International Journal of Pharmacy and Herbal Technology

e-ISSN: 2583-8962 Vol. 3, Issue 1 (January – April, 2025) pp: (3974-3987)

A Review on Therapeutic Use of Aloe Vera Extract in Digestive System Disorders

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Received Date: February 02,2025; Published Date: April 03,2025

Abstract

A fleshy plant with a long history of medicinal usage, aloe vera has drawn interest due to its possible therapeutic effects for conditions affecting the digestive system.

This review investigates the Aloe vera's bioactive ingredients, especially its gel and latex, and their effects on intestinal health. Aloe vera's anti-inflammatory, antioxidant, and antibacterial qualities are attributed to its polysaccharides, enzymes, vitamins, and minerals.

Studies indicate that aloe vera extract may be useful When treating inflammatory bowel diseases (IBD), such as Crohn's disease and ulcerative colitis, ulcers and irritable bowel syndrome (IBS). Its capacity to promote mucus secretion and its calming and restorative effects on the gastrointestinal mucosa may be beneficial. shield the intestinal lining and encourage the recovery of lesions and ulcers. Aloe vera is also known for its laxative qualities, which help ease constipation.

Keywords – Crohn's disease, ulcerative colitis, irritable bowel syndrome, inflammatory bowel diseases

INTRODUCTION

The medical properties of Aloe Vera (Aloe barbadensis miller), a succulent plant, are well known, particularly in the fields of dermatology and wound treatment. But historically, it has also been used to treat a number of digestive system problems. Aloe vera's medical benefits are mostly ascribed to its gel-like extract, which includes active ingredients including polysaccharides, amino acids, vitamins, enzymes and other phytonutrients.

The methods, advantages, scientific proof and security of applying aloe vera extract in the therapy for digestive disorders. Although aloe vera is primarily recognised for its topical uses, particularly in the management of burns, wounds, and skin irritations, its internal use has also drawn interest especially in relation to digestive health.

Aloe vera stands out for its potential to help cure a range of digestive system issues, and the field of gastrointestinal medicine is seeing an increase in interest in natural therapies. As GERD, IBD, peptic ulcers, and irritable bowel syndrome (IBS) increase in prevalence, different therapeutic approaches One substance that is being researched as a supplement or adjunct to conventional medication is aloe vera extract. The majority of the plant's nutritional benefits for the digestive system are due to its high content of vitamins, minerals, amino acids, polysaccharides, enzymes, and bioactive substances.

Ingredients like loin, Alemanni, and emodin. They give Aloe Vera its laxative properties., antioxidant and antibacterial qualities, which may make it a useful remedy for a variety of digestive disorders. [1]

Historical and Traditional Use

In the past, aloe vera was utilised for both internal and external therapeutic purposes in ancient civilisations like Egypt, Greece, India, and China. Aloe vera is mentioned as a treatment for infections and digestive issues in the Ebbers Papyrus, an ancient Egyptian medical treatise that dates back to 1500

B.C. Aloe was also utilised to treat digestive issues and support digestive health in ancient Greek and Roman medicine.

Aloe Vera's function in regulating digestion has also been highlighted by traditional medical systems like Ayurveda and Traditional Chinese Medicine (TCM). Aloe is referred to in Ayurveda as "Kumari," which translates to "the princess," reflects its esteemed reputation as a digestive and internal organ tonic. Aloe vera is acknowledged in TCM for its capacity to eliminate toxins and dissipate heat. which are believed to upset the balance of the digestive system. [2]

Modern Interest in Aloe Vera for Digestive Health

As pharmacology and phytochemistry have advanced, contemporary study has concentrated on knowing the ways in which aloe vera extract supports the digestive system and produces its medicinal benefits. Because of its softer effect on the gastrointestinal tract, the plant's gel, which is made from the interleaf, is frequently chosen over Aloe latex, the bitter yellow secretion that is located beneath the outer leaf tract. Aloe latex is a potent laxative; however, it comes with a risk because it contains anthraquinones. potential toxicity and prolonged usage are usually not advised.

Scientific Rationale

It is thought that the bioactive substances in aloe vera gel function via a number of important pathways:

Inflammatory action

Aloe Vera is beneficial for inflammatory illnesses like IBS and IBD because its polysaccharides and other bioactive ingredients prevent the production of pro-inflammatory cytokines.

