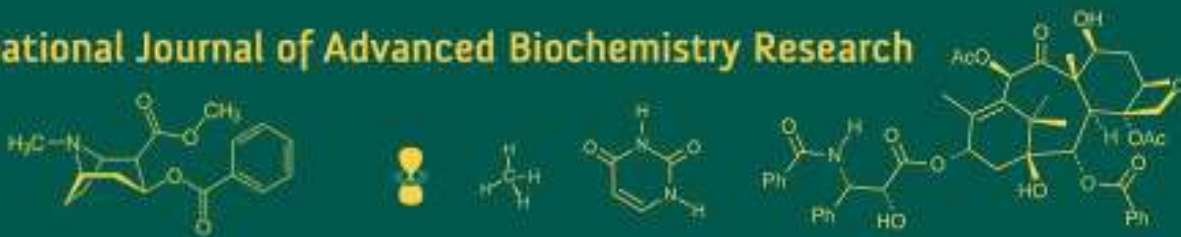


## International Journal of Advanced Biochemistry Research



ISSN Print: 2617-4693

ISSN Online: 2617-4707

IJABR 2024; SP-8(10): 1333-1338

[www.biochemjournal.com](http://www.biochemjournal.com)

Received: 02-08-2024

Accepted: 08-09-2024

**Satpute VD**

P.G Scholar, Department of Horticulture, College of Agriculture, Latur, VNMKV, Parbhani, Maharashtra, India

**Bele PD**

P.G Scholar, Department of Horticulture, VNMKV, Parbhani, Maharashtra, India

**Kharade MR**

Ph.D Scholar, Department of Horticulture, VNMKV, Parbhani, Maharashtra, India

**Nerkar AP**

Department of Genetics and Plant Breeding, Dr. PDKV, Akola, Maharashtra, India

**Gavhale KN**

P.G Scholar, Department of Horticulture, College of Agriculture, Latur, VNMKV, Parbhani, Maharashtra, India

**Malve MS**

P.G Scholar, Department of Dairy Science, RCSI College of Agriculture, Kolhapur, MPKV, Rahuri, Maharashtra, India

**Talhar AA**

P.G Scholar, Department of Horticulture, College of Agriculture, Latur, VNMKV, Parbhani, Maharashtra, India

**Sarvade PB**

P.G Scholar, Department of Horticulture, College of Agriculture, Latur, VNMKV, Parbhani, Maharashtra, India

**Corresponding Author:****Satpute VD**

P.G Scholar, Department of Horticulture, College of Agriculture, Latur, VNMKV, Parbhani, Maharashtra, India

## Correlation analysis of yield and yield-contributing traits in F<sub>4</sub> and F<sub>5</sub> generations in okra [*Abelmoschus esculentus* (L.) Moench]

Satpute VD, Bele PD, Kharade MR, Nerkar AP, Gavhale KN, Malve MS, Talhar AA and Sarvade PB

DOI: <https://doi.org/10.33545/26174693.2024.v8.i10Sp.2717>

**Abstract**

The present investigation was conducted at the experimental research farm of the Department of Horticulture, College of Agriculture, Latur, during the *rabi* season of 2022 (selfing) and the *kharif* season of 2023 (evaluation). The study aimed to explore the genetic characteristics of the F<sub>4</sub> and F<sub>5</sub> generations of Okra [*Abelmoschus esculentus* (L.) Moench] derived from three crosses, employing a Randomized Block Design with two replications. Correlation coefficient analysis showed that fruit yield per plant (kg) was significantly and positively correlated with the plant height, number of nodes per plant and days required for first picking at both phenotypic and genotypic levels in the F<sub>4</sub> and F<sub>5</sub> generations. Additionally, it was positively and significantly correlated with node at first flower appear at the both phenotypic and genotypic level in the F<sub>4</sub> generation. In the F<sub>5</sub> generation, it was positively and significantly correlated with fruit yield per plot and fruit yield per hectare at the both phenotypic and genotypic level in the F<sub>4</sub> and F<sub>5</sub> generations of the cross Kashi Pragati × Arka Abhay (C-1: P<sub>3</sub> × P<sub>1</sub>). These findings are detailed in Tables.

