



A REVIEW ON ALOEVERA – HERBAL WITH MEDICINE USES

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ABSTRACT

In many part of the world, there is a rich tradition of using herbal medicine for the treatment of infection disease. Alovera is one of the essential component of traditional medicine. Research is now directed to isolate biologically active compounds form palnts for use as herbal medicine. Aloe barbadensis Miller (Aloe- vera) belongs to the Lilicaceal family, it is a cactus like plant and grows readily in hot and arid climate. This review highlights the importance of using Aloe-vera as a medicinal herb.

Introduction

The Aloe vera plant has been known and used for centuries for its health, beauty, medicinal and skin care properties. The name Aloe vera derives from the Arabic word “Alloeh” meaning “shining bitter substance,” while “vera” in Latin means “true.” 2000 years ago, the Greek scientists regarded Aloe vera as the universal panacea. The Egyptians called Aloe “the plant of immortality.” Today, the Aloe vera plant has been used for various purposes in dermatology.[1]

It grows mainly in the dry region of Africa, Asia,

Europe and America. In India it is found in Rajasthan, Maharashtra, Andhra Pradesh, Gujarat and

Tamil Nadu[2]. Aloe is also popular in both traditional Chinese and Ayurvedic medicine. In Ayurvedic medicine, the traditional medicine of India, aloe is used internally as a laxative, antihelminthic, hemorrhoid

Species - *Aloe barbadensis Mill***History**

Aloe vera has been used for medicinal purposes in several cultures for millennia: Greece, Egypt, India, Mexico, Japan and China.[4] Egyptian queens Nefertiti and Cleopatra used it as part of their regular beauty regimes. Alexander the Great, and Christopher Columbus used it to treat soldiers' wounds. The first reference to Aloe vera in English was a translation by John Goodyew in A.D. 1655 of Dioscorides' Medical treatise De Materia Medica. [5] By the early 1800s, Aloe vera was in use as a laxative in the United States, but in the mid-1930s, a turning point occurred when it was successfully used to treat chronic and severe radiation dermatitis.[5]

Plant

The botanical name of Aloe vera is *Aloe barbadensis miller*. It belongs to Asphodelaceae (Liliaceae) family, and is a shrubby or arborescent, perennial, xerophytic, succulent, pea- green color plant. It grows mainly in the dry regions of Africa, Asia, Europe and America. In India, it is found in Rajasthan, Andhra Pradesh, Gujarat, Maharashtra and Tamil Nadu.[1]

Anatomy

The plant has triangular, fleshy leaves with serrated edges, yellow tubular flowers and fruits that contain numerous seeds. Each leaf is composed of three layers: An inner clear gel that contains 99% water and rest is made of glucomannans, amino acids, lipids, sterols and vitamins. The middle layer of latex which is the bitter yellow sap and contains anthraquinones and glycosides. The outer thick layer of 15–20 cells called as rind which has protective function and synthesizes carbohydrates and proteins. Inside the rind are vascular bundles responsible for transportation of substances such as water (xylem) and starch (phloem). [6]

Properties of Aloe vera

1. **Anti-inflammatory action:** Aloe vera inhibits the cyclooxygenase pathway and reduces prostaglandin E2 production from arachidonic acid. Recently, the novel anti-inflammatory compound called C-glucosyl chromone was isolated from gel extracts.
2. **Laxative effects:** Anthraquinones present in latex are a potent laxative. It increases intestinal water content, stimulates mucus secretion and increases intestinal peristalsis.
3. **Effects on the immune system:** Alprogen inhibit calcium influx into mast cells, thereby inhibiting the antigen-antibody-mediated release of histamine and leukotriene from mast cells. In a study on mice that had previously been implanted with murine sarcoma cells, acemannan stimulates the synthesis and release of interleukin-1 (IL-1) and tumor necrosis factor from macrophages in mice, which in turn initiated an immune attack that resulted in necrosis and regression of the cancerous cells. Several low-molecular-weight compounds are also capable of inhibiting the release of reactive oxygen free radicals from activated human neutrophils.
4. **Antiviral and antitumor activity:** These actions may be due to indirect or direct effects. Indirect effect is due to stimulation of the immune system and direct effect is due to anthraquinones. The anthraquinone aloin inactivates various enveloped viruses such as herpes simplex, varicella zoster and influenza.[11] In recent studies, a polysaccharide fraction has shown to inhibit the binding of benzopyrene to primary rat hepatocytes, thereby preventing the formation of potentially cancer-initiating benzopyrene-DNA adducts. An induction of glutathione S-transferase and an inhibition of the tumor-promoting effects of phorbol myristic acetate has also been reported which suggest a possible benefit of using aloe gel in cancer chemoprevention.[12-13]
5. **Antiseptic effect:** Aloe vera contains 6 antiseptic agents: Lupeol, salicylic acid, urea nitrogen, cinnamonic acid, phenols and sulfur. They all have inhibitory action on fungi, bacteria and viruses

