Assessment of extraction parameters on antioxidant capacity, polyphenol content, epigallocatechin gallate (EGCG), epicatechin gallate (ECG) and iriflophenone 3-C-β-glucoside of agarwood (Aquilaria crassna) young leaves

Abstract

The effects of ethanol concentration (0%–100%, v/v), solid-to-solvent ratio (1:10–1:60, w/v) and extraction time (30–180 min) on the extraction of polyphenols from agarwood (Aquilaria crassna) were examined. Total phenolic content (TPC), total flavonoid content (TFC) and total flavanol (TF) assays and HPLC-DAD were used for the determination and quantification of polyphenols, flavanol gallates (epigallocatechin gallate—EGCG and epicatechin gallate—ECG) and a benzophenone (iriflophenone 3-C-β-glucoside) from the crude polyphenol extract (CPE) of A. crassna. 2,2’-Diphenyl-1-picrylhydrazyl (DPPH) radical scavenging activity was used to evaluate the antioxidant capacity of the CPE. Experimental results concluded that ethanol concentration and solid-to-solvent ratio had significant effects (p < 0.05) on the yields of polyphenol and antioxidant capacity. Extraction time had an insignificant influence on the recovery of EGCG, ECG and iriflophenone 3-C-β-glucoside, as well as radical scavenging capacity from the CPE. The extraction parameters that exhibited maximum yields were 40% (v/v) ethanol, 1:60 (w/v) for 30 min where the TPC, TFC, TF, DPPH, EGCG, ECG and iriflophenone 3-C-β-glucoside levels achieved were 183.5 mg GAE/g DW, 249.0 mg QE/g DW, 4.9 mg CE/g DW, 93.7%, 29.1 mg EGCG/g DW, 44.3 mg ECG/g DW and 39.9 mg iriflophenone 3-C-β-glucoside/g DW respectively. The IC50 of the CPE was 24.6 mg/L.

Keyword: Agarwood (Aquilaria crassna) leaves; Epigallocatechin gallate (EGCG); Epicatechin gallate (ECG); Iriflophenone 3-C-β-glucoside; Polyphenol; Antioxidant capacity