

From weed to medicinal plant: antioxidant capacities and phytochemicals of various extracts of *Mikania micrantha*

ABSTRACT

Mikania micrantha is commonly consumed as traditional medicine in some countries, including Malaysia. Little is known about the antioxidant properties and phytochemicals of *M. micrantha*. This study was aimed to investigate the total phenolic content (TPC), total flavonoid content (TFC) and antioxidant capacities of the leaves and stems of *M. micrantha* of hot water, cold water, 70% ethanol, ethyl acetate, and hexane extracts. Folin-Ciocalteu and aluminium chloride colorimetric assays were used to determine the TPC and TFC, respectively. The antioxidant capacities were determined using rapid, inexpensive and small-scale microplate of five different antioxidant assays. Gas chromatography-mass spectrometry (GC-MS) was used to chemically profile and characterize the phytochemicals. In comparison with different solvents, the ethyl acetate stems (EAS) and leaves (EAL) extracts of *M. micrantha* had the significantly greatest TPC (141 ± 0.51 mg gallic acid equivalent/g) and TFC (70.1 ± 0.92 catechin equivalent/g), respectively. Moreover, EAS extract had the significantly greatest antioxidant capacities using DPPH ($EC_{50} = 324 \pm 61.4$ μ g/mL), ABTS (0.53 ± 0.01 mmol trolox equivalent/g), FRAP (1.28 ± 0.05 mmol Fe²⁺/g), phosphomolybdenum antioxidative power (219 ± 7.03 mg ascorbic acid equivalent/g), and β -carotene bleaching ($108 \pm 2.23\%$) assays. GC-MS analysis of EAS showed the presence of sesquiterpenes (30.46%), phenol (16.38%), and alkane hydrocarbons (10.45%), which may contribute to its antioxidant capacities. These findings suggest the stems extract of *M. micrantha* using ethyl acetate as the potential source of natural antioxidant agents and its utilization to prevent oxidative damage-related diseases could be further explored.

Keyword: Antioxidant; GC-MS; *Mikania micrantha*; Phenolic; Phytochemicals; Sesquiterpenes

