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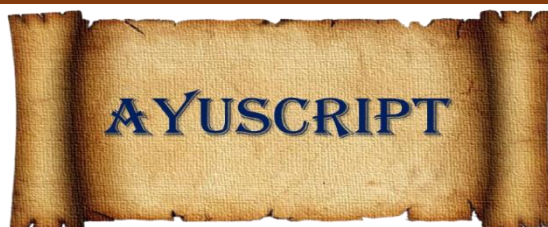
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यन्मूलकं द्वारं कांस्यकस्य यत् ॥ १ ॥ विश्वकर्मो एमाद्रूपुरीहाटकानि  
नेना ॥ नवयोऽशस्योस्वीणं चैव त्रशधिकम् ॥ ११ ॥ भवनात्मिनो ज्ञानि  
यो मध्ये चकल्पयन् ॥ परिजानतस्तु वैवतासो भोगाय कल्पयन् ॥ १२ ॥ या  
यानोऽष्टास्तत्र यद्दुपे चाशतकोटयः ॥ अन्येपि बहुबोलाकावसंनिविगत  
राः ॥ १३ ॥ अथानि विविद्युलाकेषु सुंदरं न च दृश्यते ॥ सवाग्निप्रसूनात्पि पु  
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त्तकरयन्निजोराशनमस्तेस्तु नमस्तु सर्वतो मुखः ॥ १७ ॥ विश्वव्यापिन्मस्तेस्तु  
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स्तु नमस्ते च हरिं चिद्यो ॥ वेदत्रयनमस्तेस्तु सर्वदेवुनमोस्तु ॥ १९ ॥ प्रसीद  
तस्तिद्वेचा सुदृष्ट्या मां दिवा करी ॥ अथैकं यमानो सोद्वेदं चो दिवा कर ॥ २० ॥  
अथानि तीरं न परं यत् किं न भगवते ॥ अर्धं चिद्वेदं यत् किं न भगवते ॥





## International Journal for Empirical Research in Ayurveda

### Pottali Kalpana as High-Potency Therapeutics in Emergency Care wsr to *Hemagarbha Pottali* Lahamge S.<sup>1</sup>, Gautam M.<sup>2</sup>

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#### ABSTRACT:

Rasashastra is one of the most significant branches of Ayurvedic pharmaceuticals, specialising in the preparation of herbo-mineral drugs. *Pottali Kalpana* stands out as a revolutionary dosage form in Ayurvedic emergency care. Characterized by its high density and solidified compact structure, this formulation ensures enhanced bioavailability, primarily due to its specialized sublingual route of administration. It is a unique formulation with respect to method of preparation, mode of administration, quick action, lower dosing, and ease of transportation. *Hemagarbha Pottali* is the most potent drug of choice in case of emergency, made with *Shuddha parada*, *Shuddha gandhaka*, *Swarna Bhasma* and *Tamra Bhasma*. It is traditionally revered as *sarvrogahara* and shows significant results in cardiovascular, hepatic and respiratory disorders. Modern relevance of *Pottali Kalpana* is defined by its 3P framework, viz., potency, portability and persistency. Ultimately, it is the sophisticated drug delivery system offering a rapid response alternative where conventional oral routes may be compromised. It is a pioneering dosage form of emergency care in Ayurveda.

#### Key words:

Pottali Kalpana, Hemagarbha Pottali, Atyayik Chikitsa, Emergency care, Emergency drug.

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**Introduction:**

In Rasashastra, *Rasakalpas* are classified into four categories, viz., *Kharaliya*, *Parpati*, *Kupipakwa*, and *Pottali Kalpana* (Vagbhata, 13th Century), each having a unique place in Ayurvedic therapeutics. *Pottali Kalpana* is a unique drug dosage form classified under *Pota bandha*<sup>[1]</sup>. *Pottali* is a condensed, compact, solid hard drug form made from processing ingredients mentioned in classical texts (Bhatta, 2003). 'Vistaritasya vastuno alpapibhavanam'<sup>[2]</sup> indicates the compactness properties of *Pottali* and its comprehensive size, which maximise potency and lower doses due to synergistic action. It is a unique formulation method in terms of its method of preparation, mode of administration, quick action, lower dose and ease of transportation.

