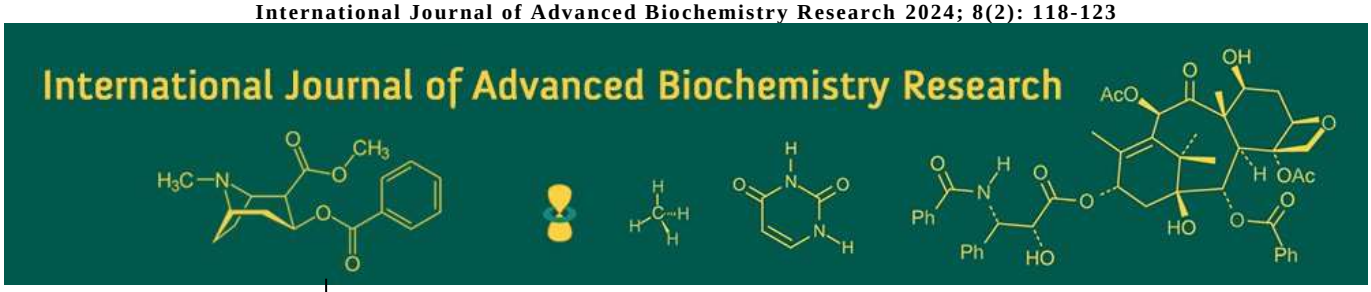

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Genetic studies in F_5 generation of ridge gourd (*Luffa acutangula* L. Roxb.)

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Abstract
The research conducted at AICRP on vegetable crops, Mahatma Phule Krishi Vidyapeeth, Rahuri during 2022-2023 studied on genetic studies in the F_5 generation of ridge gourd (*Luffa acutangula* L. Roxb.) with the aim of developing a superior and high-quality inbred line. The study employed a randomized block design (RBD) with three replications, using five parents and their respective progenies derived from the cross (Arka Sumeet x Konkan Harita). The findings indicated moderate genetic coefficient of variation (GCV) and phenotypic coefficient of variation (PCV), combined with high heritability and notable genetic advance as a percentage of the mean for specific traits in the F_5 generation. These traits encompassed the number of branches per vine, the node of first appearance of female and male flowers, the number of harvests, fruit diameter, fruit yield per vine, fruit yield per plot and fruit yield per hectare. On the contrary, characteristics like vine length, days to initial female and male flower appearance, days to 50% flowering, sex ratio, days to initial and final harvest, fruit length, fruit weight and number of fruits per vine displayed high heritability but showed moderate to low genetic advance as a percentage of the mean. Correlation analysis revealed a significant and positive association between fruit yield per vine and various growth-related characteristics, including vine length, number of branches per vine, number of harvests, days to final harvest, fruit length, fruit diameter, fruit weight, number of fruits per vine, fruit yield per vine and fruit yield per plot. Conversely, a notable and negative correlation was observed between fruit yield per vine and several reproductive traits, such as days to initial appearance of female and male flowers, node number at which the first female and male flowers appeared, duration until 50% flowering, sex ratio and days until the initial harvest.

Keywords: GCV, generation, heritability, PCV and variability

1. Introduction
Ridge gourd (*Luffa acutangula* (L.) Roxb.), also recognized as angled gourd, angled loofah, or ribbed gourd, is a member of the Cucurbitaceae family with a diploid chromosome count of 26. Predominantly grown in tropical and sub-tropical areas, its young fruits are commonly used in culinary dishes, particularly in curries or as a cooked vegetable. The nutritional content of the fruit comprises moisture (92.5 g), protein (0.5 g), fat (0.5 g), carbohydrates (3.4 g), energy (17 kcal), calcium (18 mg), vitamin C (5 mg), riboflavin (0.01 mg), phosphorus (26 mg), iron (0.5 mg) and carotene (33 µg) per 100 g of edible portion (Sheshadri and Parthasarthy, 1980) [23]. Recognized as a low-calorie vegetable, it is considered advantageous for individuals with diabetes (Pullaiah, 2006) [22]. In Ayurveda, it is recognized for its properties including immune system enhancement, antioxidant effects, hypoglycemic benefits, diuretic properties, blood purification and treatment for jaundice (Manikandaselvi *et al*., 2016) [19]. The crop is thought to have its origins in India, where wild varieties still exist, and later spread to areas with ample rainfall (Grubben and Denton, 2004) [13]. Traditionally, ridge gourd has been utilized for addressing stomach ailments and fever. The seeds are recognized for their purgative, emetic, and antihelminthic properties attributed to the presence of secondary metabolites. Ridge gourd seeds have gained attention for isolating Ribosome Inactivating Proteins (RIPs) and luffaculin, showcasing various pharmacological activities including abortifacient, antifungal, antitumor, antivirus and HIV-1 integrase inhibitory properties. As a predominantly monoecious cross-pollinated crop, ridge gourd is cultivated in tropical and sub-tropical regions for its tender edible fruits, both commercially and in small-scale kitchen gardens across India, as well as in parts of

