Evaluation of Nutritional Composition and Antioxidant Properties of *Cissus quadrangularis* ('Pirandai')

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Cissus quadrangularis ('Pirandai') is one of the edible plants available in the Northern region of Sri Lanka. However, it remains underutilized due to the lack of awareness of its health beneficial properties. This study was aimed to evaluate the nutritional composition and antioxidant properties of *C. quadrangularis* stem. Fresh *C. quadrangularis* stems were collected from the home gardens located in Navatkiri, Jaffna and oven-dried at 45 ℃ for 48 hours until a stable moisture content was reached. Dried samples were analyzed for nutritional composition such as crude protein, crude fat, crude fiber, ash, moisture, and carbohydrate contents. The extract was obtained from both fresh and dried stems by using 70% (v/v) methanol and 70% (v/v) ethanol as solvents. Extraction of the fresh and dry stems was done by shaking the mixture of sample and solvent at 200 rpm using a mechanical shaker at ambient conditions for selected time durations (2, 4, and 6 hours). These dried extracts were used to analyze antioxidant properties, namely, Total Phenolic Content (TPC), Total Antioxidant Capacity (TAC), and 2,2-Diphenyl-1-picrylhydrazyl (DPPH) radical scavenging activity. Composition analysis of dried stem powder yielded 6.02±.023% moisture content, 3.40±0.26% crude fat, 21.58±0.88% crude protein, 53.61±4.43% carbohydrate, 17.11±0.77% ash, and 4.30±0.28% crude fiber. Among all the samples tested, the significantly highest ($p<0.05$) TPC and TAC (29.3±0.3 mg gallic acid equivalent/g dry matter, 16.38±0.44 mg ascorbic acid equivalent/g dry matter, respectively) were obtained in the fresh sample with 6 hours of methanolic extraction. The fresh sample showed the lowest IC_{50} value (0.029±0.002 mg/mL), which means the highest antioxidant activity among the tested samples. Fresh samples were significantly higher ($p<0.05$) in the antioxidant properties than the dried samples. The methanolic extract of all fresh and dried samples significantly higher in the antioxidant properties (TPC and TAC and antioxidant activity) than the ethanolic extract of corresponding samples. Gas chromatography analysis identified the different types of fatty acids present in dry powder of *C. quadrangularis* stem (C8:0, C10:0, C12:0, C14:0, C16:0, C17:1, C18:1, C18:2, and C20:1). Since *C. quadrangularis* stem has good nutritional and antioxidant properties, it could be used as a natural health promoter.

Keywords: Antioxidant properties *Cissus quadrangularis,* Gas chromatography analysis, Proximate composition