

PHARMACEUTICAL STANDARDIZATION OF “HINGULADRASA SINDOORA”
PREPARED BY ELECTRIC MUFFLE FURNACEAnamika Arjaria¹, Shankar Dayal Upadhyay², R.K. Pati³^{1,2}M.D. (Ayu) Lecturer in SRS Ayurvedic Medical College Agra, Post Graduate Department of *Rasashastra* & *Bhaishajya Kalpana*, Pt. Khushilal Sharma Govt. Ayu. College & Institute, Bhopal, Madhya Pradesh, India³M.D. (Ayu), Professor, Department of *Rasashastra* & *Bhaishajya Kalpana*, Pt. Khushilal Sharma Govt. Ayu. College & Institute, Bhopal, Madhya Pradesh, IndiaCorresponding Author: upadhyay0319@gmail.com<https://doi.org/10.46607/iamj2208102020>

(Published online: October 2020)

Open Access

© International Ayurvedic Medical Journal, India 2020

Article Received:29/09/2020 - Peer Reviewed:02/10/2020 - Accepted for Publication:04/10/2020



ABSTRACT

Kupipakwa Rasayana bears a unique place in Rasa Shastra treatises because of its mercurial preparation with quicker action and synergistic effects in the body at very low dose. *Rasa Sindoor* is one of the *Kupipakwa Rasayana* a most potent medicine of Ayurveda. *Acharaya Sadanand Sharma* mentioned in his text *Rasatarangini* that *Hinguladrasa Sindoor* has equal property, dose, therapeutic indication, *Anupan* (Adjuvant) and *Pathya* (Wholesome) etc. same as *Rasa Sindoor*. *Hinguladrasa Sindoor* was prepared with same proportion of *Shodhita Hingula* (Purified Cinnabar) and *Shodhita Gandhaka* (Purified Sulphur) as per the reference of *Rasa Tarangini*. **Aim**-To standardize manufacturing procedure of *Hinguladrasa Sindoor*. **Material and Method**- Purified *Hingula* and Purified *Gandhaka* both grounds properly and made into the *Shlakshana Churna* (Smooth Powder). Three batches were prepared to standardize the procedure by using electric muffle furnace (EMF). **Results and Conclusion** - Average melting temperature of *Shlakshana Churna*, Average flame appearing temperature and Average corking temperature were 185°C, 483°C and 703°C respectively. Average yield in three consecutive batches was 85 gm and the average time was 15.41 hrs. Three batches of *Hinguladrasa Sindoor* preparation concluded that for 200 gm of *Shlakshana Churna* by following

intermittent heating pattern that was mild heat (100-250°C) for 4 hrs., Moderate heat (250-450°C) for 4 hrs. and strong heat (450-750°C) for 7-8 hrs.

Keywords: *Kupipakwa, Rasa Sindoor, Shlakshana Churna, Electric Muffle Furnace (EMF), Hinguladrassa Sindoor.*

INTRODUCTION

In the Medieval period of Ayurveda, *Rasa Vaidyas* were regarded as very prestigious assets for their contribution of a wide variety of herbomineral formulation to the society. They were capable to cure diseases very quickly and effectively. *Rasausadhis* are unique and efficacious compound in Ayurvedic therapeutic, due to its lesser doses, enhancement of the action of the other ingredients of the formulation, quicker action, palatability and more self-life as compare to herbal formulation. Out of a wide variety of *Rasa* preparation, *Rasa Sindoor* which is well known *Kupipakwa Rasayana* has proven its efficacy in a wide spectrum of ailments over the time with different herbal drug and *Anupan* in a variety of doses. *Acharaya Sadanand Sharma* mentioned in his text *Rasatarangini* that *Hinguladrassa Sindoor* (HS) has equal property, dose, therapeutic indication, *Anupan* (Adjuvant) and *Pathya* (Wholesome) etc. same as *Rasa Sindoor*.¹ *Hinguladrassa Sindoor* was prepared with same proportion of *Shodhita Hingula* (Purified Cinnabar) and *Shodhita Gandhaka* (Purified Sulphur) as per the reference of *Rasatarangini*.