Indonesia, Myanmar, Malaysia, the Philippines, Sri Lanka and Taiwan. It can be cultivated in spring, summer or as a rainy season crop. Significant genetic variation is observed across different regions of India, encompassing variations in fruit shape, size, color and the sex ratio of staminate and pistillate flowers. The efficacy of any breeding program depends on the careful selection of germplasm, allowing plant breeders to create novel gene combinations and select varieties suitable for diverse agricultural systems. Successful breeding relies on understanding the nature and extent of genetic variability, the transmissibility of desirable traits and the expected genetic gain for a given trait in a population. Therefore, assessing variability and heritability within available germplasm is crucial for informed breeding program planning. The present study aims to investigate genetic variability and heritability in a set of genotypes, offering valuable insights for future breeding endeavors.

2. Materials and Methods

The investigation was conducted at AICRP on Vegetable Crops, Department of Horticulture, MPKV, Rahuri, Maharashtra, India, in the summer of 2023. The study utilized five progenies obtained from the cross (Arka Sumeet x Konkan Harita) and included their respective parents as genetic material. Planting of the ten progenies and their five parental lines took place in the summer of 2023 and evaluated in the F_5 generation. The assessment of the F_5 generation was conducted using a randomized block design (RBD) with three replications. Numerous observations were documented during the research, encompassing parameters like vine length, number of branches per vine, duration until the initial appearance of female and male flowers, node where the first female flower emerged, node where the first male flower emerged, time to achieve 50% flowering, sex ratio, duration until the first harvest, duration until the final harvest, fruit length, fruit diameter, fruit weight, number of fruits per vine, fruit yield per vine, fruit yield per plot and fruit yield per hectare.

3. Results and Discussion

The extent of variability within the selected genotype of ridge gourd in the F_5 generation arising from the cross between Arka Sumeet and Konkan Harita was assessed and the measurements for variability, heritability and genetic advance as a percentage of the mean are presented in Table 1.

3.1 Genotypic and phenotypic coefficient of correlation

Significant variability was evident across a broad spectrum of traits in the F_5 generation resulting from the cross Arka Sumeet x Konkan Harita. Notably, for all quantitative traits, the genotypic coefficient of variation consistently appeared lower than the phenotypic coefficient of variation, suggesting the influence of environmental factors on the expression of these traits.

Table 1: Mean, range, GCV, PCV, ECV, heritability, genetic advance and genetic advance as percent of mean of F_5 population in ridge gourd C - 1 (Arka Sumeet x Konkan Harita)

