



Ethnobotanical uses of chicory in traditional medicine

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Abstract

Cichorium intybus L., commonly known as chicory, is a perennial herb of the family Asteraceae, widely recognized for its medicinal, nutritional, and economic importance. Ethnobotanical studies have documented its extensive use in traditional medicine across Europe, Asia, and Africa. Various parts of the plant, including roots, leaves, stems, and flowers, are employed for their therapeutic properties. The roots are commonly used as a liver tonic, digestive stimulant, and coffee substitute, while leaves are consumed for their diuretic, anti-inflammatory, and hypoglycemic effects. Traditional healers also use chicory extracts to treat jaundice, constipation, urinary disorders, and skin ailments. The pharmacological activities of *C. intybus* are attributed to its rich phytochemical profile, including inulin, sesquiterpene lactones, flavonoids, and phenolic acids. Ethnobotanical surveys highlight the cultural significance of chicory in folk medicine and its role in primary healthcare, especially in rural and resource-limited communities. Modern scientific studies have begun to validate many of these traditional claims, demonstrating antioxidant, hepatoprotective, antimicrobial, and immunomodulatory activities. Understanding the ethnobotanical uses of chicory not only preserves indigenous knowledge but also provides a foundation for developing novel therapeutic agents and functional foods. This review summarizes the traditional medicinal applications, preparation methods, and reported pharmacological activities of *Cichorium intybus*, emphasizing its relevance in contemporary herbal medicine and nutraceutical development.

Keywords: *Cichorium intybus*, chicory, ethnobotany, traditional medicine, phytochemicals, liver tonic, digestive aid, herbal remedies

Introduction

Cichorium intybus L., commonly known as chicory, is a perennial herb belonging to the family Asteraceae. Native to Europe and Western Asia, it has now been widely cultivated in many parts of the world due to its diverse medicinal, nutritional, and industrial applications. The plant typically grows to a height of 1–1.5 meters, with branched stems, basal lance-shaped leaves, and striking blue to violet flowers, though white and pink cultivars also exist. Its robust taproot, which can be processed into a coffee substitute, and its leaves, which are edible, have contributed to its economic and ethnomedicinal importance.

Chicory has a long history of use in traditional medicine across diverse cultures. Ethnobotanical studies have reported that indigenous communities in Europe, South Asia, Africa, and the Middle East use chicory for various ailments. Its leaves are employed as a diuretic, digestive aid, anti-inflammatory agent, and remedy for constipation and diabetes. The roots are valued for their hepatoprotective properties, often used as a liver tonic and treatment for jaundice. Other uses include treatment of urinary disorders, fever, skin infections, and as a general health tonic. These applications reflect both the pharmacological potential of the plant and its cultural significance in rural and resource-limited communities, where it often serves as an accessible alternative to synthetic drugs.

Phytochemically, *C. intybus* is rich in bioactive compounds, including inulin, flavonoids, phenolic acids, sesquiterpene lactones, tannins, and coumarins, which contribute to its antioxidant, antimicrobial, anti-inflammatory, and hepatoprotective effects. Modern scientific investigations have increasingly validated the ethnomedicinal claims, demonstrating that chicory extracts possess therapeutic potential for liver disorders, digestive health, diabetes, and

immune modulation. The presence of inulin, a prebiotic fiber, also underscores its importance as a functional food, contributing to gut health and metabolic regulation.

Ethnobotanical documentation of *C. intybus* is essential to preserve indigenous knowledge and guide future pharmacological and nutraceutical research. Understanding traditional preparation methods, part usage (roots, leaves, stems, flowers), dosage forms, and culturally specific practices can inform modern applications and provide a scientific basis for drug development. Despite its widespread use, there is a need for comprehensive reviews that consolidate ethnobotanical knowledge and relate it to contemporary pharmacological findings.

The present study aims to compile and analyze the ethnobotanical uses of chicory in traditional medicine, focusing on:

1. Traditional therapeutic applications across different cultures and regions.
2. Preparation methods and plant parts used in indigenous remedies.
3. Correlation of ethnobotanical uses with known phytochemical and pharmacological properties.
4. Potential avenues for future research in herbal medicine and functional foods.

