

Evaluation of Antidiabetic and Anti-Inflammatory Activities of *Melastoma malabathricum* (White Flower Variety) in Different Extraction Methods

Mohammad Farizul Mohammad Fatihi^a, Muhd Hanis Md Idris^{ab*}

Structured Abstract

Background: Diabetes mellitus is a serious problem that affects public health worldwide. This problem is further exacerbated by the existing antidiabetic drugs that may cause side effects to their users. Alternatives from natural sources for these drugs are needed that have fewer side effects. *Melastoma malabathricum* has been selected as the natural source to be tested for its antidiabetic and anti-inflammatory properties and it will be tested in various extraction methods. Therefore, not only the antidiabetic and anti-inflammatory properties of *M. malabathricum* can be evaluated, but also which of the extraction method has the highest antidiabetic and anti-inflammatory activity can be identified.

Methods: In this study, the antidiabetic properties of *M. malabathricum* were evaluated by conducting an α -glucosidase inhibition assay and the 50% inhibitory concentration (IC₅₀) for inhibition of α -glucosidase enzyme activity by ethanolic, methanolic aqueous maceration and aqueous decoction extracts of *M. malabathricum* were calculated. The anti-inflammatory properties of *M. malabathricum* were also evaluated by conducting a bovine serum albumin (BSA) denaturation inhibition assay to see whether all *M. malabathricum* extracts had the capacity to prevent BSA protein from denaturing. Liquid chromatography-mass spectrometry (LCMS) was also conducted on all *M. malabathricum* extracts to identify the metabolites present in each extract.

Results: The results of this study showed that all *M. malabathricum* extracts showed positive results for α -glucosidase inhibition assay with aqueous maceration showing the highest potency because it had the lowest IC₅₀ which was 1.860 ± 0.935 mg/mL. The results for BSA denaturation inhibition assay could not be obtained because there were errors when the experiment was conducted. The LCMS results showed that choline which has antihyperglycemic activity was present in the ethanol extract of *M. malabathricum* and quercetin which has both antidiabetic and anti-inflammatory activity was present in the methanol extract of *M. malabathricum*.

Conclusion: In conclusion, the antidiabetic properties of ethanolic, methanolic, aqueous maceration and aqueous decoction of *M. malabathricum* were successfully evaluated by IC₅₀ calculation. Next, the anti-inflammatory properties of all *M. malabathricum* extracts could not be evaluated due to errors. Finally, the metabolites present in all *M. malabathricum* extracts in this study could be identified by performing LCMS.

Keywords: Diabetes Mellitus, *Melastoma malabathricum*, 50% Inhibitory Concentration (IC₅₀), Antidiabetic, Anti-Inflammatory

*Correspondence: muhdhanis@uitm.edu.my

^a School of Biology, Faculty of Applied Sciences, Universiti Teknologi MARA, Shah Alam, Malaysia.

^b Integrative Pharmacogenomics Institute (iPROMISE), Universiti Teknologi MARA, Kampus Puncak Alam, Bandar Puncak Alam, Malaysia