J. Pharm. Res. 2026;25(3):197-201

Print ISSN: 0973-7200
Online ISSN: 2454-8405

Journal of Pharmaceutical Research

ORIGINAL ARTICLE

Traditional Processing of *Haratala* in *Talagarbha Pottali*: A Pharmaceutical and Analytical Study

Hetvi Hitendrasinh Bhadigar[1*], T U Ebin[2]

[1]*Postgraduate Scholar, Department of Rasashastra evum Bhaishajya Kalpana, Parul Institute of Ayurved, Parul University, Vadodara, Gujarat, India*

[2]*Assistant Professor, Department of Rasashastra evum Bhaishajya Kalpana, Parul Institute of Ayurved, Parul University, Vadodara, Gujarat, India*

ARTICLE INFO

Article history:
Received 03-07-2026
Accepted 18-08-2026
Published 24-09-2026

** Corresponding author.*
Hetvi Hitendrasinh Bhadigar
hetvibhadigar2001@gmail.com

https://doi.org/10.18579/jopcr/v25.i3.154

ABSTRACT

Talagarbha Pottali is a classical *Pottali Kalpana* described in *Rasashastra*, prepared using purified *Haratala, Rasa Sindura*, and *Gandhaka* through the *Gandhaka Drava Paka* process. The formulation is traditionally used in *Vata-Kapha* predominant disorders, particularly respiratory conditions. To prepare *Talagarbha Pottali* according to classical principles and evaluate its structural characteristics using X-ray diffraction (XRD). The formulation was prepared with purified *Haratala, Rasa Sindura, Gandhaka*, and *Kumari Swarasa*. The *Pottali* was processed in molten *Gandhaka* under controlled heating, and pharmaceutical observations during the procedure were systematically recorded. Organoleptic evaluation and XRD analysis were performed on the finished product. Controlled heating produced a hard, compact, reddish-brown *Pottali* with a uniform surface. Characteristic observations such as bubble formation, honey-like sulphur consistency, and resonant sound indicated proper completion of the process. XRD analysis revealed a crystalline multiphase sulphide structure containing arsenic- and mercury-based sulphide compounds, suggesting transformation of the ingredients into stable mineral phases during processing. The study demonstrates that the classical *Gandhaka Drava Paka* technique yields a structurally stable *Talagarbha Pottali*. The observed physicochemical changes support the traditional concept that *Pottali Kalpana* enhances the stability and therapeutic potential of herbo-mineral formulations.

Keywords: *Talagarbha Pottali, Pottali Kalpana, Rasashastra, Gandhaka Paka*, Pharmaceutical study, *Shodhana*, Ayurvedic herbo-mineral formulation

INTRODUCTION

In *Rasashastra*, the *Chaturvidha Rasayana* (four principal rejuvenative formulations) include *Khalviya*, *Parpati*, *Pottali*, and *Kupipakwa Rasayana*. Each of these dosage forms is designed with distinct pharmaceutical techniques to enhance the potency, stability, and therapeutic efficacy of herbo-mineral drugs. Among them, *Pottali Kalpana* is considered one of the most potent and convenient dosage forms due to its compact nature, prolonged shelf-life, and requirement of minimal therapeutic dose.

Classical *Rasashastra* texts describe several types of *Pottali Kalpana*, based on different methods of preparation and formulation. It can be prepared either by boiling in molten *Gandhaka* (Sulphur) until it reaches a compact form (which can be designated as *Gandhaka Dravita Pottali* (eg; *Tamragrabha Pottali*) or it can be prepared by filling the drugs inside a *Varatika* (Oyster shell) or *Shankha* (Conch shell) and subjected to incineration *(eg: Lokanatha Rasa) Pottali* can be prepared by mere grinding. The drug is triturated with a suitable medium until the formulation attains a fine powder consistency (*eg: Hamsa Pottali*).

Pottali Kalpana offers significant advantage over other formulations due to its nano- to micro-sized particles, which enhance its potency.

Haratala (Arsenic trisulphide), commonly referred to as yellow orpiment, is an age-old and potent medicinal substance mentioned in Ayurvedic texts. Owing to its inherent toxicity from arsenic content, it requires rigorous *Sodhana* (purification) and *Marana* (incineration) procedures to render it safe and effective for therapeutic applications.

Talagarbha Pottali is a traditional *Pottali Kalpana* formulation composed of *Haratala, Parada* (mercury), and *Gandhaka* (sulphur). Esteemed for its high potency in minimal doses, it is prescribed for conditions such as *Śvāsa* (dyspnoea), *Kāsa* (cough), *Vātavyādhi* (neuromuscular disorders), and *Rakta-Śleṣma Roga* (respiratory disorders with hemoptysis). Its preparation involves transforming the purified, processed, and incinerated ingredients into a compact, cohesive bolus (*Pottali*) through specialized pharmaceutical techniques.