**Keywords:** GCV, PCV, genetic variability, heritability, correlation coefficient and genetic advance

**Introduction**

Okra (*Abelmoschus esculentus* [L.] Moench) is one of the most popular vegetables of the family Malvaceae, with a chromosome number 2n=130 has good nutritional value, particularly the high content of vitamin C (13 mg/100 g), calcium (66 mg/100 g) and iron (0.35 mg/100 g) in the edible fruit. Also rich in protein and minerals with about 88% moisture, 7.7% carbohydrate, 1.1% fiber, 0.7% mineral matter, 0.08% phosphorous and 41 (kcal) calorific values. The vitamin content is 58 IU vitamin A, 0.06 mg vitamin B, 0.06 mg Nicotinic acid and 0.06 mg Riboflavin. The tender fruits are consumed as cooked vegetable, mostly fresh but sometimes sun dried and frozen. It has also has been put to several domestic and medicinal uses. commercially cultivated in West Africa, India, South East Asia, Southern United States, Brazil and Turkey. In India, Uttar Pradesh, Assam, Bihar, Orissa, Maharashtra, West Bengal and Karnataka are the important okra producing states. Among the vegetables grown in India, okra occupies an area of 549 (000 Ha) with annual production of 7158 (000 MT) (Anon, 2023) <sup>[2]</sup>. In Maharashtra okra is grown in an area of 13.82 (000 ha) with production of 171.56 (000 MT) (Anon, 2023) <sup>[2]</sup>. It is a potential export earner, accounting for 13 percent of export of fresh vegetables.

**Materials and Methods**

Four okra genotypes along with seeds of F<sub>4</sub> progenies of cross Kashi Pragati × Arka Abhay (C-1: P<sub>3</sub> × P<sub>1</sub>) provided from the previous M.Sc. research work carried out at Instructional-cum Research Farm, Department of Horticulture, College of Agriculture, Latur were grown in a Randomized block design in *rabi* 2022 and selfed to obtained F<sub>5</sub> generation. The F<sub>4</sub> and F<sub>5</sub> generation of cross Kashi Pragati × Arka Abhay (C-1: P<sub>3</sub> × P<sub>1</sub>) were evaluated during *kharif* 2023. The experimental plot size was 14.8 m × 12 m and seed sown at 45 cm × 30 cm spacing between rows and plants randomized block design (RBD) for each cross. The recommended dose of fertilizer for okra is 20 tones FYM + 100:50:50 kg NPK per ha was applied.

The dose of FYM 20 tones per hectare and the 50 percent recommended dose of nitrogen (50 kg/ha) and full dose of phosphorus (50 kg/ha) and potassium (50 kg/ha) were incorporated in the soil at the time of sowing the crop. The remaining dose of 50 percent of nitrogen (50 kg/ha) was applied one month after sowing. The plant protection measures were applied as per recommendation. The gap filling and thinning was done.

Observations were made in F<sub>5</sub> generation on five randomly chosen plants from each progenies, and the mean value was used for statistical analysis for thirteen characters: The plant height (cm), inter nodal length (cm), number of branches per plant, node at which the first flower appeared, number of nodes per plant, number of days required to 50% flowering, days required for first picking, fruit length (cm), fruit diameter (mm), fruit weight (g), fruit yield per plant (kg), fruit yield per plot (kg), fruit yield per hectare (q).

The formula of Panse and Sukhatme (1985) [11] will be used to calculate variation for all of the features under consideration. The mean squares from the variance table will be used to determine genotypic and phenotypic variances (Johnson *et al.* 1955) [7]. The GCV and PCV will be determined using Burton and Devane (1953) [5] approach. Heritability (in the broad sense) will be calculated using the method proposed by Allard (1960) [1]. Johnson *et al.* (1955) [7] proposed a formula for calculating genetic advance.

### Estimation of correlation coefficient

In order to study the inter relationship between different characters, the genotypic and phenotypic correlation coefficients (r) were calculated by using the following formula

$$r_g = \frac{\text{Co - variance XY (G)}}{\sqrt{\text{Variance X (G) x Variance Y (G)}}}$$

$$r_{ph} = \frac{\text{Co - variance XY (PH)}}{\sqrt{\text{Variance X (PH) x Variance Y (PH)}}}$$

Where,

$r_g$  = Genotypic correlation coefficient between character X and Y

$r_{ph}$  = Phenotypic correlation coefficient between character X and Y

X, Y = Two variables under consideration

The significance of these correlation coefficients were compared with statistical table value of correlation coefficient at 1 percent and 5 percent level of significance (Snedecor and Cochran 1967) [17].

