PHARMACEUTICAL STUDY OF HEMGARBHA POTTALI RASA

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ABSTRACT

The Pottali rasayana is a unique preparation in Ayurveda as it is very compact in structure and quick acting due to its high potency. Hemgarbha pottali rasa is a medicine which is known as emergency medicine of Ras shastra because of its efficacy and its quick effect in condition like Sannipataj awastha. It is prepared with the combination of Shudha parada, Shudha gandhaka, Shudha tamra bhasma and Shudha swarna. Preparation method of this Hemgarbha pottali ras is unique in the way that it is prepared in molten sulphur which increases its efficacy many folds. Inspite of availability of vast theoretical description in Ayurvedic texts regarding Pottali rasayana, very less research work is carried out on Hemgarbha pottali rasa, so it is mostly out of practice in Ayurvedic community. Hemgarbha pottali rasa is a very potent medicine which should be made popular by Ayurvedic practitioners. In the present article various methods of preparation of Hemgarbha pottali rasa has been described and most common method of preparation which is molten sulphur method is discussed in detail.

KEYWORDS: Hemgarbha Pottali Rasa, Sannipataj Awastha, Parada, Gandhaka, Tamra, Swarna.

INTRODUCTION

In Rasashastra the mercury is used as medicine with the combination of sulphur and without sulphur. The combination of mercury with sulphur is mainly divided in four categories viz. Kharaliya Rasayan, Parpati Rasayan, Kupi pakva Rasayan & Pottali Rasayan. Out of these four preparations Kharaliya, Parpati and Kupi pakva are very popular and well accepted among Ayurvedic physicians. But the last one i.e. Pottali rasayan which is very potent because of the unique method of preparation and the way of administration, is still awaiting to gain its previous glory.

As per the nomenclature, the drug which is prepared by giving compactness to the scattered materials by special method of preparation is termed as Pottali.[¹] During ancient era, the physician have to carry the medicine with them and there were every chances of breakage and destruction of medicine during transportation, so because of these factors the Pottali kalpana came into existence,[²] as it was safe to carry, easy to administer, and no chances of destruction due to its hard and solid form. It is administered by rubbing it on a hard surface or stone applied with 1-2 drop of Ghrita or honey and then taken orally. The medicinal properties of Pottali were enhanced by the process of formation and it was an additional achievement. It was a medicine which gives quick response even in emergency situations.[³] If Pottali rasayan is researched keeping in mind its antimicrobial effect could be proved a milestone in the history of Ayurvedic antibiotics. Among the description of Pottali in Ayurvedic texts, the most described Pottali is Hemgarbha pottali Rasa because of its efficacy. Lots of references are available in Rasashtra for its preparation.[⁴,⁵,⁶,⁷,⁸,⁹] There are various types of Hemgarbha pottali rasa on the basis of different method of preparation, contents, and the physical properties. As per the different texts, in some cases no Paka is required, in other different types of Putas are used, and according to some Acharyas, Pottali is immersed in a container having liquid form of Gandhaka. Here we are discussing the most accepted method of Pottali preparation i.e.
with the help of Gandhak drava with Dola Yantra method.[10]

MATERIAL & METHOD

In the preparation of Hemgarbha pottali, the main constituents are - Shuddha Parad, which is a potent antiaging agent (Jara), and makes a man strong like Vajra and it is said to be a remedy for all diseases.[11] Another main constituent is Gandhak which is strong Vishaqghn, Jantughn (antimicrobial), Krimighn (wormicidal), and Deepan-pachana. Because of it synergistic action with Parad, it also potentiate the medicinal and other properties of Parad. So the Gandhak is written as Sutendraviryaprad and Sutajit in Ayurveda.[12]

The next constituent of Hemgarbha pottali is Swarn (gold), which is a well known Rosayan, Ojovriddhkar, Brihana, Balya, Medhya and Tridosaghn.[13] In Hemgarbha pottali rasa, Tamra is also used which is useful in Swas-kasa, Krimi roga, and Pandu roga (anaemia).[14] It is also a good medicine for Liver diseases and a well known cardiac stimulant. So by the combination of all i.e. purified mercury, sulphur, gold and copper Bhashma, Hemgarbha pottali rasa is prepared which is very potent medicine in many aspects. The method of preparation can be divided in following steps:

