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A PHARMACEUTICAL STUDY ON GANDHAMRUTHA RASA

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ABSTRACT

Rasa Shastra is an important branch of *Ayurveda* which deals with the use of metallic and mineral drugs which are pharmaceutically processed and rendered fit for internal administration. These are known as *Rasa Oushadis*. The word *Rasa Shastra* literally means the "science of mercury". Knowledge of *Rasa* has been in existence from the time immemorial. Exploration of natural resources for the benefit of human beings is the object of this therapy. Medieval period can be treated as a golden age for the development of this science. It is recognized as a medical science with an independent philosophical background in 14th century. *Rasa Oushadhis* have faster action in smaller doses, quicker assimilation, excellent therapeutic values, longer shelf life.[1] The present study is concerned with the immunomodulatory action of one among the herbo-mineral preparation called *Gandhamrutha Rasa*,[2] explained in the classical text *Bhaishajya Ratnavali*, which has indication of eradication of *Jara* and *Akala Mrityu*.[3] It contains *Rasa Sindura*, *Shudha Gandhaka* and *Ghrutha Kumari*.[4]*Rasa Sindura* is a herbo-mineral preparation containing *Shudha Parada*, *Shudha Gandhaka* and *Vatankura Swarasa*.[5] *Rasa Sindura* comes under *Kupipakwa Rasayana*[6] mentioned in *Rasa Tarangini*. *Shudha Parada* is being extracted from *Hingulotha Parada*,[7] mentioned in *Rasa Tarangini*, which has properties similar to *Ashta*

Samskritha Parada.[8] *Shudha Gandhaka* is obtained through *Kurma Puta* method mentioned in *Ayurveda Prakasha*[9] Till now no study has been conducted on *Gandhamrutha Rasa*, so this study aims to prepare *Gandhamrutha Rasa*.

KEYWORDS: *Gandhamrutha Rasa, Rasa Sindura, Hingulotha Parada.*

INTRODUCTION

Gandhamrutha Rasa is a traditional Ayurvedic herbal-mineral formulation mentioned in the *Vajikarana Adhyaya* of *Bhaishajya Ratnavali*. Despite its traditional use, no scientific study has been conducted on this formulation. This study aimed to evaluate the pharmaceutical, analytical, and immunomodulatory properties of *Gandhamrutha Rasa*.

METHODS

The study involved the preparation of *Gandhamrutha Rasa* using traditional Ayurvedic methods. The Pharmaceutical production of *Rasa Sindura* and the formulation was prepared with Rasa Sindura and *Gandhaka,* using *Gritha Kumari Swarasa* as the *Bhavana Dravya*.

METHODOLOGY

The present study involved the preparation and purification of various Ayurvedic substances, including *Gandhaka, Hingula, Parada, Rasa Sindura,* and *Gandhamrutha rasa.* The following procedures were employed:

Hingulotha Parada and *Gandhaka Shodhana*.

For *Rasa Sindura* preparation, *Kacha Kupi* method.[10]

Rasa Sindura and *Shudha Gandhaka* is made into *Kajjali.*[11]

Then it is subjected to *Bhavana*[12] with *Ghrutha Kumari Swarasa.*

Subjected *to Laghuputa*[13] after making it into *Chakrika and Bhasma* is obtained.[14]

Gandhaka Shodhana Kurmaputa

Gandhaka (500g) was powdered and spread over a cloth tied around the mouth of a mud vessel containing 1 liter of milk. The vessel was sealed with another mud vessel using seven layers of *Sandhibandhana* and heated for a specified period.

Hingula Shodhana

Hingula (300g) was powdered and subjected to a 24-hour grinding process (*Mardana)* with lemon juice. The resulting powder was shaped into uniform tablets (*Chakrikas).*

AHingulotha Parada

Purified *Hingula* (323g) was placed in a lower pot, sealed with another pot using seven layers of *Sandhibandhana*, and heated for a specified period. The adhered *Parada* was scraped off, filtered, and collected.

Hingulotha Parada Shodhana

Purified *Parada* (104g) underwent trituration with *Haridra Churna* (6.32g), *Saindhava (*6.32g), and *Nimbu Swarasa* for 48 hours.

Kajjali Nirmana

Shudha Parada (91g) and *Shudha Gandhaka* (91g) were combined and subjected to rigorous grinding and mixing (*Mardana*) until a uniform jet black color was attained.

Kajjali Bhavana with Vatankura Swarasa

Kajjali (165g) underwent Mardana with *Vatankura Swarasa* (40ml) for 3.5 hours.

