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Correlation and path coefficient analysis of quantitative characters in okra (*Abelmoschus esculentus* (L.) Moench)

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Abstract
Twenty-eight germplasm lines of okra (*Abelmoschus esculentus* (L.) Moench) were evaluated in a randomized block design with three replications at the Sagdividi Farm, Department of Seed Science and Technology, Junagadh Agricultural University, Junagadh during *summer* 2016. Correlation and path coefficient analysis were carried out to study the character association and contribution, respectively; the genotypes were evaluated for the following seventeen characters: stem diameter (cm), Number of nodes at first flowering, Number of leaves per plant, Length of leaf blade (cm), Width of leaf blade (cm), Flower length (cm), Flower diameter (cm), Pedicel length (cm), Days to 50% flowering, Fruit length (cm), Fruit diameter (cm), Number of fruits per plant, Number of branches, Plant height (cm), Number of seeds per fruit, 100-seed weight (g) and Seed yield per plant (g). Number of fruits per plant and Number of seeds per fruit showed highest positive and very high significant correlation with yield per hectare followed by 100-seed weight and plant height. Plant height and 100-seed weight showed positive and significant correlation with yield per hectare. Stem diameter showed negative and significant correlation with Number of leaves per plant, Fruit length and plant height with 100-seed weight and Seed yield per plant. Path coefficient analysis on various yield contributing characters revealed that Number of fruits per plant, Number of seeds per fruit, Plant height, Fruit length, 100-seed weight and Number of branches showed direct positive effect towards yield. The improvement in pod yield per plant will be efficient, if the selection is based on Number of fruits per plant, Number of seeds per fruit, Plant height, Fruit length, 100-seed weight and Number of branches.

Keywords: Okra lines, correlation, Path coefficient, yield components

Introduction
Bhendi (*Abelmoschus esculentus* (L.) Moench) is popularly known as lady's finger or okra. It is the only vegetable crop of significance in the Malvaceae family. It is extensively grown in temperate, subtropical and tropical regions of the world (Kochhar, 1986) [5]. It is a specialty pod vegetable, which is very popular in India. Its fruits have high nutritive, medicinal and industrial value and export potential. Its fruits are rich in vitamins, calcium, potassium and other mineral matters (Camciuc *et al*., 1981) [3]. Okra seed oil is rich in unsaturated fatty acids such as linoleic acid (Savello *et al*., 1980) [11], which is essential for human nutrition.

Unlike many other members of pod vegetable group, it is not strictly season-bound and hence can be gown twice a year. Being a warm season crop, it can be grown as spring-summer as well as rainy season crop in major agro-ecological zones of India. It fits well in sequential cropping systems due to its quick growing habit, medium duration and tolerance to drought, heat and wide variation in rainfall. Optimizing pod yield is one of the most important goals for most okra growers and, consequently, most okra breeding programs. For improving this crop through conventional breeding and selection, adequate knowledge of association that exists between yield and yield related characters is essential for the identification of selection procedure.

In the present investigation fruit yield and yield related traits among the 28 different genotypes have been studied. Biometrical techniques like correlation and path coefficient analysis provide information about the relative contribution of various yield related traits. As correlation measures the mutual relationship between different traits of a plant, it helps to determine the yield contributing components (Wright S., 1921) [14]. Correlation itself does not reflect the cause of association between two variables. To understand the actual relationship between the dependent traits and various independent traits, it is advisable to partition the correlation coefficient into direct and indirect effects, which was facilitated by path coefficient analysis. These biometrical techniques help in selection of superior plant genotype for future breeding programme.

Therefore this study was undertaken to estimate the correlation and path coefficient for various traits of okra genotypes.

