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The portent plant with a purpose: *Aloe vera*

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Abstract
The stemless shrub perennial plant with thick and fleshy grey to green leaves containing variants phytochemicals of genus *Aloe*. The widely cultivated plant in all over the world having incredible properties in it also known by the name of "Medicinal Plant", "Miracle Plant". It is a source of two products gel and latex obtained from their fleshy leaves. It is regarded as one the most remarkable of 1.6 billion botanical plant species man to known. An updated overview has been done and still conducting on the *Aloe vera* species for determining and finding its more usage in various fields. Still now the scientists and researchers are doing work on the effective utilization of the *Aloe vera* species.

Keywords: Stemless, miracle plant, medicinal plant, phytochemicals

Introduction
Aloe vera now days is widely used in different aspects such as cosmetics, daily basis products etc. *Aloe vera* belongs to the genus *Aloe* [1]. It originates from the Arabian Peninsula but grows wild in tropical climates around the world and is cultivated for agricultural and medicinal uses. *Aloe vera* is used as a cooking oil and for the decorative purposes and grows indoors as potted plant. *Aloe vera* belongs to kingdom *Plantae* [2]. *Aloe vera* structurally is a stem less or very short-stemmed plant growing to 60-100 cm tall. The leaves of *Aloe vera* are thick and fleshy, color of the leaves vary from green to grey-green [3]. The margin of the leaf is serrated and has small white teeth. The flowers are produced in summers on a spike up to 90 cm each flower being pendulous, with a yellow tubular corolla 2-3 cm long. *Aloe vera* leaves also contains phytochemicals such as acetylated mannas, polymannans, anthraquinone, c-glycosides, anthrones and other anthraquinones such as emodin and various lectins. *Aloe vera* is also an ornamental plant and is popular with modern gardeners as a medicinal plant because of its interesting flowers form and succulence it is widely used for different purposes [4]. The property of succulence in *Aloe vera* enables it grow in places which has low rainfall thus making it useful for rockeries and other low water use gardens [5]. *Aloe vera* is intolerant to heavy snow and frost. It is resistance to many of insect pests however spider mites, mealy bugs, scale insects and aphid species can cause damage to the health of plant. When we grow *Aloe vera* in pots, we should provide well-drained sandy potting soil and bright sunny conditions for its proper growth [6]. When it does not get suitable environment, it is not effectively grown like it can burn under too much sun or it can shrivel when the pot does not drain water. For good drainage, good quality commercial propagation mixes or packaged "cacti and succulent mix" are available while rewatering the plant it should be allowed to dry completely. In winters *Aloe vera* may become dormant during which little moisture is required [7]. In areas that receive frost or snow the species is best kept indoors or in heated glass houses. The agricultural production of *Aloe vera* occurs in different parts of the world like Australia, Bangladesh, China, Mexico, India, Jamaica, Spain where it grows even well inland, Kenya, Tanzania and South Africa along with USA. According to research little scientific evidence of safety of *Aloe vera* extracts are there for either cosmetics or medicinal uses [8]. The medicine and cosmetics industries regularly make claims regarding the soothing, moisturizing and healing properties of *Aloe vera. Aloe vera* is used as an ingredient in beverages, yoghurts and desert but at high doses it could be severe when taken orally because of its toxic properties. *Aloin* is the compound found in the exudate of some of the Aloe species which is responsible for toxicity in *Aloe vera*. *Aloe vera* has toxicity with side effects that occur at some level of dose when ingested or applied topically [9]. Toxicity level of *Aloe vera* can be reduced by removing the *Aloin* by various processing's. *Aloin* present in *Aloe vera* in excess amounts may induce side effects. *Aloe vera* juice are also available in the market for the health of the digestive system but there is no scientific evidence to support this. *Aloe vera* is considered as traditional medicine for treatment of skin [10].

Aloe vera is used for the skin as a moisturizer and anti-imitant to reduce chafing of the nose. Cosmetic companies also use *Aloe vera* and these companies add sap or other derivatives to their products such as moisturizers, soaps, makeup, sunscreen, incense, shaving cream or shampoo.

Table 1: The Ranking and scientific and common name

Rank	Scientific Name and Common Name
Kingdom	Plantae
Subkingdom	Tracheobionta
Superdivision	Spermatophyta
Division	Magnoliophyta
Class	Liliopsida
Sub Class	Liliidae
Order	Liliales
Family	Aloaceae
Genus	Aloe L
Species	*Aloe* Barbadenis Mill, or *Aloe vera* (L.) Burm.F.

