

Therapeutic potential of ash gourd (*Benincasa hispida*) juice in digestive health management

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Abstract

Ash gourd (*Benincasa hispida*), also known as winter melon or wax gourd, is a versatile vegetable renowned for its therapeutic properties in traditional medicine. This review explores the potential benefits of ash gourd juice in promoting human digestive health. Rich in bioactive compounds such as flavonoids, terpenes, and phenolic acids, ash gourd juice exhibits anti-inflammatory, antioxidant, and antimicrobial properties that may support gut health. The juice is known for its hydrating and cooling effects, which can soothe the digestive system, alleviate hyperacidity, and prevent constipation. Additionally, its fiber content contributes to healthy bowel movements, while its prebiotic potential may foster a balanced gut microbiome. This paper discusses the mechanisms underlying these benefits, supported by scientific studies and traditional usage, while also addressing the safety, dosage, and limitations of its consumption. Further research is warranted to validate the long-term efficacy and therapeutic potential of ash gourd juice in digestive health management.

Keywords: Ash gourd juice, *Benincasa hispida*, digestive health, gut microbiome, prebiotics, anti-inflammatory, antioxidant, traditional medicine, gastrointestinal health, functional foods.

Introduction

Ash gourd (*Benincasa hispida*) is a member of the Cucurbitaceae family and has been used for centuries in traditional medicine systems, including Ayurveda, Traditional Chinese Medicine (TCM), and Unani. Its juice is particularly valued for its cooling, detoxifying, and digestive properties. Modern research has identified several bioactive compounds in ash gourd, such as flavonoids, phenolics, terpenoids, and polysaccharides, which contribute to its therapeutic effects. This paper reviews the role of ash gourd juice in managing digestive health, including its anti-ulcer, anti-inflammatory, and gastroprotective properties.

Bioactive Compounds in Ash Gourd Juice

Ash gourd juice is rich in bioactive compounds that contribute to its therapeutic potential. Key constituents include:

- **Flavonoids:** Known for their antioxidant and anti-inflammatory properties, flavonoids help protect the gastrointestinal (GI) tract from oxidative stress and inflammation (Kumar et al., 2018).
- **Phenolic compounds:** These compounds exhibit gastroprotective effects by reducing gastric acid secretion and enhancing mucosal defence mechanisms (Rahman et al., 2020).
- **Polysaccharides:** Ash gourd polysaccharides have been shown to modulate gut microbiota and improve gut barrier function (Zhang et al., 2019).
- **Vitamins and minerals:** The juice is a good source of vitamins (e.g., vitamin C) and minerals (e.g., potassium), which support overall digestive health.

Table No. 1 Bioactive Compounds in Ash Gourd Juice

Study	Bioactive Compounds Identified	Key Findings
Athira & Reshma (2024)	Total polyphenols: 19.15 ± 2.03 mg GAE/g Total flavonoids: 16.71 ± 1.5 mg QE/g	Ash gourd juice exhibits α-glucosidase inhibition, suggesting potential antidiabetic properties. Spray-dried juice powders, especially those using gum arabic as a carrier, retain significant bioactive content and inhibitory activity.
Palamthodi et al. (2019)	Total polyphenols: 267.45 ± 1.2 µg GAE/mL Total flavonoids: 16.50 ± 0.12 µg QE/mL Total anthocyanins: 8.85 ± 0.5 µg C3GE/mL	Blending ash gourd juice with jamun enhances its antioxidant properties, as evidenced by increased polyphenol and flavonoid content. The beverage also demonstrated significant DPPH radical scavenging activity.
Purohit et al. (2019)	Total polyphenols: 225.47 ± 0.67 µg GAE/mL Total flavonoids: 18.69 ± 0.06 µg QE/mL Total anthocyanins: 2.34 ± 0.44 µg C3GE/mL	Incorporating karonda into ash gourd juice results in a beverage with notable antioxidant activity and potential antihyperglycemic effects, as indicated by α-amylase and α-glucosidase inhibition assays.
Gupta et al. (2019)	Total phenols: 28.36 mg/100 g Total flavonoids: 1.67 mg/100 g	Comprehensive analysis of ash gourd highlights its rich phenolic and flavonoid content, contributing to its antioxidant and therapeutic potential.
Tiwari et al. (2011)	Total polyphenols: 0.08 ± 0.01 mg GAE/mL Total flavonoids: 0.01 ± 0.01 mg RE/mL	Ash gourd juice demonstrated the ability to moderate starch-induced postprandial glycemia in rats, suggesting potential benefits in managing postprandial blood sugar levels.

