



Research Article

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Significance of Puta in Bhasmikanana with special reference to Sankha Bhasma

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ABSTRACT

Rasashastra is the branch which deals with drugs of metals and mineral origin. According to Rasashastra, procedures like *shodhana* and *marana* are employed to detoxify the metals and minerals. Traditionally *Puta* is used in the *marana* procedure used to obtain *bhasma*. Sankha is an animal product which is included in *sudha varga*. Main chemical constituent of sankha bhasma is calcium carbonate. Sankha bhasma is done usually through *puta* process which is the best method as per our Acharyas to enhance its therapeutic efficacy.

Keywords: Rasashastra, Marana, Puta, Sankha bhasma.

INTRODUCTION

Rasashastra is the branch of Ayurveda which was developed in the medieval period. It mainly deals with the drugs of mineral origin. Various impurities and toxins are present in these minerals. In order to eliminate these toxins and to make them therapeutically suitable for internal administration procedures like *shodhana*, *marana* are done. The process by which metals and minerals are converted into *bhasma* form is called *Marana*. *Puta* plays a vital role in *bhasmikanana* of metals and minerals. For proper attainment of *paka* of *Rasadi dhatus* an ideal quantity of heat is required which should be neither less nor more, that is called *puta* [1]. By utilising *puta* as a device, one can judge whether *Samyak Paka* of the drug have been achieved or not. The fire generated with the cow dung cakes help to achieve this *Paka* [2].

Sankha (Conch shell) is the shell of a marine creature called *Turbonella rapa*. It belongs to the Mollusc group. Its chemical composition is CaCO_3 . They have no bone and are covered by a hard shell. Sankha is used from vedic period itself. A good Sankha should be round, smooth, with a small opening, bright like full moon, long and heavy. *Rasa kamadhenu* says that sankha has *katu* and *kashaya rasa*, *laghu guna*, *na - ushna virya*, and properties like *kaphaghna*, *lekhana* and *raktapittahara* [3]. It is used in diseases like *amlapitta*, *swasa*, *agnimandya*, *atisara*.

Although the knowledge of Sankha is available from vedic period acharyas included it under different *varga* in Table 1.

Table 1: Vargas of Sankha according to different acharyas.

Grantha	Varga
Susrutha Samhita [4]	Anupa varga
Rasaratnakara [5]	Sweta varga
Ayurveda prakasa [6]	Uparasa varga
Rasendrasarasangraha [7]	Uparasa varga
Rasa tarangini [8]	Sankhadi varga

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Definition of puta

The process by which mercury etc. drugs are levigated with herbs, made into small rounded cakes or pellets, dried and exposed to heat is altogether called *puta*.

Types of puta

Puta can be classified into 3 types i.e.; *Surya puta*, *Chandraputa* and *Agni puta* based on the nature of heat given. Based on the intensity of heat given *Agni puta* is again divided into 3 that is *Mrdu agni*, *Madhyama agni* and *Tivra agni*. *Lavaka puta* and *Kapota Puta* can be included under *Mrdu agni*, *Kukkuta Puta* and *Varaha puta* included under *Madhyama Agni* and *Gaja Puta* and *Maha Puta* under *Teevra Agni*.

Name of puta according to classical texts, its dimension (classical and metric system) and the maximum temperature attained by each puta are shown in table 2.

Table 2: Dimension and temperature attained by different puta

Sl.No	Name of the Puta	Dimension		Max.Temp
		Classical	Metric system (cm ³)	
1.	Mahaputa	2 hasta	91x91x91	1000°C for 1 hr.
2.	Gaja puta	1Rajahasta	57x57x57	1000°C for 1 hr.
3.	Kukkuta puta	2 vitasti	46x46x46	1000°C for 1/2 hr
4.	Varaha puta	1 Aratni	42x42x42	1000°C for 1/2 hr
5.	Laghu puta	8 Upala	23x23x23	800°C for ½ hr
6.	Bhudhara puta	-	20x20x20	140°C for ½ hr
7.	Gorbara puta	1 Vitasti (Ht)	23x23x23	400°C for 4 hr
8.	Bhanda puta	Brihat Bhanda	-	400°C for 8 hr
9.	Valuka puta	Brihat Bhanda	-	400°C for 6 hr

Parts of puta

Samputa, *upalas* and *chakrika* are the materials used in the procedure of *Puta*. The place where pellets or *chakrikas* are kept during the incineration is called *Samputa*. According to various procedures different *samputas* are utilised which include *Sharava samputa*, *Kamsya samputa*, *Lavana samputa*, *Suranakanda samputa*, *Patra samputa* etc. An ideal *samputa* should be inert, neither too thick nor too thin, heat stable and not a good conductor of heat.

Upala is used to generate heat in *Putas*. The synonyms of *upalas* are *Pistaka*, *Chana*, *Chagana*, *Utpala*, *Upala*, *Girinda*, *Upalasthi*, *Karisa* and *Vanopala*. In small *putas*, *gorvara* (the dried cow dung powder and husk of paddy) can be used instead of *upalas*.

After levigation, the material is made into uniform round shape which is called *chakrikas* or pellets. These pellets should be dried under shade in order to avoid very fast loss of moisture and hence cracking.