Mucosal healing

The gel's mucilage-like consistency aids in the formation of a protective layer over the mucosa of the gastrointestinal tract, reducing irritation and encouraging recovery in diseases including peptic ulcers and GERD. By promoting peristalsis and raising intestinal water content, the anthraquinones found in aloe latex, such as aloin and emodin, have strong laxative effects. Aloe gel, without the latex, offers a gentler, non-irritating alternative for constipation relief. [3]

Chemical Composition of Aloe Vera

Aloe vera is a very complex plant with over 75 active chemicals that are essential to its many therapeutic uses, especially for digestive health. The inner leaf’s gel is full of bioactive substances that have been shown to have anti-inflammatory, antibacterial, antioxidant, and restorative qualities. An extensive examination of Aloe Vera’s main constituents and their specific roles in promoting digestive health is provided below. [4]

Polysaccharides

Polysaccharides are the primary bioactive compounds in Aloe vera, particularly known for their immune-modulating, anti-inflammatory, and gastroprotective properties. Notable examples of these polysaccharides include:

Acemannan

Acemannan is the most researched polysaccharide in Aloe vera, recognized for its ability to boost immune function and support healing. It creates a thick, gel-like layer that coats the mucous membranes of the gastrointestinal (GI) tract, offering a soothing and protective shield. Additionally, it aids in tissue regeneration, making it effective in promoting the healing of ulcers and repairing a damaged gut lining.

Glucomannan

Like acemannan, this polysaccharide has a high molecular weight and plays a role in Aloe vera's ability to create a protective mucus layer in the gut. These polysaccharides support aloe vera’s ability to hold onto moisture and form a barrier over the digestive system, which helps to reduce inflammation and irritation in diseases including acid reflux, gastritis, and ulcers. [5]

Enzymes

Aloe vera contains various enzymes that support digestion by breaking down food and improving nutrient absorption. The key enzymes involved in digestion include:

Amylase

This enzyme assists in the digestion of carbohydrates by converting starches into sugars. It can help alleviate bloating and indigestion, particularly in individuals with enzyme deficiencies.

Lipase

Lipase plays a key role in breaking down fats into fatty acids and glycerol, which enhances fat digestion and helps prevent conditions such as steatorrhea (excess fat in stool) and malabsorption. Seven of the eight essential amino acids required by the human body are among the twenty-two essential and non-essential amino acids found in aloe vera. For tissue repair, particularly the regeneration of the gastrointestinal tract's mucosal lining, amino acids are essential. Key amino acids consist of:

Histidine

Histidine is known for its ability to reduce stomach acid production, making it helpful in managing conditions such as GERD and acid reflux.

Glutamine

Cellulase

Although humans lack the ability to produce cellulase, Aloe vera contains this enzyme, which helps break down cellulose (a key component of plant cell walls). This aids in the digestion of plant-based foods and can help prevent digestive discomfort associated with high-fiber diets.

Bradykinase

Bradykinase contains anti-inflammatory qualities that aid in gastrointestinal system healing and inflammation reduction, even though it is not directly involved in digesting. People with inflammatory bowel illnesses (IBD), such as Crohn's disease and ulcerative colitis, may benefit most from this enzyme. [6]

Anthraquinones

Anthraquinones are a group of compounds mainly found in the outer leaf of Aloe vera, known for their laxative, antimicrobial and anti-inflammatory effects.

The key anthraquinones in Aloe vera are:

Aloin (Barbaloin)

Aloin is the compound in Aloe vera that causes its potent laxative effect. It promotes peristalsis (intestinal contractions) and boosts water content in the intestines, making it an effective remedy for constipation. However, when used in excess, aloin can lead to cramping and diarrhoea, and long-term use may result in risks such as dehydration and electrolyte imbalances.

Emodin

Emodin is another anthraquinone with laxative effects, but it also has anti-inflammatory and antimicrobial properties. It may help prevent infections and improve digestive health by preventing the growth of some dangerous bacteria in the gut.

Chrysophanic Acid

This anthraquinone may help treat intestinal infections and lessen gastrointestinal tract inflammation because of its antibacterial and anti-inflammatory qualities.

Due of the potent laxative properties of anthraquinones, Aloe latex (which contains these compounds) is typically removed from Aloe vera products designed for internal use. Instead, the focus is on the gel, which is milder on the digestive system. [7]

Vitamins

Aloe vera is packed with various vitamins that play an important role in supporting a healthy digestive system.

