

## Chapter 36

# Therapeutic and Pharmaceutical Potential of Cinnamon

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### ABSTRACT

*Cinnamon has been used as a spice, condiment, and aromatic plant since centuries ago. Cinnamon is a small evergreen tree belonging to the genus *Cinnamomum* in the family Lauraceae. There are more than 250 species of cinnamon worldwide. In India, *Cinnamomum verum* and *Cinnamomum cassia* are the most common species grown in the Himalaya region. They have been used as folk medicine for the treatment of nausea, flatulent dyspepsia, coughs, diarrhea, malaria, gastric disorder, and to alleviate pain and inflammation in rheumatic arthritis. Therapeutic properties of cinnamon are due to the presence of bioactive constituents such as p-coumaric, cinnamaldehyde, cinnamic acid, and eugenol. Cinnamaldehyde and eugenol are the major active constituents responsible for its characteristic flavor, aroma, and therapeutic properties. Pharmacological studies found that it could be a promising candidate with potential for designing new drugs. This review is aimed to summarize the ethnomedicinal importance, phytochemistry, and wide spectrum of pharmacological and therapeutic applications of cinnamon.*

### INTRODUCTION

Cinnamon is a medicinal plant belonging to the Lauraceae family. The bark of the plant is commonly used as a spice and an aromatic and flavoring agent since ancient times. The botanical name *Cinnamomum* is derived from the Hebraic and Arabic term amomon, meaning fragrant spice plant. All over the world, there are about over 250 species belonging to the genus *Cinnamomum* in the family Lauraceae; however, only a few *Cinnamomum* species are grown commercially (Sangal 2011; Vangalapati et al. 2012). Among them, four species are most commonly used as spices including *Cinnamon cassia*, *Cinnamon verum*, *Cinnamon loureiroi* and *Cinnamon burmanni* Blume (Ravindran 2004).

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## **Therapeutic and Pharmaceutical Potential of Cinnamon**

Cinnamon is native to South Asia, although now it is distributed all over the world. These are evergreen trees and shrubs, and most of the species are aromatic. *Cinnamomum verum* and *Cinnamomum cassia* is the most common species of India and Sri Lanka (USDA-ARS, 2009). In India, it generally cultivated in the upper Himalayas at altitudes of 900 meters to 2500 meters. Different parts of cinnamon, especially bark and leaves, have been used as spices since Ayurvedic times. In India, dry bark is known as dalchin and leaves known as bay leaves. It is used as a folk medicine for the treatment of nausea, flatulent dyspepsia, coughs, diarrhea, malaria, gastric disorder, and to alleviate pain and inflammation in rheumatic arthritis. Around the world it is commonly used as a flavoring agent in a wide variety of cuisines, confectionery, sweets, snack foods, beverages, and chewing gums. In addition, they are commonly used in the soap and perfume industry due to its unique fragrance and aroma. Bark and leaves of the plant are a good source of aromatic essential oil that contains more than 80 phytochemical compounds and commonly used as spices. The primary constituents of the essential oil are cinnamaldehyde (65–80%) and less amount of eugenol (5–10%). It also contains mucilage, starch, and tannins (Trease and Evans 1989). The characteristic aroma and flavor of cinnamon derive from the principal component, cinnamaldehyde, and *trans*-cinnamaldehyde (Cin) present in essential oil (Yeh *et al* 2013). The pungent taste is attributed to cinnamic aldehyde, whereas sweetness in cinnamon arises from mannitol. This is well established that it also contributes to various biological activities such as anti-inflammatory, antioxidant, anti-ulcer, anti-microbial, hypoglycemic and hepatoprotective activities (Lin *et al.* 2003). The pharmacological and therapeutic properties of cinnamon are due to the presence of bioactive constituents such as vanillic, caffeic, gallic, protocatechuic, *p*-coumaric, ferulic acids, cinnamaldehyde, cinnamate, cinnamic acid and eugenol. It is also documented that it is active against many pathogenic gram-positive and gram-negative bacteria. It could serve as an ideal preservative agent as it would increase the safety and shelf life of food products by acting against foodborne pathogens and spoilage bacteria. Cinnamon is being practiced in Ayurvedic medicine, unani medicine, traditional Chinese medicine for cold, diarrhea, digestive disorder and as an appetizer. In European, it is approved by German health authorities for the same. Several types of research have been done on exploring its biological activities since last two decades. The aim of this review article is to summarize the ethnomedicinal importance, phytochemistry and wide spectrum of pharmacological and therapeutic applications of Cinnamon.

### **Taxonomic Tree**

Domain: Eukaryota  
Kingdom: Plantae  
Phylum: Spermatophyta  
Subphylum: Angiospermae  
Class: Dicotyledonae  
Order: Laurales  
Family: Lauraceae  
Genus: *Cinnamomum*  
Species: *Cinnamomum verum*

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