ABSTRACT

Rasashastra & Bhaishajyakalpana (Ayurvedic Pharmaco-therapeutics) is branch of Ayurved which is enriched with many herbal & Herbo-mineral formulations. Among these Snehabalpana holds it superiority. In Sneha Kalpana; kalka (bolus of drugs) and dravya (liquid material) are mixed in specific proportion and heated with oil or ghrita by applying constant and moderate heat till it fulfil certain pharmaceutical parameters. While reviewing texts one came across many formulations and different pharmaceutical procedures of the same compound drugs. It is indeed a need of time to develop Standard Manufacturing Procedure of Panchakoladi Ghrita. In this study each and every step has been studied in detail and documented in sequential manner. The prepared drug is assessed for quality parameters prescribed in Ayurvedic Pharmacopoeia of India (API). The results obtained are found to be within acceptable limits prescribed in API. This study is small step towards standardization of Panchakoladi Ghrita.

KEYWORDS: Snehabalpana; Ayurvedic Pharmacopoeia of India (API); Panchakoladi Ghrita.

INTRODUCTION

Ayurveda has prescribed large number of plants and compound formulations in different dosage form for the treatment of various disorders. Among these Snehabalpana holds it superiority. In SnehaKalpana; kalka (bolus of drugs) and dravya (liquid material) are mixed
in specific proportion and heated with oil or ghrita by applying constant and moderate heat till it fulfil certain pharmaceutical parameters.\cite{1}

_Panchakoladi Ghrita_ is prescribed in the ailments like Grahani, Rajyakshama, Gulma, Jwar, Kasa, Pandu etc.\cite{2} Considering the easy availability of its ingredients and clinical utility it is used abundantly by Ayurved practitioner. Now-a-Days there is trend in Ayurved Practitioner to prepare the medicine on their own and dispense to their patients. But lots of time while preparing drugs due to lack of availability of Standard Manufacturing Procedures, it has been compromised in many preparatory and quality parameters issues which in turn results into preparation of substandard medicine.

_Rasashastra & Bhaishajyakalpana_ (Ayurvedic Pharmaco-therapeutics) is branch of Ayurved which is enriched with many herbal & Herbo-mineral formulations. While reviewing texts one came across many formulations and different pharmaceutical procedures of the same compound drugs. There are no detail guidelines regarding preparations and quality parameters assessment. One has to read in between the lines. It is indeed a need of time to develop Standard Manufacturing Procedure of _Panchakoladi Ghrita_.

Considering all these facts the pharmaceutical procedure of _Panchakoladi Ghrita_ has been selected for study. In this study each and every step has been studied in detail and documented in sequential manner. To confirm the quality of prepared medicine it has been assessed according to quality parameters prescribed in Ayurvedic Pharmacopoeia of India which falls in prescribed limit. This study will definitely prove to be helpful in establishing Standard Manufacturing Procedure of _Panchakoladi Ghrita_ which is a milestone for Standardization of _Panchakoladi Ghrita_.

**AIM**


**OBJECTIVES**

1) To develop a Standard Preparatory Aspect of _Panchakoladi Ghrita_.
2) Physicochemical Analysis of _Panchakoladi Ghrita_ according to Ayurvedic Pharmacopoea of India (API).
REVIEW OF LITERATURE

While studying preparatory procedure of *Panchakoladi Ghrita*, an extensive review of ingredients have been carried out as follows.

