

Wijit Wisoram 2014: Meiotic Study, Mitochondrial Genome Analysis and the *vitellogenin* Gene Cloning in Giant Water Bug, *Lethocerus indicus*.  
Doctor of Philosophy (Genetics), Major Field: Genetics, Department of Genetics. Thesis Advisor: Associate Professor Lertluk Ngernsiri, Ph.D.  
131 pages.

This study comprises three experiments. First, the meiotic chromosome of *Lethocerus indicus* was studied in insect samples collected from Thailand, Myanmar, Laos, and Cambodia. Testicular cells stained with lacto-aceto orcein, Giemsa, DAPI, and silver nitrate were analyzed. The results revealed that the chromosome complement of *L. indicus* was  $2n = 22A + \text{neo-XY} + 2m$ , which differed from that of previous reports. Each individual male contained testicular cells with three univalent patterns. The frequency of cells containing neo-XY chromosome univalent (~5%) was a bit higher than that of cells with autosomal univalents (~3%). Some cells (~0.5%) had both sex chromosome univalents and a pair of autosomal univalents. Second, the first complete mitogenome of the *L. indicus* (Hemiptera: Belostomatidae) was sequenced using long PCR-based approach. This mitogenome was a 17,632 bp circular molecule with a total A+T content of 70.51% and 69.45% for coding regions. The gene content and order are consistent with common features found in mitogenome of hemipteran. The A+T rich region comprises of two types of extensive tandem repeat. First type included five regions, four copies of 174 bp and one copy of 175 bp. The other type was a shorter 114 bp sequence aligned in nine tandem repeats. Third, complete nucleotide and deduced amino acid sequences of giant water bug, *LiVg* cDNA were identified and characterized from fat body female. A 6,048 bp with 5,664 bp of open reading frame followed by a termination codon (TGA) and a polyadenylation signal (AATAAA). The *LiVg* cDNA coded 1,888 amino acids and the calculated molecular weight was 212.40 kDa. The *LiVg* expression in fat body was detected in only adult female.

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Student's signature

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Thesis Advisor's signature