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Composition and Applications of *Aloevera* Gel

Dr. Sanjay Kholiya[1], Dr. Jyoti Gangwal[2], Dr. Rajendra Prasad Sharma[3]

[1,2]PG Scholar, [3]Associate Professor,
[1,3]Department of Ras Shastra & Bhaishajaya Kalpana, [2]Department of Sharir Rachana,
[1,2,3]National Institute of Ayurveda, Jaipur, Rajasthan, India

ABSTRACT

Aloevera is a succulent plant species of the genus *Aloe.* It is cultivated for agricultural and medicinal uses. *Aloevera* gel is the most recognized herbal medicine in the world today, used to cure thermal burn and sunburn, increase wound healing, and soften and moisturize skin. Everyone who uses it has experienced that it works. Although there is some scientific evidence of the effectiveness or safety of *Aloevera* extracts for either medicinal or cosmetic purposes, the cosmetics and alternative medicine industries regularly make claims regarding the soothing, moisturizing, and healing properties of *Aloevera*. Today most people in the world know *Aloevera* because of its addition in many popular cosmetic products. Over the years, the plant has been known by a number of names such as 'the wand of heaven', 'heaven's blessing and the silent healer'. Although not medically recognised as a therapeutic preparation, there have been many reports of the healing power of *Aloevera*.

KEYWORDS: *Aloevera, herbal medicine, wound healing, cosmetic products*

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INTRODUCTION

Aloevera is a succulent plant species of the genus *Aloe.* An evergreen perennial, it originates from the Arabian Peninsula, but grows wild in tropical, semi-tropical, and arid climates around the world. It is cultivated for agricultural and medicinal uses. The species is also used for decorative purposes and grows successfully indoors as a potted plant. It is found in many consumer products including beverages, skin lotion, cosmetics, or ointments for minor burns and sunburns. There is little clinical evidence for the effectiveness or safety of *Aloevera* extract as a cosmetic or medicine. *Aloevera* gel is the most recognized herbal medicine in the world today, used to cure thermal burn and sunburn, increase wound healing, and soften and moisturize skin. Everyone who uses it has experienced that it works. Additionally, recent research shows that *Aloevera* gel can help stimulate immune system of the body. But, the way *Aloevera* works is not yet properly understood.

Scientific classification-
Kingdom- Plantae
Clade- Tracheophytes
Clade-Angiosperms
Clade- Monocots
Order -Asparagales
Family-*Asphodelaceae*
Sub family- *Asphodeloideae*
Genus- Aloe
Species- A. vera

Binomial name
Aloevera (L.) Burm.f.

Synonyms
- *Aloe barbadensis* Mill.
- *Aloe barbadensis* var. *chinensis* Haw.
- *Aloe chinensis* (Haw.) Baker
- *Aloe elongata* Murray
- *Aloe flava* Pers.
- *Aloe indica* Royle
- *Aloe lanzae* Tod.
- *Aloe maculata* Forssk. (illegitimate)
- *Aloe perfoliata* var. *vera* L.
- *Aloe rubescens* DC.
- *Aloe variegata* Forssk. (illegitimate)
- *Aloe vera* Mill. (illegitimate)
- *Aloe vera* var. *chinensis* (Haw.) A. Berger
- *Aloe vera* var. *lanzae* Baker
- *Aloe vera* var. *littoralis* J.Koenig ex Baker
- *Aloe vulgaris* Lam.

Description

Aloevera is a stemless or very short-stemmed plant growing to 60–100 cm (24–39 in) tall, spreading by offsets. The leaves are thick and fleshy, green to grey-green, with some varieties showing white flecks on their upper and lower stem surfaces. The margin of the leaf is serrated and has small white teeth. The flowers are produced in summer on a spike up to 90 cm (35 in) tall, each flower being pendulous,

with a yellow tubular corolla 2–3 cm (0.8–1.2 in) long. Like other *Aloe* species, *Aloevera* forms arbuscular mycorrhiza, a symbiosis that allows the plant better access to mineral nutrients in soil.

Distribution

A. vera is considered to be native only to the south-west Arabian Peninsula. However, it has been generally cultivated around the world, and has become naturalized in North Africa, as well as Sudan and neighboring countries, along with the Canary Islands, Cape Verde, and Madeira Islands. It is also naturalized in wild areas across southern Spain, especially in the region of Murcia, being the only place in Europe where it has been found naturalized.

The species was introduced to China and various parts of southern Europe in the 17th century. It is widely naturalized elsewhere, occurring in arid, temperate, and tropical regions of temperate continents. The current distribution may be the result of human cultivation.

Uses

Although there is some scientific evidence of the effectiveness or safety of *Aloevera* extracts for either medicinal or cosmetic purposes, the cosmetics and alternative medicine industries regularly make claims regarding the soothing, moisturizing, and healing properties of *Aloevera*. There is no good evidence *Aloevera* is of use in treating wounds or burns, nor that topical application is effective for treating genital herpes or psoriasis.

Aloevera gel is used commercially as an ingredient in yogurts, beverages, and some desserts, but at certain high doses, its toxic properties could be severe when taken orally.

Aloevera is used on facial tissues where it is promoted as a moisturizer and anti-irritant to reduce chafing of the nose. Cosmetic companies commonly add sap or other derivatives from *Aloevera* to products such as makeup, tissues, moisturizers, soaps, sunscreens, incense, shaving cream, or shampoos.

