Analysis of Differentiated Chemical Components between Zijuan Purple Tea and Yunkang Green Tea by UHPLC–Orbitrap–MS/MS Combined with Chemometrics

作者： 文章来源： 点击数：201 更新日期：2021-08-08

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Analysis of Differentiated Chemical Components between Zijuan Purple Tea and Yunkang Green Tea by UHPLC–Orbitrap–MS/MS Combined with Chemometrics

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Journal

Foods

DOI

https://doi.org/10.3390/foods10051070

Abstract

Zijuan tea (Camellia sinensis var. assamica cv. Zijuan) is a unique purple tea. Recently, purple tea has drawn much attention for its special flavor and health benefits. However, the characteristic compounds of purple tea compared with green tea have not been reported yet. The present study employed a non-targeted metabolomics approach based on ultra-high performance liquid chromatography (UHPLC)-Orbitrap-tandem mass spectrometry (MS/MS) for comprehensive analysis of characteristic metabolites between Zijuan purple tea (ZJT) and Yunkang green tea (YKT). Partial least squares-discriminant analysis (PLS-DA) indicated that there are significant differences in chemical profiles between ZJT and YKT. A total of 66 major differential metabolites included catechins, proanthocyanins, flavonol and flavone glycosides, phenolic acids, amino acids and alkaloids were identified in ZJT. Among them, anthocyanins are the most characteristic metabolites. Nine glycosides of anthocyanins and six glycosides of proanthocyanins were found to be significantly higher in ZJT than that in YKT. Subsequently, pathway analysis revealed that ZJT might generate anthocyanins and proanthocyanins through the flavonol and flavone glycosides. Furthermore, quantitative analysis showed absolutely higher concentrations of total anthocyanins in ZJT, which correlated with the metabolomics results. This study presented the comprehensive chemical profiling and the characterized metabolites of ZJT. These results also provided chemical evidence for potential health functions of ZJT.