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A critical review on the Applications and uses of Aloe Vera

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Abstract

Aloe vera, herbs like *cacti,* and traditional medicine have been around for thousands of years. Aloe vera can be divided into two parts: latex, yellow liquid under the epidermis, paper and gel, colorless and unused paper. They all contain many living things, usually, anthraquinones and polysaccharides (the strongest acetone), which can form alone or in combination. Scientific studies have shown that Aloe Vera can be used in cosmetics, kinds of toothpaste, and more. In foods such as satiety or storage with fresh food and human or animal medicines. Aloe vera appears to treat several conditions due to its healing, anti-inflammatory, immune, antidiabetic, antioxidant, laxative, antibacterial, antifungal, antiviral, and anticancer effects. In addition to these additives, they can be added to the diet of animals to provide many benefits.

Keywords: Aloe vera, antioxidant, inflammatory, medicine, polysaccharides

Introduction

Aloe vera has been used in human medicine for thousands of years for its therapeutic properties, especially for the skin. This plant is one of the oldest and most famous recorded human exploits from the Egyptian papyrus dating to 3500 BC. The Greek philosopher Aristotle wrote of the medicinal properties of aloe vera, and references are found throughout the Bible. It was used by the ancient Greeks, Romans, Chinese, and Indians. In the early 1800s, aloe vera was used as a medicine in the United States [1-4].

Furthermore, the current treatment process began in the 1930s with reports of successful treatments for new X-rays in new circuits. Aloe vera gets its name from the Arabic words "language", which means "bright" due to the bitter water in the book, and "Latin" means "true." This type of animal was described by Charles Linnaeus in 1753 when the division was introduced [5].

Kingdom: *Plantae*, Order: *Asparagales*, Family: *Asphodelaceae*, Genus: *Aloe,* Species: *Aloe vera.*

There are numerous references: *Mulino Aloe Barbadians., Aloe Index Royal, Perforated Aloe L Vera Vera, and Papa Vulgaris Lam*. Most fruits are not bitter, but other fruits are very painful. There are about four main types of natural herbs in 420, and they include aloe vera, which is considered vital and therefore one of the most popular plants, widely used as an ornamental [6]. The general nature of aloe vera is unclear due to its widespread cultivation worldwide and its origins in Africa. It grew in many tropical and subtropical regions, including South Africa and Latin America, and spread to China, India, and various parts of southern Europe in the 17th century.Aloe vera is a cactus-like plant, although it is associated with onions, garlic, and asparagus. It is sessile with fleshy triangular leaves ranging from gray-green to light green and has small white teeth along the edge of the leaf. The leaves are made up of three layers: the inner gel, the yellow core, and the outer, 15-20 cell thick layers called the cortex. Aloe

leaves have long been used for medicinal, cosmetic, and nutritional purposes, but there is no clear scientific understanding or analysis of these properties.According to some researchers, aloe vera can be broken down into two main products: latex and gel. Latex is a bitter yellow exudate from the pericyclic tubules under the epidermis of the leaf that makes up about 20-30% of the weight of the entire leaf, known as "aloe juice" or "aloe juice." Younger leaves had higher levels of latex components than older leaves. Colorless and tasteless gel, on the other hand, consists of the pulp or mucus of the plant parenchyma cells within the leaf [7-9].

In early 1941, the pulp of aloe vera leaves contained 98.5% water, and the alcohol-insoluble part contained mucus, which contained uronic acid, fructose, hydrolyzed sugars, and enzymes. We now know that the gel, which represents about 70 to 80% of the total weight of the leaves, acts as a reserve of water and energy for the plants. When using a whole aloe vera leaf, it is difficult to determine whether its biological effects are gel or latex related, as exudates can enter during gel manufacturing [10-15].

Biological Components

Latex and aloe vera gel contain physiologically active substances that have a biological effect, which acts independently or show a synergistic effect. The identification of these substances is essential for the effective use of the plant. The chemical composition of aloe vera varies depending on the climate, region, growing conditions, age of growth, or processing method [16-19].

