Metabolite characterization of different palm date varieties and the correlation with their NO inhibitory activity, texture and sweetness

ABSTRACT

The aim of this study was to examine the variation in metabolite constituents of five commercial varieties of date fruits; Ajwa, Safawi and Ambar which originated from Madinah, the Iranian Bam and Tunisian Deglet Noor. The differences of metabolome were inves-tigated using proton nuclear magnetic resonance (1HNMR) spectroscopy combined with multivariate data analysis (MVDA). Principal Component Analysis (PCA) revealed clear separation between the date varieties. The Tunisian Deglet Noor demonstrated distinct cluster from the rest of the palm date samples based on the metabolite composition as shown by the pattern observed in Hierarchical Clustering Analysis (HCA) and PCA. Deglet Noor exhibited a significant higher level of sucrose (d5.40) and fructose (d4.16) in comparison with the other four varieties which can be associated with the distinctive sweet taste of this variety.Dates originated from Madinah and Tunisia exhibited a contrast manner in the amount of xylose and moisture content. These two aspects may contribute towards the soft texture of Tunisian dates. All Madinah dates were found to contain phenolic compounds which were well established as great antioxidant and antiinflammatory agent. Ajwa dates exerted greater effect in inhibiting the generation of nitric oxide (NO) from the stimulated RAW264.7 cells at 95.37% inhibition. Succinic acid was suggested to have the most significant correlation with the trend of NO inhibitory shown by the selected date palm varieties.

Keyword: Phoenix dactylifera; Ajwa dates; H-NMR spectroscopy; RAW cells; Nitric oxide inhibitory activity