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CORRELATION AND PATH CO-EFFICIENT ANALYSIS OF QUANTITATIVE TRAITS IN OKRA [*ABELMOSCHUS ESCULENTUS* (L.) MOENCH]

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ABSTRACT
A field experiment of correlation and path analysis was undertaken in 60 genotypes (5 checks) of okra for fruit yield and its quantitative traits, this study assist in identifying the characters which mainly contributing to the fruit yield. Yield plant^{-1} had highly significant positive phenotypic correlation with *viz.,* number of fruits plant^{-1} (0.803), fruit diameter (0.376), fruit length (0.349), number of seeds fruit^{-1} (0.316), days to maturity (0.301), fruit weight (0.274) leaf blade width (0.219),100 seed weight (0.219), flower diameter (0.154), fruiting span (0.152), petiole length (0.151), and stem diameter (0.150). Highly negative non-significant association was observed with incidence of YVMV (-0.389), days to 50 per cent flowering (-0.319) and node at first flower appears (-0.307) this correlation study indicated that close interrelationship between genotypic and phenotypic correlation co-efficient and magnitude of genotypic correlation were higher than their corresponding phenotypic correlation for most of the traits. Phenotypic path coefficient analysis revealed that traits *viz.,* number of fruits plant^{-1}(0.733) followed by number of seeds fruit^{-1} (0.165), number of branches plant^{-1}(0.147), fruit diameter (0.133), fruit weight (0.097), days to maturity (0.058), fruiting span (0.056), 100 seed weight (0.055), stem diameter (0.027) and plant height (0.023) have positive and high direct effects with fruit yield per plant. Number of fruits plant^{-1}, fruit diameter, fruit length, plant height, number of seeds fruit^{-1}, days to maturity, fruit weight, and stem diameter indicating importance of these characters and can be strategically used to selection criteria to develop and improve high yielding okra varieties.

INTRODUCTION

Okra (*Abelmoschus esculentus* L.) belongs to the family Malvaceae. It is extensively grown in temperate, sub-tropical and tropical region of the world (Kochhar, 1986). It is an allopolyploids, with 2n =130 - 2n = 8x =72 or 144 chromosomes. It is an annual herbaceous vegetable crop that is grown for its tender fruits often consumed as vegetable. Fresh okra fruit contains 2.1 g protein, 0.2 g fat, 8 g carbohydrate, 36 calories, 1.7 g fiber and 175.2 mg minerals, 100 g of edible portion (Tindall, 1983; Berry *et al.,* 1988).

Fruit yield of okra is a polygenic trait, which is governed by numbers of gene action; direct selection for yield alone is usually not very effective. Hence, selection based on its contributing traits could be more efficient and reliable (Kumar *et al.,* 2013a; Kumar *et al.,* 2013b). The achievement of any breeding program mainly depends on genetic diversity, trait interrelationship and direct and indirect effects on yield and its attributing traits. Association of plant characters which is determined by correlation coefficient is although useful in determining the relative influence of the various characters on fruit yield. Path coefficient analysis a mathematical data tools in partitioning the correlation co-efficient into direct and indirect effects. Hence, study of correlations and path coefficient analysis of yield would be of help in selection of yield component traits in the genetic improvement of quantitative traits, which are positively correlated. Correlation and path coefficient analysis have been studied by several workers to measure the associations between fruit yield and other traits. Growth parameters like plant height and number of leaves at different stages varied significantly between the fruit weight and varieties (Thapa *et al.,* 2012; Prasad *et al.,* 2013; Balai *et al.,* 2014; Rai *et al.,* 2014). Plant height (Adiger *et al.,* 2011; Kumar *et al.,* 2012; Jagan *et al.,* 2013; Rai *et al.,* 2014), fruit weight (Mehta *et al.,* 2006; Chaukhande *et al.,* 2011; Simon *et al.,* 2013b), pod length (Mehta *et al.,* 2006; Dakahe *et al.,* 2007; Nasit *et al.,* 2009; Adiger *et al.,* 2011; Kumar *et al.,* 2012; Balai *et al.,* 2014; Rai *et al.,* 2014) and number of seeds per fruit (Simon *et al.,* 2013b; Prasad *et al.,*2013; Balai *et al.,* 2014; Rai *et al.,* 2014) were positive and highly significant correlation with yield per plant.