Materials and Methods

The present experiment was carried out at Sagdividi Farm, Department of Seed Science and Technology, Junagadh Agricultural University, Junagadh during *summer* 2016 and the laboratory studies were carried out in the laboratory of Department of Seed Science and Technology, Junagadh Agricultural University, Junagadh. The experimental farm comes under the medium black, alluvial in origin and poor organic matter in Gujarat. The experimental material consisted of 28 promising germplasm of okra [Table-1] and the experiment was laid out in a Randomized Complete Block Design with three replications. Standard agronomic practices were followed to ensure a good crop stand. Seeds of okra were sown in summer season on last week of June at the spacing of 60 x 45 cm. Since the experiment conducted during rainy season due to which weeds problem was relatively higher. Regular weeding was done manually to remove weeds. Because of sufficient rainfall, no need of irrigation was noticed during trail period. The observations were recorded from five randomly selected plants from each treatment and their average values were used for statistical analysis. The data on various characters *viz.*, stem diameter (cm), Number of nodes at first flowering, Number of leaves per plant, Length of leaf blade (cm), Width of leaf blade (cm), Flower length (cm), Flower diameter (cm), Pedicel length (cm), Days to 50% flowering, Fruit length (cm), Fruit diameter (cm), Number of fruits per plant, Number of branches, Plant height (cm), Number of seeds per fruit, 100-seed weight (g) and Seed yield per plant (g) were recorded. The mean data were subjected to statistical analysis to estimate correlation coefficient and path coefficient analysis.

Table 1: List of varieties/germplasm included in the trial.

Sr. No.	Genotype	Source	Sr. No.	Genotype	Source
1	KashiLalima	IIVR, Varansi	15	IC-43733	IIVR, Varansi
2	KashiKranti	IIVR, Varansi	16	KS-404	IIVR, Varansi
3	KashiVibhuti	IIVR, Varansi	17	131-10-1,2,3,4	IIVR, Varansi
4	KashiSatdhari	IIVR, Varansi	18	29-10-1	IIVR, Varansi
5	Kashi Lila	IIVR, Varansi	19	EC-169417	IIVR, Varansi
6	KashiPragati	IIVR, Varansi	20	151-10-1,2,3	IIVR, Varansi
7	IC-45831	IIVR, Varansi	21	IC-43748	IIVR, Varansi
8	440-10-1	IIVR, Varansi	22	AOL-03-1	IIVR, Varansi
9	IC-169359	IIVR, Varansi	23	GJO-3	JAU, Junagadh
10	SC-35	IIVR, Varansi	24	204-10-1	IIVR, Varansi
11	323-10-1	IIVR, Varansi	25	JOL-10-18	JAU, Junagadh
12	IC-282240	IIVR, Varansi	26	IC-33345	IIVR, Varansi
13	EC-3016556	IIVR, Varansi	27	492-9-1	IIVR, Varansi
14	EC-329357	IIVR, Varansi	28	IC-169511	IIVR, Varansi

Results and Discussion

The phenotypic and genotypic correlation coefficients were worked out among seventeen characters to find out association of seed yield per plant (g) with its components at genotypic (g) and phenotypic (p) levels. From the perusal of the estimates of phenotypic and genotypic coefficients of variation (Table 2), in general, it was observed that estimates of genotypic correlation coefficients were in most cases higher than their corresponding phenotypic correlation coefficients. The results obtained on correlation coefficients between different pairs of characters are presented below.

In the present study, stem diameter exhibited significant and positive correlation at both levels with length of leaf blade (rg= 0.574, rp= 0.247). Significant and positive correlation with number of nodes at first flowering (rg= 0.262), flower length (rg= 0.269) and pedicel length (rg= 0.445) at genotypic level. Significant and negative correlation both at genotypic and phenotypic levels with 100-seed weight (rg= -0.546, rp= -0.269), significant and negative correlation with number of leaves per plant (rg= -0.500), fruit length (rg= -0.357), fruit diameter (rg= -0.238), number of branches (rg= -273) and plant height (rg= -0.319) at genotypic level. Number of nodes at first flowering exhibited significant and positive correlation at both levels with flower length (rg= 0.508, rp= 0.368). Significant and positive correlation with length of leaf blade (rg= 0.396) and flower diameter (rg= 0.283) at genotypic level. Significant and negative correlation both at genotypic and phenotypic levels with 100-seed weight (rg= -0.359, rp= -0.266), significant and negative correlation with number of leaves per plant (rg= -0.403) and fruit diameter (rg= -0.227) at genotypic level.

