



Research Article

PHARMACEUTICAL STANDARDIZATION OF YASHADA BHASMA

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ABSTRACT

Rasa Shastra is the pharmaceutical branch of Ayurveda. As like any other medical system, success of Ayurvedic treatment also depends upon quality of medicine prescribed to the patient. The integral part of *Rasa Shastra* lies in the successful pharmaceutical process. *Bhasma* are the potent Ayurvedic preparations prepared by metals and minerals. These *Bhasma* possess wide range of therapeutic efficacy and are considered superior because of their qualities like small dose, quick action, palatability and longer shelf life. *Yashada bhasma* is important formulation mentioned in *Rasa shastra* texts obtained from the incineration of Raw *Yashada*. The pharmaceutical procedures adopted in this study are *Shodhana*, *Jarana*, *Marana*. The present study has been planned to standardize the method of preparation of *Yashada bhasma* according to the method explained in the classical literature.

KEYWORDS: *Yashada bhasma*, *Shodhana*, *Jarana*, Standardization.

INTRODUCTION

The nature possesses immensely valuable and powerful medicines in the form of metals, minerals and plants. However, most of the drugs as such are not absorbable into the biological system, until and unless they undergo certain modifications. Some specialized techniques are adopted to make these drugs absorbable and therapeutically viable. The drug manufacturing processes of Ayurveda are included in discipline of *Rasa Shastra Bhaishajya* and *Kalpana*. Heating, boiling, quenching, dipping, trituration, distillation, washing, filtering etc., are the important procedures involved in drug manufacturing. During *Shodhana*, *Jarana*, *Marana*, *bhavana* classical processes, the above-mentioned procedures are adopted. All these procedures play a significant and vital role in the pharmaceutical processing of drug materials.

Yashada bhasma has to be prepared accordingly, without any deviation from the classical preparation method in order to assure its safety and efficacy and also to get the desired effects in the diseases in which it is indicated like *Prameha*

MATERIALS AND METHODS

References: *Rasatarangini (Shodhana, Jarana)*, *Rasaamrutham (Marana)*.

Collection of Raw Material

Yashada was obtained from local market of Chennai, Tamil Nadu.

(Diabetes), *Pandu* (anemia), *Vatavyadhi* (neuromuscular disorders) and *Netravikaras* (eye disorders), which are routinely seen in our clinical practice. In the present study, *Yashada* was subjected to *Samanya Shodhana* (general purification method for all metals), *Vishesha Shodhana* (specific purification method for Zinc) and *Jarana* (roasting) as per *Rasatarangini*. *Yashada Marana* (incineration) was done as per *Rasaamrutham*. Standardization of Ayurvedic drugs at various levels starting from the selection and collection of raw material to the final product is essential to produce a safe and efficacious drug. Therefore in the present study an effort has been made to highlight the significance of these pharmaceutical procedures and to standardize the method of preparation of *Yashada bhasma*.

AIM OF THE PRESENT STUDY

- Pharmaceutical Standardization of various steps involved in the preparation of *Yashada bhasma*.

Methods

Entire preparation of *Yashada bhasma* was carried out in Department of *Rasa Shastra* and *Bhaishajya Kalpana*, TTD's S.V. Ayurvedic College, Tirupati, Andhra Pradesh.

Table 1: Total Pharmaceutical Study was carried out in Four Stages

Stage -1	<i>Kanji nirmana</i> , <i>Kulutta</i> (Sh.Ma. Kh. 10/12) <i>Kwatha nirmana</i> (Sh.Ma. Kh. 2/1-2), <i>Samanya shodhana</i> of <i>Yashada</i> (R.R.S. 5/13).
Stage -2	<i>Churnodaka nirmana</i> (R.T 11/216-217) <i>Visesha shodhana</i> of <i>Yashada</i> (R.T 21/98-99)
Stage -3	<i>Jarana</i> of <i>Shodhita Yashada</i> .(R.T21 /108-109)
Stage -4	<i>Marana</i> of <i>Jaritha Yashada</i> (Rasamrtam 3/119)

(R.R.S – *Rasa Ratna Samuchaya*, R.T – *Rasa Tarangini*, Sh. M.Kh – *Sharangadhara Madhyama Khanda*)