Vitamin A (Beta-Carotene)

This fat-soluble vitamin is vital for preserving the health of the mucosal lining in the digestive tract. It also offers antioxidant benefits, helping to protect the stomach and intestines from oxidative stress and free radical-induced damage.

Vitamin C (Ascorbic Acid)

Strongly anti-inflammatory and anti-healing, vitamin C helps. Additionally, it boosts the immune system, which is crucial for preventing gut infections and aiding in quicker recovery from digestive illnesses.

Vitamin E

Vitamin E, another antioxidant, helps safeguard the cells of the digestive system from oxidative damage and aids in the healing of ulcers and other injuries to the gut lining.

Vitamin B Complex: B1 (thiamine), B2 (riboflavin), B3 (niacin), B6 (pyridoxine), and B12 (cyanocobalamin) are among the B vitamins found in aloe vera. These vitamins support nervous system function and play a role in energy metabolism. which is closely connected to gut health. The inclusion of vitamin B12 is especially noteworthy, as it is uncommon in plant-based foods and is essential for proper nerve function and the formation of red blood cells. [8]

Amino Acids

In addition to being necessary for maintaining the integrity of the intestinal lining, glutamine has been shown to help people with leaky gut syndrome and other digestive diseases heal.

Minerals

Aloe vera contains a variety of essential minerals that aid in promoting digestive health.

Calcium

Calcium is crucial for proper muscle function, including the muscles in the digestive tract that regulate peristalsis. Sufficient calcium levels help prevent constipation by supporting the tone and strength of the intestinal muscles.

Magnesium

Magnesium has a gentle laxative effect and aids in regulating bowel movements. It is especially effective in alleviating constipation by relaxing the muscles in the intestinal wall and drawing water into the intestines.

Zinc

Immune system and tissue repair both depend on zinc. It is helpful for those with peptic ulcers or inflammatory bowel disease (IBD) because it plays a crucial part in mending ulcers and maintaining the integrity of the gut lining.

Potassium

Potassium is essential for preserving fluid equilibrium and guaranteeing healthy contractions of the digestive tract's muscles. It aids in controlling intestinal electrolyte levels, avoiding dehydration brought on by diarrhea or overuse of laxatives. [9]

Other Compounds

Saponins

Saponins are glycosides with detoxifying and antimicrobial qualities. They assist in removing harmful microbes from the digestive system, lowering the risk of infections and supporting a healthy balance of gut bacteria.

Sterols

Plant sterols with anti-inflammatory and antibacterial qualities, such as lupeol, are found in aloe vera. These substances might promote general digestive health and lessen intestinal inflammation.

Lignin

Lignin provide Aloe vera with its ability to penetrate the deeper layers of the gut lining.This helps transport the plant's nutrients more efficiently to damaged tissues, supporting faster healing of the digestive tract.

Salicylic Acid

Salicylic acid has anti-inflammatory effects similar to aspirin, helping to alleviate pain and inflammation in the digestive tract, particularly in conditions such as IBS and gastritis. [10]

Amino Acids

Twenty of the twenty-two essential and non-essential amino acids needed by the human body are found in aloe vera. In the gut, a number of these amino acids enhance immunological function and aid in tissue repair.

Glutamine

One amino acid in Aloe vera that is especially beneficial for digestive health is glutamine. It can aid in damage healing and acts as the gut lining's main source of energy. caused by inflammation or infection, supporting conditions such as ulcers or leaky gut. [11]

Mechanism of Action of Aloe Vera in Digestive Health

Aloe vera's therapeutic benefits for the digestive system are diverse, due to its abundant physiological substances that offer anti-inflammatory, antioxidant, gastroprotective, laxative, and prebiotic properties Aloe Vera contains anti-inflammatory compounds like polysaccharides, which help reduce irritation and inflammation in the gut lining. This can promote healing in conditions like gastritis, ulcers and inflammation bowel disorders (IBD), including ulcerative colitis and Crohn's syndrome. [12]

Anti-inflammatory Effects

Aloe vera's anti-inflammatory action is one of the primary ways it benefits the digestive system. IBS, ulcerative colitis, Crohn's disease, and gastritis are among the digestive illnesses where inflammation plays a major role. The polysaccharides in Aloe vera, especially acemannan, are essential in promoting this effect.

