

Extraction of Crude Proteins from Black Tea and Green Tea of Uva Region in Sri Lanka & Determination of its Antioxidant Properties

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The consumption of tea has gained much attention due to its antioxidant potential. Tea polyphenols are believed to be the major contributor. However, proteins can also act as powerful antioxidants and there are few scientific reports on crude tea proteins' antioxidant properties. Tea proteins contribute around 21-28% dry weight of tea. Uva is one of the most top tea growing regions in Sri Lanka with distinguishable flavour characteristics. This study was focused on the investigation of antioxidant properties of crude tea extract of green and black tea collected from the Uva region. Black and green tea samples were collected from selected tea factories representing Uva high and Uva mid regions. The crude extract was obtained using hot water treatment with different temperatures (30°C and 40°C) in 2 hrs followed with lyophilisation. Extracted crude was elucidated using 15% SDS-PAGE and quantification was done using the Lowry method for proteins. The lyophilized crude extract was tested for antioxidant activity using DPPH and Fe²⁺ chelating assays. According to protein yield analysis, approximately 40% in green tea and 30% in black tea was observed (40°C series) in lyophilised powder. As with the assays Uva teas have a maximum of 95.33% inhibition of DPPH radical at 10 mg/ml solution which is obtained by 1g of made tea, using the water extraction method. It shows a significant difference in protein concentration between black and green teas in prepared 30°C and 40°C series ($p < 0.05$). There is no difference between crude extract powder yield between the temperatures used for the extraction procedure ($p > 0.05$). Uva teas showed antioxidant properties in DPPH assay but negative results in Fe chelating assay. However, there is no significant difference in levels of elevation, type of tea, and temperature in % inhibition of DPPH radicals in Uva teas. Further studies need to be done with other antioxidant assays to determine the antioxidant property of Uva tea.

Keywords: Uva tea, Green tea, Black tea, Crude protein, Antioxidant activity