

Title Phenolic compounds and antioxidant activity of six varieties of greenhouse grown bitter melons

Author Sing P. Tan, Sophie Parks, Costas E. Stathopoulos, Paul D. Roach

Citation Abstracts of 7th International Postharvest Symposium 2012 (IPS2012). 25-29 June, 2012. Putra World Trade Centre (PWTC), Kuala Lumpur, Malaysia. 238 pages.

Keywords bitter melon; antioxidant

Abstract

Bitter melon (*Momordica charantia* L.) is a popular medicinal vegetable in most tropical countries. It has a wide range of putative beneficial effects on health, including anti-diabetic properties, some of which have been related to its antioxidant phenolic compounds. There are many varieties of bitter melon in terms of shape, colour and bitterness. However, it is not known whether different varieties differ in their phenolic compounds and antioxidant activity. Therefore, the aim of this study was to determine the total phenolic compounds and antioxidant activity of six varieties of frozen and vacuum oven dried bitter melons (White, Hanuman, Jade, Big Top Medium, Niddhi and Indra). The phenolic compounds were measured by the spectrophotometric Folin-Ciocalteu assay as gallic acid equivalents (GAE) and by HPLC as caffeine equivalents (CE). The antioxidant activity was determined as trolox equivalents (TE) using the oxygen radical absorbance capacity (ORAC) assay. The results revealed that the phenolic compounds of frozen and vacuum oven dried melons ranged from 451.9 ± 1.2 to 871.0 ± 8.4 $\mu\text{molesGAE/g}$ and 290.7 ± 0.4 to 612.3 ± 3.9 $\mu\text{molesGAE/g}$, respectively. The HPLC peaks of the six varieties of frozen and vacuum oven dried bitter melons ranged from 906.7 ± 84.3 to 2152.8 ± 33.4 $\mu\text{gCE/g}$ and 666.8 ± 73.1 to 1296.0 ± 240.7 $\mu\text{gCE/g}$, respectively. The antioxidant activity for frozen bitter melons ranged from 5.1 ± 0.1 to 7.1 ± 0.2 $\mu\text{molesTE/g}$ whilst for the vacuum oven dried samples, it ranged from 1.0 ± 0.1 to 2.5 ± 0.3 $\mu\text{molesTE/g}$. There was a significant ($p < 0.05$) positive correlation between the phenolic compounds and the HPLC peaks ($R^2 = 0.779$) and between the antioxidant activity and 1) the phenolic compounds ($R^2 = 0.438$) and 2) the HPLC peaks ($R^2 = 0.491$). The six varieties of bitter melon differed in their phenolic compounds and antioxidant activity and the dried samples had less of both compared to the frozen samples. The smaller varieties, Niddhi and Indra, had the highest ($p < 0.05$) phenolic compounds and HPLC peaks.