Puta vidhi

Drug should be collected first. In order to remove the chemical and physical impurities *Shodhana* should be done. *Churnikarana* of the material should be done for decreasing the particle size. After *Churnikarana*, *Bhavana* (Trituration) of the drug should be done with juices or decoctions of herbs. Then small, flat, round, pellets called *Chakrikas* are made, dried and kept inside an earthen plate (*sarava*) and closed with another. Clay smeared cloth should be utilised for sealing the earthen plates and should be kept for drying. Then with the help of cow dung cakes the sealed earthen plates are heated.

Opinions of different Acharyas about the *Shodhana* and *Marana* procedures of Sankha bhasma are described briefly in the table 3 and 4.

Table 3: Different Shodhana procedures of Sankha bhasma

Sl.No	Name of text	Procedure	Bhavanadravya	Time
1.	Rasa tarangini ^[9]	Sankha is made into small pieces, tied it into a poultice and subjected to boiling in dolayantra and wash with hot water.	Jambira	12 hours
			Jayanti	3 hours
			Kanji (sour gruel)	3 hours
			Tanduliyaka	3 hours
2.	Ayurveda prakasa ^[10]	Swedana (boiling) in Dola yantra	Amla dravya	3 hours
			Kanji	
3.	Rasendrasarasan graha ^[11]	Swedana in dola yantra	Kanji	3 hours
4.	Rasamitra ^[12]	Swedana in dolayantra	Amla dravya	3 hours
			Nimbu swarasa Kanji	
5.	Rasajalanidhi ^[13]	Swedana in dolayantra	Amla dravya along with kanji	
6.	Rasa vaidyaka ^[14]	After heating wash with water	Mixture of cow's urine, salt and lemon	6 hours

Table 4: Different Marana procedures of sankha bhasma.

Sl. No	Name of text	Procedure	Name of puta	No. of puta
1.	Rasa tarangini	puta vidhi	Gaja puta	2
2.	Ayurveda prakasa	Puta vidhi – bhavana with Nimbu swarasa	Laghu puta	-
3.	Rasendra sara sangraha	Along with tankana heat it in andha musha and stir by danda yantra (khalva yantra)		-
4.	Rasamitra	Burning in heat Puta vidhi – bhavana with kumari swarasa	Gaja puta	3
5.	Rasajala nidhi	Along with tankana heat it in andha musha	-	-
6.	Rasavaidyaka	Puta vidhi – along with ghrita kumari.	Gaja puta	1
7.	Bhaishajya ratnavali ^[15]	Along with tankana heat it in andha musha and stir by danda yantra		-
8.	Yoga ratnakara ^[16]	Sodhana by amla dravya	-	-

DISCUSSION

Acharyas have described various methods for the preparation of Sankha bhasma. But of these *Gaja puta* is said to be the best method for the preparation of Sankha *bhasma*. The ideal temperature for the *bhasmikrana* of sankha is around 800° C which can be achieved easily through *Gajaputa* ^[17].

The properties of bhasma prepared through puta includes *Curnatva* - Breaking the material to a powdered state by providing external heat to the metal, *Laghuta* – Lightness, *Apunarbhava* – Unable to regain its original form, *Gunadhikya* - Potentiation, *Agrata* – Making the drugs to its best form, *Anapsu Majjanam* –The obtained *bhasma* will not sink in water, *Rekhapurnata* - Occupying the inter ridge spaces of the finger,

Sighravayapti - Spreading and occupying very rapidly, *Dipanam* - Increasing the appetite [18].

Previous studies show that there is a marked reduction in the particle size after each and every *puta* when it is given in proper quantum. The review of chemical analysis, indicates that percentage of Acid insoluble ash gradually decreases and percentage of Acid soluble ash gradually increases as the number of *Puta* increases indicating its conversion to more assimilatory form [19]. *Bhasmas* are considered to reduce the particle size which increases the bioavailability of the drug.

Thermodynamics of *puta*

Different kind of Laws can be utilised for explaining the thermodynamics of *puta*. By using Mechanism of conduction heat flow in *puta* can be explained. Heat flows from a hot surface to a cold surface when there is a temperature gradient. Fourier's law can be used to explain the conduction of heat through the pellet. The area and the temperature gradient is proportional to the rate of heat flow through a uniform material. So the shape of pellets is very much important. It should be flat in shape, and thickness must be standard to facilitate the easy flow of heat. Hess's law of thermodynamics can be used to explain the exchange of heat from the *puta* to the pellets inside the *sarava samputa*. Whether the process takes place in one or several steps, the amount of heat evolved or absorbed in a chemical change is the same. Several chemical changes take place to the material inside the *puta* and it gets changed into compound form. The energy of heat absorbed by the material and the energy required for the chemical change are the same inside the earthen plate during *putapaka* [20].

Nowadays, muffle furnace is used as an alternative for *puta*. They are of two type Front loading (horizontal) and top loading (vertical). Generally, muffle furnace has a maximum working temperature of 1100°C – 1200°C. It helps to provide a uniform temperature throughout the process.

CONCLUSION

Puta is one of the ancient methods utilised by our *Acharyas* for the conversion of metals and minerals into *bhasmas*. *Bhasmas* which are considered to have nanoparticle size are more bioavailable than their original form. Particle size analysis shows that as the number of *puta* increases, particle size decreases, making it more fine. The ideal method explained to obtain *bhasmas* is through *putas*. Various methods are told by *Acharyas* for the preparation of Sankha bhasma but among these methods *puta* is the best method for the preparation of sankha bhasma. So *puta* has a significant role in *bhasmikarana* of sankha bhasma.

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