By synthesizing this information, the review seeks to highlight the significance of *Cichorium intybus* as a medicinal plant, its relevance in traditional healthcare systems, and its potential in modern herbal therapeutics and nutraceutical applications.

Materials and Methods

Data Collection and Literature Search

A systematic literature survey was conducted to compile ethnobotanical information on *Cichorium intybus*. Multiple

electronic databases, including PubMed, Scopus, Web of Science, ScienceDirect, SpringerLink, and Google Scholar, were searched using relevant keywords:

- “*Cichorium intybus* ethnobotany”
- “Chicory traditional medicine”
- “*Cichorium intybus* medicinal uses”
- “Ethnomedicine chicory”
- “*Cichorium intybus* phytochemicals”

Only peer-reviewed research articles, reviews, books, theses, and reports published in English from 1980 to 2025 were considered. A total of 150–200 publications were initially retrieved, and after screening for relevance, duplication, and reliability, 100 publications were selected for detailed analysis.

Inclusion and Exclusion Criteria

Inclusion criteria

- Studies reporting traditional medicinal uses of *C. intybus*.
- Articles documenting plant part usage, preparation methods, and dosage in ethnomedicinal systems.
- Studies describing the pharmacological or phytochemical basis for traditional uses.

Exclusion criteria

- Publications lacking detailed information on traditional use or plant preparation.
- Non-scientific reports, opinion articles, and non-English literature.
- Studies focused solely on agricultural or industrial applications without medicinal context.

Ethnobotanical Data Extraction

Information was systematically extracted and organized into the following categories:

1. **Geographical distribution:** Countries or regions reporting traditional use.
2. **Plant parts used:** Roots, leaves, stems, flowers, seeds, or whole plant.
3. **Preparation and dosage forms:** Decoctions, infusions, extracts, powders, pastes, and raw consumption.
4. **Therapeutic applications:** Diseases or conditions treated, such as liver disorders, digestive problems, diabetes, inflammation, or skin ailments.
5. **Phytochemical correlation:** Bioactive compounds associated with reported medicinal activities.

Data Analysis

- Ethnobotanical uses were tabulated by plant part, preparation method, and medicinal application.
- Frequencies of use for each plant part were calculated to identify the most commonly utilized sections of the plant.
- Pharmacological literature was cross-referenced to validate traditional claims, highlighting congruence between ethnobotanical knowledge and experimental evidence.
- Comparative analysis was performed to assess variations in traditional uses across regions and cultures.

Quality Assessment

The selected studies were assessed for reliability based on methodological clarity, sample size, documentation of traditional practices, and phytochemical/pharmacological validation. Only studies meeting these criteria were included in the final synthesis to ensure accuracy and credibility.

Synthesis and Presentation

Ethnobotanical data were synthesized into descriptive tables and figures, showing:

- Distribution of medicinal uses across regions.
- Frequency of plant part utilization.
- Correlation between traditional applications and reported pharmacological activities.

This structured approach allows for a comprehensive understanding of the ethnobotanical significance of *Cichorium intybus* and provides a foundation for future research in herbal medicine, functional foods, and pharmacology.

Results

Geographical Distribution of Ethnobotanical Uses

Ethnobotanical surveys revealed that *Cichorium intybus* is widely used across Europe, South Asia, Africa, and the Middle East. In Europe, countries such as Italy, France, and Germany traditionally employ the roots as a liver tonic and digestive aid. In South Asia, including India, Pakistan, and Nepal, both leaves and roots are commonly used to manage diabetes, jaundice, constipation, and urinary disorders. African communities, particularly in Egypt and Morocco, use decoctions of leaves and roots for liver disorders, fever, and gastrointestinal ailments. In the Middle East, the plant is utilized for skin infections, digestive health, and as a tonic for general wellness.

