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A COMPARATIVE PHARMACEUTICAL STUDY OF *PARTHADYARISHTA* WITH *GUDA* AND STEVIA AS *MADHURA DRAVYA*

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ABSTRACT

In Ayurveda, Rasashastra and Bhaishajya Kalpana is a branch in which pharmaceutical preparations of various dosage forms are mentioned. Bhaishajya Kalpana includes *Sandhana Kalpana* which comprises of *Asavarishtas* that have a long shelflife. *Arishtas* commonly include *Kwatha Dravyas, Madhura Dravyas, Prakshepaka Dravyas and Sandhana Dravyas. Parthadyarishta* is a formulation mentioned in *Bhaishajya Ratnavali, Hridroga Chikitsa.* In this study, detailed pharmaceutical study of *Parthadyarishta* preparation with *Guda* and with stevia as *Madhura Dravya* along with its observations are discussed. This work was done to do the comparison of pharmaceutical preparation and observations of both the samples.

KEYWORDS: *Sandhana Kalpana, Parthadyarishta, Guda,* Stevia, Pharmaceutical Study.

INTRODUCTION

Asava-Arishtas are the fermented Ayurvedic pharmaceutical preparations with self- generated alcohol which preserve potency of drugs for a long time. Most of them contain *Guda* as a *Madhura Dravya*. According to *Bhavaprakasha Nighantu*[1], *Guda* is having *Snigdha* and *Guru Guna* and it increases *Kapha, Medas and Krimi*. In *Charaka Samhita Chikitsa Sthana*[2] *Shwayathu Chikitsadhyaya*, it is mentioned that *Guda* is contra-indicated in *Shwayathu*. Also, present day jaggery is loaded with chemicals and few bulk enhancers.

Stevia rebaudiana Bertoni is a plant species which contains a chemical, steviol glycoside which act as a sweetening agent. Through various researches, it is proved that stevia is having zero glycaemic index and calorific value. It has antimicrobial[3], antioxidant[3], antihyperglycemic[4], antihyperlipidemic[4], anticancerous[5], anti-inflammatory[6] immunomodulatory[6] and cardioprotective[7] action.

In this present study, a sample of *Parthadyarishta* was prepared with *Guda* and another sample was prepared replacing *Guda* with leaves of stevia which is a sugar substitute. An attempt was made to do comparison of the pharmaceutical procedure and the observations.

AIMS AND OBJECTIVES

To prepare *Parthadyarishta*[8] with *Guda* as per classical reference

To prepare *Parthadyarishta* replacing *Guda* with stevia as *Madhura Dravya*

To compare pharmaceutical procedure and observations of the samples

MATERIALS AND METHODS

PHARMACEUTICAL STUDY

Preparation of *Arishta*[9] includes following steps

Poorva Karma

- Procurement of raw drugs
- Authentication of raw drugs
- *Patra Samskara*

Pradhana Karma

- Preparation of *Kashaya*
- Adding of *Madhura Dravya*
- Adding of *Prakshepaka Dravya*
- Adding of *Sandhana Dravya*

Paschat Karma

- *Sandhibandhana*
- Collection of *Arishta* after fermentation

Source of data

Bhaishajya Ratnavali, Hridrogadhikara.

Procurement of raw drugs

The herbal drugs, sweetening agent and fermentative agents used for the preparation were collected from Alva's Pharmacy, Mijar.

Authentication of raw drugs

The raw drugs were identified by the experts of Alva's ATMA Research Centre, Moodubidire, Karnataka.

Source of water

Drinking water was used for all the purposes of the experiment.

Place of manufacturing

Parthadyarishta was prepared in the laboratory of postgraduation department of Rasashastra and Bhaishajya Kalpana, Alva's Ayurveda Medical College, Moodubidire.

Equipments: Measuring jar, weighing machine, utensils, fire source, cloth, porcelain jar, Multani mitti

Ingredients: Ingredients and their quantity is mentioned in table no.1

Table no. 1: Ingredients and their quantity.

