International Journal of Contemporary Research In Multidisciplinary

Research Article

A Pharmaceutical Standardisation and Analytical Study of Jatyadi Taila Prepared by Three Different Methods

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DOI: https://doi.org/10.5281/zenodo.18616957

Abstract

Jatyadi Taila is a classical Ayurvedic medicated oil extensively used in the management of wounds (Vrana), ulcers, burns, and inflammatory conditions. The pharmaceutical process of Sneha Kalpana plays a pivotal role in determining the quality, stability, and therapeutic efficacy of the formulation. The present study was undertaken to prepare Jatyadi Taila by three different pharmaceutical methods and to evaluate them through pharmaceutical observations and analytical parameters. Comparative assessment was carried out based on organoleptic characters, physicochemical constants, and chromatographic profiles. The study highlights the influence of pharmaceutical methodology on the extraction efficiency, stability, and standardisation of Jatyadi Taila.

Manuscript Information

- **ISSN No:** 2583-7397
- **Received:** 14-10-2025
- **Accepted:** 23-11-2025
- **Published:** 31-12-2025
- **IJCRM:**4(6); 2025: 667-670

- **Plagiarism Checked:** Yes
- **Peer Review Process:** Yes

How to Cite this Article

Sheikh H, Kinkar D, Urmalia N. A pharmaceutical standardisation and analytical study of Jatyadi Taila prepared by three different methods. Int J Contemp Res Multidiscip. 2025;4(6):667-670.

Access this Article Online

www.multiarticlesjournal.com

KEYWORDS: Jatyadi Taila, Sneha Kalpana, Pharmaceutical Standardisation, Analytical Study

1. INTRODUCTION

The Sneha Kalpana is one of the most significant dosage forms in Ayurvedic pharmaceutics, where lipid media such as Taila serve as carriers for both water-soluble and fat-soluble active principles. Jatyadi Taila, described in classical Ayurvedic texts, is indicated in Vrana Ropana, Shotha, Daha, and Vedana. It is widely employed in surgical and para-surgical conditions due to its wound-healing, anti-inflammatory, and antimicrobial properties.

Despite its extensive clinical use, variations in pharmaceutical procedures—such as method of preparation of Kwatha, form of Kalka, duration of heating, and temperature control—can significantly influence the final product. Hence, pharmaceutical standardisation is essential to ensure quality, safety, and reproducibility. The present study aims to compare Jatyadi Taila prepared by three different methods to establish analytical and pharmaceutical standards.

Aim and Objectives

Aim

To evaluate and standardise Jatyadi Taila prepared by three different pharmaceutical methods.

2. OBJECTIVES

To prepare Jatyadi Taila by three different methods.
To record pharmaceutical observations during preparation.
To analyse and compare physicochemical parameters.
To evaluate chromatographic profiles of the samples.
To determine the most pharmaceutically and analytically acceptable method.

3. MATERIALS AND METHODS

Raw Materials

All herbal ingredients were procured from an authenticated source and identified according to standard Ayurvedic pharmacognostical guidelines. Tila Taila was used as the base oil.

Methods of Preparation

Method I – Classical Kwatha-Based Sneha Kalpana

Kalka, Kwatha, and Sneha were used in the classical ratio of **1: 4:** 16. Heating was continued until classical Madhyama Sneha Siddhis were observed.

Method II – Direct Kalka Method

Kalka was prepared using water without prior Kwatha preparation. Reduced liquid media was used, and heating was continued until Sneha Siddhi features appeared.

Method III – Modified Controlled Heating Method

Herbal drugs were extracted using controlled temperature, filtered, and then processed with Tila Taila using a regulated heating mantle (90–95°C) to achieve Sneha Siddhi.

Pharmaceutical Observations

The duration of heating was maximum in Method I and minimum in Method III.
Charring tendency was highest in Method II.
Yield was highest in Method III.
Sneha Siddhi Lakshanas were clearly observed in Method I and

III. Analytical Evaluation

Organoleptic Characters

Method, I produced a dark brown oil with a characteristic odour; Method II showed an opaque appearance with a strong odour; Method III yielded a clear, light brown oil with a pleasant odour and smooth texture.

Physicochemical Parameters

Specific gravity and refractive index of all samples were within permissible limits. The acid value was highest in Method II and lowest in Method III. Iodine and saponification values remained stable in Methods I and III, indicating better oxidative stability.

HPTLC Analysis

All samples showed similar phytochemical profiles, confirming formulation identity. Method III exhibited the maximum number of well-resolved spots, while Method II showed diffused bands indicating degradation.

4. RESULTS

The pharmaceutical and analytical evaluation of Jatyadi Taila prepared by three different methods revealed marked variations in processing behaviour, yield, organoleptic characters, and physicochemical parameters. These variations highlight the significant influence of the method of preparation on the quality and stability of the final Sneha Kalpana.

