World Journal of Nutrition and Health, 2015, Vol. 3, No. 1, 1-7
Available online at http://pubs.sciepub.com/jnh/3/1/1

DOI:10.12691/jnh-3-1-1

Medicated Evaluation of Aloe Vera: Overview on Characteristics and Application

Tewolde Mulu[1], Firomsa Teshale[2], Samuel Gemeda[2], Omprakash Sahu[2,*]

[1]Department of Textile Engineering, KIOT Wollo University, Kombolcha (SW), Ethiopia
[2]Department of Chemical Engineering, KIOT Wollo University, Kombolcha (SW), Ethiopia
*Corresponding author: ops0121@gmail.com

Received December 30, 2014; Revised January 02, 2015; Accepted February 03, 2015

Abstract Medicated plants have major impact on the day-today life. These types of plant are effectively and economically, which are adopted in different field of science and technology. The aim of review is to study the back ground, characterstic and application of Aloe Vera plant. The discussion shows that it's physically, biologically and chemically suitable in many applications.

Keywords: *anciently, biologically, chemically, physically, traditionally*

Cite This Article: Tewolde Mulu, Firomsa Teshale, Samuel Gemeda, and Omprakash Sahu, "Medicated Evaluation of Aloe Vera: Overview on Characteristics and Application." *World Journal of Nutrition and Health*, vol. 3, no. 1 (2015): 1-7. doi: 10.12691/jnh-3-1-1.

1. Introduction

Aloe Vera has been used for over five thousand years. Throughout history, it has been considered a magical plant, almost a panacea, capable of remedying many of mankind's ailments. Behind Aloes humble and discreet appearance lies hidden what has been defined as a prodigy of nature because of its therapeutic values [1]. It is only in the last 20 years, after a series of proven research that can highlight the characteristics of this plant whose secrets have been hidden behind a blanket of botanical and pharmacological puzzles that only today begin to yield some answers.

The first group of components includes the complex sugars, called mucopolysaccharides. These carbohydrates have a filamentous consistency similar to the elice secreted by snails. The slimy or viscous capacity of this substance suggested its gastro-protective effect to the first researchers [2]. In fact, mucopolysaccharides spread themselves throughout the digestive tract, preventing many of the various imbalances which can alter the structure and proper function and absorption of the digestive tract. This extraordinary effect has distracted the scientific community from a much more important and qualifying aspect of these structured sugars: that is, their extraordinary capacity to stimulate the immune system and therefore generate strong and effective reactions to a great number of pathologies [3]. The second large groups of active principles present in Aloe are the anthraquinones. Truly be called the body's "garbage disposals". It is important to remember that a laxative substance often carries a secondary effect which seems to know how best to eliminate that which is toxic to the body [4]. Finally, but of no lesser importance, is Aloe's wealth of vitamins, minerals, and general nutritional value. Each and every Aloe plant constitutes a veritable chemical synthesis factory, producing a vast range of varied elements. The extraordinary qualitative richness of this plant, when compared to its substantial shortage of citrate components, has inopportunely caused many expert nutritionists to miss what may be considered a fundamental fact: the synergistic and homeopathic micro stimulus of the plant's constituents. Modern homoeopathy teaches us that, often, the body greatly prefers micro stimuli coming from synergistic microdoses of vitamins and mineral salts, rather than the typical "overdosing" which, even at the best of times, brings about dependency or overload. The Aloe plant contains over 150 active constituents which will be analyzed and described later in this text [5]. However, we need to remember that the role played by Aloe juice is not a strictly nutritional one, but rather more that of an "advisor" to the body, pointing out the best way to retain and synthesize all nutrients – an art in which this plant is specialized. These three evaluations and interpretations of Aloe's therapeutic potentials constitute the greater part of this text, offering an exploration into the numerous cultural and instructive aspects of this plant, including the historical, botanical, productive, chemical, therapeutic, and medical scientific aspects [6]. After a careful reading of this in-depth look into Aloe, the reader will find suggestions on the correct use of the products derived from this plant. In fact, despite the primary use offered by the Aloe leaves' juice, we will point out how the many products derived from Aloe can, in our own day and age, significantly improve the quality of our health [7].