The main aim of plant breeder is to evolve high yielding varieties. It is therefore, need of plant breeder to know the extent of interrelationship between yield and its various components, which will facilitate desirable selection based on component traits. Path analysis is a standardised partial regression coefficient measuring the direct influence of one variable upon the other and permits separation of correlation

coefficient into components of direct and indirect effects. Correlation and path coefficient could be necessary tools at the disposal of the breeder in improvement programme for enhancing the production and productivity of okra and also know suitable genetically source which express resistance against yellow vein mosaic virus.

MATERIALS AND METHODS

The present experimental material comprised of 55 exotic and indigenous genotypes of okra collected from NBPGR, New Delhi and 5 standard checks *viz.,* (Phule Utkarsh, Hisar Unnat, VRO-5, VRO-6 and Pusa A4) for the study a field experiment was conducted at Vegetable Research Farm, Department of Horticulture, Collage of Agriculture JNKVV, Jabalpur (M. P.) during *Kharif* in 2011 to the study correlation and path co-efficient analysis of quantitative traits in okra [*Abelmoschus esculentus* (L.) Moench].The experiment was laid out in Randomized Complete Block Design with 3 replications. Each entry was sown in two rows of 3 meters length with a spacing of 70 x 30 cm row to row and plant to plant. Randomly marked ten plants from each plot were taken for recording observation on twenty two characters *viz.,* number of locules fruit^{-1},100 seed weight (g), leaf blade length (cm), node at first flower appears, fruit yield plant^{-1}, fruit length (cm), leaf blade width (cm), number of fruit plant^{-1}, number of seeds fruit^{-1}, flower length (cm), petiole length (cm), Internodal length (cm), fruiting span, Incidence of yellow vein mosaic virus, fruit diameter (mm), number of branches plant^{-1}, stem diameter, days to 50 % flowering, fruit weight (g), days to maturity, flower diameter (mm), plant height (cm). The variance components and co-efficient of variation were determined according to Burton (1952). Correlation coefficients were calculated for all quantitative character combinations at phenotypic, genotypic and environmental levels by the formula given by Miller *et al.,* (1958) and path co-efficient analysis developed by Wright (1921) and elaborated by Dewey and Lu (1959).

RESULTS AND DISCUSSION

Correlation analysis

Fruit yield is a complex quantitative trait and it generally depends on a number of other associated traits. Hence, yield can be improved by direct as well as indirect selection. To identify yield component characters, correlation is an important bio-metrical tool. Further, estimates of correlation at genotypic as well as at phenotypic levels is more informative. The result are presented in (Table1) and show that yield plant^{-1} had highly significant positive phenotypic correlation with *viz.,*number of fruits plant^{-1} (0.803), fruit diameter(0.376), fruit length (0.349), number of seeds fruit^{-1} (0.316), days to maturity (0.301), fruit weight (0.274) leaf blade width (0.219),100 seed weight (0.219), flower diameter (0.154), fruiting span (0.152), petiole length (0.151) and stem diameter (0.150). Highly negative non-significant association was observed with incidence of yellow vein mosaic virus (-0.389), days to 50 per cent flowering

Table 1: Estimates of genotypic, phenotypic and environmental coefficients of correlation among yield and its contributing characters in okra