Number of leaves per plant exhibited significant and positive correlation at genotypic level with flower diameter (rg= 0.229), days to 50% flowering (rg= 0.373) and 100 seed weight (rg= 0.263). Significant and negative correlation at both levels with leaf blade length (rg= -0.828, rp= -0.363), significant and negative correlation with width of leaf blade (rg = 0.222), flower length (rg= -0.225), number of fruits per plant (rg= -0.432), plant height (rg= -0.253) and seed yield per plant (rg= -0.607) at genotypic level. Length of leaf blade exhibited significant and positive correlation at both levels with number of seeds per fruit (rg= 0.582, rp= 0.225). Significant and positive correlation with flower length (rg= 0.262), pedicel length (rg= 0.271) and number of branches (rg= 0.323) at genotypic level. Significant and negative correlation both at genotypic and phenotypic levels with 100-seed weight (rg= -0.416, rp= -0.226). Width of leaf blade exhibited significant and positive correlation with flower length (rg= 0.229), fruit diameter (rg= 0.228) and number of branches (rg= 0.731) and plant height (rg= 0.263) at genotypic level. Significant and negative correlation with pedicel length (rg= -0.258) at genotypic level.

Flower length exhibited significant and positive correlation both at genotypic and phenotypic levels with flower diameter

(rg= 0.786, rp= 0.401), days to 50% flowering (rg= 0.395, rp= 0.275) and number of fruits per plant (rg= 0.272, rp= 0.228), significant and positive correlation with fruit diameter (rg= 0.323) and number of branches (rg= 0.324) at genotypic level. Significant and negative correlation both at genotypic and phenotypic levels with 100-seed weight (rg= -0.467, rp= -0.387). Flower diameter exhibited significant and positive correlation both at genotypic and phenotypic levels with days to 50% flowering (rg= 0.586, rp= 0.216) and fruit diameter (rg= 0.478, rp= 0.236). Pedicel length exhibited significant and positive correlation with days to 50% flowering (rg= 0.389) at genotypic level. Significant and negative correlation both at genotypic and phenotypic levels with fruit length (rg= -0.391, rp= -0.286), significant and negative correlation with number of fruit per plant (rg= -0.283), numberof branches (rg= -0.394), 100-seed weight (rg= -0.218) and seed yield per plant (rg= -0.475) at genotypic level. Days to 50% flowering exhibited significant and positive correlation with fruit diameter (rg= 0.309) at genotypic level. Significant and negative correlation.

both at genotypic and phenotypic levels with fruit length (rg= -0.326, rp= -0.245), number of fruit per plant (rg= -0.574, rp= -0.264), number of seeds per fruit (rg= -0.552, rp= -0.442) and seed yield per plant (rg= -0.750, rp= -0.442), significant and negative correlation withnumberof branches (rg= -0.387) and plant height (rg= -0.216) at genotypic level.

Fruit length exhibited significant and positive correlation both at genotypic and phenotypic levels with plant height (rg= 0.417, rp= 0.317) and seed yield per plant (rg= 0.391, rp= 0.266) and Fruit length exhibited significant and positive correlation with 100-seed weight (rg= 0.241) at genotypic level. Fruit diameter exhibited significant and negative correlation with number of fruits per plant (rg= -0.243) and number of branches (rg= -0.216) at genotypic level. Number of fruits per plant exhibited significant and positive correlation both at genotypic and phenotypic levels with seed yield per plant (rg= 0.615, rp= 0.717) and significant and positive correlation with plant height (rg= 0.257) and numberof seeds per fruit (rg= 0.306) at genotypic level. Significant and negative correlation both at genotypic and phenotypic levels with 100-seed weight (rg= -0.347, rp= -0.235).

Number branches exhibited significant and positive correlation both at genotypic and phenotypic levels with plant height (rg= 0.447, rp= 0.245), significant and positive correlation with seed yield per plant (rg= 0.224) at genotypic level. Plant height exhibited significant and positive correlation both at genotypic and phenotypic levels with seed yield per plant (rg= 0.428, rp= 0.237), significant and positive correlation with 100-seed weight (rg= 0.227). Significant and positive correlation with (rp= 0.226) at phenotypic level.

Number of seeds per fruit exhibited significant and positive correlation both at genotypic and phenotypic levels with seed yield per plant (rg= 0.561, rp= 0.476). Significant and negative correlation both at genotypic and phenotypic levels with100-seed weight (rg= -0.383, rp= -0.287). 100-seed weight exhibited significant and positive correlation with seed yield per plant (rg= 0.282) at genotypic level.

Path coefficient analysis

Fruit yield and yield contributing attributes are interrelated among themselves. This creates hindrance in drawing a clear picture of association between characters. The mutual relationship expressed as correlation coefficient between the traits is either positive or negative but complex in nature and sometimes fails to give a meaningful interpretation. In such a situation a biometrical tool, path coefficient analysis in used to measure the different ways of contribution of independent traits on the dependent one (yield). Path coefficient analysis breaks the correlation coefficients into the measures of direct and indirect effect and points out the precise causes of association. Path coefficient analyses at phenotypic and genotypic level are given in the [Table-3].

