

## A Brief Scientific Review on Aloe Vera

Mohammad Kamil \*

Lotus Holistic Health Institute Abu Dhabi, UAE.

\*Corresponding Author: Mohammad Kamil, Lotus Holistic Health Institute Abu Dhabi, UAE.

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### Abstract

This plant has been traditionally used through the centuries; for both internal ingestion as well as for topical purposes. Historically, the aloe plant has enjoyed wide use for its enhancement of normal gastrointestinal functioning.

**Keywords:** balancing blood sugar; antibiotic; anti-inflammatory

### Introduction

In continuation of my earlier work<sup>1</sup>, I would like to describe more detailed work carried out on Aloe vera, along with medicinal and traditional uses, constituents, and adulteration reported in some of its products in the best interest of public health, as a review.

Aloe is one of the oldest healing plants known to mankind. It is even described in the bible for its healing properties. Hundreds of Scientific Research Papers describe the activities of Aloe Vera taken internally or applied externally to the skin or hair. These Research Papers include, but are not limited to the following nutritional uses: A natural cleaner, powerful in penetrating tissue, relieving pain associated with the joints and muscles, bactericidal, acts as a strong antibiotic, virucidal when in direct contact for long periods, fungicidal, anti-inflammatory, instrumental in increasing circulation to area, breaks down and digests dead tissue, and moisturizes tissues. [2-10].

This plant has been traditionally used through the centuries; for both internal ingestion as well as for topical purposes. Historically, the aloe plant has enjoyed wide use for its enhancement of normal gastrointestinal functioning. It has been used by many for constipation, intestinal colic, inflammatory conditions of the small and large intestine, and for digestive disturbances. Topically, aloe has demonstrated benefits in assisting in the healing of minor cuts, wounds, and burns. More recent research and clinical use have shown even wider applications for this amazing plant including enhancing immunity, balancing blood sugar, and providing pain relief.

### Aloe vera leaves

Aloe has been used topically for cuts, burns, insect stings, bruises, acne and blemishes, poison ivy, welts, skin lesions, eczema, and sunburns. Aloe also has a history of traditional use by Native Americans for stomach disorders and intestinal disorders including constipation, hemorrhoids, colitis, and colon problems. Additionally, numerous constituents within aloe vera have demonstrated enhancement of immune system functioning within the body. With the impressive elements found in Aloe that work in synergy with one

another, it's no wonder that Aloe Vera is so effective in the nutritional assistance and supplementation of the human metabolism.

### Constituents

There are over 100 active biological constituents found within aloe. The plant is a rich source of many natural health-promoting substances including:

Vitamins/Minerals - Vit C, A, E, B vitamins, B-carotene, Zinc, Calcium, Copper, Magnesium, Manganese, and Phosphorous.

Enzymes - At least five different enzymes have been identified and likely more are contained within.

Amino Acids - Twenty-two amino acids are found within aloe.

Plant sterols - These plant-based compounds are potent anti-inflammatory agents.

Gibberellin - A growth factor that assists in healing.

Polysaccharides - Including B1-3 and B1-4 Glucmannans known for their immune-stimulating effects. Based on its constituent makeup, aloe has a wide array of applications.

### Traditional Use Scientific Literature References

Aloe vera is widely used in phytomedicine.

- As an aid for protecting the skin's immune system against UV damage
- Isolation of active compounds from Aloe vera with a possible role in skin protection
- Immunoprotective effect preventing skin cancer and maintaining effective immune responses to infectious disease after sun exposure

- Protective effect on mild damage caused by type-II diabetes on kidney tissue.
- Gastric acid anti-secretory activity; could Gastric mucosa protection
- Immunomodulatory and antimicrobial effects.
- Randomized, double-blind, placebo- controlled trial of oral aloe vera gel. Effective against active ulcerative colitis

Strickland et al., 2004  
Kostalova et al., 2004  
Henry Ford Health System, USA, 2004  
Bolkent et al., 2004  
Yusuf et al., 2004

Tan BK, Vanitha J., 2004  
Langmead et al., 2004

- Antioxidant activity Beppu et al., 2003
- Antiinflammatory activity Yagi A, Takeo S., 2003
- Technology of eye drops containing aloe and eye drops containing both aloe and neomycin sulfate.

Kodym et al., 2003

#### Supportive Information:

1. Wound healing - Numerous studies have shown improved wound healing in both diabetics as well as non-diabetic individuals using Aloe Vera. Aloe stimulates epidermal growth factor (responsible for enhancing skin growth), and enhances fibroblast function (cells responsible for collagen formation). This results in the "healing and sealing" of wounds and makes topical Aloe an important product for assistance in the healing of minor burns, cuts, scrapes, and even skin ulcers.

2. Immune modulation - Research has indicated that Aloe has the ability to stimulate macrophages. Macrophages help the immune system to "see" dangerous microorganisms and tumor cells and assist in their destruction. The long-chain polysaccharides (B1-3 and B1-4 Glucomannans) have direct immune enhancing and modulating properties. These properties include increasing immune cell production and stimulating and improving white blood cell activity. Aloe thus provides excellent nutritional support for an optimum functioning immune system.

3. Enhancing GI functioning - Dr. Jeff Bland studied the effects of Aloe on the GI (gastrointestinal) tract. He found improved bowel regularity, increased protein absorption, decreased unfriendly bacteria and yeast, and increased water content of the stool. In this study, the use of aloe also resulted in an overall improvement in an individual's energy and sense of well-being in addition to enhanced bowel functioning.