Composition of *Aloe vera*

Aloe vera leaf has 240 nutritional and medicinal ingredients including vitamins, enzymes, minerals, sugar, sterols, lignin, saponins, salicylic acid amino acid etc. No other naturally occurring products have so many ingredients that are beneficial to health. [11]

Amino Acids

Aloe vera contains 19 out of 20 known amino acids that are necessary for any organism. The human body has the capability to produce only 12 amino acids and cannot produce the remaining 8 amino acids as they are consumed from food. These 8 amino acids that are consumed from food are called Essential amino acids.

***Aloe vera* contains 7 out of 8 essential amino acids and they are**

- Isoleucine
- Lysine
- Leucine
- Methionine
- Threonine
- Phenylalanine
- Valin

***Aloe vera* also contains 12 non-essential amino acids**

- Arginine
- Cysteine
- Glumatic acid
- Alanine
- Asparagine
- Histidine
- Glycine

Hormones

Aloe vera has two hormones.

- Auxin
- Gibberellin

Auxin and Gibberellin are helpful in healing wounds and it prevents inflammation and infection. Gibberellin acts as a growth hormone that regenerates cells and stimulate their growth [12].

Lignin

Lignin are plant fibers which give strength to plant and are used to connect and support. *Aloe vera* contains lignin that penetrates deep into the skin and introduces other medicinal ingredients of *Aloe vera* into our skin.

Anthraquinone

Aloe vera contains 12 anthraquinones.

- Antracin
- Aloe Emodin
- Aloetic Acid
- Aloin
- Antranol
- Chrysophanic Acid
- Barbaloin
- Emodin
- Ethereal Oil
- Isobarbaloin
- Resistannol
- Cinnamonic Acid Ester

Enzymes

***Aloe vera* contains different enzymes.**

- Alkaline Phosphatase
- Amylase
- Aliiase
- Cellulase
- Catalase
- Carboxypeptidase

Vitamins

Our body uses vitamins for various metabolic processes. They are essential for the normal functioning of cells, tissues and organs. We get vitamins from food (vitamin k and biotin are formed in the intestines). *Aloe vera* contains the following vitamins [13].

- Vitamin a (Beta-carotene)
- Vitamin b1 (Thiamine)
- Vitamin b2 (Riboflavin)
- Vitamin b3 (Niacin)
- Vitamin b5
- Vitamin b6
- Vitamin b12
- Vitamin c
- Vitamin e
- Kolin
- Folate

Vitamins A, C and E have anti-oxidant properties and neutralize free radicals. Group B vitamins and choline are responsible for the metabolism. Vitamin B12 is responsible for the formation of RBC while folic acid is necessary for proper cell development.

Minerals

Minerals are inorganic substances which constitute 4-5% of the human body. Minerals are necessary for preserving the delicate balance of cellular ionic liquids, building bone tissue and blood cells, the electrochemical activity of nerve cells and the regulation of muscle tone. Minerals are found in *Aloe vera* such as-

- Calcium
- Iron
- Copper
- Chrome
- Manganese
- Magnesium
- Sodium
- Zinc
- Potassium
- Phosphorous

Saponins
Saponins found in *Aloe vera*, have a cleansing and antiseptic effect. They have anti-microbial properties and protect against bacteria, viruses and fungi [14].

Sterols
Aloe vera contains four plant sterols

- Lupeol
- Sitosterol
- Cholestrol
- Campesterol

Sterols have anti-inflammatory properties. Lupeol also has antiseptic and analgesic.

Salicylic Acid
Aloe vera contains salicylic acid-natural painkiller which also has anti-inflammatory and anti-bacterial properties. Aspirin is nothing other than salicylic acid in chemical form. *Aloe vera* has the effect of aspirin but operates in a gentle manner and has no adverse effect on health.

Sugars
Aloe vera contains two monosaccharide, glucose and fructose which have anti-inflammatory effects. [15]

Table 2: Composition of *Aloe vera* gel [16].

Mono and Polysaccharides (50-60% Of Solids)					
Polyhexanoses	**Hexans**	**Xylose**	**Arabinose**	**Galactose**	**Glucose**
Amino Acids (ppm)					
Lysine:5-6		Histidine:2.8-3.3		Arginine: 4.5-5.5	
Threonine:5-6		Aspartic acid:13-15		Serine:6-7	
Glutamic acid:13.5-15.5		Proline:8-9		Analine:1-1.3	
Glycine:7-8		Valine:6.5-7		Methionine:1.5-2	
Isoleucine:3.5-4		Leucine:8.5-9		Tyrosine:2.8-3.3	
Phenylalanine:4.3-4.7					
Vitamins (mg per 100 ml)					
B-1:6-7		B-2:6-7		C:47-67	
Niacinamide:30-37		B-6:3-3.7		Choline:9.5-11.2	
Enzymes (per 100 ml)					
Amylase:1100-1600 units				Lipase:600-800 units	
Protein: 0.11/100gr					
Fat: 0.09g/100gr					
Ash: 0.25%					
Calories: 3.3/100gr					
Crude fibre: 0.10%					

