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Hptlc Fingerprint Profiling of Triphala Churna for Quality Identification and Standardization

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Abstract - Triphala is a classical Ayurvedic polyherbal formulation composed of Haritaki (Terminalia chebula Retz.), Vibhitaki (Terminalia bellirica (Gaertn.) Roxb.) and Amalaki (Phyllanthus emblica L.). Because polyherbal formulations contain multiple phytoconstituents, chromatographic fingerprinting can provide a useful quality-control approach for identity and batch characterization. The present report describes the HPTLC fingerprint profile of Triphala Churna based on the available laboratory report. The chromatographic profile was recorded at 366 nm and demonstrated two major resolved constituents at Rf values of 0.62 and 0.92. The two reported bands showed clear separation without apparent co-elution. The observed profile provides a characteristic chromatographic fingerprint that may be used as a reference for identification and routine quality evaluation of the tested Triphala Churna. The findings support the use of HPTLC fingerprinting as a complementary analytical tool for standardization of Triphala Churna. However, the present report is limited to the reported fingerprint observations; solvent system, stationary phase, sample preparation, marker identification, validation parameters and quantitative assay data were not available in the supplied report and therefore are not inferred in this article.

Keywords: Triphala Churna; HPTLC; fingerprint profile; Rf value; quality control; standardization; Ayurvedic formulation.

1. INTRODUCTION

Quality assurance of herbal and polyherbal formulations requires appropriate methods capable of demonstrating identity, consistency and reproducibility. Unlike single-ingredient preparations, polyherbal formulations contain a complex mixture of chemical constituents originating from more than one botanical source. A single physicochemical parameter may therefore be insufficient to characterize the complete chemical profile.

High-performance thin-layer chromatography (HPTLC) is widely used in herbal analysis because it permits visual comparison of chromatographic patterns and can provide a reproducible fingerprint of complex plant-derived preparations. The presence, position and relative appearance of separated bands can assist in identity testing and batch-to-batch comparison.

Triphala Churna is a classical combination of three medicinal fruits: Haritaki, Vibhitaki and Amalaki. Establishing a characteristic chromatographic profile for the formulation can support routine quality control, particularly when the formulation is intended for further pharmaceutical or clinical use.

The present article reports the HPTLC fingerprint observation available for the tested Triphala Churna sample, with emphasis on the reported major Rf values and the quality-control significance of the chromatographic separation.

2. AIM

To document the HPTLC fingerprint profile of Triphala Churna and assess its suitability as a reference chromatographic profile for identification and quality evaluation.

3. OBJECTIVES

1. To record the reported HPTLC fingerprint profile of Triphala Churna at 366 nm.
2. To document the major reported Rf values.
3. To assess the reported chromatographic separation and apparent co-elution.
4. To discuss the utility of the fingerprint profile for routine identification and quality control.

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4. MATERIALS AND METHODS

4.1 Test Material

The test material was Triphala Churna. The supplied laboratory presentation identified the material as Triphala Churna and provided the corresponding HPTLC report.

4.2 Analytical Approach

The present article is based strictly on the HPTLC observations documented in the supplied laboratory report. The report states that the HPTLC fingerprint profile was recorded at 366 nm. The available material does not provide sufficient information to reproduce the complete analytical procedure; therefore, the stationary phase, mobile phase composition, application volume, chamber saturation conditions, development distance, derivatization procedure, scanning parameters and validation characteristics are not specified here.

4.3 Parameters Considered

The reported chromatographic parameters considered for interpretation were the detection wavelength, major Rf values and the qualitative observation of separation/no apparent co-elution.

5. RESULTS

The HPTLC fingerprint profile of Triphala Churna recorded at 366 nm revealed two major phytochemical constituents with reported Rf values of 0.62 and 0.92. The chromatographic profile demonstrated clear separation of the reported major components without apparent co-elution.

Parameter	Observation	Interpretation	Quality-control relevance
Test sample	Triphala Churna	Polyherbal formulation under evaluation	Identity and batch characterization
Detection wavelength	366 nm	Fluorescence/UV observation reported at 366 nm	Defined observation condition
Major reported band 1	Rf 0.62	Clearly resolved	Potential fingerprint reference point
Major reported band 2	Rf 0.92	Clearly resolved	Potential fingerprint reference point
Co-elution	No apparent co-elution reported	Major components were separated	Supports clarity of fingerprint

