

Title : Extraction, Chemical Composition Analysis, Antibacterial Activity Evaluation and Perfume Formulation of Essential Oil from Wild and Commercial *Cinnamomum* spp.

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Major : Chemistry

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ABSTRACT

Cinnamomum spp. is an aromatic herb characterized by its distinctive fragrance. This study investigated the extraction of essential oils from commercial and wild cinnamon using the hydrodistillation method. The chemical compositions of the essential oils were analyzed by gas chromatography–mass spectrometry (GC–MS), while chemical functional group identification was performed using attenuated total reflectance Fourier transform infrared spectroscopy (ATR–FTIR). Antimicrobial activity against Gram-positive and Gram-negative microorganisms was evaluated using the agar diffusion method by measuring the clear zones after 24 and 48 hours. The extraction yield of commercial cinnamon essential oil was 1.107%, whereas that of wild cinnamon was 1.201%. GC–MS analysis identified 16 chemical constituents in commercial cinnamon essential oil, accounting for 98.86% of the total peak area, and 30 constituents in wild cinnamon essential oil, accounting for 98.48%, based on similarity indices $\geq 90\%$ with the Wiley W9N11 database. The major component in both samples was (E)-cinnamaldehyde, representing 84.49% in commercial cinnamon and 59.75% in wild cinnamon. The IR spectra of both essential oils showed similar characteristic absorption patterns. Antimicrobial activity was tested against *Bacillus cereus* (B358, 4AC), *Staphylococcus aureus*, *Candida albicans*, *Escherichia coli*, and *Salmonella enterica*. Both essential oils effectively inhibited microbial growth; however, wild cinnamon exhibited stronger activity than commercial cinnamon. After 24 hours, the clear zone diameters of wild cinnamon ranged from 22.15 to 63.88 mm, while those of commercial cinnamon ranged from 17.13 to 51.05 mm. After 48 hours, the clear zone diameters ranged from 15.60 to 57.53 mm for wild cinnamon and 12.08 to 40.30 mm for

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commercial cinnamon. From the satisfaction questionnaire on perfume formulations containing cinnamon essential oil, conducted with 21 participants, 9 participants (42.86%) preferred the perfume without cinnamon essential oil. Six participants (28.57%) preferred the formulation containing wild cinnamon essential oil, 4 participants (19.05%) preferred the formulation containing both wild and commercial cinnamon essential oils, and 2 participants (9.52%) preferred the formulation containing commercial cinnamon essential oil.

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