

DETERMINATION OF ANTIOXIDANT ACTIVITY, TOTAL PHENOLIC CONTENT AND FREE RADICAL SCAVENGING ACTIVITY OF EDIBLE BIRDNEST

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ABSTRACT

Edible birdnest refers to the nest produced by the saliva of swiftlets is commonly found in the South East Asia region including Malaysia. It is known to have a number of nutritional benefits as a great delicacy and effective medicine as well as beauty enhancer through its relatively high antioxidant capacity. The objectives of this study was done to evaluate total antioxidant capacity, total phenolic content and radical scavenging activity of both wild and farm birdnest of the hot aqueous (HA), cold aqueous and methanol extracts. All data were reported as mean \pm standard deviation (SD) of tenth replicate determination and analyzed using one-way analysis of variance (ANOVA) with significant differences between means determined at $p < 0.05$. Wild hot aqueous indicates the highest percent yields ($28.15 \pm 0.81\%$); follow by wild cold aqueous ($20.31 \pm 1.02\%$), farm hot aqueous ($18.01 \pm 0.25\%$), farm cold aqueous ($10.65 \pm 1.87\%$), wild methanol ($5.12 \pm 0.54\%$) and farm methanol ($3.05 \pm 0.11\%$). It was found that wild hot aqueous showed the highest phenolics concentration of 26.70 ± 0.02 mg/g of GAEs followed by wild cold aqueous (11.02 ± 0.09 mg/g of GAEs), farm hot aqueous (7.63 ± 0.05 mg/g of GAEs), farm cold aqueous (7.24 ± 0.10 mg/g of GAEs), wild methanol (5.74 ± 0.01 mg/g of GAEs) and farm methanol (3.45 ± 0.03 mg/g of GAEs). It was observed that reaction mixture extract of wild hot aqueous were dark blue in colour that visually indicated high phenolics content as compare with other samples. Based on the results obtained, the tested wild hot aqueous showed strong antioxidant activity or differential capacity to inhibit lipid peroxidation by ABTS and FRAP method which is indicated by their low absorbance values. At a given concentration, the relatively higher activity was recorded in the extracts of wild hot aqueous followed wild cold aqueous, farm hot aqueous, farm cold aqueous, wild methanol and farm methanol, surpassing the activity of standard commercial antioxidant, α -tocopherol and BHT. In general, the antioxidant by ABTS method is higher than FRAP method. The birdnest extracts activities was lower than α -tocopherol, BHA and BHT standards and these differences were statistically very significant ($p < 0.05$). Wild hot aqueous showed low radical scavenging activity as compared to BHA but greater than BHT and α -tocopherol, showing that wild hot aqueous contained high amount of radical scavenging compounds. The results show that there was increase in reducing power of the birdnest extracts as the extract concentration increases. Wild hot aqueous also showed the highest reductive activity as compared with wild cold aqueous, farm hot aqueous, farm cold aqueous, wild methanol and farm methanol. Superoxide radical scavenging activity of those samples followed the order: BHA > BHT > α -tocopherol > wild hot aqueous > wild cold aqueous > farm hot aqueous > farm cold aqueous > wild methanol and farm methanol. wild hot aqueous showed low radical scavenging activity as compared to BHA but greater than BHT and α -tocopherol, showing that wild hot aqueous contained high amount of radical scavenging compounds. The present study shows that birdnest extracts are strong radical scavenges and can be considered as good source of natural antioxidants to improve human health.

Keywords: Antioxidant activity, ABTS, FRAP, DPPH and total phenolic compound