Antioxidant compounds and capacities of Gac (Momordica cochinchinesis Spreng) fruits

ABSTRACT

Objective: To identify and determine the composition of antioxidant compounds, and to evaluate the antioxidant abilities of Gac fruit parts (peel, pulp, seed and aril) grown in Malaysia.

Methods: LC-MS/MS was used for identification of antioxidant compounds and UV-Vis for estimation of the contents of phenolics, flavonoids, and carotenoids. Lycopene and β-carotene were quantified using high-performance liquid chromatography. DPPH (2, 2-diphenyl-1-picrylhydrazyl) and ferric reducing antioxidant power assays were employed to evaluate antioxidant capacities.

Results: Phytochemicals were found amongst all the fruit parts. Notably, significant amounts of carotenoids [(107.4 ± 4.5), (85.7 ± 4.4), (110.6 ± 2.1) mg/100 g dry weight (DW)], and relatively high levels of both phenolics [(27.3 ± 1.7), (28.9 ± 2.4), (30.8 ± 2.7) mg/100 g DW] and flavonoids [(38.1 ± 2.2), (8.8 ± 1.3), (24.5 ± 3.3) mg/100 g DW] were found in the fruit’s peel, pulp and aril, respectively. Seed part also showed a relatively high level of flavonoids [(18.1 ± 2.3) mg/100 g DW]. Lycopene and β-carotene were found to be significantly high (P < 0.05) in aril [(579.3 ± 22.7) and (621.0 ± 35.0) µg/g DW], followed by peel [(51.0 ± 7.5) and (210.0 ± 12.5) µg/g DW] and pulp [(37.6 ± 10.9) and (205.6 ± 22.1) µg/g DW)]. Antioxidant assays revealed that aril possessed the highest scavenging activity (IC50 = 865 µg/mL), while the peel possessed the highest ferric reducing power of 140 µmol FeSO4/µg.

Conclusions: The current results demonstrate that Gac fruit grown in Malaysia is a rich source of phytochemicals, especially carotenoids, and possesses antioxidant activities. Thus, such findings suggest Gac fruit as a source of an antioxidant plant.

Keyword: Momordica cochinchinensis; Phytochemicals; Carotenoids; Antioxidants; Polyphenols; High-performance liquid chromatography