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Review Article

## COMMONLY USED NATURAL PRODUCTS AS WOUND HEALERS: A COMPREHENSIVE REVIEW OF AYURVEDIC HERBAL PLANTS AND NON-CLINICAL APPLICATIONS

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### Abstract

The process of wound healing involves a synchronized series of cellular and biochemical stages that work together to support the recovery of the damaged tissue. The complexity of tissue healing makes wound care difficult. The three stages of healing are remodelling, proliferative, and inflammatory. Antibiotics, antiseptics, and extracts are among the treatments; nevertheless, synthetic medications have drawbacks. Plant-based compositions for the efficient healing of wounds are gaining popularity. Studies showing numerous discovered mechanisms for better healing have reinforced the growing recognition of medicinal plants' ability to heal wounds with fewer side effects, especially in diabetic, infected, or open wounds. Many medicinal plants, including Aloe Vera, Centella asiatica, Neem, Tulsi, Achiotte (Bixa Orellana) have shown promise in healing wounds. The effectiveness of medicinal plants in excision and incision wound healing is examined in this review, which focuses on in-vivo models.

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### Introduction

Our life depends on the skin's ability to sense and react to our surroundings, control temperature and chemical balance, store critical nutrients, provide defensive systems, and react to stress and injuries [1-6]. The skin requires robust, effective mechanisms to protect it from damage, restore key functions when impaired, and repair or regenerate damaged or missing tissue in order to maintain these vital responsibilities. Humans have been caring for their wounds for thousands of years. Traditional wound treatment frequently only uses locally accessible materials, such as plants, dirt, water, and animal products. Millions of

people in areas across Eastern Asia, Africa, Southwest Asia, and Ibero-America rely mostly, if not entirely, on locally produced wound care products made from plants, animals, and natural materials [7-10].

### How Do Wound Heal

Wound healing is a complex and dynamic process with the wound environment changing with the changing health status of the individual [11]. The knowledge of the physiology of the normal wound healing trajectory through the phases of hemostasis, inflammation, granulation and maturation provides a framework for an understanding of the basic principles of wound healing. Through this understanding the health care professional can develop the skills required to care for a wound and the body can be assisted in the complex task of tissue repair. A chronic wound should prompt the health care professional to begin a search for unresolved underlying causes. Healing a chronic wound requires care that is patient centered, holistic, in-

terdisciplinary, and cost effective and evidence based [12-19]. This is one of five articles made available by the Canadian Association of Wound Care to assist the wound care clinician develop an increased understanding of wound healing.

The phases of wound healing [20].

- Hemostasis
- Inflammation
- Proliferation or Granulation
- Remodeling or Maturation

Table 01: Phases of Healing

Phase Of Healing	Days Post injury	Cells Involved in Phase	Analogy To Housing Building
Hemostatis	Immediate	Platelets	Capping off Conduits
Inflamation	Day 1-4	Neutrophils	Unskilled laborers to clean up the site
proliferation	Day4-21	Macrophages	Supervisor Cell
Granulation		Lymphocytes	Specific laborers at the site
		Angiocytes	Plumber
		Neurocytes	Electrician
Contracture		Fibroblasts	Framers
Remodeling	Day 21-2 years	Fibrocytes	Remodelers

### Role of Traditional Medicines In Wound Healing

According to WHO estimates, at least 80% of people worldwide, primarily in developing nations, still rely on herbal remedies for their basic medical requirements. The use of traditional medicine is predicated on its cost, accessibility, and strong religious integration. Any nation can benefit much from traditional knowledge since it is essential to advancing the country and changing its culture. Traditional medicine is a compilation of different doctors' therapeutic experiences using indigenous or traditional medical systems. The WHO states that "Tradition medicine refers to health practices, approaches, knowledge and beliefs that include physical techniques and exercises, spiritual therapies, and medications derived from plants, animals, and minerals that can be used alone or in combination to treat, identify and stop diseases or preserve health. Alternative medicine, complementary medicine, natural medicine, herbal medicine, phyto-medicine, non-conventional medicine, indigenous medicine, folk medi-

cine, ethnomedicine, and so on are some of the names for traditional medicine. People continue to apply their knowledge in rural areas where access to modern health care facilities is still limited. expertise in using a variety of plant items to treat a range of illnesses. According to estimates, 70% of Ayurvedic medications for wound healing are derived from plants, 20% are derived from minerals, and the other 10% are derived from animal products. 30. Disinfection, debridement, and creating a moist environment are all part of traditional wound care, which aims to create an environment that is conducive to the body's natural healing process [21].

