

Name of Herb: Aloe

Scientific names: Aloe vera, A. perryi (Zanzibar or Socotrine aloe), A. barbadensis (Curacao or Barbados aloe), A. vulgaris, A. arborescens, or A. ferox (Cape aloe). Family: Liliaceae

Common names: Cape, Zanzibar, Socotrine, Curacao, or Barbados aloes, aloe vera, aloe capensis, aloe spicata, aloe latex, burn plant, elephant's gall, lily of the desert, miracle plant, plant of immortality

Active ingredients: There are 2 products produced from aloe that are used pharmaceutically. Aloe resin or latex is obtained from the leaf lining and contains anthraquinone glycosides (aloin, aloe-emodin, barbaloin)

The second product, aloe gel, is the clear, jelly-like material from the sticky cells found in the inner tissue of the leaf. It generally doesn't contain the anthraquinone glycosides found in the latex but does contain the polysaccharides glucomannan and acemannan

Other potentially active components that have been identified include bradykininase, magnesium lactate, and salicylic acid¹⁻³.

MOA: The anthraquinone glycosides are potent stimulant laxatives. The active substance, aloe-emodin anthrone, is formed by the enzymatic or bacterial reductive cleavage of the anthracene derivatives. This takes place in the colon and leads to an irritation of the colonic mucosa, which in turn precipitates the active secretion of mucous that stimulates peristalsis. The result is increased propulsion and reduced transit time. Aloe also causes fluids and electrolytes to be secreted in the lumen and inhibits their reabsorption. This can cause a loss of potassium that paralyzes the intestinal muscles and with continued use; increasing doses must be used to produce their cathartic effect.

The aloe gel is often used for wound healing which may be due to the inhibition of bradykinin, which is a powerful proinflammatory mediator and also a pain producing agent. By inhibiting bradykinin, there is also inhibition of the formation of thromboxane, which causes vasoconstriction. Aloe gel may also inhibit cyclooxygenase, resulting in a decreased production of prostaglandin, leading to decreased inflammation.

Glucomannan is an emollient polysaccharide that is a good moisturizer and used in many cosmetic products. Acemannan is a water-soluble long chain mannose polymer that accelerates wound healing, modulates immune function, and is also said to have antineoplastic and antiviral effects. Magnesium lactate helps reduce itching by blocking histamine production and salicylic acid helps to relieve inflammation by inhibiting prostaglandins⁴⁻⁷.

Current indications and efficacy:

Aloe latex has been used for centuries as a laxative or cathartic. It has also been used for such indications as seizures, asthma, colds, ulcers, bleeding, amenorrhea, colitis, depression, diabetes, glaucoma, multiple sclerosis, hemorrhoids, peptic ulcers, varicose veins, bursitis, arthritis, and vision problems. It is likely effective when used orally as a laxative, but like other stimulant laxatives, should not be used on a chronic basis. A randomized controlled trial has documented its potency as a laxative, in a combination product (celandin, aloe vera, and psyllium), for chronically constipated adults^{1,4}. The treatment group experienced more frequent bowel movements, softer stools, and reduced laxative dependence over placebo⁸. Overall, 16 out of 19 patients in the treatment group regarded themselves as improved compared to only 4 of the 13 on placebo (p<0.05). There is insufficient clinical data about the efficacy of aloe latex for any of the other above mentioned indications.

Aloe gel is applied topically for burns and wound healing, inflammation, arthritis, psoriasis, cold sores, as an antiseptic and moisturizer. It has also been used orally for indications such as inflammation, arthritis, fever, itching, as a general tonic, gastroduodenal ulcers, diabetes, and asthma. It is possibly effective when used topically for enhancing the healing of burns, skin ulcerations, psoriasis, and frostbite, and for

reducing pain and inflammation. There is insufficient clinical data to support its use for any of the other above mentioned indications^{1,5,9}.

Animal data has shown Aloe gel to have a positive influence on the content of collagen and its characteristics in a healing wound, which indicates a beneficial role in the healing of wounds. One particular study showed enhanced collagen deposition varying from a 93% increase in topical treatment and a 67% increase in the case of oral treatment.

In humans, there are relatively few controlled clinical trials of Aloe for any indication. Several studies have reported that Aloe gel speeds the healing of scrapes, burns, and frostbite^{1,7,11}. However, there is one study that found an opposite effect, that aloe-treated surgical wounds were significantly delayed in healing vs. standard management (83 days vs. 53 days)¹². The proposed mechanisms of Aloe's healing properties are providing essential micronutrients, anti-inflammatory effect, antimicrobial effect, and stimulation of skin fibroblasts when taken orally or applied topically^{2,7}.

