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A CRITICAL APPRAISAL OF SUDHA VARGA IN THE CONTEXT OF AYURVEDA

Divya Dwivedi[1]* and Ashutosh Shukla[2]

[1]Assistant Professor, Dept. of Rasashastra & Bhaishajya Kalpana, L.N. Ayurveda College & Hospital Bhopal M.P. India.

[2]Associate Professor, Dept. of Shalyatantra, L.N. Ayurveda College & Hospital Bhopal M.P. India.

***Corresponding Author: Dr. Divya Dwivedi**

Assistant Professor, Dept. of Rasashastra & Bhaishajya Kalpana, L.N. Ayurveda College & Hospital Bhopal M.P. India.

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ABSTRACT

Rasashastra is a branch of Ayurveda pharmaceutics where drugs of varied origin like metals, minerals, marine drugs are employed in therapeutics. There is such a unique category of calcium rich or Sudha Vargiya Bhasma which has enormous collection of different calcium sources. These are mentioned in Rasa text like Rasa Tarangini, Rasamruta etc. Calcium is one of the major constituents of our body formation. It is the most abundant mineral in the human body, out of which 99% deposits occur in bone and teeth, while 1% share of calcium is present in blood and muscles of the body. For the first time all calcium compounds were exclusively categorized in a single group based on their chemical composition as "sudha vijnaneeyam" by rasamritam the text of 20th century. Though introduced by recent authors, sudha varga dravyas (calcium compounds) have gained therapeutic importance in clinical practise. This article attempts to screen Rasashastra classics for references emphasizing the "Therapeutic potentials of sudha varga dravyas vis-à-vis calcium compounds" and related alchemical aspects of these drugs. 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.

KEYWORDS: Sudha Varga, Calsium compound, Rasashastra, Brahatrayi.

INTRODUCTION

Rasashastra includes various drugs of metals and mineral origin along with details of their varieties, characteristics, processing techniques, properties, therapeutic values, precise dose, probable adverse effects, their management and various alchemical procedures in a comprehensive way. The word Sudha varga was first introduced by acharya Yadavji trikamji in his book rasamritha. Charaka acharya has considered sudha as Parthiva dravya. Acharya Susrutha has used Sudha to prepare Prathisaraniya kshara in Susrutha samhitha. Rasarnava and rasarathnakara has entittled this varga as Shukla varga. calcium containing drugs). In Charaka and Sushruta samhita, sudha has been included under parthiva dravyas.[1,2] Both, rasaratnakara and rasarnavakara have enumerated in shweta / shukla varga.[3,4] The name calcium is derived from latin word calx meaning lime or limestone in which it is found. Calcium ranks the fifth in the order of abundance of elements in earth's crust, the percentage being estimated as 4.2%. It is a soft, silvery-white crystalline metallic element. It readily reacts with both oxygen and water.[5]

Sudha nirukthi

The literal meaning of the word "sudha" is ambrosia, nectar, honey of flowers, comfort, water, milk, good drink, beverage of god's etc.[6]

Antiquity of sudha varga

In charaka samhita and susruta samhita (Classical texts of Ayurveda), sudha (Lime) has been included under "parthiva dravyas". Both rasaratnakara and rasarnava have enumerated in shukla varga.[7] Rasamritam has included these drugs under "sudha vijnaneeyam" based on chemical composition.[8]

Classification of sudha varga

Table 1: Sudha Varga Dravya according to different authors.

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

Table 2: Description of sudha varga dravya:

S. No.	Name	Common name	Origin	Chemical constituents	Form
1.	Sudha	Lime	Mineral	CaO	Oxide
2.	Khatika	Chalk	Minera	CaCO3	Carbonate
3.	Godanti	Gypsum	Mineral	CaSO4 2H2O	Sulphate
4.	Sankha	Conch shell	Marine	CaCO3	Carbonate
5.	Kshudrasanka (Sambuka	Australian snail	Marine	CaCO3	Carbonate
6.	Mukta sukti	Pearl oyster shell	Marine	CaCO3	Carbonate
7.	Varatika	Cowry shell	Marine	CaCO3	Carbonate
8.	Kurmaprista	Turtle shell	Marine	Calcite	Phosphate
9.	Surmasapheda	Cuttle fish bone	Marine	CaCO3	Carbonate
10.	Pravala	Coral	Marine	CaCO3	Carbonate
11.	Mukta	Pearl	Marine	CaCO3	Carbonate
12.	Mrigasringa	Deer's antlers	Animal	Ca3(PO4)2	Phosphate
13.	Kukkutandatwaka	Hen's egg shell	Animal	CaCO3	Carbonate
14.	Ajasthi	Goat's bone	Animal	Calcium, Phosphorus etc	Phosphate

Sudha (Lime)

Description about Sudha is available in samhitha period. Charaka has considered Sudha as Parthiva dravya. Acharya Susrutha has used Sudha to prepare Pratisaraniya kshara. Sri Sadananda Sharma has described process to prepare Churnodaka. Lime is obtained by heating limestone in strong heat.

