Plant Archives Vol. 26, No. 1, 2026 pp. 923-930 e-ISSN:2581-6063 (online), ISSN:0972-5210

Plant Archives

Journal homepage: http://www.plantarchives.org

DOI Url : https://doi.org/10.51470/PLANTARCHIVES.2026.v26.no.1.125

ASSESSMENT OF GROWTH, YIELD AND QUALITY ATTRIBUTES OF BITTER GOURD (*MOMORDICA CHARANTIA* L.) GENOTYPES UNDER NORTHERN DRY ZONE CONDITIONS OF KARNATAKA INDIA

Matam Jayanth Kumar[1*], Vijayakumar Rathod[2], Vilas D. Gasti[1], Sandhyarani Nishani[3], Prashantha A.[4] and Mohana Kumara P.[3]

[1]Department of Vegetable Science, Kittur Rani Channamma College of Horticulture, University of Horticultural Sciences, Bagalkot -591218, Arabhavi, Karnataka, India

[2]Department of Vegetable Science, College of Horticulture Bagalkot, University of Horticultural sciences, Bagalkot -587104, Karnataka, India

[3]Department of Biotechnology and Crop Improvement, College of Horticulture Bagalkot, University of Horticultural sciences, Bagalkot -587104, Karnataka, India

[4]Department of Plant Pathology and AICRP on Fruits, Kittur Rani Channamma College of Horticulture, University of Horticultural Sciences, Bagalkot -591218, Arabhavi, Karnataka, India

*Corresponding author E-mail: jayanth.m.babblu@gmail.com

(Date of Receiving-12-01-2026; Date of Revision-27-02-2026; Date of Acceptance-17-03-2026)

ABSTRACT

Bitter gourd (*Momordica charantia* L.) is an important cucurbitaceous vegetable cultivated for its nutritional and medicinal value. The present study was conducted during late kharif 2024-25 at Kittur Rani Channamma College of Horticulture, Arabhavi, in the Northern Dry Zone of Karnataka to evaluate the performance of 68 genotypes for growth, yield and quality traits. The experiment was laid out in a Randomized Block Design with two replications. Significant differences were observed among genotypes for all sixteen characters studied. Fruit yield per hectare ranged from 0.76 to 10.46 tonnes, with Preethi, IC85634-2 and SBC/DRB-169 emerging as superior yielders. Preethi also exhibited desirable earliness traits, including early female flowering and first harvest. IC85634-2 recorded the highest average fruit weight, while Pusa Aushadhi excelled in vine length, fruit length and antioxidant activity. The results identified high-performing genotypes suitable for cultivation and further evaluation under Northern Dry Zone conditions.

***Key words*:** Bitter gourd, Genotype performance, Yield evaluation, Earliness, Quality attributes

Introduction

Bitter gourd (*Momordica charantia* L.), popularly known as bitter melon, is an important tropical and subtropical vegetable belonging to the family Cucurbitaceae, which comprises about 90 genera and 750 species. India is considered the primary centre of origin, with China and Southeast Asia recognized as secondary centres of diversity (Gruthew, 1977). The crop possesses a somatic chromosome number of 2n = 2x = 22 and is widely cultivated across India as an important commercial cucurbitaceous vegetable. India produces 1,769.14 thousand MT from 135.89 thousand hectares, while Karnataka contributes 11.25 thousand MT from 1.19 thousand hectares (Indiastat, 2023-24). Major bitter gourd producing countries include India, Indonesia, Malaysia, China and Tropical Africa. Within India, the crop is extensively grown in Maharashtra, Gujarat, Rajasthan, Punjab, Tamil Nadu, Kerala, Karnataka, Andhra Pradesh, West Bengal, Odisha, Assam, Uttar Pradesh and Bihar.

Bitter gourd is highly valued for its nutritional and medicinal properties. The plant contains several biologically active compounds such as momordicin, charantin and cucurbitacin. The characteristic bitterness is attributed to momordicin (momordicosides-glycosides of tetracyclic triterpenoids with a cucurbitane skeleton),

Table 1: Mean performance of bitter gourd genotypes for growth characters.

