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A review on *Aloe vera* and its traditional uses in India

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Abstract
Traditional medicine plays a critical role in the treatment of various types of diseases. Nowadays, the use of complementary medicine and natural products has been increasing rapidly worldwide because they are effective and inexpensive and have fewer side effects. The therapeutic value of Indian medicinal plants is well recognized and acknowledged all over the world. There has been an ever enhancing awareness globally to rely on natural remedies in place of the chemical drugs. Different types of medicinal plants and their constituents have been used to treat disease from ancient times. The significance of plants and their constituents in the curing of diseases has been discussed in Ayurveda, Unani, and Chinese medicine, and also in various religious books. In Islam, herbs are of significant value in health management, Curcumin, played a major part in the prevention of diseases, via modulation of several activities (Aldebasi *et al*. 2013, Rahmani *et al*. 2014) Only a few plants and their constituents. In this scenario, *Aloe vera*, the succulent species, plays a role in curing disease via modulation of various activities. The relevant chemical constituents are vitamins, minerals, enzymes, sugars, anthraquinones, lignins, alicylic acid, and saponins (Vogler *et al*. 1999, Shelton *et al*. 1991) and most of the constituents appear to be of biological importance in curing diseases. *Aloe vera* is the oldest medicinal plant ever known and the most applied medicinal plant worldwide. Extracts of *Aloe vera* is a proven skin healer. *Aloe vera* help to soothe skin injuries affected by burning, skin irritations, cuts and insect bites, and its bactericidal properties relieve itching and skin swellings. It is known to help slow down the appearance of wrinkles and actively repair the damaged skin cells that cause the visible signs of aging.

Keywords: Medicinal plants, traditional knowledge, adverse effect, *Aloe vera*

Introduction
Aloe vera is the oldest medicinal plant ever known and the most applied medicinal plant worldwide. Extracts of *Aloe vera* is a proven skin healer. *Aloe vera* help to soothe skin injuries affected by burning, skin irritations, cuts and insect bites, and its bactericidal properties relieve itching and skin swellings. It is known to help slow down the appearance of wrinkles and actively repair the damaged skin cells that cause the visible signs of aging. Aloe is a powerful detoxifier, antiseptic and tonic for the nervous system. It also has immune-boosting and anti-viral properties. Research has proven that adding *Aloe vera* to one's diet improves digestion. As a general health tonic. *Aloe vera* is a useful source of vitamins. *Aloe vera* Gel contains a large range of vitamins - even vitamin B12, Vitamin A, contains B-Group vitamins, Vitamin C, Vitamin E and folic acid.

Aloe vera gel is useful for dry skin conditions, especially eczema around the eyes and sensitive facial skin. Its juice may help some people with ulcerative colitis, an inflammatory bowel disease. Aloe has been marketed as a remedy for coughs, wounds, ulcers, gastritis, Diabetes, Cancer, headaches, arthritis, immune-system deficiencies, and many other conditions when taken internally. However, the general internal use is as a laxative. The lower leaf of the plant is used for medicinal purpose. If the lower leaf is sliced open, the gel obtained can be applied on the affected area of the skin. Aloe (*Aloe vera*) is an important and traditional medicinal plant belonging to the family Liliaceae. WHO has recently estimated that 80% of the populations of the developing countries rely on traditional medicine, mostly plant drugs, for their primary health care needs (Denoe and Bough, 1999) [7].

Phytochemicals
Aloe contains two classes of Aloins: (1) nataloins, which yield picric and oxalic acids with nitric acid, and do not give a red coloration with nitric acid; and (2) barbaloins, which yield aloetic acid (C7H2N3O5), chrysammic acid (C7H2N2O6), picric and oxalic acids with nitric acid, being reddened by the acid. This second group may be divided into a-barbaloins,

obtained from Barbados aloes, and reddened in the cold, and bbarbaloins, obtained from Socotrine and Zanzibar aloes, reddened by ordinary nitric acid only when warmed or by fuming acid in the cold. Nataloin forms bright yellow scales. Barbaloin forms yellow prismatic crystals.

