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**Surbhi Sharma**  
Assistant professor, Baba Farid  
College, Bathinda, Punjab, India

**Smita Sharma**  
Assistant professor, Baba Farid  
College, Bathinda, Punjab, India

## *Aloe vera*: An ancient herb its components and applications

**Surbhi Sharma and Smita Sharma**

### Abstract

*Aloe vera* has marvelous medicinal properties. *Aloe vera* is one of the most powerful and well-known medicinal plants. Today, it has a strong global reputation due to its widespread usage in cosmetics, particularly to treat burns and sunburn, to aid wound healing, and to fight against cell aging. *Aloe vera* plant also used as reinforce the immune system and improve blood circulation. The range of usage of *Aloe vera* is thus very broad even if it has very specific benefits for the skin. The ten main areas of chemical constituents of *Aloe vera* include amino acids, anthraquinones, enzymes minerals, vitamins, lignin's, monosaccharide's, polysaccharides, salicylic acid, saponins, and steroids. Many benefits and properties are found in *Aloe vera*, due to present components in it. Now a days, many products in the market are available in the form of *Aloe vera* products such as juice, cream, shampoo, sweets and many other things. Medicated plants have major impact on the day-today life. These types of plant are effectively and economically, which are adopted in different field of science and technology. The aim of review is to study the back ground, characteristic and application of *Aloe vera* plant.

**Keywords:** *Aloe vera*, ancient herb, components

### Introduction

*Aloe vera* is a perennial, drought-resisting, succulent plant belonging to the *Asphodelaceae* family. The name, *Aloe*, is derived from the Arabic "*alloe*" or Hebrew "*halal*" meaning bitter shiny substance. It has a vast traditional role in indigenous system of medicine like Ayurveda, Siddha, Unani and homoeopathy. The *Aloe vera* plant is a member of lily plant known as *Aloe barbadensis*, which is full of juice and closes like a cactus. Due to its cactus like feel, *Aloe* is often mistakenly called a "Desert Cacti". *Aloe vera*, a semi tropical plant is one of the 250 species of *Aloe*. Most commonly used for its medicinal properties, *Aloe Vera* or the Sanskrit name "Ghee kunwar" is a member of Lilly family. The plant has lance-shaped, sharp pointed, and jagged and edged leaves.

It is native to North Africa and Spain, now the plant is also grown in the hot dry regions of Asia, Europe and America. *Aloe vera* is found as the wild herb along the coast of south India. It is under cultivation in large areas in many parts of India viz; Tamil Nadu, Maharashtra. Although the plant is native to northern parts of Africa, it has rapidly spread across the world because its cultivation is easy. An important distinction has to be made between the strongly laxative and purgative latex derived from the bundle-sheath cells and the clear mucilaginous gel. The plant has been used by Egyptians, Assyrians, and Mediterranean civilizations, as well as in Biblical times. A variety of *Aloe* species are still used in folk medicines of Africa and Asia. Hunters in the Congo reportedly rub their bodies in the clear mucilaginous gel to reduce perspiration; some African tribes apply the gel for chronic conjunctivitis; the gel is used in India for the treatment of asthma.

*Aloe vera* gel is used as an ethno medicine in Trinidad and Tobago for hypertension. The most common folk use of *Aloe* has been for the treatment of burn wounds and specifically to aid in the healing process, reduce inflammation, and tissue scarring. The gel was described by Dioscorides and used to treat wounds and mouth infections, soothe itching, and cure sores. The use of *Aloe vera* gel as a household remedy in the United States was triggered by reports of its beneficial effect on radiation dermatitis followed by a boom in cultivation in the 1930s; it remains a common plant and for burns and abrasions. Important contemporary uses of the gel exist in traditional medicines of India, China, and Mexico, as well as Middle America and the West Indies. Mexico is producing roughly 47% of aloe worldwide with a total sales volume of \$123.5 million US dollars as of 2008.

They are often thought to only grow in hot and dry climates, but they actually grow in a variety of climates including desert, grassland, and coastal or even alpine locations.

**Correspondence**  
**Surbhi Sharma**  
Assistant professor, Baba Farid  
College, Bathinda, Punjab, India

### Botany of *Aloe vera*

*Aloe vera* is a spiky cactus like xerophytes. It is a clump forming perennial plant with thick fibrous root which produces large basal leaves, usually 12–16 per plant, weighing up to 1.5 kg when mature. The plant matures when it is about 4 years old and has a life span of about 12 years. The leaves are up to 0.5 m long and 8–10 cm across at the base, tapering to a point, with saw-like teeth along their margins. In a transverse section, the plant shows a slightly concave appearance on the adaxial surface and distinctly convex appearance on the lower abaxial surface. The leaves are covered with thick cuticle, beneath which epidermis and mesophyll are present. Later is differentiated in upper chlorenchyma and lower parenchyma, as the rosette mature, successive leaves have fewer whitish spots and grey-greenish in color. The plant can be harvested every 6–8 weeks by removing 3–4 leaves per plant. Red, yellow, purple or pale striped flowers are present most of the year growing in a long raceme at the top of the flower stalk which originates from the centre of the basal leaves. The flower stalk grows up to 1.5 m in height. The fruit is a triangular capsule containing numerous seeds. The plant is practically disease free, occasionally black spots may occur on upper surface because of fungal infection or soft rotting may damage whole plant. The causal organism for soft rotting is a bacterium. Frost is another enemy of aloe vera plant and it cannot survive in frost conditions (33). Smoking in field during frost nights is one measure practiced by farmers to protect the plantation from frost. There are over 550 species of aloe grown world over. However, only two species are grown commercially i.e. *Aloe barbadensis* Miller (*Aloe vera*) and *Aloe aborescens*.

