

**COMPARATIVE STUDY ON POLYPHENOL
ANTIOXIDANT ACTIVITY OF HEMPEDU
BUMI (*Andrographis paniculata*)
CRUDE EXTRACT**

THOO YIN YIN

**B. Sc. (Hons.) Food Science and Nutrition
Faculty of Applied Sciences
UCSI University**

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Library Services
UCSI Education Sdn. Bhd. (1994-19-0)
No. 1, Jalan Menara Gading, UCSI Heights,
56000 Kuala Lumpur, Malaysia.
Tel: 603-9101 8880 Fax: 603-9102 3606
Website : www.ucsi.edu.my

ABSTRACT

This study was aimed to optimized extraction of polyphenols content from *Andrographis paniculata* investigating ethanol concentration (0 – 100%), extraction time (60 – 100 min), and extraction temperature (25 - 65°C). Assays employed in determination of polyphenols content were total phenolic content (TPC), total flavanoid content (TFC), and condensed tannins content (CTC) while antioxidant capacities were 2, 2'-azinobis-(3-ethylbenzothiazoline-6-sulfonic acid) (ABTS) radical scavenging assay and 2, 2-diphenyl-1-picrylhydrazyl (DPPH) radical scavenging assay. Experimental results showed extraction parameters (ethanol concentration, extraction time, and extraction temperature) had significant effect ($p < 0.05$) on extraction of polyphenols content and antioxidant capacities. The optimized extraction parameters for polyphenols content (TPC, TFC, and CTC) were 60% ethanol, 65°C, and 60 min at values of 928.03 ± 2.77 mg GAE/ 100 g DW, 394.85 ± 13.72 mg CE/ 100 g DW, and 304.42 ± 5.11 mg CE/ 100 g DW, respectively. Meanwhile, maximum yield of antioxidant capacities (ABTS, DPPH) was extracted by 60% ethanol at 25°C for 60 min with values of 813.89 ± 1.20 μ mol TEAC/ 100 g DW and 1614.90 ± 23.90 μ mol TEAC/ 100 g DW, respectively. CTC as a function to extraction time showed significant positive correlation (0.939) with DPPH. However, polyphenols content (TPC, TFC, and CTC) showed significant negative correlation with ABTS (-0.924, -0.909, and -0.887, respectively) and DPPH (-0.992, -0.938, and -0.928, respectively). Total antioxidant activity for crude polyphenols extract (CPE) obtained at 25°C ($13.68 \pm 14.27\%$) and 65°C ($31.10 \pm 11.68\%$) was found not comparable with L-ascorbic acid ($-8.33 \pm 5.73\%$), α -tocopherol ($71.97 \pm 7.81\%$) and BHA ($87.80 \pm 4.61\%$) at 200 ppm by using beta-carotene bleaching (BCB) assay. Increasing concentration for CPE obtained at 25 or 65°C (200 ppm – 1000 ppm) showed significant increment in antioxidant activity ($13.68 \pm 14.27\%$ to $75.08 \pm 5.76\%$). Yield of CPE obtained at 25 and 65°C were $10.81 \pm 0.53\%$ and 12.55 ± 0.66 , respectively.

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Website : www.ucsi.edu.my