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Pharmaceutical Standardization

Preparation and physicochemical analysis of *Rasaka Bhasma*

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Abstract

Rasaka, which is one among the *Maharasas*, is an ore of zinc and has been used to extract *Yashada* in ancient times. It has a wide range of therapeutic applications, including in diseases like *Prameha, Streeroga,* and so on. The practice of *Rasaka Bhasma* preparation has declined with time due to various reasons. The present study aims to identify the genuine samples of *Rasaka*, prepare *Rasaka Bhasma* by subjecting it to *Shodhana* and *Marana,* and undertake a physiochemical analysis of the prepared *Bhasma* with an eye toward the standardization of *Rasaka Bhasma*.

Key words: *Rasaka,* identification, *Shodhana, Marana,* physicochemical analysis

Introduction

Rasaka comes under *Maharasa Varga*. It is an ore of zinc, which was used to extract '*Yashada*' (zinc) in ancient times. It was also used in the preparation of brass (*Pittala*).

The synonyms, types, *Shodhana* methods, and *Satvapatana Vidhi* of *Rasaka* have been elaborately described in *Rasarnava* the oldest treatise of *Rasashastra*. Since the beginning it has been known by the name of *Rasaka* or *Kharpara*, and the *Satva* obtained from it is called '*Yashada*' following the invasion of India by Arabs in the fourteenth century.[1]

In the classic texts, there are two methods described for the preparation of *Rasaka Bhasma*: One is by using *Parada* and subjecting it to *Valuka Yantra Pachana, and* the second method is by using *Shuddha Patra Haratala* by giving three *Putas*.[2]

Aims and Objectives

The present study was aimed to study pharmaceutical aspect of *Rasaka Bhasma* and establishment of *Rasaka Bhasma* with the analytical findings.

Materials and Methods

Selection of raw materials

Grahya Rasaka,[3] the *Mruttikabha* variety of *Rasaka*, is considered as *Shreshta*. Some Acharyas have associated *Mruttikabha Rasaka* with $ZnCo_3$ and some with ZnO; because of this uncertainty, the samples of both have been taken for use in this study.

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Shodhana of *Rasaka*

The reference from Rasatarangini was followed for *shodhana* of *Rasaka*.[4] Ingredients used were as follows.

Ingredients and quantity

Rasaka, that is,	zinc carbonate	400 g
	zinc oxide	400 g
	Nimbu swarasa	as required

Procedure

Rasaka was taken in a *Khalwa Yantra*. *Nimbu Swarasa* was added and the mixture triturated until it had totally dried up. The procedure was repeated seven times. After that it was washed with water until the *Amleeyata* of the *Nimbu Swarasa* was removed. It was then allowed to dry.

Marana of *Rasaka*

The marana of Rasaka was carried out as per reference from Rasatarangini.[2] The ingredients were as follows.

Ingredients and quantity

Shodhita Rasaka, that is,	
$ZnCO_3$	30 g
ZnO	30 g
Shodhita	163.2 g
Haratala (total)	(equal weight with each sample)
Jala	as required.

Procedure

Shodhita Rasaka ($ZnCO_3$ and ZnO, one sample each) was taken after weighing 30 g of each. This was placed in a *Khalwa Yantra* and an equal quantity of *Shodhita Haratala* was added. This was mixed well by trituration.

Sufficient water was added to get a consistency fit for preparation of a *Chakrika*. After it had attained a proper consistency, *Chakrikas* were made, having the size and shape of a *Palasha Beeja*. The *Chakrikas* were allowed to dry properly. These *Chakrikas* were then taken in a *Sharava* after recording their weights before and after drying. *Sharava Sandhi Bandhana*

Table 1: Results of analysis of the *Rasaka* sample ($ZnCO_3$)

Samples	A (%)	A_1 (%)	A_2 (%)
pH	8.73	7.79	7.73
Total ash	83.34	73.28	64
Acid insoluble ash	1.5	4.1	2.17
LOD	0.09	0.22	0.19
Free sulfur	ND	ND	7.07
Total sulfur	ND	ND	32.66
Zinc as Zn	48.97	47.26	53.59
Arsenic as As	ND	ND	0.8
Copper as Cu	0.022	0.032	280 ppm
Lead as Pb	0.58	0.97	0.98

