

Anyalak Wachirachaikarn 2008: Application of Biotechnology for Genetic Improvement of African Catfish (*Clarias gariepinus*). Master of Science (Genetic Engineering), Major Field: Genetic Engineering, Interdisciplinary Graduate Program. Thesis Advisor: Professor Uthairat Na-Nakorn, Ph.D. 80 pages.

African catfish, *Clarias gariepinus* was introduced to Thailand for aquaculture in 1987. The stocks have been maintained without proper genetic management. Currently farmers observed remarkable deterioration of economic important traits which was likely associated with genetic deterioration. One of the possible solutions is cross breeding between genetic distinct strains. The present study employed six microsatellite loci to elucidate genetic diversity of four African catfish strains in Thailand (Suphanburi, Angthong, Nakornpathom and Nakorn sawan). The results revealed two distinct groups of strains (Nakornpathom-Nakornsawan and Suphanburi-Angthong group) as shown by F_{ST} of 0.1444. Genetic variation within populations was moderate ($A=4.67-12.17$; $A_e=3.15-5.80$; $A_r=4.67-9.65$; $H_o=0.50-0.69$; $H_e=0.67-0.80$). Then two genetically distinct populations were chosen (Angthong and Nakornpathom) for cross breeding. The comparison between the parental strains and reciprocal hybrids showed no difference of body weight and length through out the experiment. The specific immune response to *Aeromonas hydrophila* (Antibody titre) during the peak of response was not different among groups. Mean phagocytosis activity of the hybrid was significantly higher ($P<0.01$) than mean of parent (heterosis= 70.97%) while no difference was observed for phagocytic index. Moreover the present study developed a novel primer for the study on variation of MHC class I gene of African catfish for the first time. The study revealed that the variation of MHC class I gene of the hybrids was slightly higher than one of the parent (Nakornpathom) but not different with the other (Angthong).

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