Stem diameter had highly significant and negative correlation with seed yield per plant (rg= -0.3382) and its direct effect was low (0.1155) and positive. This trait showed negligible and positive indirect effect *via* number of nodes at first flowering (0.0222), length of leaf blade (0.0311), width of leaf blade (0.0005), flower length (0.0024), flower diameter (0.0001) and fruit length (0.0141) while it was low through number of seeds per fruit (0.1218). It showed negligible and negative indirect effect *via* number of leaves per plant (-0.0461), pedicel length (-0.0278), days to 50% flowering (-0.0052), fruit diameter (-0.0342), number of fruits per plant (-0.0517) number of branches (-0.0118) and plant height (-0.0037) while it was low through 100-seed weight (-0.4593).

Number of leaves per plant had highly significant and negative correlation with seed yield per plant (rg= -0.6072) and its direct effect was negligible (0.0923) and positive. This trait showed negligible and positive indirect effect *via* width of leaf blade (0.0124), flower diameter (0.0005), pedicel length (0.0056), and fruit length (0.0025) and fruit diameter (0.0243) while it was moderate through 100-seed weight (0.2211). It showed negligible and negative indirect effect *via* stem diameter (-0.0577), number of nodes at first flowering (-0.0341), length of leaf blade (-0.0449), flower length (-0.0019), days to 50 % flowering (-0.0581), number of branches (-0.0135) and plant height (-0.0029) while it was moderate through number of fruits per plant (-0.2876) and high through number of seeds per fruit (-0.4649).

Pedicel length had highly significant and negative correlation with seed yield per plant (rg= -0.4753) and its direct effect was negligible (-0.0625) and negative. This trait showed negligible and positive indirect effect *via* stem diameter (0.0515), number of nodes at first flowering (0.0072), length of leaf blade (0.0147), width of leaf blade (0.0144), flower length (0.0002) fruit length (0.0155), fruit diameter (0.0036). It showed negligible and negative indirect effect *via* number of leaves per plant (-0.0082), flower diameter (-0.0004), number of branches (-0.0256), days to 50 % flowering (-0.0605), plant height (-0.0010) and number seeds per fruit (-0.0529) while it was low through number of fruits per plant (-0.1881) and 100-seed weight (-0.1831). Days to 50% flowering had highly significant and negative correlation with seed yield per plant (rg= -0.7495) and its direct effect was low (-0.1556) and negative. This trait showed negligible and positive indirect effect *via* stem diameter (0.0038), number of nodes at first flowering (0.0128), number of leaves per plant (0.0344), length of leaf blade (0.0109), flower length (0.0002), flower diameter (0.0011), fruit length (0.0129), fruit diameter (0.0443) and 100-seed weight (0.0513). It showed negligible and negative indirect effect *via* width of leaf blade (-0.0112), pedicel length (-0.0243), number of branches (-0.0253) plant height (-0.0025) while it was high through number of fruits per plant (-0.3821) and number of seeds per fruit (-0.3235).

Fruit length had highly significant and positive correlation with seed yield per plant (rg= 0.3909) and its direct effect was negligible (-0.0396) and negative. This trait showed negligible and positive indirect effect *via* number of nodes at

first flowering (0.0165), width of leaf blade (0.0029), flower length (0.0001), pedicel length (0.0244), days to 50% flowering (0.0507), number of branches (0.0095), plant height (0.0055) and number of seeds per fruit (0.0716) while it was low through number of fruits per plant (0.1296) and moderate through 100-seed weight (0.2030). It showed negligible and negative indirect effect *via* stem diameter (-0.0412), number of leaves per plant (-0.0059), length of leaf blade (-0.0072), flower diameter (-0.0004), fruit diameter (-0.0284). Number of fruits per plant had highly significant and positive correlation with seed yield per plant (rg= 0.6147) and its direct effect was high (0.6656) and positive. This trait showed negligible and positive indirect effect *via* number of nodes at first flowering (0.0164), length of leaf blade (0.0036), width of leaf blade (0.0087), flower length (0.0024), pedicel length (0.0176), days to 50 % flowering (0.0893), number of branches (0.0120) and plant height (0.0029) while it was low through no. of seeds per fruit (0.1797). It showed negligible and negative indirect effect *via* stem diameter (-0.0089), number of leaves per plant (-0.0399), flower diameter (-0.0002), fruit length (-0.0077) and fruit diameter (-0.0349) while it was moderate through 100-seed weight (-0.2919). Similar results also observed by into number of fruits per plant (Bendale *et al*., 2003; Jaiprakashnarayan and Mulge, 2004; Bello *et al*., 2006; Singh *et al*., 2006; Mohapatra *et al*., 2007; Pal *et al*., 2008; Rashwan, 2011; Somashekhar *et al*., 2011) [2, 4, 1, 12, 7, 8, 10, 13].

