



PHARMACEUTICO ANALYTICAL ASPECTS OF PIPPALYADI GHRITA

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ABSTRACT

In Ayurvedic classics Sneha kalpana has gained its own importance. Sneha kalpana has been introduced as a Pharmaceutical preparation only in the Samhita period. It consists of Samskara anuvarthitwa guna that is sneha can enhance the therapeutic properties of the drugs which are used in the preparation which makes the Ghrita kalpana superior in the context of Sneha Kalpana. Pippalayadi Ghrita (PG) is such a preparation which is mainly indicated in Jwara. **Aim:** Preparation and Physico-chemical evaluation of Pippalayadi Ghrita. **Materials and Methods:** Pippalayadi Ghrita is prepared by using general method of preparation of Sneha kalpana as per reference. It is indicated in Jwara, ksyaya, hikka, etc. **Results:** Three samples of Pippalyadi Ghrita have been prepared. Different quantities of final products were obtained.

Refractive Index 1.4513, Saponification Value 223.01, Total Fatty Matter 87.60, Acid Value 1.56, Iodine Value 21.05, Viscosity 4.64, No Microbial contamination including Escherichia coli/10gms and No heavy metals observed in SEM-EDAX. **Discussion:** Pharmaceutical and Analytical study of Pippalyadi Ghrita is discussed regarding its safety. **Conclusion:** The Physico-chemical analytical parameters, microbial contamination and test for heavy metals of the processed Ghrita follow the standard values within normal limits.

KEYWORDS: Sneha Kalpana, Pippalyadi Ghrita, Standardization, Pharmaceutical and Analytical.

INTRODUCTION

Sneha kalpana is one of the important type of formulation technique where all the fat soluble active principles are saved in the Sneha. Pippalyadi Ghrita is prepared with reference of Bhishaijya Ratnavali Jwara Chikitsa Adhyaya. It is mainly indicated in Jwara and also it is indicated in ksaya, svasa, hikka, sirashula, arochaka, angabhitapa and visamagni. The preparation includes kalka, sneha and drava dravya with the ratio of 1part; 4parts; 16 parts as general method of preparation of sneha kalpana. It also includes certain additional methods where sugandha dravyas are added at last since there are possibilities of evaporation.

Standardization of all the drugs has become mandatory at present. Especially in case of Ayurvedic drugs it is much important to be standardized since maximum preparations in Ayurveda are classical preparations. For easy understanding and further reference of the drugs and science it has to be standardized in all the possible ways that includes analytical study of that particular drug which was taken for standardization. Analytical study for Sneha kalpana includes parameters like Refractive index, saponification value, iodine value, viscosity, acid value, free fatty acids, TLC, microbial contamination, heavy metal analysis etc.

AIMS AND OBJECTIVES

1. Preparation of Pippalyadi Ghritha.
2. Physico-chemical analysis of Pippalyadi Ghritha.

MATERIALS AND METHODS

Collection of drugs used in the preparation of pippalyadi ghrita

All the raw drugs needed for the preparations of both the compounds are obtained from the market and they were authenticated and certified for Ayurvedic standards by the department of Dravya Guna, JSS Ayurveda Medical College, Mysuru.

Procedure of murchita ghrita:^[1]

Kalka dravyas – Haritaki, Amalaki, Vibhitak, Musta, Haridra – Each 145 gms

Matulunga swarasa – 620gms

Sneha dravyas: Go-Ghrita – 2900ml

Dravadravaya: Water – 11600ml

Method of preparation

Preparation of kalka: All the five drugs were powdered individually and weighed 145gms respectively. They were mixed properly. The mixture was taken and Kalka was prepared by adding 620ml of Matulunga Swarasa.

Preparation of murchita ghrita: 2900 ml of *Ghrita* was melted, *Kalka* and water was added and mixed properly. The mixture was heated until the *Sneha Siddhi Lakshanas*. *Murchita Ghrita* was collected and packed in tight mouthed procilien jar. This preparation is repeated for three times.

