

PREPARATION AND PHYSICOCHEMICAL EVALUATION OF MALASHODHANA SYRUP AND SHUNTYADI SYRUP

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ABSTRACT

Constipation in children is defined as a delay or difficulty in defecation present for two or more weeks and sufficient to cause significant distress to the child. When there is no underlying organic cause for constipation, then it is termed functional constipation. This is the cause of constipation in 95% of children. In the present scenario, it is more prevalent below the age of 15 years and about 0.7 % to 29.6% in childhood. The treatment modality includes two main measures; they are Disimpaction and Maintenance therapy. PEG is the laxative of the first choice for both Disimpaction and Maintenance therapy. The long-term prognosis is moderate even if early therapeutic interventions are done.

Constipation can be correlated to *Vibandha*, explained in our classics. *Vibandha* as a separate disease entity is not mentioned in the Ayurveda classics. But the different presentations of *Pureesha*, like *Baddha Pureesha*, *Ghana/Grathitha Pureesha*, *Vitgraha*, *Sushkapureesha*, and *Malavabaddhata*, are found in Ayurvedic texts which can be taken as *Vibandha*. (Mentioning various lines of treatment & selection of the above trial drug) *Malashodhana Kashaya*, mentioned in *Sahasrayoga Kashaya Prakarana* and *Shuntyadi Kashaya*, mentioned in *Bhavaprakasha*, *Jatharagni Vikaradhikara* possesses properties that may help in the proper formation of *Malas* and breaks the obstruction & brings them downwards there by relieving the *Vibandha*. To make the trial drug more palatable and easy administration it will be made into syrup form. The present work aims at reporting the physicochemical evaluation of *Shuntyadi* syrup and *Malashodhana* syrup. Both formulations are standardized as per the physico-

chemical parameters of API. Since both the formulations are not standardized in API, we have attempted to standardize them, and it will serve for further research in the area of Ayurvedic formulation.

Key words: *Vibandha, Malashodhana Kashaya, Shuntyadi Kashaya, physicochemical parameters*

INTRODUCTION

The word *Vibandha* means to bind or stretch out or to obstruct. *Vibandha* as a separate disease entity is not mentioned in the *Ayurveda* classics. The different presentations of *Pureesha* like *Baddha Pureesha, Ghana/Grathitha Pureesha, Vitgraha, Sushkapu-peesha, and Malavabaddhata* are found in Ayurvedic texts, which can be considered under the broad spectrum of *Vibandha*.¹ *Vibandha* can also be correlated with the *Lakshna* of *Pureeshaavritta Vata*.² The causative factor for *Vibandha* is *Agnimandya* and *Apanavata dusti*. So, children involved in unhealthy dietary habits such as *Ruksha-Sheetha Guna Ahara, Alpa Bhojana, Kashaya, Katu, Tikta Rasa Atisevana, Ati Ksheerapana*, etc majorly suffer from *Vibandha*.

This condition can be potentially related to functional constipation. Constipation in children is defined as a delay or difficulty in defecation present for two or more weeks and sufficient to cause significant distress to the child and is associated with both physical and psychological morbidity and a poor quality of life.³ A person with functional constipation may be healthy yet has difficulty in defecation. Delayed or inadequate intervention may result in stool with holding behavior along with worsening constipation and may end up in poor appetite, impaired weight gain,

and frequent abdominal complaints and even causes hemorrhoids, anal fissures, and Sentinel tag in due course of time. According to Ayurveda, the line of treatment for *Vibandha* is *Agni Deepana* and *Vatanulomana*. *Apana Vata* is the main factor involved in causing *Vibandha*, and *Vibandha* itself is one of the symptoms of *Udavarta*, so the *Udavarta* line of treatment can be adopted.