<table>
<thead>
<tr>
<th>INGREDIENTS</th>
<th>SYNONYMS</th>
<th>SWARUP</th>
<th>RASA</th>
<th>VEERYA</th>
<th>VIPAKA</th>
<th>DOSHAGHNATA</th>
<th>ROGAGHNATA</th>
<th>MATRA</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Shunthi</em> (Zingiberofficinale)</td>
<td><em>Nagar, Mahaushadha, Vishwabhe shaj, Sonth</em></td>
<td>Herbaceous perennial, grows annual stems about a meter tall with narrow green leaves and yellow flowers. Its rhizome is called ginger which when dried is called ‘Shunthi’.</td>
<td>Katu</td>
<td>Ushna</td>
<td>Madhur</td>
<td>Kapha-vaataghna</td>
<td>Aamvata, Vatavyadhi, aruchi, chardi, agnimandhya, kasa, shwasa, hikka, pratishyaya, jwara, kushtha, pandu</td>
<td>Churna 1-2gm</td>
</tr>
<tr>
<td><em>Chavva</em> (Piperretrofractum)</td>
<td><em>Chavika, Chabh</em></td>
<td>Climbing vine with stems of about 3-4mm diameter, leaves having blades that are glabrous, lanceolate, asymmetric base and are 10-12cm long, 3-3.5cm wide. The vine is dioecious. Its berries are arranged densely on the axis and are spherical.</td>
<td>Katu</td>
<td>Ushna</td>
<td>Katu</td>
<td>Kapha-vataghna</td>
<td>Agnimandhya, ajirna, arsha, krimi, kasa, shwas</td>
<td>Churna 1-2gm</td>
</tr>
<tr>
<td><em>Chitrak</em> (Plumbagozeylanica)</td>
<td><em>Agni, Cheeta, Chitramool</em></td>
<td>Herbaceous plant with glabrous stems that are climbing, prostate or erect. The leaves are petiolate or sessile, having lance-elliptic blades 5-6cm long and 2-4cm wide. Inflorescences are 3-15cm in length. Heterostylos flowers have white corollas. Capsules contain reddish brown seeds.</td>
<td>Katu</td>
<td>Ushna</td>
<td>Katu</td>
<td>Kapha-vataghna</td>
<td>Shlipada, shotha, shwitra, agnimandhya, grahani, yakritvikara, arsha, krimi roga, kasa, jeemapratish yay, kushtha, jwara</td>
<td>Churna 1-2gm</td>
</tr>
<tr>
<td><em>Pippali and Pippalimool</em> (Piper longum)</td>
<td><em>Vaidehi, Krishna, Kanaa, Tikshnat</em></td>
<td>Slender, aromatic, climber with perennial woody</td>
<td>Katu</td>
<td>Anushnas hita</td>
<td>Madhur</td>
<td>Vata-kaphaghna</td>
<td>Kushtha, arsha, krimi, amvata, vatarakta, agnima</td>
<td>½-1gm</td>
</tr>
</tbody>
</table>
andula, Ushna roots, creeping and jointed stems and fleshy fruits embedded in spikes. Leaves are numerous, 6.3-9 cm, dark green in colour. The older leaves are dark in colour and heart shaped. Flowers are monoecious. Male and female flowers born on different plants. Fruit is long. It attains red colour after ripening and black colour after drying. The plant flowers in rain and fruits in early winters.

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>NAME OF TEXT</th>
<th>INDICATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>AshtangSangrahaChikitsaSthan 7/34-35</td>
<td>Grahani, Rajyakshama, Gulma, Jwar, Kasa, Pandu</td>
</tr>
<tr>
<td>2</td>
<td>AshtangHridayaChikitsaSthan 5/22-23</td>
<td>Grahani, Rajyakshama</td>
</tr>
<tr>
<td>3</td>
<td>CharakSamhitaChikitsaSthan 8/169-170</td>
<td>Rajyakshama</td>
</tr>
<tr>
<td>4</td>
<td>CharakSamhitaChikitsaSthan 15/170</td>
<td>Grahani</td>
</tr>
</tbody>
</table>

After reviewing through Ayurvedic texts Panchakoladi Ghrita has been found mentioned in various Samhitas with slight differences in ingredients and indications. The details are summarized in following table.
Previous works done on Panchakoladi Ghrita

- Rajendra Kumar Singh et al carried out a clinical study of Panchakolaavaleha in respect of its toxicological evaluation on albino rats.
- SangitaD.More et al carried out a clinical study of PanchakolaSiddhaYavagu in the management of Agnimandya.
- Hemal R. Trivedi et al carried out a clinical study of PanchakolaSiddhaYavagu in the management of Vataraktasamavastha.
- Channappa R. Harisha studied the pharmacognostical and pharmacetical aspect of Panchakolachurna.

