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Bioconversion of oleic acid into 7,10-dihydroxy-8(E)-octadecenoic acid

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PURPOSE OF THE ABSTRACT

7,10-Dihydroxy-8(E)-octadecenoic acid (DOD) was produced using an extracellular enzyme present in the supernatant of *Pseudomonas aeruginosa* [1]. DOD concentration and productivity were improved by using extracellular enzyme obtained from *P. aeruginosa* culture medium compared to the conventional whole cell culture method. Among the carbon sources used during cell preculture, glycerol showed higher DOD production than glucose. In the batch process, the highest concentration of DOD (8.82 g/L) was achieved using supernatants derived from a 12-hour pre-culture of *P. aeruginosa* after 72 hours of bioconversion process. To further improve DOD production, a fed-batch process was used with the addition of surfactants and concentrated enzymes. The fed-batch process using a 4-fold concentrated enzyme solution containing Tween 80 yielded the highest DOD concentration (27.5 g/L at 72 hours) with an 8.28-fold increase in DOD production compared to using whole cells. This research is expected to accelerate the development of DOD production using inexpensive substrates such as crude glycerol on a large scale.

FIGURES

FIGURE 1

FIGURE 2

KEYWORDS

7,10-dihydroxy-8(E)-octadecenoic acid | *Pseudomonas aeruginosa* | extracellular enzyme | fed-batch process

BIBLIOGRAPHY

[1] J.W. Jeong, M. Singhvi, B.S. Kim, *Biotechnology and Bioprocess Engineering* 2022, 27, 415-422