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## Aloe Vera: An emerging herb

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### ABSTRACT

Aloe vera is not only used in Ayurvedic system of medicines but also in Homoeopathic & Allopathic system of medicine. The leaves of Aloe vera contains a number of minerals, vitamins, amino acids including sugars. The plant is also consumed for their various pharmacological properties like purgative, emollient & antimicrobial effects with antiinflammatory and anti-oxidant potentials. The plant is also used in cosmetic preparations to prevent & cure burns, sunburns, minor cuts. The study was reviewed due to marvelous healing properties of Aloe vera on the basis of available literature.

**Keywords:** Aloe vera, Ayurveda, Pharmacological properties

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### Introduction

Aloe vera is a plant species of the genus Aloe belonging to the family *Asphodelaceae*. It propagates wildly in humid weathers all around the world which is nurtured for agronomically for its variety of medicinal uses. The regular variety of Aloe vera is not clear, as the classes has been extensively cultivated. The natural form occurs in the southern part belonging to Arabian peninsula, over North Africa (i.e. Morocco, Egypt, Mauritania) including Sudan and its neighbouring territories, along with the Cape Verde, Canary and Islands of Madeira. This spreading is slightly parallel to the one of *Pistacia atlantica*, *Euphorbia balsamifera* with a little others, signifying that a dry sclerophyl forest formerly covered the large areas, but has been vividly condensed due to desertification within the Sahara, leaving these few covering squarantined. Quite a few closely linked species (or sometimes called identical) can also be found on the two extreme edges of the Sahara: *Aeonium* and Dragon trees being the several most typical examples.[1, 2]

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### Distribution

The species of Aloe vera extended to the Mediterranean basin and West Indies, India, China and some other countries in the 16th Century; wheresome species are now a days cultivated for its profitable dedications, principally in certain areas of West Indian islands towards the north coast of South America. The plant is also widely cultivated throughout India as it is mentioned in Ayurveda to prevent & heal a number of physical discomforts. Aloevera plants may also be originated in high temperate zones where it is cultivated in form of crops or ornamentals. A numerous types of Aloe vera plant range from stemless, tiny only an inch or two high as climbing and trailing forms, high clustering bushes, and sometimes a tree like varieties from 30 to 60 feet tall with trunks as considerable as 10 feet in case of perimeter found in distant regions of Southwest Africa and its natal.[2,3]

### Morphology

The plant of Aloe vera grows without stem or regarded sometimes as very short stemmed that grows up to 60-100 cm tall, distributed by equalizers. The plant bears thick & fleshy leaves which are greyish to green in colour. Some varieties of the plant shows white spots upon the lower & upper surfaces of stem. The margin of the leaf appears to be the small white colored & toothed. The flowers are formed during summer like a spike up

to 91 cm in height. The flower is swinging on a yellow colored tubular corolla from 2 to 3 cm long. Aloe vera formulate arbuscular mycorrhiza to allow the plant enhanced entrance of various nutrients like minerals from soil. [4,5]

#### **Chemical constituents**

Aloe vera leaves are bundled in three layers. Amongst which the exterior most layer contain 16 to 20 cells densed shielding made up of synthesized carbohydrates & proteins. The plant contains chromones, anthraquinones, enzymes including polysaccharides as active chemical constituents. The chromones & anthraquinones are supposed to be accountable for its anti-tumor & anti-inflammatory activities. Aloe vera gel is also found to contain various elements like Ca, Fe, Mg, Al, B, Ba, Na, P & Si. The unpleasant yellow colored latex within pericyclic tubules in outer covering contain derivatives of anthraquinone, hydroxyanthracene including characteristic glycosides aloin A & B from 16% to 39% as investigated. Further active constituents of Aloe includes aloemodinanthrone, hydroxyanthrone, chrones & 10-C-glucoside. [6]

