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PHARMACEUTICAL STUDY OF SAMANGADI ARISHTA – A MODIFIED DOSAGE FORM

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ABSTRACT

Sandhana Kalpana, an age-old Ayurvedic remedy, has withstood the test of time and is renowned for its remarkable efficacy. The fundamental concept guiding the creation of *Sandhana Kalpana* involves extracting active components through a distinctive biochemical fermentation process that occurs in a mildly self-generated alcoholic environment. The formulation of Samangadi Arishta is based on the ingredients derived from *the Samangadi Kwatha* formulation mentioned in *Chakradatta*, primarily designed for addressing *Atisara*. While *Kwatha* needs to be prepared and used immediately due to its limited shelf life, *Arishta* boosts an extended shelf life and is also easier for administration. Given these considerations, the current study is designed to formulate *Samangadi Arishta* using the ingredients from *Samangadi Kwatha*. **Methodology:** In pharmaceutical study, the preparation of *Samangadi Arishta* was carried out using *Samangadi Kwatha Dravyas* according to the *Anukta mana* reference of *Sharngadhara Samhitha*. **Results:** The pharmaceutical study conducted using the *Anukta Mana Arishta* of *Sharngadhara* demonstrated that a standardized *Arishta* of high quality can be formulated using *Kwatha Dravya*.

KEYWORDS: *Sandhana Kalpana, fermentation, pharmaceutical study, Samangadi Arishta.*

INTRODUCTION

Ayurveda, a traditional system of medicine, has a long and enduring history that has spanned centuries. Its roots can be traced to the four ancient *Vedas*: *Rigveda, Yajurveda, Samaveda,* and *Atharvaveda*. *Ayurveda* holds a prominent position and is regarded as an *Upaveda*, a sub-section specifically affiliated with the *Atharva Veda*. *Sandhana Kalpana*, an ancient *Ayurvedic* remedy, has endured through generations and is celebrated for its exceptional effectiveness. The core principle guiding the formulation of *Sandhana Kalpana* revolves around the extraction of active components through a unique biochemical fermentation process taking place in a mildly self-generated alcoholic environment. Fermentation techniques have been utilized globally for their nutritional, preservative, and revitalizing attributes over an extended period. What sets them apart is their exceptional attributes, including prolonged shelf life, swift efficacy, adaptability for therapeutic and purifying applications, wide-ranging acceptance, liquid form versatility for various conditions and cost-effectiveness. Furthermore, the inherent characteristics of fermentation, in conjunction with the qualities of the raw materials and the precise formulations, render them highly suitable for therapeutic purposes. Fermentation uniquely excels at extracting a diverse array of active compound ingredients, including both alcohol-soluble and water-soluble constituents, more efficiently than other extraction methods. The concept of *Arishta* formulations is rooted in the *Sandhana* process.

The *Samangadi Arishta* is crafted using the ingredients derived from the *Samangadi Kwatha*[1] (SK) formulation mentioned in *Chakradatta*, primarily intended for the treatment of *Atisara*. This formulation comprises of nine ingredients, which are *Samanga (Lajjalu), Ativisa, Musta, Vishwa, Hribera, Dhataki, Kutaja Twak, Indrayava,* and *Bilwa Phala Majja*. The formulation was developed based on the "*Anukta Mana Arishta* Ratio" as mentioned by *Acharya Sharngadhara*.[2] *Kwatha* should be prepared and used immediately due to its limited shelf life.[3] In contrast, *Arishta* formulations have an extended shelf life[4] and are also convenient for administration.

Taking these factors into account, the current study was undertaken to prepare *Samangadi Arishta* (SA) from *Samangadi Kwatha* and to assess and validate its pharmaceutical characteristics.

AIMS AND OBJECTIVES

To prepare *Samangadi Arishta* according to *Anukta mana* reference *of Sharngadhara Samhitha* using the ingredients of *Samangadi Kwatha.*

METHODOLOGY

Pharmaceutical study

Samangadi arishta was prepared according to the *Anukta mana Arishta* reference of *Acharya Sharngadhara.*

Table 1: Ingredients of *Samangadi Arishta.*

Sl. No	Ingredients	Quantity
1	*Samangadi Kwatha*	2.25L
2	Jaggery	1.125kg
3	*Dhataki Pushpa*	112.5g
4	*Prakshepaka Dravya*	12.5g each of *Kwatha Dravya*

Preparation of *Samangadi Kwatha*

Samangadi kwatha was prepared based on general method of *Kwatha* preparation by *Acharya Sharngadhara.*[5]

Table 2: Ingredients of *Samangadi kwatha.*

Sl.No	Ingredients	Part used	Quantity
1.	*Samanga*	*Panchanga*	125gms
2.	*Ativisha*	*Kanda*	125gms
3.	*Musta*	*Mula*	125gms
4.	*Shunthi*	*Kanda*	125gms
5.	*Hribera*	*Mula*	125gms
6.	*Dhataki*	*Pushpa*	125gms
7.	*Kutaja*	*Twak*	125gms
8.	*Indrayava*	*Beeja*	125gms
9.	*Bilva*	*Phala Majja*	125gms

The raw drugs were washed and dried properly. Freshly collected *Samanga* was thoroughly dried in the shade. Using a pulverizer, the raw drugs were ground into a coarse powder. The coarse powder was then placed in a stainless-steel vessel and 16 times of water was added. The entire setup was heated with an LPG gas cylinder and burner, with the low flame. After being reduced to 1/8th of its original volume, the *Kwatha* was filtered through a cotton cloth into a separate container, and the residue left on the cloth was discarded.