The aim of work is to present in this brief study is an outline of Aloe's character as a therapeutic plant. The classification of plant was carried with physically, biologically and chemically. The plantation, harvesting and application was also focus in the review.

2. Characteristic of Aloe Vera

2.1. Physical Classification

The leaf resembles a long triangular sheaf with two external membranes which are green and leathery. Inside this tough resistant covering is the gel, which presents itself as a compact, gelatinous mass with a translucent pearly aspect [8,9,10]. It is common practice to liberate the pulp from the leaf's outer skin in order to extract the juice by a decortications process. In reality, the skin contains some active constituents, some of which should be kept. These include the anthraquinones (mentioned in the introduction and which will be further elaborated in the following pages) which offer our body a good detoxifying cleanse. In the case of Aloe Vera, the presence of these substances brings about unpleasant sensations. In fact, the anthraquinones in Aloe Vera are primarily made up of barbaloin, which is distinguished by its very bitter taste and unpleasant acrid odor [11]. These two unfavorable notes have gradually diminished the tendency for manufacturers to use even small parts of the plants' cortices. Regarding the other three botanical varieties presented, suffice to say that the difficulties encountered in the decortications of the leaf and the bitter, yet pleasant enough, taste of the anthracite constituents have safeguarded its use. Furthermore, the above-mentioned gel definitely better tastes and has a lighter aroma [12,13]. The latter also contains a marked dose of mucopolysaccharides (if safeguarded by production methods respectful of their delicate chemical structure) which can produce an immune-stimulating property worthy of highlighting. The nutritional components of Aloe are equally distributed between the pulp and the cortex of the leaf [14].

2.2. Botanical Classification

The botanical genus of Aloe has always been classified in the family called Liliaceae, because it germinates from an original bulb in the same way as lilies. Other plants well known to us in this family are onions, garlic, and asparagus. Tom Reynolds, a researcher from London, England, coined a new classification. In assessing the specifications and particular characteristics of the Aloe plant, he inserted it into a new botanical family, that of the Aloaceae. Aloe is a perennial evergreen shrub with succulent leaves having flowers of an elongated tubular form varying in color according to the species, from orange to bright scarlet red, particularly spectacular and reminiscent of an autumn landscape. The Aloaceae family contains approximately three hundred and fifty varieties of the plant throughout the planet. In South Africa alone, in 1955, a total of 132 species were catalogued! The range spanned from the miniature type like Aloe aristata and Aloe brevifolia, to one which can be defined as the most beautiful in existence in the world, the Aloe striata. Among the larger-sized Aloes, and those having a cosmetic, curative value, we can mention Aloe arborescens Miller, Aloe ferox, Aloe Barbadensis Miller Vera, Aloe chinensis, Aloe saponaria, and Aloe succotrine. A more generalized botanical distinction is achieved by observing the trunk and leaves. In this way, we can distinguish three large groups of Aloe: acauleas (without a trunk), subcauleas (visible trunk but with a reduced size), and cauleas (having a large and branched trunk). The first group contains the plants that don't have a trunk and, if present, is very short, soft, and thick, covered by the leaves which are arranged in a rosette, rising outward from the base of the stem. Belonging to this first group are Aloe Barbadensis miller, Aloe saponaria and Aloe aristata. Belonging to the second group are aloe succotrine and Aloe Chinensis [15]. The short, woody trunk is easily visible and canreach a foot in height. Finally, in the third group, with a woody, branching trunk and bushy boughs reaching a height of as many as several feet, belong the species like Aloe ferox, Aloe arborescens, and the very famous and distinctive aguillaria agallocha. The Aloe, which comes from Barbados, named Barbadensis according to Miller, or Aloe Vera by Linnaeus, or yet still called Aloe vulgaris by Lamark, are one and the same botanical species. Much confusion has arisen from the added word "Vera", since Miller named Vera a species different to the one named "Vera" by Linnaeus. As a result, today we tend to accept a plant classification which is unclear, not allowing us to distinguish between the two varieties. We shall call Vera the species Barbadensis Miller, and add the word (Vera) "Quality", to the Aloe described by Linnaeus. This is as much as has been understood from the writings of the great herbalist, Burman [16].

