ANTI-AGING
EXTRACTS

ALOE VERA 10X-D GEL FOR MAKING COSMETICS AND SHAMPOO

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ALOE VERA 10X-D GEL FOR MAKING COSMETICS AND SHAMPOO

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HOW TO FORMULATE ALOE VERA GEL FOR ANTI-AGING, HEALING, SCARS, ACNE, DANDRUFF, AND OTHER SKIN ISSUES

PROPERTIES OF ALOE VERA GEL FOR COSMETICS AND SHAMPOO

FORMULATING NOTE:

You should be able to decipher how aloe vera can be formulated with the following subject matters. The circumstances or other ingredients may be different than your application so good judgement will be required. It is difficult to come up with percentages required for the different applications. As a rule of thumb, 1% is low, 10% is great.

ANTI-AGING EXTRACTS

SUBJECT MATTERS/INDEX

Aloe Vera Gel for healing, making cosmetics and shampoo

INTRODUCTION

Nowadays, the health benefits provided by *Aloe vera* are vastly known, being present in diverse treatment plans that go from purely cosmetic and beauty procedures to more clinically-based ones.

Through scientific research, numerous studies have demonstrated the positive effects this plant has, especially for the skin wellbeing. Thanks to its increased hydrating, moisturizing, and elastin and collagen-producing properties, *Aloe vera* is capable of helping solve different skin conditions; including facial wrinkles, aging spots, increased pigmentation, dry skin, among others (1, 2, 3).

In addition, its anti-inflammatory and immunomodulatory effects help the body defend itself from bacterial, fungal, and viral activity, increasing the afterward self-healing process evidenced in burns and wounds (2, 4, 5, 6).

However, to enjoy all of the *Aloe vera* health benefits is fundamental to use an extract that provides them without removing any positive property or including not useful ingredients in the mixture.

With this in mind, we at Anti-Aging Extracts can proudly say that our product is considered superior to other forms of *Aloe vera*.

Here is why.

Following established guidelines.

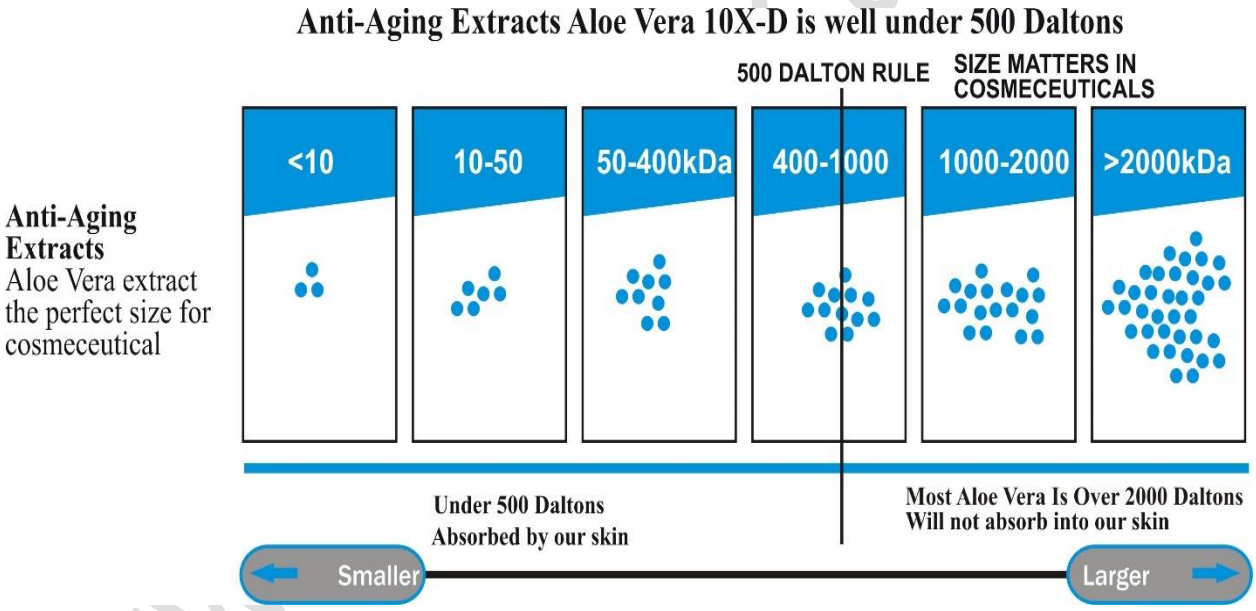
The International Aloe Science Council (IASC) has established specific standards of product strength, considering the minimum required for an *Aloe vera* juice to be 1% total Aloe solids in *Aloe vera* purified leaf juice and 0.5% total Aloe solids for inner leaf juice ingredients (7).