#### **Pharmacological properties of Aloe Vera**

**Cosmetic & Skin Protection Application:** Aloin and Aloe vera gel are extensively used as skin tonic agent in contrast to pimples. Aloe vera also have soothing effects on skin keeping skin moist to protect against dry weather. The sugars from Aloe are included in moisturizing cosmetic preparations. Aloe vera mixed with some essential oils works as excellent skin smoothening moisturizer as well as sun blocking lotion and hence used in most of the beauty products. Due to plant's soothing as well as cooling specularities, it is mentioned in Ayurveda in number of skin problems. [7, 8]

**Antiseptic:** Aloe vera possesses the anti-septic potential due to the abundance of various antiseptic agents like lipoic acid, urea nitrogen, cinnamonic, salicylic acid, phenols and sulphur. These compounds shows antagonistic property against microbes. Although significant data is still to be needed to establish its uses in such diseases. [9, 10]

**Anti-diabetic:** The 5 phytosterols from Aloe vera 24-ethyl-10-phenol, cycloartanol, 10-phenol, 24-methyl-10-phenol and 24-methyl-10-cycloartanol exhibited anti-diabetic potential in type-2 diabetic mice. Polysaccharides present in Aloe vera is reported to increase insulin level and revealed its hypoglycemic action. Noor et al. reviewed the valuable effects of

selective medicinal plant species including *Allium cepa*, *Aloe vera*, *Azadirachta indica*, *Gymnema sylvestre*, *Allium sativum*, *Syzygium cumini* & *Pterocarpus marsupium*. The study emphasized about the anti-diabetic potential. [11] The treatment of diabetes mellitus has also been practiced with the use of numerous Indian native plants including different polyherbal formulations. Promising results have also been exhibited from these plant extracts to possess antidiabetic efficacy but till date only a small number of plants has been showed anti-diabetic activity including Aloe vera. In a study it was found that extracts of Aloe gum significantly increased the glucose tolerance power in both normal as well as in diabetic rats. [12, 13]

**Anticancer Properties:** The appropriate data for anticancer activity possessed by Aloe vera is not yet significantly produced. The prolonged misuse of anthranoid containing laxatives is being hypothesized to have protective potential against colo-rectal cancer, however, no fundamental affiliation between anthranoid laxative misuse & colorectal cancer has yet been explained. [14] A report on preventive care against cancer by Aloe vera juice caused by radio & chemotherapy that abolishes vigorous resistant cells essential for the retrieval. An anthraquinone named as emodin has been found to have the capability to suppress or inhibit the progression of malicious cancer cells building Aloe vera to possess anti-tumor potential. [15]

**Stress:** Aloe vera juice is found extremely helpful in smoothening the body mechanisms. It is reported to reduce cell-damaging progression during stress that minimizes biochemical and physiological changes within body. Aloe vera is a brilliant pattern of a functional substance as edible food item playing a significant role in prevention against oxidative stress. [16]

**Antibacterial Activity:** Aloe vera gel was found to exhibit bactericidal potential against *Pseudomonas aeruginosa* preventing it from sticking to human lung's epithelial cells in a monolayer culture. A processed Aloe vera gel preparation resulted in inhibition of growth of fungi *Candida albicans*. The gel contained 99.2% of water and 0.8% is of solids with carbohydrates constituting for a large components. Rigorous extracts of Aloe vera leaves are used as laxative as well as in the treatment of haemorrhoid. Aloe gel is proved to

stimulate the body's immunological system. Glucmannan & acemannan have been proved to accelerated wound healing by activation of macrophages resulting in stimulation of immune system as well antibacterial with antiviral potential. Aloe vera gel have also been reported to possess antibacterial efficacy against *Streptococcus pyogenes* & *Streptococcus faecalis*. It was also proved that Aloe vera gel in vivo improved the wound healing mechanisms by eradicating the bacteria responsible for inflammation in a rat model. The aloe vera extract was also found potent against 3 strains of *Mycobacterium* (*M. fortuitum*, *M. smegmatis* & *M. kansasii*). Thus, it was concluded that Aloe vera gel could be a ridiculous source as antimicrobial agents. [17]

