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BHASMA: A HERBAL AYURVEDIC NANOFORMULATION

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ABSTRACT

Ayurveda and other Indian system of medicine use metals, but their use is also amply described in Chinese and Egyptian civilization in 2500 B.C. Bhasma are unique ayurvedic metallic/minerals preparation, treated with herbal juice or decoction and exposed for Ayurveda, which are known in Indian subcontinent since 7th century A.D. and widely recommended for treatment of a variety of chronic ailments. Animal's derivative such as horns, shells, feathers, metallic, nonmetallic and herbals are normally administered as Bhasma. A Bhasma means an ash obtained through incineration; the starter material undergoes an elaborate process of purification and this process is followed by the reaction phase, which involves incorporation of some other minerals and/or herbal extract. The holistic eternal healing science has achieved worldwide recognition because of remarkable efficiency in curing chronic and degenerative diseases with a few side effects. Bhasmas are Ayurvedic herbomineral formulation prepared from herbs, minerals and metals by calcinations process. Nano particles natures of bhasma make them unique and are wildly recommended to treat chronic diseases in most efficient ways. Nano particulate nature and chemical characterization of bhasma can be estimated by using analytical instruments like X-ray diffraction (XRD), Fourier transform infrared spectroscopy (FTIR), Atomic absorption spectroscopy (AAS), Thermo gravimetric analysis (TGA), Scanning electron microscope (SEM), Atomic force microscope (AFM). In this review an attempt is made to gather the physical chemical and biological evaluation methods for bhasma and to develop a systematic approach for the quality control parameters of bhasma and thus make them more appreciable by the world.

KEYWORDS: Ayurveda, bhasma, marna, Nano-particle, shodhna, standardization.

1. INTRODUCTION

Ayurveda is the science made up of Veda (knowledge) and Ayush (life) i.e. knowledge of life. An Ayurvedic system adopts a holistic approach towards health care by balancing the physical, mental and spiritual functions of the human body. Rasa-Shastra (vedic-chemistry) is one of the parts of Ayurveda, which deals with herbomineral/metals/non-metals preparations called Bhasmas. Rasayana[1] (immunomodulation and anti-aging quality) and yogavahi (ability to target drugs to the site) are characteristics of a properly made herbo-mineral/metals/ non-metals preparation, which is also nontoxic, gently absorbable, adaptable and digestible in the body.[2]

Bhasma in Ayurveda has been defined as substance obtained by calcination. Use of both bhasma (reduce after incineration-calcinated preparation) as well as in pishti (powdered gem or metal) form along with appropriate herbs for treatment of critical ailments is a medicinal prepertion in Ayurveda and Unani. Bhasma are claimed to be biologically produced nanoparticles, which are prescribed with several other medicines of Ayurveda. The concept of using nanometal particle is prevailing since Charakasamhita.[3] For a metallic preparation of Lauhadi Rasayana, iron is used to heat up until red hot and quenched in some liquid media immediately until flakes of iron become in fine powder form.[4, 31, 32]

1.1. HISTORY

Ayurveda and other Indian system of medicine use metase is also amply described in Chinese and Egyptian civilization in 2500 B.C. Bhasma are unique ayurvedic metallic/minerals preparation, treated with herbal juice or decoction and exposed for Ayurveda, which are known in Indian subcontinent since 7th century A.D. and widely recommended for treatment of a variety of chronic ailments. Animal's derivative such as horns, shells, feathers, metallic, nonmetallic and herbals are normally administered as Bhasma. A Bhasma means an ash obtained through incineration; the starter material undergoes an elaborate process of purification and this process is followed by the reaction phase, which involves incorporation of some other minerals and/or herbal extract. There are various importance of Bhasma like maintaining optimum alkalinity for optimum health, neutralizing harmful acids that lead to illness; because Bhasma do not get metabolized so they don't produce any harmful metabolite, rather it breakdowns heavy metals in the body. Methods including for Bhasma preparation are parpati, rasayoga, sindora, etc., Bhasma which contain Fe, Cu, S or other manufacturing process plays a specific role in the final product(s). Particle size (1-2 μ)

reduced significantly, which may facilitate absorption and assimilation of the drug into the body system. Standardization of Bhasma is utmost necessary to confirm its identity and to determine its quality, purity safety, effectiveness and acceptability of the product. But the most important challenges faced by these formulations are the lack of complete standardization by physiochemical parameters.[4]

