



Review Article

A THERAPEUTIC APPROACH OF *SUDHA VARGA DRAVYA* W.S.R. TO GASTROINTESTINAL DISORDER

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ABSTRACT

The human Gastro intestinal tract is responsible for transporting and digesting food stuffs, absorbing nutrients and expelling waste. Any interruption or change in physiology of GIT results in various disease like Hyperacidity, Peptic ulcer, duodenal ulcer, Irritable Bowel Syndrome, Gastro-Esophageal Reflux Disorder etc. In *Ayurveda* all these diseases comes under *Annavaha Srotas Vikara*. There are many treatment modalities available in *Ayurveda* but *Sudha vargiya Dravyas* describe in *Rasa-shastra* literature plays an important role in the treatment of GIT disorders. *Bhasmas* of *Sudha vargiya Dravyas* have attained importance in prevention and cure of conditions such as *AmlaPitta* (hyperacidity), *Grahani* (Irritable Bowel Syndrome), *Annadrava shula* (Gastric ulcer), *Parinaam shula* (Duodenal ulcer), *Atisara* (Diarrhoea) etc. *Bhasmas* are considered as nano medicine in *Ayurveda* which is therapeutically very potent in small dose, quick acting and without specific taste. All the drugs in *Sudha Varga* have calcium in compound form, as salt. Calcium has very essential role in physiology related to bone structure as well as regulation of Gastro intestinal secretions. As these having *Sheet virya* in all the *Sudha vargiya Dravyas* the acid neutralizing capacity is present due to higher pH value.

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INTRODUCTION

The drugs which are available in *Ayurvedic* system of medicine are obtained either from herbal, animal and mineral sources. There are many treatment modalities available in *Ayurveda* but *Sudha vargiya Dravyas* describe in *Rasa-shastra* literature plays an important role in the treatment of GIT disorders. *Bhasmas* of *Sudha vargiya Dravyas* have attained importance in prevention and cure of conditions such as *AmlaPitta* (~hyperacidity), *Grahani* (~IBS), *Annadrava shula* (~Gastric ulcer), *Parinaam shula* (~Duodenal ulcer), *Atisara* (~Diarrhea) etc. *Bhasmas* are considered as nano medicine in *Ayurveda* which is therapeutically very potent in small dose, quick acting and without specific taste. In the current kinetic era, *Rasaushadhis* have given *Ayurveda* a complete novel health care look. [1] All the drugs enlisted in *Sudha Varga Dravya* have calcium in compound form, as salts. It plays very essential role in physiology and regulation of gastrointestinal secretions.

Material and methods

Classification of *Sudha Varga Dravya*

In *Charak Samhita* and *Sushruta Samhita* '*Sudha*' comes under *Parthiva Dravya*. Both *Rasaratnakar*

and *Rasarnava* include it in '*Shukla Varga*'. [2] *Rasamritam* has included these drugs under '*Sudha Vijnaneyama*' based on their chemical composition. [3]

Sudha Varga includes both *Khanija Dravyas* (drugs of mineral origin) like *Khatika*, *Sudha*, *Godanti* and *Pranija Dravyas* (products obtained from animal) like *Samudraphena*, *Sankha*, *Shukti*, *Mukta*, *Pravala*, *Kurmapristha*, *Mrigsringa*, *Kukkutanda twaka* etc. Among these *Kaparda* has been grouped under '*Sadharana Rasa*' [4] (group of minerals depending on their role in alchemical processing of mercury) whereas *Pravala* and *Mukta* comes under *Ratna Varga* (group of gems) [5] *Sudha Varga Dravya* is different in different authors. *Mukta* and *Pravala* were included by recent authors in *Ayurvediya Rasashastra* and *Rasashastra*. The Mercurial System along with *Badrashma* (silicate of lime), *Vamsalochana* (*Phyllostachys edullis*) and *Sweta-anjana* (surma saphed), *Hastidanta* (elephant's tusk) respectively.

