

Tip-ruthai Pornoi 2007: Effects of Various Stresses on Stressed Proteins Production and Cross Protection Against Hydrogen Peroxide of *Vibrio parahaemolyticus*. Master of Science (Food Science), Major Field: Food Science, Department of Food Science and Technology. Thesis Advisor: Mrs. Warapa Mahakarnchanakul, Ph.D. 95 pages

Vibrio parahaemolyticus is the foodborne bacteria known as the cause of gastroenteritis disease from seafood consumption. Although, the food processing has many steps for reduce this bacteria but some cells can survive and become to stress state. The stressed cells have been shown that cells can resist better to stress conditions, thus cells have found in food. The objectives of this study aim to study the protein profile of *V. parahaemolyticus* from various stress conditions which expect to be part of the mechanism of cells survive. In addition, the study of stressed *V. parahaemolyticus* cells to express cross protection against hydrogen peroxide are demonstrated.

The 2 strains of thermostable direct hemolysin (TDH) *V. parahaemolyticus* (vp-293 and vp-330) and 3 strains of thermostable direct hemolysin-related hemolysin (TRH) *V. parahaemolyticus* (FS-004, FS-006 and FS-015) were subjected to 4 stress conditions as heat shock at 42 °C for 30 minutes, glucose starvation for 12 hours, exposed to peracetic acid 1.0 ppm for 15 minutes and hydrogen peroxide 0.17 ppm for 15 minutes. The profile of stressed protein production in cells were examined by 1-dimensional gel electrophoresis and found that many stressed proteins were increased. Those proteins molecular weight were similar to heat shock proteins (HSPs) including DnaK, GroEL, DnaJ, HSP90 and RpoH and also similar to general stress proteins. Moreover, TDH and TRH *V. parahaemolyticus* stressed cells were able to present cross-protection when exposed to 30 ppm of H₂O₂ for 30 minutes. D-value of all stressed cells were higher than normal cell. Among them starved cell showed that highest D-value. The starved cell of strain vp-293 (represented as TDH *V. parahaemolyticus*) had a D-value 27.6 minutes and starved cell of strain FS-015 (represented as TRH *V. parahaemolyticus*) had a D-value 17.2 minutes. These starved cells had a D-value 3 to 4-fold higher than normal cells. Results showed that TDH and TRH *V. parahaemolyticus* stressed cells could better resist and express cross-protection to H₂O₂ due to the increasing of stressed proteins. Therefore, seafood process should be emphasized in the reduction of *V. parahaemolyticus* contamination in raw materials and during process to prevent the stressed cells, which resist better in process and storage, and possible cause risk in seafood consumption.

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