Phytochemical Aid Wound Healing: A Review

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Abstract
Wound healing is the process of replacing lost or devitalized cellular structures and tissue layers; it is a complicated and dynamic process that occurs. There are three or four main stages to the adult human wound healing process. The wound goes through three phases before the repair is stimulated: the inflammatory, remodelling, and fibroplastic phases. There are several ways to classify wounds or injuries, including source, extent, and contamination. Triterpenes, alkaloids, and flavonoids are examples of naturally occurring bioactive substances that play a significant part in accelerating the wound healing process. Many medicinal plants are used by folk and traditional medicine healers to cure a wide range of diseases. Medicinal plants have several therapeutic abilities as they are a rich source of phytochemicals and secondary metabolites which helps in restoring body functions. This review discusses the potential for plants to treat wounds, as well as the species, common name, part used, family, and references that can assist researchers create new human-use wound healing formulations.

Keywords: Wound Healing, Medicinal Plants, Phytochemicals, Healing Process, Topical Treatment

1. INTRODUCTION

A wound represents a form of physical impairment resulting from the disruption of tissue due to various factors, including chemical, physical, microbiological, or immunological influences that compromise functionality. This condition not only affects the underlying tissues but also disrupts the integrity of the skin [1]. It is evident that wounds inflict physical harm leading to the loss of skin; thus, achieving complete wound healing is essential for the restoration of anatomical continuity. The restoration of the physiology of damaged tissues involves a complex series of processes. A variety of tissues must collaborate to promote healing, which includes mechanisms such as platelet aggregation, coagulation, angiogenesis, and re-epithelialization. The objective of wound healing is to minimize tissue damage and provide the necessary nutrients to the affected area, thereby reinstating the anatomical function of the wound [2, 3]. Even though there are many medications on the market, there aren't many that can be used to promote wound healing.
Acute reaction includes inflammation, which causes neutrophils to flood the site. Since wound-related nonphagocytic cells also produce free radicals, the wound site contains high levels of oxygen and nitrogen reactive species. This causes oxidative stress, which breaks down DNA, and antioxidants can be utilized as therapeutic agents.

2. MECHANISM OF WOUND HEALING

The inflammatory, remodelling, and fibroplastic phases are the three stages that the wound goes through before the repair is stimulated. This inflammatory phase begins as soon as the injury occurs, usually within 24 to 48 hours, and can last up to 2 weeks in certain situations. It starts the hemostatic process, which stops blood loss. This is the period of vasoconstriction and platelet aggregation; identifiable cardinal signs of inflammation, calor, rubor, dolor, tumor, and function-laesa arise as the consequence. The following phase, known as the fibroplastic phase, lasts between two and three weeks [4]. Three phases make up this stage: generation, contraction, and epithelialization. In the second stage, the wound edges are brought together and epithelization occurs, resulting in the formation of epithelial tissues on the wound site. Fibroblasts create a variety of bio compounds that are involved in wound repair.
When the third stage of remodeling appears, new collagen begins to grow and lasts anywhere from three weeks to two years. At this point, scar tissue has 80% of its former strength.

Rats' wound healing process, like that of other animals, is intricate and dynamic, essentially divided into four stages: hemostasis, inflammation, proliferation, and remodeling.

2.1. Hemostasis

Instantaneous Response: To stop blood loss after an injury, blood arteries contract. At the location, platelets clump together to create a clot.

Clot Formation: Pathogens are temporarily blocked from entering the clot by the stabilizing effect of fibrin strands.

2.2. Inflammation

Recruitment of Inflammatory Cells: At the location of the wound, inflammatory cells migrate, especially neutrophils and macrophages. First to arrive are neutrophils and then macrophages.

Cytokine Release**:** Macrophages release growth factors and cytokines that aid in the healing process and draw in more immune cells.

Phagocytosis: Macrophages remove bacteria and debris from wounds.

2.3. Proliferation

Formation of granulation tissue: Granulation tissue is created when fibroblasts multiply and go into the wound, where they produce collagen and other components of the extracellular matrix.

Angiogenesis: Triggered by substances such as VEGF (vascular endothelial growth factor), new blood vessels form to deliver oxygen and nutrients to the healing tissue.

