International Journal of Phytopharmacy
ISSN: 2277-2928 (Online)
Journal DOI: https://doi.org/10.7439/ijpp

Research Article

Pharmaceutical and analytical study of Shukti bhasma prepared by classical method

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Abstract

In Ayurveda many metals and minerals have been in usage as medicine since many years. Metals and minerals are in the non-absorbable form which is later converted into absorbable, most effective and non-toxic form using the process of Bhasmikarana (Incineration). The changes in the physical and chemical properties of these drugs are due to the Samskara done through the process of Shodhana, Bhavana, maranaetc. Each and every drug has its own method of incineration as required for its medicinal use. Bhasmas are unique ayurvedic metallic or mineral preparations widely recommended for treatment of a variety of ailments. Animal derivatives such as horns, shells, feathers, metallic, non-metallic and herbal are normally administered as Bhasmas. ShuktiBhasma is the choice of drug having various therapeutic uses in day today practice. An attempt is made to prepare Shuktibhasmaas per the classics.

Keywords: Bhasma, Shodhana, Marana, Gajaputa, ShuktiBhasma, Calcium content.

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***Article History:**
Received: 05/9/2021
Revised: 20/10/2021
Accepted: 22/10/2021
DOI: https://doi.org/10.7439/ijpp.v11i1.5687

QR Code

How to cite: Ambatkar B, Dive M. and Kubde S. Pharmaceutical and analytical study of Shukti bhasma prepared by classical method. *International Journal of Phytopharmacy* 2021; 11(1): e5687. Doi: 10.7439/ijpp.v11i1.5687 Available from: https://ssjournals.com/index.php/ijpp/article/view/5687

1. Introduction

Bhasmas are unique ayurvedic metallic or mineral preparations widely recommended for treatment of a variety of ailments. This group of medicines can work even in smaller doses and may even control incurable diseases effectively [1]. Animal derivatives such as horns, shells, feathers, metallic, non-metallic and herbal compounds are normally administerd as Bhasmas which are used after adopting proper purification process employing various purifying agents.

Theses detoxification processes remove the toxic potentials from minerals and metals and in part a very high-grade therapeutic efficacy. It is very clear and evident from long history of usage of Herbomineral and metallic preparations in Ayurveda and Siddha medical system that properly processed Herbo mineral preparation can contribute significantly to the health care of the society. To understand the science involved in the process of Bhasma Formation, a simple preparation of ShuktiBhasma was selected for the study. Shukti, is categorised under Sudha varga [2] and also under Shuklavarga [3] by Rasa scholars. Shukti iscommonly known as Oyster shell. Chemically, Shuktiis identified as Carbonate of Calcium. Since ancient days Shuktiis used for playing as well as for medicinal purposes. In the present paper Shukti Bhasma whose main indications are in Agnimandya (Loss of appetite), Parinamasula (Duodenal ulcer), Grahani (Malabsorption syndrome), was prepared by classical method and studied from standardization point of view.

1.1 Aims and objectives

1) To prepare ShuktiBhasma by classical method.
2) Analytical study of ShuktiBhasma prepared by classical method.

2. Materials and methods

The experiment was worked out as follows:

A. Pharmaceutical Study

B. Analytical Study

A. Pharmaceutical Study

1. Collection of Raw materials
2. Shodhan – Shukti
3. Maran –Shukti

1. Collection of Raw materials

All the ingredients were collected from the local market.

2. Shodhana of MuktaShukti[4](Oyster shell)

Material:

- RawMuktaShukti - 590gms
- Nimbuswarasa (Citrus Limon)-Q.S.

Equipments:

- Gas stove
- Dolayantra[5].

