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Research Article

PHARMACEUTICO-ANALYTICAL STUDY OF SAHACHARADI TAILA AND ITS 7 AVARTI

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Abstract

Sahacharadi Taila is mentioned in classics in Vata Vyadhi Adhikara. This formulation contains Gingelly oil, Sahachara (*Barleria prionitis* Linn.) decoction, Milk and Sahachara root paste. All the ingredients have to be added and boiled till attaining Taila Paka Siddhi Lakshanas. This formulation was used again for preparing its Avarti according to classical reference and was subjected to physico-chemical analysis. An increase in Saponification value and Loss on drying is observed while a decrease in Refractive index, Iodine value, Unsaponifiable matter and Peroxide value which is suggestive that Sahacharadi Avartita Taila is more stable than Sahacharadi Taila.

Keyword: Sahacharadi Taila; Taila Paka; Analytical study.

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INTRODUCTION

Pharmaceutics is a technique or operation followed to convert and facilitate the raw medicinal substance to an edible and potent formulation which can be used either internally or externally according to the site of disease or manifestation of disease. Sneha (oil) preparations are having better results on Vataja Rogas (nervous diseases). Avartana of a Sneha is a special pharmaceutical procedure, in which the prescribed quantity of ingredients are added and Sneha Paka siddhi is carried repeatedly, till desired quantity of its potency is attained. The purpose of potentiation is to minimize the dose and for faster drug delivery. Sahacharadi Taila preparation is mentioned in Ashtanga Hrudaya in Vata Vyadhi Chikitsa Sthana 21st chapter[1] and its Avartana is mentioned in Ayurveda Yoga Sangraham.[2]

Objectives

To collect literary data and material data from authentic sources and prepare Murcchita Tila Taila, Sahacharadi Taila and Sahacharadi Taila 7 Avarti as per classics and to analyse the prepared Taila organolepticaly and chemically.

MATERIAL AND METHODS

The literary detail was collected from the authentic text books like Ashtanga Hrudaya, Ayurveda Yoga Samgraham and Bhaishajya Ratnavali where it is mentioned to take the ingredients for Taila Murcchana[3] and Sahacharadi Taila[4] as depicted on Table 1 and Table 2 respectively.

Source of data

Market sample of Tila Taila was collected from genuine source. The certified raw drugs prescribed in the formulations were collected from Alva's Pharmacy, Mijar, Karnataka. Pharmaceutical study was carried out in the laboratory of P.G. Department of Rasashastra and Bhaishajya kalpana, Alva's Ayurveda Medical College, Moodbidri.

Method of Preparation

Taila Murcchana was carried with 1:4:16 ratio of Kalka (paste): Sneha (oil): Drava Dravya (liquid). After adding all ingredients the boiling was carried out until Madhyama Paka, i.e. the Kalka starts to roll between the fingers and no crackling sound was heard when put on fire.

Preparation of Sahacharadi Taila

Sahachara Kashaya was prepared by taking the drugs as mentioned in Table 3, Using Murcchita Tila Taila as the Sneha Dravya, Sahacharadi Taila was prepared taking Sahachara Kashaya and Milk as Drava Dravya and Sahachara Moola as Kalka Dravya respectively in the above mentioned ratio according to the reference.

Preparation of Sahacharadi Taila Avarti

Method of preparation is same as Sahacharadi Taila, where instead of Tila Taila the Sahacharadi Taila was used as Sneha Dravya and continued using the same Taila for the succeeding practicals.

For 2nd Avartana, the 1st Avartita Sahachara Taila was taken in the place of Sneha (oil) and fresh Sahachara kashaya, Sahachara Kalka and Ksheera are added in the prescribed ratio. Similarly further Avartana were carried by using preceding oil prepared Avartita as base.

OBSERVATIONS

Organoleptic changes observed in Sahachara Kashaya after self-cooling are as mentioned in Table 4. Since the heating process was done in Madhyamagni (mild fire), there was no spillage of contents from the vessel.

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Table 1: Showing the ingredients of Tila Taila Murcchana

Ingredients	Botanical Name	Quantity taken
1) Tila Taila	*Sesamum indicum* DC.	2.500Litres
2) Water		10 Litres
3) Manjishta	*Rubia cordifolia* Linn.	156.2g
4) Haridra	*Curcuma longa* Linn.	40g
5) Lodhra	*Symplocos racemosa* Roxb.	40g
6) Musta	Cyprus rotendus Linn.	40g
7) Amalaki	*Emblica officinalis* Gaertn.	40g
8) Vibheetaki	*Terminalia bellerica* Roxb.	40g
9) Hareethaki	*Terminalia chebula* Retz.	40 g
10) Ketaki pushpa	*Pandanus fascicularis* Linn.	40g
11) Vata	*Ficus bengalensis* Linn.	40g
12) Hribera	*Plectranthus vettiveroides*	40g