		Stem diameter (cm)	No. of branches plant^{-1}	Internodal length (cm)	Petiole length (cm)	Leaf blade length (cm)	leaf blade width (cm)	Node at 1st flower appears	Flower length (cm)	Flower diameter (cm)	Fruit length (cm)
Plant height (mm)	G	0.2998	-0.2892	0.4604	0.5176	0.3006	0.3249	-0.3205	0.2618	0.492	0.4379
	P	0.1593*	-0.1157	0.2183**	0.2928***	0.1570*	0.1690*	-0.1629*	0.067	0.0767	0.2675***
	E	0.0428	0.0754	-0.024	0.111	0.0165	0.0078	0.0073	-0.1967	-0.1303*	0.1641
Stem diameter (mm)	G		0.3387	-0.0422	0.2424	0.2042	0.2224	0.0451	-0.0107	0.1591	0.1097
	P		0.2860***	-0.0235	0.2231**	0.1861*	0.1892*	0.0568	-0.0159	0.0383	0.0866
	E		0.061	0.0593	0.133	0.0977	-0.0015	0.1405	-0.0408	-0.1353*	-0.0339
No. of branches plant^{-1}	G			-0.2884	-0.1195	0.1877	0.0907	0.4297	0.0149	-0.0524	-0.3402
	P			-0.2254**	-0.0847	0.1910*	0.0815	0.3926***	0.0124	-0.01	-0.2771***
	E			0.0998	0.1307	0.2186*	0.0169*	0.1408	-0.0013	0.0613	0.1176
Internodal length	G				0.0021	-0.1465	-0.089	-0.1026	0.2207	0.2347	-0.0295
	P				0.0014	-0.1427	-0.0909	-0.1029	0.2104**	0.1671*	-0.0382
	E				-0.0029	-0.1205	-0.1116	-0.1117	0.1529	0.1086	-0.095
Petiole length (cm)	G					0.4238	0.342	-0.0886	0.223	0.0078	0.2407
	P					0.3553***	0.3024***	-0.0852	0.1969**	-0.0085	0.2303**
	E					-0.2008*	-0.0657*	-0.0553	0.0215	-0.049	0.1484*
Leaf blade length (cm)	G						0.7793	-0.1172	0.0858	-0.1306	0.0136
	P						0.7224***	-0.1054	0.0635	-0.0623	0.0126
	E						0.1627*	0.0091	-0.0952	0.0556	0.0045
leaf blade width (cm)	G							-0.3708	0.0216	-0.1059	0.0548
	P							-0.3341***	0.027	0.0763	0.0383
	E							0.0852	0.0729	-0.0605	-0.1209
Node at 1st flower appears	G								-0.0834	-0.2795	-0.2943
	P								-0.0687	-0.1735*	-0.2741***
	E								0.0487	-0.0347	-0.0863
Flower length	G									0.4113	-0.2562
	P									0.3207***	0.1616*
	E									-0.0168	0.0465
Flower diameter (cm)	G										0.0486
	P										0.1957**
	E										0.1135
Fruit yield plant^{-1}	G	0.1856	0.0289	-0.0282	0.1668	0.1266	0.2464	-0.3431	0.0877	0.2582	0.3924
	P	0.1505*	0.0208	-0.0485	0.1519*	0.1233	0.2199**	-0.3070***	0.0602	0.1540*	0.3496***
	E	-0.0507	-0.0369	-0.2026**	0.0191	0.0921	-0.0712	0.0862	-0.1550*	0.0061	-0.0402

(-0.319) and node at first flower appears (-0.307). It suggested that fruit yield per plant could be improved through selection based on these associated traits. Similarly with traits *viz.,* plant height with petiole length, fruit length and number of fruits plant^{-1}.Fruit length with number of fruits plant^{-1}, fruit diameter and number of seeds fruit^{-1}. Fruit diameter exhibited with number of fruit plant^{-1} and fruit weight, days to maturity, and number of seeds fruit^{-1} revealed positive associations. Fruit weight with 100 seed weight, days to maturity and number of seeds fruit^{-1}. Number of fruits plant^{-1}indicated significantly

Table 1: Cont.....