2.3. Aloe Barbadensis Miller or Vera

Vera is a perennial that grows into the shape of a tuft, whose base is surrounded by a rosette of succulent and thorny-edged leaves with a spiral development. This is the characteristic that clearly distinguishes this species among all the existing species. Its structure and consistency are vaguelreminiscent of the cactus.

Figure 1. Barbadensis mille

Originating in Africa, Aloe Barbadensis then spread to the Americas after the expeditions of Columbus and Vespucci. The hot, humid climate of Central America favors its growth, as well as the Caribbean archipelago to which we owe the actual denomination of Barbadensis, from the islands of Barbados. After 1950, plants arose in the central and southern states of the United States, such as Texas, Arizona, and Florida, and extending into Mexico and throughout South America. Aloe Vera has succulent, fleshy leaves of a mottled light green color with delicate edges sometimes punctuated with a pink hue during the winter months. Over time, the brilliant green color tends to fade to a grey green. The plant reaches maturity after four years and has leaves with a length averaging between

two and three feet and a base width from three to five inches, each leaf weighing from two to four pounds. The plants complete life cycle's twelve years. It produces an average of twelve to thirty leaves. When these are cut, two or three times a year, one can observe the almost instantaneous remargining of the "wounds" suffered from the severing of the leaves [17]. The plant produces a protective fluid that prevents the loss of sap from the leaf. As we previously mentioned, this variety does not have a trunk that supports the plant itself. Instead, the plant is formed like a large lanceolate-leaved bush, anchored well into the ground by an adequately developed root system. Aloe Barbadensis flowers once a year. From the center of the leafy tuft rises an erect, rigid, and woody flowered stalk which can reach a height of four to five feet. Flowering occurs during summer, with yellow colored tubular flowers growing in a raceme at the far end of the spike. Aloe Vera propagates easily by cutting the shoots that sprout from the base of the plant. It is important not to expose the plant to climactic extremes such as high temperatures or excessive humidity. Young plants love semi-shade, while adult plants adore full exposure to the sun. This type of Aloe requires sandy soil with good porosity. Its leaves are very rich in gel in comparison to the external cuticle or the skin encasing it. The predominant substance in this gel is mucopolysaccharide acemannen, a complex carbohydrate involved mainly in the processes of immune-modulation, wound healing, and anti-inflammatory reactions, all of which shall be explored in later chapters. The aloin contained in the plant, an antraquinone, has numerous actions, i.e., laxative, blood purifying, and diuretic. In Aloe Barbadensis, the specific characteristics of barbaloin are recognizable by an ochre color and unpleasant fleshy odor. Aloe Barbadensis is the type of Aloe most used and known in the world today because its leaves give the highest yield of substances due to its size, and the ease this presents in transforming the yield into the production of a pulp, juice, and gel. The gel is used for external purposes. The active quantity of constituents contained in this variety cannot be compared to the smaller, rarer varieties which are also more difficult to process commercially. Aloe Vera remains, despite its limitations compared to the other varieties, an excellent therapeutic product for the human body and its health [18].

2.4. Aloe Arborescence Miller

Another species of Aloe is the arborescence Miller which, like the Barbadensis (Aloe Vera) species, has its origins in central-south Africa. It remains widespread in South Africa, in Asia, and, above all, in Russia and Japan. Unlike the Barbadensis Miller (Aloe Vera), Aloe arborescence Miller does not develop from a single stump. Rather, it extends along a long central woody trunk, with alternating leaves that reach a height of six to nine feet at maturity. The plant produces a chaotic bushy formation with many stems and no discernable starting root, as in the case of Aloe Vera (Barbadensis Miller) [19].

Aloe arborescence Miller is also a perennial plant with succulent lanceolate leaves, thorny borders, and a spiral formation. These leaves are grey-green in color and less fleshy, thinner, and threadlike, with a length between 20 and 24 inches and a weight of between .35 ounce and 3.5 ounces each. Its tight, threadlike leaves have a thicker external cuticle, rendering this plant resistant to rigid climatic and environ-mental factors. This characteristic supplies a high presence of anthraquinone elements, mainly aloin, responsible not only for its laxative effects, but also cytoprotective and anti-tumoural effects. The gel inside the leaf is proportionally less compared to the Aloe Barbadensis Miller variety. This latter observation has unfortunately relegated Aloe arborescence to less popular usage even though its therapeutic properties are indisputably superior to its big sister, Aloe Barbadensis Miller. The yield per leaf and the manual labor involved to extract the juice derived from this plant variety has inflated the cost, making it difficult to mass market unless it is justified by a very real need for its use as a therapeutic agent [20].

