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PHARMACEUTICAL STUDY OF PANCHAKOLADIGHRITA

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ABSTRACT

Rasashastra & Bhaishajyakalpana (AyurvedicPharmaco-therapeutics) is branch of Ayurved which is enriched with many herbal &Herbo-mineral formulations. Among these *Snehakalpana* 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: *Snehakalpana*; 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 *Snehakalpana* 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.[1]

Panchakoladi Ghrita is prescribed in the ailments like*Grahani,Rajyakshama, Gulma,Jwar, Kasa, Pandu* etc.[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 *PanchakoladiGhrita*.

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 *PanchakoladiGhrita* which is a milestone for Standardization of *Panchakoladi Ghrita*.

AIM

Study of Standard Manufacturing Procedure of *PanchakoladiGhrita* and its Physico-chemical Analysis.

OBJECTIVES

1) To develop a Standard Preparatory Aspect of *PanchakoladiGhrita*.
2) Physicochemical Analysis of *PanchakoladiGhrita* according to AyurvedicPharmacopea 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 1: Review of Ingredients.

INGREDIENTS	SYNONYMS	*SWARUP*	*RASA*	*VEERYA*	*VIPAKA*	*DOSHAGHNATA*	*ROGAGHNATA*	*MATRA*
Shunthi(Zingiberofficinale)[3]	*Nagar,Mahaushadha,Vishwabheshaj,Sonth*	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'.	*Katu*	*Ushna*	*Madhur*	*Kapha-vaataghna*	*Aamvata, Vatavyadhi, aruchi,chardi, agnimandhya,kasa,shwasa, hikka,pratishyaya, jwara, kushtha, pandu*	*Churna* =1-2gm
Chavya (Piperretrofractum)[4]	*Chavika, Chabh*	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.	*Katu*	*Ushna*	*Katu*	*Kapha-vataghna*	*Agnimandhya,ajirna,anaha, arsha,krimi,kasa,shwasa*	*Churna* =1-2gm
Chitrak (Plumbagozeylanica)[5]	*Agni,Cheeta,Chitramool*	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. Heterostylous flowers have white corollas. Capsules contain reddish brown seeds.	*Katu*	*Ushna*	*Katu*	*Kapha-vataghna*	*Shlipada,shotha,shwitra,agnimandhya,grahani, yakritvikara,arsha,krimiroga,kasa,jeernapratishyay,kushtha,jwara*	*Churna* =1-2gm
Pippali and *Pippalimool* (Piper longum)	*Vaidehi,Krishna,Kanaa,Tikshnat*	Slender,aromatic,climber with perennial woody	*Katu*	*Anushnashita*	*Madhur*	*Vata-kaphaghna*	*Kushtha,arsha,krimi,aamvata,vatarakta,agnima*	½-1gm

[6]	*andula,Ushna*	roots,creeping and jointed stems and fleshy fruits embedded in spikes.Leaves are numerous,6.3-9cm,dark green in colour.The older leaves are dark in colour and heart shaped.Flowers are monoceous.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.					*ndhya,gulma,pandu,shotha,ajirna,kasa,shwasa,hikka,kshaya,jwar,hridaurbalya*	
Yavakshara(Hordeumvulgare) [7]	*Paakya,kshar,yavagraj,Darulawan*	Alkali preparation of Yava or barley containing Potassium bicarbonate	*Katu*	*Ushna*	*Katu*	*Vata-kaphaghna*	*Hridrog,pandu,grahani,pleeha,anaha,galagraha,kasa,kaphajashmari*	125-500mg

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.

