Abstract

Characterization and quantification of anthocyanins in selected tea cultivars processed into black (aerated) and green (unaerated) tea products was carried out in this study. The anthocyanins were extracted from tea products processed from a number of newly bred purple leaf coloured Kenyan tea cultivars (Camellia sinensis) using acidified methanol/HCl (99:1 v/v). Extracted anthocyanins were purified by C 18 solid phase extraction (SPE) catridges and characterised by HPLC-UV–Visible. They were identified according to their HPLC retention times, elution order and comparison with authentic standards that were available. Total monomeric anthocyanins were determined by the pH-differential method. Although the tea cultivars gave different yields of anthocyanins, the unaerated (green) teas had significantly (p 6 0.05) higher anthocyanin content than the aerated (black) teas. This was attributed to the degradation of anthocyanins by polyphenol oxidase products (catechin O-quinones) formed during the auto-oxidation (fermentation) process of black tea manufacture. Of the six most common natural anthocyanidins, five were identified in the purified extracts from purple leaf coloured tea, in both aerated (black) and unaerated (green) teas namely; delphinidin, cyanidin, pelargonidin, peonidin and malvidin. The most predominant anthocyanidin was malvidin in both tea products. In addition, two anthocyanins namely, cyanidin-3-O-galactoside and cyanidin-3-O-glucoside were also identified. Tea catechins were also identified in the tea products derived from the purple coloured tea cultivars namely, epigallocatechin (EGC), catechin (+C), epicatechin (EC), epigallocatechin gallate (EGCG), and epicatechin gallate (ECG). Correlation between the total catechins versus the total anthocyanins and anthocyanin concentration in unaerated teas revealed significant negative correlations (r = -0.723 ⁄ and r = -0.743 ⁄⁄, p 6 0.05 and p 6 0.01, respectively). However, in aerated (black) tea the correlations were insignificant (r = -0.182 and r = -0.241, p > 0.05).