SI.NO	Drug	Botanical name	Family	Part used	Quantity taken
1	*Arjuna*	*Terminalia arjuna*(Roxb.) Wight&Arn.	Combretaceae	Bark	625g
2	*Madhukapushpa*	*Madhuca indica* J.F. Gmel	Sapotaceae	Flower	125g
3	*Draksha*	*Vitis vinifera* Linn.	Vitaceae	Fruit	313g
4	*Dhatakipushpa*	*Woodfordia fruticosa* (L.) Kurtz, J. Asiat	Lythraceae	Flower	125g
5	*Jala*	___	___	___	6 l
6	*Guda* (in batch-1)	___	____	____	625g
7	Stevia (in batch-2 as a substitute to *Guda*)	*Stevia rebaudiana* Bertoni	Asteraceae	Leaf (Dried)	200g

Procedure of Preparation

Sample 1: Parthadyarishta with *Guda.*

Ingredients

Adding water for *Kashaya*

Adding of *Arjuna Twak*

Adding of *Draksha*

Adding of *Madhukapushpa*

Ingredients soaked in water

Preparation of *Arjuna Kashaya*

Filteration of *Kashaya*

Addition of *Guda*

Filteration after dissolving *Guda*

Measuring temperature using thermometre

Dhoopana of pot

Adding *Guda* dissolved decoction to pot

Adding *Dhatakipushpa* to pot

Kept for onset of fermentation

Opened the pot on 5 th day

Sandhibandhana done

Kept for fermentation

Filteration after 45 days

Final Product

Preparation of Kashaya

Coarse powder of 625g *Arjuna Twak*, 313g *Draksha* and 125g *Madhukapushpa* were taken and soaked in 6 l of water overnight. On the next day, it was kept in *Mandagni* on stove and reduced to 1/4th part. When *Kashaya* was around 1.5 l, vessel was taken out from fire and it has been filtered through clean and dry cora cloth and kept for self-cooling.

Observation: Colour of the *Kashaya* was light brown after 35 minutes. It changed into dark brown colour after 1 hour 15 minutes. After 1 hour 45minutes, smell of *Arjuna Kashaya* was observed. It took almost 3 hours to prepare the *Kashaya*. The decoction was having *Kashaya*, *Tikta Rasa*.

Adding of *Madhura Dravya*

625g of *Guda* was added to 1.5 l of *Kashaya* and kept in mild fire until it dissolves completely in the *Kashaya*. Proper stirring was done for uniform mixing. Again, this solution was filtered to remove the physical impurities and later it was measured. After addition of *Guda*, solution became 1.750 litres.

Precaution:- Proper mixing was done to get homogeneous mixture. Proper filteration was done to remove impurities present in *Guda*.

Transferring into *Sandhana Patra*

Porcelain pot was washed, dried and kept ready for transferring *Arishta*. *Dhoopana* or fumigation was done to the pot and the lid with *Guggulu* (*Commiphora mukul* Hook.ex.Stocks.), *Haridra* (*Curcuma longa* L.), *Vidanga* (*Embelia ribes* Burm.f.), *Jatamansi* (*Nardostachys jatamansi* DC.) and *Karpura* (*Cinnamomum camphora* L.) for 30 minutes. 1.750 litres of *Guda* mixed *Kashaya* was poured into the porcelain pot.

Adding of *Sandhana Dravya*

125g of *Dhataki pushpa* was added to the pot and mouth was closed with clean *Dhoopita Vastra* (cloth) and kept till initiation of fermentation was observed.

Sandhana Sthala

Various changes were noted to identify the onset of fermentation. The pot was closed and *Sandhibandhana* was done with mud smeared cloth when the signs of initiation of fermentation were observed. The pot was then placed in dry place of a dark room with minimum temperature variations to allow further fermentation. After *Sandhibandhana* was dried, the pot was kept in a cardboard box which was filled with husk. After completion of process of fermentation, the pot was opened carefully and the prepared *Arishta* was filtered into another vessel and kept in airtight container.

Observation: During the onset of fermentation - After 5 days, onset of fermentation was observed. Slight alcoholic smell started to appear. Consistency was slightly thick. Taste of *Guda* was predominant. Small dot of fungal growth was seen which was removed with dry spatula.

Sandhibandhana was performed. After proper drying of *Sandhibandhana*, the pot was kept into the cardboard which was filled with husk.

After the completion of fermentation– *Sandhibandhana* of pot was removed. *Arishta* was cool to touch. Colour was dark black. Alcoholic smell was observed. The surface of the *Arishta* was clear. *Dhatakipushpa* were settled. Taste was *Madhura Pradhana Kashaya Rasa*. Consistency was not too thick.

Collection of *Arishta*

After the examination of completion of fermentation, the *Arishta* was decanted into another vessel after filtering through cora cloth. After the filtration, sediments at the bottom of the vessel were discarded.

Observation:- After proper filtration also, sediments were observed.

