

Herbal Remedies in Burn Wound Management: A Comprehensive Review

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ABSTRACT

This study focuses on the formulation and evaluation of a herbal burn healing cream using *Jatropha curcas* latex extract. The cream combines *Jatropha curcas* latex with compatible excipients to optimize stability, texture, and therapeutic efficacy. Various physicochemical, rheological, and pharmacological evaluations were conducted to assess its suitability for burn wound management. The cream demonstrated desirable pH, viscosity, spreadability, and consistency, along with significant antimicrobial activity against common wound pathogens. The formulation aims to harness the anti-inflammatory, antimicrobial, and wound healing properties of *Jatropha curcas* latex for effective burn treatment.

Keywords: Healing Cream, Rheological, Anti-Microbial, Anti-Inflammatory

INTRODUCTION

A damage to the skin brought on by exposure to radiation, heat, or chemicals is called a burn. Burns can be categorized as either chronic or acute based on their stages. Burns mostly damage the skin, which is the biggest organ in the body. This includes 95 percent of the body. Burns are among the most frequent injuries that people sustain. Larger burns, particularly partial thickness ones, can be severe if improperly treated, although most burns rarely become life-threatening. Furthermore, severe pain and the possibility of developing problems like giant scars, keloids, also and inflammation make even minor burns potentially dangerous. Investigators from universities as well as businesses have recently focused a great deal of attention on a number of creams, including herbal creams, that have been produced with different compositions and assessed for therapeutic safety and efficacy. The natural ingredients in the herbal creams are mostly derived from herbal plants and offer nutritional and health advantages without being harmful or harmful. Herbal herbs are also the source of the cream bases utilized to create the creams. Furthermore, there is currently no comprehensive explanatory analysis of herbal creams in the available literature, which mostly concentrates on different facets of cream formation.

BACKGROUND

Over the decades, burn care has changed, frequently as a result of advances in science, medical science, and cultural views. In the past, people used natural cures for burns, including vinegar, honey, and even dirt. For instance, honey was utilized to help prevent infections in burn wounds and was prized for its antibacterial qualities. Famous for their medical expertise, the Egyptians treated burns with plant-based and animal-based fats because they understood how important it was to wrap and shield the wound. Burn treatment made little headway throughout the Middle Ages, and many methods relied on superstition. Boiling oil or other toxic chemicals were occasionally employed to treat burn sufferers, which did more harm than good. But as medical knowledge grew throughout the Renaissance, physicians started to create a advanced technique Over the decades, burn care has changed, frequently as a result of advances in science, medical science, and cultural views. In the past, people used natural cures for burns, including vinegar, honey, and even dirt. For instance, honey was utilized to help prevent infections in burn wounds and was prized for its antibacterial qualities. Famous for their medical expertise, the Egyptians treated burns using animal fat and plant-based compounds because they understood how important it was to cover and preserve the wound and had a better grasp of skin injuries and how to treat them. Doctors didn't start creating more potent burn remedies until the 19th century, when Louis Pasteur's germ theory was discovered and medical research advanced.

Types of Burn –

Depending on how deep the wound

- First degree
- Second degree

➤ Third.degree



Fig 1. Types of Burn

- **First degree-**

First-degree burns, which only harm the skin's uppermost layer, the epidermis, are the least severe type of burn. It causes redness, discomfort, and sometimes mild bruising, but it is not related to blisters. Although the skin might appear dry or sore to the touch, these burns usually disappear in a few days to an entire week without behind any scars. Sunburn is a common example of a first-degree burnt.



Fig 2 First Degree Burn

- **Second degree-**

A second-degree blister which is more serious than a first-degree burn, harms both the dermis, the lowest layer of the skin, and the epidermis, the outermost part of the skin. Blisters, inflammation, and redness and

pain are the outcomes. The skin may seem moist or shiny, and the affected region is often very uncomfortable.



Fig 3 Second Degree Burn

- **Third degree-**

Third-degree burns, which harm the skin's innermost layers as well as the outermost layer of the skin, are the most dangerous type of burn. Because it can damage nerves, the region may not feel pain at first. The skin may be burnt, black, or white, and it looks crusty and dry. Third-degree burns may require medical attention, including skin transplants and take an extended period to recover.

