

## QUALITATIVE ANALYSIS OF MUKTA BHASMA BY NAMBURI PHASED SPOT TEST

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### ABSTRACT

*Mukta Bhasma* (Pearl) is unique preparation which is traditionally used as *Jwarahar* (antipyretic), *Parinamashulhar* (antiulcer), *Amlapittahar* (antacid) and *Asthiposhak* (treatment of bone metabolic disorders associated with calcium deficiency). A study was conducted to analyze the fineness, proper preparation and quality of the *Bhasma* using organo-leptic and *Namburi phased Spot Test* (NPST). NPST method is newly introduced in the field of Ayurvedic pharmaceutical standardization accepted by CCRAS. The *Namburi phased Spot Test* (NPST), a spot test based on chemical reaction, is a technique for quality assessment of a *Sindura* and *bhasma*. *Shodhana* (Purification) of *Mukta* was done in *sudhodaka* (lime water) by *Dolayantra vidhi* for 3 hours and *bhawana* of *Godugdha* (cow milk) given to form *Mukta Bhasma*. Then subjected to organo-leptic and Namburi Phased Spot Test (NPST) Analysis. The analysis was observed in three phases from 0 to 24hrs and compared with standard protocol. The prepared *Mukta Bhasma* gave results in accordance to NPST standards.

**Keywords:** *Mukta Bhasma*, Ayurveda, NPST (*Namburi phased spot test*)

### INTRODUCTION

For the first time in Ayurveda, all calcium compounds were exclusively categorized in a single group based on their chemical composition as “*sudha vijnaneeyam*” by *rasamritam* the text of 20th century<sup>[1]</sup>. Pearls (*Mukta*) are the calcareous concretions formed as protection against the irritation caused by foreign objects in between the mantle and the shell of the animal. A fold of soft tissue envelops the foreign particles and deposits layer after layer of nacre (secretion) on it to form a pearl. Nacre is composed of conchiolin and calcium carbonate<sup>[2]</sup>.

*Mukta* (pearl) is a product of marine origin and *sudhavargeeya dravya*. It is used in form of *Bhasma* and utilized in ailments like diabetes mellitus, dysuria, acid peptic disorder, chronic fever, respiratory disorders, Ca deficiency etc.<sup>[3]</sup>

In Ayurvedic system of medicine, Quality of herbal drugs is directly related to the collection process, timing and procedure adopted during drug preparation. In order to minimize variability and to strengthen the quality of *Ayurvedic products*, standardization of a *Bhasma* is essential<sup>[4,5]</sup>. It has be-

come necessary to study the organoleptic properties of drug sample in comparison with organoleptic properties of standards. *Namburi Phased Spot Test* (NPST) method is newly introduced in the field of Ayurvedic pharmaceutical standardization accepted by CCRAS. Therefore, present study was conducted to analyze the fineness, proper preparation and quality of the *Bhasma* using *organo-leptic* and *Namburi phased Spot Test* (NPST). *Namburi phased spot test* (NPST) [6] is known as circular paper chromatography (variety of paper chromatography) which is called also radial paper chromatography. *N.P.S.T.* was introduced by Dr. Namburi Hanumantha Rao in the year 1970. This study involves careful observation of spots with its colour at three successive stages of time (1<sup>st</sup> phase: 0 to 5 min, 2<sup>nd</sup> phase :5 to 20 min, 3<sup>rd</sup> phase :20 min to one day) [7]. This test has an advantage of measuring the sensitivity of reac-

tions at different time intervals. This technique is very helpful for quality assessment of *Bhasmas* as per the standards of *Rasashastra*.

## Material and Methods

### Collection of raw materials

Good quality *Mukta* was purchased from authentic gemstone selling shop from Karnal, Haryana [Fig.1] and testing were done at Ozone Pharmaceuticals Ltd. analytical lab, Bahadurgarh, Haryana [Report 1]. 2 ml of *Gomutra* (cow urine) was taken in a test tube, 2 pinch of *Saindhava Lavana* was added and mixed well. Beads of *Mukta* (Pearl) were dropped in this mixture and kept for overnight. Then *Mukta* was taken out and rubbed with thick rough cloth [8]. No change in shining, colour as well as weight was observed in *Mukta* beads after the process. So it can be affirmed that the selected sample is genuine.



Fig-1 a.Raw mukta b.Patu yukta test for Mukta c.No change after Patu yukta test

### Preparation of Mukta Bhasma

Formulation of *mukta Bhasma* was done in two steps namely *Shodhana* (purification) and *Marana* (incineration). For *Shodhana* (purification), 300gms *mukta* (Pearl) was boiled in *Dolayantra* containing *Sudhodaka* (lime water) for 3hours [9] followed by second step viz *marana*. For this step, purified *Mukta* were made into smaller pieces in the *khalva*

*yantra* (mortar) and grounded into fine powder. Then this powder was triturated with *godugdha* and forms a homogenous paste. From this paste, *chakrika* (pellets) were formed and completely dried in Sunlight. Dried pellets were subjected to *sharava samputa* (*marana* process) [10] and after subjecting three *Laghuputa*, *Mukta Bhasma* was formed [Fig.2].



