Research Article

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SHANKHANABHI BHASMA WITH AND WITHOUT BHAVANA SAMSKARA: A COMPARATIVE PHARMACEUTICAL STUDY

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ABSTRACT

Naturally occurring calcium-containing compounds are found in the human body and are necessary to maintain physiological processes. The calcinated conch shell named Shankhanabhi is included in Sudha Varga of the ancient Rasa Shastra texts. Shankhanabhi has been widely used in the form of single drug or as an adjunct to compound preparations. Among its numerous uses, it is known to be effective for treating gastrointestinal conditions like Amlapitta (Acid dyspepsia), Grahani (Irritable bowel syndrome), Udarshula (Abdominal pain), and Atisara (Diarrhoea). The current study focused on undertaking the pharmaceutical preparation and characterisation of Shankhanabhi Bhasma. The drug was subjected to Shodhana (Purification) and Marana (calcination) with Bhavana Dravya according to the standardized steps as mentioned in Rasa Tarangini and without Bhavana Dravya for comparative evaluation. The end product, Shankhanabhi Bhasma, was yielded after Shodhana and Marana. These treatments converted the crude drug into fine, bioabsorbable powder with smaller particle size and enhanced safety profile. The processed Bhasma demonstrated classical attributes like lightness, fine texture, and internal administration compatibility. The pharmaceutical evaluation stressed the importance of traditional processes in detoxification and transformation of Shankhanabhi to its medicinally active form. Shankhanabhi Bhasma is an important Ayurvedic drug used mainly in gastrointestinal illnesses. The current research highlights the importance of adhering to the conventional protocols such as Shodhana and Marana for producing a secure, efficient, and standardized preparation. Additional analytical and clinical investigations are necessary to confirm its curative value.

Keywords: Shankhanabhi Bhasma, Shodhana (Purification), Bhavana (Levigation), Marana (Incineration).

INTRODUCTION

Ayurveda, an unequivocal traditional system of medicine, uses the inherent principles of nature to maintain a person's health by keeping his body, mind, and spirit in perfect equilibrium. Ayurveda is the first Indian medical science that mainly focuses on maintaining positive health and comprehensively eradicating disease. Pharmacopoeia of "Ayurveda" comprises drugs derived from herbs and minerals, metals and animals. But they can't be taken as it is. Hence, they need to be converted into a form that is therapeutically fit for use.[1] Rasa Shastra is an essential branch of the Indian system of medicine, which involves the pharmaceutical processes such as the preparation of Bhasma, Kharliya Rasayana, Druti, Kupipakwa Rasayana, Parpati, Pottali etc. It is a renowned fact in the Ayurvedic world that Bhasma is highly efficacious. Bhasma is a unique dosage form, prepared after proper levigation with a particular extract of medicinal herbs with particular metals and minerals. Later, they are subjected to a particular quantum of heat and due to their fineness and nanoparticle size, they turn to the most assimilatory, harmless & therapeutically effectual form. Bhavana is a wet grinding process in which a powdered drug of herbal, animal or a specific drug is triturated with a liquid for a specific period of time.[2] This process of trituration is followed by drying. It is carried out until the attainment of Subhavita Lakshana and complete liquid absorption into the powder.[3] It is followed by Marana to form Bhasma. The changes made by Bhavana in nature of drug can be preliminarily and easily perceived at pharmacogenetic as well as chemical level.[4] However its utility will be majorly dependent on therapeutic actions. Thus, it plays a pivotal role in the alteration of Gunas (properties) of drugs so as to fulfil therapeutic requirements.[5] Shankhanabhi Bhasma is a good source of calcium as properly manufactured Bhasma contains calcium in the form of calcium carbonate. According to the classics of Ayurveda, Shankhanabhi Bhasma, properties like Madhura Rasa, Laghu Guna, Sheetal Veerya, etc., have been widely used in treating Amlapitta.[6] The present study aims to evaluate the pharmaceutical parameters of Shankhanabhi Bhasma prepared using two different methods: one with Bhavana Dravya and the other without it. Although classical texts do not specify the use of Bhavana Dravya in the preparation of Shankhanabhi Bhasma, substances like Kumari Swarasa (Aloe vera Juice) or Nimbu Swarasa (Lemon Juice) are generally used to neutralize the excessive alkaline effects.