Following IASC guidelines and regulations, our product guarantees no less than 10% of Aloe strength by dry weight for inner leaf and no less than 8% by dry weight for purified leaf, surpassing every possible commercial concentration out there.

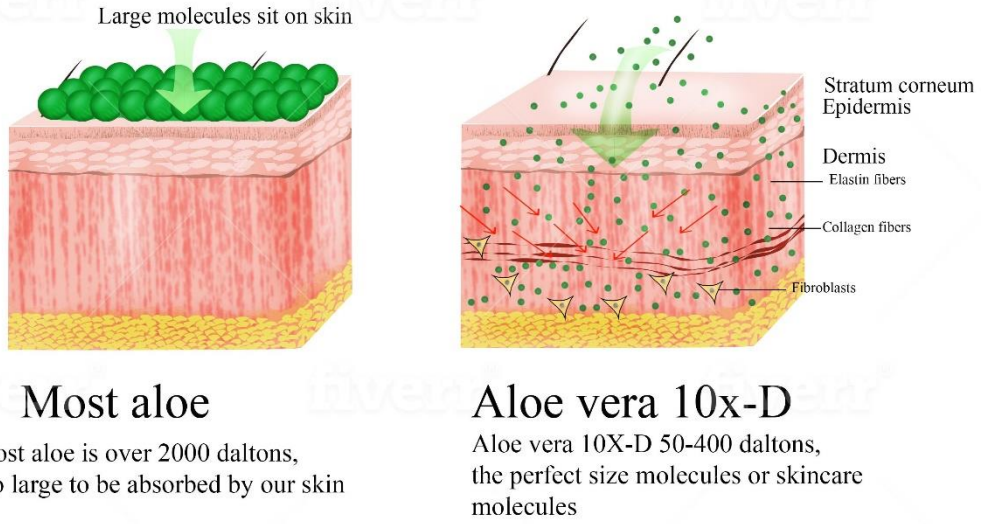
Polysaccharides: the measure of greatness.

Experts on the matter assure that the above-mentioned beneficial properties are directly linked with the *Aloe vera* polysaccharides type, composition, and concentration. Biochemically, these elements are long-chained sugars that can be found in all plant. However, *Aloe vera* contains a special type of polysaccharide called Acemannan, which is in charge of providing many of the Aloe positive health effects.

Today, for purely commercial reasons, many of the products commercialized use denatured and diluted mixes of *Aloe vera*. Certainly, this process affects the quality of the final product, reducing both the polysaccharides concentration to the minimum accepted along with its health benefits (7).



ALOE VERA 10X-D



500-DALTON RULE APPLIES TO SKINCARE – COSMECEUTICAL GRADE ALOE VERA

Human skin has unique properties of which functioning as a physicochemical barrier is one of the most apparent. The human integument (tough outer protective layer) can resist the penetration of many molecules. However, especially smaller molecules can surpass transcutaneous. They can go by the corneal layer, which is thought to form the main deterrent. The molecular weight (MW) of a compound must be under 500 Dalton to allow skin absorption. Larger molecules cannot pass the corneal layer.

Arguments for this "500 Dalton rule" are.

1) virtually all common contact allergens are under 500 Dalton, larger molecules are not known as contact sensitizers. They cannot penetrate and thus cannot act as allergens in man.

