Society of Krishi Vigyan
www.iskv.in

J Krishi Vigyan 2025, 13(2) : 384-390

DOI: 10.5958/2349-4433.2025.00070.9

ISSN 2319-6432 (Print)
ISSN 2349-4433 (Online)

Genotypic and Phenotypic Correlation Analysis for Important Quantitative Characteristics in Okra Cultivars

Udit Joshi[1*], D K Rana[2], Yogesh Kumar[3], Arun Prakash[4] and Kamlesh Kumar Yadav[5]

Department of Vegetable Science,
Govind Ballabh Pant University of Agriculture and Technology, Udham Singh Nagar, Pantnagar, 263145, (Uttarakhand), India

ABSTRACT

Okra is grown all over the world during spring-summer season. Estimations based on interrelations among yield related characters are crucial in order to understand the selection process ultimately improving yield during breeding programme. Therefore, the present research was undertaken during *Kharif* 2019 using 26 different cultivars to examine the degree to which various yields and its linked traits are related to one another at the H.N.B. Garhwal University Srinagar (Garhwal) Pauri Garhwal Uttarakhand. The data regarding correlation study revealed that the at both the phenotypic as well as genotypic levels, the average weight of fruit, fruits per plant, petiole length, diameter of fruit, seed index, length of fruit and moisture content were all significantly and positively associated with yield. Whereas, pedicel length, length of leaf, epicalyx segments, chlorophyll content, plant height, nodes at first flowering, internodal length, number of ridges per fruit, primary branches per plant, days taken to first fruit harvest, days taken to first flowering and days taken to first fruit set showed negative correlation. Finally, it might be summed up that the selections based on positively associated traits might prove to be more advantageous during mapping out the selection processes in crop improvement plans in okra.

Keywords: Cultivars, Crop improvement, Correlation, Okra, Vegetable, Yield.

INTRODUCTION

Okra [*Abelmoschus esculentus* L. (Moench.)] is a spring-summer season vegetable crop grown in varied climatic conditions all over the world for its tender fruits (Reddy *et al,* 2013; Ray *et al,* 2022). The fact that okra is considered to be a crop that is often cross-pollinated and has monoadelphous stamens, huge flowers that can be emasculated, and a high seed yield when pollinated by hand make it an intriguing crop for geneticists (Kumari *et al,* 2019; Joshi *et al,* 2021). Several commercial hybrids and varieties of okra crop are available in the local and international seed markets, however, most of them cannot be considered amenable for cultivation in each and every growing region which becomes a cause of difficulty for the farmers (Kumar and Joshi, 2024). In order to improve certain traits related to the yield and allied traits, the knowledge on the variability at genetic level along with the inter-relationship among various parameters are very crucial (Sharma and Prasad, 2015; Joshi *et al,* 2020). For any selection strategy, it would be advantageous to consider the proportionate degree of association between various traits and yield (Raval *et al,* 2017). Hence, in the present research programme using the correlation studies, an investigation into the relationships between multiple attributes related to the several yield and allied traits and the final yield and productivity of fruits in the cultivars and genotypes under present investigation was undertaken.

MATERIALS AND METHODS

The current inquiry was conducted at the H.R.C., Horticulture Department, H.N.B.G.U., Srinagar (Garhwal), Uttarakhand, India for studying the relation between different quantitative characters during the summer season, 2019. During the experiment, 25 diverse genotypes of okra *viz.,* Arka Anamika (check), Varsha Uphar, Hisar Naveen, Lucky-666, Punjab-8, Kashi Pragati, Kashi Kranti,

Corresponding Author's Email - uditjoshi444@gmail.com
2Department of Horticulture, H.N.B.G.U., Srinagar (Garhwal), Pauri Garhwal, 246174, (Uttarakhand), India
3Department of Agriculture, M.J.P.R.U., Bareilly, 243006, (Uttar Pradesh), India
4Depratment of Food Technology, D.B.U.U., Dehradun, 248007, (Uttarakhand), India
5Department of Horticulture, S.K.N.A.U., Jobner, 303329, (Rajasthan), India

Table 1: Genotypic and phenotypic correlation coefficients among growth and yield parameters of okra.