### Results and Discussion

The results of the study on fifteen F<sub>4</sub> progenies, which are shown in Tables 1 and 2 show the link between yield and yield contributing features in F<sub>4</sub> generations of cross Kashi Pragati × Arka Abhay (C-1: P<sub>3</sub> × P<sub>1</sub>).

The number of branches per plant show negatively and significant correlation at genotypic and phenotypic levels with plant height. The node to first flower appeared, fruit diameter, fruit yield per plant and fruit yield per hectare at the genotypic and phenotypic levels positively and

significantly correlate with the plant height. Mishra *et al.* (2015) [8] and Awasthi *et al.* (2022) [3]. Discovered similar results. The fruit diameter and fruit yield per hectare at the genotypic and phenotypic levels negatively and significantly correlate with the number of branches per plant. Sravanthi *et al.* (2021) [18] discovered similar results. Inter nodal length shows the both genotypic and phenotypic levels, there is a positive and non-significant association between plant height, fruit yield per plant, the number of branches per plant and the number of nodes per plant. Balakrishnan and Sreenivasan (2010) [4], Rathava *et al.* (2019) [13] and Verma and Singh (2020) [15] discovered similar results. The number of nodes per plant shows positive and significant correlation with days to 50% flowering and fruit yield per plant at genotypic and phenotypic level. The result is in confirmation with find Narkhede *et al.* (2015) [9], Prakash *et al.* (2022) [12] and Shinde *et al.* (2023) [16]. The node at which first flower occur shows positive and significant correlation with fruit yield per plant at genotypic and phenotypic level. The result is in confirmation with find Awasthi *et al.* (2022) [3] and Prakash *et al.* (2022) [12]. The days required for 50 percent flowering shows positive and non-significant correlation with fruit length, fruit weight and fruit yield per hectare at genotypic and phenotypic level. The result is in confirmation with finding of Samiksha *et al.* (2021) [15] in okra. The days required for first picking shows positive and significant correlation with fruit yield per plant at genotypic and phenotypic level. The result is in confirmation with finding Narkhede *et al.* (2015) [9] and Tudu *et al.* (2021) [19] in okra.

The fruit diameter, fruit weight and fruit yield per plant shows positive and non-significant correlation with length of fruit at both genotypic and phenotypic level. The result is in confirmation with finding Verma and Singh (2020) [15] and Awasthi *et al.* (2022) [3] in okra. Fruit weight, Fruit yield per plot and fruit yield per hectare shows positive and significant correlation with fruit diameter at both genotypic and phenotypic level. The above results were in arrangement with those Sravanthi *et al.* (2021) [18] and Awasthi *et al.* (2022) [3] in okra. The fruit yield per plot and fruit yield per hectare shows positive and significant correlation for fruit weight in F<sub>4</sub> generation at both the level. The above results were in positioning with Rynjah *et al.* (2020) [14] and Sravanthi *et al.* (2021) [18] in okra. Fruit yield per plot shows positive and significant correlation with fruit yield per hectare at both genotypic and phenotypic level. Fruit yield per hectare shows positive and non-significant correlation with fruit yield per plant at genotypic and phenotypic level. Rynjah *et al.* (2020) [14] and Sravanthi *et al.* (2021) [18] in okra discovered similar result.

The results of the study on fifteen F<sub>5</sub> progenies, which are shown in Tables 3 and 4 show the link between yield and yield contributing features in F<sub>5</sub> generations of cross Kashi Pragati × Arka Abhay (C-1: P<sub>3</sub> × P<sub>1</sub>).