1. Parada Shodhan
2. Gandhak shodhan
3. Preparation of Kanji
4. Preparation of Kajjali
5. Samanya shodhana of Tamra
6. Vishesh Shodhana of Tamra
7. Preparation of Hemgarbha pottali rasa
8. Tamra Marana
9. Amritikaranana of Tamra Bhasma
10. Preparation of Hemgarbha pottali rasa

1. Parada Shodhan[15]

Parada was made purified with the help of Kshar traya. The Asuddha Parada and Pan Swarasa and Ardraka Swarasa, Yava Kshara, Sojji Kshara and Tankan kshara all were mixed and levigated for 36 hours.
- Then the mixture was washed with warm water till only Parada was remained.
- There after Parada was collected from this paste by washing with hot water and Nimbu swarasa.

<table>
<thead>
<tr>
<th>Ashudha Parada Taken</th>
<th>Shudda Parada obtained</th>
<th>Time Taken</th>
<th>Total Time of mardana</th>
<th>Weight Loss</th>
<th>% Loss</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000gms</td>
<td>1960 gms</td>
<td>15 days</td>
<td>36 hours</td>
<td>40gm</td>
<td>2%</td>
</tr>
</tbody>
</table>

2. Gandhak shodhan[16]

Fine powder of Ashudha Gandhaka was prepared with the help of mortar and pestle. Then 3Lt of boiled Godugdh (cow milk)and Goghrat were mixed in mud pot of larger circumference, then tied a Sieve cloth over the neck of mud pot and make a boundary of Multani mitti, so that the hot plate/burning coals does not touch the Sieve cloth, when placed over the circumference. Now approx 800gm of Ashudha Gandhaka churna was spread over the Sieve cloth and placed the hot plate over the Aal-vaal. By the passing of time Ashudha Gandhaka starts melting by temperature of hot plate/burning coals and started to fall in the mixture of Godugdh and Goghrat. When all Ashudha Gandhaka fall in Dugdh, then open the Sieve cloth and take out all melted Gandhaka from milk and washed it with hot water. By this process the Gandhaka get purified in a single attempt.

<table>
<thead>
<tr>
<th>Ashudha Gandhaka Taken</th>
<th>Yield of Shudha Gandhaka</th>
<th>Time taken</th>
<th>Total loss</th>
<th>% loss</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.5 kg</td>
<td>3.25 kg</td>
<td>3 days</td>
<td>50gms</td>
<td>7.5%</td>
</tr>
</tbody>
</table>

3. Preparation of Kanji[17]

1.5 kg. of rice was washed twice or thrice with water. Three liter of water was added to it and cooked on Mandagni. When rice was properly cooked, further 6 liter of lukewarm water (coooled after boiling) was added to it and macerated on cooling. A porcelain jar was fumigated with fumes of Vaca, Guggula and Kapura. Cooked and macerated rice along with water was kept in porcelain jar and covered with lid smeared with Multani mitti and was allowed to ferment. When fermentation process was completed the prepared Kanji was filtered and stored.

Table 1: Observations during Parada Shodhana

Table 2: Observations during Gandhak shodhana

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4. Preparation of Kulathva Kwatha [18]

Kulathva seeds were soaked overnight in water enough to dip them completely. Next day morning remaining water was added to the soaked seeds and Kwatha prepared by reducing water to 1/4th.

5. Samanya Shodhana of Tamra [19]

Ashudha Tamra was taken in the iron pan heated till red hot and quenched in each of the 5 liquid media for 7 times. Each time the liquid media was changed.


Samanya Shodhita Tamra was tightly bound in a cloth and suspended on a rod in Dola Yantra into the Gomutra kept inside the vessel, the whole apparatus kept on heating plate, Swedana of the Samanya Shodhita Tamra was done in Dola Yantra for 6 hours. Then Shodhita Tamra was taken out and dried in shade.

