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DETAIL ABOUT ALOE VERA

***Atul Yadav, Mr. Awan Kumar Pandey (Assistant Professor)**

B.Pharm 4TH Year, Dr. A.P.J. Abdul Kalam Technical University.

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***Corresponding Author: Atul Yadav**

B.Pharm 4TH Year, Dr. A.P.J. Abdul Kalam Technical University.

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ABSTRACT

Aloe vera is a type of plant that grows in dry and warm areas. It is famous for its healing qualities and is used in different types of medicine like Ayurveda, Homoeopathy, and Western medicine. People from many different cultures have used it for a long time. Some traditional ways of using it include helping to reduce sweating, giving it by mouth to manage diabetes, and treating various stomach problems. It is also used to treat burn wounds, small cuts, genital herpes, and seborrheic dermatitis. The leaves of this amazing medicinal plant have many vitamins, minerals, natural sugars, enzymes, amino acids, and are also rich in different bioactive compounds. These compounds have several benefits, such as making the skin softer, helping to empty the bowels, reducing inflammation, protecting against damage from free radicals, fighting bacteria, getting rid of worms, preventing fungal growth, improving sexual health, killing germs, and being useful for skincare. Many cosmetic companies use this plant because it helps heal and nourish the skin. Keywords:Aloe vera, Medicinal Uses, bioactive compounds, Cosmetic industries

INTRODUCTION

Medicinal plants are very important in the pharmaceutical industry because they contain a lot of active chemical compounds. Most of the new antibiotics that come into the market are taken from natural sources. Medicinal plants are considered the best source for getting a wide range of drugs, as stated by the World Health Organization. The succulent plant called Aloe vera, which is part of the Alliaceae family, can grow up to a height of 60 to 100 centimeters, which is about 24 to 39 inches. It takes 4 to 6 years to fully mature and can live for almost 50 years if it has good growing conditions. Among more than 500 species of the Aloe genus, Aloe vera (L.) Burm. f. syn. is one of them. Aloe barbadensis Miller, is most biologically active3,4,5. They are originally from southern and eastern Africa, along the upper Nile in the

Sudan. Later, these plants are brought to North Africa and many other countries around the world. Many countries like India, South Africa, the United States of America, Venezuela, Aruba, Bonaire, Haiti, and others grow this plant for commercial use.

HISTORY

Aloe vera has been utilized for many centuries and is widely recognized for its therapeutic, medicinal, cosmetic, and skincare benefits. The term “Aloe vera” originates from the Arabic word *Alloeh*, meaning “bright bitter substance,” and the Latin word *vera*, meaning “genuine.” Approximately 2,000 years ago, Greek scholars regarded Aloe vera as a complete healing remedy. The earliest documented use of Aloe vera is found in the Ebers Papyrus, an ancient Egyptian medical manuscript dating back to the 16th century BC. In ancient Egypt, it was referred to as the “plant of immortality.”

Historical records indicate that Aloe vera has been used for centuries in regions such as China, Japan, India, Greece, Egypt, and Mexico. Renowned Egyptian queens like Nefertiti and Cleopatra incorporated Aloe vera into their regular beauty practices.

Notable figures such as Alexander the Great and Christopher Columbus are also believed to have used it for healing wounds of their troops. The earliest English reference to Aloe vera appeared in 1655 through a translation by John Goodyer of Dioscorides’ medical work *De Materia Medica*.

In the United States, Aloe vera began to be used as a laxative during the 19th century. By the mid-1930s, it marked a significant advancement when it was effectively used to treat persistent and severe radiation dermatitis.