A = Raw *Rasaka* sample of $ZnCO_3$; A_1 = *Shodhita* sample; A_2 = *Rasaka Bhasma*

Table 2: Analytical results of *Rasaka* sample (ZnO)

Sample	B (%)	B_1 (%)	B_2 (%)
pH	6.04	6.48	5.9
Total ash	95.50	89.21	82.77
Acid insoluble ash	0.02	1.77	3.52
LOD	0.24	0.34	0.16
Free sulfur	ND	ND	5.33
Total sulfur	ND	ND	30.44
Zinc as Zn	85.38	86.10	69.51
Arsenic as As	ND	ND	0.11
Copper as Cu	0.00085	0.00022	0.01 ppm
Lead as Pb	0.0050	0.0050	186.6 ppm

B = Raw *Rasaka* sample of ZnO; B_1 = *Shodhita* sample; B_2 = *Rasaka Bhasma*

was performed. Then *Puta* was given by using *Vanopala* thrice. The procedure was repeated for each *Puta*.

Results (Pharmaceutical process)

Shodhana of *Rasaka*: A = Raw *Rasaka* sample of $ZnCO_3$, A_1 = *Shodhita* sample. B = Raw *Rasaka* sample of ZnO, B_1 = *Shodhita* sample

Properties	Before *Shodhana*		After *Shodhana*	
	A	B	A_1	B_1
Weight	400 g	400 g	380 g	430 g
Color	White powder	White powder	Gray powder	Milky white
Touch	Crystalline	Amorphous	Fine powder	Fine powder
Odor	Carbonate smell	No smell	No smell	Fragrant

Marana of *Rasaka*: A_2 = Rasaka *Bhasma* from $ZnCo_3$, B_2 = Rasaka *Bhasma* from ZnO

Properties	After *Marana*	
	A_2	B_2
Weight	26 g	26.8 g
Color	Snuff color	Creamish
Touch	Fine powder	Fine powder
Odor	No smell	No smell

Analytical results

Tables 1 and 2 provide the results of the analysis carried out on the *Rasaka Bhasma*.

Discussion and Conclusion

After using classical parameters for the identification of *Rasaka*, two samples were taken up for analysis: $ZnCO_3$ and ZnO. Both the samples were subjected to *Shodhana* using *Nimbu Swarasa*. A fragrant odor in the ZnO sample after *Shodhana* was obtained, which may have been due to trituration with *Nimbu Swarasa*.

The prepared *Bhasmas* were subjected to qualitative and quantitative analysis. The result showed that there was not much difference in LOD, but there was a difference in the pH of the samples before *Shodhana*, after *Shodhana*, and after *Marana*. The pH of zinc carbonate before *Shodhana* was 8.73, after *Shodhana* 7.79, and after Marana 7.73. In the case of zinc oxide, the pH was 6.04 before *Shodhana*, 6.48 after *Shodhana*, and 5.9 after *Marana*.

In the case of $ZnCO_3$ the percentage of zinc present was as follows: before *Shodhana* it was 48.95%, after *Shodhana* 47.26%, and after *Marana* 53.59%. In the case of ZnO: before Shodhana it was 85.38%, after *Shodhana* 86.10%, and after *Marana* 69.51%. There was an increase in the percentage of zinc in the ash of $ZnCO_3$ because of the calcination reaction. However, in the case of ZnO there was reduction in the percentage of zinc because of the oxidative reaction.

References

1. Mishra S. Ayurvediya Rasashastra. 11th ed. Varanasi: Choukhamba Orientalia; 2001. p. 411.
2. Sharma S. Rasa tarangini. 11th ed. Motilal banarasi das publication; 1979. p. 556.
3. Joshi D. Rasa shastra. 1st ed. varanasi: Chaukhambha Orientalia; 2006. p. 192.
4. Sharma S. Rasa tarangini. 11th ed. Varanasi, Motilal banarasi das publication; 1979. p. 555.