7. Kajjali Preparation [21]

Parada was put into Khala Yantra and Mardana was done by slowly adding Gandhaka to it. Mardana continued till particle of Parada were disappeared and it was observed by adding a drop of water on palm with prepared Kajjali and mixed by rubbing, and make dry. Now see the palm in natural day light, if particle of Parada are not shining, Kajjali is prepared. It should be soft in touch and smooth. Kajjali prepared has the properties of Rekhapurnata, Anjana Sannibham and Nischandratva.

8. Tamra Marana [22]

Shuddha Tamra and Kajjali were put into the Khala Yantra and after mardan with Nimbu Swaras, Chakrikas (pellets) were made. Dried Chakrikas were put into Sarava with another Sarava covered over it and Kapadmitti was done in three layers. Sarava Samputa thus prepared was dried in shade and subjected to classical Puta.

Changes were done accordingly as per the requirement for preparation of Bhasma. In Gajputa, Upala were filed 2/3rd then Sarava Samputa kept and remaining 1/3rd covered with Upala. This procedure was repeated 15 times and during this period the repetition of Putas leads to great loss of taken material.

9. Amritikaran of Tamra Bhasma [23]

Prepared Tamra bhasma was taken in a kharal and mixed with half part of Shuddha Gandhaka and the Mardana was started. When the Gandhaka was mixed with the Tamra bhasma properly, the Panchamrit equal to the quantity of Tamra bhasma was added and Mardana was done for three days When all the contents mixed with the Tamra bhasma, the pellet were made and left to dry. After this Kapadmitti was done and after proper drying the Gajputa was given.

Table 3: Organoleptic characters of Kanji

<table>
<thead>
<tr>
<th>Color</th>
<th>pH</th>
<th>Taste</th>
<th>Consistency</th>
<th>Smell</th>
</tr>
</thead>
<tbody>
<tr>
<td>Milky white</td>
<td>3.5</td>
<td>Acidic</td>
<td>Liquid</td>
<td>Acidic</td>
</tr>
</tbody>
</table>

Table 4: Organoleptic characters of Kulathva kwatha

<table>
<thead>
<tr>
<th>Final Kwatha qty</th>
<th>Color</th>
<th>pH</th>
<th>Taste</th>
<th>Smell</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 liters</td>
<td>Reddish Brown</td>
<td>5</td>
<td>Astringent</td>
<td>Specific to itself</td>
</tr>
</tbody>
</table>

Table 5: Observations during Tamra Samanya Shodhana

<table>
<thead>
<tr>
<th>Quantity of Tamra before Shodhana</th>
<th>Quantity of Tamra after Shodhana</th>
<th>Time taken</th>
<th>Total loss</th>
<th>% Loss</th>
</tr>
</thead>
<tbody>
<tr>
<td>580gms</td>
<td>485gms</td>
<td>31 days</td>
<td>95gms</td>
<td>16.5%</td>
</tr>
</tbody>
</table>

Table 6: Observations during Tamra Vishesh Shodhana

<table>
<thead>
<tr>
<th>Tamra before vishesh Shodhana</th>
<th>Tamra after Shodhana</th>
<th>Vishesh Time Taken</th>
<th>Total Loss</th>
<th>% Loss</th>
</tr>
</thead>
<tbody>
<tr>
<td>485gms</td>
<td>480gms</td>
<td>7 hours</td>
<td>5gms</td>
<td>1%</td>
</tr>
</tbody>
</table>

Table 7: Observations during Kajjali Preparation

<table>
<thead>
<tr>
<th>Total material taken</th>
<th>Total Kajjali prepared</th>
<th>Time taken</th>
<th>Total Loss</th>
<th>% Loss</th>
</tr>
</thead>
<tbody>
<tr>
<td>500gms</td>
<td>480gms</td>
<td>4 days</td>
<td>20 gms</td>
<td>4%</td>
</tr>
</tbody>
</table>

