



SULPHUR (*GANDHAKA*) PURIFICATION METHODS W.S.R. TO RASA CLASSICS

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Article Info: Received 10 November 2019; Accepted 20 December. 2019

DOI: <https://doi.org/10.32553/jbpr.v8i6.698>

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Conflict of interest statement: No conflict of interest

ABSTRACT:

Gandhaka is one of the materials that are in extensive use in the past and also in the present era. It can be equated with Sulphur in modern chemistry. All most all the *Rasa* literature have included it under *UpaRasa* group, however in the periodic table it belongs to VI – A. It has a great role mainly in the preparations of *Rasa* and *Rasayana* drugs. As such the material in crude form can't be used in drug manufacturing and therefore the crude materials are to be subjected to certain pharmaceutical measures to render them suitable for conversion into medicine and among such procedures the *Shodhana* is one. Historically *Shodhana* concept was in existence since the time of *Smriti grantha Manusmriti* and *Charak Samhita*¹(600- 1000 B.C) as while enumerating the fundamentals of *Ayurvedic* Pharmaceutics-*Saucha*(*Sudhnikarana*) is found enumerated as one of the basic necessity for "*Gunantaradhana*"(alteration and/or addition of properties in the drugs). This concept was further developed after the development of *Rasashastra*. In the current article 18 classics of *Rasashastra* been explored and different *Gandhaka Sodhana* (purification) methods were analyzed and discussed elaborately.

Keywords: *Gandhaka, Sodhana, Dhalana, Bhavana, Prakshalana, Mardana, Nirvapa, Swedana, Galana*

INTRODUCTION:

Gandhaka is one of the member of *UpaRasa* by *Rasa vagbhata* found described in bible as brim stone. It was found indicated with the name of *Lelitik* in *Kustha* treatment in *Charak Samhita* and later *Chakrapani* has commented it as *Pashana bheda*. The sulphur is extensively used in *Rasa Shastra* especially in various mercurial operations. *Shodhan* – a concept of purification was existed and started as simple process since *Smriti* and *Samhita* literature was later flourished and included several processes into its fold. As such *Shodhana* can be compared with purification

process, however when a drug was subjected to *Shodhana* following traditional methods the material is no longer retains original purity of the starting material.

There are several methods for the *Shodhana* of *Gandhaka* has been found mentioned in different texts. Among them the commonest method consists of heating of sulphur up to melting stage with *ghrita* on fire and then pouring through a cloth into cow milk taken in a container and then washing it with hot water. The process should be repeated for 3 to 7 times and every time taking fresh *Dugdha* and *Ghrita*.

Table 1: Showing *Gandhaka Shodhana* procedure & media with reference

Procedure	No. of methods	Media used for Shodhana	Reference
<i>Dhalana</i> using <i>Sthaliyantra</i> <i>Dhalana</i> in <i>Karsha</i> or <i>Kundali Patra</i>	2	<ul style="list-style-type: none"> Milk Ghee, milk 	<i>Rasadhyaya</i> ²
<i>Dhalana</i> (7 times) <i>Bhavana</i> <i>Bhavana, Prakshalana</i> <i>Dhalana</i> <i>Dhalana</i> in milk and <i>Bhavana</i> in other media	5	<ul style="list-style-type: none"> <i>Karanja taila, Eranda taila, Goat milk, Dhatura swaRasa</i> <i>Jalini seed, matsya pitta</i> <i>Bhringaraja swaRasa, warm water</i> <i>Bhringaraja swaRasa</i> Milk, ginger, <i>Bhringaraja</i> and <i>Nimbu swaRasa</i> 	<i>Rasarnava</i> ³

