

Suthida Chueapanich 2010: Selection of Bacteriocin Producing Lactic Acid Bacteria as Biocontrol of *Listeria monocytogenes* in Fresh Cucumber. Master of Science (Microbiology), Major Field: Microbiology, Department of Microbiology. Thesis Advisor: Assistant Professor Wanna Malaphan, Ph.D. 151 pages.

Biocontrol of pathogenic microorganism in foods is an alternative way to replace the chemical sanitizers that may leave any residue in foods. In this study 769 isolates of lactic acid bacteria were screened from fresh vegetables and fruits. Among these, *Pediococcus pentosaceus* KU-F2 was capable of producing bacteriocin substance which efficiently inhibit *Listeria monocytogenes*.

Bacteriocin production by *P. pentosaceus* KU-F2 was associated with growth and affected by various factors such as temperature, pH, NaCl and glucose concentrations. Growth in MRS broth pH 5.8, as well as in 2% glucose or 0-2% NaCl, incubated at 37°C exhibited a good condition for producing bacteriocin with highest antilisterial activity at 12,800 AU/ml. Its antilisterial activity was stable at pH 2-8 and at 121°C for 15 min and also stable at -20°C for 10 months but completely destroyed by proteolytic enzymes.

Bacteriocin produced by *P. pentosaceus* KU-F2 appears to have a potential to be use as a biopreservative in fresh produces especially in the washing steps. From this study, fresh cucumber artificially contaminated with *L. monocytogenes* DMST 17303 at 10² CFU/g was completely inhibited by bacteriocin at 512 AU/ml whereas only 2 Log cycle reduction was noticed in the presence of 10⁵ CFU/g for both 512 and 1,024 AU/ml. Furthermore, the shelf-life of bacteriocin treated cucumber was extended for 7 days at 7-10 °C without any increasing number of contaminants.

The result demonstrated a potential to apply bacteriocin produced by *P. pentosaceus* KU-F2 as a sanitizing agent in fresh produces to inhibit pathogenic bacteria that may contaminate during pre/postharvest.

Student's signature

Thesis Advisor's signature