Figure 2. Arborescence Miller

2.5. Aloe Ferox

Aloe ferox is also known as Cape Aloe, Wild Aloe, or African Aloe. It also has its origin in sub-Saharan regions of Africa, and is widespread in India and in the tropical and subtropical American continents. This plant extends from a central woody trunk, with alternate leaves, similar to the Aloe Arborescence Miller species, but with a more robust constitution and chaotic bushes that extend up to a height as great as 16 feet [20].

Figure 3. Aloe Ferox

This species also manifests characteristics of the perennial botanical varieties, such as the fleshy consistency of its leaves and a hard, leathery foliage structure. The leaves' outer edges have dark thorns, evolve in a spiral form, are grey-green in color, with a length at maturity of between 1¾ to 2¾ feet and a weight that

ranges between 3.5 to 17.5 ounces each. The flowers, like the majority of the world's Aloe species, are of a tubular form, in a raceme on the upper end of a strong, woody stalk which begins at the base's leaf rosette and extends to a total height ranging from 1¾ to 2¾ feet. The plant flowers from May to August in tropical climates and from September to November in sub-tropical regions, with orange-tinged coral pink blooms. The leaves of this variety have a consistency halfway between the Barbadensis Miller variety and that of the arborescence Miller [21]. The gel is rich in vitamins and minerals, among which iron is the most predominant. The botanical denomination ferox originates precisely from this latter characteristic, as Fe is the elemental symbol for ferrous or iron. Its production of mucopolysaccharides is good, but the presence of anthraquinones is very limited. For this reason, the use of Aloe ferox is recommended in conjunction with other varieties. Its invigorating effect with regard to anemia and symptomatologies caused by menstrual problems will be discussed later in the book and are worthy of mention [22].

2.6. Aloe Chinensis

This variety of Aloe is precious because it is not very widespread. Originating from China, from which we obtain its species name, it is present in various parts of the planet but in limited quantities. It is found on the coasts of Venezuela and in the Mediterranean, always in areas with sub-tropical climates. Some crops are sited in Spain, but its use is limited to the ornamental plant industry. Obtaining quantities of juice from this variety is not feasible because of its excessive cost to produce. The plant grows from a woody central trunk, with alternate leaves similar to those of the arborescence and ferox varieties, but smaller and more fragile, with chaotic tufts up to a foot in height. Like the other three species we have examined, Aloe chi-nensis also exhibits the characteristics of the perennial botanical variety, such as hard, thick leaves with a fleshy consistency [23].

Figure 4. Aloe Chinensis

These emerald green leaves are defended at their outer edges by a number of thorns and reach a length of 20 to 24 inches and a weight of .35 ounce to one ounce each at maturity. Flowering occurs between May and August in tropical climates and from September to November in sub-tropical climates. The blooms have a coral red color with yellow tinges. Reproduction occurs from cuttings. This plant can be cultivated in a greenhouse or an apartment. The fine, long leaves are thick, as in the case of Aloe arborescence Miller, and have little gel and a thick outer skin [24]. Therefore, a predominance of anthraquinones is found in respect to the mucopolysaccharides. Also, there is a consistent quantity of minerals and vitamins which are likewise found in the framework of the human body, such as calcium, magnesium, and potassium. This peculiarity has made Aloe chinensis popular in the Chinese medicine repertoire as a plant suitable in aiding the elderly and women in menopause. Its use is recommended in combination with at least two other varieties in order to obtain satisfying and generally targeted effects [25].

2.7. Chemical Classification

Aloe Vera Gel consists of around 99.3% of water. The remaining 0.7% is the solids that consist for a large part of polysaccharides of the glucose and mannose type. Aloe has a high enzyme content (about 92 enzymes), which makes it a rare and valuable resource because enzymes help the body to absorb basic nutrients while also purifying it. Studies have found that there are 75 ingredients contained in the Aloe leaf. These ingredients have a variety of medical benefits. They are divided into the following categories [26]:

(a). Lignin: This cellulose substance is found in the gel has no known medical properties except it posses the property of penetrating the human skin.

