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SSR Markers Revealed Genetic Diversity of King Coconut (*Cocos nucifera*) in Sri Lanka

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Abstract

King coconut (*Cocos nucifera* variety *Aurantiaca* form king coconut) known as thembili has been recognised as a high demanding beverage crop. Yearly increasing demand for king coconut for the global market needs parallel higher productivity which only can achieve through successful utilisation of available genetic diversity of the crop. Unidentified genetic diversity of king coconut genetic resources in Sri Lanka has posed a great restriction in the utilisation. In an effort to overcome this problem, Coconut Research Institute of Sri Lanka has initiated a programme for identification of genetic diversity of king coconut germplasm available in Sri Lanka. The research carried out with the objective of identification of genetic diversity of king coconut samples collected from geographically different locations of Sri Lanka using SSR markers. One hundred king coconut palms from five different areas (Pannala, Colombarage-ara, Kadugannawa, Anuradhapura and Marandawila) were used in the study and SSR markers were developed for all hundred individuals with ten SSR primer pairs using DNA extracted from immature leaves. Two palms from each variety Tall from Typica (Tall standard) and variety Dwarf from Red Dwarf (Red Dwarf standard) were used as standard palms. Developed markers were scored by separating on denaturing polyacrylamide gels and data were analysed using PowerMarker v3.25. Constructed dendrogram with three (03) main clusters revealed the genetic relatedness of king coconut individuals collected from five different areas of Sri Lanka. Two king coconut samples collected from Colombarage-ara and two Tall standards grouped in to one cluster and all other 98 king coconut samples and two Red Dwarf standards grouped in to other two clusters. Structure analysis was performed using STRUCTURE v2.3.4 and the collection was structured into four clusters. Identified diversity has immense value in the improvement of the crop.

Keywords: King coconut, Genetic diversity, SSR markers, *Cocos nucifera*, Genetic resources