



A REVIEW ON ALOE: THE MIRACLE PLANT

Sandhya*, Anjali Yadav*, Suraj Kumar Kanaujia, Swapna Sahu , Smita Verma

Nirmala Devi Pharmacy College, Jaunpur, Uttar Pradesh- 222133

Abstract

Aloe vera, a plant with a rich history in medicinal use spanning centuries, possesses diverse beneficial properties that make it valuable across industries such as healthcare, cosmetics, and agriculture. Its therapeutic benefits, revered by civilizations like the Egyptians, Greeks, and Romans, range from treating skin conditions to promoting digestive health. Modern scientific research continues to unveil its potential in wound healing, inflammation reduction, and immune system support. Its adaptability to various climates and ease of cultivation ensure widespread availability. In skincare, it serves as a popular ingredient due to its moisturizing, anti-inflammatory, and antioxidant properties, benefiting both skin and hair care products. As a dietary supplement, it offers hydration, digestive support, immune boosting, detoxification, and overall wellness benefits. Despite its generally safe nature, consultation with healthcare professionals is advised before use, especially for those with underlying health conditions or taking medication. Aloe vera remains a cherished botanical resource, promising holistic well-being across generations.

Keyword

Aloe vera , Pharmacological activity of aloe vera, Cosmeceutica activity

Introduction

Aloevera used from ancient period in traditional medicine for its soothing and healing effects, particularly on the skin. Aloe vera gel is rich in antioxidants, vitamins, and minerals that can help to moisturize and calm irritated skin, promote wound healing, and reduce inflammation. Additionally, aloe vera is often used in skincare products, cosmetics, and even dietary supplements due to its potential health benefits. This plant is relatively easy to care for and can be grown both indoors and outdoors in suitable climates. Whether used topically or orally, ghratkumari is a versatile plant with a capacity of potential characteristics for health and well-being.¹

Historically, aloe vera has been revered for its therapeutic benefits, utilized it to treat various ailments ranging from skin conditions to digestive issues. Its soothing and moisturizing properties have made it a popular ingredient in skincare products, including lotions, creams, and sunburn remedies.² Moreover, aloe vera is celebrated for its adaptability and resilience, thriving in diverse climates and requiring minimal maintenance. Its ability to withstand arid conditions and store water in its leaves has earned it the moniker "the plant of immortality" in some cultures.

Today, scientific research continues to uncover the vast potential of aloe vera in promoting health and well-being. Studies have demonstrated its effectiveness in wound healing, inflammation reduction, and immune system support. Because of its anti-inflammatory and antibacterial qualities, it's a great help for treating a variety of skin issues, including acne, eczema, and burns.³

In addition to its medicinal uses, aloe vera has found applications in the cosmetic and pharmaceutical industries, appearing in a plethora of products ranging from cosmetics to dietary supplements. Its versatility and efficacy have cemented its status as a prized botanical resource with a wide array of practical applications.⁴

Plant Description

One of the most notable features of the aloe vera plant is its medicinal properties. The gel found inside its leaves is rich in vitamins, minerals, amino acids, and antioxidants, making it highly valued for its healing and soothing properties.⁵

Cultivating aloe vera is relatively easy, as it thrives in well-drained soil and requires minimal watering. It prefers warm climates and plenty of sunlight, although it can tolerate some shade. Aloe vera plants can be grown both indoors and outdoors, making them popular additions to gardens, as well as household collections of succulents.⁶

Botany of Aloevera Plant

Aloe vera, scientifically known as *Aloe barbadensis miller*, is a perennial succulent plant belonging to the Asphodelaceae family. Here's a breakdown of its botanical characteristics:⁷

1. Taxonomy: Aloe vera falls under the kingdom *Plantae*, division *Magnoliophyta* (Angiosperms), class *Liliopsida* (Monocotyledons), order *Asparagales*, family *Asphodelaceae* (formerly known as *Liliaceae*), and genus *Aloe*. The specific epithet "*barbadensis miller*" is often added to denote its most common cultivated variety.⁸

