

Thesis Title Effects of 5-Methoxyindole Acetic Acid, Para-Chlorophenyl Alanine and Cyproheptadine on Growth of Juvenile Giant Freshwater Prawns, Macrobrachium rosenbergii de Man.

Name Pini'j Thaweethamsewee

Degree Master of Science (Anatomy)

Thesis Supervisory Committee

 Boonsirm Withyachumnarnkul, M.D., Ph.D.

 Boonserm Poolsanguan, Ph.D.

 Chaitip Wanichanon, Ph.D.

Date of Graduation 24 February B.E. 2536 (1993)

ABSTRACT

Crustacean growth is characterized by successive molting throughout life and activated by a molting hormone, ecdysone, which is produced in Y-organ. Ecdysone synthesis is regulated by a periodic rise of molt-inhibiting hormone (MIH) from optic lobes of the eyestalks. It has been shown that 5-hydroxytryptamine (5-HT) or serotonin could stimulate the release of MIH. This evidence led to a study to determine whether 5-HT and other indoleamine treatments might affect crustacean growth rate. Our previous study indicated that 5-methoxyindole acetic acid (5-MIAA) is the most effective agent among several indoleamines that could stimulate growth of juvenile Macrobrachium rosenbergii de Man. Because of its similar structure to 5-HT, it was hypothesized that 5-MIAA might act by competing against 5-

HT on MIH cells. Therefore this study was aimed at determining if other agents known to suppress 5-HT could also stimulate growth of the prawns. The two agents tested were para-chlorophenylalanine (PCPA) and cyproheptadine (CHD); the former blocks 5-HT synthesis and the latter antagonized 5-HT action. Juvenile M. rosenbergii were given 5-MIAA (10mg/100g feed and 100mg/100g feed), PCPA (5mg/100g feed and 50mg/100g feed), and CHD (5mg/100g feed and 50mg/100g feed) for 20 days. Carapace length (CL), orbital length (OL) and survival rate were monitored every two weeks. The prawns treated with 5MIAA showed a significant increase in body length in dose-related manner when compared to prawns given regular feed. The prawns treated with PCPA and CHD had growth rate comparable to that of the control. At day 42 (22 days after the last treatment), prawns treated with CHD (50mg/100g feed) had shorter OL than that of the control. The survival rate of the prawns, except for those treated with the high dose of CHD, was higher in the treated group when compared to that of the control. This study confirms the growth-stimulating effect of 5-MIAA which was not shared by agents known to suppress 5-HT activity. It also suggests that 5-MIAA acts via mechanism other than suppressing 5HT- stimulating MIH activity.