Observations

1. When little Kalka was put on fire there was no crackling sound noticed.
2. At the terminal stage of Ghrita Murchana foam was not produced.
3. When Kalka rolled in between fingers wick like structure was observed.
4. Yellow colour and characteristic odour was observed.

Final product of murchita ghrita obtained

1. Initial quantity of Go-Ghrita taken for Murchana - 2900ml
2. Final quantity of Murchita Ghrita obtained - 2726ml
3. Loss of Murchita Ghrita - 174ml

Precautions

1. Madhyamagni was maintained until the whole process of Ghrita Murchana got complete.
2. Murchita Ghrita was filtered when it was hot only.
3. Ghrita murchana was prepared only in stainless steel.

Shodhana of ativisha^[2]

Though it's not necessary to do Shodhana for Ativisha, performing Shodhana Karma is done as this is a Visha Dravya according to Acharyas. It is done as a precaution and to avoid the risk factors if any. It is purified under general purificatory techniques of Visha.

Ingredients and their quantities: Ashuddha Ativisha – 100 gms.

Go-Dugdha – 1.5 litres

Procedure: Ativisha of 100gms are taken and weighed and washed in water. Pottali is prepared and subjected for Swedhana in godhugda for 5 Praharakalas and dried.

Observations

1. Colour of the Ativisha became dark and shiny and size got enlarged as it is boiled in liquid medium.

Final product of shuddha ativisha obtained

1. Initial quantity of Ativisha taken for Shodhana - 100gms
2. Final Quantity of Shodhita Ativisha - 79gms
3. Loss of weight - 21gms

Precaution: Whole process of Swedhana is done in Mandhagni.

Procedure of pippalyadi ghrita^[3]**Ingredients and their quantities**

Kalka dravyas – Pippali, Shweta Chandana, Mustaka, Ushira, Katuki, Indrayava, Bhumyamalaki, Anantamula, Ativisha, Shalaparni, Mridvika, Amalaki, Nimba, Katuki, Kantakari – all the drugs are taken 20gms each.

Sneha dravyas: Murchita Ghrita – 1200ml

Dravadravya: Water – 4800ml

Method of preparation

Preparation of kalka: All the Kalka Dravyas were pounded individually and weighed 20gms respectively. They were mixed properly. The mixture was taken and *Kalka* was prepared by adding required amount of water.

Preparation of pippalyadi ghrita: 1200 ml of Ghrita was melted; Kalka and water were added and mixed properly by the use of a spoon. The mixture was heated until the Sneha Siddhi Lakshana. Pippalyadi Ghrita was collected and packed in air tight mouthed procilien jar. This preparation is repeated for three times.

Observations

1. When little Kalka was put on fire there was no crackling sound noticed.
2. At the terminal stage of Pippalyadi Ghrita foam was not produced.
3. When little Kalka rolled in between fingers wick like structure was observed.
4. Greenish yellow colour and characteristic odour was observed.

Final product of pippayadi ghrita obtained

1. Initial quantity of Murchita Ghrita Taken - 1200ml

2. Final quantity of Pippalyadi Ghrita obtained - 1090ml
3. Loss of Pippalyadi Ghrita - 110ml

Precautions

1. Madhyamagni was maintained until the whole process of Pippalyadi Ghrita got complete.
2. Pippalyadi Ghrita was filtered when it was hot only.
3. Pippalyadi Ghrita was prepared only in stainless steel.

Analytical study

Physico chemical analysis of pippalyadi ghrita

1. Organoleptic test
2. Refractive index^[4]
3. Viscosity^[5]
4. Iodine value^[6]
5. Saponification value^[7]
6. Acid value^[8]
7. Total fatty matter^[9]
8. TLC^[10]
9. Microbial Contamination^[11]
10. Test for heavy metals

OBSERVATION AND RESULTS

Organoleptic characters of pippalyadi ghrita

Pippalyadi ghrita

- Consistency - Oily and sticky
- Colour - Greenish yellow
- Taste - Bitter
- Odour - Characteristic odour

