Abstract (บทคัดย่อ)

In this study, we have identified the structure of olfactory nerve system of giant freshwater prawn, *M. rosenbergii*, and its role in perceiving mating pheromones. The antennules and antennae were dissected and found to be supplied with separately nerve fibers originated from different sources of brain suggesting different functions of these organs. Four types of sensilla setae including long simple, short simple, tuft medium simple and aesthetasc have been identified on the antennules and antenna using scanning electron microscope imaging. The aesthetasc sensilla setae which were previously suspected to be odor receptor was found on the short lateral antennules implicating that this organ may be involved in olfactory perception system. The short lateral antenular nerve from aesthetasc was connected to olfactory receptor neuron conjugated with nerve bundle directly projected to olfactory neurophil of the brain. Immunofluorescense staining with anti-GABA antibody indicated that the olfactory neurons were GABAnergic types and ensured that short lateral antennular neurons connected to the olfactory neuropil in the brain. The functional studies of antennular and antenna neuronal pathway on mating response after female reproductive pheromone attraction was performed by ablation test. Significantly lost of mating behavior response and to female prawn attraction was observed after lateral antennules ablated implicating that this organ was critical for determining reproductive pheromone. Decrease in relative sexual scores was observed in antenna ablated prawn indicated that this organ might be cooperated with antennules in determining female reproductive pheromone.