Preparation, Phytochemical Analysis and Wound-Healing Screening of a Polyherbal Formulation in Albino Wistar Rats

Divya Rao[1], Dr. Shobhit Prakash Shrivastava[2]
[1,2]*Dr. M.C Saxena College of pharmacy, Lucknow, Uttar Pradesh 226101*

Abstract- Wound management is a clinical problem, which has raised the interest in plant-based interventions. Polyherbal preparations - mixtures of extracts of medicinal plants - have become the focus of interest due to their synergy in wound healing [1][2]. This review summarizes the preparation procedure of a polyherbal wound-healing formulation, its phytochemical components and efficacy of such preparations in an albino Wistar rat wound model. Polyherbal remedies take advantage of several bioactive molecules to speed up the healing process by regulating inflammation, stimulating collagen synthesis, fighting microbial infection, and improving tissue regeneration [3][4]. Recent experiments on rats show that ointments or gels of plant extracts (i.e., Curcuma longa, Aloe vera, Centella asiatica, Azadirachta indica) cause a significant improvement in wound contraction, healing time, and tensile strength of repair tissue as compared to controls [5][6]. The phytochemical studies indicate that these preparations contain high levels of flavonoid, phenolic, tannin and other antioxidants which form the basis of their therapeutic activity [7][8]. In general, polyherbal preparations are a potential biocompatible approach to wound healing, which should be developed in terms of clinical application.

Keywords: Wound healing, polyherbal formulation, medicinal plants, phytochemicals, Wistar rats

I. INTRODUCTION

The process of wound healing is dynamic and involves hemostasis, inflammation, proliferation and remodelling phases [9]. Effective healing recovers the structural and functional integrity of the tissue and failure to heal can cause long term wounds. Chronic wounds (e.g. non-healing ulcers) represent a major health problem, particularly when it comes to elderly and diabetic patients [10][11]. The standard wound care methods (e.g. dressings with antiseptics or silver sulfadiazine creams) may be expensive and may delay the healing process (e.g. inhibit epithelialization) [12]. Further, the untargeted administration of antibiotics has resulted in resistant infections making it difficult to take care of the wounds [13]. It is due to these challenges that there has been interest in exploring the use of plants as a bioactive source of wound management because plants contain a large number of bioactive compounds that can stimulate tissue repair with fewer side effects [14][15].

Combining several herbs in a formula to reach greater therapeutic effect was long promoted by such traditional medicine systems as Ayurveda [16]. Polyherbalism (Sarangdhara Samhita) is an idea that recommends a synergistic combination of herbs to treat different facets of a disease, and gives superior outcomes compared to herb extracts [17][18]. Within the context of wound healing, this method implies that a single formulation has the ability to simultaneously address inflammation, oxidative stress, microbial growth and tissue regeneration [19]. These assertions are supported by recent pharmacological research: a good number of medicinal plants have antimicrobial, anti-inflammatory and antioxidant effects, which are useful in wound healing [20]. As an illustration, plants such as turmeric (Curcuma longa), neem (Azadirachta indica), aloe vera (Aloe barbadensis), and gotu kola (Centella asiatica) have been well-reported to have wound-healing effects [21]. These botanical agents are able to stimulate fibroblast growth, deposition of collagen, angiogenesis and re-epithelialization of wounds [22][23].

Based on this history, polyherbal preparations provide a multimodal approach to wound care. In this review, the authors concentrate on the preparation of a

polyherbal formulation as a wound healing agent, the phytochemical composition of the formulation and the results of the preclinical wound-healing screens in the albino Wistar rats. A common experimental model in the study of wound healing is the albino Wistar rats; their skin anatomy and healing systems are similar to those of the human being [25]. Through the synthesis of the recent studies, we will put emphasis on how the combination of multiple medicinal plants can accelerate wound healing and enhance the outcome of the healing process that may serve as a possible and affordable solution to the management of wounds.

II. THE PREPARATION OF POLYHERBAL FORMULATION

Choice of Medicinal Plants: The initial aspect in developing a polyherbal wound remedy is the choice of complementary therapeutic plants. Conventionally, herbs that have been shown to have wound-healing effect, antimicrobial, antioxidant, or antimicrobial, or antioxidant effects are chosen. As an example, a formulation can contain strict herbs to induce tissue contraction, demulcents to calm and hydrate tissue, and antimicrobial herbs to avoid infection [19][18]. Table 1 summarizes common choices as well as roles. A lot of recipes are based on Ayurvedic recipes or on ethnobotanical traditions. As an example, Panchavalkal ointment is an Ayurvedic mixture of 5 tree barks (such as Ficus species) used in cleaning and anti-inflammatory effects on wounds [26][27]. Similarly, amrit oil is a polyherbal oil with extract of varieties of plant such as Terminalia chebula, Emblica officinalis, Curcuma longa, Adhatoda vasica, Azadirachta indica among others, and is traditionally used to treat wounds [28].

