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## Review Article

### A PANORAMIC VIEW OF POTTALI KALPAS

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#### INTRODUCTION

Rasashastra, the miracle mercurial system deals with minerals, metals, precious stones, certain poisons for manufacturing special formulations to combat chronic disease difficult to treat. In general, the term Pottali is used in the context of Swedana. Pottali Kalpa is a process in which the ingredients are made into a compact and comprehensive size and shape or technique or processing which gives compactness to scattered material. Pottali Kalpa is Murchita Parada Yoga in consolidated form. Like any other Rasayanas, Parada (mercury) and Gandhaka (sulphur) are the principle ingredients of Pottali Kalpana.

#### Etymology

The word Pottali is derived from the root words, Puta, Pota, Potta, Pottam & Pottali which means to adhere, to support and to concise.<sup>1</sup>

**Put** – Puta word means adhesion (Sanshlesa)

**Pot** – Pota means adhesions or to give support

**Pottali** – The word pottali is derived from 'puta' which means 'to minimize' or 'concise'.

#### Vernacular Names

English : Packet, Bundle

Hindi : Pottali

Marathi : Pishavee, Purachundee

Sanskrit : Pottali, Pottalika

#### Pottali Sankhya

According to various Rasagranthas approximately 40 Pottali Kalpanas are available. But with mild variations in the ingredients, Pottali preparations are approximately 73<sup>2</sup> in number. Ardha Kajjali is an important feature of this preparation. Few examples of Pottali Kalpana includes – Hemagarbha Pottali, Hiranya Garbha Pottali, Navaratna Pottali, Ratnagarbha Pottali, Mrugankapottali, Hamsa pottali,

#### Abstract

Pottali Kalpana is a variety of Murchita Parada Yoga which was invented with a vision of compact, comprehensive size and shape, convenience in preserving, easy transportation, and its efficacy in treatment of emergency conditions with minimum dosage. Pottali kalpana has wide therapeutics and methods of preparation. Pharmaceutical preparation of this kalpa includes Khalvi method of preparation, without Agni Samskara. Ex: Hamsa Pottali, and with Agni Samskara through i) Puta method – example: Rasa Pottali; ii) Kaparda/ Shankha Purana Method – example: Lokeshawara Pottali Ras and iii) Gandhaka Purana method – example: Hemagarbha Pottali. Pottali Kalpana has unique method of preparation, mode of administration and drug efficacy. In this paper an honest attempt has been made to have “a panoramic view of Pottali Kalpanas”.

**Keywords:** Rasa chikitsa, Pottali kalpana/ Pottali Kalpa, Murchita Parada Yogas.

Lokanatha Pottali, Vajra pottali, Sankha pottali are few frequently practised formulations, among the pottali group.

#### Antiquity

Reference of Pottali preparation is unavailable in Veda period. In Bhrihat trayi the term Pottali was used in reference to Swedana, Avapeedana Nasya etc, but references for the preparation of Pottali Kalpanas is not available. The first reference of Putapaka vidhi of Pottali Kalpana is found in the text Rasaratnakara of 12<sup>th</sup> century A.D. The text Rasa Prakasha Sudhakara of 13<sup>th</sup> century A.D, had first mentioned the preparation of Pottali by Gandhaka Drava Paka in the context of Vajra Pottali.<sup>3</sup> The author of Yogaratanakara of 18<sup>th</sup> century A.D has mentioned Gandhaka Drava Paka in an iron vessel.<sup>4</sup> The texts of 18<sup>th</sup> and 19<sup>th</sup> century had repeated previously mentioned Pottali Kalpas, where in the author of Rasayana sangraha has added five new Pottali preparations. During 20<sup>th</sup> century, texts like Bharat bhaishajya ratnakara, Rasayoga sagara, Siddha prayoga sangraha etc, have compiled many Pottali yogas. Rasayoga sagara has compiled maximum number of Pottali kalpas under the chapter 'Pottali Rahasyam'.<sup>2</sup>

#### Definition

“Vistaritasya vastuno alpibhavanaam pottam pottam lati gruhnati iti pottali |”

It can be defined as “to collect scattered materials into a compact and comprehensive size”.<sup>5</sup>

