Synthesis of a new flavone from clove oil

Athuman Abdallah

Master of Sciences, (Chemistry)

University of Dar es salam, College of Natural and Applied Sciences, 2018

Chemical synthesis of bioactive natural products has been an important part of natural product research. This is because natural products have proven to be the most important source of pharmaceutical development worldwide. Much new therapeutics is derived from natural products. Thus, this dissertation reports on the synthesis of a new flavone which is analogous to the natural flavones. Flavones have been proven to be more valuable in biological and pharmacological activities. In the research reported in this dissertation a new flavone, 14, has been synthesized starting from clove oil. Cloves were steam distilled to obtain clove oil which was subsequently separated into eugenol and acetyl eugenol, its major phenolic constituents using dilute NaOH (3%). In route 1, eugenol was treated with cinnamoyl chloride resulting into the ester which, without isolating, was refluxed with aluminium chloride to effect Fries rearrangement into a common intermediate 19 in 72% yields. Upon refluxing with acetic acid in ethanol compound 19 gave the target compound 14 in 88.20% yields. Alternatively (i.e. route 2) acetyl eugenol was refluxed with methane sulfonic acid resulting in acetophenone 17 which on aldol condensation with benzaldehyde formed the common intermediate 19 in 92% yield. Refluxing 19 with acetic acid in ethanol gave product 14 in 95% yields. The synthesized compounds were characterized by FT-IR and HNMR spectroscopic techniques. Of the two synthetic routes for 6-allyl-3-(cyclohexa-2,4-dienyl)-8-methoxy-4H-chromen-4-one (14) route 2 gave better yield than route 1.