Assessment of the Omega-3 Fatty Acids Composition and Heavy Metals Content in Fish Oils in Sri Lankan Marine Fishes

J.A.K.S. Jayakody[1*], S.A. Senevirathne[1], L. Senarathna[2] and E.M.R.K.B. Edirisinghe[1]

[1]*Department of Chemical Sciences, Faculty of Applied Sciences, Rajarata University of Sri Lanka, Mihintale*
[2]*Department of Health Promotion, Faculty of Applied Sciences, Rajarata University of Sri Lanka, Mihintale*
** Corresponding Author E-mail: ksjayakody@gmail.com, TP: +94712944951*

The consumption of fish oil provides numerous speculated health benefits due to the presence of long chain omega-3 polyunsaturated fatty acids (PUFA). These health benefits may be challenged by the presence of heavy metals in fish oil. The objective of the present study was to compare the health benefits of omega-3 fatty acids and assess the risk of some heavy metals in fish oil extracted from marine fish. Sixteen species of fish were collected (n=3) from the Trincomalee fish market and fish oils were extracted using standard Bligh and Dyer method. Fatty acid composition of extracted fish oils were quantitatively determined by Gas Chromatography - Mass Spectrometry (GC-MS). The Arsenic (As), Cadmium (Cd) and Lead (Pb) contents were determined by using Inductively Coupled Plasma - Mass Spectrophotometer (ICP-MS). The amount of fat present in fish varieties was varied over a wide range of 0.619% (*Acanthocybium commersoni*) to 8.626% (*Carangoides fulvoguttatus*). Among these species, the omega-3 content ranged from 7.814% - 31.818% of total fatty acids and the highest of omega-3 content was showed in *Hemiramphus* sp. (9.20 mg/100 g) and lowest level was reported in *Auxis thazard* (0.036 mg/100 g). In all species studied, Eicosapentaenoic acid (EPA) and Docosahexaenoic acid (DHA) are the major omega-3 fatty acids and amounts of EPA and DHA have been exceeded 70% of the total omega-3 PUFAs. The content of As in extracted fish oils were ranged from 2.4353-18.3975 mg/kg in *Nemapteryx caelata* and *Elagatis bipinnulata* while Cd content were varied from 0.0262 - 1.2305 mg/kg in *Scomberomorus commersoni* and *Nemapteryx caelata* respectively. *Platax* sp. reported the lowest Pb content (0.467 mg/kg) while *Acanthocybium commersoni* reported the highest (2.282 mg/kg). Some of the fish oil samples had exceeded recommended human daily intake values of heavy metals, thus benefite of omega-3 fatty acids is challenged.

***Keywords*:** Fish oil; Omega-3 fatty acids; Heavy metals; GC-MS; ICP-MS

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