Sawate Vannarattanarat 2011: Development of Molecular Markers Specific to Economically Important Species and Study for Candidate Genes Producing Pearl of Freshwater Pearl Mussels. Master of Science (Genetics), Major Field: Genetics, Department of Genetics. Thesis Advisor: Assistant Professor Vipa Hongtrakul, Ph.D. 77 pages.

Four samples of each female and male freshwater Amblemid mussels, *Chamberlainia hainesiana* (producing pearl at high level) , *Hyriopsis desowitzi* and *Hyriopsis myersiana* (producing pearl at moderate level) together with four samples of *Uniandra* sp. (not producing pearl) were collected from the Chao-phra-ya river, Mun river and Mae Klong river. DNA of all 28 samples were extracted from mantle tissues by the method modified from Winnepenninc *et al*. (1993) and Stothard *et al.* (1995). DNA fingerprints were generated using Amplified Fragment Length Polymorphism (AFLP) technique. Nine out of 24 primer pairs could be used to identify the species of Amblemid mussels. Fifteen clear bands from 28 specie specific DNA bands were selected for cloning and sequencing. Seventeen specie specific primer pairs were developed and then were tested with 28 samples of freshwater mussels. Three markers were found specific to *Chamberlainia hainesiana*, whereas one marker was specific to each species of *Hyriopsis desowitzi, Hyriopsis myersiana and Uniandra* sp. Comparison for different gene expression between glochidia and adult freshwater pearl mussel, *Chamberlainia hainesiana* was performed using cDNA-AFLP and differential display techniques. DNA fingerprints from cDNA-AFLP with 64 combinations of primer pairs produced 16 different DNA bands between glochidia and adult samples, whereas 14 different DNA bands were obtained from differential display with 136 pairs of oligo dT/random primers. Seven bands from differential display and six bands from cDNA-AFLP were cloned and sequenced and compare to database. All sequences obtained were found not match any sequences in Genbank. DNA marker specific to *Chamberlainia hainesiana,* the mussel that producing pearl at high level, was developed more from the DNA sequences obtained and tested for specificity compare to other mussels

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