Characters		2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	26
1	G P	-0.372** -0.244*	-0.203 -0.151	-0.577** -0.337**	-0.252* -0.164	-0.212 -0.190	-0.118 0.002	0.371** -0.020	0.310** 0.212	0.148 0.186	-0.213 -0.331**	0.364** 0.237*	-0.166 -0.102	0.234* 0.068	-0.377** -0.216	0.078 -0.058	-0.074 -0.067
2	G P		0.128 0.125	0.616** 0.599**	0.183 0.167	-0.214 -0.136	-0.028 -0.032	-0.021 -0.015	-0.171 -0.161	0.053 0.033	0.284* 0.187	-0.214 -0.211	-0.480** -0.379**	-0.517** -0.428**	-0.122 -0.084	-0.238* -0.149	-0.428** -0.416**
3	G P			0.356** 0.330**	0.262* 0.252*	-0.520** -0.377**	0.021 0.044	0.074 0.033	0.030 0.033	0.764** 0.604**	0.684** 0.463**	0.120 0.110	-0.125 -0.100	-0.036 -0.031	-0.305** -0.153	-0.466** -0.325**	-0.594** -0.567**
4	G P				-0.034 -0.032	-0.270* -0.175	0.097 0.055	0.052 -0.009	0.013 -0.006	0.224* 0.163	0.514** 0.319**	-0.410** -0.379**	-0.597** -0.477**	-0.436** -0.390**	-0.231* -0.184	-0.053 -0.038	-0.514** -0.496**
5	G P					0.163 0.123	0.079 0.073	0.208 0.007	-0.358** -0.327**	0.190 0.126	0.512** 0.283*	0.423** 0.389**	0.029 0.061	0.163 0.134	0.331** 0.163	-0.029 -0.042	0.113 0.093
6	G P						0.054 0.071	0.060 0.004	-0.088 -0.118	-0.295** -0.231*	-0.015 -0.052	0.144 0.096	0.520** 0.274*	0.415** 0.204	0.443** 0.198	0.364** 0.218	0.253* 0.194
7	G P							0.164 -0.056	-0.285* -0.161	-0.123 -0.038	0.030 -0.041	0.174 0.137	-0.147 -0.143	0.364** 0.092	0.272* 0.083	-0.165 -0.169	0.023 -0.005
8	G P								0.076 0.004	0.241* 0.110	-0.095 0.141	0.277* 0.119	-0.139 -0.024	0.556** 0.150	-0.115 0.208	-0.140 -0.197	-0.244* -0.120
9	G P									-0.013 0.025	-0.279* -0.146	0.008 -0.006	-0.260* -0.186	-0.175 -0.105	-0.563** -0.270*	-0.185 -0.093	-0.242* -0.212
10	G P										0.740** 0.496**	0.276* 0.205	-0.099 -0.087	-0.066 -0.100	-0.154 -0.068	-0.328** -0.283*	-0.695** -0.558**
11	G P											-0.004 -0.023	-0.327** -0.168	-0.136 -0.097	-0.081 0.183	-0.032 0.033	-0.450** -0.280*
12	G P												0.230* 0.166	0.518** 0.396**	0.185 0.089	-0.107 -0.058	0.073 0.068
13	G P													0.465** 0.350**	0.258* 0.161	0.311** 0.216	0.494** 0.395**
14	G P														0.261* 0.163	0.329** 0.266*	0.319** 0.257*
15	G P															0.010 0.079	0.496** 0.312**
16																	0.649** 0.482**

