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ALOE VERA: A WONDERFULL PLANT FOR PHARMACOLOGICAL, COSMETIC USE, AND SOME OTHER ASPECT - A REVIEW

Prashant Kumar Dubey[1], Santosh Kumar Singh[2]*, Arvind Dangi[1], Deepak Bachle[3], Rahul Kumar Kataria[2]

[1]IES College of Pharmacy, Kalkheda, Ratibadh Bhopal- 462044, Madhya Pradesh, India.
[2]Mittal Institues of Pharmcy, Opp. Bhopal Memorial Hospital and Research Centre (BMHRC), Bypass Road, Nabibagh, Bhopal – 462038, Madhya Pradesh, India.
[3]Radharaman Institutes of Pharmaceutical Sciences, Ratibarh, Bhadbhada road, Bhopal - 462046, Madhya Pradesh, India.

***Corresponding Author: Santosh Kumar Singh**
Mittal Institues of Pharmcy, Opp. Bhopal Memorial Hospital and Research Centre (BMHRC), Bypass Road, Nabibagh, Bhopal – 462038, Madhya Pradesh, India.

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ABSTRACT

Aloe vera plant is oldest tradional medicinal plant used for various aspects worldwide. *Aloe vera* has been attributed to the polysaccharides contained in the gel of the leaves. The whole plant as well as its specific parts (leaves, roots), plant extracts and its active constituent mucopolysaccharides (MPS) which are long chain sugars have been widely used. *Aloe* leaves can be separated into two basic products the latex, a bitter yellow liquid beneath the epidermis of the leaf and the gel, a colorless and tasteless substance in the inner part of the leaf. Both of them have many biologically active components, mainly anthraquinones and polysaccharides (the most active is acemannan), which may act alone or in synergy. The medicinal value of the plant is recognized since centuries because of the gel like pulp obtained by peeling its leaves. Its juice has cooling properties, is anabolic in action, a fighter of 'pitta', storehouse of phytochemicals and guards against fever, skin diseases, burns, ulcers, boils eruptions etc. Commercially, aloe can be found in pills, sprays, ointments, lotions, liquids, drinks, jellies, and creams, to name a few of the thousands of products available. Reports also describe antidiabetic, anticancer and antibiotic activities, so we may expect to see a widening use of aloe gel. The author is advice to peoples to read and educate and aware about the importance or magical plant Aloe vera.

KEYWORDS: Aloe Vera; Penetration enhancer; Colchicine; Mefenamic acid; Oxybutynin; Quinine

INTRODUCTION

Genus *Aloe* has a long history of usage as medicinal agents and was the main source of medicines prior to the advances of modern medicine. In many developing countries, herbal medicinal systems remain important in the treatment of many ailments. Ayuvedic medicine is still commonly practiced within India with an estimated 85% of Indians still using crude plant preparations for the treatment of a wide variety of diseases and ailments.[1]

Plant is a perennial succulent herb has grown in temperate and subtropical parts of the world. This plant genus is originated in Africa. The genus includes 200 or more species. Some of them are cultivated for the resinous latex contained in their thick, fleshy leaves. Since biblical times, aloe plants have figured among folk-loric remedies as purgatives and as treatments for skin disorders. *Aloevera*is a member of liliaceae family. It is commonly called aloe, burn plant, lily of the desert, elephant's gall. *Alovevera*(L.) in synonym *Alovebrobadensis* Miller, is a cactus (leaves) like plant with green, dagger- shaped leaves that are fleshy, tapering, spiny, marginated and filled with a clear viscous gel. The name *Aloe* is derived from the Arabic "alloeh" or Hebrew "halal" meaning bitter shiny substance. Two types of exudates are secreted by aloe leaves. One is a bitter reddish-yellow juice contained in the pericyclic cells located under the strongly cutinized epidermis of the leaves. This "juice" has been generally used for laxative purposes and in dried form. Its bitterness is due to the presence of aloin, aloe-emodin and related compounds.[2]

There are approximately 500 species of the genus *Aloe*of which 160 are indigenous to South Africa.[3] Many of these are used in traditional healing. *Aloe* has long been used as a remedy in many cultures. There are anecdotal references to its use in ancient Egypt in 1500 B.C., and it is mentioned in the pharmacopoeia produced by Dioscorides in the first century A.D.[4] *Aloe* gel, the clear jelly-like substance obtained from the parenchymatous cells in the inner leaf, was first used clinically in the 1930s for the treatment of radiation burns.[5] Today, *Aloe* gel is a familiar ingredient used in ointments and the cosmetic industries. The latex, found in the pericyclic

cells in the margins of the leaves, is mainly used for its laxative effect.[6] In this paper, the chemistry, uses and pharmacological activity of *Aloe* gel, latex, and isolated compounds are reviewed.

