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AN OVERVIEW OF HERBS POSSESING WOUND HEALING ACTIVITY

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ABSTRACT

Wounds are defined as the disruption of anatomical and functional integrity of living tissue. Wound healing is an intricate and continual cascade of events, with various cellular and biochemical processes, ultimately resulting in the reconstruction and regeneration of damaged tissue. Various plant products have been used in treatment of wounds over the years. Plants and their extracts have immense potential for the management and treatment of wounds. The phyto-medicines for wound healing are not only cheap and affordable but are also safe as hyper sensitive reactions are rarely encountered with the use of these agents. These natural agents induce healing and regeneration of the lost tissue by multiple mechanisms. Various plant products have been used in treatment of wounds over the years. Wound healing herbal extracts promote blood clotting, fight infection, and accelerate the healing of wounds. The aim of present review was to give list of herbs having wound healing potential which is used in our regular life.

KEYWORDS: herbs, wound, healing, herbal medicine, wound contraction.

INTRODUCTION

Wound which is disturbed state of tissue caused by physical, chemical, microbial (or) immunological insults (or) typically associated with loss function.[1] According to the wound healing society wounds are physical injuries that results in an opening (or) break f the skin that cause disturbance in the normal skin anatomy and function.[2] Several factors delay (or) reduce the wound healing process including bacterial infection, necrotic tissue, & interference with blood supply, lymphatic blockage &diabetes mellitus, generally if the above factors could be altered by any agent, an increased healing rate could be achieved.[3] Many Ayurvedic 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.[4] More than 70% of wound healing pharma products are plant based, 20% are mineral based and remaining containing animal products as their base material. The plant base materials are used first aid, antiseptic coagulants and wound wash.[5]

The medicinal use of plants is very old. The writings indicate that therapeutic use of plants is as old as 4000–5000 B.C. and Chinese used first the natural herbal preparations as medicines. A rich heritage of knowledge on preventive and curative medicines was available in ancient scholastic work included in the Atharvaveda (an Indian religious book), Ayurveda (Indian traditional system of medicine) and so on. An estimate suggests that about 13000 plant species worldwide are known to have been used as drugs. Plant-based natural constituents can be derived from any part of the plant like bark, leaves, flowers, roots, fruits, seeds and so on, that is any part of the plant may contain active components. The beneficial medicinal effects of plant materials typically result from the combinations of secondary products present in the plant. Many of them are used to treat highly prevalent disorder diabetes mellitus. Some of the herbal drug which is used in our regular life style having wound healing activity. Some of them are briefed here.

1. Tecomaria capensis

Tecomaria capensis (Bignoniaceae), also known as Capehoneysuckle[6], a fast growing, scrambling shrub which may grow up to 2−3 m high and spread more than 2.5 m. Tecomaria capensis is an evergreen plant in warm climate areas but loses its leaves in colder areas Flowers are orange in color & are tubular and bird pollinated, attracting nectar-feeding birds, especially sunbirds. The plant is used as a traditional medicine to relieve pain &sleeplessness.[7] Dried & powdered bark infusions are taken for sleeplessness.[8] It is included in the list of African plants evaluated for in vitro antiplasmodial activity against Plasmodium falciparum.[9] Previously methanol extract of Tecomaria capensis leaves reported as antimicrobial[10] and antioxidant. Tecomaria capensis known to promote the wound healing process mainly due to their astringent, anti-microbial & free radicals cavenging activities Tecomaria capensis significantly stimulated wound contraction. The breaking strength of the treated incision wounds increased in Tecomariacapensis extract when treated groups

compared with the control group. These findings support wound healing activity of this plant.[11]

2. Mimusops Elengi Linn (Sapotaceae)

Mimusops elengi Linn (Sapotaceae) commonly known as Bakul, is a small to large evergreen tree found all over the different parts of India. It is cultivated in gardens as an ornamental tree. It has been used in the indigenous system of medicine for the treatment of various ailments. Several therapeutic uses as cardiotonic, alexipharmic, stomachic, anthelmintic & astringent have been as cribbed to the bark of Mimusops elengi.[12] It has been reported as dantarogahara (treats and prevent tooth decay & tooth disease) in Ayurveda.[13] A decoction of the bark is used as a gargle in salivation in weak & spongy gums, pyorrhea, stomatitis & ulcerated throat.[14] Compound powder made of the bark is recommended as toothpowder in cases of spongy gums.[15] Phytochemical review shows the presence mixture of triterpenoid saponins in the bark of Mimusops elengi.[16] The methanolic extract ointment of Mimusops elengi effectively stimulated wound contraction; increase tensile strength of incision & dead space wounds as compared to control group.[17]