1.2 BHASMA AS NANOPARTICLE

Animal derivatives such as horns, shells, feathers, metallic and nonmetallic minerals are normally administered as Bhasma. A Bhasma means an ash obtained through incineration. The starter material undergoes an elaborate process of purification (shodhana), followed by the reaction phase, which involves incorporation of some other mineral and herbal extracts. Then the material in pellet form is incinerated in a furnace. The end product is expected to be a nontoxic material. Examples are Swarna Bhasma, Shankha Bhasma, Tamra Bhasma etc. Gold in tradition Indian ayurvedic medicine as Swarna Bhasma (gold ash) has been characterized as globular particles of gold (56-57 nm). Mercury compound contains mercury sulfide (crystalline size 25-50 nm) [Figure 1].[5, 24]

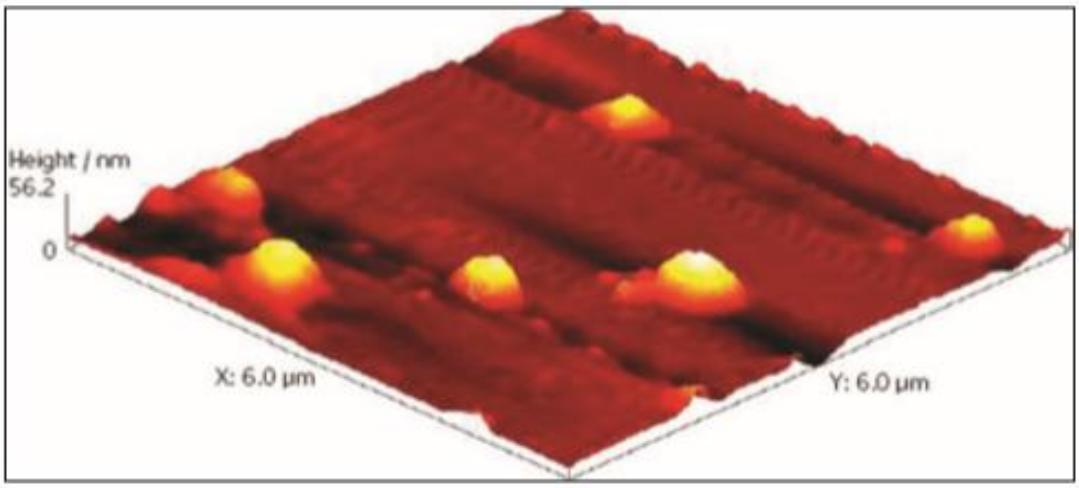

Figure 1: Atomic force microscopy image on a Nanonics Multiview.

2. CLASSIFICATION OF BHASMA

Bhasma are generally classified basis on their colour and appearance or based on their dominant metal or mineral group. Usual color of bhasma is yellowish black, dark, white, grey, reddish black and red depending upon drug used.[6]

1. Metal-based Bhasma.
2. Mineral-based Bhasma.

3. Herbal Bhasma.

3. PREPARATION OF BHASMA

3.1. GENERAL PROCEDURES

The name Bhasma is generally applied to all metallic and nonmetallic substances that are subjected to the process of incineration and reduction into ash [Table 1]. Here it is applied to the scientific basis for ayurvedic therapies metals, minerals, and animal products that are, by special processes, calcinated in closed crucibles in pits with cow dung cakes (puttam).[7]

Table 1: Bhasma and their ingredients.

Bhasma	Ingredients
Abhrak Bhasma	Mica
Halthiana Bhasma	Charcoal of elephant tusk
Jasada Bhasma	Zink oxide
Loah Bhasma	Iron oxide
Mandura Bhasma	Iron oxide
Mayrapicha Bhasma	Ash of peacock feather
Mukta Bhasma	Oxide of pearl
Nag Bhasma	Lead
Parade Bhasma	Mercury compound
Pravala Bhasma	Oxide of coral
Rajata Bhasma	Silver oxide
Sankha Bhasma	Oxide of conch Bhasma
Mukta Shukti Bhasma	Oxide of pearl, oyster shell
Talaka Bhasma	Arsenic sulfide
Tamra Bhasma	Cupric oxide
Vanga Bhasma	Tin compound

3.2. THE PROCESS OF PREPARING BHASMA

Shodhana (Purification): By this process material becomes free from visible and invisible impurities, masses of minerals are converted to fine and brittle.

Bhavana: It is a wet trituration process using mortar and pestle. By this the materials are mixed uniformly and divided in to fine particles by rubbing and attrition that is the force applied which help to increase the surface area of the material and thereby increases the rate of reaction21.

Jarana: Small pellets are made and dried in sunlight. Their melting point are increased due to oxidation process. These pellets are arranged in earthen sharava (casserole) and covered with another sharava. Joint are sealed and dried again.

Putapak: Puta system of keeping – prepared sharava are heated, enumeration according to the nature of materials, inorganic part of plant material supplies trace elements to the materials. During putapaka material are formed on the surface of the particle.

