Title : Chemical Composition of 52 Thai Herbal Plants Determined by UV–Visible Spectrophotometry and Gas Chromatography–Mass Spectrometry (GC–MS)

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Major : Chemistry

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ABSTRACT

This study aimed to investigate the chemical composition and antioxidant activities of Thai herbal plants (wan). A total of 52 species were evaluated for antioxidant activity, total phenolic content (TPC), and total flavonoid content (TFC) using UV–Visible spectrophotometry. Nine selected species were further analyzed for their chemical constituents using Gas Chromatography–Mass Spectrometry (GC–MS). The DPPH radical scavenging assay demonstrated percentage inhibition ranging from 17.85% to 94.34%, corresponding to 0.336–50.448 mg AAE/g. Total phenolic content ranged from 1.366–113.740 mg GAE/g, while total flavonoid content ranged from 0.088–139.635 mg QE/g. Correlation analysis revealed a strong positive relationship between TPC and antioxidant activity (R^2 = 0.8544), whereas TFC showed a moderate correlation (R^2 = 0.412). The correlation between TPC and TFC was relatively weak (R^2 = 0.328), suggesting that phenolic compounds as a whole contribute more substantially to antioxidant capacity than flavonoids alone. The results indicated that Wan Khamin Chan, Wan Phaya Ha Roi, and Wan Kwak Thong demonstrated comparatively higher antioxidant capacity and total phenolic content among the investigated species. GC–MS analysis indicated that the predominant constituents were terpenes and terpenoids, particularly sesquiterpenes. Additional compounds identified included phenolic compounds, flavonoids, fatty acid derivatives, phytosterols, and hydrocarbons, demonstrating the chemical diversity and potential bioactivity of Thai herbal plants (wan).

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