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A PHARMACEUTICAL AND ANALYTICAL STUDY ON DADRUHARA MALAHARA PREPARED WITH SOMRAJI TAILA

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ABSTRACT

Background: Ayurvedic pharmaceutics includes various dosage forms intended for external application. Dadruhara Lepa is an external formulation used in the management of skin disorders, while Malahara Kalpana provides a semisolid dosage form suitable for convenient application and prolonged contact with the affected area. In the present study, the contents of Dadruhara Lepa were incorporated into a Somraji Taila-based Siktha Taila to prepare Dadruhara Malahara, followed by pharmaceutical and analytical evaluation. **Aim:** To prepare Dadruhara Malahara with Somraji Taila and to evaluate the prepared formulation through organoleptic, physicochemical, microbiological, elemental and chromatographic parameters. **Materials and Methods:** The pharmaceutical study included Shodhana of Bakuchi, Guggulu, Tankana and Gandhaka, followed by preparation of Somraji Taila and Dadruhara Malahara. Somraji Taila was prepared in three batches according to the principles of Sneha Paka. Dadruhara Malahara was prepared in three batches by incorporating the contents of Dadruhara Lepa—Shodhita Gandhaka, Shodhita Tankana, Safeda Kattha, Rala and Shodhita Guggulu—into a Siktha Taila base. Somraji Taila and Siktha were used in a ratio of 6:1 for preparation of the base, while Dadruhara Lepa contents and the prepared Siktha Taila base were used in a ratio of 1:2.5. The prepared formulation was evaluated for organoleptic characteristics, pH, moisture content, total fat, spreadability, Total Viable Count (TVC), X-ray Fluorescence (XRF) and High-Performance Thin-Layer Chromatography (HPTLC). **Results:** Somraji Taila and Dadruhara Malahara were successfully prepared in three batches. From an initial Sneha quantity of 1000 g in each batch, the obtained quantities of Somraji Taila were 819 g, 832 g and 812 g, respectively. The prepared Dadruhara Malahara was mustard brown, smooth, homogeneous and semisolid with a characteristic herbal-medicated odour. The pH was 8.04, moisture content was 1.73% w/w, total fat was 64.82%, spreadability was 7.14 g·cm/s and TVC was 1×10^2 CFU/g. XRF analysis showed sulphur at 2.57%, along with silicon, aluminium, calcium, phosphorus, iron and other trace elements. Lead was detected at 2 ppm. HPTLC produced a characteristic multi-spot chromatographic profile at 254 nm, 366 nm and 540 nm. **Conclusion:** Dadruhara Malahara prepared with Somraji Taila was successfully obtained as a smooth, homogeneous semisolid formulation. The pharmaceutical study documented the preparation process and observations across three batches, while analytical evaluation generated preliminary physicochemical, microbiological, elemental and chromatographic data for characterization and quality assessment of the prepared formulation.

KEYWORDS: Dadruhara Malahara, Somraji Taila, Dadruhara Lepa, Malahara Kalpana, Sneha Paka, HPTLC, XRF, analytical evaluation.

INTRODUCTION

Ayurvedic pharmaceutics comprises numerous dosage forms intended for internal as well as external administration. The pharmaceutical quality of these formulations depends not only upon the appropriate selection of ingredients but also upon various pharmaceutical processes such as Shodhana, heating, mixing, filtration and storage. Proper documentation of these procedures and the changes occurring during pharmaceutical processing is important for obtaining formulations with consistent characteristics.

Malahara Kalpana is a semisolid pharmaceutical preparation intended primarily for external application. Siktha Taila, prepared by combining Siktha (beeswax) with Taila, provides an oleaginous semisolid base into which therapeutic ingredients can be incorporated.

Dadru is described under Kushtha and is characterized by manifestations such as Kandu, Raga, Pidika and Mandala. External applications have an important role in its management. Dadruhara Lepa contains ingredients traditionally indicated in skin disorders. However, the Lepa dosage form requires preparation and application as a paste and may have practical limitations related to handling, storage, uniform application and retention over the affected area.

In the present study, the contents of Dadruhara Lepa were incorporated into a Malahara dosage form using Somraji Taila as the medicated oil component of the Siktha Taila base. This provided a semisolid formulation suitable for external application.

In addition to pharmaceutical preparation, analytical evaluation provides objective information regarding the physical, physicochemical, microbiological, elemental and chromatographic characteristics of a formulation. Therefore, the present study was undertaken to document the pharmaceutical preparation of Dadruhara Malahara prepared with Somraji Taila and to evaluate the prepared formulation using selected analytical parameters.