### Chemical Constituents

Aloe contains two classes of Aloins: (1) nataloins, which yield picric and oxalic acids with nitric acid, and do not give a red coloration with nitric acid; and (2) barbaloins, which yield aloetic acid (C<sub>7</sub>H<sub>2</sub>N<sub>3</sub>O<sub>5</sub>), chrysammic acid (C<sub>7</sub>H<sub>2</sub>N<sub>2</sub>O<sub>6</sub>), picric and oxalic acids with nitric acid, being reddened by the acid. This second group may be divided into a-barbaloins, obtained from Barbados aloes, and reddened in the cold, and b-barbaloins, obtained from Socotrine and Zanzibar aloes, reddened by ordinary nitric acid only when warmed or by fuming acid in the cold. Nataloin forms bright yellow scales. Barbaloin forms yellow prismatic crystals. The plant produces at least 6 antiseptic agents such as lupeol, salicylic acid, urea nitrogen, cinnamonic acid, phenols and sulphur. All of these substances are recognized as antiseptics because they kill or control mold, bacteria, fungus and viruses, explaining why plant has the ability to eliminate many internal and external infections. Lupeol and salicylic acid present in the juice are two very effective pain-killer. It contains at least three anti-inflammatory fatty acids, cholesterol, campesterol and  $\beta$ -sitosterol. These are highly effective in treatment of burns, cuts, scrapes, abrasions, allergic reactions, rheumatoid arthritis, rheumatic fever, acid indigestion, ulcers, plus many in inflammatory conditions of the digestive system and other internal organs, including the stomach, small intestine, colon, liver, kidney and pancreas.  $\beta$ -sitosterol is also a powerful anti-cholesterol which helps to lower harmful cholesterol levels, helping to explain its many benefits for heart patients. About 23 polypeptides are present in Aloe juice which helps to control a broad spectrum of immune system diseases and disorders. The polypeptides plus the anti-tumor agents, Aloe

emodin and Aloe lectins, are now also used in treatment of cancer.

### Medicinal

Aloes have long been in use for several diseases, particularly connected with the digestive system; they have also been used for wounds, burns and skin problems. The term Aloes stand for the dried juice, which flows from transversely cut bases of its leaves. It is the best herbal answer to support the health and healing mechanisms of the body because it does not heal, rather it feeds the body's own systems in order for them to function optimally and be healthy.

Pharmacologically it is an immunity booster and detoxifies the system. It is recommended in adjuvant therapy with antibiotics, NSAIDs (Nonsteroidal Anti-Inflammatory Drugs) and chemotherapy to eliminate drug induced gastritis and other adverse effects. Useful in various diseases such as type II diabetes, arthritis, eye disease, tumor, spleen enlargement, liver complaints, vomiting, bronchitis, asthma, jaundice and ulcers. Relieves constipation, maintains a good gastric pH, helps in inflammatory bowel diseases, non-ulcer dyspepsia, gastric and duodenal ulcers. A dietary supplement in pre and post-operative patients.

Despite its widespread popularity, scientific evidence on the *Aloe vera* gel remains sparse. *Aloe vera* gel is regarded as safe if applied topically with only a few allergic reactions being reported. The efficacy of *Aloe vera* gel to treat burn wounds, genital herpes, and seborrheic dermatitis have been shown in clinical trials, but other indications such as psoriasis or internal application for the treatment of type 2 diabetes remain inconclusive. The major application of *Aloe vera* gel remains as a skin moisturizer in cosmetics and as an après treatment for sunburns, for which it has proven its effectiveness.

For centuries, it has been medicinally used for an array of ailments such as mild fever, wounds and burns, gastrointestinal disorders, diabetes, sexual vitality and fertility problems to cancer, immune modulation, AIDS and various skin diseases. In the pharmaceutical industry, it has been used for the manufacture of topical products such as ointments and gel preparations, as well as in the production of tablets and capsules.

Application of aloe to skin may increase the absorption of steroid creams such as hydrocortisone. It reduces the effectiveness and may increase 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

*Aloe vera* is a medicinal plant and due to its extensive medicinal, nutraceutical and other uses its enjoy a great demand in the market across the globe. The major markets for *Aloe vera* and its extracts are Australia, US and the entire Europe. Given the exponentially growing demand for it in the international market, *Aloe vera* presents the finest commercial opportunity among the various medicinal plants. India is among the few countries gifted with the unique geographical

features essential for cultivation of *Aloe vera* and other high potential medicinal plants.

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