Janjarus Watanachote 2008: Antibacterial Activity of Lectins from Hemolymph of Banana Prawn (*Penaeus merguiensis* De Man) Doctor of Philosophy (Marine Science), Major Field: Marine Science, Department of Marine Science. Thesis Advisor: Assistant Professor Suriyan Tunkijjanukij, Dr. Scient. 92 pages.

Lectins play relevant role in humoral defense responses of invertebrates. The hemolymph of banana prawn, *Penaeus merguiensis* contains a lectin (PML). In an attempt to identify the lectin subunits and responsive proteins in banana prawn after infected with *Vibrio harveyi*, lectin was purified by affinity chromatography on mucin-CNBr-activated Sepharose 4B and by gel filtration chromatography on Sephacryl S-200. The native molecular mass of PML was estimated to be 112 kDa and consisted of 30.09 (PML1) and 28.01 kDa (PML2) subunits by SDS-PAGE. The internal amino acid sequence of purified lectin by using gel filtration was analyzed by 2-D gel electrophoresis and LC-MS/MS and then compared with nrFasta database which it was identified to be DAELLLLR, DAEALEVGR and DTDVTTVRSR. The antibacterial activity of gel filtration purified lectin on *Vibrio* spp. was higher than that of affinity purified lectin. Protein profile of affinity purified lectin after the prawns were infected with *V. harveyi* by SDS-PAGE and 2-D gel electrophoresis demonstrated that the lectin expression responded to the bacterial infection.

Hemocytes from *P. merguiensis* are classified into three main populations, hyaline small-granular and large-granular under light microscope like other crustaceans. Hyaline cells refers to hemocytes that their cells contain no or few granules, whereas granulocytes (small-granular and large-granular) contain abundant granules. Granulocytes and hyaline cells compose 91 and 5 % of the circulating hemocytes, respectively. Proteins in serum hemolymph and hemocyte lysate supernatant (HLS) possess antibacterial activity which highly inhibitory effects on gram-negative bacteria. Antibacterial proteins mainly located in serum and hemolymph. The serum hemolymph and HLS of banana prawn agglutinate erythrocytes of different vertebrate species. These results show that one of the antibacterial proteins in the serum hemolymph and HLS from *P. merguiensis* is a lectin and involves in shrimp immune responses.

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