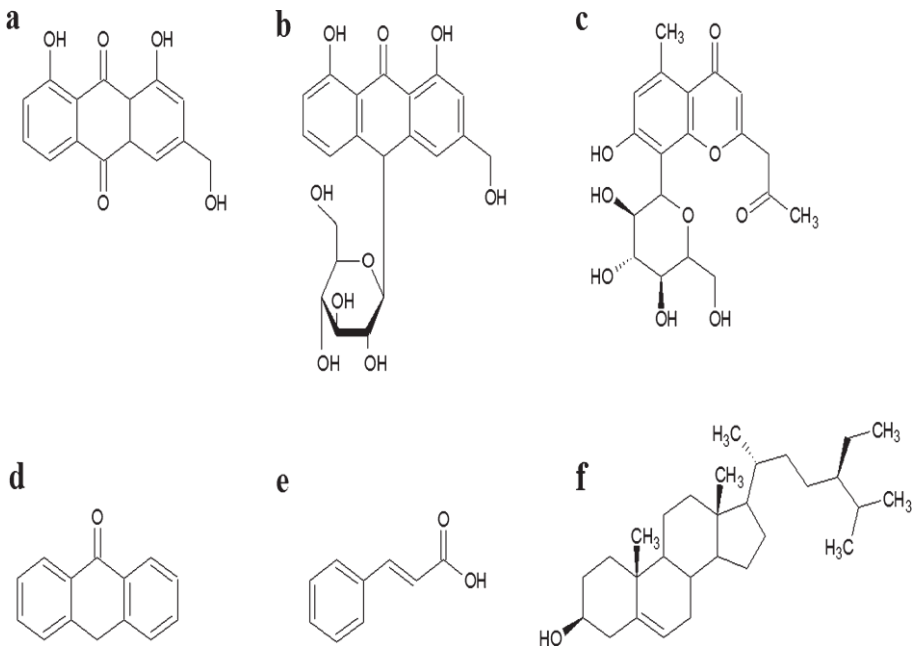
The plant has a crassulacean acid metabolism (CAM) that allows water conservation within the tissue, andtherefore, resistance to high water stress.[7] Today *Aloevera* gel is an active ingredient in large numbers of skin lotions, sun blocks, and cosmetics.[8] The use of gel use in cosmetics has a function similar to anti-aging effects of vitamin A derivatives.[9]The gel or mucilage obtained from the flesh of the leaf contains compounds some amount of bitter latex extract came from leaf lining [10]. *Aloe* gel is 99% water with a pH of 4.5 and is a common ingredient in many non-prescription skin preparations. The gel contains an important component like polysaccharide, glucomannan etc. It acts asmoisturizer, which accounts for its use in many cosmetics.[11,12]

PHYTOCHEMISTRY

Aloes have long been recognized by pharmacopoeias over the world[13] as a purgative drug; one variety, called Curacao aloes, is the dried juice of *A. barbadensis.* In 1956 paper chromatography showed the presence ofanthrano, aloe-emodin, chrysophanic acid and chrysophanol.[14] The juice of fresh *Aloe* leaves was studied in a nitrogen atmosphere, aloin (barbaloin) and *p*-coumaric acid but no aloe-emodin was found [15] presumably the latter was an artifact produced by air oxidation. A commercial sample of *Aloes* (*A. barbadensis*) contained aloesin[16] in another one the principal constituent was barbaloin, some free aloe-emodin and isobarbaloin were present.[17] A thin-layer chromatographic study of 22 species of *Aloes* showed that 12 species contain flavanoids, hydroxyanthraquinones, and coumarin.[18]

The juice is ofcourse mostly water (99.52%); the carbohydrates of *Aloe* juice have been reported to be glucose[19] and a polyuronide composed of a polyose (molecular weight up to about 2.75 × 105) containing glucose and mannose and hexuronic acids such as glucuronic, mannuronic, and galacturonic acids. Later work confirmed that hydrolysis gives glucose and mannose, as well as traces of galactose, arabinose, and xylose, but found no uronic acids [20]Free amino acids, free monosaccharides and total saccharides released upon hydrolysis, sterols, and triterpenoids of the leaves of *Aloe barbadensis*Miller leaves were determined. Some seventeen amino acids, D-glucose, and D-mannose were present in the water-soluble fraction. Cholesterol, campesterol, *β*-sitosterol, and lupeol were found in substantial amounts in the lipid fraction. An unknown alkaloid was detected using Dragendorff's reagent.[21]

Figure 1: Chemical structures for the anthraquinones (a) Aloe emodin and (b) Aloin, the chromone (c) Aloesin, (d)Anthrone, (e) Cinnamic acid and (f) β-sitosterol.