**Antiviral Activity:** Some ingredients found in Aloe vera gel have been exhibited to be effective antiviral agent. Acemannan reduced herpes simplex contamination in 2 cultured target cell lines. Lectins found in Aloe vera gel showed direct inhibition of the cytomegalovirus proliferation during cell culture due to interference with protein synthesis. [18] A purified sample of aloe's emodin was found to be effective against contamination of herpes simplex virus Type I & Type II and found to be eligible inactivation of all viruses including influenza virus, varicella-zoster virus & pseudorabies virus. Electron micrograph inspection of anthraquinone treated herpes simplex virus confirmed that the partially disruption of envelopes. These results indicated that anthraquinones extract from Aloe vera is directly cidal against enveloped viruses. These actions may be considered due to subsidiary effect because of stimulation of the immune system. The anthraquinone aloin also inactivated various enveloped viruses like varicella zoster, herpes simplex and influenza. [19]

**Antifungal Activity:** A study was carried to demonstrate the anti-fungal activity on the mycelium development of *Fusarium oxysporum*, *Rhizoctonia solani*, & *Colletotrichum coccodes*. Result indicated an inhibitory effect of the pulp of Aloe vera against *F. oxysporum* at 105 µl L-1 while liquid fraction reduced the rate of colony growth at a concentration of 106 µl L-1 against *R. solani*, *C. coccodes* & *F. oxysporum*. In another study, it was also reported that the Aloe vera juice possessed anti-inflammatory, antibacterial, anti-arthritis activity & hypoglycaemic effects. Inner layer of leaf gel from Aloe vera also exhibited in the inhibition of

*Streptococcus* & *Shigella* species growth in vitro. [20]

**Conclusion:** The dynamic constituents concealed in Aloe Vera's juicy leaves have the supremacy to soothe human life as well as health in innumerable ways. The plant has significance in ordinary life to pacify a variety of skin disorders such as mild cuts, antidote for insect stings, bruises & eczema including skin moisturizing with anti-ageing, blood and lymphatic circulation, digestive tract health, functioning of kidney, gall bladder and liver makes it a bonus to mankind. Aloe vera as being the "magical plant" possess multiple potential from being an antiseptic, anti-inflammatory agent, helps in relieving like cancer and diabetes, and being a cosmetic field to the skin smoothening effects. The plant is still lacking to establish the scientific data for the uses, those are still being done as traditional to emphasis for better utilization of the plant. Aloe vera is undeniably, the nature's gift to civilization for burn, cosmetic & medicinal application and it leftovers for all of us to familiarize the plant and acknowledge the nature for its everlasting present.

## References

1. V. E. Tyler, "Herbs of Choice," Pharmaceutical Products Press, New York, 1994.
2. T. Reynolds and A. C. Dweck, "Aloe vera Leaf Gel: A Review Update," *Journal of Ethnopharmacology*, Vol. 68, No. 1-3, 1999, pp. 3-37.
3. B. K. Vogler and E. Ernst, "Aloe vera: A Systematic Re-view of Its Clinical Effectiveness," *The British Journal of General Practice*, Vol. 49, No. 447, 1999, pp. 823-828.
4. J. Townsend, "Aloe vera. The UK Reference Guide to Complimentary Medicine," Chartwell House Publishing, London, 1998.
5. P. Antherton, "Aloe vera: Magic or Medicine?" *Nursing Standard*, Vol. 12, No. 41, 1998, pp. 49-54.
6. M. S. Shelton, "Aloe vera, Its Chemical and Therapeutic Properties," *International Journal of Dermatology*, Vol. 30, No. 10, 1991, pp. 679-683.
7. D. P. West and Y. F. Zhu, "Evaluation of Aloe vera Gel Gloves in the Treatment of Dry Skin Associated with Occupational Exposure," Vol. 31, No. 1, *American Journal of Infection Control*, 2003, pp. 40-42.

