WOUND HEALING MEDICINAL PLANTS—AN OVERVIEW

R.DEVIKA*

Department of Biotechnology, Aarupadai Veedu Institute of Technology, Paiyanoor-603 104

ABSTRACT

From the historic era, plants have been a proved to be an excellent source of food, shelter and medicine for various ailments of mankind and animals. Nowadays, research has been focussed on the utility of the plant sources as an alternative medicine as they are less cost with fewer side effects. Wound healing is one of the major process which involves various stages with multiple components involvements. The present review articles reveals the importance of the stages of wound healing and the various traditional methods involved with medicinal plants. This emphasizes the value of plant products used in various ailments and the methods involved for wound healing processes.

KEYWORDS: Therapeutic, traditional, bioactive compounds, phytochemicals, wound healing, metabolites.
INTRODUCTION

Wound is known as disruption of tissue integrity associated with loss of function or a break in the continuity of tissue due to trauma or violence or carelessness. Wounds are classified as without tissue loss, with tissue loss, and during trauma, abrasions etc. Healing properties differ for different wounds. Wound healing is one of the major biological process which results in the restoration of anatomic continuity and function. Wound healing is an intricate phenomenon by which skin repairs itself and can be classified into any of three types: First Intention, Second Intention, and Third Intention.

First Intention: Edges are smoothly closed that no scar is left
Second Intention: Formation of granulation tissues and associated with significant loss of tissue, leaving little scars
Third Intention: Wound healing occurs and resulting in extensive scar formation.

Deficiency of certain vitamins, cytotoxins, immunosuppressant, non steroidal anti inflammatory drugs suppresses wound healing. Management of wound healing is a complicated programme and the healing properties differ for different wounds. It is evident that the involvement of collagen is highly significant which involve in repair and lead to the formation of scar tissue composed of collagenous fibers. The hydrophilic nature of the collagen with high content of diamino dicarboxylic amino acids and carbohydrate moities provides surface geometry for all adhesion and the glycoprotein on the surface promotes attraction of fibrogenic cells to collagen. Healing requires a collaborative effort which involves platelets aggregation, blood clotting, inflammatory response to injury etc. and it is completed until a firm knit formation by collagen. The role of reactive oxygen species [ROS] are deleterious to the wound healing process because of its harmful effects on cells and tissues. The free radical, scavenging enzymes (FRSE) are responsible for the deactivation or removal of ROS and also in the regulation of wound healing process. The other physical and biological factors which influences the wound healing are bacterial infection, sterility, obesity, movement of wound edges, nutritional deficiency etc. has to be arrested or destroyed or inhibited using phytoconstituents until sign of toxicity.

THERAPEUTIC VALUE OF MEDICINAL PLANTS

More than 80% of the World population depends upon traditional medicine and commercialised drugs. Evidence of many scientific experiments documented that plants exhibit antimicrobial properties from late 19th century and the plant drugs were used in various and G. sylvestere (Asclepiadeceae) is a highly potent anti diabetic, anti inflammatory, anti microbial, hepatoprotective, anti hyperlipedemic plant. The leaves of Gymnema sylvestere contain efficient bio active component such as saponins, olecanane, triterpene saponins, gymnemic acids. Tagetes erecta Linn. (Marigold) are reported to be highly effective against kidney troubles, muscular pain, ulcers and wounds. Napeoleona imperialis (Leycithidaceae) is a woody, several meters high, leaves is about 12 cm long and 7 cm wide with reticate venation and acute apex is used as analgesic, tonic, antitussive, antiasthmatic and in wound dressings and the root bark extracts are used in treating asthma and the leaf volatile oils are evaluated for wound healing activity on guinea pigs. Plants based drugs are used in India and China for more than thousands of years and are the part of evolution of human, health care and 119 plant secondary metabolites are commercialised in pharmaceutical companies and about 15% phytochemicals are from angiosperms origin these derived medicines act as a first line of defense for health and combating diseases. Phytoconstituents of the whole plant of neem are proved to be highly potent against virus, tumor and microbial agents. The phytochemicals such as alkoids, tannins, flavonoids and phenolic compounds influences certain physiological actions on the humanbeings and they nare sometimes added in the food of pregnant and nursing women for medicinal purposes. Euphorbia heterophylla leaf is found to be a traditional medicine as laxatives, antgonorrheal and for megraine and the plant latex is used for fish poisoning, insecticides and ordeal poisons. The leaves of E. heterophylla contain quercertin which acts against skin irritant, anti tumor, anti cancer and anti HIV activities and used for treatment of various ailments in Ayurvedic system of medicine as blood purifier, immunomodular, anti inflammatory, anti oxidant increases appetite and stimulation and contraction of uterus.