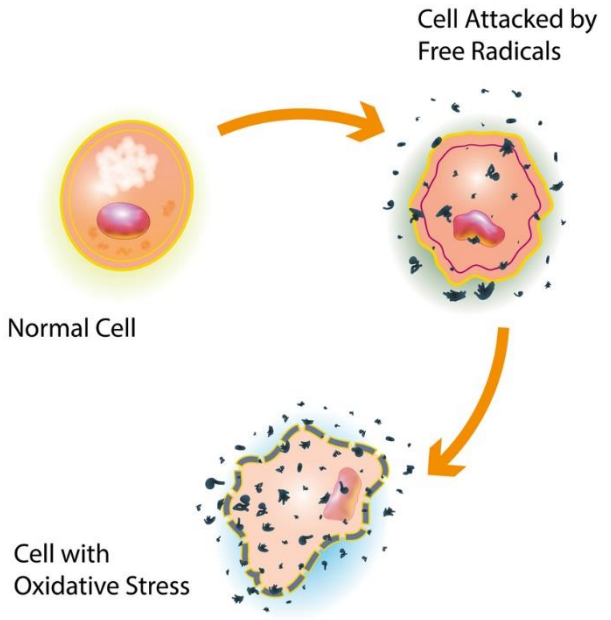
2) the most used cosmeceutical agents applied in topical dermatotherapy are all under 500 Dalton.

3) all known topical drugs used in transdermal drug-delivery systems are under 500 Dalton. For cosmeceutical development purposes, it seems logical to restrict the development of new innovative compounds to a molecular weight

of under 500 Dalton, when topical dermatological therapy or percutaneous systemic therapy.

FORMULATION TIPS FOR ALOE VERA GEL

Aloe vera gel can be added to any product where moisturization or mildness is required. Generally aloe is compatible with cationic, anionic, and non-ionic ingredients (consider the ionic charge of your emulsifiers and surfactants) With anionic ingredients only a limited amount of gel can be incorporated where the quinones can react with the base to cause product discoloration. In addition, the natural pH of the aloe gel can cause the neutralization of the product (Meadows, 1980).



ANTIOXIDANT EFFECT OF ALOE VERA

Several antioxidants such as tocopherol, carotenoids, ascorbic acid, flavonoids, tannins, vitamin C and E are present in aloe vera. Aloe vera are able to capture free radicals and nitric oxide in a concentration dependent manner, as seen in an in vitro study of the efficacy of the gel (Saini et al, 2011).

Psoriasis Treatment by Aloe Vera:

Aloe vera extract is also used in a hydrophilic (having a tendency to mix with, dissolve in water) cream for the treatment of Psoriasis. A randomized, double-blind, placebo-controlled, four-week study of 60 patients with mild-to-moderate chronic Psoriasis compared the use of a topical aloe vera extract vs. a placebo cream. Each subject applied the creams to the affected areas. Every subject had four weeks of active treatment, and during that period, progressive reduction of desquamation, followed by decreased erythema, infiltration, resulting in moderate to excellent improvement or complete resolution of psoriatic lesions, was noted. By the end of the 4-week active treatment (45%) patients and 46.7% of psoriatic plaques were cured. Aloe hydrophilic cream cured 83.3% of patients treated vs. 6.6% in the control group. The patients subsequently were followed for a 12-month period, during which there were no relapses and side effects.

The results of this study may suggest that the extract acted in an occlusive manner, keeping the skin moistened and, at the same time, directly inhibiting the psoriatic plaques

by suppressing proliferation and stimulatory differentiation of the cells in the epidermis.

Concentration: 0.5% (aloe vera extract in a hydrophilic cream)
Reference: (Syed et al., 1996)

Wound Healing Potential of Aloe Vera Leaf Gel

Aloe vera leaf gel extracts having the potential to satisfy all the requirements of an ideal dressing material in that it provides an environment at the surface of the wound in which healing takes place at the maximum rate consistent with the formation of granulation tissue with an acceptable cosmetic appearance and also provides a rationale for the use of Aloe vera preparations in the traditional system of medicine to promote wound healing. A well-advanced organization of granulation tissue was noticed in leaf extract treated rabbits on 7th day, and complete healing and formation of the scar were found in rabbits after 14 days of treatment with Aloe vera. The enhanced rate of wound contraction and a significant reduction in healing time in treated rabbits compared to untreated rabbits might be due to enhanced epithelization facilitated by Aloe vera gel ingredients.

Percentage: 10% (An ethanol-free extract of aloe vera leaf gel was mixed with soft white paraffin for the preparation of w/w ointment).

