

ALOE VERA

The name *Aloe vera* derives from the Arabic word “Alloeh” meaning “shining bitter substance,” while “vera” in Latin means “true.”

It is the dried latex of leaves of *Aloe barbadensis* Miller belongs to family Liliaceae.

Biological name: *Aloe barbadensis miller*.

Family: Liliaceae

Chemical constituents:

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

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.

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.

Minerals: It includes 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.

Sugars: It includes monosaccharides (glucose and fructose) and polysaccharides: (glucomannans/polymannose). The most prominent monosaccharide is mannose-6-phosphate, and the most common polysaccharides are called glucomannans [beta-(1,4)-acetylated mannan].

Anthraquinones: It includes 12 anthraquinones, which are phenolic compounds traditionally known as laxatives. Aloin and emodin act as analgesics, antibacterials and antivirals.

Fatty acids: It includes 4 plant steroids; cholesterol, campesterol, β -sisosterol and lupeol. All these have anti-inflammatory action and lupeol also possesses antiseptic and analgesic properties.

Hormones: Auxins and gibberellins that help in wound healing and have anti-inflammatory action.

Others: It also contains salicylic acid that possesses anti-inflammatory 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.

Mechanism of actions

Healing properties: Glucomannan, a mannose-rich polysaccharide, and gibberellin, a growth hormone, interacts with growth factor receptors on the fibroblast, thereby stimulating its activity and proliferation, which in turn significantly increases collagen synthesis after topical and oral Aloe vera.² Aloe gel not only increased collagen content of the wound but also changed collagen composition (more type III) and increased the degree of collagen cross linking. Due to this, it accelerated wound contraction and increased the breaking strength of resulting scar tissue.¹⁰ An increased synthesis of hyaluronic acid and dermatan sulfate in the granulation tissue of a healing wound following oral or topical treatment has been reported.¹¹

Effects on skin exposure to UV and gamma radiation: Aloe vera gel has been reported to have a protective effect against radiation damage to the skin. The administration of aloe vera gel, an antioxidant protein, metallothionein, is generated in the skin, which scavenges hydroxyl radicals and prevents suppression of superoxide dismutase and glutathione peroxidase in the skin. It reduces the production and release of skin keratinocyte-derived immunosuppressive cytokines such as interleukin-10 (IL-10) and hence prevents UV-induced suppression of delayed type hypersensitivity.

Anti-inflammatory action: Aloe vera inhibits the cyclooxygenase pathway and reduces prostaglandin E2 production from arachidonic acid. The novel anti-inflammatory compound called C-glucosyl chromone was isolated from gel extracts.

Laxative effects: Anthraquinones present in latex are a potent laxative. It increases intestinal water content, stimulates mucus secretion and increases intestinal peristalsis.

Antiviral 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.

Moisturizing and anti-aging effect: Mucopolysaccharides help in binding moisture into the skin. Aloe stimulates fibroblast which produces the collagen and elastin fibers making the skin more elastic and less wrinkled. It also has cohesive effects on the superficial flaking epidermal cells by sticking them together, which softens the skin. The amino acids also soften hardened skin cells and zinc acts as an astringent to tighten pores. Its moisturizing effects has also been studied in treatment of dry skin associated with occupational exposure where aloe vera gel gloves improved the skin integrity, decreases appearance of fine wrinkle and decreases erythema.²¹ It also has anti-acne effect.

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.

Marketed available preparations: Aloe vera skin gel, Aloe vera gel, aloe vera juice.

ALMOND OIL

Almond oil is a fixed oil obtained by expression from the seeds of *Prunus amygdalus* var. *dulcis* (sweet almonds) or *P. amygdalus* var. *amara* (bitter almonds) belongs to family **Rosaceae**.

Chemical Constituents

Both varieties of almond contain 40–55% of fixed oil, about 20% of proteins, mucilage and emulsin. The bitter almonds contain in addition 2.5–4.0% of the colourless, crystalline, cyanogenetic glycoside amygdalin.

Almond oil consists of a mixture of glycerides of oleic (62–86%), linoleic (17%), palmitic (5%), myristic (1%), palmitoleic, margaric, stearic, linolenic, arachidic, gadoleic, behenic, and erucic acid. Bitter almond oil contains benzaldehyde and 2–4% of hydrocyanic acid. Purified volatile oil of bitter almonds has all its hydrocyanic acid removed and, therefore, consists mainly of

benzaldehyde. The unsaponifiable matter contains β -sitosterol, Δ^5 -avenasterol, cholesterol, brassicasterol and tocopherols.

There are two types of almond oil: sweet and bitter. Sweet almond oil is the kind that's better suited to your skin. It contains the following nutrients:

- **Vitamin A:** The retinol in vitamin A has the ability to stimulate the production of new skin cells and smooth fine lines.
- **Vitamin E:** This nutrient has antioxidant properties that may help prevent cell damage and help reduce ultraviolet (UV) damage to the skin caused by the sun.
- **Omega-3 fatty acids:** These nutrients may help prevent premature aging and safeguard against sun damage.
- **Zinc:** This is an essential nutrient for healing acne or other facial scars.

Uses

Expressed almond oil is an emollient and an ingredient in cosmetics. Almond oil is used as a laxative and emollient. The volatile almond oils are used as flavouring agents.

Almond oil [Oleum amygdalae] has long been used in complementary medicine including anti-inflammatory, immunity-boosting and anti-hepatotoxicity effects. The almond oil improved bowel transit, which consequently reduces irritable bowel syndrome symptoms. Further, some studies show a reduced incidence of colonic cancer. Moreover, cardiovascular benefits have also been identified with almond oil elevating the levels of so-called 'good cholesterol', high-density lipoproteins (HDL), whilst it reduces low-density lipoproteins (LDL). Historically, almond oil had been used in Ancient Chinese, Ayurvedic and Greco-Persian schools of Medicine to treat dry skin conditions such as psoriasis and eczema. Almond oil has emollient properties and, therefore, has been used to improve complexion and skin tone.

Cosmetic uses

- Reduces puffiness (swollen) and under-eye circles.
- Improves complexion and skin tone.

- Treats dry skin.
- Improves acne.
- Helps reverse sun damage.
- Reduces the appearance of scars.
- Reduces the appearance of stretch marks.

However, according to some clinical studies and anecdotal evidence, applying almond oil to the skin may have the following benefits:

- **Reduces puffiness and under-eye circles.** Because almond oil is an anti-inflammatory, it may help ease swelling of the skin.
- **Improves complexion and skin tone.** Due to its emollient properties, almond oil has the potential to improve both complexion and skin tone.
- **Treats dry skin.** Almond oil has been used for centuries to treat dry skin conditions, including eczema, and psoriasis.
- **Improves acne.** The oil's fatty acid content may help dissolve excess oil on the skin, while the retinoids in the oil may reduce the appearance of acne and improve cell turnover.
- **Helps reverse sun damage.** Animal studies have shown that vitamin E, one of the nutrients in almond oil, may help reduce damage to the skin caused by UV exposure.
- **Reduces the appearance of scars.** In ancient Chinese and Ayurvedic medicine, almond oil was used to reduce scarring. The vitamin E content may contribute to helping smooth the skin.
- **Reduces the appearance of stretch marks.** Sweet almond oil may be an effective treatment for preventing and reducing stretch marks.

Marketed Products

It is one of the ingredients of the preparations known as Baidyanath lal tail (Baidyanath Company), Himcolin gel, Mentat, Tentex Royal (Himalaya Drug Company), and Sage badam roghan (Sage Herbals).