PLANT METABOLITES IN WOUND HEALING

Several evidences on wound healing plants are in advance in the recent years and they are known to be highly potent healers with efficient repair mechanisms in natural ways. Research on the combined wound healing activity with Gymnema sylvestere and Tagetes erecta linn. Revealed a significant increase in activity in terms of wound contraction in animals treated with alcoholic extracts of the two plants. The powdered leaves are used externally for boils and carbuncles.
and the plants are reported to have good wound healing activity. The various combinations of *Napoleona imperialis* exhibited good wound healing effect compared to circatrin (An antibiotic) and the best activity was observed with cationic ointment of *N.imperialis*.

Table 1

**List of plants with therapeutic practice on wound healing**

<table>
<thead>
<tr>
<th>S.No</th>
<th>Name of Plant</th>
<th>Vernacular Name</th>
<th>Parts of the plant as healers</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Argemone mexicana</td>
<td>Pivala diholara</td>
<td>Leaves and latex</td>
</tr>
<tr>
<td>2.</td>
<td>Brassica juncea</td>
<td>Mohari</td>
<td>Fruit</td>
</tr>
<tr>
<td>3.</td>
<td>Thespesia populnea</td>
<td>Ghulbhendi</td>
<td>Fruit</td>
</tr>
<tr>
<td>4.</td>
<td>Pongonia pinnata</td>
<td>Karanji</td>
<td>Leaves</td>
</tr>
<tr>
<td>5.</td>
<td>Moringa oleifera</td>
<td>Shenvga</td>
<td>Leaves</td>
</tr>
<tr>
<td>6.</td>
<td>Cassia alata</td>
<td>Shimaigaose</td>
<td>Leaves</td>
</tr>
<tr>
<td>7.</td>
<td>Mimosa pudica</td>
<td>Lajala</td>
<td>Leaves</td>
</tr>
<tr>
<td>8.</td>
<td>Daucas carota</td>
<td>Gajari</td>
<td>Flowers</td>
</tr>
<tr>
<td>9.</td>
<td>Calendula officinalis</td>
<td>Zendu</td>
<td>Flowers</td>
</tr>
<tr>
<td>10.</td>
<td>Nerium indicum</td>
<td>Kaneri</td>
<td>Leaves</td>
</tr>
<tr>
<td>11.</td>
<td>Datura stramonium</td>
<td>Kateridhotora</td>
<td>Latex of leaves</td>
</tr>
<tr>
<td>12.</td>
<td>Ficus religiosa</td>
<td>Pimpel</td>
<td>Bark</td>
</tr>
<tr>
<td>13.</td>
<td>Aloe vera</td>
<td>Korphad</td>
<td>Leaves</td>
</tr>
<tr>
<td>14.</td>
<td>Areca catechu</td>
<td>Supari</td>
<td>Fruit</td>
</tr>
</tbody>
</table>

Acalyphia indica and Azadirachta indica leaf extracts were more effective against the pathogens present in the wound and their revealed to be more therapeutic against wound infection. Early dermal and epidermal regeneration was efficient with the ethanolic extract of *Rubia cordifolia* and showed positive response towards cellular proliferation, granular tissue formation and epitheliasation. Research on various applications of secondary metabolites of plants have been demonstrated in vivo (Animal models) for facilitating the healing processes of wounds such as tannins from *Terminalia arjuna*, shikonin derivatives from *Onosma argentatum*, asiaticoside, asiatic acid and madecassic acid from *Centella asiatica*, Curcumin from *Curcuma longa*, quercetin from *Hippophae rhamnoides*.

**CONCLUSION**

The review indicated that many different medicinal plants of various families have wound healing properties which indicates that the further research on the particular bioactive compounds of these plants will prove to be the best remedy. Several works on the crude extracts of the plants in the article revealed the maximum healing in the animal model. In silico work will prove the exact interactions of the bioactive compounds on to the target molecule which will give more authentication in the research achievement.

**REFERENCES**

11. Piez KA. Molecular and aggregate structure of collagens. In Piez KA and Reddi AM. Editors


44. Karadi K, Jadhav M, Rub R, Bafna A. Evaualtion of the wound healing activity of a crude extract of...