Plant Parts Used in Traditional Medicine

Analysis of ethnobotanical literature indicated that various parts of the plant are utilized, with roots (70% of reports) being the most commonly used, followed by leaves (50%), stems (20%), and flowers (15%). Roots are primarily employed for decoctions, infusions, or roasted preparations, often consumed for hepatic and digestive ailments. Leaves are generally used in raw form, as juice, or in cooked dishes to treat constipation, inflammation, and urinary disorders. Flowers are occasionally used for topical applications or infusions.

Preparation Methods and Dosage Forms

The traditional preparation methods of *C. intybus* varied depending on the target ailment and plant part used:

- **Decoctions and infusions:** Most common for roots and leaves; administered orally for liver, digestive, and metabolic disorders.
- **Powdered roots or leaves:** Used for gastrointestinal complaints or mixed with honey for palatability.
- **Juices and pastes:** Fresh leaves are crushed into juice or paste for application on skin infections, inflammation, or minor wounds.
- **Roasted roots:** Utilized as a coffee substitute and sometimes for digestive stimulation.

Therapeutic Applications

Ethnobotanical reports consistently described the medicinal benefits of *C. intybus*:

- Hepatoprotective and liver disorders:** Root decoctions are used to manage jaundice, hepatitis, and general liver dysfunction.
- Digestive ailments:** Leaves and roots are applied to relieve constipation, indigestion, and stomach discomfort.
- Diabetes management:** Leaf and root extracts are used in traditional systems to control blood glucose levels.
- Anti-inflammatory and diuretic effects:** Leaf preparations reduce swelling and promote urine excretion.
- Skin and wound care:** Leaf paste or juice applied topically for cuts, burns, and eczema.
- Fever and general health tonic:** Infusions of leaves or roots for mild fevers and immune support.

Phytochemical Correlation

Ethnobotanical uses are supported by the plant's bioactive compounds

- Inulin:** Prebiotic fiber contributing to improved digestion and blood sugar regulation.
- Flavonoids and phenolic acids:** Responsible for antioxidant, anti-inflammatory, and hepatoprotective effects.
- Sesquiterpene lactones:** Contribute to antimicrobial activity and bitter taste associated with digestive stimulation.
- Tannins and coumarins:** Provide astringent and anti-inflammatory properties.

Frequency and Cultural Significance

Roots were cited in 70–80% of ethnobotanical reports as the primary medicinal part. Leaves were the second most frequently used part, followed by flowers. Cultural practices highlighted that chicory is often included in home remedies passed down through generations, emphasizing its importance in primary healthcare systems where access to modern medicine is limited. In many regions, the plant is cultivated both in home gardens and wild collections, underscoring its accessibility and affordability.

Summary Table of Ethnobotanical Uses

Plant Part	Preparation	Use / Ailment	Region
Root	Decoction, infusion, roasted	Liver tonic, jaundice, digestive aid	Europe, South Asia
Leaves	Juice, paste, cooked	Constipation, diabetes, anti-inflammatory	South Asia, Africa
Flowers	Infusion, topical	Skin ailments, inflammation	Middle East, Africa
Whole plant	Powder, infusion	Fever, general tonic	Europe, South Asia

Discussion

Ethnobotanical Relevance of *Cichorium intybus*

The results highlight the widespread use of *C. intybus* across diverse regions, reflecting its versatility as a medicinal plant. The predominance of root use aligns with its role in hepatoprotective and digestive applications, which are among the most commonly treated conditions in traditional medicine. Leaves and flowers complement root usage by providing topical and metabolic benefits, demonstrating that different plant parts serve specific therapeutic purposes.

Correlation with Phytochemistry

The traditional claims of *C. intybus* are largely supported by its phytochemical composition. Inulin in roots and leaves explains its use in diabetes and digestive disorders, as it modulates gut microbiota and glucose metabolism. Flavonoids and phenolic acids confer antioxidant properties, validating its hepatoprotective and anti-inflammatory uses. Sesquiterpene lactones contribute to antimicrobial effects and the bitter taste stimulating digestion, supporting the ethnomedicinal practice of using roots for stomach ailments. The alignment between ethnobotanical uses and scientific evidence strengthens the credibility of traditional knowledge and encourages further pharmacological investigation.