Marana (Enumeration or calcinations): The compound materials are converted to another compound where elements are get reduced. Sometimes bhasmas are subjected to post-operative procedures like lohitikarana and amritikarana to enhance the therapeutic properties of bhasmas.[8]

For the production of Bhasmas, Shodhan (Purification / Pretreatment) and Marana (incineration /calcinations), these two procedures are the important steps (including some intermediary procedures in respect of particular materials like Dhanyabhraka for Abhraka and jarana for lead, tin and zinc).[13]

1. Purva Karma: Shodhan (Purification)
2. Pradhana Karma: Marana (incineration /calcination)
3. Paschat Karma: Lohitikarana, Amritikarana.

3.2.1. PURVA KARMA: SHODHAN (PURIFICATION)

In Ayurveda, purification is called Shodhana. Shodhana is the process through which the external and internal impurities of metals and minerals are removed. Shodhana is an addition and separation process, it is a pre process for marana.

- **The following processes are involved in purification**

1. Elimination of harmful matter from the drug.
2. Modification of undesirable physical properties of the drug.
3. Conversion of some of the characteristics of the drug to different stages.
4. Enhancement of the therapeutic action.

- **Effect of Shodhana**

Following effects are observed during Shodhana,

1. Material becomes free from visible and invisible impurities.
2. Masses of minerals converted into fine and brittle.
3. Development of fineness and brittleness facilitates the bhavana process.
4. Partial reduction takes place.
5. Induction of organic therapeutic property in the inorganic material.

- **Bhavana and its effect**

It is a wet trituration process.

Advantages of Bhavana are following,

1. Materials are mixed uniformly.

2. Materials divided into fine.

3. Surface area of material exposed and expended which facilitates reaction during firing (Marana).

4. Develops softness, smoothness and stickiness in the material facilitates better binding of material.

5. Enhances the therapeutic property of minerals and metals.

- **Pellatization**

Drying of pellets:

1. Small disk of Bhavita material should be made.

2. Dry in sun or in dryer

3. Wet pellets if subjected for puta desired colour will not appears.

4. Desired smoothness will not develop.

5. Before putting it in Sharava (casseroles) for sealing it should be dried completely.

6. Wet pellets should not be allowed.

- **Sarava samputikarana**

1. Arrange pellets in an earthen sharava.

2. Covered it with another sharava.

3. Joints of earthen lids should be sealed 7 layers with cloth and mud.

4. Again dry it in sun or in dryer.

5.Properly sealed prevents the escape of volatile material.

6.It prevents interference of out side gases and dirt.

7. Finally sealed sharavas subjected to puta system of repeated heating till the material completely converted into bhasma with desired characteristics.

- **Puta system of heating**

3. Puta is a specific system of heating for the incineration metals and minerals.

2. For the hard, soft, organic, inorganic, volatile, inflammable and according to heat resistance various puta have been described.

3. According to the quantity of fuel Mahaputa, Gajaputa, Varahaputa, Kukkutaputa, kapotputa, Gorbarputa, Bhanda and Tusha, etc. puta are mentioned.

4. Each and every puta have different diameters.

5. Intensity of heat, Mode of Temperature and Time duration depends upon the puta.

6. According to the heat resistance of the material puta are selected and applied for the marana purpose. Such as, for Gold & Silver Laghu or Kapot puta, Vanga, Naga, Yashada Kukkutaputa or Ardha gajaput, Tamra in Varaha or kukkutaputa and for Abhraka and Loha in Varaha or Gajaputa are applied.[13, 14, 15, 16, 17]

Figure 2: Bhavna.

Figure 3: Pellatization.

Figure 4: Sarava Samputikarana.

