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Zingiber officinale Roscoe: Phytotherapeutic Effects and Therapeutic Potential

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Abstract

Ginger (*Zingiber officinale* Roscoe) is a plant belonging to the Zingiberaceae family, widely used in both Eastern and Western traditional medicine due to its therapeutic properties. Its main bioactive compound, gingerol, is responsible for various pharmacological activities, including anti-inflammatory, antioxidant, antimicrobial, and antiemetic actions. This article presents a literature review of the main phytotherapeutic effects and therapeutic potentials of ginger, based on studies published between 2010 and 2025 in the PubMed, Scielo, and ScienceDirect databases. Scientific evidence demonstrates that ginger has promising applications in gastrointestinal disorders, inflammatory processes, and the prevention of chronic diseases, being considered one of the most versatile and safest herbal medicines.

Keywords: *Zingiber officinale*, ginger, phytotherapy, bioactive compounds, natural pharmacology

Introduction

Ginger (*Zingiber officinale* Roscoe) is one of the oldest and most valued medicinal plants in the world, widely used both as a culinary spice and a therapeutic agent. Native to Southeast Asia, ginger has been used for millennia in traditional Chinese and Ayurvedic medicine, mainly to treat nausea, colds, muscle pain, and digestive disorders.

In recent decades, scientific interest in ginger has grown considerably, especially due to the presence of phenolic compounds known as gingerols, shogaols, and zingerone, which exhibit a wide range of pharmacological activities. The aim of this article is to review recent scientific literature on the phytotherapeutic effects of ginger and its potential therapeutic applications.

Methodology

This is a narrative literature review based on articles published between 2010 and 2025 in the PubMed, Scielo, and ScienceDirect databases. The following descriptors were used: “*Zingiber officinale*,” “ginger,” “phytotherapy,” “therapeutic effects,” and “medicinal plants.”

Inclusion criteria:

- Original articles, reviews, and clinical studies addressing the therapeutic effects of ginger.
- Publications in English, Portuguese, or Spanish.

Exclusion criteria:

- Studies focused exclusively on food, cosmetic, or agricultural applications.

Results and Discussion

Bioactive Compounds: The main active constituents of ginger are gingerols, shogaols, and zingerone, which are responsible for its characteristic aroma and flavor, as well as its pharmacological properties. These compounds display anti-inflammatory, antioxidant, and antiemetic actions that have been extensively studied in the scientific literature.

Anti-inflammatory and Antioxidant Effects: Gingerols and shogaols inhibit inflammatory mediators such as TNF- α , IL-1 β , and prostaglandins, in addition to reducing the formation of reactive oxygen species. These mechanisms explain the traditional use of ginger in treating joint inflammation and muscle pain.

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Digestive and Antiemetic Activity

Ginger is widely recognized for its effectiveness in relieving nausea and vomiting, especially during pregnancy and chemotherapy treatments. It acts by modulating serotonergic receptors in the gastrointestinal tract and central nervous system, promoting antiemetic and gastroprotective effects.

Antimicrobial Activity

Several studies report that ginger extracts exhibit inhibitory effects against pathogenic bacteria such as *Staphylococcus aureus*, *Escherichia coli*, and *Helicobacter pylori*, as well as antifungal action against *Candida* spp. These findings support ginger's potential as a natural antimicrobial agent.

Potential Clinical Applications

In addition to the effects already mentioned, ginger has been investigated for its hypoglycemic, cardioprotective, and neuroprotective properties, showing potential in the management of chronic diseases such as diabetes and Alzheimer's disease. However, more robust clinical studies are still needed to confirm these properties.

Safety and Toxicity

Ginger is considered safe when used in standard therapeutic doses. Adverse effects are rare and usually mild, including occasional gastrointestinal discomfort. Its wide safety margin supports its prolonged use in natural therapies.

Conclusion

Ginger (*Zingiber officinale* Roscoe) stands out as one of the most versatile and well-studied medicinal plants from a phytotherapeutic perspective. Its bioactive compounds confer anti-inflammatory, antioxidant, antimicrobial, and digestive properties that justify its traditional and modern therapeutic use. The available scientific evidence confirms its value as a safe and effective herbal medicine, although additional clinical studies are needed to standardize doses and formulations.

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