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Conceptual study on efficacy of *Lajjalu Moola Taila* in *Sadhyovrana*

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ABSTRACT

A surgeons' initial challenge is management of *Vrana* (wound). *Vrana* is the one which does the *Gatravichurnana* (disruption of tissues) and produces *Vivarnata* (discolouration) of the defected body part. *Sadhyovranas* are those which are caused by trauma and exogenous factors. *Sadhyovrana* encompasses various types of fresh wounds, including traumatic wounds, burn wounds, animal bites, and post-operative wounds. The aim of wound care is to promote wound healing in the shortest time possible, with minimal pain and scarring. While promotion of wound healing still remains a topic of discussion in modern science, the ancient system of *Ayurveda* has described concept of *Vrana Ropana* and is elaborated in the treatise *Sushruta Samhita* under *Shashti Upakrama.*[1] There is a need to explore this unique concept of *Vrana Ropana* under which many formulations have been mentioned in various classics which aids in early healing of the wounds. In the context of *Sadhyovrana*, *Acharya Shodala,* as cited in the *Gadanigraha,* refers the use of *Lajjalumoolataila* especially in *shastraghata Vrana.*[2] He particularly emphasises on its *Ropanakarma* function, which accelerates wound healing by preventing *Paka* thus, ensuring a quick recovery. Hence, an effort has been undertaken to explore the effectiveness of *Lajjalumoola Taila* in promoting wound healing, with a particular focus on its application in *Sadhyovrana.*

Key words: *Vrana, Sadhyovrana, Vrana Ropana, Lajjalumoola Taila.*

INTRODUCTION

Wound is described as 'a break in the continuity of tissue' and is regarded as healed if there is a restoration of the wounded or inflamed tissue to normal condition. Retrospective analysis of Medicare beneficiaries reveals that 8.2 million people had wounds with or without infections in 2018.[3] Wound

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Healing is the interaction of a complex cascade of cellular events that generates resurfacing, reconstitution and restoration of the tensile strength of injured skin. It is a systematic process, traditionally explained in terms of three classic phases' viz. inflammation, proliferation, and maturation. The major aspect of the management of the fresh wound is prevention of the infection and speedy healing. Hence, the proper initial care of the fresh wound is necessary to assure timely healing.

Even though there are many advents in the field of wound management in modern system the quest to explore new drugs or formulations which promotes wound healing is accelerating due to the problem of resistance exhibited by microbes against many topical and oral antimicrobial agent which hinders proper healing.

Sadhyovranas are those which are caused due to exogenous factors. All the fresh wounds like traumatic

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wounds, burn wounds, animal bites, and post operative wounds can be considered under *Sadhyovrana.* Numerous formulations have been mentioned in context of *Sadhyovrana* which accelerates wound healing. *Acharya Shodala* in the book of *Gadanigraha* mentions the use of *Lajjalumoolataila* in the context of *Shastraghata Sadhyovrana*. He states that this *Taila* ensures quick healing of fresh wounds especially those which are inflicted by *Shastra* (instruments), by avoiding *Paka.* So, the study has been taken up to evaluate the wound healing property of *Lajjalumoola Taila.*

Disease Review

Nidana:

Fresh wounds known as *Agantuja Vrana* results from diverse external factors such as animal bites, sharp or blunt objects, cautery or fire, *Kshara, Visha,* and more.

Types:

6 types of *Sadhyovrana* are explained in *Sushrutha Samhita*[4] which is elaborated in table 1:

Table 1: Types of *Sadhyovrana* according to *Acharya Sushrutha*

SN	Type	*Lakshana*
1.	*Chinna Vrana*	Extensive wounds either oblique or straight associated with separation of body parts
2.	*Bhinna Vrana*	Injury to body cavities with pointed objects resulting in discharge of fluids
3.	*Viddha Vrana*	The wound in which any part other than body cavities gets pierced by sharp pointed weapon
4.	*Kshataja Vrana*	It is neither cut nor perforated but is in between *Chinna* and *Bhinna Vrana*
5.	*Picchitha Vrana*	Due to severe pressure, a part of body along with bone gets flattened and is covered with marrow and blood
6.	*Ghrista Vrana*	When the skin gets peeled off due to rubbing injury, associated with burning sensation and discharge

