

## ***A Physico-Chemical Analysis of Nishkabhara Variety of Varatika Bhasma***

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### ***Abstract***

*Rasa literature is taken up and studied from physico -chemical analysis of varatika bhasma. Varatika is the external shell of sea animal Cyprea monneta linn. Chemically Varatika is identified as Carbonate of Calcium. Varatika Bhasma was prepared as per standard classical methods. Chemically analysed at the final product of Nishkabhara variety varatika. Analyses were carried out employing sophisticated instrumentation techniques such as XRD, NPST and Physico - chemical standards were determined for Nishka bhara variety of varatika. The data of the results of the prepared sample are discussed in this papered.*

***Keywords: Shodhana, Bhasmikanana, Bhasma pariksha.***

### **INTRODUCTION**

Bhasmas are unique formulations belonging to Ayurveda a leading and popular traditional Indian system of medicine. This group of medicines can work even in smaller doses and may even control incurable diseases effectively. Bhasmas essentially contain minerals and metals as integral part of formulations and used after adopting proper purification

process employing various purifying agents. Theses detoxification processes remove the toxic potentials from minerals and metals and impart a very high grade therapeutic efficacy. It is very clear and evident from long history of usage of herb mineral and metallic preparations in Ayurveda and Siddha medical system that properly processed herb mineral preparation can contribute significantly to

the health care of the society. To understand the science involved in the purification processes a simple preparation Nishkabhara variety Varatika Bhasma was selected and studied. Varatika, is categorized under Sadharana Rasa vargal and also under Sudhavarga by Rasa scholars.

Varatika is identified as the external shell of sea animal *Cypraea moneta* linn. It occurs in the coastal areas of the sea. *Cypraea moneta*, commonly known as the money cowry, because the shells were historically widely used in many Pacific and Indian Ocean countries as a form of exchange. Chemically, Varatika is identified as Carbonate of Calcium<sup>2</sup>. Since ancient days Varatika is used for playing as well as for medicinal purposes.

Dharana (amulet) of Varatika is practiced for the treatment of Balagraha (viral infections of children). In the present paper Nishkabhara variety Varatika Bhasma whose main indications are in Agnimandya (Loss of appetite), Parinamasula (Duodenal ulcer), Grahani (Malabsorption syndrome), Rajayakshma (Tuberculosis), Karnasrava (Otorrhoea), Netraroga (Diseases of the eye) and Sukraksaya (Oligospermia) was prepared.

### **Grahya Varatika – Salient Features of Acceptable Variety**

Based on colour -The Varatika which is having yellowish tinge and has nodules on the back and oval in shape is praised as varatika<sup>3</sup>. Based on weight is saardhanishka bhara variety of varatika is superior, nishka bhara variety of varatika is medium and padonanishka variety of varatika is inferior for medicinal. But Nishkabhara variety of varatika is often recommended in the preparation of varatika bhasma

### **Method and Materials**

Nishkabhara variety of Varatika (Cowrie shells) were procured from Raw drug from local Market. The drug was purified as per the methods mentioned in Standard Ayurvedic texts. Collected the Kulamasha, Dhanya, Kulatha, Mulika, Jeeraka, Shunthi, Mudga, Haridra, Sarsapa, and mand all these drugs are collected in a big vessel and kept for 10day without disturbance for fermentation than collected kanji for purification of Nishabhara variety of varatika by swedan in dolayantra for one yama kala. Fresh Aloe vera was collected and its juice was used for making chakrikas or pellets to be used in the incineration process of Varatika. Chemical analyses were carried out employing modern XRD and NPST.

**Ingredients of Varatika Bhasma:**

1. Raw Varatika
2. Kanji ( for Purification)
3. Kumari swarasa (Aloe vera juice for grinding during incineration)

Dosage: 250 mg<sup>4</sup>

**Anupana (Vehicle)**

- Vasa swarasa (Adhatoda vasica juice),
- Nimbu swarasa (lemon juice),
- Trikatu kashaya (decoction prepared with equal quantity of Piper longum, Piper nigrum and Zingiber officinale).

