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EFFECT OF MEDIAS OVER MARANA W.S.R. TO PHYSICO- CHEMICAL ANALYSIS OF KASISA BHASMA

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ABSTRACT

Rasoushadhies are unique preparations, where a metal or a mineral is transformed from sulphide to oxide form. *Marana* is a process of converting a raw drug into a bio-available form, with the aid of *Bhavana dravya* and *Puta*. An effort had been made to understand -the role of medias used in *the Marana* of *KasisaBhasma*. Hence 3 samples of *KasisaBhasma* were prepared using the different *Bhavana dravyas* and they were compared with respect to their organoleptic characters and Physico-Chemical attributes.

Keywords: *Bhavana dravya,KasisaBhasma, Marana*

INTRODUCTION

Rasashastra is a branch, dealing with metals and minerals. Being a well-developed ancient alchemy, it holds an integral place in Ayurveda due to formulations like *Bhasmas, Kharaliyarasayanas, Parpatikalpas*, and so on. *Bhasmas* are unique formulations by virtue of their qualities like tastelessness, quicker action, minimal or nil side effects, and administered in the lesser dose and they also get absorbed very quickly in the body[1].

In the classics, for each *Rasa dravya*, more than one method of *Bhasma* preparation has been told. The media used in the formulations and type of *Puta*

adopted may influence the pharmaceutics of *Bhasma*, which may alter the physico- chemical properties of the *Bhasma*. So, to understand the effect of the media *(Bhavana dravya)* on the *Bhasma* preparation, the drug *Kasisa* was chosen, and its *Bhasma* was prepared using three different methods.

MATERIALS AND METHODS:

Materials were procured from the local market as per *Grahyalakshanas* mentioned in *Rasa* classics and a common *Shodana* method was adopted for the preparation of all three samples of *KasisaBhasma*. The preparation of three varieties of *KasisaBhasma* were carried out in Dept. of PG studies of Rasashastra and Bhaishajya Kalpana, AMV, Hubli

Shodana- The *Shodana* of *Kasisa* was done by the *Bhavana* method, using *BringarajaSwarasa* as a liquid media. The quantity of *Ashuddha Kasisa* used was 1000gms. The three *Bhavana*s were given to obtain 1050gms of greyish-coloured*Shodita Kasisa*[2].

Table 01: Showing the list of *Bhavanas* for *KasisaShodana*

S.no.	*Bhavana*	Quantity of Bhavana dravya used	Trichuration time
1	1st *Bhavana*	275ml	7 hours
2	2nd *Bhavana*	200ml	6 hours
3	3rd *Bhavana*	125ml	6 hours

Marana- The three different methods of *Marana* of *Kasisa* were adopted as per *Rasamritam* and *Rasa Tarangini*. After achieving the *Bhasma Siddhi Lakshanas*, all three samples were compared by their organoleptic characters and analytical results.

1st Sample preparation – *Nimbu Swarasa Bhavana* was given, and the first *Puta* adopted was *Dashaprastha puta* and from the second puta, *Laghu puta* was given[3].

2nd Sample preparation - 7 *bhavana*s of *Kanji* were given followed by one *Laghu puta* and from the second puta, *NimbuSwarasa Bhavana* was given[4].

3rd Sample preparation – *Snuhipatra Swarasa Bhavana* was given followed by *Laghu puta*[5]

Table 02: Showing the *Marana* of three samples of *KasisaBhasma*

S.No.	Observations	Sample 1	Sample 2	Sample 3
1.	Type of *Puta*	One *Dashaprastha Puta* followed by *Laghu Puta*	*Laghu Puta*	*Laghu Puta*
2.	No. of *Putas*	6	6	10
3.	*Bhavana Dravya*	*NimbuSwarasa*	*Kanji and NimbuSwarasa*	*Snuhi Patra Swarasa*
4.	Quantity of *Shoditadravya* used for *Marana*	300gms	300gms	300gms
5.	Quantity of final product obtained	75gms	98gms	102gms
6.	Loss	225gms	202gms	198gms

