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SYNTHESIS AND CHARACTERIZATION OF ABHRAK BHASMA PREPARED BY TWO DIFFERENT AYURVEDIC METHODS- A STANDARDIZATION STUDY

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ABSTRACT

The ancient Indian science of life, *Ayurveda*, is gaining favour again. It was invented hundreds of years ago by Indian gurus. To make *Ayurvedic* remedies more acceptable to the medical community and individuals who are unwell, it is vital to demonstrate their usefulness in light of contemporary experimental research. *Abhrak* is a mineral compound that contains tiny amounts of silicon, magnesium, calcium, potassium, and aluminium. There have been a few studies on abhraka bhasma and physiochemical characterization of abhraka bhasma, but only few of them have evaluated the influence of various media in shodhana, dhanyabhraka nirmana, or marana. The goal of this study is to conduct a pharmaceutical study of *Abhraka shodhana, Dhanyabhraka,* and *Marana* to establish a method for *Abhraka Bhasma* formation and the role of various Medias in pharmaceutical processing, as well as an analytical study of various samples collected during the *Abhraka Bhasma* preparation process to depict the effect of various Medias. *Abhraka shodhana* was performed according to the procedure described in *Rasa Ratna samuchaya* using *Triphala kwath* as a medium. *Shodhit Abhraka* was used for *dhanyabhraka nirman*. This *dhanyabhraka* was subjected to *marana* process by two different methods utilizing *arka patra swaras* and *kasamarda panchanga swaras*. The analysis of abhraka bhasma was made at each manufacturing stage. Different ayurvedic testing shows that both procedures were accurate. More phase 2 and 3 trials on the efficiency of *abhraka bhasma* produced with various medias on various conditions might aid in the ultimate confirmation of its efficacy on patients.

KEYWORDS: *Abhraka Bhasma, Triphala Kwath, Arka patra swaras, Kasamarda patra swaras, Marana.*

INTRODUCTION

The ancient Indian science of life, *Ayurveda*, is gaining favour again. It was invented hundreds of years ago by Indian gurus. To make *Ayurvedic* remedies more acceptable to the medical community and individuals who are unwell, it is vital to demonstrate their usefulness in light of contemporary experimental research. The *Rasa Shastra* branch of *Ayurveda* is concerned with the production of medications. Following their introduction, herbal mineral medicines and *bhasmas* were popular for therapeutic purposes. Metals have been highlighted more frequently in *Rasa* literature for medicinal and alchemical purposes.[1]

With the creation of *Rasa Shastra*, several pharmacological methods such as *shodhana* (purification), *marana* (incineration), *satvapatana* (metal extraction), and *bhavana* (levigation) were established to make medication toxic-free and more effective. The pharmacological therapies indicated above use a variety of plant-derived media in the form of *swarasa* (juice) or *kwatha* (decoction).[2]

Metal and mineral pharmaceutical manufacturing relies heavily on these media.

These compounds are divided into several classes based on their medical and alchemical use.

The *Maharasa* group is made up of the most useful minerals.

Abhrak is a mineral compound that contains tiny amounts of silicon, magnesium, calcium, potassium, and aluminium. *Ayurveda* classifies *Abhrak* into four categories: *Pinak, Naag, Manduk,* and *Vajra.* It is further classified into four categories based on colour: Yellow, White, Red, and Black.[3]

In *Ayurveda, abhrak* is utilised in the form of *bhasma*, which is a fine powder. *Abhrak bhasma* is a component of many revitalising formulas and is utilised in the treatment of a wide range of diseases. There have been a few studies on *abhraka bhasma* and physiochemical characterization of *abhraka bhasma*, but only few of them have evaluated the influence of various media in *shodhana, dhanyabhraka nirmana,* or *marana*.

AIMS AND OBJECTIVES

The goal of this study is to conduct a pharmaceutical study of *Abhraka shodhana, Dhanyabhraka*, and *Marana* to establish a method for *Abhraka Bhasma* formation and the role of various medias in pharmaceutical processing, as well as an analytical study of various

samples collected during the *Abhraka Bhasma* preparation process to depict the effect of various medias.

MATERIALS AND METHODS

Selection & Procurement of material

The raw material is procured from online pharmacy SK Biotite black mica flakes. (Online purchase)

Shodhana process

Abhraka shodhana was performed according to the procedure described in *Rasa Ratna samuchaya* 3/16. 3 kilogramme of *abhraka* was used in this procedure, with 25 litres of *triphala kwath* serving as the medium. The iron pan was placed on a charcoal burner until the desired temperature was reached, and the *abhraka* flakes were heated on both sides until they were red hot. The flakes were dipped in the media (*triphala kwath).* after this stage was reached. After the *Abhraka* was completely immersed in the media (a few minutes), the media was removed by shifting it through an iron sieve, and the soft *Abhraka* pieces were gathered in an iron pan to be subjected to the next nirvapa. The process is performed seven times, each time with a different medium.[4]

Changes observed in *abhraka* after *shodhana* process

Abhraka released fumes throughout the heating process. It became brittle after each *nirvapa*, converting into smaller particles, and coarse powder form after seven *nirvapa*. The lustre intensified, and the colour changed to a blackish brown.

