Comparative conventional extraction methods of ethanolic extracts of Clinacanthus nutans leaves on antioxidant activity and toxicity

ABSTRACT

Purpose: The purpose of this paper is to evaluate the antioxidant activity and toxicity of Clinacanthus nutans leaves from three conventional extraction methods, i.e. maceration, Soxhlet and magnetic stirring. Design/methodology/approach: Total flavonoid content (TFC) and phenolic content (TPC) were determined using colorimetric method of aluminum chloride and Folin-Ciocalteu (FC) assay, respectively. Antioxidant property of C. nutans was evaluated using 2,2'-diphenyl-1-pierylhydrazyl (DPPH) free radical scavenging assay. Cytotoxic activity of C. nutans against brine shrimp was evaluated based on LC50 (lethality concentration) after 24 h exposure to the plant extract. Findings: The highest TPC of C. nutans was observed with Soxhlet extraction method (98.87 ± 10.43 mg of gallic acid equivalents (GAE/g) followed by maceration (68.77 ± 2.45 mg of GAE/g) and magnetic stirring (46.75 ± 2.45 mg of GAE/g). Interestingly, remarkable highest TFC was observed with magnetic stirring (568.90 ± 4.85 mg of rutin equivalent (RE)/g) followed by maceration (249.60 ± 2.79 mg of RE/g) and Soxhlet (174.8 ± 1.74 mg of RE/g). On the other hands, the extract obtained using maceration method showed the highest antioxidant activity (IC50: 14.18 mg/mL compared to ascorbic acid 144.36 µg/mL). Cytotoxicity of C. nutans from all extraction methods showed similar LC50 values with maceration (3.81 mg/mL), Soxhlet (2.61 mg/mL) and magnetic stirring (4.56 mg/mL), respectively. Originality/value: Both phenolic and flavonoids are responsible for the antioxidant activity, of C. nutans extracts. Based on Meyer's toxicity index, all extracts were nontoxic (LC50>1 mg/mL).

Keyword: Clinacantcus nutans; Free radical scavenging; Cytotoxic activity; Gallic acid equivalents; Rutin equivalent