IAMJ

INTERNATIONAL
AYURVEDIC
MEDICAL JOURNAL

Research Article ISSN: 2320-5091 Impact Factor: 6.719

PHARMACEUTICAL ASPECTS OF SHUNTHYAADI GHRITA AND ITS ANALYTICAL IMPORTANCE IN SNEHA KALPANA

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https://doi.org/10.46607/iamj0809082021

(Published Online: August 2021)

Article Received: 15/07//2021 - **Peer Reviewed:** 19/07/2021 - **Accepted for Publication:** 20/07/2021

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ABSTRACT

Ayurveda being the oldest science, comprising ample of medicines for various disease & Disorders. Propagating this holy science scientifically to an international platform is the times need. *Shunthyaadi Ghrita* is a unique *Sneha Kalpana* indicated specifically in *Kshavathu Roga* in the form *of Nasya*. Even though *Shunthyaadi Ghrita* is effective to date no research work has been carried out. *Shunthyaadi Ghrita* contains *Shunthi, Kushta, Kana, Bilva* and *Draksha* processed as per the Standard operative procedure of Ayurvedic Pharmacopoeia of India for ghee preparation. The main aim of the present study is to prepare *Shunthyaadi Ghrita* as directed in the classics & qualitative & quantitative Physico-chemical Analysis of *Shunthyaadi Ghrita*. The results obtained will be the reference standards and can also be used for future studies on *Shunthyaadi Ghrita* standardisation.

Keywords: *Shunthyaadi Grita, Ghrita Murchana*, *Sneha Kalpana*, Physico-Chemical Analysis, HPTLC.

INTRODUCTION

Bhaishajya Kalpana being the key branch of Ayurveda comprises *Panchavidha Kashaya Kalpanas* as the base of all the formulations which includes *Swarasa, Kalka, Kashaya, Hima* & *Phanta*. In addition to these other preparations like *Avalehakalpana, Vatikalpana, Snehakalpana, Sandhanakalpana* etc are also mentioned in our classics. *Sneha Kalpana* plays an important role in the treatment aspects when

we considered its wide range of application among the diseases. It is the process where the active principles of the drugs are transferred into *Sneha*. *Ghrita*, *Taila* or such other fatty substances are used here as a base. This *Kalpana* helps to obtain the extra benefits of the *Ghrita* or *Taila* used and at the same time helps to preserve the drugs for a longer time. *Sneha Kalpana*s are considered to be the most potent formulations due to the high drug delivery system in the body and enhances the absorption of the drugs. *Shunthyaadi Ghrita*[1] is one such formulation containing *Shunthi, Kushta, Kana, Bilva, Draksha* processed in *Ghrita* which possess the *Pitta-Anilahara* and *Kshavathu Rogahara* property. Physico-chemical analysis of the formulation is carried out by using current analytical methodologies for understanding and interpretation of Physico-chemical changes occurring during and after pharmaceutical processing. The Physico-chemical analysis of *Shunthyaadi Ghrita*[1] was done. *Shunthyaadi Ghrita Nasya*[1] has been indicated in *Kshavathu Roga* by many *Acharyas*.

Materials and Methods:

Pharmaceutical stride involved in the preparation of *Shunthyaadi Ghrita*[1]*:*

1. *Ghrita Murchana*[2].
2. *Shunthyaadi Kashaya*[3] preparation.
3. Preparation of *Shunthyaadi Ghrita* by the general method of *Sneha* preparation[4].

Procedure: Method of Preparation of *Murchita Ghrita*:

Table 1: Showing the Ingredients of *Murchita Ghrita*[2]

	Name of the ingredient	Quantity
Kalka Dravya	*Haritaki*	125gm
	Vibhitaki	125gm
	Amalaki	125gm
	Musta	125gm
	Haridra	125gm
	Matulunga Swarasa	125ml
Sneha Dravya	*Go-Ghrita*	2000ml
Drava Dravya	*Jala*	8000ml

All the coarse powdered *Kalka Dravya*s are taken in a vessel and then *Kalka* was prepared with *Matulunga Swarasa*, and the *Kalka* was added to the *Go-Ghrita*. Then the water was added 4 times to that of *Sneha*. Then the *Snehapaka* was done over *Mandagni* until *Sneha Siddhi Lakshanas* attained.

