

Effects of Solvent System, Drying and Storage on the Total Phenolic Content and Antioxidant Activities of Clinacanthus nutans Lindau (Sabah Snake Grass)

ABSTRACT

The effects of extraction solvent system (boiling water, water at room temperature, 50% aqueous methanol and 100% methanol), drying (oven drying and sun drying) and storage (refrigeration) on the total phenolic content (TPC) and antioxidant activities of the extracts from *Clinacanthus nutans* Lindau (Sabah Snake Grass) leaves were studied. TPC was determined using Folin-Ciocalteu method. Antioxidant activities were evaluated using three different methods, namely i) 2,2- diphenyl-1-picrylhydrazyl (DPPH) radical scavenging assay, ii) ferric reducing antioxidant power (FRAP) assay, and iii) beta-carotene bleaching (BCB) assay. Boiling water extraction of fresh leaves resulted in the highest TPC and DPPH and FRAP activities. However, methanolic (100% methanol) extract from the fresh leaves showed the highest antioxidant activity in BCB. Both oven drying and sun drying caused a significant decrease in the antioxidant capacity with sun drying resulting in a lower TPC than oven drying. Cold storage (at 4 ± 2 o C) for three weeks after drying resulted in a decrease in TPC. A significant decrease was observed in DPPH, FRAP and BCB activities after three weeks of refrigeration storage. TPC was strongly correlated to DPPH, 1/EC50 ($r^2 = 0.969$, $p < 0.05$) and FRAP ($r^2 = 0.991$, $p < 0.01$) activities. However, there was no correlation between TPC and BCB. In conclusion, boiling water extraction of fresh *C. nutans* leaves resulted in the highest TPC and antioxidant activities. Drying and storage resulted in deterioration of the TPC and antioxidant activities of *C. nutans* leaves.