Sr. No.	Character	Mean	Range	GCV (%)	PCV (%)	ECV (%)	H^2 (b.s.) (%)	GA	GAM (%)
1.	Vine length (m)	6.34	5.48-6.99	7.96	8.10	1.48	96.63	1.02	16.12
2.	Number of branches per vine	11.56	8.12-13.96	17.25	17.38	2.12	98.50	4.08	35.28
3.	Days to 1st female flower appearance	44.53	41.79-47.74	3.39	3.50	0.86	93.89	3.01	6.78
4.	Days to 1st male flower appearance	37.87	35.13-41.23	4.95	5.15	1.40	92.57	3.72	9.83
5.	Node of 1st female flower	13.52	11.91-16.02	12.48	12.76	2.68	95.59	3.40	25.14
6.	Node of 1st male flower	2.89	2.21-4.24	22.83	23.50	4.67	95.98	1.33	46.08
7.	Days to 50% flowering	51.80	49.33-54.00	2.96	3.35	1.56	78.21	2.80	5.40
8.	Sex ratio	12.31	11.17-14.17	6.94	7.37	2.46	88.82	1.66	13.49
9.	Days to first picking	53.36	50.33-56.66	4.03	4.25	1.34	90.06	4.21	7.90
10.	Number of pickings	16.02	13.33-19.00	11.54	12.13	3.74	90.46	3.63	22.62
11.	Days to last picking	112.27	109.00-114.66	1.68	1.77	0.52	91.05	3.73	3.32
12.	Length of fruit (cm)	29.62	26.90-32.16	5.30	5.63	1.89	88.66	3.04	10.28
13.	Diameter of fruit (cm)	3.61	2.54-4.08	15.51	16.88	6.67	84.37	1.06	29.35
14.	Weight of fruit (g)	127.81	120.46-132.34	2.91	2.95	0.49	97.25	7.58	5.93
15.	Number of fruits per vine	18.52	15.87-21.88	9.59	9.88	2.35	94.31	3.56	19.19
16.	Fruit yield /vine (kg)	2.22	1.80-2.72	12.92	13.20	2.71	95.77	0.58	26.05
17.	Fruit yield /plot (kg)	22.13	17.86-27.17	13.02	13.30	2.71	95.83	5.81	26.26
18.	Fruit yield (t/ha)	14.75	11.91-18.11	13.01	13.29	2.71	95.83	3.87	26.24

GCV: Genotypic coefficient of variation
PCV: Phenotypic coefficient of variation
ECV: Environmental coefficient of variation
H^2 (b.s.): Heritability in broad sense and
GAM: Genetic advance as percent of mean.

Table 2: Genotypic and Phenotypic Correlation co-efficient for yield and yield contributing characters in F_5 generation of ridge gourd C - 1 (Arka Sumeet x Konkan Harita).