- Method of preparation of *Shunthyadi Kashaya*: *Dravyas* and *Jala* of specified quantity added and reduced to 1/4th quantity for the *Kashaya* preparation.

Table 2: Showing the Ingredients of *Shunthyadi Kashaya*

	Name of the ingredient	Quantity
Kashaya Dravya	*Shunthi*	200gm
	Kushta	200gm
	Kana	200gm
	Bilva majja	200gm
	Draksha	200gm
Drava Dravya	*Jala*	16000ml

Method of Preparation of *Shunthyaadi Ghrita*:

Table 3: Showing the Ingredients of *Shunthyaadi Ghrita*

	Name of the ingredient	Quantity
Kalka Dravya	*Shunthi* (Rhizome)	1/6thpart
	Kushta (Root)	1/6thpart
	Kana (Fruit)	1/6thpart
	Bilva (Fruit)	1/6thpart
	Draaksha (Fruit)	1/6thpart
Sneha Dravya	*Murchita Ghrita*	1 part
Drava Dravya	*Kashaya* of *Shunthi, Kustha, Kana, Bilva, Draksha*	4 parts

Kalka Dravya: *Shunthi, Kushta, Kana, Bilva majja, Draksha*-167gm., *Sneha Dravya*: *Murchita Ghrita*-1000ml, *Drava Dravya*: *Shunthyadi Kashaya*-4000ml

- *Murchita Ghrita* was heated and *Kalka* was added slowly with continuous stirring, next to this *Kashaya* was added and stirred well. The boiling over *Mandagni* was continued till the *Sneha Siddhi Lakshanas* attained[4].

Observations:

- Preparation of *Murchita Ghrita* took 13hours 40min and the observed colour was Yellow.
- *Shunthyaadi Kashaya* was brown and was thick in consistency.
- Preparation of *Shunthyaadi Ghrita* took 9 hours 10 min and observed colour was yellowish orange.
- *Shunthyaadi Ghrita* was stopped when *Mridupaka Lakshanas* are observed as it will be used for *Nasya Karma*[5].
- *Kalka Dravya* for *Shunthyaadi Ghrita* was taken 1/6th part to the *Sneha* based on the reference mentioned in *Sharangadhara Samhita*[6].
- For 1000ml *Murchita Ghrita*, 500ml was the yield of *Shunthyaadi Ghrita*. The reduced yield may be because of the presence of *Draksha* in *Kalka* and *Kashaya Dravya* along with thickness of the *Kashaya*, made the final product semisolid which made difficulty in filtration of the *Ghrita*.

Results of Physico-Chemical Parameters:

Table 4: Showing Results of Standardization parameters

Parameter	***Results n = 3 %w/w***	
	MG	**SG**
Loss on Drying at 105°C	0.03%	0.02%
Saponification value	210.37	232.81
Iodine value	39.22	37.45
Acid value	0.31	0.34
Peroxide value	0.64	0.72
Ester value	210.06	232.47
Refractive index	1.456	1.456
Specific gravity	0.9063	0.9076
Weight (gm) per ml	0.9235	0.9248
Viscosity (cP)	38.02	37.27
Rancidity test (Kreis test)	Negative	Negative

HPTLC:

***Shuntayaadi Gritha* And *Murchita Ghrita* - Scanning at 254 nm**

Table 5: Showing Peak table with Track, Peak, Rf Value and Area at 254 nm

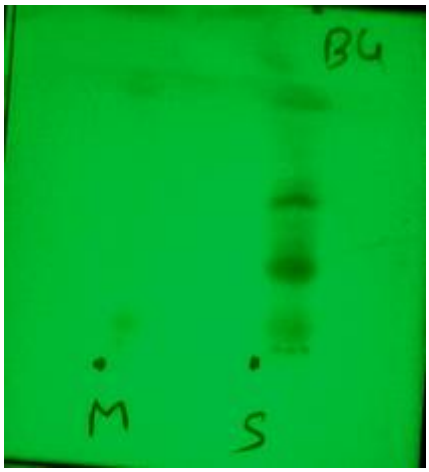
Track	Peak	Rf Value	Area
1	1	0.11	1705.9
1	2	0.14	1303.1
1	3	0.26	5493.0
1	4	0.43	12862.9
1	5	0.47	2137.1
1	6	0.60	7369.7
1	7	0.68	1539.0
1	8	0.73	889.4
1	9	0.83	3677.3
1	10	0.90	678.2
1	11	0.96	386.1
2	1	0.47	375.6
2	2	0.59	801.6
2	3	0.96	1798.6

