

Antioxidant and Antidiabetic Activities of *Melastoma Malabathricum* Leaves Extracts

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Abstract: Currently, no effective medication is available to treat diabetes despite this disease is a serious health problem. As part of our project to explore Indonesian medicinal plants for antidiabetic agents, this study aimed to investigate the total phenolic and flavonoid contents, antioxidant and antidiabetic properties of *Melastoma malabathricum* leaves extracts. Spectrophotometric methods were used to determine the total phenolic and flavonoid contents. Antioxidant activity was performed using DPPH, ABTS, and FRAP methods. The *in vitro* antidiabetic test was conducted through an inhibitory evaluation of α -glucosidase and α -amylase, while STZ-induced diabetic rats were used for *in vivo* study. The highest value of total phenolic (183.71 ± 0.11 mg GAE/g Extract) was recorded in the methanolic extract and flavonoid (24.10 ± 0.04 mg QE/g Extract) contents were recorded in the EtOAc extract. The methanolic extract has the highest DPPH and ABTS activities with IC_{50} values of 8.58 ± 0.03 and 4.59 ± 0.03 μ g/mL, respectively. It also showed the highest FRAP activity with a 51.15 ± 0.10 μ M Fe^{2+} /g. *In vitro* antidiabetic testing of the methanolic extract of leaves against α -glucosidase and α -amylase was reported for the first time. This novel result showed that the methanolic extract inhibited α -glucosidase and α -amylase with IC_{50} values of 75.25 ± 1.60 and 52.38 ± 1.32 μ g/mL, respectively. A dose of 200 mg/Kg body weight of the methanolic extract reduced rats' blood glucose rate and serum blood glucose by 51.01% and 37.82%, respectively, after 15 days of treatments. These findings suggested that the methanolic extract of *M. malabathricum* leaves can be used as a potential source of antioxidant and antidiabetic agents.

Keywords: antidiabetic activity, antioxidant, *Melastoma malabathricum*, α -glucosidase, α -amylase.