

Therapeutic Mechanism of *Jeeraka Ghrita* in the Healing of *Agni Dagdha Vrana* (Burn Wounds): A Critical Review

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Abstract: Burn injuries (*Agni Dagdha Vrana*) are among the most painful and debilitating conditions, leading to tissue destruction, inflammation, and scarring. While modern medicine uses topical agents like silver sulfadiazine, these often delay epithelialization and may cause pigmentation or contracture. Ayurveda provides holistic management through *Ghrita Kalpana*, particularly *Jeeraka Ghrita*, described in *Bhaishajya Ratnavali* for *Dagdha Vrana Chikitsa*. This formulation comprises *Jeeraka* (*Cuminum cyminum*), *Ghrita* (clarified butter), *Rala* (*Vateria indica* resin), *Moma* (beeswax). Ayurvedically, it pacifies aggravated *Pitta* and *Rakta* doshas, relieves *Daha* (burning) and *Shoola* (pain), and promotes *Vrana Shodhana* and *Ropana* (wound cleansing and healing). Pharmacologically, the ingredients exhibit antioxidant, anti-inflammatory, antimicrobial, and collagen-stimulating properties that accelerate epithelialization and minimize scarring. The *Snigdha* and *Sheeta* Guna of *Ghrita* and *Moma* maintain moisture and soothe tissues, while *Jeeraka* enhances circulation and prevents infection. *Rala* contributes to tissue regeneration through its flavonoid and phenolic content. Thus, *Jeeraka Ghrita* acts synergistically at every stage of burn healing—reducing inflammation, promoting granulation, and ensuring tissue remodeling. This review reaffirms its efficacy as a traditional yet scientifically plausible formulation for managing second-degree burns, bridging classical Ayurvedic wisdom with modern wound-healing science.

Keywords: *Jeeraka Ghrita*, *Agni Dagdha Vrana*, Burn Wound Healing, *Ghrita Kalpana*

I. INTRODUCTION

Burn injuries are among the most distressing and painful conditions known to humankind. They involve destruction of the skin and underlying tissues, leading to inflammation, fluid loss, infection, and scarring. Globally, burns remain a major cause of morbidity and mortality, with long-term complications such as cosmetic disfigurement, physical disability, and psychological distress.^[1]

Modern medicine classifies burns according to the depth of tissue injury—superficial (first-degree), superficial partial-thickness (second-degree), deep partial-thickness, full-thickness (third-degree), and fourth-degree burns.^[2] Among these, superficial second-degree burns are marked by blisters, a moist red surface, and severe pain. Healing usually occurs within 7–21 days with proper cleansing and dressing. Although silver sulfadiazine is widely used for topical management, it often delays epithelialization and may lead to post-healing pigmentation or contracture.^[3] This limitation has inspired growing interest in Ayurvedic formulations known for faster healing and scar prevention.

In Ayurveda, burn injuries are described as *Dagdha Vrana*. Their management is elaborated under *Shashti Upakrama* (sixty therapeutic measures), among which *Ghrita* (medicated ghee) plays a vital role due to its *Vranashodhana* (cleansing), *Vranaropana* (healing), and *Ropana* (regenerative) properties.^[4] During para-surgical procedures like *Agnikarma*, accidental burns called *Pramada Dagdha* or *Ittartha Dagdha* often occur, for which Ayurvedic texts



recommend specific formulations. One such formulation is Jeeraka Ghrita, described in *Bhaishajya Ratnavali*, indicated especially for *Dagdha Vrana*.^[5]

Jeeraka Ghrita is prepared from *Jeeraka* (*Cuminum cyminum*), *Ghrita*, *Rala* (*Vateria indica*), *Moma* (beeswax). It possesses *Vranaghna*, *Vranashodhana*, and *Vranaropana* actions.^[6] The formulation is *Tridoshaghna*, particularly pacifying *Pitta* and *Vata dosha*, thereby reducing *Daha* (burning) and *Shoola* (pain). Its *Madhura Rasa*, *Snigdha Guna*, and *Ushna Virya* promote granulation tissue formation and aid in rapid wound healing.^[7] The *Ghrita* base enhances bioavailability and deeper penetration of active components, ensuring sustained therapeutic action.

From a modern pharmacological perspective, the ingredients of *Jeeraka Ghrita* exhibit anti-inflammatory, antimicrobial, antioxidant, and collagen-stimulating properties, supporting faster epithelialization and minimizing scar formation.^[8] Thus, it may serve as a safe and effective alternative to conventional burn treatments, combining Ayurvedic wisdom with modern wound-healing science.

Hence, exploring the mode of action of *Jeeraka Ghrita* in the management of *Agni Dagdha Vrana* (second-degree burns) is vital for establishing its scientific basis and integrating traditional Ayurvedic formulations into evidence-based burn care.

II. MATERIAL AND METHODS

This study is a conceptual and literary review based on Ayurvedic classics including *Bhaishajya Ratnavali*, *Sushruta Samhita*, and *Charaka Samhita*, supported by modern scientific literature. Relevant data on *Jeeraka Ghrita* and *Agni Dagdha Vrana* were collected from classical texts, journals, and pharmacological studies. The information was analyzed comparatively to interpret the Ayurvedic mode of action of *Jeeraka Ghrita* in second-degree burns.