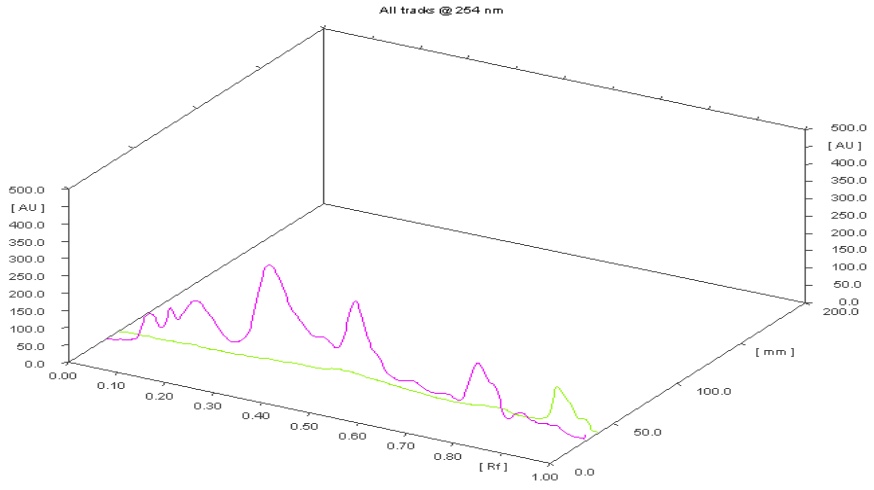
1 – MG in Track

2 – SG in Track

HPTLC photo documentation of sample of Ethanolic fraction of MG and SG

3-D Chromatogram Scanning at 254 nm





Pink- *Murchita Gritha*

Green- *Shuntayaadi Gritha*

DISCUSSION

a) Discussion on *Murchana:* *Murchana* increases the degree of dissolution of bioactive constituents, accordingly the excellence of properties of *Sneha* and establishes its superior position with a simple scientific explanation, *Ghrita* has the power to assimilate effectively the properties of other substances with retaining its properties. *Ama Dosha* may be considered as an unwanted component among the raw *Ghrita*, like intermediate chemical constituents, dissolved gases, adulterants, plant toxins and moisture present in raw *Ghrita* is developed due to long time storage.

By removing its *Ama Lakshana* which inhibit lipid peroxidation and incorporates antioxidant property for augmentation of medicinal properties of the medicated *Sneha* and also increases the capacity of the *Ghrita* to absorb the active components of the drug, thus renders *Veeryavan Soukhyadayi* property. *Murchana* process reduces the degree of saturation of *Sneha* and enhances the degree of unsaturation which is beneficial for human health. Hence pre-preparatory *Murchana* procedure is important to increase the potency of the *Siddha Ghrita*.

b) Discussion on *Shunthyaadi Ghrita*:

- Significance of *Sneha Dravya*: The *Sneha*, which is glycerides of fatty acid interacts with *Drava* and undergoes hydrolysis resulting in the formation of fatty acid and glycerol. So formed fatty acids are Amphipathic which comprises a hydrophobic (or lipophilic) exterior and hydrophilic interior.
- Significance of *Kalka Dravya*: The *Drava* which diffuses into *Kalka* dissolves the water-soluble active principle and discharges it into the liquid media due to collapse of the boundary layer which results in the transfer of active principles from *Kalka* to solvent. Soaking of the drug in the *Drava* results in softening of the drug. It is due to the diffusion of liquid into *Kalka* by the phenomenon of osmosis. Due to the presence of the hydroxyl group, the *Kalka* swells which results in increased diffusion pressure inside the cells ultimately leading to the bursting of the cell wall.
- Significance of *Drava Dravya*: In the case of *Snehapaka*, the *Dravadravya* plays an important role and acts as an ideal medium. It facilitates the migration of the active principles from the *Kalka Dravya*, thereby enriching the *Sneha*. *Drava* itself has high therapeutic importance due to its absorption along the cell membranes.
- Significance of *Mandagni* during *Paka*: *Shunthyaadi Ghrita* was prepared on *Mandagni* which reduces boundary layer thickness, increases the diffusion coefficient and decreases the viscosity of the liquid, thereby facilitating the migration of active principles from the solid component to the medium. *Mandagni* provides stage wise release of the active principles at different temperatures and also at different time periods which renders the Bio-constituents to get affixed inside the chemical bond of the saturated and unsaturated fatty acids. It also provides optimum release of active principles due to the increased duration of the *Agni* contact.

c) Discussion on Analytical Findings:

Saponification Value: The saponification value of **MG, SG** are 210.37, 232.81 respectively. Long-chain fatty acids found in fat have low saponification value and vice versa. Short-chain fatty acids are readily absorbed than long-chain fatty acids. Increased saponification value shows that **SG** has greater short-chain fatty acid than **MG**. Thus, **SG** is easily absorbed and digested in the body.

Iodine Value: Iodine value decreased gradually from **MG** to **SG** 39.22 to 37.45 respectively. This indicates that there is a decrease in the degree of unsaturation but within normal limits.

Acid Value: Acid value of **MG**, **SG** is 0.31, 0.34 respectively, this shows the reduced chance of rancidity after preparing **SG** and ultimately it leads to increased shelf life and reducing the toxic properties of *Sneha*. Less acid value denotes the less chance of decomposition of the composition of *Sneha* thus increasing both life span and therapeutic value.

Peroxide Value: Peroxide values of **MG**, **SG** are 0.64, 0.72. These values indicate that they are free from rancidity.

Ester value: The ester value of **MG**, **SG** are 210.06, 232.47 respectively. As the esters are increased, the rancidity chance is decreased. Ester value of **SG** is increased after the *Snehapaka* process indicating the fewer chances of rancidity and thus possesses increased shelf life.

Refractive Index: The values of **MG, SG** are 1.456, 1.456 respectively which reveals that some active substances of ingredients used in the process were incorporated into *Sneha Kalpana*. As *Ghrita* is denser than air, the refractive index is always more than one, this is confirmed in this study. The Refractive index of *Ghrita* also depends on the chain length, with an

increase in chain length, the refractive index of *Ghrita* increases when the active principles are more incorporated.

Specific Gravity: Specific gravity of **MG, SG** is 0.9063, 0.9076 respectively. Specific gravity indicates the addition of some bio constituents from the drugs used during *Sneha Kalpana*. It may be due to solid extractives that come from the herbals.

HPTLC: Through the HPTLC technique major phytochemicals present in the drug or formulation can be estimated. It helps to find out the adulteration in the formulation and is used as a standard for the herbal compounds. In the present study HPTLC of **MG, SG** was done. In MG and SG there are 11 and 3 peaks noticed. These peaks are due to the influence of chemical constituents present in the compound.

CONCLUSION

Shunthyaadi Ghrita is the formulation containing ingredients that act as *Vishaghna, Kshavathuhara, Pitta Vatahara* and *Vata Kahphahara* in the treatment of *Kshavathu Roga*. *Shunthyaadi Ghrita* with *Chakradatta* reference was selected for the preparation. The *Kalpana* was prepared with *Shunthi, Kana, Kushta, Bilva* and *Draksha* in the *Ghritapaka* method. In an Analytical study, the incorporation of various phytochemicals was noticed and also *Shunthyaadi Ghrita* was enriched with medicinal values and good shelf life.

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Source of Support: Nil
Conflict of Interest: None Declared

How to cite this URL: Shreeganesh Aithal et al: Pharmaceutical Aspects Of Shunthyaadi Ghrita And Its Analytical Importance In Sneha Kalpana. International Ayurvedic Medical Journal {online} 2021 {cited August 2021} Available from: http://www.iamj.in/posts/images/upload/1648_1653.pdf