Ayurvedic emergencies are addressed to *daruna* (chronic) and *ashukari* (fast-acting), requiring rapid interventions<sup>[3]</sup>. Emergencies can be broadly classified under surgical, mostly due to trauma/accidents or medical emergencies due to functional impairment or external foreign body effect, such as snake bite, etc. In ayurveda health is a balance between *tridoshas*, *agni*, *dhatu*, and *mala*. Imbalance between these and impairment of *srotas* leads to anomalies resulting in the urge for emergency care. To tackle this, acharyas have mentioned various routes of administration of the drug, using *Nasya*, *Basti*, *abhyanga*, *Lepa*, as well as sublingual medication. *Pottali kalpa* are mainly formulated to be administered in the form of a sublingual drug, by passing first passed metabolism and showing high efficacy. *Hemagarbha Pottali* is one of the important and unique classical formulations widely used in *Atyayik chikitsa* (emergency care) due to its high therapeutic efficacy<sup>[4]</sup>. This article mainly aims to underline the potency of *Pottali Kalpana* with special reference to *Hemagarbha Pottali* in emergency conditions. While primary emergency management relies on modern

resuscitative protocols, *Pottali Kalpana* may hold translational relevance as a potency-driven adjunct to support systemic resilience during critical illness and recovery.

**MATERIAL AND METHOD**

The information was gathered by thoroughly reviewing classical texts such as *Rasa Ratna Samucchaya*, *Sharangdhara Samhita*, *Yog Ratnakar*, *Bhaishajya Ratnavali*, *Rasa Yoga Sagara*, etc. Various research articles and books were compiled and analysed.

**Brief History of Pottali Kalpana**

The concept of *Pottali Kalpana* was first mentioned in *Rasa Ratnakara* in the 12th century, where the formulation was prepared using *Putapaka Vidhi*. In 13th century, *Rasa Prakash Sudhakara* defined the method of *Gandhaka Drava Paka*, particularly in the preparation of *Vajra Pottali*<sup>[5]</sup>. Later, *Yoga Ratnakara* described the use of an iron vessel for processing, indicating progressive pharmaceutical advancement<sup>[6]</sup>. The compendium *Rasa Yoga Sagara* systematically compiled numerous formulations under *Pottali Rahasyam*. Subsequent works such as *Rasa Raja Sundara*, *Rasa Raja Siromani*, and *Rasa Raja Shankara* were introduced, including *Hamsa*, *Ratnagarbha*, *Narsimha*, *Vaikrantagarbha*, and *Muktagarbha Pottali*. In later literature, *Rasamritam* by *Yadavji Trikamji Acharya* documented *Hemagarbha Pottali Rasa*. *Hemagarbha Pottali* has evolved from the 13<sup>th</sup> to the 20<sup>th</sup> century transition through various techniques. *Rasendra Sangraha*<sup>[7]</sup> and *Rasa Prakash Sudhakar*<sup>[8]</sup> mentioned the *Putapaka* method and *bhudhara yantra* for the preparation. By the 14th century, *Rasa Ratna Samucchaya* and *Sharangdhar Samhita* introduced the *Kaparda Purana* method of preparation<sup>[9][10]</sup>, which is also mentioned in *Bhaishajya Ratnavali* and *Nighantu Ratnakar* in the 18<sup>th</sup> and 19<sup>th</sup> century respectively<sup>[11]</sup>. In the 19<sup>th</sup> century, *Siddha Bhesaja Manimala* had introduced the *Gandhaka drava swedana* (sulphur bath)

method of preparation for *Hemagarbha Pottali*. Modern 20<sup>th</sup> century texts like *Rasayana Sara* consolidate these methods as the primary mode of preparation<sup>[12]</sup>.