Treatment

Acharya Sushruta while discussing the treatment modality of *Sadhyovrana,* recommended employing medications with *Kashaya, Madhura Rasa, Sheeta*, and *Snigdha Guna* qualities for the healing of wound. *Acharya Shodala* in the book of *Gadanigraha* mentions *Lajjalumoolataila* in the context of *Shastraghata Sadhyovrana* which helps in *Ropanakarma* quickly by avoiding *Paka.*

Lajjalu contains *Tiktha, Kashaya Rasas, Sheeta Guna* which aids in *Vranaropana.*[5] *Dhanwanthari Nighantu* attributes *Shophagna, Dahaghna* and *Vranahara* properties to *Lajjalu.*[6]

Drug review

Mimosa pudica L. is a diffuse, thorny under shrub that belongs to the Mimosaceae family. The plant originates from tropical America and has become naturalized in almost all tropical and subtropical regions of India. It is commonly distributed in open-spaces, especially road side, cultivated land, and waste area.[7]

General description

It is a small, prostrate or ascending, short-lived shrub. The reddish-brown, woody stems are sparsely or densely armed with curved prickles. The root system consists of a taproot and extensive fibrous roots with nodules. The twigs are fine and flexible. Leaves are compound, sensitive, sessile, linear oblong. The flowers are pink and clustered in globose heads. The legume (pod) is linear-oblong.

Mimosa pudica is famous for its swift plant movements, exhibiting a distinctive 'nyctinastic motion'. This involves the leaflets folding together in the evening, and the entire leaves drooping downward. The leaves can also close in response to various stimuli, including touch, warmth, or shaking. This particular type of movement is referred to as 'seismonastic movement'. The parenchymatous motor cells in the pulvini are responsible for the contractibility. It is widely acknowledged that these movements result from the reduction or sudden loss of turgor in the motor cells.

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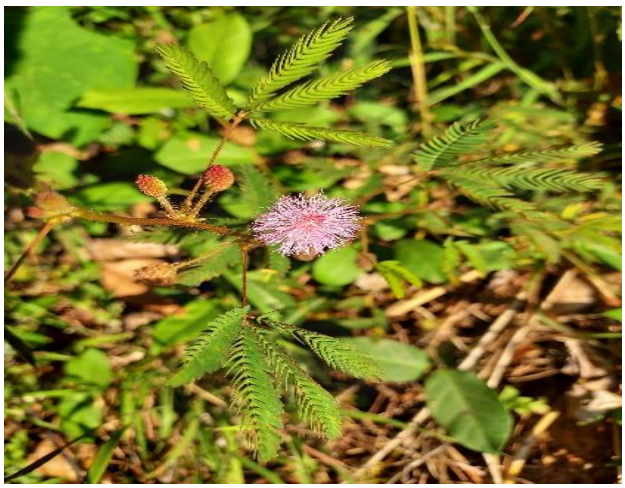

Fig. 1: *Lajjalu (Mimosa pudica)* plant

In *Ayurveda,* the herb *Lajjalu* is recognized by various synonyms, including *Namaskari, Samangaa, Samokchini, Shamipatra, Khadira Patrika,* as well as *Raktapadi*. It has been traditionally used to treat several diseases including bleeding disorders such as menorrhagia, dysentery, piles, and in wound healing.

Acharya Charaka categorises the drug in *Sandhaneeya* (group of drugs used in quick wound/ fracture healing) and *Pureesha Sangrahaneeyana Gana* (group of drugs helpful in increasing bulk of feces).

