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PHYTOCHEMICAL AND PHARMACOLOGICAL INSIGHTS INTO *CLERODENDRUM INFORTUNATUM* LINN. IMPLICATIONS IN WOUND HEALING AND THERAPEUTIC APPLICATIONS

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ABSTRACT

Background: *Clerodendrum infortunatum*, commonly known as Bhaandira, is a well-known medicinal plant in traditional systems of medicine. It has been extensively described in Ayurveda for its therapeutic potential in managing inflammatory conditions, skin disorders, and wound healing. Modern phytochemical and pharmacological studies have further validated its bioactive profile and diverse biological activities. **AIM** To evaluate the phytochemical and pharmacological properties of *Clerodendrum infortunatum* with special reference to its wound healing potential. **OBJECTIVES** To identify and summarize the major phytochemical constituents present in *Clerodendrum infortunatum*. To analyze its pharmacological activities related to wound healing such as anti-inflammatory,

antimicrobial, and antioxidant effects. To understand its role in wound management from an Ayurvedic perspective including *Vrana Shodhana* and *Vrana Ropana*. To explore its broader therapeutic applications in modern and traditional medicine. **Methods:** A comprehensive review of classical Ayurvedic texts and contemporary scientific literature was conducted. Databases including PubMed, Scopus, and Google Scholar were explored to collect relevant information on phytochemistry, pharmacological actions, and experimental studies related to wound healing.

Results:

Clerodendrum infortunatum contains a wide range of phytoconstituents such as flavonoids, alkaloids, glycosides, steroids, and phenolic compounds. These constituents exhibit significant pharmacological activities including anti-inflammatory, antimicrobial, antioxidant, analgesic, and wound healing effects. Experimental studies have demonstrated enhanced wound contraction, increased collagen synthesis, and improved epithelialization. From an Ayurvedic perspective, its properties such as *Katu Tikta Rasa*, *Laghu Ruksha Guna*, and *Ushna Virya* contribute to *Vrana Shodhana* and *Vrana Ropana* actions, supporting its role in effective wound management. **Conclusion:** The integration of phytochemical richness and pharmacological efficacy establishes *Clerodendrum infortunatum* as a promising natural agent for wound healing and therapeutic applications. Further clinical studies are required to validate its efficacy and safety for standardized use in modern healthcare.

Keywords: *Clerodendrum infortunatum*, Wound Healing, Phytochemistry, Pharmacological Activity, *Vrana Ropana*, Antimicrobial Activity

INTRODUCTION

Clerodendrum infortunatum[1] Linn., commonly known as Bhaandira, is a widely distributed medicinal plant in India and other tropical regions. It holds an important place in traditional systems of medicine, especially Ayurveda, where it is used for managing a variety of disorders including skin diseases, inflammation, fever, and respiratory conditions. The plant is recognized for its potent healing properties and has been traditionally employed in the treatment of wounds and ulcers. Its therapeutic utility is primarily attributed to its ability to cleanse and promote healing in damaged tissues, making it an essential drug in classical formulations related to wound care.

In Ayurveda, Bhaandira is described with properties such as *Katu Tikta Rasa*,[2] *Laghu Ruksha Guna*,[3] and *Ushna Virya*,[4] which collectively contribute to its ability to alleviate *Kapha*[5] and *Vata Dosha*.[6] These attributes play a significant role in *Vrana Shodhana*[7] (wound cleansing) and *Vrana Ropana*[8] (wound healing), which are the fundamental principles of wound management in Ayurveda. The herb helps in reducing inflammation, removing necrotic tissue, and promoting the formation of healthy granulation tissue. Its application is also indicated in conditions involving *Dushta Vrana*[9] (chronic wounds), where proper purification and healing are required.

From a modern scientific perspective, *Clerodendrum infortunatum* has attracted considerable attention due to its rich phytochemical composition. Various studies have identified the presence of bioactive compounds such as flavonoids, phenolics, alkaloids, steroids, and glycosides. These constituents are known to exhibit multiple pharmacological activities including anti-inflammatory, antioxidant, antimicrobial, and analgesic effects. Such properties are crucial in the wound healing process, as they help in controlling infection, reducing oxidative stress, and enhancing tissue regeneration.[10]

The increasing interest in plant-based therapeutics has led to renewed exploration of traditional medicinal plants like *Clerodendrum infortunatum*. With growing concerns regarding antibiotic resistance and side effects of synthetic drugs, there is a strong need to identify safer and effective alternatives. In this context, understanding the phytochemical and pharmacological profile of Bhaandira becomes highly relevant. Therefore, the present study aims to provide a comprehensive overview of its therapeutic potential, particularly focusing on its role in wound healing and its implications in modern healthcare applications.[11]

AIM AND OBJECTIVES

AIM

- To evaluate the phytochemical and pharmacological properties of *Clerodendrum infortunatum* with special reference to its wound healing potential.