Polysaccharides and Cytokine Modulation

Aloe vera's polysaccharides, particularly acemannan, help reduce the production of TNF-α and other pro-inflammatory cytokines, such as interleukin-1 (IL-1), interleukin-6 (IL-6), and others. These cytokines are key players in the inflammatory response that impacts the gut lining in conditions such as IBD. By lowering the levels of these inflammatory markers, Aloe vera can help calm the inflamed tissues in the digestive tract, offering relief from symptoms like abdominal pain, cramping and diarrhoea. [13]

Reduction of Prostaglandin Synthesis

Aloe vera may also reduce the production of pro- inflammatory prostaglandins through the cyclooxygenase (COX) pathway. This action is especially beneficial in conditions like gastritis and peptic ulcers, where inflammation of the stomach lining is a crucial element in how symptoms develop.

Bradykinase

The enzyme found in Aloe vera, bradykinase, has been shown to break down bradykinin, a peptide that triggers inflammation. By reducing bradykinin levels, bradykinase helps alleviate pain, swelling, and inflammation in the digestive tract, making it particularly useful in treating IBD and other inflammatory digestive conditions.

Gastroprotective and Mucosal Healing Effects

Aloe vera is recognized for its protective effects on the gastrointestinal mucosa, which is vital in conditions such as GERD, gastritis, and peptic ulcers. The plant creates a protective layer that safeguards the stomach and intestinal linings from irritants like stomach acid and harmful microbes.

Mucilage Formation

Aloe vera gel contains mucilage, a thick substance that forms a protective coating over the stomach and intestinal linings. This coating is especially helpful for those with GERD or peptic ulcers, as it creates a barrier that prevents stomach acid from directly contacting the stomach or esophageal mucosa. This helps reduce irritation and can also prevent the development of new ulcers. [14]

Wound Healing and Cellular Regeneration

Acemannan, the main polysaccharide in Aloe vera is renowned for supporting cellular regeneration and speeding up the healing of damaged tissues. In the digestive system, this is especially valuable for repairing the epithelial lining in conditions like ulcers or leaky gut syndrome. Acemannan increases collagen synthesis and fibroblast activity, two processes that are critical for tissue repair.

Antioxidant Activity

Aloe vera is packed with antioxidants like vitamins C and E, as well as flavonoids, which help counteract free radicals that can lead to oxidative damage in the cells of the digestive tract. By reducing oxidative stress, Aloe vera helps preserve the integrity of the gut lining. [15]

Laxative Effects

Aloe vera is widely recognized for its natural laxative properties, mainly due to anthraquinones like aloin and emodin, found in the outer leaf. However, the anthraquinones derived from the latex are usually removed from commercial products because of their strong potency & potential toxicity. Instead, Aloe vera gel (extracted from the inner leaf) is typically used for a gentler and safer relief from constipation.

Anthraquinones and Peristalsis

Aloin and emodin function by promoting peristalsis, the rhythmic contractions of muscles that move food through the digestive system, and increasing the amount of water retained in the intestines. This effect can be beneficial for those with constipation, as it helps accelerate the movement of waste through the colon, making bowel movements easier. However, excessive use of anthraquinones can lead to dependency and result in problems like electrolyte imbalances, so their use should be carefully monitored.

Increased Water Retention

Aloe vera contains natural laxatives that help retain water in the intestines, softening the stool and making it easier to pass. This effect is milder when using the gel (as opposed to the latex), making it ideal for people with mild to moderate constipation. By increasing the moisture content in the stool, Aloe vera gel also helps prevent straining during bowel movements, which can be particularly beneficial for individuals with hemorrhoids or other anorectal issues. [16]

Prebiotic Effects and Microbiota Modulation

Aloe vera gel has been used to possess prebiotic properties, indicating that it supports the development of advantageous gut bacteria, which are essential for gut health in general. Preventing dysbiosis requires keeping the balance of gut bacteria in a healthy state. a condition in which harmful bacteria surpass beneficial microbes, leading to digestive problems such as bloating, constipation, and diarrhea.

Polysaccharides as Prebiotics

Aloe vera's polysaccharides in particular are essential for preserving a balanced gut microbiome, which is necessary for proper digestion, infection prevention, and inflammation reduction.A healthy microbiome also supports the proper fermentation of undigested food, helping to prevent gas and bloating.