Melting & pouring (<i>Laghu putta</i>). Melting & pouring, <i>Bhavana</i> & Drying (Two times). <i>Bhavana, Dhalana</i> , Melting & pouring (<i>Mriduputa</i>), <i>Bhavana</i> (3 times) <i>Bhavana</i> (7times each), <i>Prakshalana, Shuskikarana,</i> <i>Dhalana.</i> <i>Bhavana, Dhalana</i> (7 times) <i>Bhavana</i> , melting & pouring (<i>Laghu puta</i>), <i>Bhavana</i> , melting and pouring, <i>Bhavana</i> (7 times), <i>Mardana Bhavana</i> (7 times), <i>Prakshalana, Dhalana</i> <i>Bhavana, Dhalana</i> (7times) <i>Patana</i> method	6	<ul style="list-style-type: none"> Ghee Milk <i>Kanguni/Sarshapa/Eranda/ Kusumbha Tailam/Goat milk/Ghrita/Godugdha/Kanji, Dhatura swaRasa.</i> <i>Tilaparni, Ajamoda, Brahmi, Bhringaraja & Dhatura swaRasa, Ghrita</i> (equal quantity) and <i>Aja dugdha, Godugdha, Ghrita, Tilaparni SwaRasa, Matsyapitta, Jwalini bija churna, Bhringaraja swaRasa, Ghrita and Bhringaraja swaras.</i> <i>Brihati, Ajagandha, Bhringaraj, Dhatura & Tilaparni drava, Ghrita</i> (equal quantity) and <i>Ajadugdha.</i> <i>Dhatura swaRasa & Karanja taila, Eranda taila, Chhagidugdha, Dhatura swaRasa, matsya pitta, koshataki Bija churna, Bhringaraj swaRasa, Jala, Ghrita & Bhringaraja swaRasa.</i> <i>Brahmi, Ajagandha, Bhringaraja, Dhatura or Tilaparni Rasa, Ghrita and Meshidugdha.</i> 	<i>Anandakanda</i> ⁴
<i>Bhavana & Dhalana</i> (3 times)	1	<i>Bhringaraja swaRasa</i>	<i>Chakradatta</i> ⁵
Melting & pouring <i>Nirvapa</i>	2	<ul style="list-style-type: none"> Milk Milk 	<i>Rasa Paddhati</i> ⁶
<i>Swedana in dolayantra,</i> <i>Prakshalana, Dhalana</i> <i>Dhalana</i> <i>Nirvapa / swedana in dola yantra</i> (7 times)	3	<ul style="list-style-type: none"> Milk, warm water & <i>Ghrita</i> Milk, warm water <i>Bhringaraja swaRasa</i> 	<i>Rasendra chudamani</i> ⁷
<i>Dhalana & swedana</i> <i>Dhalana & swedana</i> (7 times) Melting & pouring	3	<ul style="list-style-type: none"> Milk <i>Bhringaraja swaRasa</i> Milk 	<i>Rasa Ratna Samucchaya</i> ⁸
Melting & pouring, <i>Prakshalana</i>	1	<ul style="list-style-type: none"> Milk 	<i>Rasa prakash sudhakara</i> ⁹
<i>Dhalana in kurmaputa</i> <i>Dhalana</i> <i>Bhavana</i>	3	<ul style="list-style-type: none"> Milk / <i>Kanji</i> with <i>Ghrita</i> <i>Ghrita</i>(equal quantity), milk <i>Tankana(1/4th), nimbu swaRasa, eranda taila ,</i> 	<i>Rasendra chintamani</i> ¹⁰
<i>Swedana</i>	1	<ul style="list-style-type: none"> <i>Rakta , sneha, vasa, milk</i> 	<i>Rasa kamadhenu</i> ¹¹
<i>Laghu puta</i> <i>Dhalana</i>	2	<ul style="list-style-type: none"> Milk, <i>Ghrita</i> Milk , <i>Ghrita</i> 	<i>Rasendra sara samgraha</i> ¹²
<i>Dhalana</i>	1	<ul style="list-style-type: none"> <i>Ghrita, Milk</i> (equal quantity) 	<i>Sharangadhar samhita</i> ¹³ <i>Bhava prakasha</i> ¹⁴
<i>Kachapa puta or kurma puta,</i> <i>Prakshalana</i>	1	Milk	<i>Ayurveda prakash</i> ¹⁵ <i>Yoga ratnakar</i> ¹⁶
<i>Swedana in dola yantra,</i> <i>Prakshalana</i> Melting & pouring <i>Nirvapa / swedana in dola yantra</i> (7 times)	3	<ul style="list-style-type: none"> Milk, warm water <i>Ghrita, Milk, warm water</i> <i>Bhringaraj swaRasa / kanji</i> 	<i>Br. Rasa Raja sundara</i> ¹⁷
<i>Laghu puta, Dhalana.</i> <i>Dhalana</i> <i>Swedana & Dhalana</i> <i>Dhalana</i> <i>Dhalana / swedana</i> (7 times)	5	<ul style="list-style-type: none"> <i>Ghrita, Milk</i> <i>Ghrita</i> (equal quantity), Milk Milk & <i>Ghrita</i> <i>Ghrita, Trifala kwath</i> <i>Bringaraja swaRasa</i> 	<i>Rasa chandanshu</i> ¹⁸
<i>Dhalana & nirvapa</i> Melting & aavapa (3 times) <i>Galana, dhalana</i> (3 times for yoga & 5 times for <i>sevana</i>) is the	4	<ul style="list-style-type: none"> <i>Ghrita, takra</i> <i>Bhalltaka taila, trifala kwath/guduchi swaRasa</i> <i>Ghrita</i> (1/4th), milk (2 times) <i>Ghrita</i> (1/4th), <i>Palandu swaRasa</i> 	<i>Rasayana sara</i> ¹⁹