MATERIALS AND METHODS

Ashuddha Shankhanabhi were procured from the pharmacy of Pt. Khushilal Sharma government (Autonomous) Ayurveda College & institute, Bhopal. Citric acid was obtained from the Local market of Bhopal. Aloe Vera was freshly collected from the herbal garden maintained by the same institute.

Table 1: Shodhana of Shankhanabhi [7]

1.	Reference	Rasa Tarangini
2.	Principle	Swedana
3.	Duration	1.5 hour
4.	Ashuddha Shankhanabhi	500 gm
5.	Citric acid	200gm (Diluted in 4 litres of distilled water)
6.	Equipment	Gas Stove, cotton cloth, Dola Yantra, Infrared thermometer, Iron rod, Knife

Procedure

Ashuddha Shankhanabhi was accurately weighed and enclosed in a cloth to prepare a Pottali. The Pottali was suspended in an earthen vessel using an iron rod to form a Dolayantra. Citric acid solution was added until the Pottali was completely immersed, and the vessel was heated on a gas stove at moderate temperature for 1.5 hours. Additional citric acid was supplied as needed to maintain complete immersion. Observations were recorded throughout the process. After 1.5 hours, the system was allowed to cool, the Pottali was removed, and the Shankhanabhi pieces were collected. These were washed with warm water, dried, and stored in an air-tight container for further processing.

Table 2: Sample A - Marana of Shankhanabhi with Bhavana Dravya[8]

1.	Type of Procedure	With Bhavana Dravya
2.	Drug for incineration	Shuddha Shankhanabhi
3.	Bhavana Dravya	Aloe vera leaf pulp
4.	Equipment	Khalva yantra, Sharava, Multani Mitti, cotton cloth, Electric Muffle furnace

First Puta: Purified Shankhanabhi was placed in an earthen dish (Sharava), sealed with a clay-smeared cloth strip (Sandhibandhan), and dried under sunlight. The sealed container (Sharavasamputa) was then heated in an electrical muffle furnace at 800°C for 1.5 hours. After natural self-cooling (Swanga-shita) for approximately 12 hours, the container was carefully opened, and the material obtained inside was collected and weighed.

Second Puta: The material obtained from the first heating (Puta) was taken in a clean mortar and pestle (Khalva Yantra). Fresh Aloe vera leaf pulp was added and levigated under constant pressure to form a smooth paste. This paste was then shaped into pellets (Chakrika) and dried under sunlight. After complete drying, the pellets were placed inside an earthen dish (*Sharava*), sealed to form a closed container (Sharavasamputa), and again dried under sunlight. The second heating (Puta) was then carried out in an electrical muffle furnace at 800 °C for 1.5 hours. Followed by natural self-cooling (Swanga-shita) for about 12 hours, the sealed container was carefully taken out, the clay-sealed binding (Sandhibandhana) was removed, and it was opened with caution. The material obtained inside was weighed, and observations regarding its colour, odour, taste, touch, and overall appearance were recorded.

Table 3: Sample B - Marana of Shankhanabhi without Bhavana Dravya

1.	Type of Procedure	Without Bhavana Dravya
2.	Drug for incineration	Shuddha Shankhanabhi
3.	Bhavana Dravya	Not added
4.	Equipment	Khalva yantra, Sharava, Multani Mitti, cotton cloth, Electric Muffle furnace

First Puta: Same procedures as mentioned in the first puta of Sample A were followed.

Second puta: The material obtained from the first heating (puta) was powdered and again sealed in earthen dish with a clay smeared cloth strip (Sharava Samputa), followed by drying under sunlight. The dried Sharava Samputa was placed in an electrical muffle furnace at 800°C for 1.5 hours. After self-cooling for 12 hours, the setup was removed, the binding (Sandhibandhana) was cut open, and the earthen dish (Sharava) were carefully separated. The material obtained was then collected and weighed.

