

Determination of Physico-Chemical Parameters, Enzyme-Inhibitory and In Vitro Antioxidant Activities of Pretreated, Dehydrated Leaves of *Amaranthus Viridis L.*

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Amaranthus viridis L., belongs to family *Amaranthaceae* is a perennial plant used in edible purposes and traditional medicine in Sri Lanka. The plant is under-investigated for its biological efficacy and there is inadequate scientific information for food use applications. The market potential for dehydrated value-added products is increasing in demand. Hence, the aim of the research was to determine the effect of pretreatments and dehydration processes on the nutritional composition, phytochemical profile, ferric reducing antioxidant activity (FRAP), alpha-glucosidase inhibitory activity and acetylcholinesterase and butyrylcholinesterase inhibitory activity of *Amaranthus* leaves. In various ratios of potassium metabisulphite, sodium bicarbonate and magnesium oxide were experimented as pretreatments. The pretreated leaves were steam blanched for five minutes, followed by dehydration at $60\pm 1^\circ\text{C}$ for 12 hours. The best pretreatment was soaked with 0.1% magnesium oxide, 0.1% sodium bicarbonate and 0.5% potassium metabisulphite. The dry weight basis analysis revealed the following content percentages: Protein ($21.90\% \pm 1.01$), fat ($3.70\% \pm 0.02$), fibre ($5.90\% \pm 0.05$), ash ($11.30\% \pm 0.12$), and carbohydrate ($49.24\% \pm 0.08$). Data was statistically analyzed using one-way analysis of variance (ANOVA) test at a 95% confidence level ($p < 0.05$). The qualitative phytochemical analysis confirmed the presence of phenols, saponins, flavonoids, alkaloids, glycosides, steroids, amino acids, carbohydrates and reducing sugars. Methanolic extract indicated in vitro FRAP of 20.22 ± 0.45 mg Trolox equivalents per 1g of *Amaranthus* dry powder with moisture content of 5.46 ± 2.31 . The methanolic extracts demonstrated inhibitory activity levels of $25.59\% \pm 0.35$, $35.65\% \pm 2.55$, and $44.75\% \pm 2.11$ on the alpha-glucosidase enzyme at concentrations of 500 $\mu\text{g/ml}$, 1500 $\mu\text{g/ml}$, and 2000 $\mu\text{g/ml}$, respectively. No inhibitory activity was detected against acetylcholine esterase and butyrylcholinesterase enzymes. In conclusion, pretreated dehydrated leaves of *A. viridis* have retained their health-beneficial properties and can be used as a potential source of food ingredient.