3. Allium cepa

Allium cepa Linn belongs to the family of Liliaceae. It contains kampferol, β-sitosterol, ferulic acid, myritic acid, prostaglandins. These constituents used as abortifaciant and bulb extract shown to have ecobolic effect in rats. Allium cepa Linn is proved that anti diabetic [18] Antioxidant, anti hypertensive, anti thromboic, hypoglycemic& hyper lipidemic Activities.[19] Flavonoids have been documented which is believed to be one of the most important components of wound healing. The enhanced wound healing may be due to free radical scavenging action and the antibacterial property of the Phytoconstituents presents in it which either due to their individual or additive effect fastens the process of wound healing. This could be the reason for prohealing activity of Allium cepa Linn.

4. Hyptis suaveolens Linn.

The plant, Hyptis suaveolens Linn. belongs to family Lamiaceae. The extract of Hyptis suaveolens contains steroids, alkaloids, carbohydrates, proteins, flavonoids ,tannins, glycosides, leaves of this plant used as stimulant, carminative, sudorific, galactogogue, parasitic cutaneous disease, leaf extracts used as a relief to colic and stomachaches leaves and twigs are acts as anti-rheumatic and anti-soporific bats, anti-inflammatory anti-fertility. The plant continues to use in the treatment of wound.[20]

5. Carica papaya Linn.

Carica papaya Linn. belongs to family Caricaceae. Papaya fruits contain a mixture of cysteine endopeptidases such as papain. Chympopapain A and B, papaya endopeptidaseII, papaya endopeptidase IV, omega endopeptidase, chinitase, protease-inhibitors, and proteins. Papaya fruits posses wound healing properties; papaya latex was applied to the burn wound using hydrogel as a vehicle system.[21]

6. Tephrosia purpurea Linn.

Tephrosia purpurea Linn. belongs to family Leguninosae. It also called as "Sarwa Wran vishapaka". It contains glycosides, rotenoids, isoflavones, flavones, chalcones, flavonoids and sterols. It is also used in the treatment of bronchitis, boils, bleeding piles, pimples, roots and seeds are used as insecticidal, vermifuge, leprous wound and the juice is used for the eruption on skin.[22]

7. Arnebia densiflora Ledeb.

The genus Arnebia are represented by 4 species in the flora of Turkey, one of which, Arnebia densiflora Ledeb. belongs to family Boraginaceae, is widespread in Sivas district and known as egnik by local people and used as red colouring for dying the carpets and the rugs. Arnebia densiflora roots soaked in butter are used in local wound healing care. The roots of this plant have been reported to contain alkannin derivatives, namely β, β dimethylacrylalkannin, teracrylalkannin, isovalerylalkannin, α-methyl-n-butylalkannin. Rats treated with Arnebia densiflora showed rapid healing than the control group. Wound closure and collagen production were faster and healing occurred on the 14th day after wounding.[23]

8. Adhatoda vasica Linn.

Adhatoda vasica Linn. (Acanthaceae) known as chue Mue, grows as weed in almost all parts of the India. Leaves and stems of the plant have been reported to contain an alkaloid mimosine, leaves also contain mucilage and root contains tannins. The methanolic, chloroform and Diethyl ether extract ointment (10%w/w) of Adhatoda vasica has significant wound healing activity. In both extract ointment, the methanolic extract ointment (10%w/w) showed significant effect when compare to standard drug and other two extract in excision wound model.[24]

9. Piper Betel

Piper betel Linn (Piperaceae) leaves is widely used as a post meal mouth freshener and the crop is extensively grown in India. Due to strong pungent aromatic flavour betel leaves are used as masticatory by the Asian people. In Indian folkloric medicine, betel leaf is popular as an antiseptic and is commonly applied on wounds and lesions for its healing effects. This particular property has paved way for further experimental studies, which have established pan extract to have antimicrobial and antileshmian properties. Fresh juice of betel leaves is also used in many Ayurvedic preparations. Betel leaves have long been studied for their diverse pharmalogical actions.[25]