8. M. Castleman, "The Healing Herbs," Rodale Press, Em-maus, 1991, pp. 42-44.
9. J. P. Heggors, "Beneficial Effect of Aloe on Wound Heal-ing in an Excisional Wound Healing Model," *Journal of Alternative and Complementary Medicine*, Vol. 2, No. 2, 1996, pp. 271-277.
10. R. H. Davis, M. G. Leitner, J. M. Russo and M. E. Byrne, "Wound Healing. Oral and Topical Activity of Aloe vera," *Journal of the American Paediatric Medical Asso-ciation*, Vol. 79, No. 11, 1989, pp. 559-562.
11. M. Tanaka, et al., "Identification of Five Phytosterols from Aloe vera Gel as Antidiabetic Compounds," *Bio-logical and Pharmaceutical Bulletin*, Vol. 29, No. 7, 2006,
12. A. Yagi, Y. Sato, Y. Miwa, A. Kabbash, S. Moustafa, K. Shimomura and A. El-Bassuony, "Ribosomal DNA Se-quence Analysis of Different Geographically Distributed Aloe vera Plants: Comparison with Clonally Regenerated Plants," *Saudi Pharmaceutical Journal*, Vol. 14, No. 3-4, 2006, pp. 208-211.
13. A., Noor, S., Gunasekaran, A. S. Manickam and M. A. Vijayalakshmi, "Antidiabetic Activity of Aloe vera and Histology of Organs in Streptozotocin-Induced Diabetic Rats," *Current Science*, Vol. 94, No. 8, 2008, pp. 1070-1076.
14. C. P. Siegers, "Anthranoid Laxative Abuse—A Risk for Colorectal Cancer," *Gut*, Vol. 34, No. 8, 1993, pp. 1099-1101.
15. C. P. Siegers, "Anthranoid Laxatives and Colorectal Cancer," *Trends in Pharmacological Sciences*, Vol. 13, 1992, pp. 229-231.
16. S. Y. Peng, J. Norman, G. Curtin, D. Corrier, H. R. McDaniel and D. Busbee, "Decreased Mortality of Nor-man Murine Sarcoma in Mice Treated with the Immuno-modulator, Acemannon," *Molecular Biotherapy*, Vol. 3: 1991, pp. 79-87.
17. J. P. Heggors, A. Kucukcelibi, C. J. Stabenou, F. Ko, L. D. Broemeling, M. C. Robson and W. D. Winters, "Wound Healing Effects of Aloe Gel and Other Topical Antibacte-rial Agents in Rat Skin," *Phytotherapy Research*, Vol. 9, No. 6, 1995, pp. 455-457.
18. T. A. Syed, M. Afzal and A. S. Ashfaq, "Management of Genital Herpe in Men with 0.5% Aloe vera Extracts in a Hydrophilic Cream: A Placebo-Controlled Double-Blind Study," *Journal of Dermatological Treatment*, Vol. 8, No. 2, 1997, pp. 99-102
19. M. C. Kemp, J. B. Kahlon, A. D. Chinnah, R. H. Carpen-ter, B. H. McAnalley, H. R. McDaniel and W. M. Shan-non, "In Vitro Evaluation of the Antiviral Effects of Ace-mannan on the Replication and Pathogenesis of HIV-1 and Other Enveloped Viruses: Modification of the Proces-sing of Glycoprotein Glycoprotein Precursors," *Antiviral Res*, Vol. 13, Suppl. 1, 1990, p. 83.
20. D. J. de Rodríguez, D. Hernández-Castillo, R. Rodríguez-García and J. L. Angulo-Sanchez, "Antifungal Activity in Vitro of Aloe vera Pulp and Liquid Fraction against Plant Pathogenic Fungi," *Industrial Crops and Products*, Vol. 21, No. 1, 2005, pp. 81-87.

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