



AN OVERVIEW OF *Cinnamomum zeylanicum* (CINNAMON) MEDICAL APPLICATIONS

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Abstract : The spice plant *Cinnamomum verum* is well known for its therapeutic and pharmacological properties. The original botanical name for this tree, *Cinnamomum zeylanicum*, comes from Sri Lanka's previous name, Ceylon. From antiquity, the spice *Cinnamomum zeylanicum* has long been used as a medicine. Its native habitats are the southernmost states of India and Sri Lanka. The Lauraceae family includes *Cinnamomum verum*, also known as *Cinnamomum zeylanicum* Blume. It is dried bark that has been purified of its outer cork and underlying parenchyma. The medicinal plant *Cinnamomum verum* has a variety of uses. It has been used for a very long time to flavour food and in pharmaceutical formulations to treat a wide range of illnesses. For advertising in the present day, it is frequently used in candies, chewing gum, mouthwash, and toothpaste. The plant contains a lot of volatile oils, especially cinnamaldehyde, cinnamic acid, and cinnamate. The primary active element, eugenol, has been connected to numerous biological processes. Almost every pharmaceutical system in existence uses this plant. Each of these characteristics is necessary for the advancement of human health. The plant's main medical properties include antimicrobial, anti-anxiety, and Parkinson's resistance. Eugenol, cinnamaldehyde, cinnamyl acetate, copane, and camphor are among the principal substances found in the *Cinnamomum verum* plant. Many studies have been conducted on cinnamomum aldehyde's pharmacological effects. In this study, every aspect of the plant—from its morphological description to its phytochemical profile and medicinal action—was carefully analysed. We have made an effort to list all of its therapeutic and pharmacological properties in this review.

KEYWORDS - Medicinal Qualities, volatile oils, antimicrobial, and; *Cinnamomum verum*; Dalchini;

INTRODUCTION

There are various Asian nations where *Cinnamomum verum* (Lauraceae) is grown, mainly in Sri Lanka and Southern India. Russia, China, and Korea all have historic folk uses for cinnamon.¹ Around the world, many different cultures have long employed cinnamon. *Cinnamomum zeylanicum* (CZ) and Cinnamon cassia (CC) are two types of cinnamon that are both made from the inner bark of the tropical evergreen shrub *Cinnamomum zeylanicum* (CZ).² The drug is made from *Cinnamomum verum* shoots that have shed their outer cork beneath parenchyma.³

The fracture is short and splintery, and the surface is longitudinally striated. It has at least 12 millilitres of essential oil produced through steam distillation per kilogramme. It has a distinctive scent that is both fragrant and enticing. It has a flavour that is sharply peppery, mucilaginous, mildly sweet, and barely harsh.⁴ Up to 4% of the essential oil found in cinnamon bark is cinnamaldehyde (60–75%), followed by cinnamyl acetate (1–5%), eugenol (1–10%), -caryophyllene (1–4%), linalool (1–3%), and 1,8-cineole (1–2 percent). pentacyclic diterpenes cinnzeylanol and its acetyl derivative, cinnzeylanine, sugars mannitol,⁵ L-arabino-Dxylose, L-arabino-Dxylose, Dxylose, D-glucane, and mucilage polysaccharides Research has demonstrated that cinnamon has anti-inflammatory, antimicrobial, blood glucose, cardiovascular, cognitive function, and anticarcinogenic properties.⁶⁻⁷ Cinnamon is recognised as a potent neuroprotective agent⁸ and a medication for the management of type 2 diabetes mellitus in the traditional Chinese medical system.⁹

HISTORY

For thousands of years, cinnamon has been used in a wide range of culinary preparations. Because to its significant medicinal value, it has been used in Ayurvedic medicine as an antiemetic, anti-diarrheal, ant flatulent, and stimulant. The Egyptians used it for mummification. Portuguese traders carried the spice (*C. zeylanicum*) from Sri Lanka to Europe in the 16th and 17th centuries. The Dutch East India Company started growing cinnamon in Java in the 17th century, and they later exported it to Europe. Sri Lanka became the main supplier of cinnamon oils, which are used in the culinary and pharmaceutical industries, as Ceylon cinnamon production dwindled. Chinese cinnamon oil is also used by pharmaceutical businesses.