2. Morphology



Leaves: Aloe vera is characterized by its rosette of thick, succulent leaves arising from a central stem or crown. The leaves are lanceolate (long and narrow), tapering to a pointed tip, and typically have serrated margins.⁹

Stem: Aloe vera typically lacks a visible stem above the ground level. Instead, it forms a dense cluster of leaves that arise directly from the root system.¹⁰

Roots: The roots of aloe vera are fibrous and shallow, spreading out horizontally in the soil to anchor the plant and absorb water and nutrients.¹¹



3.Flowers:



Inflorescence: Aloe vera produces tall, slender flower stalks (inflorescences) that emerge from the center of the rosette of leaves. These stalks can reach heights of up to 3 feet (1 meter).¹²

Flower Structure: The flowers of aloe vera are tubular and pendulous, typically arranged in dense clusters along the length of the flower stalk. They come in various colors, including yellow, orange, and red, depending on the species or cultivar.¹³

Pollination: Aloe vera flowers are pollinated by bees and other insects attracted to their nectar. The plant is capable of both self-pollination and cross-pollination.¹⁴

Habitat and Distribution: Aloe vera is native to the Arabian Peninsula but has been widely cultivated and naturalized in tropical and subtropical regions worldwide. It thrives in arid and semi-arid climates, where it can withstand periods of drought by storing water in its fleshy leaves.¹⁵

4.Cultivation:

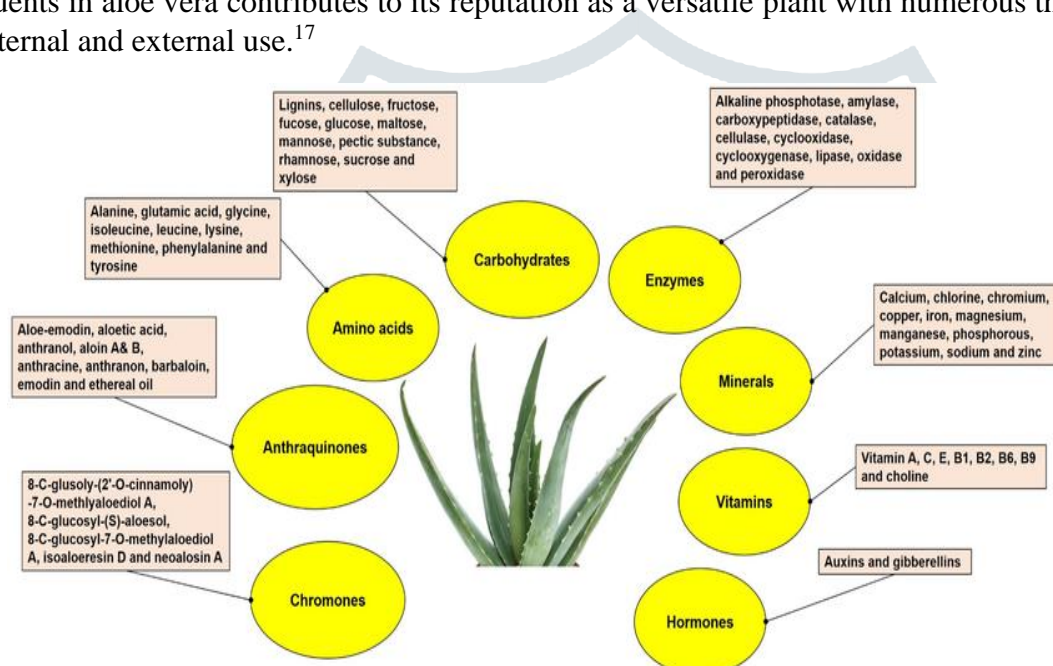
Propagation: Aloe vera can be propagated from offsets (pups) produced at the base of mature plants or from seeds. It is relatively easy to grow and adapts well to a variety of soil types, as long as they are well-draining.

