3737046 : MAJOR : PHARMACY ; M.Sc. (PHARMACY)
KEY WORDS : BIOEMULSIFIER / BIOSURFACTANT / *Pseudomonas cepacia*
AROONSRI WONGPATIKARN : A STUDY OF BIOEMULSIFIERS FROM *Saccharomyces cerevisiae* AND A NEWLY DISCOVERED BACTERIUM. THESIS ADVISORS: MALYN CHULASIRI, Ph.D., VARAPORN JUNYAPRASERT, Ph.D., SAOVANEE DHARMSTHITI, Ph.D. 112 P. ISBN 974-662-465-2

In the screening of 11 bioemulsifier-producing microorganisms, a newly discovered gram negative bacterium strain MA1 which was later identified as *Pseudomonas cepacia* showed the potential ability of bioemulsifier production. After optimization of the medium, carbon source, temperature and incubation period, it was found that the maximal yield of biomass (9.6 g/l) and bioemulsifier (1.2 g/l) was obtained if MA1 was cultivated in the mineral medium supplemented with 1% soybean oil under shaking condition at 28°C for 5 days. The bioemulsifier could be extracted from the bacterial cells by autoclaving at 121°C for 15 min. The extraction by ultrasonication yielded a low amount of the bioemulsifier. In the treatment of bioemulsifier from MA1 with 3 types of hydrolytic enzymes, i.e., lipase, β-glucosidase and protease, it was found that protease and lipase could diminish the emulsifying ability of the agent. Partial purification of the bioemulsifier showed that its molecular weight was more than 30,000 Da. The bioemulsifier from MA1 stabilized the emulsion more effectively than sodium lauryl sulfate (SLS), the commonly used commercial synthetic emulsifier. The emulsion emulsified by the above agent had a shelf-life of at least 18 months. Such emulsion was also stable after 4 months at 4°C and 45°C. Most importantly, the emulsion was stable after temperature stress test at 4°C (cooling) to 45°C (heating) on a 48 h cycle for 30 cycles, whereas the emulsion yielded from 1% SLS showed a sign of separation after 10 heating/cooling cycles. The bioemulsifier was stable at pH ranging from 5-12 but its emulsification property was affected at the lower pH. This bioemulsifier reduced the surface tension of the water to 41 dyne/cm, though it has low ability to reduce the interfacial tension against both kerosene (9.6 dyne/cm) and mineral oil (9.7 dyne/cm).