Table 1: *Sudha Varga Dravya* according to different authors

S.No.	Name	Rasaratnakar ^[6] and Rasarnava ^[7]	Ananda Kanda ^[8]	Rasamritam ^[9]	Aurvediya Rasashastra ^[10]	Rasashastra- The Mercurial System ^[11]
1.	<i>Sudha</i>	+	-	+	+	+
2.	<i>Khatika</i>	-	-	+	+	+
3.	<i>Godanti</i>	-	-	+	+	+
4.	<i>Sankha</i>	+	+	-	+	+
5.	<i>Kshudrasanka</i> (<i>Sambuka</i>)	-	+	-	+	+
6.	<i>Mukta sukti</i>	-	+	-	+	+
7.	<i>Varatika</i>	+	-	-	+	-
8.	<i>Kurmaprista</i>	+	-	+	+	+
9.	<i>Kurmaprista</i>	-	-	+	-	-
10.	<i>Pravala</i>	-	-	-	+	+
11.	<i>Mukta</i>	-	-	-	+	+
12.	<i>Mrigasringa</i>	-	-	-	-	+
13.	<i>Kukkutandatwaka</i>	-	-	-	+	+
14.	<i>Ajasthi</i>	-	-	-	+	-
15.	<i>Badrashma</i>	-	-	-	+	-
16.	<i>Vansalochana</i>	-	-	-	+	-
17.	<i>Swetanjana</i>	-	-	-	-	+
18.	<i>Hastidanti</i>	-	-	-	-	+

Table 2: Description of *Sudha Varga Dravya*

S.No.	Name	Common name	Origin	Chemical constituents	Form
1.	<i>Sudha</i>	Lime	Mineral	CaO	Oxide
2.	<i>Khatika</i>	Chalk	Mineral	CaCO ₃	Carbonate
3.	<i>Godanti</i>	Gypsum	Mineral	CaSO ₄ 2H ₂ O	Sulphate
4.	<i>Sankha</i>	Conch shell	Marine	CaCO ₃	Carbonate
5.	<i>Kshudrasanka</i> (<i>Sambuka</i>)	Australian snail	Marine	CaCO ₃	Carbonate
6.	<i>Mukta sukti</i>	Pearl oyster shell	Marine	CaCO ₃	Carbonate
7.	<i>Varatika</i>	Cowry shell	Marine	CaCO ₃	Carbonate
8.	<i>Kurmaprista</i>	Turtle shell	Marine	Calcite	Phosphate
9.	<i>Surmasapheda</i>	Cuttle fish bone	Marine	CaCO ₃	Carbonate
10.	<i>Pravala</i>	Coral	Marine	CaCO ₃	Carbonate
11.	<i>Mukta</i>	Pearl	Marine	CaCO ₃	Carbonate
12.	<i>Mrigasringa</i>	Deer's antlers	Animal	Ca ₃ (PO ₄) ₂	Phosphate
13.	<i>Kukkutandatwaka</i>	Hen's egg shell	Animal	CaCO ₃	Carbonate
14.	<i>Ajasthi</i>	Goat's bone	Animal	Calcium, Phosphorus etc.	Phosphate

Pharmacology of *Sudha Varga Dravya*

Most of the *Sudha Varga Dravya* are highly effective in combating hyperacidity and dyspepsia because they are rich in calcium salts which aid in acid neutralization. *Pravala* and *Mukta* have *Dipana* (appetizer) and *Pachana* (digestive) properties^[12] maintain the normalcy of *Agni* (digestive fire) and thus help in curing and preventing the production of ulcers.^[13] The *Kshariya* (alkaline) nature of the both drugs would reduce the *Amliyata* (acidic nature) and help in *Vrana ropana* (promotes wound healing). Due to *Sita virya* (the drug having cold potency or cooling effect usually

resembles to endothermic) which does *Pitta shamana* (pacify the biological fire) and *Vrana ropana*. *Pravala pisthi*, *Pravala bhasma* and *Mukta bhasma* are useful in burning sensation, dyspepsia.^[14,15] *Pravalapanchamrita* rasa indicated in *Amla Pitta*.^[16] In an experimental study *Mukta Bhasma* produced significant protection in against cold restraint stress induced gastric ulcer and Diclofenac induced ulcer respectively.^[17] *Mukta pisti* has appreciable properties in *Raktaatisara*, activate digestion and alleviates disease of digestion. It alleviates burning sensation.^[18]

