

## Evaluation of Chemical Compositions and Biological Activities of Five Essential Oils

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**Abstract :** It is well known that essential oils used for therapeutic purposes for many years. In this study, five different Pharmacopoeia grade essential oils (*Achillea millefolium* L., *Pimpinella anisum* L., *Matricaria recutita* L., *Eucalyptus globulus* L., *Salvia officinalis* L.) which obtained from commercial sources were evaluated for chemical compositions, synergistic antimicrobial activities, and lipoxygenase enzyme inhibitions. Volatile components were determined by gas chromatography/flame ionization detector and gas chromatography/mass spectrometer, simultaneously. The potential antimicrobial activity of essential oils was tested against oral pathogenic standard strains such as *Streptococcus mutans*, *Streptococcus sanguinis*, *Staphylococcus aureus*, *Corynebacterium striatum*, *Candida albicans* and *Candida krusei* by broth microdilution methods. Ciprofloxacin and ketoconazole were used positive controls. It has been observed that the essential oils tested have average inhibitory antimicrobial activity against oral pathogens with a Minimum Inhibition Concentration of 20-0.625 mg/mL. The active essential oils have been combined with antibiotics and synergistic effects have been evaluated by Checkerboard method.  $\Sigma$ FIC values were determined. In combination with antibiotics *M. recutita* essential oil has been shown to have a synergistic effect against *S. aureus* in combination with tetracycline ( $\Sigma$ FIC 0.46). In addition, 5-LOX inhibitory activity was measured by modifying the spectrophotometric method developed by Baylac and Racine. As a result, 5-LOX % inhibition of *S. officinalis*, *E. globulus* and *M. recutita* were calculated as  $34.0 \pm 6.66$ ,  $72.7 \pm 2.78$  and  $27.7 \pm 0.60$ , respectively.

**Keywords :** antimicrobial activity, essential oils, synergistic activity, 5-lipoxygenase inhibition

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