Rasa Sindura Preparation

Bhavita Kajjali (160g) was filled into a *Kacakupi*, sealed, and heated for a specified period. The resulting *Rasa Sindura* was collected, triturated, and stored.

Bhavana* of *Rasa Sindura* and *Shudha Gandhaka* with *Kumari Swarasa

Rasa Sindura (66g) and *Shudha Gandhaka* (132g) underwent *Mardana* with *Kumari Swarasa* (70ml) for 4 hours.

Chakrikarana* for *Laghu Puta

The *Bhavita* mixture was rolled and compressed into uniform *Chakrikas.*

Laghu Puta

The *Chakrikas* were arranged in a *sarava*, sealed, and heated for a specified period. The resulting *Gandhamrutha Bhasma* was collected and preserved.

These procedures were performed with utmost care and attention to detail to ensure the quality and efficacy of the prepared substances.

RESULTS AND OBSERVATIONS

1. Gandhaka shodhana

The purified *Gandhaka*, now in granular form, had settled at the bottom of the lower vessel, mingling with the milk. This *Shudha Gandhaka* was collected, thoroughly washed, dried, and stored for future use.

Table 1: Showing temperature of *gandhaka shodhana.*

Time	Temperature in degree celcius
1:30 pm	37.3
1:40 pm	83.5
1:55 pm	275
2:05 pm	286
2:15 pm	255
2:25 pm	196
2:35 pm	155
2:45 pm	146
3:00 pm	110.2
3:15 pm	70.5
3:25 pm	53.8
3:35 pm	47
3:45 pm	45.1
3:55 pm	43
4:05 pm	40
4:15 pm	38

Table 2: showing results of *gandhaka shodhana.*

Ashudha gandhaka	Milk	*Vanopala*	*Shudha gandhaka* obtained	Loss %
500 g	1 litre	1916 gm	489 gm	2.2

2. *Hingula shodhana*

Colour of *hingula* changed from a deep red to a brick red when *nimbu swarasam* was added. After the *nimbu swarasam* was dried off, *swarasam* was added in frequent intervals.

Table 3: Showing results of *hingula shodhana.*

Name of the sample	Wt before *shodhana*	Wt after *shodhana*	Amount of *nimbu swarasam*	Colour at the end of *shodhana*
Ashudha hingula	300 gm	323 gm	90 ml	Brick red

3. *Hingulotha parada*

During *urdhwa patana*, a characteristic smell was felt during the procedure.

Wide range of temperature difference was noted between the lower pot and upper pot.

During collection, *parada* appeared as grey coloured ash inside the upper pot.

Table 4: showing results of *hingulotha parade*.

Wt of hingula	Wt of obtained *parada*	% of loss	Colour	Appearance of *parada*
302 gm	104 gm	75%	Silver white	Liquid, shining

4. *Hingulotha parada shodhana*

After few hours of trituration, colour of *haridra* changed to green gram colour.

Parada started to disintergrate within ½ hours of trituration.

Till the addition of *nimbu swarasa*, disintegration was not complete and some amount of *parada* remained as large globule.

After the addition of *nimbu swarasa*, *parada* has remained as fine globules till the completion of *mardana*.

Table 5: Showing results of *hingulotha parada shodhana*.

Wt of *parada* before *shodhana*	Wt of *parada* after *shodhana*	% of loss	Colour	Appearance
104 gm	91 gm	12 %	Silver white	Liquid and shining

6. *Kajjali nirmana*

Table 6: showing observations of *kajjali*.

Features	Time
Parada turned into fine globules	5 minutes
Colour of the mixture changed to light greyish yellow	20 minutes
Mixture turned to grey colour	45 minutes
Globules of *parada* completely disappeared	1 hour
Colour of mixture turned to blackish grey	4 hours
Mixture turned to black colour	7 ½ hours
Rekhapoornatvam	10 hours
Varitaratvam	11 hours
Nischandratvam	95 hours

Table 7: showing results of *kajjali*.

Initial weight	Obtained weight	Loss %	Colour	Consistency
182 gm	165 gm	9.3	*Kajjalabha*	Fine powder

7. Kajjali bhavana with *vatankura swarasa*

Mardana was started after adding *swarasa*, till the *kajjali* was soaked.

After 5 minutes, *kajjali* was completely mixed with *swarasa* with a liquid consistency. *Mardana* was smooth without friction, as liquid content was high.

After 45 minutes, on continuous *mardana*, the liquid content was observed to be reduced.

After 2 hours, the mixture was observed to be thicker and on *mardana* slight friction was observed.

After 3 hours 20 minutes, the *bhavita lakshanas* were observed and the *bhavana* was stopped and was kept for drying.