		Fruit diameter (mm)	No. of locules fruit^{-1}	Fruit weight (g)	No. of fruits plant^{-1}	No. of seeds fruit^{-1}	100 seed weight (g)	Days to 50 % flowering (days)	Fruiting span (days)	Days to maturity ('days)	Incidence of YVMV
Plant height (mm)	G	0.3833	-0.3558	0.3623	0.5057	0.1156	0.1178	-0.3943	0.1535	0.287	-0.3013
	P	0.1188	-0.1965**	0.1347	0.2672***	0.0454	0.0962	-0.1617*	0.0476	0.0961	-0.1843*
	E	-0.1514	-0.0585	-0.0776	0.0395	-0.0251	0.1324	0.0138	-0.0303	-0.0278	-0.1053
Stem diameter (mm)	G	0.198	0.2472	0.1552	0.0306	0.1482	-0.3758	-0.1887	0.2722	0.0986	-0.1218
	P	0.1405	0.2162**	0.1113	0.0447	0.0948	-0.2806***	-0.1041	0.2122**	0.0722	-0.098
	E	-0.0615	0.0572	-0.0329	0.1268	-0.1045	0.2291*	0.1066	0.0859	0.0268	-0.0099
No. of branches plant^{-1}	G	-0.3058	0.3935	-0.2229	-0.0966	-0.1641	-0.2855	0.4185	0.2483	-0.0767	0.2781
	P	-0.2372**	0.3477***	-0.2145**	-0.1063	-0.1176	-0.2381**	0.3015***	0.1323	-0.0465	0.2159**
	E	0.0398	0.0571	-0.1883	-0.173	0.0837	0.0625	-0.0145	-0.1686*	0.0162	-0.051
Internodal length	G	0.0636	-0.0656	0.0862	0.0948	-0.1368	0.1649	0.0912	-0.0459	0.0379	0.1713
	P	0.079	-0.032	0.0745	0.0848	-0.0745	0.1500*	0.0521	-0.0429	-0.0141	0.1407
	E	0.1458	0.1944**	0.0312	0.0197	0.2031*	0.0543*	-0.0608	-0.0409	-0.1447	0.0068
Petiole length (cm)	G	0.3614	-0.0885	0.1759	0.1783	0.0357	0.0408	-0.1558	0.2811	0.0152	-0.2441
	P	0.2686***	-0.0644	0.139	0.1694*	0.0102	0.0555	-0.1082	0.1964**	-0.0069	-0.2109**
	E	-0.1818*	0.1326	-0.0234	0.098	-0.1269	0.1738*	0.0431	-0.0393	-0.0746	-0.0452
Leaf blade length (cm)	G	0.1707	-0.0146	0.2793	0.0539	-0.0416	-0.1304	-0.2632	0.2112	0.2779	-0.3551
	P	0.1421	-0.0094	0.2074**	0.0423	-0.0676	-0.1284	-0.1881*	0.1254	0.1794*	-0.2897***
	E	0.0027	0.0357	-0.1278	-0.0563	-0.2198*	-0.1115*	0.055	-0.1442	-0.0555	0.0574
leaf blade width (cm)	G	0.2399	-0.0999	0.0597	0.2447	-0.0289	-0.1874	-0.3258	-0.1319	0.267	-0.5183
	P	0.1740*	-0.0997	0.0264	0.2112**	-0.0491	-0.1731*	-0.2112**	-0.0822	0.1814*	-0.4383***
	E	-0.2063**	-0.0982	-0.1623*	-0.1173	-0.1899*	-0.0343	0.2259*	0.0889*	-0.0281	0.0235
Node at 1st flower appears	G	-0.2005	0.029	-0.0721	-0.3828	-0.1952	-0.2074	0.5668	0.0541	-0.2275	0.4917
	P	-0.1739*	0.0371	-0.081	-0.3609***	-0.1736*	-0.1825*	0.4475***	0.0299	-0.1618*	0.4067***
	E	-0.0397	0.1176	-0.1485*	-0.1507*	-0.0563	0.0565	0.0807	-0.0568	-0.0147	-0.0879
Flower length	G	0.2454	0.4269	-1256	0.1374	-0.0055	0.1866	0.0119	0.0696	-0.1558	0.0259
