



# Single Herbs and Diet Propagated by Classical Ayurvedic Texts for Improving 'Gut Health' as Indicated in *Grahani* (Irritable Bowel Syndrome) - A Review

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## Abstract

'Gut' is being referred to as 'second brain' as the role played by the gut is very crucial to health. In continuation, the gut microbiome is a part of gut health. Diet plays an important role in maintaining the healthy microbiome. A close correlation to gut health is found to *Grahani* mentioned in *Ayurveda*. The word '*Grahani*' is used to specify the organ '*Grahani*' correlated as duodenum and the disease '*Grahani*' whose clinical presentation of alternating frequent watery bowels, and constipation blood-stained stools can be correlated to Irritable Bowel Syndrome (IBS). This disease is attributed to the pathology of the *Annavaha srotas* (channels carrying the food and the related organs). Even with medical intervention, *Ahara* (food) is to be planned with utmost care and sensitivity. In *Grahani*, the treatments and diet prescribed are meant for the healing and recovery of the alimentary tract, they are inclusive of the gut microbiome also. Hence a literature review of the *Brhatrayis* - the three major classical textbooks in *Ayurveda*: *Charaka Samhita*, *Susruta Samhita* and *Ashtanga Sangraha* and *Hrdaya* were reviewed for the single herbs and diet recommendations in *Grahani*. Articles supporting this fact from modern pharmacology were added as supporting documents. No review has been done so far exploring into the depths of the *Ayurvedic Samhitas* regarding the single herbs and diet mentioned to address gastric ailments thus relating to the gut and gut health. This article aims at filling this lacuna.

**Keywords:** *Ahara*, *Ayurveda*, Gut, Gut Biome, Irritable Bowel Syndrome, *Samhita*

## 1. Introduction

The position of different layers '*kala*' is used to explain the location of the internal organs in the Ayurvedic texts<sup>1</sup>. *Grahani* as an organ is mentioned to be located on the left side of the body, in-between the *Amashaya* (stomach) and the *Pakvashaya* (large intestines) i.e. the sixth *Kala*. As this plays an important role in the movement of the food material, there is also an effect on digestion, absorption and pushing it into the next part of the alimentary canal. This is also the seat of *Agni* (digestive fire). *Grahani* and

*Agni* vitiate each other. When *Agni* is weak, *Grahani* also becomes weak. And when *Grahani* becomes weak, then *Agni* also becomes weak. So, maintaining the health of the *Grahani* is very important as prophylaxis for several diseases. When the organ becomes afflicted, it gives rise to the disease *Grahani* - characterized by clinical symptoms pertaining to the alimentary canal<sup>2</sup>. 'Gut Health' is a term attributed to multiple aspects of the gastrointestinal tract (GI), inclusive of the digestion and absorption of food, absence of gastrointestinal pathology, stable microbiome, positive immunity and well-being. Five major criteria

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have been identified that play a major role in maintaining the gut health and derangement of any one can led to GI diseases. Microbiota is also one among the five major criteria identified<sup>3</sup>. Hence a healthy *Grahani*, mentioned in *Ayurvedic* texts can be considered in the context of maintaining healthy microbiota. The diet and herbs prescribed by the classical textbooks of *Ayurveda*, for the treatment of *Grahani*, will thus effectively target the 'Gut Health' and thus the gut microbiota also.

## 2. Materials and Methods

The *Brhatrayis* - the three major classical textbooks of *Ayurveda*, written by *Charaka* - *Charaka Samhita*, *Susruta* - *Susruta Samhita* and by *Vagbhata* - *Ashtanga Sangraha* and *Ashtanga Hridaya* were used as the reference textbooks. The E-version of every *Samhita* was searched using the keyword '*Grahani*' and the verses were marked. These were read and the single herbs and dietary therapy indicated in the textbooks were picked out and tabulated. The therapeutic indications were noted down and summarized. Databases like PubMed and SCOPUS were searched using key words of herbs identified in the *Ayurvedic* classical textbooks and they were used as supporting data.