MATERIAL AND METHODS

The present study has been done in following two heads
1. Preparatory Aspect of Panchakoladi Ghrita.
2. Quality Parameters assessment of Panchakoladi Ghrita.

1. Preparatory Aspect of PanchakoladiGhrita

It is further divided into
a) Pre-Operative Phase
b) Operative Phase
c) Post-Operative Phase

a) Pre-Operative Phase

In this phase pre-requisites of Panchakoladi Ghrita has been prepared ready.

It is further divided into
i) Collection of Raw Materials
ii) GhritaMurchana

i) Collection of Raw Materials

Raw materials of pharmacopeial quality has been procured from local market (GMP Certified Company) and identified by Dravyaguna Expert.

Ingredients

The ingredients of Panchakoladi Ghrita are as follows.
Table 3: Ingredients with proportion For GhritaMurchana

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>INGREDIENTS</th>
<th>QUANTITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>01.</td>
<td>AmalakiChurna(Emblicaofficinalis)</td>
<td>40 g</td>
</tr>
<tr>
<td>02.</td>
<td>HaritakiChurna(Terminaliachebula)</td>
<td>40 g</td>
</tr>
<tr>
<td>03.</td>
<td>BibhitakChurna(Terminaliabellarica)</td>
<td>40 g</td>
</tr>
<tr>
<td>04.</td>
<td>HaridraChurna(Curcuma longa)</td>
<td>40 g</td>
</tr>
<tr>
<td>05.</td>
<td>MustaChurna(Cyperusrotundus)</td>
<td>40 g</td>
</tr>
<tr>
<td>06.</td>
<td>Go-ghrita(Cow’s ghee)</td>
<td>1 kg</td>
</tr>
<tr>
<td>07.</td>
<td>MatulungaSwaras(Citrus medica)</td>
<td>As required</td>
</tr>
</tbody>
</table>

Table 4: Ingredients with proportion For Panchakoladi Ghrita Nirman

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>INGREDIENTS</th>
<th>QUANTITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>01.</td>
<td>PippaliChurna(Piper longum)</td>
<td>30 g</td>
</tr>
<tr>
<td>02.</td>
<td>PippalimulaChurna(Piper longum)</td>
<td>30 g</td>
</tr>
<tr>
<td>03.</td>
<td>ChavyaChurna(Piper retroflectum)</td>
<td>30 g</td>
</tr>
<tr>
<td>04.</td>
<td>ChitrakarootChurna (Plumbagozeylanica)</td>
<td>30 g</td>
</tr>
<tr>
<td>05.</td>
<td>ShunthiChurna(Zingiberofficinale)</td>
<td>30 g</td>
</tr>
<tr>
<td>06.</td>
<td>YavaksharChurna(Hordeumvulgare)</td>
<td>30 g</td>
</tr>
<tr>
<td>07.</td>
<td>Go-dugdha</td>
<td>1 lit</td>
</tr>
<tr>
<td>08.</td>
<td>MurchitGhrita</td>
<td>915 ml</td>
</tr>
<tr>
<td>09.</td>
<td>Water</td>
<td>3 lit</td>
</tr>
</tbody>
</table>

ii) Ghrita Murchana[^8]

➢ Procedure of Ghrita Murchna.

