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Qualitative analysis of praval bhasma bynamburi phased spot test

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Abstract
Praval Bhasma is unique preparation which is traditionally used as antipyretic, antiulcer, antacid and 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 Praval was done in *sarjika- kshar* by Dolayantra vidhi for 3 hours and bhawana of Godugdha (cow milk) given to form Praval 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 Praval Bhasma gave results in accordance to NPST standards.

Keywords: Praval Bhasma, Ayurveda, NPST (Namburi phased spot test), Organo-leptic

1. 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 [1]. Praval (Coral) is the calcareous skeleton of the minute marine organism called Anthezoa polypus and and belongs to phylum coelenterate. The skeleton is in the form of minute irregular deposits, called spicules which contain mainly calcium carbonate. It is used in the form of bhasma and pisti in order to cure various ailments since ancient times in Ayurvedic system of medicine [2]. Praval bhasma (PB) is used for treatment of inflammation, cough due to phthisis, excessive sweating, cardiac fibrillation, osteoporosis, dysureia and ligourea [3].
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 [4, 5]. It has become 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 (1st phase:0 to 5 min, 2nd phase :5 to 20 min, 3rd phase :20 min to one day) [7].This test has an advantage of measuring the sensitivity of reactions at different time intervals. This technique is very helpful for quality assessment of bhasmas as per the standards of Rasasasthra.

2. Material and Methods
2.1 Collection of raw materials
Good quality Praval (500gms) was purchased from local market of Gajendergarh, Karnatka (Fig. 1). *Sarjika kshar* which is also called Sajjikhar (sodium bicarbonate) and godugdha was also purchased from local market of Gajendergarh, Karnatka.

2.2 Preparation of Praval Bhasma
Formulation of Praval Bhasma was done in two steps namely shodhana and Marana. For shodhan, 500gms Praval was boiled in Dolayantra containing 3 litre of sarjika- kshar for 3hours [8]. Followed by second step viz marana. For this step, purified Praval was grounded into fine powder in the khalva yantra.

Bhawana of godugdha was given and chakrikas were formed, dried completely. Put in sharava samputa (marana process) and after subjecting 3 Gajaputa [9]. Praval Bhasma was formed (Fig. 2).

2.3 Preparation of Haridra paper

Washed fresh rizhomes were cut into small pieces and crushed into course 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 3 days for proper extraction. After 3 days it was filtered through filter paper. About 50 ml of the solution was poured into a stainless steel tray just oversize 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.

2.4 Preparation of solution

0.5gms of Praval 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.

3. Observation and Result

Prepared Praval bhasma was Creamish white in colour, tasteless and smooth in touch (Table no.1). NPST phased spot observations are tabulated in Table no.2.The results were observed in two different stages Heat and wet treatment. Praval bhasma does not liberate charring and fumes. In spot test, Marked differences in colour and pattern of spots were found (Fig 3).

Table 1: Organo-leptic Properties of Praval Bhasma

Parameters	Praval Bhasma
Colour	Cremish white
Odour	Nil
Taste	Tasteless
Touch	Smooth

Table 2: Observations during NPST of Praval Bhasma.

Criteria		Praval Bhasma
Changes On Heating	Liberation of Fumes	Nil
	Charring	Nil
	Odour	Nil
Changes On Wetting	Exothermic reaction	Not present
	Endothermic reaction	Not present
	Color of the solution	Colourless
	Absorption	Normal
	Settling time	Rapidly
Fading away time		Rapid
Color pattern of 1st phase (After 5 mins)		formation of pink spot with wet periphery
Color pattern of 2nd phase (After 20 mins)		Fadding away rapidly.
Fading time (3rd phase) (After 24 hrs)		Central circle fades away most rapidly.

Fig 1: Raw Praval

Fig 2: a). Shodhan of Praval b). Powered Praval c). Bhawana of Godugdha d). Chakrika in Sharava Samputa e). Cremish coloured Praval Bhasma

Fig 3: a) Praval Bhasma 1st phase b) Praval Bhasma 2nd phase c) Praval Bhasma 3rd phase

4. 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. Praval 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 Praval 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.

5. 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 Praval bhasma and also help for the quality standardization of the Praval Bhasma.

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