PHYTOCHEMICAL CONSTITUENTS OF CINNAMOMUM ZEYLANICUM (DALCHINI)

A number of resinous substances, including cinnamaldehyde, cinnamate, cinnamic acid, and several essential oils, can be found in cinnamon. Because it contains cinnamaldehyde, cinnamon has a flavour that is spicy and a potent scent.¹⁰ Some of the essential oils contained in cinnamon include transcinnamaldehyde, cinnamyl acetate, eugenol, L-borneol, caryophyllene oxide, b-caryophyllene, L-borneol acetate, nerolidol, alpha-cubebene, alpha-terpineol, terpinolene, and alpha thujene.¹¹⁻¹⁸

Among the chemical components included in *Cinnamomum zeylanicum* are aldehydes, alcohols, esters, phenols, acids, monoterpenes, diterpenes, sesquiterpenes, benzopyrones, hydrocarbons, and flavonoids. Cinnamaldehyde, methoxycinnamaldehyde, hydrocinnamic, benzaldehyde, vanillin, cuminaldehyde, benzenepropanal, 2-methyl-3-phenyl-propanal, and citronellal are the aldehydes found in *C. zeylanicum* bark essential oil. Alcohols originating from the *Cinnamomum zeylanicum* plant include cinnamyl alcohol, -terpineol, linalool, and bisabolol; esters include cinnamyl acetate, cinnamaldehyde diethyl acetal, methyl cinnamate, hydrocinnamyl acetate, benyl benzoate, and bornyl acetate.

Cinnamic acid, ferulic acid, caffeic acid, gallic acid, protocatechuic acid, oleic acid, and phydrobenzoic acid are all present in various parts of the plant. Monoterpenes discovered in *Cinnamomum zeylanicum* include P-cymene, limonene, -terpinene, -pinene, camphene, camphor, 1,4-cineole, -pinene, -phellandrene, and -3-carene.¹⁹⁻²⁰ Isolating and separating all of the essential oils could take a while because there are so many of them.²¹ The most often used separation technique is hydrodistillation. Chemical elements are extracted from the plant's bark, leaves, fruits, buds, and stalks.²² The process is swift and reasonably priced. The disadvantage of this strategy is that heat-sensitive materials are easily damaged and chemical alterations are caused.²³ To get over this restriction, the supercritical fluid extraction method was developed. The isolation of compounds that are both thermally and chemically unstable can be accomplished using this method. Eugenol is mostly prevalent in cinnamon leaves, while ylangene, methyl, and ethyl cinnamate are also detected in the leaf oil.

Terpinen-4-ol and benzyl benzoate were also present in cinnamon's bark oil and root-bark oil, respectively. In a study by Jayaprakasha and Jagan Mohan Rao, 72 substances, including leaf, stem, and root bark oils, and 32 previously reported compounds, were discovered in various parts of *C. zeylanicum*. Of the newly identified compounds, there were 11 monoterpenes, 4 sesquiterpenes, 2 aliphatic, and 15 aromatic ones. In the dried bark of *C. zeylanicum*, Isogai et al. also found two unique compounds called cinnzeylamine and cinnzeylanol. Vermin et al. identified the presence of p-cymene (21.35%) and eugenol (16.7%) in the oil of *C. zeylanicum* leaves. A GC-MS analysis of the essential oils extracted from cinnamon leaves grown in India found 47 chemical components.²⁴⁻²⁶

