

Wisanutorn Ratanatrivong 2012: Breeding Enhancement of Red-tail Catfish (*Hemibagrus wyckioides*, Fang and Chau, 1949) by Using Cyclodextrin Complex Administration and Spermatozoa Cryopreservation. Doctor of Philosophy (Aquaculture), Major Field: Aquaculture, Department of Aquaculture. Thesis Advisor: Associate Professor Wara Taparhudee, Ph.D. 94 pages.

The aim of this present study was to develop Red-tail Catfish (*Hemibagrus wyckioides*) breeding techniques by using LHRH (des-Gly<sup>10</sup>-, [D-Ala<sup>6</sup>]-LH-RH) combined with cyclodextrins (Heptakis-(2,6-di-O-ethyl)- $\beta$ -cyclodextrins) complex (LHRH-CDs) as hormone vehicle and preservation of spermatozoa by cryopreservation method. The study comprised of four experiments. The first experiment was to study the effectiveness of LHRH-CDs on gonadal development of red-tail catfish. Randomized complete block design (RCBD) was applied having three treatments i.e. 30  $\mu$ g/kg LHRH-CDs, 30  $\mu$ g/kg LHRH and arachis oil for control with 3 different periods (low, medium and high maturation periods) as blocks. Results found that GSI, estradiol and gonadal development were not significantly different between hormones ( $p>0.05$ ) but highly significantly different between times ( $p<0.01$ ). The second experiment was to enhance red-tail catfish breeding by using LHRH-CDs hormone injection. It revealed that both LHRH-CDs and LHRH could induce spawning of female fishes and no significantly differences ( $P>0.05$ ) in spawning times and eggs weight but LHRH-CDs hormone gave higher fertilization and hatching rates than LHRH ( $P<0.05$ ). The third experiment was to study embryonic and larval development of the fish. Results showed that pronase enzyme combined with embryonic medium could reduce adhesive compound from chorions. The newly hatched larvae were about 5.0 millimeter in length, fully developed in 180 days and became first maturity in 2 years. The fourth experiment was to establish a protocol for red-tail catfish spermatozoa cryopreservation. The red-tail catfish milt was diluted in different extenders and stored in a refrigerator (0-4 degrees Celsius) for 6 days before sperm motility was examined. The result showed that 0.9% NaCl and Ginsberg fish's Ringer (GFR) solution were suitable extenders in terms of sperm motility. The study of protocol for the cryopreservation of red-tail catfish spermatozoa showed that methanol had the least toxic effect to the sperm whereas DMSO had the most toxic effect. The use of 6% fructose and 5% glucose as extenders, 10% (v/v) methanol as cryoprotectant, and cooling rates of 2 and 5 degrees Celsius/min to freeze the sperm above liquid nitrogen (-196 degrees Celsius) for 20 minutes and keep in dewar showed higher thawed sperm motility, compared with using GFR as an extender, 10% methanol and 10 degrees Celsius/min cooling rate. The percentage of eyed stage eggs between thawed and fresh sperms was not different ( $P>0.05$ ).

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Student's signature

Thesis Advisor's signature