<i>Galana, dhalana (50 times)</i>			
<i>Bhavana, dhalana ,prakshalana</i>	1	<ul style="list-style-type: none"> • <i>Ghrita, Milk, Bhringaraja swaRasa</i> 	<i>Rasamritam</i> ²⁰
<i>Dhalana (3 times), Prakshalana Melting & pouring Dhalana , Prakshalana Dhalana (7 times) Damaru yantra paka (Patana) Galana Aavapa, sedimentation, shushkikarana</i>	6	<ul style="list-style-type: none"> • <i>Ghrita(equal quantity) , milk</i> • <i>Ghrita, milk</i> • <i>Sarshapa taila/ kusumbha taila (equal quantity), milk</i> • <i>Bhringaraja swaRasa</i> • <i>No media</i> • <i>Churnodaka, lavanadravaka</i> 	<i>Rasa Tarangini</i> ²¹

Table 2: showing Procedures referred by various classics

Procidure→ Reference↓	Dhalana	Swedana	Bhavana	Patana	Aavapa	Mishrita (Mixed procedures)
<i>Rasadyaya</i>	+					
<i>Rasarnava</i>	+		+			
<i>Anandakanda</i>	+		+	+		+
<i>Chakradatta</i>	+		+			
<i>Rasa Paddhati</i>					+	+
<i>Rasendra chudamani</i>	+	+			+	
<i>Rasa Ratna Samucchaya</i>	+	+				+
<i>Rasa prakash sudhakara</i>						+
<i>Rasendra chintamani</i>	+		+			
<i>Rasa kamadhenu</i>		+				
<i>Rasendra sara samgraha</i>	+					<i>Laghu Puta</i>
<i>Sharangadhar samhita/ Bhava prakasha</i>	+					
<i>Ayurveda prakash/Yoga ratnakar</i>						<i>Kacchapa /Kurma Puta</i>
<i>Br. Rasa Raja sundara</i>		+			+	+
<i>Rasa chandanshu</i>	+	+				<i>Putra</i>
<i>Rasayana sara</i>	+				+	<i>Galana</i>
<i>Rasamritam</i>	+		+			
<i>Rasa Tarangini</i>	+			+	+	<i>Galana</i>

From the above Table, it can be summarized that *Rasashastra* classics have adopted following 6 types of methods (procedure) for *Gandhaka Shodhana*.