Yashada Bhasma Preparation

References	<i>Rasatarangini</i> (Shodhana, <i>Jarana</i>), <i>Rasaamrutham</i> (<i>Marana</i>)
Materials	a) Major material – <i>Yashada</i> b) Associated drugs - <i>Kanji</i> (Sour gruel) <i>Takra</i> (Buttermilk) <i>Kulattha Kwatha</i> (decoction of <i>Dolichus biflorus</i>) <i>Gomutra</i> (cow's urine) <i>Tilataila</i> (oil of <i>Sesamum indicum</i>) <i>Churnodaka</i> (lime water) <i>Nimba kashta</i> (Neem stick) <i>Kumariswarasa</i> (<i>Aloe vera</i>)
Method/ Principle	<i>Shodhana</i> , <i>Jarana</i> and <i>Marana</i>
Apparatus	<i>Pithara yantra</i> , <i>Khalwa yantra</i> , Gas stove, Iron ladle, Knife, measuring jar, Steel vessels, Spoon, Cloth, Filter paper, <i>Sharava</i> , <i>Multani mitti</i> , cow dung cakes.

Procedure

- *Raktasali* 1000g was taken, washed and cooked in 5 litres water. Rice was macerated and the liquid portion was filtered. Liquid was taken in a mud pot. The mouth of pot was covered with cloth and multani mitti. Pot was kept undisturbed for 14 days. After 14 days the liquid was filtered and stored in a container.
- 1000g of *Kulattha* was taken in a steel vessel and 16 litres of water was added to it. Vessel was kept over gas stove and heated on moderate fire. When water got reduced to one fourth of initial level, heating was stopped and the contents were filtered through a cloth.
- The *Yashada* was melted in an iron pan. It was immediately poured in to sufficient quantity of *Tila taila*. The procedure was repeated for six more times. Each time the *Tila taila* was changed. Likewise, the procedure was repeated with *Takra*, *Gomutra*, *Kanji*, *Kulutta kwatha* subsequently.
- 200g of *Sudha churna* was added to 4.8 litres of water taken in a steel vessel. Vessel was kept undisturbed for 9 hours. After 9 hours the liquid is filtered through a filter paper into a glass bottle.
- The *Yashada* was melted in an iron pan. It was quenched in sufficient quantity of *Churnodaka*. The process was repeated for six more times. Each time the *Churnodaka* was changed.
- *Shodhita Yashada* was placed in an iron pan and heated to melt. After complete melting of *Yashada* continuous rubbing was done with *Nimba kashta*. Rubbing was continued until all the *Yashada* turned into powder form and there were no metal particles visible. Then all the powder was collected in the centre of pan and covered with an earthen lid and subjected to *Tivra agni* for 3 hours. After self-cooling the powder was sieved through cloth, there were remains of some metal particles on cloth which were separated and again subjected to the same procedure. Obtained powder was washed with water for complete removal of alkali content. For washing powder was dissolved in water and left undisturbed for 3 hours and the clear supernatant liquid was drained. Water was tested each time for presence of *Kshara* with the litmus paper. After complete removal of alkaline content it was dried.
- *Jaritha Yashada churna* was taken in a *Khalwa Yantra*, sufficient quantity of *Kumari swarasa* was added to it and triturated. *Chakrika* of uniform size were prepared and dried well. They were kept in *Sharava* and subjected to *Sandhi Bandhana*.

Sharava samputa was kept in sunlight for drying. After drying it was subjected to *Gaja puta*. Whole procedure was repeated until all the *Bhasma Lakshanas* were attained as mention in the classics.

Observation

- In *Kanji* preparation, on 4th day sour alcoholic odour was observed near the pot indicating the process of fermentation. On 6th day bubbling sound was heard from the pot. After 12th day, more fermenting smell was observed. On 14th day the pot was opened and the liquid was filtered and collected in a clean vessel. *Kanji* was translucent yellowish in colour.
- During *Samanya shodhana*, *Yashada* initially was silvery white in colour. It was turned to coarse powder by the end of the procedure.
- During *Vishesha shodhana*, *Yashada* as the metal melts, which is less in amount as compared to the powder form, the dried remnants, from the last quenching in the *Kulattha Kwatha* burn with fumes and obnoxious smell is observed. The *Churnodaka* boils on quenching of the *Yashada* but does not spill over.
- *Jarana* procedure was carried out it was noted the *Nimba kastha* was burned and turned to ash, and then it was mixed with *Yashada*. After subjecting to severe heat the colour around the

periphery of earthen lid changed to orange and that of powder was reddish orange.

