Lipid profile of marine and fresh water fish consumed by Sri Lankans

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Percentage moisture and lipid in the edible flesh and the lipid profile of the oil of seven commercially important commonly consumed marine and fresh water fish namely *Scomberomorus commerson* (Sinh. Thora), *Neothunnuus macropteurus* (Sinh. Kelawella), *Stoleophorus indicus* (Sinh. Hendella), *Scomberomorus guttatus* (Sinh. Anjeelawa), *Sphyraena jello* (Sinh. Jeelawa), *Etroplus suratensis* (Sinh. Irikoraliya) and *Oreochromis mossambicus* (Sinh. Tilapia) were determined. Comparison of the composition of the oil of different varieties of fish as well as that between marine and fresh water fish is reported in the present study. For each species 48 fish samples purchased from fish markets in

Pettah, Negambo, Gampaha and Moratuwa during periods of March - May (2005), June - August (2005), September - November (2005), December (2005) - February (2006) were analysed. Moisture content of the edible flesh was determined using Dean and Starke apparatus with toluene as the solvent. The lipid from the fish was extracted using $CHCl_3$: CH_3OH (1:1) and methylated using boron trifluoride - methanol. 39 fatty acids were identified in the methylated fish oil by glc analysis using methyl esters of fatty acids and methylated cod liver oil whose peaks have been identified by standards in a previous study.

Moisture and lipid content per 100 g of edible flesh ranged from 64.9 – 72.4 g and 4.49 – 0.57 g respectively. Except for *S. indicus* all other marine fish species analysed contained a high content of lipid compared to fresh water fish. In all fish samples analysed total monounsaturated fatty acids (MUFA)(13.57 – 26.01%) was low compared to saturated (SFA)(37.40 – 47.73%) and polyunsaturated (PUFA)(29.02 - 43.56%). The content of palmitic acid (C16:0), oleic acid {C18:1(n-9)}, docosohexaenoic acid (DHA){C22:6(n-3)}, eicosapentaenoic acid (EPA){C20:5(n-3)}, arachidonic acid {C20:4(n-6)}, linoleic acid C18:2(n-6), γ -linolenic acid C18:3(n-6), α – linolenic acid C18:3(n-3) and the n-3/n-6 were 24.32 -28.69%, 3.78 - 12.34%, 5.43 - 21.08 %, 1.14 – 8.60%, 2.28 – 4.41%, 0.40 – 5.31%, 0.22 -2.78%, 0.19 – 0.50% and 1.23 – 4.81% respectively. Concentrations of EPA, DHA, n-3/n-6 and the percentages of EPA and DHA in PUFA in fresh water fish was very much lower than those in marine fish showing that they contain more n-6 acids. The results were subjected to two way ANOVA and significant difference in the values was observed for site, period of collection and the interaction of the two.

The results of the present study reveals that of the fish species analysed the oils of *N. macropteurus* and *S. indicus* are the two best sources of oil that could contribute to the beneficial health effects for they had the highest % of PUFA, lowest % of SFA and highest % sum of DHA and EPA.

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