AIM AND OBJECTIVES

Aim

To prepare Dadruhara Malahara with Somraji Taila and to evaluate the prepared formulation through pharmaceutical and analytical parameters.

Objectives

1. To carry out the required Shodhana procedures of the ingredients used in the formulation.
2. To prepare Somraji Taila in three batches.
3. To prepare Dadruhara Malahara with Somraji Taila in three batches.
4. To evaluate the organoleptic and physicochemical characteristics of Dadruhara Malahara.
5. To assess the microbiological quality of the prepared formulation.
6. To determine the elemental composition using X-ray Fluorescence (XRF).
7. To obtain the chromatographic fingerprint of the formulation using HPTLC.

MATERIALS AND METHODS

Collection and Authentication of Raw Materials

Bakuchi, Haridra, Daruharidra, Sarshapa, Kushtha, Karanja, Chakramarda, Aragvadha, Amlasara Gandhaka, Tankana, Safeda Kattha, Rala and Guggulu were procured from the local market of Varanasi. Sarshapa Taila and Gomutra were also procured locally, while beeswax was obtained from beekeepers.

The raw materials were verified and authenticated based on their characteristic features with the assistance of experts from the Department of Rasashastra and Bhaishajya Kalpana and the Department of Dravyaguna, Government Ayurvedic College & Hospital, Varanasi.

Pharmaceutical Study

The pharmaceutical study was carried out in the following stages:

1. Shodhana of Bakuchi.
2. Preparation of Triphala Kashaya and Shodhana of Guggulu.
3. Shodhana of Tankana.
4. Shodhana of Gandhaka.
5. Preparation of Somraji Taila in three batches.
6. Preparation of Dadruhara Malahara in three batches.

Shodhana Procedures

Drug	Shodhana method/medium	Endpoint/observation	Reference
Bakuchi	Nimajjana in Gomutra for seven days	Seeds were washed and dried after completion of the procedure	*Ashtang Sangraha*[3]
Guggulu	Dolayantra Swedana using Triphala Kashaya	Shodhita Guggulu was obtained after concentration and drying	*Rasa-Jala-Nidhi*[4]
Tankana	Nirjalikarana by heating	White, porous, brittle and easily powderable material was obtained	*Rasatarangini*[6]
Gandhaka	Dhalana using Go-ghrita and Go-dugdha	Shodhita Gandhaka was obtained after three Dhalanas, followed by washing and drying	*Rasatarangini*[5]

Triphala Kashaya used for Guggulu Shodhana was prepared according to the general Kwatha preparation method described in *Sharangadhara Samhita*.[7]

Bakuchi Shodhana

Guggulu Shodhana in Triphala Kwatha

Tankana Shodhana

Gandhaka Shodhana

Preparation of Somraji Taila

Somraji Taila was prepared in three batches according to the formulation described in *Bhaishajya Ratnavali*, Kushtha Rogadhikara 54/312–314.[1] Kalka, Sneha and Drava were maintained in the ratio of 1:4:16 as described in Sharangadhara Samhita.[8] In each batch, 250 g of Kalka Dravya, 1000 g of Sneha Dravya and 4000 g of water were used.

The Kalka consisted of Bakuchi, Haridra, Daruharidra, Sarshapa, Kushtha, Karanja, Chakramarda and Aragvadha. Sarshapa Taila was used as Sneha Dravya.

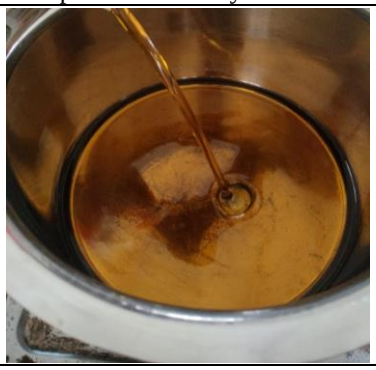
The ingredients were subjected to heating with appropriate stirring. Heating was continued while observing the progressive stages of Sneha Paka. After attainment of the desired Paka stage, the Siddha Taila was filtered while warm and stored appropriately.

Pharmaceutical Results of Somraji Taila

Parameter	Batch 1	Batch 2	Batch 3
Initial Kalka Dravya	250 g	250 g	250 g
Initial Sneha Dravya	1000 g	1000 g	1000 g
Initial Drava Dravya	4000 g	4000 g	4000 g
Obtained Somraji Taila	819 g	832 g	812 g
Loss of Sneha	181 g	168 g	188 g
Percentage loss	18.1%	16.8%	18.8%

The three batches showed comparatively close pharmaceutical yields.