Mechanism of activity

Aloe vera is a useful plant in alternative medicine and has a long history of use in traditional medicine for curing diseases due its ability to modulate various biological activities. Several active constituents have been identified in *Aloe vera*, and most of them have therapeutic implications for disease prevention and treatment through the modulation of various biological and genetic activities. The possible mechanisms of actions of *Aloe vera* are described as follows:

1. *Aloe vera* and its constituents such as aloe emodin (AE), aloin (barbaloin), anthracene, and emodin are relevant to cancer prevention owing to the activation and inactivation of molecular pathways associated with them.
2. *Aloe vera* also appears to function as an antioxidant through free radical-.and superoxide radical-scavenging activities and anti-inflammatory activities via inhibition of prostaglandin E2 production from arachidonic acid and also inhibition of various transcription factors and the activities of enzymes including lypoxygenase and cyclooxygenase.
3. *Aloe vera* shows antimicrobial activity by rupturing bacterial cell walls. Earlier studies have reported the anti-inflammatory and antibacterial properties of *Aloe vera* gel (Ndhlala *et al*. 2009, Athiban *et al*. 2012) [11 4].

Table 1: Biological activity of *Aloe vera* and Its phytoconstiuents

Biological activity	Finding	References
Antitumor activity	*Aloe vera* protected mice against DMBA/croton oil-induced skin papillomagenesis	Saini *et al*. 2010 [16]
Antiproliferative activity	Showed pronounced antiproliferative and cytotoxic effects	Niciforovic *et al*. 2007 [13]
Anticarcinogenetic activity	AE showed its anticarcinogenetic properties by inhibiting proliferation and inducing cell cycle arrest and apoptosis	Chen *et al.* 2004 [6]
Anticancer activity	Inhibition of casein kinase II activity, the release of apoptosis-inducing factor and cytochrome c, and the caspase-3 activation are involved in AE-mediated apoptosis	Lin and Uen 2010 [9]
Antimicrobial activity	The maximum of antibacterial activities were observed in acetone extracts rather than aqueous and ethanol extracts	Nejatzadeh-Barandozi 2013 [12]
Antioxidant activity	MEAG and AEAG showed the maximum DPPH free radical-.and superoxide radical-scavenging activities	Saritha *et al.* 2010 [17]
Anti-inflammatory activity	Inhibitory action on the arachidonic acid pathway via cyclooxygenase	Vázquez *et al.* 1996 [19]
Preventing glycoproteinmediated secondary diabetic complications	Oral administration of ethanolic extract of Aloe vera leaf gel extract for 21 days significantly restored the levels of hexose, hexosamine, and sialic acid to near-normalcy	Rajasekaran and Sathishsekar 2007 [15]
Hepatoprotective effect	*Aloe vera* significantly reduced the levels of AST, ALT, and ALP and restored the depleted liver thiol levels significantly	Nayak *et al.* 2011 [10]
Immunomodulatory effect	*Aloe vera* (400 mg/kg, orally) significantly enhanced the secondary humoral immune response	Halder *et al.* 2012
Antiulcer activity	Antiulcer effect of *Aloe vera* in indomethacin-induced peptic ulcer was observed. The mean ulcer index of the test (*A. vera*) group was 20±1.79.	Borra *et al.* 2011 [5]
Gastric ulcer-healing effect	*Aloe vera* treatment can reduce leukocyte adherence and tumor necrosis factor (TNF)-alpha level, elevate interleukin (IL)-10 levels, and promote gastric ulcer healing	Eamlamnam *et al.* 2006 [8]

Future prospects

- There is need to screening of medicinal plants with reference to the phytoconstituents on the basis of health concern research problem
- To explore indigenous Traditional knowledge through medicine plants needs government support and establishment of biotechnology industry for proper implementation of herbal medicine
- Need of establishment and implementation of policy frame work for the regulation and standardization of herbal medicines.

Conclusion

- The chance of mininmize development of drug resistance problem in comparison to chemical anthelmintics
- It is eco-friendly and promotes biodiversity.

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