Nipaporn Ngernyuang 2007: Transformation of *α-amylase* Gene into Silkworm (*Bombyx mori* L.) by Using a *piggyBac* Vector. Master of Science (Genetics), Major Field: Genetics, Department of Genetics. Thesis Advisor: Assistant Professor Lertluk Ngernsiri, Ph.D. 140 pages.

α-amylase is commonly enzyme for starch hydrolysis. In the silkworm, *Bombyx mori*, α-amylase is found in both digestive fluid and hemolymph. *α-amylase* genomic DNA of *B. mori,* Nanglai strain (multivoltine strain), was 6,942 bp long and showed 97% identity with *α-amylase* of *B. mori*, p50 strain, in database (nscaf2827.1 Data of NIAS). A 1,503 bp full length ORF sequence was cloned by using Rapid Amplification of cDNA Ends (5' and 3' RACEs) strategy. Six clones were randomly selected and subjected to nucleotide sequencing. Four predicted deduced amino acid sequences, 500 residues each, sharing 99% homology to each other. One of these clones, AMYT-1, provided the sequence homology to *α-amylase* of *B. mori* in database with 97-99 % and to that of other insects, *Ostrinia nubilalis*, *Spodoptera frugiperda*, *Diatraea saccharalis* and *Ceratitis capitata* with 78%, 81%, 79% and 60 % respectively. Comparison of the nucleotide sequence between cDNA and genomic DNA of Nanglai's *α-amylase* showed that the *α-amylase* gene consists of 9 exons. *α-amylase* gene expression was detected by RT-PCR method in silkworm strains, Nanglai, C108 and w1-pnd and found that the *α-amylase* gene was expressed only in gut tissue of the Nanglai and w1-pnd strains. Then, the *α-amylase* gene was cloned into two *piggyBac* vectors, *pBac*[A3-AMY1-A3UTR, 3xP3-DsRed2] and *pBac*[A3-AMY1-SV40UTR, A3-EGFP]. Each recombinant vector was injected into silkworm eggs to produce transgenic silkworms. Two transgenic lines harboring *pBac*[A3-AMY1-A3UTR, 3xP3-DsRed2] were obtained. The expression of *α-amylase* transgene in the transgenic silkworms could express in several tissues.

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