



## Variability in yield of diverse apple genotypes and their correlation with biochemical aspects.

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### ABSTRACT

The objective of this study was to assess the yield and fruit quality of apple produced within conventional systems in ICAR-CITH, Srinagar. The orchards consisted of alternate rows from 9 to 10 year old apple trees on seedling, at 4x4 m spacing. Sixty apple cultivars harvested in the 2016 and 2017, were analysed for their yield tonne per hectare and its correlation with phenolics, flavanoid content and their yield. Catechin and Rutin were main metabolites identified in all cultivars. The results showed substantial differences both in the total phenolics as well as flavanoids with pronounced accumulation of catechin and rutin. The catechin ranged from 109.98 mg/g to 5290.47 mg/g, while rutin ranged from 12.136 mg/g to 483.88mg/g. The yield of apple cultivars ranged from 0.43t/ha to 52.59 t/ha. Data were processed using principal component analysis (PCA), hierarchical cluster analysis (HCA) and correlation analysis. Using Ward's minimum variance cluster analysis, sixty apple cultivars were categorized in 4 main clusters except *Mallus floribunda* which was alienated as an independent cluster. *Mallus florinunda* exhibited maximum catechin content (5290.47 mg/g), number of fruits/tree (325 fruits/tree) and minimum yield tonne hectare (1.57t/ha) and). Rutin rich sub-cluster includes Lal Ambri, Antinovika, Red Fuji while as catechin rich cluster bears Benoni, Mayan, Micheal, *Malus baccata*, Red Delicious, Black Ben Davis and Ambri. On the contrary, yield tonne per hectare and number of fruits exhibited maximum value in Hardiman, Rome Beauty, Starking Delicious. Significant ( $P < 0.01$ ) positive correlations was revealed between rutin and number of fruits per tree ( $r = 0.64$ ) while as catechin revealed negative correlation with number of fruits per tree ( $r = -0.018$ ). PCA was a suitable approach to check for similarities among apple samples, explaining up to 48% of data variability.

**Keywords:** Yield, Catechin, Rutin, Apple