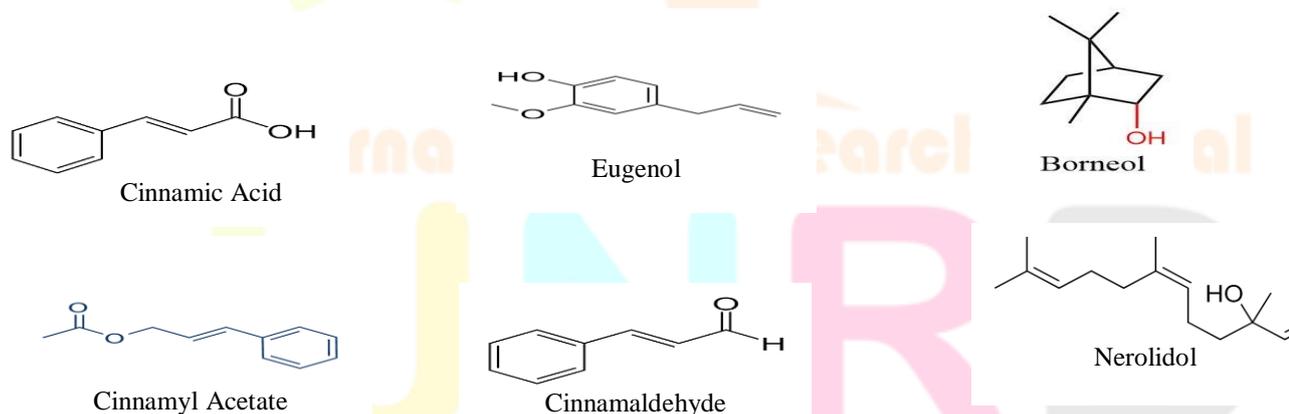


Figure 1: Some of the Important Elements in *C. zeylanicum*'s Chemical Structure

BOTANICAL DISTRIBUTION OF CINNAMOMUM ZEYLANICUM

A tropical evergreen shrub with thick, smooth, reddish-brown bark, *Cinnamomum zeylanicum* (Dalchini), can reach heights of 6 to 8 metres. Glabrous, ovate and lanceolate, hard and coriaceous are the characteristics of the opposite or sub-opposite leaves, as well as opposite or sub-opposite leaves that are glabrous, ovate and lanceolate, hard and coriaceous. The leaves have 3-5 major nerves and are vividly coloured above and pallid below.



Figure 2: Cinnamomum Zeylanicum

Petiole lengthened to 1/2 inch. Flowers are produced by axillary or subterminal cymes or panicles. The fruit is dark purple in colour, ovate or oblong in shape, 1.5 to 2 cm long, minutely apiculate, dry or moderately fleshy.

Table 1: Vernacular names of Cinnamomum Zeylanicum

Hindi	Dalchini
English	Cinnamon
Urdu	Darchini
Punjabi	Dalchini, Darchin
Gujrati	Taja
Bengali	Daruchini
Oriya	Dalechini, Guda twa
Malayalam	Karuvapatta, Ilavarngathely
Tamil	Ilayangam
Telugu	Lavanga Patta

Table 2: Morphological Classification of Cinnamomum Zeylanicum

Taxonomical Rank	Taxon
Kingdom	Plantae
Phylum	Magnoliophyta
Class	Magnoliopsida
Order	Lurales
Family	Lauraceae
Genus	Cinnamomum
Species	Zeylanicum

TRADITIONAL USES

Its wood is used to make plywood, cabinets, furniture, and other items. The resistant wood produced by *Cinnamomum zeylanicum* is used in building and dwellings. It is employed in the creation of liquors, chocolate, drinks, and spicy candies, among other things.²⁷ One of the most popular spices is true cinnamon, which is produced from the bark of the *Cinnamomum verum* tree.²⁸ To strengthen muscles and ease discomfort, hot liquids can be enhanced with *Cinnamomum zeylanicum* politum bark. *Cinnamomum zeylanicum*. crassinervium for headaches It is advised to use bark paste and crushed leaves. The leaves of *Cinnamomum zeylanicum* rhynchophyllum and *Cinnamomum zeylanicum* soengengii are used to cure nausea and food poisoning.²⁹ *Cinnamomum zeylanicum* iners, whose mucilage is used to make formica, fragrant joss sticks, and mosquito coils, are all household items.³⁰ In addition to other properties, cinnamon possesses antifungal, antibacterial, antitermitic, larvicidal, nematocidal, and insecticidal properties.³¹⁻³² The Vata and Pitta forces in the body are balanced by this plant.³³⁻³⁴ It lessens the discomfort of menstruation. A research found that daily ingestion of a cup of warm cinnamon water helped women experience temporary relief from menstrual discomfort.³⁵

