

***Bhasmikanana* – Significance of Process**

C.S.Maladkar\*

\*P.G.Department of Rasashastra & Bhaishajya kalpana, Shri J.G.Co-Operative Hospital Societies Ayurvedic Medical College & Ghataprabha, Karnataka, India

**Abstract**

The aim of this article is to view the role of processing techniques in the preparation of *Bhasma*. For any metal & minerals to be therapeutically effective, it is necessary that it should be prepared with caution. These metals have a different structure than the tissue constituents. If these are used in unprocessed form then they will not be metabolized, will get assimilated to the tissue cells of the body may produce harmful effects to the body. To prepare them as non-toxic, easily digestible, therapeutically potent and make them suitable for metabolic changes, several processing techniques have been mentioned. In this manuscript, significant information is provided on processing techniques of *Bhasma*.

**Keywords**

*Marana, Bhavana, Chakrika, Putapaka, Bhasma pariksha*

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## INTRODUCTION

*Rasashastra* is the branch of *Ayurveda* that deals with processing methods & techniques for application of metals & minerals for therapeutic purpose. Drugs used in *Rasashastra* (Ayurvedic alchemy), can be broadly classified into three categories; a) Vegetable origin, b) Animal origin, c) Metallic & mineral (*Rasadi dravya*) origin. Mineral substances are introduced richly by *Rasashastra*. These are practically reached the position of independent medicinal system of *Ayurveda*. Metals described in *Rasashastra* includes iron, copper, gold silver, lead copper pyrites etc. they were meant for both internal and external uses. Metals as such cannot be administered therefore several manufacturing techniques had emerged such as *Putapaka*, *Pottali Rasayana* & *Kupipakva rasayana*. It is cautiously stated that, if the metals are in raw form or even in unprocessed, then they cannot be metabolized in the cells of the body. Thus they are considered to be therapeutically ineffective. For achievement of effective *Bhasma*, there must be proper processing techniques are required in each step of the process. Hence, in this manuscript, some of the aspects have been

enlightened for making the metals suitable, absorbable, assimilable & non toxic.

For conversion of metals into therapeutically potent *Bhasma*, mainly two processes are required: *Shodhana* (Purification) & *Marana* (Incineration).

**Shodhana:** For purification process the metal is converted into thin leaves or sheets known as *Kantakavedhi patra*<sup>1</sup> / *Suchivedha patra*. It is one of the fundamental forms, formed by heating & hammering the metals and mould into thin sheets due to its malleability. This sheet can be easily pierced by thorn or needle. Size of the *kantakavedhi patra*<sup>1</sup> is of 4 *angula* (16 inch) in length, breadth & width. Thickness is considered as size as thickness of *tila* (sesame) seed.

**Method:** Sheets (*Kantakavedhi patra*) of metals are heated over the flame of fire and immersed for seven times in each of *Tila taila*, *takra*(butter milk), *gomutra*(cows urine), *kanji*(type of fermented liquid), *kulattha kwath*. Heat treating used to change the physical properties and removal of chemical impurities of the metals. In this process metal gets softened i.e., used to alter the mechanical properties of metals such as hardness, strength & toughness then makes metal brittle.

**Marana:**



*Marana* is a process of transformation of the purified metals in to *Bhasma* form. This process involves combustion of these substances. Generally metals have relatively high density & are often very toxic in nature. These needs to be treated with caution in *marana* process.

*Marana* process can be carried out in two steps: *Bhavana* & *Putapaka*

***Bhavana*** is wet grinding the purified metal (*shodhita*), completely soaked in prescribed liquid media. *Bhavana* process is consist of treatment of purified metals with specific herbal juices / extracts by grinding method with the help of mortar & pestle<sup>2</sup>. Major changes taking place during this process, there is development of surface cracks (fragmentization) in the purified metal piece, which makes easily grind in to fine powder. These surface areas of the metal react with ingredients of the herbal media & get converted in to organo-metallic compound. The process effectiveness is increased by intermediate *Bhavana* after each *Puta*.

***Chakrika***: pellets prepared at end of the *Bhavana* and dreid well. This pellets burns very efficiently. Pellet size<sup>3</sup> is 15 mm.

