IMPORTANCE OF PUTA IN RASA SHASTRA: A REVIEW
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ABSTRACT
Ayurveda the science of life gives importance to keep balance between nature and human relationship. From Vedic period to Samhita period there was less use of metals/minerals in formulation, but from the period of Nagarjuna formulation of herbo-mineral drugs are used profusely. A careful survey of the original texts on Rasashastra shows that subject covers the entire field of inorganic pharmaceutical preparation like metallic, nonmetallic and organometallic compounds of Ayurvedic material media. Shodhana and marana of the substance are done with some special processes and thereafter can be used therapeutically. A process in which the substance placed inside a covered container is subjected to specified quantity of heat using various sizes of pits i.e. puta. It is process of heating in a specific heating grade (puta) in particular atmosphere for a specified period, leading to proper incineration of the material. Pata (Agni) work is basis on quantum heat theory, (quantum heat theory is a branch of physics which is the fundamental theory of nature at small scales and low energy levels of atoms and subatomic particles). This article is focused on importance of puta in Rasashastra a review.

Keywords: Puta, Agni, Cow dung cakes, Muffle furnace.

INTRODUCTION
Rasadravyas can be used safely only after pharmaceutical processing. These include, Shodhan, Mardana, Dhalana, Jarana etc. Agni plays an important role for providing Agni, various Puta have been described 1.

Puta is a system of heating that gives an understanding of how much paka (heating) is required for a particular metal or mineral for its conversation into ashes, during putapaka. In this process, successive putas are given as prescribed in the texts or till the proper fineness & bhasma quality are obtained. As only measured heating is always recommended for achieving desired medicinal products, neither more nor less heating is desirable 2.

The decision over number of putas to be applied largely depends on the nature of drug hardness, density, melting point etc) subjected for puta 3. In general, the ancient authors recommend 10 to 100 putas for many rasa dravya for their purification or for incineration. In case of Lauha bhasma 10 to 100 puta are advised to make the bhasma, for Vajikaran karma 10 to 500 puta and 100 to 1000 puta are advised to make the bhasma fit for Rasayana karma 4. Drug with less hardness may require only one puta. The calcium compounds like Sankha, shukti, kaparda require three putas for their incineration. Whereas, the gold, copper and other such metals require up to 40 putas for better incineration 5.

Aim & objects
- To provide a particular temperature pattern (no less or more heating).
- Reduction in particle size.
- To provide a suitable atmosphere for desirable chemical reaction.
- To make the material ductile, smooth & homogenous.
- To potentiate the material for therapeutic purposes.
- To make the material absorbable, colloidal, adaptable & assimilable form.
- Putas generates following properties into the bhasmas

Classification of puta
According to the source of heat:
1. Agni puta: paka through fire.
2. Surya puta: paka through sun Rays.

Table 1: According to temperature

<table>
<thead>
<tr>
<th>No.</th>
<th>Temperature</th>
<th>Puts</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>High temperature</td>
<td>Mahaputa, Gaiputa</td>
</tr>
<tr>
<td>2.</td>
<td>Medium temperature</td>
<td>Ardhaagaya, Varaha &amp; Kakkaputa</td>
</tr>
<tr>
<td>3.</td>
<td>Low temperature</td>
<td>Kapot , Laghu &amp; Lavakaputa</td>
</tr>
</tbody>
</table>
Table 2: According to Dimensions

<table>
<thead>
<tr>
<th>Name</th>
<th>Dimension metric system (cm)</th>
<th>Uppala</th>
<th>Maximum temperature (°C)</th>
<th>Swang Shit kala</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mahaputa</td>
<td>91 x 91 x 91</td>
<td>1500</td>
<td>1000 for 1 hr</td>
<td>10 hrs</td>
</tr>
<tr>
<td>Gajaputa</td>
<td>57 x 57 x 57</td>
<td>1000</td>
<td>1000 for 1hr</td>
<td>10 hrs</td>
</tr>
<tr>
<td>Kukkutaputa</td>
<td>46 x 46 x 46</td>
<td>100</td>
<td>1000 for ½ hr</td>
<td>7 hrs</td>
</tr>
<tr>
<td>Varalaputa</td>
<td>42 x 42 x 42</td>
<td>500</td>
<td>1000 for ½ hr</td>
<td>6 hrs</td>
</tr>
<tr>
<td>Laghapataputa</td>
<td>23 x 23 x 23</td>
<td>8</td>
<td>800 for ½ hr</td>
<td>3.5 hrs</td>
</tr>
<tr>
<td>Bhudharapataputa</td>
<td>20 x 20 x 20</td>
<td>-</td>
<td>140 for ½ hr</td>
<td>9 hrs</td>
</tr>
<tr>
<td>Gorvaraputa</td>
<td>23 x 23 x 23</td>
<td>Uppala Churna</td>
<td>400 for 4 hrs</td>
<td>23 hrs</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-</td>
<td>400 for 4 hrs</td>
<td>28 hrs</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-</td>
<td>400 for 6 hrs</td>
<td>28 hrs</td>
</tr>
</tbody>
</table>

Chandra and Surya Pata depend on the natural source of energy.

