

Pakawat Kraisintu 2009: Optimization of Lipid Production by Oleaginous Yeast. Master of Science (Microbiology), Major Field: Microbiology, Department of Microbiology. Thesis Advisor: Professor Savitree Limtong, Dr.Eng. 95 pages.

Newly isolated oleaginous yeast *Rhodospidium toruloides* DMKU3-TK16 was obtained from three steps screening from 63 strains of known species in the genus *Rhodotorula* and 104 newly isolated strains of unidentified species. Lipid production by this strain was highest in shaking flask cultivation at 150 rpm and 28 °C in nitrogen-limited medium II containing per liter 70 g glucose, 0.75 g yeast extract, 0.55 g (NH₄)₂SO₄, 0.4 g KH₂PO₄, 2.0 g MgSO₄•7H₂O and pH 5.5. Under these optimal conditions, when the C/N ratio of the medium was 140, *R. toruloides* DMKU3-TK16 produced lipid of 9.26 g/l, which was 71.30 % of dry biomass (13.33 g/l) after 168 h of cultivation. Lipid production in a 5 l jar fermenter with agitation speed of 300 rpm, aeration rate of 3.0 vvm and 30 °C throughout the cultivation, *R. toruloides* DMKU3-TK16 yielded a final lipid of 15.12 g/l, which was 67.23 % of dry biomass (22.49 g/l) after 156 h of cultivation. The major fatty acids of the cellular lipid were oleic acid (40.93%), palmitic acid (20.42%), linoleic acid (18.04%) and steric acid (11.65%).

Student's signature

Thesis Advisor's signature