***Sharava samputa***: A *Sharava* (shallow dish made from clay) is container that is used in *Puta*. *Sharava* can withstand very high

temperature & it is better for slow burning of the metals. This earthenware distinctively used where the temperature rise takes place gently. As *sharava* made by clay, it consist of minute pores. That porous nature allows heat to circulate easily through in it. This supports mild and constant heating stage.

Basically clay soils are alkaline in nature with high pH of greater than 8.5<sup>4</sup>. This helps in neutralizing the pH of the metal by interacting with acid present in it. *Sharava* can be made from any material that withstands temperature high enough to prepare *bhasma*.

#### **Decision of Heat by PUTA:**

The *Puta* (Hollow space constructs in the plane ground) is device to inform consistent amount of heat required for making *bhasma*. Increase & lower Heat / temperature may affect the safety & efficacy of *Bhasma*<sup>5</sup>. It has been warned that lesser or higher heating process leads to improper formation of *Bhasma*, that which is not acceptable by clinical response.

Every metal has its own heat due to its hardness. For that the *Puta* concept recommends about the application and decision of amount of *Agni* (Quantity of



Heat / Temperature) and its adjustment by following factors.

- Form of number of *Vanoupala's* (cow dung cakes i.e. animal excreta of the cows).
- Quantity of *Gorvar churna* & Husk of the grains.
- Through Sand.
- Different size of *Putas*.

The decision regarding the choice of these factors for *Putapaka* is made based on the metal consistency. *Vanoupala's* are an alternative fuel source, contains reserved

strong energy released during heating process i.e. *Marana* (Incineration). Husk is efficient burning fuel & used to prepare *Bhasma* of *mrudu* dravya (soft metals) which requires low temperature. Sand has ability to transfer little amount of heat. This indicates it can keep the heat for longer duration.

The *puta* are described in different names which indicate size of the Pit (deep cavity made in earth ground), the number of *Vanoupala's*, *Tusha* & Sand to be used as fuel, shown in the table no 1.

**Table 1** "Showing Size & Heating media for *Puta*"

Name of <i>Puta</i> <sup>5,6,11</sup>	Measurements of Pit	Heating media	Qty.of heating media
	L X B X W		
Mahaputa	Dvihasta:48 angula (91.44cm)	Vanoupala	1500 n
Gajaputa	Gaja /Raja hasta:27 angula (55.88 cm)	Vanoupala	1000 n
<i>Varaha Puta</i>	1 <i>Aratni</i> : 22 angula (42 cm)	<i>Vanoupala</i>	Fill up as per size
Kukkuta puta	2 vitasti 24 angula (46 cm)	Vanoupala	Fill up as per size
Kapota Puta	Performed on plane ground	Vanoupala	8 n
<i>Gorvara Puta</i>	Required Size of Pit/vessel	<i>Gorvar churna / Tusha</i>	<i>Tola</i> (768 gm)
Bhand Puta	Required Size of Pit/vessel	Through Tusha	Fill up as per size
Valuka Puta	Required Size of Eathen pot	Through sand	Fill up as per size
Bhudhar Puta	2 angula pit : (8 inch)	Vanoupala	Decided by Qty.of Med.

n: Number, 1 angula: 9.95 cm=3.9 inch. Tusha: Husk of grains.  
Gorvar Churna: Dried Cowdung is crushed by hoof of a cow.

### Factors that affects Temperature during *Putapaka*:

These *Vanoupala's* do not give uniform quality of heat due to following factors:

- Selection of less or more number of *Vanoupala's* which is not mentioned in classical text.

- Thin, small sized and mixed with herbage in *Vanoupala* burns in less time.

- Semi dried and thick *Vanoupals* takes more time to burn. The presence of dampness in the cow dung decreases the temperature of the *Puta*, which causes



reduction in performance of the *Marana* process.

These are the chances of failure in regulating the heat. Therefore, there is a necessity to plan to control the *Agni*. To record the temperature, there are various kinds of thermometers available. For reading the rise of temperature, thermo couple Pyrometers can be used. From this instrument, record the temperature of the preparation from starting to the end of the *Putapaka* process.