1. Dhalana

In this procedure, there are also two sub procedures- a) By melting *Ashuddha Gandhaka* in container and pouring immediately in container having milk, etc liquid. This procedure is termed as '*Dhalana*' in above table. This procedure has been mentioned first by *Chakradatta*. Later this *Patha* from *Chakradatta* is also adopted by *Rasendra sara samgraha*²² in *Amlapitta Chikitsa Prakarana*. The second procedure of *Gandhaka Shodhana* of *Rasa ratna samucchaya* has also get mention by authors

of *Ayurveda prakash, Rasendra purana, Br. Rasa raja sundara, Rasa chandanshu and Rasa jala nidhi*.

Use of different liquids and *Sneha drava* in *Gandhaka Shodhana* have been first mentioned in *Rasayana Sara*.

Almost all authors use *Lauhapatra* for melting of *Gandhaka*, while *Kanta Patra* used by *Anandakanda, Lauhapatra & Hansatika* by *Rasa Taragini and Katah, Darvi & Mritpatra* by *Rasayana Sara*. Almost all authors quoted '*Sthali*' or '*Bandha*' as a container and used '*Kharpara*' or '*Shravaka*' above *Gandhaka & 'Vanyopala*' as fuel.

b) By giving *Laghuputa*, melting, and self pouring of *Gandhaka* through a cotton cloth into the container having *Dugdha* etc. liquid in it. This

procedure is here mentioned by the term 'melting & pouring'. This procedure has been mentioned first by *Anandakanda* and *Rasa prakasha sudhakara*.

For *Putra*, author of *Rasa prakasha sudhakara* used 20 *Upalas* and the number of *Upalas* was mentioned for the first time. How much time heat should be given has been mentioned first by *Rasadyaya* as '*Jwalayet ghatika dvayam*'. Author of *Rasendra Chintamani* termed *Laghuputa* as '*Kurmaputa*' and used *Kanji* instead of *Dugdha* first. The mouth of liquid containing container has been tied by woolen cloth by *Rasa paddhati*.

2. Swedana

In this method, *Dolayantra* has been recommended for *Gandhaka Shodhana*. By making *Pottali* of *Ashuddha Gandhaka* in cloth, do *Swedana* in *Dolayantra* containing liquids like *Dugdha*, *Vasa*, *Sneha*, *Rakta*, etc. This method is first depicted by *Rasendra chudamani*. *Rasa manjari*²³ only mentioned *Dugdha* for *Swedana*.

It is not so common method for *Gandhaka Shodhana*. Instead of *Pranij Dravya*, author of *Rasa dhatu prakash*²⁴, used *Audbhida swaRasa* as *Nimba swaRasa/ Bhringaraja swaRasa* for *swedana* of *Gandhaka*.

3. Bhavana

This procedure of *Gandhaka Shodhana* is first depicted by *Rasarnava*.

4. Patana

In this procedure, *Damaru yantra* has been used for *Gandhaka Shodhana*. It is first quoted in *Ananda kanda* and later in *Rasa tarangini*. For this, the author advised to make a fine powder of 4 *pala*. *Gandhaka*, placed it in a lower container of *Damaru yantra* and do *paka* for 4 *Yama*. Then, after cooling, evaporated *Gandhaka* crystals scraped from the upper container. This *Shuddha Gandhaka* is devoid of *Pashanadi doshas*.

5. Aavapa

This procedure is also depicted first by *Rasa Tarangini*. For this, take *Sudhajala* 13 parts and *Ashuddha Gandhaka* 2 parts, melt them till *Gandhaka* become '*Kapilabha varna*', and then filtered it by cloth and place in glass container.

After cooling, do *Aavap* of *Lavanadravak* till *Gandhaka* gets settled. Then the liquid spilled out and do *Prakshalana* of *Gandhaka*, dry and powder it.