Traditional medicine

Aloevera is used in traditional medicine as a skin treatment. In *Ayurvedic* medicine it is called *Kathalai*, as are extracts from agave. The healing properties of the succulent plant *Aloevera* have been known for thousands of years. Related to the lily family and related to the garlic, onion and asparagus, evidence supporting the early use of *Aloevera* was discovered on a Mesopotamian clay tablet dating from 2100 BC. *Aloevera* was well known not only to the Egyptians, but also the Roman, Greek, Arab and Indian cultures and all over the world.

Aloevera

Today most people in the world know *Aloevera* because of its addition in many popular cosmetic products. Over the years, the plant has been known by a number of names such as 'the wand of heaven', 'heaven's blessing and the silent healer'. Although not medically recognised as a therapeutic preparation, there have been many reports of the healing power of *Aloevera*.

The true *Aloevera* plant is called *Aloevera barbadensis* Miller, otherwise called the Curacao *Aloevera*, and is the most medicinally potent of the 300 (and more) varieties found around the world.

***Aloevera* gel**

The gel constitutes more than seventy-five compounds, including steroids, polysaccharides (complex carbohydrates), organic acids, antibiotic agents, enzymes, amino acids and minerals. One enzyme found in *Aloevera* gel has been prefered as the primary component responsible for the gel's ability to heal burns. Many Researches have shown that some lectins (a type of protein) in *Aloevera* gel may stimulate the immune system. These lectins increase production of killer cells' lethal chemicals, preventing them from damaging healthy, functional cells, or naturally occurring lymphocytes that kill bacteria and tumor cells. A research group studying the effects of *Aloevera* extracts on normal and tumor cells in humans. Such experiments provide more information on how *Aloevera* gel heals wounds and burns. A review of the medical literature by a group concluded that *Aloevera* gel clearly enhances wound healing and prevents skin damage caused by burns and frostbite. It works by penetrating injured tissue, reducing inflammation, relieving pain, and dilating capillaries to increase blood flow to the injury. *Aloevera* stop the aging of skin, they actually moisturize the skin.

THE ACTIONS AND COMPOSITION OF *ALOEVERA* VERA

For understand how *Aloevera* works, and its effects on wound healing, it is essential first to exartine the physical and chemical properties of the plant. In *Aloevera* plant 99 and 99.5 percent is water, with an average pH of 4.5. The remaining solid material contains over 75 different ingredients including vitamins, enzymes, sugars, minerals, anthraquinones or phenolic compounds, lignin, saponins, sterols, amino acids and salicylic acid.

Vitamins- *Aloevera* contains many vitamins, excluding vitamin D but including the important antioxidant vitamins A, C and E. Vitamins B (thiamine), niacin, vitamin B2 (riboflavin), choline and folic acid are also present. Some authorities suggest that there is also a trace of vitamin B12 (Coats 1979).

Enzymes- When *Aloevera* taken orally, many biochemical catalysts, such as amylase and lipase, can aid digestion by breaking down fats and sugars. One important enzyme, a carboxy peptidase, inactivates bradykinins and produces an anti-inflammatory effect. During the inflammatory process, bradykinin produces pain associated with vasodilation and therefore, its hydrolysis reduces these two components and produces an analgesic effect.

Minerals- Sodium, calcium, potassium, magnesium, copper, manganese, zinc, chromium and iron are all found in the *Aloevera* plant. Magnesium lactate inhibits histidine decarboxylase and prevents the formation of histamine from the amino acid, histadine. Histamine is released in many allergic reactions and causes intense itching and pain. The prevention of its formation may explain the antipuritic effect of *Aloevera*.

Sugars- Sugars are derived from the mucilage layer of *Aloevera* plant under the rind, surrounding the inner parenchyma or gel. They form 25 % of the solid fraction and comprise both mono and polysaccharides. By far the most

important are the long chain polysaccharides, comprising glucose.

Composition-

- *Alovera* weight - 3kg.
- *Alovera* pulp -1.932 kg Total weight of gel - 6.0 kg
- Carbopol – 1% of 60 gm
- Water- 2 kg
- TEA (Triethylamine) - 1%.
- Glyecrine = 5% - (300gm)
- Preservative – 0.5%.
- Colour & fragrance 0.5%
- Remaining water = 92%
- Carbopol = 1% (Galling agent)
- Weight of container - 880 gm
- Weight of container -1172 gm

- HPMC (Hydroxy propyl Methyl Cellulose)- Galling agent
- CMC (Carboxy Methyl cellulose - Galling agent
- TEA - for viscosity (maintain PH level)
- Glycerine -for moisture.
- Carbopol quantity change according to material.

Processes –

1. Blend *Aloevera* pulp.
2. Dip carbopol (60 gm) in water (2kg) for 24 hours.
   - glycerine - 300gm
1. Mix the carbopol with Blender.
2. Mix carbopol with *Aloevera* gel.
3. Mix glycerine.
4. Mix 1 kg water & Blend.
5. Mix preservative & Blend.
6. Add colour & then Blend.
7. Add fragrance & mix with Blender.
8. Add TEA with continution Blend.

(Add TEA step by step) - Mixed continously

- **Preservative** :

EDTA DISODIUM SALT- 10 gm
Propyl Parabene Sodium- 10gm,
Total- 20 gm
MPS -Methyl propyl sodium

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