



### STANDARDIZATION OF *TRAILOKYASUNDAR RASA* WITH SPECIAL REFERENCE TO *RASARATNASAMUCHCHAYA*

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#### ABSTRACT

The imperishable fundamentals of *Ayurveda*, which were laid down by the great sages of the olden days are still applicable because of their eternal sustainability. These fundamentals need to be time tested through scientific research not only to prove the validity but also to update the existing knowledge. *Rasa Shastra*, with its blend of mystical and medical insights, is source of valuable knowledge. *Rasa aushadhis* are appreciated for their Quick efficacy even at small dosages, long durability etc. *Trailokyasundar rasa* is a *Rasakalpa* explained in *Rasaratnasamucchaya*. Little research has been done on this *Kalpa* and it is not commonly prescribed by the Ayurvedic practitioners and *Vaidyas*. Considering all the above factors, a step has been taken to develop standard operating procedures (SOP) for preparing *Trailokyasundar rasa*, in this study. This is an attempt towards standardizing the processes at every stage of preparation of *Trailokyasundar rasa* (so as to define the SMP) which is exclusively mentioned in *Rasaratnasamuchhaya Pandurogadhikara*. The final product has been analyzed on the basis of various parameters such as organoleptic characters, physico-chemical properties and XRF testing. The observations recorded through these techniques show that following the classically recommended directions for this *Kalpa*, results in the final product matching the desired standards.

**KEYWORDS:** *Rasa shastra*, *Trailokyasundar rasa*, Standardization.

#### INTRODUCTION

Science is the intellectual process for using all of the mental and physical resources available in order to understand, explain, quantitate and predict normal as well as unusual natural phenomena. *Ayurveda* as a science also follows this rule. The imperishable fundamentals of *Ayurveda*, which were laid down by the great sages of the olden days are still applicable because of their eternal sustainability. These fundamentals need to be subjected to scientific research so as to validate them and bring into practice.

*Rasa Shastra*, with its blend of mystical and medical insights, is source of precious knowledge. Medical alchemy and mercurial medicines have been widely accepted and utilized for over a thousand years on the Indian subcontinent. Available literature from all the ancient civilizations indicates that man has used metals in treating ailments since time immemorial. *Ayurvedic* literature is full of the use of metals in medicine. Not only *Ayurveda* and other Indian systems of medicine have mentioned the use of metals, but their use is also thoroughly described in Chinese and Egyptian civilizations in 2500 B.C. From 7th century onwards, it was the golden era of *Rasashastra* and Indian alchemy. *Rasa aushadhis* are appreciated for their smaller dosages, quicker effectiveness, long durability etc.

*Trailokyasundar rasa*<sup>1</sup> is a *Kalpa* which is explained in *Rasaratnasamucchaya*, the very basic *Grantha* of *Rasashastra*. Little research has been done on this *Kalpa* and also it is not commonly practiced by the *Vaidyas*.

Keeping all the above factors in view, a sincere attempt has been taken for standardization of preparation of *Trailokyasundar rasa* at various stages which is exclusively mentioned in *Rasaratnasamuchhaya Pandurogadhikara*<sup>1</sup>.

#### Material and Methods

**Material:** 1. *Shuddha Parada* (Hg), 2. *Shuddha Gandhak* (S), 3. *Lauha* (Fe) *bhasma*, 4. *Abhrak* (Mica) *bhasma*, 5. *Guduchi* (*Tinospora cordifolia*) *satva*, 6. *Varahikanda* (*Dioscorea bulbifera*) *churna*, 7. *Triphala* (*Terminalia chebula*, *Terminalia bellerica*, *Emblica officinalis*) *churna*, 8. *Shigrumool* (*Moringa oleifera*) *churna*, 9. *Bhringraja* (*Ecliptaalba*) *swarasa*.

#### Methods

The entire procedure of preparation as well as standardization has been conducted in the institutional pharmacy of the department of *Rasashastra* and *Bhaishajyakalpana* at Dr.G.D.Pol foundation's YMT Ayurvedic medical college.

