EVALUATION OF ANTIOXIDANT, ANTIBACTERIAL AND ANTICANCER ACTIVITY *OF CYMBOPOGON CITRATUS, ARTEMISIA ABSINTHIUM* AND *MENTHA LONGIFOLIA* LEAVES

By

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ABSTRACT

The study aimed to investigate and compare the antioxidant, antibacterial, and anti-cancer activities of lemongrass (*Cymbopogon citratus*), wormwood (*Artemisia absinthium*), and peppermint (*Mentha longifolia*) for methanol, n-butanol, and ethyl acetate successively extracts and their essential oils for beneficial effects. Different extracts by using HPLC showed that lemongrass, wormwood, and peppermint contain many compounds of polyphenols and their essential oils were identified chemical composition using the GC-MS technique. The MeOH extracts have the highest concentration of antioxidant activities than n-BuOH and EtOAc extracts using DPPH, ABTS, and FRAP methods and the plant's essential oils were monitored by radical scavenging assay (DPPH). The lemongrass and wormwood EOs contain the highest TPC than peppermint while lemongrass EtOAc, wormwood and peppermint MeOH extracts contain the highest TPC. Furthermore, the antibacterial activites were evaluated for all plants extracts and their essential oils against *E.coli*, *S. typhimirium* and *S.aureus*.Where The inhibitory effect of lemongrass, peppermint, and wormwood EOs was higher against Gram-negative bacteria while lemongrass and wormwood MeOH extracts had a higher inhibitory effect against *S.typhimirium* (26mm and 23.1mm, respectively) but peppermint MeOH extract showed a higher inhibitory effect against *S. aureus* was 15mm.The possible anti-cancer activity was determined in vitro against colon cancer, breast cancer, and normal human lung cell lines for plants methanol extract and their essential oils. Meanwhile, lemongrass, wormwood, and peppermint methanol extract showed the highest anti-cancer potential against the HCT116 cell line. But Lemongrass and wormwood EOs showed the highest anti-cancer potential against HCT116 was IC_{50}=77.413 and IC_{50}=297.5 µg/ml. Lemongrass and wormwood EOs effectively inhibited the HCT116 cancer cell line's growth. In conclusion, the plant's methanol extract and their essential oils understudy had high effective antioxidant and antibacterial activity and inhibited HCT116 cancer cell line growth, depending on their vital constituents. We recommended using these plants and their essential oils, which acts as antioxidants, antibacterial, and anti-cancer.

Keywords: Anti-Cancer, Anti-Bacterial, Anti-Oxidant, *Cymbopogon citratus*, *Artemisia absinthium*, *Mentha longifolia*, Essential Oil.

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