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AMPORNPAN KENGLUECHA : MOLECULAR CLONING AND EXPRESSION OF CATALASE GENE OF LACTOBACILLUS SAKE 911 IN LACTOBACILLUS SP.A28. THESIS ADVISORS : WILAI NOONPAKDEE Ph.D., SAKOL PANYIM Ph.D., RUUD VALYASEVI Ph.D.. 111 P. ISBN 974-662-647-7

Lactobacillus sake 911 is a bacterial strain isolated from Thai fermented sausage, which shows high catalase activity in the presence of heme. This property is desirable as it can prevent discoloration and rancidity caused by hydrogen peroxide. The catalase gene of *L. sake* 911 was amplified by polymerase chain reaction method and using the primers which were designed from the nucleotide sequence of catalase gene of *L. sake* LTH 677. The 1.6 kb amplified product carrying the complete catalase gene from –35 promoter to the terminator sequence was cloned into pGKV210 *Escherichia coli-Lactococcus* shuttle vector and pIL1020 lactococcal gene expression vector. The recombinant plasmids containing the catalase gene of *L. sake* 911 were transformed into *E. coli* and then in *Lactobacillus* sp.A28, both of them which were deficient in catalase activity. The transformed *E. coli* and *Lactobacillus* sp.A28 cells were shown to have the ability to decompose hydrogen peroxide. High expression level of catalase gene was achieved under the control of lactococcal p59 promoter. The approximate 62 kDa protein was presented in *E. coli* UM2 harbouring the recombinant plasmids. The expressed catalase protein exhibiting the enzymatic activity was detected by staining the crude protein extracts from the recombinant *Lactobacillus* sp.A28 on nondenaturing polyacrylamide gel.