Genotypes	Vine length at harvest (m)	No. of branches per vine	Node to first female flower	Days to first female flowering	Days to 50 % flowering	Sex ratio
IC505640-1	2.67	6.39	13.44	35.67	40.50	15.73
IC505640-2	2.65	6.83	11.89	37.94	41.00	17.01
IC505640-3	4.37	8.77	11.25	35.73	36.50	18.66
IC213308	2.93	5.78	15.73	37.99	42.50	18.32
IC66023	3.56	10.33	15.41	38.39	42.00	15.49
IC470556-1	3.42	8.77	12.11	34.61	37.00	18.27
IC470556-2	3.43	10.63	9.62	32.09	39.00	16.80
IC536670	3.64	8.38	11.79	32.59	38.50	17.61
IC427432	3.64	8.36	10.83	39.11	40.00	17.43
IC68306	3.90	8.98	12.95	33.13	39.50	15.47
IC470555	3.16	8.88	18.09	34.39	38.00	13.95
IC65972-1	3.20	9.49	15.83	32.05	37.00	12.83
IC65972-2	3.60	9.32	14.63	32.72	36.50	12.66
IC470553-2	5.91	11.23	18.41	32.99	36.26	14.13
IC85635	5.81	10.33	14.94	36.13	38.04	15.56
IC505639-3	3.30	10.93	14.35	37.35	37.50	14.55
IC505629-1	3.64	8.66	13.20	36.49	41.50	17.28
IC505629-2	3.86	7.29	13.44	33.43	39.50	17.32
IC85626-1	3.96	10.71	12.66	35.55	44.50	15.25
IC113875	3.27	9.69	12.31	36.04	38.00	19.28
IC68314	3.21	7.39	14.51	34.73	36.00	10.75
IC505632	3.03	7.21	14.39	35.27	40.00	11.22
IC68309-1	4.68	11.76	11.32	35.48	36.96	13.60
IC505638	3.83	9.41	19.33	35.28	39.50	16.92
IC85636	2.62	6.49	15.85	36.82	39.00	14.63
IC470554-1	2.32	6.67	15.99	36.38	37.00	10.21
Priyanka	3.60	7.28	16.91	36.49	37.59	18.02
IC470554-3	5.49	11.74	12.64	35.43	36.96	16.15
IC85650-1	3.64	8.45	20.28	33.65	36.50	14.38
IC85650-2	5.60	10.46	10.25	36.44	36.98	12.22
IC505635-2	2.06	6.46	14.62	34.90	35.50	15.61
IC85634-1	2.15	6.83	10.25	31.72	34.50	11.14
IC85634-2	5.89	10.89	14.84	33.77	34.01	10.17
IC469512-1	2.92	6.98	15.06	33.78	40.00	12.86
IC469512-2	3.02	6.95	15.95	33.77	35.50	15.35
IC469512-3	2.39	6.74	16.05	35.78	36.50	15.51
Madhya Pradesh Local 1	3.72	7.94	16.27	33.82	40.50	14.96
Madhya Pradesh Local 2	2.93	6.67	14.83	36.89	37.50	13.29
Punjab Local 1	2.12	5.15	16.33	36.38	41.00	15.30
Punjab Local 2	3.03	6.86	15.64	38.81	39.00	10.62
Nanjangudu Local	3.20	7.94	16.61	33.84	36.50	12.11
HUB-2	4.30	8.96	6.83	36.79	41.20	12.80
Arka Harith	4.25	10.89	9.60	34.04	36.19	10.20
Kathai Vaibhav	3.72	8.98	24.21	38.44	39.50	11.00
Chaman	2.12	7.34	16.90	34.94	38.00	11.06
Dharog Local	4.20	8.55	16.65	35.83	40.00	17.19
Solan Hara	4.80	9.79	10.25	37.99	35.26	14.16
Janpuri	5.53	9.58	16.21	37.79	35.98	13.97

Continue 1...