Table 8: Observations during Tamra Marana

<table>
<thead>
<tr>
<th>Tamra taken at 1st Puta</th>
<th>Tamra prepared after bhasma 15th</th>
<th>Time Taken</th>
<th>Total loss</th>
<th>% Loss</th>
</tr>
</thead>
<tbody>
<tr>
<td>240gms</td>
<td>75gms</td>
<td>233 Days</td>
<td>165gms</td>
<td>69</td>
</tr>
</tbody>
</table>
### Table 9: Observations during Amritikarana

<table>
<thead>
<tr>
<th>Tamra Bhasma Amritikarana before</th>
<th>Tamra Bhasma Amritikarana after</th>
<th>Time taken</th>
<th>Total Loss</th>
<th>% Loss</th>
</tr>
</thead>
<tbody>
<tr>
<td>75gms</td>
<td>70gms</td>
<td>12 days</td>
<td>5gms</td>
<td>6.75</td>
</tr>
</tbody>
</table>

### Method of preparation of Hemgarbha Pottali Rasa

**Fig-1**

**Mixing of ingredients**

Very first 12gm Shudha parada was taken in a Kharal and mixed with 4gm Shudha Gandhaka, and Mardana was started, for preparation of Kajjali. When all features of Kajjali were present (i.e. when the mixture became smooth, fine, black, lusterless), the Mardana was stopped. Then 12 gm Tamra bahsma was mixed and afterward Swarna Varka were added according to weight.

One Swarna Varka was weighed 0.0653gm with butter paper

0.0632gm is the weight of butter paper

i.e. weight of Swarna Varka without butter paper = 0.0653gm - 0.0632gm

= 0.021gm

= 21mg approx

i.e. the no. of Swarna Varka in 500mg = 500mg/21mg = 23.8 Swarna Varka

So approximate No. of Swarna Varka in 1/2gm or 500mg = 24 Swarna Varka.

To add 2gm of Swarna Varka in the mixture the no. of Swarna varka = 24x4 = 96 So now it is it clear that to add 2gm of Swarna, we have to add 96 Swarna Varka. So one by one Swarna varka were started to mix.

**Apakwa stage of Pottali**

In the above mixture, Dhatura patra swaras was added for Mardan daily for 3 hours a day for regular seven days. After 7 days the paste became soft easily rolling into pill form and without sticking to the fingers, now with the help of honey the paste was modulated into a shape of Shikharakara [25]/Pugphalakriti i.e. cone shape having flat bottom and tapering upwards.

**Pottali paka with Gandhak drava**

The Apakwa Pottali was placed in Gandhaka powder over a silk cloth and the Pottali was tied which was hanged in porcelain glass beaker having liquefied Gandhaka. The whole setup was kept on a hotplate with low flame. The temperature was recorded every 30 minute to keep Gandhaka in liquid form.

### Table 10: Showing the temperature pattern recorded and the color of molten Gandhaka during Pottali paka

<table>
<thead>
<tr>
<th>Time</th>
<th>Temperature of molten sulphur</th>
<th>Color of molten sulphur</th>
</tr>
</thead>
<tbody>
<tr>
<td>11.00 am</td>
<td>92°c</td>
<td>Yellow</td>
</tr>
<tr>
<td>11.30 am</td>
<td>99°c</td>
<td>Yellow</td>
</tr>
<tr>
<td>12.00 pm</td>
<td>110°c</td>
<td>Yellow</td>
</tr>
<tr>
<td>12.30 pm</td>
<td>120°c</td>
<td>Yellow</td>
</tr>
<tr>
<td>1.00 pm</td>
<td>123°c</td>
<td>Light orange</td>
</tr>
<tr>
<td>1.30 pm</td>
<td>126°c</td>
<td>Light orange</td>
</tr>
<tr>
<td>2.00 pm</td>
<td>124°c</td>
<td>Light orange</td>
</tr>
<tr>
<td>2.30 pm</td>
<td>125°c</td>
<td>Light orange</td>
</tr>
<tr>
<td>3.00 pm</td>
<td>128°c</td>
<td>Light orange</td>
</tr>
<tr>
<td>3.30 pm</td>
<td>126°c</td>
<td>Light orange</td>
</tr>
<tr>
<td>4.00 pm</td>
<td>127°c</td>
<td>Dark orange</td>
</tr>
<tr>
<td>4.30 pm</td>
<td>125°c</td>
<td>Dark orange</td>
</tr>
<tr>
<td>5.00 pm</td>
<td>128°c</td>
<td>Dark orange</td>
</tr>
<tr>
<td>5.30 pm</td>
<td>130°c</td>
<td>Dark orange</td>
</tr>
<tr>
<td>6.00 pm</td>
<td>129°c</td>
<td>Orange red</td>
</tr>
<tr>
<td>6.30 pm</td>
<td>128°c</td>
<td>Orange red</td>
</tr>
<tr>
<td>7.00 pm</td>
<td>130°c</td>
<td>Orange red</td>
</tr>
<tr>
<td>8.00 pm</td>
<td>129°c</td>
<td>Orange red</td>
</tr>
</tbody>
</table>
Next day when the temperature of Pottali reached on room temp., the outer coverings of Pottali were removed and the Pottali was taken out, on the outer surface some Gandhaka was adhered which was scraped with the help of knife.