TAXONOMICAL CLASSIFICATION

The taxonomical classification of Aloe vera is given in Table

1.ETHNO-BOTANY OF ALOE VERA

According to Ayurveda, Aloe is called Kumari, which means "Young Girl." It isbecause,Aloe is believed to bring back

youthful energy andfemininity. Aloe is used as a tonic to support the female reproductive system. According to Ayurveda, Aloe is said to have alliterative, tonic, rejuvenating, purgative, and vulnerary effects. Aloe is also believed to provide a good solution for all three Ayurvedic constitutions, Vata, Pitta, and Kapha. It is mostly used as a treatment for constipation, colic, skin problems, worm infections, and other infections in traditional Indian medicine. It is also used as a laxative, to help get rid of worms, to treat hemorrhoids, and as a

uterine stimulant to help regulate menstruation. Aloe extract is also used on the skin to help with eczema or psoriasis, often along with liquorice root. Aloe is also used as food. People in Tamil Nadu, India usually make a curry with A. vera, which is eaten with Indian bread like nan or with rice.

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Kingdom	**Plantae**
Clade	Angiosperms
Clade	Monocots
Order	Asparagales
Family	Asphodelaceae
Subfamily	Asphodeloideae
Genus	*Aloe*
Species	***A. vera***

ACTIVE COMPONENTS OF ALOE VERA WITH THEIR PROPERTIES

Aloe vera is believed to contain over 75 potentially active compounds, including vitamins, enzymes, minerals, carbohydrates, lignin, saponins, salicylic acids, and amino acids1. Table 2 displays the active components found in aloe vera.

Name of the Active component	Active components present in *Aloe vera* with properties
Vitamins	Vitamin A (beta-carotene), C and E, - antioxidants. It also contains vitamin B1, B2, B6 & B12, folic acid, and choline. *Antioxidants protect the body by neutralizing free radicals.
Enzymes	Aliiase, alkaline phosphatase, amylase, oxidase, bradykinase, carboxypeptidase, catalase, cellulase, lipase, cylooxygenase, and peroxidase. *Bradykinase helps to reduce excessive inflammation when applied to the skin topically, while the other enzymes help in the breakdown of sugars, proteins and fats.
Minerals	Calcium, chromium, copper, selenium, magnesium, manganese, potassium, sodium and zinc. *Some of the minerals are essential for the proper functioning of various enzyme systems in different metabolic pathways and few acts as antioxidants.
Sugars	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]. *Acemannan, a prominent glucomannan has also been found. Recently, a glycoprotein with anti allergic properties, called alprogen and novel anti-inflammatory compound, C-glucosyl chromone, has been isolated from *Aloe vera* gel[15,16].
Organic acids	Sorbate, salicylic acid, uric acid *salicylic acid possesses anti-inflammatory and antibacterial properties.
Anthraquinones	Aloin, barbaloin, isobarbaloin, anthranol, aloetic acid, aloe-emodin, ester of cinnamic acid, resistannol, chrysophannic acid and emodin, * Acts as laxatives. *Aloin and emodin act as analgesics, antibacterials and antivirals.
Fatty acids and Steroids	Cholesterol, campesterol, β-sisosterol and lupeol. Fattyacids like Arachidonic acid, γ-linolenic acid. *All these have anti-inflammatory action and lupeol also possesses antiseptic and analgesic properties.
Non-essential aminoacids	Histidine, arginine, aspartic acid, glutamic acid, proline, glycine, tyrosine, alanine and hydroxyl proline.
Essential aminoacids	Methionine, phenylalanine, isoleucine, leucine, valine, threonine and lysine.
Hormones	Auxins and gibberellins *that help in wound healing and have anti-inflammatory action.
Others	*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.

THERAPEUTIC ACTIONSOF ALOE VERA

1.Anti-inflammatory action:

Aloe vera inhibits the cyclooxygenase pathway, reducing the formation of prostaglandin E2 from arachidonic acid.C-glucosyl chromone, a novel anti-inflammatory molecule, was recently identified from Aloe gel extracts.Langmeadet al. found anti-inflammatory properties of Aloe vera gel in human colonic mucosa in vitro. Reuteret al. found that Aloe veragel (97.5%) has anti-inflammatory properties in the ultraviolet erythema test. Lee et al. found that Aloe vera adventitious root extracts have anti-inflammatory action by altering primary and secondary metabolites through salicylic acid elicitation.