Summary of the chemical composition of *A. vera*leaf pulp and exudates.[22, 23, 24-25]

S.No.	Class	Compounds
1.	Anthraquinones/anthrones	Aloe-emodin, aloetic-acid, anthranol, aloin A and B (or collectivelyknown as barbaloin), isobarbaloin, emodin, ester of cinnamic acid
2.	Carbohydrates	Pure mannan, acetylated mannan, acetylated glucomannan, glucogalactomannan,galactan, galactogalacturan, arabinogalactan,galactoglucoarabinomannan, pectic substance, xylan, cellulose
3.	Chromones	8-*C*-glucosyl-(2'-*O*-cinnamoyl)-7-*O*-methylaloediol A, 8-*C*-glucosyl-(*S*)-aloesol, 8-*C*-glucosyl-7-*O*-methyl-(*S*)-aloesol, 8-*C*-glucosyl-7-*O*-methylaloediol,8-*C*-glucosyl-noreugenin, isoaloeresin D, isorabaichromone,neoaloesin A
4.	Enzymes	Alkaline phosphatase, amylase, carboxypeptidase, catalase, cyclooxidase,cyclooxygenase, lipase, oxidase, phosphoenolpyruvate carboxylase,superoxide dismutase
5.	Inorganic compounds	Calcium, chlorine, chromium, copper, iron, magnesium, manganese,potassium, phosphorous, sodium, zinc
6.	Miscellaneous including organic compounds and lipids	Arachidonic acid, γ-linolenic acid, steroids (campestrol, cholesterol, β-sitosterol), triglicerides, triterpenoid, gibberillin, lignins, potassiumsorbate, salicylic acid, uric acid
7.	Non-essential and essential amino acids	Alanine, arginine, aspartic acid, glutamic acid, glycine, histidine,hydroxyproline, isoleucine, leucine, lysine, methionine, phenylalanine,proline, threonine, tyrosine, valine
8	Proteins Lectins, lectin-like substance	Saccharides Mannose, glucose, *L*-rhamnose, aldopentose
9.	Vitamins	B1, B2, B6, C, β-carotene, choline, folic acid, α-tocopherol

PHARMACOLOGICAL ACTIVITY

Skin Permeation Enhancement Potential

The researcher wasdetermining in vitro potential of *Aloe Vera* juice as a skin permeation enhancer; and to probethe extent to which *Aloe Vera*itself permeates the skin. Saturated solutions of caffeine, colchicine, mefenamic acid, oxybutynin, and quinine wereprepared at 32 ◦C in *Aloe Vera* juice and water (control) and used to dose porcine ear skin mounted in Franz diffusion cells with water as receptorphase. Receptor phase samples were taken over a 48 h period and permeants determined by reverse-phase HPLC. For caffeine and mefenamic acidno significant enhancements occurred between *Aloe Vera* and water as vehicles. However, for colchicine, oxybutynin and quinine thepresence of *Aloe Vera* within the formulation provided enhancements. Enhancement potential was dependent upon the molecular weightof the drug in formulation, with the enhancement effect attributable to as yet unidentified components within the *Aloe Vera*. Colchicine, with amolecular weight of 399.44, achieved the best enhancement with an enhancement ratio of 10.97. No correlation with lipophilicity was apparent.In a further experiment, where freeze-dried *Aloe Vera* was reconstituted at 200% residue level, permeation of quinine was 2.8× that from normal*Aloe Vera*, providing further evidence for the presence of an enhancing factor within *Aloe Vera*. Certain, although unidentified, components of*Aloe Vera* readily permeated skin and the relative amount by which they permeated skin was inversely related to the molecular weight of the drugin solution, thus enhancement ratio.[26]

Antimicrobial Activity

Aloe vera leaf gel caninhibit the growth of the two Gram-positive bacteria *Shigella flexneri* and *Streptococcus progenes*. Specific plant compounds such as anthraquinones[27,28] and dihhydroxyanthraquinones[29], as well as saponins,[30] havebeen proposed to have direct antimicrobial activity. Acemannan, a polysaccharide component fromwhole plant material, has been proposed to have indirect antimicrobial activity through its ability tostimulate phagocytic leukocytes. [31, 32] have reported on the effect ofthe anthraquinone aloe emodin on arylamine N-acetyl transferase activity in *Helicobacter pylori*, andhence its antimicrobial activity.

