

# Pharmacological importance of *Aloe vera*

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## Abstract

*Aloe vera* herb has been used for eras for its nutrition resourcefulness, medicinal and antiseptic properties. In current scenario, focus on plant research has increased globally and gathered research data revealed that *Aloe vera* possess considerable potential to be used as a medicinal plants because of its pharmacological and phytochemical properties.

**Keywords:** *Asphodelaceae*; Glucomannans; Anthraquinones; Polymannose; Alprogen; Salicylic Acid; Laxatives.

## Introduction

The term *Aloe vera* has its origin in Arabic and Latin language which means true shining bitter constituent [1]. It has been used for its medicinal benefits for ages in countries like China, Arabia, Egypt, India, South Africa, Greece, Japan, Madagascar, United States and Mexico [2]. In United States *Aloe vera* was consumed as a purgative but now it is used as an effective treatment for chronic dermatitis [3]. There are approximately 300 species of *Aloe* known all over the world including the most commonly used *Aloe vera*, *A. perryi*, *A. vulgaris*, *A. ferox*, *A. arborescens* [4,5]. The scientific name of *Aloe vera* is *Aloe barbadensis miller* of family *Asphodelaceae* [6]. It is a recurrent luscious xerophytes shrub which appears green in color [7]. *Aloe vera* shrub has fleshy wedge-shaped leaves with notched ends and bear yellow cylindrical fruits containing numerous seeds [8].

*Aloe vera* foliage is consisted of three coats:

- An innermost transparent gel that is made up of amino acids, glucomannans, water, sterols lipids and vitamins [9]
- An intermediate bitter yellowish sap called as which is composed of glycosides and anthraquinones [10]
- Outermost layer of rind which is composed of 15-20 cells responsible for the making amino acids and sugars [11]. Vascular bundle is localized in the interior of rind responsible for the translocation of water and minerals [12].

Active biological constituents of *Aloe vera* is given in Table 1

S.no	Biological active constituents	Properties
1	<b>Vitamins</b> (folic acid vitamin A, vitamin E, vitamin B12, vitamin C and choline)	Antioxidants deactivates free radicals and acts as healing gents [13]
2	<b>Minerals</b> (magnesium, sodium, selenium, chromium, zinc, manganese, potassium, calcium and copper)	Act as a cofactors for the activation of many enzymes [14]
3	<b>Enzymes</b> (bradykinase, alkaline phosphatase, aliase, cellulase, amylase, catalase, peroxidase, carboxypeptidase and lipase)	Reduce inflammation and breaks down fats /sugars [15]
4	<b>Carbohydrates</b> (glucose, tannic acid, glucomannans, fructose and poly mannose)	Provides energy, acts as healing gents and possess pharmacological properties [16]
5	<b>Glycoprotein</b> (alprogen and C-glycosyl chromone)	Anti-inflammatory and anti-allergic [17,18]
6	<b>Fatty acids</b> (lupeol, cholesterol, $\beta$ -sisosterol and campesterol)	Analgesic, anti-inflammatory and antiseptic properties [19]
7	<b>Proteins</b> (20 human amino acids, 7 essential amino acids salicylic acid, lignin and saponins)	Antibacterial, anti-inflammatory and antiseptic properties [20,21].
8	<b>Hormones</b> (Auxins and gibberellins)	Anti-inflammatory and wound healing [22,23].
9	<b>Anthraquinones</b> (12 anthraquinones, aloin and emodin)	Antivirals, analgesics, laxatives and antibacterial [24,25]

**Table 1:** *Aloe vera* biological active constituents with its related properties

*Aloe vera* has been used for curative reasons for ages to treat numerous acute and chronic illnesses given in Table 2.

S.no	Beneficial properties	Function
1	Anti-ulcer	Inhibits gastric acid secretion [26]
2	Anti-diabetic	Potentiates insulin action [27]
3	Antibacterial/Antifungal	Effective against <i>Candida glabrata</i> , <i>Neisseria gonorrhoeae</i> , <i>Candida tropicalis</i> , <i>Candida albicans</i> and <i>M. furfur</i> [28,29]
4	Anti-acne	Treatment of mild acne vulgaris [30]
5	Polycystic ovarian syndrome	Acts directly on enzyme 3 $\beta$ HSD and controls the flux toward estradiol formation [31]
6	Potent Nutraceutical	Increases body weight and act as bone marrow stimulant [32]
7	Moisturizer	Causes skin hydration [33]
8	Immunomodulatory	Stimulates stem cells proliferation in numerous immune-suppressed clinical conditions [34]
9	Wound healing	Promote epithelization and contraction of myo-fibroblasts for wound healing [35]

**Table 2:** Beneficial properties *Aloe vera*

## Processing of *Aloe vera*

*Aloe vera* is also consumed as a food source such as in the formulation of herbal health drinks, milk, ice-cream confectionery etc [36]. In addition its application in the pharmaceuticals for the manufacturing of current liniments, facial cleaners, gel preparations, lotions, creams, drugs and pills [37]. However, capable handling procedure needs to be established to preserve and retain almost all the bioactive constituents of *Aloe vera* [38]. The manufacturing route of *Aloe* related products involves crushing, and pressing of the *Aloe vera* leaf to extract its juice. The resultant extract is then incorporated with other agents to prepare the desired product [39]. It is crucial that freshly obtained *Aloe vera* leaves should directly go into fabrication or must be preserved at low temperature to avert loss of natural activity due to gel dilapidation [40].

## Conclusion

Thus *Aloe vera* herb and its related products possess antimicrobial, anti-inflammatory and anti-acne properties. Therefore it is being used for numerous pharmacological purposes.

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