			VL	NOBPV	DTFFFA	DTFMFA	NOFF	NOMF	DT50% F	SR	DTFP	NOP	DTLP	LOF	DOF	WOF	NOFPV	FYPV	FYPP
1.	VL	G	1.00	0.943**	-0.952**	-0.999**	-0.867**	-0.953**	-0.935**	-0.959**	-0.993**	0.902**	0.969**	0.872**	0.873**	0.990**	0.863**	0.913**	0.913**
		P	1.00	0.937**	-0.940**	-0.965**	-0.859**	-0.925**	-0.870**	-0.907**	-0.957**	0.877**	0.940**	0.819**	0.807**	0.976**	0.832**	0.888**	0.888**
2.	NOBPV	G		1.00	-0.875**	-0.948**	-0.960**	-0.912**	-0.889**	-0.975**	-0.933**	0.927**	0.999**	0.912**	0.920**	0.927**	0.897**	0.926**	0.925**
		P		1.00	-0.866**	-0.924**	-0.949**	-0.896**	-0.809**	-0.938**	-0.904**	0.904**	0.971**	0.868**	0.850**	0.916**	0.875**	0.909**	0.908**
3.	DTFFFA	G			1.00	0.952**	0.758**	0.918**	0.870**	0.919**	0.911**	-0.770**	-0.892**	-0.739**	-0.755**	-0.924**	-0.739**	-0.796**	-0.797**
		P			1.00	0.938**	0.759**	0.902**	0.825**	0.882**	0.907**	-0.762**	-0.858**	-0.697**	-0.708**	-0.909**	-0.717**	-0.778**	-0.778**
4.	DTFMFA	G				1.00	0.893**	0.922**	0.980**	0.966**	0.991**	-0.926**	-0.971**	-0.880**	-0.869**	-0.966**	-0.852**	-0.898**	-0.898**
		P				1.00	0.878**	0.899**	0.894**	0.906**	0.971**	-0.888**	-0.916**	-0.810**	-0.796**	-0.931**	-0.811**	-0.862**	-0.862**
5.	NOFF	G					1.00	0.785**	0.896**	0.883**	0.889**	-0.906**	-0.944**	-0.866**	-0.911**	-0.841**	-0.815**	-0.841**	-0.841**
		P					1.00	0.781**	0.829**	0.848**	0.871**	-0.882**	-0.911**	-0.824**	-0.837**	-0.828**	-0.796**	-0.827**	-0.826**
6.	NOMF	G						1.00	0.826**	0.939**	0.899**	-0.835**	-0.951**	-0.775**	-0.819**	-0.944**	-0.842**	-0.883**	-0.883**
		P						1.00	0.731**	0.900**	0.876**	-0.807**	-0.893**	-0.746**	-0.757**	-0.925**	-0.830**	-0.872**	-0.872**
7.	DT50%F	G							1.00	0.908**	0.991**	-0.925**	-0.887**	-0.841**	-0.751**	-0.885**	-0.819**	-0.855**	-0.856**
		P							1.00	0.769**	0.923**	-0.816**	-0.789**	-0.681**	-0.654**	-0.802**	-0.702**	-0.747**	-0.747**
8.	SR	G								1.00	0.941**	-0.925**	-0.970**	-0.906**	-0.838**	-0.920**	-0.941**	-0.959**	-0.960**
		P								1.00	0.896**	-0.910**	-0.934**	-0.869**	-0.716**	-0.873**	-0.908**	-0.925**	-0.926**
9.	DTFP	G									1.00	-0.947**	-0.956**	-0.897**	-0.845**	-0.959**	-0.871**	-0.913**	-0.914**
		P									1.00	-0.911**	-0.900**	-0.831**	-0.789**	-0.932**	-0.831**	-0.879**	-0.879**
10.	NOP	G										1.00	0.941**	0.979**	0.872**	0.879**	0.956**	0.966**	0.965**
		P										1.00	0.904**	0.927**	0.770**	0.851**	0.919**	0.934**	0.934**
11.	DTLP	G											1.00	0.924**	0.964**	0.965**	0.903**	0.939**	0.937**
		P											1.00	0.869**	0.856**	0.918**	0.858**	0.895**	0.895**
12.	LOF	G												1.00	0.892**	0.868**	0.939**	0.952**	0.951**
		P												1.00	0.776**	0.823**	0.931**	0.939**	0.938**
13.	DOF	G													1.00	0.898**	0.661*	0.805**	0.802**
		P													1.00	0.838**	0.619**	0.735**	0.732**
14.	WOF	G														1.00	0.844**	0.900**	0.900*
		P														1.00	0.821**	0.886**	0.886**
15.	NOFPV	G															1.00	0.993**	0.993**
		P															1.00	0.992**	0.992**
16.	FYPV	G																1.00	0.992**
		P																1.00	0.981**

* Significance at 5% and ** Significance at 1% level.

VL: Vine length, **NOBPV**: Number of branches per vine, **DTFFFA**: Days to first female flower appearance, **DTFMFA**: Days to first male flower appearance, **NOFF**: Node at which first female flower appeared, **NOMF**: Node at which first male flower appeared, **DT50%F**: Days taken to 50% flowering, **SR**: Sex ratio, **DTFP**: Days to first picking, **NOP**: number of picking, **DTLP**: Days to last picking, **LOF**: Length of fruit, **DOF**: Diameter of fruit, **WOF**: weight of fruit, **NOFPV**; Number of fruits per vine, **FYPV**: Fruit yield per vine, **FYPP**: fruit yield per plot.