Reepithelialization: To replenish the epidermal layer, keratinocytes move throughout the wound bed [5].

2.4. Remodeling

Collagen Remodeling: Fibroblasts die off and the collagen matrix is changed over the course of several weeks to months. The wound becomes stronger in its tensile capacity.

Scar Formation: In comparison to normal skin, the ultimate scar tissue may have a different strength and appearance. It may have less elastin and is usually less vascularized [6].

2.5. Elements Affecting Healing

Age: Younger rats tend to recover more quickly.

Nutrition: A healthy diet aids in the recovery process.

Comorbidities: Diseases that affect healing include diabetes.

2.6. Investigative Research

Rats are frequently used in wound healing research so that treatments can be tested or the underlying mechanisms can be better understood, leading to insights that may be applied to human health. This procedure is a key topic of study in biomedical research and demonstrates the amazing regenerative capacities of mammals, including rats.

3. WOUND CLASSIFICATION

Wounds or injuries can be categorized according to a number of factors, such as the source, extent, and contamination. The main categories are as follows:

3.1. According to Cause

Acute wounds: Such as cuts, scrapes, or burns, are the outcome of a particular injury. They recover in a dependable way.

Chronic wounds: Over time, chronic wounds can arise as a result of underlying medical disorders such as diabetes or venous insufficiency. They don't make it through the typical healing stages [7].

3.2. Based on Depth

Superficial Wounds: These include abrasions and superficial burns, which only affect the epidermis, or outer layer of skin.

Full-Thickness Wounds: These include deep lacerations and third-degree burns that penetrate the dermis and reach underlying tissues.

Partial-Thickness Wounds: These include deeper abrasions or second-degree burns that affect both the epidermis and a portion of the dermis.

3.3. Considering Contamination

Clean Wounds: Surgical incisions performed in a sterile, contamination-free environment.
Clean-contaminated wounds: Surgical wounds that reach the gastrointestinal, respiratory, or genitourinary tract but do not significantly contaminate the surrounding tissue are referred to as clean-contaminated wounds.
Contaminated wounds: Open wounds that are very susceptible to infection as a result of germs or foreign objects are known as contaminated wounds.
Infected or dirty wounds: Infected wounds at the time of therapy, or wounds containing necrotic tissue [8, 9].

3.4. Depending on the Injury Mechanism

Sharp wounds: Sharp items, such as knives and scissors, can cause clean cuts that result in sharp wounds.
Blunt Wounds: Caused by bumps or crashes, these injuries result in contusions or bruises.
Thermal Wounds: Caused by either extreme cold (frostbite) or heat (burns).
Electrical Wounds: These can result in profound tissue damage since they are caused by electrical currents.

3.5. Considering Area and Size

Little Wounds: Usually measure less than a few centimeters.
Large Wounds: Those that cover a large region could need more involved medical care.

3.6. Considering Healing Qualities

Primary Intention: Injuries (such as surgical incisions) that heal with little loss of tissue and are sutured or stapled closed.
Secondary Intention: Self-healing wounds that do not require surgical closure and frequently leave scars behind.
Tertiary intentions: Injuries that are first kept open because of an infection or other circumstances, then closed later after the chance of infection has diminished are known as tertiary intentions [10].

4. FACTORS THAT REGULATE THE PROCESS OF WOUND HEALING

The wound healing is an anabolic process; it calls for both nourishment and energy. A decrease in the rate of collagen synthesis causes a tensile strength wound to become infected due to malnutrition. As a result, infection impeded the healing of wounds caused by a variety of pathogens, including pseudomonas aeruginosa, Escherichia coli, and Streptococcus aeurous.

A sufficient blood flow is essential for wound healing in addition to the previously mentioned reaction because wound repair requires a sufficient amount of oxygen. Because it reduces collagen formation, this medication, like anticancer treatment drugs, is known to slow the healing process of wounds.Elderly people experience a significant delay in the healing of wounds due to their advanced age. Pre-existing chronic conditions such as diabetes also impede the healing process of wounds, since individuals with diabetes are 11% more susceptible to insufficient wound healing than the general population. In addition to diabetes mellitus, conditions like liver disease are linked to a delayed wound healing process [11].

