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Pharmaceutical Study of *Ashtanga Ghrita*

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ABSTRACT

Ayurveda, a science of life aims at protection of health of a healthy person and cure of the diseased one through its holistic approach. Pharmaceutics is a science of dosage form design. Among other preparations of *Bahishajya Kalpana*, *Sneha Kalpana* is one of the widely used and preferred pharmaceutical processes of Ayurveda system of medicine. *Sneha Kalpana* is the pharmaceutical process prepared by adding one part of *kalka dravya*, four parts of *Sneha dravya* and sixteen parts of *drava dravya* on a particular heating pattern for specific duration of time. It is a pharmaceutical process adopted to produce an oleaginous medicament where the transformation of active principles takes place from the raw materials to the solvent. *Ghrita* is considered as best media among four types of *Sneha*, which facilitates the transformation of fat soluble and water-soluble constituents from drugs to lipid media without changing its own properties and without altering the properties of the drugs. When herbal drugs processed with ghee, prepared medicament will be able to carry the active components of the drugs to the targeted areas and perform many fold actions. *Ashtanga Ghrita* is one such unique formulation with eight key ingredients *Vacha, Bakuchi, Manduka parni, Shankapushpi, Shatavari, Brahma Soma, Amruta* and *Brahmi* as *kalka dravya, Ghrita* as *sneha dravya* and *Godugdha* as *dravadravya*. *Phalashruti* of the preparation are *Ayushkara, Medha, Smriti, Buddhi* and *Vak prada.* The formulation is named as *Ashtanga Ghrita* based on the presence of eight ingredients with *ghrita* as the *sneha dravya*.

Key Words *Ayurveda, Bhaishajya kalpana, Sneha Kalpana, Ghrita kalpana, Ashtanga ghrita*

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INTRODUCTION

Ayurveda, the science of life considered as *upaveda* of *Atharvaveda* deals about the life style adaptations like daily regimen, seasonal regimen, dietary management and other day to day activities which can enhance the life span and prevent the onset of diseases. Pharmaceutics is the discipline of pharmacy which deals with all facts of the process of turning a new chemical entity into a medication able to be used safely and effectively by patients in the community. The drugs should be taken in easily absorbable form rather in raw nature. Therefore, different procedures are mentioned in our classics under the heading of *Bhaishajya Kalpana* which are the special pharmaceutical techniques adopted to convert the raw drug to a dosage form which can be readily absorbed and assimilated by the body.

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Sneha kalpana is pharmaceutical process, prepared by using one part of '*Kalka dravya*, 4 parts of *Sneha dravya and* 16 parts of *Drava dravya'*[1]. By this process, the transformation of active principles of the ingredients to the solvents takes place. Hence the hydrophilic and lipophilic constituents can be obtained through this dosage form. *Ghrita* is the best media because it has the property called *Samskarasya anuvartanam* and *Sahasra virya Vidhibhighrutam Karma sahasrakrut* [2] i.e., it undergoes transformation without changing its own inherent properties and carries active principles of drugs to increase the potency of the compound drug to possess thousands of functions. The formulation is named as *Ashtanga Ghrita* based on the presence of eight ingredients and it acts as *Medha, Smriti prada, Vakprada* and *Ayushyakara.* The pharmaceutical preparation of *Ashtanga ghrita* is dealt in this paper.

AIM

- To carry out the pharmaceutical study of *Ashtanga Ghrita*

OBJECTIVES

- To prepare the *kalka* for the *Sneha paka*
- To carry out the *Sneha paka*
- To confirm the *Sneha siddhi lakshana*

Ingredients

MATERIALS AND METHODS

Sources of Raw materials:

- *Vacha, Bakuchi, Manduka parni, Shankapushpi, Shatavari, Brahma Soma, Amruta* and *Brahmi* required for the preparation of *Ashtanga Ghrita* was collected from Amrut Kesari Depot, Bengaluru.
- *Goghrita* and *Godugdha* were obtained from the authentic sources from Bengaluru.
- Necessary processing of raw materials and preparation of Ashtanga Ghrita was carried out and authenticated by the experts in Teaching Pharmacy of Department of Rasa Shastra and Bhaishajya Kalpana, Adichunchangiri Ayurvedic Medical College, Nagarur.

Methods of Data Collection:

- *Ashtanga Ghrita*[3] reference is *available in the Ghrita Prakarana of Sahasra yogam.*
- *The method of preparation of Ashtanga ghrita* is carried out as per *Sharangadhara Samhita*[4].