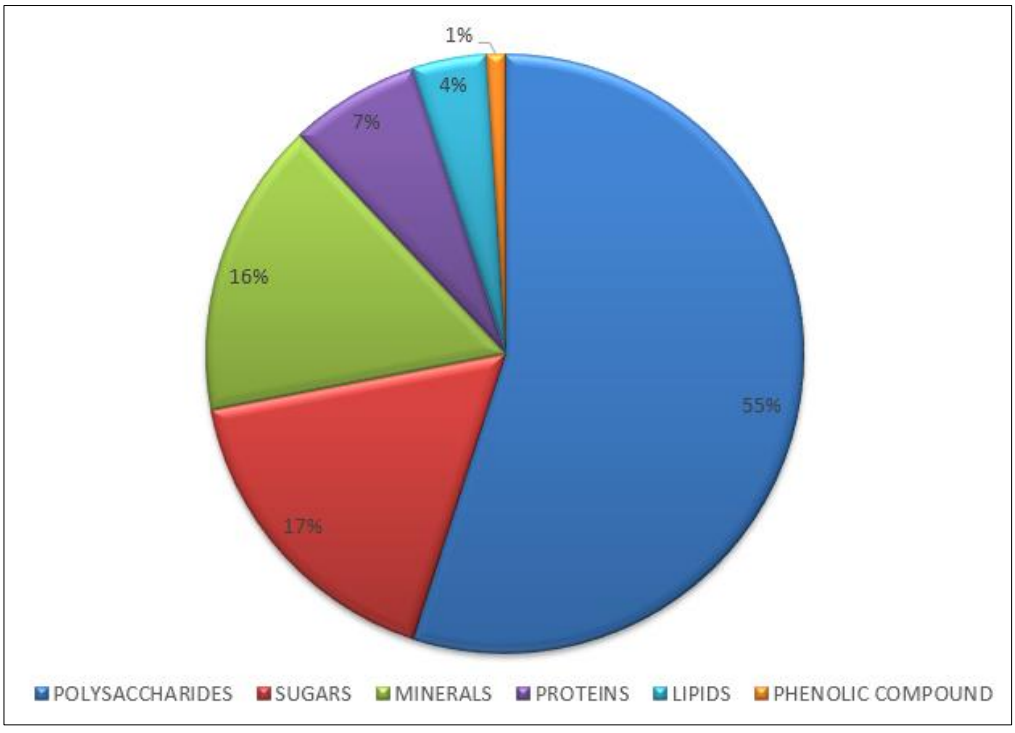

Fig1: Chemical composition of *Aloe vera* on dry matter basis [17].

Application of Aloe vera

Aloe vera is applied to a variety of products in the form of *Aloe vera* juice, concentrate and powder. Some of its applications in pharmaceuticals, foods and cosmetics are discussed in the following sections [18-23].

Pharmaceutical applications

Investigations have led to an increased importance of *Aloe vera* due to its dependable medicinal properties, and it has been used in the preparation of pharmaceutical products including ointments, tablets and capsules (Eshun and He, 2004; He *et al*. 2005). Various components present in *Aloe vera* have been found effective against many diseases.

Wound healing

Wound healing is the restoration of integrity of injured tissues. Amino acids that are essential in wound healing process are present in *Aloe vera* (Robbers *et al*. 1996). It also contains many inorganic electrolytes like iron, potassium, magnesium, chromium, copper, sodium, calcium and zinc which are vital part of wound healing process. It stimulates the body to produce antibodies and starts wound healing by releasing growth factors (Bozzi *et al*. 2007). Many studies have shown fast healing of wounds with *Aloe vera* treatment (Tarameshloo *et al*. 2012). *Aloe vera* prevents scar formation during skin injury by stimulating the cell production and promoting their generation process at the deepest layers of the skin (Eshun and He, 2004).

Anti-ulcer effect

Aloe vera gel has the potential to prevent and cure gastric ulcers through a number of mechanisms including anti-inflammatory properties, healing effects, mucus stimulation and regulation of gastric secretions (Suvitayavat *et al*. 2004). Mansour *et al*. (2014) have reported that Aloe and myrrh-based gels were found effective in decreasing ulcer size, erythema and exudation. At concentrations of about 80%, *Aloe vera* can be successfully used for treatment of skin ulcers including mouth ulcers, cold sores and leg ulcers (Sims and Zimmermann, 1971).