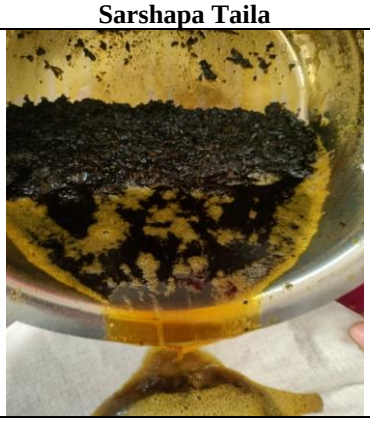
Dravya Kalka



Sarshapa Taila

Potable Water

Sneha Siddhi Pariksha



Filtration

Somraji Taila

PREPARATION OF DADRUHARA MALAHARA

Dadruhara Malahara was prepared by incorporating the contents of Dadruhara Lepa[2] into a Siktha Taila base prepared using Somraji Taila.

Composition of Dadruhara Malahara.

Ingredient	Quantity
Shodhita Gandhaka	61.6 g
Shodhita Tankana	61.6 g
Safeda Kattha	61.6 g
Rala	61.6 g
Shodhita Guggulu	61.6 g
Somraji Taila	660 g
Siktha (beeswax)	110 g

The total quantity of Dadruhara Lepa contents was **308 g**.

Somraji Taila and Siktha were taken in the ratio of **6:1** for preparation of the Siktha Taila base. The total Dadruhara Lepa contents were subsequently incorporated into the prepared Siktha Taila base in the ratio of **1:2.5 (Dadruhara Lepa contents:Siktha Taila base).**

Procedure

Somraji Taila was transferred into a clean and dry glass beaker and subjected to indirect heating using a double-boiler arrangement. Siktha was gradually added to the warm Taila and allowed to melt completely with continuous stirring.

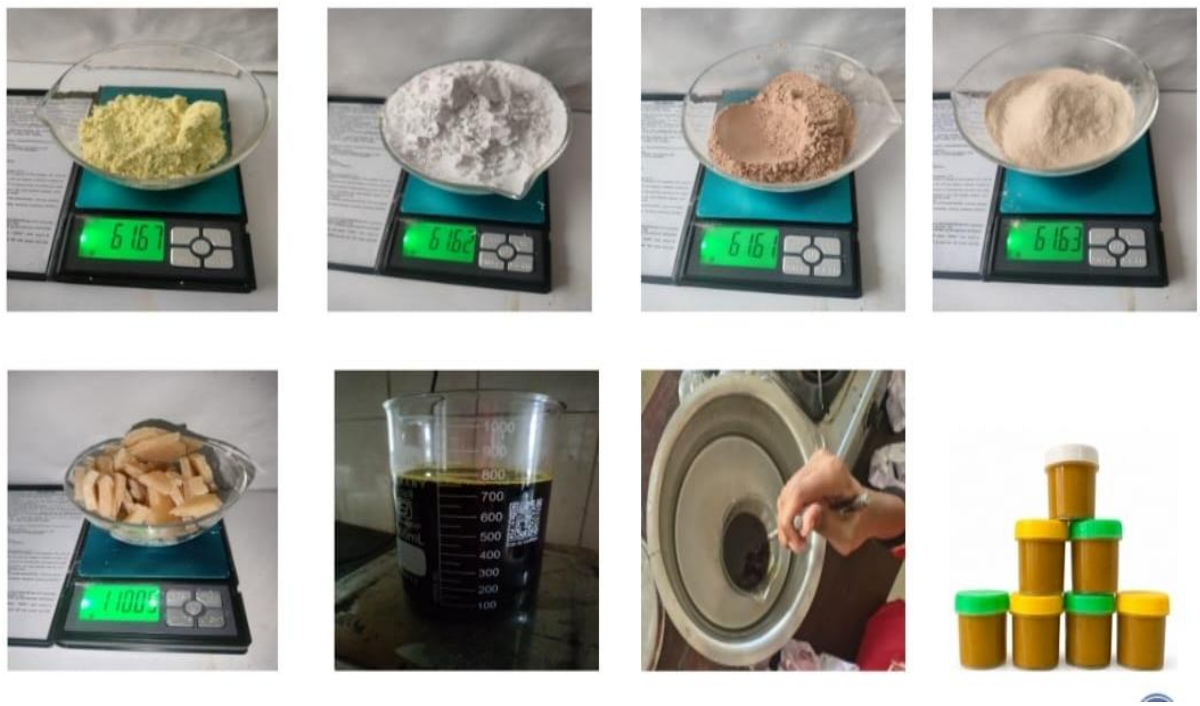
Shodhita Guggulu was gradually incorporated into the base with continuous stirring. Shodhita Gandhaka, Shodhita Tankana, Safeda Kattha and Rala were finely powdered and mixed uniformly. The powder mixture was gradually incorporated into the warm base in small portions with continuous stirring to prevent lump formation and facilitate uniform dispersion.