Kashi Vibhuti, Chanda, Hisar Unnat, LC-1, Kashi Mohini, LC-3, Kaveri, King Bhindi, LC-6, Parbhani Kranti, Pusa Sawani, Pusa A-4, LC-2, Super Anamika, VL Bhindi-2, LC-5, Vandana-241, LC-4 and Agri Bahar were evaluated. Three replications of each genotype were included in the Randomized Complete Block Design (RCBD) experiment setup. Each variety or cultivar or genotype every replication were evaluated (data collected) using five randomly selected and tagged plants. The observations noted were internodal length (cm), number of primary branches per plant, plant height (cm), days taken to first germination, stem girth (mm), petiole diameter (mm), petiole length (cm), flower diameter (cm), number of epicalyx segments, leaf length (cm), days taken to first flowering, number of fruits per plant, fruit length (cm), number of nodes at flowering, fruit diameter (mm), average fruit weight (g), number of ridges per fruit, pedicel diameter (mm), number of seeds per fruit, pedicel length (cm), days taken to first fruit set, flesh thickness (mm), days taken to first fruit harvest, seed index, yield per hectare (q), yield per plot (kg), T.S.S (^{0}Brix), chlorophyll content (SPAD), ascorbic acid (mg/100g), ash content, moisture content and physiological loss (days). After collecting data, the mean was calculated, and the mean data was analyzed statistically by various methods. The ANOVA and C.D test at 5% and 1% level of significance was applied as given by Panse and Sukhatme (1967) for the study of the significance of variation among the treatments. Using formulas provided by Al-Jibouri *et al.* (1958) the phenotypic and genotypic correlation coefficient was calculated.

Table 2: Genotypic and phenotypic correlation coefficients among seed, yield and quality parameters of okra