#### Method of *Putapaka* process:

Place the dried *chakrika* in the *sharava* (shallow earthenware). Cover the *sharava* by another *Sharava* of the same size. Seal the joints of the both *sharava* with *mrittakapata* (cloth smeared with *gopichandana* paste). This joined *sharava* is termed as '*sharava samputa*'. Place the *sharava samputa* on the heap of the cowdung cakes which should be filled up to 1/2 of the *Puta*. Then fill up rest 1/2 of the *puta* with more number of cow dung cakes. Ignite these cow dung cakes and allow it to *swang sheeta* (self cool). Then open the *sharava samputa* and collect the prepared contents. This process needs to be repeated till the *bhasma* of required quality is obtained<sup>6</sup>. Repeated *marana* process is

required to stabilize the particle to minimum size.

Usually number of *Puta* are suggested by the texts, however if the *bhasma* fails to pass through the *Bhasma pariksha*, then process needs to be continued further till *bhasma* passing through all the tests.

To assure the quality of *Bhasma*, classical text mentioned *Bhasama Pariksha* (Testing Parameters).

#### *Bhasma pariksha*<sup>7</sup>:

- **Color-** achieves different color in different metallic *bhasma*
- **Varitara:** in this test, *Bhasma* floats on the surface of the water. This indicates reduction in size & weight of the *bhasma*. Due to the surface tension<sup>8</sup> of the water, minute *Bhasma* particles unable to break the top layer of the water molecules. Reduced particle size has easily digestible in the G.I tract and immediate react able with bile juices in the duodenum<sup>8</sup>.
- **Rekha purna:** This test also indicates reduction of particle size in the *bhasma*. After rubbing of the *bhasma* in between fingers, *bhasma* enters easily in to the furrows of the finger. Average Particle size of *Bhasma* is 1000nm<sup>9</sup>. This micro fine of the *bhasma* promotes the penetration and metabolism in the G.I. system.



- **Niswadu:** generally all metallic *Bhasmas* are tasteless.
- **Nishchandra:** After *Putra* process, the luster will be lost. This test can be observed under sunlight. *Bhasma* should not contain any shining particles. Shining particles in *bhasma* indicates the presence of heavy metal. This test specially applicable to *Abhraka*(Mica) *bhasma*, *Suvarna*(Gold) *bhasma* etc..
- **Awami:** after consumption, *bhasma* should not produce nausea. This test especially applicable to *Tamra* (Copper) *bhasma*.
- **Apunarbhava:** the *bhasma* should not regain its elementary state.

**Method:** *Bhasma* mix with *Guda*, *Gunja*, *Tankana*, *Madhu* & *Ghrita* has to be taken in equal quantity, triturate in *khalwa yantra* then place it in *Musha*(crucible) and then heated at high temperature.

- **Nirutthikaran:** Have been mentioned to test the quality of *bhamas*.

**Method:** Prepare thin sheets of silver (*Rajata patra*) then along with *bhasma* place in *musha*. Subject it to high temperature in *koshti* (furnace). At the end of heating, weight of silver should not increase. If it

increases then might be due to the fusion of the metallic compound present in *Bhasma*.

The quality of the *Bhasma* is tested by using modern chemical analysis techniques, such as spectro photometer, atomic absorption spectro photometer, XRD, XRF helps in detecting the chemical compound formed during the preparation of *Bhasma* as well as determine the presence of trace elements getting added from the organic sources.

#### **Benefits of appropriate process of *Bhasma*<sup>10</sup>:**

- Attains *Laghuta* (Lightness property)
- Achieves suitable color.
- Eliminate ferociousness (*Ugrata*) of the metal.
- After administration assimilates very rapidly.
- After ingestion of *bhasma* stimulates the *Agni* (*Jatharagni*) by *Agni deepana guna*. *Bhasma* possess the properties of *teja mahabhuta* as it undergo in to *Agni* process.

## **CONCLUSION**

*Rasashastra* science stated clearly the processing techniques on the basis of information available and elucidated them in the parlance of modern science. From this *Bhasma* can be consistently prepared &



controlled according to quality standards. These processing techniques designed to minimize the risk involved in the preparation of *Bhasma*. Knowledge of these processing techniques helps in forming the potent *bhasma*.

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