Variation of Catechins and Caffeine in a Bi-Parental Progeny of Tea [*Camellia sinensis* (L.) O. Kuntze]

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Tea [Camellia sinensis (L.) O. Kuntze], the second most consumed beverage in the world, is a rich source of polyphenolic compounds**.** The characteristic properties of tea depend on the biochemical compounds present in tea leaf. Hybridization of tea aims at developing new cultivars with more favorable levels of biochemicals for commercial exploitation. Early screening of putative hybrid populations would facilitate selection of elite genotypes with desirable biochemical properties. Tea with naturally low caffeine content is highly demanded while, high catechin content ensure better quality. Current study estimated the catechins and caffeine contents in 126 hybrids generated by two diverse parental tea cultivars; TRI 2043 and TRI 3055 to screen hybrids with high catechin and low caffeine content. Three sets of finely ground freeze-dried fresh leaf samples of direct and reciprocal crosses were extracted with 70% methanol and used to determine Caffeine, (+)-catechin (C), (-)-epicatechin (EC), (-)-epicatechin gallate (ECg), (-)-epigallocatechin (EGC), (-)-epigallocatechin gallate (EGCg) and gallic acid using high performance liquid chromatography (HPLC) protocols. A significant variation was observed in these compounds. Among major catechins, EGCg was the highest (mean 70.28 ± 15.24 mg g^{-1}) followed by ECg, EGC, EC and C. Genotypes no. 129 and 138 recorded highest total catechin content (192.80 mg g^{-1}) and lowest caffeine content (19.34 24 mg g^{-1}) respectively. Mid-parent heterosis for EGC was 18.43% and 11.01% in direct and reciprocal crosses respectively. Majority of the crosses exhibited positive better parent heterosis for EGC implying that they were superior to both parents TRI 2043 and TRI 3055. Mid-parent heterosis for caffeine was -7.09% and 7.19% in direct and reciprocal crosses respectively. Negative mid-parent heterosis for caffeine indicated the existence of genotypes in the population which can be utilized to develop low caffeine and high catechin tea cultivars.

Keywords: Black tea, Caffeine, Catechins, Mid-parent heterosis

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