Material and Methods:

Pharmaceutical process of *Bahirdhoom Hinguladrassa Sindoor* includes the purification of active ingredients i.e. *Hingula* and *Gandhaka* that were used for preparing *Slakshana Churna*. Other equipments used in work were such as *Kupi* (seven layer mud-smear cloth bottle), Vertical Electric Muffle Furnace (EMF), Thick and Thin *Shalaka*, Torch, Copper coin, Brick cork etc. in *Rasashastra & Bhaisajya Kalpana* department of Pt. Khushilal Sharma govt. Ayurvedic college, Bhopal, Madhya Pradesh.

Methods: Three samples of *Hinguladrassa Sindoor* were prepared according to the reference of

Rasatarangini by using of EMF method and have following stages:

Preheating phase- it includes

- Purification of *Hingula*
- Purification of *Gandhaka*
- Preparation of *Slakshana Churna*
- Preparation of *Kupi*
- Filling of material in the *Kupi*

Purification of *Hingula*:² Fine powder of 500 gm of *Hingula* were taken and levigated with 90 ml of *Nimbu Swarasa* in each *Bhavana*. The weight of *Hingula* was increased 35 gm due to presence of the solid content of *Nimbu Swarasa*. After *Bhavana* *Hingula* was washed with water until the acidic nature of *Hingula* convert into nonacidic form. After drying up the *Hingula* its weight reduced and 500 gm of *Hingula* obtained at the end. The Loss was about nil during the *shodhana* processes and it is only due to use of single *Khalva Yantra* during the whole procedure.

Purification of *Gandhaka*:³ 800 gm of impure *Gandhaka* purified according to the reference of *Rasatarangini*, by doing *Dhalana* process, i.e. melting and pouring of *Gandhaka* in *Go-dugdha* for 3 times. At the end finally 772 gm of purified *Gandhaka* obtained. Complete *Shodhana* of *Gandhaka* 3.5% loss was observed. Reason of loss is due to adherence of *Gandhaka* on cotton cloth, impurities and also during the washing process.

Preparation of *Slakshana Churna*:⁴

Equal amount of *Shuddha Hingula* (300 gm) and *Shuddha Gandhaka* (300gm) were taken and triturated the mixture for 8 hrs, at the end mixture become fine, smooth powder i.e. *Slakshana Churna*. The loss seen during the procedure was nil.

Preparation of *Kupi*: Once collected the *Kupi* (beer bottle) and clean it well. Smectite clay was crushed,

made into powder and sieved the powder. Water was added in powder and become sloughy. After that piece of cotton cloth was taken for *Kapadmitti*. This piece was cut in the size of the *Kupi* (Bottle) and in circular shape for the base of the bottle. These cloth pieces were dipped in smectite clay for some time. Initially a circular piece of *Kapadmitti* (clay smeared cloth) was stuck in the base of the bottle and dried it. Further first layer of *Kapadmitti* was applied to the external surface of the whole bottle and dried it well. This whole process was repeated for 7 times.

Filling of material in the *Kupi*:- *Slakshana Churna* was triturated for 30 min. before filling it into the *Kupi* with a total capacity of 650 ml. *Kupi* was filled with 200 gm of material with the help of a glass funnel.

Heating phase: *Slakshana Churna* filled in *Kupi* was kept in the muffle. For find the exact temperature of *Kupi*, another thermocouple was placed in the muffle, which was associated with muffle temperature. Furnace temperature started with room temperature & with the passing of time it gradually increased. Temperature of the furnace was recorded periodically. Red hot *Shalaka* was used to clear the mouth of the *Kupi*, when it was just blocked by the *Gandhaka* as outcome of *Jarana* process. Fumes increased in bottle with rising in temperature, after sometimes fumes disappeared and flame appeared. The flame was attaining a height of 4-6 inch & after that it was gradually decreased. When the blue flame disappeared and fumes minimized, sun rise like appearance was seen inside at the bottom of the *Kupi*. After that copper coin test was performed and the test was found positive following seals of the bottle with the brick cork. After corking temperature increased that is *Tivragni* for 1 hour and furnace was switched off. It was left for self-cooling for 18 hrs.

