P 464

COMBINATION EFFECT OF *TRACHYSPERMUM AMMI* AND *LAVANDULA OFFICINALIS* ESSENTIAL OILS ON SOME BACTERIAL FOOD-BORNE PATHOGENS

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In this study the effect of *Trachyspermum ammi* and *Lavandula officinalis* on bacterial food-borne pathogens including *E. coli* O157: H7, *Salmonella typhimurium*, *Listeria monocytogenes*, *Bacillus cereus*, and *Staphylococcus aureus* was evaluated, individually and in combination, using micro-dilution broth method. Moreover, the bacterial growth curve affected by EOs, individually or in combination, was analyzed. The minimum inhibitory concentration (MIC) of both *T. ammi* and *L. officinalis* EOs against *S. aureus* was estimated 2000 ppm. Furthermore, the MICs of *T. ammi* and *L. officinalis* EOs against *E. coli* were assessed 1000 and >4000 ppm, respectively. The MICs of *T. ammi* for *S. typhimurium* and *B. cereus* were 2000 ppm and the MICs of *L. officinalis* against *S. typhimurium* and *B. cereus* were >4000 and 1000 ppm, respectively. The MIC of both EOs for *L. monocytogenes* was 1000 ppm. Combination of EOs showed a synergistic effect against *E. coli* (fractional inhibitory concentration (FIC) index of 0.75) and *S. aureus* (FIC index of 0.54), an additive effect for *L. monocytogenes* (FIC index of 1) and *B. cereus* (FIC index of 1), and indifferent for *S. typhimurium* (FIC index of 1.25). The results of growth curve analysis showed that combination usage of these two essential oils was effective in increasing the lag phase of mentioned bacterial pathogens. In conclusion, *T. ammi,* and *L. officinalis* showed to be effective against bacterial growth, especially when are used in combination, and their potential application in food systems may be suggested.

Keywords: Combination effect, essential oil, *Trachyspermum ammi, Lavandula officinalis,* bacterial food-borne pathogens

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