Preeda Lertwatcharasarakul 2006: Study on VP1 Variation of Foot-and-Mouth Disease Virus Thailand's Isolates and Evaluation of Synthetic Peptide Vaccine for FMDV Serotype O and the Development of the 3AB Protein Serodiagnostic Assays. Doctor of Philosophy (Genetic Engineering), Major Field: Genetic Engineering, Interdisciplinary Graduate Program. Thesis Advisor: Associated Professor Worawidh Wajjwalku, D.V.M. 131 pages.
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The efficiency of foot-and-mouth disease (FMD) control is a combination of vaccination, movement restriction, slaughter and surveillance. Therefore, understanding in molecular epidemiology, development of diagnostic techniques and improvement of vaccine strategy should increase the efficacy of the disease control. In this present study, the nucleotide sequence of C-terminal part of VP1 gene, the synthetic peptide vaccine based on consensus peptide of position 129-169 of serotype O linked to T cell helper epitope, monoclonal antibody against 3AB protein, and enzyme linked immunosorbent assay (ELISA) using recombinant protein 3AB from *E.coli* were used to study the genetic variation, the efficacy of the protection and the efficiency of the diagnostic of FMDV, respectively.

Phylogenetic studies revealed genetic variation of FMDV in Thailand during 1998 to 2005. The serotype O was divided into 3 topotypes (SEA, Pan Asia strain in ME-SA and Cathay). The SEA topotype can divide into 3 lineages (I-III). The Pan Asia strain was highly similar in the same group. The Cathay topotype was initially found in Thailand in the early 2005. The serotype A had low variation among isolates; however, it consisted of 3 sublineages. The nucleotide sequences of 2 isolates of serotype Asia1 were similar. The synthetic peptide vaccine could induce high neutralizing antibodies against serotype O and antibody against VP1 protein in swine than commercial vaccine (trivalent strains). The high SN titer was investigated after 2 weeks post 2$^{nd}$ immunization. The ELISA technique based on 3AB recombinant protein gave a highly sensitive (98.97-100%) and specific (90.09-100%) to discriminate infected from non-infected animals. Finally, MAb production against 3AB recombinant protein found that the 3 clones reacted to 3A protein and 2 clones reacted to 3B proteins. For immunoperoxidase monolayer assay (IPMA) technique, these MAbs reacted with FMDV-infected cells. According to these results, these MAbs should be a useful tool for the diagnosis of FMDV infection.

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