

Comparative Qualitative Phytochemical Screening of *Cordia dichotoma* G. Forst. (Lasora) Leaf Extracts Using Methanol and Petroleum Ether

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Abstract: *Cordia dichotoma* G. Forst. (Lasora), a medicinal tree of the family Boraginaceae, has a long history of traditional use in Indian medicine for cough, asthma, ulcers and inflammatory disorders. The present study qualitatively investigated phytochemical constituents of *C. dichotoma* leaves collected from Wadoda village, Nagpur, Maharashtra, and compared extraction performance using solvents of different polarities. Fresh leaves were collected, authenticated, surface-sterilized, shade-dried and pulverized. Powdered leaf material (10 g) was separately extracted with 100 mL methanol and 100 mL petroleum ether by maceration for 24 h, followed by filtration and concentration below 45°C. Preliminary qualitative phytochemical screening was performed using standard chemical tests for carbohydrates, flavonoids, saponins, phenolic compounds, tannins, phytosterols and related constituents. The methanolic extract showed a higher extraction yield (35.2%) than the petroleum ether extract (31.6%), indicating comparatively greater recovery of polar constituents.

Phytochemical investigation demonstrated important bioactive secondary metabolites, particularly phenolic compounds, flavonoids, tannins and saponins. The findings provide preliminary scientific evidence of the phytochemical richness of *C. dichotoma* leaves and demonstrate the influence of solvent polarity on metabolite recovery. Further quantitative and instrumental analyses, including HPLC and GC-MS, are recommended for identification, quantification and characterization of individual bioactive compounds.

Keywords: *Cordia dichotoma*; Lasora; phytochemical screening; leaf extract; methanol; petroleum ether; secondary metabolites; phytochemistry

I. INTRODUCTION

Medicinal plants are important sources of therapeutic agents in traditional systems such as Ayurveda, Unani and Siddha and remain relevant to modern pharmaceutical research. *Cordia dichotoma* G. Forst., belonging to the family Boraginaceae, is a medium-sized deciduous tree commonly known as Lasora, Sebestan plum or Bhokar. The plant is distributed across India and other parts of South and Southeast Asia and is valued for its ethnomedicinal importance.

Different parts of *C. dichotoma*, including leaves, bark, fruits and seeds, have traditionally been used for conditions including cough, fever, asthma, ulcers, gastrointestinal complaints, inflammation and wound-related ailments. Such traditional applications have generated interest in the plant's chemical constituents and their possible biological relevance.

Phytochemicals are secondary metabolites produced by plants and include alkaloids, flavonoids, phenolic compounds, tannins, saponins, terpenoids and related constituents. These compounds are of interest because many possess biological activities such as antioxidant, antimicrobial, anti-inflammatory or astringent effects. However, phytochemical composition can vary with plant part, geography, environmental conditions, maturity and extraction solvent.



The present study was undertaken to perform preliminary qualitative phytochemical screening of *C. dichotoma* leaves collected from Wadoda village, Nagpur, Maharashtra. Methanol, a relatively polar solvent, and petroleum ether, a non-polar solvent, were selected to compare extraction yield and qualitative recovery of selected phytochemical groups. The work provides a preliminary chemical profile of the collected leaf material and a basis for future quantitative and instrumental characterization.

II. AIM AND OBJECTIVES

Aim: To carry out a systematic qualitative phytochemical analysis of the leaf extracts of *Cordia dichotoma* G. Forst.

- To collect and authenticate *C. dichotoma* leaves from Nagpur, Maharashtra.
- To prepare leaf extracts using polar (methanol) and non-polar (petroleum ether) solvents via the evaporation/maceration technique.
- To identify major classes of bioactive compounds through preliminary phytochemical screening.
- To evaluate extraction yield and determine the suitability of different solvents for metabolite extraction.

III. MATERIALS AND METHODS

3.1 Plant Material and Authentication

Fresh, healthy leaves of *C. dichotoma* were collected from Wadoda village, Nagpur, Maharashtra. Mature leaves without visible fungal infection or mechanical damage were selected. The plant material was authenticated on the basis of morphological features including leaf shape, venation and texture with reference to standard herbarium records, as described in the field-project report.

3.2 Surface Sterilization and Preparation

Leaves were washed with tap water to remove dust and debris, rinsed with 70% ethanol for approximately 30 seconds, and treated with 2% sodium hypochlorite for 5–10 minutes. The material was subsequently rinsed with sterile distilled water. The cleaned leaves were shade-dried at approximately 25–30°C for 3–7 days, then pulverized and passed through a 40–60 mesh sieve.

