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Effect of Different Liquid Medium in the Preparation of a Bhasma (Marana) with Special Reference to Abhraka Bhasma – A Pharmaceutical Study

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ABSTRACT

Ayurvedic medicines are serving humankind since long back. Availability of enormous range of dosage form in the *ayurvedic* pharmaceutics gives it a unique approach for the treatment. *Bhasma* is a commonly used dosage form in *ayurveda*. Shodhana (purification) and marana (calcination) are the important pharmaceutical processing in *bhasma* manufacturing. Liquid medium of herbal origin are important factor in the process of marana (calcination). For the preparation of abhraka (biotite) bhasma a lot of herbal juice / decoctions are mentioned in the texts of ayurvedic pharmaceutics. To study their role, abhraka bhasma was prepared with two different liquid medium. Effect of medium on the pharmaceutical processing is summarized in the present paper.

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INTRODUCTION

Metallic and mineral preparations are frequently used for therapeutic purposes in Indian System of Medicine especially in ayurveda since many centuries. Around the medieval period 8^{th} – 10^{th} century many pharmaceutical processing like shodhana (purification), marana (incineration), satvapatana (extraction) etc. developed in ayurvedic pharmaceutics for metallic and mineral preparations. Since after this, uses of these preparations become more frequent in therapeutics and drugs which were known as Rasaushadies. These rasaushadies have innate qualities like quick action, lesser dose, tastelessness, prolonged shelf-life & better palatability[1]. Due to these qualities metallic and mineral preparation have given a unique, comprehensive health care approach to Indian system of medicine for serving as global medical system. In Ayurvedic pharmaceutics the process of Shodhana (purification) has its importance because the dravyas used for medicinal purposes are of metal, mineral, vegetable and animal origin. Shodhana (purification)[2] may be regarded as an essential step to remove the external impurities as well as to make the drug ready for other pharmaceutical processes. It is a process of purification and detoxification by which physical and chemical blemishes and toxic materials are eliminated & substances are subjected for further processing. Marana[2] (calcination) is a process of heat treatment of Shodhit (purified) material at different temperature pattern known as Puta[3] which convert it into Bhasma (ashes) form- a therapeutically accepted form. Abhraka (Biotite) is an important mineral used for medicinal purposes since long back in many diseases [3] in the form of Bhasma.

MATERIALS AND METHODS

Materials

Pharmaceutical Processing of Abhraka (Biotite) was done in the practical laboratory of department of Rasa shastra, Banaras Hindu University. 2 kg of Abhraka (Biotite) was procured from Ayurvedic Pharmacy, I.M.S., B.H.U. Then this was subjected to Shodhana (purification) process according to traditional Ayurvedic procedures of Nirvapa [3] (Heating to red hot stage and immediately quenched in liquid medium) method using Decoction of Triphala[3]{pieces of dry fruits of Haritaki (*Emblica officinalis*), Vibhitaki (*Terminalia bellirica*) & Amalaki (*Terminalia chebula*)}as media. Dhanyabhraka[3] is an intermediatory process in between shodhana

(purification) and marana (calcination) in case of abhraka. Shodhit (purified) abhraka was mixed with 1/4th of unhusked rice (paddy) and tied in cotton cloth. This tied cloth was soaked in Kanjii (filtered product of fermented boiled rice and radish in water) for 3 days. Then this was rubbed with both palms till fine particle comes out. This fine particles were collected in vessel and evaporated till the liquid lost completely. Product obtained is called Dhanyabhraka. Two different liquid medium [4] were selected for marana (calcination) process to find out their roles in the pharmaceutical processing.

• Arka Patra Swarasa (Juice of leaves of *Calotropis procera*)
• Kasmarda Panchanga Swarasa (Juice of whole part of *Cassia occidentalis*)

First of all two sets of equal weight of 500 grams of Dhanyabhraka were made. These different sets were levigated to each media separately. After levigation pellets of uniform size & shape were made. Pellets were kept on plastic sheets for drying under sunlight. Dried pellets were kept in sarav (Silica casserole) and covered with another one and put in electric muffle furnace for heat treatment at the temperature of 900^{0}C for 45 minutes. The process were repeated till the bhasma of brick red color powder was obtained and follow the parameters of unique bhasma mentioned in the ayurvedic texts [5].