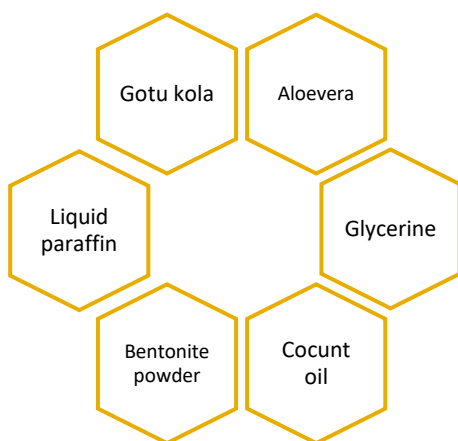


Fig 4 Third Degree Burn

Burns classification-

Type of Burn	Layers of Skin Affected	Signs and symptoms	Recovery Period	Illustrations
First-Degree Burns	Just the outermost layer, or epidermis	Zero pustules, warmth, and little discomfort	4-5 days, no scars	Sunburn
Second-Degree Burns	The second layer's epidermis and dermis	Blisters, edema, excruciating agony, and a glossy or damp look	1-2 weeks, possible scarring	Scald from hot liquid
Third-Degree Burns	Deeper tissues may be impacted by all levels.	Because of injury to nerves, skin that is white, black, or burned may not hurt.	Needs medical care and leaves lasting scars.	Fire, electrical burn

INGREDIENTS-



- **Aloe vera (Aloe barbadensis miller)-**

Aloe vera is a medicinal plant with antioxidant and antibacterial properties. Aloe vera benefits can include reducing dental plaque, accelerating wound healing, preventing wrinkles, and managing blood sugar. Aloe vera, or Aloe barbadensis, is a thick, short-stemmed plant that stores water in its leaves.

- **Glycerine-**

The corneal layer contains glycerine, which aids in moisture retention and promotes quicker wound healing. Harmonizing the skin covering and promoting healing depend on glycerin. gets rid of haemorrhoids. Because of its laxative qualities, glycerine is capable of helping relieve constipation.

- **Coconut oil (Cocos Nucifera)-**

Because the oil from coconuts is high in fatty acids and the antioxidant vitamin E, it has the ability to treat minor burns. In addition to its antibiotic and anti-inflammatory properties, it is also known to gradually lessen scars from burns.

- **Bentonite powder-**

By promoting collagen production, cell growth, and capillaries in vivo, this bentonite combination enhanced the regeneration of skin in burn injuries. Additionally, the bentonite complex therapy markedly reduced the production of cytokines associated with inflammation.

- **Liquid paraffin-**

The unattached, non-allergic, and disinfected paraffin cloth dressing aids in the quick healing of lesions used for healing burns, ulcers, dermal grafts, and other injuries from trauma.

- **Gotu kola (Centella asiatica)-**

It appears that administering gotu kola to burns of second degree speeds up the healing process. Spider veins along with additional disorders can result from inadequate circulation.

MARKET FORMULATION-

S.NO	Marketed product	Composition	Therapeutic uses
01	Burn hit	Silver Sulfadiazine USP 1.0% w/w Chlorhexidine Gluconate Solution I. P	Halting the spread of parasites or bacteria that cause illnesses. Both eliminating and stopping the development of bacteria
02	Eversil	Silver Sulfadiazine Cream with Chitosan Biopolymer	Stopping the growth of bacteria and rapidly clot the blood

03	Burn- lite	Chlorhexidine (0.20% w/w) + Silver Nitrate (0.20% w/w)	keeping germs or parasites that cause illnesses from growing. eliminating germs and stopping their growth
04	Burnol	Aminacrine Hydrochloride (0.1 gm)	Effective first-aid treatment for superficial burns
05	Scaa	Aloevera	Moisturizing and antibacterial
06	Burn heal	Silver nitrate and chlorhexidine gluconate	Treatment of burns
07	Burncon	Silver Sulfadiazine Cream	Treat burn infection of second and third degree of burns
08	Silver sulphadizine cream	Silver Sulfadiazine and chlorhexidine	Treat burn infection of second and third degree of burns
09	Silverx SSD	Silver Sulfadiazine and chlorhexidine	Treat burn infection of second and third degree of burns
10	Burn OM	Silver Sulfadiazine and chlorhexidine	Treat burn infection of second and third degree of burns

