“QUINTESSENCE OF SILICON COMPOUNDS IN AYURVEDA- SIKATA VARGA”

ABSTRACT

Introduction:

Sikata varga includes Sikata, Dugdha pashana, Kausheyashma, Naga pashana, Badarashma.

Table-1: Enumeration of Sikata varga dravyas

<table>
<thead>
<tr>
<th>Name</th>
<th>Common name</th>
<th>Origin</th>
<th>Chemical constituent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sikata</td>
<td>Sand</td>
<td>Earth material</td>
<td>SiO2</td>
</tr>
<tr>
<td>Dugdha pashana</td>
<td>Talc</td>
<td>Mineral</td>
<td>H4Mg[SiO4]2, or Mg(SiO3)(OH)</td>
</tr>
<tr>
<td>Kausheyashma</td>
<td>Asbestos</td>
<td>Alkaline-earth mineral</td>
<td>MgSi2O5(OH)</td>
</tr>
<tr>
<td>Nagapashana</td>
<td>Serpentine</td>
<td>Mineral</td>
<td>(Mg,Fe)Si2O5(OH)</td>
</tr>
<tr>
<td>Badarashma</td>
<td>Rock fossil</td>
<td>Mineral</td>
<td>Si2CaO4</td>
</tr>
<tr>
<td>Trunakantamani</td>
<td>Amber</td>
<td>Resinous exudate</td>
<td>C17H12O7</td>
</tr>
</tbody>
</table>

Antiquity:

In Purana Kala, texts like “Shathapatha brahmaana of Prajapathi”, states the “transformation of sand (Sikata) to gold (Hiranya), which infers the existence of the concept of conversion of metals (Loha veda), since Vedic period.

Sikata → Sharkara → Ashma → Ayas → Hiranya

The scattered references of Sikata, Kachaare present in classical texts like Ananda kanda, Ayurveda Prakasha and Rasendrapuranam. “Sikata varga” was mentioned for the first time in the text Rasamritam. This classification was done based on chemical composition as “silicon compounds”.

Sikata: It is commonly known as Valuka/Baluka. It is used in valuka yantra and also in Kuppakpava as a media. Silicon stones, when taken through the streams of rivers convert into white sand particles on breaking and that are known as Baluka. White sand particles are pure whereas yellow and red colour is due to the sand derived from volcanic basalts and obsidian. Chlorite-glaucite bearing sands are typically green in colour, as are sands derived from basalt (lava) with high olivine content. Glauconite bearing sands are typically green in colour, as are sands derived from volcanic basalts and obsidian.

Synonyms: Sikata, Sikta, Baluka, Baloo, Retha, Rethi, Rethaja, Reqa, Beloo, Ramala, Sainda, Sharkara, Pravaha janitha, Paneeya churnaka, Sukshma.

Vernacular names:

<table>
<thead>
<tr>
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<th>Pharsi</th>
<th>Marathi</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sikata, Baluka</td>
<td>Sand</td>
<td>Silica</td>
<td>Balu, Reta</td>
<td>Ramala</td>
<td>Rega</td>
<td>Reti, Balu</td>
</tr>
</tbody>
</table>

Types, grahya lakshanas, shodhana and marana of Sikata are not mentioned

Properties: Sweet in taste (madhura), cold (sheeta), useful in burning sensation of skin (santha nasha), regulates Vata (sakha shritya anilapaha), scratching of debris of wounds (lekhan, vranagna).

Utility: Sikata is used as an Upakarana in Rasashala. It is used as a medium in Valuka yantra, Valuka puta and Bhudhara puta. In mixture of sand and loha (metals/iron), loha can be separated from sand using magnet before further processing. Sikatavalehya is prepared with white sand in 1 Prasrita (96 gm) quantity. Other ingredients like oil, ghee, honey, vasu and maja are to be taken in equal quantity along with Gruha dhuma (soot) and Triphala leha in equal quantity. All these ingredients are to be mixed well till the consistency of aaleha is obtained. Sikatavalehya is indicated in haemoptysis (rakta sthivana), bronchiectasis (urakshata) at a dose of 3-6 grams with milk as adjuvant. Scattered references of Krishna mrittikas are also found.

Sand is a naturally occurring granular material composed of finely divided rock and mineral particles. The larger size class above sand is gravel. Sand particles range in diameter from 0.0625 (or 62.5 micrometers) to 2 mm. An individual particle in this range size is termed a sand grain. The next smaller size class in geology is silt. Sand feels gritty when rubbed between the fingers (silt, by comparison, feels like flour). Sand is commonly divided into five sub-categories based on size: very fine sand (1/16 - 1/8 mm), fine sand (1/8 mm - 1/4 mm), medium sand (1/4 mm - 1/2 mm), coarse sand (1/2 mm - 1 mm), and very coarse sand (1 mm - 2 mm). The most common constituent of sand is silica (silicon dioxide, SiO2), usually in the form of quartz, which, because of its chemical inertness and considerable hardness, is resistant to weathering. Some sands contain magnetite, chlorite, glauconite or gypsum. Sands rich in magnetite are dark to black in colour, as are sands derived from volcanic basalts and obsidian. Chlorite-glaucite bearing sands are typically green in colour, as are sands derived from basalt (lava) with high olivine content.

Dugdha pashana: Dugdha pashana was described by the authors of 20th century in texts Rasa Tarangini, Rasendra Sambhava and Rasamritam.