Shankha Bhasma being *Sita Virya*, alkaline in nature and *Grahi* (absorption enhancing), it is indicated in gastrointestinal disorders like *Amla Pitta*, *Parinama Shula*, *Grahani* (Irritable bowel syndrome) and *Agnimandhya*^[19] which is clinically proved.^[20] Useful in hyperacidity, dyspepsia and gastro-esophageal reflux^[21]. In other study *Shankha bhasma* caused significant reduction in ulcer index ($P < 0.001$) in both the indomethacin and cold restraint models.^[22] In aspirin induced model, the *Mukta sukta Bhasma* and standard group (Sucralfate) showed highly significant Anti ulcer activity than control group (food water). The *Mukta sukta Bhasma* showed highly significant Anti ulcer activity than standard group (Sucralfate) when compared because the alkaline pH and chemical components might have contributed by inhibiting secretions, neutralizing the acidity and reducing size of the ulcerative lesions.^[23]

Sambuka Bhasma is useful in abdominal colic, hyperacidity and diarrhea.^[24]

Shukti Useful in abdominal colic. It acts as an antidote, carminative and digestive.^[25]

Varatika Useful in dyspepsia and acts as an antidote.^[26]

Churnodaka is indicated for *Basti*, *Sevana* and *Kavala* apart from its preparation of *Kshara* (alkali)^[27] *Sudha Khatika* along with cold water *pravahika*, *Pittasra* and *Grahani*.^[28]

Samudraphena churna with *Kokilaksha Kasaya* (*Hygrophilla auriculata*), *Kataphala* (*Myrica esculenta*), *Usheera* (*Vetiveria Zizanoides*) and *Ikshu* (*Saccharum officinarum*) for internal administration is indicated in *Shukra Dhatu shodhana*. Only *Rasamritam* include *Surmasapheda* and considered as a substitute for *Godanti Bhasma*.^[29]

Godanti Bhasma is *Shita* (cold in potency), alleviates *Pitta dosha*, arrests bleeding and ameliorates hyperacidity. It helps in healing of ulcer in acid-peptic disease. In burning sensation of body *Godanti Bhasma* is the choicest remedy. It arrests bleeding in diarrhoea and dysentery.^[30]

Mrigasringa Bhasma is indicated with cow's ghee, cow's milk and butter in *Hritshula* (angina). Along with *Apamarga phala* (*Achyranthes aspera*) or *Pippali* powder it is used in hiccough and dyspnoea.^[31]

Kukutandatwaka Bhasma diarrhoeas, tuberculosis with cavitations and menorrhagia.^[32]

Modern perspective

Sudha Vargiye Dravya mainly contains calcium compounds chiefly calcium carbonate (CaCO_3), calcium oxide (CaO) and some amount of calcium silicates. Calcium carbonate is widely used in the treatment of peptic ulcer.^[33],^[34] It is a fast acting antacid and reduces gastric acidity resulting in an increase in the pH of stomach.^[35] Calcium being the main ingredient plays an important role in many physiological activities not only related to bones but also includes blood clotting, nerve conduction, muscle contraction, regulation of enzyme activity and cell membrane function. It takes part in production of many enzymes and hormones which regulate digestion process and metabolism.^[36] Calcium is

essential for the normal transport of nutrients through membranes, blood coagulation and muscle functioning.^[37] Calcium also helps in regulating potassium and magnesium balance in the body.^[38] It prevents blood loss if ulcers are bleeding, heals the ulcers by muscle contraction and hardening and also reduces the pain by regulating nerve function^[39] and perhaps most importantly, Calcium is the main buffer used in the body to neutralize acids and maintains the proper pH.^[40] Even it is evident that excess intake of calcium leads to production of peptic ulcers instead of healing. The administration of calcium both orally or intravenously, stimulates acid secretion and increases circulating concentration of gastrin.^[41] Stimulation of acid secretion by the parietal cells occurs by at least three major pathways: the cholinergic transmitter such as acetylcholine, histamine, which is locally released in the gastric epithelium and the hormone gastrin. The effect of histamine is mediated by increasing adenylate cyclase activity, whereas the effects of the acetylcholine and gastrin seem to involve an increase in cytosolic free calcium.^[42]

