Chemical Composition and Fungitoxic Activity of Essential Oil of *Thuja orientalis* L. Grown in the North-Western Himalaya

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The essential oil from fresh leaves of *Thuja orientalis* L. grown in the north-western Himalaya was isolated by means of hydrodistillation and analyzed by GC and GC/MS. Twenty-two compounds representing 94.0\% of the total oil were identified. The leaf oil contained \(\alpha\)-pinene (29.2\%), \(\Delta-3\)-carene (20.1\%), \(\alpha\)-cedrol (9.8\%), caryophyllene (7.5\%), \(\alpha\)-humulene (5.6\%), limonene (5.4\%), \(\alpha\)-terpinolene (3.8\%) and \(\alpha\)-terpinyl acetate (3.5\%) as major constituents. The essential oil showed antifungal activity against *Alternaria alternata* in a direct bioautography assay. Two main bioactive compounds named as \(b_1\) (\(R_f = 0.54\)) and \(b_2\) (\(R_f = 0.80\)) were observed and tested for antifungal activity; they produced an inhibition zone of 5 and 10 mm in diameter, respectively. The components \(b_1\) and \(b_2\) were further purified by preparative thin layer chromatography and their antifungal efficacy was re-tested. The minimum inhibitory amount (MIA) of \(b_1\) and \(b_2\) against *A. alternata* was determined as 30.5 and 4.5 \(\mu\)g, respectively, using a bioautography assay. The bioactive constituent corresponding to \(b_1\) was determined as \(\alpha\)-cedrol by using GC/MS analysis. The potential of essential oils as a source of natural biocides is discussed.

\textit{Key words: Thuja orientalis} L., \(\alpha\)-Cedrol, Antifungal Activity