

Effect of freeze-drying on the antioxidant compounds and antioxidant activity of selected tropical fruits.

ABSTRACT

The effects of freeze-drying on antioxidant compounds and antioxidant activity of five tropical fruits, namely starfruit (*Averrhoa carambola* L.), mango (*Mangifera indica* L.), papaya (*Carica papaya* L.), muskmelon (*Cucumis melo* L.), and watermelon (*Citrullus lanatus* (Thunb.)) were investigated. Significant ($p < 0.05$) differences, for the amounts of total phenolic compounds (TPC), were found between the fresh and freeze-dried fruit samples, except muskmelon. There was no significant ($p > 0.05$) change, however, observed in the ascorbic acid content of the fresh and freeze-dried fruits. Similarly, freeze-drying did not exert any considerable effect on β -carotene concentration of fruits, except for mango and watermelon, where significantly ($p < 0.05$) higher levels were detected in the fresh samples. The results of DPPH (2,2-diphenyl-1-picrylhydrazyl) radical scavenging and reducing power assays revealed that fresh samples of starfruit and mango had relatively higher antioxidant activity. In case of linoleic acid peroxidation inhibition measurement, a significant ($p < 0.05$) but random variation was recorded between the fresh and freeze-dried fruits. Overall, in comparison to β -carotene and ascorbic acid, a good correlation was established between the result of TPC and antioxidant assays, indicating that phenolics might have been the dominant compounds contributing towards the antioxidant activity of the fruits tested.

Keyword: Drying process; Fruits antioxidants; Bioactive compounds; Ascorbic acid; HPLC; Antioxidant attributes.