The phases of healing are influenced by a number of factors that govern the intricate process of wound healing. The following are the crucial elements:

4.1. Factors Cellular

Growth factors: Proteins that promote cell division, migration, and angiogenesis include the growth factors

vascular endothelial growth factor (VEGF), changing growth factor-beta (TGF-β), and platelet-derived growth factor (PDGF).
Cytokines: Interleukins, an example of an inflammatory cytokine, control immunological responses and have an impact on healing.

4.2. Extracellular matrix (ECM)
The composition and integrity of the extracellular matrix (ECM) are crucial for attachment , migration, and differentiation of cells since they offer structural support and chemical signals.

4.3. Blood Supply
Enough oxygen and nutrients are delivered to the wound site via adequate blood flow, which is essential for cell metabolism and healing.

4.4. Immune Response Inflammatory Cells
Macrophages and neutrophils are essential for removing infections and debris while also generating signals that aid in the healing process [12].

4.5. Mechanical Elements
Stress and Pressure: While the right amount of stress can encourage collagen strength and organization, too much tension or pressure might hinder healing.

4.6. Systemic Elements
Age: Because they have greater regenerative ability, younger people usually heal more quickly.
Nutrition: Proteins, vitamins A and C, zinc, and other essential nutrients are necessary for the production of collagen and the immune system.
Comorbidities: Disorders that affect blood flow, the immune system, and metabolism, such as diabetes, obesity, and vascular disorders, might make recovery more difficult.

4.7. Infection
Microbial Load: Bacteria can cause persistent sores and impede recovery. It is essential to keep the surroundings sanitary.

4.8. Hormonal Elements
Hormones: Some hormones, such as estrogen, may aid in healing, while others, such as corticosteroids, can hinder healing by reducing inflammation.

4.9. Environmental Elements
Temperature and Moisture: While high temperatures can hinder cellular function, maintaining a wet wound environment can speed up recovery.

4.10. Patient Compliance and Adherence to Care
Healing results are greatly impacted by proper wound care, which includes changing dressings and listening to physician instructions. Comprehending these variables is important in formulating efficacious wound care tactics and enhancing the healing progression [13].

4.11. Screening for the ability to heal wounds
Wound size, which comprises measurement, wound tracing, and scaled photo, is used to gauge the wound healing process. Tensile strength testing is another method used to further evaluate, providing insight into the strength of the restored tissue. The load in grams needed to disturb the wound serves as its calibration. In addition to the techniques mentioned above, wound bed examination is another option for determining the degree of repair.

5. PHYTOCHEMICAL'S THERAPEUTIC POTENTIAL IN WOUND HEALING

Natural bioactive components such as flavonoids, alkaloids, and triterpenes have a major role in promoting the wound healing mechanism. In addition to general polysaccharides and the gel of Xyloglucan from Tamarindusindicus, and Aloe vera, Curcumin from Curcumalonga—all of which are recognized as powerful, significant, plant-derived bioactive compounds—also aid in the healing of wounds. The leaves of Plantago major are also thought to have wound-healing properties. Due to the lack of scientific evidence, many traditional medicines rely on systematic methodologies and observation [14]. As a result, most researchers have focused on screening plants for the simple wound healing test rather than conducting in-depth research to uncover these plants' hidden therapeutic potential.

5.1. Medical Plants

Folk and traditional medical healers use a variety of medicinal plants to treat a wide range of illnesses. The phytochemical elements of these plants have been shown by organizations like the European Food Safety Authority (EFSA) and the United States Food and Drug Administration (USFDA) to have therapeutic effects. Not limited to primary healthcare, traditional medicines are also employed in rural areas. The majority of these medications are made from medicinal herbs and minerals [15].

In India, traditional medicine of this kind has a long history. Since the majority of medical professionals in Indian systems create and administer their own formulations, these calls for accurate recording and investigation. The use of herbal remedies is expanding in the West as well; it's noteworthy to note that 40% of people utilize herbs to treat illnesses these days. In addition to the general public, traditional medicines are gaining popularity in academia and government circles because of their lower side effects and affordability. It is believed that India has about 45,000 different species of medicinal plants, most of which are found in and around the Eastern Himalayan and Western Ghat regions. India is referred to as the "botanical garden of the world" since it is the world's largest producer of medicinal herbs. Seventy percent of people in India's rural areas rely on traditional medicine.It's interesting to remember that 80% of people in underdeveloped nations receive their primary medical treatment from traditional medicines, according to a WHO report. Approximately 25% of the medications in the current pharmacopoeia come from plant sources. Nowadays, medicinal plants are in high demand in both developed and developing nations due to their easy accessibility and low cost, making them affordable for the underprivileged. 600 medicinal plants are used in the Ayurvedic medical system in addition to its treatments. In additional nations, almost all wounder medications are produced from natural sources [16, 24, 26].

