

## PHARMACEUTICO-ANALYTICAL STUDY OF VARATIKA BHASMA WITH SPECIAL REFERENCE TO ITS TYPES ACCORDING TO RASATARANGINI

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### ABSTRACT

Varatika bhasma is an Ayurvedic calcined medicinal form used to treat abdominal pain, irritable bowel syndrome, bloating, duodenal ulcer and loss of appetite etc. It is mentioned in Rasatarangini based on its colour. These are Peeta (yellow), Shweta (white) and Dhusara (grey). Among these peeta color is considered as best, shweta as medium and dhusara as lower, but the texts are unable to give any explanation in this regard. With the help of Analytical method, quality of Varatika bhasma can be determined. In the present study, Varatika bhasma was prepared by classical method, analyzed for different Physico-Analytical test, NPST and XRD. The analytical reports comparatively informed insignificance difference, so all three coloured varatika can be used for treatment aspect. The quality of comparison might be the presences of pharmaceutical properties (Rasapanchaka) are in variable state.

**Keywords:** Varatika bhasma, Peeta, Shweta, Dhusara, NPST, XRD

### INTRODUCTION

Varatika (Kaparda) is one of the Rasadravya, explained in Rasashastra and it is described as external shell of sea animal *Cypramoneta* linn,<sup>1</sup> it is occurring in the coastal area of sea and collected by fishermen. These collected animals are dipped in boiled water the fishy portion is taken out. At the same time remained shell is collected and called as varatika. Since ancient days varatika is used for playing as well as for medical purposes. Wearing the varatika is practiced for the treatment of Balagraha (a seizer of children, a kind of demon) and also it is used as necklace form to wear over domestic animal's neck, therefore in Pharsi it is known as Kharmohara.<sup>2</sup> In Rasa Karma (alchemical procedures) varatika bhasma is used to prepare bidravaya for the attainment of perfection in preparing noble metals like gold and silver.<sup>3</sup> There are more than 150

kinds of Cowries. Some kinds are extremely rare and very costly.<sup>4</sup> Among three variety of varatika, dhusara and shweta were cheaper and easily available in market in comparison to peeta, the excellence of each variety is different. Hence the present study was carried out to know pharamaceutico-analytical property of three types of varatika in relation to its colour.

### Objectives:

- 1.Preparation of three varieties of Varatika bhasma.
- 2.Comparative Physico-Chemical analysis of Varatika bhasma.

### MATERIALS AND METHODS

#### Source of Drug:

Peeta, Shweta and Dhusara types of varatika were collected from Kanyakumari, and Kulattha seeds were purchased from local market, both were authenticated by Rasa Shastra and Dravyaguna department of Shri J. G. C. H. Ayurvedic Medical College

Ghataprabha, respectively.

**Pharmaceutical source:**

Shodhana and Marana for all variety have been carried out in Pharmacy of Shri. J. G. C. H. Ayurvedic Medical College, Ghataprabha.

**Analytical source:**

Were carried out at Rasa Shastra department of J.G.C.H. Ayurvedic Medical College and Shikshana Prasarak Mandal's, Late Prin. B. V. Bhide Foundation and Research in

**Weight change after Shodhana**

Table No 1: Weight of Varatika before and after Shodhana

Sl. No.	Varatika Shodhana	Weight ( g )		
		Sample A	Sample B	Sample C
1.	Weight of Varatika before Shodhana	500	500	500
2.	Weight of Varatika after Shodhana	498	499	496
3.	Weight loss after Shodhana	2	1	4

**Shodhana of all three Varatika:-<sup>6</sup>**

The varatika were well washed, put into cloth and tied with thread to prepare Pottali. This pottali was tied with stick / Rod and suspended in dholayantra. This dholayanta was filled with Kulttha kwatha for swedana process on mandagni (mild heat) maintained for three hours.

**Marana of all three Varatika:**

Gajaputa<sup>7</sup> having 1000 vanopalas (Cowdung cakes) with appropriate size were given to sample A (peeta), B (shweta), C (dhusara). The purified varatika were kept in sharava and is covered with inverted sharava of similar kind. The joint is wrapped with wet cloth smeared with clay and dried.

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**Preparation of Kulattha Kwatha:<sup>5</sup>**

Coarse powder of 4 kg of Kulattha seeds were boiled with 64 liters of water till liquid portion reduced to 1/8<sup>th</sup> (i.e. 8 liters). The kwatha was strained by cloth and used for shodhana process.

Cowdung cakes were filled half of the gajaputa pit and sharava samputa were kept at the centre of the heap of cowdung cakes, remaining half portion of pit was covered by cowdung cakes and subjected to fire. The temperature of the gajaputa was recorded by Infrared thermometer. Sharava samputa was collected after cooling. After 1<sup>st</sup> gajaputa, bhasma was possessed no accuracy, so that 2<sup>nd</sup> gajaputa was conducted.