RESULTS

During the shodhana process after each nirvapa, the crammed structure of Abhraka was destroyed to form small pieces & particles due to increased brittleness. It was observed that on complete Shodhana fine abhraka particles start floating in air & more to long distance from the place of Shodhana. It takes 25 – 30 minutes to reach at red hot stage. Result of shodhana and dhanyabhraka are tabulated in Table 1and 2 .

Summary of complete marana process, time & temperature schedule used for abhraka marana, weight of pellets before and after bhavana (levigation), organoleptic characters and bhasma pariksha (examination) during abhraka marana of both liquid medium are tabulated in Table 3 to 9.

DISCUSSION

Marana is an important process done after Dhanyabhraka, it may be equated with the process of incineration or calcinations. Marana process converts the mineral/metal into micro fine bhasma form, able to be absorbed in the biological system to provide desired therapeutic effect. In this process material is levigated with decoctions / juice of plant material, made into pellets and dried completely till it loses moisture. These pellets are subjected to particular quantum of temperature for a particular period after samputikarana.

Puta, the quantum of heat and the pattern of heat provided for incineration is the most important factor for oxidation and reduction process as well as for formation of desired compound. If the quantum of heat will be more then pellets will become hard and the material may be reduced to the original form. If the quantum of heat will be less proper reaction will not occur and may require more number of puta for the formation of desired compounds.

The temperature and time are proportionately essential for facilitating optimum reactions to occur so that a genuine product can be obtained, hence it can be said that 900^0C could be most important phase for preparation of a better quality of Abhraka bhasma.

Black pellets were turned to brownish red black from 3rd puta, after 6th puta onwards the colour of material was gradually converted into brick red. After 1st puta pellets were very hard in consistency but after 4th puta onwards pellets started to become soft gradually. From 10th puta, partially prepared bhasma slightly passed varitara (floating on water) and other test of genuine bhasma. After 22nd puta material passed all required classical test parameters of bhasma in case of levigation with Arka Patra Swarasa Bhavana and after 24th in case of levigation with Kasmarda swarasa bhavana.

Abhraka Bhasma yields more from Arka Patra Swarasa Bhavana than Kasmarda Swarasa Bhavana because number of puta required for Bhasma preparation is less in case of Arka Patra Swarasa Bhavana i.e. 24 puta in compare to 27 puta from Kasmarda Swarasa Bhavana.

CONCLUSION

Special emphasis on pharmaceutical processing is important because a suitable method only produce genuine medicines. So it is essential to find out suitable liquid medium for manufacturing of Abhraka Bhasma as lot of medium are mentioned in the ayurvedic texts. From

the present study a clear image can be drawn regarding the effect of medium in the pharmaceutical processing in various aspects like time taken for the complete process and the amount of product prepared etc.

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Table 1. Showing result after Shodhana process

Media	Initial wt. in grams	Final wt. in grams	Loss in grams
Triphala Kwath	2000	1820	180

Table 2. Showing yield after the process of dhanyabhraka

Shodhit Abhraka (gms)	1800
Dhanya (gms)	450
Kanji (ml)	8000
Dhanyabhraka yield (gms)	1530
Loss (gms)	270

Table 3. Showing the complete marana process of Abhraka Bhasma

Duration of Levigation	Total no. of Putas	Temperature	No. of days during one Puta
7 Hrs/Puta	24 for levigation with Arka Patra Swarasa (Juice of leaves of *Calotropis procera*) and 27 for levigation with Kasmarda Panchanga Swarasa (Juice of whole part of *Cassia occidentalis*)	900^0C temperature maintained for 45 min	3 days/Puta

Table 4. Showing Time & Temperature schedule used for Abhraka Marana from both liquid medium

