Junior Science Communications
Faculty of Applied Sciences, UiTM Shah Alam
https://journal.uitm.edu.my/ojs/index.php/JSC

E-ISSN 2637-0689
Vol 38 2024

Colloquium on Applied Sciences 2024
Faculty of Applied Sciences, UiTM Shah Alam, Malaysia

Synthesis of 6-Hydroxycoumarin Derivatives

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Structured Abstract

Background: Coumarin, *Dipteryx Odorata Willd* known as Tonka Bean, is the naturally occurring compound. The compound also distributed from nature such as found in roots, flowers and fruits in the presence of secondary metabolites. The group of coumarin consists of simple coumarins, furanocoumarins, dihydrofurano coumarins, phenyl coumarins etc. Existence studies mentioned the functionality of coumarins in toxicological, biological and pharmacological properties. However, the derivatives of hydroxycoumarin, a hydroxylated simple coumarin groups having different type of synthesis methods that not proven the characterization of the compounds. The study utilized the synthesis methodology for the 6-hydroxycoumarin derivatives as outcomes of the recent characteristic evidence of the compound. As the purpose of this study able to establish the recent research of the 6-hydroxycoumarin derivatives.

Methods: The 6-hydroxycoumarin derivative in the reaction of 2,5-dihydroxybenzaldehyde with malonic acid in the present of pyridine (solvent) and aniline (catalyst) using stirring method for 24hr. The progress determines by monitoring on TLC plate. The 6-hydroxycoumarin carboxylic acid that formed is gone for esterification process in reflux for 210°C, 24hr with the presence of methanol and sulfuric acid. The 6-hydroxycoumarin carboxylate formed proceed to the reaction with hydrazide with methanol in reflux too and substituted to 6-hydroxycoumarin carbohydrazide. There are three compound derivatives from the synthesis method.

Results: This study identified the presence of the synthesized 6-hydroxycoumarin derivatives by series methods through characterization using NMR, FTIR and GCMS spectrometry. The results ^{1}H NMR and ^{13}C NMR spectrum observed to gives the identification of amount of atom regarding the hydrogen and carbon bonds appears with the similarity of the atoms on the compound's chemical structure. The IR spectrum has determined the hydroxyl groups and carbonyl groups at range of ~3000 cm^{-1} and ~1715 cm^{-1}, respectively. The analysis data from GCMS spectrometry resulted in the possible compounds with the high percent of qualitative.

Conclusion: In conclusion, the 6-hydroxycoumarin derivatives compound able to be identified under the instrumentation characterization results. The study was recommended to expends further in discovers the ability of the compounds for the biological activities.

Keywords: Synthesis, Characterization, Hydroxycoumarin,

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