

Bioconversion of Molasses into Lipids Accumulation by Oleaginous Yeasts as Biodiesel Feedstock

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Abstract

Lipids were produced by various yeast species using molasses as substrate. A maximum lipid content of 65.48% of dry biomass by BJMK43 isolate could be achieved in the medium containing 12% molass and 1.0 g/L (NH₄)₂SO₄ under pH 5.5 at 30°C with shaking at 150 rpm after 6 days of incubation. The main cellular fatty acids of the all yeast were oleic, palmitic acid, linoleic acid and stearic acid. The selected lipid-producing yeasts were identified by comparing the nucleotide sequences of the PCR amplicons for the D1/D2 variable domain of the 26S ribosomal DNA using Basic Local Alignment Search Tool (BLAST) analysis. In total, 3 strains were isolated and identified as *Rhodotorula mucilaginosa* BJMK43 and BJMK58 and *Hanseniaspora opuntiae* JPMK66. Because of the predominant fatty acids were C16 and C18 in the crude lipids of yeast cells, these could be promising feedstock for biodiesel production. Molasses can be used as inexpensive substrates for microbial biomass and lipid production.

Keywords: Biodiesel, Lipid, Molasses, Oleaginous yeast, 26S ribosomal DNA