**OBSERVATION & RESULTS**

After the Shodhana and marana for all three samples A, B and C were subjected to various parameters like organoleptic, NSPT, XRD and analytical results are shown in the following tables.

**Organoleptic characters:**

Table No 2: Showing organoleptic characters of varatika bhasma after 2<sup>nd</sup> gajaputa

Sl. No.	Parameters	Observation		
		Sample A	Sample B	Sample C
1.	Colour	Slightly Dull White	Slightly Dull White	Slightly Dull White
2.	Appearance	Smooth Fine Powder	Smooth Fine Powder	Smooth Fine Powder

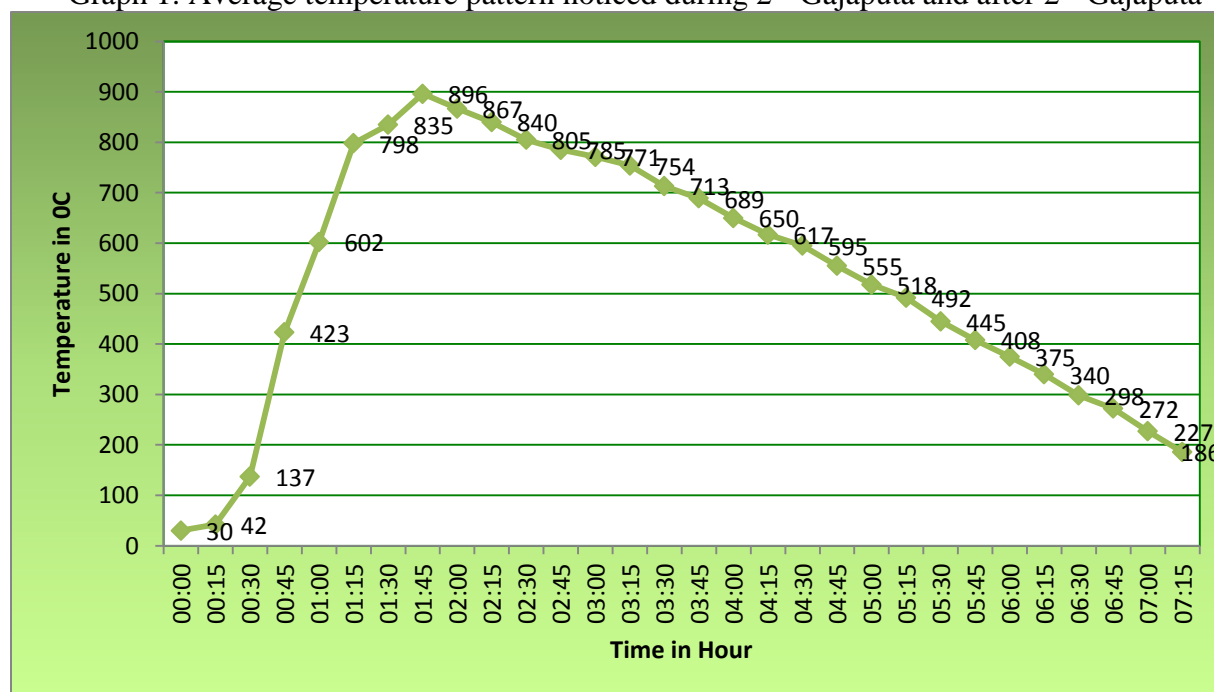
3.	Taste	Tasteless	Tasteless	Tasteless
4.	Odour	Indistinct	Indistinct	Indistinct
5.	Touch	Smooth	Smooth	Smooth

**Average Temperature pattern:**

The temperature was recorded at regular interval of 15 minutes right from the beginning to till the self-cooling. The average temperature peak noticed was 899<sup>o</sup>C and 896<sup>o</sup>C during the 1<sup>st</sup> and 2<sup>nd</sup>

gajaputa respectively and maintained for 1 hour. The total time durations required for burning of gajaputa was 9 hrs and total time required for complete burning and self-cooling was 26-27 hours.