The findings indicated relatively low levels of genetic and phenotypic variation for various traits, including vine length (7.96; 8.10), the duration until the initial appearance of female flowers (3.39; 3.50), the duration until the initial appearance of male flowers (4.95; 5.15), the duration until 50% flowering (2.96; 3.35), the sex ratio (6.94; 7.37), the duration until the first harvest (4.03; 4.25), and the duration until the final harvest (1.68; 1.77), length of fruit (5.30; 5.63), weight of fruit (2.91; 2.95) and number of fruits per vine (9.59; 9.88). This indicates that the selection process resulted in achieving homozygosity, and further selection might not significantly modify these traits. As a result, these characteristics are deemed unsuitable for additional selection. These findings are consistent with earlier studies conducted by Kannan and Rajamanickam (2019) [16] on ridge gourd, Abhijeet *et al*. (2018) [1] on sponge gourd, Muttur *et al*. (2017) [20] and Ingole *et al*. (2021) [14] on pumpkin, Chaudhari (2019) [4] and Pradhan *et al*. (2021) [21] on bitter gourd and Mali *et al*. (2015) [18] and Gaikwad (2016) [10] on muskmelon.

A moderate degree of both genotypic and phenotypic variation was noted for various traits, such as the number of branches per vine (17.25; 17.38), Node of first female flower appearance (12.48; 12.76), Number of Pickings (11.54; 12.13), Diameter of fruit (15.51; 16.88), fruit yield per vine (12.92; 13.20), fruit yield per plot (13.02; 13.30) and fruit yield per hectare (13.01; 13.29). This indicates the existence of a moderate level of variability, and there may be room for improvement in these traits to some extent in subsequent generations to achieve homozygosity. These results are in line with previous studies conducted by Koppad *et al*. (2015) [17] on ridge gourd, Ingole *et al*. (2021) [14] on pumpkin, Chaudhari (2019) [4] on bitter gourd and Mali *et al*. (2015) [18] and Gaikwad (2016) [10] on muskmelon.

Conversely, significant levels of genetic and phenotypic variation were detected for the node of first male flower appearance (22.83; 23.50). These findings align with research conducted by Durga *et al*. (2021) [8] and Farheen *et al*. (2022) [9] in ridge gourd and Pradhan *et al*. (2021) [21] in bitter gourd. Across the progenies of this cross, there was generally a moderate to low range of variation observed for most traits, indicating that the F_5 generation of ridge gourd exhibits moderate to low levels of variation.

3.2 Heritability and genetic advance as percent of mean

For the Cross (Arka Sumeet × Konkan Harita), there was a substantial heritability observed alongside significant genetic advance as a percent of the mean for various characteristics, including number of branches per vine (98.50; 35.28), node of first female flower appearance (95.59; 25.14), node of first male flower appearance (95.98; 46.08), number of pickings (90.46; 22.62), diameter of fruit (84.37; 29.35), fruit yield per vine (95.77; 26.05), fruit yield per plot (95.83; 26.26) and fruit yield per hectare (95.83; 26.24). The combination of high heritability and notable genetic advance indicates the existence of adaptable additive gene effects, rendering these traits valuable for selection criteria. Moreover, these traits seem to be less affected by environmental factors, making the selection of plants based

on such characteristics worthwhile. These findings align with research by Koppad *et al*. (2015) [17] in ridge gourd, Abhijeet *et al*. (2018) [1] in sponge gourd, Ingole *et al*. (2021) [14] in pumpkin, and Pradhan *et al*. (2021) [21] in bitter gourd.

On the other hand, certain traits in the F_5 generation of the cross (Arka Sumeet × Konkan Harita) exhibit high heritability but only a moderate to low genetic advance as a percentage of the mean for vine length (96.63; 16.12), days to first female flower appearance (93.89; 6.78), days to first male flower appearance (92.57; 9.83), days to 50% flowering (78.21; 5.40), sex ratio (88.82; 13.49), days to first picking (90.06; 7.90), days to last picking (91.05; 3.32), length of fruit (88.66; 10.28), weight of fruit (97.25; 5.93) and number of fruits per vine (94.31; 19.19). These results imply the existence of a degree of non-additive gene effects, suggesting that selection may not yield as significant improvements for these traits. Comparable findings were documented by Kannan and Rajamanickam (2019) [16] in ridge gourd, Ingole *et al*. (2021) [14] in pumpkin and Pradhan *et al*. (2021) [21] in bitter gourd.

3.3 Correlation coefficient

3.3.1 Correlation coefficient of cross Arka Sumeet × Konkan Harita (C_1: P_3 x P_4) for F_5 generation

The correlation coefficients, both genotypic and phenotypic, for the cross between Arka Sumeet and Konkan Harita (C1: $P_3 \times P_4$) in the F_5 generation, are presented in Table 2.