These *Patha* of *Patana* and *Aavapa* is then only mentioned by *Rasa dhatu prakasha*²⁵.

6. Mishrita (Mixed procedures)

From the above procedures, *Anandakanda*, *Rasarnava*, and *Rasa ratnakara* have mentioned mixed procedures i.e. 2, 3 or 4 procedures for *Gandhaka Shodhana*. These mixed procedures seem to be useful in *Dhatu vada*.

From all these *Gandhaka Shodhana* procedures, nowadays the most common method generally adopted practically and commercially, is the 1st procedure of *Dhalana* i.e. *Dhalana* followed by *galan*.

INSTRUCTIONS REGARDING GANDHAKA SHODHANA BY DHALANA PROCEDURE

1. Gandhaka

Before melting *Gandhaka*, it should be powdered first as '*Rajawata*' according to *Chakradatta*, *Ayurveda prakasha*, *Rasa tarangini*, *Rasa ratna samucchaya*, and *Rasendra chintamani*.

2. Patra

Almost all *Rasashastra* classics mentioned *Lauha patra* for *Gandhaka* melting. *Anandakanda* has used *Kantapatra*. Especially *Lauhapatra* having broad base should be used. *Tamra patra* should be avoided.

3. Agni

Use of *Mridu agni* instructed for the melting of *Gandhaka*, *Gandhaka* should be melted upto '*Tailanibha*' according to *Rasadyaya*, *Rasa chandanshu*, *Rasa tarangini*, and *Rasendra sara samgraha*.

4. Sneha

Karanja, *Eranda*, *Sarshapa*, *Tila*, *Kusumbha*, *Bhallataka*, *Jayapala* & *Bibhitaka taila*, and *Ghrita* should be used as *Sneha dravya* according to *Rasarnava*, *Rasa ratnakar*, *Rasa tarangini*, and *Rasayana Sara*. Generally, *Ghrita* should be used.

5. Sneha matra

Regarding *Sneha matra* got following 5 instructions

- Melting of *Gandhaka* without *Sneha* is instructed by authors of *Chakradatta*, *Rasendra Sara samgraha*, *Ayurveda prakash*, *Rasendra purana*, *Br. Rasa Raja Sundara*, *Rasa dhatu prakash* and *Rasa chandanshu*.
- Melting of *Gandhaka* in *Ghrityukta patra* is mentioned by *Rasarnava*, *Anandakanda*, *Rasa ratnakara*, *Rasadhyaya* and *Rasamritam*.
- Equal quantity of *Sneha* is used by *Anandakanda*, *Rasa ratna kara*, *Rasendra chudamani*, *Rasa kama dhenu (Rasa sara)*, *Rasendra sara samgraha*, *Rasendra chintamani*, *Sharangadhara samhita*, *Rasendra bhaskara*, *Rasa dhatu prakash*, *Rasa chandanshu*, *Ayurveda Prakash*, *Bhava prakash*, and *Rasa Tarangini*.
- 1/4th *Sneha* for *Gandhaka dravana* has been quoted by *Rasayana Sara*.

6. Drava

Besides *Dhatuvada Granthas*, mostly *Dugdha* and then *Bhringaraja swaRasa* is indicated.

- Dravya Matra* – Instruction of *Dravyamatra* has not mentioned generally in all classics except *Rasayana Sara*, here 2 times of *Drava* (of *Gandhaka*) is indicated.
- Dravavastha* – According to *PRasadini Sanskrit* commentary on *Rasa tarangini*²⁶, the *drava* i.e. *Dugdha* should be taken hot. If taken cold, the *dugdha* and *ghrita* enter into pores of *Gandhaka* making it flavored (*Gandhayukta*).

7. Vastra

Rasashastra classics instructed to use '*Tanu vastra*'.

