Research Article

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STANDARD MANUFACTURING PROCEDURE OF MAKSHIKA SATVA BHASMA

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ABSTRACT

Rasa Shastra is a branch of Indian iatrochemistry which deals with the processing of metals and minerals having therapeutic importance. Various pharmaceutical procedures i.e. Shodhana (Purification), Marana (Incineration), Satvapatana (Extraction of metal from mineral), Amritikarana (Nectorization) etc. converts deadly toxic substances in to safe and potent therapeutic agent. Ayurvedic classics claimed that Satva Bhasma of any mineral is ten times more potent therapeutically in comparison to its parent mineral Bhasma. Conceivably due to complicated pharmaceutical procedure of Satvapatana and their conversion in to Bhasma, practice of Satva Bhasma in therapeutics is very limited. Rasa Scholars have developed number of methods for Satva extraction and Satva Marana. It is necessary to find out the standard manufacturing procedure (SMP) for Satva extraction and Satva Marana which ensures the quality, safety, efficacy and reproducibility of the products for their global acceptability. This paper aims to make available SMP of Makshika Satvapatana and Satva Bhasma. Shodhana was done by roasting raw Swarna Makshika with lemon juice for three days. Tankana was found advantageous as flux in Satvapatana process of Makshika. Kajjali as a Marana media and four Puta with six kg cow dung cakes were required to get genuine Makshika Satva Bhasma.

Keywords: Makshika, Bhasma, Marana, Puta, Shodhana, Satvapatana

INTRODUCTION

Rasa Shastra is a pharmaceutical science of Ayurveda known as Ayurvedic pharmaceutics which deals with mercury, minerals, metals, gems, semi gems, calcium containing compounds, poisonous drugs etc. These materials in crude form are immeasurably toxic in nature and can produce untoward effects in the body if used internally without proper processing. Ayurvedic pharmaceutical processing techniques convert these crude, toxic and poisonous substances in to such a form which can produce miraculous therapeutic effects on internal use. After the development of Rasa Shastra in medieval period as an independent branch of learning, many specialized processing techniques like Shodhana (Purification), Marana (Incineration), Amritikarana (Nectorization), Satvapatana (Extraction of metal), Samskara (Specialized processing techniques mainly used for mercury) etc, were developed to produce Ayurvedic Bhasma with higher therapeutic properties. Shodhana is a process by which physical and chemical impurities get separated from the substance by treating with various drugs. The idea behind Shodhana process is to make hard material brittle, to eliminate the associated / adherent impurities, eradicate or minimize toxicity of the material, converts material in to suitable form for further processing and to enhance the drug efficacy. Marana is the process in which repeated Bhavana and Putapaka treatment divides compound form leaving their elemental nature completely and converts it to finest particle and also convert it into organo-metallic mineral compound which when used internally would be absorbed into the system easily. In our classics, it has been claimed that Satva Bhasma of any mineral is ten times more potent in comparison to its parent mineral Bhasma in regards of therapeutic efficacy. On the basis of literary survey it is noticeable that Satvas are not only intended for therapeutic purposes but also they are equally useful in mercurial processing's. In Ayurvedic Rasa literatures many Satvas find their uses in mercurial processes. Abhraka (Mica) and Makshika (Chalcopyrites) Satva have great importance in mercurial processing's. Makshika is called as Prano Rasendrashya which indicates its utility / importance in Parada karma. It is considered 2nd most essential element, which could help to make Mercury potent and thermostable. Abhraka Satva was considered the chief material, which could make Mercury Pakchha Chhina (cutting the wings/making it thermo stable). But Abhraka Satva alone cannot be consumed by Mercury. Hence a dwandwa of Abhraka and Makshika Satva is must and that only can be accepted (digested) by Mercury.

MATERIAL AND METHODS

Raw Swarna makshika was procured from its mine situated at Khetri, Rajasthan. Other allied material i.e. Gandhaka, Hingul, Tankana and lemon were procured from the local market.

Shodhana of Makshika

Shodhana of Makshika was done by roasting raw Makshika powder with nimbu swarasa for 3 days until complete cessation of sulphur fumes and till the mixture become red like fire. 10 % loss (100 g in 1000 g) in weight of Makshika was observed after completion of the process. Reason for loss in weight of Makshika is due to Sulphur gets burnt and evaporated in the form of oxides of sulphur and some particles of Makshika escapes in the form of dust / fine powder during roasting.[1]

Extraction of Makshika Satva

One fourth part of Suddha Tankana (200 g) was added in Shodhita Makshika (800 g) and triturated to make homogeneous mixture. This homogeneous mixture is called as "Charge". This mixture (charge) was kept into a crucible (10 numbers) up to the half level and put into the specific designed furnace and heated gradually. The heating material used in the furnace was china coke. The maximum temperature recorded was 1400^0C. This peak temperature was given up to 3 hours. After self cooling of 1 hour the crucible was taken out from the furnace and material was poured into an earthen vessel and Satva was separated from slag. Out of the 1000 g of mixture (charge), 185 g (14.7 %) of Satva and 500 g (50 %) of Slag was obtained.[2]

Satva Pindi Karana

Pieces of Satva was taken into crucible, heated up to molten stage in furnace and left for ½ an hour. Then a cotton cloth was spread on a platform. Over it crucible was kept upside down. A little bit pressure was given back to crucible which was facing upward direction. By this slight pressure Satva and slag come out from crucible. It was observed that collected Pindit Satva have two pattern color i.e. at bottom like copper and like bronze at the top. It was due to more specific Gravity of Cu than Fe.