The antimicrobial activity of *Aloe vera* juice was investigated by agar disc diffusion against a panel ofbacteria, fungi and yeast. *Aloe vera* juice showed antibacterial activity against only the Gramnegative bacteria *A. hydrophilia*and *E. coli*. It did not show any inhibitory activity against any of the fungi or yeast.[33]

Antioxidant Activity

The effects of the exudate of *Aloe barbadensis*leaves on oxidative stress and some antioxidant status of streptozotocin induced - diabetic rats were studied. There was significant reduction in scavenging enzymes like superoxide dismutase (SOD) activity and significant increase in signs of oxidative tissue

damage, such as lipid peroxidation products (plasma MDA) in streptozotocin induced - diabetic rats. Treatment with *Aloe barbadensis*(150mg/kg) increased antioxidant enzymes like SOD activities and significantly reduced lipid peroxidation products. This study shows that high blood sugar leads to increased oxidative stress and that exudates of *Aloe barbadensis*leaves possessed antioxidant activity as shown by increased scavenging SOD

activity and decreases in lipid peroxidation products levels.[34] SODactivity are in conformation with previous reports documenting elevated serum lipid peroxide levels and diminished antioxidant status in diabetic subjects[35]. *Aloe*supplementation results in suppressed free radical-induced oxidative damage. The superoxide dismutase (SOD) activity was increased in the aloe treated group and signs of oxidative tissue damage, such as lipid peroxide, were decreased. **[36]**Author was found similar results in the treatment of neonatal streptozotocininduced type 2 diabetic rats. Can and coworkers reported that treatment with aloe decreased damage to liver, increased glutathione and decreased lipid peroxidation. Reports of research indicating high blood sugar leads to increased oxidative stress and evidence of oxidative damage has been demonstrated in arterial samples from human diabetic subjects [37, 38].

Anti-inflammatory and Analgesic Effects

The anti-inflammatory and analgesic activities of aqueous extract of *Aloe barbadensis* was investigated in rats. Formalin- induced hind paw oedema was used to assess the anti- inflammatory activity of the extract while acetic acid-induced abdominal writhing was used for analgesic activity. The results of the anti-inflammatory study revealed that 25, 50 and 100 mg/kg of the extract reduced the formalin-induced oedema at the beginning of 3 hours when compared to the control group. In the analgesic study, 25, 50 and 100 mg/kg of extract reduced the number of writhes induced by a 0.6% Acetic acid solution with an approximately 66.49%, 57.59% and 68.06% inhibition respectively. The study showed that the aqueous extract of *Aloe barbadensis* has anti-inflammatory and analgesic activities that could be mediated via modulators of pain and inflammation or through central activity. [39]

Antiviral Activity

The study showed that the antiviral activity of a crude hot glycerine extract of *Aloe vera*gel which was grown in Bushehra (Southwest of Iran) against HSV-2 replication in Vero cell line. The extract showed antiviral activity against HSV-2 not only before attachment and entry of virus to the Vero cells but also on post attachment stages of virus replication. The IC50 before attachment and entry of virus to the cells is 428µg/ml and the CC50 value which is the cytotoxicity of the extract for Vero cells is 3238 µg/ml, while the calculated selectivity index (SI) is 7.56. Also, IC50 of extract on post attachment stages of replication is 536 µg/ml and the SI value for inhibition of the post attachment stages of HSV-2 replication is 6.04. Therefore, compounds of *Aloe vera*from Bushehr could be a good candidate as a natural source for antiviral drug development against HSV-2. [40]

Hypoglycemic Effect

Aloe vera high molecular weight fractions (AHM) containing less than 10 ppm ofbarbaloin and polysaccharide (MW: 1,000KD) with glycoprotein, verectin (MW29KD), were prepared by patented hyper-dry system in combination of freeze-drytechnique with micro wave and far infrared radiation. AHM produced significantdecrease in blood glucose level sustained for 6 weeks of the start of the study. Significant decrease in triglycerides was only observed 4 weeks after treatment and continued thereafter. No deterious effects on kidney and liver functions were apparent. Treatment of diabetic patients with AHM may relief vascular complications probably via activation of immunosystem. [41]