RESULTS:

ORGANOLEPTIC PARAMETERS:

Table 03: Showing organoleptic characters of the three samples of *KasisaBhasma*

S. No.	Organoleptic Characters	Sample 1	Sample 2	Sample3
1.	Taste	Tasteless	Tasteless	Tasteless
2.	Colour	Deep red colour	Mild blackish red	Mild reddish grey
3.	Touch	Soft	Soft	Soft
4.	Odour	Not Specific	Not Specific	Not Specific
5.	Appearance	Very fine powder	Very fine powder	Very fine powder

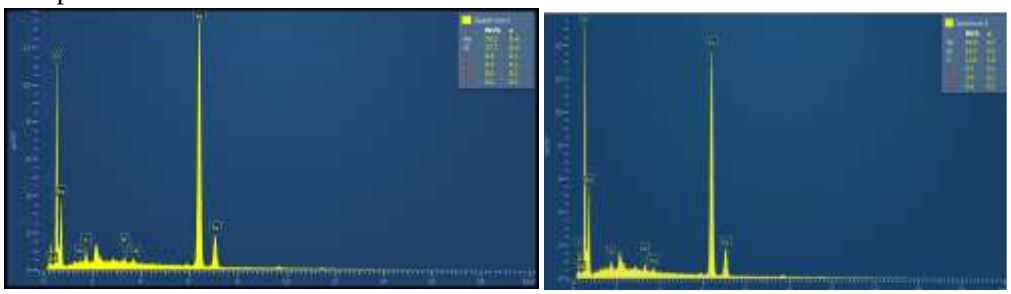
ANALYTICAL PARAMETERS:

Table 04: Showing the results of various Analytical tests of all three samples of *KasisaBhasma*

S.No.	Analytical Parameter	Sample 1	Sample 2	Sample 3
1.	pH	6.5	6.5	5.5
2.	Total Ash value	97%	74%	57%
3.	Acid Insoluble Ash	91.75%	80.76%	73.68%
4.	Water Soluble Ash	0.03%	0.15%	0.19%
5.	Specific gravity	5.395	2.558	2.558
6.	Particle size assessment	0.411µm	0.582 µm	0.673 µm
7.	Elemental Analysis	Fe- 895470.38ppm Fe_2O_3 2560617.16ppm S- 1765.80ppm SO_2- 0.0033%	Fe- 603877.98ppm Fe_2O_3- 1726802.30ppm S- 110632.04ppm SO_2- 0.0049%	Fe- 411329.56ppm Fe_2O_3 1176205.88ppm S- 156513.75ppm SO_2-0.0033%

SEM EDAX:

Sample 1:



Spectrum 1 Spectrum 2

Table 05: Showing spectrum 1 Analysis of Sample 1 of *KasisaBhasma*

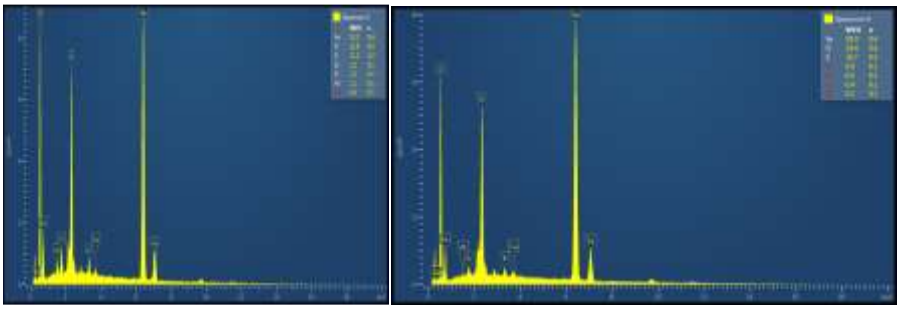
Elements	Line type	Apparent concentration	K Ratio	Wt.%	Wt.% sigma	Std.Label	Factory Standard
O	K Series	9.15	0.03078	27.71	0.36	SiO_2	Yes
Al	K Series	.08	0.00056	0.52	0.10	Al_2O_3	Yes
Si	K Series	0.15	0.00122	0.83	0.09	SiO_2	Yes
K	K Series	0.12	0.00103	0.40	0.08	KBr	Yes
Ca	K Series	0.12	0.00107	0.39	0.089	Wollastonite	Yes
Fe	Kseries	18.89	0.18893	70.15	0.38	Fe	Yes
Total				100.0			

