

Investigation of Anti-Inflammatory and Acetylcholinesterase Inhibitory Activities of Ceylon Black Tea

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Tea is brewed from the processed dry leaves of *Camellia sinensis* and one of the most widely consumed beverages in the world. Tea is rich in many phenolic compounds, which are important for its taste, flavour and health benefits. Neurodegenerative disorders are of worldwide concern and both black and green tea has been investigated for their neuroprotective activity. However neuroprotective activity of Ceylon black tea is not reported. Neuro-inflammation plays a major role in the age related cognitive impairment. The present study investigated the neuroprotective activity of Ceylon black tea with respect to its anticholinesterase and anti-inflammatory activities. A freeze-dried infusion of Ceylon black tea (2 g/100 mL of water) was used to investigate the *in vitro* acetylcholinesterase enzyme (AChE) inhibitory activity following Ellman's method. The anti-inflammatory activity of Ceylon black tea was evaluated by *in vitro* red blood cell (RBC) membrane stabilization assay. Donepezil hydrochloride and aspirin were used as positive controls. Assays were performed in triplicate and half- maximal inhibitory concentration (IC₅₀) values were calculated. Results showed Ceylon black tea possess neuroprotective activity through AChE inhibition with an IC₅₀ of 275.9 ppm (IC₅₀ of donepezil hydrochloride= 0.04 ppm). Black tea extracts exhibited an anti-inflammatory activity having 50% inhibition of heat induced haemolysis of RBC at 327 ppm (aspirin= 397 ppm). It can be concluded that Ceylon black tea has neurprotective activity through multiple mechanisms having AChE inhibition and anti-inflammatory activities. Flavonoids and other polyphenols present in black tea may be responsible for the observed bioactivities.

Key words: Ceylon black tea, Neuroprotective, Anti-inflammatory, Acetylcholinesterase inhibition