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## Research Article

### Pharmaceutical Study of 'Kapardika Bhasma'

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#### Abstract

*Kapardika (Cypraea moneta* Linn.) is the choice of drug having various therapeutic uses in Ayurvedic practice. The present study was conducted to generate a comparative data for processed *Kapardika bhasma (Angara Dhamana and Gajaputa)* using techniques which can be used by pharmacies. *Kapardika* was subjected to *Svedana* in *Dolayantra* with *Kanji*. *Bhasma* of this *suddha kapardika* was obtained by triturating it with *Kumari swarsa (Aloe vera Juice)*. It was then subjected to *Angara dhamana* and *Gajaputa* for *Marana* (Incineration) process. To assure the quality of *bhasma*, *Rasa Shastra* quality control tests like *nischandratva*, *varitara*, etc. were used. After *bhasma* complied with these tests, the *bhasma* was analyzed for calcium estimation studies. The studies showed that the *Kapardika bhasma (Angara dhamana)* contain 43.02 % Calcium whereas *Kapardika bhasma (Gajaputa)* contain 44.31% Calcium. It may concluded that in Pharmaceutical processing *Kapardika bhasma* prepared by *Gajaputa* method is better than *Angara dhamana* because it is easy process and yield more.

#### 1.0 Introduction

*Ayurveda* is a well-documented traditional system of Indian Medicine. *Rasa Shastra*, an offshoot of *Ayurveda* popular from medieval period, mostly deals with therapeutic utilization of metals and minerals<sup>1,2</sup>. *Rasa Shastra* is the unique knowledge system which provides unmatched database of economical, effective and wide range of medicine. It utilizes almost all forms of matter available on earth. In this regard there is a segment which deals with products of marine origin under the heading *Sudha Varga*. Among those *Varatika* (also under *Saadharna rasa varga*), which is identified as the external shell of sea animal *Cypraea moneta linn.*, is having upper hand and is popular among traditional practitioners. Again, this is used widely in the form of *Bhasma*, which is the exclusively unique dosage form of *Ayurveda*, these acts in small doses and can cure chronic ailments. In traditional system of medicine the *Kapardika (Cypraea moneta)*, have been used as medicine to cure various ailments mainly related with stomach and in the treatment of dyspepsia, jaundice, enlarged spleen, liver, asthma, cough and also reported to be externally used as caustic in various forms of ointments<sup>3,4</sup>. *Kapardika* is also included in *Sadharan Rasa*<sup>5,6</sup>. *Kapardika* is the name given to small convolute glossy shells of variegated colours of oblong, oval shape varying in size<sup>7</sup>. Cowries shells were used in many area of medicines i.e. dyspepsia, jaundice, enlarged spleens and liver, asthma and cough<sup>8</sup>. The metal and minerals are generally used in unique dosages from i.e. *Bhasma* without which these could not be absorbed and assimilated in the body. *Angar dhamana* and *Gajaputa* has been described for the purpose of application of heat in the *Marana* (incineration) of *Kapardika*. Thus, in this study, an attempt has been made to prepare *Kapardika bhasma* using different *Marana* (incineration) procedures. A comparative study has been carried out to evaluate the *Marana* (incineration) procedures of *Kapardika Bhasma*.

#### 2.0 Materials and Methods

*Kapardika* (Cowrie shells) were procured from authentic source of Raipur market. *Kanji (Self prepared Acidic media)* required for the *Shodhana* of *Kapardika* are prepared as per Ayurvedic text.

##### 2.1 Sodhana of Kapardika

For *Shodhana* of *Kapardika* 500g was taken and *kanji* was used as media for *Swedana*. *Kanji* was prepared as per *Bhaisajya ratnavali*. *Asudha kapardika* was kept in two folded white clean cotton cloth and *Pottali* was prepared. It was suspended in *Dola Yantra* containing 2L of *Kanji* and mild heat was applied to boil *Kanji* which was maintained for 3h. When the level of *Kanji* decreased, again extra 1L (average) was added. After completion of processing, heating was stopped and left for self cooling. Then the *Pottali* was opened and *Kapardika* pieces were washed thoroughly with luke warm water and dried.