Jhalri Long	4.28	8.94	10.82	35.43	38.50	14.19
CO-1	3.53	9.58	11.33	33.67	39.56	12.24
TNAU Local	3.86	7.33	13.25	40.52	44.02	10.20
Gujarat Local	4.79	10.95	8.25	36.98	39.12	14.25
SBC/DRB-184	5.26	9.25	14.89	35.21	43.85	12.33
SBC/DRB-169	5.26	12.01	6.12	36.58	39.01	14.26
SBC/DRB-129	5.96	12.59	9.18	34.26	36.26	18.16
SBC/DRB-204	4.21	11.02	8.12	39.56	45.97	14.26
Bengaluru Local	3.63	8.59	12.56	38.28	40.85	15.26
LSV/21-12	3.58	6.98	14.96	31.59	41.96	14.39
White big Local	3.98	9.26	16.87	37.69	42.15	18.25
Priya	4.96	8.74	19.25	32.15	40.56	14.36
Green big Local	3.45	7.48	14.65	41.23	43.25	17.25
IC427433	5.25	7.36	12.84	38.26	44.01	16.25
IC4418	3.47	9.99	16.84	36.96	41.98	18.23
Preethi	5.96	10.99	5.88	29.65	32.98	8.36
Pusa Aushadhi	5.99	11.91	7.18	29.99	35.01	9.28
VR-2-1	3.85	9.89	16.46	36.22	40.23	14.29
VR-1	3.47	8.74	15.16	37.96	42.85	13.78
Haveri Local	3.47	8.24	13.96	42.26	46.54	12.94
Grand mean	3.86	8.82	13.82	35.64	39.04	14.43
SE(m) ±	0.16	0.41	0.58	1.41	1.54	0.58
CD (0.05)	0.47	1.17	1.64	3.98	4.35	1.64
CV (%)	5.84	5.77	5.95	5.60	5.59	5.69

which differs from the cucurbitacins found in other cucurbits. Charantin, a major bioactive compound, exhibits strong hypoglycaemic activity and plays a significant role in diabetes management. The fruits are rich in vitamins and minerals and are consumed after cooking in various culinary forms such as boiling, frying, stuffing and pickling. The immature fruits and tender shoot tips are also used as vegetables. The crop exhibits considerable phenotypic variability in sex expression, growth habit, maturity, fruit shape, size, colour and surface texture (Behera *et al*., 2006), offering substantial scope for genetic improvement. In view of this variability and the need for region-specific high-yielding cultivars, systematic evaluation of bitter gourd genotypes for growth, yield and quality traits is essential. Therefore, the present investigation was undertaken to assess the performance of bitter gourd genotypes under the Northern Dry Zone of Karnataka to identify superior and adaptable types suitable for this agro-climatic region.

Material and Methods

The experiment was conducted during the late kharif season of 2024-25 at the Department of Vegetable Science, Kittur Rani Channamma College of Horticulture, Arabhavi, University of Horticultural Sciences, Bagalkot, Karnataka, located in the Northern Dry Zone of Karnataka. The experimental site is situated at 16.22° N latitude and 74.83° E longitude, with black sandy loam

Fig. 1: Fruit colour variation in bitter gourd genotypes.

Table 2: Mean performance of bitter gourd genotypes for yield characters.

