



## MAHARASA – IT'S CONTROVERSIES WSR TO GRAHYA LAKSHANA

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### ABSTRACT :

Uncertainty in Ayurveda is reflected in the interpretation of names and description of drugs found in the ancient treatises like *Charaka Samhita*, *Susrutha Samhita*, etc. Ayurvedic treatises were also handwritten before the establishment of British rule, by a handful of dedicated workers who believed that Ayurveda is built by the rationale of observation, experiment, induction and deduction. Due to lack of scientific names in the original texts, under one name, different plants are known in different parts of the country as per the description, which makes the drug controversial. These controversies lead to decline in the quality and standards of the ayurvedic compound preparations. *Maharasa* group of drugs explained in the various *Rasashastra* textbooks are said to be most nearer to *Parada* (Mercury). These are used in various *lohavedha* (Process of conversion of lower to higher metals) and *dehavedha* (therapeutical action) aspects. But the drugs which are mentioned as *Maharasa* in the treatises and the drugs available now in market shows higher controversies.

**Keywords :-** *Maharasa, Grahya lakshana, Controversy*

**INTRODUCTION:** *Sandhigdha dravya* is a term used for *dravyas* having controversial sources, which appears in the different ancient Indian literature. Knowledge of the science gained from ayurvedic and other Sanskrit literatures revealed various incidences where one common vernacular name is used for two or more entirely different plant species in traditional system of medicines. These controversies are also seen in the various drugs mentioned in *Rasashastra* that is the science of Alchemy. Controversies can be the difference of opinion among scholars regarding the identification, properties or actions of any drug. Controversies also refer to the dilemma or confusion of objective or subjective aspect of different school of thoughts in ayurvedic system of medicine<sup>1</sup>.

### CONTROVERSY???

1. Language - India is a country having variety of languages and a vast popu-

lation. The people in different parts of the country are dependent on different tribal and folklore medicine persisting in that region. The variation in the languages sometimes is responsible for confusion in the nomenclature of different herbal or mineral drugs having similar name or same drug having different names in different regions.

2. Synonyms - The descriptions of drugs in ancient literature are found in versus with the use of synonyms. Same synonym may be given to entirely different drugs. These synonyms have caused controversy in the identification of drugs.

3. Unavailability of Literatures - Many of the ancient classical texts has been lost in the flow of time by various foreign invasions, mishandling and lack of preservation.

4. Miss-interpretation of *shastra* - Interpretation of the classical textbooks differs from *acharya* to *acharya*, region to

region, one school of thought to other, etc. The same *sloka* will be explained in 2 different ways by 2 different commentators.

### Relevance in Rasashastra:

Rasashastra is the science of Alchemy mainly dealing with the metals and minerals as raw drugs along with the herbs. The science deals with *lohavedha* (conversion of lower to higher metals) and *dehavedha* (therapeutic action). There is a need to highlight or to identify the area of confusion or controversies in the field of Rasashastra, in order to come up with standard ayurvedic preparations. Understanding the controversies will help in the following aspects:-

- To remove misunderstanding
- To identify drug of better utilities
- To obtain from available sources

**MAHARASA:** The important substances useful in *Parada karma* (Mercurial processes) are categorized under *Maharasa*, which are said to be most nearer to *Parada* (Mercury). All of them are having

metallic contents (*satwas*) which are extracted for *Parada karma* (Mercurial Processes). *Acharyas* are having difference of opinion regarding the number & substances of *Maharasa* and even about the identification of each *dravya*. Drugs which are included in the *Maharasa* group of drugs are<sup>2</sup>

1. *Abhraka*
2. *Vaikranta*
3. *Makshika*
4. *Vimala*
5. *Shilajatu*
6. *Sasyaka*
7. *Chapala*
8. *Rasaka*

But, another reference given in *Rasaratna-samuchaya* mentions a different set of 8 drugs as *Maharasa* in the context of *Rasamandapa*. The drugs included are *Rasaka*, *Vimala*, *Tapya*(*Makshika*), *Chapala*, *Tutha*, *Anjana*, *Hingula* and *Sasyaka*.<sup>3</sup> But *acharyas* have explained the reference from 2<sup>nd</sup> chapter of *Rasaratna-samuchaya* as *Maharasa* group of drugs and are used in *Rasakarmas* (Mercurial processes) as well as therapeutics.

### Basis of Controversy

Controversies in *Maharasa* group of drugs can be explained under 3 categories.