Anticancer activity

Glycoproteins and polysaccharides present in *Aloe vera* make it a potent chemo-preventive agent that is useful against various types of cancers (Reynolds and Dweck, 1999). These agents stimulate the immune system to fight against cancer (Steenkamp and Stewart, 2007). Barbaloin, Aloe-emodin and Aloesin extracted from *Aloe vera* have shown cytotoxicity against acute myeloid leukemia (AML) and acute lymphocytes leukemia (ALL) cancerous cells. Administration of these active compounds have been reported to significantly extend the life span of tumor transplanted animals (El-Shemy *et al*. 2010).

Antioxidant effect

A number of antioxidants such as α-tocopherol, carotenoids, ascorbic acid, flavonoids, tannins vitamin C and E are present in *Aloe vera* (Aburjai and Natsheh, 2003; Eshun and He, 2004; Radha and Laxmi Priya, 2015). Antioxidant potential of the extracts of *Aloe vera* (leaf and flower) have been reported by Lopez *et al*. (2013). *Aloe vera* has a dose dependent antioxidant effect, which is helpful in treatment of various diseases (Hamman, 2008). Investigations of the antioxidant potential of a polysaccharide isolated from *Aloe vera* gel showed that it had a protective effect against dihydrochloride induced oxidative stress and cell death in kidney epithelial cells (Kang *et al*. 2014).

Antihyperlipidemic activity

Aloe vera gel is claimed to have antihyperlipidemic activity. When administered to patients not responding to dietary interventions, it effectively reduced the blood cholesterol level (15.4%), triglycerides (25.2%) and LDL cholesterol (18.9%) (Mulay, 2014). An investigation reported by Kumar *et al*. (2013) also showed that *Aloe vera* gel in combination with probiotic lactobacillus rhamnosus can improve the lipid profiles in hypercholesteremic rats together with enhanced cholesterol production and absorption resulting in reduced risk of cardiovascular diseases.

Teeth and gum protection

Aloe vera is widely used in the field of dentistry to treat a Variety of dental complications, such as to relieve pain and accelerate healing after periodontal flap surgery (Eshun and He, 2004). Gum diseases like gingivitis and periodontitis are treated by using *Aloe vera* to reduce bleeding, control inflammation and stop the swelling of the gums (Sujatha *et al*. 2014).

Genital herpes

Genital herpes (caused by Herpes Simplex Virus) is one of the most common sexually transmitted diseases. Treatment of this disease involves medication for faster healing of sores and lesions so that outbreaks can be reduced or prevented. *Aloe vera* extract (0.5%) in the form of a hydrophilic cream has shown effectively to treat genital herpes in men (Syed *et al*. 2009) through a more rapid healing process

Asthma

Storage of *Aloe vera* extract in the dark for a period of 3-10days produces some active compounds (proteinoids) in the glycoprotein and polysaccharide fractions. These active compounds have shown effectiveness against chronic bronchial asthmatics. However, the activity against asthma becomes ineffective if the patient has been previously administered with steroid drugs (Capasso *et al*. 1998; Shida *et al*. 1985).

Food applications

The demand for functional foods with prolonged shelf life and without chemical preservatives has increased around the world. Recently, processing of *Aloe vera* gel has converted to a big industry owing to its applications in the food industry (Hiatal, 2005). *Aloe vera* incorporation is made as a dietary supplement and functional ingredient in many food products including beverages, yoghurt, milk, ice creams, confectionary etc. (Kapoor *et al*. 2009; Ramachandra and Rao, 2008).

Functional and nutraceutical foods

Ional foods started in 1970s in Europe and United States (Park and Jo, 2006). Currently, its applications have been extended to the development of a variety of functional and nutraceutical foods. Mannose polymers with some sugars including glucose and emanon are present in Aloe gel. These together with glycoproteins, enzymes, amino acids and vitamins contribute to the functionality of foods without affecting their quality and acceptability (Rodŕiguez *et al*. 2010). Pushkala and Srividya (2011) formulated functional dahi (a fermented South Asian dairy product) by replacing skim milk with *Aloe vera* gel. It not only added to its nutritional and therapeutic

potency, but the quality parameters of dahi (whey syneresis, water holding capacity, total yield, whiteness index and viscosity) were also improved. *Aloe vera* gel enriched beverages (sweetened *Aloe vera* juice, ready-to-serve juices and squashes) have also been reported which are claimed to have potential to maintain good health (Sharma *et al*. 2015). Other health foods developed from *Aloe vera* include ice-cream (Manoharan and Ramasamy, 2013), lassi (a traditional fermented dairy beverage of South Asia) (Hussain *et al*., 2014), mango nectar (Elbandy *et al*. 2014) and carbonated beverages (Moore and McAnalley, 1995). The foods described above are claimed to be both functional and nutraceutical based on their in vitro analysis which confirms the presence of bioactive compounds (e.g. flavonoids). However, their bio functionality can be influenced by their interactions with food components. Biological studies are therefore recommended to confirm the nutraceutical potential Of such products.