Table 1: Showing the observation related to preparation of HS-I

Time (hour)	Temp. setting (°C)	Reading (°C)	Observation
7:00	100°C	28°C	<i>Kupisthapna</i>
8:00	150°C	95°C	-
8:40	150°C	142°C	Sulfur smells start to felt.
8:50	150°C	149°C	Fumes start.
9:00	200°C	152°C	Fumes continue.
9:35	200°C	170°C	Yellowish material deposited on the mouth of the bottle.
9:45	200°C	185°C	<i>Slakshna Churna</i> was melt and appearance was like bright red colour liquid material.
9:50	200°C	191°C	Fumes and smell become increased.
10:00	250°C	201°C	Fumes and smell continue.
10:05	250°C	210°C	Whitish yellow colour fumes seen.
10:15	250°C	220°C	Smell increases with yellowish fumes.
10:40	250°C	240°C	On examining with <i>Shalaka</i> , brownish colour shiny material seen on the tip of <i>Shalaka</i> . The material was semisolid & smooth with yellow fumes.
11:00	300°C	250°C	On examining with <i>Shalaka</i> , semisolid rough material seen on the tip of <i>Shalaka</i> when <i>Shalaka</i> insert 4.5 inches inside the <i>Kupi</i> and yellow fumes increases on performing.
11:05	300°C	254°C	Boiling stage of <i>Slakshna Churna</i> , when <i>Shalaka</i> insert 3 inches inside the <i>Kupi</i> , <i>Slakshna Churna</i> seen on the tip of <i>Shalaka</i> .
12:00	350°C	300°C	Fumes start to decrease
1:00	400°C	350°C	Fumes almost disappear.
1:45	400°C	387°C	The Flame appears when <i>Shalaka</i> put on neck, when <i>Shalaka</i> remove flame disappears.
2:00	450°C	402°C	-
3:00	500°C	453°C	-
3:15	500°C	472°C	Profuse yellow fumes.
3:18	500°C	476°C	1-inch length blue flame appears.
3:20	500°C	483°C	Flame length 2.5-3 inches.
3:25	500°C	490°C	Flame length 4-4.5 inches.
4:05	500°C	499°C	Flame gradually decreased.
4:52	500°C	402°C	Flame length less than ½ inch or tiny flame.
5:00	550°C	505°C	Tiny flame.
6:00	600°C	555°C	Tiny flame continues.
6:25	600°C	585°C	Tiny flame continues and on cleaning the mouth plenteous flame appears.
7:00	650°C	602°C	Tiny flame continues.
8:00	700°C	650°C	A whitish blue tiny flame appeared.
8:30	700°C	690°C	½ inch below the neck, flame were appearing & disappear alternatively.
9:45	700°C	705°C	<i>Shita Shalaka</i> test was positive, a trace layer of white smoky appearance is found on a copper coin. Sunrise like appearance was seen inside the <i>Kupi</i> . Corking was done.
9:50	750°C	-	This temperature was maintained for 1 hour.

Table 2: Showing the observation related to preparation of HS-II:

