



Research Article

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A COMPARATIVE PHARMACEUTICAL STUDY ON CA (ION) SUBSTANCES OF VARIOUS AYURVEDIC CALCIUM COMPOUNDS

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ABSTRACT

Various Ayurvedic calcium compounds, which are among the sudha vargiya dravya, are a rich source of calcium. These calcium compounds have wide range of therapeutic application. In chemical composition these compounds are same hence the present study was aimed to identify the rich percentage of calcium (as CaO) in these Bhasmas. Preparation of Ayurvedic calcium compounds i.e. praval bhasma, shankha bhasma, shukti bhasma, varatika bhasma, godanti bhasma and kukkutandatvak bhasma was done by subjecting these to shodhan and marana and physiochemical analysis of prepared bhasmas. The prepared bhasmas were subjected to qualitative and quantitative analysis. The comparative quantity of calcium was more in case of shukti bhasma and less in godanti bhasma. Acid soluble matter percentage was higher in praval bhasma and lower in godanti bhasma. In all bhasmas the acid neutralizing capacity (pH value) was higher but especially in praval bhasma. Kukkutandatvak bhasma provided more ash value as compared to other bhasma.

Keywords: Ayurvedic calcium compounds, Sudha vargiya dravya, Bhasma, Shodhan, Marana, Physiochemical analysis.

INTRODUCTION

In Ayurveda various Ayurvedic calcium compounds are considered in sudha vargiya dravya. Though sudha varga is named latterly, but the knowledge of various dravyas, concerned to this group are available since Vedic Kala. In Athrva veda shankha and mriga sringa are used as medicine. In Samhita period, 8 drugs are recorded- asthi, kukkutandatwak, mukta, pravala, shankha, shukti, varatika and samudra phane. Charak considered sudha as bhoomik dravya. Rasa ratanakar (7th century) has grouped kurma prista, varatika, chuna, shukti in sukla varga. Rasarnava (11th century) has included shankha in it. Rasa tangini (20th century) has discussed these drugs in three different chapters- manasiladi vignaniyan, shankhadi vignaniyan and ratanadi vignaniyan. In Rasamtra Achrya yadavji trikramji firstly named the group of these drugs as sudha varga in which only khatika and godanti were included. In this study different types of bhasmas were prepared by different calcium compounds i.e. praval, shankha, shukti, varatika, godanti and kukkutandatvak.

Aims and Object

The present study was aimed to identify the rich percentage of calcium (as CaO) in these bhasmas. Preparation of Ayurvedic calcium compounds— praval bhasma, shankha bhasma, shukti bhasma, varatika bhasma, godanti bhasma was done according to the method given in Rasa-tarangini and kukkutandatvak bhasma was prepared according to the method given in

Ras-tantra Sara and Siddha Prayoga Sangraha. Bhasmas were subjected to shodhan and marana and was undertaken for an organoleptic and chemical analysis of prepared bhasma.

MATERIAL AND METHODS

Selection of raw materials

Grahya praval¹, shankha², shukti³, varatika⁴, godanti⁵ and kukkutandatvak.

Shodhan of various compounds

The shodhan of praval⁶, shankha⁷, shukti⁸, varatika⁹, godanti¹⁰ are mentioned in Rasa Tarangini and kukkutandatvak¹¹ is mentioned in Sidha Bhaishajya Manimala. (Table 1)

Procedure

All these compounds were taken in a Dola yantra. Swarasa was added as mentioned in classical text. The procedure was done for 1 to 3 hours. After that it was washed with water until the used medium was removed. It was then allowed to dry.

Marana of these compounds

The marana of praval¹², shankha¹³, shukti¹⁴, varatika¹⁵, godanti¹⁶ are mentioned in Rasa Tarangini and kukkutandatvak¹⁷ is mentioned in Rasa tantra Sara and Siddha Prayoga Sangraha (Table 2).

Table 1: Comparison of shodhan process

Comparison	Praval	Shankha	Shukti	Varatika	Godanti	Kukkutandatvak
Process	Dola yantra	Dola yantra	Dola yantra	Dola yantra	Dola yantra	Prakshalana
Liquid/medium used	Swarjika kshara jala	Kanji	Kanji	Kanji	Nimbu swarasa	Lavanodak/ saline water
Time	3 hour	3 hour	3 hour	3 hour	3 hour	1 hour
Collected	In pottali	In pottali	In pottali	In pottali	In pottali	In Water
Weight before shodhan	500 g	500 g	500 g	500 g	500 g	500 g
Weight after shodhan	446 g	496 g	498 g	494 g	480 g	496 g
Loss of weight	54 g	4 g	2 g	6 g	20 g	4 g
Reference	R.T. 23/132	R.T. 12/10	R.T. 12/66	R.T. 12/87	R.T. 11/239	S.B.M. ¹¹

R.T.=Rasa Tarangini, S.B.M.= Sidha Bhaishajya Manimala

Table 2: Comparison of marana process

Name of bhasma	Type of bhavana dravya used	Types of puta	Wt. before put (grams)	Wt. after put (grams)	Loss of weight	Reference
Praval bhasma	Kumari swarasa	3 Gaja puta	446 g	276 g	170g	R.T. 23/135
Shankha bhasma	Kumari Swarasa	3 Gaja puta	496 g	348 g	148 g	R.T. 12/17-19
Shukti bhasma	Kumari swarasa	3 Gaja puta	498 g	307 g	191g	R.T. 12/67
Varatika bhasma	Kumari swarasa	3 Gaja puta	494 g	305 g	189 g	R.T. 12/91-93
Godanti bhasma	Kumari swarasa	3 Gaja puta	480 g	480 g	120 g	R.T. 11/240
Kukkutandatvak bhasma	Kumari swarasa	4 Gaja puta	496 g	330 g	166g	R.T.S. and S.P.S. ¹⁷

R.T. = Rasa Tarangini, R.T.S. and S.P.S. = Rasa tantra Sara and Siddha Prayog Sangraha.

