



## Research Article

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### PREPARATION OF PARAD MARIT YASHAD BHASMA AND HARTAL MARIT YASHAD BHASMA WITH THEIR COMPARATIVE ANALYTICAL STUDY

Ingole Rajesh.Kundlikrao<sup>1</sup>, Patange Ravish Shamsunder<sup>2</sup>, Dhanurkar Santosh Ramchandra<sup>3</sup>, Bakare Sunil Chandrakant<sup>4</sup>

<sup>1</sup>Associate professor, P.G. department of R.S. and B.K., YAMC and RC Kodoli, Kolhapur, Maharashtra, India

<sup>2</sup>P.G. Scholar Rasa shastra department, YAMC and RC kodoli, Kolhapur, Maharashtra, India

<sup>3</sup>Associate professor, P.G. department of R.S. and B.K., YAMC and RC Kodoli, Kolhapur, Maharashtra, India

<sup>4</sup>Professor, P.G. department of R.S. and B.K., YAMC and RC Kodoli, Kolhapur, Maharashtra, India

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#### \*Corresponding author

E-mail: rajesh.ingole@rediffmail.com

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#### ABSTRACT

Yashada (Zinc) is one of the Dhatu mentioned under Loha varga in various Rasa shastra texts. It was separately mentioned with name Yashada along with its physical and pharmaceutical properties in 17<sup>th</sup> century by Madanpalnighantu; although it carries a classical reference as Kharpar satwa in Rasaratna samuccaya; which belongs to 13<sup>th</sup> century. Various authors had mentioned number of maran procedures of Yashada. As per the reference of Rasaratna samuccaya, the maran of Loha with Parada is considered as Shreshta while maran with Ariloha is considered as Durgunaprat. By applying this principle to maran of Yashada, here an evaluation is done on basis of its analytical study. Also the pharmaceutical aspect of maran with Parad and Hartala is been evaluated.

**Keywords:** Yashada, Loha varga, Maran, Parad, Hartala.

#### INTRODUCTION

Rasa shastra the Indian alchemy mainly deals with Lohavada and Dehavada. Primarily it was evolved as a metallurgical science in ancient India. Pre historic references show the use of metals like Gold, Silver, Copper, Brass etc. for various purposes. The metallurgical science was par developed in ancient period. As per the principle, “Yatha lohe tatha dehe.” the scientific principles were applied to make this metals useful for humans. Then the endeavour began to increase the metal bioavailability in number of human aliments. Experiments were carried out for generations and principles were laid down for making metals to be used as medicines. The procedures were named as ‘Marana’ and each metal were processed accordingly to get finished drug as ‘Bhasma’ of respective metal. The Bhasma altogether consisted of nano sized particles which were easily absorbed. They were also target oriented and hence used in specific disease. The maran procedures had a major role in utility of processes metal. Rasa Vagbhata had mentioned a principle regarding maran of loha<sup>1</sup>. It states that maran of Loha with Rasa is Shreshta, maran with Kashtha Aushadhi is Madhyama, maran with Gandhakadi is Kanishtha and maran with Ariloha is Durgunaprat. Many maran procedures of Yashada were mentioned through various Rasa shastra texts. Out of which two procedures were selected for current study. Maran of Yashada with Parad and with Hartala was carried out. Evaluation of procedure and Bhasma was done on pharmaceutical and analytical grounds.

#### Aims and Objectives

- Pharmaceutical study of Parad marit Yashad Bhasma according to Rasatarangini 19/107

- Pharmaceutical study of Hartal marit Yashad Bhasma according to Rasatarangini 19/111
- Comparative study based on ancient and modern analytical parameters.

#### MATERIALS AND METHODS

##### Materials

It include raw Yashada(Zn), Parada(Hg), Ghandhaka(S), Hartala(As) and associated drugs needed for Shodhana and Maran procedures. Various types of equipments along with fuel are included under this caption.

##### Methods

It included all the pharmaceutical study carried out in current context. Shodhana of raw Yashada<sup>2</sup>, Parada<sup>3</sup> and Ghandhaka<sup>4</sup> was carried out. Then the Shodhit Yashada was subjected to maran procedure by two methods.

##### Method- I Marana of Yashada

The procedure was carried out in following steps

- Shodhit Yashada (200g) was melted in iron vessel by giving tivra agni.
- After melting it was poured in Khalwa Yantra containing Shuddha Parada (200g) and was triturated vigorously.
- Thus formed mixture was washed with Nimbu (*Citrus limon*) swarasa and dried.
- Shuddha Gandhaka (200g) was added to the mixture and triturated to obtain fine kajjali.
- This kajjali was then subjected for one Gaja puta. After giving one Gaja puta the formed Bhasma didn't passed the Bhasma pariksha. Hence was subjected for second puta. After second Gaja puta the Bhasma obtained passed the Bhasma pariksha.<sup>5</sup>

**Method- II Marana of Yashada**

The procedure was carried out in following steps

- Shodhit Yashada was melted in iron vessel by giving tivra agni.
- After melting it was rubbed with freshly collected Nimba Kashta (Fresh sticks of *Azadirictina indica*) by jarana method.

