



POTENTIALLY TOXIC CHEMICALS IN CONVENTIONAL THAI SEAFOODS: LEVEL OF
POLYCYCLIC AROMATIC HYDROCARBONS IN RAW SEAFOODS
AND THE EFFECT OF PROCESSING

BY

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จาก

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Thesis title: Potentially toxic chemicals in conventional Thai
seafoods: level of polycyclic aromatic hydrocarbons
in raw seafood and the effect of processing

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ABSTRACT

Polycyclic aromatic hydrocarbons (PAHs) are potentially toxic chemicals which occur ubiquitously in human environment. Their presence in raw and processed seafood is important for health and marine environmental evaluation.

In this study, PAH levels of raw seafood were determined in five different types of marine animals, namely banana shrimp, threadfin bream, Indo-Pacific mackerel, green mussel and squid. Each sample consisted of ten replicates collected from retail markets in Bangkok. In order to study the processing effect on PAH contamination, the concentrations of these compounds in differentially processed Indo-Pacific mackerel were determined. Before being cooked by three cooking methods (charcoal broiling, wood broiling and damp coir smoking) Indo-Pacific mackerel were divided into three groups accordingly to different materials i.e. foil wrapping, banana-leaf wrapping and without wrapping. The edible portion of each sample was analysed for PAH using high

performance liquid chromatographic technique.

The results of the present study demonstrated that green mussel and squid were more contaminated with PAHs than Indo-Pacific mackerel, threadfin bream and banana shrimp. The average of total identified PAH equivalents (in ppb) ranged as follows: squid (89), green mussel (49), threadfin bream (34), Indo-Pacific mackerel (33) and banana shrimp (21). Phenanthrene equivalent was the most common PAH equivalent found in the collected seafood (60-80%). Such PAH levels found in these marine animals suggested that their habitats were the area contaminated with PAHs. However, the levels of PAHs found in these animals were not as high as those found in samples from oil polluted areas. Wood broiling and damp coir smoking caused PAH contamination of the processed samples. The average levels of total PAH equivalents (in ppb) of charcoal broiled mackerel, wood broiled mackerel and smoked mackerel were 33, 413, and 745, respectively. Wrapping with either foil or banana-leaf similarly protected the processed samples from PAH contamination during wood broiling and damp coir smoking. The average levels of total PAH equivalents (in ppb) of wood broiled mackerel wrapped with foil and banana-leaf were 55 and 17 while those of smoked mackerel wrapped with either foil or banana-leaf were 3 or 11, respectively. This suggested that frequent cooking with wood broiling and damp coir smoking should be avoided and should the food protected by wrapping with either foil or banana-leaf was advisable.