Environmental Requirements: Aloe vera prefers full sunlight but can tolerate partial shade. It requires minimal water and is susceptible to root rot if overwatered. Frost can damage the plant, so it is typically grown as a houseplant or in warm outdoor climates.

Understanding the botanical characteristics of aloe vera is essential for its cultivation, propagation, and utilization in various industries, including pharmaceuticals, cosmetics, and agriculture.¹⁶

Active components of Alovera with its Characteristics

Aloe vera contains several active constituents that contribute to its various beneficial properties. The gel found in the leaves of aloe vera is rich in polysaccharides, such as acemannan, which have anti-inflammatory and immunomodulatory effects. These compounds help to reduce inflammation and support the immune system. Aloe vera also contains enzymes like amylase and lipase that aid in digestion and have soothing effects on the digestive tract. Additionally, the plant is rich in antioxidants like vitamins C and E, as well as minerals such as zinc and selenium, which help to protect cells from damage caused by free radicals and promote overall health. Other compounds found in aloe vera, such as anthraquinones and saponins, possess antimicrobial and cleansing properties that can help to promote skin health and wound healing. Overall, the combination of these active constituents in aloe vera contributes to its reputation as a versatile plant with numerous therapeutic properties for both internal and external use.¹⁷



Pharmacological Activity of Alovera Plan

Ghratkumari is a plant that has been used for centuries for its medicinal properties. Its pharmacological activity is diverse, making it a popular ingredient in various health and skincare products. Here are some of its pharmacological activities:

Anti-inflammatory: Aloe vera contains compounds such as acemannan which have anti-inflammatory properties. These properties help in reducing inflammation, making it beneficial for conditions like arthritis and inflammatory skin conditions.¹⁸

Wound healing: Aloe vera gel is widely known for its ability to promote wound healing. It accelerates the healing process by stimulating the production of collagen and promoting tissue repair. It also possesses antimicrobial properties, which help in preventing infections in wounds.

Moisturizing: Aloe vera gel is a natural moisturizer that hydrates the skin without leaving it greasy. It contains polysaccharides that help to lock moisture into the skin, making it effective for dry skin conditions.¹⁹

Antioxidant: Aloe vera is rich in flavonoids, polyphenols, vitamins C and E, and other antioxidants. By assisting the body in combating free radicals, these antioxidants shield cells from harm and lower the chance of developing chronic illnesses.

Digestive health: Aloe vera juice is frequently used to support healthy digestion. It has enzymes that help break down fats and carbohydrates, like lipase and amylase. Aloe vera is useful for treating constipation because it also possesses laxative qualities.

Immune modulation: Some studies suggest that compounds found in aloe vera, such as polysaccharides, may help to modulate the immune system, enhancing its function and promoting overall health.²⁰

Skin benefits: It is effective in treating sunburns, acne, psoriasis, and eczema, thanks to its anti-inflammatory, antimicrobial, and moisturizing properties.

Anti-tumour: Aloe vera has been studied for its potential anti-tumor properties, primarily in laboratory and animal studies. Some of the components found in aloe vera, such as acemannan, have shown promising effects in inhibiting the growth of certain types of cancer cells in vitro (in test tubes or petri dishes) and in vivo (in animal models).²¹

However, it's essential to note that while these findings are interesting, they are not conclusive evidence of aloe vera's effectiveness as a standalone treatment for cancer in humans. Cancer is a complex disease, and its treatment typically involves a combination of approaches, including surgery, chemotherapy, radiation therapy, and targeted therapies.

Further research, particularly well-designed clinical trials in humans, is needed to fully understand the potential anti-tumor activity of aloe vera and its safety and effectiveness as a cancer treatment. Additionally, if you or someone you know is considering using aloe vera or any other alternative treatment for cancer, it's crucial to consult with a healthcare professional for guidance and to ensure it complements conventional medical care.

