Suchonwat Wongwilikhit 2008: Morphological and PCR-Based Typing Identification of Nucleopolyhedrovirus. Master of Science (Cell and Molecular Biology), Major Field: Cell and Molecular Biology, Department of Earth Science. Thesis Advisor: Associate Professor Mingkwan Mingmuang, Ph.D. 83 pages.

Morphological structure of four nucleopolyhedrovirus (NPV) pathogens of *Helicoverpa armigera* single - nucleocapsid (HaSNPV), *Spodoptera exigua* multiple - nucleocapsid NPV (SeMNPV), *S. litura* multiple - nucleocapsid NPV (SlMNPV) and *Trichoplusia ni* multiple - nucleocapsid NPV (TnMNPV) were compared using transmission electron microscope (TEM). TEM results showed diffferent number of nucleocapsid in each type of NPV. HaSNPV contained only one nucleocapsid/virion, SeMNPV contained 1,3,4,5 nucleocapsids/virion, SlMNPV contained 1,3,7,8,9 nucleocapsids/virion while TnMNPV contained 1,2,4,6,7,8,11 nucleocapsids/virion. Interestingly, TnMNPV was found to be a multiple- nucleocapsid NPV which is different from the previous reports. The mean sizes of polyhedral inclusion bodies of HaSNPV, SeMNPV, SlMNPV and TnMNPV were 1.07, 1.25, 1.90 and 1.78 μm, respectively, as observed by scanning electron microscope (SEM). Identification of NPV using PCR based-typing was done by designing degenerate primers from cathepsin gene. The cathepsin forward and reverse primers were 5′- TT(AC)G AA(G)A GTC AA(G)T ATG CC(T)A T -3′ and 5′- TAG CA(GC)G TCG AC(T)G CCC A(G)TG(C) G -3′. DNA fragments of polymorphism were successfully amplified and showed base pairs of 350 and 300 bp for HaSNPV, 400 bp for SeMNPV, 550 and 250 bp for SlMNPV and only 100 bp for TnMNPV. These designated primers could be used for rapid detection of four NPV which took only 16 hours compared to the total of 15 days required by host larvae process. Moreover *Eco*RI-AA and *Mse*I-CG seemed to be high potential primers for the identification of these viruses using AFLP.

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