Antimicrobial agent

An antimicrobial agent is a substance having the ability to inhibit or delay the growth of microorganisms including bacteria, fungi, and viruses. *Aloe vera* gel can effectively inhibit the growth of food borne spoilage and pathogenic microorganisms including Staphylococcus aureus, Salmonella, Streptococcus, Escherichia coli, Aspergillus Niger, Candida etc. (Kedarnath *et al*., 2013; Lone *et al*. 2009; Nidiry *et al*. 2011; Shelton, 1991). Thus, incorporation of *Aloe vera* gel not only contributes towards safety of foods but also prevents them from microbial spoilage. A variety of antimicrobial compounds are present in *Aloe vera* gel and antimicrobial activity is exhibited due to their synergistic effect (Lawrence *et al*. 2009). Valverde *et al*. (2005) have reported the improved safety of table grapes treated with *Aloe vera* gel. The microbial load of mesophilic aerobic bacteria, yeasts and molds was effectively reduced during storage. Similar antimicrobial effects have also been reported for other foods like mango, green grape berries and sweet cherries (Castillo *et al*. 2010; Chauhan *et al*. 2014; Martínez-Romero *et al*. 2006; Sophia *et al*. 2014).

Cosmetic applications

Aloe vera gel is extensively used in the cosmetic industry, where it has become an important selling ingredient. It is used as a base material for various formulations including moisturizers and suntan lotions which are used as humectant in skin preparations (Iwu, 2014). *Aloe vera* gel and powder have many other applications in the cosmetic industry due to their valuable moisturizing and soothing effects in products like shampoos, soaps, cleansers and moisturizing creams. Soaps prepared with *Aloe vera* have the advantage that they do not cause irritation and do not leave the skin dry. Aloe extracts are also added into some having creams and lotions in the USA and Asia to enhance the healing of shaving wounds. The mucilaginous nature of *Aloe vera* gel also helps it to serve as a protective barrier between skin and beard in shaving creams (Eshun and He, 2004; Lad and Murthy, 2013). Many skin problems such as sunburns, flaky or dry skin, hair and scalp problems, psoriasis, stretch marks, and dandruff are being treated by lotions and sun-blocks. *Aloe vera* is famous for its powerful healing activity even at the epithelial level of the skin and thus provides a protective layer on the skin which allows the skin to heal at a faster rate due to its nutritional contents and antioxidant properties (Bouchey and Gjerstad, 1969; Meadows, 1980). The skin drying is prevented by the application of *Aloe vera* before the use of mineral-based make-up. Its moisturizing effect (without giving a greasy feel) makes it perfect for oily skin. Gibberellin (present in *Aloe vera*) is a growth hormone which stimulates the growth of new cells and heals the skin with minimal scarring. *Aloe vera* is used in Ayurvedic medicines to heal chronic skin problems such as psoriasis, acne and eczema (Arunkumar and Muthuselvam, 2009). Antioxidants including β-carotene, vitamin C and E present in *Aloe vera* leaves improve the natural firmness of the skin and keep the skin hydrated (Aburjai and Natsheh, 2003; Eshun and He, 2004). *Aloe vera* gel can be added to any product where moisturization or mildness is required. However, successful development of such products depends upon the compatibility of the gel with the product system. Generally, *Aloe vera* gel is compatible with cationic, anionic and non-ionic systems. However, with anionic systems only a limited amount of gel can be incorporated where quinones can react with the base to cause product discoloration. In addition, the natural pH of the gel (if added in conc. > 30%) can cause the neutralization of the product system (Meadows, 1980).