Cosmeceutical Activity of Aloe vera

Cosmeceuticals are cosmetic products that contain biologically active ingredients purported to have pharmaceutical effects on the skin. Aloe vera, a plant known for its soothing and moisturizing properties, is a popular ingredient in cosmeceutical products due to its potential benefits for the skin. Here are some common uses of aloe vera in cosmeceuticals:

Moisturizing: Aloe vera is renowned for its hydrating properties. It helps to lock moisture into the skin, making it a common ingredient in moisturizers, lotions, and creams.²²

Soothing: Aloe vera has anti-inflammatory properties, making it useful for calming irritated or sunburned skin. It can be found in aftersun products, soothing gels, and creams designed to alleviate redness and discomfort.

Anti-aging: Some cosmeceutical formulations incorporate aloe vera for its potential anti-aging effects. It is believed to help improve skin elasticity, reduce the appearance of fine lines and wrinkles, and promote a more youthful complexion.

Acne treatment: Aloe vera contains salicylic acid and other compounds that have antibacterial and anti-inflammatory properties, which may help in the treatment of acne. It can be found in acne creams, gels, and spot treatments.²³

Scar reduction: Aloe vera is sometimes included in formulations aimed at reducing the appearance of scars. Its moisturizing and healing properties may help to soften and fade scars over time.

Wound healing: Due to its ability to promote skin regeneration and repair, aloe vera is often used in cosmeceutical products designed to aid in wound healing. It can be found in ointments, gels, and creams for minor cuts, burns, and abrasions.

When incorporating cosmeceuticals containing aloe vera into your skincare routine, it's essential to patch-test first, especially if you have sensitive skin, to ensure you don't experience any adverse reactions. Additionally, it's advisable to consult with a dermatologist or skincare professional for personalized recommendations tailored to your skin type and concerns.²⁴

Aloe vera Cosmetic Product

1. Aloe Vera Gel

"Aloe gel, derived from the succulent leaves of the aloe vera plant, has long been revered for its myriad health and skincare benefits. Rich in vitamins, minerals, and antioxidants, this translucent gel boasts properties that soothe, hydrate, and nourish the skin.

One of the most renowned uses of aloe gel is for treating sunburn. Its cooling effect provides instant relief, while its anti-inflammatory properties aid in reducing redness and irritation. Additionally, aloe gel's moisturizing capabilities help to prevent peeling, promoting faster healing of damaged skin.²⁵

Beyond sunburn relief, aloe gel is a versatile ingredient in skincare routines. Its gentle nature makes it suitable for all skin types, including sensitive and acne-prone skin. From hydrating dry patches to calming acne flare-ups, incorporating aloe gel into daily skincare rituals can promote a clearer, more radiant complexion.

Furthermore, aloe gel's benefits extend beyond skincare. When applied to the scalp, it can help alleviate dandruff and promote healthier hair growth. Its antimicrobial properties also make it an effective natural remedy for minor cuts, burns, and insect bites.

For those interested in harnessing the power of aloe gel at home, crafting DIY skincare products is simple. Mixing aloe gel with ingredients like honey, coconut oil, or essential oils can create personalized moisturizers, masks, and serums tailored to individual skincare needs.²⁶

In conclusion, aloe gel stands as a versatile and effective natural remedy with a wide range of applications in skincare and beyond. Whether soothing sunburns or nourishing the skin, its healing properties make it a staple in any wellness routine.



2. Aloe Vera Cream

Aloe vera cream is a skincare product made with aloe vera gel as its primary ingredient. Aloe vera is known for its moisturizing, soothing, and healing properties, which can benefit the skin in various ways. Aloe vera contains vitamins, minerals, amino acids, and antioxidants that nourish the skin and promote its health. Some potential benefits of using aloe vera cream include:

Moisturizing: Aloe vera helps to hydrate the skin without leaving it feeling greasy, making it suitable for all skin types, including oily and acne-prone skin.²⁷

Soothing: Aloe vera has anti-inflammatory properties that can help calm irritated or sunburned skin. It can also provide relief for conditions like eczema and psoriasis.