10. Ageratum conyzoides

Ageratum conyzoides is a common weed found everywhere in India & commonly known as goat weed, white weed, in various parts of India. The leaves are applied to the wounds act as septic & heel them quickly. The juice of the fresh plant and extract of dried plant are used to cure allergic conditions.[26] Several Phytoconstituents like alkaloids & saponins [27] are known to promote wound healing process due to their antioxidant anti microbial activities. The wound healing property of Ageratum conyzoides appears to be due to the presence of its active principles, which accelerate the healing process & confers breaking strength to the healed wound.[28]

11. Moringa oleifera Linn.

Moringa oleifera Linn. (Moringaceae) has been an ingredient of Indian diet since centuries. The root bark of the plant contains two alkaloids. It has anti inflammatory antibacterial & counter irritant action, which helps in wound healing.[29] The leaves of the plant have also been reported malaria, menstrual cramps, mouth sores, respiratory disorders, ringworms, sinusitis, sprains, stroke, skin inflammation & wounds.[30] The aqueous extract was studied and it was found that there was significant increase in wound closure rate, skin-breaking strength, granuloma breaking strength, hydroxyproline content, granuloma dry weight and decrease in scar area was observed.[31]

12. Eucalyptus globules

It is also called Dinkum Oil. This oil is obtained by steam distillation of fresh leaves of Eucalyptus globules belonging to family Myrtaceae. It is indigenous to Australia and Tasmania. It is cultivated in United States, Spain, Portugal, and in India. It contains cineole, also known as eucalyptol. In skincare it can be used for burns, blisters, herpes, cuts, wounds, skin infections and insect bites. It can furthermore boost the immune system and is helpful in cases of chicken pox, colds, flu and measles. Oil is used as a counter irritant, an antiseptic, and expectorant. It is used to relieve cough and in chronic bronchitis in the form of inhalation. It is ingredient of several liniment s and ointments. Solution of eucalyptus oil is used as nasal drop.[32]

13. Terminalia Chebula

It also called Haritaki, chebulic myrobalan. It consists of dried, ripe, and fully matured fruits of Terminalia Chebula belonging to family Combretaceae. It has yellowish white flowers in the terminal spike. It contains hydrolysable tannins which upon hydrolysis yield chebulic acid and d-galloyl glucose. It also contains chebulagic, chebulinic, ellagic and gallicacid. It is used mainly as an astringent, laxatives, stomachic and tonic, anthelmintic. Fruit pulp used to cure bleeding. It is an ingredient of ayurvedic preparation 'Triphala'. It is also used in piles and external ulcers.[33]

14. Aegel marmelos (Bael)

It is also called a Bael fruits, Indian bael. It consists of unripe or ripe fruits of the plant known as Aegel marmelos belonging to family Rutaceae. It is indigenous to India and found in Mynmar and Sri Lanka. The pulp is red in colour with mucilaginous and astringent taste. The chief constitute of drug is marmelosin which is furocoumarin. The drug also contains carbohydrates, protein, volatile oil and tannins. The pulp also contains vitamin C and vitamin A. It is used as digestive, appetizer and also used in the treatment of diarrhea and dysentery. It is also a tonic and it has a wound healing properties.[34]

15. Curcuma longa (Turmeric)

It is also called Indian saffron, curcuma. It consists of dried as well as fresh rhizomes of the plant known as curcuma longa belonging to family zingiberaceae. It contains not less than 4% of volatile oil. Traditionally it has been proved as anti-inflammatory, anticancer, antiseptic and shows wound healing activity.[35]

CONCLUSION

Plants were inextricably associated with humans from the time immemorial. Earlier the wound treatment was done using the herbal preparations as well as the raw herbs. With the advancement of technology and introduction of allopathic formulation, herbal products have lost their significance. But in the last decade biological, economical, nutraceutical and therapeutic benefits of herbal preparations have attracted the world pharmaceutical market in the treatment. Now, once again plants are emerging as time worn invaluable therapeutic agents, with their efficacious wound healing properties.

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