



## Research Article

## The Impact of Tukh Malanga (Basil seeds) on Digestive Health

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Abstract	Manuscript Information
<p>Commonly referred to as sabja seeds, tukmaria, or tukh malanga, basil seeds are being used more as a functional diet and traditional therapy for digestive disorders. Their high dietary fibre and mucilage-forming polysaccharide support indicated methods that improve bowel regularity, lower glycemic responses, and transform the gut environment. Along with the nutritional composition, physical properties, and mechanistic evidence (bulk-forming fibre, mucilage, prebiotic potential, and anti-inflammatory effects), this review highlights the available clinical and preclinical data on digestive effects (constipation, stool consistency, motility, and gut microbiota). A large number of compositional, <i>in vitro</i>, animal, and a few but growing human/nutritional intervention studies support a potential beneficial effect for basil seeds in promoting digestive comfort and regularity, despite the current lack of high-quality randomised clinical trials and mechanistic human microbiome studies. In addition to the valuable suggestions for therapeutic use, major research gaps are recognised.</p>	<ul style="list-style-type: none"> <li>▪ ISSN No: 2583-7397</li> <li>▪ Received: 15-04-2025</li> <li>▪ Accepted: 28-04-2025</li> <li>▪ Published: 31-04-2025</li> <li>▪ IJCRM:4(2); 2025: 429-432</li> <li>▪ ©2025, All Rights Reserved</li> <li>▪ Plagiarism Checked: Yes</li> <li>▪ Peer Review Process: Yes</li> </ul>
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**KEYWORDS:** Basil Seeds, Sabja, Tukmaria, Tukh Malanga, *Ocimum basilicum*, Mucilage, Dietary Fibre, Gut Microbiota, Constipation, Digestive Health

## INTRODUCTION

Managing gut health is vital for general wellness, as gastrointestinal function impacts immunological response, metabolic balance, and nutrient absorption. The past few years have seen an increase in the demand for functional foods that naturally support gut health through their fibre, prebiotic, and bioactive chemical content (Hill et al., 2014) [3]. Amongst those, tukh malanga, sometimes termed sabja, tukmaria, or basil seeds, has gained recognition as a traditional but neglected food component that may have digestive qualities (Bravo et al., 2021) [1].

*Ocimum basilicum* L., the plant that provides basil seeds, can be grown extensively throughout Asia and is used for both medicinal purposes and food preparation. When soaked in water, the polysaccharide-rich top layer of these seeds produces a thick mucilaginous gel (Nguyen-Le et al., 2021) [4]. This mucilage's complex carbohydrates, particularly glucomannans and arabinogalactans, have a high water-absorbing capacity, a vital characteristic that aids in regular bowel movements and softens stool (Fariás et al., 2024) [2]. The seeds are likewise rich in dietary fibre, omega-3 fatty acids, and polyphenolic substances, all of which may support gastrointestinal comfort while shielding the mucosa (Shahrajabian et al., 2020) [6].

Soaked basil seeds have been historically utilised as an alternative treatment for constipation, acidity, and bloating in Ayurvedic and Unani traditional medical systems. Modern nutritional science is currently supporting these traditional claims by finding the potential to promote bowel motility, increase stool size, and regulate the composition of the intestinal microbiota (Bravo et al., 2021) [1]. The gel-forming abilities of the mucilage may also indirectly boost metabolic health and digestive efficiency by delaying stomach emptying and glucose absorption (Nguyen-Le et al., 2021) [4].

The scientific proof remains dispersed despite these favourable findings. According to Fariás et al. (2024) [2], the majority of published studies deal with compositional analysis, *in vitro* evaluations of mucilage functionality, or animal models, including very few large-scale human trials focused on digestion outcomes. It is necessary to carry out a comprehensive review of the available information in order to attain a better understanding of the physiological mechanisms, clinical outcomes, and research gaps relevant to the consumption of tukh malanga and digestive health. The purpose of this review is to collect recent research on the nutritional, physicochemical, and biological qualities of basil seeds with a concentration on its possible impact on gastrointestinal function and complete digestive wellness.

## METHODS

A thorough evaluation of the literature was carried out to identify specific studies on the effect of basil seeds (*Tukh Malanga* or *Ocimum basilicum* L.) on digestive health. PubMed, Scopus, ScienceDirect, and Google Scholar were some of the electronic databases evaluated for locating English-language publications published between 2000 and 2024.

