

Quantification of Tocopherols in fresh fish and fishery products in Sri Lanka by high performance liquid chromatography

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Vitamin E is an important micronutrient that provides a natural antioxidant activity and is important in gene expression and neurological functions. Four tocopherols (α , β , γ , δ) and four tocotrienols (α , β , γ , δ) have different biological activities and have different distribution in food. Marine Derived Tocopherol (MDT) is a newly found member of the tocopherol family, which has biological activity similar to α -tocopherol. MDT is mainly reported from marine fish inhabiting the Pacific Ocean and limited research have been carried out with fish caught from the Indian Ocean and from the reservoirs in tropical countries.

A simple method for the quantification of tocopherols in fish and fishery products was developed in this study. Separation of tocopherols was achieved using a Sunrise C28 (5 μ m) column with methanol as mobile phase (flow rate 1mL/min) in High Performance Liquid Chromatography (HPLC) and monitored at 26°C with a UV detector at 298nm. The time duration for the discharge of tocopherols was less than 20 minutes. The linearity of the standard curves for all the tocopherols (α , β , γ , δ and MDT) were expressed in terms of the correlation coefficient (r) from plots of the integrated peak area vs concentration of the standard (mol/mL). Correlation coefficients were >99% confirming the validity of the method for the determination of all the tocopherols. Four marine fish species, three inland fish species and three fishery products were analyzed for tocopherol contents by using this method. Oil extracted from each sample by Bligh and Dyer method was dissolved in chloroform: methanol (1:1) before injecting to HPLC.

α -tocopherol, δ -tocopherol and MDT in fish oil were clearly separated by this method and it was observed that the method is sensitive and selective enough to be tested on a wide variety of fish (inland and marine species) and fishery products. α -tocopherol was the main vitamin E homologue found in all samples while δ and β -tocopherols were not detected. The highest tocopherol level was found in common glass fish (katilla-S) (32.94 mg/100g) followed by scribbled goby (Weligovva-S) (16.78 mg/100g) and canned tuna chunk (5.79 mg/100g) respectively. γ -tocopherol and MDT was found in less amounts in Tuna chunk (0.895 mg/100g), fish fingers 0.75 mg/100g, canned jack mackerel (0.43 mg/100g) and blacktip trevally (sura paraw-S) (0.42 mg/100g). Results indicated that the new method is an efficient simple method for the rapid quantification of tocopherols in fish and processed fish products.

Keywords: tocopherol, HPLC, fish, quantification, marine derived tocopherol

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