

## A New *Coccinia (Coccinia indica)* DRC-1, A Variety Boon to Vegetable Growers

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**Abstract :** Investigation on identification of superior genotype of coccinia was undertaken during 2002-2006 at Olericulture Unit, UAS, Dharwad. The results revealed that out of 46 genotypes evaluated, DRC-1 recorded significantly higher fruit yield of 28.98 kgs/plant and higher fruit yield of 84.17 t/ha. The quality parameters of DRC-1 were also superior for all the traits except shelf life of fruits. The yield attributing characters like fruit length (5.7 cm), fruit diameter (2.06 cm), average fruit weight (20.13 gms) and average number of fruits/plants (1788.66) were significantly superior in DRC-1 compare to other genotypes. Based on the 4 years of investigation, DRC-1 genotype was found superior for all the characters except shelf life and this genotype is recommended for cultivation among the vegetable growers

**Key words:** Coccinia, DRC-1, yield, shelflife, fruits

### Introduction

Coccinia or Ivy gourd or little gourd or tondekai is an underexploited cucurbitaceous perennial vegetable crop. It is an aggressive climbing vine that spread quickly over, trees, shrubs, fences and other supporting structures. It is grown in most parts of India. But its cultivation is restricted around cities and coastal area. In our country it is being grown in larger areas viz., Bangalore, Kerala, TN, A.P., Maharastra, Bihar and M.P. It is mainly used as a vegetable in southern and coastal India. Immature fruits are used for cooking and are rich sources of Carbohydrates, protein, vitamins, A & C, medicinally this vegetable gaining importance among diabetic patients. The plant is dioecious in nature and it is propagated by both seeds and stem. Young plants require support to keep their young shoots growing upright, since the new shoots are delicate. For commercial crop, plants are trained on a bower system. In the initial stages the plants are supported by stakes so that they grow straight to the bower system and spread their branches. Tendrils of this plant are long and elastic with coil like springy characters and they will coil on the G.I. wire of the bower system. Presently vegetable growers are cultivating this vegetable in larger areas and exporting their produce to cosmopolitan cities and farmers getting very remunerative prices for their produce. Among vegetables it is considered as one of the major economically viable vegetable crops. But unfortunately till today no systematic research has been initiated in University and Private institutions. Hence the work on identification of superior genotypes has been initiated at UAS, Dharwad to help the vegetable growers.

### Material and Methods

The present investigation was carried out during 2002-06, at Olericulture Unit, UAS, Dharwad. Forty six genotypes were collected from various corners of South India and planted

in randomized block design with three replications in 2002 on inceptisil which had a pH of 6.7 and soil depth of 0.75 meters with the bed rock of shales. Each experimental unit was represented by 3 plants spaced at 6 ft. x 6 ft. and the plants were trained on pendal (bower) system. The fertilizer dose of 50:100:100 kg NPK/ha was given in 3 equal installments at every four months. Observation on fruits length, fruit diameter, fruit weight, number of fruits per plant, yield per plant, yield per ha, T.S.S. and shelf life of fruits were recorded on 3 plants from every genotype in each replication and the data was pooled for yield/plant and yield/ha. The quality parameters were recorded during the year 2005. The data was subjected to statistical analysis as suggested by Cochran and Cox (1965).

### Results and Discussion

Among the 46 genotypes DRC-1 was recorded significantly higher fruits yield / plant during all the four years (Table-1). The average fruit yield of pooled data of DRC-1 genotype was 28.98 kgs/plant followed by DRC-2 (25.49 kgs). Whereas least was noticed in UDP-4 (11.31 kgs). Similar trend was noticed for yield / ha (Table-2). The genotype DRC-1 was recorded significantly higher yield/ha compare to other genotypes during the all the years. The average of four years yield was 84.17 tonnes/ha was recorded in DRC-1 genotype followed by DRC-2 (75.12 t/ha). These results were in accordance with Kutty & Dharmatti (2004) in bitter gourd.

