ALOE VERA

Aloe vera syn. Aloe barbadensis M.

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1 GENERAL INFORMATION

Aloe vera, also called aloe or aloe vera, is a genus of succulent plants in the Asphodelaceae family. It is a perennial herbaceous species with a short stem, with a roseate appearance, of a grayish green color. It reaches 80 cm in height, it has long and narrow leaves, ending in points, with spiny-toothed margins; leathery in texture (similar to leather); 30-60 cm long and usually clustered in a dense rosette; the flowers form an inflorescence that grows up to 90 cm high, they are generally yellow and measure 2 to 3 cm.

Figure 1. Aloe (Aloe vera)

It is native to North Africa, but grows in regions with warm and temperate climates. In Mexico it is distributed mainly in the central regions, particularly in the states of San Luis Potosí, Hidalgo, Tamaulipas and Guanajuato, south and southeast of the country, from the low jungles in Yucatán and the Isthmus of Tehuantepec, to the Valley of Tehuacán and state of Hidalgo. They are located at altitudes from 10 to 2000 meters above sea level.

Figura 2. Aloe

There is a wide diversity of *Aloe vera* species, such as *Aloe perryi* Baker, *Aloe ferox* Mill. and *Aloe barbadensis* Mill., This last species is the one that is cultivated in the state of Tamaulipas. It is important to mention that this crop is used to make food, cosmetic and pharmaceutical products. The foregoing gives it economic importance worldwide, both in industry and in agriculture.

Table 1. Aloe's Taxonomic Classification

Common Name	Aloe
Scientific Name	*Aloe vera*
Order	Asparagales
Family	Xanthorrhoeaceae
Genre	*Aloe*
Species	*Aloe vera*

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2 CHEMICAL COMPOSITION

In *Aloe vera* (*barbadensis* Miller), the main components that can be found are anthraquinones (aloetic acid, anthranol, barbaloin, aloin, aloeemodin, anthracene, etc); vitamins such as folic acid, thiamine (B1), vitamin C, niacin (B3), pyridoxine (B6), vitamin E, and β-carotenes; minerals such as calcium, magnesium, potassium, zinc, sodium, copper, iron, manganese, phosphorus, and chromium; carbohydrates such as cellulose, galactose, glucose, xylose, mannose, arabinose, aldopentose, glucomannan, fructose, etc.

Contains organic compounds such as steroids (campestrol), lignin, triterpenes; amino acids and enzymes may also be present.

3 USES AND APPLICATIONS

3.1 Cosmetic Applications

The gel has various properties and is used orally or topically. It is used in creams to heal skin lesions, abrasions or small wounds, mainly due to the emollient and softening power of the pulp that contains vitamins A, B1, B2, C, E and folic acid, so it is also used to hydrate Dry skin. The gel is also used to treat burns and ulcers of the oral mucosa. It also contains minerals, essential amino acids and polysaccharides that stimulate tissue growth and cell regeneration.

It is also added in creams since, although it does not act as a sunscreen against UV rays, it helps prevent sunburn or reduce burning of the skin if a sunscreen was not used. Likewise, the gel is added to creams, thanks to the presence of oxidases that help against damage induced by free radicals.

In general, in cosmetic products it can be used in typical applications such as:

1. Shampoos and lotions for dry, damaged, thin, delicate, normal hair and even for baby hair.
2. Emollient gels for the eye contour.
3. Moisturizing body milks.
4. Lipsticks with regenerative action on the lips.
5. After-shave products.
6. Softening hand creams.
7. Regenerating creams for tired, damaged skin or to provide matte tones.
8. Moisturizing creams for normal or dry skin.
9. Relaxing creams for delicate or sensitive skin.
10. Baby products.
11. Treatments for acne.

3.2 Uses in Tradicional Medicine

The *Aloe vera* plant was known and used for centuries for its properties related to health, beauty, medicinal and skin care. 2000 years ago, Greek scientists considered *Aloe vera* the universal panacea. The Egyptians called Aloe "the plant of immortality." It has also been used in other cultures for millennia:

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India, Mexico, Japan, and China. The Egyptian queens Nefertiti and Cleopatra used it as part of their regular beauty regimes. Alexander the Great, used it to treat the wounds of soldiers.

Aloe Vera has traditionally been used for digestive tract disorders such as constipation; in skin diseases such as dermatitis, psoriasis and skin protection due to radiation damage; eye conditions, for small wounds and ulcers on the oral mucosa. It is also used for its healing, anti-inflammatory, anti-hemorrhoidal action, as well as having bactericidal and laxative properties. In some regions of Mexico it is used to remove spots on the skin.

The juice obtained from the leaves accelerates the healing of wounds and burns, stimulates hair growth in patients with alopecia areata and its quinolic components have a laxative action, actions that validate some of the traditional uses of this plant.

3.3 Pharmacological Studies

It has been shown to reduce inflammation in wounds and accelerate the healing process in experimentally induced wounds and burns in rats and rabbits. It has also been reported to have antiviral action (against Herpes simplex virus type 1) and antibiotics against *Bacillus subtilis* and *Staphylococcus aureus*. Another study recognizes its antioxidant activity by stimulating the activity of fibroblasts and collagen proliferation, favoring healing, angiogenesis and the reduction of free radicals that cause oxidation reactions associated with various diseases.

On the other hand, *Aloe vera* gel also showed hypoglycemic activity in rats with insulin-dependent diabetes mellitus and non-insulin-dependent diabetes mellitus and was found to reduce plasma glucose levels.

4 TOXICITY AND CONTRAINDICATIONS

4.1 Toxicity

The anthranoid compounds (anthraquinones) present in Aloe can irritate the colon and induce kidney inflammation if used for a long time.

4.2 Contraindications

Aloe should not be used in cases of colitis, Crohn's disease, irritable gallbladder and intestinal obstruction. Its use should be prohibited during pregnancy, lactation or newborns. May cause allergy or photodermatitis in sensitive subjects.

In the use of Aloe cream, significant side effects are not very frequent. Although people who apply them for long periods have been reported to have developed allergic reactions, including hives and outbreaks in the form of eczema. Application prior to sun exposure can cause flare-ups in sun-exposed areas.

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There is no information to suggest that Aloe cannot be used during pregnancy and lactation, however, it is suggested that as a preventive measure the use of this plant is limited.

Due to the chemical complexity of the extract, it is suggested that as a preventive measure the consumption of Aloe should be avoided along with medicines, food supplements and other medicinal plants. However, there is no evidence of Aloe interactions with these types of products.

5 REFERENCES

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