## 3. Observation - Ahara and Aushadha Listed

### 3.1 Single Herbs

#### 3.1.1 *Amlika* (*Tamarindus indica* L.) Family - *Fabaceae*

This is considered to be very beneficial in *Grahani* and in *Arshas* (hemorrhoids). This is easily digestible, the potency is not very hot, this pacifies *Vata* and *Kapha*, and has the property to bind the bowels<sup>4</sup>. An *in vitro* study conducted proved that the Tamarind seed polysaccharide, could modify the gut microbiota composition, inhibit the enteropathogenic bacteria, thus producing a prebiotic effect on the gut health<sup>5</sup>.

#### 3.1.2 *Carngeri* (*Oxalis corniculata* L.) Family - *Oxalidaceae*

This is very effective in *Grahani*, because the predominant sour taste helps improve digestion. It can pacify *Vata* and *Kapha* and helps in binding the bowels, due to its *Grahi* property (absorbent). This is hot in potency and thus is

primarily indicated in *Grahani* and *Arshas*. *Charaka*, *Susruta* and *Vagbhata* have propagated the use of this herb for the maintenance of gut health<sup>6</sup>. An *in vivo* study conducted on the whole plant with the methanol extract suggested that this plant has a very strong gastro protective effect. There was a decrease in the number of ulcers, ulcer score and ulcer index in indomethacin treated and pylorus ligated rats<sup>7</sup>.

#### 3.1.3 *Haritaki* (*Terminalia chebula* RETZ and WILLD.) Family - *Combretaceae*

*Haritaki* has a unique property of having the *Pancarasa* (five tastes - *Madhura* - sweet, *Amla* - sour, *Katu* - pungent, *Tikta* - bitter, *Kashaya* - astringent). Due to this unique property, it can pacify the *Vata* and *Kapha*, and thus has a therapeutic effect on the GI. This is easy to digest, acts like a carminative, and maintains a healthy gut. This can be taken as a hot infusion or taken along with honey. This herb is endowed with significant health benefits pertaining to gastric complaints like diarrhea, vomiting, intestinal worm manifestation, abdominal enlargement and tumours, anorexia<sup>8</sup>. An *in vitro* study conducted by Kim, *et al.*, suggested that the fruit extract of *T. chebula* had inhibitory effect on the harmful and pathological bacteria in the gut like *C. perfringens* and *E. coli*, weak or no inhibitory effects against *B. bifidum*, *L. acidophilus*, and *L. casei*, moderate inhibition of the growth of *B. longum*. The paper also suggests that this herb can be considered as an option in the treatment of *Clostridia* or *E. coli*-induced diseases, pertaining to the human gastrointestinal tract<sup>9</sup>.

#### 3.1.4 *Satavari* (*Asparagus racemosus* WILLD.) Family - *Asparagaceae*

*Satavari* is cold in potency and acts like a rejuvenative. This is sweet and bitter in taste, and pacifies all the three *dosas*. This is specifically indicated in *Grahani* and *Arshas*, as it enhances the digestive capacity and also strength. In practice, this is used to treat ailments pertaining to inflammation, liver disorders and neurological conditions<sup>10</sup>. The root is used in *Ayurvedic* clinical practice. A study conducted by Papan Kumar, *et al.*, asparagus was used as an ingredient in a fermented rice preparation, and on microbial and nutrient profiling, it was found that the food was enriched with lactic acid and acidic acid, and improved nutrient value. The paper further suggested that asparagus could deliver large number of gut microbes for the sustainability of health. This can be considered as an

effective starter in rice-based food recipes, to improve the gut health<sup>11</sup>.