The term *Talagarbha Pottali* is composed of three parts: Tāla—referring to *Haratala*, the chief ingredient; Garbha—meaning the core or essence enclosed within; and *Pottali*—denoting a tied, compact medicinal mass. This pharmaceutical method preserves the complete therapeutic value of all ingredients while simultaneously improving their bioavailability, stability, and potency, thereby establishing it as a significant formulation within the Rasa Yoga tradition.

MATERIALS AND TRADITIONAL COMPOSITION

Table 1: Raw Materials

Ingredient	Quantity
Rasa Sindoor	1gm
Shuddha Gandhaka	0.125 gm
Shuddha Haratala	8 gm
Kumari Swarasa	Q. S

Rasayogasagar, Part 2, Preparation No. 110[9]

Procurement and Authentication:

Botanical raw materials should be authenticated using macroscopic and microscopic techniques, organoleptic evaluation, and voucher specimen deposition.

Mineral raw materials must be procured from authorized sources and tested for identity and permissible impurities.

Method of Preparation:

Impure *Gandhaka (Asuddha Gandhaka*) served as the medium for Pottali preparation. The measured quantities of *Shuddha Parad* and *Shuddha Gandhaka* were taken in clean *khalava yantra* and triturated for preparation of *Kajjali*. Then *Shuddha Haratala choorna* was added to it and bhavana of *kumari swarasa* was performed till it becomes consistency of wet clay. The prepared mass was shaped into a *Pottali*, featuring a dome-like apex and a flat base, and then shade-dried. Once dried, it was wrapped in a single layer of off-white silk cloth and securely tied at the centre of a glass rod.

Table 2: Time to Time events in the procedure with respective temperatures

Time	Time In Duration	Tempe-rature	Observation
10:00	Time of comme-ncement	30° C	*Gandhaka* was poured
10:35	After 35 minutes	81° C	
11:00	After 1 hour	110° C	Melting of *Gandhaka* started
11:50	After 1 hour and 50 min	120° C	Bubbles started emerging from the *Pottali*
12:00	After 2 hours	120° C	*Pottali* was comp-letely immersed in molten *Gandhaka*
12:25	After 2 hours and 25 mins	110° C	
01:30	After 3 hour and 30 min	164° C	
02:30	After 4 hour and 30 min	176° C	
04:00	After 6 hours	181° C	Reddish orange honey like consistency of *Gandhaka*
04:10	After 6 hour and 10 min	164° C	
04:45	After 6 hour and 45 min	164° C	A resonant sound was observed from *Talagarbha Pottali*
05:10	After 7 hour and 5 min	160° C	*Pottali* was taken out

For the preparation process, a small mud pot measuring approximately 15 cm in length and 8 cm in diameter was selected. Crystals of *Gandhaka* were added to fill about two-thirds of the pot's capacity. This setup was placed on a *ValukaYantra* (sand apparatus) and firmly fixed in the sand. The arrangement was positioned over a gas stove, and gentle heat was applied. A pyrometer probe was placed at the midpoint on the outer surface of the pot to monitor the temperature. Heat was gradually increased, and once the *Gandhaka* began to melt, additional quantities were added slowly until the molten *Gandhaka* completely immersed the *Pottali*. Observations were recorded throughout the process, correlating each stage with the gradual rise in temperature.

Fig. 1: *Kajjali* and *Haratala* were triturated with *kumari swarasa* and prepared into *pottali* form

Fig. 2: The *Pottali* tied to a glass rod was mounted in *ValukaYantra*

Fig. 3: *Pottali* was withdrawn

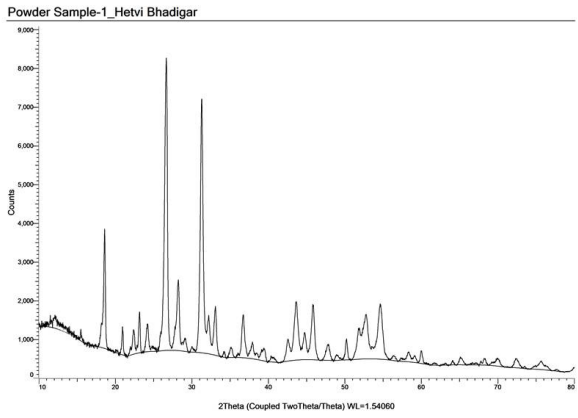
Fig. 4: Final product- *Talagarbha Pottali*

Next day, after the *Pottali* had cooled down to room temperature, its outer covering was carefully removed and *Pottali* was taken out. A thin layer of adhered *Gandhaka* was noticed on outer surface, which was scrapped off by knife.