Genotypes	FL (cm)	FD (cm)	NFPV	AFW (g)	FYPV (kg/vine)	DFH	FYPH (t)
IC505640-1	11.50	3.16	14.22	16.25	0.23	53.20	1.03
IC505640-2	9.75	3.33	17.86	40.96	0.73	58.80	3.25
IC505640-3	13.66	4.45	18.03	44.30	0.80	49.96	3.55
IC213308	12.60	3.94	17.98	39.86	0.72	57.80	3.18
IC66023	8.10	3.20	18.89	19.89	0.38	54.20	1.67
IC470556-1	8.40	2.80	17.26	42.98	0.74	57.20	3.30
IC470556-2	7.89	3.37	18.69	39.88	0.75	53.60	3.31
IC536670	14.50	3.20	20.12	36.96	0.74	52.60	3.30
IC427432	9.25	3.36	12.89	56.95	0.73	50.40	3.26
IC68306	12.50	4.25	18.75	23.76	0.45	60.40	1.98
IC470555	12.81	2.76	19.44	40.68	0.79	63.20	3.51
IC65972-1	9.33	3.63	20.37	38.36	0.78	56.41	3.47
IC65972-2	10.20	3.01	18.81	39.98	0.75	62.31	3.34
IC470553-2	15.25	4.22	18.00	116.67	2.10	47.56	9.33
IC85635	6.75	4.33	16.33	103.67	1.69	48.56	7.52
IC505639-3	10.21	3.43	12.33	22.67	0.28	56.80	1.24
IC505629-1	8.33	2.70	17.10	43.25	0.74	55.80	3.29
IC505629-2	10.11	3.23	14.44	49.99	0.72	57.89	3.21
IC85626-1	7.51	3.20	17.89	21.02	0.38	65.40	1.67
IC113875	10.61	3.00	12.13	14.96	0.18	63.04	0.81
IC68314	9.65	4.42	14.96	22.28	0.33	57.60	1.48
IC505632	11.33	4.06	13.65	26.95	0.37	67.20	1.63
IC68309-1	13.62	5.56	13.02	90.07	1.17	49.21	5.21
IC505638	5.21	3.40	16.10	19.90	0.32	65.21	1.42
IC85636	7.66	3.04	11.78	16.03	0.19	61.28	0.84
IC470554-1	10.22	3.56	18.19	42.80	0.78	63.41	3.46
Priyanka	9.95	3.40	13.44	40.95	0.55	59.08	2.45
IC470554-3	12.82	4.11	17.07	46.67	0.79	50.12	3.54
IC85650-1	9.22	4.03	17.69	30.98	0.55	62.20	2.44
IC85650-2	15.01	5.41	18.50	44.20	0.82	49.36	3.63
IC505635-2	11.33	3.33	10.89	34.56	0.38	58.89	1.67
IC85634-1	9.25	2.92	16.23	45.98	0.75	59.63	3.32
IC85634-2	11.01	4.50	17.33	126.00	2.18	47.98	9.70
IC469512-1	8.52	3.42	15.69	25.15	0.39	61.40	1.75
IC469512-2	13.01	2.56	15.69	49.78	0.78	62.51	3.47
IC469512-3	11.25	3.31	17.48	44.16	0.77	60.28	3.43
Madhya Pradesh Local 1	12.22	3.53	16.99	10.11	0.17	64.23	0.76
Madhya Pradesh Local 2	7.75	3.46	16.26	26.67	0.43	65.82	1.93
Punjab Local 1	9.89	3.14	15.78	49.12	0.78	62.36	3.44
Punjab Local 2	6.62	3.53	11.57	28.78	0.33	58.75	1.48
Nanjangudu Local	5.33	3.63	28.62	12.47	0.36	59.64	1.59
HUB-2	6.23	3.52	18.67	44.67	0.83	48.63	3.71
Arka Harith	5.66	4.12	17.67	51.33	0.90	49.36	4.03
Kathai Vaibhav	9.66	3.61	20.65	37.96	0.78	60.80	3.48
Chaman	6.75	3.26	19.97	39.87	0.80	58.96	3.54
Dharog Local	12.22	3.95	14.01	45.14	0.63	57.26	2.81
Solan Hara	7.25	3.16	18.67	67.00	1.25	49.15	5.56
Janpuri	8.29	3.52	24.00	35.00	0.84	50.29	3.73
Jhalri Long	4.33	4.10	19.19	38.19	0.73	65.49	3.26

Continue 2...

