

Pharmacological importance of *Aloe vera*

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Citation: Nida TK (2018) Pharmacological importance of *Aloe vera*. SAJ Biotechnol 5: 301

Article history: Received: 03 December 2018, Accepted: 27 December 2018, Published: 28 December 2018

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 | Vitamins (folic acid vitamin A, vitamin E, vitamin B12, vitamin C and choline) | Antioxidants deactivates free radicals and acts as healing gents [13] |
| 2 | Minerals (magnesium, sodium, selenium, chromium, zinc, manganese, potassium, calcium and copper) | Act as a cofactors for the activation of many enzymes [14] |
| 3 | Enzymes (bradykinase, alkaline phosphatase, aliase, cellulase, amylase, catalase, peroxidase, carboxypeptidase and lipase) | Reduce inflammation and breaks down fats /sugars [15] |
| 4 | Carbohydrates (glucose, tannic acid, glucomannans, fructose and poly mannose) | Provides energy, acts as healing gents and possess pharmacological properties [16] |
| 5 | Glycoprotein (alprogen and C-glycosyl chromone) | Anti-inflammatory and anti-allergic [17,18] |
| 6 | Fatty acids (lupeol ,cholesterol, β -sisosterol and campesterol) | Analgesic ,anti-inflammatory and antiseptic properties [19] |
| 7 | Proteins (20 human amino acids ,7 essential amino acids salicylic acid, lignin and saponins) | Antibacterial, anti-inflammatory and antiseptic properties [20,21]. |
| 8 | Hormones (Auxins and gibberellins) | Anti-inflammatory and wound healing [22,23]. |
| 9 | Anthraquinones (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 β 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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