Changes observed in media after *shodhana* process

After each *nirvapa*, the temperature of the media increased, and the colour of the media got more blackish. Media loss increased as the number of *nirvapa* increased.

Table 1: Changes in *abhraka* after *shodhana.*

Initial Wt. (gm) Before *shodhan*	Final Wt. (gm) After *shodhan*	*Triphala kwath*	Duration (hrs)
3000	2580	25000ml	14

Table 2: Organoleptic, and Physiochemical characters of *abhraka bhasma* Before and After *shodhana* procedures.

Variable		Before *shodhana*	After *shodhana*
Organoleptic characters	Colour Odour Texture Taste	Black Odourless Hard tasteless	Blackish brown odourless soft, brittle and shiny particles tasteless
Physiochemical characteristics	PH Specific gravity Mohs hardness	7.7 2.8 2.8	6.5 1.8 Became brittle, powdery

Dhanayabhrak nirman

The procedure described in *Rasa Ratna Samucchaya* 2/21 was used to perform *Dhanyabhrak Nirman. Shodhit abhraka* with *triphala kwath* is the raw material for *dhanyabhrak nirman*. In an enamel tray, *shodhit abhraka* and 1/4th quantity of *dhanya* were mixed together, then transferred to a jute *pottali* and dipped in *kanji* for 72 hours. After that, the *pottali* was massaged in the hands after being submerged in pure water until all of the *dhanyabhraka* was extracted. For total extraction, 8 water changes were required. On the second day, the water was sedimented and decanted, and the remaining water was heated for evaporation, yielding black *dhanyabhraka.*

Table 3: Showing yield during *dhanyabhrakikaran.*

Shodhit Abhraka (gms)	2000
Dhanya (gms)	450
Kanji (ml)	10000
Dhanyabhraka yield (gms)	1250
Loss (gms)	750

Marana* of *dhanyabhraka

This *dhanyabhraka* (1000 grammes) was treated to *marana* using two methods (500 grammes each) described in *ayurved prakash*: the first technique used *arka patra swaras,* while the second way used *kasmarda panchang swaras* (Method B) for giving *bhavana* during *marana*.

***Arka patra swarasa* (Method A)**: The *arka patra swarasa* was prepared. *Dhanyabhraka* was levigated with a specific amount of *Arka patra swarasa*, and then *chakrika* was made using the mass obtained and dried. They were preserved in a *sharava samputa* and incinerated by *Gajaputa* to make *bhasma*. The substance is lavigated with new *arka patra swarasa* after

each *puta* is produced. Following the completion of each *puta bhasma pariksha* was done as stated in ancient texts. For the final *bhasma*, 20 such *puta* were required.[5]

Method B: The *kasamarda panchanga swarasa* was prepared. *Dhanyabhraka* was levigated with a measured amount of *kasamarda panchanga swarasa*, followed by the preparation of *chakrika* from the mass produced, and drying. They were preserved in a *sharava samputa* and incinerated by *Gajaputa* to make *bhasma*. Each *puta* obtained material is lavigated with new *kasamarda panchanga swarasa* after each *puta* is acquired. After doing each of the *puta bhama parikshas* stated in ancient literature. For the final *bhasma*, 25 such *puta* were required.

Table 4: Organoleptic characteristics of *Abhraka bhasma* obtained by two different methods.

Variables		**Method A** (*shodhit Abhraka* and *arkapatra swaras*)	**Method B**(*Shodhit Abhraka* and *kasamarda panchang swaras*)
Physical characters	Colour Lustre Lightness and fineness Tactile sensation Particle size Weight of *bhasma*	Brick red Lustreless Fine powder Doesn't irritate the hand Powdered form 400 grams	Brick red Lustreless Fine powder Doesn't irritate the hand Powdered form 380 grams
Chemical characteristics	*Apunarbhava* *Nirutha* *Nirdhoom*	*Bhasma* when mixed with *mitrapanchaka* and heated at high temperature did not undergo any change in its physical properties *Bhasma* is heated at high temperature in a *koshthi* along with measured quantity of silver. At the end of the process, the quantity of silver did not increase. When a Small quantity of the *Bhasma* was heated no smoke was produced i.e., it was	*Bhasma* when mixed with *mitrapanchaka* and heated at high temperature did not undergo any change in its physical properties *Bhasma* is heated at high temperature in a *koshthi* along with measured quantity of silver. At the end of the process, the quantity of silver did not increase When a Small quantity of the *Bhasma* was heated no smoke was produced i.e., it was