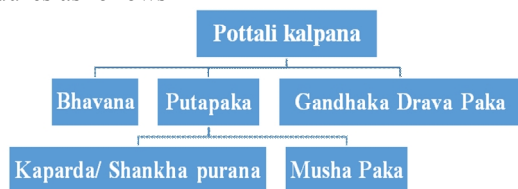
#### Classification of Pottali kalpas

##### A) Figure 1: Types of Pottali – Based on

- **Appearance – Churna, Bhasma, Conical solid**
- **Presence/ Absence of Parada**
- **Presence/ Absence of Gandhaka**
- **Agni Samskara**

**B) Figure 2: Types & method of preparation of Pottali**

The method of preparation of Pottali Kalpanas according to various classics may be broadly classified into four basic procedures as follows



**Bhavana Method**

In this method, the ingredients are triturated with a prescribed liquid media in a Khalva Yantra and made into pills or stored in powder form. This method of preparation is similar to other Khalvi Rasayanas, i.e. only trituration without any Agni Samskara.

Ex: Hamsa Pottali, Gandhakadi Pottali rasa<sup>6</sup>

**Putapaka (Musha) Method**

In this method, ingredients for preparing Pottali are triturated with fresh juices of Nagavalli (*Piper betle*), Datura (*Datura stramonium*), Kumari (*Aloe vera*), Nimbu (*Citrus acida*), Nirgundi (*Vitex negundo*), Jayanti (*Sesbania sesban*) or Chitraka Mula (roots of *Plumbago zeylanica*) decoction, etc. and subjected to Puta to obtain the final product, usually in the form of Bhasma. In Rasayoga sagara, Divya jala has been mentioned as Bhavana dravya to make the Pottali very hard and glossy.<sup>2</sup> Siddha sampradaya mentioned white portion of Krishna Kukkutanda, to increase the potency of the Pottali.<sup>5</sup> Type of Puta varies from Kukkuta Puta to Gaja Puta and duration from 1 Yama (3 hr) to three days, depending on the nature of materials used as ingredients. Ex: Rasa Pottali,<sup>3</sup> Mriganka Pottali<sup>6</sup>

**Varatika/ Shankha Purana Method**

This is a special technique where in all the ingredients are filled into Varatika (Cowrie shell)/ Shankha (Conch shell) and closed with paste of Tankana (borax) mixed with Godugdha / Gomutra (cow's milk/ urine) and subjected to Puta. After Puta, Varatika/Shankha is powdered and stored. Ex: Lokeshwara Pottali Ras/ Lokanatha rasa, Ratnagarbha Pottali.<sup>7</sup> Similarly Musha prepared of Sankhanabhi bhasma and Godugdha is also mentioned. Ex: Sankhagarbha Pottali,<sup>8</sup> Mriganka Pottali rasa<sup>9</sup>

**Gandhaka Drava Paka Method**

**Purva karma**

a. **Ingredients:** Parada, Gandhaka & Lohadi Varga etc. The Gandhaka Drava Paka is done in the medium of molten Gandhaka.

b. **Binding agents:** Usually Isabgol, Babbul niryasa (*Acacia nilotica*), Tulasi (*Ocimum sanctum*), Kanaka (*Datura stramonium*), Nirgundi, Ardraka swarasa (juice of *Zingiber officinale*), etc are used as binding agents<sup>2</sup> to prepare pottali.

c. **Shape:** Puga phala akara (half-moon shape), shikhara akara (cone shape)

1. Shikhara rambhikakara<sup>10</sup>

2. Shanka akara<sup>10</sup>

3. Puga matra gutikritwa<sup>11</sup>

4. Karsya manansca varatika<sup>12</sup>

d. **Container:** iron vessel,<sup>4</sup> mud pot<sup>12</sup> & even china clay<sup>2</sup>

e. **Cloth:** Most of the authors opine usage of 1 to 4 folds of silk cloth to cover the Pottali.<sup>2</sup>

f. **Quantity of Gandhaka:** The quantity of Gandhaka for Paka varies from equal, double to 6 times to the weight of Pottali.<sup>4</sup> Vasudev Mulashankar Dvivedi has mentioned 2 inches of Gandhaka as base and 1 inch of Gandhaka after placing the Pottali.

g. **Nature of heat:** Indirect heat through Valuka or Lavana media on Mandagni (mild heat).

**Pradhana karma**

**Preparing shape of pottali:**

All the ingredients of pottali are mixed well and triturated with Kumari Rasa or Babbula Niryasa to consolidate them to cone or half-moon shape and dried in shade to avoid cracks. After drying, they are wrapped in silk cloth to prepare Pottali for Paka.