The quality parameters of coccinia fruits were revealed that the genotype DRC-1 was superior for the all the traits except shelflife of fruits (Tabl-3). The yield attributing characters like fruit length, fruit diameter, average fruit weight and number of fruits/plant will directly influence on the yield/plant and yield/ha. The fruit length was significantly more in HNN (8.43 cm), where as DRC-1 it was 5.7 cm and least was noticed in BNG-8 (2.56 cm). Similarly fruit diameter of DRC-1 genotype was more (2.06 cm) but higher was noticed in BLG-1 (2.16 cm) compared to

Table 1. Evaluation of Coccinia genotypes yield / plant (kg)

Sl. No.	Genotypes	Yield/ plant (kg) 2003	Yield/ plant (kg) 2004	Yield/ plant (kg) 2005	Yield/ plant (kg) 2006	Pooled Mean (kg/plant)
1.	SHE-2	15.63	15.21	17.93	17.65	16.60
2.	ME-1	17.12	15.45	25.15	25.65	20.84
3.	MUD-1	13.03	12.31	21.48	20.09	16.73
4.	MUD-2	11.95	12.35	19.15	19.65	15.77
5.	CKG-1	18.21	18.40	20.31	19.85	19.19
6.	CKG-2	16.63	15.70	25.65	26.00	20.99
7.	DRC-4	21.45	21.09	26.01	25.10	23.14
8.	DRC-3	19.73	22.57	38.05	29.00	24.83
9.	KR-1	18.15	17.00	26.09	24.70	21.48
10.	ORS-1	12.56	12.99	26.16	25.05	19.19
11.	CKG-3	13.18	13.00	20.61	19.85	16.66
12.	ANK-1	18.21	14.88	23.60	23.55	22.56
13.	HNN	9.91	10.35	31.70	21.20	15.79
14.	BLG-1	20.01	18.45	20.34	19.55	19.58
15.	DRC-1	25.77	26.50	31.78	31.90	28.98
16.	DRC-2	23.13	23.66	27.29	27.90	25.49
17.	DWD-3	17.85	15.30	26.31	25.90	21.34
18.	MUN	17.05	16.75	17.92	18.92	17.66
19.	GA	16.12	14.59	15.67	17.07	15.86
20.	BNG-1	19.40	18.85	18.11	17.35	18.43
21.	BNG-2	14.38	15.65	33.25	22.55	18.95
22.	BNG-3	16.83	15.22	20.33	19.70	18.02
23.	BNG-4	19.17	14.56	25.00	23.25	20.49
24.	BNG-5	16.14	14.65	18.89	19.05	17.18
25.	BNG-6	13.73	14.90	14.26	14.75	14.41
26.	BNG-7	16.30	17.60	20.91	19.25	18.56
27.	IC-3	16.11	16.85	21.88	20.50	18.83
28.	IC-6	11.71	13.90	15.02	15.97	14.15
29.	IC-7	17.22	15.00	17.72	16.50	16.61
30.	IC-8	13.09	14.97	22.88	20.85	17.94
31.	IC-9	15.75	14.95	21.09	19.25	17.74
32.	SRS-1	13.30	15.10	22.20	23.60	18.55
33.	BNG-8	12.91	13.75	14.35	13.65	13.66
34.	BNG-4	12.44	14.42	18.15	17.20	15.55
35.	BNG-5	11.85	14.55	13.56	14.45	13.60
36.	BNG-6	13.32	13.10	19.33	18.40	16.04
37.	BNG-7	10.06	12.25	12.45	12.45	11.80
38.	BNG-8	13.09	15.09	13.45	13.80	13.85
39.	SRS-2	13.69	14.05	18.89	16.40	15.01
40.	UDP-I	14.09	16.60	16.41	17.05	16.04
41.	UDP-2	15.52	16.15	19.64	18.25	17.39
42.	UDP-3	15.54	15.25	19.95	18.45	17.29
43.	KR-1	16.41	15.50	23.15	20.75	18.95
44.	UDP-4	10.65	11.11	18.83	11.65	11.31
45.	UDP-5	13.85	15.65	15.12	16.95	15.46
46.	UDP-6	14.22	13.96	17.56	17.05	15.70
	S.Em+	0.92	1.05	1.86	1.18	1.43
	C.D.at 5%	2.62	2.99	5.29	3.37	4.01