Characters		17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
1	G P	0.496** 0.293**	0.153 0.136	0.203 0.037	0.140 0.159	0.074 0.142	0.311** 0.154	-0.295** -0.209	0.380** 0.149	-0.074 -0.068	-0.074 -0.067	-0.043 -0.024	0.066 0.049	0.837** 0.120	0.175 0.159	-0.137 -0.025	0.037 -0.009
2	G P	-0.054 -0.041	0.138 0.128	-0.588** -0.458**	0.129 0.117	0.061 0.059	-0.387** -0.285*	-0.021 -0.027	-0.003 0.014	-0.428** -0.416**	-0.428** -0.416**	0.098 0.096	0.409** 0.353**	0.469** 0.230*	0.036 0.014	0.018 0.024	0.036 0.046
3	G P	0.607** 0.541**	0.408** 0.380**	-0.217 -0.182	0.763** 0.675**	0.826** 0.677**	0.056 0.032	0.543** 0.497**	-0.469** -0.343**	-0.593** -0.566**	-0.594** -0.567**	0.487** 0.453**	-0.077 -0.054	0.048 0.035	0.110 0.104	-0.102 -0.094	-0.274* -0.245*
4	G P	0.024 -0.003	0.214 0.193	-0.297** -0.227*	0.223* 0.197	0.242* 0.186	-0.373** -0.252*	0.142 0.124	-0.024 -0.041	-0.513** -0.495**	-0.514** -0.496**	0.288* 0.256*	-0.019 -0.004	-0.030 -0.046	-0.290* -0.236*	-0.343** -0.252*	0.028 0.026
5	G P	0.267* 0.246*	0.634** 0.557**	-0.249* -0.132	0.199 0.163	0.259* 0.188	0.129 0.082	0.314** 0.281*	-0.104 -0.060	0.113 0.093	0.113 0.093	0.173 0.160	0.132 0.103	0.226* 0.128	0.231* 0.181	0.000 0.011	-0.306** -0.252*
6	G P	-0.395** -0.300**	-0.099 -0.064	0.451** 0.281*	-0.322** -0.191	-0.346** -0.182	0.309** 0.222	-0.055 -0.037	0.108 0.196	0.252* 0.193	0.253* 0.194	-0.556** -0.372**	0.222 0.090	-0.344** -0.097	0.067 -0.051	-0.262* -0.054	-0.247* -0.105
7	G P	0.231* 0.148	-0.103 -0.043	0.362** 0.130	-0.168 -0.121	-0.152 -0.068	0.124 0.062	0.149 0.091	0.120 0.087	0.023 -0.005	0.023 -0.005	-0.324** -0.241*	-0.312** -0.170	-0.192 -0.138	0.015 -0.010	-0.213 -0.167	0.195 0.153
8	G P	0.233* 0.006	0.177 0.026	0.672** 0.215	0.305** 0.111	0.287* 0.060	0.311** 0.015	0.298** 0.144	0.274* 0.056	-0.243* -0.121	-0.244* -0.120	-0.381** -0.141	0.288* 0.152	0.508** 0.360**	0.058 0.047	-0.082 -0.084	-0.153 -0.158
9	G P	0.006 0.047	-0.190 -0.171	0.320** 0.182	0.099 0.049	0.137 0.064	0.166 0.150	0.032 0.024	-0.252* -0.180	-0.243* -0.213	-0.242* -0.212	-0.102 -0.087	0.026 0.055	-0.277* -0.177	-0.041 -0.044	0.163 0.092	0.030 -0.001
10	G P	0.740** 0.514**	0.498** 0.390**	-0.066 -0.106	1.002** 0.844**	1.022** 0.822**	-0.056 0.020	0.460** 0.281*	-0.291** -0.161	-0.695** -0.558**	-0.695** -0.558**	0.476** 0.404**	-0.135 -0.046	0.251* 0.042	0.298** 0.209	-0.411** -0.257*	-0.376** -0.308**
11	G P	0.256* 0.092	0.472** 0.328**	0.024 -0.013	0.605** 0.361**	0.698** 0.379**	-0.133 -0.105	0.472** 0.280*	-0.187 -0.095	-0.449** -0.279*	-0.450** -0.280*	0.549** 0.361**	0.144 0.050	0.028 -0.017	0.082 -0.036	-0.380** -0.324**	-0.454** -0.373**
12	G P	0.463** 0.410**	0.325** 0.316**	0.097 0.077	0.282* 0.272*	0.348** 0.308**	0.185 0.113	0.540** 0.501**	0.011 0.006	0.073 0.068	0.073 0.068	0.100 0.090	0.151 0.135	0.106 0.020	0.556** 0.445**	0.119 0.068	-0.056 -0.057
13	G P	-0.176 -0.150	-0.232* -0.206	0.033 0.038	-0.007 -0.035	-0.058 -0.070	0.323** 0.235*	-0.053 -0.039	0.066 0.025	0.494** 0.395**	0.494** 0.395**	-0.316** -0.237*	-0.285* -0.153	-0.420** -0.167	0.273* 0.169	0.442** 0.265*	-0.174 -0.126
14	G P	0.196 0.200	0.306** 0.238*	0.549** 0.375**	-0.105 -0.124	-0.072 -0.082	0.710** 0.399**	0.189 0.125	0.319** 0.167	0.319** 0.257*	0.319** 0.257*	-0.229* -0.178	0.130 0.032	-0.096 -0.036	0.222 0.107	0.092 0.089	-0.338** -0.237*
15	G P	-0.295** -0.247*	-0.071 -0.100	0.156 0.086	-0.174 -0.137	-0.069 -0.106	-0.124 -0.155	0.414** 0.203	0.620** 0.317**	0.496** 0.312**	0.496** 0.312**	0.210 0.162	0.191 0.014	-0.458** 0.128	0.192 0.053	0.336** 0.002	-0.221 -0.170
16	G P	-0.535** -0.306**	0.057 0.021	-0.080 -0.001	-0.352** -0.323**	-0.381** -0.273*	-0.004 0.060	-0.300** -0.184	0.372** 0.228*	0.649** 0.482**	0.649** 0.482**	-0.096 -0.040	-0.134 -0.092	-0.343** -0.126	-0.023 -0.018	-0.001 -0.035	0.025 0.034
17	G P		0.586** 0.510**	-0.012 0.018	0.673** 0.540**	0.697** 0.475**	0.212 0.084	0.230* 0.184	-0.247* -0.132	-0.545** -0.474**	-0.545** -0.475**	0.211 0.162	-0.183 -0.148	0.229* 0.110	0.150 0.130	-0.427** -0.268*	-0.223* -0.154
18	G P			-0.203 -0.216	0.447** 0.404**	0.498** 0.422**	0.304** 0.232*	0.221 0.180	0.084 0.029	-0.269* -0.244*	-0.269* -0.244*	0.489** 0.428**	0.213 0.170	0.468** 0.146	0.143 0.127	-0.283* -0.215	-0.440** -0.418**
19	G P				-0.263* -0.166	-0.229* -0.132	0.465** 0.209	0.005 0.033	0.010 0.027	0.042 0.034	0.042 0.034	-0.447** -0.338**	-0.030 -0.046	-0.541** -0.034	-0.180 -0.137	-0.336** -0.160	-0.215 -0.110
20	G P					1.002** 0.937**	-0.015 -0.025	0.392** 0.323**	-0.238* -0.158	-0.666** -0.614**	-0.666** -0.614**	0.424** 0.380**	-0.011 -0.013	0.396** 0.107	0.305** 0.245*	-0.267* -0.155	-0.343** -0.277*

