

Determination of Anti-acetylcholinesterase Activity of Calyx *Hibiscus mutabilis* Ethanolic Extract

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Structured Abstract

Background: Several uses of synthetic medicines such as donepezil and tacrine to treat neurodegenerative diseases have shown some side effects. The use of acetylcholinesterase inhibitors from plant-based products as a better option for the treatment of Alzheimer's disease is expanding. However, no study has been conducted on the anti-acetylcholinesterase activity of *Hibiscus mutabilis* ethanolic extract.

Methods: In this study, the calyx of *Hibiscus mutabilis* was extracted using 95% ethanol. By using Ellman's method, the extracted product was then added with dithiobisnitrobenzoic acid (DTNB), acetylcholine iodide, acetylcholinesterase, and Tris-HCl and was read at 410 nm, to determine the anti-acetylcholinesterase activity. A graph of concentration versus percentage of inhibition was plotted and the linear equation was used to calculate the IC₅₀ of the extract. The ethanolic extract was sent for GCMS analysis for determination. Only compounds with qualities above 80% were tabulated.

Results: The percentage yield of crude ethanolic extract obtained was 8.64%. The IC₅₀ obtained in this study was 5.625 mg/mL, indicated a low inhibition. The result of GCMS showed that the calyx of *Hibiscus mutabilis* contains 11 compounds including n-hexadecanoic acid, oleic acid, hexadecane, octadecanoic acid, (8Z)-oxacycloheptadec-8-en-2-one, hexadecanoic acid, 5-hydroxymethylfurfural, heptadecane, neophytadiene, and butylated hydroxytoluene (BHT). BHT and oleic acid were found to be useful as neurodegenerative disease treatment.

Conclusion: The IC₅₀ obtained exhibited a low inhibition activity for anti-acetylcholinesterase. GCMS result indicated that only butylated hydroxytoluene was found to be useful as neurodegenerative diseases treatment when hybridized with 4-amino-2,3-polymethylene quinoline, although oleic acid was reported to have anti-acetylcholinesterase activity in another study.

Keywords: Anti-acetylcholinesterase activity, inhibition, butylated hydroxytoluene, oleic acid, *Hibiscus mutabilis*

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