Pharmaceutical study of *Ashtanga Ghrita*

Proportion: 1/8:1:4:4 =*Kalka: Sneha: Dugdha: Jala* (4 parts of *Sneha)*

Time duration: 32 hours

Reference: *Sahasra yoga, Ghrita prakarana*

Table 1 Ingredients of *Ashtanga ghrita*

Sl.no	Ingredients	Botanical name	Part used	Quantity
1.	*Vacha*	Acorus calamus	Rhizome	250gms
2.	*Indulekha*	Psoralia corylifolia	Seed	250gms
3.	*Manduka Parni*	Centella asiatica	Whole plant	250gms
4.	*Shankapushpi*	Convolvulus pluricaulis	Whole plant	250gms
5.	*Shatavari*	Asparagus recemosus	Roots	250gms
6.	*Soma*	Arygereia speciosa	Roots	250gms
7.	*Amruta*	Tinospora cordiflolia	Leaves	250gms

ORIGINAL RESEARCH ARTICLE

8.	*Brahmi*	Bacopa monnieri	Whole plant	250gms
9.	*Goghrita*	Cow ghee	Cow ghee	16litres
10.	*Godugdha*	Cow milk	Cow milk	64litres
11.	*Jala*	Drinking Water	Drinking Water	64 litres[5]

Equipments required:

Khalwa yantra, Spoon, Big Vessels, Gas Stove, Big ladle, Cloth and Plate

Procedure:

1. Preparation of *Kalka:*

- All the ingredients like *Vacha, Bakuchi, Mandukaparni, Shankapushpi, Shatavari, Brahma Soma, Amruta* and *Brahmi* are pounded separately in clean khalwa yantra **[Figure No-1-8].**
- After proper pounding, the above-mentioned drugs are sieved separately through a clean cloth to get fine powder of each drug.
- Later, 250 grams of fine powder of each ingredient are taken in clean stainless-steel vessel and mixed properly with the ladle.
- After attaining the homogenous mixture of powders, it is added with 2 litres of *Godugdha* to prepare *Kalka.*

2. Preparation of *Ghrita:*

- 16 litres of *ghrita* are taken in a clean wide mouthed vessel for the preparation and heated on *mandagni* till foams start appearing on its surface and colour of *ghrita* changes.
- Fire is put off and stirring is done to avoid the charring of the *Dravya* for the proper cooling of Ghee.
- Prepared *kalka* is added with continuous stirring **[Figure 17]**
- 62 litres of remaining *Godugdha* taken for the preparation added carefully to the vessel containing *Ghrita*, followed by 64 litres of *Jala* for the *Samyak paka* of *Sneha* **[Figure 19 & 20].**
- The whole mixture is stirred to get homogenous mixture, so that all the ingredients distribute well and undergo proper paka throughout the process.
- Temperature maintained throughout the preparation is *Mandagni.*
- Continuous stirring is done for the proper *paka* and to avoid the carbonisation *of kalka dravyas.*
- Paka is stopped after attaining the *Ghrita siddhi lakshanas.*
- Prepared *ghrita* is filtered through clean kora cloth to a stainless-steel vessel.
- The obtained *Ghrita* is measured using volumetric jar.
- The quantity obtained is 15,530ml.
- The obtained *Ghrita* is packed in air tight container after self-cooling.

Observation:

Observations noted during the ghrita paka like change in the colour, odour and nature of ghrita [Table No-2]

Table 2 Observations noted during the *ghrita paka*

Duration	Observation
Initial paka of *ghrita*	Foam and sound were appeared
One hour	Yellow colour to light brown**. [Figure16]**

ORIGINAL RESEARCH ARTICLE

Two hours	Milk starts to boil and yields pleasant odour of *ghrita* and milk. **[Figure21]**
After Two hours	Dense formation of foam seen on the surface of *ghrita*
After 12 hours	The colour of *ghrita* changes to dark green colour, pleasant odour of *dugdha* and *ghrita* was appreciated. **[Figure22]**
After 20 hours	Gradual reduction in the quantity of the *snehapaka* is observed.
After 26 hours	*Kalka* was tested but shows the presence of moisture content
After 28 hours of boiling	Foam started to diminish **[Figure25]**
After 30hours of boiling	The Bitter Taste and Green Colour of *ghrita* were appreciated.
After the 32 hours of paka	*Kalka* was tested again for the *Sneha siddhi lakshanas*[6]*:* When the *kalka* was rolled between thumb and index finger, it attained wick shape without any difficulty. **[Figure27]** When *kalka* is placed on fire with *samdamsha yantra*, it burnt without producing any crackling sound. **[Figure28]** Foam disappeared at the end of the *Sneha paka.* Pleasant odour and bitter taste of the ingredients were appreciated at the end of the *Ghrita paka.* The final obtained product was green in colour. **[Figure32]**