Table 2. Evaluation of Coccinia genotypes yield t/ha

Sl. No.	Genotypes	Yield t/ha 2003	Yield t/ha 2004	Yield t/ha 2005	Yield t/ha 2006	Pooled Mean (t/ha )
1.	SHE-2	46.90	45.63	54.21	52.95	49.92
2.	ME-1	51.35	46.39	75.35	76.60	62.42
3.	MUD-1	39.70	36.69	62.75	60.27	49.85
4.	MUD-2	35.40	37.30	57.35	58.95	47.25
5.	CKG-1	55.38	55.95	62.44	59.55	58.33
6.	CKG-2	48.95	46.10	77.50	75.00	61.88
7.	DRC -4	65.50	66.12	78.69	75.10	71.35
8.	DRC -3	59.20	69.76	81.56	84.75	73.81
9.	KR-1	54.47	51.30	78.27	74.85	64.72
10.	ORS-1	37.70	39.77	76.48	74.65	57.15
11.	CKG-3	39.60	40.30	62.08	59.15	50.28
12.	ANK-1	54.64	44.30	71.06	69.90	59.97
13.	HNN	29.75	31.05	65.11	63.60	47.37
14.	BLG-1	60.02	55.95	57.87	58.00	57.96
15.	DRC-1	77.32	78.85	88.99	91.55	84.17
16.	DRC-2	69.40	70.99	79.95	85.15	75.12
17.	DWD-3	53.57	44.90	79.93	84.25	65.66
18.	MUN	51.14	50.75	53.12	54.97	52.49
19.	GA	48.37	43.85	46.22	49.22	49.99
20.	BNG-1	58.20	57.57	55.74	52.22	55.93
21.	BNG-2	43.21	41.40	71.20	71.60	56.85
22.	BNG-3	51.10	45.66	60.15	59.40	54.08
23.	BNG-4	59.91	52.08	74.60	69.30	63.97
24.	BNG-5	48.54	42.80	54.99	56.55	50.72
25.	BNG-6	41.24	44.10	41.29	44.15	42.69
26.	BNG-7	47.16	51.80	62.23	58.35	54.86
27.	IC-3	48.13	50.95	65.15	61.50	56.43
28.	IC-6	35.13	41.70	44.66	46.35	41.96
29.	IC-7	52.17	45.20	53.16	49.50	50.00
30.	IC-8	38.06	45.01	68.25	62.55	53.46
31.	IC-9	45.71	44.00	62.60	58.75	52.76
32.	SRS-1	39.91	45.35	66.05	70.75	55.51
33.	BNG-8	38.73	40.80	42.05	40.95	40.63
34.	BNG-4	37.32	43.26	54.36	51.60	46.63
35.	BNG-5	35.11	42.95	40.10	43.35	40.37
36.	BNG-6	39.31	39.40	57.95	55.20	47.96
37.	BNG-7	29.85	30.10	37.20	35.85	33.25
38.	BNG-8	38.77	46.77	40.36	41.10	41.71
39.	SRS-2	41.18	44.05	46.95	48.20	45.09
40.	UDP-I	43.85	48.35	49.24	51.05	48.12
41.	UDP-2	46.86	45.15	58.92	54.75	51.12
42.	UDP-3	45.82	43.32	59.85	55.35	51.08
43.	KR-1	50.24	46.90	68.45	62.25	56.96
44.	UDP-4	33.00	32.90	35.50	34.65	34.01
45.	UDP-5	41.28	48.25	45.37	50.80	46.42
46.	UDP-6	42.04	42.10	52.05	51.15	46.83
S.Em+		2.62	2.80	2.45	6.23	3.21
C.D.at 5%		7.47	7.98	6.99	17.75	8.99

Table 3. Quality parameters of coccinia genotypes (harvested during 2005)