(b). Saponins: These form soapy lathers when mixed and agitated with water. They have been used in detergents, foaming agents and contain antiseptic properties.

(c). Anthraquinones: There are 12 of these contained in the sap of Aloe Vera: Aloin, Isobarbaloin, Anthracene, Emodin, Ester of Cinnamonic acid, Chrysophanic acid, Barbaloin, Anthranol, Aloetic acid, Aloe Emodin, Ethereal oil and Resistannol. These act as natural laxatives, painkillers and analgesics, and they contain powerful antibacterial, antifungal and virucidal properties.

(d). Minerals: Aloe Vera contains the following minerals: Calcium: (essential for proper bone and teeth density)**.** Manganese: (a component of enzymes necessary for the activation of other enzymes)**.** Sodium: (ensures that the body fluids do not become too acidic or too alkaline)**.** Copper: (enables iron to work as oxygen carriers in the red blood cells)**.** Magnesium: (used by nerves and muscle membranes to help conduct electrical impulses)**.** Potassium: (regulates the acidic or alkaline levels of body fluid)**.** Zinc: (contributes to the metabolism of proteins, carbohydrates and fats)**,** Chromium: (necessary for the proper function of insulin, which in turn controls the sugar levels in the blood). Iron: (controls the transportation of oxygen around the body via the red blood cells).

Table 1. Percentage of Minerals in Aloe Vera

S.No	Minerals	Aloe Vera (Whole Leaf)
1	Calcium	3.58
2	Magnesium	1.22
3	Sodium	3.66
4	Potassium	4.06
5	Phosphorous	0.02
6	Iron	0.1
7	Copper	0.06
8	Zinc	0.02

(e).Vitamins: Aloe Vera contains numerous vitamins: Vitamins A, C, & E (crucial antioxidants that combat dangerous free radicals in the body). Vitamin B & Choline (concerned with the production of energy, amino acid metabolism and developing muscle mass). Vitamin B12 (responsible for the production of red blood cells) and Folic acid (helps develop new blood cells).

(f). Amino Acids: Amino Acids are the building blocks of protein, which manufacture and repair muscle tissue. The human body requires 22 amino acids and needs 8 essential ones. Aloe Vera provides 20 of 22 required amino acids and 7 of 8 essential ones. These amino acids are:

Table 2. Amount of amino acids in aloe vera gel

S.No	Amino acid	Aloe vera(whole leave)
1	Glutamic acid	4.7
2	Asparagines	3.29
3	Aspartic acid	1.75
4	Serine	1.27
5	Glycine	0.95
6	Alanine	0.91
7	glutamine	0.83
8	Valine	0.36
9	Threonine	0.33
10	Proine	0.25
11	Lysine	0.18
12	Arginine	0.12
13	Leucine	0.09
14	Phenylalanine	0.08
15	Isoleucine	0.07
16	Tyrosine	0.06
17	Cystine	0.04
18	Histidine	0.03
19	Methionine	0.02
20	Tryptophane	0
21	Total concentration (nMol/mg dry mass)	15.33

(g). Sugars

Aloe Vera contains both monosaccharide, such as glucose and fructose, and polysaccharides. Polysaccharides are the most important types of sugars. They aid in proper digestion, maintain cholesterol levels, improve liver functions and promote the strengthening of bones.

(h). Sterols

Sterols are important anti-inflammatory agents. The ones found in Aloe Vera are: Cholesterol, Sitosterol, Campesterol and Lupeol. These sterols contain antiseptic and analgesic properties. They also have pain killing properties similar to aspirin.

(i). Enzyme

Enzymes are natural protein molecules with highly specialized catalytic functions in biochemical reactions produced by all living organisms (microorganisms, plants, animals, and human beings). Although like all other proteins, enzymes are composed of amino acids, they differ in function in that they have the unique ability to facilitate biochemical reactions without undergoing change themselves. Some of the most important enzymes in Aloe Vera are: Peroxidase, Aliiase, Catalase, Lipase, Cellulose, Carboxypeptidase, Amylase and Alkaline Phosphates.