Reduction of Pathogenic Bacteria

Aloe vera has gentle antimicrobial properties thanks to compounds like saponins and anthraquinones.

These substances can help inhibit the of harmful bacteria including Escherichia coli, Helicobacter pylori, and Clostridium difficile, which are linked to digestive infections, ulcers, and other inflammatory conditions. By reducing the presence of harmful bacteria and supporting beneficial strains, Aloe vera aids in restoring a healthy balance of gut flora. [17]

Antimicrobial and Antioxidant Effects

Aloe vera possesses antimicrobial properties that are especially useful for preventing infections in the digestive tract. This effect is attributed to various compounds in Aloe vera, including salicylic acid, saponins, and phenols, all of which have demonstrated antimicrobial and antifungal activities.

Inhibition of Helicobacter pylori

Aloe vera's antimicrobial properties can help inhibit the growth of Helicobacter pylori, the bacteria responsible for many peptic ulcers. By suppressing this bacterium, Aloe vera may lower the risk of developing ulcers and support the healing of the stomach lining.

Prevention of Dysbiosis

Aloe vera's antimicrobial properties also help prevent dysbiosis, a condition in which harmful bacteria overpopulate the gut, disrupting the balance and leading to symptoms like bloating, gas, and diarrhea. These properties enable Aloe vera to selectively target pathogenic bacteria supporting overall gut health. [18]

Risk and quality control

Aloe vera is commonly used for its therapeutic benefits, especially for skin care, digestive health, and immune support. However, like any natural substance, it can cause side effects and pose risks, particularly when used incorrectly or in excessive amounts. The safety of Aloe vera depends on factors such as which part of the plant is used (gel vs. latex), the dosage, the method of application (topical or oral), and the individual's overall health. Below is a comprehensive overview of the potential risks and side effects associated with Aloe vera use. [19]

Aloe Vera Gel (Internal and Topical Use)

The transparent, gel-like material found inside aloe vera leaves, is generally regarded as safe for both topical and oral use. However, in some cases, even Aloe vera gel can lead to adverse reactions, particularly when used in large amounts or by individuals with sensitivities.

Topical Use Risks and Side Effects

Aloe vera gel is commonly used to treat psoriasis, burns, wounds, and other skin disorders. Even while it is usually well tolerated, some people may experience negative effects, particularly if they have allergies or sensitive skin.

Allergic Reactions

Some individuals may experience contact dermatitis (a form of skin irritation) or allergic reactions when applying Aloe vera topically. Symptoms can include redness, itching, burning, or a stinging sensation at the site of application. An allergic reaction to Aloe vera may be more likely among people who have known sensitivities to plants in the Liliaceae family, which includes tulips, garlic, and onions. [20]

Delayed Healing

While Aloe vera gel is commonly used to support wound healing, some studies have indicated that it may actually delay healing in certain types of wounds. For instance, a study published in Burns (2005) found that Aloe vera slowed the healing process in deep surgical wounds, possibly due to its moisture-retaining properties, which can hinder scab formation in certain cases.

Phototoxicity

Although uncommon, some individuals may develop increased sensitivity to sunlight (phototoxicity) after applying Aloe vera gel to the skin. This can result in sunburn-like symptoms or changes in skin color when exposed to sunlight following application. [21]

Oral Use Risks and Side Effects

Aloe vera gel is often taken orally to aid digestion, relieve gastrointestinal discomfort, and boost immune health. While it is generally considered safer for internal use than Aloe latex, it can still lead to side effects.

Gastrointestinal Issues

In some people, taking Aloe vera gel orally can lead to cramping, diarrhea, or nausea, especially when consumed in large quantities. Although Aloe vera gel is typically gentler than Aloe latex, individuals with sensitivities may still experience these side effects. Hypoglycaemia (Low Blood Sugar): People with diabetes or those on blood sugar-regulating drugs may be at risk since aloe vera gel may lower blood sugar levels. While this effect may be beneficial for some, it can lead to hypoglycemia (low blood sugar) if not carefully monitored. [22]

Electrolyte Imbalance

Overuse of Aloe vera gel in supplements can cause mild to moderate diarrhea, leading to the loss of fluids and important electrolytes like potassium and sodium. This imbalance may result in symptoms such as muscle weakness, fatigue and heart palpitations.