Anxiolytic Activity

*Aloe vera*was evaluated for CNS activities in mice and different behavioral activities foranxiety and depression were tested on Exploratory activity, Open field test, Swimming –induced Depression test, Stationary Rod, Cage Crossing and Inclined Plane test. *Aloevera*was administered orally in both sexes of mice and was found to cause significantdepression in general as well as exploratory behavioral profiles. The results revealed that*Aloe vera*caused reduction of Exploratory and Locomotor activities along with thesignificant decrease in traction in an inclined plane test. The author wassuggesting that *Aloevera*may have anxiolytic potential with sedative action. [42]

Hypocholesterolemic Effect

Dailysupplementation with *Aloe vera*(L) stimulates immune system and improves wound healing. *Calotesversicolor* Daudin were madehypercholesterolemic by oral administration of cholesterol (100 mg/kg, body weight/day)suspended in ground nut oil. In one month, theserum cholesterol level in normal controls was 321.333 ± 16.621mg/dland in cholesterol fed animals 437.333 ±8.066 mg/dl. Those animal receiving different doses ofraw extracts of *Aloe vera*(L.) along with cholesterol, there was significantdecrease in serum cholesterol level. Four groups of *Calotes*were administered *Aloe vera*(L)extract in four different doses (3 mg/kg, 4 mg/kg, 5 mg/kg and 6 mg/kg/day) for 21 days. Therewas a significant increase in serum cholesterol levels at 1% level after feeding with highcholesterol diet. There was adecrease in serum cholesterol levels in all the *Aloevera*(L) treated groups. The researcher reported maximumdecrease in serum cholesterol level is 5% for a dose of 6 mg/kg and other doses i.e. of

3mg/kg, of 4 mg/kg & of 5 mg/kg show significant decrease at 0.1%, 0.5% and 0.2% level, respectively.[43, 44]

Anti Carcinogenic Activity

Agrawal et al reportedantitumor activity of this plant in two stage, skin carcinogenesis tumour model and antimutagenic activity using chromosomal aberration assay in the experimental animals. In this investigation, the comparative antitumour effect of *Aloe vera*extract has been undertaken by topical/oral application of 7, 12-dimethyabenz (a) anthracene followed by 1% croton oil till the end of the experiment.GSH level were also measured during carcinogenicity studies. In another set of experiment the antimutagenicity activity was performed using chromosomal aberration assay in bone marrow cells of *Swiss albino* mice. The results have indicated that there was a delayed in the first appearance of tumour and significant reduction in incidence and cumulative numbers of papillomas which were observed in the *Aloe vera*extract treated groups (by topical and oral route) as compared to control. The GSH levels were restored in *Aloe vera*extracts along with DMBA + croton oil treated groups whereas DMBA + croton oil treated group depleted the GSH levels.[45] In chromosomal aberrations assay, single application of *Aloe vera*extract at the dose of 250, 500, and 750 mg/kg body weight,24 hours prior the i.p. administration of Cyclophosphamide (at the dose of 50 mg/kg) have significantly prevented the chromosomal aberrations in bone marrow cells of mice as compared to Cyclophosphamide treated group. These reports indicate that *Aloevera* may be used as an alternative medicine for chemoprevention of cancer.[45, 46]

Wound Healing Activity

Wounds were induced on both sides of the vertebralcolumn of ICR mice using a biopsy punch.A 62.5% reduction in wound diameter was noted in micereceiving 100 mg/kg/day oral Aloe vera and a 50.80%reduction was recorded in animals receiving topical 25% [47]*Aloe vera*. Aloe gel is ofthen used for wound healing due to inhibition of bradykinin, which is a powerful proinflammatory mediator and also inhibition of the formulation of thromboxane, which causes vasoconstriction. It also inhibit cyclooxygenase, resulted decrease production of prostaglandin, leading to decrease inflammation.glucomannan is an emollient polysaccharide that is a good moisturizer and acemannan is water soluble long chain mannose polymer that accelerate wound healing.[48]

ImmunomodulatoryActivity

Mice, when administered with *Aloe vera*extract (150 mg/kg and 300 mg/kg) respectively for 5 days there was asignificant increase in the total white blood cell count andmacrophages with the engulfed SRBC with increase inconcentration. This shows the immunomodulatoryproperty of the extract. [49]