5.2. Source of plant-based metabolites

"Secondary metabolites" are typically produced by glycosylation, methylation, and hydroxylation of primary metabolites. Secondary metabolites are structurally complicated compounds that are categorized according to their chemical structure (e.g., sugar, aromatic rings), composition (nitrogen present or absent), synthesis route, and solvent solubility [17]. They are divided into three groups: chemicals containing sulfur and/or nitrogen, phenolics (containing benzene rings, oxygen, and carbon), and terpenes (made of carbon and hydrogen). A variety of secondary metabolites are produced by every plant species, genus, and family.

5.3. Secondary Metabolite Types

5.3.1. Terpenoids

Terpenoids, often referred to as terpenes or isoterpenes, are dimers or polymers of isoprene units that are typically connected in a head-and-tail pattern. The methyl erythritol phosphate pathway (for mono and diterpenoids, for example) or the mevalonoic acid pathway (for sesquiterpenoids, for example) are the pathways via which plants synthesis the building blocks of each type of terpenoid in the active form of the isoprene unit (isopentanyl pyrophosphate). The isoprene units often condense to create linear rings or ring compounds, with the carbon atom counts of the sesquiterpenoids being 15 or the triterpenoids being 30 (the monoterpenoids) [18].

5.3.2. Phenolic substances

Every phenolic compound has an aromatic ring, several nonaromatic ring structures, methoxy (-O-CH3) and hydroxyl groups attached, among other substituted groups. The shikimic acid or acetate route and its following reactions are used to produce phenolic chemicals. Numerous medicinal properties, including

anticancer, anti-HIV, analgesic, anti-inflammatory, antihepatic, antioxidant, antilipopolytic, antiulcerogenin, immunostimulant, and vasodilatory properties, are associated with phenolic compounds [19]. Plants use phenolic chemicals as an efficient defense against herbivores.

5.3.3. Flavonoids

Comprising fifteen carbon compounds, flavonoids are commonly found in the kingdom of plants. Over two thousand flavonoids have been found from plants.

Flavonoid gives fruits, flowers, and even leaves their color. Some people may add to the color by acting as copigments. The term flavonoid is derived from the Latin word "flavus," which means yellow. With their vibrant colors, flavonoids aid in pollination by drawing animals to the plant and shielding it from UV ray damage. Flavonoids are primarily composed of the 2-phenyl chromane skeleton. The biosynthesis of flavonoids involves a mixture of the shikimate acetate or acid routes [20]. Flavonoids can exist as aglycones or as glycosides.

5.3.4. Substances containing nitrogen

Numerous plant secondary metabolites, such as alkaloids and cyanogenic glycosides, are known to contain antiherbivore chemicals due to the nitrogen present in their structures [21].

5.3.5. Alkaloids

Cyclic chemical compounds with a restricted distribution in living organisms are known as alkaloids. It has nitrogen that is negatively oxidized. Alkaloids' fundamental ring structure divides them into a number of subclasses. Tetrandrin is an example of a bisbenzylisoquinoline alkaloid; triterpene alkaloid solasodine; and nonheterocyclic or pseudoalkaloid mescaline. Alkaloids are important in medicine. For example, quinine is used as an antiarrhythmic, morphine is used as a narcotic analgesic, codeine is used to treat cough and pain, and colchicine is used to treat gout [22]. L-hyoscyamine is also used to dilate pupils.

