

Quantitative production of carotenoid and plasmid stability of *Escherichia coli* JM 109 pCAR25 Recombinant

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Abstract

Carotenoids are orange-to-yellow natural pigments found in many plant species and some microorganisms. Carotenoids are isoprenoid compounds and having diverse biological functions especially anti-carcinogenic activity and preventing chronic diseases. Natural carotenoid production levels are not yet competitive with carotenoid levels presently produced by fermentation, chemical synthesis or by extraction of plant materials. *Erwinia uredovora* is a carotenoid-producing bacterium that uses the mevalonate pathway, while *E. coli* produces isoprenoids via the non-mevalonate pathway. A combination of isoprenoid genes from different organisms that follow different branches of the pathway makes it possible to produce carotenoids and increase carotenogenesis. The aims of the research are measuring carotenoid production from *E. coli* JM109 pCAR25 recombinant quantitatively. It is also examined whether plasmid stability would be involved in carotenoid production of recombinant. The research was carried out by examining microbial growth, carotenoid production and plasmid stability on *E. coli* JM109 pCAR25. The result shows that growth of recombinant was slower than wild type detected from the cell weight and indicating the existence of plasmids. The highest carotenoid production of recombinant was 165,25 µg/g dcw at stationary phase. The stability of plasmid on *E. coli* JM109 pCAR25 was consistent until 80 generations but tended to slightly decrease for each generation. It was assumed that the decrease of plasmid stability does not affect carotenoid production on *E. coli* JM109 pCAR25 recombinant due to the need of carotenoid for survival of the organisms.

Key word : carotenoid, plasmid stability, *E. coli* JM109 pCAR25, *E. uredovora*