#### *Parada shodhana* (Purification of mercury)<sup>2</sup>

##### Step I – with *Sudharaja* (Lime)

*Ashuddha Parada* (Hg) and *Sudha raja* (lime powder) were taken in a clean stone mortar. The mixture was triturated uniformly (*Mardana*) for 72hrs. After completion of trituration, *Shuddhaparada* was separated from this mixture by subjecting it to hot water treatment in plastic tray. Later, the mixture was filtered through a thick (two layered) cotton cloth. Collected *Parada* was washed with lukewarm water.

**Step II-** with *Saindhava* (Rock salt) and *Rasonkalka* (Paste of *Allium sativa*).<sup>3</sup>

*Sudharajashodhit Parada*, *Rasonkalka* and *Saindhav* were taken in the mortar and pestle and triturated (*Mardana*) for 10hrs. The colour changes during the procedure were observed and noted. The mixture obtained after *Mardana* was washed with lukewarm water (40°C) (2 X 3L) and *Shuddha parada* was obtained.

#### **Gandhak (S) Shodhana (Purification of Sulphur)<sup>4</sup>**

Cow milk was taken in a SS vessel and its mouth was covered with a white cotton cloth. Cow ghee was taken in an iron pan and was kept on a low flame to melt the ghee. On liquefaction, powdered *Ashudhagandhak* was added into it. After melting of *Gandhak*, it was immediately poured into the vessel containing cow milk through white cotton cloth. The white cotton cloth filtered the contents resulting in a blackish slush formation on its surface indicating the separation of impurities from *Gandhak (S)*. The purified cake of *Gandhak* was taken out from vessel and washed with lukewarm water. The *Gandhak* obtained after 1st purification was dried, weighed and powdered. The procedure was repeated thrice. *Shuddhagandhak* thus obtained was dried well and powdered.

#### **Preparation of Samagandhak kajjali<sup>5</sup>**

For preparation of *Samgandhakajjali*, *Parada* and *Gandhak* were mixed in equal proportion. The mixture was triturated slowly with uniform speed for 72 hrs to obtain *Kajjali* of desired standards.

#### **Preparation of Lauhabhasma<sup>7</sup>**

After *Shodhan* procedure<sup>6</sup>, *Shuddhalauha* i.e., purified iron was taken in to black stone mortar and pestle and it was further triturated with decoction of *Triphala*. This process was carried out up to 8hrs. After levigation, the whole mixture was spread on a fine plastic sheet and cut into square shaped pellets.

All the dried pellets were weighed and arranged in two layers in *Sharavayantra* (earthen pot). Another *Sharav* was kept on it in such a manner that the faces of both the *Sharava* accurately coincided each other. The joint was sealed with the help of wet *Multanimitti*. Further a fine layer of white cotton cloth dipped in semisolid *Multanimitti* was wrapped around the whole length of *Sharavsamput yantra* carefully. Well dried *Sharavsamput yantra* containing *Lauha* pellets was further subjected to incineration in *Gajputa*<sup>8</sup>. After 24 hrs of incineration and self-cooling, the *Sharavsamput yantra* was taken out of the pit with precaution.

The same procedures of levigation, pelletisation, *Sharavsamputikaran* and incineration were repeated for each *Gajput* and total 13 of such *Gajputas* were given to obtain the *Lauhabhasma* of desired standards. The *Siddhilakshnas* of *Lauhabhasma* were tested periodically, well observed and were noted.

#### **Abhrak shodhan<sup>9</sup> and Dhanyabhrak Nirman<sup>10</sup>**

After *Shodhan* procedure, obtained *Shuddha Abhrak* was processed with the help of *Kanji* (Sour gruel), jute bag and *Dhana*. *Dhanyabhrak* in the form of Lustrous black coloured coarse powder was obtained.