		nirdhoom.	*nirdhoom.*
Specific tests	*Amla pariksha* *Avami* *Vishishtavarnotpatti*	No change in colour of *dadhi* Ingestion of drug did not result in nausea/vomiting Color of *bhasma* matched to the mentioned color in the classical reference of the procedure. The sample drug was of brick red in color in accordance with the text	No change in colour of *dadhi* Ingestion of drug did not result in nausea/vomiting Color of *bhasma* matched to the mentioned color in the classical reference of the procedure. The sample drug was of brick red in color in accordance with the text
Analytical Tests	Loss on drying	1.2%	1.3%
	Ash Value	97.2%	96.22%
	Acid insoluble ash	68.5%	67.3%

Table 5: Quantitative analysis of abhraka bhasma after different *marana* procedures.

Quantitative analysis of elements	After *marana* with Arkapatra swarasa	After *marana* with kasamarda panchanga swarasa
C	1.33	1.04
Fe	18.34	23.23
Cl	2.04	1.65
O	39.65	38.56
Mg	1.97	1.83
Al	4.23	3.45
Si	12.84	13.27
K	5.84	6.49

Quantitative chemical analysis was performed by a GMP certified laboratory with composition analysis, trace material analysis with parts per million detection levels.

DISCUSSION

The *shodhana* technique, which is used to remove contaminants from mercurial kingdom medications, is literally translated as "purification." *Shodhana* is a pre-requisite treatment for all chemical components that have a negative or non-existent impact. The next phase in the medication formulation process is *marana*, which literally means "killing," which involves reducing the drugs to ashes before delivering them to the body. The metal loses all physical properties and gains medicinal effectiveness as a result of this process.[6]

There is a lot of talk these days regarding the hazardous potential of *ayurvedic* medications, particularly metals, and how they are linked to nephrotoxic effects. Metals are used in the form of *bhasma* in ayurveda, contrary to popular belief in modern science. There is a paucity of understanding about the manufacture of *bhasmas*, particularly herbo mineral compounds, where lavigation with herbal compounds reduces metal toxicity and the *bhasma* comes in a form that is easy to absorb and nontoxic in nature.[7]

Ayurveda discusses many *shodhana* and *marana abhraka bhasam* procedures; however there are few studies that compare the composition of the end product created by each method. In order to meet this demand, more research is needed to compare the end product created by different approaches so that the pharmaceutical company may pick the best one and conduct patient outcome studies.

With the advancement of the *Nirvapa* process, the colour of *Krishnavajrabhraka* got darker during the *shodhana* phase. This might be due to the fact that during the red hot state, *Abhraka* elements react with ambient oxygen to generate oxide compounds, which are typically black in colour. *Abhraka's* black colour look grew after *shodhana*, most likely as a result of this. The *Shodhana* and *Marana* procedures have a significant impact on the end product's constituent composition. Sometimes the concentration of free metals decreases, while other times it increases. The oxidation process is revealed by the increase in percent of oxygen during the *shodhana* and *marana* stages. It is carried out with the goal of determining the physico-chemical changes that occurred throughout the processing of *Krishnavajrabhraka's shodhan, dhanyabhraka,* and *marana*, as well as the influence of media on these processes.

Both procedures produced *abhraka bhasma* that passed all of the traditional requirements mentioned in the Rasa Literature. The inclusion and deletion of trace components of media in the *shodhit* and *bhasmas* samples is shown by an analytical investigation. C, O, Si, Fe, K, Al, & Mg are primary constituents of raw *Krishnavajrabhraka*, whereas iron oxide and silica oxide are compounds generated in both *Krishnavajrabhraka bhasmas*, according to analysis.

CONCLUSION

Abhraka bhasma is made using a variety of processes, including *shodhana* and *marana*, which generate exceedingly tiny particles. The substance undergoes a full physico-chemical transition throughout the *bhasma* preparation process (in terms of particle size and chemical

composition). C, O, Si, Fe, K, Al, and Mg are all macro elements found in *abhraka bhasma*. For *bhasma* preparation, one can utilise any approach. Different *ayurvedic* testing shows that both procedures are accurate. More phase 2 and 3 trials on the efficiency of *abhraka bhasma* produced with various medications on various conditions might aid in the ultimate confirmation of its efficacy on patients.

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