Preparation of *Sandhana Patra*

Selection of *Sandhana Patra*

- Mud pot is used to prepare *Samangadi Arishta.*

Patra samskara

- ***Lepana*** - A mud pot with a capacity of 5 liters was selected and thoroughly cleaned. After cleaning, the pot was dried in sunlight. The vessel wss then coated with a layer of *Gritha*.
- ***Dhupana*** – The mud pot is subjected to *Dhupana*, a process of fumigation. *Guggulu, Jatamansi* and *Vidanga* were burnt in a small *Sharava* to produce fragrant smoke and *Sharava* is placed inside *Sandhana Patra*.

Preparation of *Prakshepaka Dravya*

Since *Samangadi Arishta* is an adapted dosage form, it does not specify any particular *Prakshepaka Dravya*. Therefore, fine powdered *Samangadi kwatha* ingredients are employed as *Prakshepaka Dravya*.

Preparation of *Sandhana Dravya*

The *Kwatha* was transferred to a Stainless-steel vessel, and 1.125kg of *Guda* was added to it. The mixture was stirred thoroughly until all the *Guda* dissolved in the *Kwatha*. After that, the *Kwatha* was filtered to remove any impurities and the filtered liquid was poured into the *samskaritha* mud pot. *Prakshepaka Dravyas* were added to the *Kwatha* in the mud pot. The pot was then securely sealed with a dry cloth. The mud pot was placed in a dark room to initiate the fermentation process.

***Sandhana* process**

On the third day after the initiation of fermentation, *Sandhi Bandhana* was performed using *Multani Mitti*. Once the *Sandhi Bandhana* was completed, the mud pot was returned to the dark room. During this time, the pot was left undisturbed, allowing the fermentation process to continue until completion. During the fermentation process, periodic checks were conducted to observe the signs indicating the completion of fermentation. On 31st day, the pot was opened and checked for confirmatory signs and tests were conducted. Then the supernatant *Arishta* was carefully filtered through a clean and dry cloth to remove any solid particles. The filtered liquid was then stored in a mud pot for further use.

RESULT

Fig 1. SA Kwatha Dravya Churna.

Fig 2. Boiling of SA Kwatha Dravya.

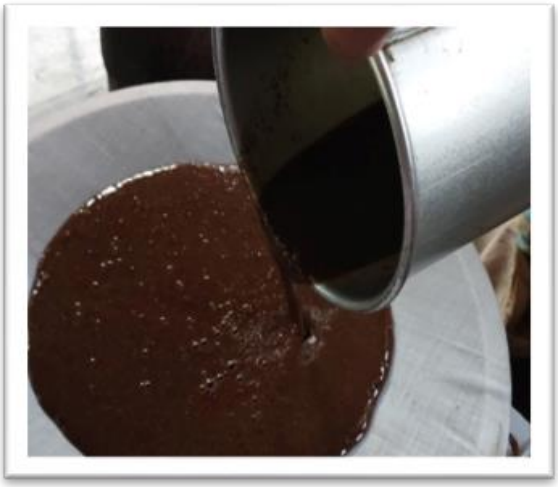

Fig 3. Filtration *SA Kwatha Dravya.*

Fig 4. Addition of Guda.

Fig 5. Floating of Prakshepaka Dravya.

Fig 6. SA kept for fermentation.

Fig 7. Settling of Prakshepaka Dravya.

Fig 8. Burning candle test.

Fig 9. Final sample of Samangadi Arishta.

Pharmaceutical study

Table 3: Observation of *Samangadi Arishta* in different stages of fermentation.

Characteristics	**Initial stage**	**Onset of fermentation**	**Completion of fermentation**
Roopa	Thick liquid	-	Thin liquid
Varna	Light Brown	Brown	Dark Brown
Rasa	*Tikta,*		*Tikta Kashaya*
Gandha	*Kashaya*		Alcoholic odour
State of *Prakshepaka Dravyas*	Floating	Floating	Sunken
Effervescence	Absent	Present	Absent
Hissing sound	Absent	Present	Absent
Burning candle	-	Turns off	Continues to burn
No. of days	1st day	3rd day	31st day
Total *Samangadi Arishta* obtained after filtration: 3L			

DISCUSSION

Samangadi Arishta was prepared using the ingredients from the *Samangadi Kwatha* formulation, following the recommended *Anukta Mana* for *Arishta* preparation as mentioned

in *Sharngadhara Samhitha*. The specific ratios mentioned in the *Sharngadhara Samhitha* provide guidance on the appropriate amounts of each ingredient to be used, taking into account their therapeutic properties and synergistic effects.