Functions [12]

Aloe vera contains 75 potentially active constituents: vitamins, enzymes, minerals, sugars, lignin, saponins, salicylic acids and amino acids.[7-8]

1. **Vitamins:** It contains vitamins A (beta-carotene), C and E, which are antioxidants. It also contains vitamin B12, folic acid, and choline. Antioxidant neutralizes free radicals.
2. **Enzymes:** It contains 8 enzymes: aliase, alkaline phosphatase, amylase, bradykinase, carboxypeptidase, catalase, cellulase, lipase, and peroxidase. Bradykinase helps to reduce excessive inflammation when applied to the skin topically, while others help in the breakdown of sugars and fats.
3. **Minerals:** It provides calcium, chromium, copper, selenium, magnesium, manganese, potassium, sodium and zinc. They are essential for the proper functioning of various enzyme systems in different metabolic pathways and few are antioxidants.

4. **Sugars:** It provides monosaccharides (glucose and fructose) and polysaccharides: (glucomannans/polymannose). These are derived from the mucilage layer of the plant and are known as mucopolysaccharides. The most prominent monosaccharide is mannose-6-phosphate, and the most common polysaccharides are called glucomannans [β -(1,4)acetylated mannan]. Acemannan, a prominent glucomannan has also been found. Recently, a glycoprotein with antiallergic properties, called alprogen and novel anti-inflammatory compound, C-glucosyl chromone, has been isolated from Aloe vera gel. [9-10]
5. **Antaquinones:** It provides 12 anthraquinones, which are phenolic compounds traditionally known as laxatives. Aloin and emodin act as analgesics, antibacterials and antivirals.
6. **Fatty acids:** It provides 4 plant steroids; cholesterol, campesterol, β -sisosterol and lupeol. All these have anti-inflammatory action and lupeol also possesses antiseptic and analgesic properties.
7. **Hormones:** Auxins and gibberellins that help in wound healing and have antiinflammatory action.
8. **Others:** It provides 20 of the 22 human required *amino acids* and 7 of the 8 essential amino acids. It also contains salicylic acid that possesses antiinflammatory and antibacterial properties. Lignin, an inert substance, when included in topical preparations, enhances penetrative effect of the other ingredients into the skin. Saponins that are the soapy substances form about 3% of the gel and have cleansing and antiseptic properties.

What's in aloe vera gel: [13]



- Water
- 20 minerals
- 12 vitamins
- 18 amino acids
- 200 active plant compounds (phytonutrients), including:
 - Triterpenes (a phytonutrient that lowers blood sugar)
- Glyconutrients & glycoproteins
- Polysaccharides, including:
 - Acemannan, mannose-6-phosphate polymannans
- Phenolic glycosides, including:
 - Dihydrocoumarins

Benefits of aloe vera[14]

offers a wide range of benefits for both health and skincare. Here are some of the most notable:

Skin benefits

1. **Soothes Sunburns** – Aloe vera gel has cooling and anti-inflammatory properties that help heal sunburned skin.
2. **Hydrates Skin** – It acts as a natural moisturizer without leaving a greasy feel, great for oily or acne-prone skin.
3. **Heals Wounds** – Promotes faster healing of minor cuts, burns, and abrasions.
4. **Reduces Acne** – Contains antibacterial and anti-inflammatory compounds that help treat acne.
5. **Anti-Aging** – May reduce wrinkles and improve skin elasticity due to its antioxidants like vitamins C and E.

Hair Benefits

1. **Reduces Dandruff** – Its antifungal and moisturizing properties help control dandruff and itchy scalp.
2. **Promotes Hair Growth** – Enzymes in aloe vera can help remove dead cells from the scalp and promote healthy hair follicles.
3. **Conditions Hair** – Acts as a natural conditioner, leaving hair smooth and shiny.

Health Benefits

1. **Aids Digestion** – Aloe vera juice may help with indigestion, constipation, and maintaining a healthy gut.
2. **Boosts Immunity** – Contains vitamins, enzymes, and minerals that support immune function.
3. **Anti-Inflammatory** – May help reduce internal inflammation and ease joint or muscle pain.
4. **Blood Sugar Regulation** – Some studies suggest it can help lower blood sugar in people with type 2 diabetes (consult a doctor before use).

Application of Aloe vera

Aloe vera is applied to a variety of product in the form of Aloe vera juice, concentrate and powder. Some of it's applications in pharmaceuticals, foods and cosmetics

THERAPEUTIC PROPERTIES OF ALOE, VERA

Moisturizing actions

Moisturizing action is mainly 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 drying tissues and humectant properties that promote retention of moisture in tissues.

