

Antidiabetic, cytotoxic and antioxidant activities of *Rhodomyrtus tomentosa* leaf extracts

Muddatstsir Idris,^{ab} Edwin Risky Sukandar,^a Adi Setyo Purnomo,^{id}^a Fahimah Martak^a and Sri Fatmawati^{id}^{*ac}

As part of our project on exploring Indonesian medicinal plants for antidiabetic and anticancer agents, this study was conducted to investigate the total phenolic and flavonoid contents, and antioxidant, cytotoxic and antidiabetic properties of *R. tomentosa* leaf extracts. The antioxidant activity was tested using DPPH, ABTS, and FRAP methods. *In vitro* cytotoxic assay was performed against MCF-7, HeLa, A549, and B16 cancer cell lines. The *in vitro* antidiabetic testing was determined using α -glucosidase and α -amylase inhibitory evaluation, while STZ-induced diabetic rats were used for *in vivo* study. The highest values of total phenolic (191.97 ± 0.19 mg GAE g⁻¹) and flavonoid (29.11 ± 0.05 mg QE g⁻¹) contents were recorded in methanolic extract. This extract also showed the highest DPPH and ABTS activities with IC₅₀ values of 7.79 ± 0.03 and 4.03 ± 0.02 μ g mL⁻¹, respectively, as well as the highest FRAP activity with a value of 64.05 ± 0.54 μ M Fe²⁺ g⁻¹. The methanol extract had cytotoxicity against MCF-7, HeLa, A549, and B16 cancer cell lines with IC₅₀ values of 123.49 ± 0.79 , 28.28 ± 0.17 , 168.88 ± 1.14 , and 42.44 ± 0.18 μ g mL⁻¹, respectively. *In vitro* antidiabetic evaluation indicated that the MeOH extract inhibited α -glucosidase and α -amylase with IC₅₀ values of 45.73 ± 1.06 and 41.31 ± 1.12 μ g mL⁻¹, respectively. A dose of 400 mg kg⁻¹ body weight of the MeOH extract reduced rats' blood glucose rate and serum blood glucose by 48.51% and 17.73%, respectively after 15 days of treatment. Taken together, these findings suggested that the methanolic extract of *R. tomentosa* leaves can be used as a potential source of antioxidant, cytotoxic, and antidiabetic agents.