**Paaka of Pottali:**

Stainless steel/ iron vessel is taken and rod is placed on the walls of the container to hang the pottali. The total pottali apparatus is kept in sand bath to prepare Valuka Yantra. To the iron vessel Suddha Gandhaka is added and Valuka Yantra is heated. Precaution is to be taken to regulate temperature to facilitate melting of sulphur. Temperature of molten sulphur should be maintained between 111°C – 120°C. Pottali is tied so that it is immersed into the molten sulphur without touching the base or sides of the vessel. Pottali is constantly heated with a gradual step rise of 15°C temperature for every 1 hour till temperature rises to 210°C in 4 hours.

**Paka kaala** – 1 – 8 hours<sup>4,12</sup>

**Paaka lakshanas** – Neela shaayama varna,<sup>13</sup> vyoma varna,<sup>4</sup> metallic sound & completely burnt silk cloth.

**Paschat karma**

After completion of Paka kala, pottali is to be removed before the molten sulphur temperature is 111°C. After cooling (svangasheeta) of Pottali, the silk cloth is removed carefully and excess sulphur is scraped out with sharp edge blade i.e. polishing of pottali.

**Organoleptic characters: Table-1**

Character	Pottali
Colour	Dull black
Odour	Odourless
Taste	Tasteless
Form	Cone/ half-moon shape
Touch	Rough

**Test of completion of pottali**

- Complete burning of cloth and cloth colour changes to black colour in Puta method.
- The pottali attains metallic lustre and metallic sound is heard on tapping Pottali over a metal object, in puta and Gandhaka Paka method.

**Mode of administration of pottali**

- Pottali should be rubbed over a stone by applying ghee (Ghrita) or honey (Madhu) and the whole paste is administered orally.
- Ardraka or Nagavalli patra swarasa are used as Anupana in Sannipataja avastha.<sup>12</sup>

**Pathya** – Ghrita, Dadhi, Shali, Shaka sevana without Hingu  
**Apathya** – Amla dravya, Taila, Bilwa, Kanji, Kakarashataka gana, Ratri jagarana, Stree and Krodha are contraindicated.

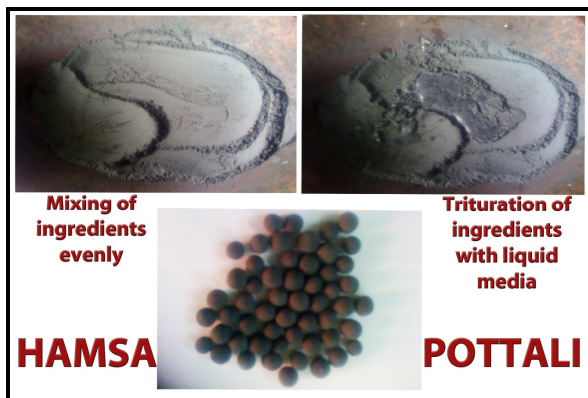


Figure 3: Bhavana Method-Hamsa Pottali



Figure 4: Puta Method – Gowrichintamani Ras



Figure 5: Puta Method-Grahani Kaparda Pottali Ras with Kaparda Bhasma



Figure 6: Rasa Pottali – Rasa Parpati is used instead of Kajjali or Bhasmas in preparation of Rasa Pottali



Figure 7: Kaparda Puran Method-Kaparda Pottali Ras



Figure 8: Gandhaka Drava Method – Hemagarbha Pottali

## DISCUSSION

All Pharmaceutical preparations explained in Rasashastra are basically chemical reactions. Pottali Rasayana is a specified pharmaceutical technique which is intended for a unique complex formulation after appropriate purification, processed or incinerated form of multiple ingredients, for better therapeutic efficacy. This technique has been developed for potentiating and stabilizing the bonding between the constituents and obtaining high therapeutic efficacy. In Pottali Kalpana, the ingredients are made into a compact form for easy administration, preservation and transportation. But its practical usage is very less in present day. Preparation of Pottali is costly, probably due to this reason Pottali

Kalpna is not in regular practice with decreased clinical applicability.

