Research Article

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PHARMACEUTICAL STUDY OF SAMAGUNA BALIJAARITA RASASINDURA (RED SULPHIDE OF MERCURY)

Veena B Kupati ^{1*}, P. G. Jadar ²

¹Assistant prof. Department of Rasashastra and Bhaishajyakalpna, KAHER'S Shri B.M Kankanawadi Ayurveda Mahavidyalaya, A Constituent unit of KLE Academy of Higher Education and Research, Belagavi 590 003 India

²Prof. Department of Rasashastra and Bhaishajyakalpna, KAHER'S Shri B.M Kankanawadi Ayurveda Mahavidyalaya, A Constituent unit of KLE Academy of Higher Education and Research, Belagavi 590 003 India

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*Corresponding author

E-mail: veenakupati@gmail.com

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ABSTRACT

Rasasindura is a herbomineral preparation mentioned in Chaturvidya Rasayana of Parada. It is one of the kupipakwa Rasayana commonly used in the practice. Rasasindura is prepared by mixing of equal quantity of Shodhita Parada (processed mercury) and Shodhita Gandhaka (purified sulfur) in kupi by Kramagni paka. It is either used as a single medicament or in the preparation of formulations. Rasasindura is having ample therapeutic indications to treat the diseases like prameha (diabetes mellitus), Jwara (fever), Mutragata vikara (urinary tract infection), Shwasa (respiratory infections), Rajayakshma (Tuberculosis), Kushtha (Leprosy) etc. It alleviates Vatadi dosha and increases longevity and vitality. Aim and Objective: To prepare Rasasindura. Objectives are to do shodhana of Parada, Gandhaka, and Preparation of Kajjali. Methodology: The drugs were selected according to grahya lakshanas and quantified by modern parameters. The Parada and Gandhaka shodhana, Preparation of Kajjali and Rasasindura were done according to the reference of Rasatarangini. Results: Rasasindura has shown classical characteristics like Suryodaya varna after 21 hours of heating. Kajjali pareeksha passed all classical parameters like Kajjalabha, Varitara, Unnama and Rekhapurnatva. Discussion: The preparation was completed in 21 hours. In classics the duration given is 12 hours, the variation may be due to fuel used in the preparation. The maximum temperature reached in the preparation was 602°C and copper test was positive in that temperature. Conclusion: From this study it can be concluded that prepared Rasasindura passed classical siddhi lakshana and yield was found to be more than 50%

Keywords: Parada, Gandhaka, Kajjali, Kupipakwa, Rasasindura

INTRODUCTION

Ayurvedic compound formulations are divided into two groups: Rasaushadhi (predominantly metals and minerals are used for preparation) and Kashthaushadhi (predominantly plant drugs are used for preparation). In general the term Aushadha means the conquest of disease in fact; it comprehends two important and vital aspects of medicine and therapeutics viz. **Preventive**-The promotion and preservation of health, strength and longevity in the swastha or the healthy person and **Curative**-The cure of the disease in the ailing and the afflicted.

According to Sarvadarshana Sangraha

“Na cha Rasashastram Dhatuvadartha meva iti manthavyam I
Dehaveda dwara muktareva parama prayojanatwat II”

Concept of Rasashastra in ancient classical text book shows the inclination in the usage of Parada towards Dhatuvada (converting lower metals into higher) and Dehavada (making body strong and immortal) which gradually turned its importance in chikitsa. For the purpose of chikitsa the concept of murchana¹ to Parada came into existence. Murchana is the most important process of Mercury in which Mercury is made to convert in such compound form which must possess disease destroying property.

Kupipakwa Rasayana is one of the Murchana bheda of Parada. It is considered as one of the distinctive pharmaceutical preparations. In this, medicament is prepared in a glass bottle

covered with 7 layers of kapadamitti (rags and mud). The formulation is prepared by Kramagni paka in a traditional furnace. Rasasindura is prepared by using Shodhita Parada (processed mercury) and Shodhita Gandhaka (purified sulfur), and due to its broad therapeutic index, it is used in several formulations as well as a single medicament in treating a many diseases.

Ayurveda Pharmacopeia prescribes Rasasindura as an effective medicine for various diseases like Prameha (diabetes), Pandu (anemia), Vata vyadhi (neurological disorders), Arbuda (tumour), Bhagandara (fistula in ano), Rajayakshma (tuberculosis), Kushtha (leprosy), mahajwara (fever), gulma etc. Rasasindura is having properties like Deha-Bala-Virya-vardhaka and Rasayana. It alleviates Vatadi Dosha, increases longevity and vitality².