Phytochemicals: Phytochemicals are extracted once the plants are chosen and can be extracted with the help of solvents. The hydro-alcoholic technique is widely used because it is able to extract a wide spectrum of compounds with polar and medium-polar head groups (flavonoids, phenolics, glycosides and so on) [29][30]. Pre-drying followed by powdering of each part of the plant (leaves, roots, bark, etc.) may be done before extraction. As an illustration, to make an ointment, ethanol/water extracts of each plant can be acquired by either maceration or Soxhlet extraction followed by extraction concentration [29]. As an example, Shukla et al. (2023) used Aloe vera gel and Azadirachta indica (neem) leaves to produce a polyherbal gel; the extracts were combined in different ratios in order to optimize the formulation [31][6]. The resulting product (named PHF4) was a perfect proportion of aloe and neem extracts and added into the carbopol gel base to be applied topical [32].

Formulation and Stability: The concentrated plant extracts are then put together in particular amounts to come up with the polyherbal product [28]. Traditional formulations tend to inform the ratio of each extract or may be optimized by preliminary experiments (e.g., best antioxidant or antimicrobial activity). The entire extract is able to be incorporated into an appropriate dosage form like an ointment, cream or gel. The phytochemicals are evenly applied to the wound using a neutral base (petroleum jelly, cream base or polymer gel). Parameters of formulation such as pH, viscosity, spreadability, and stability are considered to make the product homogenous and shelf-stable [33][30]. As an illustration, Shukla et al. have found the physical look, pH (~6 compatible with skin) and viscosity of their aloe-neem gel, and the optimal formula turned out to be smooth and stable with time [33][30].

The preparation is also taken into account in terms of sterility and safety. The herbal extracts are normally filtered to eliminate the particulate matter and in order to prevent microbial growth, preservatives can be included in the formulation. In case of chronic use, stability (at varying temperatures) tests are used to be sure the activity is preserved - one of the studies on a Thai polyherbal ointment (Ya-Samarn-Phlae) found key markers (such as a-mangostin) to be stable during 6 months [34][35]. In general, thorough preparation produces an array of polyherbal formulation, which has a concentration of the complete phytochemicals in a practical state to apply to the wound.

Table 1. Selected Medicinal Plants Commonly Used in Polyherbal Wound Formulations

Plant (Scientific name)	Key Phytochemicals	Reported Wound-Healing Actions
Turmeric (*Curcuma longa*)	Curcumin (polyphenol), demethoxycurcumin, tumerones	Anti-inflammatory; antioxidant; enhances collagen deposition and granulation tissue formation[36][35].

Plant (Scientific name)	Key Phytochemicals	Reported Wound-Healing Actions
Neem (*Azadirachta indica*)	Nimbidin, nimbolide, tannins, flavonoids	Antimicrobial (broad-spectrum); anti-inflammatory; promotes wound contraction and epithelization[28][19].
Aloe vera (*Aloe barbadensis*)	Polysaccharides (acemannan), glycoproteins	Moisturizes wound, immune-modulatory; accelerates re-epithelialization and reduces inflammation[31][6].
Indian Gooseberry (*Emblica officinalis*)	Vitamin C, tannins (emblicanin), flavonoids	Antioxidant; promotes fibroblast proliferation and wound closure (often used with Terminalia spp.)[28][37].
Gotu Kola (*Centella asiatica*)	Asiaticoside (triterpenoid saponin), madecassoside	Promotes angiogenesis and collagen synthesis; improves tensile strength of healed skin[20][21].
Tridax Daisy (*Tridax procumbens*)	Flavonoids (quercetin), tannins, alkaloids	Anti-hemorrhagic; antimicrobial; accelerates wound contraction and collagen formation[38][39].
Brahmi (*Hydrocotyle/ Bacopa monnieri*)	Bacosides (triterpenoids), asiatic acid	Antioxidant; improves wound tensile strength; anti-inflammatory effects aid repair[20][4].