Healing: Aloe vera promotes the healing of minor cuts, burns, and wounds due to its ability to stimulate cell regeneration.

Anti-aging: The antioxidants present in aloe vera can help protect the skin from damage caused by free radicals, potentially reducing the signs of aging such as wrinkles and fine lines.²⁸

When choosing an aloe vera cream, it's essential to look for products that contain high concentrations of aloe vera gel and minimal additives or preservatives to maximize its benefits. Additionally, performing a patch test before using any new skincare product can help determine if you have any sensitivities or allergies to its ingredients.



Benefits of Aloe Vera in Hair Care:

Scalp Health: Aloe vera possesses anti-inflammatory and antimicrobial properties, making it effective in soothing irritated scalp conditions like dandruff, itchiness, and inflammation.

Moisture Retention: Its high water content and ability to penetrate the hair shaft help in hydrating and moisturizing dry, brittle hair, promoting elasticity and preventing breakage.²⁹

Hair Growth Stimulation: Aloe vera contains enzymes that stimulate hair follicles, promoting healthy hair growth and reducing hair loss.

pH Balance: The pH level of aloe vera is similar to that of the scalp, making it ideal for maintaining the scalp's natural balance and pH level.

Conditioning: Aloe vera's natural enzymes and vitamins, such as vitamins A, C, and E, nourish and condition the hair, leaving it soft, smooth, and shiny.³⁰



Aloe used as Supplements

1. Aloe Juice:

Discover the versatile essence of Nature's Elixir AloeJuice™, a pure and revitalizing beverage crafted from the succulent leaves of the aloe vera plant. Bursting with natural goodness, AloeJuice™ offers a myriad of uses to uplift your health and wellness journey.

Hydration with a Purpose: Quench your thirst and nourish your body simultaneously with AloeJuice™. Sip on its refreshing goodness post-workout or throughout the day to replenish electrolytes and stay hydrated.³¹

Digestive Harmony: Support your digestive system with the soothing properties of AloeJuice™. Enjoy a glass before meals to promote healthy digestion and ease occasional digestive discomfort.

Internal Cleansing: AloeJuice™ acts as a gentle cleanser for your digestive tract, aiding in the removal of toxins and promoting regularity. Incorporate it into your detox routine for a revitalizing cleanse.³²

Immune Boost: Fortify your immune system with the nourishing vitamins, minerals, and antioxidants found in AloeJuice™. Enhance your body's natural defenses and support overall wellness.³³

Skin Rejuvenation: Experience the beauty benefits of AloeJuice™ from the inside out. Its hydrating and antioxidant-rich properties promote skin health, helping to maintain a clear, radiant complexion.

Holistic Wellness: Embrace a holistic approach to wellness with AloeJuice™ as part of your daily routine. Its natural healing properties offer a gentle yet powerful support system for your body and mind.³⁴

Indulge in the pure goodness of AloeJuice™ and elevate every aspect of your well-being. With each sip, immerse yourself in the rejuvenating embrace of nature's finest gift – aloe vera.

2. Aloe Capsule:

Introducing AloePure™ Capsules, your daily dose of natural wellness encapsulated in the pure essence of aloe vera. Each capsule is a treasure trove of botanical goodness, meticulously crafted to unlock the holistic benefits of this ancient plant.³⁵



Digestive Harmony: AloePure™ Capsules offer gentle support for digestive health, promoting balance and comfort within your gastrointestinal system. Experience relief from occasional digestive discomfort and encourage optimal digestion with the soothing properties of aloe vera.