Special precautions:

- The vessel must be clean and wide mouthed with adequate size to accommodate the ingredients for the preparation.
- After paka the ghee for one hour, it should be subjected to cool.
- Fine powder of the ingredients was taken for the *kalka* preparation.
- After the cooling of *ghrita*, homogenous paste of fine powders should be added carefully to avoid the spillage of ghee and such accidents.
- Sequential order of the addition of drugs as *Ghrita, Kalka, Dugdha* followed by *jala* to be maintained for the proper mixing of drugs.
- Paka should be carried out on *mandagni* throughout the *paka.*
- On each day of *paka*, after the cooling of *ghrita* vessel should be closed with the clean wide lid to maintain the hygiene and mixing of external impurities.
- Continuous stirring should be done at the end part of the preparation to avoid the charring of the drugs.
- *Sneha paka siddhi lakshanas* should be carefully monitored.
- Filtration of *ghrita* should be done after attaining the *siddhi lakshanas* and when it is hot by using clean kora cloth
- Proper squeezing of the *kalka dravyas* to be done during the filtration to get the maximum yield of the *ghrita.*
- Final part of *ghrita* in the vessel should be filtered again using filter paper to avoid the collection of minute particles of *kalka.*
- Filtered *ghrita* should be measured using volumetric jars.
- After self-cooling, *Ghrita* should be stored in air tight container.

RESULTS AND DISCUSSION

The reference of *Ashtanga ghrita* mentioned in the classical text *Sahasra Yoga.* The method of preparation is carried out as per *Sharangadhara samhita* for the proper extraction of active principles from the drug. The yield obtained was 15,530ml.

ORIGINAL RESEARCH ARTICLE

Discussion on ingredients and its ratios:

The fine powder of the dry drugs is taken to prepare *kalka* so that the increased surface area helps in quick extraction of active principles by facilitating easy dissolution in the media. Hence the obtained formulation will be more effective with more absorption rate. The *Kalka dravyas* are taken in 1/8th part of *sneha dravya* as per the rules mentioned for *kalka* and *drava dravya* in *sneha kalpana*. *Sneha dravya* ie. *Goghrita* is taken in one part. Plain ghee is taken instead of *Murchita ghrita* in order to know the action of the ingredients mentioned under the *Ashtanga ghrita* only and to avoid the interference of action of drugs used for the *Murchana. Dravadravya - Goksheera* is taken in the ratio 4 parts and additionally *jala* is added 4 parts to that of *sneha dravya* for the proper *paka of sneha*. The *kalka* is added initially into the vessel containing warm *Ghrita* followed by *Dugdha* and *Jala.*

Discussion on Requirements:

A wide mouthed big vessel should be taken to accommodate the ingredients subjected for the *sneha paka.* Furthermore, it should be wide so that each drug molecule will come in contact with the lipid molecule and aqueous molecule which facilitate the extraction of active principles of the drugs. Ladles should be long and big to stir continuously to avoid the burning of drugs. Gas stove is taken to maintain uniform temperature (mild fire) throughout the procedure. Wide lid should be used to cover the vessel after each day of *ghrita paka* to avoid the addition of external impurities and to maintain hygiene.

Discussion on pharmaceutical study:

The plain ghee is heated for one hour to remove the moisture content from it. After one hour of paka the colour of *ghrita* changes from yellow colour to light brown. The change in the colour and odour of *ghrita* signifies the Murchana samskara only. *Mandagni* is maintained throughout the procedure for the proper extraction of lipid and water-soluble active molecules. The *ghrita, dugdha* and *kalka dravyas* were homogenous initially mixed together to form a heterogenous mass during the boiling process and the intensity of green colour increased after 20 hours of paka. After 28hours of boiling, the mixture of *sneha paka* was reduced and the *kalka dravya* was taken to test the *Sneha siddhi lakshanas*. Due to the presence of moisture content, boiling was continued. After 30 hours of boiling, foam started to diminish, the Bitter Taste and Green Colour of *ghrita* were appreciated. The reduction in the quantity and increase in the consistency of the liquid was also seen. The *ghrita* separated from the *kalka* at the end of the *Sneha paka.* After the 32 hours of paka, *kalka* was tested again for the *Sneha siddhi lakshanas.*

Firstly, when the *kalka* was rolled between thumb and index finger, it attained wick shape without any difficulty. If the moisture content is still present, *kalka* cannot be rolled into *varti,* even if it is rolled it will break. Secondly, when *kalka* is placed on fire with *samdamsha yantra,* it burnt without producing any crackling sound. It also signifies the absence of moisture content in the prepared *paka,* if it burns with sound represents

ORIGINAL RESEARCH ARTICLE

the presence of water content in it. Foam disappeared at the end of the *Ghrita paka*. The cow ghee contains saturated fatty acids, after mixing with *kalka* and *drava dravya*, which on paka undergo liquefaction which is seen in the form of foam on the surface. After the complete evaporation of water content from the mixture, foam disappears. A combination of *ghrita* and *dugdha* results in a fragrance which was appreciated throughout the process. Pleasant odour and bitter taste of the ingredients was appreciated at the end of the *Ghrita paka*. The final obtained product was green in colour.