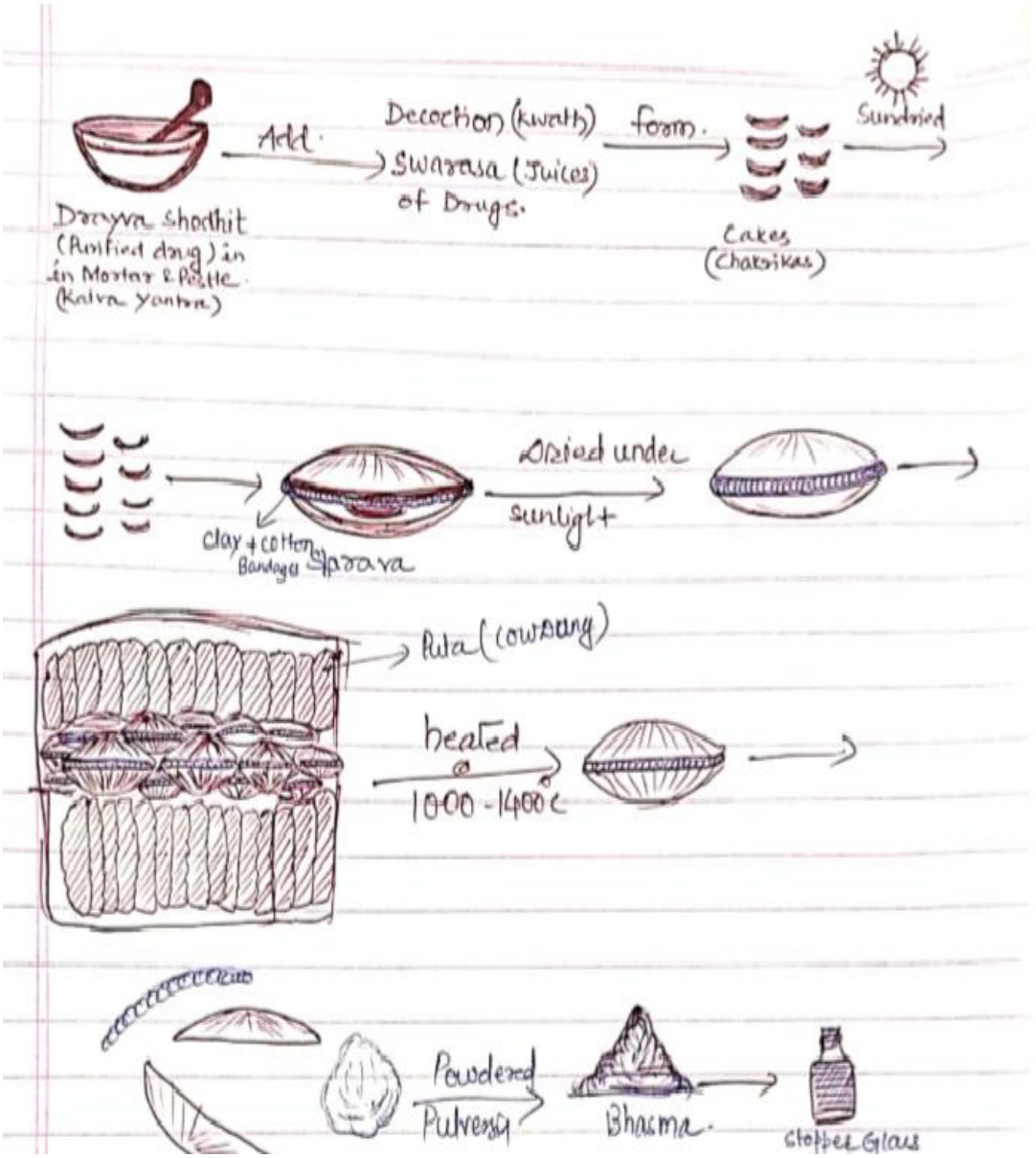

Figure 5: S.C. Representation of Bhasma preparation.

3.2.2. PRADHANA KARMA: MARNA (INCINERATION /CALCINATION)

1. Marana term denotes the meaning of incineration or calcinations. When minerals (compounds) and metals (elements) are subjected for heating on moderate to intense temperature, compound material converted to certain other compounds where as elements get reduced to certain compounds.

2. Nature of compound depends upon the material added in to the main material and exposure of environment.

3. Various system of heating is applied for this purpose but the puta system of heating is common for marana.

4. Marana is an Association and dissociation process.

5. Elements are converted into certain compounds.
6. Metals are reduce to ash (forms compound).
7. Compounds are converted into certain other compounds.
8. Nature of compound formed depends upon the material used for marana.
9. It may be sulphide, oxide, chloride, sulphates etc.
10. Macro forms of material converted into micro form.
11. Heavy and solid material converted into light and soft.[18, 19, 20]

Figure 6: Marna.

3.3.3. PASCHAT KARMA: LOHITAKARANA, AMRITIKARANA

In some cases post operative procedures are also followed to achieve safe, effective and desired Bhasma.

- **Amritikarana**

1. It removes the remaining blemishes of the bhasma.
2. It enhances the therapeutic properties of the bhasma.

- **Lohitikarana**

It develops desired red color (rakta varga dravyas) in case of loha and Abhraka bhasma. It is mainly use to impart red color to Abhrak bhasma, as the color of Abhrak bhasma is mentioned as Ishtika varna (brick red color).

3.3. PROCESS REACTION

Rasaushadhies are mainly based on minerals (compound state) and metals (elemental state). The basic material when treated frequently with plant extractives and heated on fire the following reactions are observed.

