



Isolation and characterization of acetylcholinesterase inhibitors from *Piper longum* L.

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Background and objectives: The cholinergic deficit correlates with the severity of Alzheimer's disease. The cholinergic function can be improved by AChE inhibitors blocking this key enzyme in the breakdown of acetylcholine. Based on traditional medicine, during two last decades the use of herbal medicinal substances in dementia therapy has been studied. The fruit extract of *Piper longum* L. (Piperaceae) has been used in traditional medicine with various therapeutic properties, among those for the enhancement of cognitive performance in several herbal mixtures. It has been demonstrated that the fruit extract of *P. Longum* inhibites AChE. In order to find new natural compounds with AChE inhibitory effect, in this study the fruits of *P. longum* were investigated. **Methods:** First the fruits were pulverised smoothly, and then extracted with dichloromethane by stirring after sonification. The extract was investigated by an enzymatic TLC bioautography assay to identify the active zones. Then the active compounds were isolated using several chromatographic techniques. **Results:** The structures of active components were characterized by different methods like ¹H, ¹³C NMR-spectroscopy, FTIR and mass-spectrometry. The four isolated substances were identified as methylen-dioxide and piperine derivatives. **Conclusion:** The present study indicated the reasonability of the use of this plant in traditional medicine for treatment of cognitive performance.

Keywords: AChE inhibitor, Alzheimer's disease, Ellman's assay, *Piper longum* Linn., TLC bioautography