Preparations associated with Agni (heating) process are monitored at precise controlled temperatures. Agni plays an important role in modifying Kajjali to Pota bandha i.e. altering Guru (heavy for digestion) quality of Kajjali to Laghu (light/easily digestible) quality, because this change in quality is required for better absorption and assimilation to serve the therapeutic purpose. When the constituents are individually prescribed naturally the quantum of medicaments are enormous. This technique potentiates the constituents bonding between the constituents forming a co-ordinating complex with wide spectrum and high therapeutic efficacy, with minimum dose.



Pottali Kalpana has 4 different methods of preparations like Bhavana method, Puta Paka, Varatika purana and Gandhaka Drava Paka. But each method differs in shape, consistency and form, but they are included in Pottali Kalpanas probably for drug's efficacy after complete processing. The text like Yogaratnakara, Rasamrutha have explained Pottali Paka in Gandhaka Drava method. Though maximum number of Pottali preparations are of Putapaka Vidhi, Gandhaka Drava Paka, Pottali gained more importance; may be due to their unique method of preparation and hence the preparations were explained in detail in Rasashastra texts. The text Rasa Yoga Sagara contains wide collection of various Pottali preparations and also in the name of Pottali Rahasyam has given the history, method of preparation, precautions to be taken during its preparation.

Criteria for classification depending on method of preparation – Bhavana Method: Ex-Hamsa Pottali Ras – The process is similar to other Khalvi Rasayanas, but the criteria of classifying under Pottali Kalpa & its efficacy compared to other Pottali Yogas with Agni Samskara is not very clear. During the preparation of Pottali, the prescribed liquid for Bhavana might act as a binding agent for compact form.

Putapaka Vidhi is a unique pattern of heating process, i.e. indirect uniform and mild heat for longer duration, where in the drug gets processed gradually and may help in enhancing the pharmacological properties. Temperature pattern is of mild heat as per the reference and the cow dung cakes were added accordingly to maintain the temperature. Bhavana before puta with prescribed liquid will not only help in making definitive shape of Pottali to Puga, Ardha Chandra Akrti, but also for even mixing thus enhancing the bonding and properties of pottali.

The opinion of using silk cloth to tie Pottali either with one to four folds was explained in the context of Gandhaka Drava Paka, where silk cloth prevents the adhesion of the molten Gandhaka in the space between the particles of dravya and is occupied by molten sulphur and the air present in the space comes out in the form of bubbles. Whereas in Putapaka, there are no such chances and hence cotton cloth of two folds may be used.

Using sharava/ mud pots and small mud pots is to conduct indirect heat to the Pottali. If the heat is direct or excess, Pottali will start melting as free sulphur is still present in the ingredients. Valuka puta employs slow, gradual, uniform, indirect and mild heat for longer duration and to aid the gradual processing of the drug. Paka Lakshanas like burning of the cloth and metallic sound on taping are apt for the Putapaka Pottali. Usually Pottali's prepared by Putapaka Vidhi will be in Bhasma form; whereas Rasa Pottali is in solid conical form. The reason may be due to the multiple strong bonding provided by Kajjali, Parpati and Pottali bandha as well as restricted heat through sand media.

In Gandhaka Drava method Pottali Paka Lakshanas describes Vyoma Varna that might suggest the colour in Paka Vidhi

where in the process is continued till Gandhaka turns to Vyoma Varna. By the increased compactness of the particles the sound of Pottali is also transformed after the preparation of the Pottali. Heat pattern in Gandhaka Pottali Paka is slow, uniform and indirect heat. Temperature of molten sulphur is maintained at 120-130°C during Paka. So the properties of sulphur might be imbibed in Gandhaka Paka method. Thus results in increased weight of the pottali due to the extra added sulphur during the process and facilitates compactness to the particles. Sulphur is a bad conductor of heat & it has a property of allotropism. Its various ingredients are made into a solid form which facilitates easy administration, enhances the properties of the drug, thereby decreasing the dosage. Target activity is on Koshtagata and Sarvashareera. Some of these preparations are given in the Maharogas as therapeutic potentials of Pottali Kalpas are phenomenal. It is also said that Hemagarbha pottali can postpone the death of an individual by 1-2 hours. Mode of administration of Pottali according to Rasamrutha is to rub the Pottali with Ardraka Ras or Parnakhanda Ras during Sannipatawastha to gain consciousness.

To conclude Pottali Kalpana is one of the 4 Murchita Parada Yogas which is a specialised pharmaceutical technique which was intended for compactness of different constituents in their processed, incinerated form into unique complex formula with enhanced physico-chemical properties and drug efficacy in treatment of diseases.

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