Ingredients

1) Ghrita – 1kg
2) Haritakichurna (Terminaliachebula) – 40gm
3) Bibhitakchurna (Terminaliabellarica) – 40gm
4) Amalakichurna(Emblicaofficinalis)– 40gm
5) Mustachurna(Cyperusrotundus) – 40gm
6) Haridrachurna(Curcuma longa)– 40gm
7) Matulungkinaswaras (Citrus medica) – as required
8) Water – 3L

Method

- The kalka was prepared by all the kalka dravya churna by adding Matulunga Swaras.
- Go-ghrita was taken in a frying pan and heated over madhyamagni till complete evaporation of moisture becomes possible at temperature around 140°C.
- The kalka was added to ghrita after slight cooling at temperature around 85°C.
- Then the mixture was heated on mandagni with constant stirring for 10-15min. to complete the Snehapaka till Sneha Siddhi lakshana appear.
- Then the ghrita was taken out from fire and filtered through clean cloth in its mild hot stage.
- Thus the ghrita murchana was completed.

Thus, MurchitGhrita was obtained.

2) Operative Stage

This stage consists of actual preparation of Panchakoladi Ghrita. It consists of following steps.

- The kalka was prepared by all the kalkadravya.
- Then the murchitghrita was heated slightly in the frying pain.
• The prepared *kalka* was then added slowly to the *murchitghrita* with constant stirring.
• Water was added in proportion to 3 times of *sneha* when *kalka* became light brown in colour with constant stirring.
• Next day, 1lit of cow milk was added to the above mixture and heated on *mandagni* till *snehasiddhilakshana* appeared.
• Then the *ghrita* was taken out from fire and filtered through clean cloth in its mild hot stage.

![IMAGE 2: Preparation of *PanchakoladiGhrita*.](image)

3) Post-Operative Stage

In this stage the *Ghrita* was tested for the *SnehaSiddhilakshana* and was then filtered and packed.

*Sneha Siddhi lakshana (Confirmatory Tests)[11]*

1) *Phenpariksha* - Subsidence of froth in case of *ghritai.e, phen shanti*.
2) *Vartipariksha* - Formation of *varti* from *kalka*.
3) *Agnipariksha* - On exposing the *varti* to flame, the absence of crackling sound indicates absence of moisture.
4) *Gandhpariksha* - The *sneha* smells of the *dravyas* used.

The prepared *PanchakoladiGhrita* was stored in airtight PEP container.
2. **Quality Parameters Assessment of *Panchakoladi Ghrita***
   The analytical study of *Panchakoladi Ghrita* is conducted in following parameters.

1) **Refractive Index**[^12]
   The refractive index (η) of a substance with reference to air is the ratio of the sine of the angle of incidence to the sine of the angle of refraction of a beam of light passing from air into the substance. It varies with the wavelength of the light used in its measurement.

2) **Specific gravity**[^13]
   The specific gravity of a liquid is the ratio of the weight of a volume of a substance to the weight of an equal volume of the reference substance at the same temperature, all weighing being taken in air.

3) **Determination of Iodine Value**[^14]
   The Iodine value of a substance is the mass of iodine in grams that is consumed by 100 grams of a chemical substance.

4) **Determination of Acid Value**[^15]
   The acid value is the number of mg of *potassium hydroxide* required to neutralize the free acids in 1 g of the substance.

**OBSERVATIONS**
- **Table 5 – Ghrita Murchana.**

<table>
<thead>
<tr>
<th>Sr.No.</th>
<th>TASK</th>
<th>QUANTITY</th>
<th>DURATION</th>
<th>REMARKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>01.</td>
<td>Heating the ghrita</td>
<td>1 lit</td>
<td>10 min.</td>
<td></td>
</tr>
<tr>
<td>02.</td>
<td>Addition of Kalka</td>
<td>250 g</td>
<td>5 min.</td>
<td>Froth formation</td>
</tr>
<tr>
<td>03.</td>
<td>Heating of mixture</td>
<td>-</td>
<td>15-20 min.</td>
<td>Light brown colour kalka formed.</td>
</tr>
<tr>
<td>04.</td>
<td>Filtration</td>
<td>915 ml</td>
<td>5 min.</td>
<td>Mustard yellow coloured MurchitGhrita</td>
</tr>
</tbody>
</table>
RESULTS

I. Preparatory aspect

Thus, 870ml of Panchakoladighrita was prepared according to the Standard Operating Procedure.