1. Marana is a compounding / reduction and dissociation process.
2. Plant extractives are converted into ash or solid organic / inorganic forms depend upon the intensity of heat applied.
3. Compounds are reduced and converted into another compounds.
4. Elemental metals gradually reduced and converted into compounds.
5. Nature of compound depends upon the media as catalyst added.
6. Herbal residue participates in formation of compoundor it may present with the mineral compounds.
7. Wet grinding after each firing exposes the surface of metallic Particles.
8. Exposed surface coated with the media of catalysts for further reaction.[21, 22]

4. STANDARDIZATION AND EVALUATION OF BHASMA

Standardization is a measurement for ensuring the quality and is used to describe all measures which are taken during the manufacturing process & quality control leading to a reproducible quality.

4.1. NEED FOR STANDARDIZATION OF BHASMA

Evaluation of a drug means confirmation of its identity and determination of its quality and purity and detection of its nature of adulteration. The analysis carried out on the formulations used for treatment show that the raw metals used for their preparation lose their metallic characteristics and turn into mineral complex after processing.[23] In their raw form, the metals like mercury, copper, sulphur and lead etc. would be highly toxic.

However according to the ancient text of Ayurveda the traditional manufacturing process over a period of two to three years, whereby the medical arc repeatedly ground and fired in furnaces at temperatures between 1200 °C to 6000 °C are believed to remove the toxicity and impart remarkable therapeutic value to the compound. Some compounds for instance, have grinding and heating cycles repeated hundred times with each cycle lasting 4.7 days.

In order to prove the effect of processing in the elimination of toxicity of metal based formulations various toxicological studies were carried on raw, partially processed &

processed copper, mercury and sulphar metals (used against certain types of cancer and inflammatory disorder). The parameters studied included various liver function tests, hematological and histopathological studies. Based on the results obtained it can be inferred that processing indeed has profound influence in the elimination of toxicity as maximum deviation from normal values of various studies was found in rats treated with raw metal and then followed by partially processed and processed copper.

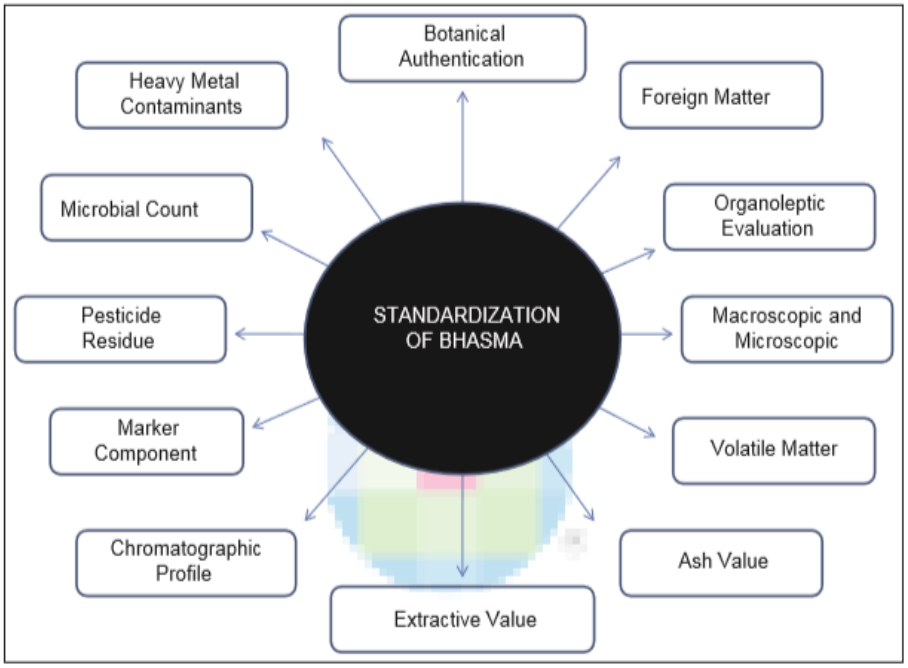

Figure 7: Standardization of Bhasma.

4.2. BHASMAS PARIKSHANS (ANCIENT METHOD OF STANDARDIZATION)

Rekhaspurnata - By rubbing between fingers finest is tested.

Varitarq (floating test) – Pinch of bhasmas is added on the surface of clean water. It should float.

Unamas - Rice grain was placed on the surface of floating bhasmas. The floating should persist.

Niswadu (taste) – Pinch of bhasmas was placed on the tongue.

Nishchandrata – A pinch of bhasmas was taken and observed under bright sunlight. No shinning particles in the bhasmas.

Nirdhumatva – A pinch of bhasmas was sprinkled on ignited charcoal and observed if fumes are emerging out.

Apunarbhava –bhasma was triturated with guda (jaggery), gunja (*Abrus preceatorius*), Tankana (borax), madhu (honey), and ghrita (ghee). One gram each and a paste were

prepared. This paste was kept in musha (crucible) and sandhibandhana (sealing) was done. It was then subjected to teevragni (intense heating up to 1000°C) for an hour. After swangasheeta (self cooling) musha was opened and charred mass was powdered and observed for absence of shinning particles.