2. Anti Ulcer effect ofAloe vera:

The anti-ulcer effect of Aloe verain non-steroidal anti-inflammatory drug (NSAID) induced peptic ulcers in rats was reported by Borra et al.

3.Effects on the immune system:

Alprogen, an anti-allergic chemical found in Aloe vera, blocks calcium influx into mast cells, preventing the antigen-antibody-mediated release of different mediators such as histamine, serotonin, SRSA, leukotrienes, and so on from mast cells.Acemannan stimulates the synthesis and release of interleukin-1 (IL-1) and tumor necrosis factor from macrophages in mice that have previously been implanted with murinesarcoma cells, resulting in an immune attack that causes necrosis and regression of the cancerous cells.Several low molecular elements of Aloe vera gel can also prevent the release of reactive oxygen free radicals from activated human neutrophils.Madan et al. investigated the immunomodulatory characteristics of Aloe vera gel in mice.Im et al. identified the ideal molecular size of modified Aloe polysaccharides for maximal immunomodulatory action. Zhanget al. discovered antioxidative and immunomodulatory effects in two new dihydrocoumarins from Aloe vera.

4.Laxative effects:

The Anthraquinones found in latex serve as powerful laxatives. They achieve this by enhancing the water levels in the intestines, promoting mucus production, and boosting intestinal contractions.

5.Antiviral activity:

The effects of Aloe extracts as antiviral agents could stem from either direct or indirect mechanisms. Indirectly, they exert these effects by enhancing the immune response, while directly, they act through anthraquinones. The anthraquinone compound aloin has the capacity to deactivate several enveloped viruses, including Herpes simplex, Varicella zoster, and Influenza.

6.Antitumor activity:

In a research project, a type of sugar found in Aloe was found to stop benzopyrene from attaching to main rat liver cells. This action helps avoid creating harmful benzopyrene-DNA connections that could lead to cancer. Another research indicated that Aloe gel might help prevent cancer by boosting the activity of glutathione S-transferase and lowering the harmful effects of phorbol myristic acetate. Saini and colleagues observed

that Aloe vera had anti-cancer effects against skin tumors in Swiss albino mice caused by DMBA and croton oil. Additionally, El-Shemy and others noted that Aloe vera's beneficial compounds, obtained through a special extraction method using carbon dioxide, demonstrated cancer-fighting qualities and influenced the activity of antioxidant enzymes.

7.Anti bacterial and Anti fungal activities:

Extracts from Aloe vera were found to have anti bacterial and anti fungal activities.

8.Moisturizing and anti-aging effect:

Aloe is full of mucopolysaccharides that assist in keeping the skin hydrated. Aloe encourages fibroblasts to generate collagen and elastin fibers, which helps the skin become more flexible and reduces wrinkles. It also has a sticking effect on the outer layer of skin cells, making them adhere to each other and smoothing out the skin. The amino acids found in Aloe gel contribute to softening tough skin cells. The zinc in the gel works as an astringent and helps tighten the pores. Using Aloe vera gel gloves improved the health of the skin, lessened the look of fine wrinkles and redness in those with dry skin from work exposure, showing its moisturizing properties. Additionally, the gel is beneficial for treating acne.

9.Antiseptic effect:

The antiseptic properties of Aloe vera can be attributed primarily to six key antiseptic compounds, which include Lupeol, salicylic acid, urea nitrogen, cinnamic acid, phenols, and sulfur. Each of these compounds demonstrates a capability to inhibit fungi, bacteria, and viruses.

CONCLUSION

The amazing and extraordinary plant, Aloe vera, has demonstrated its versatility in addressing a variety of health issues. While the herb is recognized for its therapeutic properties, rigorous clinical studies are needed to confirm and assess its actual effectiveness.

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