Complications and precautions

Aloe vera is generally considered as safe; however, a few side effects and complications have been reported. When used for the treatment of constipation, some side effects including abdominal cramps, flatulence and griping may occur (Mulay, 2014). Use of *Aloe vera* can promote bleeding during surgical procedures; therefore, its use should be discontinued at least two weeks before any surgery. The oral use of *Aloe vera* with furosemide or digoxin treatment for irregular heart rhythms and congestive heart failure can lower the level of potassium in the body; therefore, it should not be consumed with these drugs. Use of Aloe juice or Aloe latex for longer times or in high doses can cause an imbalance of electrolytes-loss of sodium can result in secondary hyperaldosteronism, and loss of potassium can result in hypokalemia leading to fatigue, muscular weakness, weight loss, mental problems and disfunctioning of kidneys (Mulay, 2014). Skin applications of *Aloe vera* along with steroid creams (such as hydrocortisone containing creams) can increase the absorption. Allergic reactions such as skin rashes may occur if *Aloe vera* gel is applied on open or deep wounds, but it can be used on the skin surface safely if there is no injury (Surjushe *et al*. 2008). Recently, anthraquinone and aloin present in *Aloe vera* gel have been related to the risk of tumors and colon cancer (Aldhous, 2011; Mulay, 2014). It is also recommended that in cosmetic products containing *Aloe vera*, anthraquinone content (especially Aloe emodin) should not exceed 50ppm to avoid phototoxicity caused by photooxidative damage to both RNA and DNA (Boudreau and Beland, 2006a, b; Christaki and Florou-Paneri, 2010)

Processing Parameters of *Aloe Vera*

Time, temperature and sanitation (TTS) unit of measurement necessary to preserve these biological activities. The TTS succulent methodology not alone preserves the natural biological activities of Aloe but put together enhances the physical stability of the finished merchandise [24].

Timing of methodology

Leaves show losses of biological activity beginning at six Hours following harvest once the leaves unit of measurement hold on at shut temperature. Most biological activities unit of measurement totally lost once twenty-four hours at shut

temperatures. The losses of activity appear to be the results of accelerator activity once the leaf is removed from the plant. In fact, it has been shown that the gel, once extracted from the leaf, has larger stability than gel, that's left inside the leaf. This means that shipping of leaves, even at cold temperatures, will cause loss of biological 494 Int. J Med. Arom. Plants succulentvera: A review Chandegara and Varshney http://www.openaccessscience.com ijmap@openaccessscience.com activity. The temporal arrangement of TTS production phases is awfully important. The method ought to be completed among thirty-six hours of gathering the leaves (http: //www. Aloecorp.com)

Process temperature

The succulent gel method temperature plays important role for gel quality for cosmetic and medicinal use [25].

Flash cooling

As an important step to preserve biological activity, the gel is cooled to below 5 0C in ten to fifteen seconds following the gel extraction. Quick cooling not alone slows accelerator and microbial deterioration of the gel, but put together aids in reducing the microbial counts inside the merchandise.

Sterilisation

Biological activity remains primarily intact once the gel is heated at sixty 5 0C for periods of however fifteen minutes. Extended periods or higher temperatures will cause greatly reduced activity levels. The only technique of sterilisation is HTST (high temperature short time), that exposes the gel to elevated temperatures for periods of one to three minutes. Once heated, the gel is flashing cooled to 5 0C or below [26].

Concentration

The gels obtained pattern the sterilisation and flash-cooling ways in which could also be targeted below vacuum whereas not the loss of biological activity. The concentration operation ought to be conducted below 100 twenty 5 mm mercury vacuum at temperatures below fifty 0C and will not exceed two minutes. Higher vacuums and temperatures will cause activity loss as will extend concentration times.

Drying

The targeted product can then be freeze dried at temperatures between-45 0C and thirty 0C or could also be spray dried with product temperatures below sixty 0C whereas not losses in biological activity. For export functions (especially for cosmetic industry), dried succulent gel is favored. Gel fillets could also be directly dried by dehydration below a low heat. However, gel liquid is mostly dried either by spray drying or freeze drying (Waller *et al*. 2004). Desiccation involves swing frozen gel below a high vacuum. Water sublimes from the frozen gel as a result of it bit by bit heats. Spray drying may well be a two-step methodology. The tactic begins with matrix development. The matrix is tense through a twig appliance chamber. Fluid is sprayed as a fine mist out a series of nozzles through this chamber. The chamber is heated between fifty to ninety 0C inflicting water to evaporate and additionally the succulent matrix to dry. With temperature participating during Aimportant role in maintaining natural plant merchandise, desiccation is favored. Heat is not added thus chemical transformations unit of measurement reduced and additionally the biological activity of the gel is not altered as is additionally the case with spray drying. Freeze drying of the Aloe fillets were at coldness below vacuum found the utmost value of rehydration relation and water holding capability (Andani, 2010). Osmotic drying of Aloe (Aloe barbadensis Miller) cubes were osmosed for four h in sweetening|syrup|sirup} of varied concentration and temperatures at constant syrup to fruit relation of 5:1. Drying of Osmosed and unosmosed Aloe samples at fully completely Different temperature with constant air rate, discovered water loss and solid gain throughout osmo-drying. (Simal *et al*. 2000, Yangtze Kiang *et al*. 2006, Vega *et al*. 2007, composer *et al*. 2009 and Pisalkar *et al*. 2011).