The node at which first flower appear fruit diameter, fruit weight, fruit yield per plot, fruit yield per hectare and fruit yield per plant at the genotypic and phenotypic levels all positively and significantly correlate with the plant height. Number of branches and fruit length shows negatively correlated at both level. Rathawa *et al.* (2019) [13], Rynjah *et al.* (2020) [14] and Vinod and Gaibriyal (2023) [21] discovered similar results. The node at which first flower appear the fruit diameter and fruit yield per hectare at the genotypic and phenotypic levels all negatively and significantly

correlate with the number of branches per plant. Sravanthi *et al.* (2021) <sup>[18]</sup> and Tudu *et al.* (2021) <sup>[19]</sup> discovered similar results. At the genotypic and phenotypic levels there is a positive and non-significant association between the days required for first picking, fruit weight, fruit yield per plot and fruit yield per hectare in okra Rathava *et al.* (2019) <sup>[13]</sup> and Tudu *et al.* (2021) <sup>[19]</sup> discovered similar results. The number of nodes per plant shows positive and significant correlation with days to 50% flowering and fruit yield per plant at genotypic and phenotypic level. The result is in confirmation with finding Narkhede *et al.* (2015) <sup>[9]</sup>, Prakash *et al.* (2022) <sup>[12]</sup> and Shinde *et al.* (2023) <sup>[16]</sup>. The node at which first flower occur shows negative and significant correlation with days required for first picking, fruit diameter and fruit weight at genotypic and phenotypic level. The result is in confirmation with finding Mishra *et al.* (2015) <sup>[8]</sup> and Dwivedi and Sharma (2017) <sup>[6]</sup>. The days required for 50 percent flower shows positive and non-significant correlation with fruit diameter, number of fruits, fruit weight, fruit yield per plant and fruit yield per hectare at genotypic and phenotypic level. The result is in confirmation with finding of Rynjah *et al.* (2020) <sup>[14]</sup>, Awasthi *et al.* (2022) <sup>[3]</sup> and Vinod and Gaibriyal (2023) <sup>[21]</sup> in okra.

The days required for first picking shows positive and significant correlation with fruit yield per plant at genotypic and phenotypic level. The result is in confirmation with finding Narkhede *et al.* (2015) <sup>[9]</sup> and Tudu *et al.* (2021) <sup>[19]</sup> in okra. The length of fruit shows negative and significant correlation with fruit yield per plot and fruit yield per hectare at both genotypic and phenotypic level. The result is in confirmation with finding of Sravanthi *et al.* (2021) <sup>[18]</sup> in okra. The fruit diameter shows positive and significant correlation with fruit yield per hectare at both genotypic and phenotypic level. The above results were in arrangement with those of Neeraj *et al.* (2017) <sup>[10]</sup>, Sravanthi *et al.* (2021) <sup>[18]</sup> and Awasthi *et al.* (2022) <sup>[3]</sup> in okra. The fruit weight shows positive and significant correlation for fruit yield per plot and fruit yield per hectare in F5 generation at both the level. The above results were in arrangement with those of Rynjah *et al.* (2020) <sup>[14]</sup> in okra. Fruit yield per plot shows positive and significant correlation with fruit yield per hectare and fruit yield per plant at genotypic and phenotypic level in okra. The fruit yield per hectare shows positive and significant correlation with fruit yield per plant at both genotypic and phenotypic levels. Rynjah *et al.* (2020) <sup>[14]</sup> and Sravanthi *et al.* (2021) <sup>[18]</sup> in okra discovered similar result.

**Table 1:** Genotypic Correlation co-efficient for yield and yield contributing characters in F<sub>4</sub> generation of okra cross Kashi Pragati × Arka Abhay (C-1: P<sub>3</sub> × P<sub>1</sub>)