The preparation of SA started by dissolving jaggery in the SK solution, which was then filtered through a cloth to ensure the removal of any foreign matter present in the jaggery. This filtration step is important to maintain the purity and quality of the solution.

Following the filtration, the *Sandhana Patra* was prepared. *Mrit Patra* was used as the fermentation vessel. To prepare the *Patra*, a layer of ghee was smeared on the inner surface. This step helps to reduce the porosity of the *Patra* and stabilize the temperature during the fermentation process.

Next, the *Dhupana* process was carried out using ingredients like *Guggulu*, *Jatamansi* and *Vidanga*. These crude drugs were used for fumigation, which creates an environment with antibacterial and antiseptic properties. This fumigation process helps to establish a specific ecosystem similar to modern sterilization procedures, ensuring the purity and safety of the fermentation process.

After preparing the *Sandhana Patra*, the *SK* solution was carefully transferred into the *Patra*. During the filling process, it is crucial to leave a portion of the container unfilled. Typically, three-fourths of the container is filled with the liquid ingredients, while the remaining one-fourth is left empty. This unfilled space serves as a vital area for the accumulation of gases that are released during the fermentation process.

Following that, the *Prakshepaka Dravya* and *Sandhana Dravya* were spread evenly over the solution in the *Patra*. To enhance the efficacy of the SA, the SK *Churna* was added as *Prakshepaka Dravya*. *Prakshepaka Dravya*s are additional ingredients added to a formulation to enhance its therapeutic effects, taste, aroma and color.

Once the ingredients were added, the *Sandhana Patra* was securely closed using a lid to create a sealed environment. It is important to prevent direct contact between the fermented solution and light, as bacterial growth during fermentation is sensitive to light exposure. Additionally, inhibiting contact with air helps maintain the integrity of the fermentation process and prevents oxidation. To ensure the optimal fermentation, the *Sandhana Patra* was kept in a dark place, away from light sources.

On the third day of fermentation, signs of the initiation of fermentation, such as effervescence, hissing sound, were observed. At this stage, the *Sandhi Bandhana*, or sealing of the *Patra*, was performed using a *Mrit Kapata*. It is important to *ensure* a proper seal to maintain the desired conditions for fermentation. After the addition of all the necessary ingredients, the *Sandhana Patra* is handled with care and placed in a suitable environment for fermentation. It is important to choose a dark, non-windy and dry area for this purpose. The *Sandhi Bandhana* was opened on the 31st day and checked for fermentation completion signs such as sinking of *Prakshepaka Dravya*s, absence of effervescence and hissing sound. The *Samangadi Arishta* was then filtered and packaged in a 200mL container.

The quantity of *Arishta* increased compared to the initial *Kwatha* due to the dissolution of jaggery during the fermentation process. Jaggery contains sucrose that can be converted into alcohol through the process of fermentation. As a result, the sugars in the jaggery are metabolized by microorganisms, leading to the production of alcohol and other by-products.

During the fermentation, the microorganisms present in the *Sandhana Patra* utilize the starch present in the ingredients, such as *Shunti*, through a process called glycolysis. This enzymatic breakdown of starch results in the production of alcohol, which contributes to the reduction in the thickness or viscosity of the *Kwatha*.

The fermentation process, including the conversion of sugars into alcohol and the breakdown of starch, contributes to the transformation of the original *Kwatha* into *Arishta*. The resulting *Arishta* may have different sensory characteristics, including changes in quantity, thickness and taste compared to the initial *Kwatha* preparation.

The process of fermentation involves two main steps. The first step is saccharification, which involves the conversion of starch into sugar. This can be achieved through the use of amylolytic microorganisms or enzymes such as glucoamylase and α-amylase. During saccharification, starch is broken down into simpler sugar molecules.

The second step of fermentation is the conversion of sugar into ethanol. This step is facilitated by the action of specific microorganisms, with *Saccharomyces cerevisiae* being a commonly used yeast strain for this purpose. *Saccharomyces cerevisiae* metabolizes the sugar present in the solution and produces ethanol as a metabolic byproduct.[6]

CONCLUSION

The **pharmaceutical study,** focused on formulating a new dosage form using *Samangadi Kwatha*. However, *Kwatha* is known to have a drawback of reduced shelf life. To address this limitation, the formulation of *Samangadi Arishta* was prepared using the same ingredients as *Samangadi Kwatha*, following the *Anukta Mana Arishta* mentioned in *Sharngadhara Samhita.*

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