Table 8: showing results of *kajjali mardana* with *vatankura swarasa*.

***Kajjali* taken**	***Swarasa* taken**	***Kajjali* before drying**	***Kajjali* after drying**	**Loss %**
165 gm	40 ml	182 gm	160 gm	4

8. Rasa sindura

Table 9: showing observation of *rasa sindura*.

Parameters	**Time**
Slight white fumes	1 hour 30 minutes
Dense white fumes	3 hours
Characteristic smell of *gandhaka*	4 hours 30 minutes
Yellow fumes	5 hours
Sheeta shalaka sanchalana (kajjali started to melt) *madhyamagni* initiated	5 hours and 30 minutes
Tatpta shalaka sanchalana (blue flame observed)	10 hours and 30 minutes
Blue flame observed	18 hours and 30 minutes
Blue flame was diminished	21 hours
Corking done (*teevraagni* initiated)	22 hours
Fire lit off	25 hours

Table 10: showing results of *rasa sindura*.

***Kajjali* used**	**Fuel**	**Time**	**Obtained *Rasa sindura***	**Yield %**
160 gm	35 kg	25 hours	66 gm	41.25 gm

9. *Bhavana* of *rasa sindura* and *gandhaka* with *kumari swarasa*

After 3 minutes of *mardana*, whole mixture was soaked in the *swarasa*.

Mardana was smooth, water like consistency.

After 45 minutes, consistency of loose paste.

After 1 hour 30 minutes, the mixture turned to a cream like consistency.

After 3 hours, stickiness reduced but not able to make *varti* (*bhavita lakshana* not attained).

After 4 hours and 30 minutes, the mixture was able to be rolled into *varti* and smooth (*bhavita lakshana* attained).

Table 11: showing results of mardana of *rasa sindura* and *gandhaka* with *kumari swarasa.*

Weight after *bhavana*	Gain	Gain %
240 gm	42 gm	17.5

10. *Chakrikarana* for *laghuputa*

Table 12: showing results of *chakrikarana* for *laghu puta.*

Total *chakrikas*	Weight before drying	Weight after Drying	Total weight	Loss %
62	4 gm	3.5 gm	218 gm	10

11. *Laghuputa* (*Gandhmarutha rasa* preparation)

After cooling, the *sarava* was carefully opened by removing the sealing *Multani mitti*. The contents were then revealed, yielding *Gandhamarutha Rasa* in the form of a grey-colored ash. This transformative process, facilitated by controlled heat and atmospheric conditions, had successfully converted the *Chakrikas* into a potent, bioavailable *Bhasma.* The resulting grey ash was carefully collected and preserved for future therapeutic applications; its efficacy enhanced by the rigorous preparation process.

Table 13: showing results of *laghu puta.*

	Total *Chakrikas*	Total weight	Total *vanopalas*	Weight of *vanopalas*	Obtained *Bhasma*	Obtained %
Sample A	17	59 gm	8	1197 gm	13 gm	22%
Sample B	17	59 gm	8	983 gm	12 gm	20%
Sample C	16	56 gm	8	968 gm	14 gm	24%

DISCUSSION

The study demonstrates the pharmaceutical processing of *Gandhamrutha Rasa*, explained as a *rasayana* in Ayurvedic medicine with the practical aspects of the steps involved in it.

CONCLUSION

According to conceptual study, *Gandamrutha rasa* possesses *prabhava* due to its materialist combination during pharmaceutical processing. *Prabhava* remains the highest in hierarchy of pharmacological action of a drug. As *rasadravyas* find its utility in *asadhya rogas*, *Gandhamrutha rasa* has the potential to cure *akalamrityu.*

Pharmaceutically *Gandamrutha rasa* can be prepared from commonly available ingredients- *parada, gandhaka, ghrutha kumari*. It is a *bhasma* and the process involved here makes the medicine potent. *Hingulotha Parada* is done by the method mentioned in *Rasa Tarangini* and *gandhaka sodhana* by *kurmaputa* method. The *rasa sindura* is made as *kupipakva rasayana* for the final product. The final process of *Gandhamrutha rasa* is the processing of *rasa sindura* and *shudha gandhaka* levigated with *ghritakumari swarasa* and subjected for *laghuputa* and the *Bhasma* is obtained. The medicine should be satisfied with the *pareekshas* like *varitaratwa, unnama, rekhapurnatwa, nischandratwa* etc.

Further research is necessary to fully elucidate the mechanisms underlying *Gandhamrutha Rasa*'s immunomodulation and to explore its clinical applications.

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