**DISCUSSION**

There are mainly four methods of Pottali preparation found in texts like Bhavna method, Putpaka method, Varatikapurana method and Gandhakadrav method. In all four methods final product differs in shape, consistency etc. but they all are included in Pottali kalpana. Maximum number of references found in classics belongs to Putpaka method but even than Gandhaka drava method is more popular because of its increased efficacy, compact shape and easy method of administration to provide quick absorption of medicine. Overall the Pottali is proved to be very costly due to its ingredients like gold etc. Here the use of Varka\(^{26-27}\) (thin flakes) or Swarna Tantu of purified gold is mentioned in text to give compactness to the Pottali. Purity of Gold is certified by the fact that Gold is not pure Swarna varka cannot be prepared. In the preparation of Pottali, temperature plays an important role as proper temperature modifies Kajjali to Pota bandha which change the Guru property to Laghu property.\(^{[28]}\) Temperature pattern should be indirect and uniform for longer duration, in this way the Pottali get processed gradually and this type of heat pattern helps in enhancing pharmacological properties too. The role of optimum heat could be understand by the fact that if the heat is excess or direct, the Pottali will start melting as the Pottali kept for Paka also have Gandhaka as an ingredient in it. Pottali paka could be estimated by the main features of Paka lakshans as Vyom varna of Gandhaka, burning of silk cloth and classical sound on tapping to mud pot. Silk cloth used during preparation because it prevents adhesion of Gandhaka with Pottali, and it also makes passing of bubbles during Paka process due to its porous nature.

**CONCLUSION**

The Pottali rasayana is a unique pharmaceutical preparation to achieve the better therapeutic efficacy by its special method of preparation which potentiate and stabilize the bonding between its ingredients. Hemgarbh Pottali Rasa could be used in different diseases by changing the vehicle according to the disease. Many Vatis/tablets can be made into Pottali by the general method of Pottali preparation. e.g. Sutashekara Rasa, the fine powder of its ingredients are mixed with Ardraka Swarasa and made into a conical shaped tablet, then dried in shadow. Then placed over silk cloth in between powders of Gandhaka and the silk cloth along with Gutika should be tied into a Pottali for Paka. As this features of Pottali rasayana will improve the effect, palatability as well as quick action of many Rasaushadhi which are more applicable in daily practices. Hemgarbh Pottali Rasa could be proved as an alternative medicine in place of modern antibiotics as this medicine is also effective against multi drug resistant (MDR) bacterial strains.

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Fig. 1-DIFFERENT STAGES OF HEMGARBH POTTALI PREPARATION

Kajjali Nirman

Adding Swarna Varka

Addition of Tamra Bhasma

Apakwa Hemgarbh

Pottali keeping in Shudha Gandhka

Tied in a silk cloth

Paka in Gandaka Drava

Opening pottali after Paka Pakwa

Hemgarbh Pottali Rasa