EXPOSURE ASSESSMENT FOR MERCURY AND OTHER METALS IN COMMONLY CONSUMED FISH OF WEST PENINSULAR MALAYSIA

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Abstract

Fish is a cheap supply of protein and is considered among the main source of protein for majority of populations in Asia. Eating fish has always been associated with health benefits due to high content of omega-3 fatty acids (EPA and DHA). As consumption of fish is the main route of exposure to pollutants in humans, it is the main interest of this study to determine the concentrations of metals (with special interest in mercury) in commonly consumed fish in West Peninsular Malaysia. Due to the toxicity of mercury which depends on its bioavailability and chemical form, it is insufficient to measure only total concentrations of mercury. Hence, mercury speciation was also measured in this study. As mercury has a high affinity for sulphur, the most likely binding ligand of mercury is free sulfhydryl groups in protein cysteine residues. There is limited information, however, on the binding sites of mercury in fish proteins. A more detailed examination on the biochemical associations of mercury in fish proteins was assessed using size exclusion chromatography and SDS-PAGE to determine the molecular weights of protein bound mercury. Reversed phase chromatography was then used to determine the chemical associations of mercury. The implications for the metabolism and toxicity of mercury in fish were discussed.

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