters (11, 12).

CONCLUSION

The Daru-Sarshpa-Musta Lepa is a classical Ayurvedic formulation with a strong theoretical and pharmacological basis for managing dermal toxicity induced by *Semecarpus anacardium* oil. Its four ingredients provide a synergistic effect that addresses the multifaceted pathology by delivering anti-inflammatory, anti-allergic, antimicrobial, cooling, and wound-healing actions. A review of classical texts and modern pharmacological studies supports the formulation's potential to reduce inflammation, relieve pain, prevent secondary infections, and accelerate healing. While tradition provides a strong foundation, rigorous scientific validation through standardization, preclinical studies, and controlled clinical trials is imperative to establish its effectiveness and safety in modern dermatological practice.

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