Namburi phased spot test- First phase (0-5min), after putting a drop of yashada bhasma solution on potassium iodide paper, a wet central spot spread outside, In the second phase (5-20 min) it was observed that spreading of the drop.[24, 25, 26]

Table 2: Bhasma Pareeksha.

Physical	Chemical
Varna (Colour)	Gatarasatva (tastelessness)
Varitara (float)	Nirdhuma (absence of fumes)
Rekhapurna (furrow filling)	Apunarbhava (irreversibility)
Unama	Nirutha (irretrievable)
Anjana sannibha (softness)	Amla pareeksha (sour test)
Varna (Colour)	Aksharatwa (lack of alkaline taste)

Figure 8: Rekhapurnatva.

Figure 9: Varitaratwa.

Figure 10: Unama.

Figure 11: Nirutha.

Figure 12: NPST- Yashada bhasma.

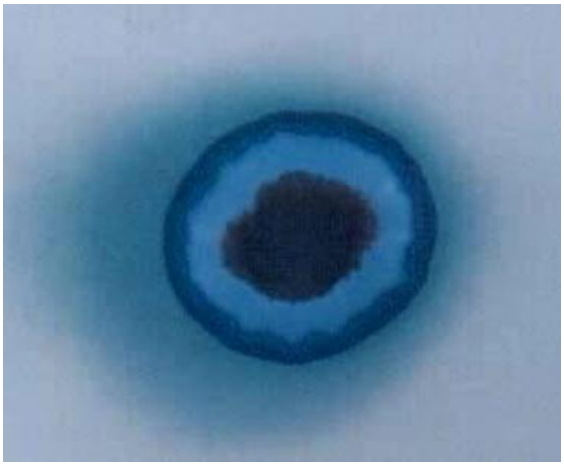

Figure 13: NPST-Tamra bhasma.

Table 3: Dhatu bhasma and Varna.

Dhatu Bhasma	Varna
Abhraka	Istika varna
Vaikranta	Raktabha
Makshika	Rakta
Vimala	Rakta
Rasaka	Rakta
Chapala	Rakta
Kasisa	Rakta
Kankshi	Shweta
Kaparda	Krishna
Sudhavargeeya dravya	Shweta
Loha	Pakwa jambuphala sadrusha
Swarna	Champaka
Rajata	Krishna
Tamra	Krishna
Naga	Kapota
Vanga	Chandrama
Yashada	Peeta 23

Table 4: Dhatu and Jala varna.

Dhatu	Jwala varna
Teekshna Loha	Krishna
Kanta Loha	Kapila
Swarna	Peeta
Rajata	Shweta
Tamra	Neela
Naga	Dhumra
Vanga	Kapota
Abhraka	Pandura
Tutha	Lohita
Vajra	Aneka

4.3. STANDARDIZATION ACCORDING TO WHO GUIDELINES (MODERN PARAMETMETERS)

By modern parameters, bhasmas has to be standardized according to WHO guidelines. Which includes the following parameters.

4.3.1. PHYSICOCHWMICAL PARAMETERS

Which include physical standardization and chemical standardization.

- **Physical Standardization**

Here Bhasmas where evaluated for

1. Physical properties like colour, odour, taste and pH.
2. Physical constants like total ash, acid insoluble ash, Water soluble ash and loss on drying
3. Particle size determination by sieve analysis and by micromeritics methods
4. Determination of floating property by placing a pinch of Bhasma over a tumbler of water.
5. Determination of fineness and metallic luster by direct observation under direct sunlight.

METHODS

1. Determination of total ash-1 gm of formulation was taken in silica crucible and incinerated at a temperature 450^0 C until free from carbon and cooled and weighed.
2. Acid insoluble ash-Total ash was boiled for 5 minutes with dilute HCl. Insoluble matter was collected, washed, ignited and weighed.
3. Water soluble ash-Total ash was boiled for 5 minutes with 25ml of distilled water, cooled and collected the insoluble matter on ash less filter paper. Washed and ignited at 450^0 C. Subtract the weight of insoluble ash and the percentage was calculated.
4. Determination of loss on drying- The samples are taken in china dish and placed in hot air oven and the weight was observed in every half an hour till same weight was observed,weight lost is due to the removal of water and volatile ingredients.
5. Determination of pH- Aqueous solutions is prepared and measurements are carried out at 25^0 C using pH meter.[27, 12]

- **Chemical Standardization**[11]

This involves use of different analytical instruments give in table No. 5.

Table 5: Analytical instrument and their uses.

