

Qualitative Analysis of 'Shataputa Abhraka Bhasma' Using 'Namburi Phased Spot Test' (NPST)

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Abstract

Abhrak Bhasma (calx of Mica), an unique mineral product and one among the *Maharajas of the Rasashastras*. *Acharyas* have mentioned *Shataputa* and *Sahastraputa Abhrak Bhasma* which are indeed unique attributes of *Abhrak*, due to its wide therapeutic utility; it is used in several formulations. *Shataputa Abhraka Bhasma* used traditionally in the management of *Yakshma* (Tuberculosis), *Prameha* (diabetes), *Pandu* (anemia), *Raktapitta* (blood dyscrasias), *Jwar* (fever), *Shwasa*, *Kasa Vikaras* (Respiratory disorders), *Hrudroga* (Heart Diseases). etc. was prepared according to the prescription in the Ayurvedic classics and subjected to various *bhasma pariksha* (tests for calx), including the Namburi Phased Spot Test (NPST), one of the qualitative tests described for various Ayurvedic preparations. NPST helps to differentiate between, and thus identify, various *bhasmas* (calx). It depends upon the pattern of the spot, which develops after a specific chemical reaction. *Shataputa Abhraka Bhasma* prepared by classical reference in our department was subjected to above said tests and the results were compared with standard protocol. The prepared *bhasma* had shown the nearest results to standard NPST of *Shataputa Abhraka Bhasma*.

Keywords: Namburi Phased Spot Test (NPST); *Shataputa Abhraka Bhasma*.

Introduction

Shataputa Abhraka Bhasma (calx of Mica) is one of the *Khanija dravya* (Mineral Substance) & "best *Rasayana* (Immunomodulator)." Its *bhasma* (calx) has as its main indication, *Yakshma* (Tuberculosis). Since Vedic period its *bhasma* has been in therapeutic use for various disorders including *Swasa*, *Kasa Vikaras* (Respiratory disorders), *Prameha* (diabetes), *Pandu* (Anemia), *Raktapitta* (bleeding dyscrasias) [1].

Shataputa Abhraka Bhasma prepared using *Kasamarda* (fresh juice of *Cassia occidentalis*) *Swarasa* is considered as the best in *Rasashastra* branch of Ayurveda. However, in this competitive, commercialized world, the quality of *bhasma* is always

open to question. For the quality assessment of *bhasma*, various *bhasma parikshas* (tests for calx) are mentioned in Ayurvedic classics.

The Namburi Phased Spot Test (NPST), a spot test based on a chemical reaction, is a new technique for assessing the quality of a prepared *bhasma*. When a drop of clear solution of a substance (*bhasma* or *sindura*) under examination is put on specially prepared chemical reacting papers (What man paper impregnated with suitable reagent), a spot appears which manifests a series of color and pattern changes. Techniques involving spot test or chromatography are commonly used in chemistry. It thus has the advantage of measuring sensitivity of reactions at different time intervals.

This method is used to study or detect continual chemical reactions taking place gradually between two chemical substances on static media at every second or even fraction of a second. The technique was developed and standardized by Namburi Hanamantha Rao in 1970, it has been accepted by CCRAS, New Delhi. It is used to assess the *bhasma* qualitatively [2].

NPST and other classical tests are performed on *Shataputa Abhraka Bhasma* sample: in order to compare with standard protocol and to evaluate its quality.

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Materials and Methods

A three- part methodology was used

1. Obtaining sample of *Abhraka*: Raw *Abhraka* (Mica) was obtained from Dorle and Suns professional supplier in Kolhapur and was authenticated by HOD Rasashastra department of Shri J.G.C.H.S Ayurvedic Medical College, Ghataprabha, Karnataka.
2. *Shataputa Abhraka Bhasma* was prepared as per classical method and subjected to classical *bhasma pariksha* (tests for calx).
3. Subjecting *Shataputa Abhraka Bhasma* sample to NPST (Evaluation of NPST).

Preparation of *Shataputa Abhraka Bhasma*

Authenticated raw *Abhraka* (mica) was taken from the department of Rasashastra, Shri J.G.C.H.S Ayurvedic Medical College, Ghataprabha, Karnataka, and subjected to *Shodhana* (Purification) by *Godugdha* (Cow's milk) using *Nirvapa* method to remove impurities and increase its potency. For *Shodhana* 1000 gm *Abhraka* was taken and two liters of *Godugdha* was taken in a wide mouthed clean stainless steel vessel. *Abhraka* was heated in Iron pan till they become red hot in colour.

The chips of *Abhraka* were turned up and down with metal tongs to given equal exposure of heat to both the surfaces. When *Abhraka* chips became completely red hot in colour, they were plunged quickly into the milk with the help of metal tongs. After few minutes, the milk was separated by filtering it through iron sieve and soft pieces of *Abhraka* were collected in an iron pan .

