High yield synthesis of kojic ester using dual enzymes system and their antibacterial activity

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Enzymatic synthesis of kojic ester, a bio-based whitening agent, was successfully carried out via esterification reaction between oleic acid and kojic acid. Commercial immobilized lipases of Novozym 435 and Lipozyme RM IM were used in combination as biocatalyst in the reaction system. Various reaction parameters were chosen to optimize the reaction in order to obtain a high yield of kojic ester including the best ratio of lipases, reaction time and reaction temperature. The optimum conditions for the synthesis of kojic ester was achieved at reaction time of 12 hours, temperature of 60 °C and equal ratio of lipases to produce more than 70 % yield. Antimicrobial tests of synthesized kojic ester towards several types of bacteria via Minimum inhibitory concentration (MIC) and Minimum bactericidal concentration (MBC) analyses were also examined. The results obtained suggested that kojic ester exhibits a good bactericidal effect towards all bacteria tested such as Bacillus subtilis, Staphylococcus aureus, Escherichia coli and Salmonella typhimurium.

Antimicrobial activity; Dual enzymes system; Kojic ester; Optimization; Whitening agent

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