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Research Article

A COMPARATIVE PHARMACEUTICO – ANALYTICAL STUDY WITH MOORCHITA AND AMOORCHITA PINYAKA TAILA SAMPLES

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Abstract

Pinyaka taila is a formulation mentioned in Charaka samhitha and Ashtanga Hridaya for kaphanubandha vataroga's. The ingredients of Pinyaka taila are laghu Panchamoola (Brihathi, Kantakari, Shalaparni, Prishniparni and Gokshura), Pinyaka (Oil cake), tila taila (Sesame oil) and Goksheera (cow's milk). This article is a comparison between 6 batches of Pinyaka taila for its pharmaceutico-analytical study. The preparation according to classics with murchita tila taila has proven good according to analytical data.

Key words: Pinyaka taila; Hriswa/laghu Panchamoola; Murchita tila taila.

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INTRODUCTION

Sneha kalpana is one of the most important kalpana mentioned in Ayurveda classics and has its unique place in Ayurvedic pharmaceutic sand therapeutics.[1] The Sneha used in Sneha paka may be of animal origin [i.e. Jangama Sneha like Gritha (cow's ghee), Vasa (animal fat), and Majja] or herbal origin (i.e. Sthavara Sneha like Tila taila (sesame oil), Sarshapa taila (mustard oil), etc.). Tila taila extracted from tila seeds (*Sesamum indicum* Linn.) are used internally and externally in Ayurvedic classics.

Murchana is a specific process in Sneha kalpana indicated as a pre requisite for Sneha Paka.[3] The process of Murchana is described in Bhaishajya Ratnavali. Murchana is indicated to remove Ama dosha from Sneha which has both pharmaceutical and therapeutical significance. Earlier studies have shown that more active principles is absorbed into the Sneha if the paka (process) is done after Murchana and in addition the product becomes easy for digestion.[4][5]

In Charaka samhitha and Ashtanga Hridaya, Pinyaka taila is a formulation mentioned for treating kaphanubandha vatarogas. Laghu Panchamoola (Brihathi, Kantakari, Shalaparni, Prishniparni and Gokshura), Pinyaka[6][7][8] (Oil cake or paste of seed from which oil has been extracted stored for 1 year), tila taila (Sesame oil) and Goksheera (cow's milk) are the ingredients of Pinyaka taila. Pinyaka / tila kitta is lekhana, ruksha, madhura, balya and pushtidayaka. Sesame oil cake with low level of aflatoxin contains 32 % crude protein, 8-10 % oil total oil and albuminoids of 40 - 42 %. Semi deflated sesame cake with 50 % protein & high calcium concentration, more than traditional calcium sources such as milk. Laghu Panchamoola are generally vata kapha hara and ama dosha nashaka. Goksheera[9] is vatapitta hara and ojo vardhaka. Though this panchamoola / Pinyaka taila is used popularly in clinical practice, its process standardisation is not yet done and also analytical standards are not developed. Pharmaceutico analytical study of Pinyaka taila will pay a base for further studies in this regard. Hence, a comparative pharmaceutico analytical study of pinyaka/panchamoola taila was made with all the 6 samples together with respect to the rancidity study.

MATERIAL AND METHODS

All the ingredients were collected and authenticated by botanist for its genuinity**.**

Pharmaceutical study

3 batches of Pinyaka taila with murchita taila and 3 batches with amurchita taila were prepared for the study. (Table 2)

Murchita tila taila was prepared as per the murchana mentioned in bhaishajya ratnavalli. (Table 1) Tila taila 3500 ml was taken and added with the ingredients mentioned in Table 1 and heated in mandagni. It took totally 47 hrs to complete the heating process. Quantity obtained was 3300 ml and this served as the base for 3 samples of Pinyaka taila with murchita tila taila.(i.e. Batch A, Batch B, Batch C). One year old Pinyaka was added in first 3 batches of murchita taila as kalka (i.e. Batch A, Batch B, Batch C). In the last 3 samples (i.e. Batch D, Batch E, Batch F), directly collected sample of Pinyaka from the market was used.

In Batch A, Batch B, Batch C murchita tila taila about 1000 ml was taken, added with 250g of kalka (Panchamoola+ Pinyaka). Then in Batch A, ksheera added was 1000ml and 4000ml of water was added and sneha paka was carried out. In Batch B, Batch C murchita tila taila about 1000ml was taken, added with 250g of kalka (Panchamoola+ Pinyaka), 4000ml of ksheera was added and sneha paka was carried out. In batch D Pinyaka taila was prepared with amurchita taila and Pinyaka was added as kalka and kashaya (Pinyaka kashaya

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was prepared as per the general method of kwatha preaparation i.e. 1:8 ratio and reduction 1/4th) and the quantity of ksheera (milk) was 1400 ml (8 times of kalka). Remaining 2 batches (i.e. Batch E, Batch F) was prepared with amurchita taila and pinyaka as kalka and the quantity of ksheera (milk) was 2800 ml (16 times of kalka).