8. Dhalana matra

Rasarnava, *Rasa Ratnakar*, *Ayurveda Prakash*, *Rasa tarangini*, *Rasamritam*, and *Rasayana Sara* have instructed *Dhalana* of *Gandhaka* (melted) once or thrice and for internal administration, *Dhalana* should be done 3, 5 or 7 times. According to *Ayurveda prakasha* and *Rasa tarangini*, *Drava* should be taken fresh each time.

9. Prakshalana

Ayurveda prakasha and *Rasa tarangini* instructed *Prakshalana* by water (hot) after *Gandhaka Shodhana*.

Note

Before *Shodhana* of *Gandhaka*, to remove its physical impurities like dust, etc. it should be washed with *Nimbu swaRasa*. Like *Gandhaka*, *Tankana* should also be washed, as per *Rasendra chintamani*²⁷.

After delving through the *Rasashastra classics*, we can find that particular *Gandhaka Shodhana* procedures have also been mentioned randomly for preparation of particular formulations, besides under heading '*Gandhaka Shodhana*'. As per *Chakradatta*²⁸, for the preparation of *Rasa parpati*, *Parada* and *Gandhaka Shodhana* should be done which is mentioned in *Kshudhavati Gudika* preparation in *Amalpitta Chikitsa Prakarana*. In this context, *Bhaishajya ratnavali*²⁹ also suggests special *Gandhaka Shodhana* procedure for preparation of *Rasa parpati*. In this method, *Gandhaka* is subjected to 7 *bhavanas* of *Bhringaraja swaRasa*, dry & powder it. Then by melting, pour into *Bhringaraja swaRasa* once, dry in sunlight and make *churna* like *Ketakarajasa*, melting done on '*Badarakasthangara*'.

In this way, *Rasendra chintamani*³⁰ also mentions '*Rasa shodhita Gandhaka*' for the preparation of *Br. Somnatha Rasa (Bahumutra Soma Rogadhikara)*. As per *Vaidya Maniram Sharma*, ('*Maniprabha*') Sanskrit commentary on *Rasendra chintamani* – '*Mushakpani Rasen Shodhito Gandhakah*'.

Discussion:

Literature regarding the *Shodhana* reveals that *Rasashastra* classics have adopted 6 types of procedures. viz. *Dhalana*, *Swedana*, *Bhavana*, *Patana*, *Aavapa*, and *Mishrita* (i.e. mixed procedures). Out of these, *Dhalana* procedure can also be divided into two types i.e. melting *Ashuddha Gandhaka* with *Ghritha* in a container and pouring in the container through cotton cloth smeared with *Ghritha* having *Dugdha*, etc. liquid which is the most common method. The classics have given scientific explanation stating that the

poisonous principles associated with *Gandhak* will bound to *ghee* and the stones and gravel, sand etc get disassociated and remained in cloth. Second *Dhalana* procedure mentioned, by giving *Laghuputa*, involving melting and self pouring of *Gandhaka* through the cotton cloth into the container having liquid in it. The former one is the contribution of *Chakradatta* and later's is of *Anandakanda* and *Rasa Prakash Sudhakara*.

Besides under heading *Shodhana*, special methods of *Gandhaka Shodhana* have also been mentioned for preparation of particular formulation.

Mostly the media used for *Gandhaka Shodhana*, *Anupana* of *Shuddha Gandhaka* and *dravya* used for management of complications caused by *Gandhaka Sevana* quoted same as *Godugdha* and *Goghrita*. It shows that *Rasacharyas* wanted to slow down its '*Agnikari*' *guna* and also to reduce its toxic or adverse effects. It also throws light on *Rasahsastriya* principles.

Conclusion

The process of *Shodhana* can be found in every *Rasashastra* classics which removes the physical, chemical impurities and reduces the toxic effects. Chemical impurities are eliminated through evaporation, dissolution and binding with *ghrita*, milk, whereas physical impurities are removed by filtering through the cloth. Though "*Dhalana*" method of *Sodhana* is very common, choice of the method of *Shodhana* is dependent on the potential usage of *Gandhaka*.

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