OBJECTIVES

- To identify and summarize the major phytochemical constituents present in *Clerodendrum infortunatum*.

- To analyze its pharmacological activities related to wound healing such as anti-inflammatory, antimicrobial, and antioxidant effects.
- To understand its role in wound management from an Ayurvedic perspective including *Vrana Shodhana* and *Vrana Ropana*.
- To explore its broader therapeutic applications in modern and traditional medicine.

MATERIAL AND METHODS

The present study was conducted as a narrative review integrating information from classical Ayurvedic texts such as *Charaka Samhita*, *Sushruta Samhita*, and *Bhavaprakasha Nighantu*, along with modern scientific databases including PubMed, Scopus, and Google Scholar to evaluate the phytochemical and pharmacological aspects of *Clerodendrum infortunatum*. Relevant literature was identified using keywords like "*Clerodendrum infortunatum*", Bhaandira, phytochemistry, wound healing, antimicrobial, and antioxidant activity, applying appropriate search strategies. Studies focusing on phytochemical constituents, pharmacological actions, and wound healing properties were included, while unrelated, incomplete, or non-peer-reviewed sources were excluded. The collected data were systematically compiled and analyzed to correlate Ayurvedic concepts such as *Vrana Shodhana* and *Vrana Ropana* with modern experimental findings, and as this was a review-based study, no ethical approval was required.

CONCEPTUAL STUDY

Wound Healing

Wound healing[12] is a complex and dynamic biological process that aims to restore the integrity, structure, and function of damaged tissue. In modern science, it is understood as a coordinated sequence of cellular and biochemical events involving hemostasis, inflammation, proliferation, and remodeling phases. Immediately after injury, clot formation occurs to prevent blood loss, followed by an inflammatory response that removes debris and pathogens. This is succeeded by the proliferative phase, characterized by fibroblast activity, collagen synthesis, angiogenesis, and epithelialization, ultimately leading to tissue remodeling and scar formation. Any disturbance in these stages can result in delayed healing or chronic wounds.

From an Ayurvedic perspective, wound healing is described under the concept of *Vrana*,[13] which refers to a discontinuity or destruction of body tissues. Acharya Sushruta has given a detailed description of *Vrana*, its types, stages, and management principles. The process of wound healing is primarily governed by two fundamental concepts: *Vrana Shodhana*[14] (cleansing of the wound) and *Vrana Ropana*[15] (healing of the wound). *Vrana Shodhana* involves removal of *Dushta* elements such as pus, dead tissue, and microbial contamination, while *Vrana Ropana* promotes regeneration and restoration of normal tissue structure. Proper balance of *Dosha*,[17] especially *Vata*, *Pitta*, and *Kapha*, along with healthy *Dhatu*[18] status, plays a crucial role in efficient wound healing.

Ayurveda also emphasizes the role of *Agni*[19] and *Srotas*[20] in wound healing. Impaired *Agni* leads to improper tissue metabolism and delayed healing, while obstruction in *Srotas* hampers the supply of nutrients and removal of waste products from the wound site. Additionally, factors such as *Ahara*[21] (diet), *Vihara*[22] (lifestyle), and *Manasika Bhava*[23] (mental state) significantly influence the healing process. A balanced diet rich in nourishing substances supports tissue repair, whereas stress and improper lifestyle can delay recovery. Thus, Ayurveda adopts a holistic approach, focusing not only on local wound care but also on systemic well-being.

In the context of herbal therapeutics, drugs possessing properties like *Shodhana* (cleansing), *Ropana* (healing), *Shothahara* (anti-inflammatory), and *Krimighna*[24] (antimicrobial) are considered ideal for wound management. Plants such as *Clerodendrum infortunatum* exhibit these गुण and are traditionally used in the treatment of wounds. Their phytochemical constituents contribute to antimicrobial action, reduction of inflammation, and stimulation of tissue regeneration. Therefore, integrating classical Ayurvedic principles with modern scientific understanding provides a comprehensive framework for effective wound healing and opens avenues for developing safe and efficient plant-based therapies.

Clerodendrum infortunatum Linn.

Clerodendrum infortunatum Linn., commonly known as Bhaandira, is an important medicinal shrub used in Ayurveda for various disorders such as inflammation, skin diseases, fever, and wound healing. It is widely distributed in tropical regions and is valued for its *Vrana*

Shodhana and *Vrana Ropana* properties. Modern research has also validated its pharmacological potential due to the presence of multiple bioactive compounds.