Basis of Controversy	Drugs included
Source of origin	<i>Shilajatu</i>
Availability of drug in genuine form	<i>Makshika</i> , <i>Vaikranta</i> , <i>Rasaka</i> , <i>Sasyaka</i>
Identification	<i>Chapala</i> , <i>Vimala</i>

The controversies will be explained in accordance with the *grahya lakshanas* of the *dravya* and the features of the samples which are available now.

**Abhraka:** *Abhraka* is the first drug in the group of *Maharasa* and is used in various *lohavedha* (Process of conversion of lower to higher metals) as well as *dehavedha* (therapeutic) procedures. Controversies are very less in case of *Abhraka* and it is taken as Mica in modern era based on the

similar features as explained in the *grahya lakshanas* of *Abhraka*.

**Grahya lakshana:** The *grahya lakshanas* are *Snigdha* (smooth), *Prthudala* (with thick layers), *Guru* (heavy), *Sukhanirmochyapatra* (easily separable layers), etc. While explaining the types of *Abhraka* , *acharya* explains *Kirsna vajrabhraka* as the best variety and can be used in medicinal preparations.<sup>2</sup> *Krisna vajrabhraka* can be correlated with Biotite variety of Mica based on its *grahya lakshanas*.<sup>4</sup>

Sl.no	Types of Mica	Chemical formula	Chemical name	Type of Abhraka
1	Biotite	(H,K) <sub>2</sub> (Mg,Fe) <sub>2</sub> (Al,Fe) <sub>2</sub> (SiO <sub>4</sub> ) <sub>3</sub>	Black Mica or Magnesium Iron Mica	Krshna
2	Lepidolite	KLi[Al(OHF) <sub>2</sub> ]Al (SiO <sub>4</sub> ) <sub>3</sub>	Lithium or Ruby Mica	Pita
3	Muscovite	H <sub>2</sub> KAl <sub>3</sub> (SiO <sub>4</sub> ) <sub>3</sub>	White or Potash Mica	Sweta
4	Phlogopite	[HK(MgF)] <sub>3</sub> Mg <sub>3</sub> Al(SiO <sub>4</sub> ) <sub>3</sub>	Magnesium or Amber Mica	Rakta
5	Paragonite	H <sub>2</sub> NaAl <sub>3</sub> (SiO <sub>4</sub> ) <sub>3</sub>	White or Sodium Mica	Sweta

**Vaikranta:** Vaikranta is a highly controversial drug and the controversies are mainly pertaining to the genuinity of sample. Vaikranta is used as the substitute of Vajra (Diamond).<sup>5</sup> Rasaratnasamuchaya includes Vaikranta in Maharasa whereas Rasatarangini and Rasendrachudamani includes it under Uparatna group of drugs.<sup>2, 6, 7</sup>

**Grahya lakshana :** Grahya Vaikranta should have Astaras (8 borders), Astaphalaka (8 surfaces), Shatkona (6 angles), Masrina (smooth), Guru (heavy) and Sudhamisritha varna (clear white or mixed colours).<sup>8</sup>

#### Controversies regarding Vaikranta<sup>6, 9</sup>

- Another reference regarding “Billora Patthar” [a type of granite] having same swaroopa like 8 phalaka, 6 angles, varna etc. is available.
- Dattatreya Kulkarni & Vaman Ganesh Desai mentions Flourspar as Vaikranta.
- Yadavji Trikamji Acharya includes Tourmaline/ Flourspar as Vaikranta when mentioned as Uparatna and Manganese (Mn) as Vaikranta, when given as Maharasa.
- In Punjab, Sphatika is sold as Vaikranta.
- In present days in the name of Vaikranta –

1. Quartz (SiO<sub>4</sub>)
2. Feldspar (KAlSi<sub>3</sub>O<sub>8</sub>)

3. Fluorspar(CaF<sub>2</sub>)

4. Tourmaline

[(Na,Ca)(Mg,Li,Al,Fe<sup>2+</sup>)<sub>3</sub>Al<sub>6</sub>(BO<sub>3</sub>)<sub>3</sub>Si<sub>6</sub>O<sub>18</sub>(OH)<sub>4</sub>], are being used.

**Makshika:** Rasaratnasamuchaya mentions Makshika under Maharasa whereas Rasatarangini and Ayurveda Prakasha mentions under Upadhatu. Makshika is mentioned to be of 2 types – Swarnamakshika and Rajatamakshika. Makshika is correlated with the pyrites i.e, sulphide group of minerals. Swarnamakshika is correlated with Chalcopyrite and Rajatamakshika with Ironpyrite. Swarnamakshika is taken as the best variety of Makshika and used in therapeutics.<sup>2,10,11</sup>

#### Grahya lakshana of Swarnamakshika<sup>10:</sup>

Grahya Swarnamakshika lakshanas are Snigdha (smooth), Guru (heavy), Syamalakanthi (bluish black shineness), Swarna samana varna (similar colour to Swarna), Niskona (without angles), on rubbing over a paper gives swarna coloured lines and on rubbing in hands gives dark spots.

