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Correlation studies on okra (*Abelmoschus esculentus* L.) cv. Arkaanamika for pod yield and yield traits

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Abstract

The present investigation entitled “correlation studies on okra (*Abelmoschus esculentus* L.) cv. Arka Anamika for pod yield and yield traits”. The experiment comprising of nine treatment combinations replicated three times, was laid out in Randomized Block design. Half dose of Nitrogen, full doses of Phosphorus and potassium were applied at the time of bed preparation. The remaining half nitrogen was applied 30 days after sowing of Okra seed. The observations were recorded on 9 yield and yield attributing characters viz. plant height (cm), no. of leaves per plant, no. of nodes per plant, no. of days to first flowering, no. of flowers per plant, length of fruit (cm), no. of fruit per plant, weight of fruit per plant (g), fruit yield per plot (kg) and combinations of nitrogen, phosphorous and potash which were used to assess their effect on growth, flowering, yield and quality of Okra.

Keywords: Bhindi, Correlation, morphological traits, yield component

Introduction

Okra (*Abelmoschus esculentus*) is the only vegetable crop of significance in the Malvaceae family and is very popular in the Indo-Pak subcontinent. In India, it ranks number one in its consumption but its original home is Ethiopia and Sudan, the north-eastern African countries. It is one of the oldest cultivated crops and presently grown in many countries and is widely distributed from Africa to Asia, southern Europe and America. Okra is cultivated throughout India for its immature fruits which are generally cooked as vegetable. Okra soups and stews are also popular dishes. When ripe, the black or brown white eyed seeds are sometimes roasted and used as substitute for coffee. The crop is used for the extraction of fiber and also used for cleaning of sugarcane juices. The nutritional constituents of okra include calcium, protein, oil and carbohydrates; others are iron, magnesium and phosphorus. Okra is recommended for consumption by World Health Organization due to its ability to fight diseases. . The mature okra seed is a good source of oil and protein has been known to have superior nutritional quality. Okra seed oil is rich in unsaturated fatty acids such as linoleic acid, which is essential for human nutrition. Its mature fruit and stems contain crude fibre, which is used in the paper industry. Okra has been found to be a rich source of vitamins A and C, calcium, thiamine and riboflavin. It is also rich in iron and is used as a medicine in the treatment of the peptic ulcer (Uka et al., 2013).

Now a day, India is one of the main vegetable growing countries of the world. Okra crop is grown over all India. Among the most important states only four Uttar Pradesh., Maharashtra, Madhya Pradesh and Tamil Nadu account three fourth of total area (Schweers and Sims,3).

Materials and Methods

The present investigation was carried out at the ‘Prakash Agriculture Farm Pilibhit’ during the year 2020 under Randomized Block Design with nine treatments repeated in three times. Seeds of okra (*Abelmoschus esculentus* L. Moench.) Var. ARKA ANAMIKA were collected from local market and sown in the experimental field. The field was ploughed, cross ploughed and leveled properly and divided into 27 plots, each measuring 2 × 1 m with 50 cm space between two plots. Each plot contained three rows and every row contained four hills. The spacing between row to row and hill to hill was 60 cm and 45 cm, respectively. Materials for this study were consisted of Okra cultivar’s cv. “ARKA ANAMIKA” and the fertilizers used for the crop were Nitrogenous, Phosphorus and Potassium.

Half dose of Nitrogen, full doses of Phosphorus and potassium were applied at the time of bed preparation. The remaining half nitrogen was applied 30 days after sowing of Okra seed.

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After germination one uniform seedling was kept in each hill and rests were thinned out. Total number of seedlings per plot was 12. Watering, weeding, mulching and other cultural practices were done as and when required. The length of main stem, number of nodes and leaves and number of branches were recorded at the opening of first flower and continued at 15 days interval till final harvest. The final data (addition of all counts) were used in the tables. The fruits of okra of all the treatments were harvested at marketable stage. Before harvesting the number of fruits per plant was recorded. The number of fruits per plant, fresh weight, length, treatment was recorded just immediately after harvest. The yield per plant was calculated by multiplying the number of fruits per plant and fresh weight per fruit.