Discussion on the yield:

In order to obtain optimum quantity of *ghrita*, the *kalka* should be squeezed at hot stage only after the *paka*. The prepared *sneha* was filtered through clean kora cloth and measured through volumetric jars. The total yield obtained is 15,530ml. There is no much loss observed may be due to the usage of *godughda* the fat content was released to the *ghrita* and the obtained loss is may be due to the manual filtration.

Discussion on the time duration for the *paka:*

Preparation of *ghrita* took 32 hours, daily 8 hours of paka was carried out for four days. After the first day of *paka* intermittent time gap was given and the next day *paka vidhi* was continued. During the gap, *sneha* was kept in the container by closing the lid in order to maintain the hygiene and to avoid the addition of external impurities.

Because of the longer duration of *sneha* preparation more dissolution of active constituents of the drugs used in the form of *kalka* and *drava dravya*, into the *sneha* takes place. Thus, the potency of *ghrita* is expected to be enhanced. As *godugdha* was used as *drava dravya*, *sneha paka* should be carried out for 2 days in order to facilitate the proper fixation of active principles with *sneha*, *sneha paka* was carried out for four days with 8 hours of paka on each day till the attainment of *siddhi lakshanas*.

CONCLUSION:

- *Sneha kalpana* is a unique dosage form, it not only extracts water soluble, fat soluble but also protein soluble active principles can be extracted from the process if the *drava dravya* is *Godughda*.
- Additionally, four parts of water is added for the proper extraction of active substitutes from the drugs.
- The time duration taken was four days with eight hours of paka on *mandagni*.
- The yield obtained was optimum without much loss and the loss is due to the manual filtration.
- Initially, *ghrita* which was yellow colour changed to dark green at the end of the *sneha paka*. The preparation was tested for the *ghrita siddhi lakshanas* and positive results were obtained.

ORIGINAL RESEARCH ARTICLE

Figure 1 Vacha

Figure 2 Bakuchi

Figure 3 Mandukaparni

Figure 4 Shankapushpi

Figure 5 Shatavari

Figure 6 Brahmasoma

Figure 7 Guduchi

Figure 8 Brahmi

Figure 9 Goghrita

Figure 10 Godugdha

Figure 11 Jala

Figure12 Ghrita before paka

ORIGINAL RESEARCH ARTICLE

Figure 13 Homogenous mixture of kalka dravyas

Figure14 Addition of dugdha

Figure 15 Preparation of kalka

Figure 16 After1 hour of paka

Figure 17 Addition of kalka

Figure18 Mixing of Ghrita & kalka

Figure 19 Addition of Godugdha

Figure 20 Addition of Jala

Figure 21 After 2hours of paka

Figure 22 After 12 hours

Figure 23 After 16hours

Figure 24 After 24 hours

ORIGINAL RESEARCH ARTICLE

Figure 25 After 28 hours

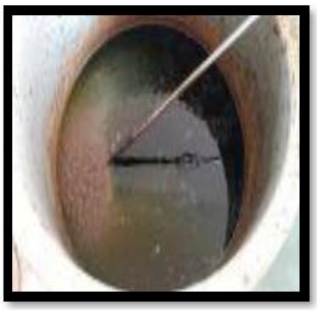

Figure 26 After 32 hours

Figure 27 Kalka rolled like Varti

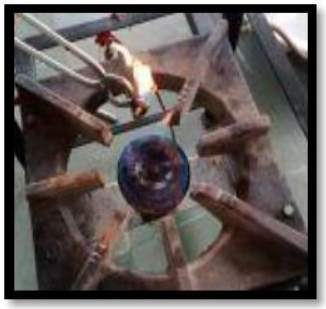

Figure 28 Kalka burns without sound

Figure 29 Ghrita before filtration

Figure 30 Ashtanga ghrita filtration

Figure 31 Residue of kalka after filtration

Figure 32 Ghrita After filtration

ORIGINAL RESEARCH ARTICLE

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