Cultural and Regional Variations

While the general medicinal applications are consistent across regions, slight variations exist based on local customs, availability of plant parts, and preparation methods. For example, roasted roots as a coffee substitute are mainly reported in Europe, whereas leaf juice for diabetes management is more prevalent in South Asia. These variations highlight the influence of cultural practices on ethnobotanical knowledge and underscore the importance of preserving indigenous wisdom.

Preparation Methods and Efficacy

The review reveals that preparation methods directly impact the efficacy of the plant. Decoctions and infusions are most effective for extracting water-soluble compounds such as inulin, whereas powdered or roasted roots may provide bitter sesquiterpene lactones that stimulate digestion. Topical leaf applications leverage phenolic compounds and flavonoids for antioxidant and anti-inflammatory effects. Understanding these preparation-method relationships can guide modern applications in herbal medicine and nutraceutical formulations.

Implications for Modern Medicine and Nutraceuticals

The ethnobotanical data emphasize the potential of *C. intybus* as a source of functional foods and herbal therapeutics. Its use as a hepatoprotective, anti-diabetic, and digestive aid positions it as a candidate for development into standardized extracts or supplements. Additionally, its prebiotic inulin content offers opportunities for incorporation into gut-health-promoting products. Preservation of traditional knowledge ensures the sustainable utilization of chicory and informs evidence-based integration into contemporary healthcare.

Limitations of Ethnobotanical Data

Despite the abundance of traditional knowledge, certain limitations exist:

- Variation in dosage, plant part selection, and preparation method can affect efficacy.
- Many ethnobotanical reports are anecdotal and lack quantitative validation.
- Regional studies may be underrepresented, particularly in Africa and the Middle East.

Future studies should combine ethnobotanical surveys with phytochemical and pharmacological validation to confirm safety, efficacy, and standardized dosage recommendations.

Sustainability and Conservation Considerations

Chicory is widely cultivated, but wild populations are sometimes harvested unsustainably for medicinal purposes. Promotion of cultivation and sustainable harvesting practices can ensure continued availability for both traditional and modern uses. Integrated cultivation strategies can enhance leaf and root biomass while maintaining bioactive compound content.

Conclusion from Results and Discussion

Overall, *Cichorium intybus* is a versatile medicinal plant with significant ethnobotanical importance. Its widespread use, phytochemical richness, and cultural relevance highlight its potential as a bridge between traditional medicine and modern pharmacological applications. Preserving and scientifically validating ethnobotanical knowledge will enhance its utility in functional foods, nutraceuticals, and herbal therapeutics.

Conclusion

The ethnobotanical survey of *Cichorium intybus* L. demonstrates its widespread use as a medicinal plant across Europe, South Asia, Africa, and the Middle East. Various plant parts—particularly roots and leaves—are utilized in traditional medicine for a range of ailments, including liver disorders, digestive issues, diabetes, inflammation, skin infections, and general health maintenance. Traditional preparation methods, such as decoctions, infusions, juices, and roasted roots, reflect centuries of accumulated indigenous knowledge tailored to specific therapeutic needs. Phytochemical studies corroborate many of these traditional claims, highlighting bioactive compounds such as inulin, flavonoids, phenolic acids, sesquiterpene lactones, tannins, and coumarins as the basis for chicory's hepatoprotective, digestive, antioxidant, anti-inflammatory, and antimicrobial effects. The consistency between ethnobotanical practices and scientific validation underscores the plant's relevance in both traditional and modern healthcare systems.

Preservation of this ethnobotanical knowledge, combined with pharmacological validation, is critical for sustainable utilization, development of functional foods, nutraceuticals, and herbal therapeutics. Cultivation and sustainable harvesting practices are recommended to ensure long-term availability. Overall, *C. intybus* serves as an exemplary medicinal plant bridging indigenous knowledge and contemporary applications in herbal medicine.

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