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Potential of minor fruits as a good alternative for mainstream fruits in Sri Lanka in terms of antioxidant properties and vitamin C content

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Abstract

Sri Lanka is rich in wide diversity of fruits, categorized into two main categories based on their utilization, as mainstream and minor fruits. In Sri Lanka most of the edible fruits (95%) are underutilized (minor) while fruit consumption among people is far below the recommended levels. Therefore, this study was conducted with the objective of determining the potential of minor fruits to be good alternatives for mainstream fruits consumed in Sri Lanka, in terms of antioxidant properties and contents of vitamin C. Sixty six species of locally grown fruits including 15 species of mainstream and 51 species of minor fruits were studied for contents of L-ascorbic acid (AA), total vitamin C (TVC), total phenolic (TPC), total flavonoid (TFC) and *in-vitro* antioxidant capacities using DPPH and FRAP assays. Principal component analysis (PCA) was done to find the best fruit among those, in terms of measured parameters. According to the PCA, *Phyllanthus emblica* (Nelli) found to be the best fruit in Sri Lanka which is a minor fruit, with the highest contents of TVC (529.6 ± 57.5 mg/100 g of fresh weight (FW)), TPC (2701.7 ± 2.9 mg Gallic acid equivalent/100 g FW) and FRAP value (2070.0 ± 61.4 μ mol FeSO₄/g FW). The highest AA and TFC contents were found in *Anacardium occidentale* (Cashew apple) (185.0 ± 10.0 mg/100 g FW) and *Melastoma malabathricum* (Maha bovitiya) (228.0 ± 27.1 mg Quercetin equivalent/100 g FW), respectively. The highest DPPH radical scavenging activity (lowest IC₅₀) was observed in *Elaeocarpus serratus* (Veralu) (0.8 ± 0.1 mg/mL). In the PCA, 7 fruit species (*P. emblica*, *Aegal marmelos*, *M. malabathricum*, *A. occidentale*, *Clidemia hirata*, *Ardisia willisii* and *Muntingia calabura*) were extracted from the main cluster, due to their high antioxidant properties and vitamin C contents. The present study emphasizes that the minor fruits grown in Sri Lanka are good alternative sources for mainstream fruits in terms of antioxidant properties and vitamin C. Therefore minor fruits should be popularized among Sri Lankans as alternative sources to mainstream fruits.

Keywords: Antioxidant properties, Fruits in Sri Lanka, Mainstream fruits, Underutilized fruits

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