##### 2.2 Marana of Suddha Kapardika

###### 2.2.1 Angar Dhamana (Marana)

First coal-charcoal was put fire to allow red hot then pieces of *shuddha Kapardika* were placed on red hot charcoal and heated till each piece swell-up and cool by itself. Temperature was recorded by means of a digital pyrometer from very beginning to end. On the next day, after self-cooling of *Suddha Kapardika*, *Kapardika* Pieces were collected carefully and weighed. The results obtained during the *Angara Dhamana* have been presented in Table 1.

###### 2.2.2 Puta paka (Marana)

*Kumari swarsa* was extracted by *Nishpidana* (expression) *Vidhi*. Leaves of *Kumari* were washed in tap water, thorny ridges and apex were cut by knife. Mucilaginous pulp was separated from the leave with the help of knife and pulp was churned in mixture and then strained through cotton cloth.

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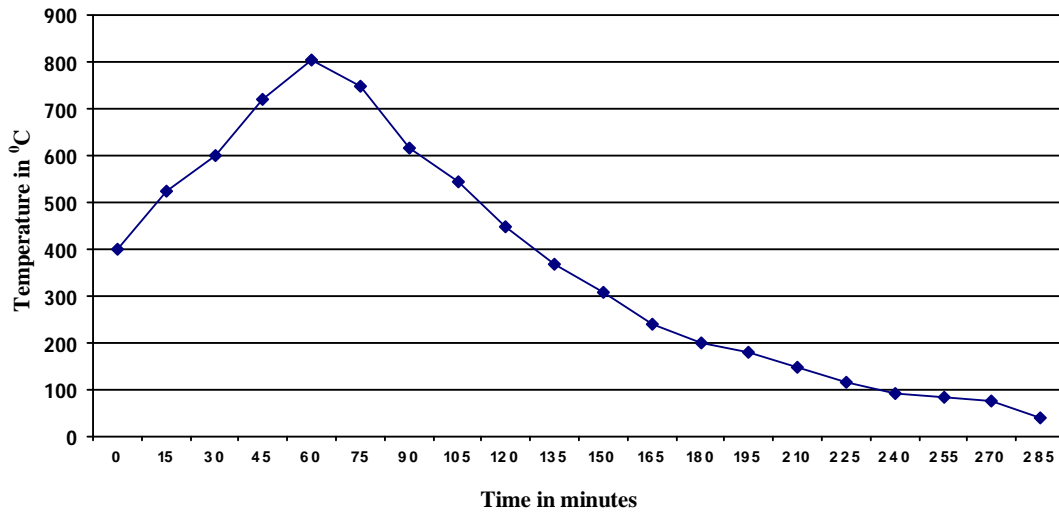
*Suddha Kapardika* was levigated with *kumari swarasa* in porcelain mortar until it formed a thick paste and becomes suitable for making *Chakrikas*. Small amount of levigated doughy mass was made into flat and round-shaped *Chakrikas*. The prepared pellets were kept on a plastic sheet for drying. After proper drying of *Chakrikas*, they were weighed and kept in an earthen *Sharava*. That *Sharava* was covered by another earthen *Sharava* and the junction between the two *Sharavas* was sealed by a cotton cloth smeared with *Mulatani Mitti* and again allowed to dry completely (*Sharava Samputa*). The *Sharava samputa* was subjected to *Puta paka* in the conventional *Puta* i.e. *Gaja Puta*. After placing ignited cow dung cakes and filling two-thirds of the pit with 60 cow dung cakes, *Sharava Samputa* was kept on them and the remaining one third part was filled with 40 cow dung cakes to cover *Sharava Samputa*. After complete burning of all the cow dung cakes, the pit was allowed to self cool. On the next day, after self cooling of *Sharava Samputa*, it was opened and *Kapardika* pieces were

collected carefully and weighed. The same process is to be repeated for another time and finally the final product was powdered and sieved through 120# mesh to obtain the fine *Bhasma*. The observations and results obtained during the first and second *puta* have been presented in Table 2.

