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Studying the genetic diversity and variability of selected rice varieties

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Abstract

Breeding rice varieties for high yield along with resistant to abiotic and biotic stresses and accepted grain quality parameters are timely needed. Genetic diversity is important for the success of any plant breeding programme. Morphological characters have been used to assess the genetic variation among the population of rice. The present study aimed to study the genetic diversity and variability of selected rice varieties at the Regional Rice Research and Development Centre, Bombuwala (6° 57' 0" N, 80° 0' 0" E), Sri Lanka during the *Yala* 2022 season. Eighteen rice varieties were selected for the experiment including exotic and local varieties. Data were collected from three replicates, five randomly taken plants per each replicate. Plant height (cm), culm length (cm), panicle length (cm), numbers of productive tillers per plant, numbers of filled grains per panicle, numbers of unfilled grains per panicle, grain yield per panicle (g), grain yield per plant (g), hundred seed weight (g), grain length (mm), grain width (mm), grain breadth, kernel length (mm), kernel width (mm), kernel breadth were recorded according to standard evaluation system, 2014. After Hierarchical clustering, K mean cluster analysis was followed for meaningful clustering and it revealed two major clusters. Cluster one was consisted with Bw 367, Bw 374, At 362, At 307 and IRLON 07A-107 while cluster two was consisted with New Basmathi, Red Basmathi, Pusa Sugand, Jasmin Rice, IRLON 121(2018), IRLON 122 (2018), IRLON 221 (2018), IR 81866 33-3-1 (BLB 81), IRFAON 421, IRFAON 417, Pusa Basmathi, Basmathi 370, Basmathi 442. Some characteristics contribute more to obtain high diversity at least significant at $P \geq 0.05$. Main anticipation of general cultivation is high yield. Therefore, cluster one has ideal morphological traits could be used in general cultivation as showing higher values of yield components' traits as higher numbers of filled grains per panicle, highest grain yield per panicle and highest grain yield per plant. In addition, it can be used as parents for breeding high yielding varieties. Varieties in cluster two has international market accepting grain size and that can be used to incorporate more advantageous characters lacking in varieties in cluster one.

Key Words: Morphological traits, Rice, Two step cluster analysis

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