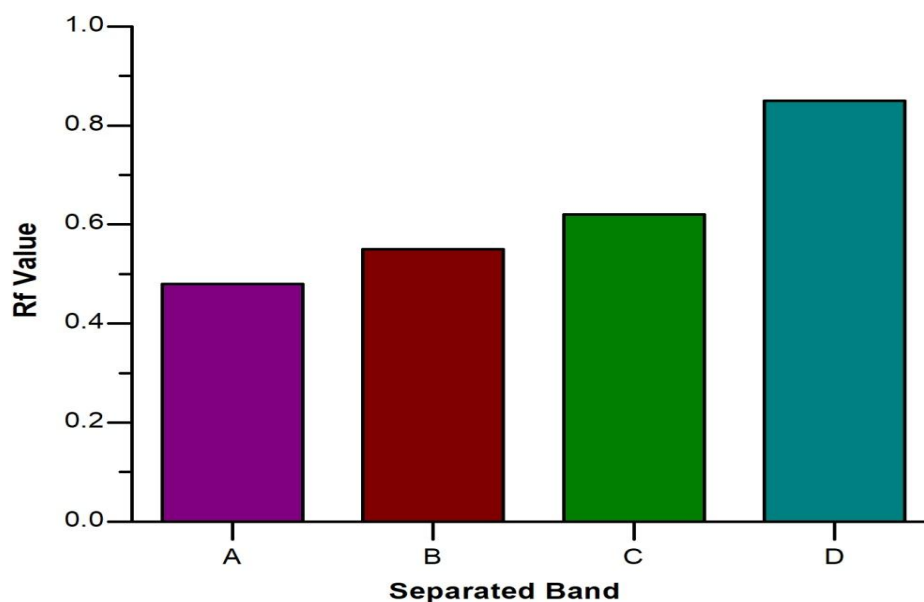
Table no. 1: Physico chemical tests of pippalyadi ghrita.

Sl. no	Test	Unit	Results	Test method
1	Colour	---	Greenish yellow	IS 286 : 1978
2	Odour	---	Characteristic	IS 286 : 1978
3	Refractive index at 40 ⁰ c	---	1.4513	FSSAI Manual Method
4	Viscosity at 40 ⁰ c	CST	4.64	FSSAI Manual Method
5	Saponification value	---	223.01	FSSAI Manual Method

6	Iodine value	---	21.05	FSSAI Manual Method
7	Acid value	---	1.56	FSSAI Manual Method
8	Total Fatty Matter	---	87.60	IS 286 : 1978

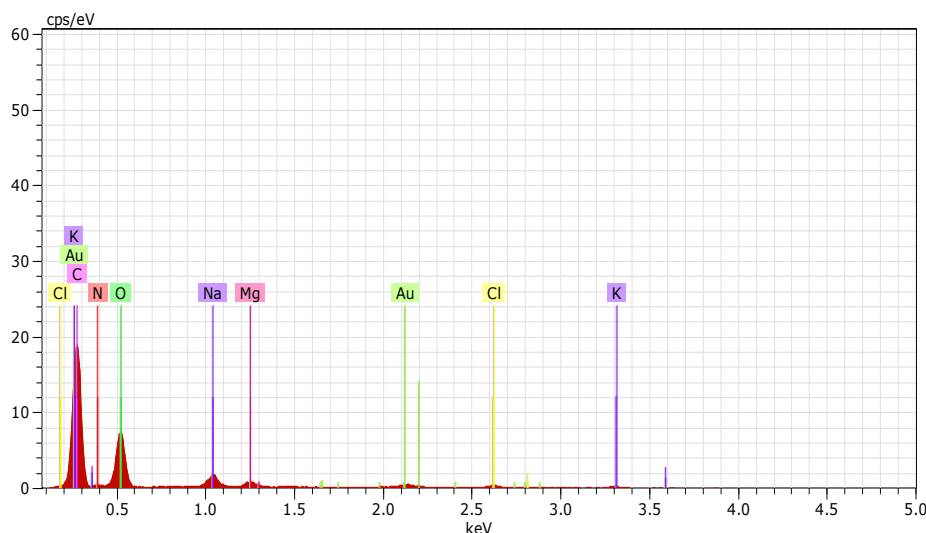
Table no. 2: Analysis for microbial contamination in pippalyadi ghrita.