Table 3: Comparison of organoleptic characters

Parameter	Praval bhasma	Shankha bhasma	Shukti bhasma	Varatika bhasma	Godanti bhasma	Kukkutandatvak bhasma
Color	Cream	Off white	Off white	Off white	White	White
Taste	Slight pungent	Slight Alkaline	Alkaline	Alkaline	Slight alkaline	Taste less
Touch	Soft and Fine	Soft and Fine	Soft and Fine	Soft and Fine	Soft and Fine	Soft and Fine
Odour	N.S.	N.S.	N.S.	N.S.	N.S.	N.S.
Rekhpuranatva	+Ve	+Ve	+Ve	+Ve	+Ve	+Ve
Varitasatva	- Ve*	- Ve*	- Ve*	- Ve*	- Ve*	- Ve*
Shlakshnatva	+Ve	+Ve	+Ve	+Ve	+Ve	+Ve
Mrudutva	+Ve	+Ve	+Ve	+Ve	+Ve	+Ve

*Due to hygroscopic nature of calcium compound; N.S. - None specific.

Table 4: Comparative chemical analytical data of selected calcium compounds

Parameter	Praval bhasma	Shankha bhasma	Shukti bhasma	Varatika bhasma	Godanti bhasma	Kukkutandatvak bhasma
Ash value % w/v (at 450^o C)	93.198	95.922	97.185	95.381	97.126	97.376
pH of 10% w/v solution in water	12.52	12.38	12.45	12.49	12.43	12.44
Acid soluble matter % w/w	99.862	99.582	99.288	99.732	93.873	97.713
Calcium as CaO% w/w	72.067	63.941	82.891	67.484	45.990	76.559

Procedure

Shodhita compounds (i.e. praval etc.) sample were taken, after weighing this was placed in a Khalwa yantra and triturated with kumari swarasa. Sufficient amount of kumari swarasa was added to get a consistency which is fit for preparation of a chakrika. Once it had attained a proper consistency, chakrikas were made and allowed to dry properly. These chakrikas were taken in a sharava. Sharava sandhi bandhana was performed. Then gaja puta was given by using vanyopala. The procedure was repeated for each puta

RESULTS

Tables 3 and Table 4 showed the results of the physiochemical analysis carried out on selected calcium compounds.

DISCUSSION AND CONCLUSION

After using classical parameters for the identification of these calcium compounds, the samples were subjected to shodhana using particular swarasa mention in text. The

prepared bhasmas were subjected to qualitative and quantitative analysis. The results showed that shodhan process of praval, shankha, shukti, varatika and godanti are same in dola yantra but kukkutandatvak shodhan process is different that is prakshalan only. Kshara dravya is used in praval shodhan, amla dravyas are used in shankha, shukti, varatika and godanti shodhan while lavan dravya is used for kukkutandatvak shodhan. So in this study all three dravyas (amla, lavan and kshara) were used for shodhan process. In final product of all these bhasmas, we are considering varitara test but due to the hygroscopic nature of calcium compound it became negative.

Analytical

Ash value

Ash content of praval bhasma was 93.198% w/w, shankha bhasma 95.922% w/w, shukti bhasma 97.185% w/w, varatika bhasma 95.381% w/w, godanti bhasma 97.126% w/w and kukkutandatvak bhasma 97.376% w/w. It indicates almost whole of material converted into incinerated form. Ash value decides the complete ignition

of bhasma whether it burn completely or incompletely. Kukkutandatvak bhasma provided more ash value as compared to other bhasma.

pH value

pH value of 10% w/v solution in water was 12.52 for praval bhasma, 12.38 for shankha bhasma, 12.45 for shukti bhasma, 12.49 for varatika bhasma, 12.43 for godanti bhasma and 12.44 for kukkutandatvak bhasma. In all bhasmas the acid neutralizing capacity (pH value) was higher but especially in praval bhasma.

Acid soluble matter (%)

Acid soluble matter % of praval was 99.862% w/w, for shankha 99.582% w/w, for shukti 99.288% w/w, for varatika 99.732% w/w, for godanti 93.873% w/w and for kukkutandatvak 97.713 w/w. Acid soluble matter indicates towards the change in rate of absorption in acid, Enzymatic activity and pharmacological activity. So the percentage of acid soluble matter is higher in praval bhasma and lower in godanti bhasma.

Estimation of calcium content

Calcium present in all bhasmas in form of oxide (CaO). Calcium as CaO% w/w in praval is 72.067%, in shankha 63.941%, in shukti 82.891%, in varatika 67.484%, in godanti 45.990 and in kukkutandatvak 76.559%. The comparative quantity of calcium was more in case of shukti bhasma (82.891%) and less in godanti bhasma (45.990%).

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