Then *Abhraka* washed with hot water and kept for drying. This same procedure was repeated for another seven times by using fresh *godugdha* for the *shodhan* of the *Abhraka* [3]. After drying it was stored in bottles and used for *Dhanyabhraka* procedure by using *Kanji* (Sour gruel) and used for *marana* (Incineration) procedure.

The *Shodhita Abhraka* was then subjected to *marana* (Incineration) by giving *bhavana* (trituration in liquid media) with *Kasamarda* (fresh juice of *Cassia occidentalis*) *Swarasa* and *chakrikas* (pallets) prepared. After drying, they were kept in *sharava* (casseroles), *Sandhi bandhan* (sealing) was done and subjected to *gajaputa* (*Putra* using 1000 cow dung). After hundred *putas*, *Abhraka bhasma* of brick read color was obtained [4].

Bhasma Parikshas (tests for calx) [5]

The *Shataputa Abhraka Bhasma* prepared by classical method in our department was subjected to various classical *bhasma parikshas* (tests for calx) like *Rekhapurna* (enters in furrows of fingers), *Vaaritara* (floats on water), *Unama* (even after keeping a rice grain on *bhasma* it floats on water), *Nischandrata* (absence of shining), *Jihwa pariksha* (taste) and *Nirdhuma* (absence of fumes when kept on fire) (Table 1).

Table 1: Analysis of *Shataputa Abhraka Bhasma*

Test	<i>Shataputa Abhraka Bhasma</i> Sample
Color	Brick Red
Touch	Ultra fine (soft)
Odour	Absent
<i>Rekhapurna</i>	Positive
<i>Vaaritara</i>	Positive
<i>Unama</i>	Positive
<i>Jihwa pariksha</i>	Tasteless
<i>Nischandrata</i>	Positive
<i>Nirdhuma</i>	Positive

Namburi Phased Spot Test

Method and Materials

Method: Phased Spot Test

Materials

- a. Distilled water : For reagent preparation.
- b. Reagents : 0.5 ml concentrated HCL.
- c. 10% KI and 2.5% KCN.
- d. Capillary or Pipette: For Putting the spot on paper.
- e. Centrifuge & simple test tube: For the preparation of drug solution.
- f. Glass rods & sheet: For drying of paper & to create a platform during test.
- g. *Shataputa Abhraka Bhasma*.

Procedure [6]

Shataputa Abhraka Bhasma sample was subjected to NPST. Initially 0.25g of *bhasma* was placed in a centrifuge test tube; 0.5 ml of conc. HCl was then added to the test tube drop by drop. It was kept in a stand for 8 hours, during which time it was shaken occasionally. It was then allowed to settle while a clear layer formed. One drop was taken from the clear layer and placed on 10% KI and 2.5% KCN papers (prepared using What man's filter paper no 1), color changes in the paper was observed over 3 time periods.

The colour chart of the camlin standard color was used for the comparison of different colours and pattern of the spot at three different time intervals.

- 1st phase (Phase of immediate reaction): 0 to 5 min.

- 2nd phase (Phase of delayed reaction): 05 to 15 min.
- 3rd phase (Phase of late reaction): 20 min to 24 hours.

Observations of NPST

Table 2: NPST observations of *Shataputa Abhraka Bhasma* sample

Phase	NPST observations of <i>Shataputa Abhraka Bhasma</i> sample
1 st phase (0-5 min)	A wide deep brown solid spot forms at centre leaving behind a brown periphery
2 nd Phase (05 to 20 min)	This continues to be the same by the end of II nd phase
3 rd Phase (20 min to 24 hours)	The brightness of brown spot fades slowly and brown periphery around the central spot fades away leaving behind a thin brown circle

Discussion and Conclusion

Shodhana of *Abhraka* was done by heated on fire till they became red hot in color, then *Nirvapa* done in *Godugdha* for 7 times and washed with hot water. Then *Dhanyabhraka* was prepared with the *kanji* and *shalidhanya*. Fine particles of *Dhanyabhraka* collected and given *bhavana* with the *Kasamarda swarasa* and *marana* procedure conducted by giving hundred *Gajaputas* to obtain the brick red colored *Shataputa Abhraka bhasma*, which has passed all the *bhasma parikshas*. In NPST the desired results were seen. The results seemed to be similar - an advantage of conducting NPST over other classical *bhasma pariksha*.

Conclusion

NPST is a chemical reaction based test helpful for quality assessment of *bhasma* before being used therapeutically. This technique is very helpful for quality assessment of *bhasmas* as per the standards of *Rasashastra* (Indian Iatro-chemistry). This test is very simple and can be carried out with minimum setup and requirements. In the present study, the *Shataputa Abhraka Bhasma* has shown results in accordance to NPST Standards.

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