Time (hour)	Temp. setting (°C)	Reading (°C)	Observation
7:00	100°C	29°C	<i>Kupi</i> was kept inside the furnace and switch on the furnace.
		145°C	Smell of sulphur start to felt
9:40	200°C	178°C	Sulphur smell and whitish yellow fumes appear.
9:45	200°C	182°C	<i>Slakshna Churna</i> was melt and it was like bright red colour liquid material with yellow fumes.
9:50	200°C	190°C	A pungent smell of sulphur increased.
9:55	200°C	198°C	Initial stage of boiling, bubbles of boiling <i>Slakshna Churna</i> start appears & vice versa with yellow fumes.
10:08	250°C	210°C	Slight yellow fumes with continuation of boiling.
10:25	250°C	223°C	Fumes increases and <i>Gandhaka</i> deposited around the mouth of bottle.
10:50	250°C	245°C	A typical stage of boiling, in which <i>Slakshna Churna</i> stick on the tip of <i>Shalaka</i> when <i>Shalaka</i> introduced 2 inch inside the bottle. Yellow fumes continue.
11:58	300°C	300°C	Fumes decreased
		480°C	Profuse yellow fumes
3:40	500°C	491°C	6-inch length flame start to appear and disappearing of fumes occur. An intolerable smell persists for a period, i.e. for 30 to 45 min that irritate the person's eye, nose, throat and also responsible for difficult breathing.
4:15	500°C	502°C	Flame gradually decreased.
7:35	650°C	645°C	A tiny flame appears only in the mouth of the bottle.
9:40	700°C	704°C	<i>Shita Shalaka</i> test was positive, a trace layer of white smoky appearance is found on a copper coin. Sunrise like appearance was seen inside the <i>Kupi</i> . Corking was done.
9:45	750°C		This temperature was maintained for 1 hour.

Table 3: Showing the observation related to preparation of HS-III:

Time (hour)	Temp. setting (°C)	Reading (°C)	Observation
7:00	100°C	30°C	<i>Kupi</i> was kept in the furnace and switched on.
Z8:00	150°C	140°C	Odour of unpleasant sulfur felt.
9:32	200°C	165°C	Fume start to appear.
9:45	200°C	170°C	<i>Gandhaka</i> deposited around the mouth of the <i>Kupi</i> .
9:55	200°C	190°C	<i>Slakshna Churna</i> was melt and its appearance was like bright red colour liquid material with yellow fumes.
10:00	250°C	250°C	Boiling stage of <i>Slakshna Churna</i> , when <i>Shalaka</i> insert 3 inch inside the <i>Kupi</i> , <i>Slakshna Churna</i> seen on the tip of <i>Shalaka</i> .
2:00	450°C	450°C	Fumes increased.
3:08	500°C	455°C	On the verge of boiling <i>Slakshna Churna</i> raised up to the mouth of bottle
3:40	500°C	478°C	Profuse dark yellow coloured fumes.
3:45	500°C	482°C	Fumes disappear and flames started after inserting the <i>Shalaka</i> .
4:30	500°C	405°C	Flame gradually decreased.
5:25	550°C	540°C	The Small blue flame appears on the <i>Kupi</i> .
7:15	650°C	630°C	A tiny flame appears only in the mouth of the <i>Kupi</i> .
8:00	700°C	690°C	A tiny flame continues.
10:40	700°C	702°C	<i>Shita Shalaka</i> test was positive, a trace layer of white smoky appearance is found on a copper coin. Sunrise like appearance was seen inside the <i>Kupi</i> . Corking was done.
10:45	750°C	-	This temperature was maintained for 1 hour.

Table 4: Showing the final results of HS-I, II and III:

Sr. No.	Wt. of Slakshna Churna (gm)	Total time required for preparation	Total time for Swang Seeta (Hrs)	Wt. of Hinguladrassa Sindoor (gm)	% of Wt. of Hinguladrassa Sindoor (%)	Wt. of Residue (gm)	% of Wt. of Residue
1.	200	15 hrs 50 min	16	80	40	0.790	0.40
2.	200	15 hrs 45 min.	16	88	44	0.660	0.33
3.	200	15 hrs 30 min.	16	87	43.5	0.810	0.41

DISCUSSION

The formulation prepared with the equal amount of *Hingula & Gandhaka. Slakshna Churna* was prepared and prior to fill in *Kupi*, *Slakshna Churna* triturated for 30min. then fill it in seven *Kapadmitti* smeared *Kupi* and subjected in furnace.

