



Review Article

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Aloe vera its medicinal uses: A review

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Abstract

Aloe Vera (AV) is the oldest medicinal plant ever known worldwide of its medicinal properties. Extracts of AV was proven to be skin healer helps to soothe skin injuries affected by any means due to its bactericidal properties relieve itching and skin swellings. It was also 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 AV to one's diet improves digestion, as a general health tonic. AV is a useful source of vitamins. AV Gel contains a large range of vitamins - even vitamin B₁₂, Vitamin A, contains B-Group vitamins, Vitamin C, Vitamin E and folic acid. AV Gel contains important ingredients including 19 of the 20 amino acids needed by the human body and seven of the eight essential ones that just cannot be made. AV has made its steps regarding diabetes also as a potential healer and also shown its Hepatoprotective activity proven by many researchers.

Key words: *Aloe Vera* (AV), Active ingredients of AV and their properties, Skin protection and hydration activity, Hepatoprotective activities, Anti diabetic activity, Neuroprotective activity.

INTRODUCTION

The AV plant has been known long back for its health, beauty, medicinal and skin care properties. The name AV derives from the Arabic word "Alloeh" meaning "shining bitter substance," while "vera" in Latin means "true." Greek scientists regarded AV as the universal panacea, Egyptians as "the plant of immortality."

Aloe Vera (AV) Scientific classification

Kingdom	Plantae
Clade	Angiosperms
Clade	Monocots
Order	Asparagales
Family	Xanthorrhoeaceae
Subfamily	Asphodeloideae
Genus	Aloe
Species	A. vera

Synonyms: *Aloe barbadensis* Mill, *Aloe barbadensis* var. *chinensis* Haw, *Aloe chinensis* (Haw.) Baker, *Aloe elongata* Murray, *Aloe flava* Pers, *Aloe indica* Royle, *Aloe lanzae* Tod., *Aloe maculata* Forssk. (illegitimate), *Aloe perfoliata* var. *vera* L., *Aloe rubescens* DC., *Aloe variegata* Forssk. (illegitimate), AV Mill. (illegitimate), AV var. *chinensis* (Haw.) A. Berger, AV var. *lanzae* Baker, AV var. *littoralis* J.Koenig ex Baker, *Aloe vulgaris* Lam.,

Vernacular names: Sanskrit-Kumari, Hindi-Giloya, English-Aloe, Kannada-Lolesara, Malayalam-Kattarvazha, Tamil-Soththu Kathalai.

AV has been used for medicinal purposes in several cultures for millennia: Greece, Egypt, India, Mexico, Japan, and China almost all countries [1]. The therapeutic claims made for AV range over a broad list of conditions, as do the Pharmacological activities associated with it. Most of these claims are based on historical use rather than hard evidence. Different parts of the plant used as

traditional medicine of diverse veterinary and human diseases [2]. The herb is used internally to combat most digestive problems, including constipation, poor appetite, colitis, irritable bowel syndrome as well as, asthma, diabetes, immune system enhancement, peptic ulcers [3]. Aloe is used externally for the treatment of skin irritation, burns, scalds, sunburn wounds, eczema, psoriasis, acne, dermatitis, ulcers, to stimulate cell regeneration. The plant is also used in the treatment of healing properties, effects on skin exposure to UV and gamma radiation, anti-inflammatory, antiviral and antitumor, moisturizing, anti-aging effect, antiseptic, enhance immune system, hypoglycaemic, cytotoxic, antiulcer and anti-diabetic effects, antibacterial effect, antioxidant, cardiovascular effect [4,5,6,7]. To this day the AV plant has been used for various purposes in dermatology.