### Pharmaceutical synthesis of *Hemagarbha Pottali*

*Hemagarbha Pottali* contains *Shuddha Parada*, *Shuddha Gandhaka*, *Swarna Bhasma*, and *Tamra Bhasma*<sup>[13]</sup>. *Kajjali* is prepared using *Parada* and *Gandhaka*, and then *Swarna Bhasma* and *Tamra Bhasma* are added to it. A 7-day *Bhawana* is given to it using *Kumari Swaras*, after which it is shaped into *pugakara* or *shankhukara* and dried in the shade. After complete drying, a 4-folded silk cloth is taken, and *Gandhaka churna* is spread over it. *Pottali* is kept and tied with a thread. This *Pottali* is then dipped into *Gandhaka drava* (molten sulphur), with indirect heat given by the *Gandhaka drava paka* method. The temperature is maintained at not more than 200°C.<sup>[14]</sup> *Gandhaka churna* is added whenever needed. After *swangshita* (self-cooling), *Pottali* is opened by removing the silk cloth, and excessive *Gandhaka* is scraped to obtain a shiny, lustrous, hard solid *Pottali kalpa*<sup>[15]</sup>.

### Mode of administration

*Pottali* is usually administered by rubbing over the stone for the desired number of rotations with the juices of ginger, stalks of piper betel, honey or *ghee*, either sublingually or orally<sup>[16]</sup>. The number of rotations is to be decided by the physician according to the nature, severity of the disease and age of the patient.

### Indication of *Hemagarbha Pottali*

S. NO	AUTHOR	INDICATION
1	Rasa Prakash Sudhakar	<i>Kasa, Shwasa, Grahani, Kshaya, Karshya,</i>
2	Rasa Ratna Samuchhaya	<i>Rajyakshma</i>
3	Sharangdh ar Samhita	<i>Kasa, Kshaya, Chhardi, Aruchi</i>

4	Rasa Kamdhenu	<i>Kasa, Shwasa, Grahani, Kapha Vataja Vikara</i>
5	Yogratnakar	<i>Sarv Roga</i>
6	Bhaishajya Ratnavali	<i>Rajyakshma</i>
7	Rasayana Sara	<i>Grahani, Atisara, Kshaya, Jwar, Kasa</i>
8	Rasa chandanshu	<i>Shwasa, Kasa, Kshaya, Vata Atisara, Mandagni, Sarvrogshamana ya</i>
9	Rasa Jala Nidhi	<i>Vishamjwara, Grahani, Mahashoola, Pinasa, Atisara, Pandu, Koshtaroga</i>
10	Rasa yoga Sagara	<i>Unmada, Sannipata</i>
11	Siddha bhashaja manimala	<i>Kshaya</i>

**Table 1: Indication of *Hemagarbha Pottali* by different Acharya**

### Pharmacokinetic study

*Hemagarbha Pottali* is administered by rubbing *Pottali* over the stone with *adraka swarasa*, performing into fine, homogenous suspension of nanoparticles, enhancing quick absorption. Sublingual administration leads to bypassing first-pass metabolism increases the bioavailability of the drug. Gingerols from ginger juice used as *anupana* act as a bioenhancer<sup>[17]</sup> and facilitate drug entry into the superior vena cava via sublingual veins, bypassing hepatic metabolism.

### Pharmacodynamic study

*Parada* (Mercury) shows *Rasayana, Yoghahi, Agni dipaka, Jantughna* properties, whereas *Gandhaka* (Sulphur) shows *Dipana, pachana, vishahara* properties. *Kajjali*, prepared from these, increases the efficacy and potency of the medicine<sup>[18]</sup>. It subsides the *Hriday*

*Ashrita vatadushti*, thereby strengthening the cardiac muscle. *Tamra Bhasma* exhibits *lekhana Karshana sthaulyahar, medohar* properties<sup>[19]</sup>, and thus can be used in hypercholesterolemia and dyslipidaemia. It acts as a metabolic catalyst, improving oxygen utilisation and clearing atherosclerotic micro-channels. Copper deficiencies lead to hypercholesterolemia, which results in CVD. Copper plays a crucial role in lipid metabolism<sup>[20]</sup>. *Swarna* is stated as '*dushtagrahanyadinuta*', which means it can be used in chronic gastritis, ulcerative colitis, etc. It is also stated as '*yakshonmadaprashamanam*', meaning all types of *rajyakshma, unmada*<sup>[21]</sup>. This shows its action on the respiratory system as well as the nervous system. *Swarna*, being a *rasayana dravya*, reduces *dhatukshaya* and increases metabolism.