Reference: (Subramanian, Kumar, & Arulselvan, 2006)

Aloe Vera Gel Acne Wound Healing Properties

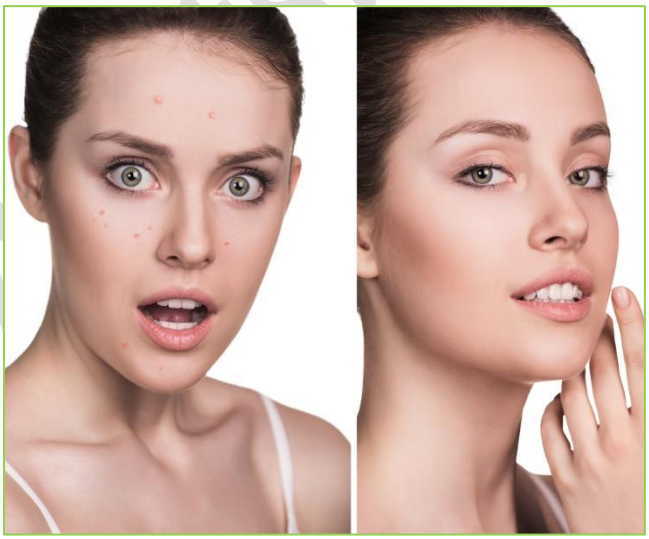
Aloe vera is used for the healing of acne wounds. A study was conducted on eighteen patients with facial scarring from acne vulgaris. After full-face dermabrasion, one side was treated with the standard polyethylene oxide gel wound dressings; another side was treated with a polyethylene oxide gel dressing saturated with stabilized aloe vera. The aloe site healed more rapidly in every case. Although there was slight initial burning noted on the application of aloe vera gel, the patients usually felt less overall pain and throbbing on the aloe site. Re-epithelialization (is the reconstitution of the cells of the epidermis in order to cover the injured site and restore barrier function) was complete to 90% on the aloe side compared with 40–50% on the control side after five days. The aloe gel appeared to provide an approximate 72-hour reduction in wound healing. The recent studies suggested that aloe vera accelerates wound healing by promoting the proliferation and migration of fibroblasts and keratinocytes and by protecting keratinocytes from preservative-induced death.

Concentration: Saturated (polyethylene oxide gel dressing saturated with stabilized aloe vera)

Reference: (Fulton Jr, 1990)

Aloe Vera Gel use in Acne Treatment and Healing

Aloe vera is used with other creams in the treatment and healing of acne vulgaris. The study compared the efficacy and safety of the combination of tretinoin (TR) cream (0.05%) and Aloe vera topical gel with TR and vehicle in an 8-week trial. The results of this randomized, double-blind trial demonstrate that the combination therapy of TR and A. vera was well tolerated and results in significantly greater improvement in mild to moderate acne vulgaris than drug and placebo. The combination therapy of TR and Aloe vera took 4-8 weeks to significantly reduce the lesion score than the control group. This combination therapy effectively treated both inflammatory and non-inflammatory lesions and showed less AEs, especially in skin erythema.



Concentration: 50% (Aloe vera topical gel in combination with tretinoin cream)

Reference: (Hajheydari, Saeedi, Morteza-Semnani, & Soltani, 2014)

Aloe Vera use in Acne Treatment

Aloe is used in various herbal creams to treat acne due to its anti-inflammatory and bacteriostatic activities. A study was conducted on sixty patients with mild to moderate acne vulgaris were randomly divided into three groups: treated with cream containing 20% propolis, 3% “tea tree oil”, and 10% “Aloe vera” (PTAC propolis, tea tree oil, aloe) (n=20); or with 3 % erythromycin cream (ERC) (n=20); or with placebo (n=20). Results showed that PTAC improved the erythema index of papules and erythematous scars more prominently than

erythromycin cream, as demonstrated by early action on scar inflammation, unlike the erythromycin cream, improved since the first 15 days. PTAC cream was able to reduce acne severity index by 68%, and the total lesion count by 64% after 30 days of daily use compared to 50% and 47%, respectively, by erythromycin cream. The PTAC formulation was better than erythromycin cream in reducing erythema scars, acne severity index, and total lesion count. The anti-inflammatory efficacy of the product can be linked to the presence of Aloe vera and propolis.