The observations have suggestive of different changes occurred in *Kupi* at different stages of Agni. Temperature on the *Mradu Agni* stage at the temp. of 140-145°C the smell of Sulphur was felt and at the temp. of 182-190°C *Slakshna Churna* was completely melt and seems like red colour liquid material. After that the *Slakshna Churna* become boiling at the temp. of 245-254°C. When temp. range in b/w 472-480°C profuse yellowish fumes of Sulphur was seen. On 476-491°C temp. fumes converted to flame and at last on the temp. of 702-705°C corking was done. After corking temp. raised 50°C to the sublimation of the drug for 1 hour, then it was left for self-cooling. To get proper absorption/digestion of extra Sulphur in HS during *Kupipakwa* process the temp. 500°C sustain for 1 more hour. Positive *Sheeta Shalaka* test indicate absence of free Sulphur in the *Kupi*. It suggests that Sulphur inside the *Kupi* was present in compound form not in free form. Positive copper coin test indicates the onset of sublimation stage of the

compound and free Mercury particles if seen it suggested the dissociation of compounds. This is not desirable. Temp. after 550°C were adjusted according to observation and sign as seen in the *Kupi*.

CONCLUSION

In pharmaceutical process of *Hinguladrassa Sindoor* required a special intermittent heating pattern that is mild, moderate and severe heat. Average melting temperature of *Shlakshana Churna*, Average flame appearing temperature and Average corking temperature were 185°C, 483°C and 703°C respectively. Average yield in three consecutive batches was 85 gm and the average time was 15.41 hrs. Three batches of *Hinguladrassa Sindoor* preparation concluded that for 200 gm of *Shlakshana Churna* by following intermittent heating pattern that was mild heat (100-250°C) for 4 hrs., Moderate heat (250-450°C) for 4 hrs. and strong heat (450-750°C) for 7-8 hrs.

In the process of *Gandhaka Jarana* specially *Bahirdhoom KupiPaka* have the specific oxidation reaction that converts the *Shlakshana Churna* into sublimated Vermilion colour crystalline compound structure i.e. *Hinguladrassa Sindoor*.



