

ABSTRACT

The essential oil from lemongrass (Cymbopogon citratus) has potential as an antibacterial agent but exhibits weak antioxidant activity. Conversely, the essential oil from clove flower (Syzygium aromaticum) is known for its potent bioactivity, particularly as an antioxidant and antimicrobial due to its high eugenol content. This study aimed to isolate, characterize, and analyze the enhancement of antioxidant and antibacterial activities of lemongrass essential oil after being combined with clove flower essential oil. The essential oils were isolated using steam distillation, and their chemical components were analyzed using Gas Chromatography-Mass Spectrometry (GC-MS). Activity tests included the determination of total phenolic content, antioxidant activity (DPPH method for IC₅₀ values), and antibacterial activity against Staphylococcus aureus and Escherichia coli (agar well diffusion method). The results showed essential oil yields of 0.09% for lemongrass and 0.73% for clove flower. GC-MS analysis identified Neral (36.59%) and Citral (31.96%) as the major components of lemongrass oil, while clove oil was dominated by Eugenol (75.22%). Clove flower oil demonstrated vastly superior total phenolic content (956.721 mg GAE/g) and antioxidant activity (IC₅₀ 7.387 mg/L). The combination of both oils was proven to significantly enhance bioactivity; the 2:1 (lemongrass:clove) ratio showed the strongest activity enhancement against S. aureus, while the 1:1 ratio showed optimal enhancement against E. coli.

Keywords: *Essential oil, lemongrass, clove flower, antioxidant, antibacterial*