- In *Yashada marana*, temperature attained in *Gajaputa* was 1003°C. Maximum temperature was attained after 210 minutes. *Yashada* attained creamy white colour after 1st *Putra*. Consistency of the pellets was very soft after 2nd *Putra*. *Rekha purnatwa* was attained after 2nd *Putra*. *Varitaratwa* was attained after 5th *Putra*.

Precautions

- The quantity of *Dravadravyas* taken for each *Dhalana* should be sufficient to immerse the *Yashada* completely. Heating should be intense so as to *Yashada* melt completely. In each quenching the *Dravadravya* should be changed.
- In *Jarana* melted *Yashada* was rubbing was continued until all the *Yashada* turned into powder form and there were no metal particles visible.
- Powder was sieved through cloth, there were remains of the some metal particles on cloth which were separated and again subjected to the same procedure to prevent loss of *Yashada*.
- During *Marana* of *Yashada*, *Sandhi bandhana* should be done properly. Temperature should be noted at regular intervals. *Sharava* should be kept at the centre of the pit.

RESULT

Table 2: Showing the changes in weight of *Yashada bhasma* in various procedures

Name of the procedures	Initial weight (g)	Final weight (g)	Loss in weight (g)
<i>Samanya shodhana</i>	500	400	100
<i>Visesha shodhana</i>	400	370	30
<i>Jarana</i>	370	300	70
<i>Marana</i>	300	200	100

Table 3: Showing the temperature pattern of *Gajaputa*

Time in minutes	Temperature (degree Celsius)
0	24
30	125
60	300
90	540
120	775
150	945
180	975
210	1003
240	820
270	770
300	740
330	547
360	450
390	343
420	241
450	215