Antidepressant Effects

The antidepressant activities of hydro alcoholic extract of *Aloe vera* at different concentrations were compared with the fluoxetine-treated and the control groups of mice using forced-swimming, FST and OFT tests. The mice were evaluated in five groups (control, taking aloe vera at the dosage levels of 150 mg/kg, 300 mg/kg, and 450 mg/kg, and finally fluoxetine at a dose of 10 mg/kg) by the FST and OFT tests on 1st, 7th, and 14th days. The results of the OFT test showed no significant differences between these five groups. The results of FST test indicate the antidepressant effects of *Aloe vera* even at low doses and it was found that the effect of fluoxetine at a dose of 10 mg/kg was equivalent to the effect of *Aloe vera* at a dose of 150 mg/kg for the reduction in immobility time in mice in FST test. The result of FST test indicate that the antidepressant effects on mice treated with the 450 mg/kg dose of *aloe vera* showed better recovery as compared with other groups on 1st, 7th, and 14th days. All the evidence pointed to the conclusion that the antidepressant effect of has moreantidepressant effects on mice as compared to the fluoxetine-treated and the control groups. The better effects were seen by increasing the dose and duration of *Aloe vera* extract use.[50]

Anti-tumor Activity

Antitumor activity of 50% ethanol extract (100 mg/kg) of *Aloe vera*was evaluated against Ehrlich ascites carcinoma (EAC) tumor in mice. After 24 h of tumor inoculation, the extractwas administered daily for 14 days. After administration of the last dose followed by 18 hfasting, mice were sacrificed for observation of antitumor activity. The effect of *Aloe vera*onthe growth of transplantable ascites tumor, body weight of EAC bearing hosts andsimultaneous alterations in the hematological profile, serum (ALT, AST, LDH, ALP andglucose) and liver biochemical parameters (lipid peroxidation, GSH and antioxidant enzymes)were estimated. The *Aloe vera*showed decrease in abdominal circumference and bodyweight of EAC tumor bearing mice. Hematological profile reverted towards normal levels inextract treated mice. Treatment with *Aloe vera*, restored the serum biochemical parameterstowards normal levels and decreased the levels of lipid peroxidation and increased the levelsof reduced glutathione and other antioxidant enzymes (SOD, CAT and GPx). Thus navena and coworkers concluded thatthe 50%ethanol extract of *Aloe vera*exhibited antitumor effect by modulating lipid peroxidation andaugmenting antioxidant defense system in EAC bearing mice.[51]

Anticancer

Ahirwar and coworker evaluated some anti tumor plants for their efficacy against highly malignant tumors that are not normally included in the classical screening assays.The electrochemical behavior of the anticancer herbal drug emodinhydroxyanthraquinone

present in *Aloe vera*leaves has a specific *in vitro*and *in vivo*antineuroectodermal tumor activity. The compound does not inhibit the proliferation of normal fibroblasts or that of hemopoietic progenitor cells. The cytotoxicity mechanism consists of the induction of apoptosis, whereas the selectivity against neuroectodermal tumor cells is founded on a specific energy-dependent pathway of drug incorporation. [52]

COSMETIC USE

A.Vera has unique anti aging formulation to maintain healthy, fresh looking skin. The *Aloe* plants healing powers are most widely touted to treat skin conditions like psoriasis, shingles and other associated with itching .[53]Skin absorb *A.vera* up to four times faster than water, this help the pores of skin open and receive the moister and nutrients of the plant. The leaf gel is applied several times a day for light burns and wounds for mild sun burn. The cosmetic action of the plant is anti-inflammatory, shoothing, toning, moisturizing and protective.[54 55]

Sunburn

Suntans will have to wait in favor of avoiding the dangerous and consequences of UV rays, sunburn and melanomas. Aloe juice treatment should valid in this kind of burns. The enzyme bradykinase in aloe stops the inflammatory reaction wich is caused by an over exposure to the sunrays and stimulate immune system intervention. Barbalion and aloetic acid have an antibiotic and antibacterial action. The isobarbaloin ester of cinnamic acid and salicylic acid carry out action aimed at easing pain. Acemannan speeds up the repair phase (the regeneration of skin tissue), intervening in the stimulation of macrophages and the increased production of fibroblast and collagen[56]

Table 1: Water phase and oil phase ingredient for formulation of *A. vera*cream which is usedfor protection of UV and sunlight