4. Anti-inflammatory - Aloe has shown biologic anti-inflammatory properties over a wide range of animal experiments. The sterols in Aloe have strong abilities to inhibit acute inflammation, similar to cortisone, without any of the side effects. It is believed that aloe works in a manner similar to aspirin in blocking prostaglandin effects but this remains to be proven.

#### Additional Uses

1. Analgesia (Pain Relief) - A number of the smaller chain

polysaccharides found within aloe have anti-inflammatory activity as do the plant sterols. Numerous pain conditions, such as arthritis, involve inflammation. Aloe may reduce joint and muscle pain due to its anti-inflammatory properties.

2. Blood Sugar Balancing - Lowering of blood sugar has been observed in individuals ingesting Aloe on a regular basis. One single-blind study in Thailand reported that combining 1 tablespoon of Aloe Juice twice daily with glyburide (a medication to lower blood sugar in diabetics), significantly improved blood sugar and lipid levels in people with diabetes, compared with placebo. Previously, glyburide by itself had not effectively controlled diabetes in the people in this study. Aloe may therefore have numerous beneficial effects in diabetic individuals.

#### Recommended Use:

Juices - 2 to 4 oz. daily for wellness and prevention purposes, 6 to 12 oz daily for intensive tissue and organ support  
Topical - Apply 1 to 3 times daily as needed

#### Side Effects:

As aloe juice may lower blood sugar, careful monitoring of blood glucose is recommended for diabetic individuals currently on blood sugar-lowering medication.

Market Aloe Royal

TLC analysis using methanolic extract shows the presence of the following compounds:

1. Royal jelly
2. Vitamin C
3. Vitamin B3
4. Vitamin E
5. Vitamin B6
6. Vitamin B2
7. Folic acid
8. Fructose
9. Benzoic acid and sodium benzoate
10. Sorbic acid
11. Vitamin A

GC-MS analysis shows the presence of the following compounds:

1. Thymine
2. Niacinamid (Vitamin B3)
3. Glycerine
4. Palmitic acid
5. Tricyclodecane methanol
6. Oleic acid
7. P-chlorophenyl hydrazine or Benzene-1-chloro-4-methoxy
8. 2-Amino-6-methoxy purine
9. 4H-Pyran-4-one, 2,3-dihydro-3,5-dihydroxy-6 methyl
10. Benzoic acid
11. Squalene
12. Pantalactone
13. 1-Eicosanol
14. Isopropyl palmitate

Result for identification of the following compounds:

Sildenafil: -ve Tadalafil: -ve Vardenafil: -ve Vitamin C: +ve Vitamin B2: +ve Vitamin B6: +ve Vitamin B1: +ve Vitamin E: +ve

Weight Reducing Activity of the Aloe Extract Experimental detail:

Acute and sub-acute toxicity of the Aloe sample was carried out with the

aim of observing the body weight-reducing activity effect.

Acute and sub-acute toxicity study:

For acute toxicity studies Aloe sample was given, orally at the dose of 5 g/kg (0.3ml/10g, p.o.) and for sub-acute dose effects the Aloe sample was given for 18 days of treatment. Both treated and control groups of animals were observed for gross behavioral signs and symptoms using a battery of tests.

For sub-acute toxicity studies, mice were divided into two groups of 10 animals each for each treatment schedule Aloe sample at the dose of 1 g/kg, (0.3 ml /10g) was administered orally by gavages to the treated groups and water to control groups. The body weight of animals, and the organ weight ratio including, kidney, liver, spleen, heart, lung, testes, and uterus were recorded. The blood was analyzed for WBC, RBC, Hgb, HCT, PCV, MCV, and MCHC and the serum was analyzed for Cholesterol and total triglycerides. At the end of the experiment animal vital tissues are fixed in buffered formalin for histopathological examination in case pathologic effects are needed to evaluate.

#### Summary of results:

1. Acute toxicity of the Aloe sample studied showed no noticeable toxic signs and symptoms in the treated animals as compared to the control values and no mortality among the treated animals was recorded.
2. The repeated dose effects (18 days treatment) studies showed no change in locomotor activity of the animals, motor coordination, and body temperature of the treated animals as compared with the control. No statistically significant changes were recorded in the vital organ weight ratio. Hematological parameters (WBC, RBC, Hgb, HCT, PCV, MCV MCHC, and platelets) remained unchanged. Cholesterol showed no change as compared to the control values.
3. The weight change studies showed from day 1 to day 18 that the animal has lost weight as compared to the control values. A pronounced body weight reduction has been recorded on day 14 only.

#### Intensive Body Lotion with Aloe Vera:

The MHRA has found that samples of OSAS11 (Intensive Body Lotion with Aloe Vera), an unlicensed product, have tested positive for variable amounts of Betamethasone dipropionate

- a type of medicine called a corticosteroid. The product also contains Clotrimazole which is used in anti-fungal medications.

Strong corticosteroids (such as betamethasone) are only available on prescription and are used in the treatment of a variety of inflammatory conditions, including skin conditions such as eczema and psoriasis. Careful medical supervision of these treatments is important and inappropriate long-term use of corticosteroid medicines can cause skin thinning and other skin complications.

The lotion, illegally claiming to treat eczema and psoriasis, has been

supplied over the internet and from a variety of Asian and African beauty shops.

The lotion was brought to the attention of the MHRA by a pediatric dermatologist who became concerned when the parent of a baby he was treating for eczema started to use this product on the infant.

The Agency would strongly advise that anyone using this product, particularly young children and babies, should stop immediately. Discontinuation of the product may cause a rebound effect (worsening of the condition) and you should therefore consult your doctor or healthcare provider about suitable treatments.

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