The Rasasindura being used in diseases like Prameha (diabetes), Rajayakshma (tuberculosis), Jwara (fever), Kushtha (leprosy) etc provoked us to take the present study.

MATERIAL AND METHODS

Parada and Gandhaka were the major raw materials used in this study. These materials were purchased from GMP certified KLE Ayurved Pharmacy Khasbag, Belagavi and got authenticated from Central Research Facility, Shri. B.M.K. Ayurveda Mahavidyalaya, Belagavi by the subject experts and by Geology department, G.S. Science College, Belagavi.

Table 1: Material used during various pharmaceutical procedures

S.No	Procedure	Materials used
01.	Parada shodhana	Sudha churna, Rasona (<i>Allium sativum</i> .L) and Saindhava lavana
02.	Gandhaka shodhana	Godugdha and Goghrita
03.	Kajjali Bhavana	Vatankura

Schematic presentation of *Rasasinura* preparation

Purva Karma

Shodhana of Parada³ and Shodhana of Gandhaka⁴ were carried out as per classics. Kajjali was prepared. Initially Shodhita Gandhaka was taken in the khalwa yantra and made into fine powder. Then equal quantity of Shodhita Parada was added and mardana (Trituration) was done for 6 to 7 hrs daily⁵. Kajjali was taken in a Khalwa yantra, to this 200 ml of Vatankura swarasa was added and bhavana was given till the complete evaporation of liquid i.e. about 5 and 1/2 hrs. This samyak bhavita kajjali was dried in shade.

Preparation of kupi: Green colored glass beer bottle of 650 ml was taken. The bottle was washed and dried. A Cloth was cut into 3 different pieces, neck piece having shape of trapezoid and having a base measurement of 10 and 13.5cm, middle part is in rectangular shape of 25.5 x 18 cm and bottom part having a rectangular shape of 9.5 x 9.5. A cloth smeared with Multanimitti was covered in circle separately and was allowed to dry completely. After complete drying, another cloth smeared with Multanimitti, having same measurement was applied over the first layer. In this way 7 layers got covered over the surface of the bottle.

200 g of Vatankura swarasa bhavita kajjali was slowly filled in to Kacha kupi with the help of a funnel and a glass rod.

Valuka Yantra: A Loha patra (iron vessel) of conical shape with the measurement of 24cm height, circumference of 93cm at the top and 67cm at the bottom, which had a hole of 2cm at the centre of the bottom of the vessel, was taken. Over that hole which is present at the bottom of the Loha patra, 04 Abhraka patras were placed, over this a 02 angula of sand was spread evenly, then Kajjali filled Kupi was kept firmly and centrally. Remaining portion of the yantra was filled with sand of 17 kg up to the neck of the Kupi.

Pradhana karma

The Kajjali filled Kacha Kupi was kept in the Valuka yantra and was placed on the Gas. Pyrometer was placed in Valuka yantra next to the Kacakupi to monitor temperature. Temperature reading was carried out with the help of pyrometer with thermocouple for every 10 minutes. Kramagni tapa was maintained according to classical reference. For the first 3 hours

Mrudvagni was given i.e. temperature maintained between 100°C – 250°C. Next 3 and 1/2 hours Agni was gradually raised to 250°C-450°C i.e. Madhyamagni. Next 11 and 1/2 hours Tivragni was given i.e., temperature maintained between 450°C- 600°C and above. After getting Aushadhi siddha lakshanas, corking was done. After corking, again 3 hours of tivragni was given and apparatus was left for Swang sheetala. The whole procedure was completed in 21 hours. After complete cooling of the Valuka Yantra, surrounding sand of the Kupi in Valuka Yantra was carefully removed and then Kupi was removed.

Paschat karma

Breaking of kupi: The mud smeared cloth layers of the Kupi were scrapped out with a knife. A jute thread dipped in kerosene was tied to the Kupi below the level of sublimated product and ignited. When the whole thread gets burnt off, wet cloth was wrapped around that. The bottle got broken into 2 equal halves with a breaking sound. From the neck region Sindura was scraped and collected in a clean glass bowl.