Potential Drug Interactions

Aloe vera gel may interact with certain medications, such as those used to manage blood sugar (e.g., insulin, oral hypoglycemics), laxatives, diuretics, and anticoagulants (blood thinners). These interactions can either increase or decrease the effectiveness of the medications, potentially causing adverse effect. [23]

Aloe Latex (Internal Use)

Aloe latex, a yellow sap located just beneath the skin of Aloe vera leaves, contains compounds known as anthraquinones, with aloin being the most notable. Aloe latex is recognized for its potent laxative effects and has traditionally been used to relieve constipation. However, its use carries considerable risks and potential side effects, particularly when taken over extended periods or in large doses.

Laxative Effects

Cramping and Diarrhoea

Aloe latex is a potent stimulant laxative that works by irritating the colon and stimulating peristalsis (intestinal movement). While it can help relieve constipation, excessive use can cause abdominal cramping, pain, and severe diarrhea.

Dehydration

The strong laxative effect of Aloe latex can result in dehydration due to fluid loss from diarrhea. Dehydration may lead to symptoms such as dizziness, confusion, low blood pressure, and, in severe cases, kidney damage. [24]

Electrolyte Imbalance

When aloe latex is used for an extended period of time, electrolytes, especially potassium, might be significantly depleted. Hypokalaemia, or low potassium levels, can result in arrhythmias, muscular weakness, and other heart-related issues. This is particularly risky for individuals taking medications like diuretics, which also lower potassium levels.

Dependency

Extended use of Aloe latex as a laxative can lead to laxative dependency, where the intestines become dependent on the laxative to function properly. Over time, this can worsen constipation and may require increasing doses to achieve the same effect. This presents a major risk with long-term use and can result in chronic bowel dysfunction.[25]

Potential Toxicity

Carcinogenicity Concerns

Aloe latex has been linked to potential carcinogenic effects in animal studies. In a 2013 study by the U.S. National Toxicology Program (NTP), rats that consumed long- term Aloe vera whole-leaf extract (which contains latex) showed an increased risk of developing intestinal tumors. Although these findings have not been definitively proven in humans, the FDA banned the use of Aloe latex in over-the-counter laxatives in 2002 because there is insufficient safety data.

Kidney Damage

Excessive or Long-term Aloe latex consumption has been linked to acute kidney injury and, in some cases, kidney failure. This is believed to occur due to the loss of electrolytes (especially potassium) and dehydration, which place additional strain on the kidneys. People with pre-existing kidney conditions are especially vulnerable to these effects. [26]

Pregnancy and Breastfeeding

Aloe latex is considered unsafe for pregnant women because it may stimulate uterine contractions, increasing the risk of miscarriage or preterm labor. It is also not recommended during breastfeeding, as the anthraquinones in Aloe latex can pass into breast milk and potentially cause diarrhea in nursing infants. As noted earlier, Aloe latex should use during pregnancy due to the risk of many harmful effects. While Aloe vera gel is generally considered safer, consulting a healthcare professional is still advised. [27]

General Contraindication

Pre-existing Gastrointestinal Conditions

Aloe latex has powerful laxative properties that may make symptoms worse for people with Crohn's disease, ulcerative colitis, or irritable bowel syndrome (IBS). Aloe vera gel can be used cautiously, but only under the supervision of a healthcare provider.

Heart Conditions

Individuals with heart disease or those taking heart medications should be cautious when using Aloe latex, as it can cause potassium depletion, potentially worsening heart problems or interfering with heart medications.

Regulatory Warnings and Recommendations

Due to these risks, various regulatory authorities have provided warnings or guidelines regarding the use of Aloe vera.

FDA Warning

The FDA has banned the use of Aloe latex in over-the-counter (OTC) laxatives due to insufficient safety data. Although some prescription laxatives may still include Aloe latex, they must only be used under a healthcare provider's supervision. [28]

European Medicines Agency (EMA)

The EMA has reviewed the use of Aloe latex and issued warnings about its potential for misuse and the associated risks, including dehydration and electrolyte imbalances. The agency recommends that Aloe latex should only be used for a few days at most, and solely for short-term relief of constipation.

