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SUNTHORN CHOOLUCK : CLONING AND EXPRESSION OF A cDNA ENCODING GROWTH-RELATED PEPTIDE HORMONE OF *Penaeus monodon* IN *Escherichia coli.* THESIS ADVISORS : APINUNT UDOMKIT, Ph.D., CHANAN ANGSUTHANASOMBAT, Ph.D., SAKOL PANYIM, Ph.D. 128 P. ISBN 974-663-482-8

The crustacean hyperglycemic hormone (CHH), molt-inhibiting hormone (MIH), gonad inhibiting hormone (GIH) are the neuropeptides produced from the X-organ sinus gland complex system in the eyestalks of crustacean, and play important roles in their growth and development.

This study involved cloning and expression of the cDNA encoding a peptide that is related to the CHH/MIH/GIH family (CMG peptide) of black tiger prawn, *Penaeus monodon*. The cDNA encoding CMG neuropeptide was cloned and characterized. Total RNA isolated from a single pair of eyestalks of *P. monodon* was used as a template for reverse transcription-polymerase chain reaction (RT-PCR). Specific primers were designed from the nucleotide sequence of the 5′ and 3′ fragments of CMG cDNA that have been previously cloned, and were used to amplify an open reading frame encoding the CMG peptide and CMG mature peptide. Sequence analysis of a 387 bp open reading frame revealed a 54-amino acid leader peptide and a mature peptide of 74 amino acid residues. The mature peptide shared a high degree of homology to the hormones in the CHH/MIH/GIH family from several crustaceans whose amino acid sequences have been submitted to the Genbank database. This peptide also shared the highest degree of homology to CHH I precursor, Pej-SGP-I of *Penaeus japonicus* (O15980) and containing all the same characteristics of this hormone family. The six cysteine residues were located in the same position. The length of the mature peptides are in the range of 72-74 amino acids and the conserved amino acids were found around the sequence CEDCYN. Expression of CMG cDNA in *Escherichia coli* BL21 (DE3) pLysS upon IPTG induction showed that the two expressed products occurred at the expected size of 14.5 kDa for the full-length CMG peptide and 9 kDa for CMG mature peptide on SDS-PAGE. The N-terminal sequencing results revealed that these14.5 kDa and 9 kDa peptides were expressed from CMG cDNA cloned in this study.