IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429
Volume 6, Issue 4, June 2026
Impact Factor: 8.2

A Review on Lemongrass (Cymbopogon citratus) and its Applications in Herbal Syrup Formulations

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Abstract: *Lemongrass, a medicinal plant widely recognized for its therapeutic and pharmacological properties. Herbal formulations are gaining increasing importance due to their natural origin, safety, cost-effectiveness, and reduced side effects compared to synthetic drugs. Lemongrass contains various bioactive phytochemical constituents such as flavonoids, tannins, alkaloids, saponins, and essential oils, which contribute to its antimicrobial, antioxidant, anti-inflammatory, and digestive properties. In this study, fresh lemongrass leaves were collected, cleaned, shade dried, and powdered. The aqueous extract of lemongrass was prepared using a suitable extraction process and further utilized in the preparation of herbal syrup by incorporating sweetening agents, preservatives, and flavouring agents in appropriate quantities. The prepared formulation was evaluated for various physicochemical parameters including colour, odour, taste, pH, viscosity, and stability.*

Keywords: Lemongrass, Cymbopogon citratus, Herbal Syrup, Phytochemicals, Medicinal Plants, Citral, Antioxidant Activity.

I. INTRODUCTION

Lemongrass (Cymbopogon citratus) is an important medicinal and aromatic plant belonging to the family Poaceae. Medicinal plants have gained considerable attention worldwide due to their therapeutic efficacy, safety, affordability, and fewer side effects compared to synthetic drugs [1]. In recent years, herbal medicines have become increasingly popular in both developed and developing countries because of their wide application in traditional and modern healthcare systems [2]. According to the World Health Organization, nearly 80% of the population in developing countries relies on traditional medicines for primary healthcare needs [3]. India has a rich heritage of medicinal plants and Ayurvedic systems, where aromatic herbs such as lemongrass are extensively utilized for medicinal, culinary, and pharmaceutical purposes [4]. Lemongrass is widely cultivated in tropical and subtropical regions including India, Sri Lanka, Thailand, and Brazil due to its economic and medicinal importance [5]. The plant is well known for its characteristic lemon-like aroma, which is mainly attributed to the presence of citral-rich essential oil [6]. Besides its aromatic properties, lemongrass has been traditionally used for the treatment of fever, digestive disorders, inflammation, microbial infections, anxiety, and pain [7]. Phytochemical investigations of lemongrass have revealed the presence of several bioactive constituents including alkaloids, flavonoids, tannins, terpenoids, saponins, phenolic compounds, and essential oils [8]. These phytochemicals are responsible for various pharmacological activities such as antioxidant, antimicrobial, antifungal, anti-inflammatory, antidiabetic, and anticancer effects [9]. The essential oil extracted from lemongrass is widely used in pharmaceutical formulations, cosmetics, perfumery, food preservation, and aromatherapy industries [10]. Due to the increasing demand for natural therapeutic agents, scientific evaluation of the phytochemical constituents and biological activities of lemongrass has become an important area of research.

DOI: 10.48175/IJARSCT-36501

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Therefore, the present study is aimed at the formulation and evaluation of herbal syrup prepared from Cymbopogon citratus. The study may help in exploring the phytochemical potential and therapeutic applications of lemongrass for the development of effective herbal formulations.

II. AIM OF THE REVIEW

To review the medicinal importance, phytochemical composition, pharmacological activities, and applications of Cymbopogon citratus in herbal syrup formulations.

III. BOTANICAL DESCRIPTION

Scientific Name: Cymbopogon citratus
Family: Poaceae
Common Name: Lemongrass
Plant Type: Perennial aromatic grass.
Lemongrass is a tropical and subtropical plant with long, thin leaves that smell strongly like lemons. The plant is grown for pharmacological, culinary, cosmetic, and therapeutic purposes.
According to other research, lemongrass is still being studied for its variety of phytochemicals, medicinal uses, and possible integration into contemporary herbal remedies. Researchers stress the significance of quality assurance, standardization, and evidence-based assessment.

Morphology

A fragrant perennial grass, lemongrass can reach a height of one to one and a half meters. The leaves have rough edges and are green, long, and narrow. Because the leaves contain volatile oils, the plant develops in dense clumps and smells strongly like lemons.