#### Controversies regarding Swarnamakshika

- All the grahya lakshanas of Swarnamakshika are not found in any of the samples.
- Chalcopyrite's are copper iron sulfides (CuFeS<sub>2</sub>). Hardness of 3.5 to 4 on the Mohs scale. Minor amounts of ele-

ments such as Silver (Ag), Gold (Au), Cadmium (Cd), Cobalt (Co), Nickel (Ni), Lead (Pb), Tin (Sn) and Zinc (Zn) can be measured (at part per million levels), likely substituting for Copper (Cu) and Iron (Fe). Selenium, Bismuth and Arsenic may substitute for Sulphur in minor amounts. The brassy-yellow metallic colour of this group of pyrite has in many cases lead to people mistaking it for Gold, hence the common nickname 'Fool's gold'.

- Presently in market, Chalcopyrite is used as it satisfies most of the *grahya lakshanas* given in the classics for *Swarnamakshika*.

**Vimala:** *Rasaratnasamuchaya* includes *Vimala* under *Maharasa* and *Rasatarangini* mentions it under *Upadhatu*. *Vimala* is mentioned from *Rasarnava* onwards, prior to that its explanation is not available. *Rasatarangini* mentions *Vimala* and *Rajatamakshika* as same.<sup>2,12</sup>

**Grahya Rajatamakshika<sup>12</sup>:** *Grahya Rajatamakshika lakshanas* are *Snigdha* (smooth), *Sakona* (with angles), *Guru* (heavy), *Vartula* (circular in shape) and *Rajatojvala* (shininess similar to Silver).

**Grahya Vimala<sup>13</sup> :** *Grahya Vimala lakshanas* are *Vartula* (circular in shape), *Konasamyuktha* (with angles), *Snigdha* (smooth) and *Phalakanvita* (with surfaces).

*Grahya lakshanas* of *Vimala* and *Rajatamakshika* are almost all same. So

*Rajatamakshika* is considered as *Vimala*. In *Ayurveda Prakasha*, *acharya* told ‘ *Vimala makshikabhedena* ‘ i.e, *Vimala* is a type of *Makshika*.<sup>11</sup> Thus questioning the existence of *Vimala* and including it under *Rajatamakshika*.

**Shilajatu:** *Rasaratnasamuchaya* includes *Shilajatu* under *Maharasa*, *Rasatarangini* includes under *Misraloha* and *Ayurveda Prakasha* under *Upadhatu*. The exact source of the origin of *Shilajatu* is still under controversy. *Shilajatu* is of 2 types namely *Gomootragandhi Shilajatu* and *Karpuragandhi Shilajatu*. The type used in therapeutics is *Gomootragandhi Shilajatu*.<sup>2,12,14</sup>

**Grahya lakshana<sup>15</sup>:** *Grahya Shilajatu lakshanas* are *Gomootragandhi* (it smells like *gomootra*), *Krisna* (black in colour), *Snigdha* (smooth), *Mrdu* (soft in touch), *Guru* (heavy), *rasa – Tiktha*, *Kasaya* and *Seeta veerya*.

**Controversies regarding Shilajatu:** According to *Charaka samhita*, mountain rocks, which are abundant in metallic elements like Gold, Silver, Copper and Iron are heated up in *greeshma rutu*, then the lac like exudate, which is soft like clay oozes out and gets dried up by sunrays and is collected as *Shilajatu*. Based on the metallic composition of the rock from which the *Shilajatu* is obtained, it can be of different types as given in the following table:-<sup>16</sup>

Sl no	Types of <i>Shilajatu</i>	Metallic composition of rocks	Colour
1	<i>Swarnadrija</i>	Gold	<i>Japakusuma varna</i>
2	<i>Rajatadrija</i>	Silver	<i>Pandu varna</i>
3	<i>Tamradrija</i>	Copper	<i>Neela varna</i>
4	<i>Lohadrija</i>	Iron	<i>Krisna varna</i>

Now a day's only, *loha Shilajatu* is available and it is having the similar colour as

mentioned in *grahya lakshana* of *Shilajatu*.