A double-blinded, placebo-controlled study demonstrated the effectiveness of Aloe vera extract 0.5% in a hydrophilic cream, on 60 patients with psoriasis vulgaris. The study suggested that it was more effective at clearing plaques than placebo (82.8% of treated patients vs. 7.7% of placebo patients), was well tolerated, and could be considered a safe and alternative treatment to cure patients with psoriasis¹³.

Animal and human data have shown that Aloe gel may lower blood glucose levels by an unknown mechanism. It may also enhance the hypoglycemic effects of certain medications. There is conflicting data and no adequate studies in regards to the use of Aloe in patients with diabetes with or without current pharmacological therapy^{11,14}.

Contraindications/allergies:

As with other stimulant laxatives, aloe should not be used in patients with obstruction, atony, chronic constipation, or severe dehydration with electrolyte depletion. It also should not be used in patients with inflammatory intestinal diseases (appendicitis, ulcerative colitis, irritable bowel syndrome, Crohn's disease), kidney disease, children under 10 years old, or during pregnancy or lactation. Nor should it be used in patients with complaints of cramps, colic, nephritis, or any undiagnosed abdominal symptoms such as pain, nausea or vomiting^{4,6}.

Aloe should be avoided if one has an allergy to plants in the Liliaceae family (garlic, onions, tulips). Incidences of contact dermatitis have been reported related to *A. arborescens* and erythema, edema, urticaria, and eczematous rash have been reported following application of *A. vera*. Minor skin irritations have been reported but clear upon discontinuation¹.

Dosage forms^{4,5,15}: liquid, capsule, gel, cream, spray, and lotion

Recommended doses and duration:

The common laxative dose is 100-200mg aloe or 50mg aloe extract taken orally in the evening. The range is from 50-300mg but should be titrated to the minimum effective dose to maintain a soft stool. This is approximately 10-30 mg of hydroxyanthracene derivatives, calculated as anhydrous aloin. If using a tincture (1:40 in 45% ethanol), the typical dose is 2-8mL in the evening. Aloe latex should not be taken for longer than 7-10 days^{4,6}.

Aloe leaf gel is applied liberally on the skin three to five times daily as needed. In oral form, people typically use 50-200mg daily of the capsules, 30mL of the gel three times a day, or 15-60 drops of the tincture (1:10, 50% alcohol) as needed^{5,6}.

Drug interactions:

Due to the potential loss of potassium with aloe latex, it may interact with cardiac glycosides by increasing the risk of toxicity from these drugs, which occurs more frequently in patients with low potassium. Signs of toxicity may include nausea and vomiting, tachycardia, arrhythmias, and headaches. Similarly, overuse of aloe latex may also increase the risk of toxicity with antiarrhythmic drugs. Hypokalemia could potentially be compounded with non-potassium sparing diuretics and corticosteroids. Also, due to the increased propulsion and reduced transit time, aloe can interfere with the absorption of oral drugs. It should be separated from other medications by two hours. Concurrent use of this herb with other stimulant laxatives should be done carefully or avoided for the increased risk of potassium depletion and diarrhea^{4,6}.

Because aloe gel may lower blood glucose levels, there may be potentiation of hypoglycemia with glyburide or other hypoglycemic agents. Signs of hypoglycemia include cold sweat, heart palpitations, inability to concentrate, headache, and fatigue. Theoretically, using topical aloe gel and hydrocortisone concurrently may enhance absorption and/or increase their anti-inflammatory effects^{5,6}.

Drug – Disease interactions:

Aloe latex should not be used in patients with inflammatory intestinal disease or obstruction because of the irritating effect on the colonic mucosa. In hemorrhoids, it could possibly cause stenosis, thrombosis, or prolapse. Because of the potential for potassium depletion, aloe latex could interact with heart conditions. In kidney disorders, excessive doses could theoretically cause nephritis^{4,6}.

There is potential for aloe gel to be contaminated with aloe latex and should be used cautiously in patients with GI or kidney disorders and because of their potential hypoglycemic effects, close monitoring of blood glucose needs to be done in patients with diabetes^{5,6}.

Other safety issues:

When selecting a product, make sure to determine if it is derived from aloe latex or aloe gel because aloe latex is a strong cathartic that needs to be used cautiously. Doses can vary depending on what form it is in, so follow package instructions and start with the lowest dose needed.

In May 2002, the FDA issued a final rule stating that the stimulant laxative herbs aloe and cascara sagrada are not generally recognized as safe and effective because no comments or data were submitted in regards to their mutagenicity, genotoxicity, and carcinogenicity. The regulation went into effect in November 5, 2002. On that date, existing inventory on shelves could be sold until gone, but distribution was no longer permitted. Any OTC product that contains either of these herbs and labeled as a laxative will be considered in violation of federal law. If the FDA receives new data about these laxatives, they will be re-evaluated¹⁶.

References:

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