Drugs of *Sudha Varga* contain not only calcium but also other minerals thus reducing excess absorption of calcium. Magnesium is one of the minerals which is said to reduce the absorption of calcium in the intestine. However, the action of magnesium is very weak; hence it may not hinder the absorption of calcium to a large extent. These drugs also contain many elements like iron, oxygen, sodium, zinc, aluminum, silicon, potassium and others which are essential minerals for the maintenance of a healthy body. The presence of zinc, aluminum and magnesium also helps in the ulcer healing process.^[43-45] These drugs display gastro-protective activity against different ulcer-inducing agents, as well as it has the ability to decrease gastric secretion.^[46]

1. *Shankha Bhasma* acts like an antacid. Its acid neutralizing capacity, speed of antacid action and prolonged buffering action were excellent.^[47] *Shankha Bhasma* causes a noteworthy decrease in ulcer index in both the indomethacin and cold resistant stress models for studying peptic ulcer disease. Thiobarbituric acid reacting substances (TBARS) of stomach in the indomethacin treated rats were also reduced by *Shankha Bhasma*, but serum calcium level was not altered.^[48]
2. Study revealed that *Mukta Bhasma* rendered dose dependent protection produced significant protection in cold restraint stress induced gastric ulcer and diclofenac induced ulcer in low doses of therapeutic range when compared with control. Thiobarbituric acid reacting substances of stomach in ulcer induced rats were also reduced by *Mukta Bhasma*.^[49] In other study *Mukta Bhasma* also possesses variable reduction in free and total acidity, peptic acidity and acid output in pyloric ligated rat model.^[50]
3. Ingredients of *Kamadudha Rasa* (*Mukta Bhasma*, *Pravala Bhasma*, *Shukti Bhasma*, *Kapardika Bhasma*, *Shankha Bhasma*, *Shuddha Gairika*, *Guduchi Sattva*) are individually useful in peptic ulcer.^[51]

4. Kirtikumar *et al.*, performed a comparative clinical study between *Jala Shukti Bhasma* and *Mukta Shukti Bhasma* with reference to *Amla Pitta*.^{[52], [53]}
5. The study conducted to assess the effectiveness of *Pravalapanchamrita* (formulation containing *Mukta Bhasma*, *Shankha Bhasma*, *Shukti Bhasma*, *Varatika Bhasma* and *Pravala Bhasma*) in patients of *Amla Pitta* and conclude that it is a highly effective medicine.^[54]
6. Evaluation of the effect of *Shukti Bhasma* against *Amla Pitta* to observe its clinical efficacy.^[55]
7. Ten new derivatives of amberin, isolated from *Agnijara*, which was prepared by chemical transformation, exhibit cytotoxic activity against human liver carcinoma, colon adenocarcinoma, lung carcinoma and human breast carcinoma cell lines. The anti-inflammatory activities in term of the inhibition of human neutrophil function were also evaluated for emberine.^[56]

CONCLUSION

In the present era, various types of modern drugs are used to treat gastrointestinal disorder such as proton pump inhibitor, H₂ blocker etc., but the most important lacunas in them are their side effects. In *Ayurveda*, *Sudha Varga Darvya* is widely used for the treatment of gastrointestinal disorder in common practice. It is expected that it would be beneficial for society to eradicate this problem and their further use would also be expected. The advanced research may discover its exact mechanism. In context to the present review, it can be concluded that the ingredients of *Sudha Varga Darvya* can be regarded as the contributing factors in the treatment of peptic ulcer, gastric ulcer, IBS etc. It is worthy of exploring the opportunity of employing the therapeutic advantages of *Sudha Varga Darvya*.

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