Wound healing effects

The aloe vera gel polysaccharide acemannan was shown to activate macrophages; an effect that improved wound healing in a rat model.[15-16] A mannose-6-phosphate component of the gel has been credited with a wound healing effect.[17]

Antibacterial/antifungalantiviral effeers

Streptococcus progenes and Streptococcus faecalisare two microorganisms that have been inhibited by aloe vera gel.[15,16] Aloe vera gel reportedly was bactericidal against Pseudomonas aeruginosawhile acemannan prevented it from adhering to human lung epithelial cells in a monolayer culture. A processed aloe vera gel preparation reportedly inhibited the growth of 2Candida albicans. In terms of antiviral effects, acemannan reduced herpes simplex infection in two cultured target cell lines.[2]

Anti-inflammatory effects

Hanley et al., reported that an aloe vera extract (described as 5.0% leaf homogenate) decreased inflammation by 48% in a rat adjuvant-induced arthritic inflammatory model. 13.14 More recently, the peptidase bradykinase was isolated from aloe and shown to break down the bradykinin, an inflammatory substance that induces pain.[10]

Clinical uses : The clinical use of aloe vera is supported mostly by anecdotal data. Through most of the uses are interesting, controlled trials are essential to determine its effectiveness in all the following disease[18-19]

A. Uses based on scientific evidence: These uses have been tested in humans or animals. Safety and effectiveness have not always been proven.

Conditions: Seborrheic dermatitis,[20] psoriasis vulgaris, genital herpes,[21] ,[22] skin burns,[25] ,[26] diabetes (type 2),[27] HIV infection,[28] cancer prevention,[29] ,[30] ulcerative colitis[31] wound healing (results of aloe on wound healing are mixed with some studies reporting positive results[32] and others showing no benefit[33] or potential worsening[34], [35], pressure ulcers,[33] mucositis,[36] radiation dermatitis,[37] acne vulgaris,[38] lichen planus,[39] frostbite,[40] aphthous stomatitis,[41] and constipation.[42]

Aloe vera gel as an anti tumor:

- *Aloe vera boosts immune function and destroys cancer tumor
- *aloe vera polysaccharides have strong immunomodulatory and antitumour properties
- *aloe vera polysaccharides exhibited potent macrophage-activating activities including producing increased volumes of nitric oxide (which has antitumor potential).
- *That means the gel helps boosts immune system function while destroying cancer tumors



Aloe vera heals radiation burns from radiation:

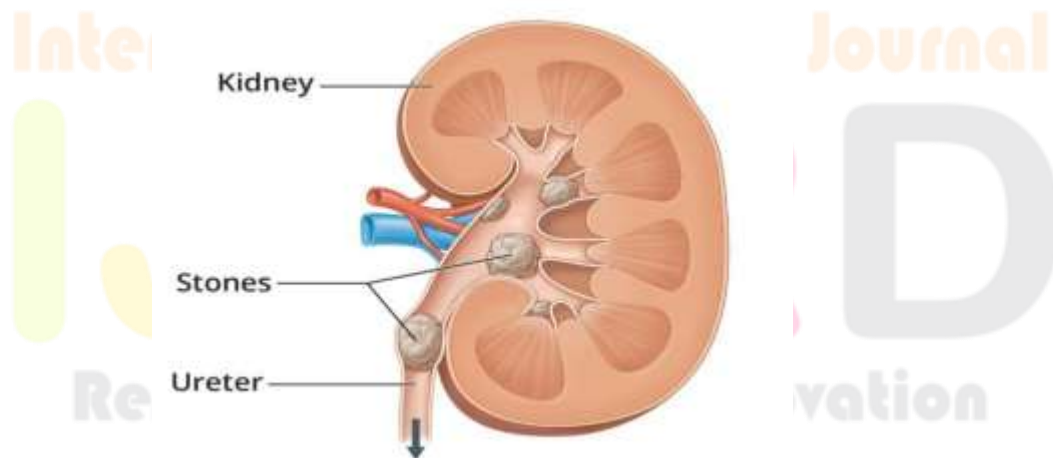
- Applying aloe vera topically to the radiation area will rapidly accelerate the healing response.
- Consuming aloe vera internally will also help heal radiation burns.