Fig 2 a. Shodhan of Mukta in sudhodhaka b. Bhawna given to Mukta in godugdha c. Chakrika formation d. Chakrika in sarava samputa

### Preparation of *Haridra* paper

Washed fresh rhizomes were cut into small pieces and crushed into coarse pulp. Pulp was taken in a conical flask having 100ml Ethyl alcohol and closed with a rubber stopper covered by glossy paper. Frequently, the flask was shaken for maceration and then kept for three days for proper extraction. After three days it was filtered through filter paper. About 50 ml of the solution was poured into a stainless steel tray just oversized to the impregnated. Whatman's filter paper was put into solution and allowed to soak for 1 min and afterwards it was reversed and soaked for another 1 minute paper was carefully pulled out of the tray and kept for drying in shade.

### Preparation of solution

0.5 gms of *Mukta bhasma* was taken in a test tube and heated over spirit lamp for till the lower end of

the test tube became red. Then it was allowed to cool. After cooling 1 ml of distilled water was added and allowed to settle down without disturbing. After complete settling, two drops of supernatant solution were carefully placed over the prepared *Haridra paper* with the help of dropper. The change of color and the pattern of the spot at 3 different phases at 3 different time intervals i.e., 5 minutes 20 minutes and 24 hours were recorded.

### Observation and Result

Prepared *Mukta bhasma* was greyish in colour, tasteless and smooth in touch [Table 1]. *NPST* phased spot observations are tabulated in [Table 2]. The results were observed in two different stages Heat and wet treatment. *Mukta bhasma* does not liberate charring and fumes. In spot test, marked differences in colour and pattern of spots were found [Fig.3]

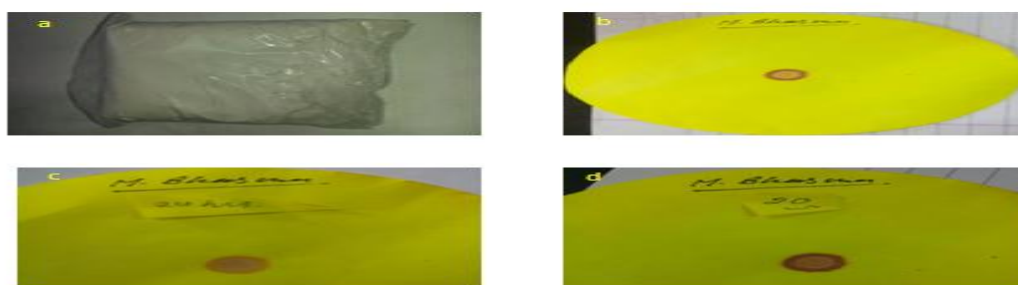


Fig 3 a. Prepared Mukta Bhasma b. NPST for 1<sup>st</sup> phase c. NPST for 2<sup>nd</sup> phase d. NPST for 3<sup>rd</sup> phase

Table 1: Organoleptic properties of *Mukta Bhasma*

Parameters	Observations
Colour	Greyish white
Odour	Nil
Taste	Tasteless
Touch	Smooth

**Table 2:** Observations during NPST of *Mukta Bhasma*

Criteria		Mukta Bhasma
<b>Changes On Heating</b>	Liberation of Fumes	Nil
	Charring	Nil
	Odour	Nil
<b>Changes On Wetting</b>	Exothermic reaction	Not present
	Endothermic reaction	Not present
	Color of the solution	Yellowish
	Absorption	Normal
	Settling time	1 1/2 hr
<b>Fading away time</b>		Slow as compare to praval bhasma
<b>Color pattern of 1<sup>st</sup> phase</b> (After 5 mins)		Develops a thin circle on a wide wet spot.
<b>Color pattern of 2<sup>nd</sup> phase</b> (After 20 mins)		Spot fading away.
<b>Fading time (3<sup>rd</sup> phase)</b> (After 24 hrs)		Central circle Fades away most rapidly.

## DISCUSSION

Turmeric is an example of a natural pH indicator which means that it can be used to determine a substance's pH. The turmeric indicator changes colour between roughly a pH of 7.4 and 8.6. If turmeric is exposed to neutral or acidic substances (those with a pH of less than 7.4), it will retain its yellow coloration. However, if turmeric is exposed to more alkaline substances (those with a pH greater than 8.6) it becomes a dark pink/red. Higher the alkalinity shows darker red color. *Mukta bhasma* is enriched in calcium content which is alkaline in nature. It turns yellow *haridra* paper to dark red. This test (*NPST*) is said to be very beneficial in identification *Sudha vargeeya dravyas*. In *Mukta bhasma* formed contains calcium in the form of  $Ca^{2+}$  form which is considered to be the most compatible forms of calcium supplementation in the body. The rate of the absorption of the iron depends on the fineness of the powder. *Bhasma* process makes mineral into very minute particles which are easy to absorb. *NPST* done on the *bhasma* prepared proved the fineness of the powder.

## CONCLUSION

It is a simple test that it can be carried out with minimum set up and requirements. CCRAS has also accepted the monograph of *NPST*, and so the quality of *bhasma* can be checked before being used therapeutically. In the present study, *Bhasma* gave results

in accordance to *NPST* standards. Tests of the *ayurvedic parameters of bhasma* like *rekhapurnatwa*, *varitaratwa* and the *Namburi Phased Spot Test* proved the fineness of *Mukta bhasma* and also help for the *quality standardization* of the *Mukta Bhasma*.

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