



ROLE OF GODHUMA IN THE PHYSIOLOGY OF WOUND HEALING - A REVIEW

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ABSTRACT

Background: Wound healing is a highly coordinated physiological process involving inflammation, cell migration, proliferation, angiogenesis, extracellular matrix deposition and tissue remodeling. Ayurveda describes Godhuma (Triticum aestivum Linn) as a Vranaya, Vrana Pachana Dravya and Pathya Ahara for Vrana Rogi, suggesting its potential role in promoting tissue repair and wound healing. Aims and Objectives: To review the available Ayurvedic literature and contemporary scientific evidences on the effect of Godhuma in the physiology of wound healing. Materials and Methods: A narrative review was conducted using classical Ayurvedic texts and peer-reviewed scientific literatures. Discussion and conclusion: Godhuma contains diverse bioactive constituents, including phenolic acids, flavonoids, tocopherols, carotenoids, phytosterols, polysaccharides and essential amino acids, which exhibit antioxidant, anti-inflammatory, antimicrobial and proliferative activities. These constituents may influence multiple phases of wound healing by reducing oxidative stress, regulating inflammatory mediators, promoting fibroblast and myoblast proliferation and migration, enhancing collagen synthesis, stimulating angiogenesis, and facilitating extracellular matrix remodeling. The Ayurvedic properties of Godhuma, such as Madhura Rasa, Guru-Snigdha Guna, Sheeta Veerya and Madhura Vipaka, further support its Brimhana, Sandhanakara, Balya, and Ropana actions, providing a possible physiological basis for its wound healing potential. The available evidence suggests that Godhuma possesses significant potential to enhance wound healing through multiple cellular and molecular mechanisms, supporting its traditional Ayurvedic use in the management of Vrana.

KEY WORDS: Godhuma: Triticum aestivum, Wound healing, Wound, Vrana

INTRODUCTION

Wounds are as old as human existence. The first wound a person experiences occurs at birth during the cutting of the umbilical cord and the need for wound care begins at that point. This primordial experience of injury underscores why ancient Acharyas accorded great importance to the science of wound healing^[1]. As humans encountered injuries over time, methods of managing wounds gradually developed. The evolution of wound care is closely intertwined with the history of surgery. Although the molecular basis of wound healing have been elucidated by modern science only in recent times, the fundamental principles of wound management have been recognized for centuries. Traditional medical systems such as Ayurveda, one of the world's oldest healthcare sciences, possess extensive and well-documented knowledge regarding the treatment and management of various types of wounds. References to the management of wounds are found even in the Vedas, composed around 5000 BC, and a systematic exploration of wound care in the Samhitas reveals profound and advanced insights into the healing process^[2].

Around 2000 BC, Atreya Punarvasu significantly expanded the conceptual framework of Vrana by systematically describing their etiology, clinical features and therapeutic measures. He was among the earliest physicians to document an extensive range of medicinal formulations for wound management. Subsequently, during the period of Acharya Sushruta (approximately 1000 BC), wound care reached remarkable sophistication. As an eminent surgeon, Sushruta thoroughly understood the importance of proper wound management and elaborated on diverse clinical aspects, including causes, classification, symptomatology, prognosis, treatment modalities, and complications of wounds.

Vagbhata, during the fifth century AD, enriched the existing knowledge of wound healing through the integration of his clinical experience with the principles established by Charaka and Sushruta. He classified wounds according to their stages and advocated stage-specific therapeutic measures along with appropriate drug formulations. A fundamental principle emphasized in the management of severe wounds was the conversion of contaminated wounds into clean wounds. This approach involved multiple strategies such as correction of vitiated Dosha, control of inflammation, surgical intervention and elimination of causative factors.



Drugs endowed with *Madhura*, *Tikta* and *Kashaya Rasa* are considered particularly beneficial in the treatment of wounds [3]. *Godhuma* (*Triticum aestivum*), commonly known as wheat, is a staple cereal that is extensively documented in Ayurvedic texts and widely utilized as a dietary component and holds a prominent place both as *Ahara* and *Oushadha*. It is classified under *Dhanya varga* and is considered superior among cereals due to its nourishing, strengthening and tissue-building properties. Classical Ayurvedic texts regard *Godhuma* as a wholesome food that supports growth, sustenance and longevity when consumed appropriately. Regular consumption of *Godhuma* is advocated for individuals experiencing debility, emaciation, and *Vata*-predominant disorders, highlighting its importance in preserving the body's structural and functional integrity.