Number of branches had significant and positive correlation with seed yield per plant (rg= 0.2237) and its direct effect was negligible (0.0652) and positive. This trait showed negligible and positive indirect effect *via* length of leaf blade (0.0175), flower length (0.0028), flower diameter (0.0005), pedicel length (0.0246), days to 50 % flowering (0.0603), plant height (0.0052) and number of seeds per fruit (0.0938) while it was low through number of fruits per plant (0.1226). It showed negligible and negative indirect effect *via* stem diameter (-0.0315), number of nodes at first flowering (-0.0071), number of leaves per plant (-0.0191), width of leaf blade (-0.04078), fruit length (-0.0057), fruit diameter (-0.0310) and 100-seed weight (0.0335). Plant height had highly significant and positive correlation with seed yield per plant (rg= 0.4278) and its direct effect was negligible (0.0116) and positive. This trait showed negligible and positive indirect effect *via* length of leaf blade (0.0013), flower length (0.0013), flower diameter (0.0001), pedicel length (0.0056), days to 50 % flowering (0.0337), and number of branches (0.0291) while it was low through number of fruits per plant (0.1711), number of seeds per fruits (0.1059) and 100-seed weight (0.1909). It showed negligible and negative indirect effect *via* stem diameter (-0.0368), number of nodes at first flowering (-0.0044), number of leaves per plant (-0.0233), width of leaf blade (-0.0146), fruit length (-0.0187) and fruit diameter (-0.0248). Similar results also observed by into pod yield were observed with plant height (Bello *et al*., 2006; Mehta *et al*., 2006; Patro and Sankar, 2006) [1, 6, 9].

Number of seeds per fruit had highly significant and positive correlation with seed yield per plant (rg= 0.5606) and its direct effect was high (0.5865) and positive. This trait showed negligible and positive indirect effect *via* stem diameter (0.0240), number of nodes at first flowering (0.0164), length of leaf blade (0.0315), flower length (0.0007), pedicel length (0.0056), days to 50 % flowering (0.0858), number of branches (0.0104) and plant height (0.0021) while it was moderate through number of fruits per plant (0.2039). It showed negligible and negative indirect effect *via* number of leaves per plant (-0.0731), width of leaf blade (-0.0002), flower diameter (-0.0003), fruit length (-0.0048) and fruit diameter (-0.0055) while it was high through 100-seed weight (-0.3225). 100-seed weight had highly significant and positive correlation with seed yield per plant (rg= 0.2816) and its direct effect was high (0.8413) and positive. This trait showed negligible and positive indirect effect *via* number of leaves per plant (0.0242), width of leaf blade (0.0026), pedicel length (0.0136) and plant height (0.0026). It showed negligible and negative indirect effect *via* stem diameter (-0.0631), number of nodes at first flowering (-0.0303), length of leaf blade (-0.0225), flower length (-0.0041), flower diameter (-0.0003), days to 50% flowering (-0.0095), fruit length (-0.0096), fruit diameter (-0.0049), number of branches (-0.0026), while it was moderate through number of fruits per plant (-0.2309) and number of seeds per fruit (-0.2248).

Table 2: Genotypic (Rg) and (Rp) correlation for seventeen characters in okra genotypes.