PATENT–

S.no	Authors	Title	Patent no	Submission Date	Publication Date
1.	Zhang, et al.	Herbal Composition for Skin Burn Treatment	US9345561B2	2015-05-13	2016-05-24
2.	Gupta, R., et al.	Aloe-Based Burn Healing Formulation	US20170233211A1	2017-02-16	2017-08-17
3.	Lee, J., et al.	Method for Extracting Calendula for Burns	US8110513B2	2010-08-12	2012-02-07
4.	Chen, M., et al.	Turmeric-Infused Burn Treatment Gel	EP2975544A1	2014-07-25	2016-01-20
5.	Nakamura, T., et al.	Herbal Cream for Burns Containing Neem Oil	JP2016505943A	2015-08-14	2016-02-18
6.	Patel, A., et al.	Antibacterial Burn Cream with Natural Oils	US10772932B2	2019-03-22	2020-09-15
7.	Kumar, S., et al.	Multipurpose Herbal Gel for Skin Burns	WO2017175432A1	2017-08-18	2018-02-22

8.	Ramesh, K., et al.	Honey-Based Burn Cream with Antibacterial Herbs	US20170276035A1	2016-04-06	2017-10-12
9.	Singh, N., et al.	Herbal Burn Ointment with Anti-inflammatory Agents	US20170276035A1	2016-12-29	2017-09-28
10.	Chen, L., et al.	Burn Healing Cream Using Traditional Herbs	CN104065326B	2013-12-06	2016-03-09

FUTURE PRIOSPECTS OF HERBAL BURN CREAM –

One of the most serious and quickly expanding diseases in the world, burn causes a significant amount of death and morbidity each year. The individual and their family may have severe psychological, economical, and physical repercussions. According to researchers most recent assessment, there were over 2 million incident instances of burns in the 7 MILLIMETERS that needed treatment in 2021. Additionally, in 2021, there were about 55,000 and 349,000 treated incident instances of burns in the United States that required pain care in outpatient as well as inpatient environments. Formulation and Administration System Innovation. Novel applications for burned creams are being made possible by developments in pharmaceutical and cosmetic technologies. Hotel Advances in cosmetic and pharmaceutical technology are opening up novel opportunities for herbal burn creams. Improvements in composition and delivery techniques will improve these items' efficacy and user experience. Advances in cosmetic and pharmaceutical technology are opening up new opportunities for organic burn creams. Improvements in formulating and delivery techniques will improve these items' efficacy and user experience. The market for holistic burn creams is expected to develop as demand for natural remedies continues to rise globally. As interest in herbal therapy continues to grow worldwide, the market for botanical burn creams is anticipated to grow nationally and economically. Global Market Growth: The growing need for organic beauty products in the United States of America, Europe, and the Asia-Pacific region presents a substantial opportunity for herbal burn creams to boost their market share. In these regions, the market for organic and herbal medical supplies is already expanding. Rural Medical Care:

Herbal burn creams may be an affordable and easily accessible burn treatment option in undeveloped and rural areas where access to high-quality medical care is scarce.

CONCLUSION-

With an emphasis on herbal antiseptic burn creams, this review study discusses the evolution of burn therapies across time. It illustrates how ancient people employed plant-based substances and honey as natural treatments. Silver sulfadiazine is one of the most sophisticated antiseptic therapies used today to help burns heal and prevent infections. Simple ingredients like aloe vera, gotu kola, coconut oil is used to make herbal burn creams, which are emphasized as safe and efficient choices. These lotions aid in pain relief, infection prevention, and skin healing. In order to help us comprehend how serious each sort of burn might be, the study also examines first-, second-, and third-degree burns. It highlights the growing popularity of herbal burn creams due to consumer demand for eco-friendly and natural solutions. With continued investigation and fresh. Herbal burn creams, which provide a safe and natural option for treating burns at home, are predicted to grow even more popular in the future along with other product innovations including ointments, gels, and sprays.