Many plants contain overlapping classes of compounds (phenolics, flavonoids, terpenes) which collectively contribute to faster healing. Polyherbal formulations harness these multiple mechanisms simultaneously.[19][20]

III. PHYTOCHEMICAL PROFILE OF POLYHERBAL FORMULATIONS

Polyherbal wound formulations are biochemically complicated and have dozens of them. To determine the key classes of compounds that phytochemicals have, phytochemical screening is carried out, as this is associated with therapeutic activity. They are usually performed through qualitative tests (e.g., color reactions) and chromatographic analyses. An example is Singh et al. (2022), which had phytochemical profiling of a multi-herb extract and established the presence of alkaloids, phenols, tannins, flavonoids, fats and oils in different extracts [7]. Polyherbal mixtures are characterized by such a wide spectrum. Quantitative tests also demonstrated a high total phenolic content (e.g. a value of about 35.6 mg GAE/g in ethanolic extract) and total flavonoid content (e.g. a value of about 76.3 mg QE/g in chloroform extract) in that formulation [40][41]. These results suggest that polyphenolic compounds, which are famous due to their antioxidant and wound-healing properties are abundant.

Curcumin (turmeric), asiaticoside (Centella), aloin (Aloe), catechins (green tea), and other flavonoids (quercetin, kaempferol, etc.) are some of the examples of key bioactive compounds of common wound-healing herbs. These constituents can have a synergistic effect when used in polyherbal preparation. Indicatively, one study employed the HPLC in determining protocatechuic acid, syringic acid, kaempferol, apigenin, and diosmetin in a 5-plant gel; all are powerful antioxidants, which together work together to heal [42]. Even in silico studies even indicate that a large number of compounds meet drug-like requirements, which means that they can be well bioborated when used in wounds.

Standardization of polyherbal products is also important using phytochemical fingerprinting using TLC or HPLC. The content of herbs may be different depending on the source, thus the establishment of marker compounds guarantees consistency between batches [40][41]. As an example, the formula of Amrit oil (that contains Terminalia spp. containing tannins) may be made standardized by using a minimum amount of gallic acid (a marker of tannins). By the same token, the presence of curcumin may serve as an indicator of formula containing turmeric. The a-mangostin (mangosteen peel) and curcumin were followed in Ya-Samarn-Phlae ointment; a-mangostin was stable during the course of 6 months, whereas curcumin declined slightly [35]. Although there were some losses, the formulation was still of potent activity, which highlights the fact that several phytochemicals give a buffering action.

It is worth noting that polyherbal preparations have high antioxidant potential as a result of synergistic actions of the components. Both high DPPH radical scavenging activity and lipid peroxidation inhibition have been established [24]. This antioxidant activity is

essential since an overload of oxidative stress derails healing of wounds; therefore, polyphenol formulations prevent harm to tissue and aid in wound healing. Most of them also exhibit widespread antimicrobial effects, such as against typical wound pathogens such as Staphylococcus aureus and Pseudomonas aeruginosa[24]. To illustrate this, Dev et al. (2019) prepared a gel containing the extract of Plumbago zeylanica, Datura stramonium and Argemone mexicana; this gel has a stronger antimicrobial effect against Gram-positive and Gram-negative bacteria compared to the extracts of the individual plants. This formulation had increased the anti-inflammatory effect in a rat paw edema model, probably due to flavonoids and alkaloids of the constituent herbs[16]. These phytochemicals inhibited pro-inflammatory cytokines and enzymes and thus hastened the healing process.

To conclude, phytochemical proficiency of polyherbal preparations - especially, polyphenols, flavonoids, tannins, terpenoids, and alkaloids - is the basis of their wound-healing behavior. Such formulations, by incorporating plants, have a multi-target phytochemical profile and can target multiple biochemical pathways of wound repair (oxidative damage, infection, inflammation, collagen synthesis) in one formulation [19][4]. This is the main benefit of polyherbal therapy, which involves a comprehensive mode of action.

IV. AMNESTY IN ALBINO WISTAR RATS WOUND-HEALING

The final trial of a formulation used to heal wounds is its in vivo performance. The Albino Wistar rats are commonly utilized in order to determine the safety and effectiveness of new wound treatments. Wound healing experiments are usually performed using standardized wounds on anesthetized rats followed by the assessment of the progress of healing in the presence and the absence of the treatment. The models of common wounds are: excision wounds (full-thickness skin wounds of a constant size), incision wounds (a clean cut, frequently to measure tensile strength of healed skin), and burn wounds. In research, the polyherbal formulation is applied to group of rats (typically topically) and results are compared to a control group (e.g. untreated or base ointment) and usually to a standard drug group (e.g., povidone-iodine or other known healing agent).