Chemical Properties

Aloe barbadensis-miller is called member of lilaceafamily or asphodelaceae. It creates nutritious 'super food' such as onion, garlic, Asparagus. It is dry climates grown in semi-arid for the plant reaches maturity after four years. And is perennial, which means that it lasts for several seasons.

It maintains a large amount of water. *Aloe vera* plant is made of water, with remaining 1% solid material filled with over 75 active vitamins and minerals.

Inner leaf pulp known as the gel. Outer leaf pulp a thin mucilage layer between rind and gel. In consists of vascular bundles. Thick Outer peel looks like a cactus with its barbed meat. In these 18 layers of cells that are filled healthful nutrients or phytochemicals, that synthesize the fats and carbohydrates and proteins. Vascular bundles transporting systems for the plant. They contain xylem, while move water and minerals from roots into leaves and phloem. Which take synthesized minerals to the cell's responsive fat store the *Aloe vera* juice or latex. *Aloe vera* leaves pulp contains highly maternity of polysaccharides. *Aloe vera* gel decreases cholesterol and triglyceride levels. It makes a natural remedy of coronary heart disease and diabetes [27-29].

Process flow diagram for whole leaf *Aloe vera* processing [30].

Cleaning (high pressure sprayers and scrub brushes)
↓
The base and tip are removed
↓
Leaf is cut into sections
↓
Ground into slurry
↓
Chemical treatment
↓
Juice press (rind particles are removed)
↓
Press filter (5 micron filter paper)
↓
(Carbon coated plates absorb the action and alic emodin)
↓
Series of filter
↓
(Remove the aloin and Aloe emodin, sand and other partcles)
↓
Final purification
↓
Aloe vera juice
↓
Pasteurization
↓
Flassh cooling
↓
Adding flavours and sugars
↓
Preservatives
↓
Packing

Conclusion

Aloe vera, owing to its beneficial medicinal effects has found applications in a variety of products including pharmaceuticals, foods and cosmetics. The consumption of *Aloe vera* can be increased by developing appropriate processing techniques. Establishment of standards for its incorporation in various science council as well as in countries including European union, China and Korea. The application of *Aloe vera* in fields like functional foods and cosmetics will increase with time. Precautions need to be considered while using *Aloe vera* in some specific conditions and with some specific compounds. It is recommended that its continuous use for extended period of time should be avoided in order to avoid any possible complications.

