

Characterization of Conserved Sugarcane (*Saccharum* spp.) Germplasm for Parental Selection in Directional Breeding of Economically Important Traits

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Abstract

Enhancement of sugar production in Sri Lanka is very important since a large amount of foreign exchange is spent on sugar importation every year. Cultivation of improved varieties developed through proven crosses involving selected parents, for desired cane and sugar yield components, is a necessity to reach the production targets in Sri Lanka. The present study focused on the evaluation of 509 sugarcane parental accessions (*Saccharum* spp.) for important cane and sugar yield traits. Twelve different cane and sugar yield components; plot weight, stalk length, stalk diameter, number of stalk per plots, hand refractometer brix, rind hardness, laboratory brix, pol in juice, purity, pure obtainable cane sugar, fibre percent fresh weight and sugar yield per plot were measured or estimated. The data were statistically analyzed for testing significance of variance ratios (ANOVA), phenotypic correlations, clustering of parental clones and estimation of breeding values of the parental clones. The results revealed stalk length and number of stalks to be the major determinants of cane yield. A total of 2,500 bi-parental crossing combinations were identified from the selected parental accessions with the best breeding values for the development of high cane and high sugar yielding progenies. The accessions H 820778, M 1356, SL 89 2688, SLC 87 04, SLC 08 62, SLC 08 106, SLC 12 05 and SLC 91 20 were identified as the most promising parents to be used in simultaneous improvement of cane yield and sugar content with moderate fibre content.

Keywords: [Germplasm](#), [Proven crossing system](#), [Sri Lanka](#), [Sugarcane breeding](#)