### 3.1.5 *Rajakshavaka (Brassica campestris L. var. glauca) Family - Brassicaceae*

*Rakakshavaka* i.e. mustard is a household name, but the fact that it holds tremendous therapeutic effect is little known. According to *Ayurveda*, this pacifies all the three *dosas*, and is easily digestible. This is specifically indicated in *Grahani* as it possesses the ability to bind the bowels<sup>12</sup>. A mini review conducted by Kumar S and Andy, stated that cruciferous vegetables contain several protective phytochemicals, which when incorporated into a daily meal, can fight against cancer of the colon, lung, bladder and ovary. The mustard leaves have been reported to have antioxidant properties, and can ameliorate the damage caused by oxidative stress<sup>13</sup>.

### 3.1.6 *Vastuka (Chenopodium album L.) Family - Chenopodiaceae*

*Vastuka* is specifically indicated in *Grahani* as it has the capacity to bind the bowels and regularize the bowel movement<sup>14</sup>. An *in vivo* study conducted on *Cyprinus carpio*, to analyse the digestive enzymatic activity by evaluating the protein content of the intestinal supernatants stated that on oral administration of *Chenopodium* extract, there is an improvement of digestive enzyme activity due to the active principles present in the plant. In *C. carpio*, this stimulates the endocellular digestive activity and extracellular digestive activity by modulating the intestinal microflora<sup>15</sup>.

## 3.2 Diet Specified

### 3.2.1 *Takra (Buttermilk)*

The habit of consuming buttermilk is considered to be best for gastrointestinal health. Hence *takra* is mentioned as a compatible drink for patients suffering from GI problems like *Grahani*, *Shopha* (edema) and *Arshas*. This stimulates the healing in the intestines, which is indicative of its effect on the gut biome<sup>16</sup>. A clinical study conducted by Sarika Mane, *et al.*, concluded that when buttermilk processed with medicinal herbs was administered rectally, there was an overall increase in the bacterial diversity. The microbial composition in the prepared buttermilk and the fecal samples were assessed to conclude that rectal administration of buttermilk processed with medicinal

herbs, definitely alters the gut microbe and in a positive way<sup>17</sup>.

### 3.2.2 *Peya (Medicated gruel)*

*Grnjana* (*Allium sativum* L.) and *Surasa* (*Ocimum basilicum* L.) is fried in required quantity of ghee and a gruel is prepared with these as ingredients. This helps in improving the gut health and also healing of intestinal ulcers. This is recommended as a daily food and as a compatible food in *Grahani*<sup>18</sup>. An *in vivo* study conducted by Md Javed Foysal, *et al.*, revealed that out of the twelve medicinal plant parts studied against *Streptococcus iniae*, garlic extract had the greatest recovery effect, and modulated the cytokine gene expression profiling and microbial community, increasing the survival rates of gut bacterial units<sup>19</sup>. An *in vivo* study conducted by Elizangela, *et al.*, stated that *Ocimum* has a very significant effect on improving the digestive activity and the digestive enzymes<sup>20</sup>.

### 3.2.3 *Dadima peya (Medicated gruel Prepared with Pomegranate)*

A rice gruel is prepared by adding *Dadima* (*Punica granatum* L.) i.e. pomegranate, and buttermilk. To this, *Vrkshamla* (*Garcinia indica* (DUP) CHOISY) is also added and cooked. The concept is to increase the sour content, to stimulate the digestive enzymes and activity. This recipe is indicated in treatment GI disorders where the bowels are mainly affected<sup>21</sup>. Both pomegranate<sup>22</sup> and tamarind<sup>23</sup> have been proven to have a significant effect on the gut microbiota.

### 3.2.4 *Pancakola yavagu (Medicated Thin Gruel with Pancakola)*

*Pancakola* is a collective term for five herbs- *Pippali* and *Pippalimula* (*Piper longum* L. and its root), *Cavya* (*Piper chaba* HUNTER), *Citraka* (*Plumbago zeylanica* L.) and *Nagara* (*Zingiber officinale* ROSC). The textbook suggests that a thin gruel be prepared with *Pancakola curna* (powder)<sup>24</sup> and a little salt to taste and consumed regularly for helping in the binding of the bowels and gut health<sup>25</sup>. There is also reference to prepare soup with *Pancakola curna* and is to be regularly consumed by a patient who is suffering from *Grahani*<sup>26</sup>. This is a unique combination of herbs that is mentioned in *Ayurveda*. Though individual herbs are proven to have effects on the digestive capacity

and enzymes, studies on this combination on GI health has never been published before.