Mechanisms of Action in Digestive Health

Ash gourd juice exerts its therapeutic effects through multiple mechanisms:

Anti-Ulcer Activity

Ash gourd juice (*Benincasa hispida*) has garnered attention for its potential anti-ulcer properties, making it a promising natural remedy for managing gastric ulcers. Gastric ulcers, often caused by factors such as excessive gastric acid secretion, oxidative stress, and *Helicobacter pylori* infection, can lead to significant discomfort and complications if left untreated. Ash gourd juice is rich in bioactive compounds, including flavonoids and phenolic acids, which have been shown to exert gastroprotective effects by reducing gastric acid secretion, enhancing mucosal defense mechanisms, and scavenging free radicals that contribute to oxidative damage in the gastric lining (Kumar et al., 2018). Preclinical studies have demonstrated that ash gourd extract significantly reduces ulcer formation in animal models by promoting the production of protective mucin and inhibiting inflammatory pathways (Rahman et al., 2020). These findings suggest that ash gourd juice could serve as a natural and effective adjunct in the prevention and management of gastric ulcers, offering a holistic approach to digestive health.

Anti-Inflammatory Effects

Ash gourd (*Benincasa hispida*) juice is gaining attention for its potential anti-inflammatory properties, attributed to its rich composition of bioactive compounds such as flavonoids, polyphenols, and antioxidants. These compounds help combat oxidative stress, reduce inflammatory markers, and support immune function. Studies suggest that ash gourd juice may aid in alleviating inflammation-related conditions, including gastrointestinal disorders, metabolic syndromes, and even neuroinflammation. Its hydrating and cooling properties further contribute to its therapeutic benefits. As a natural and refreshing beverage, ash gourd juice offers a promising approach to managing inflammation and promoting overall health. Chronic inflammation is a key factor in many digestive disorders, such as inflammatory bowel disease (IBD) and

gastritis. Ash gourd juice has been shown to suppress pro-inflammatory cytokines (e.g., TNF- α and IL-6) and inhibit the NF- κ B signaling pathway, thereby reducing inflammation in the GI tract (Rahman et al., 2020).

Gut Microbiota Modulation

The polysaccharides in ash gourd juice act as prebiotics, promoting the growth of beneficial gut bacteria such as *Lactobacillus* and *Bifidobacterium*. This helps maintain a healthy gut microbiome, which is essential for proper digestion and immune function (Zhang et al., 2019).

Laxative and Detoxifying Properties

Ash gourd juice is widely recognized for its natural laxative and detoxifying properties, making it a popular choice in traditional medicine and holistic wellness practices. Rich in fiber and water content, it aids digestion by promoting regular bowel movements and relieving constipation. Additionally, its diuretic nature helps flush out toxins from the body, supporting kidney function and overall detoxification. The presence of antioxidants and bioactive compounds further enhances its ability to cleanse the digestive tract and improve gut health. Regular consumption of ash gourd juice is often recommended for maintaining a healthy digestive system and promoting overall well-being. Ash gourd juice is traditionally used as a natural laxative to relieve constipation. Its high water content and fiber help soften stools and promote regular bowel movements. Additionally, its detoxifying properties aid in the elimination of toxins from the digestive system (Sharma et al., 2017).

Clinical Evidence

Several preclinical and clinical studies have investigated the effects of ash gourd juice on digestive health:

- A study by Kumar et al. (2018) found that ash gourd extract significantly reduced gastric ulcer formation in rats by enhancing mucosal defense and reducing oxidative stress.

- Rahman et al. (2020) reported that ash gourd juice reduced inflammation and improved symptoms in patients with mild to moderate gastritis.
- Zhang et al. (2019) demonstrated that ash gourd polysaccharides improved gut microbiota composition and reduced symptoms of irritable bowel syndrome (IBS) in a clinical trial.

Safety and Dosage

Ash gourd juice is generally considered safe for consumption. However, excessive intake may lead to gastrointestinal discomfort due to its high fiber content. Traditional Ayurvedic texts recommend consuming 50–100 mL of fresh ash gourd juice daily on an empty stomach for digestive health benefits (Sharma et al., 2017).

Conclusion

Ash gourd juice holds significant therapeutic potential in managing digestive health due to its anti-ulcer, anti-inflammatory, and gut microbiota-modulating properties. While traditional use and preclinical studies provide strong evidence, further large-scale clinical trials are needed to fully establish its efficacy and safety. Incorporating ash gourd juice into the diet may offer a natural and effective approach to maintaining digestive health.

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