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GENETIC CORRELATION FOR DIFFERENT TRAITS IN CASTOR (*Ricinus communis* L.) CROSSES

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The seed yield is a complex and polygenically inherited trait being dependent on several component traits. The degree and direction of association between two characters can be understood by studying their correlation coefficient. The study of such association of seed yield per plant with yield contributing characters is of immense importance to get information regarding exercising selection pressure in F_2 and subsequent segregating generations in relation to yield attributes for genetic improvement of seed yield. In the present study, genetic correlation coefficient in F_2 generation was computed with seed yield per plant in respect of paired combinations in 11 characters of five castor crosses.

The experimental material was comprised of five crosses each with six basic generations, viz., P_1, P_2, F_1, F_2, BC_1 and BC_2. Five parents involving two pistillate lines (JP 96 and JP 101) and three inbred lines (JI 368, JI 372 and SKI 215) were used to developed five crosses. The experiment was laid out in Compact Family Block Design with three replications at main oilseeds research station, J.A.U., Junagadh during khrif 2010. Each replication was divided into five compact blocks each consists of single cross and each block was consisted of six plots comprised of six basic generations of each cross. The single row plot was sown for both parents and its F_1; five rows for each F_2 generation and three rows for each backcross during kharif 2010. The crop was dibbled at 7.2 m of row length with 90 cm and 60 cm inter and intra row spacing, respectively. All the recommended cultural and plant protection practices were followed to raise good crop of castor. Observations were recorded on seed yield and other component traits viz., days to flowering and maturity of main raceme, plant height up to main raceme, nodes up to main raceme, length and effective length of main raceme, effective branches/ plant, number of capsules on main raceme, 100-seed weight, shelling outturn and oil content on five plants from P_1, P_2 and F_1, forty plants from F_2 and twenty plants from BC_1 and BC_2 generations in each replication. Genetic correlation (r) was estimated as per the procedure sugested by (1).

The genetic correlation coefficients (r) in F_2 generation for seed yield per plant with all other characters are appended in Table-1. The genetic correlation coefficient between seed yield per plant and days to flowering of main raceme was significant and negative in cross 1 (r = -0.316), cross 2 (r = -0.241) and cross 4 (r = -0.721). While Cross 4 displayed significant and positive genetic correlation coefficient (r = 0.204) between days to maturity of main raceme and seed yield. Similarly, cross 1 displayed significant and positive genetic correlation coefficient (r = 0.194) of plant height up to main raceme with seed yield. Significant and negative relationship of number of nodes up to main raceme was observed with seed yield in cross 4 (r = -0.998) and cross 5 (r = -0.266), while significant and positive correlated response was observed for same pair in cross 1 (r= 0.192).

Significant and positive genetic correlation of length of main raceme and effective length of main raceme with seed yield was observed in cross 5, while significant and negative genetic correlation was observed in cross 4 for both these traits. Significant and positive association between number of effective branches per plant and seed yield was observed in cross 1, 2 and 3. While Significant and negative genetic association between seed yield per plant and number of capsules on main raceme was found only in cross 4 (r = -0.967), In the rest of crosses, the association between these two traits was positive but not significant. Correlation coefficients between seed yield per plant and shelling out turn was found significant and positive only in cross 3 (r = 0.334) and cross 4 (r = 0.597), whereas in cross 2 (r = -0.192) they were negatively correlated. Seed yield per plant showed significant and positive genetic correlation in

Table-1: Genetic correlation coefficient (r) of seed yield per plant with different traits in F_2 generation of five crosses in castor.

Characters	JP 96 x JI 368 (cross 1)	JP 96 x JI 372 (cross 2)	JP 101 x SKI 215 (cross 3)	JP 101 x SKI 291 (cross 4)	JP 102 x JI 372 (cross 5)
Days to flowering of main raceme	-0.316**	-0.241**	-0.061	-0.721**	-0.049
Days to maturity of main raceme	-0.042	0.040	-0.042	0.204*	0.107
Plant height up to main raceme	0.194*	-0.114	0.116	0.012	0.091
Number of nodes up to main raceme	0.192*	-0.020	-0.157	-0.998**	-0.266**
Length of main raceme	0.119	-0.066	-0.053	-1.071**	0.829**
Effective length of main raceme	0.074	-0.057	-0.062	-1.166**	0.813**
Number of effective branches per plant	0.561**	0.610**	0.361**	0.101	-0.267**
Number of capsules on main raceme	0.011	0.017	0.046	-0.967**	0.018
Shelling out turn	-0.081	-0.192*	0.334**	0.597**	-0.114
100-seed weight	0.025	0.170	0.072	0.689**	0.032
Oil content	-0.037	0.127	0.059	0.215*	-0.002

*, ** Significant at 5 and 1% levels, respectively.

cross 4 with 100-seed weight (r = 0.689) and with oil content (r = 0.215).

The negative relationship between seed yield per plant and other developmental character is desirable, while positive association is desirable for yield attributing traits in castor. The significant and negative correlation coefficient of seed yield per plant was observed in hybrid JP 96 x JI 368 with days to flowering of main raceme; in JP 96 x JI 372 with days to flowering of main raceme; in JP 101 x SKI 291 with days to flowering of main raceme and number of nodes up to main raceme and in JP 102 x JI 372 with number of nodes up to main raceme. On the other hand significant and positive correlation coefficient of seed yield per plant exhibited in hybrid JP 96 x JI 368 and JP 96 x JI 372 with number of effective branches per plant; in JP 101 x SKI 215 with number of effective branches per plant and shelling out turn, in JP 101 x JI 291 with shelling out turn, 100-seed weight and oil content and in JP 102 x JI 372 with length of main raceme and effective length of main raceme. The genetic correlation coefficient varied with cross to cross in present investigation. This suggested that selection of early maturing and short statured plants in segregating generations rewards to obtain elite genotype from such crosses which showed negative correlation, while the positive association of seed yield per plant with yield contributing characters is of immense importance regarding exercising selection pressure in F_2 and subsequent segregating generations in relation to yield attributes for genetic improvement of seed yield. Total length of main raceme, effective length of main raceme, number of effective branches per plant, shelling out turn and 100-seed weight are to be considered as a major important seed yield contributing traits for seed yield improvement in castor, as these traits showed positive and significant correlation with seed yield in many crosses. Similar finding were also reported by (2, 3).

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