Morphological comparison of tea (*Camellia sinensis* L) germplasm originating from old seedling tea populations in different agro-ecological regions in Sri Lanka

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Abstract

Characterization of germplasm is an important initial step towards proper utilization of genetic resources in plant breeding programs. Tea germplasm accessions, especially the "estate selections", which originating from old seedling tea populations in various tea estates have not been adequately studied to maximize its utilization in tea breeding programs. Hence, present study aimed at assessing the phenotypic variation of germplasm originating from old seedling tea populations adapted in various agro-ecological regions in Sri Lanka through a multivariate statistical analysis. A representative sample of 62 "estate selections" originating from 9 agro ecological regions of the country were scored using six highly discriminating morphological descriptors identified in a previous study. Principle Component Analysis (PCA) and cluster analysis based on first 4 principle component (PCs), which accounted for about 83% of the total phenotypic variation, delineate 62 estate selections accessions into 6 major groups. However, the phenotypic diversity among the members between groups were revealed as marginal and hence, the agro-ecological isolation of the seedling tea populations on various tea plantations did not contribute to the phenotypic variation among the old seedling tea populations in the country. The study also enabled identification of useful morphological traits that are decisive in distinguishes estates selections that fall into individual groups. The exceptional morphological descriptors identified in this study would facilitate cultivar identification, which has become one of most demanding needs among tea growers. The results generated also lay a proper base for more advanced characterization studies using molecular makers in order to assemble a core collection in tea to facilitate utilization and managerial aspects of tea germplasm.

Keywords: *Camellia sinensis* L, Estate Selections, Morphological Descriptors, Principle Component Analysis, Tea