Table 2 – Indications of *Panchakoladi Ghrita*

Sr. No.	NAME OF TEXT	INDICATION
1	*AshtangSangrahaChikitsaSthan* 7/34-35	*Grahani,Rajyakshama, Gulma, Jwar, Kasa, Pandu*
2	*AshtangHridayaChikitsaSthan* 5/22-23	*Grahani,Rajyakshama*
3	*CharakSamhitaChikitsaSthan* 8/169-170	*Rajyakshama*
4	*CharakSamhitaChikitsaSthan* 15/170	*Grahani*

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 *Paanchakoladi 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

Sr. No.	INGREDIENTS	QUANTITY
	GHRITA MURCHANA DRAVYA	
01.	*AmalakiChurna(Emblicaofficinalis)*	40 g
02.	*HaritakiChurna(Terminaliachebula)*	40 g
03.	*BibhitakChurna(Terminaliabellirica*)	40 g
04.	*HaridraChurna(Curcuma longa)*	40 g
05.	*MustaChurna(Cyperusrotundus)*	40 g
06.	*Go-ghrita*(Cow's ghee)	1 kg
07.	*MatulungaSwaras(Citrus medica)*	As required

Table 4: Ingredients with proportion For *Panchakoladi Ghrita Nirman*

Sr.No.	INGREDIENTS	QUANTITY
	PANCHAKOLADI GHRITA DRAVYA	
01.	*PippaliChurna(Piper longum)*	30 g
02.	*PippalimulaChurna(Piper longum)*	30 g
03.	*ChavyaChurna(Piper retrofractum)*	30 g
04.	*ChitrakarootChurna (Plumbagozeylanica)*	30 g
05.	*ShunthiChurna(Zingiberofficinale)*	30 g
06.	*YavaksharChurna(Hordeumvulgare)*	30 g
07.	*Go-dugdha*	1 lit
08.	*MurchitGhrita*	915 ml
09.	Water	3 lit

***ii) Ghrita Murchana*[8]**

➢ **Procedure of *Ghrita Murchna*.**

Ingredients

1) *Ghrita* – 1kg

2) *Haritakichurna (Terminaliachebula)* – 40gm

3) *Bibhitakchurna (Terminaliabellirica)* – 40gm

4) *Amalakichurna(Emblicaofficinalis)*– 40gm

5) *Mustachurna(Cyperusrotundus)* – 40gm

6) *Haridrachurna(Curcuma longa)*– 40gm

7) *Matulungaswaras*(*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.

Image 1: *Ghrita Murchana* Procedure.

2) Operative Stage[9][10]

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.*

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) *Gandhapariksha*- The *sneha* smells of the *dravyas* used.

The prepared *PanchakoladiGhrita* was stored in airtight PEP container.

2. Quality Parameters Assessment of *PanchakoladiGhrita*

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 theangle of incidence to the sine of the angle of refraction of a beam of light passing from air intothe 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 substanceat 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 thefree acids in 1 g of the substance

OBSERVATIONS

- **Table 5 – *Ghrita Murchana.***

Sr.No.	TASK	QUANTITY	DURATION	REMARKS
01.	Heating the *ghrita*	1 lit	10 min.	
02.	Addition of *Kalka*	250 g	5 min.	Froth formation
03.	Heating of mixture	-	15-20 min.	Light brown colour *kalka* formed.
04.	Filtration	915 ml	5 min.	Mustard yellow coloured *MurchitGhrita*

- **Table 6: *Panchakoladi Ghrita Nirman.***

Sr. No.	TASK	DATE	QUANTITY	DURATION	REMARK
01.	Heating of *murchitghrita*	09/03/2017	1 lit	5 min.	
02.	Addition of *Kalka*	09/03/2017	250 gm	5 min.	Froth formation
03.	Addition of water with constant stirring	09/03/2017	3 lit	2.30 hrs.	
04.	Addition of cow milk with stirring	10/03/2017	1 lit		
05.	Heating of mixture with constant stirring	10/03/2017 11/03/2017		2 hrs. 2hrs.	Colour of *Ghrita* changed to light green It smelled sweet.
06.	Filtration	11/03/2017	870 ml		

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 commmonly 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

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 *PanchakoladiGhrita* will serve as guideline for *Ayurvedic*Physicians to prepare the genuine *PanchakoladiGhrita* 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 *PanchakoladiGhrita* 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 *PanchakoladiGhrita*.

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