Wound Contraction and Closure: The rate of wound contraction i.e. the area of wound reduction with time is considered one of the classic products. Polyherbal preparations have always exhibited rapid wound contraction. As an example, Kumar et al. (2021), tested a formulation Septaheal in Wistar rats that had excision, incision and burn wounds. The treated rats in excision wounds exhibited faster wound healing in comparison to controls, which was due to the angiogenic and mitogenic effects of the formulation (enhancement of new blood vessels and cell growth)[14]. In the other study, polyherbal ointment, which contained Zingiber officinale, Curcuma longa, Aloe barbadensis, Citrus aurantium and Emblica officinalis, gave approximately 90 percent wound closure after 12 days using the highest concentration of extracts of 6 percent w/w which was 6 times higher than the control group (wound was not treated) achieving a wound closure of approximately 77 percent after 12 days. The length of time during which epithelization (skin regrowth) occurred in treated animals was reduced - high dose treated wounds re-epithelialized in approximately 11 days compared with 15-20 days in controls. These findings indicate that the polyherbal ointment was not only effective in closing wounds earlier, but it also reinstating the skin barrier to normal was even faster, as compared to standard care.

The influence of a polyherbal ointment and controls on the healing of wounds in rats (non-diabetic model). Top row (A): Day 0 and day 11 picture of herbal-treated wounds (III) demonstrate almost complete closure like the standard drug (II), whereas the untreated control (I) has the remaining wound[5][57]. Bottom graphs (B, C): Wound area reduction, percent wound closure augment at a higher rate in the polyherbal-treated (III, green line), standard (II, blue line), and control (I, gray line) groups over 11 days[5][10]. SEM is represented by error bars; $p < 0.05$ vs. control.

There are several other studies that support these results. Dhurve et al. (2021) noted that the difference between the contraction percentage of the wound area of Panchavalkal ointment-treated and control rats was significantly high[27]. At the conclusion of their experiment, almost all of the wounds that received Panchavalkal (and even the base sesame oil) were

completely healed, but the control wounds healed slower[27]. Moreover, epithelization period (period of the wound covered with new epithelium) in the treated groups was significantly shorter - which means that the wound bed resurfaced more quickly[58]. According to Shukla et al. (2023), within 12 days, 99-100 percent of wounds were contracted in rats receiving their aloe-neem polyherbal gel (PHF4), which was significantly better than that of rats that receive extract alone[32][6]. The polyherbal gel also resulted in reduced epithelialization period (c. 13 days) relative to control (c.18+ days) and a rise in the hydroxyproline level of the wound tissue, which represents increased collagen deposition in the healing tissue[6].

Tensile Strength and Collagen Deposition: The quality and quantity of collagen fibers determine the other important measure, which is the strength of healed skin. Polyherbal therapies tend to enhance the tensile strength of the wounds. Indicatively, Shukla et al. in incision wound models discovered that the rats treated with polyherbal gel exhibited a much higher wound breaking strength as compared to the ones treated with single-herb preparation. Hydroxyproline assay (a collagen measuring assay) revealed greater collagen in the wounds covered with the polyherbal gel signifying a healthy healing matrix[6]. Polyherbal gel (Plumbago-Datura-Argemone) used by Dev et al. (2019) also led to early high-strength healing; at the end of the study, the treated wounds recorded significant increases in breaking strength and scar tissue; this effect was associated with faster collagen fiber remodeling. Histological analysis always shows that the density and the organization of the collagen fibers of polyherbal treated wounds are better than those of the untreated wounds[22]. Masson trichrome staining on day 11 revealed that with a Thai herbal gauze (YaSP) thicker, well-aligned collagen bundles formed within the herbal group, but sparse fibers formed within controls[22].

