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Acetylcholinesterase inhibitory and antioxidant activity of some vegetables

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Age related neurological disorders are of worldwide concern. Loss of acetylcholine (ACh) activity directly correlates with memory impairment in patients having Alzheimer's disease (AD). Acetylcholinesterase (AChE) is the key enzyme that terminates nerve impulse transmission by rapid hydrolysis of the neurotransmitter acetylcholine. Restoration of cholinergic function and elevation of ACh level through inhibiting AChE is one of the treatment approaches to reduce the symptoms of neurological disorders. Further,free radical induced oxidative damage plays a significant role in the pathogenesis of neurodegenerative disorders including AD. Therefore the present study is aimed at investigating AChE inhibitory and antioxidant activities of selected local vegetables in the Sri Lankan diet.Sri Lankan local vegetables namely*Abelmoschus esculentus* (ladies fingers),*Brassica oleracea* (knol khol),*Cucumis sativus* (cucumber), *Cucumis melo* (Kekiri), *Cucurbita* (pumpkin), *Momordica charantia* (bitter gourd),*Momordica dioica* (spine gourd), *Musa paradisiaca* (ash plantains),*Psophocarpus tetragonolobus* (winged bean),*Raphanus raphanistrum* (radish) and*Vigna unguiculata* (long beans)were purchased from the local market, sliced and air dried. Each plant material was sequentially extracted into n-hexane, ethyl acetate and methanol. The AChE inhibitory activities of the above extracts were tested *in vitro* following Ellmen's method with slight modifications. Antioxidant activities of above extracts were tested using 2, 2-diphenyl-1-picrylhydrazyl (DPPH) radical scavenging assay.Results indicated *V. unguiculata* and *A. esculentus*are very good sources of antioxidants. Out of the tested extracts ethyl acetate extract of *V. unguiculata* showed a significant AChE inhibitory activity (73% inhibition at 1000 ppm). This study has revealed that *V. unguiculata* is a good source of AChE inhibitors with high antioxidant activity. *V. unguiculata*is a potential source to discover novel therapeutics for neurodegenerative disorders.

Keywords: *acetylcholinesterase;antioxidants; neurological disorders;vegetables*