Immune Support: Nourish your body from within with the immune-boosting properties of AloePure™ Capsules. Packed with vitamins, minerals, and antioxidants, these capsules help fortify your body's natural defenses, keeping you feeling strong and resilient.³⁶

Skin Vitality: Unlock the secret to radiant skin with AloePure™ Capsules. From the inside out, aloe vera works its magic, promoting hydration, soothing occasional skin irritations, and supporting a healthy, glowing complexion.³⁷

Detoxification: Support your body's natural detoxification processes with AloePure™ Capsules. Aloe vera's gentle cleansing properties help flush out toxins and impurities, promoting a revitalized and rejuvenated feeling from within.³⁸

Joint and Muscle Health: Experience relief from occasional joint and muscle discomfort with the soothing effects of AloePure™ Capsules. Whether it's after an intense workout or simply the strains of daily life, aloe vera provides natural comfort and support.³⁹

Overall Wellness: Embrace a holistic approach to wellness with AloePure™ Capsules as a vital part of your daily routine. Feel the transformative power of aloe vera as it nurtures your body, mind, and spirit, promoting balance and vitality in every aspect of your life.

Elevate your well-being with AloePure™ Capsules and discover the transformative benefits of nature's botanical treasure – aloe vera. Experience the difference with each capsule, as you embark on a journey to enhanced vitality and holistic wellness.⁴⁰

Conclusion

In conclusion, aloe vera is truly a remarkable plant with a rich history of medicinal use dating back centuries. Its versatile nature and numerous beneficial properties make it a valuable asset in various industries, including healthcare, cosmetics, and agriculture.

Throughout history, civilizations such as the Egyptians, Greeks, and Romans have utilized aloe vera for its therapeutic benefits, particularly in treating skin conditions and promoting digestive health. Today, scientific research continues to uncover its vast potential in wound healing, inflammation reduction, immune system support, and even potential anti-tumor activity.

From its adaptability to diverse climates to its ease of cultivation, aloe vera remains a cherished botanical resource with widespread availability. Whether used topically in skincare products or orally as a dietary supplement, its healing and soothing properties offer a wide range of applications for promoting overall well-being.

In skincare, aloe vera's moisturizing, anti-inflammatory, and antioxidant properties make it a popular ingredient in various cosmeceutical products, from moisturizers to acne treatments. Its benefits extend beyond skincare to hair care, where it can soothe the scalp, moisturize hair, and stimulate healthy growth.

Furthermore, aloe vera can be consumed as a supplement in the form of juice or capsules, offering hydration, digestive support, immune boosting, detoxification, and overall wellness benefits.

In essence, aloe vera stands as a botanical treasure with a promising future, offering a holistic approach to health and well-being. Individuals should consult with healthcare professionals before incorporating it into their routines, especially if they have underlying health conditions or are taking medication. Overall, aloe vera remains a beloved and indispensable ally in promoting holistic wellness across generations.

Reference

[1] Himes S, Sharma S, Mishra K, Singhai A.K and Chaubey N; Qualitative & Quantitative profile of alone isolated from Aloe Vera. *International Research Journal of Pharmacy*, 2011; 2(9):121-122.

[2] Baby J, Justin SR. Pharmacognostic and phytochemical properties of Aloe Vera linn –an overview. *International journal of pharmaceutical sciences review and research* 2010; 4:106.

[3] Benefits of Aloe Vera Plant, Aloe Vera Juice & Aloe Vera Products. *Knowledge Base Script*.2009; 1-7. Available from: www.knowledgepublisher.com. Das N, Chattopadhyay RN. *Commercial cultivation of Aloe*. *Natural product radiance* 2004; 3:85-87.

[4] Perkins, Cyndi. "Is Aloe a Tropical Plant?". *SFgate.com*. Retrieved 13 February 2016.

[5] Anonymous (2006) For Aloe Vera as semi finish products like gel, powder and finish products like aloe Vera drink or fizzy tablets. *Technology transfer and project management network, Enzyme consulting of biotechnology*. <http://www.ensymm.com/pdf/ensymmProjectstudyAloeVeraproduction.pdf>. Accessed on 5 October 2010.

