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A review of the most important medicinal plants effective on wound healing on ethnobotany evidence of Iran

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ABSTRACT

Wound is referred to the disruption of joined structure of the body caused by physical, chemical, and biological agents. Wound healing is a reconstructive process which takes place after damage to skin and soft tissues. After damage, inflammatory response is developed and subdermal cells begin to increase the production of collagen and then epithelial tissue is gradually reconstructed. In Iran traditional medicine, natural substances and medicinal plants are used to heal wounds. This study was conducted to review the most important medicinal plants used for wound healing in different provinces of Iran. The key words including wound healing and skin healing combined with the words medicinal plants, ethnobotany, and traditional medicine in Iran were used to search for in the databases Information Sciences Institute, PubMed, Scopus, Islamic World Science Citation Center, and Magiran. The findings of this study on 15 different regions of Iran indicated use of 67 medicinal plants for wound healing. In some regions Scrophulariastriata, Althaea officinalis, Nerium oleander L. and Plantago major L. were jointly used for wound healing. The medicinal plants reported in this study with their wound-healing property are some alternatives that could be used to develop herbal medicines effective on wound healing if complementary studies confirm their properties.

Key words: Medicinal plants, Ethnobotany, Iran, Wound healing

INTRODUCTION

The body skin is a barrier to invasion of pathogenic microorganisms and loss of water, and prevents bleeding. Therefore, skin is a vital organ whose joined structure may be damaged or disrupted by physical, chemical, and biological agents. This damage is referred to as wound [1, 2]. Wound healing is an active process throughout which a series of connections between different cells, cytokine mediators, and extracellular matrix take place. Generally, wound healing is a continuous process including coagulation, inflammation, proliferation, and recover [3, 4]. Moreover, wound healing is a reconstructive process that takes place after the damage to skin and soft tissue. In fact, after the damage incidence, an inflammatory response is developed and subdermal cells begin to increase collagen and then epithelial tissue is gradually reconstructed [5]. Studies have shown that the factors that contribute to wound healing include fibronectin, macrophage migration inhibition factor, growth factors, matrix metaloproteinases, and hormones [6-10]. In Iran, the disinfectant solutions such as acetic acid and betadine, washing with physiology serum, hydrocortisones, and antibiotic ointments are used to treat and heal wounds. Several drugs and ointments, with their specific limitations and side effects, are used to heal open wounds [11].
In fact, serious tendency to using medicinal plants has been instigated for several reasons including their related industries, prevention of currency outflow, helpful entrepreneurship, and World Health Organization's recommendations to use medicinal plants [12-14]. This tendency towards medicinal plants has caused natural drugs in Iran traditional medicine, natural substances and medicinal plants are also used for wound healing [12-14]. Although use of chemical and synthetic drugs has been extremely become popular over the past half-century [15-23], their deleterious effects on human life has caused recreation to medicinal plants, and several studies have been conducted to investigate and confirm their effects on different diseases and to determine their effective dose [24-36]. In fact, serious tendency to using medicinal plants has been instigated for several reasons including their fewer side effects of different types and effective substances, the recommendations of medicinal plants cultivation-related industries, prevention of currency outflow, helpful entrepreneurship, and World Health Organization's recommendations to use medicinal plants [37-48]. This tendency towards medicinal plants has caused natural drugs to be considered as the basis of and only even treatment, and their compounds to be used in pharmaceutical industry [49-59].

In Iran traditional medicine, natural substances and medicinal plants are also used for wound healing [12-14]. Although use of chemical and synthetic drugs has been extremely become popular over the past half-century [15-23], their deleterious effects on human life has caused recreation to medicinal plants, and several studies have been conducted to investigate and confirm their effects on different diseases and to determine their effective dose [24-36]. In fact, serious tendency to using medicinal plants has been instigated for several reasons including their fewer side effects of different types and effective substances, the recommendations of medicinal plants cultivation-related industries, prevention of currency outflow, helpful entrepreneurship, and World Health Organization's recommendations to use medicinal plants [37-48]. This tendency towards medicinal plants has caused natural drugs to be considered as the basis of and only even treatment, and their compounds to be used in pharmaceutical industry [49-59].