International Aloe Science Council (IASC)

The IASC has set standards for the aloin content in Aloe vera products to ensure safety. For products meant for internal use, the aloin content should not exceed 10 parts per million (ppm) to reduce the risk of adverse effects linked to Aloe latex. [29]

Side Effects Related to Contamination or Poor-Quality Control

Aloe vera products, particularly those sold as dietary supplements or cosmetics, are sometimes adulterated with other substances or contaminated with bacteria, fungi, or heavy metals. Poor quality control during processing can lead to:

Microbial Contamination

Inadequate preservation methods can lead to microbial growth in Aloe vera products, particularly in topical gels and creams. This can cause skin infections or irritation in sensitive individuals.

Heavy Metal Contamination

Aloe vera grown in polluted environments may accumulate heavy metals such as arsenic, lead, and cadmium, which can pose serious health risks when ingested or applied topically. [30]

Clinical evidence and studies

Aloe vera has been extensively studied in clinical trials to assess its effectiveness in treating digestive issues. While many of these studies report positive outcomes, it's crucial to recognize that Aloe vera's impact can differ depending on the specific part of the plant used (such as the gel or latex), the dosage, and the particular digestive condition being addressed. [31]

Aloe Vera for Irritable Bowel Syndrome (IBS)

In order to manage the symptoms of irritable bowel syndrome (IBS), a natural therapy is occasionally employed. The calming and anti-inflammatory qualities of the gel found inside aloe vera leaves may aid in calming the digestive tract. The potential of aloe vera to reduce the symptoms of IBS has been the subject of numerous clinical investigations.

Clinical Evidence

Aloe vera's effects on 44 IBS patients were evaluated in a randomized, double-blind, placebo-controlled experiment by Hutchings et al. (2002). Two sets of participants were formed, one of which was given aloe vera and the other a placebo. Three months later, the group receiving aloe vera treatment reported feeling less bloated and uncomfortable.

Pittler et al. (2006)

Aloe vera's efficacy in treating IBS and other gastrointestinal disorders was investigated in a systematic review. While some studies indicated slight improvements in IBS symptoms such as constipation, the authors concluded that the overall evidence was inconclusive. This was primarily due to the small sample sizes of the studies and the differences in the Aloe vera formulations used.

Odes and Madar (1991)

In this open trial, 16 IBS patients suffering from constipation were treated with Aloe vera for a period of 7 days. The patients reported improvements in bowel regularity and a reduction in discomfort. The authors came to the conclusion that aloe vera might help IBS sufferers who are constipated, but they stressed the need for more controlled research to support these findings.

Although some studies indicate that Aloe vera might help alleviate IBS symptoms, especially constipation and bloating, the clinical evidence remains inconsistent. To confirm these results and gain a clearer understanding of the optimal dosage and form of Aloe vera for treating IBS, larger and more rigorously designed trials are needed. [32]

Aloe Vera for Gastroesophageal Reflux Disease (GERD)

Research on aloe vera has also focused on GERD, a disorder where stomach acid refluxes into the esophagus, causing inflammation and heartburn.

Clinical Evidence

Study by Panahi et al. (2015)

Aloe vera syrup was administered for four weeks to 79 GERD patients in a randomized, double-blind, placebo-controlled research. When compared to the group, the results demonstrated that aloe vera considerably reduced the frequency and intensity of symptoms such nausea, acid regurgitation, and heartburn. Furthermore, Aloe vera was found to be as effective as omeprazole, a widely used GERD medication, in relieving symptoms, but without the side effects typically associated with proton-pump inhibitors. [33]

Wang et al. (2014)

According to a clinical study that looked at the usage of aloe vera to treat GERD symptoms, ingesting 10 milliliters of aloe vera syrup twice a day lessened the intensity of reflux symptoms like regurgitation and heartburn. Aloe vera may be a safe and efficient treatment for mild to moderate GERD symptoms, according to the study's findings.

Clinical studies suggest that Aloe vera gel or syrup could be a promising natural alternative for managing GERD symptoms. Its soothing and anti-inflammatory effects seem to help reduce heartburn and acid reflux, offering relief without the side effects commonly associated with conventional medications. [34]

Aloe Vera for Ulcerative Colitis (UC)

A kind of chronic inflammatory bowel disease (IBD) that primarily affects the colon and rectum, ulcerative colitis causes ulcers and ongoing inflammation in the digestive tract. Owing to its anti-inflammatory qualities, aloe vera is thought to be a possible UC treatment.