Sharkarakalpna is an *Upakalpna* of *Kwatha Kalpana* with palatability having the consistency of honey. In modern pharmaceuticals, syrups are similar to pharmaceutical preparations. *Malashodhana Kashaya*,⁴ mentioned in *Sahasrayoga Kashaya Prakarana* has ingredients *Katuka, Amalaka, Guduchi, Shunti*, and *Shampakapallava* in it, and *Shuntyadi Kashaya*⁵ mentioned in *Bhavaprakasha Jatharagni Vikaradhikara* has *Shunti, Pippali, Haritaki* in it, the details of the same are explained further. The ingredients are easily available, cost-effective, and have properties that may help in relieving *Vibandha*. This article highlights the different ingredients and methods of preparation of *Malashodhana* syrup and *Shuntyadi* syrup.

MATERIALS AND METHOD

Ingredients of *Malashodhana Kashaya*⁴ are.

Table No.1: Ingredients of *Malashodhana Kashaya*

Sl.no	Sanskrit name	Latin name	Family	Parts /quantity
1.	<i>Katuka</i>	<i>Picrorhiza kurroa Royle ex Benth.</i>	Plantaginaceae	1 Part
2.	<i>Amalaka</i>	<i>Phyllanthus emblica L.</i>	Phyllanthaceae	1 Part
3.	<i>Guduchi</i>	<i>Tinospora cordifolia (Thunb)Miers.</i>	Menispermaceae	1 Part
4.	<i>Shunti</i>	<i>Zingiber officinale Roscoe.</i>	Zingiberaceae	1 Part
5.	<i>Shampakapallava</i>	<i>Cassia fistula Linn.</i>	Caesalpinioideae	1 Part
6.	<i>Shiva</i>	<i>Terminalia chebula Retz.</i>	Combretaceae	1 Part
7.	Water			8 Parts

KATUKI⁶

It was creeping herbs spread by stolons. A whorl of radical leaves arising from the rhizome tip. It contains Irridoid bitter substances, Picroside 1, Picroside 2, Kutkoside, Kutkin, and Picrorhizin.

Part used: Rhizome.

Rasa Panchaka:

<i>Rasa</i>	<i>Tikta</i>
<i>Guna</i>	<i>Ruksha, Laghu</i>
<i>Virya</i>	<i>Sheeta</i>
<i>Vipaka</i>	<i>Katu</i>
<i>Karma</i>	<i>Krimighna, Bhedhana, Deepana, Hrdya</i> <i>Doshakarma- Kapha Pittashamaka</i> <i>Rogaghnata- Kamala, Yakrut Vikara, Hridroga, Jwaraghna, Pramehahara, Agnimandya, Kusta, Arsha, Raktavikara, Daha, Shwasa, Vishamajwara.</i>

AMALAKI⁷

A deciduous small or middle size tree with a crooked trunk and spreading branches. Branchlets are glabrous or finely pubescent. It contains Fruit-Ellagic acid, Amlaic acid, Phyllantine, Phyllantidine, Zeatin, Zeatin nucleotide, Zeatin riboside, Benzenoid, Chebulic acid, and Chebulinic acid.

Part used: *Phala*.

Rasa Panchaka:

<i>Rasa</i>	<i>Amlapradhana Lavanavarjitha Pancharasa</i>
<i>Guna</i>	<i>Ruksha, Laghu, Sara</i>
<i>Virya</i>	<i>Sheeta</i>
<i>Vipaka</i>	<i>Madhura</i>
<i>Karma</i>	<i>Rasayana, Vayastapana, Vrshya, Keshya, Ruchya, Medhogna, Cakshushya, Bagna Sandhanakara.</i> <i>Doshakarma- Tridosahara</i> <i>Rogaghnata- Prameha, Jwara, Raktapitta, Panduroga, Kamala, Sukra Dourbalya, Daha, Chardhi, Sopha, Kesa Vikara.</i>

GUDUCHI⁸

A glabrous climber with succulent, corky, and grooved stems. It contains Tinosporide, Cordifolide,

Tinosporon, Tinosporic Acid, Cordifol, Heptacosanol B-Sitosterol, and Tinosporidine.

Part used: *Kanda*.