Concentration: 10%(Aloe vera + propolis + tea tree oil)
Reference: (Mazzarello et al., 2018)

Healing Property of Aloe Vera

Experimental animals were given Aloe vera in Eucerin cream topically. The control animals received cream only. A 50.8% reduction was recorded in animals receiving topical 25% A. vera compared to control animals. This data suggests that Aloe vera is effective by topical routes of administration.
Percentage: 25% (Aloe vera gel was mixed with Eucerin cream)

Reference: (Vera, 1989)

Aloe Use in the Treatment of Dandruff and Scalp Issues

(Seborrheic dermatitis/ Seborrheic Eczema)
Aloe vera is commonly used in the treatment of Seborrheic dermatitis (dandruff), a common inflammatory skin disorder that affects your scalp and causes scaly patches, red skin, and stubborn dandruff. Aloe vera therapy was significantly superior to placebo in reducing scaliness, pruritus, and the number of involved sites and was associated with better global improvement

ratings as assessed by both patients and physicians in 4-6 weeks. The emulsion formulated from Aloe vera crude extract was effective in the therapy of seborrheic dermatitis, inducing complete resolution, or significant improvement in 58% of the patients. Since seborrheic dermatitis is primarily an inflammatory dermatosis, the beneficial influence of observed in patients might be related to its anti-inflammatory activity. It is also conceivable that the effect in patients was partially antifungal. Topical Aloe vera therapy was well tolerated by all patients, with no significant adverse drug-related symptoms.

Concentration: 30% (Aloe vera crude extract in an emulsion base)

Reference: (Vardy, Cohen, Tchetov, Medvedovsky, & Biton, 1999)

Humectant/Moisturizing Properties of Aloe Vera Gel

Aloe is used in several cosmetic products due to its moisturizing property. In the solution of mixtures, the better results were obtained with 10% of the humectant with 10% aloe vera gel, than with 20% humectant alone. When aloe gel is added to the propylene glycol (B), or glycerin (C), it lowers their evaporation rate. The aloe gel is further utilized in the formulation of cosmetic products as a humectant and proved to be

beneficial for a moisturizing effect. The moisturizing effect of aloe vera gel appears to be due to the mix of water and polysaccharide components, creating a jelly-like consistency that holds the water within the mix and minimizes its evaporation, providing a sustained moist environment when applied to dry tissues and humectant properties that promote retention of moisture in tissues.

Experimental Percentages: 10%

Aloe anionic moisturizer formulation: 25%

Aloe nonionic moisturizer formulation: 7.5%

Reference: (Meadows, 1980)

Aloe Vera Gel helps to Prevent Wrinkles

Aloe is used to prevent wrinkles because of its substantial substances. Wrinkles are creases in the skin that develop with advancing age due to the skin's loss of collagen, whereby its elasticity and structure begin to cede. A study formulated Aloe as an anti-aging sheet mask and tested its effectiveness against the skin of volunteers. Essences were made in 4 formulations, and each essence was containing 0%, 4%, 8%, and 12% of Aloe in the same base composition. Results showed that the Aloe vera gel could be formulated to reduce/prevent wrinkles. Effectiveness is best seen in the concentration of aloe vera gel 12 % were able to improve skin condition by decreasing wrinkles. The improvement results showed by Aloe vera were in 4 weeks by applying the mask once in a week. Aloe's various nutritive substances, with their marked astringent effect, as well as its Acemannan

(Acemannan, pronounced “ace-man-nan”, is a polysaccharide found in the inner part of Aloe vera leaves), served to stimulate the production of collagen and aid in the fight against wrinkles.

Concentration: 12% (aloe gel with essence base)
Reference: (Reveny et al., 2016)

Aloe Vera Gel Protection Against Sunburns

Aloe vera leaf gel is used in sunscreen lotions to protect against UV radiation. The study attempted to develop herbal sunscreen lotion using extracts of Alpinia galanga, Curcuma longa, and Aloe vera and examined their efficacy for preventing sunburn. Results showed that the sunscreen lotions were non-mutagenic, nonirritant, stable, and possess Sun Protection Factor SPF for normal skin. The efficacy, when tested with a standard, was observed to be the same as that of a marketed sunscreen with SPF 55 and SPF 20. The sunscreen property of these extracts may be due to the presence of flavonoids, phenols, and terpenoids present in herbal drugs Alpinia galanga, Curcuma longa, and Aloe vera. Further, the formulations were proved to be non-mutagenic, which differentiates them from the synthetic sunscreens. It has been believed that Aloe gel has a modulating effect on the skin by preventing UVB sun rays from sensitizing the skin, especially in the first 24 h following exposure.

