



Isolation and Characterization of Alkaloids from *Cinnamomum* Scha. (Lauraceae) species

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ABSTRACT

The hydrodistilled volatile oil of the four species of *Cinnamomum* were analysed using HPLC and GC-MS. Many compounds of the oil were characterized, Linalool, Camphene, Cinnamaldehyde, β terpineol, Camphor, Safrole, Heptanal are found to be the major compounds.

Keywords: *Cinnamomum* species, Lauraceae, alkaloids (active packaging), HPLC, GC-MS.

INTRODUCTION

The genus *Cinnamomum* comprises several hundred species, which occur in Asia and Australia. These are evergreen trees and shrubs and most of the species are aromatic. Perfumery applications are far less than in flavours because the oil has some skin sensitizing properties, so it has limited use in some perfumes. Mallavarapu [1] identified 53 constituents along with the major component eugenol (81-84.5%) in Cinnamon leaf oil. Cinnamon leaf oil has a warm spicy, but rather harsh odour, lacking the rich body of the bark oil. Leaf oil has fragrant odour and very pungent taste. Thirty four compounds have been previously identified in cinnamon fruit oil with (E)-Cinnamyl acetate (42-54%) and caryophyllene oxide (7%) as the major compounds [2]. The objective of the present study is to determine the chemical composition of the volatile oil from the leaves of four wild species of *Cinnamomum*. In recent times, natural food additives are in great demand due to consumers preference and health concerns associated with the use of synthetic additives. Agricultural and industrial by products are interesting sources of natural additives. A number of by products have been previously studied as potential source of food additives.

In the background of present knowledge base investigation on the chemical as well as bioactivity studies of the volatile oils from leaves of *Cinnamomum* species were undertaken. The present study aimed to the isolation, purification and evaluation of the alkaloids in different *Cinnamomum* species by the use of HPLC and GC-MS.

MATERIALS AND METHODS

Isolation of volatile components

Mature leaves of four different species of *Cinnamomum* i.e. *Cinnamomum malabattrum*, *Cinnamomum sulphuratum*, *Cinnamomum macrocarpum* and *C. travancoricum* were collected from different locations of western ghats of Karnataka and other states. Solvent extraction, separation, purification and identification of chemical constituents from leaf extracts of four different species of *Cinnamomum* have been presented. Fresh leaves of different species of *Cinnamomum* were cleaned air dried. Dried plant samples were further air dried in a ventilated oven at 40°C for 24hrs. Then ground into a fine powder and passed through a sieve. The leaf powder of four different species of cinnamon was extracted with ethyl acetate. Extract was found to possess maximum phenolics and antioxidant activity.

GC- MS analysis

GC-MS analysis using a GCMS QP2010 GAS CHROMATOGRAPH MASS SPECTROMETER SHIMADZU resulted in detection and identification of volatile constituents of four species of *Cinnamomum*. Sample of (0.1 μ l) of oil were analysed on an HP-GCD apparatus equipped with an HP5 (30m x 0.25mm) fused -silica

capillary column using helium (1ml /min) as carrier gas. The injector and detector temperatures were 250^oC and 280^oC respectively, and the oven conditions were 70^oC for 2min, then rising from 70 to 200^oC at a rate of 4^oC/ min and subsequently held at 200^oC for 10 min. The mass range was recorded from 45 to 45 M/Z, with ionization energy of 70ev. Major components were identified by with authentic standards and by with recorded from computerized libraries. The constituents of the oil were identified by the combination of mass spectral and retention indexes and they were compared with both those of reference authentic compounds and from library spectra data and literature [3&4].

RESULTS AND DISCUSSION

The volatile oil of four species of *Cinnamomum* i.e. *Cinnamomum malabratrum*, *C.sulphartum*, *C.macrocarpum* and *C.travancoricum* were obtained by hydrodistillation and was analysed by HPLC and GC-MS. The essential oils from leaves of four species of *Cinnamomum* were analysed for quality and quantity using GC-MS. Ten essential oil compounds were obtained. Among them Linalool, camphene, transcinnamaldehyde, β -terpineol were major compounds. Camphor is present in all four species of *Cinnamomum*, in *Cinnamomum malabratrum*(93%),*Cinnamomum sulphuratum*(91%),*Cinnamomum macrocarpum* (41%) and *Cinnamomum travancoricum* (80%). In *Cinnamomum malabratrum* in addition to camphor β -terpineol (0.73%) is there. In *Cinnamomum sulphuratum* camphor and heptanal (2.8%) were present. And in *Cinnamomum macrocarpum* in addition to camphor, safrole (43%) and trans-cinnamaldehyde (0.68%) were present. These compounds are used as food additives for flavouring, used in the preparation of fragrance, used as scent, cleaning agents, detergents, shampoos and lotions as pest repellent and used as an ingredient in cosmetics and perfumes and flavours and also in medicine.

Essential oil of leaves of four different *Cinnamomum* species were obtained by hydro distillation and were analysed by HPLC and GC-MS.Retention indices for all the compounds were determined.The compounds were identified by comparison retention indices with those reported in the literature [4&5]. A total of 10 compounds were identified.

These observations suggest that the bioactive compounds responsible for the activity are polar and can be extracted through the organic solvent medium. It is established that spices and their derivatives could be suitable alternatives for inclusion in food conservation systems, some evaluation about microbiological quality,economic feasibility and antimicrobial effect for a long time and toxicity should be carried out.

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