

The Study of Natural Synthetic Linalool Isolated from Ginger (*Zingiber officinale*) Using Photochemical Reactions

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Abstract : Ginger (*Zingiber officinale*) is so important plant for its medicinal properties from ancient time and used as a spicy herb all over the world. This study was designed to examine the chemical composition of the essential oil and various crude extracts (n-hexane, chloroform and ethanol) of *Zingiber officinale* as well. GC-MS analyses of the essential oil resulted in the identification of 68 compounds; 1,8-cineole (8.9%) and linalool (15.1%) were the main components in the essential oil. The crude extracts were analyzed with TLC plates and revealed several spots under UV light; however the hexane extract exhibited the highest number of spots compared to the other extracts. Hexane extract was selected for GC-MS profile, and the results revealed the presence of several volatile compounds and linalool was the major component with high percentage (11.4 %). Further investigation on the structure elucidation of the bioactive compound (linalool) using IR, GC-MS and NMR techniques compared to authenticated linalool then subjected to purification using preparative and column chromatography. Linalool has been epoxidized using m-chloroperbenzoic acid (mcpba) at room temperature in the presence of fluorescent lamps to give two cyclic oxygenated products (furan epoxide & pyran epoxide) as a stereospecific product. It is concluded that, oxidation process is enhanced by irradiation to form epoxide derivative, which acts as the precursor of important products.

Keywords : epoxide, ginger, irradiation, linalool

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