Stirring was continued until a smooth, homogeneous semisolid preparation was obtained. The prepared Malahara was allowed to cool to room temperature with intermittent stirring to maintain uniform consistency.

The same pharmaceutical procedure was followed for all three batches of Dadruhara Malahara.

Pharmaceutical Results of Dadruhara Malahara

Parameter	Batch 1	Batch 2	Batch 3
Somraji Taila	660 g	660 g	660 g
Siktha	110 g	110 g	110 g
Dadruhara Lepa contents	308 g	308 g	308 g
Initial theoretical quantity	1078 g	1078 g	1078 g
Final quantity obtained	1060 g	1070 g	1068 g
Loss	18 g	8 g	10 g
Percentage yield	98.33%	99.26%	99.07%
Percentage loss	1.67%	0.74%	0.93%
Final consistency	Semisolid	Semisolid	Semisolid



ANALYTICAL STUDY

Analytical evaluation of Dadruhara Malahara was carried out at Jeevanrekha Analytical Services Ltd. and Vasu Research Centre, Vadodara. The prepared formulation was subjected to organoleptic, physicochemical, microbiological, elemental and chromatographic evaluation.

Organoleptic Evaluation

Parameter	Observation
Colour	Mustard brown
Odour	Characteristic herbal-medicated
Appearance	Uniform, smooth semisolid
Consistency	Homogeneous semisolid

Physicochemical Evaluation

Parameter	Result
pH	8.04
Moisture content	1.73% w/w
Total fat	64.82%
Spreadability	7.14 g·cm/s

Microbiological Evaluation

Parameter	Result
Total Viable Count (TVC)	1×10^2 CFU/g

X-Ray Fluorescence Analysis

XRF analysis was performed to characterize the elemental composition of the prepared Dadruhara Malahara.

Element	Concentration
Sulphur (S)	2.57%
Silicon (Si)	5840 ppm
Aluminium (Al)	2080 ppm
Calcium (Ca)	1607 ppm
Phosphorus (P)	1041 ppm
Iron (Fe)	766 ppm
Titanium (Ti)	430 ppm
Zinc (Zn)	79 ppm
Manganese (Mn)	42 ppm
Lead (Pb)	2 ppm

HPTLC Fingerprinting

For HPTLC analysis, 1 g of Dadruhara Malahara was extracted with methanol and applied onto silica gel 60 F_{254} plates. Chromatographic development was performed using **Toluene:Ethyl acetate:Acetic acid (7:2:1)** as the mobile phase.

The developed plates were visualized at 254 nm and 366 nm and after derivatization at 540 nm.

Visualization	Chromatographic observation
254 nm	Six spots; Rf range 0.50–0.78
366 nm	Five spots; Rf range 0.50–0.86
540 nm after derivatization	Eight spots; Rf range 0.25–0.83

The obtained chromatographic pattern provided a characteristic fingerprint of the analysed Dadruhara Malahara sample.

RESULTS

Somraji Taila and Dadruhara Malahara were successfully prepared in three batches following the respective pharmaceutical procedures.

From an initial Sneha quantity of 1000 g in each batch, the obtained quantities of Somraji Taila were 819 g, 832 g and 812 g in Batch 1, Batch 2 and Batch 3, respectively. The corresponding percentage losses were 18.1%, 16.8% and 18.8%.

Dadruhara Malahara was subsequently prepared using Somraji Taila-based Siktha Taila and the contents of Dadruhara Lepa. The finished Malahara was mustard brown, smooth, homogeneous and semisolid with a characteristic herbal-medicated odour. The final quantities obtained from the three Malahara batches were 1060 g, 1070 g and 1068 g in Batch 1, Batch 2 and Batch 3, respectively.