Figure 1. Graphical representation of the reported HPTLC Rf values

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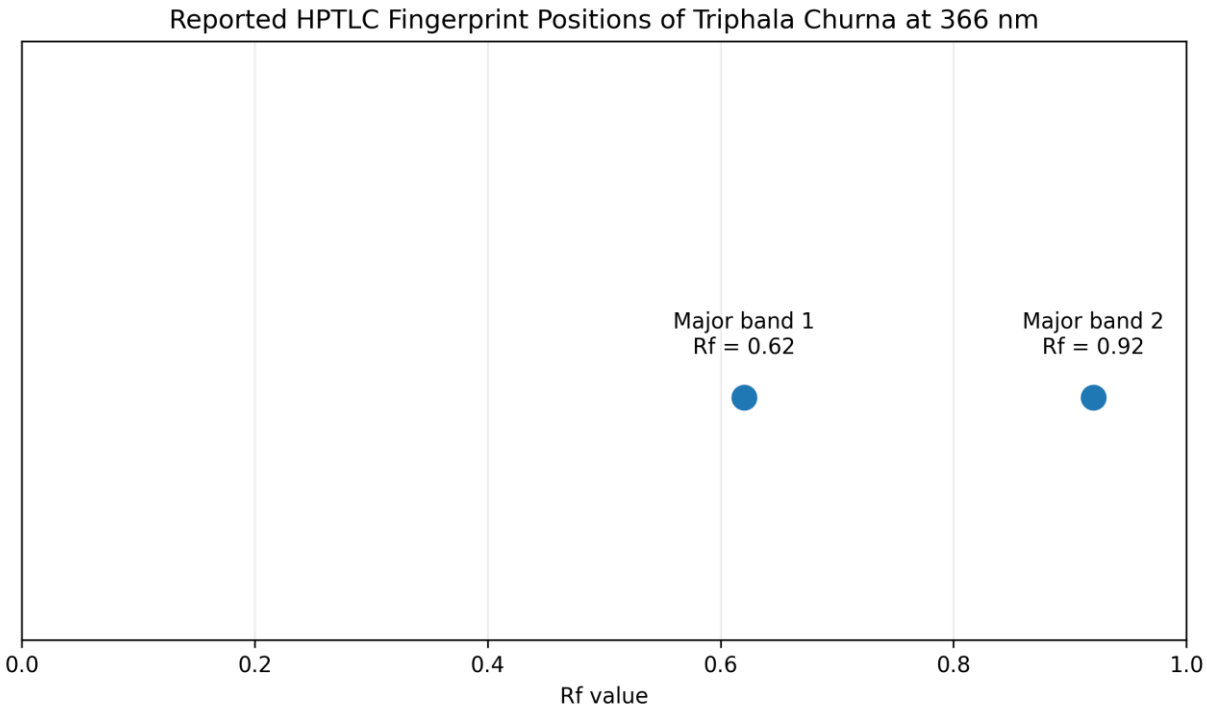

The figure summarizes the two major reported chromatographic positions (Rf 0.62 and 0.92) observed at 366 nm. It is a graphical representation of the supplied report data and is not a densitogram.

6. DISCUSSION

The principal finding of the present analytical report is the presence of two major, clearly resolved chromatographic constituents at Rf values of 0.62 and 0.92 when the Triphala Churna fingerprint was observed at 366 nm. The absence of apparent co-elution between these reported major components indicates a distinct chromatographic pattern in the tested sample.

A chromatographic fingerprint is particularly useful for complex herbal formulations because it represents a pattern of multiple constituents rather than relying exclusively on a single chemical marker. In routine quality control, a characteristic fingerprint can be compared with an authenticated or reference batch to detect major deviations in the chemical profile.

The present findings should, however, be interpreted as a qualitative fingerprint observation. An Rf value alone does not establish the chemical identity of a compound. Therefore, the two bands reported at 0.62 and 0.92 should not be assigned to specific phytochemicals without additional reference standards or spectroscopic/chemical confirmation.

The report also does not provide quantitative peak-area data or analytical validation parameters. Consequently, conclusions regarding assay, precision, accuracy, robustness, detection limits or batch-to-batch reproducibility cannot be drawn from the available data. These parameters would strengthen the analytical standardization of Triphala Churna in future work.

Reported parameter	Observation	Interpretation
Detection wavelength	366 nm	Reported observation condition
Major band 1	Rf 0.62	Clearly resolved; potential fingerprint reference point
Major band 2	Rf 0.92	Clearly resolved; potential fingerprint reference point
Co-elution	No apparent co-elution	Supports clarity of reported fingerprint

Table 2. Summary of the supplied HPTLC analytical observations

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7. QUALITY-CONTROL SIGNIFICANCE

- The reported fingerprint can serve as a preliminary reference profile for the tested Triphala Churna.
- The two major Rf positions (0.62 and 0.92) can be documented as characteristic observations for comparison in subsequent batches, provided the same validated analytical conditions are used.
- The absence of apparent co-elution supports visual clarity of the reported major bands.
- Routine quality-control use should be supported by validated analytical conditions and comparison with authenticated reference material.
- Specific chemical identification should not be assigned solely on the basis of Rf values.

8. LIMITATIONS

- The supplied report contains qualitative fingerprint observations but does not provide the complete HPTLC method.
- The identity of the two reported bands was not established using reference standards in the supplied material.
- Quantitative peak-area or densitometric assay data were not provided.
- Analytical validation parameters such as specificity, precision, accuracy, robustness, LOD and LOQ were not available.
- Only the reported tested sample is described; comparative batch analysis was not supplied.

9. CONCLUSION

The HPTLC fingerprint profile of the tested Triphala Churna, recorded at 366 nm, demonstrated two major resolved constituents at Rf values of 0.62 and 0.92, with no apparent co-elution. These observations provide a characteristic qualitative fingerprint that may be useful for identification and preliminary quality evaluation of Triphala Churna. The findings support further development of a validated HPTLC fingerprinting method for routine standardization, including reference-standard confirmation, quantitative densitometric assessment and validation of analytical performance characteristics.

Source of analytical observations: supplied HPTLC report/presentation. The present article retains only observations supported by that report; no compound identity, quantitative assay, or validation parameter has been inferred.

10. DECLARATIONS

Ethical approval: Not applicable to the present analytical report.

Patient consent: Not applicable to the present analytical report.

Conflict of interest: The author declares no conflict of interest.

Funding: No external funding was reported for the analytical work described in the supplied material.

Data availability: The analytical observations reported in this manuscript are derived from the HPTLC report supplied for preparation of the article.

11. REFERENCES

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