#### **Abhrakbhasmanirmana<sup>11</sup>**

The procedures of levigation by *Erandapatra* (*Ricinus communis*) *swarasa* and jaggery, followed by palletisation, *Sharavsamputikaran* and incineration were repeated for each *Gajput*. Total 16 *Gajputas* were given to obtain the *Nishchandra*, *Varitar* and brick red coloured *Abhrakbhasma*.

#### **Guduchisatvanirmana<sup>12</sup>**

Fresh *Guduchi* stem was collected from *Guduchi* (*Tinospora cordifolia*) specially grown on *Neem* (*Azadirachta indica*) tree. These were washed and cut. Chopped stem pieces were crushed completely in iron mortar pestle to make a slimy paste. This mass was further mixed with 4 times of potable water in stainless vessel and soaked overnight (12 hours). Next morning this mass was macerated manually in water for about 1 hour. Then the whole mixture was filtered slowly through a clean four folded cotton cloth. The filtered liquid was kept undisturbed for 6 hours for settlement. The supernatant was decanted carefully. Heavy sediment, settled at the bottom was collected carefully and shifted into a tray and air dried. *Guduchisatva* thus obtained was collected and stored in glass bottle.

#### **Triphalachurna<sup>13</sup>, Varahikand and Shigrumul churna nirman<sup>14</sup>**

All the collected dried parts of the plant were cleaned well. Then, each fruit of *Triphala* was broken with iron rod so as to remove its seed. After removal of seed the dried fruits were collected and subjected to *Churnikaran* process. The *Churna* was then filtered through 100 no. sieve. The same process was carried out to prepare *Churna* of *Varahikand* and *Shigrumul*.

#### **Bhringaraja Swarasnirman<sup>15</sup>**

Freshly collected entire plant of *Bhringaraja* (*Eclipta alba*) was chopped into fine pieces with asharp knife. Paste of *Bhringaraja* was prepared with the help mortar pestle of stone and minimum required amount of water. Then *Swarasa* was extracted from *Kalka* by filtering through double layered cotton cloth. Prepared *Swaras* was measured by measuring cylinder.

#### **Trailokyasundar rasa nirman<sup>16</sup>**

All the contents of *Trailokyasundar rasa*, except *Bhringarajaswarasa* were taken in a black pestle and *Bhringarajaswarasa* was added to it till the mixture was completely submerged in the *Swarasa*. The mixture was triturated properly for 6 days to complete three *Bhavanas*. The mixture was kept for drying at room temperature. The well dried *Trailokyasundar rasa* was collected and kept in air tight glass jar. Same procedure was carried for next 2 batches. Total 3 batches were prepared of the drug. Samples were taken from each batch for analytical study.

#### **Observations and Results**

The analytical testing has been carried out in the Central research laboratory at Dr. G. D. Pol foundation's YMT Ayurvedic medical college. XRF analysis was conducted at the Varsha bullion lab, Mumbai.

**Table 1: Physico-chemical analysis<sup>17</sup> of Trailokyasundar rasa**

Parameter	Batch I	Batch II	Batch III	Mean
pH	6.04	6.01	6.02	6.023
Loss on drying	12.6	13.1	12.4%	12.7
Total ash	35.543	35.398	35.794%	35.578
Acid insoluble ash	22.532	23.534	22.906%	22.990
Water insoluble ash	24.343	25.121	25.536%	25.000

**Table no. 2: Organoleptic study<sup>18</sup> of Trailokyasundar rasa**

Sr. no.	Properties	Batch I	Batch II	Batch III
1.	<i>Shabda</i>	Not significant	Not significant	Not significant
2.	<i>Sparsha</i>	Smooth	Smooth	Smooth
3.	<i>Roop</i>	Greyish Black	Greyish Black	Greyish Black
4.	<i>Rasa</i>	Not specific	Not specific	Not specific
5.	<i>Gandha</i>	Not Specific	Not Specific	Not Specific