Rasa Panchaka:

<i>Rasa</i>	<i>Tikta, Kashaya</i>
<i>Guna</i>	<i>Guru, Snigdha</i>
<i>Virya</i>	<i>Ushna</i>
<i>Vipaka</i>	<i>Madhura</i>
<i>Karma</i>	<i>Medhya, Rasayana, Sangrahi, Deepana, Amahara, Cakshushya.</i> <i>Doshakarma- Tridoshashamaka</i> <i>Rogaghnata- Jwara, Vataraktha, Prameha, Kusta, Agnimandhya, Trshna, Daha, Kasa, Kṛmi, Chardi, Arsha, Hrdroga.</i>

SHUNTI⁹

Perennial herb with elongated leafy stems and horizontal tuberous root stock. It contains α - curcumene, β -D-cucurmene, β -bourbornene, d-borneol, citral, d-camphene, citronellol, geraniol, gingerol, α - & β -Zingiberenes, zingiberol, zingerone, gingerols, paradol, gingerenone A, ginger glycolipids A, B & C, gingerdiol, zingerone B & C.

Part used: Rhizome.

Rasa Panchaka:

<i>Rasa</i>	<i>Katu</i>
<i>Guna</i>	<i>Laghu, snigdha</i>
<i>Virya</i>	<i>Ushna</i>
<i>Vipaka</i>	<i>Madhura</i>
<i>Karma</i>	<i>Vata Kaphahara, Deepana, Bhedana</i> <i>Doshakarma- Kapha Vata shamaka</i> <i>Rogaghnata- Shoola, Aamavaata, Aadhmaana, Atisaara, Shlipada, Kaasa, Shwasa, Hridroga, Shopha, Arsha, Hikka, Vibandha, Raktapitta, Pandu, Jwara, etc.</i>

SHAMPAKAPALLAVA¹⁰

Medium-sized perennial tree with an erect, branched, cylindrical, woody solid stem. It contains Rhein glycoside, anthraquinone derivatives, tannin, free Rhein, Sennoside-A, and Sennoside-B.

Part used: *Patra*.

Rasa Panchaka:

Rasa Madhura
 Guna Guru, Sheetha
 Virya Sheetha
 Vipaka Madhura
 Karma Medha Vishoshaka and Virechaka
 Doshakarma- Vatapitta shamaka and
 Pitta Kapha Samshodhaka
 Rogagnata- Medoroga.

HARITAKI¹¹

A moderate-sized or large deciduous tree with rounded crowns and spreading branches. Fruit contains tannin up to 30%, chebulinic acid, chebulagic acid, gallic acid, tetrachebulin, Anthraquinone glycoside, and vitamin C. Fruit kernels contain arachidic, benenic, linoleic, palmitic, and stearic acid.

Part used: *Phala*.

Rasa Panchaka:

Rasa Kashayapradhana Lavanavarjita
 Pancharasa
 Guna Laghu Ruksha
 Virya Usna
 Vipaka Madhura
 Karma Rasayana, Vayasthapana,
 Ayushya, Sarvarogaprashamana,
 Dipana-pachana- Anulomana, Yakr-
 duttejaka, Vranashodhana- Ropana,
 Shotahara, Chakshushya
 Doshakarma- Tridosahara,
 Vatasamaka
 Rogakarma- Agnimandya-Ajirna-
 Shula-Anaha-Adhmana-Vibandha-
 Chardi, Krimi, Grahani, Arsha.
 Kasa, Svasa, Pratishyaya, Hikka,
 Jwara-Vishamajwara-Jirnajwara

Ingredients of Shuntyadi kashaya⁵ are.