Table 3: Organoleptic Parameters

Parameter	Observation
Colour	Reddish Brown
Odour	Mild sulphurous and arsenic
Taste	Tasteless to slightly bitter/astringent
Texture	Hard and compact
Appearance	Solid, dome shaped *Pottali*
Surface	Slightly lustrous, uniform, *Gandhaka* coating present

XRD Analysis of *Talagarbha pottali:*



Sl No.	Peak Range	Probable Compound	Characteristics	Reference value
1	27.5 – 28.5	Arsenolite	Semi Crystalline	27.86-28.23 Base, 27.98 Apex
2	31-32	Arsenic	Crystalline	31.82-32.87 Base, 32.23 Apex
3	18-19	Orpiment	Crystalline	18-19.18 Base, 18.54 Apex
4	26-27	Cinnabar	Crystalline	26.12-27.05 Base, 26.52 Apex

The X-ray diffraction (XRD) pattern of *Talagarbha Pottali* was recorded over 2θ range of approximately 10°–80° using Cu-Kα radiation (λ = 1.5406 Å). The diffractogram exhibits multiple sharp and well-defined peaks, indicating the crystalline nature of the prepared formulation.

Prominent diffraction peaks were observed in the region of 2θ ≈ 26°–32°, along with several minor peaks distributed throughout the spectrum. The presence of intense peaks suggests the formation of stable crystalline phases during the pharmaceutical processing. These peaks can be correlated with sulphide forms of the constituent minerals, particularly arsenic sulphide (*Haratala* derived phases) and mercury sulphide (formed from *Parad* and *Gandhaka* interaction).

The overall pattern indicates that the drug is not amorphous but possesses a well-organized crystalline lattice. At the same time, the presence of multiple smaller peaks and slight baseline variation suggests heterogeneity in particle size and the coexistence of more than one crystalline phase.

The *Gandhaka Drava Paka* process appears to play a crucial role in facilitating these transformations. Continuous heating in molten sulphur medium likely promotes sulphidation reactions, leading to the conversion of raw metallic components into more stable sulphide complexes. This transformation is important from both safety and therapeutic perspective, as it may reduce the availability of free toxic elements while enhancing stability.

Additionally, the sharpness and the distribution of peaks indirectly indicate reduction in particle size and improved structural uniformity, which may contribute to better bioavailability of the formulation.

In summary, the XRD analysis confirms that *Talagrabha Pottali* is crystalline, multi-phase sulphide- based formulation formed through controlled thermal processing. These structural changes support the classical claim that *Pottali Kalapana* enhances the potency and stability of herbo-mineral drugs.

DISCUSSION

Talagarbha Pottali is an important formulation mentioned in Rasashastra and is prepared using the classical *Gandhaka Drava Paka* method. In this procedure, the prepared drug mass is heated in molten sulphur under controlled temperature conditions. This process is considered significant because it helps convert the raw ingredients into a more stable, compact, and therapeutically effective form. Since *Pottali* preparations are highly concentrated, they are usually administered in very small doses while still producing considerable therapeutic action.

The formulation mainly contains *Shuddha Haratala, Parada, and Gandhaka*. During the preparation, gradual heating plays a major role in achieving proper transformation of these ingredients. If excessive heat is applied suddenly, there may be decomposition of sulphur or loss of volatile components. Therefore, maintaining a controlled temperature throughout the procedure is essential for obtaining a properly prepared *Pottali*.

The observations recorded during the preparation indicate the progression of the pharmaceutical process. The appearance of bubbles from the *Pottali* during heating may suggest ongoing internal reactions and removal of moisture or volatile impurities. Later, the development of a resonant sound indicates proper hardening and compactness of the formulation. The molten *Gandhaka* attaining a reddish-orange honey-like appearance is considered an important stage of proper *Paka*. These observations are useful practical markers while preparing *Talagarbha Pottali*.

The XRD study showed the presence of crystalline compounds such as orpiment, cinnabar, arsenolite, and elemental arsenic. The sharp peaks observed in the diffraction pattern indicate that the final product possesses a crystalline nature. The presence of cinnabar suggests conversion of mercury into sulphide form during processing, while orpiment confirms the persistence of arsenic sulphide phases. These findings indicate that important physicochemical changes occur during the *Gandhaka Drava Paka* process.

The pharmaceutical processing may facilitate the conversion. free metallic forms into more stable sulphide complexes. Such transformations are considered important because they may reduce toxicity and improve stability of the formulation. In addition, controlled heating and repeated processing may also help in reducing particle size, which can improve absorption and bioavailability of the drug.

Therapeutically, *Talagarbha Pottali* is mainly indicated in disorders involving *Vata* and *Kapha Dosha*. Classical references describe its use in conditions such as *Śvāsa* (dyspnoea), *Kāsa* (cough), *Rakta-Śleṣma* disorders, and certain *Vata* disorders. Due to its *Ushna* and *Tikshna* properties, the formulation is believed to help remove

obstruction caused by *Kapha* and improve the functioning of respiratory channels.