REFERENCES-

1. Mihai MM, Preda M, Lungu I, et al. Nanocoatings for chronic wound repair—modulation of microbial colonization and biofilm formation. *IJMS*. 2018;19(4):1179.
2. Zheng Y, Ji S, Wu H, et al. Topical administration of cryopreserved living micronized amnion accelerates wound healing in diabetic mice by modulating local microenvironment. *Biomaterials*. 2017;113:56–67.
3. Mulholland EJ, Dunne N, McCarthy HO. MicroRNA as therapeutic targets for chronic wound healing. *Mol Ther Nucleic Acids*. 2017;8:46–55.
4. Krishnan K A, Thomas S. Recent advances on herb-derived constituents-incorporated wound-dressing materials: a review. *Polym Adv Technol*. 2019;30(4):823–838.
5. Datta HS, Mitra SK, Patwardhan B. Wound healing activity of topical application forms based on ayurveda. *Evid Based Complement Alternat Med*. 2011;2011:1–10.
6. Van Loey, N. E., & Van Son, M. J. (2003). Psychopathology and psychological problems in patients with burn scars: epidemiology and management. *American journal of clinical dermatology*, 4, 245-272.
7. Warby, Rachel, and Christopher V. Maani. "Burn classification." (2019).
8. Rowan, M. P., Cancio, L. C., Elster, E. A., Burmeister, D. M., Rose, L. F., Natesan, S., ... & Chung, K. K. (2015). Burn wound healing and treatment: review and advancements. *Critical care*, 19, 1-12.
9. Sarabahi S. Recent advances in topical wound care. *Indian J Plast Surg*. 2012;45(2):379–387.
10. Nagula RL, Wairkar S. Recent advances in topical delivery of flavonoids: a review. *J Control Release*. 2019;296:190–201.

11. Vijayalakshmi A, Sangeetha S, Ranjith N. Formulation and evaluation of herbal shampoo. *Asian J Pharm Clin Res.* 2018;11(4):121–124.
12. Oguntibeju OO. Medicinal plants and their effects on diabetic wound healing. *Vet World.* 2019;12(5):653–663.
13. Patel S, Srivastava S, Singh MR, et al. Mechanistic insight into diabetic wounds: Pathogenesis, molecular targets and treatment strategies to pace wound healing. *Biomed Pharmacother.* 2019;112:108615.
14. Patel, D. K. "Some traditional medicinal plants useful for boil, burn and for wounds healing." *J Biodivers Endanger Species* 2.133 (2014): 2.
15. Jeschke, M. G., van Baar, M. E., Choudhry, M. A., Chung, K. K., Gibran, N. S., & Logsetty, S. (2020). Burn injury. *Nature Reviews Disease Primers*, 6(1), 11.
16. Aliasl, Jale, and Fariba Khoshzaban. "Traditional herbal remedies for burn wound healing in canon of Avicenna." *Jundishapur journal of natural pharmaceutical products* 8.4 (2013): 192.
17. Hettiaratchy, Shehan, and Peter Dziewulski. "Pathophysiology and types of burns." *Bmj* 328.7453 (2004): 1427-1429.
18. oyd, A.N.; Blair, M.E.; Degenkolb, K.E.; Foster, D.R.; Hartman, B.C.; Sood, R.; Walroth, T.A. A prospective analysis describing the innovative use of liposomal bupivacaine in burn patients. *Burn* 2020, 46, 370–376.
19. Yang, Z.; Tan, Y.; Chen, M.; Dian, L.; Shan, Z.; Peng, X.; Wu, C. Development of amphotericin B-loaded cubosomes through the SolEmuls technology for enhancing the oral bioavailability. *AAPS PharmSciTech* 2012, 13, 1483–1491.
20. parajay, P.; Dev, A. Functionalized niosomes as a smart delivery device in cancer and fungal infection. *Eur. J. Pharm. Sci.* 2022, 168, 106052.