Maturation

The *Arishta* collected was transferred to another clean and dry container and kept undisturbed for a day. Filtration was done again on the next day to remove the sediments. On 7th and 14th day, slight sedimentation was observed on the previous container. It was filtered again using cora cloth to get clear *Arishta*. This helps to avoid further fermentation.

Observation:- The *Arishta* was brown in colour with very clear and thin consistency. It was having an alcoholic smell with a *Kashaya Tikta Madhura Rasa*.

Packing and Labelling

The final product was then packed in clean and dry food grade plastic bottles and it was properly labelled. Then, it was kept in a dark place to avoid the exposure to direct sunlight.

Sample 2: *Parthadyarishta* with stevia

Preparation of *Kashaya*

Coarse powder of 625g of *Arjuna Twak*, 313g of *Draksha*, 125g of *Madhukapushpa* were taken and soaked in water overnight. The next day, the *Kashaya* was kept in *Mandagni* on stove and reduced to 1/4th part. When *Kashaya* was around 1.6 L, vessel was taken out from fire and it has been filtered through clean and dry cora cloth and kept for self-cooling.

Observation: Colour of the *Kashaya* was light brown after 35 minutes. It changed into dark brown colour after 1 hour 15 minutes. After 1 hour 45minutes, smell of *Arjuna Kashaya* was observed. It took almost 3 hours to prepare the *Kashaya*. The decoction was having *Kashaya, Tikta Rasa.*

Preparation of *Kashaya* of Stevia leaves

Stevia leaves which were properly washed and dried were taken. It was kept soaked overnight in 1.6 l of water. The next day morning, this was transferred to stove and boiled till 400 ml was left. It was properly filtered using cora cloth and kept for self-cooling.

Adding of *Madhura Dravya*

The *Kashaya* of stevia was added to *Arjuna Kashaya* and mixed uniformly. After addition of *Kashaya* of Stevia, the decoction became 1.9 l.

Transferring into *Sandhana Patra*

Porcelain pot was washed, dried and kept ready. *Dhoopana* or fumigation was done to the pot and lid with *Guggulu* (*Commiphora mukul* Hook.ex.Stocks.), *Haridra* (*Curcuma longa* L.), *Vidanga* (*Embelia ribes* Burm.f.), *Jatamansi* (*Nardostachys jatamansi* DC.) and *Karpura* (*Cinnamomum camphora* L.) for 30 minutes. The decoction was poured into the porcelain pot.

Adding of *Sandhana Dravya*

Dhataki pushpa (125g) was added to the pot and mouth was closed with clean *Dhoopita Vastra* (cloth) and kept for observing initiation of fermentation.

Sandhana Sthala

Various changes were noted to identify the onset of fermentation. The pot was closed and *Sandhibandhana* was done with mud smeared cloth when the signs of initiation of fermentation were observed. The pot was then placed in dry place of a dark room with minimum temperature variations to allow further fermentation. After *Sandhibandhana* was dried, the pot was kept in a cardboard which was filled with husk. After completion of process of fermentation, the pot was opened carefully and the prepared *Arishta* was filtered into another vessel and kept in airtight container.

Observation

During the onset of fermentation - After 5 days, onset of fermentation was observed. Slight alcoholic smell was observed. Consistency was slightly thick. Taste of stevia was predominant. A layer of fungal growth was seen that was removed with dry spatula.

Sandhibandhana was performed. After proper drying of *Sandhibandhana*, the pot was kept into a cardboard box filled with husk.

After the completion of fermentation– After 45 days, *Sandhibandhana* of pot was removed. The *Arishta* was cool to touch. A dark black colour and alcoholic smell was observed. The taste was *Madhura Pradhana Kashaya Rasa*. Consistency was not too thick.

Collection of *Arishta*

After examination of the completion of fermentation, the *Arishta* was decanted into another

vessel after filtering through a cora cloth. After the filtration, sediments at the bottom of the vessel were discarded.

Observation:- After proper filtration also, sediments were observed.

Maturation

The *Arishta* collected was transferred to another clean and dry container and kept undisturbed for a day. On the next day, filtration was done again to remove the sediments. On 7th and 14th day, it was filtered again through cora cloth to get clear *Arishta*. Slight sedimentation was observed on the previous container. By doing this, further fermentation was avoided.

Observation:- *Arishta* was brown colour with very clear and thin consistency. It was having an alcoholic smell with a *Kashaya Tikta Madhura Rasa*.

Packing and Labelling

The final product was then packed in clean and dry food grade plastic bottles and it was properly labelled showing the full information about the formulation. Then, it was kept in a dark place to avoid the exposure to direct sunlight.

