

Kinetic Extraction of Antioxidant and Total Phenolic Content of *Clinacanthus nutans*

Absract

Clinacanthus nutans or Belalai Gajah is one of the herbs that contain natural antioxidant. This natural antioxidant can be used commercially in food as well as pharmaceutical industries. This research explored antioxidant of *C. nutans* and it was extracted by using solid-liquid extraction. Antioxidant of *C. nutans* extract was determined by using 2,2-diphenyl-1-picrylhydrazyl (DPPH) radical scavenging assay and Total Phenolic Content (TPC) were determined using Folic-Ciocalteau reagent. Screening of the suitable particle size to be used in the extraction of *C. nutans* shows that mixture and leaves of *C. nutans* with particle size $< 63 \mu\text{m}$ was the best to obtain the highest DPPH scavenging activity. However, only mixture of *C. nutans* sample was used for the thermal extraction kinetic due to the availability of the samples. Thermal extraction kinetic of DPPH was fitted to the exponential growth model and show a good fit with $R^2 = 0.9921$. When transformed, the data gave a linear Arrhenius plot, $R^2 = 0.717$ with an activation energy of $17.35 \times 10^3 \text{ kJ/mol}$. Thermal extraction kinetic of TPC was fitted to the exponential growth model and show a good fit with $R^2 = 0.9892$. When transformed, the data gave a linear Arrhenius plot, $R^2 = 0.897$ with an activation energy of $5.3832 \times 10^4 \text{ kJ/mol}$. The model is adequate to predict DPPH scavenging activity and TPC of the *C. nutans* extracts with no significant different of the prediction and validation conducted at temperature of 70°C for 30 min.