480	151
510	120
540	80
570	50
600	42
630	37
660	27

Graph No.1: Showing the temperature pattern of Gaja Puta

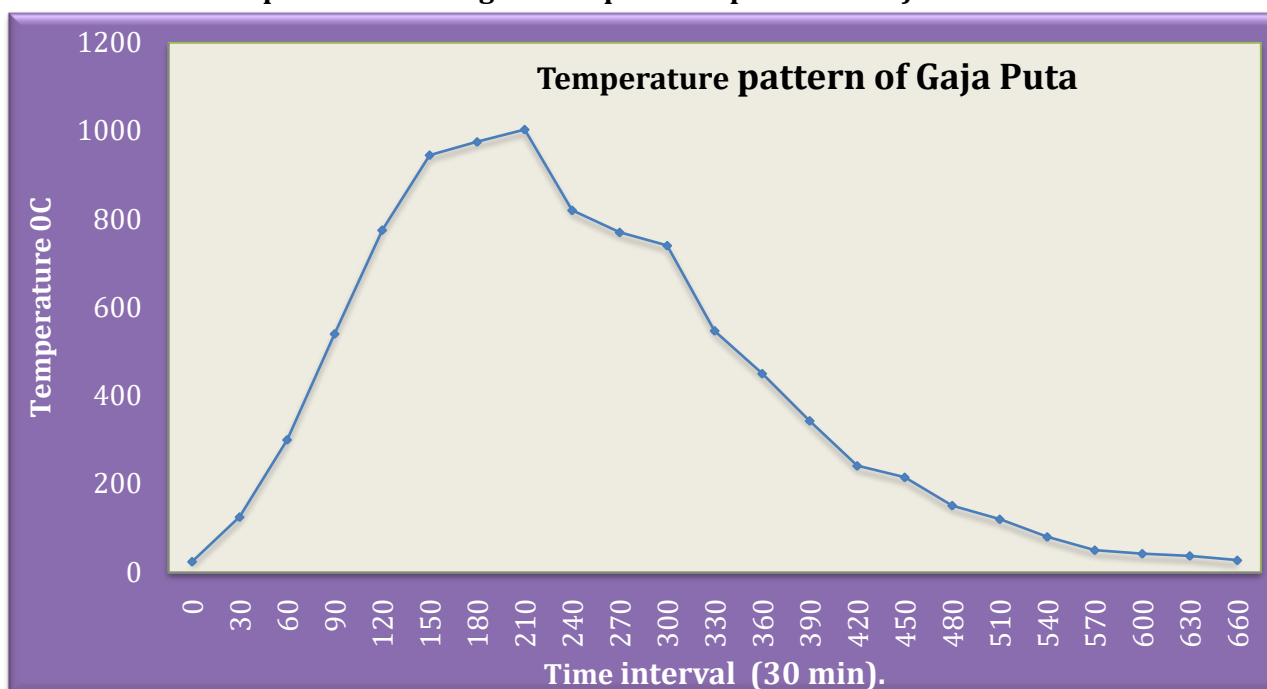


Table 4: Showing the Rekhapurnatwa of Yashada bhasma after every Puta

No. of Puta	Rekhapurnatwa
1 st	+
2 nd	+++
3 rd	++++
4 th	+++++
5 th	+++++

Table 5: Showing Varitaratwa of Yashada bhasma after every Puta

No. of Puta	Varitaratwa
1 st	---
2 nd	---
3 rd	++
4 th	++++
5 th	+++++

DISCUSSION

The pharmaceutical procedures adopted in this study are *Shodhana*, *Jarana* and *Marana*. *Shodhana* is done for *Yashada* to convert materials into suitable form for further procedures, to remove visible and in visible impurities, to reduce the toxicity and to enhance the therapeutic properties.^[1] *Jarana* is done *Nimba kashta* to convert powder form to suitable for *Marana*. *Marana* of *Yashada* was done

with *Kumari swarasa (Bhavana dravya)* to make it adaptable, absorbable and assimilable in body.

Samanya Shodhana of Yashada

- According to *Rasa Tarangini*, *Ashudha Yashada Bhasma* when taken internally causes *Prameha*, *Kushta*, *Gulma* and *Kshaya*^[2].
- *Shodhana* procedure makes *Yashada* free from fat soluble and water soluble impurities and makes it suitable for next procedure i.e. *Marana*.

- *Tila Taila* has *Snigdha*, *Sukshma* and *Ashukari* property;^[3] it may rapidly enter into the material through the cracks and intermolecular spaces, and makes film coating and further heating causes chemical reaction and compound formation.
- *Takra* is *Tikshna* and acidic in nature and it removes *Snigdhatata* imparted by *Tila Taila* due to its *Ruksha guna*.^[4]
- *Gomutra* by its *Ksharana* property^[5] may help in eradication of undesired substances from the material.
- *Kanji* and *Kulattha Kwatha* by their *Bhedhana* property^[6] make *Yashada* brittle.
- Repeated melting and quenching in specific media in specific order (pH: acidic, acidic, basic, acidic and basic) disrupts the compression tension equilibrium in the internal structure of *Yashada* which leads to cracks on its surface (Griffith theory, Stress corrosion theory and Theory of thermal expansion).^[7]

Visesha Shodhana of Yashada

- *Churnodaka* was taken as a liquid media for *Dhalana* in *Visesha Shodhana* process.
- *Churnodaka* has *Tikta rasa*, *Kshara guna*^[8]. By this property it may cause *Bhedana* in *Yashada*.

Yashada Jarana

Jarana is intermediary preparatory stage for *Marana*. In *Puti lohas* are transformed into powder form making them suitable for incineration. In this procedure melted zinc is oxidized in air to Zinc oxide at temperature of about 700°C. ($2Zn+O_2 = 2ZnO$)^[9]

Yashada Marana

- Metallic drugs should always be reduced to *Bhasma* form for internal use. *Jarita Yashada* was taken *Bhavana* with *Kumari swarasa* subjected to *Marana*.^[10] Main aim of *Marana* is *Yashada* reduce it to *Bhasma* form.
- *Marana* makes *Shodhita dravyas* adaptable, absorbable and assimilable for the body. During this procedure, various physico-chemical changes take place gradually and after repeated processing metals change into such forms that are suitable for internal administration.^[11]