FTIR	To detect the composition of bhasma.
Thermo gravimetric analysis (TGA)	To check the temperature of loss of Absorbed dioxygen species.
Scanning electron microscopy (SEM)	To detect surface morphology
Atomic Force Microscopy	Gives Chemical Composition
X-ray photo electron spectroscopy (XPS)	Gives valuable information about surface States of sample bhasma.
Energy dispersive X-ray analysis (EDX)	chemical composition, crystallographic
X-ray diffraction methods (XRD)	structure and crystallite sizes of Bhasma are obtained.
Atomic absorption Spectrometry (AAS)	Helps in quantitative determination of metals present in Bhasma
Bet Surface Area Measurement	Helps to find out the specific surface area of the particle of drug sample.[32]

4.3.2. PHARMACOLOGICAL STUDIES

Here the samples are tested for specific pharmacological activity using animal models. Animals have to be selected and they are treated according to GLP guidelines. Specific pathological conditions are produced by inducing agents. This includes specific activity studies and toxicological and histopathological studies of Bhasma under study. This standardization parameter ensures the therapeutic effectiveness and quality control methods using sophisticated instruments for herbometalic formulations.

4.3.3. INSTRUMENTATION ANALYSIS

Instrumental analysis of bhasma is give in the table No.6.

Table 6: Instrumental analysis of bhasma.

Sr.	Parameter	Purpose
1.	EDX-SEM	Chemical nature, size & morphology of particles
2.	TEM, AFM	Particle size, size distribution
3.	EPMA	Distribution of individual elements
4.	XRD	Phase analysis
5.	XRF, PIXE	Bulk chemical analysis after making pellets, Detecting metal as element
6.	ESCA	Electronic nature & oxidation state of metal
7.	Extraction & Chromatography	To extract out organic matter if any
8.	HPLC, NMR, IR, MALDI,	Characterization of organic matter.[28]

EDX- Energy Dispersive X ray analysis, TEM- Transverse Electron Microscopy, AFM- Atomic Force microscopy, EPMA- Electron Probe Micro Analyzer, XRF- X ray Fluorescence, PIXE- Particle Induced X ray Emission, ESCA-Electron spectroscopy for

Chemical Analysis, NMR-Nuclear Magnetic Resonance, IR- Infrared spectroscopy, MALDI-Matrix Assisted Laser desorption / ionization.

Figure 14: NMR.

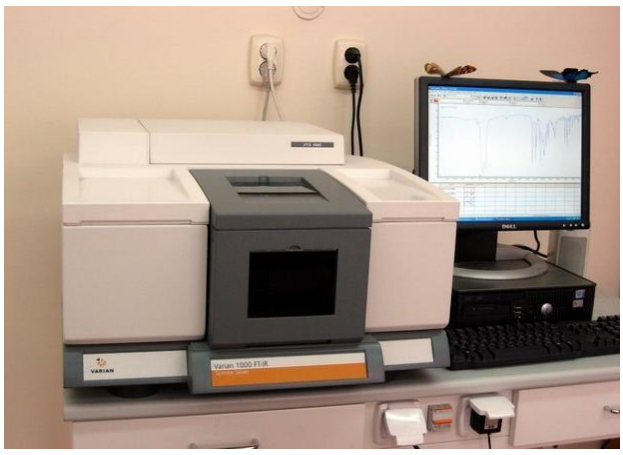

Figure 15: IR Sprctrometer.

Figure 16: AFM.

Figure 17: ESC.

Figure 18: EDX.

Figure 19: EPM.

Figure 20: MAL.

Figure 21: TEM.

5. IMPORTANCE OF BHASMA

1. Maintain optimum alkalinity for optimum health.
2. Provide easily absorbed and usable calcium.
3. Cleanse the kidneys, intestines and liver.
4. Maintain stronger bones and healthier teeth.
5. Alleviate insomnia, depression.
6. Keeps rhythmic heart beating.
7. Keeps arrhythmias and minerals balance.
8. Help metabolize iron in body.
9. Aid nervous system.
10. Breakdown heavy metals and drug residues in body.
11. Neutralize harmful acids that lead to illness.
12. Achieve a healthy alkaline level by neutralizing acid.
13. Protect body from free radical damage.[19, 29]

6. MARKETED BHASMA PRODUCTS AND THEIR USES

Table 7: Marketed bhasma product and there uses.[30]