	P	-0.1264	-0.1397	-0.1182	0.1184	0.0065	0.1753*	0.0332	0.0457	-0.1265	0.0278
	E	0.0366	-0.003	-0.0935	-0.0146	0.0633	0.0977	0.1069	-0.0175	-0.0824	0.0371
Flower diameter (cm)	G	0.3269	0.3886	0.2307	0.2561	0.2296	0.3919	-0.1648	0.262	0.1256	0.0004
	P	-0.0772	0.0551	0.121	0.0865	0.0998	0.2011**	-0.1048	0.0855	0.0898	-0.0506
	E	0.0881	0.1156	-0.0057	-0.2471	-0.0735	-0.1084	-0.0495	-0.0805	0.0617	-0.1404
Fruit length (cm)	G	0.4113	-0.2562	0.2454	0.4269	0.3974	0.1321	-0.3446	0.2661	0.1515	-0.3684
	P	0.3305***	-0.2389**	0.1905*	0.3965***	0.3279***	0.1259	-0.2530***	0.1895*	0.0903	-0.3048***
	E	-0.0601	-0.0948	-0.0557	0.1472	-0.0341	0.0747	0.0317	-0.0231	-0.0609	0.0225
Fruit diameter (mm)	G		0.0486	0.3269	0.3886	0.1711	0.1392	-0.2945	-0.0398	0.2064	-0.3485
	P		0.0473	0.2617***	0.3134***	0.1617*	0.1165	-0.2601***	-0.0109	0.1805*	-0.2427**
	E		0.0453	0.058	-0.0564	0.1287	0.0068	-0.1865*	0.0531	0.1474*	0.1291
No. of locules fruit^{-1}	G			0.0213	-0.2234	0.1446	0.0344	0.1696	0.3566	0.2395	0.1678
	P			0.0162	-0.2139**	0.1181	0.0312	0.1068	0.2338**	0.1367	0.135
	E			-0.0074	-0.133	-0.0239	0.0042	-0.1101	-0.1358	-0.1299	-0.0403
Fruit weight (g)	G				0.134	0.3985	0.4257	-0.1416	0.319	0.3995	-0.3443
	P				0.1231	0.2970***	0.3487***	-0.1901*	0.1846*	0.3132***	-0.2632***
	E				0.0831	-0.0389	0.0078	-0.3047*	"0.0904	0.1787*	0.0033
No. of fruits plant^{-1}	G					0.1417	0.2293	-0.3437	0.0442	0.2766	-0.5552
	P					0.1203	0.2205**	-0.2585***	0.028	0.1953**	-0.4667***
	E					0.0081	0.1466*	0.0046	-0.0211	0.0209	-0.0049
No. of seeds fruit^{-1}	G						0.0654	-0.5386	0.2669	0.2843	-0.3408
	P						0.0674	-0.3769***	0.1647*	0.1670*	-0.2660***
	E						0.0833	0.0192	-0.0661	-0.0552	0.0138
100 seed weight (g)	G							0.0212	0.1247	0.292	-0.0998
	P							0.0241	0.0484	0.2199**	-0.0809
	E							0.0411	-0.2072*	0.0837*	0.0191
Days to 50 % flowering (days)	G								0.0367	-0.0869	0.5315
	P								-0.0083	-0.1095	0.3441***
	E								-0.0813	-0.1429	-0.117
Fruiting span (days)	G									0.2304	-0.0159
	P									0.1186	0.0413
	E									-0.0267	0.1793
Days to maturity (days)	G										-0.3752
	P										-0.2817***
	E										-0.1233
Fruit yield plant^{-1}	G	0.4448	-0.0129	0.304	0.8793	0.3674	0.2534	-0.412	0.1933	0.3943	-0.4718
	P	0.3767***	0.0009	0.2742***	0.8033***	0.3164***	0.2195**	-0.3195***	0.1526*	0.3019***	-0.3892***
	E	0.0276	0.1331	0.1606*	0.0932	0.0323	-0.0964	-0.0298	0.0508	0.1347	0.0807