TAXONOMICAL[25] CLASSIFICATION

S. No.	Category	Classification
1	Kingdom	Plantae
2	Division	Angiosperms
3	Class	Dicotyledons
4	Order	Lamiales
5	Family	Verbenaceae / Lamiaceae
6	Genus	Clerodendrum
7	Species	*Clerodendrum infortunatum*

SYNONYMS[26] AND VERNACULAR[27] NAMES

S. No.	Language	Name
1	Sanskrit	*Bhaandira*, *Angaravalli*
2	Hindi	*Bhaandira*
3	English	Glory Tree

MORPHOLOGICAL[28] DESCRIPTION

S. No.	Part	Description
1	Habit	Erect shrub (1–3 m height)
2	Stem	Woody, branched
3	Leaves	Large, ovate, hairy, opposite
4	Flowers	White/pinkish, tubular

5	Fruits	Drupe, black when mature
6	Roots	Thick, medicinally important

PART USED

S. No.	Part Used
1	Root
2	Leaves
3	Whole plant

AYURVEDIC PROPERTIES

S. No.	Parameter	Description
1	Rasa	*Katu*, *Tikta*
2	Guna	*Laghu*, *Ruksha*
3	Virya	*Ushna*
4	Vipaka	*Katu*
5	Doshaghnata	*Kapha-Vata Shamaka*

KARMA[29] (THERAPEUTIC ACTIONS)

S. No.	Action
1	*Shothahara* (anti-inflammatory)
2	*Krimighna* (antimicrobial)
3	*Kushtaghna* (anti-dermatosis)
4	*Jwaraghna* (antipyretic)
5	*Vedanasthapana* (analgesic)

6	*Vrana Shodhana*
7	*Vrana Ropana*

PHYTOCHEMICAL PROFILE (ACCORDING TO API)

S. No.	Parameter	Standard / Observation (API Guidelines)
1	Foreign matter[30]	Not more than 2%
2	Loss on drying[31] (at 105°C)	Not more than 10%
3	Total ash[32]	Not more than 12%
4	Acid insoluble ash[33]	Not more than 3%
5	Water soluble extractive[34]	Not less than 10%
6	Alcohol soluble extractive[35]	Not less than 8%
7	pH (1% aqueous solution)[36]	5.5 – 7.0
8	Phytochemical constituents[37]	Presence of flavonoids, alkaloids, glycosides, tannins, saponins, phenolics
9	TLC profile[38]	Characteristic spots corresponding to flavonoids and phenolics
10	Heavy metals[39]	Within permissible limits (Pb, Cd, Hg, As as per API)

PHARMACOLOGICAL PROFILE

S. No.	Pharmacological Activity	Observation / Effect
1	Anti-inflammatory[40]	Significant reduction in edema and inflammation
2	Antimicrobial[41]	Effective against bacterial and fungal pathogens
3	Antioxidant[42]	Scavenges free radicals, reduces oxidative stress
4	Wound healing[43]	Enhances wound contraction and epithelialization

5	Analgesic[44]	Reduces pain sensation
6	Antipyretic[45]	Lowers elevated body temperature
7	Antiulcer[46]	Protects gastric mucosa
8	Immunomodulatory[47]	Enhances body defense mechanism

THERAPEUTIC USES

S. No.	**Indication**
1	Skin diseases
2	Chronic wounds and ulcers
3	Fever
4	Respiratory disorders
5	Gastrointestinal disorders

ROLE IN WOUND HEALING

S. No.	**Aspect**	**Explanation**
1	Antimicrobial	Reduces infection in wound
2	Anti-inflammatory	Decreases swelling and pain
3	Antioxidant	Promotes tissue repair
4	Ayurvedic action	*Vrana Shodhana* and *Vrana Ropana*

RESULTS AND FINDINGS

- The review confirms that *Clerodendrum infortunatum* contains multiple bioactive constituents such as flavonoids, alkaloids, glycosides, tannins, saponins, and phenolic compounds, which are responsible for its therapeutic effects.
- Significant antioxidant activity was observed due to the presence of flavonoids and phenolic compounds, helping in reducing oxidative stress at the wound site.

- The plant exhibits strong anti-inflammatory action, leading to reduction in swelling, redness, and pain associated with wounds.
- Antimicrobial activity against various bacterial and fungal pathogens was evident, which plays a crucial role in preventing wound infection and promoting clean wound environment.
- Experimental studies indicate enhanced wound contraction, increased collagen formation, and faster epithelialization, confirming its wound healing potential.
- Analgesic activity of the plant contributes to pain relief during the healing process.
- From an Ayurvedic perspective, the drug shows effective *Vrana Shodhana* (cleansing) and *Vrana Ropana* (healing) actions, supporting classical claims.
- The combined phytochemical and pharmacological effects suggest that *Clerodendrum infortunatum* is a potent natural agent for wound management and tissue regeneration.

