

## LC-MS/MS BASED PHYTOCHEMICAL FINGERPRINTING OF MALAYSIAN HERBS

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Majority of Malaysians apply herbs or herbal products in their daily life, solely based on the traditional knowledge and practices. Many herbal products have recently been developed and promoted in the market for the convenience of consumers to enhance their overall well-being. This includes *Eurycoma longifolia* (King of herb), *Labisia pumila* (Queen of herb) and other popular herbs such as *Orthosiphon aristatus*, *Andrographis paniculata* and *Ficus deltoidea*. The functionality of the herbal products is strongly related to their phytochemicals which are very complex in nature. Therefore, it is important to have an unbiased and reliable technique to identify or authenticate the products, especially those products with functional claims. Phytochemical fingerprinting using the hyphenated technique of LC-MS/MS is suggested to be a comprehensive analytical platform because it is sensitive enough even for trace quantity of phytochemicals. Phytochemicals are secondary metabolites which usually possess certain biological functions in the defense mechanism of plants. This explains the ethnopharmacological properties of herbal plants. The complex mixture of plant samples is separated by liquid chromatography, and individually flowed into mass spectrometer for ionization and detection. Huge dataset that are generated during fingerprinting could be statistically analyzed using chemometric tools for sample classification and identification. High performance and unsupervised multivariate data analysis techniques such as principal component analysis, hierarchical clustering analysis and heat mapping are the common pattern recognition tools for quality control and standardization of herbal samples. Therefore, phytochemical fingerprinting coupled with chemometrics is a reliable technique to describe the entirety of phenotypes for quality control and quality assurance of herbal samples.