**Pharmacological Properties:-<sup>5</sup>**

Rasa (Taste) – Katu (Pungent)

Guna (Property) – Ushna (Hot)

Virya (Potency) – Ushna (Hot)

Vipaka (Post digestive effect)

– Katu (Pungent)

Karma (Action) – Agnidipana (increases appetite),

-Pachana(improves digestion),

**Preparation of Nishkabhara Varatika Bhasma**

**A. Sodhana [Method of purification]**

Nishkabhara variety of Varatika is subjected to Swedana in Dola yantra with Kanji for 1 yama kala (3 hours)<sup>6</sup>. The observations made during sodhana process are given in Table no – 1. Dola yantra<sup>7</sup> is an earthen vessel which has two holes at the opposite sides of its edge and filled with prescribed liquid. It has a rod inserted through these holes across the mouth of the vessel. The mineral substance undergoing the process of swedana, were tied in to pottali (bundle) and suspended with the help of a thread in to the liquid, so that it is completely immersed. The other end of the thread was tied to the rod. The pot is then kept on the stove and heated. This instrument is called Dola yantra. Here the liquid used was Kanj.



***Kanji preaparation drugs***



*Nishkabhara varatika shodhana*

*Table no- 01: Observations made during Sodhana process with Kanji*

Sample	Colour	Weight
Raw Drug	Yellowish white	500gm
Purified	Grayish	499gm

### **B. Method of Marana – [Incineration]**

The Kanji<sup>8</sup> treated Nishka bhara Varatika was directly placed in sarava samputa after bhavana with kumari swarasa 400ml for 4 hours (earthen plate), sealed with another earthen plate and dried. After drying it was subjected to Gajaputa and the sarava samputa was collected after cooling. Gajaputa<sup>9</sup> means a pit which measures one Rajahastha (about 30”) in length, width and depth was made and cow dung cakes are filled up to brim of this pit. Then properly sealed sarava samputa containing mineral drugs was placed upon the heap of the cow dung cakes and half the number of cow dung cakes were spread upon the sarava samputa and the fire was lit.

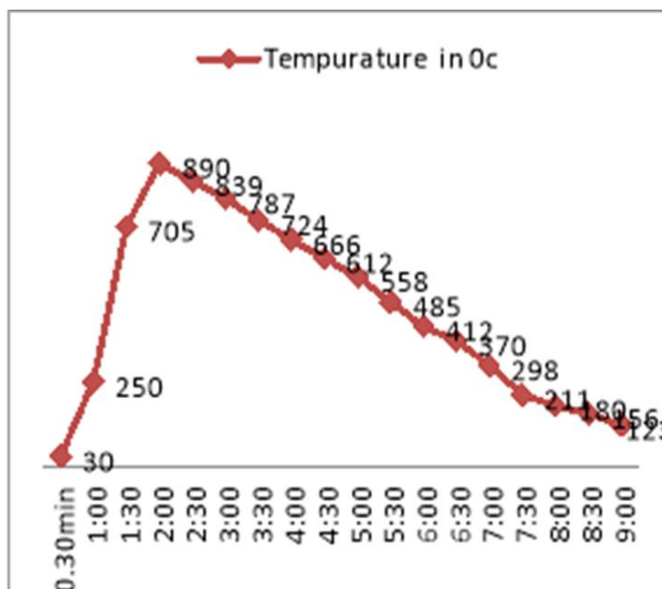
The Nishkabhra Varatika which became brittle were collected and powdered. The powdered Nishkabhara Varatika is given bhavana (trituration) with 400 ml of kumari swarasa (Aloe vera juice) for 4 hours. Then Chakrikas (pellets) were prepared and dried. After drying these pellets were subjected to second puta. The process was repeated for three times. Third time, 400 ml of Kumari svarasa was used and it was ground for 4 hours. After cooling white coloured Nishka bhara variety of Varatika Bhasma was obtained.<sup>10</sup> here bhavana refers to the process of grinding the mineral drugs in the liquids like juices or decoction of herbs, cow’s milk, urines or any such specified liquids. The quantity of liquid

should be sufficient to immerse the mineral powder. The grinding was continued, until liquid added dried up and semisolid consistency was achieved. This