Analytical evaluation showed a pH of **8.04**, moisture content of **1.73% w/w**, total fat content of **64.82%**, spreadability of **7.14 g·cm/s** and TVC of **1×10^2 CFU/g**.

XRF analysis detected sulphur at **2.57%**, together with silicon, aluminium, calcium, phosphorus, iron, titanium, zinc and manganese. Lead was detected at **2 ppm**.

HPTLC analysis demonstrated a multi-spot chromatographic profile at 254 nm, 366 nm and 540 nm after derivatization, providing chromatographic fingerprint data for the analysed formulation.

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HPTLC FINGERPRINTING REPORT

Sample	:	Ointment
Name of Scholar	:	Dr. Jiwane Mohan, Government Ayurvedic College & Hospital, Varanasi
AR No.	:	VARS/RS/26/04/024
Date of Report	:	22.04.2026

Preparation of Test solution: 1 gm of ointment Sample was taken in evaporating dish, and 10 ml of methanol was added. The mixture was heated on a water bath until it completely dissolved. It was then filtered through whatman filter paper no.1.The filtrate thus obtained was used for HPTLC fingerprinting.

Preparation of Spray reagent: [Anisaldehyde – sulphuric acid reagent]: 0.5 mL Anisaldehyde is mixed with 10 mL Glacial acetic acid, followed by 85 mL Methanol and 5 mL Sulphuric acid (98 %).

Chromatographic Conditions:

Application Mode	CAMAG Linomat 5 - Applicator
Filtering System	Whatman filter paper No. 1
Stationary Phase	MERCK - TLC / HPTLC Silica gel 60 F_{254} on Aluminum sheets
Application (Y axis) Start Position	10 mm
Development End Position	80 mm from plate base
Sample Application Volume	12.0 µL
Development Mode	CAMAG TLC Twin Trough Chamber
Chamber Saturation Time	30 minutes
Mobile Phase (MP)	Toluene : Ethyl acetate : Acetic acid (7 : 2 : 1 v/v)
Visualization	@ 254 nm, @ 366 nm and @ 540 nm (after derivatization)
Spray reagent	Anisaldehyde – sulphuric acid reagent
Derivatization mode	CAMAG – Dip tank for about 1 minute
Drying Mode, Temp. & Time	TLC Plate Heater Preheated at 100± 5°C for 3 minutes

Analyzed by **Approved by**

Officer / Sr. Executive **Dy. Manager**

Vasu Research Centre (A Div. of Vasu Healthcare Pvt. Ltd.)
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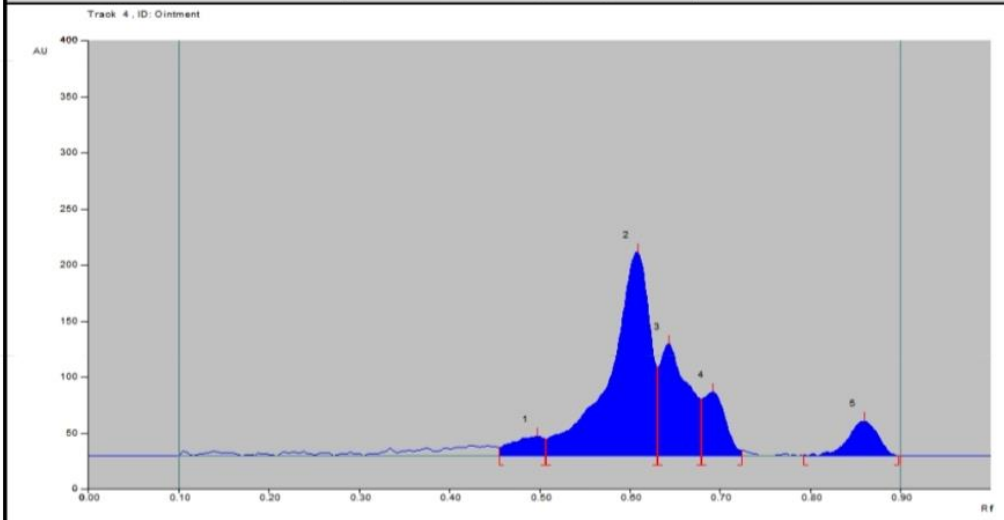
HPTLC Chromatogram @ 366 nm



