**UNIVERSITI TEKNOLOGI MARA**

# GCMS ANALYSIS, ALPHA-AMYLASE AND ALPHA-GLUCOSIDASE INHIBITORY ACTIVITIES OF SELECTED FLOWERS

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**MSc**

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# AUTHOR'S DECLARATION

I declare that the work in this thesis was carried out in accordance with the regulations of Universiti Teknologi MARA. It is original and is the results of my own work, unless otherwise indicated or acknowledged as referenced work. This thesis has not been submitted to any other academic institution or non-academic institution for any degree or qualification.

I, hereby, acknowledge that I have been supplied with the Academic Rules and Regulations for Post Graduate, Universiti Teknologi MARA, regulating the conduct of my study and research.

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# ABSTRACT

Diabetes mellitus has a significant impact on society and its prevalence is steadily increasing worldwide including in Malaysia. Maintaining postprandial glucose level through the inhibition of glucose hydrolysing-enzymes such as α-amylase and α-glucosidase is one of the treatment approaches used to manage the disease. However, the use of synthetic inhibitors could lead to several complications such as cardiovascular disease and gastrointestinal reactions. Thus, researches are suggesting the usage of inhibitors derived from natural sources such as plants. This might be due to the fact that plants contain various phytochemicals which contribute to many pharmacological activities including antidiabetic. Hence, the objectives of this study are to screen the phytochemicals constituents and to examine the antidiabetic potential of *Ixora coccinea, Ruellia brittoniana, Mussaenda philippica, Plumeria obtusa* and *Allamanda cathartica* ethanol flower extract through α-amylase and α-glucosidase inhibition assays. The phytochemical analysis was determined by using gas chromatography mass spectrometry (GCMS) whereas the α-amylase and α-glucosidase inhibition activities were examined using colorimetric method. From the GCMS analysis, all the ethanol flower extracts had more than 10 compounds with probability values of 90 above. *P. obtusa* contains the most phytochemicals with 26 compounds, in which linoleic acid ethyl eser and ethyl 9-cis,11-trans-octadecadienoate were found to be the most abundant . In the α-amylase inhibition assay, *M. philippica* showed the lowest $IC_{50}$ value (371.47 ± 28.76 µg/ml ) followed by *A. cathartica* (394.66 ± 32.45 µg/ml), *I. coccinea* (444.58 ± 9.84 µg/ml), and *P. obtusa* (449.38 ± 57.70 µg/ml) whereas the α-glucosidase inhibition assay showed that *M. philippica* obtained the lowest $IC_{50}$ value (60.89 ± 2.69 µg/ml), followed by *I. coccinea* (154.31 ± 15.00 µg/ml), *A. cathartica* (198.14 ± 22.31 µg/ml), *R. brittoniana* (229.02 ± 20.07 µg/ml) and *P. obtusa* (250.71 ± 33.40 µg/ml). From this study, it can be observed that the ethanol flower extract of *M. philippica* had the lowest $IC_{50}$ value in both α-amylase and α-glucosidase assay. This is might be due to the presence of squalene, supraene and pentadecanoic acid, 14-methyl,methyl ester as detected in the GCMS analysis, thus suggesting the extract as a potential candidate for natural inhibitors of α-amylase and α-glucosidase. However, the safety and efficacy of these extracts should be further assessed in the future research through toxicity test and *in-vivo* study to validate their potential as α-amylase and α-glucosidase inhibitor.

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