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Evaluation of Cucumber (*Cucumis sativus* L.) Genotypes under Hill Zone of Karnataka, India

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A B S T R A C T

A field investigation was carried out with thirty genotypes of cucumber to evaluate the performance of the genotypes for growth and yield characters under hill zone of Karnataka. The genotype Sirsi Local-2 exhibited superiority for vine length, number of primary branches per plant, days to first harvest of the fruit, per cent marketable fruits per vine and chlorophyll content. Minimum number of node to appear first female flower, highest number of fruits per vine (13.90) and maximum yield per vine were found in the cultivar Poinsette. Fruit yield per hectare was highest in Banglore Local followed by Poinsette and Sirsi Local- 2. Lowest was seen in Pondecherry-1.The best genotypes identified in present investigation based on mean performance were Banglore Local, Poinsette and Sirsi Local -2. These genotypes can be utilized further for crop improvement programme in cucumber. Variations among different genotypes of cucumber may be attributed to inherent genetic makeup of the genotype and influence of environmental conditions.

Introduction

Cucumber (*Cucumis sativus* L.) is one of the most popular vegetable belong to the family Cucurbitaceae, with a chromosome number 2n=14.

It is an ideal summer vegetable crop chiefly grown for its edible tender fruits. It provides cooling effect, prevents constipation, useful in jaundice and seeds have number of ayurvedic uses. Seeds contain oil, which is helpful for brain development and body smoothness. In spite of the extensive cultivation and consumption, there is no systematic research work has been carried out in this region in order to understand the genetic architecture and endeavor in an improvement programme. Many important features of cultivated crops are not associated with discrete Mendelian traits, but are of a continuous or quantitative nature. Yield and many factors that affect it are subject to considerable environmental influence.

Hence, the present study was undertaken to estimate the growth and flowering parameters contributing to the yield performance of thirty different genotypes of cucumber under hill zones of Karnataka.

Materials and Methods

The present research study was carried out at Department of Vegetable science, College of Horticulture, Mudigere during 2017-18. The material used for research work consists of thirty cultivars of cucumber (Table 1) procured from COH Banglore, KRCCH Arabhavi and UAHS Shivmogga. The experiment was laid out in accordance with Randomized Complete Block Design (RCBD) comprising of thirty treatments and two replications. All the cultural practices were same for all the cultivars used. Observations on growth, flowering and yield parameters were recorded and subjected to statistical analysis.

Results and Discussion

Field emergence, ranged from 7 (Arbhavi Local -5, JMG-1 and Pusa Uday) to 12 days (Arbhavi Local -1 and Green Salad). The genotype Sirsi Local-2 exhibited superiority for vine length (2.22 m), number of primary branches per plant (6.81), days to first harvest of the fruit (36.48), per cent marketable fruits per vine (85.43 %) and chlorophyll content (2.12 mg/g). Inter nodal length (13.30 cm) and rind thickness (9.70 mm) was maximum in Hasan Local whereas they were found minimum in US-646. Number of nodes per vine (21.34) was maximum in the genotype JMG-1and found least in Kerala -2 (10.85). Genotype TUPE recorded appearance of first male flower at the earliest node. Minimum number of days to appearance of first male, female, 50 per cent flowering was recorded by the genotypes US-646 (20.66), JMG-1 (26.13) and Arbhavi Local-5 (30.67), respectively. Minimum number of node to appear first female flower (3.51), minimum number of days to last harvest of the fruits (83.38), highest number of fruits per vine (13.90) and maximum yield per vine were found in the cultivar Poinsette. Banglore Local showed maximum fruit diameter of 6.18 cm and lowest was seen in IIHR-285 (3.21 cm).