Synonyms – Churna, Churnaka, Sudha, Saudavilepanam, Shilaksharam.

Churnodaka preparation: Five Tola of water should be added to 2 Ratti of lime in a bowl and left for 12 hours. Later filter the fluid through filter paper. Keep in a coloured bottle and cork it.

Karma -Krimighna, Vishaghna

Dose of churnodaka- 30 to 60 drops in 1year child 2 Tola (24gm) in adults Anupana – Jala **Therapeutic uses-** Krimi Athisara, Amlapitta, Shula, Grahani, Mukhapaka, Kshata.

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 which is clinically proved. Useful in hyperacidity, dyspepsia and gastro-esophageal reflux.

Khatika (Pipe clay)

Bhavaprakasha and Ayurveda prakasha has included Khatika in Uparasa. Chalk is found in the form of marble, limestone calcite or islandspar. It is is soft fine grained limestone formed as mud on ancient sea. It

differs from pure, fine grained lime stone as it is soft and did not change into hard rock.
Synonyms- Khatika, Khatini, Khati, Lekhana-mrttika, Kathini, Kathinika, Varnika, Varna-lekhika. Types- Khatika – contains impurities Goura khatika- white in colour, heavy in weight, useful for medicinal purpose.
Shodhana- Take the powdered Khatika in a bowl and add water. After mixing leave the bowl settle Khatika, later decant the water and make the residue dry and use
Pharmacological properties- Rasa- Madhura tikta Guna- Sita Virya – Sita Karma- Grahi, Dahahara, Netrya, Lekhana Dosagnata- Kaphagna, Pittaprasamana Anupana- Sita jala, Madhura jala, Ssarkara **Dose-** 1Masha (1gm)
Therapeutic uses- Daha, Raktadosa, Netryaroga, Vishanashaka, Shotha, Raktapitta, Vrana, Harita varna atisara.
Formulations- Khatikadipeya, Mugdha rasa, Khatikadi choorna, Dasanasamskara choorna.

Godanti (Gypsum)
Gypsum is a very soft mineral comppsed of calcium sulphate dihydrate. Description about Godanti is not available in ayuverdic classic till 20th centuary. It was first mentioned int the book rasatarangini. Acharya Yadavji Trikamji has also mentioned about Godanti in rasamrita. It is found during low tides in ocean and also found as a mineral in mines.
Synonyms- Godantika, Godanta
Types- Kanarupa, Talakruti, Pindakruti, Kausheyakruti
Grahyaargyata- A good quality Godanti is having multiple thin layers, smooth, whitish, and clean as moon and shiny.
Shodhana- Swedana with Nimbu swarasa and Dronipushpi swarasa for one and half hours.
Marana- Shudha godanti is rubbed with Kumari swarasa and subjected to Puta.
Pharmacological properties: Virya- Sita Karma- Deepana, Balya
Dose – 1-3 ratti(125 to 325mg)
Anupana- Madhu, Godugdha, Grita, Tulsi swaras, Sita
Therapeautic uses- Agnimada, Pitta jwara, Jirna jwara, Swasa kasa, Sweta pradara, Pandu, Uraskshatavataroga, Balroga, Shirasoola Fornulations-Kasisa godanti basma, Kalagni bairava rasa, Shanka dravaka rasa, Muktadivati, Shudha shataka yoga, Balapanchabadra rasa, Trailokyachintamani rasa.