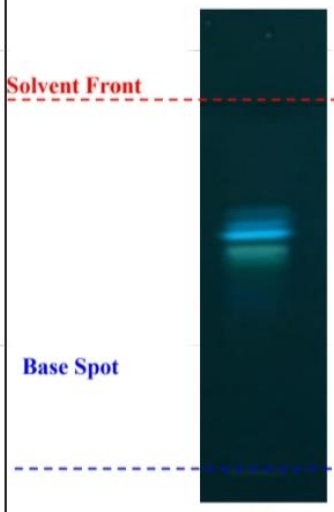
2D Chromatogram

R_f value

Spot No.	Track T1
1	0.50
2	0.61
3	0.65
4	0.70
5	0.86

Track T1: Ointment

HPTLC Plate



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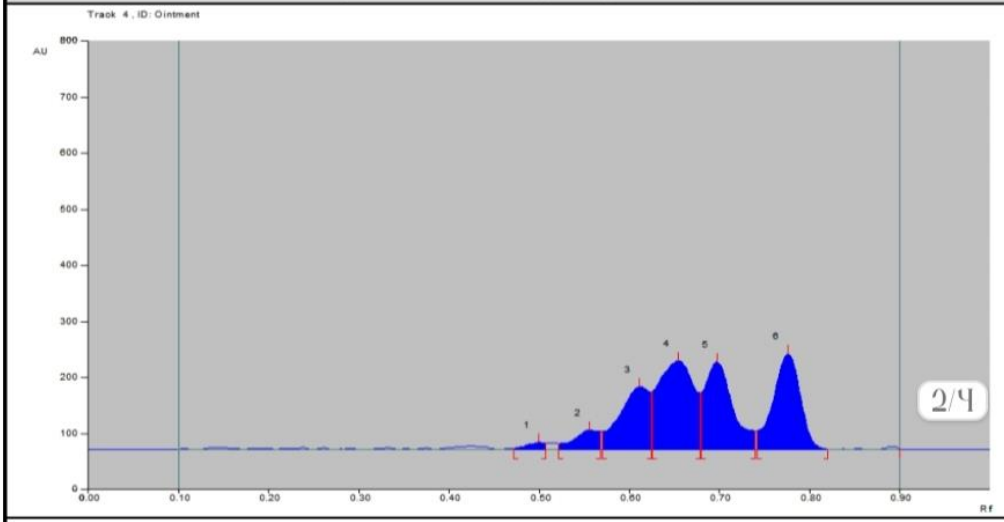
HPTLC Chromatogram @ 254 nm



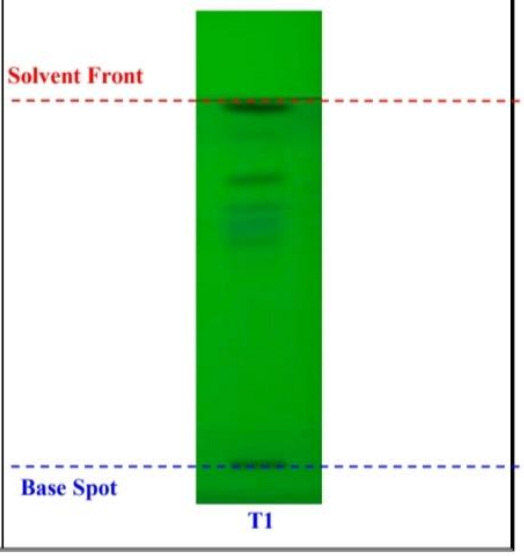
2D Chromatogram

R_f value

Spot No.	Track T1
1	0.50
2	0.56
3	0.61
.4	0.65
5	0.70
6	0.78

Track T1: Ointment

HPTLC Plate



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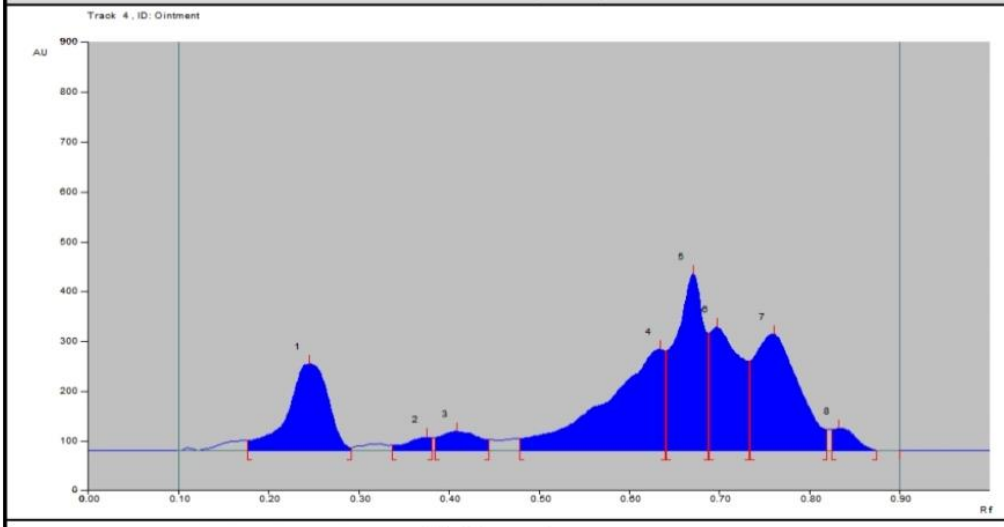
HPTLC Chromatogram @ 540 nm