Table 2: Ratio of ingredients for Sahacharadi Taila

Kashaya	100 Pala	4800ml
Taila	64 Pala	3072ml
Kalka	10 Pala	480g
Milk	256 Pala	12288ml

Table 3: Showing the quantity of Sahacharadi Kashaya prepared according to Sharangadhara (16 parts of water reduced to 1/8th part)

Sl.No.	Ingredients	Quantity
1.	Sahachara Moola Kalka	1540g
2.	Water	24600 ml
3.	Total quantity of Kashaya obtained	3070 ml

Table 4: Organoleptic characters of Sahachara Kashaya

Organoleptic characters	Observations
Color	Dark reddish brown
Consistency	Thick
Odour	Characteristic Sahachara smell
Taste	Bitter

Table 5: Showing the observations obtained during prepration of Sahacharadi Taila and its 7 Avarti

	ST	I	II	III	IV	V	VI	VII
Date	14/12/14	16/12/14	18/12/14	20/12/14	22/12/14	24/12/14	26/12/14	28/12/14
Taila	2000	1900	1900	1900	1700	1600	1600	1600
Kashaya	3070	2900	2900	2900	2600	2460	2460	2460
Kalka	307	292	292	292	260	246	246	246
Ksheera	7860	7500	7500	7500	6550	6150	6150	6150
Taila obt	2000	1900	1900	1900	1600	1600	1600	1600
Kalka obt	1323	1380	1431	1450	1840	1495	1341	1308
Gain/Loss in ml	0	0	0	0	-100	0	0	0
Gain/Loss in %	0	0	0	0	-5%	0	0	0

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The Sneha Paka Lakshanas (qualities of prepared taila)[5] like, Kalka became soft, non sticky, can be rolled into varti (roll), produced no cracking sound when placed on fire were observed in Kalka and Taila during the end stage of process.

Precautions which was considered in this study

Continuous stirring was carried throughout the preparation of Taila to avoid burning of Kalka Dravya and big sized vessel was used to avoid the spilling of Taila.

RESULTS

The observations obtained during preparation of Sahacharadi Taila and its 7 Avarti are mentioned in Table 5.

Organoleptic Analysis

The Organoleptic features of Sahacharadi Taila and its Avarti are depicted in Table 6.

Physico-Chemical Analytical Study

The results of standardization parameters of Sahacharadi Taila and its 7 Avati are mentioned in Table 7.

DISCUSSION

Crackling sound and froath was observed when Kalka was added to the hot oil initially, which is probably due to the moisture content in the Kalka. Continuous stirring is required or else the Kalka may stick to the bottom of the vessel thus resulting over charring of Kalka. After 5-10 minutes, crackling sound and froath got reduced, this indicates loss of moisture.

As by adding Ksheera as Drava Dravya,[6] Paka was carried out for 2 days according to classics, for enhancing the absorption of active principles to the Taila by increasing the contact of all the ingredients at different temperatures for two nights which potentiates the chemical constituents into the Taila.

The milk poured is converted to lipid form or fat and absorbed into the Taila which can be noted from the gain in the quantity of Taila.

For preparing both Kashaya and Taila, Mandagni was maintained in order to reduce the loss of active principles due to overheating. Some chemical constituents present in the preparation may change their properties due to effect of thermodynamics.

A. Organoleptic characters

Colour

The colour of the Taila was reddish brown. On 7th Avarti it was having light yellowish colour on lower half portion which was semisolid in consistency and light brown colour in upper half

Odour

It had a characteristic odour of Sahachara and milk, but on 7th Avarti the odour resembled that of ghee.

Taste

Astringent taste was reduced and changed to sweet astringent on 7th Avarti

Consistency

Unctuous and liquid initially, after 3rd Avarti consistency became thicker. On 7th Avarti when cooled, its lower half portion was becoming semisolid yellowish colour and the upper portion was in liquid state only.

It is due to the gradual conversion of milk fat into Ghruta (ghee) was changed the consistency in succeeding Avartanas.