#### **Hemagarbha Pottali as in emergency care**

*Hemagarbha Pottali* is an ancient precursor to the modern drug delivery system. It is traditionally called '*Sarvaroga hara*'<sup>[22]</sup> and specifically targets the *pranavaha srotas* and *rasavaha srotas*, acting on the respiratory and circulatory systems, respectively. The sublingual or oral route of administration of *Hemagarbha Pottali* can be justified for emergency management<sup>[23]</sup>. This ensures rapid bioavailability, making it a translational adjunct in managing chronic disorders. The sublingual route facilitates easy drug delivery, particularly in unconscious patients. The high concentration of gingerols in *adraka swarasa* causes local vasodilation, increasing the mucosal permeability of *Hemagarbha Pottali*.

*Hemagarbha Pottali* is effective in the *vegavastha* and *avegavastha* of post-COVID-19 Lung fibrosis in 125 mg per day *muhurmuhu* doses as an adjuvant<sup>[24]</sup>. It has a beneficial effect on symptoms such as breathlessness, cough, fever, and chronic illness. It reduces signs, such as an increased respiratory rate and crepitus. It can also be used as an alternative to

modern antibiotics, as it is effective against multidrug-resistant bacterial strains<sup>[25]</sup>

#### **Discussion:**

*Hemagarbha Pottali* is a highly potent revolutionary drug of Ayurvedic emergency care. It represents an ancient pinnacle of nanomedicine. The nano-structural form of *Hemagarbha Pottali* allows for potential crossing of blood brain barrier (BBB), leading to high therapeutic efficacy in emergency cases such as coma, syncope. Its efficacy can be decoded through three primary physiological vectors, such as the sublingual mucosal shunt, *Sarvarogahara*, specifically cardiopulmonary resuscitation and cellular catalyst optimising oxygen utilisation at the tissue level. In case of emergency, *Hemagarbha Pottali* act on the cardiovascular system, supporting heart rate and blood pressure, the respiratory system by stimulating the drive to breathe in gasping stages and the nervous system by restoring consciousness by improving cerebral blood flow. The lipophilic nature of Sulphur enables it to achieve a targeted rapid release mechanism through the *Gandhaka drava paka* method.

Though *Pottali Kalpana* is a concise and potent medicament in the Indian system of medicines, the commercial availability of this type of medicines are negligible. Few *Pottali kalpa* are available in the market. Despite being the most convenient dosage form, only a few vaidyas are practising *Pottali kalpa* as the choice of drug. Despite low commercial availability, *Hemagarbha Pottali* remains a 'golden milestone' in ayurvedic critical care. It shows 3P benefits as potency, portability, and persistency. The nanoparticle size structure of *Pottali*, with a high surface area to volume ratio, ensures therapeutic effect at minimal doses. It's solid, impervious to moisture and oxidation, nature require no specialised storage, making it ideal for first aid. The *akshaya* nature of *Pottali* ensures the infinite shelf life, remaining active for decades.

**Conclusion:**

*Hemagarbha Pottali* represents a sophisticated Ayurvedic drug delivery system designed for the rapid onset of therapeutic action in life-threatening emergencies. Its wide range of therapeutics, including cardiovascular, respiratory, hepatic diseases, and cancer, makes it the drug of choice in emergencies. Its unique method of preparation creates a lipophilic nanoparticle-sized matrix suitable for emergency sublingual absorption, even in unconscious patients. Despite higher efficacy, potency, and persistence, future research in clinical trials, physicochemical profiling, and toxicological safety is needed to facilitate its integration into emergency care.

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