### Herbal Treatment

#### Commonly used natural products as wound healers

India has a rich tradition of plant-based knowledge on healthcare. A large number of plants/plant extract/decoctions or pastes are equally used by tribal and folklore traditions in India for treatment of cuts, wounds, and burns [22]. Many ayurvedic herbal plants have a very important role in the process of wound healing. Plants are more potent healers because they promote the repair mechanisms in the natural way. The healing process can be physically monitored by assessing the rate of contraction of the wound [23]. what's been injured or lost. Throughout history, humans have tended to their wounds for thousands of years [24-26].

Some of the natural products are Aloe Vera, Centella asiatica, Neem,Tulsi,Achiote (Bixa Orellana)

#### Aloe Vera

Aloe Vera, often referred to as Kumari, is a perennial herb that is a member of the Liliaceae family. Nowadays, hundreds of skin creams, sunscreens, and cosmetics use aloe vera gel as an active ingredient (Grindlay et al., 1986). Aloe Vera is a great treatment for small cuts, sunburns, and burns. The leaves' juice and aqueous extract both exhibit notable therapeutic qualities. Additionally, it is said to not only hasten the healing process but also shield the wounded area from infection (Chitra et al., 1998). In addition to its ability to cure wounds, it is said to have ulcer-healing properties (when taken internally) and skin-protective properties [27].



Fig 01: Aloe vera

#### Centella Asiatica

*Centella asiatica* is a little trailing herb that typically grows abundantly in damp areas and has white to scarlet blooms. It is commonly referred to as Brahmi. When administered topically three times a day for twenty-four days to an open wound site, clinical investigations of the formulation (ointment, cream, and gels) of aqueous extracts of *Centella asiatica* show positive results. In comparison to the control wound, the treated wound epithelized more quickly and contracted at a higher rate [27].



Fig 02: *Centella asiatica*

### Tulsi

The plant *Ocimum sanctum*, a member of the Labiatae family, is the source of this extract. *Ocimum santum* is used to treat skin illnesses, stomach issues, and malarial fevers. Tulsi's primary chemical component has the ability to heal wounds.



Fig 03: Tulsi

### Neem

Neem alcoholic extract helps with ringworm, scabies, and eczema. Extracts from neem leaves and seed oil have been shown to have antimicrobial properties. This prevents secondary microbial infections from developing in any wound or lesion. Neem reduces inflammation just as well as cortisone acetate, according to clinical research, which speeds up wound healing. Margosic acid, fatty acid glycerides, butyric acid, and trace valeric acid are all found in neem oil [27].



Fig 04: Neem

### Achiote (*Bixa Orellana*)

The achiote plant's inedible fruit is called anatto. The annatto plant is grown for its seeds, which contain a substance called bixin that has anti-inflammatory and antioxidant properties. Because it reduces inflammation and accelerates collagen maturation and wound contraction, this extract is used to treat ulcers and other wounds [27].



Fig 05: Achiote (*Bixa Orellana*)

### Conclusion

The use of commercial and herbal wound healing lotions has been supported by several studies that demonstrate the ability of medicinal plants and their extracts to improve wound healing. Aloe Vera, *Centella asiatica*, Neem, Tulsi, and Achiote (*Bixa orellana*) are just a few of the medicinal plants whose extracts have shown good consistency, spreadability, and wound-healing properties. Recent advancements in skin administration methods have also improved the efficacy of applying natural wound-healing substances. These findings highlight the intriguing role of herbal creams in wound care as well as the possibility of safe and efficient treatment alternatives for a range of wound types.

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