

Antibacterial Activity of Trans-Cinnamaldehyde and Geraniol and Their Potential as Ingredients of Biocidal Polymers

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Abstract : In this paper, the biocidal effects of trans-cinnamaldehyde (a main component of cinnamon oil) and geraniol (a constituent of Pelargonium graveolens essential oil) are presented. The activity of the combination of trans-cinnamaldehyde and geraniol was tested against 3 bacterial strains: Staphylococcus aureus ATCC6538 (Gramm+), Escherichia coli ATCC8739 (Gramm-, Lac+) and Pseudomonas aeruginosa KKP 991(Gramm-, Lac-). The biocidal activity of trans-cinnamaldehyde-geraniol mixture against bacteria mentioned above was evaluated by disk-diffusion method. The model strains were exposed on 1, 2.5, 5 and 10 mg of trans-cinnamaldehyde-geraniol mixture per disk, and all strains were susceptible to this combination of plant compounds. For all microorganisms, also Minimal Inhibitory Concentration (MIC) and Minimal Bactericidal Concentration (MBC) were estimated. For Staphylococcus aureus MIC was 0.0625 mg/ml of the trans-cinnamaldehyde and geraniol mixture, and MBC was 1.25 mg/ml; For Escherichia coli MIC=0.5 mg/ml, MBC=1 mg/ml, and finally Pseudomonas aeruginosa was inhibited in 0.5 mg/ml, and minimal biocidal concentration of tested mixture for it was 1.25 mg/ml. There are also reports about the synergistic working of trans-cinnamaldehyde and geraniol against microorganisms and the antimicrobial activity of polymers enriched with trans-cinnamaldehyde or geraniol, therefore the successful development and introduction to the today life of biocidal polymer enriched with trans-cinnamaldehyde and geraniol are possible.

Keywords : antibacterial activity, biocidal polymers, geraniol, trans-cinnamaldehyde

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