Table.1 List of cucumber genotypes used in study

Sl. No	Genotypes	Sl. No	Genotypes
1	Arbhavi Local -1	16	Honnavar Local
2	Haveri Local	17	IIHR-285
3	Arbhavi Local-2	18	IIHR-341
4	Arbhavi Local-3	19	JMG-1
5	Poinsette	20	Phule Shubhangi
6	Arbhavi Local-4	21	Pebkernal
7	Arbhavi Local-5	22	Kerala-2
8	Banglore Local	23	NCU-1207
9	Davangere Local	24	Pondecherry -1
10	White Long	25	Pusa Uday
11	Dharwad Local	26	Sirsi Local-1
12	EMU-102-402	27	Sirsi Local-2
13	Green Salad	28	TUPE
14	Hasan Loocal	29	US-640
15	Himangi	30	US-646

Table.2 *Per se* performance of cucumber genotypes for growth and flowering parameters

Sl. No	Genotypes	1	2	3	4	5	6	7	8	9	10
1	Arbhavi Local-1	12.00	1.44	6.58	15.55	8.95	3.00	27.17	5.31	33.13	34.72
2	Haveri Local	11.00	1.48	5.36	17.76	9.15	2.70	22.87	7.61	32.62	33.06
3	Arbhavi Local-2	10.50	1.29	6.41	13.94	9.00	3.30	27.56	4.52	44.84	41.99
4	Arbhavi Local-3	10.50	1.48	6.32	13.81	10.30	3.45	21.6	5.26	35.44	36.63
5	Poinsette	10.50	1.66	5.42	19.61	8.55	2.20	20.81	3.51	29.33	33.77
6	Arbhavi Local-4	11.00	1.48	5.94	17.85	8.75	3.60	23.02	5.84	34.37	35.85
7	Arbhavi Local-5	7.00	1.62	5.45	15.96	9.90	2.75	22.86	5.34	33.67	30.67
8	Banglore Local	8.00	1.61	6.17	15.05	9.30	3.50	21.60	6.32	32.65	32.87
9	Davangere Local	8.00	1.41	5.15	12.95	9.45	3.50	21.33	5.36	31.3	33.34
10	White Long	9.00	1.36	4.41	12.65	10.60	2.80	29.46	5.41	38.03	33.73
11	Dharwad Local	10.00	1.37	5.46	17.30	9.10	3.55	27.96	5.49	37.65	35.61
12	EMU-102-402	11.00	1.30	6.45	17.04	9.50	2.30	34.12	5.44	42.9	35.00
13	Green Salad	12.00	1.83	6.70	21.25	8.925	2.85	22.92	3.84	32.55	31.55
14	Hasan Loocal	11.00	1.46	5.28	10.95	13.30	3.35	25.55	5.38	33.67	39.05
15	Himangi	11.50	1.91	5.40	20.35	9.30	2.30	23.28	4.45	28.56	34.55
16	Honnavar Local	11.50	1.78	6.56	16.66	9.70	2.65	21.44	5.16	28.97	33.45
17	IIHR-285	9.00	1.47	5.08	16.05	9.05	3.65	25.13	5.62	31.91	39.55
18	IIHR-341	8.00	1.37	5.41	18.87	9.25	3.30	29.19	4.76	33.56	34.10
19	JMG-1	7.00	1.79	6.38	21.34	9.45	3.30	22.39	4.48	26.13	32.96
20	Phule Shubhangi	10.50	1.66	4.96	18.30	9.40	3.15	24.26	4.33	30.81	43.25
21	Pebkernal	10.00	1.44	5.46	15.81	8.95	2.50	31.49	4.40	40.61	33.12
22	Kerala-2	11.00	1.21	5.83	10.85	11.35	3.60	28.06	8.19	36.14	45.35
23	NCU-1207	10.00	1.53	5.53	12.42	10.75	4.25	29.06	7.44	36.15	42.36
24	Pondecherry -1	8.50	1.22	5.51	12.40	9.45	3.10	22.55	7.25	31.77	35.76
25	Pusa Uday	7.00	1.36	5.48	13.95	9.75	3.60	26.99	7.01	32.55	32.00
26	Sirsi Local-1	8.00	1.41	6.52	15.36	9.60	2.60	33.22	7.05	33.96	35.32
27	Sirsi Local-2	8.00	2.22	6.81	16.94	9.05	2.25	21.66	4.27	32.94	32.50
28	TUPE	8.00	1.22	5.30	18.43	9.00	2.15	32.12	8.59	32.71	32.53
29	US-640	10.00	1.32	5.32	17.83	8.80	2.80	30.49	6.10	35.62	43.21
30	US-646	8.00	1.51	5.14	15.81	7.80	2.40	20.66	5.26	29.06	33.86
		9.58	**1.51**	**5.73**	**16.10**	**9.51**	**3.02**	**25.70**	**5.64**	**33.79**	**35.73**
S.Em±		0.46	0.10	0.24	1.14	0.63	0.13	0.92	0.21	1.43	1.35
C.D (5%)		1.32	0.28	0.69	3.29	1.84	0.37	2.65	0.61	4.13	3.90