- [6] Davis RH, Kabbani JM, Maro NP. Aloe Vera and wound healing. *J Am Podiatric Med Assoc* 1987; 77:165-9.
- [7] Newton LE (1979). "In defense of the name Aloe Vera". *The Cactus and Succulent Journal of Great Britain*. 41: 29–30
- [18] www.e Pharmacognosy.com/2012/03/alo es.html
- [8] 6.Davis, R. H., Donato, J. J., Hartman, G. M., and Haas, R. C. Anti-inflammatory and wound healing activity of a growth substance in Aloe Vera. *J Am Podiatr.Med Assoc* 1994; 84(2):77-81.
- [9] Pecere, T., Sarinella, F., Salata, C., Gatto, B., Bet, A., Della, Vecchia F., Diaspro, A., Carli, M., Palumbo, M., and Palu, G. Involvement of p53 in specific anti-neuroectodermal tumor activity of aloe-emodin. *Int J Cancer* 10-10-2003; 106(6):836-847.
- [10] Singh, R. P., Dhanalakshmi, S., and Rao, A. R. Chemo modulatory action of Aloe Vera on the profiles of enzymes associated with carcinogen metabolism and antioxidant status regulation in mice. *Phytomedicine* 2000; 7(3):209-219.
- [11] 22.970212541aloe vera.blogspot.com/2017/01/plant anatomy-and-morphology.html.
- [23] Atherton P. Aloe Vera revisited. *Br J Phytother*. 1998; 4:76–83. [Google Scholar]
- [12] Atherton P. *The essential Aloe Vera: The actions and the evidence*. 2nd ed 1997. [Google Scholar]
- [13] Visuthikosol V, Chowchuen B, Sukwanarat Y, Sriurairatana S, Boonpucknavig V. Effect of Aloe Vera gel to healing of burn wound- a clinical and histologic study. *J Med Assoc Thai* 1995; 78:403-9.
- [14] Miller MB, Koltai PJ. Treatment of experimental frostbite with pentoxifylline and aloe Vera cream. *Arch Otolaryngology Head Neck Surge* 1995; 121:678-80.
- [15] Heggors JP, Pelley RP, Robson MC. Beneficial effects of Aloe in wound healing. *Phytotherapy Res* 1993; 7:S48 52.
- [16] *Unani Pharmacopeia of India .Part-1 vol. 1*. New Delhi: Department of Ayush; 2007 p.82-83.
- [17] Yates A. (2002) *Yates Garden Guide*. Harper Collins Australia
- [18] *Random House Australia Botanica's Pocket Gardening Encyclopedia for Australian Gardeners* Random House Publishers, Australia.
- [19] Gong M, Wang F, Chen Y (2002). "[Study on application of arbuscular-mycorrhizas in growing seedings of Aloe.
- [20] Ro JY, Lee B, Kim JY, Chung Y, Chung MH, Lee SK, et al. Inhibitory mechanism of aloe single component (Alprogen) on mediator release in guinea pig lung mast cells activated with specific antigen-antibody reactions. *J Pharmacol Exp There*. 2000; 292:114–21. [PubMed] [Google Scholar]
- [21] Hunter JA, Salmon M, Stavinoha WB, Satsangi N, Williams RF, Streeper RT, et al. Anti-inflammatory C glucosyl chromone from Aloe barbadensis. *J Nat Prod*. 1996; 59:541–3. [PubMed] [Google Scholar]
- [22] S.Ito R. Teradaira, H.Beppu, M. Obata, T. Negates and K. Fujita,. Properties and pharmacological activity of carboxpeptidase in aloe arborescens Mill.var. Natalen sis Berger, *Phytotherapy Research*, vol 7, No.7 1993pp S26-S29. <http:// dx.doi.org/10.1002/ptr.2650070710>.
- [23] L. Langmead, R.M. Feakins and S. Goldthorpe, Randomized, Doubled, Placebo-controlled Trail of oral aloe Vera gel for active Ulcerative Colitis , *Alimentary Pharmacology & Therapeutic*, vol,19 No, 7. 2004 pp.739-747.
- [24] West DP, Zhu YF. Evaluation of aloe Vera gel gloves in the treatment of dry skin associated with occupational exposure. *Is J Infect Control?* 2003; 31:40–2.
- [25] Sai Krishna Borra, Radha Krishna Lagisetty and Gownrinath Reddy Mallela. 2011. *African Journal of Pharmacy and Pharmacology* vol.5.pp.1867-1871.
- [26] 34. Wang, Z. W., Huang, Z. S., Yang, A. P., Li, C. Y., Huang, H., Lin, X., Liu, Z. C., and Zhu, X F. [Radio protective effect of aloe polysaccharides on three non-tumor cell 47. lines]. *Ai. Zheng*. 2005; 24(4):438-442.
- [27] Reynolds T, Dweck AC. Aloe Vera leaf gel: A review update. *J Ethnopharmacol*. 1999; 68:3–37. [PubMed] [Google Scholar]
- [28] S. Y. Peng, J.Norman, G Curtin D. Corrier, H. R.McDaniel and D.Busbee, Decreased Mortality of Norman Murine Sarcoma in Mice Treated with the Immuno-modulator, Acemannaon , *Molecular Biotherapy*, vol.3, 1991,pp.79 87.