From the perspective of *Rasa-pancaka*, *Godhuma* possesses *Madhura rasa*, *Guru* and *Snigdha guna*, *Shita veerya*, and *Madhura vipaka*.^[4] Due to these attributes, it exhibits *Vata- Pitta shamaka* action. The *Madhura rasa* and *Madhura vipaka* impart nourishing and anabolic effects, while *Snigdha* and *Guru guna* contribute to lubrication, stability, and strength of tissues. The *Shita veerya* provides a cooling and soothing effect, making *Godhuma* beneficial in conditions characterized by burning sensation, dryness, and excessive catabolism.

Godhuma is particularly valued for its *Bramhana*, *Balya* and *Tarpaka* properties. It nourishes multiple *Dhatus*, thereby improving strength, stamina and vitality. Its action on *Mamsa dhatu* supports muscle bulk and tissue regeneration. Because of its stabilizing and nourishing nature, *Godhuma* is recommended in conditions of chronic illness, convalescence and post-traumatic weakness.

In the context of *Vrana*, *Godhuma* plays a significant therapeutic role due to its *Sandhanakara* and *Ropaṇa* properties. Classical references indicate that substances possessing *Madhura Rasa*, *Snigdha Guna* and *Shita Veerya* promote wound healing by enhancing tissue regeneration, reducing irritation and restoring normal structure. *Godhuma*, either as part of internal dietary support or external formulations, supports in strengthening newly formed tissue and improving wound stability. Its nutritive properties promote granulation tissue formation and epithelialization, thereby enhancing wound healing and minimizing complications.

AIMS AND OBJECTIVES

To review the available Ayurvedic literature and contemporary scientific evidence on the effect of *Godhuma* in the physiology of wound healing with special emphasis on its influence on cellular physiology and the mechanisms involved in tissue repair.

MATERIALS AND METHODS

A narrative review was conducted using classical Ayurvedic texts, peer-reviewed scientific literature and electronic databases including PubMed, Scopus, Google Scholar and ScienceDirect. Relevant articles describing the phytochemistry of *Triticum aestivum*, wound healing physiology, cellular mechanisms of tissue repair and experimental evidence on the biological activities of *Godhuma* were critically reviewed and synthesized.

DISCUSSION

The basic elements of the body are *Dosha*, *Dathu* and *Mala*.^[5] The healthy state consists of balance of these entities and its imbalance leads to various diseases.^[6] The consumption of appropriate food helps to balance *Tridoshas* thus maintain good health status. Hence specific *Pathya Aahara* has been advised in disease conditions which maintains the health of the body and plays a major role in pacifying the disease by bringing *Dosha* to normalcy. Because of this *Aahara* has been called as *Mahabhaishajya*.^[7] *Vata* is pacified by *Madhura*, *Amla* and *Lavana Rasa*, *Pitta* is pacified by *Kashaya*, *Tikta* and *Madhura Rasa* and *Katu*, *Tikta*, *Kashaya Rasas* pacifies *Kapha Dosha*.^[8] The *Vrana Rogi* should abstain from *Lavana*, *Amla*, *Katu Rasa*^[9] and considering this, *Madhura Rasa* can be used as *Pathya* with *Vranaropana* effect.^[10] *Godhuma* is one of the *Nithya Sevaneeya Aahara*^[11] having *Madhura Rasa* which is told as one among the *Pathya Aahara* of *Vrana Rogi*.^[12] *Godhuma* is mentioned as *Vranya*^[13] and which is included in the *Vrana Pachana Dravyas*^[14] and *Godhuma Choorna* is used as *Lepa* for *Vrana Dharana*.^[15]