Analytical study

All the 6 samples were analytically scrutinized for the study. 1st 3 batches (i.e. Batch A, Batch B, Batch C) were analyzed for GC-MS and HPTLC study. (Table 3 to Table 5)

HPTLC Analysis

The **b**iomarker used was Coumaric acid. HPTLC plates silica gel 60F 254 (6.0x 11.0 cm) and Methanol was the sample solvent. The Mobile phase was Toluene: Ethyl Acetate: Hexane in the ratio (6:3:1). Solvent front position was 70.0 mm.

The second biomarker used was Sesamol. The stationary phase was HPTLC Silica Gel GF_{254} (10 cm x 10 cm) and mobile phase was n-Hexane: Diethyl Ether in the ratio (7:3). The Concentration of sample was 100 mcl in 1000 mcl of Diethyl ether. Detection wave length was in 284 nm. For standard, Sessamol was taken and the solvent system was Hexane: diethyl ether. (Table 6 to Table 13)

DISCUSSION

The concept of sneha murchana plays an important role in its shelf life. When murchita sample was compared amurchita sample, a higher peroxide value and acid value was observed in amurchitha than murchitha indicating its higher rate to rancidity. Krie's test also proved the same.

Batch D (classical way according to Charaka) showed values of acid, saponification and peroxide lesser than Batch E and Batch F. Pinyaka as kashaya was added to batch D only and quantity of ksheera (Milk) quantity was less in D compared to E and F. Lesser values with respect to acid, iodine, loss on drying etc was observed in Batch D and the reason may be due to the difference in quantity of milk and the drava dravya being Pinyaka kashaya. When comparing sample D with B and C, there was mild differences between the three samples.

As the present article is a preliminary study it can be concluded that murchita Pinyaka taila in good with respect to rancidity. All the samples have slight variation pharmaceutically especially in the quantity of milk, pinyaka kashaya being added only in Batch D. In batch A jala (water) was added for samyak paka (desired) of sneha. To arrive at a conclusion the study should be conducted in large samples.

As the study gives a base that murchita taila is good with respect to rancidity, HPTLC was carried out for samples of Batch A, Batch B, Batch C alone and hence for further studies Batch A, B, C was considered. With coumaric acid as marker the HPTLC was run, but the compound was not detected and so could be inferred that it would have destroyed due to heating process. With sesamol as marker, all 3 samples showed high peaks. Pinyaka adds to improving the concentration in the sample.

GC-MS study was done for all the 3 samples (i.e. Batch A, Batch B, Batch C). Maximum peak was for oleic acid. Second highest was for Linoleic acid for all the 3 samples. Sesame oil had chemical constituents: Linoleic acid (41% total), oleic acid (39%), palmitic acid (8%), Stearic acid (5%) and all others in small amounts.

pH was 3 for all the samples. Specific gravity was almost similar for all the samples (<1). Viscosity was highest for Batch B and lowest for Batch C.

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Table 1: Drugs and quantity taken for Tila taila murchana

Ingredients	Latin name	Family	Part used	Form	Quantity
Manjishta	*Rubia cordifolia*	Rubiaceae	Stem	Dry	218.75 g
Haridra	*Curcuma longa*	Zingiberaceae	Rhizome	Dry	54.68 g
Lodhra	*Symplocos racemosa*	Symplocaceae	Stem bark	Dry	54.68 g
Mustha	*Cyperus rotundus*	Cyperaceae	Rhizome	Dry	54.68 g
Nalika	*Cinnamom tamala*	Lauraceae	Stem bark	Dry	54.68 g
Amalaki	*Emblica officinalis*	Euphorbiaceae	Pericarp	Dry	54.68 g
Haritaki	*Terminalia chebula*	Combretaceae	Pericarp	Dry	54.68 g
Bhibhithaki	*Terminalia bellerica*	Combretaceae	Pericarp	Dry	54.68 g
Vatankur	*Ficus benghalensis*	Moraceae	Lt. bud	Fresh	54.68 g
Hribera	*Coelus vettiveroides*	Laminaceae	Whole plant	Dry	54.68 g
Kethaki	*Pandanus tectorius*	Pandanacea	Root	Dry	54.68 g
Tila oil	*Sesamum indicum*	Pedaliaceae	Seed oil	-	3500ml
Water	-	-	-	-	14000ml