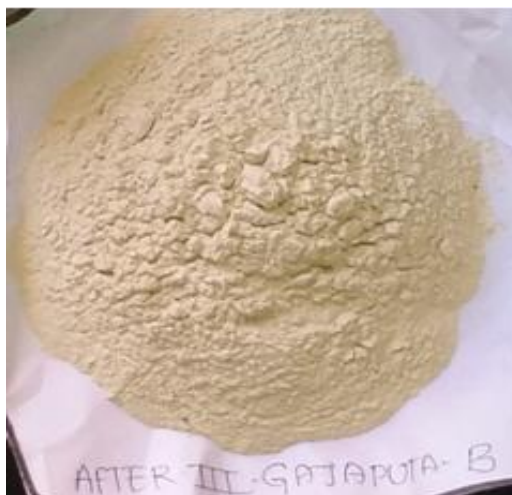
makes on bhavana and the same process was repeated for three times. Observations made during Marana (incineration) process are shown in Table No – 02

**Table no-2: Observations made during Marana**

No.of puta	Kumaris warasa	Grinding hrs	Weight before puta	Weight after puta
First	400ml	4hrs	470gm	464gm
second	400ml	4hrs	460gm	456gm
Third	400ml	4hrs	450gm	443gm



**Tempurature records**



**Final Varatika bhasma**

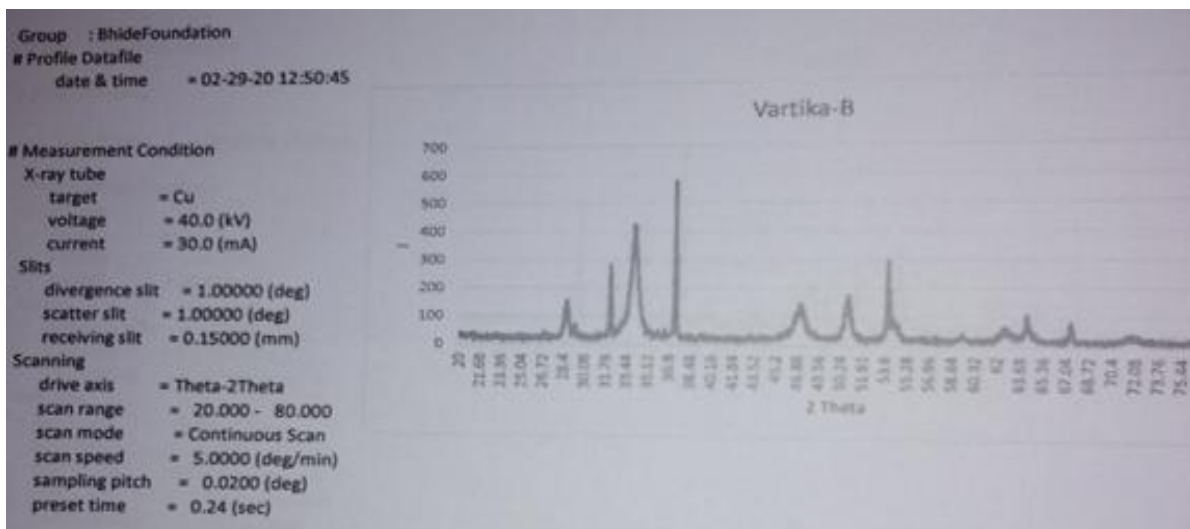
**Table no- 3: parameter tests of Nishkabhara variety of varatika Bhasma**