Sl. No.	Genotypes	Fruit length (cms)	Fruit diameter (cm)	Average fruit weight (g)	T.S.S.	No. of fruits/ plant	Shelf life (days)
1.	SHE-2	7.26	1.90	12.90	2.83	1022.33	7.33
2.	ME-1	5.03	1.80	9.78	3.03	926.00	6.67
3.	MUD-1	4.96	1.63	6.97	2.50	951.33	7.70
4.	MUD-2	3.16	1.56	10.21	3.20	904.33	5.00
5.	CKG-1	4.00	2.06	13.33	3.767	1425.33	6.67
6.	CKG-2	3.80	2.06	10.56	3.933	1541.00	10.00
7.	DRC-4	5.23	2.03	9.99	3.067	1548.66	8.67
8.	DRC-3	5.06	1.83	15.12	2.90	1998.00	7.33
9.	KR-1	5.03	1.96	14.51	3.33	2005.66	7.67
10.	ORS-1	4.20	1.86	15.20	2.70	1754.33	9.00
11.	CKG-3	5.96	2.06	15.95	2.90	1236.33	9.00
12.	ANK-1	5.93	2.00	22.20	3.20	1485.00	8.00
13.	HNN	8.43	1.90	16.00	3.56	1005.33	5.67
14.	BLG-1	5.50	2.16	23.33	3.96	1392.33	6.00
15.	DRC -2	4.46	1.73	17.90	4.10	1237.33	12.00
16.	DRC -1	5.70	2.06	20.13	3.80	1788.66	8.00
17.	DWD-3	4.46	1.90	6.20	3.00	1021.33	10.00
18.	MUN	5.20	2.00	5.50	3.53	1040.00	9.00
19.	GA	4.40	2.00	10.78	2.93	932.33	11.00
20.	BNG-1	5.63	1.96	8.50	4.13	1213.66	4.00
21.	BNG-2	5.50	1.83	17.20	4.00	1462.00	6.00
22.	BNG-3	5.13	2.00	13.67	3.86	1076.00	13.00
23.	BNG-4	5.50	1.96	7.60	3.76	1015.67	7.00
24.	BNG-5	4.83	1.86	10.67	3.00	913.33	9.00
25.	BNG-6	5.43	1.73	13.33	3.20	905.00	5.33
26.	BNG-7	6.00	2.03	10.56	4.13	1515.67	7.27
27.	IC-3	5.10	1.80	5.57	2.86	1014.00	9.00
28.	IC-6	4.63	1.83	9.12	2.00	912.00	4.00
29.	IC-7	5.16	1.86	10.32	2.70	1379.00	7.00
30.	IC-8	5.43	1.90	10.83	4.00	1336.00	10.00
31.	IC-9	5.13	1.86	12.57	3.00	1691.67	5.27
32.	SRS-1	5.06	2.0	11.27	3.90	973.33	7.00
33.	BNG-8	5.93	1.96	10.23	2.93	908.33	9.56
34.	BNG-4	5.06	1.73	20.10	3.90	993.00	14.00
35.	BNG-5	6.03	1.90	5.60	4.06	942.67	4.27
36.	BNG-6	4.53	1.76	20.10	3.10	986.33	7.00
37.	BNG-7	5.36	2.06	4.50	2.90	945.00	10.00
38.	BNG-8	2.56	1.73	5.83	3.80	1029.67	3.00
39.	SRS-2	3.73	1.73	7.17	3.10	934.33	8.16
40.	UDP-I	4.20	1.96	5.20	3.00	1052.00	6.23
41.	UDP-2	4.26	1.90	5.60	2.70	1327.67	9.00
42.	UDP-3	4.80	1.83	6.70	3.10	1771.66	4.00
43.	KR-1	5.50	1.70	10.20	4.03	1122.33	6.00
44.	UDP-4	4.40	1.93	16.83	3.93	994.00	7.67
45.	UDP-5	5.60	2.00	9.10	2.33	1006.33	8.00
46.	UDP-6	4.13	1.83	15.03	3.90	827.67	12.00
S.Em+		0.33	0.09	0.93	0.08	267.59	0.21
C.D.at 5%		0.92	0.27	2.62	0.25	751.17	0.70

other genotypes. Significantly least diameter of fruits ( 1.56 cm) was noticed in MUD-2 genotype. Similar opinions were expressed by Mangal et al., (1981) in bitter gourd.

The data (Table-3) indicates that average fruit weight of DRC-1 (20.13 gm) was significantly superior than the other genotypes and less fruit weight was observed in BNG-7 (4.50 gm). T.S.S. content of DRC-1 was less (3.8) compare to other genotypes and indicates higher amount of vitamin 'C' and DRC-1 fruits can be very well stored in ambient condition for eight days. While BNG-8 fruits can be stored upto maximum of three days and indicates lower shelf life of fruits. Significantly fruits of BNG-4 can be stored maximum of fourteen days.

Characteristic features of DRC-1: DRC-1 is perennial vine type cultivar. It spreads upto 2-3 meters on pendal system. Leaves are big narrowly serrated, with big fruits with white stripes on fruits. Fruits are ready for harvest after 50-60 days after planting and is susceptible to powdery mildew. Fruits are oval to cylindrical in shape. Average fruit length 5.7 cm, fruit diameter 2.06 cm, average fruit weight 20.13 gm and TSS was 3.8.

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Among the perennial cucurbitaceous vegetables, coccinia is reported to be highest yield with 85-90 tons per hectare (FAO 2005). In India where the local cultivars of coccinia are generally low yielding; genetic improvement is probably the immediate answer towards augmenting the yield potential. Identification of first variety in Karnaaka DRC-1 in coccinia is believed to help the vegetable growers, wishing to improve coccinia production for subsistence purposes. The superior fruits associated with this variety should enable successful acceptance and adoption by vegetable growers.

Summing up the results of 4 years of thorough investigations in coccinia, it can concluded that DRC-1 recorded higher yield, with better quality parameters. Hence a new genotype of coccinia 'DRC-1' is really a boon to the vegetable growers for enhancing their economic levels.

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