| Character                       | Plant height | Number of Branches | Inter nodal length | No. of nodes per plant | Node at first flower appear | Days to 50% flowering | Days required for first picking | Fruit length | Fruit diameter | Fruit weight | Fruit yield per plot | Fruit yield per hectare | Fruit yield per plant |
|---------------------------------|--------------|--------------------|--------------------|------------------------|-----------------------------|-----------------------|---------------------------------|--------------|----------------|--------------|----------------------|-------------------------|-----------------------|
| Plant height (cm)               | 1.000        | -0.791**           | 0.2750             | 0.556                  | 0.556 *                     | 0.1796                | 0.2586                          | -0.2586      | 0.629 *        | -0.2394      | 0.3892               | 0.649 *                 | 0.7695**              |
| Number of branches              |              | 1.000              | -0.1080            | -0.2301                | -0.3168                     | -0.1599               | -0.4954                         | -0.1719      | -0.659 *       | -0.3559      | -0.4152              | -0.758 **               | -0.3633               |
| Inter nodal length (cm)         |              |                    | 1.000              | 0.1441                 | 0.3275                      | 0.1077                | 0.4642                          | 0.3303       | 0.2104         | 0.2241       | -0.2448              | -0.088                  | 0.298                 |
| No. of nodes per plant          |              |                    |                    | 1.000                  | 0.0299                      | 0.6692**              | 0.5287                          | 0.4068       | 0.4666         | 0.5157       | 0.4865               | 0.3935                  | 0.6836 *              |
| Node at first flower appear     |              |                    |                    |                        | 1.000                       | 0.1087                | 0.811                           | 0.3276       | -0.176         | -0.2806      | 0.2758               | 0.245                   | 0.557 *               |
| Days to 50% flowering           |              |                    |                    |                        |                             | 1.000                 | 0.2707                          | 0.2174       | 0.277          | 0.2155       | 0.2533               | 0.1526                  | -0.1315               |
| Days required for first picking |              |                    |                    |                        |                             |                       | 1.000                           | 0.2957       | 0.2974         | 0.1991       | 0.3861               | 0.3233                  | 0.646 *               |
| Fruit length (cm)               |              |                    |                    |                        |                             |                       |                                 | 1.000        | 0.3218         | 0.3122       | 0.3357               | 0.2167                  | 0.3563                |
| Fruit diameter (mm)             |              |                    |                    |                        |                             |                       |                                 |              | 1.000          | 0.842**      | 0.617*               | 0.889 **                | 0.3164                |
| Fruit weight (g)                |              |                    |                    |                        |                             |                       |                                 |              |                | 1.000        | 0.662 *              | 0.693 *                 | 0.3726                |
| Fruit yield per plot (kg)       |              |                    |                    |                        |                             |                       |                                 |              |                |              | 1.000                | 0.799 **                | 0.2329                |
| Fruit yield per hectare (q)     |              |                    |                    |                        |                             |                       |                                 |              |                |              |                      | 1.000                   | 0.3585                |
| Fruit yield per plant (kg)      |              |                    |                    |                        |                             |                       |                                 |              |                |              |                      |                         | 1.000                 |

\*, \*\*: Significance at 5% and 1% respectively.

**Table 2:** Phenotypic Correlation co-efficient for yield and yield contributing characters in F<sub>4</sub> generation of okra cross Kashi Pragati × Arka Abhay (C-1: P<sub>3</sub> × P<sub>1</sub>)

| Character                       | Plant height | Number of Branches | Inter nodal length | No. of nodes per plant | Node at first flower appear | Days to 50% flowering | Days required for first picking | Fruit length | Fruit diameter | Fruit weight | Fruit yield per plot | Fruit yield per hectare | Fruit yield per plant |
|---------------------------------|--------------|--------------------|--------------------|------------------------|-----------------------------|-----------------------|---------------------------------|--------------|----------------|--------------|----------------------|-------------------------|-----------------------|
| Plant height (cm)               | 1.000        | -0.792**           | 0.2785             | 0.1753                 | 0.555 *                     | 0.2254                | 0.5192                          | -0.2634      | 0.637 *        | 0.2480       | 0.3846               | 0.648*                  | 0.7650 **             |
| Number of branches              |              | 1.000              | -0.194             | -0.3689                | -0.2059                     | -0.1912               | -0.4768                         | -0.154       | -0.644 *       | -0.3710      | -0.3008              | -0.758 **               | -0.3655               |
| Inter nodal length (cm)         |              |                    | 1.000              | 0.1869                 | 0.3144                      | 0.2108                | 0.4206                          | 0.205        | 0.2353         | 0.2308       | -0.2527              | -0.1055                 | 0.2184                |
| No. of nodes per plant          |              |                    |                    | 1.000                  | 0.096                       | 0.5822 **             | 0.3578                          | 0.3043       | 0.2061         | 0.4737       | 0.4813               | 0.4854                  | 0.5965 *              |
| Node at first flower appear     |              |                    |                    |                        | 1.000                       | 0.2386                | 0.6674                          | 0.3129       | -0.1675        | -0.2706      | -0.2830              | 0.1362                  | 0.561 *               |
| Days to 50% flowering           |              |                    |                    |                        |                             | 1.000                 | 0.3232                          | 0.2325       | 0.2767         | 0.1947       | 0.2878               | 0.1719                  | -0.1143               |
| Days required for first picking |              |                    |                    |                        |                             |                       | 1.000                           | 0.2567       | 0.2538         | 0.1878       | 0.4575               | 0.4964                  | 0.573*                |
| Fruit length (cm)               |              |                    |                    |                        |                             |                       |                                 | 1.000        | 0.3414         | 0.3335       | 0.334                | 0.2120                  | 0.3682                |
| Fruit diameter (mm)             |              |                    |                    |                        |                             |                       |                                 |              | 1.000          | 0.835**      | 0.736**              | 0.895**                 | 0.3163                |
| Fruit weight (g)                |              |                    |                    |                        |                             |                       |                                 |              |                | 1.000        | 0.674*               | 0.602*                  | 0.3754                |
| Fruit yield per plot (kg)       |              |                    |                    |                        |                             |                       |                                 |              |                |              | 1.000                | 0.798 **                | -0.2356               |
| Fruit yield per hectare (q)     |              |                    |                    |                        |                             |                       |                                 |              |                |              |                      | 1.000                   | 0.3582                |
| Fruit yield per plant (kg)      |              |                    |                    |                        |                             |                       |                                 |              |                |              |                      |                         | 1.000                 |

