

## Determination of anti-acetylcholinesterase activity from the ethanolic extract of *Artocarpus heterophyllus* branches

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### Structured Abstract

**Background:** The Patients with Alzheimer's disease (AD) have a problem in maintaining longer synaptic transmission due to degeneration of cholinergic neuron which lowers the amount of acetylcholine (ACh). Less ACh and abundance of acetylcholinesterase (AChE) which hydrolyse ACh cause shorter synaptic transmission in brain. One strategy to compensate for the low level of ACh is by using acetylcholinesterase inhibitor (AChEI) with anti-AChE ability which maintains longer impulse transmission and improves AD symptoms. This study is conducted to determine the percentage yield, anti-AChE activity and bioactive compounds related to the anti-AChE activity from *A. heterophyllus* ethanolic extract.

**Methods:** Ethanol (95%) was used to macerate the plant for extraction. Modification of Ellman's method (1961) was utilised for determination of anti-AChE activity. GC-MS analysis was chosen to identify the bioactive compounds from the ethanolic extract and statistical analysis by simple linear regression using GraphPad Prism was done to examine the results.

**Results:** *A. heterophyllus* branches ethanolic extract results in 7.22% of percentage yield. Furthermore, *A. heterophyllus* branches ethanolic extract have a very low potency on anti-AChE activity when compared to classification on standard AChE inhibition of plant extracts by Santos *et al.* (2018) as the  $IC_{50}$  value computed from the graph of percentage inhibition against concentration was 6.09 mg/mL. Apart from that, bioactive compounds in the ethanolic extracts of the plant materials that may be associated with anti-AChE activity was identified through GC-MS analysis. Four major bioactive compounds that makes up 73.06% mass spectra were identified as n-hexadecanoic acid (45.07), ethylbenzene (11.47%), p-xylene (5.12%), and octadecanal (2.56%).

**Conclusion:** The percentage yield of *A. heterophyllus* branches ethanolic extract was elucidated and this study found that the plant extract has a very low potency on anti-AChE activity. The bioactive compound that may be associated with anti-AChE activity was n-hexadecanoic acid, ethylbenzene, p-xylene, and octadecanal.

**Keywords:** Anti-AChE, *A. heterophyllus*, branches, ethanolic extracts, bioactive compounds

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