1. Pharmaceutical Processing Results

The duration of heating varied considerably among the three methods. Method I (classical Kwatha-based Sneha Kalpana) required prolonged heating due to higher aqueous content, whereas Method II required a comparatively shorter duration but showed inconsistency during Sneha Siddhi assessment. Method III, which employed controlled heating, showed the least processing time with uniform heating and minimal loss.

The yield of medicated oil was highest in Method III, followed by Method I, while Method II showed the lowest yield, possibly due to higher loss during heating and filtration. Charring of Kalka was minimal in Method I, moderate in Method II, and completely absent in Method III.

Sneha Siddhi Lakshanas, such as absence of frothing, wick test positivity, and characteristic odor were distinctly observed in Method I and Method III. In Method II, Sneha Siddhi's features appeared inconsistently, indicating incomplete or uneven extraction.

2. Organoleptic Evaluation

Organoleptic analysis demonstrated perceptible differences among the three samples. Method, I produced a dark brown oil with a classical characteristic odour, reflecting prolonged heating and deeper extraction of phytoconstituents. Method II

resulted in a comparatively opaque oil with a strong odour and increased viscosity, suggesting possible thermal degradation.
Method III produced a light brown, clear, and pleasant-smelling oil with smooth texture, indicating controlled extraction and minimal oxidative changes. Transparency was highest in Method III, moderate in Method I, and least in Method II.

3. Physicochemical Analysis
Physicochemical parameters revealed that all samples were within permissible limits; however, notable differences were observed.
Specific gravity and refractive index of Method III were closest to standard reference values, indicating better uniformity and purity.
Acid value was highest in Method II, suggesting increased free fatty acid content due to excessive heating or oxidative degradation. Method III showed the lowest acid value, indicating better stability.
Saponification value was consistent in Method III, reflecting uniform fatty acid composition, whereas Method II showed variability.
Iodine value, an indicator of unsaturation and susceptibility to oxidation, remained stable in Methods I and III but showed a reduction in Method II, indicating probable breakdown of unsaturated bonds.

4. Chromatographic (HPTLC) Results
HPTLC analysis demonstrated the presence of similar major phytoconstituents across all three samples, confirming the identity and authenticity of the formulation. However, variation was observed in the number, intensity, and resolution of spots.
Method III exhibited the maximum number of well-resolved spots with sharp bands, indicating superior extraction and preservation of phytoconstituents. Method I showed comparable but slightly less distinct spots, while Method II showed fewer and diffused spots, suggesting degradation or loss of active principles.

5. DISCUSSION
Sneha Kalpana is a delicate pharmaceutical process wherein the quality of the final product is influenced by factors such as duration of heating, temperature control, ratio of Kalka and Drava, and method of extraction. The present study demonstrates that variation in pharmaceutical methodology significantly alters the physicochemical and analytical profile of Jatyadi Taila.
In Method I, the classical Kwatha-based approach ensured thorough extraction of water-soluble and lipid-soluble components. However, prolonged heating increased the risk of thermal stress and oxidation, which may explain the darker colour and moderate acid value observed. Despite this, Method I maintained classical Sneha Siddhi Lakshanas and acceptable analytical values, validating its traditional reliability.
Method II, which omitted Kwatha preparation, resulted in insufficient aqueous medium during processing. This led to uneven heating, higher chances of Kalka charring, increased acid value, and reduced iodine value. The analytical findings suggest that the absence of adequate liquid media compromises extraction efficiency and promotes degradation of unsaturated fatty acids and phytoconstituents.
Method III employed controlled temperature and pre-filtered extracts, which significantly reduced oxidative degradation and ensured uniform heat distribution. The lower acid value, stable iodine value, higher yield, and superior chromatographic resolution observed in Method III indicate enhanced pharmaceutical efficiency and product stability. Controlled heating appears to preserve thermolabile constituents while improving clarity and shelf stability.
The chromatographic superiority of Method III further supports the hypothesis that regulated pharmaceutical conditions facilitate optimal extraction and retention of bioactive compounds. From an Ayurvedic perspective, this aligns with the concept of Yukti Pramana, where classical principles are applied with rational modification to enhance therapeutic quality without violating fundamental Sneha Siddhi norms.
Inference from Discussion
Classical method remains pharmaceutically acceptable and textually authentic.
Absence of adequate liquid media adversely affects Sneha's quality.
Controlled heating improves extraction, stability, and analytical consistency.
Modern modifications, when aligned with Ayurvedic principles, enhance formulation quality.

6. CONCLUSION
The study concludes that pharmaceutical methodology plays a crucial role in determining the quality of Jatyadi Taila. Among the three methods, the modified controlled heating method proved to be pharmaceutically superior and analytically more stable. However, the classical method remains valid and acceptable from a traditional Ayurvedic perspective. The study provides a strong basis for standardisation and quality control of Jatyadi Taila.
Scope for Further Study
Stability studies
Microbial load analysis
GC-MS profiling
Comparative clinical evaluation

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