Table No.2: ingredients of *Shuntyadi kashaya*

Sl.no	Sanskrit name	Latin name	Family	Parts / Quantity
1.	<i>Shunti</i>	<i>Zingiber officinale. Rose</i>	Zingiberaceae	1 Part
2.	<i>Pippali</i>	<i>Piper longum. Linn</i>	Piperaceae	1 Part
3.	<i>Haritaki</i>	<i>Terminalia chebula. Retz.</i>	Combretaceae	1 Part
4.	Water			8 Parts

SHUNTI¹¹

Perennial herb with elongated leafy stems and horizontal tuberous root stock. It contains α - cucurmene, β -D-cucurmene, β -bourbornene, d-borneol, citral, d-camphene, citronellol, geraniol, gingerol, α - & β -Zingiberenes, zingiberol, zingerone, gingerols, paradol, gingerenone A, ginger glycolipids A, B & C; gingerdiol, zingerone B & C.

Part used: Rhizome.

Rasa Panchaka:

Rasa Katu
 Guna Laghu, snigdha
 Virya Ushna
 Vipaka Madhura
 Karma Vata Kaphahara, Deepana, Bhedana
 Doshakarma- Kapha Vata shamaka
 Rogagnata- Shoola, Aamavaata,
 Aadhmaana, Atisaara, Shlipada,

Kaasa, Shwasa, Hridroga, Shopha,
 Arsha, Hikka, Vibandha, Raktapitta,
 Pandu, Jwara, etc.

PIPPALI¹²

A slender, aromatic climber with perennial woody roots. Stems creeping, jointed. Essential oils and alkaloids (piperine, piper longumine, sesamin), reducing sugars, glycosides, and piperic acid.

Part used: *Phala, Mula*

Rasa Panchaka:

Rasa Katu
 Guna Laghu, Snigdha
 Virya Anushna
 Vipaka Madhura
 Karma Rasayana, Kasa- swasahara,
 Hikkani-grahana, Medhya,
 Kshayahara
 Doshakarma- Vata
 kaphashamaka

Rogagnata- Kasa svasa
hikka, Gulma, Arsa, Yakrit-
plihavikara, Krimiroga,
Amavata vatarakta, Ag-
nimandya, Ajirna, Vatavyad-
hi, Kshaya

HARITAKI¹¹

A moderate-sized or large deciduous tree with rounded crowns and spreading branches. Fruit contains tannin up to 30%, chebulinic acid, chebulagic acid, gallic acid, tetrachebulin, Anthraquinone glycoside, and vitamin C. Fruit kernels contain arachidic, benenic, linoleic, palmitic, and stearic acid.

Part used: *Phala*.

Rasa Panchaka:

<i>Rasa</i>	<i>Kashayapradhana</i>	<i>Lavanavarjita</i>
	<i>Pancharasa</i>	
<i>Guna</i>	<i>Laghu</i>	<i>Ruksha</i>
<i>Virya</i>	<i>Usna</i>	
<i>Vipaka</i>	<i>Madhura</i>	
<i>Karma</i>	<i>Rasayana,</i>	<i>Vayasthapana,</i>
	<i>Ayushya, Sarvarogaprashamana,</i>	<i>Dipana-Pachana-Anulomana,</i>
	<i>Yakruduttejaka,</i>	<i>Vranasho-</i>
	<i>dhana- Ropana,</i>	<i>Shotahara,</i>
	<i>Chakshushya</i>	
	<i>Doshakarma-</i>	<i>Tridosahara,</i>
	<i>Vatasamaka</i>	
	<i>Rogakarma-Agnimandya-Ajirna-</i>	
	<i>Shula-Anaha-Adhmana- Vibandha-</i>	
	<i>Chardi, Krimi, Grahani, Arsha.</i>	
	<i>Kasa, Shwasa, Pratishyaya, Hikka,</i>	
	<i>Jwara-Vishamajwara-Jirnajwara</i>	

COLLECTION AND AUTHENTICATION OF RAW DRUGS

All the above-mentioned drugs were collected from the GMP-certified Hindustan Drugs Palimar, Udupi Karnataka, India.

METHOD OF PREPARATION

Method of preparation of Kashaya

The dried drugs of taken in one part in coarse powder form along with 8 parts of water. The mixture is boiled over *Mandagni* and reduced to 1/4th part, and

filtered. This filtrate is used for further *Sharkara Kalpana* preparation.