Concentration: 5% (Aloe gel mixed with ethanolic extract of Alpinia galanga (EEA), ethanolic extract of Curcuma longa (EEC), and vitamin E).

Reference: (Rasheed, Shama, Mohanalakshmi, & Ravichandran, 2012)

Exfoliation Property Aloe Vera

Aloe is used in exfoliating scrubs. A study was conducted to invent an exfoliating scrub that contains therapeutically effective amounts of niacinamide and exfoliating agents. The cream of the invention has been shown to be effective in reducing the number and severity of lesions resulting from acne and other skin conditions that cause blemishes. Aloe vera extract is included in the formulation because it is known to be effective in reducing any stinging resulting from the niacinamide. It is known to have direct beneficial effects in the treatment of acne.

Concentration: (0.25-1.25) %

Reference: (Fitzjarrell, 2002)

Anti-aging Properties of Aloe Vera Gel

Various substances contained in Aloe are believed to provide anti-aging effects. A study formulated aloe gel as an anti-aging sheet mask and tested its effectiveness against the skin of volunteers. Preparations of sheet masks were made by adding aloe gel with various concentrations, to the essence base. Essences were made in 4 formulations, and each essence was containing 0%, 4%, 8%, and 12% of aloe gel in the same base composition. Results showed that the Aloe vera could be formulated as an anti-aging sheet mask. Effectiveness is best seen in the concentration of Aloe vera gel 12 % were able to improve skin condition in terms of moisture, evenness, pore, spot, and wrinkles. The higher concentration of Aloe vera gel in the preparation can enhance the effects of

anti-aging. The improvement results showed by Aloe vera were in 4 weeks by applying the mask once in a week.

Concentration: 12% (aloe gel with essence base)

Reference: (Reveny, Surjanto, & Lois, 2016)

Aloe Vera Gel Reduces Enlarged Skin Pores

Aloe is used to decrease skin pore size in cosmetics industry. Pores may be enlarged if exposed to the sun is too hot, the increase in temperature causes the opening of the pores on the skin. A study formulated Aloe as an anti-aging sheet mask and tested its effectiveness against the skin of volunteers. Essences were made in 4 formulations and each essence was containing of 0%, 4%, 8%, and 12% of aloe gel in the same base composition. Results showed that the Aloe vera can be formulated to reduce skin pores sizes. Effectiveness is best seen in the concentration of Aloe vera 12 % were able to improve skin condition by decreasing pores sizes. The improvement results showed by Aloe vera were in 4 weeks by applying the mask once in a week. Zinc contained in aloe vera could have shrunk the pores in the skin of the face.

Concentration: 12% (aloe gel with essence base)

Reference: (Reveny et al., 2016)

Eczema/Atopic Dermatitis/Itchy and Irritated Skin Treatment by Aloe Vera Gel

Eczema, also called atopic dermatitis (AD), is a skin condition that causes patches of itchy, irritated skin. There is no particular treatment present for eczema, but Aloe is considered effective due to its moisturizing and anti-inflammatory effects. A study compared the effects of topically applied extracts of Aloe ferox with that of Aloe vera on the symptoms as well as IgE levels (Immunoglobulin E) of a mouse model of atopic dermatitis. The gels were applied on daily basis for 10 days on affected areas. The gels of both the Aloe species inhibited the cutaneous inflammatory response as well as serum IgE levels in the rats. These gels proved to be safe and useful alternatives for the treatment of patients suffering from recurring chronic AD.

Concentration: 0.25% (Aloe 96% pure extract in sesame oil)

Reference: (Finberg, Muntingh, & van Rensburg, 2015)

Genital herpes Treatment by Aloe Vera Gel

One study evaluated the effect of aloe vera in hydrophilic cream and aloe vera gel versus placebo for the treatment of genital herpes and concluded that aloe vera in hydrophilic cream is more effective than Aloe vera gel, but that both resulted in faster healing times compared to placebo. Both aloe cream and gel were effective in reducing healing time compared to placebo (4.8 vs. 7.0 vs. 14.0 days, respectively), aloe cream was more efficacious in the number of cured

patients compared to gel (70% vs. 45% vs. 7%, respectively, no side effects observed).
Concentration: 0.5% (aloe extract in hydrophilic cream)
Reference: (Syed et al., 1996)