- Many researchers claim that *Shilajatu* exuding from the rocks of mountains is basically derived from vegetative source. References of *Susrutha Samhita* also maintain this point of view. According to *Susrutha Samhita*, in the months of *sukra -suchi* (May-June) the sap or juice of plants comes out as gummy exudation from the rocks of mountains due to strong heat of sun.<sup>17</sup>

- *Shilajatu* is the latex of *Asphaltum punjabinum* tree.

**There are several hypotheses regarding the origin of *Shilajatu*:<sup>18</sup>**

- Earlier work on *Shilajatu* showed that it is mainly composed of humus-the characteristic constituent of soils-together with other organic components.
- Some researchers opines that *Euphorbia royleana* Boiss . plants are responsible for origin of *Shilajatu*, because this plant has very rich latex.
- The chemical analysis of *Shilajatu* by researchers at Banaras Hindu University in India revealed that humification of some resin/latex bearing plants is the most likely source of *Shilajatu*.

- The recent discoveries suggest that the humification of resin-bearing plants was responsible for the major organic mass of *Shilajatu*. And chemical analysis showed that about 80% of the humus components are present in *Shilajatu*.

- Another recent research claims that the mosses like species of *Barbula*, *Fissidens*, *Minium*, *Thuidium* and species of Liverworts like *Asterella*, *Dumortiera*, *Marchantia*, *Pellia*(*Monosolenium tenerum*), *Plagiochasma* and *Stephenrencella-Anthoceros* were present in the vicinity of *Shilajatu* exuding rocks and these bryophytes are responsible for formation of *Shilajatu*. The bryophytes reveal occurrence of minerals and metals in their tissue such as Copper, Silver, Zinc, Iron, Lead etc, which are similar to the elements present in *Shilajatu*.

- The composition of *Shilajatu* is influenced by factors such as the plant-species involved, the geological nature of the rock, local temperature profiles, humidity and altitude.

**Controversies pertaining to *Karpura Shilajatu*<sup>19,20</sup>**

Sl.no	Reference	Controversial drug used as <i>Karpura Shilajatu</i>
1	<i>Rasaratnasamuchaya, Rasamrutam</i>	<i>Suryaksara</i> (Pottassium Nitrate – KNO <sub>3</sub> )
2	In South India (Sindhu region)	Gypsum or Calcium Sulphate or <i>Godanti</i> (CaSO <sub>4</sub> .2H <sub>2</sub> O)
3	In Nepal, Bihar,Bengal	Aluminium Sulphate{ Al <sub>2</sub> (SO <sub>4</sub> ) <sub>3</sub> }

In the present times, Black Bitumen is taken as *Gomootragandhi Shilajatu* and Potassium Nitrate as *Karpura Shilajatu*. *Shilajatu* is considered as Mineral bitumen. Bitumen is a sticky, black and highly viscous liquid or semi-solid form of petroleum. The *grahya lakshanas* explained in classics can be seen in Bitumen also.

**SASYAKA:** In case of *Sasyaka* , the controversy pertains to its nomenclature. While explaining *Maharasa* in 6<sup>th</sup> chapter of *Rasaratnasamuchaya*, *acharya* includes *Sasyaka* and *Tutha* in the group as 2 different drugs.<sup>3</sup> But now a days , these 2 are used as synonyms.

- *Maharasa* - *Rasaratnasamuchaya, Rasarnava, Rasapadhati*.<sup>2,21,22</sup>

- *Uparasa* - *Rasamanjari*, *Rasendra Sara Sangraha*.<sup>23,24</sup>
- *Upadhatu* (of *Tamra*) – *Rasajalanidhi*.<sup>25</sup>

### Controversies regarding *Sasyaka*

- *Sasyaka* - *Sasyaka* is the natural form, which is available in mines.<sup>26</sup> It is a sulphate ore of Copper (Bornite) and is having colour similar to *mayurakandha*.
- *Tutha* - *Tutha* is the artificially prepared variety of *Sasyaka*. Chemically it is Copper Sulphate and is blue in colour.
- Presently, *Sasyaka* and *Mayuratutha* are taken as synonyms. *Acharya* in *Rasaratnasamuchaya*, while explaining *shodana* of *Sasyaka* has given *swedana* procedure. Presently if we take Copper Sulphate as *Mayuratutha*, the whole material will dissolve in liquid taken for *swedana*.<sup>27</sup> It is very evident that *acharya* could never suggest a *swedana karma* for a totally soluble substance. It means *Sasyaka* used at that time was different from the present day Copper Sulphate. Thereby we can conclude that the *Sasyaka* mentioned in classical textbooks is an ore of Copper and *Tutha* is the artificially made variety.

