

ABSTRACT

**THE EFFECT OF BREWING TIMES ON CAFFEINE
CONCENTRATION IN GREEN TEA BAG EXTRACT**

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Green tea have pharmacological effects, such as, decrease body weight, cholesterol, triglycerides, and glucose, prevent teeth caries, antimutagenic, antioxidants and antibacterial agent. Tea leaves contain important components that affect the quality of beverages namely caffeine and polyphenols. Tea leaves contain caffeine of 3-4% w/w. The amount of caffeine in tea extract is affected by the solvent composition (water and ethanol), extraction time, temperature and pH. This study aims to determine the effect of brewing time on caffeine concentration in green tea bag extract. The caffeine concentration was determined using high performance liquid chromatography. This study used seven variant of brewing times (1, 2, 4, 8, 12, 16, and 24 min). Optimum condition for HPLC operation were as follow. The coloumn was C-18 μ bondapak 10 μ m, 3.9 x 300 mm using methanol: water: acetic acid 2 % v/v of (35: 60: 5) as mobile phase with flowrate of 1,0 ml/min and detection was done at wavelength of 273 nm. The result of validation method were as follows: Selectivity of caffeine with nearest peak has Rs value of 2,744; accuracy of 97,21% \pm 1,92; linierity with r of 0,9999 and Vxo of 0,70%, precision with KV of 0,27%. Limit of Detection (LOD) and Limit of quantitation (LOQ) values were 0,14 ppm and 0,41 ppm, respectively. As result of the study, the increasing of brewing time was related with the increasing of caffein concentration from green tea bag product samples. There were significant difference between caffeine concentration at the first (1-8) minutes with the 24 minutes, i.e. $1,16 \pm 0,05\%$ (w/w) and at 24 min $2,00 \pm 0,02\%$ (w/w), respectively. It can be concluded that dissolved caffeine levels in green tea bag extract are affected by the time of brewing.

Keywords: Caffeine, green tea bag, HPLC