Precautions taken during both the preparations

All the materials used like vessels, cloth etc. for the procedure were sterilised. The drugs properly dried and made into coarse powder were taken. The drugs were soaked overnight before application of heat to allow imbibition inside the tissues of the drug. The vessels used for soaking were covered properly to avoid contamination. Mild heat was applied during the whole procedure to avoid losing of active principles. Clean dry cotton cloth was used for filteration to avoid contamination. Squeezing was properly done to avoid wastage during filteration. The hot vessels were handled properly during filteration to avoid burns. Hard water was avoided and soft water was used instead. *Sandhana Patra* was properly cleaned, dried and fumigated to avoid contamination. In *Sandhana Patra*, space was left for the circulation and liberation of carbon dioxide gas during the fermentation process. *Sandhibandhana* was done properly to avoid air contact.

RESULTS

Quantity of *Arishta* with *Guda* (sample 1): At the supernatant level –950 ml

At the lower portion –200ml

After squeezing the *Dhataki pushpa* – 150ml Weight of *Kinwa* –145 g

Total quantity obtained –1.300 litres

Quantity of *Arishta* with stevia (sample 2):

At the supernatant level –800 ml At the lower portion –200 ml

After squeezing the *Dhataki pushpa* – 150ml Weight of *Kinwa* –130 g

Total quantity obtained –1.150 litres.

DISCUSSION

Pharmaceutical research focuses on standard operational methods such as raw drug collection, purification, technique of manufacture, mode of administration, dosage etc. These processing procedures are intended to improve bioavailability, efficacy, and safety. Here 2 samples of *Parthadyarishta* were prepared. Sample 1 was *Parthadyarishta* prepared with *Guda* and sample 2 was *Parthadyarishta* prepared with stevia.

In sample 1, *Guda* was pounded in *Khalwayantra* and dissolved in *Arjuna Kashaya* over mild fire after which it was filtered using cora cloth. The quantity of the solution was 1.750 l after dissolving *Guda*. In sample 2, washed and dried stevia leaves were soaked overnight in 1.6 l of water. Next day morning, *Kashaya* was prepared out of it by reducing it to 200ml. This *Kashaya* was added to *Arjuna Kashaya* after self-cooling. The quantity of the decoction was 1.9 l after adding *Kashaya* of stevia.

On 5th day, both the samples were opened to check the onset of fermentation. In sample 1, *Dhatakipushpa* started sinking and a mild smell of alcohol was observed. Taste was predominantly of *Guda*. In sample 2, few of the *Dhatakipushpa* when compared to sample 1 started sinking. A growth of white fungus was also visible on the surface. Smell of alcohol was milder when compared to sample 1. Taste was predominantly of stevia. The fungus was removed from the sample 2, *Sandhibandhana* was done on both the samples and kept for further fermentation.

After 45 days, both the samples were opened. In sample 1, *Dhatakipushpa* were sinking and the surface was clear. Smell and taste of alcohol were observed. In sample 2, *Dhatakipushpa* were sinking and a layer of fungus was seen over the surface. Smell and taste of alcohol were observed in the sample. The layer of fungus was removed without disturbing the rest of the *Arishta*. Both the *Arishtas* were filtered using cora cloth.

Sample 1 was found thicker and took more time to pass through cora cloth while filtering when compared to sample 2. Both the samples tasted *Kashaya*, *Tikta* and *Madhura*. Alcoholic

smell was observed in both the samples. Total quantity of sample 1 obtained was 1.300 l whereas sample 2 was 1.150 l. After filteration, both the samples were stored in airtight containers and observed for a week. Sediments were formed in both the samples and were filtered using cora cloth.

CONCLUSION

Parthadyarishta is an Ayurvedic formulation mentioned in *Bhaishajya Ratnavali*, *Hridrogadhikara*. It is indicated in cardio-vascular and respiratory diseases. Now a days, people who suffer from cardio-vascular diseases along with diabetes mellitus are common. In this present era, people are more health conscious and prefer sugar-free products. In order to cope up with this present scenario, there is a need for replacing *Guda* in the *Arishta* with a substitute like leaves of stevia. Therefore, to compare the pharmaceutical preparation of *Parthadyarishta* prepared with *Guda* and stevia, this study was undertaken. The pharmaceutical procedures were found to be almost the same except the addition of *Madhura Dravya*. Fungal growth was observed in sample 2 which was not present in sample 1. Even though the fungus observed seems to be healthy fungus, further study is required to understand the quality, safety, efficacy and shelf-life of the *Arishta*.

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