

# Assessment of Intra-population Genetic Variation in few species of *Coffea* using Random Amplified Polymorphic DNA markers

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## Abstract

Coffee is one of the major plantation crops having high economic importance that calls for continuous efforts to develop better genotypes for sustainability and to meet the ever-changing demands of agro-climatic conditions and the commercial markets. In India, a large coffee germplasm is maintained at Central Coffee Research Institute, Chikamagalur, that has small populations of many exotic wild *Coffea* species in addition to the two cultivated species, *C. arabica* and *C. canephora*. Importantly, these diverse wild species hybridize readily with each other and provide a very valuable secondary gene-pool for genetic improvement of *Coffea* and thus understanding their genetic base becomes important for their judicious exploitation through breeding. In this context, the present investigation was conceded for intra-population genetic variability in four such exotic species, *C. euginoides*, *C. salvatrix*, *C. stenophylla* and *C. dewevreii*, using Random Amplified Polymorphic DNA (RAPD) markers. Thirty-two samples, representative of the originally introduced small populations of these species, were used for analysis. Using 41 random decamer primers, a total of 760 RAPD markers were obtained that were used to compute Nei's distance coefficients. The later were used in PCA and UPGMA analysis to understand the genetic base of the analysed samples. The results revealed limited genetic variation and absence of significant genetic sub-structuring in the populations of any of the four species studied.

In addition, attempts were made to optimize the limits of molecular markers (RAPD) based analysis for reliable assessment of germplasm diversity, especially with respect to the number of scored markers, level of molecular polymorphism vis-à-vis genetic distances and clustering. For the purpose, the relationship between the number of molecular phenotypes and the distance measure was critically analysed through regression statistics, which indicated the existence of a threshold level for the number of primers to be used in RAPD analysis. The details of the above investigations will be discussed.

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