- *Rasa - Kashaya, Tiktha*
- *Guna - Sheeta, Ruksha Guna*
- *Veerya - Sheetha*
- *Vipaka - Katu*
- *Karma - Kaphapittha Hara*
- Therapeutic indications - *Yoniroga, Atisara, Bhagandara, Shopha, Vrana*.
- Parts used - root, whole plant.
- Chemical composition - Phytochemical studies on *M. pudica* have revealed the presence of alkaloids, non-protein amino acid (mimosine), flavonoids C-glycosides, sterols, terpenoids, tannins, and fatty acids.

Research works on wound healing activity of *Lajjalu*

By adding the methanolic and total aqueous extracts to simple ointment base B.P. at concentrations of 0.5% (w/w), 1% (w/w), and 2% (w/w), the wound healing efficacy of *M. pudica* roots was investigated. Three different rat models were used to study the healing activity of wounds: excision, incision, and biochemical parameter measurement. Significant ($P < 0.001$) results were observed when wounds were treated with ointment containing 2% (w/w) methanolic and 2% (w/w) total aqueous extract. It showed a notable incisional wound tensile strength. The phenolic components in the methanolic extract are likely what caused the good wound healing action.[8]

A second study was done on webster albino rats to assess the effect of *Mimosa pudica* on wound healing. Methanolic extract of the root and shoot were used. From Day 1 of the treatment to Day 9, contraction of the excision wound was encouraged. The epithelization of wound in case of mice treated with extracts was found to be quite earlier than control. It implies that *Mimosa pudica* extracts from the shoots and roots aided in the healing of wounds.[9]

Impact on burn wound model: topically applied formulations of *M. pudica* leaves extract (5% & 10%) and mupirocin standard medication considerably decreased the time required for epithelialization and generated a significant 50% (days) reduction in wound contraction when compared to control.[10]

Wound healing evaluation of chloroform and methanolic extracts of M. *Pudica* roots in rats resulted in significant reduction in wound contraction (50%) when compared to control ($P<0.001$). The decline in period of epithelization and wound contraction with Methanolic and chloroform Extract of M. *pudica* formulations at both high and low doses were found to be significant compared to their respective emulsifying bases. High doses were found to be more effective than their lower doses.[11]

Using the zone of inhibition, the antimicrobial activity of successive extracts of the whole plant of *M. pudica* in petroleum ether, chloroform, ethyl acetate, methanol, and water was investigated against a variety of Gram positive and Gram-negative bacterial strains. The result of the study showed that the *M. pudica* whole plant extract had good antibacterial activity

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against the pathogens utilized for screening in 7–18 mm range.[12]

1) Preparation of *Lajjalu Moola Taila*

Ingredients:

- *Kalka Dravya: Ardra Lajjalu Moola Kalka* - 1 part
- *Sneha Dravya: Moorchitha Tilataila* - 4 parts
- *Dravadravya:* Water - 16 parts.

Method of preparation:

Moorchitha Tila Taila is taken in a thick bottomed vessel and is heated over *Mandagni.* To this specified quantity of *Ardra Lajjalu Kalka* is added followed by water. It is heated till the *Taila Siddhi Lakshanas* are observed. When the *Taila* attains room temperature, it is filtered and stored in a clean, sterile container.

