

Phongchate Pichitkul 2014: Efficiency of Cortisol and Heat Shock Protein 70 as Stress Indicators in Nile Tilapia (*Oreochromis niloticus* Linn.). Doctor of Philosophy (Aquaculture), Major Field: Aquaculture, Department of Aquaculture. Thesis Advisor: Associate Professor Yont Musig, Ph.D. 105 pages.

Efficiency of cortisol concentration in blood plasma and expression of Heat Shock Protein 70 gene (HSP70) from gill tissue as stress indicators in Nile Tilapia using reverse transcription (RT)-PCR technique. In this study, stressors were temperature at 22, 27 and 32 °C and salinity at 0, 5 and 15 ppt. Results revealed that concentration of cortisol in blood plasma was responding to temperature stressors as irregularly pattern as comparing to ambient temperature. In contrast to relative expression of (HSP70) which indicated that fish rear at temperature of 22 and 32 °C showed significantly higher level of HSP70 than those keeping at control temperature (27 °C) in 3 and 6 hours after being stress induced ( $P<0.05$ ). However, during hours 12-168, significant different of HSP70 levels were observed only in fish treated with 32 °C water. Similar tendency was also found in experimental which salinity was used to test concentration of cortisol was irregularly responded to level of salinity while the level of HSP70 was significantly higher in group of Nile tilapia that stressed with 5 and 15 ppt after 6 and 12 hours exposure respectively.

Study on relationship between temperature and the Streptococcosis disease in Nile tilapia, revealed that in group which was kept at 32 °C with *Streptococcus agalactiae*, fish were obviously infected by bacteria and showed constantly dead. Significantly higher of mortality approximately 36.67% was observed in this group while low mortality rates at  $8.33\pm1.53$  % and  $8.33\pm0.58$ % were showed in fish which treated in 22 and 27 °C water respectively.

This study showed that the use of expression of heat shock protein HSP70 gene by RT-PCR technique may be an effective stress indicator for Nile tilapia in both salinity and temperature. Since the HSP70 was an important molecule for fish to correspond with various stressors in order to adjust new balance and constantly responding pattern in fish body. Results from this study might be a precious information which can be developed to find the precisely, conveniently and effectively techniques or tools for detecting of expression of HSP70 gene in the future.

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