5.3.6. Glycosides cyanogenic

Secondary metabolites associated with defense are called cyanogenic glycosides. When the plant is crushed, these voluntary breakdown products which are deadly in and of themselves emit volatile toxins. The well-known cyanogenic glycosides emit respiratory toxic gasses and hydrogen cyanide. Secondary metabolites are produced by all plants, and they are frequently unique to a particular genus or species as well as environmental factors [23]. In contrast to main metabolites, secondary metabolites, which include fragrances, tastes, medicines, and insecticides, are regarded as high-value fine chemicals that can cost anywhere between $500 and $10,000 per kilogram [25].

6. MEDICINAL PLANTS WITH WOUND HEALING CHARACTERISTICS

6.1. Ginkgo biloba

Ginkgo biloba extract is obtained from the foliage of the *Ginkgo biloba* tree, a species recognized as the oldest living tree type, predominantly found in regions such as China, Japan, and Korea. The leaves and extracts of *Ginkgo biloba* have been utilized extensively among older adults and within traditional Chinese medicine for many centuries. The primary active compounds in *Ginkgo biloba* extract include flavonoids (notably quercetin, kaempferol, and isorhamnetin), terpenoids (such as ginkgolide A, ginkgolide B, ginkgolide C, and bilobalide), along with ginkgolic acids. These extracts are frequently cited in the literature for their potential to treat and prevent a range of health issues, including ischemic conditions affecting the brain and heart, diabetes, skin infections, cancer, and cognitive impairments [27].

6.2. Betulautilis

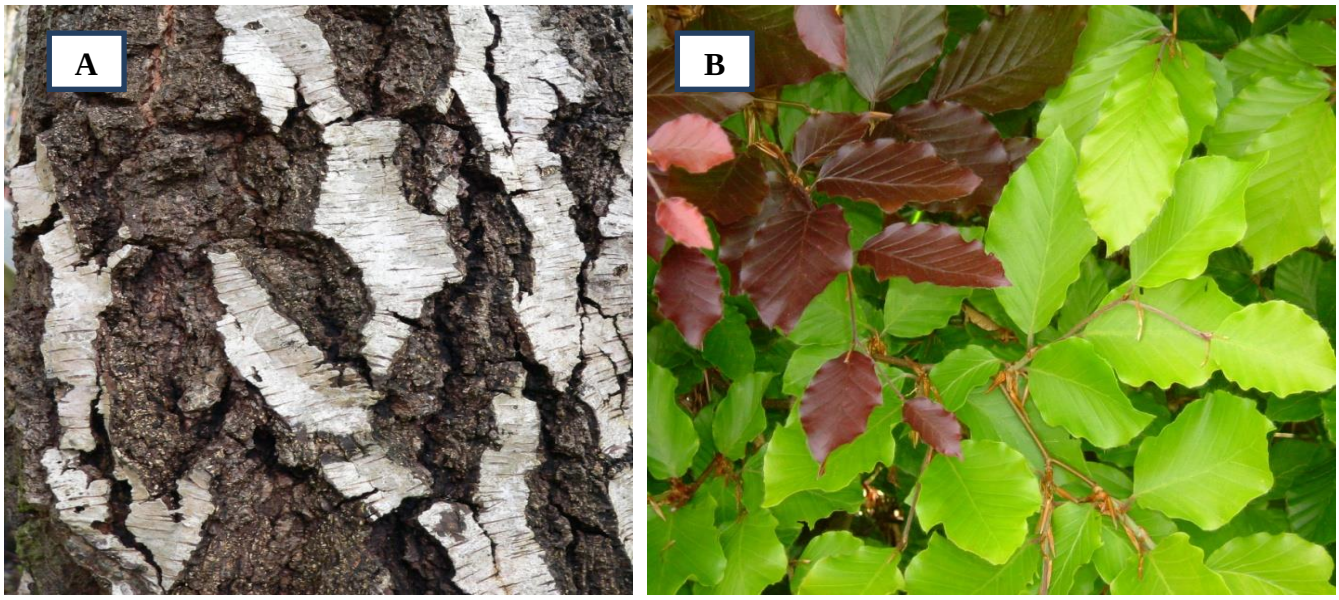

Figure 1: (A) Bark of *Betulautilis* and (B) Birch plant.

