Anthocyanin Variations of Camellia Cultivars and Their Application on Cultivar Classification

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The compositions and content of anthocyanins in 56 traditional Chinese camellia cultivars were analyzed with HPLC. The results showed that there were 24 types of anthocyanins found in these cultivars, 10 of which have been identified for their chemical compositions. The 14 other types remain to be identified. Principal component analysis (PCA) revealed that 87.0% of total cultivar information can be interpreted by the first eight principal components (PC). The first PC is positively correlated with the pigment of Cy3G5G; the second is negatively correlated with the pigment of Dp; the third is negatively correlated with the pigment of Cy3GGpC; the fourth is negatively correlated with pigment 26; the fifth is positively correlated with pigment 1 and 60pigment 12; the sixth is positively correlated with the pigment 19; the seventh is negatively correlated with the pigment of Cy3pCG; the eighth is positively correlated with the pigment of Cy3G5GpC. Based on PCA with consideration of the pigments derived from their parents, these 56 cultivars have been classified into six cultivar groups, i.e., *C. reticulata* Group, *C. japonica* Group, *C. chekiangoleosa* Group, Hybrid Group between *C. japonica* and *C. reticulata*, Hybrid Group between *C. reticulata* and *C. saluenensis* and Hybrid Group among multiple camellia species. *C. chekiangoleosa* Group is recommended for this classification because it was a debatable species until its special petal pigment, Cy3G or Cy3Ga, was identified.