References

1. Darokar MP, Rai R, Gupta AK, Shasany AK, Rajkumar S, Sunderasan V, *et al*. Molecular assessment of germplasm diversity in *Aloe* spp. using RAPD and AFLP analysis. J Med Arom Plant Sci. 2003; 25(2):354-361.
2. Treutlein J, Smith GF, van Wyk BE, Wink W Phylogenetic relationships in Asphodelaceae (Alooideae) inferred from chloroplast DNA sequences (Rbcl, matK) and from genomic finger-printing (ISSR). Taxon. 2003; 52(2):93-207.
3. Deng S, May BH, Zhang AL, Lu C, Xue CC, Plant extracts for the topical management of psoriasis: a systematic review and meta-analysis. Br J Dermatol. 2013; 169(4):769-82.
4. Gao W, Xiao. [Peroxidase and soluble protein in the leaves of *Aloe vera* L var, chinensis (Haw) Berger]. Zhongguo Zhong Yao Za Zhi (in Chinese). 1997; 22(11): 653-4.
5. Bottenberg MM, Wall GC, Harvey RL, Habib S. Oral *Aloe vera*-induced hepatitis. Ann Pharmacother. 2007; 41(10):1740-3
6. Habeeb F, Shakir E, Bradbury F, Cameron P, Taravati MR, Drummond AJ, et al. screening methods used to determine the anti-microbial properties of *Aloe vera* inner gel. Methods. 2007; 42:315-320.
7. Ni Y, Tizard IR. Analytical methodology: the gel-analysis of Aloe pulp and its derivatives. In: Reynolds T, editor. Aloes the Genus Aloe. CRC Press; Boca Raton, 2004, 111-126
8. Dagne E, Bisrat D, Viljoen A, Van Wyk BE. Chemistry of Aloe species. Curr. Org. Chem. 2000; 4:1055-1078.
9. Eshun K, He Q. *Aloe Vera* A valuable ingredient for the food, pharmaceutical and cosmetic industries-A review. Crit. Rev. Food Sci. Nutr. 2004; 44:91-96.
10. Lyons G. The Definitive *Aloe vera*, Vera? Huntington Botanic Gardens. Archived from the original on 25 July. Retrieved. 2008.
11. Atherton P. *Aloe Vera* revisited. Br J Phytother. 1998; 4:76-83.
12. Shelton M. *Aloe Vera*, its chemical and therapeutic properties. Int. J Dermatol. 1991; 30:679-83.
13. Atherton P. The essential *Aloe vera:* The actions and the evidence, 1997.
14. Ro JY, Lee B, Kim JY, Chung Y, Chung MH, Lee SK, *et al*. Inhibitory mechanism of Aloe single component (Alprogen) on mediator release in guinea pig lung mast cells activated with specific antigen-antibody reactions. J Pharmacol Exp Ther. 2000; 292:114-21.
15. Hutter JA, Salmon M, Stavinoha WB, Satsangi N, Williams RF, Streeper RT, *et al*. Anti-inflammatory C-glucosyl chromone from Aloe barbadensis J Nat Prod. 1996; 59:541-3.
16. Chandegarai VK, Varshney AK, *Aloe Vera* L. processing and products: A reviews Table 5: Aloe gel composition, 2013.
17. Chemical composition of *Aloe vera* gel on dry matter basis. Abid Aslam Maana, B Akmal Nazir, Be Muhammad Kashif Iqbal Khana. B Tahir Ahmadb, Rabia Ziac, Misbah Muridb, Muhammad Abrard, The therapeutic properties and applications of *Aloe vera*: A review, 2018.
18. David U. *Aloe Vera*-Nature's Gift. Blackdown Publications, Bristol, England. Devaraj, S, Jialal, R, Jialal, I, Rockwood, R, 2008. A pilot randomized placebo-controlled trial of 2 *Aloe vera* supplements in patients with pre-diabetes/metabolic syndrome. Planta Med. 1999; 74:77
19. Hamman, J, Composition and applications of *Aloe vera* leaf gel. Molecules, 2008; 13(8):1599-1616.
20. Lone, MA, Malviya, D, Mishra, P, Dubey, A, Saxena, RC, Anti-inflammatory and antimicrobial activity of anthraquinone isolated from *Aloe vera* (Liliaceae). Asian J Chem. 2009; 21(3):1807
21. Eshun, K, He, Q, *Aloe vera*: a valuable ingredient for the food, pharmaceutical and cosmetic industries: a review. Crit. Rev. Food Sci. Nutr. 2004; 44(2):91-96.
22. Chauhan, S, Gupta, KC, Agrawal, M Application of Biodegradable *Aloe vera* gel to control post-harvest decay and longer the shelf life of Grapes. Int. J Curr. Microbiol. Appl. Sci. 2014; 3(3):632-642
23. Abid Aslam, Maana B, Akmal Nazir BE, Muhammad Kashif Iqbal, Khana B, Tahir Ahmadb, *et al.* The therapeutic properties and applications of *Aloe vera*: A review, Pharmaceutical applications, 2018, 4
24. Chandegarai VK, Varshney AK, *Aloe vera* L processing and products: A review, processing parameters of *Aloe vera*, 2013, 493.
25. Vega, A, Uribe, E, Lemus, R, Miranda, M Hot air-drying characteristics of *Aloe vera* (Aloe barbadensis Miller) and influence of temperature on kinetic parameters. Food Science and Technology. 2007; 40(10):1698-1707.
26. Waller TA, Pelley RP, Strickland FM. Industrial processing and quality control of Aloe barbadensis (*Aloe vera*) gel. In: Reynolds (ed.) Aloes: The genus Aloe. CRC Press, London, 2004, 139-205.
27. Wang, YT, Strong KJ. Monitoring physical and chemical properties of freshly harvested field-grown *Aloe vera* leaves. A preliminary report. Phytotherapy Research, 1993, 7.
28. Internal Uses of *Aloe vera*, Ivan E Danhof, North Medical Associates An Evaluation of the Biological and Toxicological Properties of Aloe Barbadensis (Miller), *Aloe vera*, Mary D Boudreau and Frederick A Beland, National Center for Toxicological Research, Journal of Environmental Science and Health.
29. Yaron A, Cohen E, Arad (Malis), S Stabilization of *Aloe Vera* gel by interaction with sulfated polysaccharides from red microalgae with xanthan gum. J Agrc Food Chem. 1992; 40:1316-1320.
30. Ramachandra CT, Rao PS. Processing of *Aloe vera* leaf gel: a focus on the present and innovative process technologies. In: Proc Int Conf Innovations in food and bioprocess technologies, AIT Pathumthami, Thailand. 2006-2009; 12(14):358-377.