Madhura Rasa decreases *Vata* and *Pitta* and it increases *Kapha* because of the *Gunas* like *Snigdha*, *Sheeta* and *Guru*. *Panchamahabhuta* composition of *Madhura Rasa* consists of *Pritwi* and *Jala Mahabhuta*. *Madhura Rasa* does *Sarvadhatu poshana*, *Ojovardhana*, *Ayushya*, *Indriya prasada*, *Balavarnakara*, *Jeevana*, *Tarpana*, *Stairyakara*, *Ksheena Kshata Sandhanakara* and *Grana Mukha Kanda Osha Jihwa Prahlada*.^[16] *Godhuma* (*Triticum aestivum* Linn.) is a cereal grass that belongs to the *Poaceae* family. It holds greater importance among the cereals because it is the principal food crop of the most extensive section of the globe and extensively consumed since ancient times. The main Phytoconstituents are Phenolic acid, Flavonoids, Carotenoids, Tocopherols, Tocotrienols, and Phytosterols.^[17] *Godhuma* is included under *Nitya Sevaneeya Aahara*.^[18] The attributes of *Godhuma* as *Madhura Rasa*, *Sheeta Veerya*, *Vata Pittahara*, *Vrunya* and *Sandhanakaraka*.^[19] It is mentioned as *Balya* and *Na Kaphakrut*.^[20] It is one of the *Dravya* which is mentioned for the management of *Vrana*.^{[21][22]}



As per Sushruta samhitha, *Vrana* is the condition where tissues in the body get destroyed and after repair leaves the scar for whole life. *Vrana* or wound is characterized by a structural deformity in the skin and deeper tissues, which can be associated with symptoms such as *ruja* and *srava*. Among the important factors in wound management, *Pathya* plays a significant role. The presence of carbohydrates, proteins, lipids, vitamins, minerals and various phytochemicals such as Phenolic acid, Flavonoids, Carotenoids, Tocopherols, Tocotrienols, and Phytosterols in *Godhuma* contributes to wound healing by promoting cellular proliferation, collagen synthesis, antioxidant protection and tissue regeneration.

Vrana refers to a disruption in the structural integrity of body tissues, often resulting in scar formation. In modern physiology, a wound is defined as damage to normal anatomical structure and function, ranging from superficial epithelial injury to deeper involvement of subcutaneous tissues, muscles and tendons. Wound healing occurs in four intersecting phases: hemostasis, inflammation, proliferation and maturation or remodeling phase.

Godhuma possesses *Madhura Rasa* along with *Guru* and *Snigdha* *Gunas*. These attributes contribute to *Sarvadhātu Poshana* and *Ojo Vardhana*, thereby supporting tissue regeneration. *Godhuma* helps to pacify *Vata* and *Pitta Doshas*, thereby reducing dryness, pain and inflammatory reactions associated with acute wounds. This creates a favorable and stable environment for *Kapha*. This facilitates *Sandhana* (tissue union) and *Sthirata* (structural integrity) thereby ensuring effective and stable wound healing. *Godhuma* acts as a *Sandhanakara* by promoting tissue union. It exhibits *Sthairyakara* action by providing structural stability to newly formed tissues during the maturation phase. Its *Balya* property enhances tissue strength and supports cellular proliferation. Its *Jeevana* effect maintains cell viability and sustained biological activity during the repair process. Its *Brumhana* action promotes tissue nourishment and increases tissue bulk due to its rich carbohydrate and protein content.

Naveena Ahara dravya are defined as food substances that are used within one year of preparation, whereas *Purana Ahara dravya* refer to those substances that are used after the completion of one year from the date of preparation [23]

Nava Godhuma possesses *Madhura rasa* and *Madhura vipaka*, *Sheeta virya*, and *guru, snigdha guna* and is endowed with *sandhankrut*, *jeevaniya*, *brimhana*, *balya*, and *vranya* properties; whereas *Purana Godhuma* also has *Madhura rasa* and *Madhura vipaka* with *Sheeta virya*, but is characterized by *ruksha guna* and *na atikaphakara*. [24]

From this review of therapeutic applications mentioned in *Samhitas*, it is well understood that *Godhuma* is not just a *Nithyasevaneeyaahara*, but is equally effective in several other conditions as well, like *Vrana*. The *Guna* of *dravya* changes according to the *samskara* (method of processing) and *samyoga* (combination) is unique to Ayurveda. Thus Vagbhata has rightly mentioned that *Godhuma* is a *satmyahara* for all. With the extensive therapeutic possibilities of *Godhuma*, it can be used not only as a *pathyaahara* but also as an *ushadha* in the successful management of *Vrana* [25]

CONCLUSION

The available evidence suggests that *Godhuma* possesses significant potential to enhance wound healing through multiple cellular and molecular mechanisms, supporting its traditional Ayurvedic use in the management of *Vrana*. Integrating classical Ayurvedic principles with contemporary cellular and molecular evidence may provide a stronger scientific basis for the therapeutic application of *Godhuma*, although further experimental and well-designed clinical studies are required to validate its efficacy.

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