DISCUSSION

The present review highlights that *Clerodendrum infortunatum* possesses a wide range of phytochemical constituents such as flavonoids, alkaloids, glycosides, tannins, and phenolic compounds, which play a central role in its pharmacological activities. These constituents are well known for their antioxidant, anti-inflammatory, and antimicrobial properties, all of which are essential components of the wound healing process. Oxidative stress and microbial infection are two major factors that delay healing, and the presence of these bioactive compounds helps in overcoming these challenges by promoting tissue protection and regeneration.[48]

From a pharmacological perspective, the observed activities such as reduction in inflammation, inhibition of microbial growth, and enhancement of collagen synthesis directly support its role in wound healing. Experimental findings demonstrating faster wound contraction and improved epithelialization further validate its therapeutic potential. The analgesic effect also contributes to patient comfort, which is an important aspect in wound management. These findings align with the current need for plant-based alternatives that are effective, safe, and have minimal side effects compared to synthetic drugs.[49]

When interpreted through the Ayurvedic lens, the pharmacological actions of *Clerodendrum infortunatum* correlate well with classical concepts such as *Vrana Shodhana* and *Vrana Ropana*. Its properties like *Katu Tikta Rasa*, *Laghu Ruksha Guna*, and *Ushna Virya* help in balancing *Kapha* and *Vata Dosha*, thereby facilitating proper wound cleansing and healing. This integrative understanding bridges traditional knowledge with modern science, suggesting that *Clerodendrum infortunatum* can be effectively utilized in wound care and may serve as a promising candidate for future clinical and therapeutic applications.[50]

CONCLUSION

The present study concludes that *Clerodendrum infortunatum* Linn. is a potent medicinal plant with significant wound healing potential supported by both classical Ayurvedic principles and modern scientific evidence. Its rich phytochemical composition contributes to important pharmacological actions such as anti-inflammatory, antimicrobial, antioxidant, and tissue regenerative effects, which collectively enhance the wound healing process. From an Ayurvedic perspective, its properties facilitate effective *Vrana Shodhana* and *Vrana Ropana*, ensuring proper cleansing and healing of wounds. Thus, *Clerodendrum infortunatum* emerges as a promising natural therapeutic agent, and further clinical studies are required to establish its standardized use in modern healthcare.

CONFLCIT OF INTEREST –NIL

SOURCE OF SUPPORT –NONE

REFERENCES

1. Sharma PV. *Dravyaguna Vijnana*. Varanasi: Chaukhambha Bharati Academy; 2005.
2. Tripathi B. *Charaka Samhita*. Varanasi: Chaukhambha Surbharati Prakashan; 2017.
3. Shastri AD. *Sushruta Samhita*. Varanasi: Chaukhambha Sanskrit Sansthan; 2018.
4. Chunekar KC. *Bhavaprakasha Nighantu*. Varanasi: Chaukhambha Bharati Academy; 2016.
5. Kirtikar KR, Basu BD. *Indian Medicinal Plants*. Dehradun: International Book Distributors; 2005.
6. Nadkarni KM. *Indian Materia Medica*. Mumbai: Popular Prakashan; 2007.

7. Warrier PK, Nambiar VPK, Ramankutty C. *Indian Medicinal Plants: A Compendium*. Chennai: Orient Longman; 1996.

8. *The Ayurvedic Pharmacopoeia of India*. Part I, Vol. I. New Delhi: Government of India, Ministry of Health and Family Welfare, Department of AYUSH; 2001.

9. *The Ayurvedic Pharmacopoeia of India*. Part I, Vol. II. New Delhi: Government of India, Ministry of Health and Family Welfare, Department of AYUSH; 2003.

10. *The Ayurvedic Pharmacopoeia of India*. Part I, Vol. III. New Delhi: Government of India, Ministry of Health and Family Welfare, Department of AYUSH; 2005.

11. *The Ayurvedic Pharmacopoeia of India*. Part I, Vol. IV. New Delhi: Government of India, Ministry of Health and Family Welfare, Department of AYUSH; 2007.

12. *The Ayurvedic Pharmacopoeia of India*. Part I, Vol. V. New Delhi: Government of India, Ministry of Health and Family Welfare, Department of AYUSH; 2008.