1. **Chandrputa**: In chandraputa the drug material to suitable bhavana with specified light then placed daily night under moon light. According to Rasatantrasara`, Chandra puta is explained for Praval Bhasma also known as samskar visha.

2. **Suryaputa**: Also known as Rudra / Bhanu Pata. After bhavana subjected to Sunlight. Paka takes place due to sun rays Praval Bhasma (Surya Puti Rasatantrasara), Also in RRS, RT, Ayurved Prakash, Rasendrasarasangraha. Examples – Silajatu sodhana and Bhanapak for loha churna.

3. **Agni Puta**: Artificial source of energy. Types explained depending upon Agni (Fire). For more (Atitivra): Mahapatha etc. For moderate(Madyam): Gajapata, Kukkutaputa etc For less (Manda or Atimanda) : Laghapataputa etc.

Table 3: Number of Pata according to different Authors

<table>
<thead>
<tr>
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<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Mahaputa</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>2</td>
<td>Gajaputa</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>3</td>
<td>Varahaputa</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>4</td>
<td>Kukkutaputa</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>5</td>
<td>Varalaputa</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>6</td>
<td>Varalaputa</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>7</td>
<td>Varalaputa</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>8</td>
<td>Varalaputa</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>9</td>
<td>Bhudharapataputa</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>10</td>
<td>Bhudharapataputa</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

a. **Mahaputa**: Total no of Cow Dung: 1500(750+750) dimensions is 2 x 2 x 2 (Rajhasta) According to R.T.14, and According to Rasendrudchamadani15 1500(1000+500) also RRS16 Rasprakashshudhakar17. According to Sharangadhara 30 vanyapala18 used for Tamra, Parada, Suvarna, Vajra and Trivanga Bhasma.

b. **Gajaputa**: According to RRS 1.1/4 x 1.1/4 x 1.1/4 (Rajhasta)19. Ground should be flat and dry. Total no. of Cow Dung Used: 1000 (500 + 500) also RT20 and According to Rasendrudchamadani21 1000 (700 + 300) also Rasprakashshudhakar22. and According to Ayurved prakash 30 or 20 vanyapala23. Akika, Abhraka, Rajata, Yashada, Loha, Suvarna, Vajra, Hartala, Godanti, Trivanga bhasma.

c. **Ardhagajaputa**: Mentioned in different Rasa text book, rya Yadavji clearly explained about Ardhagajaputa for the marana of Tamra and Vanga. (45.3x45.3x45.3) cm. number of Cow dung used: 500.

d. **Kukkutaputa**: According to Rasendrudchamadani 2 x 2 x 2 balista (46 cm) cubical 100 (70+30) vanyapala24 (cow dung cakes) are used also in between and ignite fire. According to RPS: Use of 300 (200+100) vanyapala25. Some author mentioned about the use of 10 vanyapala. Used for Tutha, Parada, Loha, Svarna Bhasma. There are no sources in the current document.

e. **Varalaputa**: 1 x 1 x 1 Aratni (distance between elbow joint upto little finger tip) (42cm) Different opinion about no of vanyapala (as Crodaputa, varnayakhya. Used for Abhraka, Tamra, Rajata and Kapardika bhasma.

f. **Laghapataputa**: Also known as laghapataputa, mridupata, and swalpataputa. 8 number of vanyapala are heaped up on the ground, around the enclosed sampit driavya explained by Rasprakashshudhakar26, Rasendra-chudamani27, RRS28 and RT29. Used for marana of rajata, svarna, parad, Hartal bhasma.

g. **Bhudharapataputa**: According to Rasendrudchamadani30, 4 angulapramana of depth pit should be made. Put aushadhiyuktasharavara inside pit, cover pit with vanyapal and set fire. Also RRS31, RT32, and Rasaprasakshudhakar(8vanyapala)33. Used for jarana and paradabhasma.

h. **Govar (Lavakaputa)**: Smallest among all. According to Rasaprasakshudhakar34 64 tolavanyopalachurna(cow dung powder) or 64 tolatusha, Sharava sampita placed in between and ignite fire. Also explained by Rasendrudchamadani, RRS35, RT36, Shodashi pramana (4 tola). According to Kalinga Mana. Used for bhaskarana of mridudraya i.e. gandhak and parad bhasma, Resembles with Lavaka bird (goriya).

