

Abstract

Tea industry in Kenya contributes to the economy by being the largest agribusiness and a major foreign exchange earner. However, significant revenue is lost when tea is sold in undiversified form. This has created a need to characterize the available clones for suitability in high value tea product development. Samples were obtained from 204 tea accessions conserved in Kericho and Kangaita Centres of the Tea Research Institute (TRI) and assayed for total polyphenols, catechins, caffeine, anthocyanins, chlorogenic acid and theanine. There were significant cultivar differences ($P \leq 0.05$) in total polyphenols (16.4%- 30.9%) and total catechins (11.03%-25.42%). Sixteen (16) new clones recorded significantly ($P \leq 0.05$) higher polyphenol contents (mean value of 28.11%) than the standard reference clone, TRFK 6/8 (27.4%) indicating their suitability in the development of high quality black teas. Fifteen clones were suitable for the manufacture of theaflavin-3, 3'-digallate rich black tea based on their high ECG and EGCG levels. Clones TRFK 301/5 and TRFK 301/4 had a high EGC/EC and low EGCG/ECG ratios and were found suitable for manufacture of less astringent green orthodox teas, while clones TRFK 687/1 and 73/7 had the least caffeine contents at 1.96% and 2.04%, respectively, implying their amenability for manufacture of low-caffeine tea beverages. Clones assayed for chlorogenic acid and theanine showed that AHP SC 31/37 and TRFK 6/8 had the highest contents at 0.13% and 1.7%, respectively, and are suitable for chlorogenic and theanine rich teas. The observed chemical and therefore quality differences based on clones and regions show that these Kenyan tea cultivars have high diversity in biochemical attributes and maybe suitable for development of diversified tea products with geographical indications.