3.3.2 Inter correlations among yield attributing components

At both the genotypic and phenotypic levels, vine length during harvest demonstrated a statistically significant positive association with various parameters. These included the number of primary branches per vine, number of pickings, days to last picking, dimensions of the fruit (length and diameter), weight of the fruit, number of fruits per vine, as well as the overall fruit yield per vine and per plot. Additionally, vine length exhibited a notable and significantly negative relationship with several factors across both genotypic and phenotypic levels. These factors included the days to appearance of the first female flowers, days to appearance of the first male flowers, specific node where the initial female flower emerged, node where the initial male flower appeared, time taken for 50% flowering to occur, the duration until the first picking and the sex ratio.

Similarly, at both the genotypic and phenotypic levels, the number of branches per vine showed a noteworthy and statistically significant positive correlation with a variety of factors. These included the number of pickings, days to last picking, dimensions of the fruit (length and diameter), weight of the fruit, number of fruits per vine, as well as the overall fruit yield per vine and per plot. Conversely, the number of branches per vine displayed a significant and notable negative correlation with several parameters across both genotypic and phenotypic levels. These parameters encompassed the days to the first appearance of female flowers, days to the first appearance of male flowers, specific node where the first female flower emerged, node where the first male flower appeared, sex ratio, as well as the days to the first picking.

At both the genotypic and phenotypic levels, the duration until the first appearance of female flowers exhibited a significant and statistically positive relationship with factors such as the duration until the first appearance of male flowers, specific node where the first female flower emerged, node where the first male flower appeared, period required for 50% flowering, sex ratio, as well as the time needed for the first picking. Additionally, across both the genotypic and phenotypic perspectives, the duration until the first appearance of female flowers displayed a significant and substantial negative correlation with various parameters. These included the number of pickings, duration until the last picking, dimensions of the fruit (both length and diameter), weight of the fruit, number of fruits per vine, as well as the overall fruit yield per vine and per plot.

Similarly, in both the genotypic and phenotypic dimensions, the duration until the first appearance of male flowers showed a substantial and statistically significant positive relationship with factors such as the specific node where the first female flower appeared, node where the first male flower emerged, period required for 50% flowering to occur, sex ratio, as well as the duration until the first picking. Moreover, across both the genotypic and phenotypic perspectives, the duration until the first appearance of male flowers exhibited a meaningful and significant negative correlation with various parameters. These included the number of pickings, duration until the last picking, dimensions of the fruit (both length and diameter), weight of the fruit, number of fruits per vine, as well as the overall fruit yield per vine and per plot.

The specific node where the first female flower appeared displayed a statistically significant positive relationship with factors including the node where the first male flower appeared, period required for 50% flowering, sex ratio, as well as the duration until the first picking. Furthermore, spanning both the genotypic and phenotypic dimensions, this particular node exhibited a significant and notable inverse correlation with various parameters. These encompassed the number of pickings, duration until the last picking, dimensions of the fruit (length and diameter), weight of the fruit, number of fruits per vine, as well as the overall fruit yield per vine and per plot.

Likewise, the specific node where the first male flower appeared showed a notable and statistically significant positive relationship with factors such as the period required for 50% flowering, sex ratio, and days to the first picking. Furthermore, across both the genotypic and phenotypic dimensions, this particular node demonstrated a significant and negative correlation with various parameters. These encompassed the number of pickings, duration until the last picking, dimensions of the fruit (length and diameter), weight of the fruit, number of fruits per vine, as well as the overall fruit yield per vine and per plot.

The duration taken to reach 50% flowering demonstrated a notable and statistically significant positive relationship with factors such as the sex ratio and the time to the first picking. Additionally, across both the genotypic and phenotypic contexts, this duration showed a significant and meaningful negative correlation with various parameters. These encompassed the number of pickings, the duration until the last picking, dimensions of the fruit (both length and diameter), weight of the fruit, the number of fruits per vine, as well as the overall fruit yield per vine and per plot.