Table 1. The medicinal plants effective on wound healing and complementary data

<table>
<thead>
<tr>
<th>No.</th>
<th>Scientific name</th>
<th>Family name</th>
<th>Persian name</th>
<th>Plant part used</th>
<th>Effect</th>
<th>Region</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Fumaria vulgatilis L.</td>
<td>Fumariaceae</td>
<td>گل‌البرین</td>
<td>All organs</td>
<td>Wound healing</td>
<td>Iran [62]</td>
</tr>
<tr>
<td>2</td>
<td>Heliotropium mollissimum (Linn.) DC</td>
<td>Boraginaceae</td>
<td>گل‌البرین</td>
<td>Leaves</td>
<td>Wound healing</td>
<td>Iran [62]</td>
</tr>
<tr>
<td>3</td>
<td>Platago major L.</td>
<td>Plantaginaceae</td>
<td>گل‌البرین</td>
<td>Leaves and roots</td>
<td>Wound healing</td>
<td>Iran [62]</td>
</tr>
<tr>
<td>4</td>
<td>Platypogon montanus L.</td>
<td>Plantaginaceae</td>
<td>گل‌البرین</td>
<td>Leaves</td>
<td>Wound healing</td>
<td>Iran [62]</td>
</tr>
<tr>
<td>5</td>
<td>Allium sativum L.</td>
<td>Amaryllidaceae</td>
<td>چلی</td>
<td>Leaves</td>
<td>Wound healing</td>
<td>Iran [62]</td>
</tr>
<tr>
<td>6</td>
<td>Achillea millefolium L.</td>
<td>Asteraceae</td>
<td>آرک</td>
<td>Leaves and flowers</td>
<td>Wound healing</td>
<td>Iran [62]</td>
</tr>
<tr>
<td>7</td>
<td>Sambucus nigra L.</td>
<td>Caprifoliaceae</td>
<td>بی‌لوئر</td>
<td>Leaves and roots</td>
<td>Wound healing</td>
<td>Iran [62]</td>
</tr>
<tr>
<td>8</td>
<td>Eupatorium cannabinum</td>
<td>Eupatoraceae</td>
<td>چلی</td>
<td>Leaves</td>
<td>Wound healing</td>
<td>Iran [62]</td>
</tr>
<tr>
<td>9</td>
<td>Lamium album L.</td>
<td>Lamianae</td>
<td>گل‌سرخ</td>
<td>Leaves and stems</td>
<td>Wound healing</td>
<td>Iran [62]</td>
</tr>
<tr>
<td>10</td>
<td>Ocimum sanctum L.</td>
<td>Lamiaceae</td>
<td>سیاه‌پوش</td>
<td>Leaves</td>
<td>Wound healing</td>
<td>Iran [62]</td>
</tr>
<tr>
<td>11</td>
<td>Rumex acetosella L.</td>
<td>Polygonaceae</td>
<td>گل‌البرین</td>
<td>Leaves</td>
<td>Wound healing</td>
<td>Iran [62]</td>
</tr>
<tr>
<td>12</td>
<td>Verbascum thapsus L.</td>
<td>Scrophulariaceae</td>
<td>گل‌البرین</td>
<td>Leaves</td>
<td>Wound healing</td>
<td>Iran [62]</td>
</tr>
<tr>
<td>13</td>
<td>Sanguinaria canadensis</td>
<td>Ranunculaceae</td>
<td>بی‌لوئر</td>
<td>Leaves</td>
<td>Wound healing</td>
<td>Iran [62]</td>
</tr>
<tr>
<td>14</td>
<td>Poa pratensis L.</td>
<td>Poaceae</td>
<td>گل‌البرین</td>
<td>Leaves</td>
<td>Wound healing</td>
<td>Iran [62]</td>
</tr>
</tbody>
</table>

Since medicinal plants are used for wound healing in Iran traditional medicine and the people of any region have its specific drug culture and empirically use its own flora, this review article seeks to identify the medicinal plants used

In Iran traditional medicine, natural substances and medicinal plants are also used for wound healing [12-14]. Although use of chemical and synthetic drugs has been extremely become popular over the past half-century [15-23], their deleterious effects on human life has caused recreation to medicinal plants, and several studies have been conducted to investigate and confirm their effects on different diseases and to determine their effective dose [24-36]. In fact, serious tendency to using medicinal plants has been instigated for several reasons including their fewer side effects of different types and effective substances, the recommendations of medicinal plants cultivation-related industries, prevention of currency outflow, helpful entrepreneurship, and World Health Organization's recommendations to use medicinal plants [37-48]. This tendency towards medicinal plants has caused natural drugs to be considered as the basis of and only even treatment, and their compounds to be used in pharmaceutical industry [49-59].

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Since medicinal plants are used for wound healing in Iran traditional medicine and the people of any region have its specific drug culture and empirically use its own flora, this review article seeks to identify the medicinal plants used
for wound healing in different provinces of Iran. In this line, the medicinal plants that are used for wound healing in ethnomedical resources of Iran are reported.

In this review article, the key words including wound healing and skin healing combined with medicinal plants, ethnomedical, and traditional medicine in Iran were used to search for the relevant articles in the databases Information Sciences Institute, PubMed, Scopus, Islamic World Science Citation Center, and Magiran and the relevant articles were selected. The articles with no abstract in English language or no accessible full text were excluded.

The findings of this study indicated that in different regions of Iran such as Khandagh, West Azerbaijan, Babol, Bandar Genaveh, Arasbaran, Kerman, Persian Gulf, Khuzestan, Sistan, Kazeroun, Mobarakheh of Isfahan, Marivan, Natanz of Khashan, Lorestan, and Ilam, overall 67 medicinal plants were used for wound healing. The findings of this study indicated that in some regions Scrophularia striata, Althaea officinalis, Nerium oleander L. and Plantago major L. were jointly used for wound healing while many of the species of plants are various and different.

DISCUSSION

The findings of this study to review the most important medicinal plants effective on healing of skin wounds based on ethnobotany evidence of Iran, indicated that overall 67 medicinal plants are used for wound healing in different regions of Iran. Most of the plants were from five families: Fabaceae, Asteraceae, Scrophulariaceae, and Plantaginaceae.

Studies have shown that in the extract of some plants, there are bioactive substances with antiseptic and anti-inflammatory properties and hence are able to heal wounds, as well [75, 76]. The plants in the present study are used for wound healing because of the effective and antioxidant substances. Flavonoids which are present in many of the plant families, particularly Asteraceae are involved in wound healing and are free radicals-removing due to the inhibition of nitric oxide synthesis [77]. Further, polysaccharides existing in most species of the plants presented in this study exert significant anti-inflammatory and immunomodulatory effects and are effective on burns, wounds, internal inflammations, irritations, and diarrhea [78]. It is recommended to study the cited plants phytochemically so as to identify the compounds mainly and jointly present in the family plants, Fabaceae, Asteraceae, Scrophulariaceae, and Plantaginaceae, and to study them for their wound-healing properties in animals and humans, so that they may be used to produce the herbal medicines for wound healing if their therapeutic effect is confirmed.

REFERENCES