- It calms headaches, flu, the common cold, and sore throats.
- Moreover, it functions as an expectorant and possesses antitubercular qualities.
- It is a natural therapy for rheumatoid arthritis.
- Moreover, it helps to decrease cholesterol and strengthen the heart's muscles.
- It eases the discomfort of menstruation.

According to a research, women should drink a cup of warm cinnamon water every day since it temporarily reduces the discomfort associated with menstruation.

MEDICINAL USES OF CINNAMOMUM ZEYLANICUM

Antimicrobial Activity

Several studies have found Cinnamomum zeylanicum to be a well-researched antibacterial agent due to its potent hydrophobic properties.³⁶⁻³⁷ When the antimicrobial effects of the essential oils of Cuminum cyminum, Amomum subulatum, and Syzygium aromaticum against Salmonella typhi, Salmonella paratyphi, Escherichia coli, Staphylococcus aureus, Bacillus licheniformis, and Pseudomonas fluorescens were examined using the broth, It was discovered that C. zeylanicum had stronger antibacterial effect than the other three plants against all microorganisms.³⁸ The findings showed that petroleum ether extract had the maximum sensitivity against Bacillus subtilis, whereas ethyl acetate had significant antibacterial effect against Staphylococcus aureus, Escherichia coli, and Pseudomonas aeruginosa.³⁹ In a different research, the impact of 15 essential oil extracts from 15 different plants on various bacterial strains was examined. Compared to other essential oils, cinnamon essential oil has a stronger antibacterial effect.⁴⁰

Antianxiety and Antidepressant Activity

Antidepressant and anxiolytic effects are present in cinnamon essential oil. The forced swim test (FST) and the tail suspension test (TST) were two of the tests performed to examine the antidepressant effectiveness of cinnamon essential oil (CEO). Researchers employed the elevated plus maze test (EPM) and the open field test to examine the anti-anxiety effects of CEO.⁴¹ In the FST test, cinnamon significantly reduced the immobility time delay and lengthened the total period of immobility, whereas the EPM test showed a marked decline in open arms entries. Cinnamon extract hence possesses anti-anxiolytic and anti-depressant qualities.⁴²

Anti-Parkinson Activity

In mice exposed to MPTP, Cinnamomum zeylanicum exerts antiparkinsonian effects. 100 l of cinnamon powder dissolved in 0.5 percent methylcellulose (MC) was administered to mice. The results suggest that cinnamon may be useful in the treatment of Parkinson's disease.⁴³

Overdose

When used in dosages larger than 0.2 g/day, which is equivalent to 15–20 g of pure drug, cinnamon peel oil and cinnamaldehyde have irritating properties (ESCOP, 2003).⁴⁴

CONCLUSION

A popular medicinal plant for a range of pharmacological uses is Cinnamomum verum. This plant is present in almost all medicinal systems across the world. There have been claims made about the anti-diabetic, antibacterial, antioxidant, anti-inflammatory, and anticancer properties of Cinnamomum verum. Each of these traits is essential to the advancement of human health. Eugenol, cinnamaldehyde, cinnamyl acetate, copane, and camphor are the primary substances found in the Cinnamomum verum plant. The pharmacological effects of cinnamaldehyde have been well investigated. Every part of the plant, from its morphological description to its phytochemical profile and medicinal activity, was carefully investigated in this study.

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