RESULTS AND DISCUSSION

Table 2: Ingredients required for Parad shodhana

Sl. No.	Ingredients	English/Latin name	Part used	Quantity
01	Parada	Mercury (Hg)	whole	495 g
02	Sudharaja	Lime (Ca(OH) ₂)	whole	495 g
03	Saindhava	Salt (NaCl)	whole	210g
04	N.lashuna	<i>Allium sativum</i> Linn.	Bulbs.	425 g

Table 3: Organoleptic features of Parada before and after shodhana

SI No.	Features	Before shodhana	After shodhana
01	Color	Silvery white	Silvery, bright white
02	Touch	Soft and cold	Soft & cold
03	Odor	Odorless	Odorless

Table 4: Yield of Parada

Parada shodhana	Initial wt of Parada	Wt of Parada after shodhana	Loss	Parada obtained in %
	495 g	420 g	75 g	85.71%

Table 5: Observations during Gandhaka Shodhana

Procedure	Weight of Gandhaka (gm)		pH of Godugdha		Temperature (°C)	
	Before	After	Before	After	Before	After
01	500	600	6.03	6.23	112	120
02	600	518.8	6.05	6.35	113	123
03	518.8	489.2	6.2	6.21	115	123

Table 6: Observation before and after Gandhaka Shodhana

Particulars	Before Shodhana	After Shodhana
Smell of milk	Sweetish smell	Smell of Sulphur
Colour of milk	Yellowish White	Yellow
Colour of Sulphur	Dark Yellow	Pale yellow

Table 7: Yield of Gandhaka

Gandhaka shodhana	Initial wt of Gandhaka	Wt of Gandhaka after shodhana	Loss	Gandhaka obtained in %
	500 g	434.6 g	65.4 g	86.92

Table 8: Phases of Kajjali during preparation

Hours	Observations
After 0 hours	Parada + Gandhaka
After 10 minutes	Parada seen in smaller particles
After 30 minutes	Parada was completely mixed with Gandhaka
After 1 Hour	Colour changed into greenish black
After 4 Hour	Blackish colour with shiny particles
After 14 Hours	It became soft
After 28 Hours	Black in colour and Khara(Rough) to touch
After 35 Hours	Dark black colour and Nirdhumatva were seen
After 50hours	Slightly Rekhapurnatha and Slakshnatha
After 65Hours	Attained Rekhapurnatva and Slakshnatva
After 70 Hours	Varitara and Unnama tests were positive
After 75 Hours	Nischandratva was observed
After 79 Hours	Showed completion of Kajjali Lakshanas.

Table 9: Physical properties of Kajjali

Colour: Black	Odour: Sulphur
Form: Fine Powder	Touch: Soft and Smooth
Taste: Tasteless	Appearance: Anjana Sadrasha

Table 10: Observations during the preparation of Rasasindura

Date	Time	Temperature	Observations
30/01/2014	03.00 am	22°C	Agni started
	03.10 am	71°C	No fumes were observed
	04.00 am	138°C	Slight white fumes were observed.
	04.30 am	203°C	Slight white fumes observed & sulphur smell was present.
	05.05 am	233°C	Sheeta Shalaka was inserted; Kajjali started melting. Dense white fumes were present.
	05.22 am	242°C	Bottom of Kupi was not seen, as there was a dense white fume of melted Kajjali.
	06.00 am (3 Hrs)	250° C	Thick white fumes.
	06.30 am	272° C	Kajjali not completely melted, sticking to the sheeta Shalaka.
	06.45 am	291° C	Slight yellowish fumes were present
	07.10 am	336° C	Kajjali started to boil, Sulphur fumes were present. Yellow thick powder sticked to the sheeta shalaka.
	07.20 am	353° C	Deposition of yellow powder at the neck of the Kupi.
	07.30 am	375° C	Thick yellow fumes & deposition of yellow powder at the neck of kupi.
	07.45 am	380° C	Thick yellow fumes were observed
	08.00 am	400° C	A thick yellow fume, bottom of the Kupi was not seen.
	08.15 am	411° C	Thick yellow fumes
	08.45 am	428° C	Sheeta Shalaka was inserted, Kajjali melted completely.
	09.15 am	443° C	Accumulation of yellow powder at the neck
	09.30 am (3½ Hrs)	450° C	Boiling of the Kajjali started
	09.45 am	460° C	Hot shalaka was inserted and cleared the neck of the Kupi
	11.00 am	472° C	Boiling of the kajjali
	11.15 am	500° C	Thick yellow fumes were seen, cleaned the neck of kupi
	12.30 pm	538° C	Through torch light, seen dense fumes of Sulphur. We can appreciate the red colour liquid at the bottom of the Kupi.
	01.30 pm	544° C	Hot shalaka inserted to clean the neck of kupi
	02.00 pm	544° C	Hot shalaka inserted to clean the neck of kupi
	03.15 pm	556° C	Hot shalaka inserted to clean the neck of kupi
	04.00 pm	570° C	Hot shalaka inserted, Blue flame seen up to the neck of the kupi
	06.00 pm	564°C	Hot Shalaka inserted, Flame raised about 2cm.
	06.30 pm	575°C	Hot Shalaka inserted, Flame raised about 3-4cm. Slight suryodaya varna was observed
	07.30 pm	582°C	Hot shalaka inserted to clear the block of the kupi
	07.45 pm	586°C	Flame at the neck of Kupi stopped
	08.00	590°C	Sindura test was positive
	08.30 pm	602°C	Copper coin test was + ve. Gas made slow to reduce temperature. Surrounding sand was removed
	09.00 pm	525°C	Corking was done. Tivragni was given for another 3 hours.
	12.00 am	520°C	Tivragni was stopped and allowed for self cooling

