



The Supreme Healing Power of Aloe Vera

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Cleopatra and Alexander the Great had more in common than their high-profile jobs and “type A” personalities. It’s believed they both appreciated the healing properties of the Aloe Vera plant long before modern science began proving its benefits.

Aloe Vera (Aloe Barbadensis Miller), a member of the lily family, is a spiky, succulent perennial plant indigenous to Africa. It has long been regarded as one of nature’s most useful healers. Ancient records reveal the plant was used medicinally in ancient Egypt, Greece and Rome. Egyptians referred to Aloe Vera as “the plant of immortality” and used it for embalming and bathing. Records confirm the Greek physician Dioscorides used the plant to treat mouth infections, sores and wounds in the first century.

Aloe is truly a ‘super food’, and has been for over 4,000 years—modern science is just catching up. Aloe’s triangular, fleshy leaves contain a wealth of biologically active substances. Its laxative effects are attributable to a group of chemicals known as anthraquinones, including aloin, barbaloin, aloe-emodin and aloetic acid. So potent an irritant laxative is aloin, it is an official drug in the U.S. Pharmacopeia (USP) and is removed from gel preparations. The inner gel contains polysaccharides including acemannan, a biopolymer thought to be responsible for many of the plant’s wound healing, antiviral and immunostimulating properties.

Much of aloe’s biological activity is attributed to polysaccharides, Aloe Vera is composed of almost 200 different biologically active substances. The major molecule is the polysaccharide mannose, which is thought to be responsible for directing the synergistic activity of a vast array of compounds.

In addition to polysaccharides, aloe contains simple sugars, proteins, amino acids, vitamins, minerals and glycoproteins. Research has shown there are many small molecular weight components, including glycoproteins, that play a significant role in the overall medicinal effects associated with aloe. It is likely these components work in synergy, resulting in overall enhanced and diverse effects, in contrast to purified extracts from aloe. It should be understood that purified extracts of aloe usually target one specific biological activity rather than the full scope of physiological effects demonstrated by whole aloe.

Consumers appear to be quite willing to try new product applications featuring aloe. According to the market research firm SPINS, the U.S. market for products containing Aloe Vera was more than \$30 million for health and mass market channels (excluding Wal-Mart, 52 week data ending October 2006). Sales of Aloe Vera ingredients in health food channels grew by almost 10 percent, outpacing sales in the mass market, where SPINS attributes a decline in sales to a lack of branding, positioning and quality.

101 Uses for Aloe

Aloe Vera already has a well known place in many homes. “It’s a common practice to have a potted aloe plant as a ready and helpful remedy for a myriad of everyday uses, such as for cuts, burns, injuries, etc.,” said Gene Hale, executive director of the Irving, Texas-based International Aloe Science Council (IASC).

Although there is a long-standing practice of using the plant as a digestive aid and skin care ingredient, until the mid-20th century use was based primarily on anecdotal evidence. In the 1930s, a woman with a skin radiation burn benefited from a topical application of Aloe Vera gel; the positive result encouraged trials with others suffering from radiation burns.¹ In 1953, evidence of the plant's wound-healing benefits became scientifically recognized when a study found it successfully treated radiation lesions in rats.²

However, there is great potential beyond topical application. "Aloe has broader potential as a 'super' nutrient for a range of health conditions, such as immune system modulation, anti-diabetic activity/blood sugar balance, kidney stone prevention, oral/gum health, anti-inflammatory for joint comfort, cholesterol/triglyceride reduction, and antioxidant protection and detoxification," Apps said.

Studies have shown Aloe Vera may help normalize blood sugar, stimulate the body's antioxidant defences and increase the bioavailability of antioxidant supplements. Aloe's hypoglycemic and antioxidant benefits also benefit the liver and heart.

In one trial, researchers evaluated the anti-hyperglycemic effect of Aloe Vera gel and five isolated phytosterols.³ After administration of the five phytosterols to healthy adults for 28 days, fasting blood glucose levels decreased by up to 64 percent compared to control levels. The findings suggest Aloe Vera gel and its phytosterols have a long-term blood glucose control effect and would be useful for the treatment of type 2 diabetes mellitus. Another study determined the presence of several hypoglycemic-active elements in the gel when processed into ash.⁴ The researchers suggested the presence of various inorganic trace elements in the gel may account for the hypoglycemic nature of the plant.