Method:

Muktashukti was taken in Khalvayantra and made into small pieces. These pieces were washed with hot water to remove sand and mud if any. The pieces of Shukti were placed in three folded clean cloth tied into 2 Pottali's. These Pottali's was suspended with the help of stick and immersed in nimbuswarasa present in the earthen pot so that the bottom of Pottali should not touch the inner surface of the pot. This Dolayantra was kept over mild fire and boiled for 3 hours. Nimbuswarasa was added subsequently to maintain the level of media. After 3-hour Pottali was taken out and allowed to cool. After cooling, ShodhitaShukti was collected from Pottali and washed with warm water and allowed for complete drying.

Precaution:

- Mandagni was maintained throughout the procedure.
- The Pottali was not allowed to touch the bottom of pot.

3. Observation

The weight of the MuktaShukti was reduced to 570g.

Table 1: Showing the Observations during Mukta Shukti Shodhana.

Total quantity taken Raw Shukti	590 gms
Total quantity obtainedShodhitShukti	570 gms
Loss	20 ms

3.1 Marana of Mukta Shukti [6]:

Material:

- Shoditha MuktaShukti - 570gms
- Kumariswarasa (Aloe Berbedensis) - Q.S
- Khalwayantra
- Two earthernsharava (Plates), Cotton cloth & Multanimitti, thread.
- Gajaputa Pit Cowdung Cake.

Method:

The whole method of Marana of Mukta Shukti was completed in following stages.

1. Making pieces Mukta Shukti of
2. Sharavasamputa formation
3. Gaja Puta.

Making pieces of Shuktika

Shodhita Mukta Shukti were taken in KhalvaYantra and broken into small pieces, and were taken in Sharava and spread equally.

Sharavasamputa formation

Two concave earthen sharava were taken. The broken Shuktika pieces were placed inside one of the Sharava and it was covered with another Sharava. Sandhi between two Sharavas was sealed with one-layer multani smeared thread and seven layers of multanimitti smeared cloth. Each cloth measured 80 cm in length and 8 cm in width (7 in number). Each layer was placed after drying of the previous layer.

Gaja Puta

Size and Shape: Gaja Puta was given by using the pit of following dimensions.

Size of Pit: 58.5cm Height, 58.5cm depth & 58.5cm width

Fuel: 200cow dung cakes were used.

132 cow dung cakes were placed below Sharavasamputa and 68 cow dung cakes were placed above Sharavasamputa,.to ensure uniform degree of heat.

Mode of Heating

Fire was ignited, by keeping four small camphor balls on all four sides. Thermocouple tip was kept below the sharava (upper 1/3rd of Gaja Puta). Temperature obtained during Puta was recorded with the help of Pyrometer. After Swangasheeta, Sharavasamputa was taken out of pit and layers of Multani mitti smeared cloth were scrapped carefully with knife. Burnt Shukti were taken out and weighed. Likewise, 2 more putas were given

B. Analytical study

A] Ayurvedic Parameters [7-9]

1. Rekhapurna – Bhasma fills the spaces in between the fingers
2. Varitara – bhasma floats on the surface of water
3. Slakshna – smooth
4. Sookshma – very fine
5. Laghu – light

B] Physicochemical Parameters [9]

1. pH
2. Total Ash Value
3. Water Soluble Ash
4. Acid Insoluble Ash

5. Bulk Density
6. Assay of Calcium
7. Moisture content
8. Elemental Percentage

Table 2: Changes in weight of Shukti during Shodhan

Total quantity taken Raw Shukti	590 gms
Total quantity obtainedShodhitShukti	570 gms
Loss	20 gms

Table 3: Changes in weight of Shukti during Bhasma Preparation

Batch	Initial Weight (Shudha Shukti)	Final Weight (Shukti Bhasma)	Loss in gm
Bhasma	570 Grams	477 Grams	93 Grams

Table 4: Organoleptic Parameters of Shukti Bhasma

Parameters	ShuktiBhasma
Shabda	Nil
Sparsha	Soft and Fine
Varna	Whitish
Rasa	Slightly Alkaline
Gandha	Non-Specific