Table 2: Quantities of ingredients taken in each batch of Pinyaka taila

Batches	Oil	Kalka	Ksheera	Jala	Pinyaka
Batch A (M.T)	1 l	250g	1l (snehasamana)	4 l	As kalka
Batch B (M.T)	1 l	250g	4 l (16 times)	-	As kalka
Batch C (M.T)	1 l	250g	4 l (16 times)	-	As kalka
Batch D (A.M)	700 ml	175g	1.4l (8 times)	-	As kalka and kashaya(30ml)
Batch E (A.M)	700 ml	175g	2.8l (16 times)	-	As kalka
Batch F (A.M)	700 ml	175g	2.8l (16 times)	-	As kalka

Table 3: Organoleptic characters of each batch

Parameters	Colour	Odour	Taste	Consistency
Batch A(M.T)	Brownish	Characteristic smell	Katu ++; Tikta+	Liquid, oily
Batch B (M.T)	Brownish	Characteristic smell	Katu ++; Tikta+	Liquid, oily
Batch C (M.T)	Brownish	Characteristic smell	Katu ++; Tikta+	Liquid, oily
Batch D (A.M)	Yellowish brown	Characteristic smell	Tikta++	Liquid, oily
Batch E (A.M)	Yellowish brown	Characteristic smell	Tikta++	Liquid, oily
Batch F (A.M)	Yellowish brown	Characteristic smell	Tikta++	Liquid, oily

Table 4: Physicochemical parameters

Sl.No.	Parameters	Batch A	Batch B	Batch C	Average
1	pH	3	3	3	3
2	Specific gravity	0.9383	0.9405	0.9418	0.940
3	Viscosity	91.68	92.68	57.23	80.53
4	Refractive index	1.46917	1.46867	1.46817	1.46867
5	Loss on drying	0.49701	0.33027	0.49086	0.43938
6	Iodine value	100.87	104.28	100.06	101.7366
7	Saponification value	164.59	160.60	195.89	173.6933
8	Acid value	0.55	0.55	1.09	0.73
9	Peroxide value	4.79	3.99	3.77	4.1833
10	Rancidity(slight pink)	6^{th} month	6^{th} month	6^{th} month	6^{th} month

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Table 5: Physicochemical parameters

Sl.No.	Parameters	Batch D	Batch E	Batch F	Average
1	pH	3	3	3	3
2	Specific gravity	0.9287	0.9156	0.9198	0.9214
3	Viscosity	59.23	61.98	63.54	61.583
4	Refractive index	1.46	1.45	1.45	1.453
5	Loss on drying	0.3305	0.4508	0.4979	0.4264
6	Iodine value	100.87	104.28	104.08	103.076
7	Saponification value	162.89	180.60	185.81	176.433
8	Acid value	0.67	1.08	1.07	0.94
9	Peroxide value	3.69	5.98	5.97	5.213
10	Rancidity(strong pink colour)	6^{th} month	6^{th} month	6^{th} month	6^{th} month

Table 6: Peak values for HPTLC with p-coumaric acid as marker for Batch A

Peak	Start Rf	Start Height	Max Rf	Max Height	Max %	End Rf	End Height	Area	Area%	Assigned substance
1	0.07	1.1	0.03	110.1	35.20	0.06	7.8	2542.0	33.26	Unknown*
2	0.75	2.3	0.77	10.6	3.40	0.80	0.3	164.0	2.15	Unknown*
3	0.89	6.0	0.94	16.9	5.42	0.96	1.4	458.9	6.00	Unknown*
4	0.97	0.2	1.02	175.1	55.98	1.08	0.1	4477.8	58.59	Unknown*

Table 7: Peak values for HPTLC with p-coumaric acid as markerfor Batch B

Peak	Start Rf	Start Height	Max Rf	Max Height	Max %	End Rf	End Height	Area	Area %	Assigned substance
1	0.06	0.3	0.03	82.6	41.21	0.04	4.0	1490.3	33.45	unknown *
2	0.98	0.2	1.02	117.8	58.79	1.07	2.0	2964.9	66.55	unknown

Table 8: Peak values for HPTLC with p-coumaric acid as marker for Batch C

Peak	Start Rf	Start Height	Max Rf	Max Height	Max %	End Rf	End Height	Area	Area %	Assigned substance
1	0.06	0.7	0.03	60.2	37.68	0.04	5.2	1243.5	33.01	unknown*
2	0.97	0.3	1.02	99.6	62.32	1.07	0.2	2523.8	66.99	unknown*