Anti-inflammatory and Antimicrobial Effects: To heal wounds effectively, it is necessary to control the inflammation and prevent the infection. Multi-component structure is the advantage of polyherbal preparations in this regard. There are a lot of herbs (e.g., neem, turmeric, Euphorbia hirta) that prevent the growth of microbes. In vivo, the treated wounds tend to have smaller bacterial load and decreased purulent discharge. Rats with burn wounds helped to explain, when a specific fermented polyherbal combination was used, the rate of infection was reduced and the wound was healed better in comparison with burns, which were not treated. Less redness, swelling, and pain of the treated wounds are evidence of anti-inflammatory action. Herbal-treated wounds have lower concentrations of pro-inflammatory cytokines such as TNF- a and IL-1 b, reduced inflammatory enzymes (e.g. myeloperoxidase, iNOS). Recording by Sanpinit et al., (2025) that their herbal ointment inhibited these mediators and as a result inhibition prevented the chronic inflammation which inhibits healing[35]. As a result, the treated wounds went through the proliferative stage more quickly with increased VEGF and TGF-b1 to go into stimulation of the new tissue and vessels. The overall outcome is a more organized healing process: inflammation is resolved in time and then granulation and remodeling processes are robust.

Diabetic and Chronic Wound Models: Surprisingly, polyherbal preparations have been found effective in hard-to-heal wound models i.e. diabetic wounds. Angiogenesis and high oxidative stress of diabetic wounds generally results in slow wound healing. However, in a research by Sanpinit et al., a gauze pad impregnated with the herbal YaSP ointment resulted in almost 97 percent healing of diabetic wounds in rats by the end of the 11th day, almost equal to what was being done to non-diabetic wounds[10]. Only about 84 percent of untreated diabetic wounds were closed during the same period[10]. This was also supported by the fact that the diabetic treated wounds showed the ratio of collagen III/I (which is associated with a favorable beginning of granulation tissue) and the concentration of growth factors were found to be higher indicating that even in a diminished healing milieu, the polyherbal method produced significant results.

On the whole, preclinical screenings greatly endorse the idea that polyherbal preparations have the capability of accelerating wound healing in Wistar rats. They are likely to shorten the healing period by a few days and enhance the quality of the healed skin and this they can do without any adverse effects. As an example, no irritation and delayed wound reaction was observed in animals treated with different herbal creams and gels. The efficacy together with this safety profile highlights the possibilities of translating these formulations to a clinical environment.

V. MECHANISMS OF ACTION

The multiple synergistic systems of action give rise to the impressive wound-healing effects of polyherbal formulations:

Antioxidant activity: Polyherbal extracts contain a good amount of antioxidants (flavonoids, phenolic acids, vitamins) neutralizing the overabundance of free radicals in the wound. The other way in which oxidative stress can harm tissue and slow down healing is by causing damage to the tissue. Herbal antioxidants such as Emblica officinalis (vitamin C, tannins), Terminalia spp. preserve cells and promote the development of new tissues. Oxidative damage (e.g. malondialdehyde) markers in treated wounds are much lower than in the controls[35], pointing to the herbal formulation mitigating oxidative damage to the tissue.

Anti-inflammatory effect: Chronic or excessive inflammation does not allow healing to occur since it destroys healthy tissue and leads to edema. A large number of herbal components (e.g., curcumin, quercetin, asiaticoside) block major inflammatory pathways (NF-kB, COX-2, cytokine release)[4]. Histological findings in polyherbal treated wounds usually experience less inflammatory cell infiltration[22]. Dev et al. (2019) found that their polyherbal gel gave a significant reduction in edema at the paw in rats when compared with the standard anti-inflammatory drugs. The formulation prevents additional tissue damage by balancing the inflammatory process and permits the healing phase to enter the proliferative stage on time.

Angiogenesis and cell proliferation: The process of healing involves the development of new blood vessels and granulation tissue. Such herbs as Centella asiatica and Glycyrrhiza glabra have been known to induce angiogenesis. Polyherbal preparations were proved to increase growth factor concentrations of VEGF (vascular endothelial growth factor) and TGF-b1 in wound tissue. These growth factors make the endothelial cells to develop new capillaries and get fibroblasts to make collagen. It has been shown by experiment that the capillary density and perfusion of the herbal-treated wounds are higher as compared to the untreated wounds[22]. The outcome is a healthy granulation tissue and accelerated wound defect fill-in.

Collagen production and remodeling: The strength of the tissue after healing determines on the maturation of collagen. Polyherbal preparations of several different types are known to raise the concentration of hydroxyproline (surgical analogue of collagen) and collagen production genes[37][10]. Indicatively, following Amrit oil treatment, there was an upregulation of collagen-related genes MMP-2 and KGF which suggests an active matrix remodelling and epithelial growth[37]. Polyherbals also regulate the ratio of collagen types: Sanpinit et al. observed that type III collagen was increased correctly in early (firm granulation tissue) and type I collagen was increased in later (strong scar formation) wounds in herbs-treated wounds[35]. Such a controlled change is optimal of healthy wound maturation.