Healing the wounds

Growth hormone polysaccharides and gibberellins increased production of collagen, and elastin can reduce wrinkles. The excellent healing power of aloe vera is detecting a range of mucopolysaccharides (MPS) present in the field of 10,000 to 20,000 MPS per liter. In addition, aloe vera works to heal scar tissue and prevent shrinkage due to skin damage, presumably through the action of amino acids necessary for the formation of new cells and the ability of its enzymes to stimulate cell regeneration [20-23].

Antidiabetic properties

Many disorganized substances (vanadium, manganese, copper) and especially the polysaccharides found in aloe vera may play an essential role in antidiabetic activity. This herb has been associated with lowering blood sugar and lowering blood lipids and cholesterol in diabetics [24-27].

Antibacterial applications

Many researchers report that aloe vera stimulates the growth of microorganisms such as Str. Pyogenes, Shigellaflexneri, Klebsiella sp., especially against gram-positive bacteria that cause food poisoning or disease in humans and animals [28-30].

Antifungal applications

Antifungal activity has received less attention, although inhibitory activity against Candida has been reported. Aloe vera is used in the aquarium as a water regenerator due to its antifungal properties [31-33].

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Antiviral and antitumor activity

These effects may be due to direct or indirect impact: indirect immune system stimulation and direct anthraquinones. Therefore, clinical trials are currently underway to obtain strong evidence for using aloe vera in the treatment of HIV / AIDS or cancer [34-37].

Other Medical Applications

Aloevera can be used successfully for the general treatment of skin ulcers, including mouth ulcers, herpes simplex, and psoriasis. In addition, this plant has been shown to protect against stomach ulcers. Aloe vera supports the healing of first to second-degree burns. It is suggested that lectin may be responsible for the therapeutic effect. Aloe vera-fed broilers showed significantly higher haemagglutination inhibition titer values against Newcastle disease [38-43].

Conclusions

Aloe vera contains many nutrients. It is necessary to begin the scientific study of this chemical plant and to promote its widespread use.

References

[1]. Dash, S. (2006). *Chemical and pharmacological evaluation of colebrookeaoppositifolia smith and Heracleumnepalence D Don Dc* (Doctoral dissertation, University of North Bengal).
[2]. Alam, Zulfeequar. "Marketing Mix Determination for the Promotion of Herbal Medicines in India." PhD diss., Aligarh Muslim University, 2005.
[3]. López Sampson, Arlene. "Growth physiology and productivity of cultivated Aquilariacrassna Pierre ex Lecomte (Thymelaeaceae) in tropical Australia and its reproduction biology." PhD diss., James Cook University, 2017.
[4]. Aspillera, D. C. (1986). *AN EDUCATIONAL PROGRAM ON INDIGENOUS FOODS FOR BETTER HEALTH AND BETTER ECONOMY FOR THE PHILIPPINES (ECONOMICS, AGRICULTURE)* (Doctoral dissertation, University of Massachusetts Amherst).
[5]. Doja, M. N. (2007). *International Encyclopaedia of Engineering and Technology*. Mittal Publications
[6]. Kufer, J. K. (2005). *Plants used as medicine and food by the Ch'orti'Maya: Ethnobotanical studies in eastern Guatemala*. University of London, University College London (United Kingdom).
[7]. Kufer, J. K. (2005). *Plants used as medicine and food by the Ch'orti'Maya: Ethnobotanical studies in eastern Guatemala*. University of London, University College London (United Kingdom).
[8]. Capasso, F., &Gaginella, T. S. (2012). *Laxatives: a practical guide*. Springer Science & Business Media.
[9]. Abdulrahman, E. M. E. (2016). *Impact of nutrients and bio-stimulants on growth and yield of Aloe vera plants* (Doctoral dissertation, Sudan University of Science and Technology).
[10]. Panda, H. *Aloe vera handbook cultivation, research finding, products, formulations, extraction & processing*. NIIR PROJECT CONSULTANCY SERVICES, 2003.