** Significant at p = 0.01 , * Significant at p = 0.05

positive relationship with hundred seed weight and days to maturity, similar results have been reported by Bhalekar *et al.* (2005) Verma *et al.* (2007), Balakrishnan and Sreenivasan (2010), Adiger *et al.* (2011), Sanjay Kumar *et al.* (2012), Prasad *et al.* (2013), Balai *et al.* (2014) and Rai *et al.* (2014).

Plant height, stem diameter, flower length and petiole length revealed positively non-significant association with number of seeds fruit^{-1}. While, number of locules fruit^{-1},100 seed weight, leaf blade length, fruit yield plant^{-1}, fruit length, leaf blade width, number of fruit plant^{-1}, number of seeds fruit^{-1}, fruiting span, incidence of yellow vein mosaic virus, fruit diameter, days to 50 % flowering, fruit weight, days to maturity and flower diameter revealed negative non-significant association at phenotypic level. This indicates these yield contributing traits are independent to each another and they could be selected separately for seed yield. Akinyele and Osekita (2006) also reported that non-significant genotypic correlation between 100 seeds weight and number of seeds pod^{-1}. The correlation results indicated that there was a close relation between phenotypic and genotypic correlation co-efficient in most of the characters, thus indicating that environmental influences does not play an significant role in the expression of quantitative traits. It is indicating that effect of environment on the expression of the genotype leading to decrease phenotypic expression.

Path co-efficient analysis

Akinyele and Osekita (2006) estimated that high positive direct effects of number of pods plant^{-1} on seed yield in okra. Adiger *et al.* (2011) reported that fruit weight had highest direct effect towards fruit yield followed by number of fruits plant^{-1}. Chaukhande *et al.* (2011) also observed that number of fruits plant^{-1} exhibited maximum direct effect followed by average weight of fruit on yield plant^{-1}. Kumar *et al.* (2012) also reported that fruit length and number of seeds plant^{-1} had high positive direct effect on fruit yield. Reddy *et al.* (2013) reported that fruit weight and number of fruits plant^{-1} had positive high direct effect on pod yield plant^{-1}.

The estimates of path coefficients for yield attributing traits and fruit quality on fruit yield are furnished in (Table 2). The phenotypic path coefficient analysis of different yield contributing and associated traits on fruit yield plant^{-1} revealed that traits *viz.*, number of fruits plant^{-1} recorded high estimate of positive direct effect followed by number of seeds fruit^{-1}, branches plant^{-1}, fruit diameter, This suggested that these characters were main determinant, an increase in these traits might be increase fruit yield plant^{-1}. The magnitude of residual effect at genotypic level was recorded to be very low (0.488). The results are in close harmony with Akinyele and Osekita (2006), Verma *et al.* (2007), Mehta *et al.* (2006), Akinyele and Osekita (2011), Prasad *et al.* (2013) and Rai *et al.* (2014). While, the negative direct effect were also negligible for node at first flower appears, fruit length and internodal length.