- After jarna procedure the mixture was triturated with Shuddha Hartala (1/4<sup>th</sup> of Jarit Yashada)
- Then one Gaja puta was given to it. After giving 1<sup>st</sup> puta, the obtained bhasma had metallic consistency and also didn't pass Bhasma pariksha. Further putas were given till it passed Bhasma parikshas. After fourth puta the Bhasma passed all parikshas.<sup>6</sup>

**Table 1: showing organoleptic characters of yashada**

Sample	Colour	Constancy	Touch	Smell	Sound
Raw Yashada	Silvery white	Solid	Smooth	No	Metallic
Parad marit Yashada Bhasma	Bright yellowish white	Powdery	Soft (as of talc powder)	No	No
Hartal marit Yashada Bhasma	Dark yellow	Powdery	Soft (as of talc powder)	No	no

**Table 2: X-Ray Diffraction Study**

Samples	X-ray diffraction	
	Major phase	Minor phase
Parad marit Yashad.Bhasma	Sphalerite (ZnS)	Zincite (ZnO), Zinc Oxide
Hartala marit Yashad.Bhasma.	Zincite (ZnO)	Sphalerite (ZnS)

**Table 3: AFM of Yashada Bhasma**

Sample	Particle size	
	Range	Average
Parad marit Yashad. Bhasma	Ht.- 3.575nm Area- 125.885nm <sup>2</sup> Diameter- 12.660nm	Ht.- 3.575nm Area- 125.885nm <sup>2</sup> Diameter- 12.660nm
Hartala marit Yashad. Bhasma	Ht.- 1.065 to 12.900nm Area- 118.256 to 5172.729nm <sup>2</sup> Diameter- 12.271 to 81.155nm	Ht.- 5.978nm Area- 2141.317nm <sup>2</sup> Diameter- 43.802nm



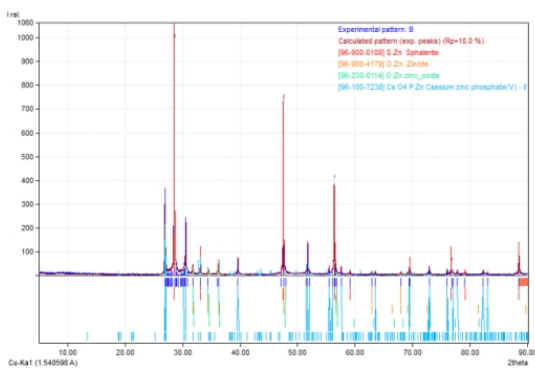
Parad marit Yashad.Bhasma after 2<sup>nd</sup> Puta



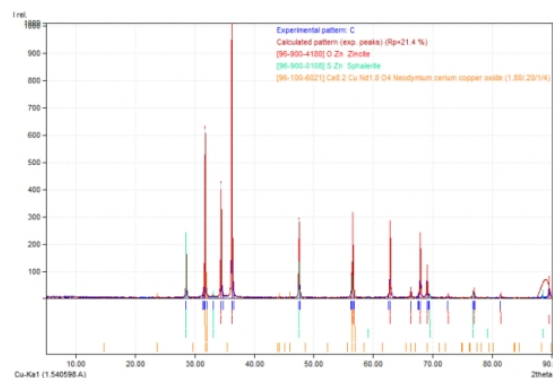
Hartala marit Yashad.Bhasma after 4<sup>th</sup> Puta



Putra



XRD- Parad marit Yashad Bhasma



XRD- Hartala marit Yashd Bhasma

## RESULT

### Analytical study

This can be divided into two parts

1. Ancient methods
2. Modern methods

### Ancient Method

Raw materials required for the study were standardized and collected according to grahya agrahya lakshanas as mentioned in text. The final produce - Yashada Bhasma prepared by two methods was also subjected for examinations like Rekhapurnatva, Varitaratva etc. for organoleptic characters of Yashada (Table 1).

### Modern Method

Yashada Bhasma prepared by two methods was subjected for XRD phase identification and AFM particle size analysis.

### X-Ray Diffraction Study

XRD is based on scattering of X-rays by crystalline structure. This is a qualitative as well as quantitative test (Table 2).

### Atomic Force Microscopy

It is an advance imaging technique for getting 3 dimensional images of given sample with particle size evaluation (Table 3).

## DISCUSSION AND CONCLUSION

Colour of Parad marit Yashada Bhasma was bright yellowish white and that of Hartala marit Yashada Bhasma was deep yellow. X- ray diffraction of Parad

marit Yashada Bhasma showed major phase of zinc sulphide and minor phase of zinc oxide. While Hartala marit Yashada Bhasma showed major phase of zinc oxide and minor phase of zinc sulphide. AFM of Parad marit Yashada Bhasma showed even particle size and were found to be smaller than that of Hartala marit Yashada Bhasma. On pharmaceutical grounds and on the basis of quality of final product, Parad marit Yashada Bhasma was found to be better as compared with Hartala marit Yashada Bhasma.

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