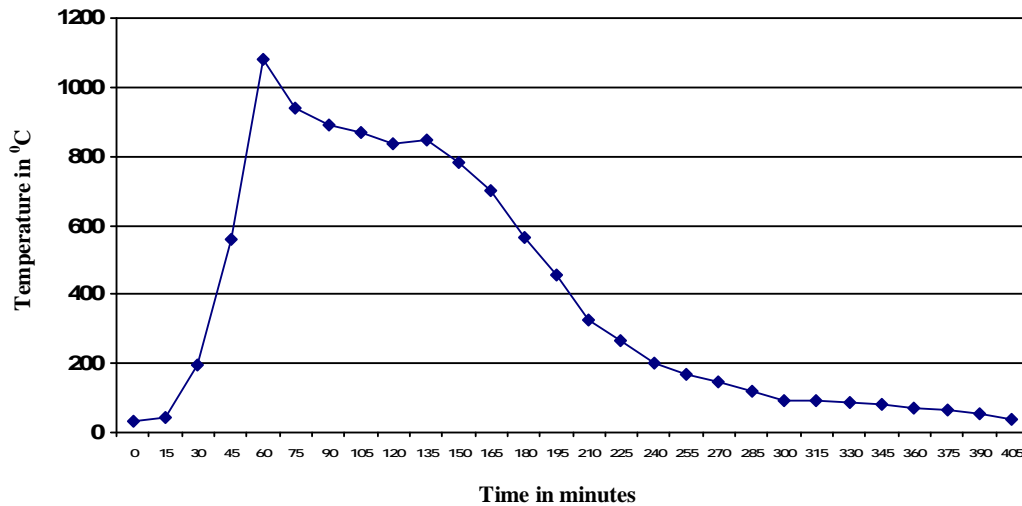
### 2.3 Average Temperature Pattern

The temperature of *Angara dhamana* and *Puta* during *Marana* procedures of *Kapardika* was recorded at regular interval of 15 min. right from the beginning to till its self-cooling. During the *Angara Dhamana*, the average peak temperature observed was 805°C. During the *Gaja puta*, the average peak temperature observed was 1080°C in the first and second *Gaja Puta*. The temperature pattern observed during the *Angara dhamana*, first and second *Puta* of the *kapardika Bhasma* are presented in Graphs 1-3.

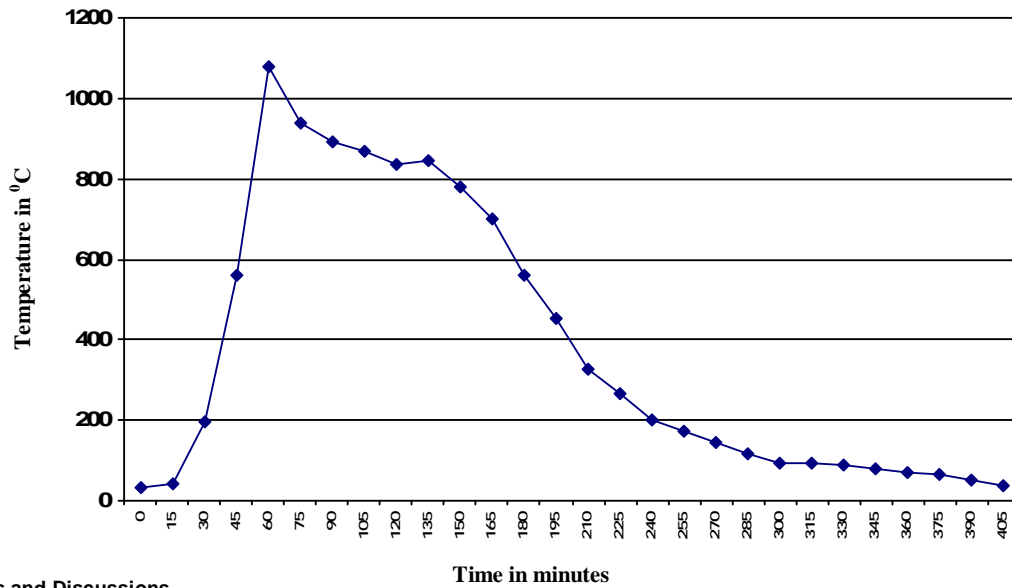
**Graph 1:** Average temperature pattern observed during *Angar Dhamana* in *Kapardika Bhasama*



**Graph 2:** Average temperature pattern observed during 1<sup>st</sup> *Gaja puta* in *Kapardika Bhasama*



**Graph 3:** Average temperature pattern observed during 2<sup>nd</sup> Gaja puta in Kapardika Bhasama



**3.0 Results and Discussions**

In the *Shodhana* procedure, before heating *Kanji* was milky white in colour and after 1.30 hour of heating *Kanji* became grayish in colour, subsequently 3 hour of heating *Kanji* became dark-grayish in colour. pH of *Kanji* was found 2 before heating and after 3 hour of heating pH of *kanji* was found 6. The change in pH may be due to dissolution of some Calcium carbonate (alkali) part of *Kapardika* in to *kanji* and the dirty substance (Sand and Clay) were also remove. Before *Shodhana Kapardika* was shiny, smooth with ceramic like glossiness but after *shodhana Kapardika* became dullness and rough in texture. Echo resogenic sound was observed more after *shodhan*.