\*, \*\*: Significance at 5% and 1% respectively.

**Table 3:** Genotypic Correlation co-efficient for yield and yield contributing characters in F<sub>5</sub> generation of okra cross Kashi Pragati × Arka Abhay (C-1: P<sub>3</sub> × P<sub>1</sub>)

| Character                       | Plant height | Number of Branches | Inter nodal length | No. of nodes per plant | Node at first flower appear | Days to 50% flowering | Days required for first picking | Fruit length | Fruit diameter | Fruit weight | Fruit yield per plot | Fruit yield per hectare | Fruit yield per plant |
|---------------------------------|--------------|--------------------|--------------------|------------------------|-----------------------------|-----------------------|---------------------------------|--------------|----------------|--------------|----------------------|-------------------------|-----------------------|
| Plant height (cm)               | 1.000        | -0.710*            | 0.1476             | -0.361                 | 0.647 *                     | 0.3708                | -0.044                          | -0.596**     | 0.745 **       | 0.526*       | 0.668**              | 0.869**                 | 0.638*                |
| Number of branches              |              | 1.000              | 0.3132             | 0.142                  | -0.560*                     | -0.3739               | -0.265                          | 0.3897       | -0.503*        | -0.3180      | -0.4572              | -0.620*                 | -0.3863               |
| Inter nodal length (cm)         |              |                    | 1.000              | 0.682*                 | -0.2740                     | -0.2337               | 0.783**                         | -0.1892      | -0.2293        | 0.336        | 0.4097               | 0.3302                  | -0.2682               |
| No. of nodes per plant          |              |                    |                    | 1.000                  | -0.262                      | 0.750**               | 0.645                           | -0.367       | 0.626          | -0.315       | 0.115                | 0.348                   | 0.861**               |
| Node at first flower appear     |              |                    |                    |                        | 1.000                       | 0.4349                | -0.636*                         | -0.784**     | -0.520*        | 0.1858       | 0.769**              | 0.632*                  | 0.2039                |
| Days to 50% flowering           |              |                    |                    |                        |                             | 1.000                 | 0.689                           | -0.3231      | 0.4567         | 0.1406       | 0.3352               | 0.3817                  | 0.3939                |
| Days required for first picking |              |                    |                    |                        |                             |                       | 1.000                           | -0.885       | 0.190          | -0.357       | 0.052                | 0.032                   | 0.943**               |
| Fruit length (cm)               |              |                    |                    |                        |                             |                       |                                 | 1.000        | -0.255         | -0.211       | -0.847**             | -0.699*                 | -0.4739               |
| Fruit diameter (mm)             |              |                    |                    |                        |                             |                       |                                 |              | 1.000          | 0.3199       | 0.2353               | 0.644*                  | 0.3617                |
| Fruit weight (g)                |              |                    |                    |                        |                             |                       |                                 |              |                | 1.000        | 0.523*               | 0.793**                 | 0.2262                |
| Fruit yield per plot (kg)       |              |                    |                    |                        |                             |                       |                                 |              |                |              | 1.000                | 0.898**                 | 0.531*                |
| Fruit yield per hectare (q)     |              |                    |                    |                        |                             |                       |                                 |              |                |              |                      | 1.000                   | 0.674*                |
| Fruit yield per plant (kg)      |              |                    |                    |                        |                             |                       |                                 |              |                |              |                      |                         | 1.000                 |

\*, \*\*: Significance at 5% and 1% respectively.

