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Fatty acid profiles of leafy vegetables consumed by Sri Lankans

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Epidemiological studies have shown that consumption of vegetables rich in antioxidants and polyunsaturated fatty acids could reduce risk of chronic diseases such as cardiovascular disorders, cancer, alzheimer and have beneficial effects on rheumatoid arthritis and inflammation. Although extensive studies have been carried out on the lipid profile of fish oil only few studies are reported on the oil from leafy vegetables and this study will be beneficial to the nutritionist in Sri Lanka and vegetarians.

Fatty acid profiles of six varieties *Ipomoea aquatica* (Sinh. Kankun), *Centella asiatica* (Sinh. Gotukola), *Alternanthera sessilis* (Sinh. Mukunuwenna), *Cardiospermum halicacabum* (Sinh. Penela), *Passiflora edulis* (Sinh. Passion fruit) and *Lasia spinosa* (Sinh. Kohila) obtained from the markets in Kiribathgoda were determined. The fresh leaves were immersed in isopropanol containing 0.01% BHT and extracted with $CHCl_3/H_2O$ followed by $CHCl_3/CH_3OH$. The oil extracted was methylated using boron trifluoride methanol. Fatty acids composition of the oils and moisture contents were determined by gas chromatography and Dean and Stark method respectively. Determinations were carried out in quadruplets for each variety of leafy vegetables and for each analysis pooled out leaves from six bundles were taken. The results were statistically analysed by one way ANOVA.

A. sessilis (0.16 ± 0.08 g/100 g) and *L. spinosa* (0.14 ± 0.10 g/100 g) contained the highest amount of oil. Thirty methyl esters were identified from the 56 fatty acids detected using standards and previously analysed methylated cod liver oil. Poly unsaturated fatty acid (PUFA) content was high in all leafy vegetables analysed. Except in *I. aquatica* the content of monounsaturated fatty acid (MUFA) was lower than the saturated fatty acids (SFA). Palmitic acid (C16:0) {6.7% (*I. aquatica*) – 30.5%(*L. spinosa*)} was the major SFA. while oleic acid C18:1(n-9) {0.3% (*I. aquatica*) - 4.6%(*L. spinosa*)} was the major MUFA. Major PUFA found in the leaves were linoleic acid (C18:2 (n-6) {32.6% (*L. spinosa)* – 5.6% (*I. aquatica*)}, the precursor for arachidonic acid (AA) and α - linolenic acid [C18:3(n-3){53.3% (*C. halicacubum*) – 17.1% (*I. aquatica*) which is the precursors for docosahexaenoic acid (DHA) and eicosapentaenoic acid (EPA). DHA and EPA, the health beneficial PUFA and AA, the precursor for prostaglandin were not detected in the leaves analysed.

The results of the present study revealed that the oil of the non conventional leafy vegetable *C. helicacubum* is the best sources of oil that could contribute to the beneficial health effects for it contained the highest % of PUFA, lowest SFA and highest amount of α - linolenic acid, the precursor for EPA and DHA.

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