Fig. No.1: Showing the process of *Slakshna Churna* preparation

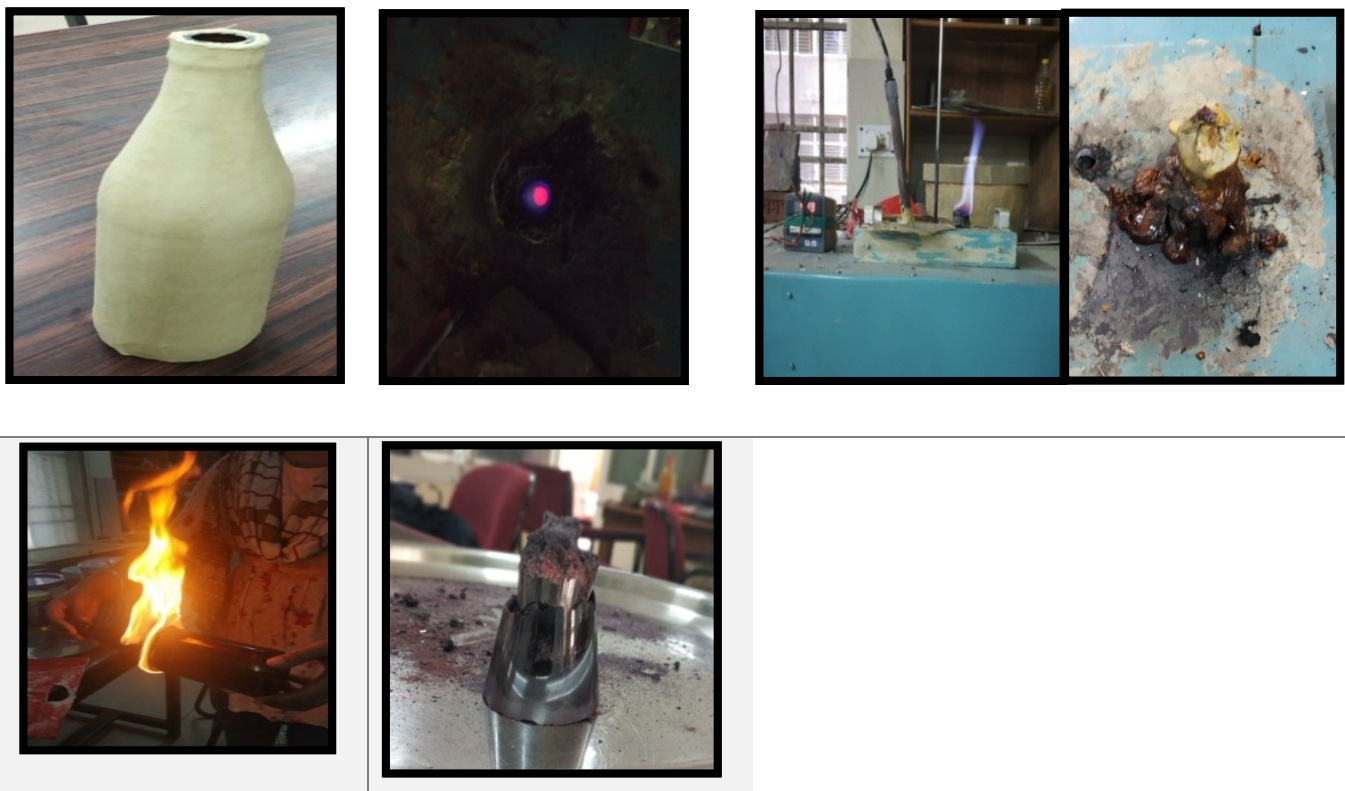


Fig. No.2: Showing the preparation of *Hinguladrasa Sindoor*

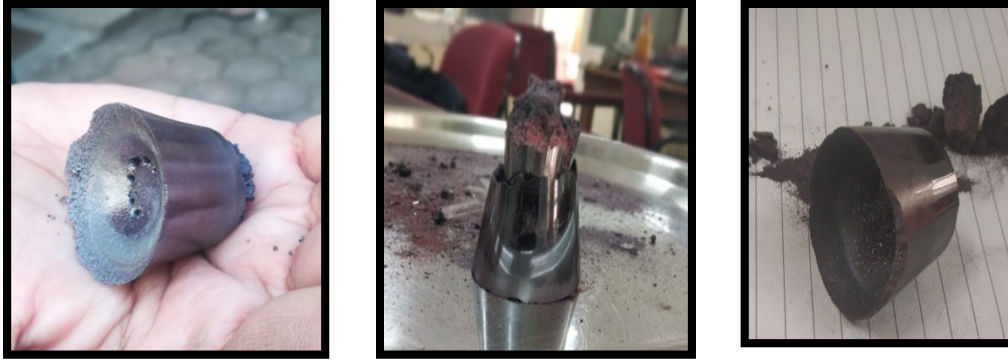


Fig. No 3: Showing the samples of *Hinguladrasa Sindoor* I,II,III

REFERENCES

1. Shastri KN. Chapt 9/32-35. *Rasa Tarangini* of shri Sadananda Sharma. 11th edi. Delhi: Motilal Banarsi das;2014.
2. Shastri KN. Chapt9/16-17. *Rasa Tarangini* of shri Sadananda Sharma. 11th edi.Delhi: Motilal Banarsi das;2014.
3. Shastri KN. Chapt*Rasa Tarangini* 8/7-12. *Rasa Tarangini* of shri Sadananda Sharma. 11th edi. Delhi: Motilal Banarsi das;2014.
4. Shastri KN. Chapt *Rasa Tarangini*9/32-34. *Rasa Tarangini* of Shri Sadananda Sharma. 11th edi. Delhi: Motilal Banarsi das;2014.

Source of Support: Nil

Conflict of Interest: None Declared

How to cite this URL: Anamika Arjaria et al: Pharmaceutical Standardization Of "Hinguladrasa Sindoor" Prepared By Electric Muffle Furnace. *International Ayurvedic Medical Journal* {online} 2020 {cited October, 2020} Available from: http://www.iamj.in/posts/images/upload/4716_4723.pdf