Animal studies have also provided supporting evidence for the antidiabetic activity of Aloe Vera. One study involved oral administration of Aloe Vera gel extract at a dose of 300 mg/kg body weight per day to diabetic rats for 21 days.⁵ Treatment significantly reduced fasting blood glucose, hepatic transaminases, plasma and tissue cholesterol, triglycerides, free fatty acids and phospholipids, and significantly improved plasma insulin. Further animal research from Kyung Hee University in Korea demonstrated the antioxidant and cholesterol lowering effects of Aloe Vera.⁶

Researchers randomly assigned rats to one of four groups: control; 1-percent freeze-dried aloe fillet; 1-percent charcoal-processed, freeze-dried aloe fillet; or charcoal-processed, freeze-dried whole leaf aloe in drinking water. Life-long intake of aloe had superior antioxidant action in vivo, as indicated by reduced levels of hepatic phosphatidylcholine hydroperoxide. Additional antioxidant action was shown by enhanced superoxide dismutase and catalase activity in the 1-percent aloe groups. Researchers also noted liver cholesterol increased significantly in the control group during aging compared to the aloe groups, which showed 30-percent lower cholesterol levels than the control animals.

For digestive health, aloe has been shown to relieve the symptoms of ulcerative colitis, a type of irritable bowel disease (IBD). A recent study showed 47 percent of participants who took aloe reported an improvement in IBD symptoms, compared with only 14 percent of those given placebo.⁷ Further, Aloe Vera appears to increase absorption of vitamins E and C by slowing their assimilation and prolonging their concentrations in blood plasma.⁸ Researchers found Aloe Vera increased levels of vitamins C and E in the bloodstream by more than 200 percent when consumed together. The study also concluded Aloe Vera enhanced the bioavailability of both water- and fat-soluble vitamins, and has a natural time release effect on vitamin absorption.

"No other matrix is known to increase the bioavailability of both water and fat soluble vitamins," Jones said. "The bioavailability research has created a landmark event and major turning point for the functional food and nutraceutical industry as these companies realize the benefits of incorporating aloe into their products containing vitamins C and E. By adding Aloe Vera to these and other supplement products, we are delivering to discerning consumers highly synergistic and superior products that allow them to gain maximum benefits from their supplements." Hale added, "This effect on absorption promises to make aloe more prevalent in energy bars, drinks and other functional foods."

A New Era of Aloe Application

The food and beverage market is a promising arena for aloe, as many modern-day health-conscious consumers feel normal food is not good enough. Many demand added value and interest from their foods and beverages. As a result, industry innovators are investing in research and development (R&D), new product development and marketing to explore new concepts that include healthier ingredients, according to Leatherhead Food RA's 2004 report "Emerging Concepts in the Global Food and Drinks Industry".

This has created a new product category, "skingestibles", for foods designed to produce external beauty benefits, as identified by Datamonitor market analyst Daniel Bone. "As the connection between beauty and health grows, there is an opportunity for manufacturers and retailers to develop sophisticated product offerings by promoting personal appearance through food and beverages," Bone said. For example, SkinCola, a beverage containing aloe and collagen, was launched in the United Kingdom as an all-natural, super-oxygenated drink designed to hydrate the skin.

Another interesting application was developed by Spanish researchers, who are using Aloe Vera as an edible coating and preservative for fruits and vegetables. In the study, researchers dipped a group of common table grapes into Aloe Vera gel and stored them for five weeks at low temperature, while exposing a group of untreated table grapes to the same conditions.⁹ The untreated grapes appeared to deteriorate rapidly within about seven days, whereas the gel-coated grapes were well-preserved for up to 35 days under the same experimental conditions. Specifically, the gel-treated grapes were firmer, had less weight loss and less color change than the untreated grapes. The quality of both the untreated and the gel-treated grapes was evaluated by a sensory panel, which found the gel-treated grapes were generally superior in taste.

The researchers believe the gel works through a combination of mechanisms. Composed mostly of polysaccharides, the gel appears to act as a natural barrier to moisture and oxygen, which can speed food deterioration. Although the safety of human consumption of aloe gel was not directly measured in this study, the coating is believed to be safe, based on history of safe use.

More Than One Way to Fillet an Aloe

Careful processing of aloe gel is necessary to maintain biological activity while removing undesirable compounds. The plant's gel can be derived solely from the inner gel fillet or by processing the whole leaf; processing methods include the hand-fillet method, machine-fillet method and squeezing method. The hand-fillet method requires careful removal of the inner gel while avoiding the latex-containing yellow sap near the rind. Whole leaf extracts are made by grinding the entire leaf and then removing the aloin. The goal of whole leaf processing is to retain as many polysaccharides as possible, since they have been shown to be partially responsible for aloe's therapeutic efficacy.

Stabilizing the constituents within aloe is another essential part of developing effective products. Selective harvesting and hand processing is the best way to maintain the integrity of inner fillet Aloe Vera gel and maximize the polysaccharide content. Immediate on-site processing reduces degradation of the ingredient thereby ensuring the activity of the polysaccharides.

To maintain the strength of the category and the industry in general, it is important for end consumers to know whether the Aloe Vera products they purchase are high quality. To this end, the IASC's Certification Program was developed to ensure accurate representation of the true amount of the ingredient in both raw materials and consumer products.

IASC developed a certification seal, which indicates the Aloe Vera used in the formulation process and finished product has met specific quality assurance standards and qualified for certification.

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