Number of fruit plant^{-1}showed high positive direct effect on fruit yield plant^{-1}, its indirect effects through fruit length was moderate for fruit diameter while it was negligible via plant height, 100 seed weight, days to maturity, fruit weight, number of seeds fruit^{-1}, internodal length, stem diameter and fruiting span were positive, it seem to be primary yield contributing characters and could be relied upon for selection of parents

Table 2: Estimates of path coefficients analysis showing direct and indirect effect on fruit yield plant^{-1} in okra

Character	Plant height (cm)	Stem diameter (cm)	No. of branches plant^{-1}	internodal length (cm)	Node at 1st flower appears	Fruit length (cm)	Fruit diameter (cm)	Fruit weight (g)	No. of fruit plant^{1}	No. of seed fruit^{1}	100 seed weight (g)	Fruiting span	Days to maturity
Plant height (cm)	0.0233	0.0037	-0.0027	0.0051	-0.0038	0.0062	0.0028	0.0031	0.0062	0.0013	0.0024	0.0011	0.0022
Stem Diameter (mm)	0.0044	0.0277	0.0079	-0.0007	0.0016	0.0024	0.0039	0.0031	0.0012	0.0036	-0.0081	0.0059	0.0020
No. of Branches plant^{-1}	-0.0170	0.0421	0.1472	-0.0332	0.0578	-0.0408	-0.0349	-0.0316	-0.0156	-0.0121	-0.0343	0.0195	-0.0069
Internodal length (cm)	-0.0211	0.0023	0.0218	-0.0966	0.0099	0.0037	-0.0076	-0.0072	-0.0082	0.0095	-0.0148	0.0041	0.0014
Node at ^{1}st flower appears	0.0084	-0.0029	-0.0203	0.0053	-0.0518	0.0142	0.0090	0.0042	0.0187	0.0083	0.0089	-0.0015	0.0084
Fruit length (cm)	-0.0186	-0.0060	0.0193	0.0027	0.0191	-0.0695	-0.0230	-0.0132	-0.0276	-0.0242	-0.0081	-0.0132	-0.0063
Fruit diameter (mm)	0.0158	0.0187	-0.316	0.0105	-0.0232	0.0440	0.1332	0.0348	0.0417	0.0171	0.0163	-0.0014	0.0240
Fruit weight (g)	0.0132	0.0109	-0.0210	0.0073	-0.0079	0.0186	0.0256	0.0977	0.0120	0.0266	0.0334	0.0180	0.0306
No. of fruit plant^{1}	0.1958	0.0328	-0.0779	0.0621	-0.2646	0.2907	0.2297	0.0902	0.7330	0.0760	0.1517	0.0206	0.1432
No. of seeds fruit^{1}	0.0094	0.0214	-0.0136	-0.0163	-0.0267	0.0576	0.0212	0.0451	0.0172	0.1655	0.0009	0.0331	0.0256
100 seed weight (g)	0.0057	-0.0163	-0.0130	0.0085	-0.0096	0.0065	0.0068	0.0191	0.0116	0.0003	0.0559	0.0031	0.0121
Fruiting span	0.0027	0.0120	0.0075	-0.0024	0.0017	0.0107	-0.0006	0.0104	0.0016	0.0113	0.0032	0.0564	0.0067
Days to maturity	0.0057	0.0042	-0.0027	-0.0008	-0.0095	0.0053	0.0106	0.0184	0.0115	0.0091	0.0128	0.0070	0.0588
Fruit yield plant^{1} (g)	0.2277	0.1505	0.0208	-0.0485	-0.3070	0.3496	0.3767	0.2742	0.8033	0.2924	0.2202	0.1526	0.3019
Partial R^2	0.0053	0.0042	0.0031	0.0047	0.0159	-0.0243	0.0502	0.0268	0.5889	0.0484	0.0123	0.0086	0.0178

R square = 0.7617, Residual effect = 0.488

genotypes to improve genetic yield potential of okra.

Number of seeds fruit^{-1}expressed low positive direct effect on fruit yield plant^{-1}, It also showed negligible positive indirect effects through fruit length, fruit weight, fruiting span, days to maturity, stem diameter, fruit diameter, number of fruits plant^{-1}, plant height and 100 seed weight. Whereas, negative indirect effects via number of branches, internodal length and node at 1st flower appears were also negligible, these results are conformity with the observation of workers Das and Mehra (1995), Chandra Deo *et al.* (1996), Magar and Madrap (2009), Simon *et al.* (2013b).

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