Phenotypic and molecular assessments of newly derived F4 recombinant lines of tomato

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Abstract:

Seven F4 recombinant lines of tomato (Solanum lycopersicum L.) were derived from the cross Peto-86 × Supermarmande following a rigid tandem multi-trait selection scheme. Selection was exercised for desirable traits such as fruit firmness, pericarp thickness, redness, total soluble solids (TSS) and fruit yield while discarding the fruit fasciation and deep ribs. These lines were assessed for field performance of horticultural traits with emphasis on fruit firmness. Diversity analysis and to study relationship among the parents and the derived lines based on phenotypic horticultural traits was carried out using RAPD, ISSR and SRAP molecular markers. Tansgressive segregation for fruit firmness was observed in all the lines exceeding the better parent in strength. Three lines (1/A, 2/A and 2/B) were notable for higher fruit yield. Recombinant line 2/B showed 44.7% increase in yield over the higher yielding parent, Supermarmande. This line also showed high TSS. The recombinant line 1/A was the best among the selected lines for fruit pericarp thickness having greater fruit firmness. Molecular markers data revealed a significant positive correlation with morphological traits indicator suggesting that these independent sets of data are likely to reflect the same pattern of genetic diversity.

Keywords:

Breeding, cluster analysis, fruit firmness, molecular markers, tandem selection scheme

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