Effects of binary solvent extraction system, extraction time and extraction temperature on phenolic antioxidants and antioxidant capacity from mengkudu (Morinda citrifolia).

Abstract

An investigation into the effects of ethanol concentration (0–100%, v/v), extraction time (20–120 min) and extraction temperature (25–65 °C) on the extraction of phenolic antioxidants from mengkudu (Morinda citrifolia) was performed using a single-factor experiment. Total phenolic content (TPC) and total flavonoid content (TFC) assays were used for determination of phenolic compounds. Antioxidant capacity was evaluated by measuring the scavenging effect on 2,2′-azino-bis(3-ethylbenzothiazoline-6-sulphonic acid) (ABTS) and 2,2′-diphenyl-1-picrylhydrazyl (DPPH) radicals. Experimental results showed that extraction conditions had significant effect on extraction of phenolic compounds and antioxidant capacities. The optimised conditions were 40% ethanol for 80 min at 65 °C, with values of 919.95 mg GAE/100 g DW for TPC, 472.73 mg CE/100 g DW for TFC, 791.71 μmol TEAC/100 g DW for ABTS and 1928.5 μmol TEAC/100 g DW for DPPH. TPC was significantly correlated with DPPH under the effects of ethanol concentration (r = 0.932) and extraction time (r = −0.938).

Keyword: Mengkudu (Morinda citrifolia); Total phenolic content (TPC); Total flavonoid content (TFC); 2,2′-Azino-bis(3-ethylbenzothiazoline-6-sulphonic acid) (ABTS) radical-scavenging capacity; 2,2-Diphenyl-1-picrylhydrazyl (DPPH) radical-scavenging capacity.