CO-1	12.33	3.03	25.10	30.00	0.75	63.24	3.35
TNAU Local	6.01	3.53	10.61	42.13	0.45	61.28	1.99
Gujarat Local	12.89	3.93	17.00	55.33	0.94	51.23	4.18
SBC/DRB-184	12.77	2.96	14.12	36.68	0.52	59.99	2.30
SBC/DRB-169	9.75	4.42	21.33	102.00	2.18	47.25	9.67
SBC/DRB-129	10.89	5.36	12.67	43.56	0.55	49.56	4.46
SBC/DRB-204	9.67	4.32	22.67	63.00	1.43	49.15	6.35
Bengaluru Local	8.25	3.13	11.43	44.00	0.50	65.70	2.23
LSV/21-12	9.69	3.63	17.01	30.06	0.51	66.58	2.27
White big Local	11.42	4.31	11.78	42.14	0.50	65.12	2.21
Priya	12.44	4.35	14.25	50.02	0.71	67.26	3.17
Green big Local	11.44	3.82	12.74	41.92	0.53	64.12	2.37
IC427433	12.98	4.51	16.67	50.67	0.84	48.72	3.75
IC4418	9.76	4.21	17.25	30.03	0.52	59.62	2.30
Preethi	15.43	2.71	22.00	107.00	2.35	47.12	10.46
Pusa Aushadhi	16.53	4.27	21.00	84.00	1.76	48.02	7.84
VR-2-1	8.65	5.12	12.68	40.87	0.52	55.46	2.30
VR-1	10.21	2.51	11.25	42.54	0.48	58.04	2.13
Haveri Local	9.96	4.52	10.32	39.42	0.41	68.15	1.81
Grand mean	10.17	3.67	16.66	44.43	0.75	57.45	3.37
SE(m) ±	0.41	0.14	0.69	1.87	0.03	2.31	0.14
CD (0.05)	1.15	0.41	1.95	5.28	0.09	6.53	0.41
CV (%)	5.70	5.63	5.90	6.01	6.34	5.69	6.33

FL: Fruit length (cm); FYPV: Fruit yield (kg/vine); FD: Fruit diameter (cm); DFH: Days to first harvest; NFPV: Number of fruits per vine; FYPH: Fruit yield (t/ha); AFW: Average fruit weight (g)

soil. A total of sixty-eight bitter gourd genotypes were evaluated, comprising diverse landraces and local cultivars collected from different agro-ecological regions of India, along with improved varieties and accessions obtained from the National Bureau of Plant Genetic Resources (NBPGR), New Delhi. The experiment was laid out in a Randomized Block Design (RBD) with two replications. Each genotype was sown at a spacing of 1.5 m × 1.5 m. Uniform agronomic practices and recommended plant protection measures were followed throughout the crop growth period to ensure a healthy and uniform crop stand.

Observations were recorded on five randomly selected plants per genotype in each replication for sixteen characters related to growth, yield and quality traits, *viz.*, vine length at harvest (m), number of primary branches per vine, node to first female flower, days to first female flowering, days to 50 per cent flowering, sex ratio, fruit length (cm), fruit diameter (cm), number of fruits per vine, average fruit weight (g), fruit yield per vine (kg), days to first harvest, fruit yield per hectare (t), flesh thickness (mm), antioxidant activity and ascorbic acid content (mg/100 g).

Results and Discussion

The mean performance of 68 bitter gourd genotypes for sixteen growths, yield and quality traits is presented in Tables 1, 2 and 3. Based on overall performance, the top five genotypes for yield traits and fruit colour at the edible stage (Fig. 1) are presented in Tables 4 and 5. Significant differences among genotypes for all traits indicated substantial genetic variability and ample scope for improvement through selection. Vine length ranged from 2.06 to 5.99 m (mean 3.86 m), with Pusa Aushadhi and Preethi recording maximum values, while IC505635-2 was the shortest. Number of branches per vine varied from 5.15 to 12.59, highest in SBC/DRB-129. Earliness traits showed wide variation; notably, Preethi recorded minimum node to first female flower (5.88), earliest first female flowering (29.65 days), 50 per cent flowering (32.98 days), lowest sex ratio (8.36) and earliest harvest (47.12 days), whereas Haveri Local was the latest. Earliness and early appearance of female flowers at lower nodes are desirable traits contributing to enhanced yield and higher market value. The observed variability in earliness traits may be attributed to inherent genotypic differences. Similar findings were reported by Triveni (2021), Revathi (2022) and Kishorkumar *et al.*, (2025).

Fruit length ranged from 4.33 to 16.53 cm, with Pusa Aushadhi producing the longest fruits, while fruit diameter varied between 2.51 and 5.56 cm, highest in IC68309-1. Number of fruits per vine ranged from 10.32 to 28.62, highest in Nanjangudu Local. Average fruit weight varied

Table 3: Mean performance of bitter gourd genotypes for quality characters.