**Table 4:** Phenotypic Correlation co-efficient for yield and yield contributing characters in F<sub>5</sub> generation of okra cross Kashi Pragati × Arka Abhay (C-1: P3 × P1)

| Character                       | Plant height | Number of Branches | Inter nodal length | No. of nodes per plant | Node at first flower appear | Days to 50% flowering | Days required for first picking | Fruit length | Fruit diameter | Fruit weight | Fruit yield per plot | Fruit yield per hectare | Fruit yield per plant |
|---------------------------------|--------------|--------------------|--------------------|------------------------|-----------------------------|-----------------------|---------------------------------|--------------|----------------|--------------|----------------------|-------------------------|-----------------------|
| Plant height (cm)               | 1.000        | -0.721*            | -0.1469            | -0.429                 | 0.646 *                     | 0.3937                | -0.126                          | -0.595 **    | 0.751**        | 0.529*       | 0.661**              | 0.861**                 | 0.639*                |
| Number of branches              |              | 1.000              | 0.3116             | 0.086                  | -0.561*                     | -0.3909               | -0.240                          | 0.3853       | -0.615*        | -0.3253      | -0.4629              | -0.634 *                | -0.3860               |
| Inter nodal length (cm)         |              |                    | 1.000              | 0.616*                 | -0.2744                     | -0.2431               | 0.705 **                        | -0.1915      | -0.2326        | 0.3349       | 0.4080               | 0.3397                  | -0.2682               |
| No. of nodes per plant          |              |                    |                    | 1.000                  | -0.223                      | 0.768 **              | 0.665                           | -0.266       | 0.415          | -0.292       | 0.082                | 0.422                   | 0.829**               |
| Node at first flower appear     |              |                    |                    |                        | 1.000                       | 0.4488                | -0.591*                         | -0.784**     | -0.535*        | 0.1875       | 0.771**              | 0.633*                  | 0.2038                |
| Days to 50% flowering           |              |                    |                    |                        |                             | 1.000                 | 0.705                           | -0.3466      | 0.4418         | 0.1376       | 0.3204               | 0.3820                  | 0.3010                |
| Days required for first picking |              |                    |                    |                        |                             |                       | 1.000                           | -0.739       | 0.201          | -0.297       | 0.033                | 0.124                   | 0.625 **              |
| Fruit length (cm)               |              |                    |                    |                        |                             |                       |                                 | 1.000        | -0.2633        | -0.315       | 0.853**              | 0.602 *                 | 0.4746                |
| Fruit diameter (mm)             |              |                    |                    |                        |                             |                       |                                 |              | 1.000          | 0.3153       | 0.2314               | 0.644*                  | 0.3633                |
| Fruit weight (g)                |              |                    |                    |                        |                             |                       |                                 |              |                | 1.000        | 0.521*               | 0.793**                 | 0.2267                |
| Fruit yield per plot (kg)       |              |                    |                    |                        |                             |                       |                                 |              |                |              | 1.000                | 0.898**                 | 0.530*                |
| Fruit yield per hectare (q)     |              |                    |                    |                        |                             |                       |                                 |              |                |              |                      | 1.000                   | 0.674*                |
| Fruit yield per plant (kg)      |              |                    |                    |                        |                             |                       |                                 |              |                |              |                      |                         | 1.000                 |

\*, \*\*: Significance at 5% and 1% respectively.

## Conclusion

The nature and extent of correlation among various characters varied. The fruit yield per plant shows highest and positive correlation observed with plant height and number of nodes per plant followed by days required for first picking. Number of nodes per plant and fruit yield per plant showed highest direct positive effect on the yield. This indicates the importance of these characters in yield improvement through selection.