Antimicrobial effect: Wound infections significantly slow down healing. The spectrum of antimicrobials of many herbs (neem, honey, Euphorbia hirta, Terminalia spp.) is wide. Polyherbal interactions may be strong - e.g. when the Plumbago-Datura-Argemone gel reduced both Gram-positive and Gram-negative bacteria through a synergistic effect. The formulation inhibits tissue damage and inflammation that are caused by infection by reducing the colony of the microbes. Other herbs are also antifungal and antiviral which contributes to the wound infection control. Herbal preparations therefore become a natural antiseptic as opposed to the cytotoxicity of certain chemical antiseptics.

Enhanced hydration and epithelial migration: The topical herbal gels and creams usually create a moist healing environment which has been shown to accelerate the migration of epithelial cells across the wound. Some ingredients such as aloe vera gel are great moisturizers as well as having polysaccharides that help to induce epidermal cell movement. There was one study where a polyherbal cream was used, it kept the wound maintained with optimum moisture and epidermal coverage of the wound was faster as compared to dry dressing. The wound surface is closed in less time, decreasing the risk of infection.

Basically, a polyherbal preparation can be considered a combination therapy in a single container, with anti-inflammatory, antioxidant, antimicrobial, and proliferative stimuli properties simultaneously[4]. Such multimodal action is the reason why wounds treated with these types of formulations usually heal better and quicker when compared to wounds treated

with one agent therapy and those left to nature. Polyherbal therapies provide an ideal microenvironment to promote wound repair by regulating the various factors that are considered in wound repair.

VI. CONCLUSIONS AND FUTURE OUTLOOKS

Polyherbal preparations are an emerging trend in wound management that is an advancement of the traditional medicine over the contemporary pharmacology. The evidence reviewed on albino Wistar rats proves that properly prepared combinations of medicinal plant extracts can increase the wound healing rate, enhance wound healing quality, and reduce complications compared to untreated wounds or conventional treatment. The rationale behind these advantages includes the synergistic action of phytochemicals in polyherbal remedies, which have the simultaneous effect of combating infection, suppressing inflammation, free radical scavenging, and repairing tissue. Polyherbals have the potential to reduce the healing time in a clinical setting by almost 90-100 percent of wound contraction in 1-2 weeks of treatment[6], which numerous studies have documented.

Notably, the majority of polyherbal formulations did not exhibit toxicity in animals - they were not irritative, had no systemic toxicity or delayed healing, which underscoring their biocompatibility. This safety profile is of critical importance to human use translation. There are still several issues prior to the clinical adoption: the quality of herbal extracts, the variability of a batch, and its reproducible effectiveness. This requires a strict quality control (e.g. through the use of marker compounds as discussed) to ensure that polyherbal products are consistent and acceptable in modern medicine. Moreover, rodent models are informative but the clinical trials should be conducted in humans. Certain small scale clinical trials and widespread historical application provide assurance that such formulations will be effective in humans but controlled trials will be useful in validating the best formulations and dosing.

Future studies can investigate polyherbal preparations in special wound conditions (such as diabetic foot ulcers, pressure sores) where existing interventions tend to be futile. An increase in the interest of designing polyherbals with contemporary drug delivery vehicles- including embedding into biopolymer scaffolds, hydrogel dressings, or nanofiber mats to be released on wounds sustained is also increasing. This could be further improved through the integration of herbal medicine and biomaterials, which would increase the results in chronic wounds. The other emerging field is the use of polyherbal formulations as an adjunct to the care of the surgical wound or as prophylaxis to avoid wound infection.

Finally, polyherbal wound-healing preparations are the use of nature pharmacy that involves using a combination of several medicinal plants in a single therapy. Albino Wistar rat experiments discussed in this paper offer a solid scientific foundation to their effectiveness: rapid recovery, tougher scars, and less infection/inflammation. These multi-herb treatments may be a cornucopia of physician and patient benefits, as they become cost efficient, natural, and effective at wound management, with standardization and clinical validation. The ever-proven wisdom of herbal formulas, now being vindicated by the experimental facts, opens a new era of integrative wound treatment when the whole is more than the sum of the parts.

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