**Table no. 3: XRF analysis of Trailokyasundar rasa**

Element	Mass (%)	Intensity (cps/ $\mu$ A)	Formula	Mass (%)
Si (Silicon)	1.85	0.178	SiO <sub>2</sub>	3.217
S (Sulphur)	9.75	2.653	SO <sub>3</sub>	18.967
K (Potassium)	4.38	0.694	K <sub>2</sub> O	3.931
Ca (Calcium)	2.55	0.452	CaO	2.635
Ti (Titanium)	0.61	0.552	TiO <sub>2</sub>	0.745
Fe (Iron)	28.57	72.380	Fe <sub>2</sub> O <sub>3</sub>	29.839
Cu (Copper)	0.23	0.835	CuO	0.207
Sr (Strontium)	0.33	1.457	SrO	0.275
Hg (Mercury)	51.75	74.505	HgO	40.183
O (Oxygen)	26.824			

## Discussion

Development of standard manufacturing process without disturbing the efficacy and safety profile of drug has become earnestly essential due to the ongoing development in Pharmaceutical field. It becomes important to check these drugs for their efficacy, potency and safety in light of ancient and modern parameters of standardization.

All the contents of *Trailokyasundar rasa* i.e. *Kajjali*, *Lauhabhasma*, *Abhrakbhasma*, *Guduchisatva*, *Varahikand churna*, *Triphalachurna*, *Shigrumoolchurna* were taken and then levigated with *Bhringarajaswarasa*. Adequate quantity of *Bhringarajaswarasa*<sup>19</sup> was taken and Levigation was continued till dough mass got completely dries. Essential quantity of *Bhringarajaswarasa* was added again and levigation was done with uniform speed and pressure. *Sharangdhar Samhita* was referred to so as to determine the number of *Bhavanas* to be given. It is mentioned in it that, whenever number of *Bhavana* are not mentioned; single, three or seven *Bhavanas* should be given. So, in the preparation of *Trailokyasundar rasa* three *Bhavanas* of *Bhringarajaswarasa* were given. Increased numbers of *Bhavanas* are known to increase potency of the drug. Three batches were prepared in all.

Organoleptic analysis of *Trailokyasundar rasa* showed it to be grayish black coloured and smooth textured. It didn't have any particular smell and taste. (Table no. 1)

Physicochemical analysis of *Trailokysundar rasa* showed the pH value to be 6.04, loss on drying 12.6, total ash 35.543%, acid insoluble ash 22.532% and water insoluble ash 24.343 %. (Table no. 2).

The samples of *Trailokyasundar rasa* were tested by XRF analysis. Results obtained shows presence of Mercury (Hg), Iron (Fe), Sulphur (S), Potassium (K), CALCIUM (Ca), Silicon (Si), Copper (Cu) in it. (Table no. 3)

## Probable *rasa*, *Virya*, *Vipaka* and *Doshagnata* of *Trailokyasundar rasa*

According to the properties of the contents of the *Trailokyasundar rasa* described in the classical text, *Trailokyasundar rasa* can be predicted as following.

<i>Rasa</i>	<i>Katu, Tikta, Madhur</i>
<i>Virya</i>	<i>Ushna</i>
<i>Vipaka</i>	<i>Madhur</i>
<i>Doshagnata</i>	<i>Pitta, Vata</i>
<i>Mahabhutadhikya</i>	<i>Vayu, Agni, Prithvi</i>

## CONCLUSION

Primary goal of the study was to standardize *Trailokysundar rasa* at various stages in order to have strict quality control and assurance.

*Trailokyasundar rasa* was selected from *Rasaratnasamucchaya Pandurogadhikar*, as study formulation amongst 5 available references. After following the procedure, *Trailokyasundar ras* was obtained with desired standards. It was clearly seen from the results of analytical and classical testing that after purification, levels of toxic elements declined significantly thus, improving quality and potency of the drug. By the *Shodhana* and *Marana* as per the references of *Rasaratnasamucchaya*, the *Abhrakbhasma* was obtained after 16 *Gajputa* and *Lauhabhasma* after 13 *Gajputa* of desired standard. This could prove the convenience and effectiveness of given methods. *Guduchisatva* of desired



quality and fulfilling the standards was obtained when prepared as per the classical reference.