1. Field emergence (days)
2. Vine length at 90 DAS (m)
3. Number of branches per vine at 90 DAS
4. Number of nodes per vine at 90 DAS
5. Inter nodal length (cm)
6. Node at first male flower appear
7. Days to first male flowering
8. Node at first female flower appear
9. Days to first female flowering
10. Days to 50 per cent flowering

Table.3 *Per se* performance of cucumber genotypes for yield and quality parameters

Sl. No	Genotypes	1	2	3	4	5	6	7	8	9	10	11	12	13
1	Arbhavi Local-1	41.77	85.46	5.50	4.09	17.10	14.17	132.01	73.31	26.69	0.73	8.11	0.96	6.76
2	Haveri Local	39.28	88.44	7.15	5.11	15.82	19.84	172.51	75.55	24.45	1.23	12.35	0.60	6.01
3	Arbhavi Local-2	51.13	98.71	4.40	4.19	14.67	20.27	239.35	76.21	23.79	1.05	9.33	0.96	4.60
4	Arbhavi Local-3	44.21	89.34	5.90	4.47	18.22	20.08	177.85	76.82	23.18	1.05	9.33	1.24	4.75
5	Poinsette	38.83	83.38	13.90	4.32	22.79	20.24	183.50	84.27	15.73	2.55	22.67	1.91	6.20
6	Arbhavi Local-4	49.56	83.78	6.30	3.49	13.72	20.34	198.48	67.87	32.13	1.25	11.11	1.37	5.45
7	Arbhavi Local-5	46.66	86.05	4.90	4.33	13.43	20.07	122.80	74.59	25.41	0.60	5.33	1.45	8.35
8	Banglore Local	38.42	85.51	8.28	6.18	23.58	29.42	288.55	74.05	25.95	2.40	24.00	1.11	7.95
9	Davangere Local	39.03	85.45	8.96	4.51	20.88	20.27	256.18	75.29	24.71	2.30	20.44	1.60	8.15
10	White Long	46.88	93.87	4.04	5.36	23.63	29.66	160.54	64.72	35.29	0.65	5.78	1.39	8.95
11	Dharwad Local	44.51	84.14	7.43	4.17	16.00	19.88	160.71	74.42	25.58	1.20	10.66	1.26	9.05
12	EMU-102-402	39.71	85.12	6.26	4.31	17.01	19.28	95.89	71.95	28.05	0.60	5.33	1.61	8.00
13	Green Salad	39.07	85.27	9.96	5.18	23.82	20.50	210.63	82.76	17.24	2.10	21.00	0.67	8.45
14	Hasan Loocal	47.68	95.56	8.75	5.31	23.78	19.93	120.42	74.83	25.17	1.05	9.32	0.64	9.70
15	Himangi	37.94	112.34	9.57	5.25	15.54	19.91	255.91	81.72	18.28	2.45	21.78	1.11	6.55
16	Honnavar Local	38.87	103.24	9.75	5.46	23.66	20.03	256.99	81.90	18.10	2.50	22.27	1.06	6.95
17	IIHR-285	46.17	94.65	6.70	3.21	13.43	13.49	156.05	75.39	24.61	1.05	9.33	1.25	6.10
18	IIHR-341	40.12	91.01	5.16	4.05	20.61	19.32	126.20	72.15	27.85	0.65	5.78	1.60	6.20
19	JMG-1	42.28	107.46	9.61	4.49	19.38	19.88	208.22	82.09	17.91	2.00	17.77	1.79	5.85
20	Phule Shubhangi	52.01	106.29	9.21	3.82	12.27	17.92	119.23	78.09	21.91	1.10	11.00	0.79	8.05
21	Pebkernal	39.27	96.17	9.09	3.56	16.98	12.16	242.19	76.63	23.37	2.20	19.55	1.24	8.40
22	Kerala-2	57.31	94.20	6.35	3.56	12.59	11.99	110.56	69.29	30.71	0.70	6.22	0.96	8.65
23	NCU-1207	45.11	84.89	5.60	3.39	14.99	16.28	151.92	66.24	33.76	0.85	7.56	0.96	8.65
24	Pondecherry -1	46.11	94.62	5.30	4.33	14.89	19.99	105.66	75.20	24.80	0.55	4.89	0.64	8.10
25	Pusa Uday	40.66	84.05	9.10	5.33	16.78	27.63	148.69	81.21	18.79	1.35	13.50	0.74	8.55
26	Sirsi Local-1	41.67	93.12	7.05	5.56	24.59	28.55	341.70	75.08	24.92	2.41	18.74	0.66	8.45
27	Sirsi Local-2	36.48	107.00	10.75	5.17	21.13	29.63	236.80	85.43	14.57	2.55	22.63	2.11	7.75
28	TUPE	38.58	85.97	5.54	4.41	18.28	19.82	145.03	74.49	25.51	0.80	7.11	1.87	6.50
29	US-640	51.81	84.77	9.01	4.35	15.87	19.33	171.79	75.77	24.23	1.55	13.78	1.83	5.25
30	US-646	52.51	90.49	7.75	4.37	17.99	19.87	129.68	76.18	23.82	1.00	8.89	1.26	4.40
Mean		**43.79**	**92.01**	**7.58**	**4.51**	**18.12**	**20.33**	**180.87**	**75.79**	**24.21**	**1.42**	**12.85**	**12.85**	**7.23**
S.Em±		2.20	3.30	0.29	0.17	1.87	0.77	18.73	2.71	2.71	0.15	1.44	1.44	0.26
C.D (5%)		6.36	9.55	0.84	0.48	0.65	2.24	54.17	7.83	7.83	0.45	4.15	4.15	0.75