Result and Discussion

Relationships between different traits were estimated at the phenotypic (P) level of the nine traits. The results obtained from the correlation coefficient show that there is a strong association between plant morphological characteristics and yield. Positive correlations between the desired traits are beneficial to plant breeders and help improve both traits at the same time.

The correlation coefficients are presented in table. Correlation studies were carried out to understand the insanity and direction of association among the nine characters like. Plant height (cm), no. of leaves per plant, number of nodes per plant, days taken to first flowering (days), number of flowers per plant, number of fruits per plant, length of fruit per plant, weight of fruit per plant, fruit yield per plot. The results and discussion are presented here under.

Very positive and significant correlations of plant height are the number of nodes per plant (0.945), the number of flowers per plant (0.944), the length of fruit per plant (0.921), number of fruits per plant (0.828) and fruit yield per plant (0.804) at phenotypic level. However, a negative, non-significant correlation with the number of days until the first flowering was observed (0.17). A significant and positive correlation

was recorded with fruit weight per plant (0.705). Similar results for this trait have been reported by Jaiprakashnarayan and Mulge (2004), Bello *et al.* (2006) ^[1, 2].

The characteristic number of leaves per plant is the length of fruit per plant (0.868), the number of flowering plants (0.846), the number of fruits per plant (0.836), and the number of nodes per plant (0.824). It showed a very significant positive correlation. A positive and significant correlation was observed with fruit weight per plant (0.697). However, a non-significant negative correlation with the number of days until the first flowering was recorded (0.307).

A highly positive correlation of number of nodes per plant was recorded with number of flowers per plant (0.959), number of fruits per plant (0.936), length of fruit per plant (0.917), fruit yield per plot (0.829). However, it has a significant and positive correlation with fruit weight per plant (0.695). In the number of days until the first flowering (0.378), a non-significant negative correlation was recorded.

The number of days to first flowering showed a non-significant and negative correlation with fruit weight per plant (0.549), number of fruit per plant (0.547), fruit length per plant (0.283), fruit yield per plot (0.58) and number of flowers per plant (0.40).

The characteristic number of flowers per plant showed a highly significant positive correlation with fruit length per plant (0.944), number of fruits per plant (0.891), fruit yield per plot (0.851) and fruit weight per plant (0.768).

A highly positive correlation of number of fruits per plant was recorded with fruits length per plant (0.849), fruit weight per plant (0.821) and yield of fruit per plot (0.781). Length of fruit per plant showed a significant and positive correlation with weight of fruits per plant (0.691) and fruit yield per plant (0.683). The Similar results for the traits were also reported by Solankey *et al.* (2009) ^[3] and Jagan *et al.* (2013) ^[4]. The characteristic fruit weight per plant showed a highly significant and positive correlation with fruit yield per plant (0.768).

Table 1: Show the number of characters

Characters	Plant height (cm)	Number of leaves	Number of nodes/plant	Day Taken to 1st Flower	Number of flower/plant	Number of fruits/plant	Length of fruit/plant (cm)	Weight of fruit/plant (gm)	Fruit yield/plot (Kg)
Plant height (cm)	1	0.777**	0.945**	-0.17	0.944**	0.828**	0.921**	0.705*	0.804**
Number of leaves		1	0.824**	-0.307	0.846**	0.836**	0.868**	0.697*	0.583
Number of nodes/plant			1	-0.378	0.959**	0.936**	0.917**	0.695*	0.829**
Day Taken to 1st Flower				1	-0.40	-0.547	-0.283	-0.549	-0.58
Number of flower/plant					1	0.891**	0.944**	0.768**	0.851**
Number of fruits/plant						1	0.849**	0.821**	0.781**
Length of fruit/plant (cm)							1	0.691*	0.683*
Weight of fruit/plant (gm)								1	0.768**
Fruit yield/plot (Kg)									1

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