3.3 Solvent Extraction

Ten grams of powdered leaf material were separately soaked in 100 mL methanol and 100 mL petroleum ether. The mixtures were kept for 24 h at room temperature with agitation using a rotary shaker. Each mixture was filtered through Whatman No. 1 filter paper. The filtrates were concentrated in a water bath below 45°C. The concentrated crude extracts were stored in airtight vials at 4°C until qualitative screening.

3.4 Preliminary Phytochemical Screening

The extracts were subjected to standard qualitative chemical tests to detect selected phytochemical groups. The field-project report documents tests for carbohydrates (Benedict's test), saponins (frothing test), phenolic compounds (ferric chloride test), tannins (gelatin test), phytosterols/triterpenes (Salkowski's test) and flavonoids (alkaline reagent test). Characteristic colour changes, precipitates, rings or stable froth were recorded as positive reactions.

IV. RESULTS

The methanolic extract showed an extraction yield of 35.2%, whereas the petroleum ether extract showed a yield of 31.6%. Thus, under the conditions used in this study, methanol produced the higher extraction yield.

Phytochemicalgroup	Methanolextract	Petroleumetherextract
Carbohydrates	Present(black-red precipitate)	Notexplicitlyreportedin extracted report text
Flavonoids	Present(whiteprecipitate)	Notexplicitlyreportedin extracted report text
Saponins	Present(foam layer)	Notexplicitlyreportedin extracted report text



Phenolic compounds	Present (green-black colour)	Not explicitly reported in extracted report text
Tannins	Present (dirty precipitate)	Not explicitly reported in extracted report text
Phytosterols	Present (blue/green ring)	Not explicitly reported in extracted report text
Proteins, amino acids, alkaloids, cardiac glycosides and terpenoids	Absent	Absent

The report explicitly states that proteins, amino acids, alkaloids, cardiac glycosides and terpenoids were absent in both extracts. The qualitative observations recorded for the methanolic extract included positive reactions for carbohydrates, flavonoids, saponins, phenolic compounds, tannins and phytosterols. Because the supplied report text does not unambiguously provide the complete petroleum-ether observation row for every phytochemical class, those values are not invented here.

V. DISCUSSION

The higher extraction yield obtained with methanol (35.2%) than petroleum ether (31.6%) indicates that the methanolic system recovered a greater mass of extractable material under the stated experimental conditions. This finding is consistent with the study's comparative design, in which solvents with different polarities were used to assess differences in metabolite recovery.

The qualitative screening of the methanolic extract indicated the presence of several phytochemical classes, including phenolic compounds, flavonoids, tannins and saponins. These groups are commonly investigated in medicinal-plant research because of their potential biological activities. The present results should nevertheless be interpreted as preliminary qualitative evidence rather than proof of therapeutic activity, since no quantitative determination, compound isolation, chromatographic profiling or biological assay was performed in the supplied project.

The observed solvent-dependent extraction performance highlights the importance of solvent selection in preliminary phytochemical investigations. The findings provide a starting point for subsequent studies using quantitative assays and instrumental techniques such as HPLC and GC-MS to identify and characterize individual compounds.

VI. CONCLUSION

The present qualitative investigation demonstrates that *C. dichotoma* leaves collected from Wadoda village, Nagpur, contain detectable classes of phytochemicals, with the methanolic extract showing positive reactions for carbohydrates, flavonoids, saponins, phenolic compounds, tannins and phytosterols. Methanol produced a higher extraction yield (35.2%) than petroleum ether (31.6%) under the conditions used. These findings provide preliminary support for the phytochemical richness of *Lasora* leaves and justify further quantitative, chromatographic and pharmacological investigations. Future work should include quantitative estimation and instrumental profiling by HPLC and GC-MS, followed by appropriate bioactivity studies.



VII. ORIGINAL EXPERIMENTAL PHOTOGRAPHS

The photographs in this section are reproduced directly from the supplied field-project thesis/synopsis. The original experimental photographs have been retained without replacing them with stock or AI-generated images.