Name	Ingredients	Dosage	Uses
Navrattankalpamrit ras	Calcined ash of expensive gems, minerals like ruby, sapphire, emerald, cat's eye stone, pearl, coral, silver, gold, iron, zinc	62.5 mg twice daily	Cancers of all types, anemia, complications of diabetes.
Heerak Bhasma	Diamond	12.5-25 mg twice daily	Useful in cancers, immunity disorders, crippling rheumatoid arthritis, bone marrow depression
Tsrailokya chintamani ras	Diamond, gold, silver, iron	62.5 mg twice daily	Severe respiratory tract infections, bone marrow depression, ovarian cysts, uterine fibroids
Swarna basant malti ras	Gold, piper-nigrum, white pear powder	62.5 mg twice daily	Tonsillitis, fevers, cough, bronchitis, decreased immunity, cancers, autoimmune disorders
Kamdudha ras	Ochre, Tinospora cordifolia, mica (calcined)	250-500 mg twice daily	Hyperacidity, headache, fever, blood pressure
Vasant kusumakar ras	Gold, silver, coral	62.5-125 mg twice daily	Complications of diabetes, neuropathy, general weakness
Kumar kalian ras	Gold, iron, mica, copper pyrite, red sulfide of mercury	62.5-125 mg twice daily	General debility in children, fever, respiratory tract infections
Tamra Bhasma	Copper, mercury, sulfur	62.5-250 mg twice daily	Anemia, jaundice, digestive disturbance, abdominal disorders
Loha Bhasma	Iron, cinnabar	125-250 mg twice daily	Enlargement of liver, anemia, jaundice
Vaikrant Bhasma	Manganese, sulfur(Tourmaline)	62.5-125 mg twice daily	Diabetes, can be used in place of diamond ash in case of poor patients
Loknath ra	Mercury, sulfur, conch shell	62.5-125 mg twice daily	Diarrhea, respiratory disorders, immunity disorders, cancers, ovarian cysts
Swarna Bhasma	Ash of gold (Calcined gold)	12.5-62.5 mg twice daily	Improves body immunity, general weakness, anemia, energetic
Abhrak Bhasma	Calcined purified mica ash	125-250 mg twice daily	Respiratory disorders, diabetes, anemia, general weakness
Rajat Bhasma	Silver ash (Calcined silver)	62.5-125 mg twice daily	Irritable bowel syndrome, acidity, pitta disorders
Ras raj ras	Red sulfide of mercury, mica, gold, iron, silver, with ania somnifera, Syzygium aromaticum	62.5-125 mg twice daily	Paralysis, hemiplegia, rheumatism, insomnia, stroke
Shwaskuthar ras	Black sulfide of mercury, aconitum ferox, sodium bicarbonate, piper nigrum, 'Trikatu'	125-250 mg twice daily	Cough, pneumonia, bronchitis
Swarnmakshik	Copper pyrite (calcined),	125-250 mg	Anemia, jaundice, stomatitis,

Bhasma	mercury, sulfur	twice daily	chronic fever
Kaharva pishti	Amber of succinite (trinkantmani), rosa centifolia (rose)	125-250 mg twice daily	Bleeding
Yogender rasa	Red sulfide of mercury, gold (calcined), magnetic iron, mica, myristica fragrans	62.5-125 mg twice daily	Polio, paralysis, muscular weakness, insomnia, headache
Bolbadh ras	Black sulfide of mercury, Tinospora cordifolia, Commiphora mukul	125-250 mg twice daily	Bleeding
Praval pishti	Purified powder of corals	125-250 mg twice daily	Calcium deficiency, blood pressure, insomnia, agitation
Praval panchamrit	Powder of corals, pearls, conch shells	125-250 mg twice daily	Richest source of natural calcium, agitation, acidity, burning sensation
Jaharmohra pishti	Powder of serpentine orephite	125-250 mg twice daily	Natural source of calcium, useful in burning sensation, acidity, heart burn
Sarvatobhadra Vati	Mercury, sulfur (purified and calcined), with gold	62.5-125 mg twice daily	Renal failure, nephrotic syndrome, dialysis, high urea and creatinine
Punarnavam andoor	Iron ore ash, Boerhavia diffusa, Picrorhiza Kurroa Embelia ribes	125-250 mg twice daily	Diuretic, anemia, swelling around joints, blood pressure, liver cirrhosis, ascites
Akikpishti	Agate stone calcined	125-250 mg twice daily	Heat/pitta diseases, blood pressure, acidity, ulcers
Mukta pishti	Pearls powder (moti pishti)	62.5-125 mg twice daily	Calcium, cooling and soothing, blood pressure, acne, headaches, acidity, ulcers, heat disorders
Vriht vat chintamani ras	Herbs and minerals for vitiated vata- calcined mercury, sulfur (purified) and other metals and minerals	62.5-125 mg twice daily	Stroke, paralysis, parkinsonism, epilepsy, tetany, muscle stiffness, joint pains

Heerak Bhasma

Kukkutandatvak Bhasma

Spatik Bhasma

MARKETED BHASMA

Loh Bhasma

Yashad Bhasma

Suvarna Bhasma

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