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Population structure of the coconut palm population in Sri Lanka as revealed by Randomly Amplified Polymorpjic DNA (RAPD)

RAPD markers were used to assess the population structure of the coconut pal in Sri Lanka by screening 43 out of the 100 ex-situ conserved germplasm at gene banks of the Coconut Research Institute (CRI) these accessions comprised 19 distinct phenotypes [7 tall (typical), 9 dwarf (nana) and 3 aurantiaca (thembili) forms], 7 Philippine-tall-like ecotypes and 17 Sri Lanka tall ecotypes. Twenty pre-tested 10-mar primers were used to

screen the accessions. A total of 186 amplification products (4-13 fragments per primer) with 166 polymorphic fragments were observed. The distance matrix constructed on Nei and Li pair-wise genetic distances ranging from 0.1-0.4. The resultant dendrogram unveiled the population structure of the coconut as an assemblage of two major groups presumably of African and South East / Pacific origin with dwarf types in a single subgroup in the latter, the Sri Lankan tall ecotypes resembling very much the African tall coconut ecotypes, appeared as a single cluster in spite of a few distinct phenotypes identified on clearly contrasting states of morphological descriptors. Interestingly, although unknowingly the CRI has already exploited the heterosis of the above three distinct groups by production of the hybrid cultivars, CRIC65 and CRISL98. The results thus indicate that further exploration of germplasm within the country for capturing more genetic variation of the palm's biodiversity as a futile exercise and suggest enrichment of germplasm by exotic introductions as a better alternative for further genetic improvement of the palm.