Samudraphena
English: Cuttle fish bone
Paryayas: Phena,
Phenaka discription: The cuttle fish bone has an internal shell called as cuttle bone. The broad cuttle bone is spongy and chalky. It is fed to Parrots because of its lime food value. This cuttle fish lives in deep water but some times found near sea shore. Cuttle bone is used to make tooth paste. When the cuttle fish dies, all the organs will disintegrate and the cuttle bone (Samudraphena) will float on the surface of sea and is collected. Cuttle bone has some fine but rough quality hence it is used to clean the surface of glass and mirror without leaving scatches on them. Since this found in the sea and looks froathy mass it is named as Samudraphena.
Shodhana: According to RT, it is scrapped and kept in khalva and mardana is done with nimbu swarasa and dried.
Dose: 2 ratti Guna karma: Used externally in Vrana. It is lekhana, Deepana and Pachana. It is good for Netra and twacha.
Prayoga: a) Samudraphena is mixed with Mriddarashringa and honey. It is applied over Vrana. b) Samudraphena is roasted and put into ears to mitigate discharge in otitis.

Shukti (Oyster)
The word oyster is used as a common name for a number of distinct groups of distinct group of bivalve molluscs which live in marine or brackish habitats. The valves are classified. Oysters are excellent sources of zinc, iron, calcium, selenium, as well as vitamin A, and vitaminB12. Oysters are low in food energy. Traditionally oysters were considered to be an aphrodiasic. They are rich in aminoacids that trigger increased level of sex hormones.
Synonyms- Shukti- Shuktika, Muktamata, Muktagraha, Mahashukti, Mouktika mandira Jala shukti- Varishukti, Krimibhu, Khudrashukti, Sambuka, Jaladimba, Putika, Toyashukti.

Types
Mukta shukti -that which forms the pearl Jala shukti- that which does not form pearl in it.
Shodhana
Shukti will be subjected for Swedana in amladravya or Jayanthi swarasa in Dola yantra for 3 hours.
Marana
The purified Mukta shukti is made into powder form and Chakrikas are made and dried by giving Bhavana with Gritha kumari swarasa after that Gaja puta is given. After two Gajaputa fine Bhasma will be prepared.
Pharmacological properties mukta shukti- Madhura rasa, Snigdha guna, Dipana, Ruchikara Jalashukti- Katu rasa, Snigdha guna, Dipana, Balya, Ruchikara Vishahara, Gulmahara, Sulahara
Dose- 2 Ratti
Anupana- Madhu, Gritha, Godugda, Nimbuswarasa.
Therapeutic uses- Mukta shukti- Sula, Hritroga, Swasa, Mutrasharkara, Pliharoga, Udararoga Jala shukti- Sula, Gulma, Vishadosa Formulation- Grahani sardula rasa, Prava panchamritha rasa, Maha gandhaka, Ashtamritha bhasma, Visamajwarantaka loha, Muktapanchamritha rasa, Sarweshwara rasa.

Shankha
English: Conch shell
Paryayas: Deerga nada, Trirekha Scientific name:
Strombus gigas / Queen conch discription: Conch is a large sea snail with heavy spiral shell. This is available in deep sea. A good variety of Shankha will be round, smooth, with small opening, bright, long and heavy.

Varities: a) Vaamavarta – Latero spiralled with opening to left side. It is very common. b) Dakshinavarta – Dextro spiralled with opening to right side. It is used for worship.
Shodhana: According to RT, Shankha is subjected to swedana in nimbu swarasa or Jayanti rasa or kanji for 3 hours.
Marana: According to RT, Shuddha Shankha is pounded well and kept in sharava, sandhibandana is done and subjected to gaja puta. Guna karma: Sheeta, indicated in Amlapitta, Agnimandya, Grahani, etc.
Dose: 1-2 ratti
Prayoga: a) Shankha bhasma along with nimbu rasa in Atisara. b) Shankha bhasma along with Trikatu in Agnimandya. c) Shankha bhasma along with Haridra in Vomitting

Sambuka(Pila)
This is also the shell of a mollusc living in water (Pila ampullaceae). The external shell psrt is generally burnt and made in to calcium. It is found in river, lake, and sea.
Synonyms- Kshudra sankha, Shankanaka, Sambhuka, Swalpa Shanka, Ksullaka, Nakha shanka **Shodhana-** Shambuka tied in to polutice which is suspended in any sour liquid in a dolayantra and subjected to Swedana for one and half hours. On cooling down the shells are taken out and washed with warm water.
Marana- piesces of Kshudra shanka Are placed in the pulp of Ghrtakumari, enclosed in Sarava samputa and subjected for one Gajaputa. White colored Bhasma will be obtained.
Pharmacological properties: Sita, Tikshna guna, Sita virya, Karma- Grahi, Dipana, Pacana.
Dose- 2 Ratti (200mg)
Anupana – Nimbu swarasa, Ushnodaka, Madhu, Gritha, Tulasi swarasa.
Therapeutic uses- Netraroga, Sphota, Sitajvara, Grahani, Raktatisara, Udarasoola.