1. Days to first harvest of the fruit
2. Days to last harvest of the fruit
3. Total number of fruits per vine
4. Fruit diameter (cm)
5. Fruit length (cm)
6. Flesh thickness (mm)
7. Average fruit weight (g)
8. Per cent marketable fruits per vine
9. Per cent unmarketable fruits per vine
10. Yield per vine (kg)
11. Yield per ha (t)
12. Chlorophyll (mg/g)
13. Rind thickness (mm)

Maximum fruit length (24.59 cm) and fruit weight (341.70 g) were found in Sirsi Local-1whereas they were found least in Phule Shubhangi and EMU-102-402, respectively. Flesh thickness was high in White Long (29.66 mm) and was low in Kerala -2 (11.99 mm). Fruit yield per hectare was highest in Banglore Local (24.00 kg) followed by Poinsette (22.67 kg) and Sirsi Local- 2 (22.63 kg). Lowest was seen in Pondecherry-1 (4.89kg) as represented in tables 2 and 3. Variations among different genotypes of cucumber may be attributed to inherent genetic makeup of the genotype and influence of environmental conditions. The results were in the line with the findings of Munshi and Acharya (2005) and Suchitra and Haribabu (2006) for growth parameters in bottle gourd. Similar results for yield and yield attributes were recorded by Kumar *et al.,* (2008), Mohd and Khan (2009), Hossain *et al.,* (2010), Reddy *et al.,* (2013) in musk melon, Basumatary *et al.,* (2014) in spine gourd, Janaranjani and Kanthaswamy (2015) in bottle gourd, Khan *et al.,* (2015), Ene *et al.,* (2016), Chinatu *et al.,* (2017), Pushpalata *et al.,* (2017), Ahirwar and Singh (2018) and Tyagi *et al.,* (2018) in bitter gourd.

In the present investigation, the results revealed that growth and yield traits were varied among the different genotypes of cucumber. The genotype Sirsi Local-2 exhibited superiority for vine length, number of primary branches per plant, days to first harvest of the fruit, per cent marketable fruits per vine and chlorophyll content.

Minimum number of node to appear first female flower, highest number of fruits per vine (13.90) and maximum yield per vine were found in the cultivar Poinsette. Genotype Banglore Local recorded highest value for fruit diameter and frit yield per hectare. Thus from the study, considering the better performance for growth and yield parameters Banglore Local, Sirsi Local -2 and Poinsett genotypes were better for cultivation under hill zone of Karnataka.

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