

**OPTIMISATION OF EXTRACTION CONDITIONS
FOR PHENOLIC COMPOUNDS AND
ANTIOXIDANT CAPACITIES FROM
MISAI KUCING (*Orthosiphon stamineus*)
BY RESPONSE SURFACE
METHODOLOGY**

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ABSTRACT

Misai kucing (*Orthosiphon stamineus*), which is from Lamiaceae family is a popular and widely used traditional medical herb found in Southeast Asia. The primary aim of this study was to optimise the extraction conditions for phenolic and flavonoid content, as well as antioxidant capacities from misai kucing by using response surface methodology (RSM). Single factor experiment was employed to obtain the optimum ranges of three independent variables, namely ethanol concentration (10 – 90%), extraction time (20 – 120 mins) and extraction temperature (25 – 65°C), then, the optimum ranges was applied in RSM in order to optimise the extraction condition on total phenolic content (TPC), total flavonoid content (TFC), 2,2'-azinobis-3-ethylbenzothiazoline-6-sulfonic acid (ABTS) radical scavenging capacity and 2,2-diphenyl-1-picrylhydrazyl (DPPH) radical scavenging capacity of misai kucing. Single factor experiment was done by using one-factor-at-a-time approach while five levels, three factors central composite design was employed in RSM. The optimum extraction conditions obtained for maximum yield of TPC and TFC are at 34.65% ethanol concentration, extraction time of 63.53 mins and temperature of 56.89°C. On the other hand, antioxidants in misai kucing denoted highest antioxidant properties (ABTS and DPPH) at 73.78% ethanol concentration and extraction temperature at 33.11°C within 43.82mins of extraction time. Under the optimum conditions, the corresponding experimental values of TPC, TFC, ABTS and DPPH were 1789.14 ± 16.96 mg GAE/100g DW, 1666.67 ± 47.41 mg CE/100g DW, 817.22 ± 3.33 μ mol TEAC/100g DW and 2417.11 ± 8.57 μ mol TEAC/100g DW respectively. In overall, the experimental values and predicted values obtained in this study were within the acceptable percentage of difference (< 5%). In a nut shell, model equations generated by RSM in optimising the extraction conditions of phenolics from misai kucing (*Orthosiphon stamineus*) was adequate, suitable and reliable.