## Nutritional & physicochemical profile relevant to digestion

Basil seeds (*Ocimum basilicum* L.), commonly referred to as *tukh malanga*, *sabja*, or *tukmaria*, are widely recognised for their distinctive physical properties and nutritional composition that contribute to many beneficial merits for digestive health. Along with a broad profile of bioactive phytochemicals, minerals, and mucilaginous polysaccharides, these seeds are loaded with macronutrients, namely dietary fibre, protein, and essential fatty acids (Bravo et al., 2021; Shahrajabian et al., 2020) [1, 6].

### Nutritional composition

Tukh malanga contains approximately 15–20% protein, 25–35% lipids, and 40–45% dietary fibre, depending on the plant variety and environmental conditions (Fariás et al., 2024) [2]. The majority of their lipid fraction is made up of unsaturated fatty acids, including linoleic (omega-6) and  $\alpha$ -linolenic (omega-3) acids, which support anti-inflammatory and mucosal health functions. The seeds are also a good source of essential minerals such as calcium, magnesium, potassium, and iron—nutrients best for maintaining electrolyte balance and gastrointestinal motility (Nguyen-Le et al., 2021) [4].

Furthermore, tukh malanga (basil seeds) include significant quantities of phenolic and flavonoid components such as rosmarinic acid, vicenin, and orientin, which possess antioxidant and anti-inflammatory properties that may shield the intestinal epithelium from degradation caused by oxidative stress (Shahrajabian et al., 2020) [6]. Additionally, the low-calorie and carbohydrate content of basil seeds makes them an adequate functional element for glycemic control and weight management, two characteristics that have been connected with enhanced digestive function (Fariás et al., 2024) [2].

### Physicochemical properties

One of the distinct characteristics of tukh malanga is its high mucilage content, which can be responsible for up to 20% of the seed's weight (Nguyen-Le et al., 2021) [4]. The seed's outermost part immediately absorbs water when it's made hydrated, and its polysaccharide matrix swells to create a thick gel. A majority of this mucilage consists of complex carbohydrates such as galacturonic acid, glucomannan, xylose, and arabinose (Nguyen-Le et al., 2021) [4].

The physiological effects of the seeds on digestion are mostly due to their water-holding capacity and viscosity, which improve stool hydration, ease intestinal transit, and coat the gastrointestinal mucosa in a protective layer (Bravo et al., 2021). The mucilage from basil seeds has a high emulsifying and stabilising ability in addition to its swelling index, which makes it a useful natural hydrocolloid in food processing (Fariás et al., 2024) [2]. From the standpoint of digestion, the gel-forming property slows down the diffusion of glucose and stomach emptying, which results in better postprandial glycemic control and longer satiety (Prangdimurti et al., 2025) [5]. While these characteristics are similar to those of other mucilaginous seeds like flax and chia, basil seeds frequently have better hydration kinetics and gel consistency (Nguyen-Le et al., 2021) [4].

The effects of basil seeds on digestive health are based on their physicochemical properties, particularly their high viscosity,

Water retention and fermentable fibre content. Increased stool size, better bowel regularity, and possible gut flora modification are the main mechanisms underlying these effects. The precise physiological processes via which these characteristics support gastrointestinal health and function will be examined in the following section.

### Mechanisms of Action on Digestive Health

#### Bulk-forming and stool-softening effects

Tukh malanga can absorb up to 30 times their weight in water when they are hydrated, creating a thick gel. This mucilage promotes peristalsis and facilitates defecation by increasing stool volume and wetness. Psyllium husk and other soluble fibres have similar effects (Nguyen-Le et al., 2021; Bravo et al., 2021) <sup>[4, 1]</sup>.

#### Viscosity and gastric emptying

In addition to extending satiety and regulating postprandial glycemia, the viscous gel slows down stomach emptying and nutritional absorption. This system promotes metabolic control and digestive comfort (Fariás et al., 2024) <sup>[2]</sup>.

#### Prebiotic potential and gut microbiota modulation

The fermentable polysaccharides included in tukh malanga mucilage act as substrates for colonic bacteria, which in turn produce short-chain fatty acids (SCFAs) such as butyrate and

acetate. Both intestinal inflammation and mucosal integrity are enhanced by SCFAs (Bravo et al., 2021; Hill et al., 2014) <sup>[1, 3]</sup>.

#### Anti-inflammatory and antioxidant effects

Antioxidant and anti-inflammatory properties of phenolic compounds, such as rosmarinic acid, shield intestinal tissues from oxidative stress and promote mucosal repair (Shahrajabian et al., 2020) <sup>[6]</sup>.