Role of Bhavana in Marana of Yashada bhasma

- *Acharya Charaka* has described *Bhavana* as one of the *samskaras*. It is described that during preparation of any medicine, *Bhavana* with *swarasa* of specific *Dravya* enhances the *Bala* (potency) of *Aushadhi dravya*.^[12]
- *Bhavana* was carried out till all the *Subhavitha lakshanas* were obtained. *Bhavana* with herbal liquids (*Kumari Swarasa*) helps to bring minute particles of material in contact with each other as well as with liquid media. During wet grinding

process, mixture gets properly mixed and material becomes soft, smooth and sticky, which facilitates better binding of material (especially in *Kharaliya Rasayana*). Wet trituration facilitates particle size reduction and homogenization leading to modification of properties (*Gunantatradhana*) of the end product. Thus *Bhavana* helps in increasing the therapeutic efficacy by converting the *Bhavya dravyas* into smaller particles and adding the trace elements in *Bhasma* and converting a metal into a Herbo-metallic compound.^[13]

Kumari impact on Yashada bhasma Guna

- *Kumari* is having *Tikta Rasa*, *Katu Vipaka* and *Kapha Vatahara* properties. It is also having properties like *Rajorodha*, *Chakshushya*, *Rasayana* and *Vrushya*.^[14] By virtue of its *Guna*, it may help in enhancing *Rajahasravanisudana* property of *Yashada bhasma*.
- After attaining *Subhavita lakshanas*, *Chakrikas* were prepared of uniform size and shape to facilitate uniform distribution of heat during the *Putapaka*. These *Chakrikas* were dried properly, subjected to *Sharava samputikarana*, and then subjected to *Gajaputa*.
- *Puti* is the heating system and heating schedule which indicates the quantum of heat required by the *Rasadi dravyas* for their conversion into suitable form (*Bhasma*).
- Neither less nor excess heat is desired (*Nesto nyunaadikam*) i.e. the desired quantum of heat (*Supakam*) is needed to be applied for making it converted to desired form suitable for internal use.^[15]
- According to classics *Agni* mentioned for *Marana* of *Yashada* is *Gaja puta*. So in the present study *Gaja puta* has been selected for preparation of *Yashada Bhasma*.
- The maximum temperature recorded during *Puti* was 1003°C and it was maintained for a period of 3-4 minutes. After that, gradual fall in temperature was noted. It took seven and half hours to reach room temperature.
- The material turned to soft powder without any luster after complete process, which indicates that the temperature was sufficient for the formation of the desired compound.
- *Nischandratwa*, *Varitaratwa*, and *Rekhapurnatwa*, for *Yashada Bhasma* were checked after every *Puti*.
- *Yashada* attained creamy white colour after 1st *Puti*, consistency of the pellets was very soft after 2nd *puti*, *Rekha purnatwa* was attained after 2nd *puti* and *Varitaratwa* was attained after 5th *puti*.

These tests are very important because they give confirmation regarding the proper formation of *Bhasma*.

- *Yashada Bhasma* also showed *Mridutwa* and *Slakshnatwa* properties.

Yashada Bhasma

- *Yashada* has *Kashaya*, *Tikta rasa*, *Katu vipaka*, *Sheeta virya* and *Kapha-pitta Hara gunas*.^[16]
- It has *Vranasamsrava Avarodha*, *Rajahasrava nishuda*, *Pandu shamana* and *Balya* properties. By virtue of these properties *Yashada Bhasma* prevents excessive flow of blood during menstruation. *Balya* nature provides required tone to uterus.^[17]

CONCLUSION

Pharmaceutical standardization is the first step towards standardization of any drug. It is an important requisite for the establishment of their safety, efficacy and consistent biological activity. All the pharmaceutical procedures adopted in the preparation of *Yashada Bhasma* like *Shodhana*, *Bhavana*, *Marana* etc, plays a vital role by removing the toxic nature and improving the therapeutic efficacy, thereby rendering a safe and effective *Bhasma*.

