

Fractionation and Determination of Total Antioxidant Capacity, Total Phenolic and Total Flavonoids Contents of Aqueous, Ethanol and N-Hexane Extracts of Vitex Doniana Leaves

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Abstract

As a result of normal metabolic processes, the human body produces reactive oxygen species capable of oxidizing biomolecules that can damage DNA, cells and also contribute to the development of chronic diseases. The process can be attenuated or perhaps reversed by herbs and diets containing components that can scavenge reactive oxygen species. In this study, the total antioxidant capacity (TAC), total polyphenolic content (TPC) and total flavonoids content (TFC) of aqueous, ethanol, n- Hexane extract as well as ethanol extract fractions of Vitex doniana leaves were determined. Ethanol extract showed the highest 1,1-diphenyl-2-picrylhydrazyl (DPPH) radical scavenging activity (69.01 ± 1.13) followed by aqueous extract (66.14 ± 1.12) and n-hexane extract (50.05 ± 2.11). The total flavonoids content is in the order; aqueous (304 ± 4.14) > ethanol (276 ± 4.69) > n-Hexane (88 ± 3.45). Hence, the total phenolic content is in a similar order as that of total antioxidant capacity. Chloroform: ethyl acetate fraction has the highest antioxidant capacity (165mg/ml). methanol: H₂O fraction (76mg/ml) and 100% methanol (76mg/ml). Similarly, the total flavonoids content is in the order of fractions; 1>6>4>13>12>2 and others. Total phenolics were in the order of fractions; 1>5>4>12>7>2. There was a strong relationship ($R^2 = 0.77$) between total antioxidant activity and total flavonoid contents and ($R^2 = 0.6517$) for total phenolic content of the fractions. The present study demonstrated that V. doniana leaves extracts contain high amounts of flavonoids and phenolic compounds so that these compounds are efficient free radical scavengers.

Keywords: Diphenyl-2-picrylhydrazyl (DPPH), Polyphenols, Flavonoids, Vitex doniana