S.No.	Ingredient	Weight % (to 100)
	A. Water phase	
1.	Carbomer	0.30
2.	*Aloe barbadensis*Leaf Juice	58.93
3.	Propylene Glycol	5.00
4.	. Methylparaben	0.20
5.	. Propylparaben	0.10
6.	Triethanolamine	0.45
7.	Tetrasodium, Ethylenediaminetetraacetic acid (EDTA)	0.02
	B. Oil phase	
8.	EthylhexylMethoxycinnamate [Octinoxate]	5.00
9.	Benzophenone-3 [Oxybenzone]	3.00
10.	Glyceryl Stearate, polyethylene glycol (PEG-100) Stearate	1.00
11.	Cyclopentasiloxane	5.00
12.	Glyceryl Stearate	4.00
13.	Stearic Acid	2.50
14.	IsostearylIsostearate	10.00
15.	Hydrogenated Castor Oil	2.00
16.	C12-15 Alkyl Benzoate	2.50

Procedure

In the main vessel, disperse Carbomer in *Aloe barbadensis*Leaf Juice. When uniform, add remaining water phase ingredients and start heating to 85°C. Meanwhile, combine oil phase ingredients in a separate vessel and heat with mixing to 85°C. When both phases are at 85°C and uniform, slowly add oil phase to water phase with strong mixing. When the batch isuniform (but at least 15 minutes after the last of oil phase has been added) start cooling withmoderate agitation. When the batch has cooled to the desired filling temperature, stop coolingand mixing Perform quality assurance checks.

Shampoo

Aloe juice posses several substances and a particular characteristic which make it useful in stopping hair loss its acidityor its pH.it having 6 pH that is weak acid and very close to the pH of skin, which allows easy penetration of the scalps corneal stratum and together with aloes nutrients revitalize the hair bulb or follicles, strengthening it and promoting hair growth. The antifungal action of various active principles contained in aloes juice is useful for curative purpose as well as in the case of seborrheic eczema.[57,58]

Table 2: Ingredient for the formulation of *A. vera*shampoo

S.No.	Ingredient	Wt % (to 100)
1.	*Aloe* barbadensis Leaf Juice	31.4
2.	Tetrasodium EDTA	0.3
3.	Styrene/Acrylates Copolymer	1.0
4.	TEA-Lauryl Sulfate	56.0
5.	Colorant	q.s.
6.	CocamidopropylBetaine	5.0
7.	Hydrolyzed Wheat Protein (20% solids)	0.4
8.	Cocamidediethanolamine (DEA)	4.0
9.	Dimethicone, Laureth-8, Succinoglycan	1.6
10.	Quaternium-15	0.3
11.	Fragrance	q.s.
12.	Citric Acid	q.s.
13.	Sodium Chloride	q.s.

Procedure

Heat item 1 to 40°C and add item 2. When uniform, slowly add item 3 with strong, smoothmixing. When uniformly dispersed, add the remaining ingredients in the order listed. Adjustto pH 5 with item 12 and adjust viscosity with Sodium Chloride as desired.

Bath and Shower Gel

A shower gel based on *Aloe* is a superior cleanser, leaving a protective film on the skin (bythe presence of acemannan) prevents the invasion of dirt for an extended period, gives it a pleasant fresh and clean sensation [59,60]

Table 3: Ingredients for the formulation of *A. vera*bath and shower gel

S.No.	Ingredient	Wt % (to 100)
1.	*Aloe* barbadensis Leaf Juice	45.4
2.	Tetrasodium EDTA	0.3
3.	Styrene/Acrylates Copolymer	1.0
4.	Sodium Laureth Sulfate, Cocamidopropyl Betaine Cocamide DEA, Lauramide DEA	50.0
5.	Colorant(s)	q.s.
6.	Hydrolyzed Wheat Protein (20% solids)	0.5
7.	PPG-12-PEG-65 Lanolin Oil	0.5
8.	Dimethicone, Laureth-8, Succinoglycan	2.0
9.	Polymethoxy Bicyclic Oxazolidine	0.4
10.	Fragrance	q.s.
11.	Citric Acid	q.s.
12.	Sodium Chloride	q.s.

Procedure

Heat item 1 to 40°C and adds item 2 and then, slowly, item 3 with strong, smooth mixing.When uniformly dispersed, add the remaining ingredients in the order listed. Adjust to pH 5with item 11 and adjust viscosity as desired with item 12.