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Images Showing the Preparation of Yashada Bhasma

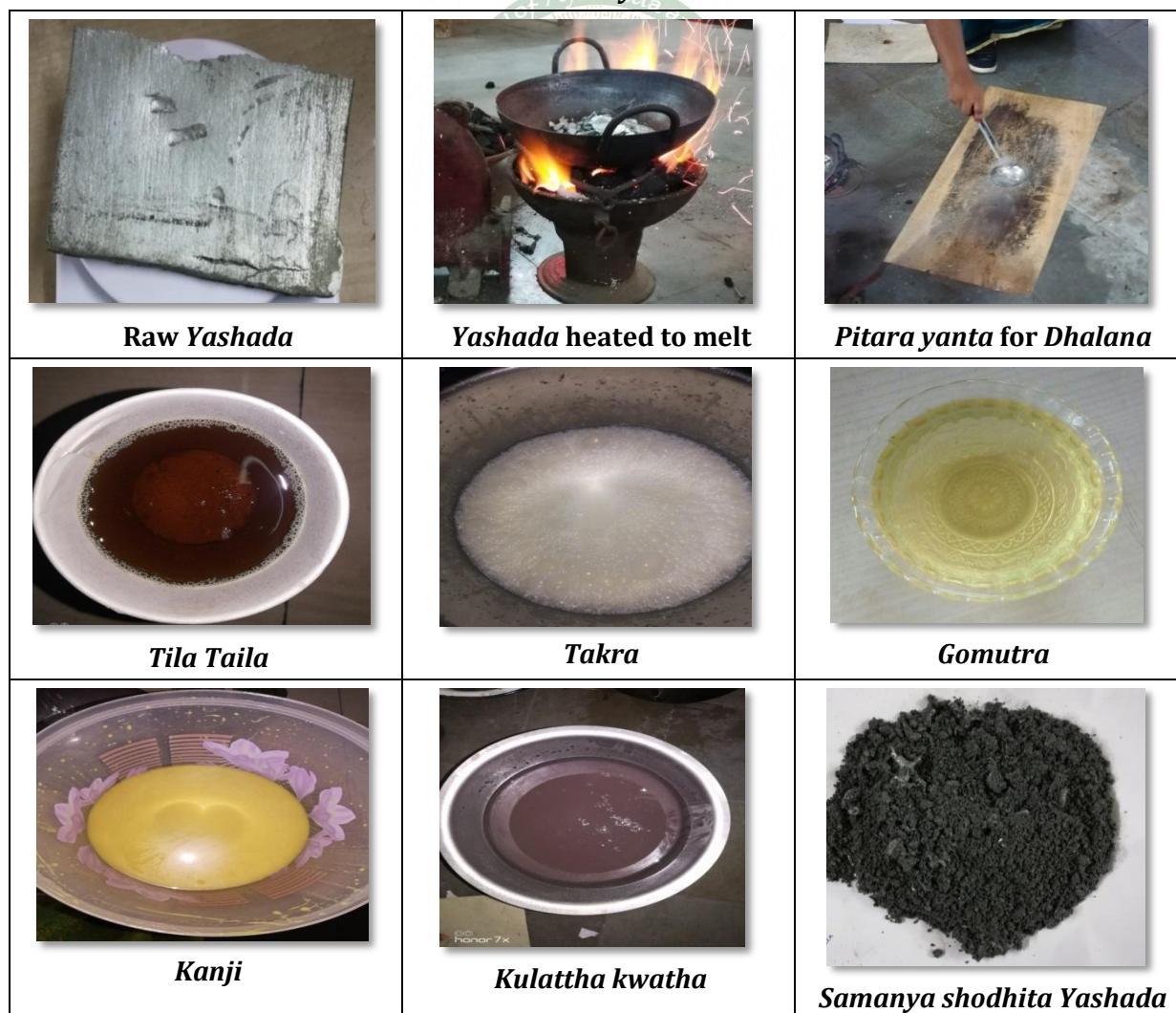
Kanji nirmana



Kuluttha Kwatha Nirmana



Yashada Samanya Shodhana



Yashada Vishesh Shodhana



Jarana of Yashada



Preparation of Yashada Bhasma



Bhasma Pareeksha