Mrigashringa
English: Horn of Deer / Antler
Discription: Mrigashringa which is not been eaten by insects, heavy in weight, branched and strong should be taken for use.
Shodhana: It is cleaned with mild acidic solution
Marana: According to RT, Shuddha Mrigashringa is made into small pieces, powdered, mardana is done with arka ksheera, kept in sharava and subjected to gaja puta.
Guna karma: Kapha hara, indicated in Hrudroga, Asthma, Kasa etc.
Prayoga: Mrigashringa is rubbed on hard surface along with water to obtain kalka. This is applied on the painful joints to relieve pain.
Dose: 1-2 ratti

Varatika (Cowrie)
Cowrie is a group of small to large sea snails, marine, gastropod molluscs. It is whitish to yellow in colour. The knowledge about the therapeutic utility of these marine shell can be traced since the period of charaka samhitha. Since this drug is useful in Parada jarana it has been included in Sadharana rasa group. Chemically it is calcium carbonate.
Synonyms- Varataka, Varata, Varati, Kapardaka, Kaparda, Kapardi, Kapardika, Balakridanaka, Chara, Charachara.

Shodhana
Varatika can be purified by subjecting it to Swedana in Kanji or Jambira swarasa, Kulatta kashaya or Amladrava or Nimbukamla for 3 hours.
Marana- Shudha varatika subjected to 1 Gajaputa and triturate after self cooling form Varatika bhasma. Kapardika bhasma- Sharadinduniba, smooth, soft, does not irritate tongue.
Pharmacological properties -Katu rasa, Usna virya, Vatakaphahara.
Karma- Dipana, Vrishya, Rasendra jarana Anupana- honey, water Dose- 2 Ratti (250mg) Therapeutic uses- Agnimadhya, Grahani, Netraroga, Karnasrava, Kshaya, Sphota, Udarasoola Formulations- Lokanatha rasa, Ratnagarba pottali pravala panchamritha rasa, Pradarantaka lauh, Grahani kapata rasa, Lavangati vati hemagarbapottali.

Kukkutanda twak
English: Egg shell
Paryayas: Dakshanda twak
Discription: Egg shell varies in size, shape and color. They are commonly white, oblong in shape with tapering blunt ends. Shells are composed of calcium carbonate.
Shodhana: It is soaked in saline water for 3-6 hours.
Marana: Shuddha kukkutanda twak is powdered, mardana is done with kumari swarasa, kept in sharava, sandhibandana is done and subjected to gaja puta.
Dose: 1-3 ratti
Guna karma: Indicated in Hrudroga, Urinary disorder, Shweta pradara, Rakta pradara.

Kurmaprishta
Paryayas
Kurmasti, Kurmakavacham Discription: It is the hard Dorsal part of Tortoise, after death it is collected.
Shodhana: It is kept immersed in hot water and buttermilk.
Marana: Shuddha kurmaprishta is made into powder and bhavana is given with kumari swarasa, chakrikas prepared and kept in sharava, sandhibandana is done and subjected to puta.
Guna karma: Indicated in Atisara, Grahani, Amlapitta etc.
Aja asti: Goats bone
Discription: Ajasti contains calcium, phosporus etc. It is washed with saline water and used to prepare bhasma. It is indicated in Atisara, Grahani, Amlapitta etc.

Hasti danta
English: Elephants Tusk / Ivory
Paryayas: Gajadanta, Kharidanta Discription: Hasti Danta is very hard. It is pounded, powdered and is burnt

with the help of iron pan till it turns black and fumes completely stops, this is Hasti danta masi. This is used externaly on Indralupta. It is also used along with any oil or Rasanjana on Indralupta.

CONCLUSION

Sudha is the first and most common drug of sudha varga dravya having calcium in more ratio. It is used for both pharmaceutical and therapeutic purpose to imbibe its properties in the drug. The compounds of calcium derivates are grouped under Sudha Varga. They are the most efficient source of calcium in the body. Calcium is one of the abundant minerals required by the human body for its growth and repairmen. Sudha varga dravya contain calcium compounds chiefly calcium carbonate, calcium oxide and calcium silicate. Calcium is a mineral often associated with healthy bones and teeth although it play an important role in blood clotting, helps muscle to contract and regulating normal heart rythms and nerve functions. Sudha varga has also results on many gastrointestinal diseases like Ajeerna, Amlapitta etc.

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