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Optimization of Zeaxanthin Production by Immobilized *Flavobacterium* sp. Cells in Fluidized Bed Bioreactor

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ABSTRACT

From time immemorial, human beings have used pigments made from vegetables, fruits, superior plants, animal tissues and cereals. One of the greatest sources of pigments is the bacterium that, with the use of the modern technology, has increased the production of metabolites of interest. The microbiological production of carotenoids has not been optimized to obtain pigment production quantities of pigments and carotenoids recovery that lower production costs. The aim of this work was to design a Zeaxanthin production process with *Flavobacterium* sp. immobilized cells in a fluidized bed bioreactor. An optimum culture medium for Zeaxanthin production in stirred flasks (2.46 $g \cdot L^{-1}$) was obtained. Furthermore, optimum process conditions for a maximum yield of Zeaxanthin production, by fluidized bed bioreactor, were established. A statistical analysis showed that the most significant factors were air flow, pH and NaCl concentration (4.5 $g \cdot L^{-1}$). In this study a maximum Zeaxanthin production of 3.8 $g \cdot L^{-1}$ was reached. The highest reported yield to date was 0.329 $g \cdot L^{-1}$.

KEYWORDS

Fluidized Bed Bioreactor; Orthogonal Design; *Flavobacterium* sp.; Zeaxanthin

Cite this paper

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