Sl.no	Parameters test	Varatika bhasma
01.	ph	10.98
02.	Loss on drying	0.58%
03.	Specific gravity	2.5
04.	Ash value	3.5%
05.	Water soluble extractive	12.5%
06.	Alcohol soluble extractive	17%

**Table no - 4 : classical bhasma pariksha after 3 putas**

Sl.noo	Parameters test	Varatika bhasma
01.	Rekhapurnatwa	+ve
02.	Varitara	+ve
03.	Sukshmatwa	+ve
04.	Niswadwata	+ve

**X-ray Diffraction(varatika bhasma)**



**Table no: 05 showing NPST tests report**

Stages	Varatika bhasma
<b>Heat treatment</b>	
1.Liberation of fumes	Nil
2.odour	Charred
3.Change of colour	Cream

Wet treatment 1.Exothermic/Endothermic 2.colour of solution 3.Adsorption 4.Setting time	Exothermic Cream Normal 5 Min
<b>NPST Observation</b> <b>1 Phase</b> ( 0-5 min)	Dull pink periphery with deep pink central spots
<b>2 phase</b> (5-20 min)	Dull pink periphery with deep pink central spots
<b>3 Phase</b> (20min -1 day)	Dull pink periphery with deep pink central spots

## DISCUSSION

Varatika, a mineral drug of animal origin is used in Ayurvedic therapeutics in many diseases. Varatika is included in compound preparations also such as Grahanikapatarasa , Pravalapamritarasa, Lokanatharasa etc.

Varatika is the key ingredient in drugs prescribed in gastrointestinal symptoms. In the present work on physico- chemical analysis of nishka bhara variety of varatika bhasma was made and studied scientifically the significance of purification and incineration processes involved in the preparation of this herbomineral formulation. Standards were also determined for this preparation as per Indian Pharmacopeia. Preparation was analysed using sophisticated instruments like NPST and XRD.

NPST (Namboori Phase Spot Test) : NPST carried out for Nishka bhara variety of varatika bhasma. The test is chemical

reaction-based, with specific results for bhasmas, we can differentiate between bhasmas clearly. This technique is very helpful for quality assessment of Bhasma as per the standards of Rasashastra. In other words, bhasmas can be identified by their name given in Rasashastra by virtue of their quality differences, but not chemically.

It is such a simple test that it can be carried out with minimum set up and requirements. NPST is a direct method by which we can differentiate easily by the pattern formed over the wattsman filter paper. In this Varatika Bhasma shows similar pattern on wattsman paper. By this we can say that there is no any difference in three phases.

XRD (X Ray Diffraction) Method : The X-ray differaction pattern is of mixed phase, it indicates Calcium carbonate was converted into Calcium oxide. Also it indicates the majority presence of calcium

oxide, and also shows the minute presence of Magnesium and Potassium oxide, it is due to Marana process. Also the sharp peak indicate the substance is well crystalline in nature, but the peak intensity is varied. By this we can say the influence of puta is very important to change form of a substance. The peak correspond to 2 theta which can be seen in in the XRD pattern,

### CONCLUSION

Present study is undertaken to prove scientifically the significance of purifying processes of this Herbo Mineral Formulation NISHKA BHARA VARIETY OF VARATIKA BHASMA Following conclusions were arrived at:

1. Before subjecting to marana, shodhana of varatika is essential.
2. Minimum three Gajaputs are required to get bhasma siddha laxana of varatika.
3. Chemical analysis like NPST, XRD and other qualitative and and quantitative analysis are essential to standardize varatika bhasma.
4. Purifying plant agents helps in the formation of co--ordination complex. Nature of co-ordination complex

formed can be determined only after carrying out some more chemical analysis,

5. XRD pattern confirmed the formation of more crystalline compound which is again due to the impact of various purification and incineration processes.

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