Uses of Lemongrass:

Lemongrass is an important medicinal herb widely used in traditional and herbal medicine due to its therapeutic properties. It contains essential oils and phytochemical constituents such as flavonoids, alkaloids, tannins, and phenolic compounds which are responsible for its medicinal activities.
Lemongrass possesses antimicrobial, antioxidant, anti-inflammatory, antipyretic, and digestive properties. It is commonly used in the treatment of cough, cold, fever, digestive disorders, stress, anxiety, and microbial infections. The plant is also used as a flavouring and aromatic agent in food, beverages, cosmetics, and pharmaceutical preparations.
Due to its medicinal benefits and natural origin, lemongrass is considered a valuable ingredient in the preparation of herbal formulations such as herbal teas, syrups, oils, and extracts.

IV. PHARMACOLOGICAL ACTIVITIES

1. Antioxidant Activity
Flavonoids and phenolic chemicals found in lemongrass have the ability to reduce oxidative stress and neutralize free radicals.
2. Antimicrobial Activity
The essential oil exhibits antifungal and antibacterial properties against a variety of harmful microbes**.**
3.Anti-inflammatory Activity
Terpenoids, including citral, decrease tissue inflammation by blocking inflammatory mediators.
4. Antipyretic Activity
Traditional medicine uses lemongrass preparations for reducing fever and body temperature.
5. Antidiabetic Activity
Lemongrass extracts may help control blood glucose levels, according to research.

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6. Analgesic Activity

Lemongrass's anti-inflammatory components have the ability to reduce pain.

7. Anticancer Potential

Lemongrass components may have cytotoxic effects on cancer cell lines,

Phytochemical Constituents

Numerous bioactive substances, such as citral, geraniol, myrcene, limonene, citronellal, flavonoids, tannins, phenolic compounds, alkaloids, saponins, and terpenoids, have been discovered by phytochemical studies. The primary active ingredient thought to be in charge of numerous biological actions is citral. These substances have a major role in lemongrass's therapeutic effect. According to other research, lemongrass is still being studied for its variety of phytochemicals, medicinal uses, and possible integration into contemporary herbal remedies. Researchers stress the significance of quality assurance, standardization, and evidence-based assessment.

Pharmacological Activities

Antioxidant, antibacterial, antifungal, anti-inflammatory, analgesic, antipyretic, antidiabetic, anxiolytic, and digestive properties have all been documented in several investigations. Free radicals are countered by antioxidant actions. Antimicrobial properties prevent the growth of fungi and bacteria. Anti-inflammatory properties may lessen discomfort and swelling. Gastrointestinal health is supported by digestive qualities.

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Herbal Syrup Formulation

Liquid dose formulations called herbal syrups are intended to increase compliance and palatability. A syrup foundation made of sugar, filtered water, citric acid, preservatives, and flavourings can be mixed with lemongrass extract. These formulations are excellent for both paediatric and elderly individuals and are simple to give.

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Therapeutic Applications

Cough, cold, fever, digestive problems, stress, anxiety, and microbiological infections can all be treated with lemongrass herbal syrup. Lemongrass has been employed in traditional medical systems to support overall wellbeing. Acceptability is further improved by the pleasant flavour and scent.

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Advantages of Lemongrass Herbal Syrup

Natural origin, enhanced flavour, simplicity of administration, cost-effectiveness, patient compliance, and the inclusion of several bioactive substances are among the benefits. When administered properly, herbal syrups may also have less negative effects than some synthetic medicines.

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Safety and Toxicity

When used in moderation, lemongrass is generally considered safe. However, sensitive people may have stomach irritation from excessive consumption. For products to be safe and effective, standardization and quality control are crucial.

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Future Prospects

There are a lot of opportunities to create standardized lemongrass formulations because of the increasing interest in herbal remedies. Clinical trials, dosage optimization, stability studies, and quality control should be the main topics of future study. In the upcoming years, it is anticipated that commercial development of lemongrass-based products would accelerate.

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V. CONCLUSION

Rich in biologically active components, lemongrass is an important therapeutic herb. Its digestive, anti-inflammatory, antibacterial, and antioxidant qualities are supported by published literature. A promising herbal formulation with potential uses in supportive and preventative healthcare is lemongrass herbal syrup. To determine long-term safety and efficacy, more research is needed.

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