Betulautilis is commonly found in the Himalayan region. The bark of this species is rich in triterpenoids, including betulin, betulinic acid, and lupeol and is shown in **Fig. 1**, which are known for their significant anticancer, antioxidant, anti-inflammatory, and antimicrobial activities against various pathogenic bacteria. Triterpenoids, particularly betulin, play a crucial role in managing the inflammatory phase of wound healing by modulating several pro-inflammatory mediators, thereby facilitating the migration of keratinocytes, which is vital during the second phase of wound healing. Research has demonstrated that extracts from birch bark exhibit promising results in scratch assays conducted with primary human keratinocytes, showing upregulation of various pro-inflammatory cytokines, chemokines, and cyclooxygenase-2 at both gene and protein levels [28].

6.3. Hypericumperforatum

Hypericumperforatum, commonly known as St. John's wort, is a well-regarded plant with a significant historical role in human health. The extracts derived from St. John's wort are rich in various polyphenolic compounds, including flavonoids, phenolic acids, naphthodianthrones, and phloroglucinols. Research has indicated that *Hypericumperforatum* may facilitate the healing process of burn wounds [29].

6.4. Polygonumcuspidatum

Polygonumcuspidatum, belonging to the Polygonaceae family, is prevalent across Asia and North America. In traditional Chinese medicine, it is referred to as Hu Zhang and is utilized for its analgesic, antipyretic, diuretic, and expectorant properties. Numerous studies have assessed the antioxidant potential of extracts derived from *Polygonumcuspidatum* [30].

6.5. Astragalusmembranaceus

Astragalus, known in China as Huang Qi, consists of the dried roots of either *Astragalusmembranaceus* (Hsiao) Bge or *Astragalusmembranaceus* (Fisch) Bge. This plant has served as a vital element in herbal formulations aimed at reducing inflammation, promoting pus drainage, and eliminating toxins for millennia. Various bioactive compounds have been isolated from *Astragalusmembranaceus*, including polysaccharides, saponins, flavonoids, amino acids, and trace elements. Contemporary pharmacological research has identified polysaccharides and saponins as the primary active constituents responsible for wound healing, enhancing immune function, and stimulating cellular metabolic processes [31].

6.6. Nerium oleander

Nerium oleander, also referred to as *N. indicum* Mill, is a prominent evergreen flowering shrub classified within the Apocynaceae family. This plant is recognized for its diverse biological activities, including

antibacterial, antiviral, antifungal, anti-inflammatory, and antioxidant properties, which are attributed to the presence of various phytochemicals such as alkaloids, flavonoids, phenolics, and glycosides found in its different parts [32].

6.7. Swieteniamacrophylla

Swieteniamacrophylla, commonly known as big-leaved mahogany, is a member of the Meliaceae family and is highly regarded in the timber industry for its superior wood quality. This economically significant timber tree has a long-standing history of use in traditional medicine for treating a variety of ailments, including diabetes, malaria, skin disorders, fever, hypertension, and tuberculosis. Additionally, it is utilized for its purgative, astringent, depurative, and tonic properties [33].

6.8. Camellia sinensis

Camellia sinensis (Green tea) were utilized us Asian individuals for wellbeing advancement mending illnesses since 3000 B.C, This plant contains polyphenolic, catechin Epivatechin, epicatechingallate, epigallo catechin and epigallo catechingallate that are capable for anti-oxidant, anti-cancer, anti-aging and anti-inflammatory impacts for this home grown restorative plant, is shown in **Fig. 2**. Too it may avoid collagen generation and collection and initiate changes in safe in the recuperating stages. These (epigallo catechingallate) have too been utilized as an operator for keratinocytes generation and qualification. Moreover, its anti-fibrinogen impacts have been affirmed in a few creature models. Due to past considers, conventional encounters and simple availability, we explored the impact of ethanolic extricate of green lea on Burn wound mending handle in wistar rodent and assurance of antioxidant action [34].

Figure 2: Plant of green tea

6.9. Malvasylvestris

Malvasylvestris, known as common mallow, is indigenous to Europe, North Africa, and Asia. In Iranian folklore, it is referred to as “Panirak.” This plant is characterized by its high mucilage and polysaccharide content, which lend them to various applications. The flowers of M. sylvestris are employed as a remedy for cuts, dermal infections, eczema, and inflammatory conditions such as gastritis and bronchitis. The plant is rich in polyphenols, vitamins C and E, β-carotene, anthocyanidines, naphthoquinones, flavonoids, mucilaginous polysaccharides, tetrahydroxylated linear diterpenes, monoterpenes, and phenolic derivatives [35].