Characters		17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
21	G P						-0.006 0.001	0.536** 0.388**	-0.260* -0.139	-0.654** -0.566**	-0.654** -0.566**	0.551** 0.461**	0.004 -0.006	0.364** 0.046	0.378** 0.252*	-0.248* -0.087	-0.347** -0.269*
22	G P							0.054 0.116	0.085 0.030	0.003 -0.013	0.004 -0.013	-0.340** -0.242*	0.019 0.060	0.062 -0.087	0.208 0.209	0.332** 0.130	-0.186 -0.168
23	G P								-0.240* -0.194	-0.198 -0.166	-0.198 -0.167	0.399** 0.343**	0.098 0.120	-0.262* -0.127	0.373** 0.352**	0.140 0.078	0.015 0.029
24	G P									0.265* 0.252*	0.265* 0.252*	0.107 0.080	0.250* 0.148	0.498** 0.130	0.004 -0.039	0.242* 0.169	-0.320** -0.183
25	G P										1.000** 1.000**	-0.195 -0.190	-0.174 -0.157	-0.381** -0.204	-0.098 -0.065	0.383** 0.292**	0.180 0.162
26	G P											-0.195 -0.190	-0.175 -0.157	-0.382** -0.204	-0.098 -0.064	0.383** 0.292**	0.180 0.163
27	G P												0.200 0.151	0.133 0.110	0.173 0.106	0.066 0.061	-0.246* -0.184
28	G P													0.777** 0.225*	0.260* 0.254*	0.288* 0.164	-0.109 -0.099
29	G P														0.049 -0.050	0.011 -0.002	-0.097 -0.036
30	G P															0.493** 0.215	0.103 0.088
31	G P																0.087 0.038
32	G P																1.000 1.000

1- Days taken to first germination, 2- Plant height, 3- Number of primary branches per plant, 4- Internodal length, 5- Stem girth, 6- Petiole length, 7- Petiole diameter, 8- Leaf length, 9- Number of epicalyx segments, 10- Days taken to first flowering, 11- Number of nodes at first flowering, 12 -flower diameter, 13- Fruit length, 14- Fruit diameter, 15- Average fruit weight, 16- Number of fruits per plant, 17- Number of ridges per fruit, 18- Pedicel length, 19- Pedicel diameter, 20- Days taken to first fruit set, 21- Days taken to first fruit harvest, 22- Flesh thickness, 23- Number of seeds per fruit, 24- Seed index , 25- Yield per plot, 26- Yield per hectare, 27- Total soluble solids, 28- Ascorbic acid, 29- Chlorophyll content, 30- Ash content, 31- Moisture content and 32- Physiological loss.

RESULTS AND DISCUSSION

Determination of the correlation coefficient at genotypic and phenotypic levels

The data (Tables 1 and 2) showed the correlation coefficients for 32 distinct traits that were calculated at the genotypic and phenotypic levels for all potential combinations of yield and the corresponding attributing characters. In the current study, the genotypic level correlation coefficient had a larger magnitude than the phenotypic level correlation coefficient. Differences between their magnitudes were less in value, which was likewise highlighted by Nwangburuka *et al* (2012), Reddy *et al* (2013), Nirosha *et al* (2014), Umrao *et al* (2015) and Kumar and Joshi (2024) in their research on okra crop.

