Suparada Khanaruksombat 2014: Proteomics Alteration of Banana Shrimp (*Fenneropenaeus merguiensis*) Allergen after Various Food Processing. Master of Science (Bioproducts Science), Major Field: Bioproducts Science, Division of Science. Thesis Advisor: Mrs. Pharima Phiriyangkul, Ph.D. 201 pages.

Shellfish refers to crustacean and mollusk such as shrimp, crab and squid. It is a major cause of adverse food reaction type I. Banana shrimp (*Fenneropenaeus merguiensis*) is a native species considered to be economically important in Thailand. Proteomic methods were used to investigate the allergenic proteins from banana shrimp by denaturing, gel electrophoresis (1/2D-PAGE) and immunoblotting with sera from patients who allergic to shrimp. Liquid chromatography-two-dimensional tandem mass spectrometry (LC-MS/MS) used for identifying IgE-binding protein and then analyzed by Mascot MS/MS software. The electrophoresis pattern of raw muscle and each treated muscle were clearly different. IgE-binding proteins in *Fenneropenaeus merguiensis* were identified and compare how the food processing treatments may alter the allergenicity of this shrimp. Vitellogenin (VG) was suggested as a major and novel allergen in banana shrimp ovarian. Ovarian peritrophin 1 precursor (SOPs), β-actin and 14-3-3 zeta were suggested as minor and novel allergens in the ovary at different stages of ovarian development. Myosin heavy chain (MHC), glyceraldehyde 3-phosphate dehydrogenase (GAPDH), hemocyanin (HC) and enolase were demonstrated as novel allergens in raw muscle of banana shrimp. Food processing treatment can alter the allergenicity of shrimp allergens, including tropomyosin (TM), arginine kinase (AK), sarcoplasmic calcium-binding protein (SCP) and GAPDH. These novel allergens should improve diagnostic allergic methods for shrimp allergic patient, because presently the only measurement of IgE to tropomyosin in shrimp allergy diagnosis can be missed. The allergenicity alteration from food processing may be the new ways to produce hypoallergenic food in the future.

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