Genotypes	FT	AA	AAC
IC505640-1	13.43	66.46	43.40
IC505640-2	13.28	77.69	80.80
IC505640-3	16.98	87.30	54.18
IC213308	14.21	60.20	65.55
IC66023	13.62	74.80	93.77
IC470556-1	13.98	72.80	33.29
IC470556-2	13.80	79.05	60.98
IC536670	13.78	81.10	108.03
IC427432	14.26	79.08	70.41
IC68306	14.15	76.62	52.86
IC470555	13.78	72.26	75.04
IC65972-1	13.69	76.33	46.27
IC65972-2	14.15	69.42	44.31
IC470553-2	17.85	76.82	44.80
IC85635	16.23	77.33	31.53
IC505639-3	15.26	66.24	53.38
IC505629-1	14.36	68.82	39.06
IC505629-2	15.21	55.67	35.00
IC85626-1	14.86	78.21	26.66
IC113875	5.29	72.36	31.47
IC68314	15.48	80.51	29.14
IC505632	14.91	78.26	33.15
IC68309-1	17.09	79.51	56.94
IC505638	13.99	61.20	59.11
IC85636	15.48	60.25	38.37
IC470554-1	15.69	63.24	37.01
Priyanka	24.62	69.36	34.96
IC470554-3	16.69	78.96	58.70
IC85650-1	15.86	55.36	47.53
IC85650-2	16.74	87.26	61.36
IC505635-2	15.47	65.85	31.93
IC85634-1	15.36	68.96	48.81
IC85634-2	17.65	76.98	51.78
IC469512-1	15.47	66.58	43.61
IC469512-2	16.28	82.15	69.90
IC469512-3	14.65	74.45	33.46
Madhya Pradesh Local 1	14.80	75.62	67.24
Madhya Pradesh Local 2	16.43	73.64	32.29
Punjab Local 1	14.95	68.26	62.97
Punjab Local 2	13.77	68.95	92.93
Nanjangudu Local	13.27	70.80	59.96
HUB-2	17.01	84.35	43.18
Arka Harith	28.48	82.26	47.95
Kathai Vaibhav	9.96	74.26	65.71
Chaman	16.43	63.40	58.70
Dharog Local	15.20	69.26	23.00
Solan Hara	17.10	73.86	44.71
Janpuri	17.68	74.26	112.78
Jhalri Long	15.02	77.26	38.96
CO-1	24.96	69.26	99.85
TNAU Local	14.96	72.10	52.81
Gujarat Local	17.26	84.26	89.41
SBC/DRB-184	24.87	59.36	84.02
SBC/DRB-169	27.92	81.25	53.09
SBC/DRB-129	17.21	79.26	82.30
SBC/DRB-204	17.31	84.26	97.30
Bengaluru Local	15.50	56.99	97.26
LSV/21-12	15.09	74.26	73.23
White big Local	14.59	73.29	87.92
Priya	24.09	68.20	82.89
Green big Local	16.48	68.08	68.96
IC427433	17.47	78.15	92.78
IC4418	15.69	69.26	64.45
Preethi	28.01	84.26	54.96
Pusa Aushadhi	24.23	87.36	54.98
VR-2-1	15.14	56.36	95.62
VR-1	14.85	66.12	78.28
Haveri Local	13.33	69.48	53.69
Grand mean	16.36	72.87	59.42
SE(m) ±	0.67	2.85	2.42
CD (0.05)	1.88	8.06	6.85
CV (%)	5.77	5.77	5.54

FT: Flesh thickness (mm); AA: Antioxidant activity (%); AAC: Ascorbic acid content (mg/100 g)

from 10.11 to 126.00 g, with IC85634-2 recording the heaviest fruits. Fruit yield per vine ranged from 0.17 to 2.35 kg and per hectare from 0.76 to 10.46 t, with Preethi, IC85634-2 and SBC/DRB-169 emerging as superior yielders under Northern Dry Zone conditions. Flesh thickness, antioxidant activity and ascorbic acid content also exhibited marked variation, indicating scope for quality improvement.