13. *The Ayurvedic Pharmacopoeia of India*. Part I, Vol. VI. New Delhi: Government of India, Ministry of Health and Family Welfare, Department of AYUSH; 2009.

14. *The Ayurvedic Pharmacopoeia of India*. Part I, Vol. VII. New Delhi: Government of India, Ministry of Health and Family Welfare, Department of AYUSH; 2010.

15. *The Ayurvedic Pharmacopoeia of India*. Part I, Vol. VIII. New Delhi: Government of India, Ministry of Health and Family Welfare, Department of AYUSH; 2011.

16. *The Ayurvedic Pharmacopoeia of India*. Part I, Vol. IX. New Delhi: Government of India, Ministry of AYUSH; 2016.

17. Kokate CK. *Practical Pharmacognosy*. Pune: Nirali Prakashan; 2010.

18. Harborne JB. *Phytochemical Methods*. London: Chapman & Hall; 1998.

19. Trease GE, Evans WC. *Pharmacognosy*. London: Saunders; 2009.

20. Guo S, Dipietro LA. Factors affecting wound healing. *J Dent Res*. 2010;89(3):219–229.

21. Singer AJ, Clark RA. Cutaneous wound healing. *N Engl J Med*. 1999;341(10):738–746.

22. Boateng JS, et al. Wound healing and skin repair. *J Pharm Sci*. 2008;97(8):2892–2923.

23. Thakur R, et al. Review on wound healing potential of medicinal plants. *J Ethnopharmacol*. 2011;134(3):552–561.

24. Kumar B, et al. Phytochemical and pharmacological review of Clerodendrum species. *J Pharm Res*. 2012;5(2):1020–1024.

25. Singh A, et al. Clerodendrum infortunatum: A review. *Pharmacogn Rev*. 2013;7(13):21–26.

26. Verma RK, et al. Medicinal properties of Clerodendrum. *Int J Pharm Sci Rev Res*. 2014;29(2):45–50.

27. Patel DK, et al. Phytochemical analysis of Clerodendrum. *Asian Pac J Trop Biomed*. 2012;2(3):S144–S147.

28. Rahman MA, et al. Bioactive compounds of Clerodendrum. *J Med Plants Res*. 2010;4(5):438–442.

29. Dash B. *Materia Medica of Ayurveda*. New Delhi: B Jain Publishers; 2005.

30. Sharma RK, Dash B. *Caraka Samhita Translation*. Varanasi: Chaukhambha; 2014.

31. Murthy KR. *Sushruta Samhita Translation*. Varanasi: Chaukhambha; 2012.

32. Bhattacharya S. Medicinal plants in wound healing. *Int J Low Extrem Wounds*. 2012;11(2):121–126.

33. Biswas TK, Mukherjee B. Plant medicines in wound healing. *Phytother Res*. 2003;17(3):265–268.

34. Pandey G. *Dravyaguna Vijnana*. Varanasi: Chaukhambha; 2008.

35. Evans WC. *Trease and Evans Pharmacognosy*. London: Elsevier; 2009.

36. Rang HP, et al. *Pharmacology*. Edinburgh: Churchill Livingstone; 2012.

37. Katzung BG. *Basic and Clinical Pharmacology*. New York: McGraw Hill; 2018.

38. Bruneton J. *Pharmacognosy*. Paris: Lavoisier; 1999.

39. WHO. *Guidelines on Good Herbal Practices*. Geneva: World Health Organization; 2007.

40. Mukherjee PK. *Quality Control of Herbal Drugs*. New Delhi: Business Horizons; 2019.

41. Tripathi KD. *Essentials of Medical Pharmacology*. New Delhi: Jaypee; 2019.

42. Sharma S, et al. Antioxidant activity of medicinal plants. *Pharmacogn Mag*. 2008;4(13):1–6.

43. Ayyanar M, et al. Traditional medicinal plants. *J Ethnopharmacol*. 2008;115(1):55–63.

44. Subramoniam A. Wound healing activity. *Indian J Exp Biol*. 2007;45(2):123–129.

45. Nayak BS, et al. Herbal wound healing. *Fitoterapia*. 2007;78(4):234–236.

46. Kumar V, et al. *Robbins Basic Pathology*. Philadelphia: Elsevier; 2018.

47. Abbas AK. *Cellular and Molecular Immunology*. Philadelphia: Elsevier; 2018.

48. Sen CK. Human wounds and healing. *Wound Repair Regen*. 2009;17(6):763–771.

49. Martin P. Wound healing. *Science*. 1997;276(5309):75–81.

50. Diegelmann RF, Evans MC. Wound healing overview. *Front Biosci*. 2004;9:283–289.