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Table 6: Showing the Organoleptic characters of Sahacharadi Taila

Characters	Observation of Sahacharadi Taila	Sahacharadi Taila 1	Sahacharadi Taila 7
1) Colour	Reddish brown	Reddish brown	Yellowish Brown
2) Smell	Smell of Sahachara and milk	Smell of Sahachara and milk	Slight smell of Ghruta
3) Consistency	Liquid, Oily	Liquid, Oily	Oily, Thicker
4) Appearance	Oily	Oily	Oily
5) Taste	Astringent	Astringent	Astringent

Table 7: Results of standardization parameters

Parameter	Sahacharadi Taila	Sahacharadi Taila 7 Avarti
Loss on Drying At 105^0C[7]	0.0747%	0.1993%
Refractive Index[8]	1.4715	1.4645
Saponification Value[9]	179.131mg/ml	204.328 mg/ml
Acid Value[10]	5.521g/ml	2.219 g/ml
Iodine Value[11]	129.050g/ml	104.316 g/ml
Unsaponifiable Matter[12]	3.286g	0.499g
Peroxide Value[13]	38.805	11.978
Specific Gravity[14]	0.9099	0.9030

B. Physico- chemical parameters

Loss on drying at 105^0C (L.O.D)

Determination both water and volatile matter in the drug was done. This indicates the moisture content in the drug. Higher the moisture content more will be the percentage of loss on drying of the substances. The higher value is suggestive of more amount of moisture content and the preparation is more susceptible to spoilage.

Sahacharadi Taila was possessing Loss on Drying (L.O.D.) of 0.0747 % w/w. The later samples Sahacharadi Taila 7^{th} Avarti were observed to be L.O.D. of 0.1993% w/w. Loss on drying was increased on Sahacharadi Taila 7^{th} Avarti than Sahacharadi Taila, suggestive of minimum water content in the first sample than later samples.

Specific gravity

The presence of dissolved substances in Sneha is expected to change its specific gravity. So it is considered to be an important parameter for analysing medicated Sneha. This helps us to access the molecular information in a non-invasive way.

The data reveals that the specific gravity of Sahacharadi Taila reduces from 0.9099 to 0.9030 after 7^{th} Avartana. The specific gravity of Sahacharadi Taila decreases gradually with the increase of Avartana and it is lesser than the specific gravity of Ghruta (0.9100). Specific gravity indicates active constituents in it.

Refractive index (R.I)

The Refractive index measurement can be used for qualitative and quantitative analysis as well as structural study. It is an intrinsic property of a substance. Hence it is used in determining the identity and purity of a chemical.

The R.I. of Sahacharadi Taila was 1.4715 which declined to 1.4645 on Sahacharadi Taila after 7^{th} Avartana which is having the value of nearer to GoGhruta (cow's ghee), which is evident from its physical nature. The R.I. of GoGhruta is 1.4610.

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Determination of Saponification value

Medicated oil with high saponification value has a better absorption. The size of the molecule can be determined by this method. It is inversely proportional to the molecular weight of fat. High saponification value indicates the presence of fatty acids of low molecular weight. It is evident that Sahacharadi Taila possesses Sap. Value of 179.131 and it was increased to 204.328 in 7th Avartana. This is suggestive of short chain fatty acids like in Ghruta on 7th Avartana..

Determination of Acid value

Acid number signifies the measure of the amount of carboxylic acid groups in a chemical compound, such as fatty acids or in a mixture of compounds. The acid number quantifies the amount of acids. It indicates the presence of free fatty acids in the sample. In 7th Avartita Sahacharadi Taila, the acid value was considerably decreased when compared with Sahacharadi Taila thereby reducing the chances of early rancidity.Acid value signifies the presence of free acids and used to indicate the rancid state. Rancidity causes free acid liberation. So it is indicating Sahacharadi Taila 7 is least prone to rancidity when compared with Sahacharadi Taila.

Iodine value

The Iodine number is a measure of degree of unsaturation of fat. The more the Iodine number, more the unsaturated fatty acid bonds are present. A high Iodine number indicates a high degree of unsaturation of the fatty acids in fat.

The Iodine value in Sahacharadi Taila 7 (104.316) was significantly reduced than the Sahacharadi Taila (129.05) indicating less chances of rancidity and more stability of Sahacharadi Taila 7 than the Sahacharadi Taila.

Unsaponifiable Matter

It can be observed that, the Unsaponifiable matter in Sahacharadi Taila is 3.286% w/w and it decreased to 0.499% w/w in Sahacharadi Taila 7Avartana.

Peroxide value

It is a measurement of peroxides present in the oil. Peroxide value signifies the percentage of oxidation of the Grutha and Taila. It helps us to find the stability of the sample. If the peroxide value is more, it shows more oxidation and chances of attaining rancidity is also more.

Peroxide value of Sahacharadi Taila is 38.805 and it was decreased to 11.978 in 7th Avartana which is suggestive that the Sahacharadi Taila 7 is more stable and the Sahacharadi Taila is more prone to rancidity.

CONCLUSION

It is possible to obtain an oil of desired potency by increasing the number of Avartanas, which is evident by the pharmaceutico- chemical findings. Overall comparison of Sahacharadi Taila with its 7 Avartana, it is quite evident from the analytical study that, more stable and quick penetrative medicaments can be obtained by increasing the number of Avartana. The values obtained from analytical study can be considered for comparing the values that will be obtained in future preparations and helps to check the quality of raw materials and standardize the finished product.

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