i. **Bhanda (kumbhaputa)**: According to Rasaprasakshudhakar Bhandapataputa, mridubhandapataputa. Tusha(husk) is taken in earthen mud pot, half of the pot is filled with husk, placed the sharvasampita over it and remaining place of the pot also filled with husk and ignite fire the mouth of pot kept open37. Also, Rasendrudchamadani38, RRS39, RT40, and Bhavaprakash also explained the same but the mouth of pot has been closed. No explanation about duration of agni is given.

j. **Valukaputa**: Different opinion of different Acharyas: According to RRS: Valuka is taken in earthen mud pot Fill it up to neck and put the sharvasampita in middle of pot and ignite fire41 and Rasendrudchamadani42, and RT43. According to Vagbhata: explained use of Baluka only. According to rasprakashshudhakar use of Baluka and vanyapala44. Some text told about the use of Lavana, Kshara, etc. Used for Gandhidh jaranath in parah.
Uses of Puta

Bhasmikarana, Remove doshas (harmfull effect of drug), Increases quality (Guna’s), Convert drugs of minerals metal origin into laghu (light) form as a result bhasma do not sink in water. Develop dipana property which stimulate whole metabolic process of the body. It encourages the formation of newer compounds that are therapeutically more potent such dhatu bhasma fulfil all the bhasma pariksa and readily accepted by the living body tissue.

Table 4: Uses of puta in according to different Acharya

<table>
<thead>
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<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Chandra Puta</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>Praval Bhasma</td>
<td>-</td>
</tr>
<tr>
<td>2</td>
<td>Surya Puta</td>
<td>- Lauha Churna, Lauha Bhasma</td>
<td>- Lauha Shodhan</td>
<td>-</td>
<td>Praval Bhasma</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Maha Puta</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>Swarna bhasma, Rajata bhasma,</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Varaha Puta</td>
<td>Swarna bhasma, Naga Bhasma</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Kukut Puta</td>
<td>Swarna bhasma, Rajata bhasma, Tamra Bhasma</td>
<td>-</td>
<td>Tutila bhasma</td>
<td>-</td>
<td>Tutila bhasma,</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Kapota Puta</td>
<td>Swarna bhasma</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Govar Puta</td>
<td>Parada bhasma, swarna bhasma, Parada Bhasma</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>Parada bhasma,</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Bhand Puta</td>
<td>Parada Bhasma</td>
<td>-</td>
<td>-</td>
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<td></td>
</tr>
<tr>
<td>10</td>
<td>Baluka Puta</td>
<td>-</td>
<td>-</td>
<td>Kaparda bhasma,</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Bhaddiara Puta</td>
<td>Rasa bhasma</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Lavaka Puta</td>
<td>Mridu Dravya paka</td>
<td>-</td>
<td>Mridu Dravya paka</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>

Necessity of puta

To apply proper heat to a substance as per its physical and chemical properties to get Supachya (more assimilable) and Supakwa Bhasma form, as well as number of Puta for particular substance is mentioned. Puta indicates quantities as well as qualitative measure of heating.

Puta in present day

Compared with Muffle Furnace. A furnace is a device used for heating. Sometimes as a synonym for kiln, a device used to fire clay to produce ceramics. In British English the term furnace is used exclusively to mean industrial furnaces which are used for many things, such as the extraction of metal from ore (smelting).

Types
- Blast furnace
- Steelmaking furnaces
- Paddling furnace
- Bessemer converter
- Open hearth furnace
- Basic oxygen furnace
- Electric arc furnace
- Electric induction furnace
- Vacuum furnaces

Furnace

Equipment to melt metals, Casting, change shape, Change properties. Type of fuel important mostly liquid/gaseous fuel or electricity. Low efficiencies due to High operating temperature Emission of hot exhaust gases.

Parts
1. Burners: raise or maintain chamber temperature
2. Chimney: remove combustion gases
3. Furnace chamber: constructed of insulating materials
4. Hearth: support or carry the steel. Consists of refractory materials

DISCUSSION

Purified & detoxified material is mixed with drug for incineration (market drugs) & is ignited and is levigated with particular liquid media for specific period. Pellets are kept in one earthen saucer, covered by another earthen saucer & junction is sealed by mud
smeared cloth and allowed to dry it. This sarvasamputa is subjected to puta for incubation. The application of heat (puta) should be such that the heat uniformly reaches every particle of the drug placed inside sarava samputa. After self-cooling the pellets are collected & ground to powder from. This process is repeated for specified times. So putapaka process is performed in the following phases.


Repetition of this process leads to reduction in particle size and fineness of the particles.

The inorganic contents of drug for levigation (bhsmadraya) supplements supplier, which are favorable to the body. After marana the metals generally convert to their compound from, which are biologically favorable to the body.

CONCLUSION

The particles of mineral and metals become very light after puta. So that its enters in to body and its absorption and assimilation are very easily performed. Hence putapaka or heating treatment for mineral and metals in Rasashatra is emphasis for internal administration.

REFERENCES

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