## Reference

- Allard RW. Principles of Plant Breeding. New York: John Wiley and Sons, Inc.; 1960.
- Anonymous. National Horticulture Board, Ministry of Agricultural and Farmers Welfare, Government of India, Statistics, Area and Production of Horticulture Crops (2nd Advanced Estimates); 2023. p. 360-361.
- Awasthi S, Singh DP, Lal B, Singh P, Upadhyay A, Singh PK, *et al.* Assessment of genetic variability, heritability, and genetic advance of okra genotypes (*Abelmoschus esculentus* L. Moench). *Agricultural Mechanization in Asia*. 2022;53(4):841-845.
- Balakrishnan D, Sreenivasan E. Correlation and path analysis studies in okra (*Abelmoschus esculentus* (L.) Moench). *Madras Agricultural Journal*. 2010;97:10-16.
- Burton GW, De Vane EH. Estimating heritability in tall fescue (*Festuca arundinacea*) from replicated clonal material. *Agronomy Journal*. 1953;45(10):478-481.
- Dwivedi M, Sharma DP. Correlation and path analysis studies in okra (*Abelmoschus esculentus* (L.) Moench) under Jabalpur conditions. *International Journal of Agriculture Sciences*. 2017;34:4504-4509.
- Johnson HW, Robinson HF, Comstock RE. Genotypic and phenotypic correlations in soybean and their implications in selection. *Agronomy Journal*. 1955;47:477-483.
- Mishra A, Mishra HN, Senapati N, Tripathy P. Genetic variability and correlation studies in okra (*Abelmoschus esculentus* (L.) Moench). *Electronic Journal of Plant Breeding*. 2015;6(3):866-869.
- Narkhede GW, Deshmukh SB, Mahajan RC, Shinde SM. Correlation coefficient and path analysis studies in okra (*Abelmoschus esculentus* (L.) Moench). *Eco. Env & Cons*. 2015;21(1):285-288.
- Neeraj S, Singh DK, Sati UC, Rawat M, Pandey P. Genetic analysis studies in okra (*Abelmoschus esculentus* (L.) Moench). *International Journal of Pure and Applied Biosciences*. 2017;5(4):361-367.
- Panse VG, Sukhatme PV. *Statistical Methods for Agricultural Workers*. New Delhi: Indian Council of Agricultural Research; 1985.
- Prakash G, Halesh GK, Jagadeesha RC, Ravishankar KV, Pitchaimuthu M, Shankarappa KS. Studies on genetic variability and character association in okra (*Abelmoschus esculentus* (L.) Moench) for yield and its contributing traits. *The Pharma Innovation Journal*. 2022;11(12):3639-3643.
- Rathava D, Patel AI, Chaudhari BN, Vashi JM. Correlation and path coefficient studies in okra (*Abelmoschus esculentus* (L.) Moench). *International Journal of Current Microbiology and Applied Sciences*. 2019;8(10):1710-1719.
- Rynjah S, Arumugan T, Ganesh KN, Kamalkumaran. Correlation and path coefficient analysis studies in okra (*Abelmoschus esculentus* (L.) Moench). *Journal of Pharmacognosy and Phytochemistry*. 2020;9(3):1423-1427.

15. Samiksha RS, Verma SK, Prakash S, Kumar S, Maurya SK. Studies on correlation and path coefficient analysis in okra (*Abelmoschus esculentus* (L.) Moench). International Journal of Current Microbiology and Applied Sciences. 2021;10:277-284.
16. Shinde SL, Zate DK, Gavade SS, Zate AK, Shinde JV. Correlation analysis for fruit yield and its related traits in okra (*Abelmoschus esculentus* (L.) Moench). The Pharma Innovation Journal. 2023;12(1):215-220.
17. Snedecor GW, Cochran WG. Statistical Methods. 5th ed. Ames, Iowa, USA: Iowa State University Press; 1997.
18. Sravanthi U, Prabhakar BN, Saidaiah P, Rao AM, Narayana DL, Sathish G. Studies on genetic variability in okra (*Abelmoschus esculentus* (L.) Moench). The Pharma Innovation Journal. 2021;10(11):151-155.
19. Tudu PP, Bahadur V, Kerketta, Luthra S. Study on heritability, correlation, and genetic divergence in okra (*Abelmoschus esculentus*). International Journal of Current Microbiology and Applied Sciences. 2021;10(6):365.
20. Verma V, Singh S. Correlation and path coefficient analysis of quantitative characters in okra (*Abelmoschus esculentus* (L.) Moench). International Journal of Chemical Studies. 2020;8(6):206-208.
21. Vinod B, Gaibriyal ML. Estimation of correlation and path coefficient analysis for quantitative characters in okra (*Abelmoschus esculentus* L. Moench) genotypes. International Journal of Environment and Climate Change. 2023;13(10):491-501.