Graph 1: Temperature graph during preparation of Rasasindura

PARADA SHODHANA

1. Parada Sanskara

2. Ashodhita Parada

3. Sudha choorna

4. Parada adding to Khalva

5. Parada with Sudha

6. Shodhita Parada

7. Parada, Rasona kalka and Saindhava lavana

8. Mardana in Rasona kalka

9. Shodhita Parada

GANDHAKA SHODHANA

10. Ashodhita Gandhaka

11. Gandhaka and Ghrita

12. Shodhita Gandhaka

KAJJALI NIRMANA

13. Sh. Parada and
Sh. Gandhaka

14. Kajjali

15. Vatankura

16. Vatankura swarasa

17. Vatankura swarasa
bhavana

18. Vatankura swarasa
bhavita Kajjali

19. Kupa nirmana

20. Kupa

RASASINDURA NIRMANA

21. Filling of Kajjali

22. Abhrakapatra in Valuka yantra

23. Placing Kupa in Valuka yantra

24. Valuka yantra

25. Fumes of Gandhaka

26. Red hot shalaka insertion

27. Kupi Mudrana

28. Swangashitita kupi

29. Kupi Breking

30. Rasasindura

31. Rasasindura(Powdered)

Preparation

Selection

Various samples were collected for the preparation of Rasasindura. Among those samples, whichever sample suitable for Grahya lakshanas that one was collected for preparation. Parada was collected by seeing Galad roupya nibham (melted silver), Antah sunil (bluish color inside) and shiny. The percentage of Hg in Parada was 85.80. The dhusara varna Parada was rejected for the preparation. Gandhaka was selected according to the grahya lakshanas like Amalasara, snigdha (oleaginous), masruna (soft). The percentage of sulphur in Gandhaka was 89.93.

Pharmaceutical

Parada shodhana in sudha churna has shown more loss compared to Rasana kalka i.e 75 g. Difficulty was faced in the separation of Parada from sudha churna, it may be because of complete mixing with Sudha churna. Prakshalana was completed after 5 days. After the end of shodhana 85.71% of Parada was collected. Gandhaka shodhana was done and 86.92% was collected.

Kajjali was prepared by using samaguna Parada and Gandhaka for 79 hours to get siddhi lakshanas. The duration taken to get siddhi lakshanas was more, may be due to less pressure while triturating. Total loss seen was 29.2 g may be because of dusting of Kajjali while triturating. After attaining siddhi lakshanas Kajjali was triturated with vatankura swarasa for one day, there was significant increase in the weight of Kajjali i.e. 25.8 g may

be because of solids present in the Vatankura swarasa. Bhavita Kajjali was dried and used in the preparation.

Rasasindura was prepared by using valuka yantra in kramagni paka by placing Abhraka patra to maintain the temperature. The preparation was completed in 21 hours. In classics, the duration given is 12 hours; the variation may be due to fuel used in the preparation. The maximum temperature reached in the preparation was 602⁰ C and copper test was positive in that temperature. After Siddhi lakshanas, kupi was corked and teevragni was given. Rasasindura was collected by breaking kupi by tying thread soaked in kerosene and burnt as it helps in the breaking with soft edges. The yield of Rasasindura was 51.3 percentages. Rasasindura was then stored in chemically inert airtight container.

CONCLUSION

From this study it can be concluded that prepared Rasasindura passed classical siddhi lakshanas and yield was found to be more than 50%

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