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Metabolite profiling of *Clinacanthus nutans* leaves extracts obtained from different drying methods by ^{1}H NMR-based metabolomics

Noor Haslinda Noor Hashim[a,b], Jalifah Latip[a], and Alfi Khatib[c]
View Affiliations

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ABSTRACT

The metabolites of *Clinacanthus nutans* leaves extracts and their dependence on drying process were systematically characterized using ^{1}H nuclear magnetic resonance spectroscopy (NMR) multivariate data analysis. Principal component analysis (PCA) and partial least square-discriminant analysis (PLS-DA) were able to distinguish the leaves extracts obtained from different drying methods. The identified metabolites were carbohydrates, amino acid, flavonoids and sulfur glucoside compounds. The major metabolites responsible for the separation in PLS-DA loading plots were lupeol, cycloclinacosides, betulin, cerebrosides and choline. The results showed that the combination of ^{1}H NMR spectroscopy and multivariate data analyses could act as an efficient technique to understand the *C. nutans* composition and its variation.

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