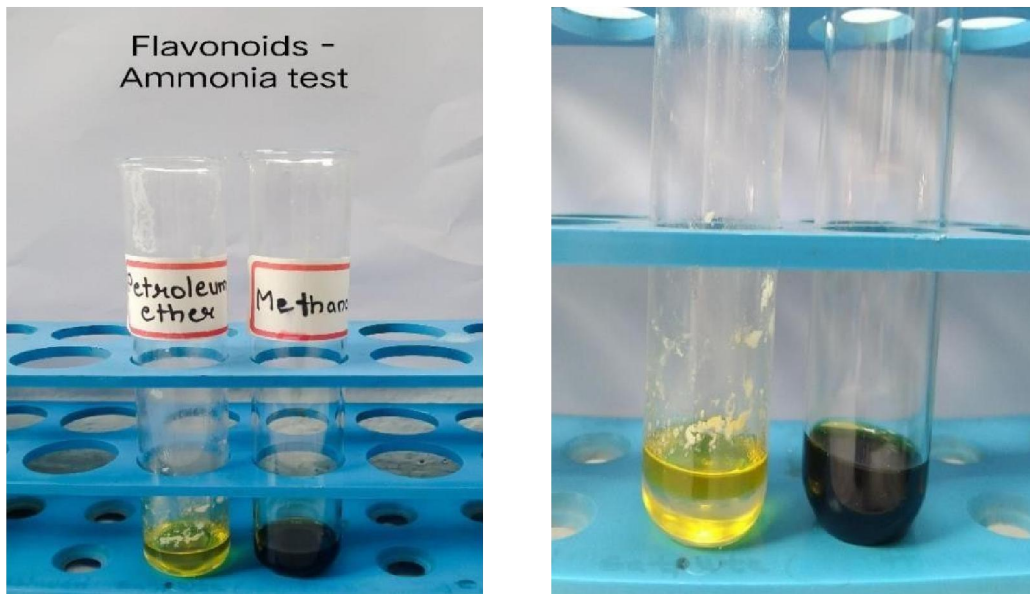


Figure 1. Flavonoids – ammonia test, as labeled in the original field-project photographs.

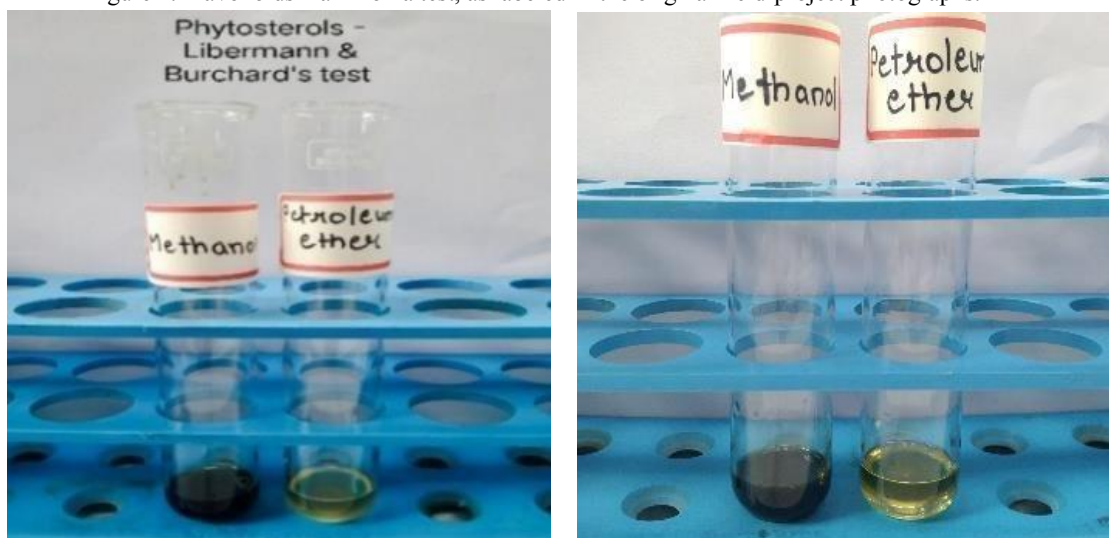


Figure 2. Phytosterols test – Liebermann–Burchard's test, as labeled in the original field-project photographs.



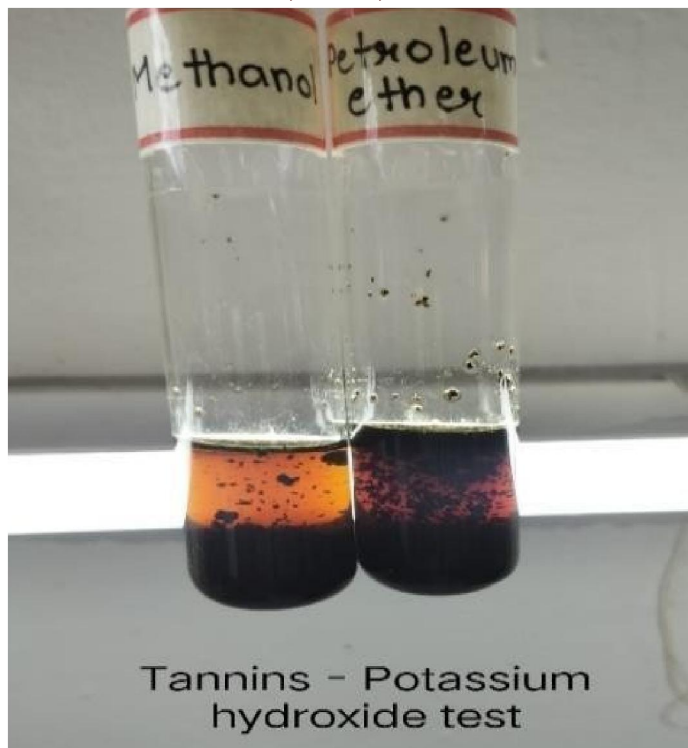


Figure 3. Tannins – potassium hydroxide test, as labeled in the original field-project photograph.