Table 06: Showing spectrum 2 Analysis of Sample 1 of *KasisaBhasma*

Elements	Line type	Apparent concentration	K Ratio	Wt.%	Wt.% sigma	Std.Label	Factory Standard
C	K Series	0.86	0.00858	13.60	0.98	C Vit	Yes
O	K Series	13.20	0.04440	35.55	0.54	SiO_2	Yes
Si	K Series	0.13	0.00106	0.45	0.07	SiO_2	Yes
K	K Series	0.21	0.0017	0.48	0.06	KBr	Yes
Ca	K Series	0.16	0.00145	0.37	0.06	Wollastonite	Yes

Fe	Kseries	18.73	0.1873	49.55	0.66	Fe	Yes
Total				100.0			

Sample 2:



Spectrum 3 Spectrum 4

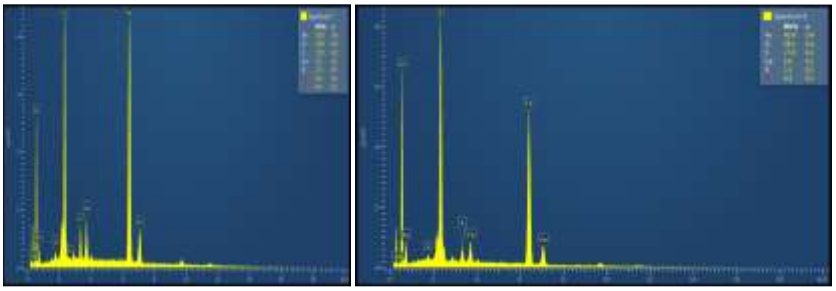
Table 07: Showing spectrum 3 Analysis of Sample 2 of *KasisaBhasma*

Elements	**Line type**	**Apparent concentration**	**K ratio**	**Wt.%**	**Wt.% sigma**	**Std. Label**	**Factory Standard**
O	K Series	7.30	0.02457	32.79	0.40	SiO_2	Yes
Al	K Series	0.16	0.00113	1.07	0.10	Al_2O_3	Yes
Si	K Series	0.22	0.00172	1.21	0.10	SiO_2	Yes
S	K Series	2.34	0.02013	11.17	0.20	FeS_2	Yes
K	K Series	0.29	0.00246	1.15	0.09	KBr	Yes
Ca	K Series	0.11	0.00100	0.44	0.08	Wollastonite	Yes
Fe	K Series	12.01	0.12007	52.17	0.40	Fe	Yes
Total				100.0			

Table 08: Showing spectrum 4 Analysis of Sample 2 of *KasisaBhasma*

Elements	**Line type**	**Apparent concentration**	**K ratio**	**Wt.%**	**Wt.% sigma**	**Std.Label**	**Factory Standard**
O	K Series	5.08	0.01708	28.37	0.40	SiO_2	Yes
Al	K Series	0.04	0.00027	0.34	0.09	Al_2O_3	Yes
Si	K Series	0.07	0.00054	0.50	0.08	SiO_2	Yes
S	K Series	1.75	0.01507	10.71	0.20	FeS_2	Yes
K	K Series	0.13	0.00107	0.63	0.08	KBr	Yes
Ca	K Series	0.09	0.00079	0.43	0.08	Wollastonite	Yes
Fe	K Series	10.76	0.10764	59.02	0.41	Fe	Yes
Total				100.0			

Sample 3:



Spectrum 5 Spectrum 6

Table 08: Showing Spectrum 5 Analysis of Sample 3 of *KasisaBhasma*

Element	Line type	Apparent concentration	K Ratio	Wt.%	Wt.% sigma	Std.Label	Factory Standard
O	K Series	2.07	0.00696	24.85	0.46	SiO_2	Yes
Si	K Series	0.04	0.00028	0.41	0.08	SiO_2	Yes
S	K Series	1.57	0.01352	15.22	0.24	FeS_2	Yes
Cl	K Series	0.03	0.0003	0.36	0.08	NaCl	Yes
K	K Series	0.30	0.00255	2.49	0.11	KBr	Yes
Ca	K Series	0.39	0.00348	3.17	0.13	Wollastonite	Yes
Fe	K Series	5.96	0.05958	53.51	0.44	Fe	Yes
Total				100.0			

Table 09: Showing Spectrum 6 Analysis of Sample 3 of *KasisaBhasma*

Element	Line type	Apparent concentration	K Ratio	Wt.%	Wt.% sigma	Std.Label	Factory Standard
O	K Series	5.39	0.01813	38.29	0.44	SiO_2	Yes
Si	K Series	0.04	0.00034	0.30	0.07	SiO_2	Yes
S	K Series	2.85	0.02457	17.65	0.24	FeS_2	Yes
K	K Series	0.24	0.00200	1.29	0.09	KBr	Yes
Ca	K Series	0.38	0.00339	2.04	0.11	Wollastonite	Yes
Fe	K Series	6.78	0.06781	40.44	0.40	Fe	Yes
Total				100.0			

DISCUSSION

The major drug used in the present study is *Kasisa,* which has the chemical formula $Fe_2SO_4.7H_2O$ and is grouped under *Uparasavarga* in *Rasashatra*. The *Shodana* process helps to eliminate the toxic properties present in the drug and induce the therapeutic and pharmacodynamic qualities which are essential for the easy assimilation of the material in the living body. In the present study *BringarajSwarasa*, prepared by *the Saagni* method, was used as the *Shodhitadravya* to prepare all three samples of *Kasisa-Bhasma*. *Bringaraj Swarasa* as a *Bhavana dravya* helps in the potentiation of therapeutic efficacy of the drug and conversion of material into a suitable form for further treatment. Ferrous Sulphate is a deliquescent solid and so during the trichuration with *Bringaraj Swarasa*, it was exposed to air and that could be the reason for the weight gain of *Shodhita Kasisa*.

Marana is a process in which the drug is converted from bio-incompatible to bio-compatible form. The physical state of the metal or mineral is changed here without harming its medicinal value, there by potentiating the drug. In the preparation of *Kasisa-*

*Bhasma*of Samples 1, 2, and 3, using 300gms of *ShoditaKasisa* for each sample of *Bhasma*, the yield of 75gms, 98gms and 102gms were obtained and loss of 225gms, 202gms and 198gms were observed respectively. The number of *Putas* adopted for Sample1 and Sample 2 *Bhasmas* were only 6 *Putas*, whereas Sample 3 was prepared after 10 *Putas.* This variation might be due to the *Bhavana dravya* used in the preparation, which is acidic in nature, and when it reacts with Kasisa, which is alkaline, might help to separate the ferric ions easily and hence the *Bhasma siddhi lakshanas* were achieved earlier, whereas the preparation of *Bhasma* using *Snuhipatraswaras* required more *Putas*, may be due to its alkaline nature.

In the present study, it was noted that there were changes in Organoleptic characters between three samples of *KasisaBhasma*, which were *Nimbu rasa bhavita(*Sample 1), *Kanji and Nimbu rasa bhavita (*Sample 2), and *SnuhipatraSwarasabhavita* (Sample 3), The *Bhavana* dravyas has the direct effect over the variations seen in the final product. All three samples are tasteless (*Niramla/Niswadu*), odourless, soft on touch (*Slakshna*), amorphous (*Sookshma*), light on weight (*Laghu*), with the presence of *Rekhapoornata* and *Varitaratwa*