Churnikarana of Satva

Pindit Satva was taken and converted into powder form with the help of scrubber machine and Khalva Yantra to make homogenous mixture of Satva.

Marana of Makshika Satva

Makshika Satva mixed with equal amount of Kajjali was triturated in a Khalva Yantra for 5 days and then levigated with Nimbu Swarasa to make it suitable for pellets formation. Properly dried pellets were put into earthen vessels (Sharava) and subjected to Puta with 6 kg cow dung cakes. Total four Puta were required to get genuine Makshika Satva Bhasma. 32 % increase in weight were observed after 4th Puta.[3]

Precautions
During Shodhana

For Shodhana, Makshika should be powdered well. Mild fire should be maintained throughout the process. During stirring, care should be taken for not spilling Makshika from the iron pot. Stirring should be done constantly while roasting.

During Satvapatana

Crucible should be preheated up to 200 – 250^0C for one hour to make it heat resistant. Crucible should be filled up to half level to avoid splitting of material during boiling. Drops of sweat and water should not be mix with material at the time of boiling to avoid of risk. Tankana should be purified properly otherwise Makshika at the time of melting split out. Wet bamboo should be taken for mixing of melted material.

During Marana

Firing of cow dung cakes should be done uniformly. Pyrometer was placed just below the casserole to record the exact temperature obtained by it. Sealing of casserole was removed very cautiously to avoid contamination of drug with dirt.[4-9]

Table 1: Time and temperature pattern with observations of extraction of makshika satva

Minutes of Heating	Temp. ^{0}C	Observations
0	23	-
15	100	-
30	250	Green Yellow fumes appeared
45	450	Green Yellow fumes increased
60	650	Green Yellow fumes decreased
75	850	Absence of fumes
90	950	Matter around crucible start melting
105	1100	All matter become in molten stage
120	1200	Bluish red color flame with bubble started like heavy rain fall (bijavarta stage)
135	1250	White flame appeared with crackling sound (Suddhavarta stage)
150	1350	-do-
165	1400	-do-
180	1400	-do-
Kept for self cooling		

Table 2: The observations of makshika satva marana

No. of Puta	Wt. of Swarna makshika satva	Wt. of Kajjali	Wt. of pellet (Before puta)	Wt. of pellet (After puta)
1	25 g	50 g	74 g	29 g
2	29 g	50 g	78 g	30 g
3	30 g	50 g	80 g	31 g
4	31 g	50 g	82 g	32 g

Figure 1: Process of Makshika Satvapatana

Figure 2: Swarna Makshika Satva

Figure 3: Swarna Makshika Slag

Figure 4: Satva Pindikarana

Figure 5: Pindita Satva

Figure 6: Scrubbed Satva

Figure 7: Bhawana with Kajjali and Nimbu Swarsa

Figure 8: Makshika Satva bhasma

DISCUSSION

Makshika, a mineral of Maharasa varga has got importance in alchemy as well as in therapeutics since the development of Rasa shastra as an independent branch of learning. Shodhana (Purification), Marana (Incineration), Satvapatana (Extraction of metal), Amritikarana (Nectorization), Samskara (18 specialized processing techniques for Mercury) etc are pharmaceutical procedures by which metals and minerals are converted in to such a form which can be used in therapeutics safely. Satva Bhasma is a unique Ayurvedic dosage form and said to be 10 times more potent than its mineral Bhasma. Swedana, Mardana, Bharjana, Nirvapana and Putapaka are the different pharmaceutical techniques (principles) adopted by our Acharyas for Makshika Shodhana. Bharjana method of Shodhana was adopted for this study with the idea to make material fine and to provide maximum time to expose all material for chemical reactions. For this, procured Makshika was crushed and grinded to 80 mesh size and then roasted with nimbu swarasa at temperature ranges between 600-650°C with continuous stirring with the help of iron pestle. During roasting sulphur fumes was liberated from the Makshika in the form of oxides of sulphur. The roasting was continued till the fumes of sulphur stops and the material becomes raddish brown. For Makshika Satvapatana, a mixture of Shodhit Makshika and Shodhit Tankana (¼ Part) were put in 10 numbers of crucible of graphite filled up to half level and subjected in to specially designed furnace of china coke. The time taken in Satvapatana of Makshika was approx. 3 hours. After separation of Satva from the slag, the pieces of Satva again put into 1 number crucible and heated up to molten stage and kept for self cooling. After that Satva was separated from the crucible by knocking from its bottom. Pindikarana is described in Abhraka Satvapatana but after considering its importance we adopted this process for Makshika also. Now Satva was powdered with help of scrubber machine and Khalva Yantra to get homogenous mixture. It was very tough to powder Makshika Satva because it is very hard to cut or hammered. Powdered Makshika Satva was mixed with Kajjali (2 parts) and triturated with Nimbu Swarasa and subjected to Puta with 6 kg cow dung cakes. Total four Puta was required to get genuine Swarna Makshika Satva Bhasma. The color of prepared bhasma was black.

CONCLUSION

Swarna Makshika is well known mineral in all era of Indian history. Bharjana method with addition of Nimbu Swarasa was found to be most suitable for shodhana of Swarna Makshika. Mercury and sulphur together act as the best media in preparing metallic and mineral bhasma. Marana with Kajjali and Bhavana with Nimbu Swarasa was found better, convenient and can save time, labour and capital.

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