Table 9: Peak values for HPTLC with p-coumaric acid as standard marker

Peak	Start Rf	Start Height	Max Rf	Max Height	Max %	End Rf	End Height	Area	Area %	Assigned substance
1	0.07	3.2	0.14	63.4	100	0.17	3.9	1613	100	coumaric acid

Table 10: HPTLC study for batch a with sesamol as markerfor Batch A

Track	Peak	Start Rf	Start Height	Max Rf	Max Height	Max %	End Rf	End Height	Area	Area %	Assigned substance
1	3	0.39	14.2	0.42	58.2	12.59	0.46	19.6	908.9	13.50	Sesamol

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Table 11: HPTLC study for batch a with sesamol as marker for Batch B

Track	Peak	Start Rf	Start Height	Max Rf	Max Height	Max %	End Rf	End Height	Area	Area %	Assigned substance
2	3	0.38	30.7	0.41	114.9	17.53	0.45	34.3	3756.9	16.79	Sesamol

Table 12: HPTLC study for batch a with sesamol as markerfor Batch C

Track	Peak	Start Rf	Start Height	Max Rf	Max Height	Max %	End Rf	End Height	Area	Area %	Assigned substance
3	5	0.38	12.0	0.42	49.6	14.69	0.46	13.0	1607.0	15.60	Sesamol

Table 13: HPTLC study with sesamol as standard marker

Track	Peak	Start Rf	Start Height	Max Rf	Max Height	Max %	End Rf	End Height	Area	Area %	Assigned substance
4	3	0.31	6.4	0.42	280.6	72.50	0.47	7.7	10574.1	81.09	Sesamol

Figure 1: HPTLC with Coumaric acid

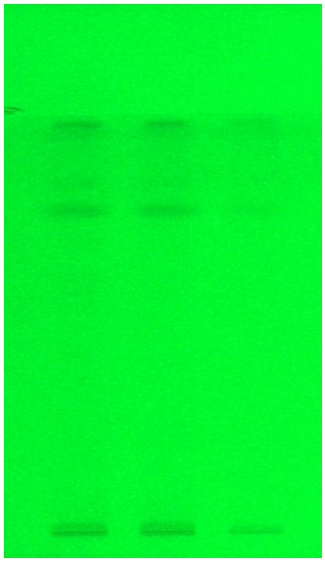
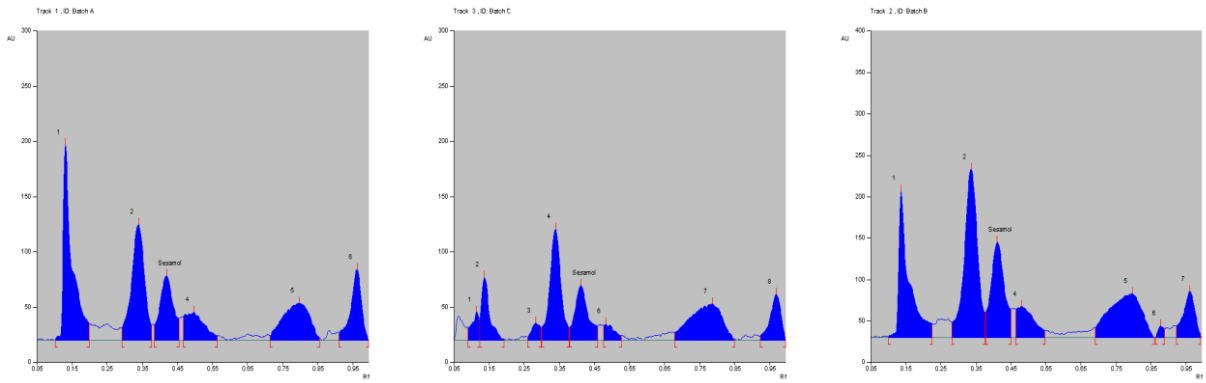


Figure 2: HPTLC with Sesamol as marker



Batch A Batch B Batch C

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The Refractive index was similar for all the batches. Loss on drying was maximum for batch A and F, the reason may be due to the milk quantity.

Iodine value, peroxide and saponificationwas least for batch D of Pinyaka taila, indicating its lower level of oxidation due to its less milk quantity.

Classical method of ashta guna ksheera and pinyaka kashaya showed better analytical parameters. Yet larger sample size should be taken to draw a conclusion regarding the principles. Hence this study plays a base and bridge for further studies.

CONCLUSION

Classical method of ashta guna ksheera and pinyaka kashaya showed better analytical parameters than 16 times ksheera and pinyaka kalka. As comparing the murchita and amurchita taila samples, murchita had lower level of rancidity than amurchita taila.

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