Correlation of yield with other traits

The present investigation revealed that yield per plot possesses a strong positive correlation with the number of fruits per plant (0.649 and 0.482), fruit weight (0.496 and 0.257), fruit length (0.494 and 0.395), moisture content (0.383 and 0.292) and fruit diameter (0.319 and 0.257) at 1% level of significance while, seed index (0.265 and 0.252) and petiole length (0.252 and 0.193) were positively significant at both the genotypic and phenotypic levels at the 5% level of significance. It had non-significant positive correlation with physiological loss (0.180 and 0.162), stem girth (0.113 and 0.093), flower diameter (0.073 and 0.068), pedicel diameter (0.042 and 0.034), petiole diameter (0.023 and -0.005) and flesh thickness (0.003 and -0.013) which was similar to the results of Koundinya *et al* (2013), Balai *et al* (2014), Prajna and Gasti (2015), Ahamad *et al* (2015) and Raval *et al* (2019) in okra. Days taken to first germination (-0.074 and -0.067), ash content (-0.098 and -0.065), ascorbic acid (-0.174 and -0.157), total soluble solids (-0.195 and -0.190) and the number of seeds per fruit (-0.918 and -0.166) showed a negative correlation with yield per plot that was not statistically significant. Pedicel length (-0.269

and -0.244), leaf length (-0.244 and -0.120) and number of epicalyx segments (-0.242 and -0.120) had a highly significant negative correlation with yield per plot at 5% level of significance while, chlorophyll content (-0.381 and -0.204) had negative correlation with yield which is opposite to the findings of Nagre *et al* (2011) and Sawant *et al* (2014) in okra which might be explained by the fact that in the present investigation, data for chlorophyll content was taken in later stages of plant growth and findings shows that the negative correlation between chlorophyll content and yield indicated towards reduced metabolic activity of plant as it grows older. Plant height (-0.428 and -0.416), number of nodes at first flowering (-0.449 and -0.279), internodal length (-0.513 and -0.495), number of ridges per fruit (-0.545 and -0.244), number of primary branches per plant (-0.593 and -0.566), days taken to first fruit harvest (-0.654 and -0.566), days taken to first flowering (-0.695 and -0.558) and days taken to first fruit set (-0.666 and -0.614) showed a strong negative connection, both at the genotypic and phenotypic levels, with yield per plot at the 1% threshold of significance the outcomes were consistent with the conclusions of Nagre *et al* (2011), Koundinya *et al* (2013), Reddy *et al* (2013), Sawant *et al* (2014) and Pithiya *et al* (2017) in okra.

Inter association among important yield components

The information about inter-relation among yield components can be beneficial in the selection programme. According to Reddy *et al* (2013) and Deepanshu and Shamd (2017), inter-relation between yield traits should be estimated in the selection process.

Plant height

The plant height, at genotypic level was highly significant and positively associated with internodal length (0.616), chlorophyll content (0.469) and ascorbic acid (0.409) at 1% level of significance and number of nodes at first flowering (0.284) was positively significant at 5% level of significance. It had a non-significant positive correlation with stem girth (0.183), pedicel length (0.138), days taken to first fruit set (0.129), number of primary branches per plant (0.128), total soluble solids (0.098), days taken to first fruit harvest (0.061), days taken to first flowering (0.053), ash content (0.036), Physiological loss (0.036), and moisture content (0.018).Plant height had a non-significant negative correlation with seed index (-0.003), leaf length (-0.021), number of seeds per fruit (-0.021), petiole diameter (-0.028), number of ridges per fruit (-0.054), average fruit weight (-0.122), number of epicalyx segments (-0.171), petiole length (-0.214) and flower diameter (-0.214). highly significant negative correlation at 5% level of significance with the number of fruits per plant (-0.238) and 1% level of significance with flesh thickness (-0.387), yield per plot (-0.428), yield per hectare (-0.428), fruit length (-0.480), fruit diameter (-0.517) and pedicel diameter (-0.588) which was following the findings of Deepanshu and Shamd (2017) and Jonah and Kwaga (2019) in okra.

