Abstract

Project Title	Rapid Analysis of Catechins, Caffeine and Gallic acid in Tea
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Project Period	1 year

A high-performance liquid chromatography (HPLC) method was developed for separation and simultaneous determination of gallic acid (G), caffeine (CF), (-)-epicatechin (EC), (-)-epicatechin-3-gallate (ECG), (-)-epigallocatechin (EGC), (-)-epigallocatechin-3-gallate (EGCG) และ (+)-catechin (C) in tea. The separation system consisted of a C18 reversed-phase column, an isocratic elution system (2.00 ml/min) of water:acetonitrile (87:13) with 0.05%trifluoroacetic acid and diode array detector (210 nm). The tea catechins were identified by comparing absorption spectra and retention time to the reference standard under the identical conditions. The developed system sufficiently separate G, EGC, C, EC, EGCG, CF and ECG within 7 min elution time at 30°C. The twice extractions with boiling water can be used for preparation of green tea extract. The quantitative measurement was performed by external standard method showing good repeatability and accuracy of results. The validation of this method showed that the detection limits of these compounds were 0.2 µg/ml. All the analyses exhibited goof linearity up to100 µg/ml. Normalization method using relative response factor with (+)-catechin (C) as reference compound was conducted in this study. It showed good results as that of external standard method. These two methods had no significant difference in the results obtained. Using relative response factor, it is economical for routine analysis due to no need to use all catechin standards. The use of a simple HPLC method and relative response factor for individual catechins given in this study give the ideal method for easy, rapid, economical and accuracy which is applicable to routine analysis.

Keywords : Tea, Catechins, Caffeine, Gallic acid, Analysis, HPLC