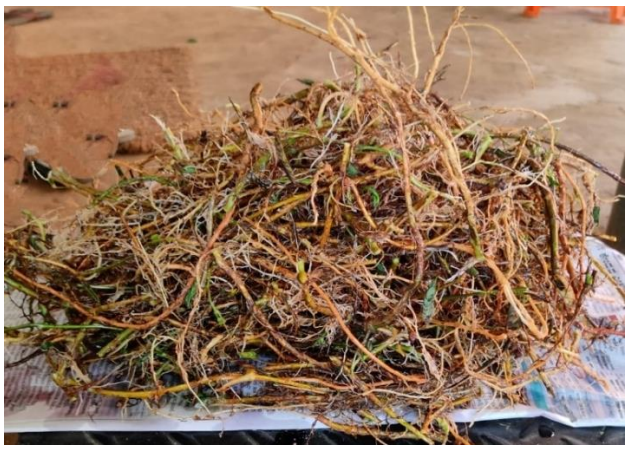

Fig 2: *Lajjalu Moola* freshly collected

Fig 3: *Kalka* of *Lajjalu Moola*

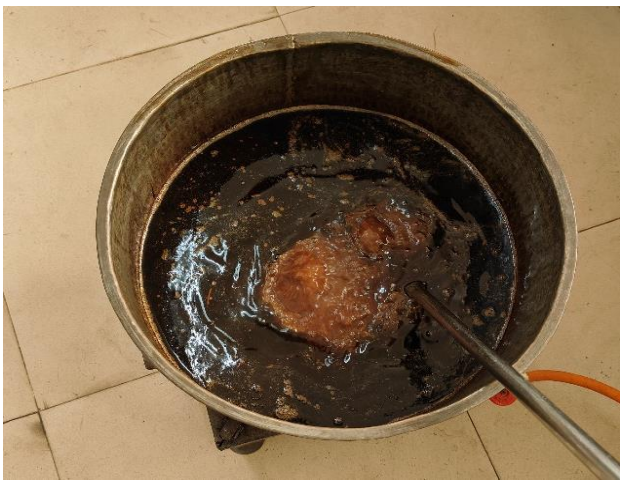

Fig 4: *Taila Paka*

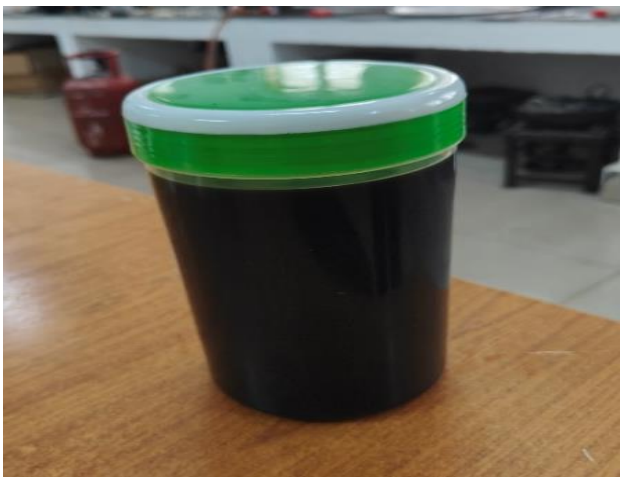

Fig 5*: Lajjalumoola Taila*

Application of *Lajjalumoola Taila*

Wound is cleaned using normal saline, sterile gauze soaked with lukewarm *Lajjalumoola Taila* is applied over the wound and sterile dressing is done for a span of 14 days. Subjective and objective parameters are assessed for wound healing along with follow up after 4 weeks.

DISCUSSION

Probable mode of action of *Lajjalumoola Taila*

Lajjalu contains *Tiktha, Kashaya Rasas, Sheeta Guna* which favours *Vranaropana.* It possesses *Shophagna, Dahaghna* and *Vranahara* properties i.e., it aids in alleviating inflammation and burning sensations, thereby expediting the healing of wounds.

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Phytochemical studies on *Lajjalu (Mimosa pudica)* shows it contains chemical constituents such as alkaloids, flavonoids, phenols, tannins, tarpenoids etc., which promote wound healing. Wound healing activity of the root of *Mimosa pudica* was studied in three types of model in rats viz. excision, incision, and estimation of biochemical parameters. The methanolic extract exhibited good wound healing activity. It was proposed that, the high content of tannins in the roots of *Mimosa pudica* may be responsible for wound healing activity, probably due to astringent property of tannins. Antimicrobial and haemostatic properties of *Lajjalu* have already been proved.

CONCLUSION

Lajjalu (Mimosa pudica) is a very common shrub, the properties of which mentioned in the treatise of Ayurveda points towards wound healing potential of the drug. Moreover, the availability of this medicinal plant is abundant in India. Therefore, it emerges as a favourable option for the assessment of the drug in subsequent studies. Hence, the use of *Lajjalu Moola Taila* is anticipated to be a safe, effective, and cost-efficient approach for the treatment of recent wounds.

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