Lichen planus Treatment by Aloe Vera Gel

Aloe is used for the treatment of erosive and ulcerative lesions in the condition of Lichen planus. The duration of the study was 8 weeks and aloe vera gel was applied twice a day. The results showed that lesions were significantly reduced in Aloe vera gel group compared to placebo with complete remission or good response in 88% of patients compared to 4% in placebo group.
Concentration: Aloe vera gel (containing 70% of aloe mucilage)
Reference: (Choonhakarn, Busaracome, Sripanidkulchai, & Sarakarn, 2008)

UV-induced erythema treatment by Aloe Vera Gel

Aloe is topically used for the treatment of UV-induced erythema. A study compared 97.5% aloe gel to 0.25% prednicarbate, 1% hydrocortisone in placebo gel, 1% hydrocortisone cream, and placebo gel for the treatment of UV-induced erythema. The occlusive bandage was applied for 2 days on the affected area. Significant reduction of erythema by aloe gel compared to 1% hydrocortisone in placebo gel after 2 days, 1% hydrocortisone cream was more effective.
Concentration: 97.5%
Reference: (Reuter et al., 2008)

Replenish amino acids, vitamins, and minerals found in Aloe Vera Gel 10X-D

Aloe provides 20 of the 22-human required amino acids and 7 of the 8 essential ones. These amino acids provide the basic building blocks of proteins in the production of muscle tissue etc. Vitamin A, C, E, B, Choline, B12, and Folic Acid are found in Aloe. Vitamin (A, C, and E) are antioxidants that neutralizes free radicals. Vitamin B's and Choline involved in amino acid metabolism, B12 required for production of red blood cells, and Folic Acid in the development of blood cells. Aloe provides 9 minerals: calcium, chromium, copper, iron, magnesium, manganese, potassium, sodium, and zinc. These minerals are essential for good health and are known to work in certain combinations with each other, vitamins, and other trace elements.

Reference: (Barcroft & Myskja, 2003)

Beneficial compounds found in Aloe Vera Gel

(excluding amino acids, vitamins, and minerals)

Aloe Provides 8 enzymes: Alliinase, alkaline phosphatase, amylase, carboxypeptidase, catalase, cellulase, lipase, and peroxidase. These enzymes help breakdown of food sugars and fats aiding digestion, enhancing nutrient absorption and provide antioxidant property. Aloe provides two hormones (Auxins & Gibberellins) that helps in wound healing and anti-inflammatory actions. Aloe provides monosaccharaides (glucose & fructose) and Polysaccharides (glucomannans / polymannose) that provides anti-inflammatory actions, anti-viral, and immune modulating activity of

Acemannan. Aloe provides 12 anthraquinones that provide analgesic, antibacterial, anti-fungal, and anti-viral activity in small quantity but may prove to be toxic in higher concentration. Aloe vera also provides ligin (penetrating power of aloe vera), salicylic acid (analgesic), sterols (cholesterol, campesterol, lupeol, and sitostero), and glycosides.

Reference: (Sajjad & Subhani Sajjad, 2014)

Aloe Vera Toxicity For Skincare Products and Haircare Products

(No study is available for aloe/aloin topical toxicity/carcinogenicity in human because generally considered as safe this data is from lab experiments)

Aloe vera is generally considered as safe for topical application; however, a few side effects and complications have been reported. The cytotoxicity (toxic to living cells) of a low molecular weight fraction (LMWF) obtained from Aloe vera gel was determined by two different assays. The toxic activity of LMWF was compared to that of sodium dodecyl sulfate (a well-known toxic substance), aloe-emodin and aloin (an anthraquinone and its precursor present in Aloe vera cortex) using the chemiluminescence assay, and was found to be of similar potency to these toxic substances on a weight-to-weight basis. These results confirm that Aloe vera gel contains toxic low molecular weight compounds, and every effort must be made to limit the amount of these toxins in the commercially prepared Aloe vera gel products. These observations are based on microscopic observation of fibroblasts as well as an analysis of the release of ROS (Reactive oxygen species) by Neutrophils in the presence or absence of LMWF (Avila, Rivero, Herrera, & Fraile, 1997) .

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). episodes

of contact dermatitis, erythema, and phototoxicity have been reported from topical applications.

