

3736662 SCEB/M: MAJOR; ENVIRONMENTAL BIOLOGY;  
M.Sc. (ENVIRONMENTAL BIOLOGY)

KEY WORDS : OOCYTE MATURATION/ SPAWNING/ GIANT  
FRESHWATER PRAWN/ SEROTONIN/ OCTOPAMINE/  
HYDROGEN PEROXIDE

SITHEE TANBOONTECK: CHEMICAL INDUCTION OF OOCYTE  
MATURATION AND SPAWNING IN GIANT FRESHWATER PRAWN  
(*MACROBRACHIUM ROSENBERGII* DE MAN). THESIS ADVISORS: WANDEE  
POOLSANGUAN, Ph.D., BOONSERM POOLSANGUAN, Ph.D., BOONSIRM  
WITHYACHUMNARNKUL, M.D., Ph.D. 62 P. ISBN 974-662-669-8

The possibility that biogenic amines, 5-hydroxytryptamine (5-HT, serotonin) and octopamine (OA) and an oxygen-donor substance, hydrogen peroxide ( $H_2O_2$ ) stimulated ovarian development and spawning in the giant freshwater prawn, *Macrobrachium rosenbergii* de Man, were investigated. The newly spawned females were given either a single intramuscular injection on day 1, or triple injections on days 1, 3, and 5 of one of the following chemicals: 20 or 40  $\mu g$  5-HT/g body weight (bd.wt.), 20 or 40  $\mu g$  octopamine/g bd.wt., 5mM or 10 mM  $H_2O_2$ . The ovarian index (OI) and the histology of the ovary of the prawns sacrificed on day 8 revealed that the groups given single injection, but not the triple injections of either, 20  $\mu g$  5-HT/g bd.wt., or 5mM  $H_2O_2$  showed significant increases ( $p < 0.01$ ) in the OI and the numbers of oocytes in secondary vitellogenic stage over the control. High concentration of 5-HT (40  $\mu g/g$  bd.wt.) or  $H_2O_2$  (10mM) and octopamine (20 or 40  $\mu g/g$  bd.wt.) did not affect OI and oocyte maturation. Injection of 0.1 ml of 5-HT, octopamine or  $H_2O_2$  of any concentration to the female in the morning following premating molt during 09.00-10.00 hr. could shorten the hour intervals between premating molt and spawning. The non-injected and saline-injected control did not spawn until 18.00 hr., while 40% of the females that received 5-HT or octopamine and 80% of the  $H_2O_2$  groups spawned during 12.00-18.00 hr. The present studies are consistent with other reports that 5-HT and  $H_2O_2$  can stimulate ovarian development and induce spawning.