Use of self-collected and authenticated ingredients like *Shigrumool*, *Varahikand*, *Triphala* confirmed the authenticity and consequently efficacy of the *Trailokyasundar rasa*. Use of fresh *Swarasa* of *Bhringaraja* for *Bhavana* ultimately increased the potency of the drug. *Trailokyasundarrasa* is of *Madhur*, *Katu*, *Tiktarasatmak*, *Ushnaviryatmak* and of *Madhurvipaka*.

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### PARAD SHODHAN (6 July – 8 Sept 2014)

72h Mardana → Ashuddha parad & sudharaj → After Dhawana

Mardana for 3days → Parad & Lashun Kalka

Dhawana with cold water → Shuddha parad

### GANDHAK SHODHAN (24 Nov - 25 Nov 2014)

शोधको विविधिय च-आमनौ प्रजयतेतान्ते तान्ते तत्रामानं विधेइत्यमकं रज.३  
विदुतं मन्थकं दुग्धं दुग्धमध्ये विविधियेत्तुएवं मन्थकञ्चुकिः यस्मिन् सर्वतोभेधु योग्यते।  
(सर्वं रासकञ्जोशु पूर्वकण्ड २१२-२१३)

Goghrit & Gandhak → Melting of Gandhak

Vastragalan in godugdha → Nirvapana in Godugdha

Koshna jala Dhawan → Shuddha Gandhak

### KAJJALI NIRMAN (17 Feb-18 March 2015)

कज्जली रसमन्थेत्वा सुश्लक्ष्णा कज्जलोपमा । तत्रोभेन संयुक्त कज्जलीबन्ध उच्यते।३३।

शुद्ध गंधक + शुद्धा parad → कज्जली Hg + S

Mardan up to 72h → कज्जली

### LAUHA BHASM NIRMAN (29 Nov - 28 March)

Shodhan in goghrit → Shodhan in gomutra → Tripthalaswaras bhawana

Chakrika → Gajputa → Gajputa

After 13 gajputa → लौह भस्म

### DHANYABHRAKA (4 Dec - 8 Dec 2014)

सर्वे धान्याभ्रकं कान्जा विष्टवा मरुत्वशिकारिः।१७०।पूर्णाचं शानिसंयुक्तं वरुणवदं हि कान्जिके  
निर्वाहं मर्दनाद्वैद्यव्याख्यप्रसिद्धि कथ्यते।१८६।

Shuddha Abhtrak + Shali → धान्याभ्रक

Kanji + Pottali dipped in kanji → धान्याभ्रक

### ABHRAK BHASM NIRMAN (23 Dec to 15 March)

Dhanyabhtrak → Erandpatra-swaras → Bhawana

Chakrika → Gajputa → Gajputa

After 16 gajputa → अभ्रक भस्म

### GUDUCHI SATVA NIRMAN (21 Oct - 25 Oct 2014)

Guduchi → Chopping → Steep → Washing → Crushing → After 18h soaking → Guduchi satva → After drying

### HARBAL CONTENTS (5 April - 29 April 2015)

<b>Varahikand churna nirman</b> <p>कस्यलोफस <i>Oxycora bulbifera</i></p>	<b>Triphala churna nirman</b> <p>त्रिकला <i>Ternstroemia cibibala</i> <i>Ternstroemia bellena</i> <i>Embelia officinalis</i></p>
<b>Shigrumul churna nirman</b> <p>शिग्रुमूल <i>Moringa deifera</i></p>	<b>Bhrungaraj swarasa nirman</b> <p>शुद्ध-अरज स्वरस <i>Eclipta alba</i></p>

### TRAILOKYASUNDAR RASA NIRMAN (5 May - 12 May 2015)

शुद्धा अभ्रक + लौह भस्म + शुद्धा गंधक + शुद्धा कज्जली + शुद्धा कज्जली → श्रुंगराजस्वरास भवाणा → त्रैलोक्यसुन्दर रस