Graph 1: Average temperature pattern noticed during 2<sup>nd</sup> Gajaputa and after 2<sup>nd</sup> Gajaputa



**Classical Chemical Results:**

Table No 3: Showing Classical Chemical Results of Varatika Bhasma (2<sup>nd</sup>Gajaputa)

Sr. no.	Parameters	Sample A	Sample B	Sample C
1.	Rekhapurnatwa	+ ve	+ve	+ve
2.	Sukshmatwa	+ve	+ve	+ve
3.	Shlakshnatwa	+ve	+ve	+ve
4.	Niswadutwa	+ve	+ve	+ve

**Analytical Results:**

Table No 3: Showing Analytical results of Varatika Bhasma (2<sup>nd</sup>Gajaputa)

Sr. No.	Parameters	Sample A	Sample B	Sample C
1.	p <sup>H</sup>	10.08	10.30	10.22
2.	Calcium content	20.76 %	18.90 %	22.10 %
3.	Magnesium Content	7.32 %	6.98 %	7.08 %
4.	Potassium Content	4.60 %	4.22 %	4.76 %

5.	Moisture content	4.18 %	6.52 %	5.46 %
6.	Ash content	95.60 %	94.82 %	97.43 %
7.	Acid Insoluble Ash	1.24 %	1.61 %	1.30 %
8.	Water Insoluble Ash	92.29 %	90.29 %	95.66 %

**Namboori Phased Spot Test (NPST):**

This test is chemical reaction based, with specific results for specific bhasma. Easily differentiate by the pattern formed over the

whatman paper. In the Varatika bhasma samples shows similar pattern on whatman paper.

Table No 4: showing NPST Observation of Varatika Bhasma (Sample A, B, & C)

Sr. No.	Stages	Observation		
		Sample A	Sample B	Sample C
<b>Heat Treatment</b>				
1.	Liberation of fumes	Nil	Nil	Nil
2.	Odour	Charred +	Charred ++	Charred +
3.	Change of colour	Light Brown	Light Brown	Light Brown
<b>Wet Treatment</b>				
1.	Exothermic/Endothermic	Slightly Exothermic	Slightly Exothermic	Slightly Exothermic
2.	Colour of solution	Slightly Brownish	Slightly Brownish	Slightly Brownish
3.	Adsorption	Normal	Normal	Normal
4.	Setting Time	Rapid	Rapid	Rapid
<b>NPST Observation</b>				
1.	Phase-1 (0-5 Min )	Wet periphery forms followed by a thick grey circle in the centre of the spot. But wet spot was not much wide.		
2.	Phase-2 ( 5-20 Min )	Wet periphery faded with reduction in the brightness of grey circle.		
3.	Phase-3 ( 20 Min-1 Day)	Grey colour faded away with reduction in the thickness of ring and became slightly yellowish on the other day.		

**1) Phase 1<sup>st</sup> :**

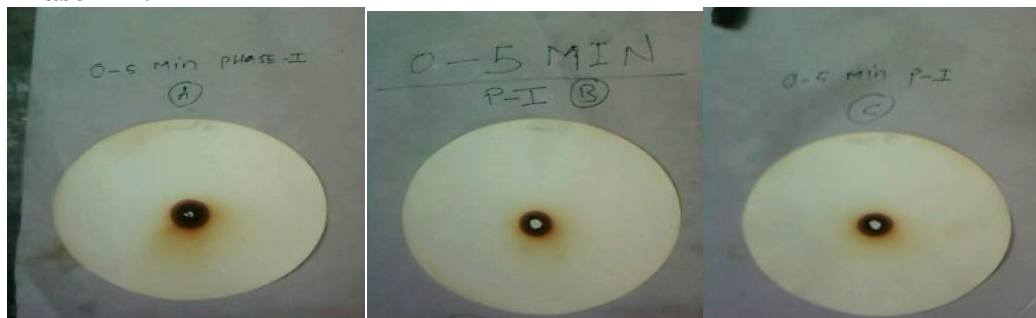


Fig 1

Fig 2

Fig 3

2) Phase 2<sup>nd</sup> :

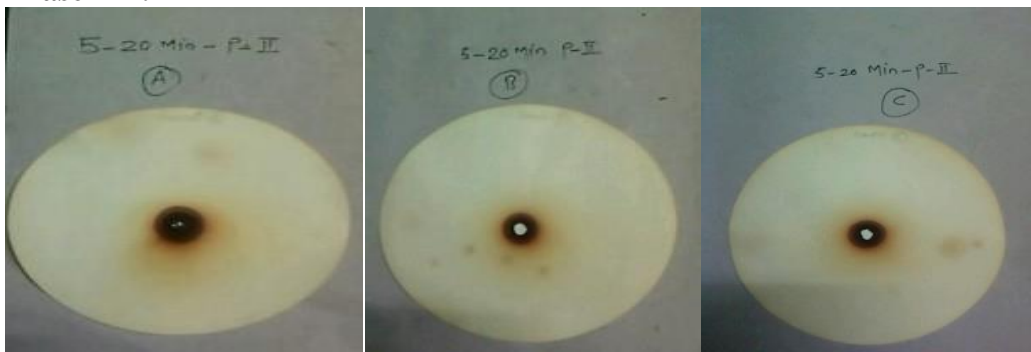


Fig 1

Fig 2

Fig 3

3) Phase 3<sup>rd</sup>:



Fig 1

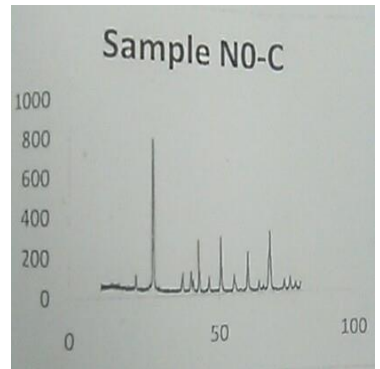
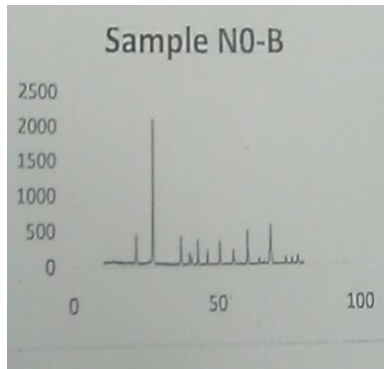
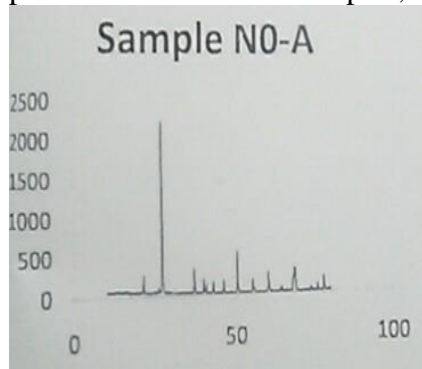
Fig 2

Fig3

**XRD Analysis of Varatika Bhasma:**

X-ray diffraction is used to identify the crystalline matters of the metals and minerals.<sup>9</sup> XRD analysis showed the highest peak at 2000 in two samples, indicates the

majority presence of Calcium oxide. However there is some signature of presence of Calcium carbonate and also showed the presence of Magnesium and Potassium oxide in some extent.



### Raw material Varatika:



Sample A (Peeta)

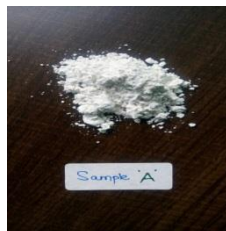


Sample B (Shweta)



Sample C (Dhusara)

### Bhasma obtained after 2<sup>nd</sup> Gajaputa



### DISCUSSION

Classical chemical parameters of three samples were not acquired the quality of bhasma in 1<sup>st</sup> gajaputa, so all three samples were subjected to 2<sup>nd</sup> gajaputa. Thereafter classical parameters have showed accuracy of bhasma. This indicated fineness in particle size, lightness so that it can easily digestible, due to this property it becomes soft, faster in action and minute form so that can easily penetrate the cell membrane. Color of samples were slightly dull white color, smooth and soft to touch, indistinct smell and tasteless. pH was found no significant difference. There was higher pH indicating higher acid neutralizing capacity needed to treat Parinama shoola<sup>10</sup> (Duodenal Ulcer). Calcium content has shown no significant difference so it can be better used for medicinal purpose for bone formation. Magnesium and Potassium are found in reasonable amount with no significant difference. Magnesium regulates and maintains enzyme activity energy

production, ATP binding property, helpful in mineral balancing cell life.<sup>11</sup> Potassium regulates the water balance and the acid – base balance in the blood and tissues.<sup>12</sup> Moisture content determined that there was no significant difference. Total Ash Content was formed to be high which indicates presence inorganic matter. Acid insoluble ash value has showed no significant difference. Water insoluble ash Value has shown no significant difference. NPST analysis reported similar pattern on whatman paper, there were no major changes, the reason may be that it is quantitative test and indicates the presence of substances. XRD analysis of bhasma showed sharp peak, which indicates substances is well crystalline in nature. The peak intensity is varied due to the influence of shodhana and marana process. The peak corresponds to 2 theta has seen in samples of XRD pattern, shown that peak height is high in sample A than sample B and C. Crystalline form of varatika bhasma

suggested well reduction in particle size, which facilitate absorption and assimilation in the physiological system.

### CONCLUSION

Analytical methods reported that all three samples displayed approximately similar properties. Altogether results informed that three samples of Varatika bhasma having insignificant differences. Hence all can be used for treatment purposes. Further works needs to evaluate the extent of absorption and intrinsic effects at tissue/cellular level of these bhasmas on various experimental models.

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