[11]. Villanueva-Suárez, M. J., Pérez-Cózar, M. L., & Redondo-Cuenca, A. (2013). Sequential extraction of polysaccharides from enzymatically hydrolyzed okara byproduct: physicochemical properties and in vitro fermentability. *Food chemistry*, *141*(2), 1114-1119.

[12]. Ramakrishnan, S. (2004). *Textbook of medical biochemistry*. Orient Blackswan.

[13]. Panda, H. (2003). *Aloe vera handbook cultivation, research finding, products, formulations, extraction & processing*. NIIR PROJECT CONSULTANCY SERVICES.

[14]. Peñalva, R. (2019). Protein nanoparticles for oral delivery of bioactives.

[15]. BOCK, A., & FIELD, H. Oxygen and Hzmoglobin. B. M. FERRY (J. Biol. Chem., 1924.

[16]. Boudreau, M. D., &Beland, F. A. (2006). An evaluation of the biological and toxicological properties of Aloe barbadensis (miller), Aloe vera. *Journal of Environmental Science and Health Part C*, *24*(1), 103-154.

[17]. Christaki, E. V., &Florou-Paneri, P. C. (2010). Aloe vera: a plant for many uses. *J Food Agric Environ*, *8*(2), 245-249.

[18]. Aburjai, Talal, and Feda M. Natsheh. "Plants used in cosmetics." *Phytotherapy Research: An International Journal Devoted to Pharmacological and Toxicological Evaluation of Natural Product Derivatives* 17, no. 9 (2003): 987-1000.

[19]. Salehi, Bahare, SevilAlbayrak, Hubert Antolak, DorotaKręgiel, EwelinaPawlikowska, Mehdi Sharifi-Rad, Yadav Uprety et al. "Aloe genus plants: from farm to food applications and phytopharmacotherapy." *International journal of molecular sciences* 19, no. 9 (2018): 2843.

[20]. Alamgir, A. N. M. (2018). Phytoconstituents—Active and Inert Constituents, Metabolic Pathways, Chemistry and Application of Phytoconstituents, Primary Metabolic Products, and Bioactive Compounds of Primary Metabolic Origin. In *Therapeutic Use of Medicinal Plants and their Extracts: Volume 2* (pp. 25-164). Springer, Cham.

[21]. Eshun, K., & He, Q. (2004). Aloe vera: a valuable ingredient for the food, pharmaceutical and cosmetic industries—a review. *Critical reviews in food science and nutrition*, *44*(2), 91-96.

[22]. Ramachandra, C. T., & Rao, P. S. (2008). Processing of Aloe vera leaf gel: a review. *American Journal of Agricultural and Biological Sciences*, *3*(2), 502-510.

[23]. Njoroge, Jane Wanjiku. "Comparative study of antihyperglycaemic activity of urticadioica (stinging nettle), zadirachtaindica (neem) and aloe secundiflora (aloe) extracts on rabbits and streptozotocin induced diabetic rats." PhD diss., University of Nairobi, 2012.

[24]. Noor, A., Gunasekaran, S., Manickam, A. S., &Vijayalakshmi, M. A. (2008). Antidiabetic activity of Aloe vera and histology of organs in streptozotocin-induced diabetic rats. *Current science*, 1070-1076.

[25]. Mohamed, E. A. K. (2011). Antidiabetic, antihypercholestermic and antioxidative effect of Aloe vera gel extract in alloxan induced diabetic rats. *Aust J Basic ApplSci*, *5*(11), 1321-1327.

[26]. Radha, M. H., &Laxmipriya, N. P. (2015). Evaluation of biological properties and clinical effectiveness of Aloe vera: A systematic review. *Journal of traditional and complementary medicine*, *5*(1), 21-26.

[27]. Koo, M. W. L. (1994). Aloe vera: Antiulcer and antidiabetic effects. *Phytotherapy Research*, *8*(8), 461-464.