## 4. Discussion

'Gut Health' is a collective term, of many factors in which microbiota are also included. The basic requirement in maintaining a healthy microbiome is diet and nutrition. When a pathology strikes, the gut microbes are also affected eventually leading to associated symptoms. In the process of retaining the gut microbiome, diet and medicines have to be planned carefully. In *Ayurveda*, *Grahani* is the organ that supports the *Agni* (digestive fire) and when one is inflicted, the other is also inflicted. This causes derangement of bowel movements, and GI complaints. So retrospectively, the single herbs and diet specified in *Grahani*, becomes applicable for gut health thus eventually will help in the building up of the gut microbiome also. Throughout the major classical textbooks of *Ayurveda*, only 6 single herbs and 4 diet recommendations could be identified, that was specified for *Grahani*, to get relief from all the gastric symptoms. Though the individual herbs have all been researched and proven to have significant effect on gut health, studies should be conducted in the dosage form that they would be cooked and used at home. This will help develop new treatment protocols, to increase the gut microbiome and stabilize them. This article does not focus on the formulations mentioned as treatment. Only functional food is being included.

## 5. Conclusion

Diet plays an important role in maintaining the Gut Health and the microbiome. If the single herbs and diet mentioned for maintaining gut health, as a part of treatment in *Grahani* is explored further, it would help understand the cause-effect relationship. They could be incorporated into daily diet chart, to maintain a healthy microbiome in the gut.

## 8. References

1. Vagbhata. Ashtanga Sangraha. Sharma SP, ed. Varanasi: Chaukhambha Sanskrit Series Office; 2012: 301.
2. Vagbhata. Ashtanga Hrdaya. Paradakara HSS, ed. Varanasi: Chaukhambha Sanskrit Sansthan; 2011: 497.
3. Bischoff SC. "Gut health": A new objective in medicine? BMC Medicine. 2011; 9(1). <https://doi.org/10.1186/1741-7015-9-24> PMID:21401922 PMCid:PMC3065426
4. Agnivesa. Charaka Samhita. Acarya JT, ed. New Delhi: Chaukhambha Publications; 2017: 160.
5. Li X, Guo R, Wu X, *et al.* Dynamic digestion of tamarind seed polysaccharide: Indigestibility in gastrointestinal simulations and gut microbiota changes *in vitro*. Carbohydr. Polym. 2020; 239:116194. <https://doi.org/10.1016/j.carbpol.2020.116194> PMID:32414435
6. Agnivesa. Charaka Samhita. Acarya JT, ed. New Delhi: Chaukhambha Publications; 2017: 159.
7. Sakat S, Tupe P, Juvekar A. Gastroprotective effect of methanol extract of *Oxalis corniculata* Linn (whole plant) experimental animals. Planta Med. 2010; 76(12). <https://doi.org/10.1055/s-0030-1264388>
8. Vagbhata. Ashtanga Hrdaya. Paradakara HSS, ed. Varanasi: Chaukhambha Sanskrit Sansthan; 2011: 117.
9. Kim HG, Cho JH, Jeong EY, Lim JH, Lee SH, Lee HS. Growth-Inhibiting activity of active component isolated from *Terminalia chebula* fruits against intestinal bacteria. J. Food Prot. 2006; 69(9):2205-2209. <https://doi.org/10.4315/0362-028X-69.9.2205> PMID:16995525
10. Susruta. Susruta Samhita. Bhattacharya CK, ed. New Delhi: Rashtriya Sanskrita Samsthanam; 2008: 536.
11. Hor PK, Goswami D, Ghosh K, Takó M, Halder SK, Mondal KC. Preparation of rice fermented food using root of *Asparagus racemosus* as herbal starter and assessment of its nutrient profile. SMAB. 2021; 2(1):147-156. <https://doi.org/10.1007/s43393-021-00046-8> PMCid:PMC8331993
12. Agnivesa. Charaka Samhita. Acarya JT, ed. New Delhi: Chaukhambha Publications; 2017: 158.
13. Kumar S, Andy A. Health promoting bioactive phytochemical from Brassica. Int. Food Res. J. 2012; 19(1):141.
14. Vagbhata. Ashtanga Hrdaya. Paradakara HSS, ed. Varanasi: Chaukhambha Sanskrit Sansthan; 2011: 101.
15. Amhamed İD, Mohamed GA, Almabrok AA, Altief TAS, Bilen S. Efficacy of dietary chenopodium album extract on some health parameters, digestive enzymes and growth performance in juvenile *Cyprinus carpio*. Alinteri Journal of Agriculture Science.