Number of fruits per plant

Genotypic correlation revealed that the number of fruits per plant was highly significant and positively correlated with yield per plot (0.649), yield per hectare (0.649) and seed index (0.372) at 1% level of significance, while a positive non-significant correlation was observed with physiological loss (0.025) and pedicel length (0.057). It had a negative non-significant correlation with moisture content (-0.001), flesh thickness (-0.004), ash content (-0.023), pedicel diameter (-0.080), total soluble solids (-0.096) and ascorbic acid (-0.134). The number of fruits per plant had highly significant negative correlation at 1% level of significance with the number of seeds per fruit (-0.300), chlorophyll content (-0.343), days taken to first fruit set (-0.352), days taken to first fruit harvest (-0.381) and the number of ridges per fruit (-0.535), which was following the findings of Adiger *et al* (2011), Nagre *et al* (2011), Koundinya *et al* (2013) and Nirosha *et al* (2014) in okra.

Yield

Yield per hectare, at genotypic level was highly significantly and positively correlated with moisture content (0.383) while it was non-significantly and positively correlated with physiological loss (0.180). which was similar with the findings of Balai *et al* (2014), Prajna and Gasti (2015) and Pithiya *et al* (2017) in okra. Yield per hectare, at phenotypic level was highly significantly and positively correlated with moisture content (0.292) while it was non-significantly and positively correlated with physiological loss (0.163). It was non-significantly and negatively associated with ash content (-0.064), ascorbic acid (-0.157), total soluble solids (-0.190) and chlorophyll content (-0.204), which was following the findings of Nirosha *et al* (2014), Sawant *et al* (2014) and Thulasiram *et al* (2017) in okra.

Ascorbic acid

Studies on ascorbic acid's genotypic correlation analysis indicated that it was highly significant and positively associated with chlorophyll content (0.777) at 1% level of significance and 5% level of significance with moisture content (0.288) and ash content (0.260). Ascorbic acid, at phenotypic level was highly significant and positively associated with chlorophyll content (0.225) and ash content (0.254) at 5% level of significance while the positive non-significant correlation with moisture content (0.164). Ascorbic acid had a non-significant negative correlation with physiological loss (-0.099). Earlier, workers like Nagre *et al* (2011), Balai *et al* (2014) and Nirosha *et al* (2014) also recorded similar observations for ascorbic acid in okra.

CONCLUSION

According to the results of the current study, the environment had less of an effect on phenotypic expression since the genotypic correlation coefficients were higher than the phenotypic correlation coefficients. The fruit length, fruit diameter, number of fruits per plant, seed index, fruit weight, moisture content and petiole length all were significantly correlated with the yield per plot at phenotypic and genotypic levels. This suggests that these traits are important for genetically improving the yield of okra through selection while pedicel length, leaf length, chlorophyll content, number of epicalyx segments, number of nodes at first flowering, plant height, internodal length, number of primary branches per plant, number of ridges per fruit, days taken to first flowering, days taken to first fruit harvest and days taken to first fruit set shown a highly significant negative association with yield per plot, suggesting that these attributes are not as important in the selection process for okra's yield-related genetic modification. Therefore, it might be concluded that the traits *viz.,* fruit weight, number of fruits per plant, fruit length, fruit diameter, moisture content, seed index and petiole length can be considered while designing breeding and selection processes for strong selection process.

ACKNOWLEDGEMENT

The authors would like to thank the faculty of Hemvati Nandan Bahuguna Garhwal University's Department of Horticulture in Srinagar (Garhwal), Uttarakhand, India, for their invaluable insights into the effective execution of the current study. The Horticultural Research Center staff members are likewise greatly appreciated by the authors for providing assistance in effectively laying out of the field experimental design.

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Received on 2/4/2025 *Accepted on 12/5/2025*