



Antibacterial Effect of Essential Oils Alone and in Combination with Antibiotics against *Escherichia coli* and *Staphylococcus aureus*

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Abstract : *The rapid emergence of multi-drug resistant pathogens has threatened the clinical effectiveness of most of the marketed antimicrobials, which increases the need to find alternatives. Essential oils have been known for their biological activities in the folkloric medicine in many countries for hundreds of years. The aim of the present study was to demonstrate the in vitro antimicrobial property of two commercial essential oils against multi-drug resistant Escherichia coli and Staphylococcus aureus, and to study the effect of combination of essential oils with standard antibiotics. The antimicrobial activity was evaluated by disc diffusion method. The result showed that both tested essential oils have considerably good antimicrobial activity against S. aureus while same cannot be said about E. coli. Grapefruit oil and Neem oil showed no effect on Escherichia coli. The interaction between the tested standard antibiotics and essential oils*

showed variable results against the tested bacteria. The results are of significance in health care system and microbial disease treatment as the present study showed that essential oils possess good antimicrobial property against tested strains. Most of the essential oil and antibiotic combinations showed synergistic effects. Essential oils can be used as adjuvant to antimicrobial therapy.

Keywords: *E. coli, S. aureus, essential oils, antimicrobial property.*

Introduction :

Antibiotic therapy is one of the most important therapies used for fighting infectious diseases and has tremendously enhanced the health aspects of human life since its introduction. Despite the advancements in this therapy, we still live in an era where incidents of antibiotic resistant infections are alarmingly on rise. The significance of the role of antibiotics in nature remains unfounded due to the responses of bacteria through the manifestation of various forms of resistance following the introduction of a new antibiotic for clinical use. The most important factor influencing the emergence and spread of antibiotic resistance is the excessive bacterial exposure to antibiotics. Today, bacteria which are resistant not only to a single drug but simultaneously to many drugs are rampantly spread in the community. (Yap *et al.*, 2014) Nowadays many infections are often caused by multi-resistant microorganisms resulting in difficulty to treat diseases and, consequently, substantial increases in healthcare costs. These multi-

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