It took 4 days to complete the entire procedure.

II. Physicochemical analysis

a) Sp. Gravity at 40 deg.C = 0.9462
b) Refractive index = 1.345
c) Iodine value = 32gI/100g
d) Acid value = 1.7265mgKOH/g

DISCUSSION

Present research work has been done by aiming at developing a standard manufacturing procedure of PanchakoladiGhrita. PanchakoladiGhrita is commonly used formulations by Ayurvedic Physicians for Grahanirog, agnimandya, gulma, jwar, udarrog, shwasa, Kasa, shoth, pandu, rajyakshama etc. Many Ayurvedic Physicians prepare it on their own and dispense it to patients. Due to lack of comprehensive preparatory procedure and non mentioning of quality control parameters the self prepared Panchakoladi Ghrita is compromised on many issues while preparation and quality control assessment which results

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Table 6: Panchakoladi Ghrita Nirman.

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>TASK</th>
<th>DATE</th>
<th>QUANTITY</th>
<th>DURATION</th>
<th>REMARK</th>
</tr>
</thead>
<tbody>
<tr>
<td>01.</td>
<td>Heating of murchitghrita</td>
<td>09/03/2017</td>
<td>1 lit</td>
<td>5 min.</td>
<td></td>
</tr>
<tr>
<td>02.</td>
<td>Addition of Kalka</td>
<td>09/03/2017</td>
<td>250 gm</td>
<td>5 min.</td>
<td>Froth formation</td>
</tr>
<tr>
<td>03.</td>
<td>Addition of water with constant stirring</td>
<td>09/03/2017</td>
<td>3 lit</td>
<td>2.30 hrs.</td>
<td></td>
</tr>
<tr>
<td>04.</td>
<td>Addition of cow milk with stirring</td>
<td>10/03/2017</td>
<td>1 lit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>05.</td>
<td>Heating of mixture with constant stirring</td>
<td>10/03/2017</td>
<td>1 lit</td>
<td>2 hrs.</td>
<td>Colour of Ghrita changed to light green It smelled sweet.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>11/03/2017</td>
<td></td>
<td>2hrs.</td>
<td></td>
</tr>
<tr>
<td>06.</td>
<td>Filtration</td>
<td>11/03/2017</td>
<td>870 ml</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
in substandard medicine having lesser therapeutic value. To resolve this issue each and every step i.e. Raw Material Identification, Preparatory Procedure, Precautions & observations during procedure, In process quality control assessment, Prepared drug quality assessment were done in logical and sequential manner and documented. This SOP of *Panchakoladi Ghrita* will serve as guideline for Ayurvedic Physicians to prepare the genuine *Panchakoladi Ghrita* on their own.

**CONCLUSION**

The Sequential, Scientific and Logical illustration and documentation of each and every step viz. Raw Material Identification, Preparatory Procedure, Precautions & observations during procedure, In process quality control assessment, Prepared drug quality assessment will make the preparation of *Panchakoladi Ghrita* easy to execute and accurate. It will serve as a small step toward standardization of *Panchakoladi Ghrita*. The results of the *Panchakoladi Ghrita* coinside with the values of Ayurvedic Pharmacopoeia of India (API) and proves to be helpful in providing standard preparatory aspects and analytical values of *Panchakoladi Ghrita*.

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11. Pt. Sharangdhara, Sharangdhara Samhita, Hindi Teeka Dipika By Dr. Brahmanand Tripathi, Chaukhamba Surbharti Prakashan Varanasi, 2015, Madhyam Kanda, Chapter No. 9/12-13, Page No. 220