Sl. No.	Test	Unit	Results	Test Method
1	Total Bacterial count	Cfu/g	Absent	Subbhulakshmi and Paranjape (2014)
2	Coli forms	Cfu/g	Absent	Subbhulakshmi and Paranjape (2014)
3	E.coli	/g	Absent	Subbhulakshmi and Paranjape (2014)
4	Staphylococcus aureus	/g	Absent	Subbhulakshmi and Paranjape (2014)
5	Salmonella	/25g	Absent	Subbhulakshmi and Paranjape (2014)



Graph no. 1: Showing Rf value of TLC of pippalyadi ghrita.

TLC graphs indicated that the test sample have created 4 bands in different intervals indicated the polar nature of the drug.



Graph no. 2: EDAX- Graph showing the elements present in pippalyadi ghrita.

Table no. 3: Quantitative results for pippalyadi ghrita on edax.

Element Line	Weight %	Weight % Error	Atom %
C	47.06	6.00	61.96
O	28.79	4.10	28.46
N	4.28	1.16	4.83
Na	3.63	0.27	2.50
Mg	1.46	0.12	0.95

Interpretation

1. On E-DAX the elements like carbon, potassium, gold, chlorine, oxygen, nitrogen magnesium and sodium have shown the peaks.
2. It showed the presence of Carbon at 61.96% which was the highest component in the given sample.
3. Presence of all those elements might be from the herbal drugs used in the formulation might be due to the habitat of the drugs where from it is collected.

DISCUSSION

Pharmaceutical study

As it is mentioned already Murchita Ghrita is used as the base of the *Ghrita Kalpana* and it is used. Here loss of Ghrita was possible through the kalka which can absorb a little quantity and by means of boiling and filtering also. The reason for the loss of Pippalyadi Ghrita was same as Murchita Ghrita. Here the texture and appearance of Pippalyadi Ghrita is clear and greenish yellow in colour and with characteristic odour.

Analytical study

1. Refractive Index at 40°C is 1.4513 shows the concentration and quality of Pippalyadi Ghrita.
2. Saponification Value and Total Fatty Matter was 223.01 and 87.60 respectively. This shows the purity and quality of Pippalyadi Ghrita.
3. Acid Value 1.56 shows the rancidity of the sample.
4. Iodine Value is 21.05 proves the unsaturated fatty materials contents in the samples.
5. Higher the iodine value more unsaturated fatty acids are noted and also reduce the stability of sample.
6. Viscosity at 40°C was 4.64 which indicate the relevance of penetration of drug.
7. Microbial contamination of Pippalyadi Ghrita is found of no (absence) contamination with *Escherichia coli*/10gms. Hence it is proven that Pippalyadi Ghrita is safe, pure, nontoxic and genuine formulation analytically.
8. R_f Value of TLC indicated more polar nature of Pippalyadi Ghrita since it travelled Slowly.
9. No heavy metals observed in SEM-EDAX which indicates the safety of Pippalyadi Ghrita and also habitat of the drugs procured. In the series of potassium, Carbon was found in excess when compared to other element as 61.96%; Oxygen was noted as second most excess element in the sample as 28.46%; nitrogen at a percentage of 4.83; sodium as 2.50 % and magnesium as 0.95% with the error of 6.00, 4.10, 1.16, 0.27 and 0.12 respectively.

CONCLUSION

1. Pharmaceutical study has been performed based on the standard operative procedure of sneha kalpana and different quantities of final products were obtained.
2. Study based on various parameters results in a conclusion that Physico-chemical analytical parameters, microbial contamination and test for heavy metals of the processed Ghrita follows the standard values within normal limits.
3. This study can be helpful for the future research in evaluation of safety and therapeutic efficacy on experimental and further clinical study.

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