Time	Temperature (^{0}C)	Time	Temperature (^{0}C)
9.30 A.M	37	1.00 P.M	875
9.45 A.M	50	1.15 P.M	800
10.00 A.M	130	1.30 P.M	720
10.15 A.M	235	1.45 P.M	680
10.30 A.M	290	2.00 P.M	530
10.45 A.M	330	2.15 P.M	440
11.00 A.M	400	2.30 P.M	345
11.15 A.M	520	2.45 P.M	280
11.30 A.M	600	3.00 P.M	220
11.45 A.M	760	3.15 P.M	195
12.00 A.M	835	3.30 P.M	175
12.30 A.M	910	3.00 P.M	124
Maintained for 45 Mins	910	3.30 P.M	90

Table 5. Showing result of marana process with both the medium

Levigation medium	Weight of Pellet after drying (gms)	No. of puta (quantum of heat)
Arka Patra Swarasa (Juice of leaves of *Calotropis procera*)	420	24
Kasmarda Panchanga Swarasa (Juice of whole part of *Cassia occidentalis*)	355	27

Table 6. Showing organoleptic character during Abhraka Marana by Arka Patra Swarasa (Juice of leaves of *Calotropis procera*)

No. of Puta	Colour of pellet	Odour	Taste	Touch
1st	Black	No typical odour	Not Performed	Hardness + + +
2nd	Black	No typical odour	Not Performed	Hardness + + +
3rd	Blackish brown	No typical odour	Not Performed	Hardness + + +
4th	Brownish red	No typical odour	Not Performed	Hardness + +
5th	Brownish red	No typical odour	Slightly Sweetish	Hardness + +
6th	Brick red	No typical odour	Slightly Sweetish	Hardness + +
7th	Brick red	No typical odour	Slightly Sweetish	Hardness + +
8th -10th	Brick red	No typical odour	Slightly Sweetish	Hardness +
11th -15th	Brick red	No typical odour	Tasteless	Softness +
16th -20th	Brick red	No typical odour	Tasteless	Softness + +
20th -24th	Brick red	No typical odour	Tasteless	Softness + + +

Table 7. Showing Bhasma pariksha of Arka patra swarasa (Juice of leaves of *Calotropis procera*) Bhavita (levigated) Abhraka Bhasma

No. of Puta	Chandrika	Varitaratva	Rekhapurnatva
1 to 4	+ + +	Absent	Absent
5 to10	+ + +	+	+
10 to 15	+ +	+	+ +
15 to 20	+	+ +	+ +
21 to 24	Absent	+ ++	+ + +

Table 8. Showing Organoleptic character during Abhraka marana by Kasmarda Panchanga Swarasa (Juice of whole part of *Cassia occidentalis*)

No. of Puta	Colour of pellet	Odour	Taste	Touch
1st	Black	No typical odour	Not Performed	Hardness + + +
2nd	Black	No typical odour	Not Performed	Hardness + + +
3rd	Blackish brown	No typical odour	Not Performed	Hardness + + +
4th	Brownish red	No typical odour	Not Performed	Hardness + + +
5th	Brownish red	No typical odour	Slightly Sweetish	Hardness + +
6th	Brick red	No typical odour	Slightly Sweetish	Hardness + +
7th	Brick red	No typical odour	Slightly Sweetish	Hardness + +
8th -10th	Brick red	No typical odour	Slightly Sweetish	Hardness +
13th -15th	Brick red	No typical odour	Tasteless	Softness +
16th -20th	Brick red	No typical odour	Tasteless	Softness + +
20th -25th	Brick red	No typical odour	Tasteless	Softness + +

Table 9. Showing Bhasma pariksha of Kasmarda Bhavita Swarasa (Juice of whole part of *Cassia occidentalis*)

No. of Puta	Chandrika	Varitaratva	Rekhapurnatva
1 to 4	+ + +	Absent	Absent
5 to10	+ + +	+	+
10 to 15	+ +	+	+ +
15 to 20	+ +	+ +	+ +
21 to 24	+	+ +	+ + +
25 to 27	Absent	+ + +	+ + +