ISOLATION AND IDENTIFICATION OF EUGENOL AND CINNAMIC ALDEHYDE FROM *in vitro* CULTURES OF *Cinnamomum zeylanicum*

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ABSTRACT

Cinnamomum zeylanicum is a tropical, evergreen tree species which belongs to family Lauraceae. It is indigenous to Sri Lanka ,and occupies a unique position as a spice due to its volatile aromatic oils of which, Eugenol and Cinnamic aldehyde are the major components. Though Sri Lanka is blessed with optimum conditions to grow cinnamon, the traditional methods used in processing of cinnamon quills and oils (leaf and bark) have not been able to harness the real economic potential of this crop . Cinnamon oil and its derivatives are used for a range of industries i.e. food flavouring, perfumery and pharmaceutical industries etc. It has been also revealed that cinnamon oil posses antitumor, antimicrobial and insect repelling properties too. Eugenol and Cinnamic aldehyde are biosynthesised predominantly in leaves via shikimic acid pathway. In this study, attempts were made to identify aromatic compounds from leaf callus cultures and cell suspension cultures, with a view of the development of an alternative method for the extraction of these compounds based on *in vitro* systems.

Procedures for callus initiation, proliferation, sampling and identification of aromatic compounds were developed. Leaf disks were cultured in WP and MS basal media supplemented with auxin (2, 4-D, NAA and IAA) and cytokinin (BAP and kinetin). A successful callus initiation and proliferation could be observed in WP medium supplemented with 5.0 mg/L NAA and 0.5 mg/L BAP. Callus predominantly consisted of elongated cells and the callus growth displayed a typical sigmoid curve. Among the different sources of explants the highest callus initiation was observed with the yellowish green leaves compared to green, reddish and light green leaves. Light enhanced the initiation and proliferation of callus.

The calli were maintained by subculturing at three weeks intervals. WP basal medium supplemented with 5.0 mg/L NAA and 0.5 mg/L BAP was used for cell cultures. Cells were seperated and homogenised with $CHCl_3$ and di - ethyl - ether respectively for analysis employing Gas Lquid Chromatography (GLC). GLC profiles clearly indicated the presence of eugenol, cinnamic aldehyde and some other volatiles that are present in the cinnamon bark and leaf oils. The results revealed that, the aromatic compounds can be identified from callus cultures, cell cultures and cell culture (filters) suggesting that there is a potential to develop an *in vitro* system to extract major components of oil from leaf callus cultures and cell suspension cultures.

Key words: *Cinnamomum zeylanicum* , callus and cell suspension cultures , aromatic compounds, eugenol, cinnamic aldehyde.