In the *Angara Dhamana*, when each *Kapardika* was placed on red hot charcoal it swells and brown flames were seen. Cracking sound was present in *Kapardika*. After *Angar dhamana Kapardika* became soft and white because Calcium carbonate changes to Calcium oxide form to some extent. The average weight loss observed was 84 g i.e. 19.76% after the *Angara Dhamana* in the preparation of *Kapardika bhasma*. The average weight loss observed was 175 g i.e. 41.18% after the 1<sup>st</sup> and 2<sup>nd</sup> *Gaja Puta* in the preparation of *Kapardika bhasma*.

**Table 1:** Results obtained during of *Angar Dhamana Kapardika Bhasama*

Batch	Before	After	Loss in Weight	% of Loss	Hardness
Angar Dhamana Kapardika Bhasama	425 gm	341 gm	84 gm	19.76	2.39

**Table 2:** Results obtained during of *Gaja puta* in *Kapardika Bhasama*

Initial weight	Final Weight		Loss in weight	Loss Percentage
	1 <sup>st</sup> Puta	2 <sup>nd</sup> Puta		
425 gm	310 gm	250 gm	175 gm	41.18

The *Varna*, *Rasa*, *Sparsha* and *Gandha* of the *Kapardika bhasma* were found whitish, slightly alkaline, soft and fine and non-specific respectively (Table 3). The *Kapardika Bhasma* had passed classical parameters like *Rekhapurnatva*, *Varitatva*, *Shlakshnatva* and *Mrudutva* (Table 4). The details of observations and results of loss on drying % w/w , total ash, % w/w , acid insoluble ash % w/w, pH, Qualitative test for calcium, carbonate and calcium estimations of *Kapardika Bhasma* are presented in Table 5. in 99.80% *Kapardika Bhasma* particles was passed through screen Table 6.

**Table 3:** Classical physical parameters in *Kapardika Bhasma*

Parameters	Angar Dhamana Kapardika Bhasama	Gaja Puta Kapardika Bhasama
Varna	Whitish	Whitish
Rasa	Slightly alkaline	Slightly alkaline
Sparsha	Soft and Fine	Soft and Fine
Gandha	Non Specific	Non Specific

**Table 4:** Classical chemical parameters in *Kapardika Bhasma*

Parameters	Angar Dhamana Kapardika Bhasama	Gaja Puta Kapardika Bhasama
Rekhapurnatva	Positive	Positive
Varitaratva	Negative	Negative
Shlakshnatva	Positive	Positive
Mrudutva	Positive	Positive

**Table 5:** Analytical data of *Kapardika Bhasma*

Parameters	Angar Dhamana Kapardika Bhasama	Gaja Puta Kapardika Bhasama
Loss on drying % w/w	0.75	0.55
Total ash, % w/w	46.23	42.66
Acid insoluble ash % w/w	0.79	0.59
pH	12	12
Qualitative test for calcium	+ Ve	+ Ve
Qualitative test for carbonate	+ Ve	+ Ve
Calcium content Ca, % w/w	43.02	44.31

+Ve = Positive

**Table 6:** Result of particle size of *Kapardika Bhasma*

Sample	Screening result
Angar Dhamana Kapardika Bhasama	99.80% passed through screen
Gaja Puta Kapardika Bhasama	99.80% passed through screen

#### 4.0 Conclusion

In the Ayurvedic system of medicine, metallic preparations are used in very minute concentrations since centuries for management of several diseases. *Kapardika* plays important role in Ayurvedic medical practice. There was always a point of concern regarding its quality. The data of the present study suggests that the inclusion of analytical techniques becomes a necessary prerequisite to evaluate the quality of Bhasma preparations and formulations. Analytical techniques must be used to help set a comprehensive label claim. Further work needs to be done using various animal models to evaluate the extent of absorption and their elemental effect at tissue level of these Bhasmas and their formulations.

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