Talagarbha Pottali is especially useful in respiratory diseases. It has traditionally been used in chronic cough, asthma, breathlessness, and other respiratory conditions associated with excessive mucus accumulation. The formulation may help in reducing *Kapha*, clearing the airways, and improving breathing. Its administration in small doses with honey or ghee is also considered beneficial for quicker action and better absorption. Because of its potent nature, it is regarded as useful in conditions where rapid relief is required.

The use of *Kumari Swarasa* during *Bhavana* may further enhance the effectiveness of the formulation. *Kumari* is known for its *Deepana* and *Yogavahi* properties, which may support proper assimilation and distribution of the medicine within the body. Thus, both the pharmaceutical process and the herbal media contribute to the overall therapeutic value of *Talagarbha Pottali*.

Overall, the present study shows that *Talagarbha Pottali* is a carefully processed herbo-mineral formulation in which classical pharmaceutical procedures bring about important structural and chemical changes. These transformations may contribute to improved stability, enhanced therapeutic activity, and improved therapeutic utility of the formulation in respiratory and *Vata-Kapha* predominant disorders.

CONCLUSION

The pharmaceutical study of Talagarbha Pottali demonstrates the precision and complexity of classical *Rasashstra* preparations, particularly those employing the *gandhaka drava paaka* technique. By maintaining a controlled and gradual rise in temperature throughout the process, the stability and integrity of ingredients- *Parada, Gandhaka, Haratala* are effectively preserved, allowing their transformation into a homogenous, potent compound. The observation suggests that the preparation method facilitates the formation of stable sulphide complexes and reduction in particle size, which may contribute to enhanced therapeutic bioavailability and reduced toxicity. This formulation exemplifies the sophistication of ayurvedic herbo-mineral processing, where traditional heating methods lead to physicochemical conversions comparable to modern Nano structuring. *Talagarbha Pottali* thus represents an optimized pharmaceutical dosage form offering potent therapeutic benefits in minimal doses, long shelf life and safe administration when properly purified and standardized. Further analytical and toxicological studies would strengthen its scientific validation and expand its clinical applicability.

DISCLOSURE

Conflict of Interest:

The authors declare that there is no conflict of interest.

Author Contributions:

Dr. Hetvi Hitendrasinh Bhadigar: Conceptualization, pharmaceutical preparation, experimentation, data collection, data analysis, manuscript drafting and revision.

Dr. Ebin T. U.: Study supervision, methodology, interpretation of results, manuscript review and final approval.

Acknowledgements:

The authors express their sincere gratitude to the Department of Rasashastra evum Bhaishajya Kalpana, Parul Institute of Ayurveda, Parul University, Vadodara, for providing the necessary facilities to carry out this research.

References

1. Sharma PH. *Rasayogasagar*.
2. Sumedhan V, Ratheesh P, Meghna PP. A Review on Pottali Kalpana. *Journal of Ayurveda and Integrated Medical Sciences (JAIMS)*. 2018; 3 (4) :96-102 . Available from: https://doi.org/10.21760/jaims.v3i4.13290
3. Ebin TU. Tamragarbha Pottali - A Compact Drug Formulation in Ayurveda Rasasastra. *International Journal of Science and Research (IJSR)*. 2021; 10 (6) :21-24 . Available from: https://doi.org/10.21275/sr21529000751
4. Chaudhari SY, Vyas SV, Nariya MN, Prajapati PK. Acute and Chronic Toxicity of Rasamanikya, an Ayurvedic Arsenical Formulation in Rats. *Indian Journal of Pharmaceutical Sciences*. 2018; 80 (2) :325-333 . Available from: https://doi.org/10.4172/pharmaceutical-sciences.1000361
5. Patil G, Hiremath SG, Patil S, Singh R, Siddhanta S. Synthesis and nanoparticle characterization of an Ayurveda formulation Tridhathu Garbha Pottali. *Journal of Drug Research in Ayurvedic Sciences*. 2024; 9 (3) :182-195 . Available from: https://doi.org/10.4103/jdras.jdras_399_23
6. Anitha H, Pandya MR, Toshikhane H. Research on pharmaceutical study of Tamragarbha Pottali. *International Journal of Biology, Pharmacy and Allied Sciences*. 2022; 11 (3) :792-797 . Available from: https://doi.org/10.31032/ijbpas/2022/11.3.1096
7. Vagbhata. *Rasaratna Samuccaya*. Chapter 3.
8. Sadananda Sharma. *Rasatarangini*. Chapter 11.
9. Hariprapanna Sharma. *Rasayogasagar*. Part 2, Preparation No. 110.