The observed variability among genotypes may be attributed to inherent genetic differences and confirms the potential of these entries as promising donors for yield and quality enhancement in bitter gourd breeding programmes. These findings are in accordance with earlier reports of significant variability in bitter gourd by Maneesh *et al.*, (2014), Khan *et al.*, (2015), Mudassar (2015), Vivek *et al.*, (2018), Thakur *et al.*, (2018), Tyagi *et al.*, (2018), Prasanth *et al.*, (2020), Chinthan *et al.*, (2021), Pradhan *et al.*, (2021) and Nithin Kumar *et al.*, (2022).

Conclusion

The performance evaluation of bitter gourd genotypes under Northern Dry Zone conditions identified Preethi, IC85634-2 and SBC/DRB-169 as superior for yield and associated traits. Preethi was notable for earliness and

Table 4: Top ranking genotypes for yield characters in bitter gourd.

S.	Characters	Top five genotypes
1.	Fruit length (cm)	1. Pusa Aushadhi (16.53)
		2. Preethi (15.43)
		3. IC470553-2 (15.25)
		4. IC85650-2 (15.01)
		5. IC536670 (14.50)
2.	Fruit diameter (cm)	1. IC68309-1 (5.56)
		2. IC85650-2 (5.41)
		3. SBC/DRB-129 (5.36)
		4. VR-2-1 (5.12)
		5. Haveri Local (4.52)
3.	No. of fruits per vine	1. Nanjangudu Local (28.62)
		2. CO-1 (25.10)
		3. Janpuri (24.00)
		4. SBC/DRB-204 (22.67)
		5. Preethi (22.00)
4.	Average fruit weight (g)	1. IC85634-2 (126.00)
		2. IC470553-2 (116.67)
		3. Preethi (107.00)
		4. IC85635 (103.67)
		5. SBC/DRB-169 (102.00)
5.	Fruit yield (kg/vine)	1. Preethi (2.35)
		2. SBC/DRB-169 (2.18)
		3. IC85634-2 (2.18)
		4. IC470553-2 (2.10)
		5. Pusa Aushadhi (1.76)
6.	Fruit yield (t/ha)	1. Preethi (10.46)
		2. IC85634-2 (9.70)
		3. SBC/DRB-169 (9.67)
		4. IC470553-2 (9.33)
		5. Pusa Aushadhi (7.84)

overall productivity, while Pusa Aushadhi excelled in fruit length and antioxidant activity. These genotypes demonstrated better adaptability and productivity under the region's agro-climatic conditions and may be recommended for cultivation and further multilocation testing.

Statements & Declarations

This work was supported by [Dr. Vijayakumar Rathod]. Author Matam Jayanth kumar has received research support from University of Horticultural Sciences, Bagalkot. All authors contributed to the study conception and design. Material preparation, data collection and analysis were performed by [Matam Jayanth Kumar] and [Dr. Vijayakumar Rathod]. The first draft of the manuscript was written by [Matam Jayanth Kumar] and all authors commented on previous versions of the manuscript. All authors read and approved the final manuscript.

Table 5: Top ranking genotypes based on fruit colour at edible stage for fruit yield in bitter gourd.

S.	Fruit colour at edible stage	Top five genotypes
1.	Dark green	1. SBC/DRB-169 (2.18)
		2. SBC/DRB-204 (1.43)
		3. IC65972-1 (0.78)
		4. IC469512-2 (0.78)
		5. CO-1 (0.75)
2.	Green	1. IC85634-2 (2.18)
		2. Arka Harith (0.90)
		3. Janpuri (0.84)
		4. HUB-2 (0.83)
		5. Chaman (0.80)
3.	Light green	1. Pusa Aushadhi (1.76)
		2. IC85635 (1.69)
		3. IC68309-1 (1.17)
		4. Gujarat Local (0.94)
		5. IC427433 (0.84)
4.	Creamy white	1. Preethi (2.35)
		2. IC470553-2 (2.10)
		3. Solan Hara (1.25)
		4. IC85650-2 (0.82)
		5. IC505640-3 (0.80)

Conflict of Interest: The authors declare that there is no conflict of interest for this study.

Acknowledgements

The authors are grateful to the University of Horticultural Sciences, Bagalkot, Karnataka, India and IKS for providing the facilities to carry out this work.