3. Plantations/Cultivation

The Aloe plant is cultivated in many areas of the world and in climates which are hot and dry. Plantations exist in Africa, Australia, Central America, Mexico, Russia, Japan, and in southern Europe, especially in Spain. Some plantations have been started in Italy, but they are still small and few. Unlike most of the African, South American, and Asian countries, Spain, as part of the European Community, is obliged to follow stringent quality control and production procedures according to European Economic Community standards. Therefore, whatever is declared as organically produced is guaranteed by state certification. This certification process assures that Aloe comes from cultivations which are not physically and chemically exploited [27]. It is believed that Spain, Greece, and Israel today constitute the best areas in the world for the production and supply of organically-grown Aloe. As a guarantee to the consumer, the producer has to declare the country of origin and the plantation's quality on the product label. The closer the plantation is to the processing and utilization area, the higher the guarantee of the freshness and true efficacy of the gel, because it has not deteriorated from months in a ship container at temperatures which would make it impossible to keep the quality of the product intact. The exclusive methods of cultivation, harvesting, extraction, and stabilization existing today allow us to obtain a juice the consistency of which is easily comparable to the authentic fresh leaf. Despite the fact that the quality of the product has generally improved through the years, there are still some companies, attracted by easy profit, who think exclusively in terms of product quantity and economical production processes, bringing to market products that do not even vaguely resemble freshly squeezed juice [28]. The following paragraphs describe the ideal production process, giving the reader an opportunity to identify a product that comes close to the rigorous process presented. This will enable you, as an end consumer, to enjoy the famous qualities of Aloe Barbadensis Miller and the other varieties available in the market, in the most effective way, and without the possible disappointments that may result from products that do not (or cannot) guarantee those qualities [29].

4. Harvesting

Another important aspect in the evaluation of a company producing and exporting Aloe is the care it takes during the harvesting process. The gathering of the leaves has to be done manually, leaf by leaf. A precise, quick, clean cut made at the base of the leaf ensures that the precious gel is not exposed to the open air for too long, causing irreparable oxidation before it reaches the stabilization process. The leaves have to be delivered to the processing center in lots of no more than one ton at a time [30]. This center is usually situated a hundred yards from the cultivation itself. In this way, the processing can begin within three hours from the first cutting and avoid excessive accumulation of the product, which could slow down the manufacturing process and create oxidation of the plant. Harvesting of the smaller and thinner varieties like Aloe arborescence Miller, Aloe ferox, and Aloe

chinensis requires more attention in order to avoid any problems that may occur because of the reduced size of the leaves. A cut made without particular care or a hurried harvesting can lead to a rapid oxidation of the leaf with dire consequences for the product quality [31].

5. Applications of Aloe Vera

The products prepared from Aloe Vera leaves have multiple properties such as emollient, purgative, antibacterial, anti inflammatory, anti oxidant, anesthetic, aphrodisiac, anti helminthes, antifungal, antiseptic and cosmetic. Most (96%) of the plant is water and rest is active ingredients like essential oil, amino acids, minerals, vitamins, enzymes and glycoprotein's [32].

When the parenchyma (the mucilaginous material in the leaves) of the leaves is removed, this so called "Gel filet" is processed and stabilized and the fibers are removed. An opalescent liquid remains that is commonly called "Aloe Vera gel". This is the liquid that is used in skin preparations and health drinks. Together with the enzymes, amino acids in the gel give the special properties as a skin care product and as raw material for the manufacturing of high grade nutritional, medicinal and cosmetic_products. Aloe has two type of application [33].

5.1. External Applications

The external uses of Aloe products are primarily as skin healer and cosmetic use. The healing effect of Aloe Vera products is because of its ability to prevent injury to epithelial tissues (skin layer) and promote healing to injured tissues. It soothes a variety of skin ailments such as mild cuts, insect stings, bruises, poison ivy and eczema. Cosmetologists call it as "water of youth" because of its anti wrinkle properties. Its rate of absorption in skin is four times higher than water, making it good moisturizer. The washing of eyes with Aloe may protect eyes from ultraviolet rays coming from sun [16].

5.2. Internal Applications

The Aloe Vera products can be taken internally in form of powder, tablets and juices. The juice and food supplement of Aloe Vera is highly useful to digestive tract irritations such as colitis and peptic ulcers. It also facilitates digestion, blood and lymphatic circulation and functioning of kidney, liver and gall bladder.

