

MORPHOLOGICAL AND MOLECULAR GENETIC DIVERSITY OF EXOTIC MUSKMELON GERMPLASM

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Executive Summary

Morphological and molecular characterization are important procedures to identify the accessions with desirable traits; to discern genetic relationship among germplasms. Five exotic germplasm showed morphological variations in growth habit, fruit shape, fruit skin texture, fruit splitting, fruit aroma, fruit size, and fruit skin colour at fully formed fruit and fruit skin colour at seed harvest maturity. Quantitative variations were recorded in days of first flowering, number of primary branches, harvesting time, fruit length, fruit width and fruit weight, number of fruits per plant, brix index, and yield/plant. The characters, for instance fruits weight, brix index and yield revealed highest. These three characters should also be considered for improvement of exotic muskmelon. Highest CV (%) was found in number of fruits fruit length, (11.75) followed by fruit diameter (11.40) and yield (11.16). Information about genetic variation has become more critical and deciding factor for any breeding and improvement effort, is difficult, inefficient, and inaccurate when based on morphological traits only. Therefore, this investigation was conducted using five microsatellite DNA markers to evaluate genetic variation among 5-muskmelon germplasm. All five microsatellite markers were polymorphic. Lower values detected in observed than expected heterozygosity for all loci, indicating homozygous condition in the sample population. A total number of 24 alleles were generated by the five primers across 5-germplasm. The locus CMGA104 and CMCTT144 showed the highest number of alleles (6), whereas followed by CMAG59, (5) CMTA134a, (4) and CMTA170a (3) number of alleles. Allele size ranged between 90 bp (CMAG59) to 415 (CMGA104). The Polymorphism Information Content (PIC) values ranged from 0.301 to 0.689 for the locus CMAG59 and CMGA104, respectively. So, based on the morphological, quantitative, and molecular analysis, ME18 and ME26 germplasm can be selected for further breeding programme due to highest brix index and yield.

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