Method of preparation of Syrup

To the prepared *Kwatha*, a double quantity of *Sharkara* is added and boiled over *Mandagni* until the liquid attains syrup consistency. It is later filtered to get rid of impurities present in *Sharkara*. Methods of preparation of *Malashodhana* syrup and *Shuntyadi* syrup are explained below,

1. Method of preparation of Malashodhana syrup (figure 1,2,3)

The dried drugs of *Malashodhana* syrup were collected in a quantity of 335g each. The drugs were soaked in water over night next day decoction of drugs was prepared by adding 8litres of water, boiling and reducing it to 4litres, and filtering, to this 2670g of sugar was added and boiled over *Mandagni* till it was reduced to 4L. The total quantity of suspension obtained was 4L, which was cooled down and bottled into 200ml each. They were packed in plastic containers, which were sealed and labelled.

2. Method of preparation of Shuntyadi syrup (figure 4,5,6)

The dried drugs of *Shuntyadi* syrup were collected in a quantity of 670g each. The drugs were soaked in water over night next day decoction of drugs was prepared by adding 8litres of water, boiling and reducing it to 4litres, and filtering, to this 2670g of sugar was added and boiled over *Mandagni* till it was reduced to 4L. The total quantity of suspension obtained was 4L, which was cooled down and bottled into 200ml each. They were packed in plastic containers, which were sealed and labelled.

ORGANOLEPTIC PARAMETERS OF THE FINISHED PRODUCT

Malashodhana syrup

1. Physical State: Viscous liquid
2. Color: Dark Brown
3. Odor: Pleasant
4. Taste: Sweet
5. Clarity: Opaque

Shuntyadi syrup

1. Physical State: Viscous liquid
2. Color: Dark Brown

- 3. Odor: Pleasant
- 4. Taste: Sweet

- 5. Clarity: Opaque

PHYSICOCHEMICAL PARAMETERS OF FINISHED PRODUCTS

Table 3: Depicts the physicochemical parameters of *Malashodhana* syrup and *Shuntyadi* syrup.

PARAMETERS	MALASHODHANA SYRUP	SHUNTYADI SYRUP
Specific gravity	1.31	1.24
pH (10% solution)	4.1	4.4
Total Solids	66.6%	90%
Reducing sugars	35.95%	32.95%
Non-Reducing sugars	15.94%	15.24%

DISCUSSION

The formulation is prepared based on *sharkara kalpana*, which is one of the *Upakalpana* prepared from *Panchavidha Kashaya Kalpana* with the help of sugar. In pediatrics, the palatability of the drug plays a major role, so this method can be inculcated to extract the active principle from raw drugs. Sugar stimulates the gut to put out water and electrolyte, which loosen bowel movements and hence maybe helpful in relieving the *Malabaddhata*.

This study reveals the organoleptic and physicochemical parameters of *Malashodhana* syrup and *Shuntyadi* syrup. The prepared Syrup is dark brown in colour with liquid consistency with a sweet taste which is a characteristic of Syrup. Specific gravity is the number of constituents solubilized in the media, which is found to be less in *Shuntyadi* syrup when

compared to *Malashodhana* syrup, pH of the Syrup was found to be slightly acidic. Total solid is comparatively more in *Shuntyadi* syrup than in *Malashodhana* syrup. Reducing and non-reducing sugar is more in *Malashodhana* syrup to counteract its bitterness and make the Syrup more palatable.

CONCLUSION

Vibandha/functional constipation is one of the common presentations in *Kaumarabhritya* OPD. Even though it's not an emergency condition but it is a matter of concern for both parents and children. Both syrups may be effective in terms of their laxative property and safe to administer in the pediatric age group, which justifies the necessity to come up with a standardized formulation.

FIGURES:



Figure 1



Figure 2



Figure 3



Figure 4



Figure 5



Figure 6

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