**Chapala:** *Chapala* is that which melts like *Vanga*. It is obtained from mines of Lead and Tin.<sup>27</sup>

### Artificial manufacturing of *Chapala*<sup>28</sup>

1. *Nagasambhuta Chapala*

2. *Vangasambhuta Chapala*

*Naga* and *Vanga* after 1000 *puta* is mentioned as *Nagasambhuta Chapala* and *Vangasambhuta Chapala* respectively. This points to the less availability of *Chapala* in ancient times itself. 6 types by *Rasakamadhenu* – *Swarna*, *Tara*, *Tamra*, *Naga*, *Vanga*, *Teekshna*. Classification is due to the colour change or due to the presence of traces of the respective metals

in it. Due to controversy, this drug is not used now days.

### Controversies regarding *Chapala* :

- According to *Rasaratnasamuchaya*, it melts quickly like *Vanga*.<sup>27</sup>
- *Ayurveda Prakasha* mentions it as an *Upadhatu* and as an associate of *Makshika* (*Makshikabhuyudbhavo*)<sup>29</sup>
- Difficult to identify *Chapala* by its *grahya lakshanas*, as mentioned in classics i.e, *Shadasra* (6 surfaces), *Sphatikachaya* (resembles *Sphatika*), *Snigdha* (smooth), *Guru* (heavy), etc.<sup>27</sup>
- There are opinions, regarding *Chapala* as Bismuth or Selenium. When we compare properties of Bismuth / Selenium, the therapeutic action mentioned are entirely different to each other, but some of the properties of Bismuth / Selenium are related with properties explained for *Chapala*.

### *Chapala* and Bismuth

In *Bharatiya Rasashastra* written by Dr.V.G.Desai, the author mentions that *Chapala* can be taken as Bismuth. He explains it on the basis of the following features:-

- Appearance is similar to *Sphatika*, having 6 facets.
- Specific gravity of Bismuth is 9 and *Chapala* is said to be guru(heavy).
- Bismuth is available from Sulphur containing minerals.

But one of the property of *Chapala* is given that it melts like *Vanga*(232° C),but Bismuth melts at 271° C.

### *Chapala* and Selenium

*Acharya* Narendranath Misra has proved that properties of *Chapala* match with that of Selenium.

Selenium	Chapala
Looks like steel and shiny grey in colour	Sweta Chapala
Red variety of Selenium melts between 170°C -180°C	Aruna and Krishna Chapala
Pure Selenium melts at 217° C	Melts like Vanga (232° C)

**Rasaka:** *Rasaratnasamuchaya* mentions it under *Maharasa*, *Rasatarangini* mentions as *Upadhatu* and *Rasa Prakasha Sudhakara* mentions it as *satva* like Lead.<sup>2,30,31</sup>

### Controversies regarding Rasaka

- *Ayurveda Prakasha* mentions *Rasaka* as a type of *Tuttha*.<sup>32</sup>
- *Rasajalanidhi* as *upadhatu* of *Yashada*.<sup>33</sup>
- *Rasarnava* gives the synonyms *Tuttha* and *Reetikrut* for *Rasaka*.<sup>34</sup>
- According to *Rasakamadhenu*, it is the *kitta* of *Rajata*, *Swarna*.<sup>35</sup>
- According to Dr. Vaman Desai, *Mrttikabha Rasaka* is Calamine ( $ZnCO_3$ ), *Gudabha Rasaka* as Zincite ( $ZnO$ ) and *Pashanabha Rasaka* as Zinc Blende ( $ZnS$ ).<sup>36</sup>

Due to the above mentioned controversies, it is not used now a days.

**DISCUSSION:** Substantial efforts to standardize the Ayurvedic crude drugs as well as finished Ayurvedic medicines has become a subject of intensive research for various aspects. However, these initiatives would imperatively need establishing the correct identity of the raw drugs. The long history of safe usage of Ayurvedic medicines can be extrapolated only when the correct identity of the raw drugs used in those medicines is established and standardized. The classical references of *Rasashastra* available in different textbooks gives the *grahya lakshanas* of different *rasadravyas*. On the basis of these *grahya lakshanas*, *acharyas* try to specify the variety of the drug to be used

therapeutically among the different varieties available. This can also be taken as a criteria for determining the uniqueness of drugs. The best sample among the market samples should be selected on the basis of these criteria.

**CONCLUSION:** Proper identification of raw drugs is a must in case of any formulation used in Ayurveda. In case of *Rasashastra*, the proper identification of the raw drug is needed for its prescribed usage for both *lohavedha* (Process of conversion of lower to higher metals) and *dehavedha* (therapeutical action) as well as to avoid the harmful effects.

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