Moisturizing Liquid Lotion

Used indicated after using makeup remover, acts toning up closing pores, in order to prepare skin for regular cream application. It is recommended morning and night use [59,60]

Table 4: Oil phase and water phase ingredient use for the formulation of *A. vera*moisturizinglotion

S.No.	Ingredient	Wt % (to 100)
	A. Oil phase	
1.	CetylPalmitate	3.0
2.	Glyceryl Stearate (and) PEG-100 Stearate	2.5
3.	Triisostearin	1.0
4.	Cetyl Alcohol	2.0
5.	Cetyl Alcohol	8.0
	B. Water phase	
6.	*Aloe* barbadensis Leaf Juice	80.0

7.	Glycerin	3.0
8.	Methylparaben	0.2
9.	Propylparaben	0.1
10.	Colorant(s)	q.s.
	Other components	
11.	Xanthan Gum	0.2
12	Fragrance	q.s.

Procedure

Heat oil and water phases separately to 75-80°C then mixing to homogeneity slowly add thewater phase to the oil phase at high shear, mixing to uniformity (at least fifteen minutes). When uniform, start cooling with moderate agitation. When cooled to 50°C, add theremaining ingredients in order when uniform and at the desired filling temperature stopcooling and mixing.

Moisturizing Liquid Soap

Soap *Aloe vera*is especially suitable for sensitive skins and skin fatty. Due to its natural components, moisturizes, protects and softens the body[59,60]

Table: 5 Ingredient use for formulation of *AloeVera*moisturizing liquid soap

S.No.	Ingredient	Wt % (to 100)
1.	Water (deionized)	40.7
2.	Colorant(s)	q.s.
3.	*Aloe* barbadensis Leaf Juice	5.0
4.	Potassium Cocoate	40.0
5.	Sodium Laureth Sulfate	5.0
6.	Cocamide DEA	5.0
7.	Glycol Stearate	2.0
8.	Sodium Chloride	1.5
9.	Hydrolyzed Collagen (55% solids)	0.5
10.	Fragrance	q.s.
11.	Quaternium-15	0.3
12.	Citric Acid	q.s.

Procedure

Combine items 1 through 9, heating and maintaining kettle at 70-75°C until contents aremolten and homogeneous. Cool to 35°C with continuous agitation and then add items 10, 11and 12 (to desired pH). Stop mixing and cooling when uniform and at desired fillingtemperature.

Deodorant Rollon

Natural deodorant that protects, smoothes and moisturizes at the same time that allows perspire naturally removing unpleasant corporal smells. Aluminium salts not included[60]

TOXICITY AND CONTRAINDICATIONS

All herbal products carry the potential for contamination with other herbal products,pesticides, herbicides, heavy metals and pharmaceuticals. Allergic reactions can occur to anynatural product in sensitive persons. Allergic reactions Contact dermatitis has been reported, potentially toxic compounds in Aloe Anthraquinone glycosides.[61, 62]

HERBAL INTERACTION

Application of *Aloe* to topical skin may increase the absorption of steroid creams such as hydrocortisone. It reduces the effectiveness and may increases the adverse effects of digoxin and digitoxin, due to its potassium lowering effect. Combined use of *Aleovera*and furosemide may increase the risk of potassium depletion. It decreases the blood sugar levels and thus may interact with oral hypoglycemic drugs and insulin. Low levels of potassium (due to laxative over use) could interfere with cardiac glycosides as well as affect other antiarrhythmic agents. Potassium deficiency can be exacerbated by simultaneous applications of thiazide diuretics, cortico-adrenal steroids or licorice root.[63]

CONCLUSION

Hence there is no wonder in considering *Aloe vera* as the 'Wonder plant'. The plant has importance in everyday life to soothe a variety of skin ailments such as mild cuts, an- tidote for insect stings, bruises, poison ivy and eczema along with skin moisturizing and anti ageing, digestive tract health, blood and lymphatic circulation and func- tioning of kidney, liver and gall bladder makes it a boon to human kind. *Aloe vera* as the "wonder plant" is mul- tiple from being an antiseptic, anti-inflammatory agent, helps in relieving like cancer and diabetes, and being a cosmetic field. Aloe vera, has an important place among such wound healing medicinal plants, it can also be used in treating inflammation, pain, ulcer and

antihyperglycaemic agent. Furthermore, in future study, the isolated principles from Aloe vera needs to be evaluated in scientific manner using various innovative experimental models and clinical trials to understand its mechanism of action. The dried gel has also showed potential as an excipient in modified release matrix type tablets.

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