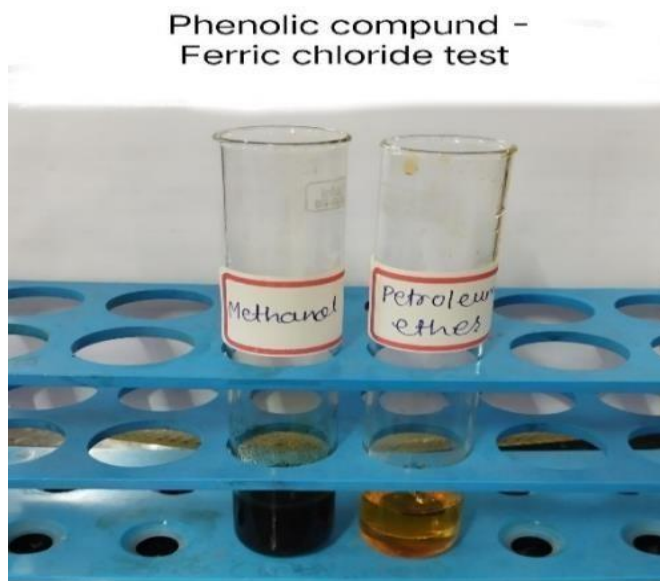


Figure 4. Phenolic compound test (ferric chloride test).





Figure 5. Saponins test (frothing test).

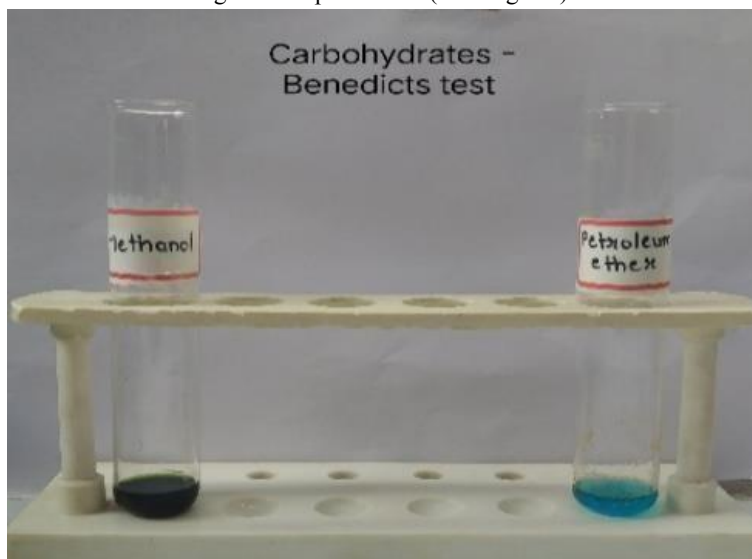


Figure 6. Carbohydrates test (Benedict's test).





Figure 7. Filtrates of *Cordia dichotoma* leaf extracts: petroleum ether extract and methanol extract.



Figure 8. Dried extracts of *Cordia dichotoma* prepared using petroleum ether and methanol.



Figure 9. (A) Dried leaves of *Cordia dichotoma*, (B) coarsely crushed dried leaves, (C) initial powdered leaves, (D) sieving of leaf powder, and (E) finely powdered material.





Figure 10. Surface sterilization of *Cordia dichotoma* leaves.



Figure 11. (A) Image of the *Cordia dichotoma* plant at the field collection site and (B) leaves after collection/cutting.

VIII. LIMITATIONS AND FUTURE SCOPE

This study is a preliminary qualitative phytochemical investigation. The supplied work does not report replicate measurements, statistical analysis, quantitative phytochemical concentrations, chromatographic identification, or direct pharmacological/antimicrobial assays. Accordingly, therapeutic claims should not be inferred directly from the qualitative screening. Future investigations should include authenticated voucher documentation, replicate extraction and assays, quantitative estimation of major phytochemical classes, HPLC/GC-MS profiling, and biological evaluation of selected extracts or isolated compounds.



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SOURCE AND DATA INTEGRITY NOTE

This manuscript was prepared from the supplied field-project report and the supplied AMMLA 2026 conference abstract. Reported experimental quantities, extraction conditions, yields, qualitative observations and conclusions were retained. Where the source material did not clearly provide a value, no value was fabricated. The manuscript should undergo institutional/journal formatting, author verification, and peer-review-specific requirements before submission.