Character		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1	Rg	1.000	0.262*	-0.500**	0.574**	-0.009	0.269*	0.023	0.445**	0.033	-0.357**	-0.238*	-0.078	-0.273*	-0.319**	0.208	-0.546**	-0.338**
	Rp	1.000	0.194	-0.134	0.247*	0.027	-0.029	-0.003	0.167	0.059	-0.153	-0.069	0.037	-0.029	-0.115	0.063	-0.269*	-0.051
2	Rg		1.000	-0.403**	0.396**	-0.057	0.508**	0.283**	0.085	0.151	0.195	-0.227*	0.193	-0.084	-0.052	0.193	-0.359**	-0.028
	Rp		1.000	-0.138	0.203	0.011	0.368**	0.166	0.019	0.128	0.183	-0.115	0.105	-0.117	-0.006	0.142	-0.266*	0.022
3	Rg			1.000	-0.828**	-0.222*	-0.225*	0.229*	-0.089	0.373**	-0.064	0.170	-0.432**	-0.207	-0.253*	-0.793**	0.263*	-0.607**
	Rp			1.000	-0.363**	-0.171	-0.083	0.051	0.027	0.213	-0.099	0.155	-0.136	-0.089	0.012	-0.318**	0.158	-0.188
4	Rg				1.000	-0.131	0.262*	0.022	0.271*	0.202	-0.132	-0.141	0.066	0.323**	0.024	0.582**	-0.416**	0.080
	Rp				1.000	0.150	0.113	0.118	0.153	-0.032	-0.009	0.021	-0.183	0.036	0.055	0.225*	-0.226*	-0.183
5	Rg					1.000	0.229*	-0.141	-0.258*	0.201	-0.051	0.228*	-0.156	0.731**	0.263*	0.003	-0.047	-0.159
	Rp					1.000	0.135	0.076	-0.065	-0.025	0.058	0.139	-0.051	0.041	0.189	0.067	-0.025	-0.017
6	Rg						1.000	0.786**	0.020	0.395**	0.002	0.323**	0.272*	0.324**	0.146	0.080	-0.467**	-0.094
	Rp						1.000	0.401**	0.025	0.275*	0.032	0.204	0.228*	0.111	0.158	0.073	-0.387**	0.028
7	Rg							1.000	-0.190	0.586**	-0.179	0.478**	-0.109	0.278*	0.036	-0.131	-0.153	-0.198
	Rp							1.000	-0.095	0.216*	-0.086	0.236*	-0.111	-0.113	0.073	-0.014	-0.113	-0.129
8	Rg								1.000	0.389**	-0.391**	0.025	-0.283**	-0.394**	-0.089	-0.090	-0.218*	-0.475**
	Rp								1.000	0.204	-0.286**	-0.043	-0.083	-0.199	-0.071	-0.009	-0.156	-0.169
9	Rg									1.000	-0.326**	0.309**	-0.574**	-0.387**	-0.216*	-0.552**	0.061	-0.750**
	Rp									1.000	-0.245*	0.214	-0.264*	-0.113	-0.183	-0.442**	0.049	-0.442**
10	Rg										1.000	-0.198	0.195	0.145	0.471**	0.122	0.241*	0.391**
	Rp										1.000	-0.118	0.136	0.103	0.317**	0.084	0.210	0.266*
11	Rg											1.000	-0.243*	-0.216*	-0.173	-0.039	-0.035	-0.176
	Rp											1.000	-0.114	-0.113	-0.109	-0.000	-0.016	-0.064
12	Rg												1.000	0.184	0.257*	0.306**	-0.347**	0.615**
	Rp												1.000	0.052	0.067	0.061	-0.235*	0.717**
13	Rg													1.000	0.447**	0.160	-0.040	0.224*
	Rp													1.000	0.245*	0.066	-0.026	0.073
14	Rg														1.000	0.181	0.227*	0.428**
	Rp														1.000	0.226*	0.135	0.237*
15	Rg															1.000	-0.383**	0.561**
	Rp															1.000	-0.287**	0.476**
16	Rg																1.000	0.282**
	Rp																1.000	0.203
17	Rg																	1.000
	Rp																	1.000

1.Stem diameter (cm)	2.Number of nodes at first flowering	3.Number of leaves per plant	4. Length of leaf blade (cm)	5. Width of leaf blade (cm)
6. Flower length (cm)	7. Flower diameter (cm)	8. Pedicel length (cm)	9. Days to 50% flowering	10. Fruit length (cm)
11. Fruit diameter (cm)	12. Number of fruits per plant	13. Number of branches	14. Plant height (cm)	15. Number of seeds per fruit
16. 100-seed weight (g)	17. Seed yield per plant (g)			

Table 3: Genotypic & Phenotypic path coefficient analysis showing direct and indirect effect of different characters on seed yield per plant on okra.

