



Tea Institute

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Research Project Efficiency improvements on Fast Blue BB method for determination of total polyphenols in teas

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Abstract

Tea is a popular beverage for the human diet because it is the main source of phenolic compounds. Total polyphenols in teas are measured regularly with Folin-Ciocalteu (FC) method. Recently a novel method using Fast Blue BB (FBBB) salt has been reported. This method provided a higher and more accurate estimation of total polyphenols than the conventional FC method due to its direct reaction with phenolic compounds. Therefore, the aims of this study were to improve and develop the Fast Blue BB (FBBB) method for determination of total polyphenols in teas. Furthermore, the total polyphenols in green, oolong and black teas assayed by FC and FBBB methods were compared. The gallic acid calibration lines (0-100 µg/mL) had a linear correlation (R) greater than 0.99 in all analysis. The FBBB method gave a yellow-brown reaction product and the spectrum characteristic was shifted to a longer wavelength under alkaline condition. The suitable conditions for the FBBB method were mixing 1.0 ml of sample, 0.1 ml (0.1%w/v) of FBBB and 0.1 ml (0.1%w/v) of NaOH, letting stand at room temperature for 30 min, following by measuring the absorbance at 420 nm. The linear regression equation of standard curve, using gallic acid as a standard was $Y = 0.0104x + 0.0169$ ($R^2 = 0.9984$). The total polyphenols in tea samples had gallic acid equivalents (GAE) of FBBB:FC 25.67-59.68:4.79-16.62, 7.69-11.82:37.12-61.61 and 4.41-9.17:24.21-64.77 GAE, g/100 g DW in green, oolong and black teas, respectively. The novel method gave a higher GAE value than the FC method.

Keywords Fast Blue BB, Folin-Ciocalteu, Total polyphenols, Teas