.Aloe vera can be applied liberally and it can be applied several times a day. To help increase the soothing power, keep the gel in a cold place, such as in the refrigerator



Aloe vera in prevention of kidney stone:

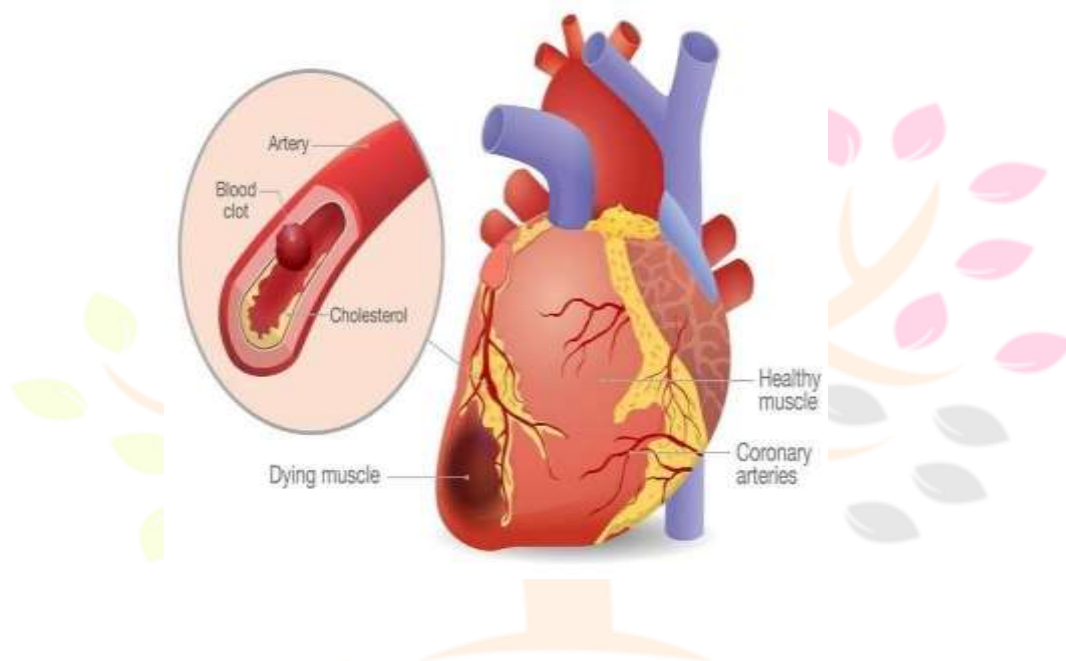
- . kidney stone is made up of calcium and oxalic acid crystal deposit
- . Aloe gel (from the Aloe Vera plant) is very high in both citrate and tartrate v prevents formation of crystals
- . Therefore it is highly recommended at preventing kidney stone formation.
- . Studies have shown that consumption of just 100g of Aloe gel daily is enough to reduce the build up of crystals in both adults and children.



Reducing stroke and heart attacks:

- Enhancing the quality of the blood will have a significant impact on reducing neart attacks and strokes.

- Eating aloe vera is like adding an all-natural non-stick additive to your blood flow.
- It stops blood cells from clumping together, which is part of what causes a stroke.
- Aloe vera, causes sticky blood to become "unsticky blood," making it flow like it should - one blood cell at a time -- so that oxygen and nutrients can reach every last organ and cell in your body
- Aloe vera can reverse "sludge blood" while allowing the blood to carry more oxygen



B. Uses based on tradition or theory: The below uses are based on tradition or scientific theories. They often have not been thoroughly tested in humans, and safety and effectiveness have not always been proven.

Conditions: Alopecia, bacterial and fungal skin infections, chronic leg wounds, parasitic infections, systemic lupus erythematosus, arthritis and tic douloureux.

Side effects

Topical: It may cause redness, burning, stinging sensation and rarely generalized dermatitis in sensitive individuals. Allergic reactions are mostly due to anthraquinones, such as aloin and barbaloin. It is best to apply it to a small area first to test for possible allergic reaction.

Oral: Abdominal cramps, diarrhea, red urine, hepatitis, dependency or worsening of constipation. Prolonged use has been reported to increase the risk of colorectal cancer. Laxative effect may cause electrolyte imbalances (low potassium levels).

Contraindication: Contraindicated in cases of known allergy to plants in the Liliaceae family.

Pregnancy and breastfeeding: Oral aloe is not recommended during pregnancy due to theoretical stimulation of uterine contractions, and in breastfeeding mothers, it may sometime causes gastrointestinal distress in the nursing infant.

Interactions: Application of aloe to 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 Aloe vera 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.

Thus, though Aloe vera has wide spectrum of the properties and uses, some of them could be myths and some of them could be real magic. In future, controlled studies are required to prove the effectiveness of Aloe vera under various conditions.

Conclusion

The pharmacology attributes of aloe vera have been revalidated in modern science through various in viva and in vitro studies. These scientific studies are good enough proof that drug has immense potential as a dental therapeutic. So proper diagnosis, knowledge the traditional medicine, and implementation of knowledge to the treatment plan are important in ensuring success with this dental therapeutic agent. As a footnote, through Aloe vera is a promising herb with its various clinical applications in medicine and dentistry, the authors feels that more clinical research needs to be undertaken especially to validate and explain the action of acemannan hydrogel in accelerating the healing of aphthous ulcers and to validate the efficiency of Aloe gel on plaque and gingivitis, so that can be established in the field of dentistry.

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