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SSR Marker based genetic relatedness of some finger millet (*Eleusine coracana*) accessions of Sri Lanka

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Finger millet (*Eleusine coracana* $2n=4x=36$) of family poaceae is a cereal cultivated in the arid and semi-arid regions of the world including Sri Lanka. It contains a higher amount of protein, fat and minerals than rice, corn and sorghum and tolerates adverse agro-ecological conditions. Therefore, continuous efforts are required for the improvement of this crop. The genetic studies of finger millet are useful in breeding programs to improve the productivity of the crop. This study was conducted to reveal the genetic diversity of twenty one finger millet germplasm accessions having the same accession name as "Kurakkan" collected from seven districts of Sri Lanka using fourteen SSR (Simple Sequence Repeats) markers published by Dida *et al* 2007 which have been used for African and Indian finger millet accessions. This study is the first time they are used for Sri Lankan accessions. DNA was extracted from 14 day old leaves, PCR amplified and alleles of the amplified products were visualized on polyacrylamide gels. Gene diversity and Polymorphic Information content (PIC) were calculated using PowerMarker version 3.25 (Liu and Muse 2006). Cluster analysis was performed with Neighbor joining method and the Treeview software (TreeView 1.6 version for WXP) was used to construct the tree diagram. Of these markers, five markers (UGEP 11, UGEP 18, UGEP 31, UGEP 78, UGEP 90) were monomorphic and the other nine markers (UGEP 03, UGEP 05, UGEP 10, UGEP 12, UGEP 15; UGEP 81, UGEP 102, UGEP 106, UGEP 110) were polymorphic. The highest distance was observed between K1 (Nuwara Eliya District) and K18 (Badulla District) followed by the distances between K1 and K8 (Anuradhapura district); K8 and K12 (Kurunegala District); K12 and K13 (Kurunegala District) and between K17 (Badulla District) and K19 (Kurunegala District). Genetic similarity was observed between K12 and K19 from Kurunegala District; K11 and K2 from Anuradhapura District; K5, K6 (Polonnaruwa District) and K15, K20 (Kurunegala District). Dendrogram constructed on the basis of SSR polymorphism revealed the pattern of genetic relatedness among 21 finger millet germplasms by grouping fifteen of them into 2 main clusters and separating the remaining six accessions from those two clusters showing their genetic distance with the rest. The present study unveils the genetic relatedness of these germplasm accessions and genetically distinct individuals could be utilized in crop improvement programs. An increased number of markers is used to identify the true genetic diversity of these accessions.

Keywords: Finger millet, genetic diversity, SSR, polymorphic information content

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