Thesis Title Egg proteins and proteases of giant freshwater prawn Macrobrachium rosenbergii (de Man)

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ABSTRACT

The soluble protein content of a fertilized egg was found to decrease during embryonic development, indicating the possible use of the soluble egg proteins for the embryonic formation. The major egg yolk protein was the most abundant soluble protein and it was found to be degraded during the embryogenesis. It was isolated by Sepharose 6B column chromatography and its native molecular weight was 190,000. It consisted of 2 major subunits (97,000 and 87,000) and a minor component (104,000) as determined by SDS-PAGE. The amino acid composition of the isolated major egg yolk protein was determined and found to be similar to those of some other crustaceans, suggesting some evolutionary relationship among them. The proteolytic degradation of the isolated major egg yolk protein was demonstrated by incubating it with chymotrypsin, trypsin, pronase and papain. The isolated major egg yolk protein was found to contain a bound protease by gelatin -SDS-PAGE and the proteolytic activity could be

separated out by chromatofocusing. During embryonic development, egg protease activities could be shown to increase in number by gelatin-SDS-PAGE and in total activity by spectrophotometric assay. The activity peaked at day 14 after fertilization and declined on day 16. These changes corresponded with the overall decrease in the soluble protein content and the degradation of the major egg yolk protein for the formation of embryo.