

Characterization of antioxidant activity of *Momordica charantia* fruit by infrared-based fingerprinting

ABSTRACT

Momordica charantia is widely consumed edible fruit. The food and pharmaceutical industries use it as a natural antioxidant. However, the quality control of *M. charantia*-based medicinal products is questionable due to the complexity of metabolites in this fruit. Hence, this study has developed a statistical model in predicting the antioxidant value through the 2, 2-diphenyl-1 picrylhydrazyl radical scavenging activity and ferric reducing antioxidant power based on infrared spectroscopy with attenuated total reflectance. This technique was reliably used for quality control. Six ethanol extracts (0, 20, 40, 60, 80, and 100% in water) of this plant's fruit were prepared. The radical scavenging and ferric reducing antioxidant power activities were measured and the chemical profiling of the extracts was fingerprinted by infrared spectroscopy between 4,000 and 600 cm^{-1} at a resolution of 4 cm^{-1} . Statistical analysis was developed by correlating the bioactivity and infrared spectra of each extract using orthogonal partial least square discriminant analysis. The C–N, C=O, C–O, C–H, and OH infrared signals were positively correlated with biological activity. The antioxidant activity of the fruit of *M. charantia* may be due to the presence of several antioxidants that work synergistically.

Keyword: Antioxidant activity; Attenuated total reflectance; Fingerprinting; Infrared spectroscopy; *Momordica charantia*