pH of all the three samples of *KasisaBhasma* were found to be acidic, which indicate the site of absorption and action of the drug in the environment of the stomach. The increase values of Total Ash of the three samples indicate that the product is inorganic in nature. The solubility of *Bhasma* was much less in the case of Sample 1 when compared to samples 2 and 3. The reaction may be due to the formation of Ferric Oxide. The percentage of Sample 1 has high Acid insoluble ash and low water-soluble ash, as Sample 1 is more in inorganic form, the Ferric Oxide present in it dissolves in acid and not in water. Hence the inorganic content is richly depicted in the study. The higher Specific gravity of Sample 1 than of Sample 2 & 3 may be due to the agglomeration of elements. The particle size of the Samples differs with a slight difference, which may be due to the effect of media.

The reading of uncompounded Iron and the Iron in Oxide form is higher in Sample1 when compared to Samples 2 & 3, and the Sulphur and Sulphur-di-oxide percentage is least among all three samples. This shows the Sample 1 is a more stable form rather than the other two samples. In Sample1, the overall concentration of Iron (70% and 49%) and Oxygen (27% and 35.5%) is high, suggesting that a major part of Iron is in Oxide form, and in Samples 2 and 3, Sulphur has been observed, which was not seen in Sample1 spectrum and the other elements in trace elements, viz. Silica, Calcium, Aluminium, and Potassium remain the same as that of Sample1. In Sample 2, the readings were, Iron (52 and 59%), Oxygen (32 and 28%), and Sulphur (11 and 10%) and in Sample 3, Iron (53 and 40%), Oxygen (24 and 38%), Sulphur (15 and 17%) are majorly available elements, which suggests that Iron is much in Oxide form than other forms, and along with this Sulphur is also majorly available may be in Sulfate form. There was variation seen in the final weight of all three samples of *KasisaBhasma.* This may be because, the Sample 1 of *KasisaBhasma* might have been converted to Ferric Oxide form, whereas in Samples 2 and 3, the Iron might be present in both Oxide and sulphide form, due to the presence of Sulphur, which may result in increased yield of both these samples. In Sample 2, Sulphur is in the percentage of 11% and 10% in two different spectra, and in Sample 3, its percentage is 15% and 17% in different spectrums. By observing this, we can assume that the weight of samples has increased as per the rate of increase of Sulphur percentage. Hence, we can observe, the proportional increase in the final weight of Bhasmas. This is evident by SEM-EDAX.

CONCLUSION

Bhasmas are the unique preparations of Ayurvedic Pharmaceutics, as they have good stability, they are potent in a small dose, and they are readily absorbable, assimilable, and adaptable to the body. The role of *Bhavana* is very important in the preparation of *Bhasma*. *Bhavana dravya* does not limit only to binding agents during the preparation of *Chakrikas.* It

extends its performance in adding up newer isotopes of the same materials or different salts of the same compound. Stable compounds of *Marita dravya*, depend upon the *Bhavana dravya.* The pH value of *Bhavana dravya*definitely influences the Chemical constituents of the *Marana*dravya, which in the present study is evident by SEM-EDAX studies. *Bhasma* obtained from *Dashaprashtha Vanopala Puta* followed by *Laghu puta* (Sample 1 of *KasisaBhasma*) and *Laghu Puta* (Sample 2 and 3 of *KasisaBhasma*) has changed in Organoleptic Character (w.r.to colour) and even in Elemental Assay. It can be understood that the Quantum of heat may also interfere with the final product, even though Classically all *Siddhi Lakshanas* were achieved. In a comparison of Organoleptic Characters of all three varieties of *Bhasma*, the variation was present only in colour, the rest of all parameters were the same, which may be due to the influence of *Bhavana dravyas* used. All the Analytical parameters viz. pH, Total Ash, Acid insoluble Ash, Specific gravity, and Particle size assessment. Elemental Analysis, SEM-EDAX of all three Samples of *KasisaBhasma* were found to be within normal limits. Thus, we conclude that prepared three varieties of *Kasisa Bhasma* are of standard quality.

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