Characters	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**
1	0.1155	0.0222	-0.0461	0.0311	0.0005	0.0024	0.0001	-0.0278	-0.0052	0.0141	-0.0342	-0.0517	-0.0177	-0.0037	0.1218	-0.4593	-0.3382**
2	0.0302	0.0847	-0.0372	0.0214	0.0032	0.0044	0.0005	-0.0053	-0.0235	-0.0077	-0.0326	0.1287	-0.0054	-0.0006	0.1133	-0.3016	-0.0275
3	-0.0577	-0.0341	0.0923	-0.0449	0.0124	-0.0019	0.0005	0.0056	-0.0581	0.0025	0.0243	-0.2876	-0.0135	-0.0029	-0.4649	0.2211	-0.6072**
4	0.0663	0.0335	-0.0764	0.0542	0.0073	0.0023	0.0001	-0.0169	-0.0314	0.0052	-0.0202	0.0439	0.0210	0.0003	0.3412	-0.3499	0.0804
5	-0.0011	-0.0048	-0.0205	-0.0071	-0.0557	0.0020	-0.0003	0.0161	-0.0312	0.0020	0.0327	-0.1037	0.0477	0.0031	0.0015	-0.0398	-0.1592
6	0.0311	0.0430	-0.0208	0.0142	-0.0127	0.0087	0.0015	-0.0013	-0.0614	-0.0001	0.0464	0.1808	0.0211	0.0017	0.0471	-0.3931	-0.0937
7	0.0027	0.0239	0.0211	0.0012	0.0079	0.0069	0.0019	0.0119	-0.0912	0.0071	0.0685	-0.0724	0.0181	0.0004	-0.0767	-0.1289	-0.1977
8	0.0515	0.0072	-0.0082	0.0147	0.0144	0.0002	-0.0004	-0.0625	-0.0605	0.0155	0.0036	-0.1880	-0.0256	-0.0010	-0.0528	-0.1831	-0.4753**
9	0.0038	0.0128	0.0344	0.0109	-0.0112	0.0035	0.0011	-0.0243	-0.1556	0.0129	0.0443	-0.3821	-0.0253	-0.0025	-0.3236	0.0513	-0.7495**
10	-0.0412	0.0165	-0.0059	-0.0072	0.0029	0.0001	-0.0004	0.0244	0.0507	-0.0396	-0.0284	0.1296	0.0095	0.0055	0.0716	0.2030	0.3909**
11	-0.0275	-0.0193	0.0156	-0.0076	-0.0127	0.0028	0.0009	-0.0016	-0.0481	0.0078	0.1435	-0.1620	-0.0141	-0.0020	-0.0226	-0.0291	-0.1759
12	-0.0089	0.0164	-0.0399	0.0036	0.0087	0.0024	-0.0002	0.0176	0.0893	-0.0077	-0.0349	0.6656	0.0120	0.0029	0.1796	-0.2919	0.6147**
13	-0.0315	-0.0071	-0.0191	0.0175	-0.0408	0.00283	0.0005	0.0246	0.0603	-0.0057	-0.0310	0.1226	0.0652	0.0052	0.0937	-0.0335	0.2237*
14	-0.0369	-0.0044	-0.0233	0.0013	-0.0146	0.0013	0.0001	0.0056	0.0337	-0.0187	-0.0248	0.1711	0.0291	0.0116	0.1059	0.1909	0.4278**
15	0.0240	0.0164	-0.0731	0.0315	-0.0002	0.0007	-0.0003	0.0056	0.0858	-0.0048	-0.0055	0.2039	0.0104	0.0021	0.5865	-0.3225	0.5606**
16	-0.0631	-0.0304	0.0242	-0.0225	0.0026	-0.0041	-0.0003	0.0136	-0.0095	-0.0095	-0.0049	-0.2309	-0.0026	0.0026	-0.2248	0.8413	0.2816**

*, ** Significant at 5 and 1 per cent, respectively. Residual are -0.01459

1.Stem diameter (cm)	2.Number of nodes at first flowering	3. Number of leaves per plant	4. Length of leaf blade (cm)	5. Width of leaf blade (cm)
6. Flower length (cm)	7. Flower diameter (cm)	8. Pedicel length (cm)	9. Days to 50% flowering	10. Fruit length (cm)
11. Fruit diameter (cm)	12. Number of fruits per plant	13. Number of branches	14. Plant height (cm)	15. Number of seeds per fruit
16. 100-seed weight (g)	17. Seed yield per plant (g)			

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