[28]. Christaki, E. V., &Florou-Paneri, P. C. (2010). Aloe vera: a plant for many uses. *J Food Agric Environ*, *8*(2), 245-249.

[29]. Dhama, Kuldeep, Ruchi Tiwari, Sandip Chakraborty, Mani Saminathan, Amit Kumar, K. Karthik, Mohd YagoobWani, Singh SV Amarpal, and A. Rahal. "Evidence based antibacterial potentials of medicinal plants and herbs countering bacterial pathogens especially in the era of

emerging drug resistance: An integrated update." *International Journal of Pharmacology* 10, no. 1 (2014): 1-43.

[30]. Da Silva, Ivanise, Rafaela Sá, Danielle CerqueiraMacêdo, and Karina Randau. "Use of medicinal plants in the treatment of erysipelas: A review." *Pharmacognosy Reviews* 12, no. 24 (2018).

[31]. Jacobsen, Stine. "Topical Wound Treatments and Wound-Care Products." *Equine wound management* (2016): 75-103.

[32]. Ruiz, MaríaCámara. "Effects of purslane (Portulacaoleracea L.) andShewanellaputrefaciens probiotic enriched diet on gilthead seabream (Sparusaurata L.)." PhD diss., 2017.

[33]. Léonard, A., Dandoy, P., Danloy, E., Leroux, G., Meunier, C. F., Rooke, J. C., & Su, B. L. (2011). Whole-cell based hybrid materials for green energy production, environmental remediation and smart cell-therapy. *Chemical Society Reviews*, *40*(2), 860-885.

[34]. Braun, L., & Cohen, M. (2015). *Herbs and natural supplements, volume 2: An evidence-based guide* (Vol. 2). Elsevier Health Sciences.

[35]. Singh, Sandeep Kumar, Saurabh Srivastav, Amarish Kumar Yadav, SaripellaSrikrishna, and George Perry. "Overview of Alzheimer's disease and some therapeutic approaches targeting Aβ by using several synthetic and herbal compounds." *Oxidative medicine and cellular longevity* 2016 (2016).

[36]. Ernst, Edzard, F. S. B. FMEdSci, Paul J. Hesketh, and Diane MF Savarese. "Complementary and alternative therapies for cancer." (2011): 1-48.

[37]. Fetrow, Charles W., and Juan R. Avila. *The complete guide to herbal medicines*. Simon and Schuster, 2000.

[38]. Rajeswari, R., Umadevi, M., Rahale, C. S., Pushpa, R., Selvavenkadesh, S., Kumar, K. S., &Bhowmik, D. (2012). Aloe vera: the miracle plant its medicinal and traditional uses in India. *Journal of Pharmacognosy and Phytochemistry*, *1*(4), 118-124.

[39]. Gupta, Akhilesh, and Swati Rawat. "Clinical importance of aloe vera." *Research Journal of Topical and Cosmetic Sciences* 8, no. 1 (2017): 30-39.

[40]. Gage, Diane. *Aloe vera: Nature's soothing healer*. Inner Traditions/Bear & Co, 1996.

[41]. Ulbricht, Catherine, Jennifer Armstrong, Ethan Basch, Samuel Basch, Steve Bent, Cynthia Dacey, Sean Dalton et al. "An evidence-based systematic review of Aloe vera by the natural standard research collaboration." *Journal of herbal pharmacotherapy* 7, no. 3-4 (2008): 279-323.

[42]. Rodríguez, Elena Rodríguez, Jacinto Darias Martín, and Carlos Díaz Romero. "Aloe vera as a functional ingredient in foods." *Critical Reviews in Food Science and Nutrition* 50, no. 4 (2010): 305-326.

[43]. Siew, Yin-Yin, SogandZareisedehizadeh, Wei-GuangSeetoh, Soek-Ying Neo, Chay-Hoon Tan, and Hwee-Ling Koh. "Ethnobotanical survey of usage of fresh medicinal plants in Singapore." *Journal of ethnopharmacology* 155, no. 3 (2014): 1450-1466.