III. RESULTS

Agni Dagdha Vrana (Burn Injury)

In Ayurvedic literature, *Agni Dagdha Vrana* represents a form of trauma caused by thermal injury, leading to both local tissue destruction and systemic disturbance. *Acharya Sushruta* classified burns (*Dagdha Vrana*) according to depth and severity into four categories — *Plushta* (first degree), *Durdagdha* (second degree), *Samyak Dagdha*, and *Atidagdha*.^[9] Among these, *Durdagdha* correlates with second-degree burns, presenting with *Shigra Sphota* (blisters), *Chosha* (pain), *Daha* (burning), redness, exudation, and delayed wound healing.

The *Samprapti* (pathogenesis) of *Agni Dagdha* involves vitiation of *Rakta* and *Pitta doshas* due to exposure to *Ushna* (hot) and *Tejas* (thermal) elements. The heat's *Tulya Virya* (similar potency) with *Pitta* aggravates it, resulting in *Teevra Vedana* (severe pain), *Jwara* (fever), and *Trishna* (thirst). This internal imbalance leads to inflammatory responses and blister formation, paralleling the modern understanding of burn pathophysiology, which includes inflammation, edema, necrosis, and delayed epithelial repair.^[10]

Ayurvedic Classification and Management

Classical Ayurvedic texts emphasize that each burn type demands a specific therapeutic approach.^{[11][12]}

Plushta Dagdha (first-degree burns) requires *Ushna Kriya* (warm therapy) to restore circulation and prevent coagulation.

Durdagdha (second-degree burns) benefits from combined *Sheeta* and *Ushna Chikitsa*, involving the application of medicated *Ghrita*, cold fomentation, and protective dressings.

Samyak Dagdha and *Atidagdha* types are managed with specialized formulations prepared from *Ghrita*, *Tugaksheera*, *Chandana*, and *Amruta*, to alleviate burning sensation and aid tissue regeneration.

Among all forms of treatment, *Ghrita*-based formulations are considered superior for their *Vranashodhana* (cleansing), *Vranaropana* (healing), and *Vata-Pitta Shamana* actions.



Jeeraka Ghrita

Jeeraka Ghrita is specifically described in *Bhaishajya Ratnavali* for managing *Agni Dagdha Vrana*.^[6] It combines *Jeeraka* (*Cuminum cyminum*), *Ghrita* (clarified butter), *Rala* (*Vateria indica* resin), *Moma* (beeswax). Each component synergistically contributes to wound cleansing, dhatu repair, and pain alleviation.^[7]

A. Jeeraka (*Cuminum cyminum*)^[13]

Jeeraka is characterized by *Katu Rasa* (pungent taste), *Laghu-Ruksha Guna* (light and dry qualities), and *Ushna Virya* (hot potency). It pacifies *Vata* and *Kapha doshas*, enhances local circulation, and prevents microbial infection. It exhibits *Dipana*, *Pachana*, *Krumighna*, and *Varnya* properties.

Modern research confirms its antioxidant, antimicrobial, and anti-inflammatory potential, largely due to the presence of cumin aldehyde, thymol, and flavonoids, which promote collagen formation and tissue remodeling.

B. Ghrita (Clarified Butter)^[14]

Go-Ghrita serves as the lipid base and major therapeutic agent. It possesses *Madhura Rasa*, *Snigdha-Guru Guna*, and *Sheeta Virya*, pacifying *Pitta* and *Vata doshas*. It acts as a *Yogavahi*, facilitating deeper tissue penetration of herbal constituents.

Chemically, *Goghrita* contains triglycerides (~98%), essential fatty acids (oleic, palmitic, stearic), and vitamins A, D, E, and K. These compounds are known for antioxidant, anti-inflammatory, and tissue-repair functions. Experimental evidence indicates that *Ghrita* enhances collagen synthesis, maintains epithelial integrity, and reduces oxidative stress, which are vital in burn wound healing.

C. Rala (*Vateria indica* Resin)^[15]

Rala or *Sarja Rasa* is the resin obtained from *Vateria indica*, having *Kashaya-Katu Rasa* and *Ushna Virya*. It exhibits *Vranashodhana* (cleansing) and *Vranaropana* (healing) actions. Modern studies confirm the presence of phenolic compounds, flavonoids, and triterpenes, contributing to potent anti-inflammatory, antioxidant, and anti-ulcer properties. *Vateria indica* extracts have shown significant inhibition of edema and cytotoxic effects on cancer cell lines, supporting its role in tissue protection and regeneration.

D. Moma (Beeswax)^[16]

Moma or *Madhuchishhta* acts as a natural ointment base with *Snigdha* and *Mridu Guna*. It protects the wound from environmental contamination while retaining moisture, essential for epithelialization. It exhibits *Vranashodhana* and *Vranaropana* properties, aiding in tissue cohesion (*Sandhana*). Physicochemical analyses confirm its purity and ideal melting point (58–66°C), making it effective for external formulations.