Food preservative: Gel made up of Aloe vera are used prolongs the conservation of fresh products, such as fresh fruit and legumes. This gel is tasteless, colorless and odorless. This natural product is a safe and environmentally friendly alternative to synthetic preservatives such as sulfur dioxide. For example, the study showed that grapes at 1°C coated with this gel could be preserved for 35 days against 7 days for untreated grapes. [2]

Cosmetic gel: Aloe Vera is a raw material for the manufacturing of high grade cosmetic range of products. Cosmetic companies add sap or other derivatives from Aloe vera to products such as makeup, tissues, moisturizers, soaps, sunscreens, shampoos and lotions. Cosmetics that produced from aloe vera can be used for skin as a skin cream [16].

Medical purpose: Together with the enzymes and amino acids in the gel, it has the special property as a skin care product, providing antifungal, antibacterial and antiviral activity. Aloe Vera has the ability to provide essential nutrients, kill bacteria, viruses, fungi, yeasts and reduce inflammation. Aloe Vera can also reduce inflammation to injured tissue. Inflammation occurs when healthy tissue is injured and blood begins to clot around the tissue to repair the injured tissue. Aloe Vera is a natural anti-inflammatory that is much more delicate on the human body. [10]

Textile: In textile fields aloe gel is used as the thickener in pigment and reactive printing, for desizing of gray fabric, for antimicrobial finishing, representing sodium chloride and carbonates in reactive dyeing of cotton fabric, to insert amine group to cotton fabric by treatment so that cotton fiber has the affinity toward acid dye [18].

6. Conclusion

Finally the study show that the properties of aloe vera makes it unique, aloe leaf contains over 75 nutrients and 200 active compounds, including 20 minerals, 18 amino acids, and 12 vitamins. Also it contains the most essential components required by the human body. Aloe vera has vitamins A, B1, B2, B6, B12, C and E. Aloe has a high enzyme content (about 92 enzymes), which makes it a rare and valuable resource because enzymes help the body absorb basic nutrients while also purifying it. It has different application in food, cosmetics, textile, pharmacy industry etc.

References

[1] Virdi HK, Jain S, Sharma S. (2012) Effect of locally delivered aloe Vera gel as an adjunct to scaling and root planning in the treatment of chronic periodontitis: A clinical study. Indian Journal of Oral Sciences, 3(2): 84-89.

[2] Surjushe A, Vasani R, Saple DG (2008) Aloe vera: A short review. Indian J Dermato. 53(4): 163-166.

[3] Collins CE (1935) Alva gel as a therapeutic agent in the treatment of roentgen and radium burns. Radiol. Rev. Chicago Med Rec. 57: 137-138.

[4] Blitzz JJ, Smith JW, Gerard JR (1963) Aloe vera gel in peptic ulcer therapy: preliminary report. J Am Osteopath Asso. 62: 731-735.

[5] Choonhakarn C, Busaracome P, Sripanidkulchai B (2008) The efficacy of aloe vera in the treatment of oral lichen planus: a randomized control trial. Br. J. Dermatol. 158: 573-577.

[6] Hayes SM (1999) Lichen planus- a report of successful treatment with Aloe vera. Gen Dent. 47(3): 268-272.

[7] Babaee, N, (2012) Evaluation of the therapeutics of Aloe vera gel on minor recurrent aphthous stomatitis. Dent Res J 9(4): 381-385.

[8] Ramachandran, Sudarshan, Rajeshwari G, Annigeri, Vijayabala GS (2012) Aloe vera in the treatment of oral sub mucous fibrosis-a preliminary study. J Oral Pathol Med. 41: 755-761.

[9] Vogler BK Ernst E (1999) Aloe vera: a systemic review of its clinical effectiveness. British Journal of general practice 49: 823-828.

[10] Poor MR, Hall JE, Poor AS (2002) Reduction in the incidence of alveolar osteitis in patients treated with Sali Cept Patch, containing acemannan hydrogel. J Oral Maxillofac Surgery 60: 374-379.