- [29] Wang ZW Huang ZS Yang AP Li CY Huang H Lin X Liu ZC and Zhu XF Radioprotective effect of aloe polysaccharides on three non tumor cell 47 lines Ai Zheng 2005 24 4 438 442.
- [30] West, Dennis P, Ya Fen Zhu, Evaluation of Aloe Vera gel gloves in dry skin associated with occupational exposure, American Journal of Infection Control, 31(1), 2003, 40-42.
- [31] Kumar KPS, Bhowmik D, Chiranjib and Biswajit, Aloe Vera: A Potential Herb and its Medicinal Importance, Journal of Chemistry and Pharmaceutical Research, 2(1), 2010, 21-29.
- [32] R.H Thomson, Naturally occurring Quinines, 2nd edition, Academy Press, London, 1971.
- [33] Yagi, A., Kabash, A., Mizuno, K., Moustafa, S. M., Khalifa, T. I., and Tsuji, H. Radical Scavenging Glycoprotein Inhibiting Cyclooxygenase-2 and Thromboxane A2 Synthase from Aloe Vera Gel. *Planta Med.* 2003; 69(3):269-271.
- [34] Hegggers J, Kucukcelebi A, Listengarten D, Stabenau J, Ko F, Broemeling LD, et al. Beneficial effect of aloe on wound healing in an excisional wound model. *J Altern Complement Med.* 1996; 2:271-7. [PubMed] [Google Scholar]
- [35] Chithra P, Sajithlal G, Chandrakasan G. Influence of aloe Vera on the glycosaminoglycan's in the matrix of healing dermal wounds in rats. *J Ethnopharmacol.* 1998; 59:179-86. [PubMed] [Google Scholar]
- [36] <https://www.aloe-medical-group.com/en/aloe-vera/botany.html>
- [37] Nadkarni KM. Indian plants and Drugs. New Delhi; srishti book 29PMid:15129907. Distributors, 2004 p.28.
- [38] Linnaeus, C. (1753). *Species plantarum, exhibentes plants rite cognitatas, ad genera relatas, cum differentiis specificis, nominibus trivialibus, synonymies selectees, loci's natalibus, secundum systema sexual digests* Vol. 2 pp. [i], 561-1200, [1-30, index], [i, err.]. Holmiae [Stockholm]: Impensis Laurentii Salvii.
- [39] Newton LE (1979). "In defense of the name Aloe Vera". *The Cactus and Succulent Journal of Great Britain.* 41: 29-30
- [40] www.epharmacognosy.com/2012/03/aloes.html

