Production of y-linolenic Acid from Absidia Corymbifera Cell Biomass

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Gamma litolenic acid (GLA, ώ-6), is a polyunsaturated fatty acid (PUFA) which possesses various medical uses. It was reported to be found only in some plant species. Several microbes known to be capable in producing GLA. This research was conducted to determine the potential use of Absidia corymbifera for production of GLA. Methods for mass production of the fungus, isolation and purification of the GLA as well as analyzing the PUFA composition were studied.

A. corymbifera was grown on a medium composing of crude palm oil (CPO) with addition of certain inorganic salt icons at pH 5.0, and the culture was incubated on a shaker for 72 h. The biomass was filtered and dried. Analysis of GLA was conducted by direct methylation to the biomass cells, extraction of the derivatives of fatty acid methyl esther, then injection of the extract into a gas chromatograph. The peaks were identified using methylated standard compounds, and verified by GC-MS instrument. Isolation of the GLA was performed by extraction of total lipid using chloroform: ethanol: water (2:1: 0.8) solvent mixture. The extract was then fractionated using a 90 cm silicagel chromatography column. The loaded column was eluted with 100 ml each of chloroform, acetone, and methanol, successively.

The results showed that A. corymbifera could grown on media containing CPO and yielded almost the same amount of the dry biomass as those grown on synthetic medium. In addition to GLA, the lipid extract contains palmitic, palmitoleic, stearic, oleic, and linoleic acid. However, GLA product was 0.71% of the dry biomass weight (d.b.w.) lower than those in a synthetic medium (1.64% d.b.w.). GLA isolated by extraction using the solvent mixture and elution with acetone through a column chromatograph could separate as many as 92% of the total GLA from the biomass.