Table 5: Classical Analytical Parameters of ShuktiBhasma

Parameters	ShuktiBhasma
Rekhapurnatva	++++
Varitaratva	- - -
Slakshnatva	++++

Table 6: Analytical study of AshudhaShukti, ShudhaShukti and ShuktiBhasma

Compound	pH	TAV	WSA	AIA	BD	A of Ca	MC
Ashudhashukti	9.27	38.42	1.39	2.15	2.396	38.47	9.25
Shudha shukti	9.49	42.65	1.20	1.09	2.709	39.03	9.50
Shukti Bhasma	9.18	97.58	0.26	1.15	2.726	39.18	0.89

*TAV- Total AshValue, WSA- Water Soluble Ash, AIA- acid Insoluble Ash BD- Bulk Density, A of Ca- Assay of Calcium, MC- Moisture Content

Table 7: Elemental Percentage (%w/w) of ShuktiBhasma

Compound	Ca	CaCo3	Mg	Na	K	Fe	Silica
ShuktiBhasma	49.92	55.97	1.45	0.31	0.018	0.17	4.20

4. Discussion

4.1 Shodhana

Swedana is one of the shodhana procedure which is used for shodhana of many Rasadravyas. In the process the drug is boiled in the liquids which are either ksharas, amlasor both and herbal juices, with the help of Dolayantra

4.2 Bhavana (Trituration)

ShuktikaBhasma were taken in a KhalvaYantra and powdered.Then it was mixed and triturated with sufficient quantity of Kumari Swaras.

Diffusion process may occur in this kind of shodhana. According to Fick's law of diffusion dx/dt = D.dc/dt the flux on atom of substance moves from higher concentration to lower concentration in fixed period of time in a solution where D is diffusion coefficient. This law may hold good with swedana process. Here the impurities may move from the drug to the shodhana liquids and some organic qualities of liquids move from the liquids to the drug resulting in purification and potentization of the drug. And also, it may be helpful in reducing the hardness of the drug as heat is given continuously through boiling liquids. Reduction in hardness may help in further processing of the drug.

4.3 Marana

Bhavana is given by grinding with some liquid media, so it may be considered as wet grinding and it is observed interestingly that finer size of particles can be achieved by wet grinding than dry grinding as this involves break down of the material by rubbing between two surfaces called as surface phenomena.

In Puta heat is applied to the Sharava from all sides, so in a spherical mass, there is a temperature difference between the surface and core. But in case of flat pellets, there may not be much difference of temperature between the surface and core, so their heat may get distributed homogeneously. And homogeneous heating is the basic criteria for proper incineration.

Earthen sharavasamputa were used for incineration because of inert nature and easy availability. Pores present in earthen sharava allow escaping of gases formed during heat treatment and also to regulate uniform heat to the substance and temperature is maintained for longer period.

Depending upon the type of material and the media used for Marana, specific types of putas have been mentioned. For shuktimaranaGaja puta is used. This depends upon the melting point and hardness of the drug.

Cow dung cakes were used as a fuel in the puta. Specific type of arrangement of cow dung cakes were used in puta i.e., lower $2/3^{rd}$ of pit was filled with cow dung cakes. Then SharavaSamputa was placed and rest of the pit i.e., $1/3^{rd}$ is again filled with cow dung cakes. This specific type of arrangement allows sustained heat for prolonged period.

Here similar kind of heating pattern was adopted till complete formation of Bhasma.

5. Conclusion

Shuktikabhasma was prepared according to the classical reference. The total weight of the obtained bhasma was 477 grams. There was significant weight loss in the 1st two Gajaputas compared to the 3rdPuta. The loss after Shodhana of Shukti in Nimbuswarasawas 20 gramsand the loss after marana was 93 grams.

The data of present study suggests that the inclusion of analytical techniques becomes a necessary prerequisite to evaluate the quality of Bhasma preparation and formulation. Further animal study and clinical study needs to be done to evaluate the absorption and elemental effects.

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