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Antioxidant and Antibacterial Activities in Kaffir Lime (*Citrus hystrix*) Essential Oil Extracted by the Hydro-distillation Method

| Chapter | First Online: 19 March 2023

| pp 143–152 | [Cite this chapter](#)



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 Part of the book series: [Advanced Structured Materials](#) ((STRUCTMAT, volume 173))

 197 Accesses  1 [Altmetric](#)

Abstract

Kaffir lime (*Citrus hystrix*), also known among the locals as ‘limau purut’, is one of Malaysia’s most lucrative commercial fruit harvests. Apart from being a staple ingredient in most Asian cuisines, the essential oil extracted from the fruit has a wide range of applications. Essential oil, also known as aromatic oil, is a colourless and concentrated hydrophobic liquid with the presence of several chemical components such as phenols, flavonoids, and terpenoids. These major chemical components contribute to the pleasant and intense aromatics of essential oil. Extraction of essential

oil may derive from peels or leaves by various extraction methods. A few synthetic antioxidant supplements have been reported to be harmful and toxic to the human body. Additionally, the emergence of pathogenic microorganisms has led to the development of resistance to major classes of antibacterial drugs. Hence, a potential natural antioxidant and antibacterial agents with special active compounds in the herbal plants that are safer for human consumption need to be identified. This study aims to determine and evaluate the antioxidant and antibacterial activities of Kaffir lime essential oil by the DPPH (1,1–diphenyl–2–picryl hydroxyl) assay and disc diffusion method, respectively. Resultantly, the Kaffir lime essential oil obtained through the hydro–distillation process was stable with potent antioxidant activity against free radicals. Kaffir lime is easily accessible, and the essential oil extracted by the hydro–distillation method in this study has low handling cost and potential activity against various types of bacteria. This study provides a natural antioxidant and antibacterial source to ensure consumers’ good health and well–being. These health benefits may assist in preventing several chronic diseases, including inflammation and cancer. Findings from this study will also be beneficial as a future reference for researchers to develop new formulations for antioxidant and antibacterial purposes.

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