#### Evidence from Preclinical and Human Studies

##### *In vitro* and physicochemical studies

Studies conducted on animals and in laboratories corroborate the gut-protective and stool-regulating qualities of basil seed mucilage by confirming its high swelling index, viscosity, and moderate fermentability (Nguyen-Le et al., 2021; Bravo et al., 2021) <sup>[4, 1]</sup>. Additionally, gut tissue in rodent models exhibits anti-inflammatory properties.

##### Human clinical findings

According to the little clinical data, eating 5–15 g of basil seeds daily can help with bloating, intestinal function, and satiety (Fariás et al., 2024) <sup>[2]</sup>. These results in functional constipation and dyspepsia are supported by traditional findings.

#### Summary of studies

Author (Year)	Study Type	Key Findings
Nguyen-Le et al. (2021) <sup>[4]</sup>	In vitro physicochemical study	High hydration and swelling; supports stool softening
Bravo et al. (2021) <sup>[1]</sup>	Compositional and functional analysis	Partial fermentability and mild prebiotic activity
Shahrajabian et al. (2020) <sup>[6]</sup>	Phytochemical review	Antioxidant and anti-inflammatory potential
Fariás et al. (2024) <sup>[2]</sup>	Human trial	Improved glycemic control and digestive comfort
Tripathi et al. (2024) <sup>[7]</sup>	Material characterization	Strong hydrocolloid and gel-forming properties
Prangdimurti (n.d.) <sup>[5]</sup>	In vitro fermentation	Moderate SCFA production and microbiota modulation

### Safety, Dosage, and Practical Recommendations

#### Safety profile

Consuming basil seeds (also known as tukh malanga or sabja) in normal food proportions is regarded as safe for human consumption. No genotoxic or hepatotoxic effects from entire seeds or their mucilage have been documented by toxicological studies (Bravo et al., 2021; Nguyen-Le et al., 2021) <sup>[1, 4]</sup>. The seeds are well tolerated in both human and animal settings, except for moderate, temporary gastrointestinal side effects as bloating, flatulence, or loose stools, when large doses are abruptly administered (Shahrajabian et al., 2020) <sup>[6]</sup>.

However, dried seeds should never be taken without first being soaked since they quickly absorb water and expand, which might clog the throat or oesophagus if they hydrate after consumption. Youngsters and the elderly are especially at risk for choking (Bravo et al., 2021) <sup>[1]</sup>. Thus, before eating, seeds should always be soaked in water for at least 15 to 20 minutes, or until a clear gel layer forms.

#### Recommended dosage and preparation

The majority of experimental and nutritional research uses 5–15 grams (1–2 tablespoons) of soaked basil seeds per day, which is equivalent to about 3–6 grams of soluble fibre. This range seems

adequate for achieving digestive benefits, including better regularity and softer stool (Fariás et al., 2024) <sup>[2]</sup>.

Traditionally, the seeds are soaked in a 1:10 ratio of water or milk until they become gelatinous, after which they are either eaten on their own or added to drinks like faloodas, smoothies, or lemon water. For full hydration, 15 to 30 minutes of soaking is sufficient; an overnight soak is not required (Nguyen-Le et al., 2021) <sup>[4]</sup>.

#### Potential interactions and contraindications

The majority of diets can accommodate basil seeds, but those who have:

- Severe digestive disorders (e.g., bowel obstruction, Crohn's disease strictures),
- Dysphagia or swallowing difficulty, or
- High-fibre sensitivity should use them with caution and under supervision.

Although there haven't been any notable drug interactions reported, theoretical prudence is suggested for drugs with limited absorption windows because the mucilage may decrease drug bioavailability and impede gastrointestinal transit if taken

concurrently. Basil seeds should be taken at least an hour before taking oral drugs (Shahrajabian et al., 2020) [6].

## CONCLUSION AND FUTURE RESEARCH DIRECTIONS

Tukh Malanga (basil seeds) have several digestive health-promoting properties, such as modulating prebiotics, protecting mucosa, and regulating stool. Their mucilage-rich makeup promotes intestinal motility and hydration, while bioactive substances help with antioxidant and anti-inflammatory protection.

Robust clinical validation is still lacking, despite promising findings from preclinical trials and traditional use. Standardised randomised controlled trials evaluating stool metrics, microbiome alterations, and long-term safety should be the main emphasis of future research. Basil seeds may be marketed as a functional food and nutraceutical for digestive health with further investigation.

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