Aloe Vera Gel Adverse Effects for Topical Applications

The allergic reaction has been attributed in most cases to anthraquinone contaminations in the gel. One randomized trial reported delayed wound healing with topical aloe gel, applied following complicated gynecological surgeries. Thus, topical Aloe may not be advisable for the promotion of postoperative incision healing. Photodermatitis has also been reported. In one case report, a 65-year-old woman who was 2 weeks postdermabrasion applied A. vera leaf gel to her skin, which produced stinging, induration, and erythema. The patient was prescribed hydrocortisone and diphenhydramine ointment, and the dermatitis subsided over time. 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).

Aloin Toxicity In Aloe Vera

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. 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. Recently, anthraquinone and aloin present in Aloe vera gel have been related to the risk of tumors and colon cancer (Aldhous, 2011; Mulay, 2014).

Jurkat T cells, an established model for the study of compound toxicity, were used to evaluate the effect of aloin on cell viability. Cells were analyzed using flow cytometry and microscopy for cell size and granularity, cell membrane integrity, mitochondrial membrane potential, and cell cycle profile. Treatment

with aloin resulted in a reduction in cell size, compromised membrane integrity, and loss of mitochondrial membrane potential in a dose-dependent manner. Additionally, treatment with aloin resulted in alteration of the cell cycle, specifically a block at G2/M phase. Importantly, the loss of cell membrane integrity was preceded by a loss of mitochondrial membrane potential, suggesting a mitochondrial-dependent pathway for aloin-induced apoptosis. These observations provide insight into the potential mechanisms of aloin-induced toxicity and thus, perhaps, Aloe preparation-induced toxicity. Furthermore, because of the concern over the safety of aloe-based supplements, this work suggests that aloe supplements not containing aloin may be safer than aloe supplements containing aloin, and that aloin should be considered in addition to concentrations of aloe-emodin (Buenz, 2008).

Carcinogenetic Effects of Topically Applied Aloe Vera

There is no carcinogenetic data available for topical application of aloe vera in human. In a study of photo-co-carcinogenesis with simulated sunlight, four articles were studied by skin application in hairless mice: three test articles containing Aloe vera that included gel, whole leaf extract, and decolorized whole leaf extract; and an aloe-emodin preparation. Almost all mice exposed to simulated sunlight developed skin neoplasms. No increase in the incidence of skin neoplasms was observed in the groups receiving any of the four test articles applied as a cream followed by simulated sunlight when compared with the group receiving control cream followed by simulated sunlight. There was a significant enhancing effect of Aloe vera gel cream or aloe emodin cream on the photocarcinogenic activity of simulated sunlight in female mice based on an increase in the multiplicity of squamous cell papilloma, carcinoma or carcinoma in situ (combined). There was a significant enhancing effect of the whole leaf extract cream or decolorized whole leaf extract cream on the

photocarcinogenic activity of simulated sunlight in both male and female mice, based on an increase in the multiplicity of squamous cell papilloma, carcinoma or carcinoma in situ.

The portent plant with a purpose: Aloe vera. Journal of Pharmacognosy and Phytochemistry. 2019; 8(3): 4124-4130.~ 4124~Journal of Pharmacognosy and Phytochemistry 2019; 8(3): 4124-4130 http://www.phytojournal.com/archives/?year=2019&vol=8&issue=3&ArticleId=8681&si=false

Composition of Aloe Vera

Reference for Composition of aloe vera
The portent plant with a purpose: Aloe vera
Nidhi Singh, Zia Iqbal, Tanveer Alam Ansari, Mukkaram Ali Khan, Nazim Ali, Afifa Khan And Manali Singh

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 in aloe vera
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
- Leucine
- Lysine
- Methionine

- Threonine
- Phenylalanine
- Valin

Aloe vera also contains 12 non-essential amino acids

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

Hormones in aloe vera

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 in aloe vera

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 in aloe vera

Aloe vera contains 12 anthraquinones.

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

Enzymes in aloe vera gel

Aloe vera contains different enzymes.

- Alkaline Phosphatase
- Amylase
- Alliinase
- Cellulase
- Catalase
- Carboxypeptidase

Vitamins in aloe vera gel

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
- Folate

Vitamins A, C and E have antioxidant 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 in aloe vera

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 in aloe vera

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 in aloe vera

Aloe vera contains four plant sterols

- Lupeol
- Sitosterol
- Cholesterol
- Campesterol

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

Salicylic Acid in aloe vera

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 in aloe vera

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

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