Clinical Evidence

Compared to merely 14% in the placebo group, 47% of participants in a randomized, double-blind, placebo-controlled study by Langmead et al. (2004) experienced clinical remission. According to the findings, aloe vera gel significantly improved ulcerative colitis patients' clinical and endoscopic results. [35]

Gupta et al. (2015)

A pilot study involving 30 ulcerative colitis patients examined the effects of Aloe Vera as adjunct therapy. The results indicated notable improvements in symptoms such as rectal bleeding and diarrhea, with some patients achieving remission. The study suggested that larger-scale trials are needed to confirm the effectiveness of Aloe vera in managing UC.

Aloe vera appears to be a promising adjunct therapy for ulcerative colitis, aiding in inflammation reduction and supporting remission in some patients. However, additional large-scale and long-term research is necessary to verify these outcomes. [36]

Aloe Vera for Constipation

Aloe latex, containing anthraquinones like aloin, has long been used as a natural laxative. Multiple studies have explored its effectiveness and safety in alleviating constipation.

Clinical Evidence

Blumenthal et al. (1998)

The German Commission E, which oversees herbal medicine regulations in Germany, has authorized aloe latex for the treatment of constipation. The Commission highlighted that anthraquinones like aloin promote peristalsis in the colon, helping to increase bowel movement frequency. However, it also warned that prolonged use may lead to negative side effects, including electrolyte imbalances and dependence.

Ulbricht et al. (2008)

A review of herbal remedies for constipation noted that Aloe vera latex is effective in relieving constipation due to its potent laxative effects. However, the authors cautioned that Aloe latex should be used with care and not for extended periods, as it may cause side effects such as cramping and electrolyte imbalances.

Aloe latex is effective as a short-term solution for constipation, but its potent laxative effect, coupled with the risk of dependence and other side effects, restricts its use. Aloe vera gel, which has a gentler impact, is often suggested as a safer alternative for promoting regular bowel movements. [37]

Aloe Vera for Peptic Ulcers

The lining of the stomach, small intestine, or esophagus can develop lesions called peptic ulcers, which are usually brought on by Helicobacter pylori infections or long-term NSAID use. The mucosal-protective properties of aloe vera have led to study on its potential to help treat peptic ulcers.

Clinical Evidence

Akinci et al. (2015)

Aloe vera gel dramatically accelerated the healing process by lowering inflammation and promoting mucosal regeneration in rats with caused stomach ulcers, according to a study examining the plant's effects on these animals. While the study was conducted on animals, the findings suggest that Aloe vera may offer potential benefits for healing peptic ulcers in humans.

Gupta et al. (2014)

When Aloe vera gel was used to treat gastric ulcer patients in a limited clinical experiment, the ulcers' size decreased and their pain and discomfort improved. The study indicated that Aloe vera's anti-inflammatory properties and its ability to promote tissue repair make it a promising option for treating peptic ulcers.

While human clinical data is limited, Aloe vera's anti-inflammatory and mucosal-healing effects indicate it could be useful in managing peptic ulcers. However, additional clinical trials in humans are necessary to confirm these results. [38]

Aloe Vera for Inflammatory Bowel Disease (IBD)

Crohn's disease and ulcerative colitis are both considered forms of inflammatory bowel disease. Research has been done to investigate the efficacy of aloe vera in treating various illnesses because of its capacity to lower inflammation.

Clinical Evidence

Ramachandran et al. (2010)

A review of Aloe vera's impact on IBD indicated that its anti- inflammatory and immunomodulatory properties could help relieve symptoms in patients. However, authors stressed the importance of conducting more well-designed clinical trials to validate these results.

Langmead et al. (2004)

This trial, which was also mentioned in relation to ulcerative colitis, demonstrated notable improvements in UC patients treated with Aloe vera, indicating possible benefits for IBD overall. However, the evidence regarding its effectiveness for Crohn's disease remains scarce. [39]

CONCLUSION

Aloe vera may assist in managing symptoms of inflammatory disease (IBD), especially ulcerative colitis, by helping to reduce inflammation and support the healing of the intestinal lining. However, more research is needed to determine its effectiveness in treating Crohn's disease and to assess the long-term impact of Aloe vera in IBD therapy.

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