6.10. Vitellariaparadoxa

Vitellariaparadoxa, previously known as Butyrospermumparkii, is a notable medicinal plant within the Sapotaceae family, commonly referred to as the Shea butter tree. It is the sole species in the genus Vitellaria and is native to Africa. The medicinal uses of Shea butter include promoting wound healing and alleviating skin irritations [36].

Table 1 List of the some plants and part used for wound healing

Serial No.	Plant name	Part used	References
1.	*Elaeisguineensis*	Leaves	37
2.	*Cassia fistula*	Leaves	38
3.	*Cynodondactylon (L.)*	Leaves	39
4.	*Justiciatranquebariensis*	Stem	40
5.	*Aloe vera*	Leaves	40
6.	*Curcuma longa*	Rhizome	40
7.	*Carica papaya*	Roots	41
8.	*Zingiberofficinale*	Roots	42
9.	*Bryophyllumpinnatum*	Leaves	43
10.	*Tageteserecta*	Leaves	44
11.	*Centellaasiatica*	Flowers, Leaves	44
12.	*Securidacalongepedunculata*	Roots	45
13.	*Centaureasadleriana*	Flowers, Leaves, stem	46
14.	*Ajuga chia*	Flowers, Leaves, stem	47
15.	*Parieteriadiffusa*	Leaves	47
16.	*Inulaviscosa*	Leaves	47
17.	*Rubiataenifolia*	Leaves	47
18.	*Wrightiaarborea*	Leaves	48
19.	*Rhuscoriaria*	Fruit	49
20.	*Globulariaarabica*	Leaves	49
21.	*Morindacitrifolia L.*	Leaves	50
22.	*Calotropisgigantea*	Roots	51
23.	*Carica papaya L.*	Leaves	52
24.	*Catharanthusroseus*	Flower	53
25.	*Glycosmisarborea*	Leaves	54
26.	*Chenopodiumbotrys*	Leaves	55
27.	*Polygonatumodoratum*	Leaves	56
28.	*Elaeisguineensis*	Leaves	57
29.	*Plumbagozeylanica*	Roots	58
30.	*Acacia leucophloea*	Bark	59
31.	*Tectonagrandis Linn*	Leaves	60
32.	*Cinnamon verum*	Bark	61
33.	*Ammanniabaccifera*	Leaves	62
34.	*Blepharismaderaspatensis*	Leaves	62
35.	*Boswelliacarteri*	Bark	63
36.	*Commiphoramyrrha*	Bark	63
37.	*Aloe littoralis*	Leaves	64
38.	*Croton macrostachyus*	Leaves	65
39.	*Eclipta alba*	Leaves	66
40.	*Tridaxprocumbens*	Leaves	67
41.	*Euphorbiaceae*	Leaves	68
42.	*Telephiumimperati*	Leaves , stem,	69

		flower	
43.	*Heliotropiumindicum*	Leaves	70
44.	*Mimosa pudica*	Leaves	71
45.	*Berberis lyceum*	Roots	72
46.	*Jasminumgrandiflorum*	Flowers	73
47.	*Ficusdeltoidea*	Flower, Leaves, stem	74
48.	*Salvia multicaulis*	Flowers	75
49.	*Trichosanthesdioica*	Fruits	76
50.	*Andrographispaniculata*	Leaves	77

7. CONCLUSION

Physical injuries that cause an opening or rupture in the skin are called wounds. For the skin's disturbed anatomical continuity to be restored and for it to function normally, wounds must heal properly. Despite the abundance of fantastic chemical medications on the market, there are still few natural substances that can speed up the healing process of wounds. Moreover, the high expense of therapy and the existence of adverse effects make managing chronic wounds a significant issue. The complex series of events known as wound healing is the result of multiple cell types responding in concert to tissue damage, which is the initial trigger for the healing process. Because they are a rich source of secondary metabolites and phytochemicals that aid in the restoration of bodily functioning, medicinal plants offer a variety of therapeutic uses. Ten medicinal plants with wound-healing qualities have been identified in the current study, which will aid researchers in creating novel human-use wound-healing compositions.

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