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Investigation of antioxidant, anti-inflammatory and acetylcholinesterase enzyme inhibitory activities of Ceylon green tea

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Green tea is rich in catechins and polyphenols and well known for its health benefits. There are limited studies done on health benefits of Sri Lankan green tea. Age related neurological disorders have become a worldwide health concern and closely linked with neuroinflammation and oxidative stress. Therefore, this study was conducted to investigate the neuroprotective activity of Ceylon green tea through three *in vitro* assays to evaluate antioxidant, anti-inflammatory and acetylcholinesterase (AChE) enzyme inhibitory activities. Green tea infusion was prepared in boiling water (2 g/10 mL). Freeze dried tea extract was tested for antioxidant activity based on the ability to scavenge nitric oxide (NO) radical following Griess assay and anti-inflammatory activity based on red blood cell (RBC) membrane stabilization assay. Memory enhancing ability was evaluated by AChE enzyme inhibition following Ellman's method. L-Ascorbic acid, aspirin and donepezil were used as standards. Results indicated Ceylon green tea to be a good antioxidant with IC_{50} of 148.3 ppm (L-ascorbic acid IC_{50}=120.5 ppm). Green tea showed IC_{50} of 67.4 ppm in RBC membrane stabilization assay (aspirin IC_{50} = 27.7 ppm). Ceylon green tea has good antioxidant and anti-inflammatory activities which are comparable with positive controls. AChE inhibitory activity of green tea was much lower than that of donepezil with an IC_{50} of 1500.5 ppm (IC_{50} of donepezil = 0.01 ppm) but was not significant ($r = 0.844$, $p > 0.05$). Since the Ceylon green tea possesses good antioxidant, anti-inflammatory and moderate anticholinesterase activities *in vitro*, Ceylon green tea has neuroprotective activity. Further investigations are required to confirm the applicability of Ceylon green tea as a preventive therapy for neurological disorders.

Keywords**:** *Ceylon green tea, anticholinesterase, anti-inflammatory, neuroprotective*

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