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A simple colorimetric method for estimation of polyphenols present in tea - Comparative study with vanillin reagent

Vanillin-HCl is used to determine polyphenols in plant materials. It is an 'exo type' reaction. Vanillin reacts with meta substituted `A 'ring of flavanols to form a chromophore. The colour developed was measured at 500 nm. The absorbance was proportional to the concentration (y=-0.0644+0.0275x; r=0.994) only within few seconds. Major disadvantage of this method is the unreliability of the readings since the absorbance declines rapidly with time.
The method described here is a modification of Folin-Denis method. The reaction is based on the reduction of phosphomolybdic acid by phenolic group in dilute alkali medium. The phosphomolybdic acid reagent was prepared by dissolving phosphomolybdic acid (1g) in sodium hydroxide (~0.1 M). Phosphomolybdic acid reagent (1.0 mL) was added to the test sample (2.0 mL). The colour developed was read at 355 nm. Epigallocatechingallate, one of the tea polyphenols was used as the standard. Linear calibration curve (y = 0.00909+0.0608x; r = 0.9994) was obtained for concentration of 20-120 µg/mL. The resultant colour was stable for one hour (y= 0.001483+0.0603x; r=0.9994) and the reagent can be used over a week.

This method was applied to estimate polyphenols in tea extract. The extractable phenols were 257 mg/g and non-polyphenolic content was 2.5 mg/g of tea.