[11] Su K, (2004) Phase II double- blind randomized study comparing oral aloe vera versus placebo to prevent radiation- related mucositis in patients with head and neck neoplasms. Int J Radiat Oncol. Biol. Phys.60: 71-77.

[12] El-Soudany, Kareman, Yagi, Akira and Kabbash, Amal. (2013) A self-controlled Single Blinded clinical trial to evaluate oral lichen planus after topical treatment with Aloe vera. Journal of GHR.2(4): 503-507.

[13] Kambizi L, Afolayan AJ. (2008) Extracts from Aloe ferox and Withania somnifera inhibit Candida albicans and Neisseria gonorrhea. African J Biotech. 7: 12-15.

[14] Hatano T, (2005). Effects of tannins and related polyphenols on methicillin- resistant Staphylococcus aureus.Phytochemistry2005; 66: 2047-2055.

[15] Kokate CK, (2005) Pharmacognosy" edition thirtieth published by Nirali Prakashan Pune, page 181-186.

[16] Davis RH, (1994). Mannose-6-Phosphate: Anti-inflammatory and wound healing activity of a growth substance in Aloe vera. J. Appl. Hort. 2(1):10-14.

[17] Evans WB, (1996) Pharmacognosy; Edition fiftienth ; published by W.B. Saunder, page no.240-242.

[18] Crosswhite F, Crosswhite C (1984) Aloe vera, Plant Symbolism and the Threshing Floor: Light, Life and Good in Our Heritage. Desert Plants. 43-50.

[19] Bruneton J, (1995) Pharmacognosy, Phytochemistry, Medicinal Plants. Paris: Lavoisier Publishing.

[20] Blumenthal M, Busse WR, Goldberg A, Hall T, (1998) German Commission E Monographs. Austin: American Botanical Council and Integrative Medicine Communications.

[21] Bradley PR, (1992) British Herbal Compendium. Vol. 1. Dorset: British Herbal Medicine Association.

[22] Davis RH, (1998) Wound Healing: Oral and Topical Activity of Aloe vera. Journal of the American Podiatric Medical Association 79: 559.

[23] Danhof I, (2001) Potential Benefits from Orally ingested Internal Aloe vera Gel. Irving, Texas: International Aloe Science Council 10th Annual Aloe Scientific Seminar.

[24] Kameyama S, Shinho M, (1980) Wound healing compositions from Aloe arborescence extracts. Japanese patent 79, 151, 113. Chemical Abstracts 93: 10375y.

[25] Ghannam M Kingston M, (1986) Antidiabetic activity of Aloes preliminary clinical and experimental observations. Horm. Res. 24: 4: 288-294.

[26] Davis RH, Agnew PS, (2006) Antiarthritic activity of anthraquinones found in Aloe for podiatric medicine. J Am.Pod. Med. Assn. 76: 2: 61-66.

[27] Dixit VP (2008) Hypolipidemic effect of Aloe barbadensis (Aloe fraction I) in cholesterol-fed rats. Lipid and Lipoprotein Metabolism, Proc. National Academy Science India: Sect. B (Biol. Sci.) 5: 339-342.

[28] Davis RH, Leitner MG, (2012) Topical anti-inflammatory activity of Aloe vera as measured by ear swelling. J Am Pod Med Assn. 77: 11: 510-512.

[29] Fan YS, (2009) Protective effect of extracts from Aloe vera L. var. chinensis on experimental hepatic lesions and a primary clinical study on the injection of in-patients with hepatitis. Chung Kuo Chung Yao Tsa Chih 14: 12: 746-748.

[30] Davis RH, Leitner MG, (2010) Wound healing, oral and topical activity of Aloe vera. J Am. Pod. Med. Assn. 79: 11: 559-562.

[31] Davis RH Rosenthal KY, (2009) Processed Aloe vera administered topically inhibits inflammation. J Am Pod. Med. Assn. 79: 8: 395-397.

[32] Sato Y, (2000) Protection effects of Aloe arborescens on skin injury by X-irradiation. Yakmgakn Zasshi 110: 11: 876-884.

[33] Pulse TL, Uhlig, E, (2009) A significant improvement in a clinical pilot study utilizing nutritional supplements, essential fatty acids and stabilized Aloe vera juice in 29 HIV seropositive, ARC and AIDS patients. Jo of J of AdMed. 3: 4-25.