Active ingredients of AV and their properties

AV contains 75 potentially active constituents: vitamins, enzymes, minerals, sugars, lignin, saponins, salicylic acids and amino acids [8,9]. In addition, AV contains products of the isoprenoid pathway, such as carotenoids, steroids, terpenes, and phytosterols. Samman, (1998) and some essential amino acids/nonessential amino acids and enzymes, such as bradykinase, carboxypeptidase, cyclooxygenase, and carboxypeptidase [10]. There are over 100 active biologic constituents found within aloe. The plant is a rich source of many natural health-promoting substances including:

Anthraquinones/anthrones : Aloe-emodin, aloetic-acid, anthranol, aloin A and B (or collectively known as barbaloin), isobarbaloin, emodin, ester of cinnamic acid.

Vitamins/Minerals: Vit C, A, E, B vitamins, B-carotene, Zinc, Calcium, Copper, Magnesium, Manganese, and Phosphorous.

Enzymes: At least five different enzymes have been identified and likely more are contained within.

Amino Acids: Twenty-two amino acids are found within aloe.

Plant sterols: 4 plant steroids (campesterol, cholesterol, β -sitosterol)

Polysaccharides: Including B1-3 and B1-4 Glucmannans known for their immune stimulating effects. Based on its constituent make up, aloe has a wide array of applications.

AV has been one of the most important plants used in folk medicine. Anthraquinone, anthracene, cinnamic acid and anthranilic acid are found in AV plants that are responsible for its activity. AV is used in variety of skin ailments such as mild cuts, insect stings, bruises, poison ivy and eczema. It has also antibacterial and antifungal properties, used as blood purifier, anti-inflammatory, diuretic, uterine tonic, spermatogenic, laxative, and purgative and fever reliever. The anti arthritis property of AV is due to the anthraquinone compound. AV stimulates the immune system and it is a powerful anti-inflammatory agent. Topical application of AV extract result in the reduction of inflammation and arthritis in adjuvant induced arthritis in one study rats [11, 12]. AV is incredible natural remedies that have internal and external applications. There are so many active components in this plant which improves human which was known to us before thousands of years. Some benefits of AV will be studied in this article. AV also is used as an adaptogen, in helping to fight against stress.

Skin protection and hydration activity

Natural components from plants can be used as dietary supplementation which improves skin protection due to it rich sources of antioxidants [13]. AV is effective in skin protection against UV radiation also. In one study regarding UV radiation protection, was studied in epidermal Langerhans cells where AV repaired the skin [14,15]. The photoprotective effect of AV juice was investigated on different types of hair, where its worked satisfactorily [16]. In another study, AV improved the skin integrity, decreased the appearance of fine wrinkling, and decreased erythema dry skin and dermatitis [17].

Hepatoprotective activities

Liver diseases are major health problem worldwide. Allopathic medicines such as paracetamol and ibuprofen belong to a class of drugs called nonsteroidal anti-inflammatory drugs (NSAIDs), which are used for the management of pain; fever and inflammation are among the major culprits in liver damage/cirrhosis. Alqasoumi (2008) has observed that Aqueous extract of this plant had recovered mice from CCl₄ hepatic damage by reversing the biochemical parameters and histopathological studies showed significant improvement [18, 19]. This plant has also been recognized for its antioxidative properties by protecting metabolizing enzymes of liver [20]. Mossa et al., (1987) have used AV as hepatic stimulant in liver enlargement [21].

Studies have demonstrated the hepato-protective activity of AV against carbon tetrachloride. The hepato-protective action was also attributed to preserving the metabolizing enzymes of the liver through an antioxidant activity [22]. Some of the signs of aging can also be prevented by the antioxidants present in this plant [23]. Antioxidants present in plants provide a platform to cure for many diseases. In one study of the AV leaf extract was tested on lindane (LD)-induced hepatotoxicity and genotoxicity where results all promising [24] by decreasing of GPT, GOT, GGT and increasing of ALP. Pre treatment with AV leaf extract at a concentration had significantly decreased, in another experiment with aqueous extract of AV AST, ALP, thiol levels were depleted showing improvement in paracetamol-induced hepatotoxicity [25].