RESULT AND DISCUSSION

After the Shodhana process, noticeable changes were observed in the material. The substance appeared brighter in appearance, while the transparent citric acid solution gradually turned greenish-yellow as well as the Shankhanabhi became brittle in nature. The role of Bhavana Dravya is crucial, as it acts as a catalyst in the Marana (incineration) process. Ghrita Kumari Swarasa specifically contributes therapeutic value by supporting conditions like acid reflux and heartburn—properties that align with the therapeutic actions of Shankhanabhi Bhasma.

The process of Bhavana involves levigating Bhasma with Aloe vera which imparts subtle organic constituents (Saindriya Tatva) into the formulation. Pharmaceutically, this enhances particle fineness (Sukṣmatva**)**, and improves the uniformity and stability of the Bhasma. Pharmacologically, these organic constituents act synergistically with the metallic/mineral components, enhancing bioavailability, therapeutic potency, and targeted absorption in the body. So, it is necessary to prepare Bhasma according to their therapeutic action.

Comparison of Sample A and Sample B in processing Shodhita Shankhanabhi shows significant variation in weight holding and physical properties. Both the Samples initially had the same weight of 240 grams. At the end of the first puta, the weight in Sample A fell to 180 grams, whereas Sample B had the higher weight of 192 grams. After the second puta, Sample A decreased to 168 grams, while Sample B still had 181 grams, which meant that Sample B suffered less material loss during the process. On physical properties, both samples were colourless, Tasteless, and soft to the touch; however, Sample B was whiter in colour than Sample A. Sample B had a slightly higher pH value of 10.2 as opposed to 10 in Sample A, which suggests a slightly more alkaline character. The loss on drying was also less in Sample B (0.77%) than Sample A (0.92%), suggesting greater stability and reduced moisture levels. Generally, Sample B possesses superior traits in respect of weight retention, appearance, and physicochemical stability.

a b c d

Figure 1: Shodhana of Shankhanabhi: a. Ashuddha Shankhanabhi, b. Citric acid diluted in DM water, c. Swedana in Dolayantra d. Shuddha Shankhanabhi

a b c d

Figure 2: Sample A: a. Before Puta, b. After 1st puta, c. After 2nd Puta, d. Final Product

Figure 3: Sample B: a. Before Puta, b. After 1st puta, c. After 2nd Puta, d. Final Product

Table 4: Physicochemical Parameters

Parameters	Sample A	Sample B
Initial wt. of Shodhita Shankhanabhi	240 gm	240 gm
Wt. after 1st puta	180 gm	192 gm
Wt. after 2nd puta	168 gm	181 gm
Colour	White	Bright White
Odour	Odourless	Odourless
Taste	Tasteless	Tasteless
Touch	Soft	Soft
pH	10	10.2
Loss on drying	0.92%	0.77%

Analysis based on classical quality control parameters revealed that both groups exhibited maximum similarities, with no significant differences observed between them.

Rekhapurnatva: When the prepared Shankhanabhi Bhasma is gently rubbed between the thumb and index finger, it settles into the grooves of the skin, making the ridges clearly visible. This smooth and even filling is a sign that the Bhasma is finely prepared and of good quality.

Sukshmatva: During the trituration process, the substance is repeatedly ground and heated, gradually breaking it down into an extremely fine form. This finely prepared Bhasma is essential, as it allows the body to absorb and utilize it more effectively.

Nirdhumatva: It means 'smoke-lessness'. If a minute quantity of Bhasma is put over the fire (Agni), it should not produce any smoke (Dhoom). This indicates that it should not contain any organic matter in a free state.

CONCLUSION

Shankhanabhi Bhasma preparation includes two significant steps: Shodhana and Marana. It is essential to follow all the procedures per our classical texts to get a good quality of Bhasma. These procedures assist in reducing the particle size, which facilitates better absorption and assimilation of the Bhasma into the human physiological system and enhances the therapeutic utility of the drug. This study revealed that a temperature of 800^0c maintained for one and half hour's duration in two puta is sufficient to obtain good quality Shankha Bhasma, which was prepared with two different methods of Marana. Shankhanabhi Bhasma required minimum 2 puta to be transformed into Rekhapurnatva, Nirdhuma, Nischandratva in both methods. Although the method of preparation of Shankhanabhi Bhasma Sample A and Sample B was different but the Physical Parameter of both the Bhasmas showed almost same results.

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