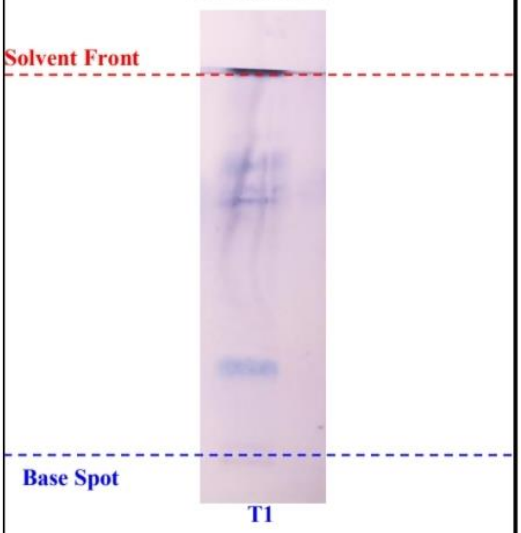
2D Chromatogram

R_f value

Spot No.	Track T1
1	0.25
2	0.38
3	0.41
4	0.61
5	0.65
6	0.70
7	0.78
8	0.83

Track T1: Ointment

HPTLC Plate



DISCUSSION

The present study was undertaken to document the pharmaceutical preparation and analytical evaluation of Dadruhara Malahara prepared with Somraji Taila. The pharmaceutical work involved the required Shodhana procedures, preparation of Somraji Taila, preparation of the Siktha Taila base and incorporation of the contents of Dadruhara Lepa to obtain Dadruhara Malahara. Somraji Taila and Dadruhara Malahara were prepared in three batches to document the pharmaceutical observations and assess the consistency of the adopted preparation process.

Pharmaceutical Observations of Somraji Taila

Somraji Taila was prepared according to the principles of Sneha Paka using Kalka, Sneha and Drava in the ratio of 1:4:16. The same quantities and general pharmaceutical procedure were followed in all three batches.

From an initial Sneha quantity of 1000 g in each batch, 819 g, 832 g and 812 g of Somraji Taila were obtained in Batch 1, Batch 2 and Batch 3, respectively. The corresponding losses were 18.1%, 16.8% and 18.8%.

The relatively small variation in yield among the three batches may be attributed to minor differences occurring

during heating, filtration, retention of Taila in the residual Kalka and adherence of the preparation to the vessels during handling. Nevertheless, the comparable pharmaceutical observations and yields obtained in the three batches indicate that the adopted method could be performed with reasonable consistency.

During Sneha Paka, characteristic changes in the appearance and consistency of the Kalka and Sneha were observed with progression of heating. The preparation was continued up to the desired Paka stage and filtered while warm. The obtained Somraji Taila subsequently served as the medicated oil component for preparation of the Siktha Taila base.

Pharmaceutical Observations of Dadruhara Malahara

Dadruhara Malahara was prepared by converting the contents of Dadruhara Lepa into a semisolid dosage form using Somraji Taila-based Siktha Taila.

The Siktha Taila base was prepared using Somraji Taila and Siktha in a ratio of 6:1. The contents of Dadruhara Lepa, comprising Shodhita Gandhaka, Shodhita Tankana, Safeda Kattha, Rala and Shodhita Guggulu, were subsequently incorporated into the prepared base in the ratio of 1:2.5 (Dadruhara Lepa contents:Siktha Taila base).

The addition of Siktha converted the liquid medicated Taila into a semisolid base suitable for incorporation of the Dadruhara Lepa ingredients. Gradual addition of the finely powdered ingredients with continuous stirring was important for preventing lump formation and obtaining uniform dispersion. The double-boiling method facilitated gradual heating, melting of Siktha and uniform mixing of the ingredients.