References

Behera, T.K., Dey S.S. and Sirohi P.S. (2006). 'DBGy-201' and 'DBGy- 202': two gynoecious lines in bitter gourd (*Momordica charantia* L.) isolated from indigenous source. *Indian J. Genet. Plant Breed.*, **66**, 61-62.

Chinthan, K.N., Rathod V., Hanchinamani C.N., Nishani S., Dileepkumar A.M. and Bhat A.S. (2021). Studies on genetic variability among Local landraces of bitter gourd (*Momordica charantia* L.) for yield attributing traits under northern dry zone of Karnataka. *J. Pharm. Innov.*, **10(1)**, 174-178.

Gruthew, J.H. (1977). Production technology of vegetable crops. *Plant Genet. Resour.*,728-731.

Indiastat. (2024). Bitter gourd: Area and production statistics for India and Karnataka (2023-24). Retrieved from https://www.indiastat.com.

Khan, M.H., Bhuiyan S.R., Saha K.C., Bhuyin M.R. and Ali A.S.M.Y. (2015). Variability, correlation and path co-efficient analysis of bitter gourd (*Momordica charantia* L.). *Bangladesh J. Agric. Res.*, **40(4)**, 607-618.

Kishorkumar, G.K., Jawadagi R.S., Shashikant E., Namita R., Shivayogi R., Noorulla H. and Sayeed W.R.M. (2025).

Evaluation of bitter gourd (*momordica charantia* L.) genotypes for growth, yield and quality traits. *Plant Arch*., **25**, 3166-3174.

Maneesh, K.S., Bhardwaj D.R. and Upadhyay D.K. (2014). Genetic architecture and association analysis in bitter gourd (*Momordica charantia* L.) landraces. *Int. Q. J. Life Sci.*, **9(2)**, 707-711.

Mudassar, I. (2015). Study of correlation among morpho-physiological attributes in bitter gourd (*Momordica charantia* L.). *J. Agric. Res*., **53(3)**, 345-349.

Nithin kumar, K.R., Kumar A.J.S., Ramachandra R.K., Varalakshmi B., Mushrif S.K. and Prashanth S.J. (2022). Genetic variability and character association studies in bitter gourd (*Momordica charantia* L.) *J. G. G. P. B.*, **6**, 1-9.

Pradhan, P., Tripathy P., Sahu G.S., Tripathy B. and Shyama S. (2021). Assessment of genetic variability in F_4 segregating population of bitter gourd (*Momordica charantia* L.). *J. Pharmacogn. Phytochem*., **10**, 1452-55.

Prasanth, K., Sadashiva A.T., Pitchaimuthu M. and Varalakshmi B. (2020). Genetic diversity, variability and correlation studies in bitter gourd (*Momordica charantia*), *Indian J. Plant Genet. Resour.*, **33(2)**, 179-186.

Revathi, B. (2022). Genetic divergence and selection parameters for different genotypes of bitter gourd (*Momordica charantia* L.) *M. Sc. (Hort.) Thesis*. Univ. Horti. Sci., Bagalkot, Karnataka (India).

Thakur, V., Kumar S., Tiwari R. and Chormule S.R. (2018). Yield and yield contributing traits of bitter gourd (*Momordica charantia* L.) genotypes. *J. Pharmacogn. Phytochem*., **7**, 844-846.

Triveni, D. (2021). Studies on morphological and molecular diversity, heterosis and combining ability in bitter gourd (*Momordica charantia* L.). *Ph. D. (Hort.) Thesis*. Dr. Y. S. R. Horticultural University, Andhra Pradesh (India).

Tyagi, N., Singh V.B. and Maurya P.K. (2018). Studies on genetic variability, heritability and genetic advance in bitter gourd (*Momordica charantia* L.) for yield and yield contributing traits. *Int. J. Curr. Microbiol. App. Sci*., **7(3)**, 1788-1794.

Vivek, S., Rana D.K. and Shah K.N. (2018). Correlation and Per se performance studies in various lines of bitter gourd (*Momordica charantia* L.) under Garhwal Himalaya region of Uttarakhand. *Int. J. Curr. Microbiol. Appl. Sci.*, **7**, 3979-87.