Comparative metabolite analysis of piper sarmentosum organs approached by Lc–ms-based metabolic profiling

ABSTRACT

Piper sarmentosum Roxb. (Piperaceae) is a traditional medicinal and food plant widely distributed in the tropical and subtropical regions of Asia, ofering both health and culinary benefts. In this study the secondary metabolites in diferent organs of P. sarmentosum were identifed and their relative abundances were characterized. The metabolic profles of leaves, roots, stems and fruits were comprehensively investigated by liquid chromatography high resolution mass spectrometry (LC-HR-MS) and the data subsequently analyzed using multivariate statistical methods. Manual interpretation of the tandem mass spectrometric (MS/MS) fragmentation patterns revealed the presence of 154 tentatively identifed metabolites, mostly represented by alkaloids and favonoids. Principle component analysis and hierarchical clustering indicated the predominant occurrence of favonoids, lignans and phenyl propanoids in leaves, aporphines in stems, piperamides in fruits and lignan-amides in roots. Overall, this study provides extensive data on the metabolite composition of P. sarmentosum, supplying useful information for bioactive compounds discovery and patterns of their preferential biosynthesis or storage in specifc organs. This can be used to optimize production and harvesting as well as to maximize the plant's economic value as herbal medicine or in food applications.