- 2018; 33(2):165-176. <https://doi.org/10.28955/alinterizbd.412455>
16. Vaghbhata. Ashtanga Sangraha. Sharma SP, ed. Varanasi: Chaukhambha Sanskrit Series Office; 2012: 125.
  17. Mane S, Dixit KK, Lathwal N, *et al.* Rectal administration of buttermilk processed with medicinal plants alters gut microbiome in obese individuals. J Diabetes Metab Disord. 2021; 20(2):1415-1427. <https://doi.org/10.1007/s40200-021-00879-z> PMid:34900793 PMCid:PMC8630144
  18. Vaghbhata. Ashtanga Sangraha. Sharma SP, ed. Varanasi: Chaukhambha Sanskrit Series Office; 2012: 496.
  19. Foyosal MJ, Alam M, Momtaz F, *et al.* Dietary supplementation of garlic (*Allium sativum*) modulates gut microbiota and health status of tilapia (*Oreochromis niloticus*) against *Streptococcus iniae* infection. Aquac Res. 2019; 50(8):2107-2116. <https://doi.org/10.1111/are.14088>
  20. de Souza EM, de Souza RC, Melo JFB, da Costa MM, de Souza AM, Copatti CE. Evaluation of the effects of *Ocimum basilicum* essential oil in Nile tilapia diet: growth, biochemical, intestinal enzymes, haematology, lysozyme and antimicrobial challenges. Aquacult Int. 2019; 504:7-12. <https://doi.org/10.1016/j.aquaculture.2019.01.052>
  21. Vaghbhata. Ashtanga Sangraha. Sharma SP, ed. Varanasi: Chaukhambha Sanskrit Series Office; 2012: 504.
  22. Song H, Shen X, Chu Q, Zheng X. Pomegranate fruit pulp polyphenols reduce diet-induced obesity with modulation of gut microbiota in mice. J. Sci. Food Agric. 2021;102(5):1968-1977. <https://doi.org/10.1002/jsfa.11535> PMid:34514612
  23. Tung YC, Shih YA, Nagabhushanam K, Ho CT, Cheng AC, Pan MH. *Coleus forskohlii* and *Garcinia indica* extracts attenuated lipid accumulation by regulating energy metabolism and modulating gut microbiota in obese mice. Food Res Int. 2021; 142:110143. <https://doi.org/10.1016/j.foodres.2021.110143> PMid:33773654
  24. Ranajan M, Cr H, Shukla V, Thakar A. Pharmacognostical and pharmaceutical study of panchakolachurna - A poly-herbal formulation. 2016. [http://www.pharmasm.com/pdf\\_files/20160403211129\\_03\\_mridul.pdf](http://www.pharmasm.com/pdf_files/20160403211129_03_mridul.pdf)
  25. Vaghbhata. Ashtanga Hrdaya. Paradakara HSS, ed. Varanasi: Chaukhambha Sanskrit Sansthan; 2011: 665.
  26. Agnivesa. Charaka Samhita. Acarya JT, ed. New Delhi: Chaukhambha Publications; 2017. p. 520.