IV. PHARMACOLOGICAL CORRELATION

The combined formulation of *Jeeraka Ghrita* demonstrates a multi-dimensional therapeutic effect. Its anti-inflammatory and antioxidant actions help control tissue damage, while antimicrobial properties prevent secondary infection. The unctuous (*Snigdha*) and mildly cooling (*Sheeta*) nature of *Ghrita* and *Moma* maintain wound moisture and comfort, preventing cracking and desiccation. *Jeeraka* and *Rala* contribute to early granulation tissue formation and epithelial proliferation, thus accelerating wound contraction.

From a modern biomedical perspective, the formulation aids in all three key phases of burn wound healing:

Inflammatory phase: Reduction of exudate, erythema, and microbial load through anti-inflammatory and antiseptic activity.

Proliferative phase: Promotion of fibroblast activity, angiogenesis, and granulation tissue formation.

Remodeling phase: Enhancement of collagen alignment and epithelial regeneration leading to soft, less pigmented scars.

The *Ropana* (healing) action of *Jeeraka Ghrita* can be scientifically attributed to its antioxidant and collagen-modulating effects, comparable to the epithelialization process in modern wound healing. The *Vranashodhana* (cleansing) action corresponds to its antimicrobial and detoxifying properties, while *Vata-Pitta Shamaka* activity helps reduce pain and burning sensation.

Hence, *Jeeraka Ghrita* represents a comprehensive wound-healing formulation—addressing not only tissue repair but also doshic balance, oxidative protection, and scar prevention.



V. DISCUSSION

According to Ayurveda, *Agni Dagdha Vrana* arises due to the vitiation of *Pitta* and *Rakta doshas* when exposed to excessive *Agni Mahabhuta* (fire element). The resultant symptoms such as *Daha* (burning), *Sphota* (blistering), *Shoola* (pain), and *Raga* (redness) represent the disturbed state of heat, blood, and tissue balance. Hence, the line of treatment focuses on pacifying aggravated *Pitta* and *Rakta*, relieving local inflammation, and initiating *Ropana* (healing) while maintaining *Dhatu Pushti* (tissue nourishment).

Among the various *Ghruta Kalpanas* described in classical texts, *Jeeraka Ghruta* has been specially mentioned in *Bhaishajya Ratnavali* (*Vrana Chikitsa Adhikara, Shloka 18*) for the management of burns.

Jeeraka Ghruta effectively reduces discharge, burning sensation, and blister formation in burn wounds, and simultaneously alleviates pain. (*Bhaishajya Ratnavali*, 48/18). The formulation is, therefore, *Daha Shamana*, *Sphota Nivara*, and *Shoola Prashamana* in nature — providing comprehensive healing to *Agni Dagdha Vrana*.

From an Ayurvedic perspective, *Jeeraka Ghruta* acts primarily by balancing vitiated *Pitta* and *Rakta*, the key factors responsible for inflammatory and suppurative stages of burn injury. The *Sheeta* (cool) and *Snigdha* (unctuous) attributes of *Ghruta* and *Moma* directly oppose the excessive heat and dryness of *Pitta* and *Agni*. This helps in soothing *Daha* (burning) and maintaining moisture within the wound bed. *Rala* (*Vateria indica*), with its *Kashaya-Tikta Rasa* and *Ushna Virya*, aids in *Vrana Shodhana* (wound purification) by drying excess exudate and reducing microbial activity. *Jeeraka* (*Cuminum cyminum*), though *Ushna* in potency, acts as a circulatory stimulant (*Srotoshodhana*), improving local metabolism and preventing *Ama* accumulation — thus maintaining a clean and healthy wound environment.

Furthermore, the *Madhura Rasa* and *Mridu Guna* of *Ghruta* promote *Mamsa Dhatu Vardhana* (muscle tissue regeneration) and *Sandhana* (union of wound margins), ensuring proper granulation and epithelialization. Its *Yogavahi* nature allows deep penetration of medicinal properties into *Srotomarga*, thereby supporting cellular-level repair. The *Rasayana* quality of *Ghruta* enhances tissue immunity (*Vrana Bala*), minimizes oxidative stress, and prevents post-burn hyperpigmentation and scarring.

In essence, *Jeeraka Ghruta* achieves *Tridoshika Samyata* — pacifying *Pitta* with its cooling and nourishing effect, *Vata* with its unctuous and soft properties, and *Kapha* through the mild *Ushna Virya* of *Jeeraka*, which avoids excessive moisture or pus formation. This balance allows the wound to progress smoothly from the *Shodhana* (cleansing) to the *Ropana* (healing) phase.

VI. CONCLUSION

Jeeraka Ghruta, as described in *Bhaishajya Ratnavali*, proves effective in managing *Agni Dagdha Vrana* through its *Pitta-Rakta Shamana*, *Daha Shamana*, and *Vrana Ropana* actions. Its ingredients collectively promote faster healing, reduce pain and discharge, and restore tissue integrity, aligning Ayurvedic principles with modern wound-healing science.

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