Dadruhara Malahara was prepared in three batches following the same procedure. The finished preparation was smooth, homogeneous and semisolid without visible phase separation. The pharmaceutical observations among the batches were comparable. The final quantities obtained were 1060 g, 1070 g and 1068 g in Batch 1, Batch 2 and Batch 3, respectively, corresponding to percentage yields of 98.33%, 99.26% and 99.07%. The finished preparations were smooth, homogeneous and semisolid without visible phase separation. The close percentage yields and comparable pharmaceutical observations among the three batches indicated consistency in the adopted preparation procedure.

Analytical Evaluation

Analytical evaluation was undertaken to characterize the prepared Dadruhara Malahara and generate preliminary quality-assessment data. The formulation was evaluated through organoleptic examination, physicochemical parameters, microbial load, XRF analysis and HPTLC fingerprinting.

Organoleptically, Dadruhara Malahara was mustard brown in colour with a characteristic herbal-medicated odour and showed a smooth, uniform and homogeneous semisolid appearance. These characteristics describe the physical nature of the finished formulation and may be useful for preliminary identification and comparison of future preparations.

The pH of Dadruhara Malahara was **8.04**, indicating a mildly alkaline nature. pH is an important physicochemical characteristic of a topical preparation and the obtained value provides a measurable parameter for characterization of the prepared Malahara.

The moisture content was **1.73% w/w**. The relatively low moisture content is consistent with the predominantly oleaginous nature of the formulation containing Somraji Taila and Siktha. Low moisture content may also be favourable from a pharmaceutical perspective because the availability of water is one of the factors influencing microbial proliferation and product stability.

The total fat content was **64.82%**, which can be related to the presence of Somraji Taila and Siktha as major components of the formulation. The lipid fraction contributes to the semisolid nature of the preparation and facilitates its retention over the applied surface.

Spreadability of Dadruhara Malahara was **7.14 g·cm/s**. Spreadability is relevant to topical preparations because it indicates the ease with which the formulation can be distributed over the skin surface. The observed value provides a quantitative parameter for describing the application characteristics of the prepared Malahara.

The Total Viable Count was **1×10^2 CFU/g**, demonstrating a low microbial load in the analysed sample and providing information regarding the microbiological quality of the formulation at the time of analysis.

XRF analysis was performed to characterize the elemental composition of Dadruhara Malahara. Sulphur was detected at **2.57%**, consistent with the presence of Shodhita Gandhaka in the formulation. Silicon, aluminium, calcium, phosphorus, iron, titanium, zinc and manganese were also detected at different concentrations, while lead was detected at **2 ppm**. Thus, XRF provided an elemental profile of the prepared formulation.

HPTLC analysis generated a characteristic multi-spot chromatographic profile. Six spots were observed at 254 nm, five spots at 366 nm and eight spots after derivatization at 540 nm. The presence of multiple spots reflects the chemically complex nature of the formulation containing several ingredients. The obtained chromatographic profile provides preliminary fingerprint

data that may be useful for comparison with future preparations of Dadruhara Malahara.

Overall, the pharmaceutical study demonstrated that Dadruhara Malahara could be prepared in a semisolid form using Somraji Taila-based Siktha Taila, while the analytical study generated organoleptic, physicochemical, microbiological, elemental and chromatographic data for characterization of the prepared formulation. Further studies involving stability assessment, repeated analytical evaluation of individual batches and establishment of validated specifications would be required before definitive standardization parameters could be proposed.

CONCLUSION

The present study documented the pharmaceutical preparation and analytical evaluation of Dadruhara Malahara prepared with Somraji Taila. Somraji Taila and Dadruhara Malahara were successfully prepared in three batches following the respective pharmaceutical procedures. The comparable pharmaceutical observations and percentage yields obtained across the three batches indicated consistency in the adopted preparation procedure. The finished Dadruhara Malahara was obtained as a smooth, homogeneous semisolid preparation without visible phase separation.

Analytical evaluation generated organoleptic, physicochemical, microbiological, elemental and chromatographic data for characterization of the formulation. The findings provide preliminary pharmaceutical and analytical data that may serve as a basis for further studies involving batch-wise analytical evaluation, stability assessment and development of quality-control specifications for Dadruhara Malahara.

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CONFLICT OF INTEREST

The authors declare no conflict of interest.

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