The observed sex ratio exhibited a notable and statistically significant positive relationship with the time to the first picking, observed across both genotypic and phenotypic levels. Simultaneously, there was a significant and

meaningful negative correlation between the sex ratio and various parameters, including the number of pickings, the duration until the last picking, dimensions of the fruit (both length and diameter), weight of the fruit, the number of fruits per vine, as well as the overall fruit yield per vine and per plot.

At both the genotypic and phenotypic levels, the time to the first picking displayed a significant and inverse relationship with a range of factors. These encompassed the number of pickings, the duration until the last picking, dimensions of the fruit (both length and diameter), weight of the fruit, the number of fruits per vine, as well as the overall fruit yield per vine and per plot.

The number of pickings exhibited a notable and statistically significant positive correlation, observed across both the genotypic and phenotypic dimensions. This correlation extended to various parameters, including the duration until the last picking, dimensions of the fruit (length and diameter), weight of the fruit, the number of fruits per vine, as well as the overall fruit yield per vine and per plot.

At both the genotypic and phenotypic levels, there was a meaningful and statistically significant positive relationship observed between the duration until the last picking and various factors. These encompassed dimensions of the fruit (length and diameter), weight of the fruit, the number of fruits per vine, as well as the overall fruit yield per vine and per plot.

Within both the genotypic and phenotypic dimensions, fruit length exhibited a notable and statistically significant positive correlation with various attributes, including fruit diameter, fruit weight, the number of fruits per vine, as well as the overall fruit yield per vine and per plot.

In both the genotypic and phenotypic contexts, there was a significant positive correlation observed between fruit diameter and attributes such as fruit weight, the number of fruits per vine, as well as the overall fruit yield per vine and per plot.

A significant positive correlation was observed between fruit weight and factors including the number of fruits per vine as well as the overall fruit yield per vine and per plot.

At both the genotypic and phenotypic levels, the number of fruits per vine exhibited a meaningful and statistically significant positive correlation with both fruit yield per vine and fruit yield per plot.

There was a notable and significant positive correlation between fruit yield per vine and fruit yield per plot, observed at both the genotypic and phenotypic levels. The outcomes of this study are in line with similar research conducted by Choudhary and Kumar (2011) [6], Dubey *et al*. (2013) [7], Ananthan and Krishnamoorthy (2017) [2], and Kannan and Rajamanickam (2019) [16], as well as Thulasiram *et al*. (2023) [24] in the context of ridge gourd, Chithra *et al*. (2023) [5] in sponge gourd. Additionally, analogous findings were reported by Vaidya *et al*. (2020) [25] concerning bottle gourd, Ingole *et al*. (2021) [14], Ingole *et al*. 2022 [15] and Ban *et al*. (2022) [3] in pumpkin.

4. Conclusion

Moderate genetic coefficient of variation (GCV) and phenotypic coefficient of variation (PCV), coupled with high heritability and substantial genetic advance as a percentage of the mean, were observed for certain characteristics in the F_5 generation of the cross between Arka Sumeet and Konkan Harita. These characteristics included the number of branches per vine, node of the first female flower appearance, node of the first male flower appearance, number of pickings, diameter of fruit, fruit yield per vine, fruit yield per plot and fruit yield per hectare. Conversely, traits such as vine length, days to the first female flower appearance, days to the first male flower appearance, days to 50% flowering, sex ratio, days to the first picking, days to the last picking, length of fruit, weight of fruit and number of fruits per vine displayed high heritability but had a moderate to low genetic advance as a percentage of the mean in the F_5 generation. This suggests that further selection may not significantly alter these traits, as they have already achieved a certain level of homozygosity. In terms of correlation, a significant and positive relationship was observed between fruit yield per vine and several growth-related traits, including vine length, number of branches per vine, number of pickings, days to the last picking, length of fruit, diameter of fruit, weight of fruit, number of fruits per vine, fruit yield per vine and fruit yield per plot. Conversely, a substantial and negative correlation was noted between fruit yield per vine and various reproductive traits, such as days to the first appearance of female and male flowers, node number at which the first female and male flowers emerged, duration until 50% flowering, sex ratio and days taken for the first picking.

5. References

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