

Differential IgE reactivity of shellfish allergic patients to fresh and heat treated black tiger prawn (*Penaeus monodon*) and king prawn (*Melicertus laticulatus*)

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Background: Increased production and consumption of tropical seafood has resulted in more frequent reports of adverse reactions highlighting the need for more specific diagnosis and treatment of crustacean allergy. While cross-reactivity between related crustaceans is often demonstrated there is a poor correlation of IgE reactivity among and between closely related fresh and processed species. This study aims at identifying and characterizing the differential patient reactivity to two fresh and thermally processed prawn species for improved diagnosis and management of patients with crustacean allergy.

Method: Protein extracts were prepared from raw (R) and heat treated (HT) extracts from Black tiger prawns and King prawns. Serum samples of sixteen patients with clinical reactivity to ingested prawns were tested for IgE antibody binding to both prawn extracts and purified tropomyosin by immunoblotting. Allergenicity of the various prawn extracts were confirmed by patient basophil activation assay.

Result: Thermal processing of prawn increased the overall IgE binding reactivity to different proteins in the Black tiger prawn. In contrast the IgE reactivity decreased after heating for the King prawn. The higher molecular weight IgE reactive proteins in the raw extract seem to be more heat sensitive whereas the lower molecular weight proteins seem to be heat resistant with an increase in IgE reactivity. While tropomyosin was the major allergen in both prawn species, thermal processing generated multiple IgE reactive isoforms. Additional heat stable allergens were identified as Arginine kinase, Myosin light chain and Sarcoplasmic calcium binding protein.

Conclusion: Heat treatment impacts on the allergenicity of the different isoforms of tropomyosin, arginine kinase and myosin light chain. Thermal processing has different effects on allergen reactivity in different prawn species and warrants further investigation on diagnosis and management of this life threatening allergy.