Heterosis and combining ability estimates for yield and fibre quality traits in line x tester crosses of desi Cotton (*Gossypium arboreum* L.)

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The present investigation was undertaken with the objectives to study the extent of heterosis and to estimate general and specific combining ability effects. It was sought through a Line x Tester design involving 6 diverse female lines and 4 male parents. The resulting 24 crosses were grown in kharif 2012 along with 10 parents and two checks were evaluated in a randomized block design with three replications. Analysis of variance for means revealed significant differences for all the eighteen characters studied. Line x tester interaction mean square was significant for all the characters except number of boll and days to maturity, indicated sufficient genetic diversity among them. The variance due to GCA and SCA indicated that the non-additive type of the gene action was predominant for all the character studied. The magnitude of heterosis, heterobeltosis and standard/economic heterosis for all the characters in the present study were highly appreciable. Among all the characters, the magnitude of heterosis was highest for plant height measuring to the extent of 117.89% over standard check NH-615 in the cross PA-532 x AKA-7 it was followed by seed cotton yield plant-1 (65.32%) in the cross PA-528 x AKA-7 over mid parent. Among females PA-08 was found to be the best general combiner for 9 characters viz., days to 50 per cent flowering, day to boll bursting, number of boll plant-1, plant height, lint yield, span length, fibre strength, uniformity ratio and short fibre index had significant GCA effects. The females PA-720 and PA-532 were the best general combiner for five characters including seed cotton yield plant-1. Among males AKA-7 found to be best general combiner for seed cotton yield and its contributing characters, which had significant GCA effects for five characters viz., number of sympodia, bolls plant-1, boll weight, plant height and seed cotton yield plant-1. Male parent Dwd-arb-10-1 was also found to be best general combiner for five seed cotton yield and fibre quality characters. There was close agreement between per se performance and GCA as well as SCA effects for most of the characters. Observations on various characters indicated that the crosses showing high heterosis and high SCA effects had high per se performance and they involved at least one high combining parent. The combinations, PA-720 x JLA-802, PA-528 x AKA-7, PA-402 x JLA-802, PA-532 x JLA-802, PA-08 x JLA-802 showed significant and desirable SCA effects for most of the yield and fibre quality traits studied, indicating potential for exploiting hybrid vigor in breeding programme.

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