

Abstract.

Bioethanol is one of the good sources of liquid energy for automobiles and industries. The bioethanol market has continued to grow rapidly in recent years. Thai government aims to increase ethanol consumption from 1.2 billion liters in 2015 to 3.3 billion liters by 2021 and up to 4.1 billion liters by 2036. *Zymomonas mobilis*, a gram-negative bacterium, is considered as dominant in large-scale fuel ethanol production which convert sugar and carbon dioxide and produces levan polysaccharide as one of by product. This project aimed to study survivor rate of *Z. mobilis* by sodium alginate at 3% concentration from simulated practical conditions including high temperature condition (85°C) and simulated food tract conditions 0.6% bile salt and acidic pH (1.55). The encapsulated beads were separated into four different sizes according to their average size by sieving method. Results indicated that survival rates of encapsulated cells of *Z. mobilis* were significantly higher ($p < 0.05$) from all simulated conditions compared to free cells. Furthermore, the highest survival rate was obtained from sieve 10 for both high temperature and simulated food tract condition with value of 19.52%, 14.72% respectively. Lastly, the results showed that there was no significant difference ($p > 0.05$) in levan production was also compared between free cells and encapsulated cells from high temperature and simulated food tract conditions in which the production level of levan were 0.46, 0.44 mg/mL and 0.35 mg/mL respectively.

Key word: *Zymomonas mobilis*, encapsulations, probiotic, levan polysaccharide bioethanol.