Synonyms: Dugdha pashana, Dugdha pashana, Dugdha, Dugdha Shila, Ksheera kshava, Vajrabha, Deeptika, Soudha, Gomedha Sannibha, Dugdhopala, Dugdhi Drusha, Dugdhi
Purification process of Kausheyashma was not mentioned also a compound of magnesium silicate. In South India it is used for hence may be used for protection from fire, in form of cloths. It is

Properties:

- Telugu: Ratinara
- Hindi: Resmi patthar
- English: Asbestos
- Vernacular names:
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  - Hindi: Resmi patthar
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  - Vernacular names:

Properties and utility:

- Danta manjan is prepare with Kousheyashma as ingredient, indicated in teeth and gum problems (danta rogas, danta shishya, danta puya). It is also used in Raktodgaram, Puyogaram, pyorrhoea, Prameha and Pradara rogas. It increases beauty and strength of body. It cures fever, asthma, cough, pain in chest region. It is sheeta veerya, rakta pitta nashaka andrakta shambaka. Internal administration is done at a dose of 4-12 grains in a day; 2-4 ratti (250-500mg) with milk and water as adjuvant.

Magnesium silicate is a lightweight, very ductile, malleable, silver-white, metallic element with atomic number 12 and relative atomic mass 24.305. It is one of the alkaline-earth metals and the lightest of the commonly used metals. Magnesium silicate, carbonate, and chloride are widely distributed in nature. It is a necessary trace element in the human diet, and green plants cannot grow without it since it is an essential constituent of the photosynthetic pigment chlorophyll (C$_{6}$H$_{12}$MgN$_{2}$O$_{6}$). Asbestos is a naturally occurring silicate mineral with long, thin fibrous crystals. Asbestos is known to have toxicity. Inhalation of toxic asbestos fibres can cause serious illnesses, including malignant mesothelioma, lung cancer and asbestosis.

Nagapashana is a compound of Magnesium silicate.

Synonyms: Nagapashana, Nagashma

Vernacular names:

- Sanskrit: Nagapashana, Nagashma
- English: Serpentine, Ophite
- Pharsi: Jahara mohar
- Arabi: Phada jahar madani
- Telugu: Salagrama silica

Properties and utility:

- It is Harita, Peeta and Swethabhi yukta varna, smooth and light stone having yellowish or greenish white colour. It is available in china, Tibbet, Laddak, Gadhawal and Nepal mountains. It acts as Yakruth vyadhikara, Medhya, Hrudhya, varna, smooth and light stone having yellowish or greenish white colour. It is available in china, Tibbet, Laddak, Gadhawal and Nepal mountains. It acts as Yakruth vyadhikara, Medhya, Hrudhya, v

Pishti: Pieces of Kaushayashma are to be triturated with rose water, for 3-4 days so that a soft paste consistency is obtained.

Incineration: Kaushayashma is to be triturated with aloe pulp and kept in mud plate and subjected to Gaja Puta. 4-8 such putas are required to obtain white colour Bhasma. It’s Purification, incineration and pishti are similar to that of Mukta (pearl).

Properties and utility:

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Serpentine (Mg,Fe)$_{2}$Si$_{2}$O$_{5}$(OH)$_{2}$, Magnesium iron silicate hydroxide. Serpentine is a major rock forming mineral and is found as a constituent in many metamorphic and weathered igneous rocks. It often colours many of these rocks to a green colour. Serpentines’s structure is composed of layers of silicate tetrahedrons linked into sheets. Between the silicate layers are layers of Mg(OH)$_{2}$. These Mg(OH)$_{2}$ layers are found in the mineral brucite and are called brucite layers. It is olive green, yellow or golden, brown, or black. Greasy, waxy or silky, crystals are translucent and masses are opaque, hardness is 3 - 4.5 with specific gravity 2.2 - 2.6.

Badarashma: Its shape resembles the Jujube fruit, hence the named so. The stone is tapering on both ends, grey in colour, with lines on surface. It is tasteless and odourless. From inside, the colour of the stone is greenish-white. Chemically it is composed of lime and grit.

Synonyms: Ashmabhid, Badrashma, Badaripashana, Pashana badara.
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</tbody>
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Properties and utility: This is a resinous exudate substance from rocks, solidified into reddish semitranslucent and semitransparent stones, it is used as a minor gem stone. It is commonly used by Unani physicians.

In the classics of Rasa Shastra, the scattered references of Sikata varga can be found in the context of Lohaveda. The classification of Sikata varga was done in Rasamritam of 20th century on the basis of their chemical composition i.e. silica compounds. As far as in the Dehaveda concept, Sikata varga though has medicinal value its clinical applicability is less. Sikata plays a needful role in the conventional methods of processing the drugs like in Kupipakwa.

Trunakantamani is listed in uparatnas (semiprecious stone) by few authors and few others consider under Sikata varga, though is not silicon compound. Hence it may be included in uparatnas than in Sikata Varga.

Conclusion:

In the context of Lohaveda, the scattered references of Sikata varga can be found in the context of Lohaveda. The classification of Sikata varga was done in Rasamritam of 20th century on the basis of their chemical composition i.e. silica compounds. As far as in the Dehaveda concept, Sikata varga though has medicinal value its clinical applicability is less. Sikata plays a needful role in the conventional methods of processing the drugs like in Kupipakwa.

References:
1. Trikamji Yadavji Acharya, Rasamritam, Trans Dr. Joshi Damodar; First Edition 1998; Chaukamba Sanskrit Bhavan, Varanasi; 315-PP.