Anti diabetic activity

Diabetic is becoming a great obstacle in humans worldwide now a day's some studies on U shape of AV showed glucose levels were some results and also there were some contrast some were unchanged [26,27]. In a study on streptozotocin-induced diabetic rats, oral administration of A. vera gel (alcohol insoluble residue extract) significantly reduced the fasting blood glucose, hepatic transaminases, plasma and tissue cholesterol, triglycerides, free fatty acids phospholipids in addition to it plasma insulin levels were significantly increased The decreased plasma levels of high density lipoprotein cholesterol and increased levels of low density lipoprotein cholesterol were restored to normal after treatment with gel extract [28]. From the findings of another study on streptozotocin-induced diabetic rats, it was suggested that the AV extract reduced blood glucose level is by enhancing glucose metabolism. It was further proposed that the glucose lowering effect could be explained by an antioxidant mechanism where oxidative damage taken place in brains of and reduced peroxidation levels in the kidneys of streptozotocin-induced diabetic rats [29]. So many studies proved AV anti-diabetic activity [28, 30, 31, 32].

The last two decades have seen varied reports providing evidence for the therapeutic property of AV to heal diabetes. Rajasekaran et al., (2006) and Kim et al., (2009) analysed the effect of AV against diabetes with the aid of in streptozotocin induced diabetic animal models and non-insulin dependent diabetes mellitus [28, 33]. Tanaka *et al.*, (2006) identified five phytosterols of AV which have the property to act against diabetes and reported its consequence on hyperglycemia and hyperlipidemia using animal studies [30]. Nomaguchi *et al.*, (2011) proved that the phytosterols act as ligands for peroxisome proliferator activated receptors and they showed that it has an enhanced expression of the target genes at the liver of the diet-induced obesity test mice [34].

Neuroprotective activity

It has been demonstrated that some phenolic antioxidants attenuate neuronal cell death induced by oxidative stress [35, 36]. In one of the study the AV extract was used as single oral 100–200 mg/kg/day of the leaf aqueous extract of Aloe were studied for their protective effects in gentamicin and Cisplatin-induced nephrotoxic where the results suggest were promising due to its inherent antioxidant and free-radical-scavenging principle(s) contained in the extract [37]. Parihar (1997) suggested that there might be promoted by phytochemicals present in plant extracts involved in increasing excitotoxic neuronal damage the antioxidative properties of plant extracts may play an important role in improving cognitive function against excitotoxicity [38]. Fruit fly is one of the models to study aging and age-related diseases [39]. Acetone extract of AV plays a major role in the inhibition of cell growth in several types of tumor cells, showing high specificity for neuroectodermal tumor cells Pecere, (2000). AV extract seems to immitate the longevity extension effects of resveratrol as well as morphine [41] through regeneration of nerve fibers, neuroprotection as indicated by increased locomotor activity, and upregulation of detoxifying enzymes.

CONCLUSION

In last decade, there is a renewed interest in the development of herbal drugs which has underlined understanding the mechanism of action rather than blind faith in people and stories, as in the past. Several approaches in exploiting the herbal wealth of the world in phytomedicine have explored many phytochemicals from variety of plants. Treatment based on synthetic/allopathic drugs is effective in the prevention and treatment of diseases, but such a type of treatment is expensive and also shows adverse effects. The implications of natural products in the prevention of diseases and treatment are in increasing evidence worldwide, especially in the developing countries, due to their affordability and fewer side effects. From the historical era it has been proved that AV is the powerful candidate as a potential pharmaceutical agent. Aloe gel has been very well known for its use in cosmetics as well as

in the other areas of medicine such as its property to heal cancer and treat AIDS. However, a few studies have confirmed the safe dose level and mechanism of action of AV in the prevention and treatment of diseases. There is a great opportunity for the cultivation of AV which shows highly economic importance but still there is lack of information about its cultivation and management.

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CONFLICT OF INTEREST

Declared None

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