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Original Article

## Comparison of antioxidant properties of dehydrated fruits and vegetables with different drying techniques

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### Abstract

Present study was carried out to evaluate the effect of various dehydration techniques such as sun drying, solar drying, drying after freezing (Freeze for one hour followed by mechanical drying), vacuum drying and drying using lab scale air oven on retention of antioxidants in different fruit and vegetable powders prepared from fruits such as Bael (*Aegle marmelos*), Palmyra (*Borassus flabellifer*) and vegetables; Pumpkin (*Cucurbita maxima*) and Hibiscus (*Hibiscus rosa-sinensis*). The major antioxidants present such as total phenolic content,  $\beta$ -carotene and total anthocyanin content were determined ( $n=3$ ) in fruits and vegetables which were dehydrated by different drying methods. The retention of antioxidant activity was evaluated by conducting the DPPH scavenging activity using methanol as a solvent. The results were analyzed by complete randomized design using ANOVA (SAS statistical package) and mean separation was done by using Least Significant Difference (LSD) at  $\alpha=0.05$ . Higher retention of  $\beta$ -Carotene and total phenolic content was recorded in vacuum dried samples significantly ( $\alpha<0.05$ ). Sun drying and solar drying were significantly affected on reduction of the retention of total phenols. Hibiscus powder contained higher level of anthocyanin; dehydrated bael, palmyra and pumpkin retained higher concentration of  $\beta$ -Carotene and total phenolic content by vacuum drying.

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### INTRODUCTION

Fruits and vegetables are very good source of essential nutrients such as vitamins, minerals, fiber and major antioxidants. It also beneficial to protect from age related diseases, cancers and heart diseases. Antioxidants are chemical compounds that can bind with free oxygen radicals and prevent damaging the healthy cells, whereas pro-antioxidant act indirectly either by modulation of direct agents or by regulation of the biosynthesis of antioxidant proteins. In recent years increasing attention has been paid to the role of diet in human health and among antioxidants, vitamin C has many biological activities on human body reducing level of C-reactive protein, a marker of inflammation and possibility a predictor of heart diseases [1]. Polyphenols and carotenoids are plant secondary metabolites which are well recognized as natural antioxidants linked to the reduction of the development and progression of life-style related diseases. Plant carotenoids are the primary dietary source of provitamins worldwide, with carotene as the most well-known provitamin A

carotenoid or retinol that can be converted to retinol vitamin A. The best-known carotenoid is carotene. Vitamin A is a group of compounds that play an important role in vision, bone growth, reproduction, cell division, and cell differentiation [2]. Vitamin A helps regulate the immune system, which helps prevent or fight off infections by making white blood cells that destroy harmful bacteria and viruses [3]. Vitamin A is obtained in two ways namely as vitamin A from animal sources such as liver, fish oils, egg yolks, and dairy products and the other as carotene from many fruits and vegetables which the body converts to retinol in the small intestine. It also helps in growth and development. Hence preservation of these fruits and vegetables becomes necessary.

Storage of fresh vegetables is the best way to maintain its nutritional value, but most storage techniques require low temperatures, which is difficult to maintain throughout the distribution chain. Drying is the suitable alternative for postharvest management especially in tropical countries such as Sri Lanka. In sufficient low temperature