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Genetic relatedness of coconut (Cocos nucifera L.) germplasm in Sri Lanka as revealed by Amplified Fragment Length Polymorphisms (AFLPs)

Coconut Research Institute (CRI) of Sri Lanka has made a consorted effort with the Coconut Genetic Resources Network (COGENT) to conserve coconut germplasm in the country and consequently, acquired a massive germplasm repository of nearly 100 accessions, as rejuvenated populations of island wide coconut collections. Understanding the accurate estimates of diversity of collections is of paramount importance for their effective management and utilisation. Hence a powerful DNA based technique; Amplified Fragment Length Polymorphism (AFLP) was applied to elucidate genetic diversity of coconut germplasm.

DNA was isolated from coconut leaves of 43 accessions out of 100 of the *ex-situ* conserved coconut germplasm and cleaved by *Eco*RI/*Mse*I. The resulted fragments were ligated to adapters of the two enzymes and assayed with eight *Eco*RI/*Mse*I based AFLP primer pairs in the PCR. The PCR products were electrophoretically separated on polyacrylamide and visualized by silver staining. A total of 221 fragments were obtained of which 163 (73.75%) were polymorphic. Nei and Li pair-wise genetic distances ranged between 0.05 – 0.25 indicated a narrow genetic base among coconut accessions in Sri Lanka. The dendrogram constructed based on genetic distances failed to support morphological descriptor-based grouping, '*tall*', '*dwarf*', '*king coconut*' and '*San Ramon*'. The result largely indicated more within group variation than between as the four major clusters of the dendrogram depicted an almost random grouping. Several sub clusters; King coconut and Nawasi Thembili, Damana, Deegawapi and Uhana, Indian and San Ramon-Ran Thembili, however, grouped more authentically. The study in general highlighted the narrowness of the genetic base of conserved coconut in Sri Lanka and emphasized the need to introduce exotic germplasm to enrich the breeder's collection if a major break through in varietal development is expected.