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Total phenolic content and antioxidant activity of some spices used in Sri Lanka

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Spices are used as food additives for flavours, colours or as preservatives. Recently, there is increasing interest in scientific research for spices because of their strong antioxidant and antimicrobial properties. The present study was conducted to investigate the Total Phenolic Content (TPC) and Antioxidant activity of eight selected spices; Chillie (*Capsicum annuum*), Black pepper (*Piper nigrum*), Turmeric (*Curcuma longa*), Clove (*Syzygium aromaticum*), Cinnamon (*Cinnamomum zeylanicum*), Ginger (*Zingiber officinale*), Garlic (*Allium sativum*) and Garcinia (*Garcinia cambogia*) which are commonly used in domestic cooking. Antioxidants in each spice were extracted by the solvent extraction method using five different solvents (Hexane, Acetone, Methanol, Ethanol and water). TPC of each extract was determined by Folin–Ciocalteu method and antioxidant activity was determined by the Ferric ion Reducing Antioxidant Power (FRAP) assay.

Results revealed that TPC and FRAP values significantly varied ($p<0.05$) with the solvent used in the extraction process. Methanolic extract of all spices showed higher TPC except in Clove, Garcinia and Garlic. Ethanolic extract of Clove showed the highest TPC (4.75 ± 0.07 mg Gallic acid equivalent/ g of spice) followed by methanloic extract of Cinnamon (3.35 ± 0.07 mg Gallic acid equivalent/ g of spice). Lowest TPC was reported in the water extract of Garlic (0.31 ± 0.01mg Gallic acid equivalent/ g of spice). A similar trend was observed in FRAP values as TPC of sample extracts. Ethanolic extract of Clove showed the highest FRAP value (1485.82 ±4.55 mmol $FeSO_4$ equivalent / g of sample) and water extract of Garlic being the lowest (129.76± 13.33 mmol $FeSO_4$ equivalent / g of sample). TPC and FRAP values are proportional to the antioxidant activity of each sample. Further water extract of each sample also gave considerable TPC and FRAP values, signifying that polyphenols and antioxidants present in spice extract into gravy during cooking and could protect food against lipid oxidation. Results concluded that Clove exhibits higher polyphenols and great antioxidant activity among selected spices.

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