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RESEARCH PAPER

Evaluation of coriander (*Coriandrum sativum* L.) genotypes for fresh and dry biomass yield under hill zone of Karnataka

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Abstract : The present study was carried out at College of Horticulture, Mudigere (Chickmagalur), University of Horticultural sciences, Bagalkot during January 2012 - March 2012. From the study on mean performance of genotypes, based on growth and yield attributing traits of genotypes *viz.*, DCC 37 (11.65 g), DCC 51 (11.63 g), DCC 49 (11.61 g), DCC 58 (11.52 g), DCC 59 (11.40 g) and DCC 8 (11.39 g) were identified as high yielding leafy types. Whereas, DCC 49 (4.24 g), DCC 51 (4.23 g), DCC 38 (4.16 g),DCC 8 (4.13 g), DCC 44 (4.12 g) and DCC 37 (4.11 g) recorded the maximum dry herbage yield during the whole season. These genotypes can be used successfully for further breeding programmes.

Key Words : *Coriandrum sativum*, Dry yield, Fresh biomass yield

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INTRODUCTION

Coriander commonly known as "Dhania" (*Coriandrum sativum* L.) belongs to family Apiaceae. Coriander fruits are an important spice of many countries of Europe, Northern Africa, West, Central and South Asia. In the Mediterranean region, coriander cultivation dates back to ancient Egypt; in Europe, coriander is known since the Middle Ages.

It is mainly used as condiment in the preparation of curry powder, pickles, sausages and seasonings. Seeds are also used in the preparation of confectionary and liquors. Due to its pleasant aroma, tender shoots and leaves are used in chutney, soups and salads. Besides condiment, coriander also has medicinal values. Besides condiment, coriander also has medicinal values. The dry seeds are said to have carminative, diuretic, stomachic and aphrodisiac properties. Green leaves of coriander are also used for culinary purposes. The content of essential oil in ripe fruit is comparably low (typically, less than 1 %); the oil consists mainly of linalool (50 to 60 %) and about 20 per cent terpenes (pinenes, α-terpinene, myrcene, camphene, phellandrenes, α-terpinene, limonene, and cymene). In India, it is being cultivated an area of 3.40 lakh hectares with an annual production of 2.23 lakh tonnes (Anonymous, 2006). Rajasthan, Gujarat, Madhya Pradesh, Tamil Nadu, U.P. are the major producing states in India. In India, the domestic marketing centres of coriander are Jodhpur, Pratapgarh, Nembhaheda, Bhawanimandi, Jhalarapatan, Ramganjmandi, Kota and Jaipur. Thus, there is a great scope for crop improvement in coriander for increasing yield and quality potential in order to increase the yield, production, productivity and quality components of this important seed-spice-cum-leaf yielding crop, breeding of high yielding coriander varities become inevitable. Hence, the present study was undertaken to evaluate the different genotypes for higher fresh and dry herbage yield.

MATERIAL AND METHODS

The trial was laid out at field, College of Horticulture, Mudigere (Chickmagalur), which located at 13^0 25' N latitude,

75^0 45' E longitude and an altitude of 976 m above MSL. The present ivestigation was carried out during Januray 2012 – March 2012. The details of the source of genotypes are presented in Table A.

Seventy one genotypes were raised in Randomized Complete Block Design (RCBD) with two replications. Each genotype was raised in flat beds of 2.0 × 1.0 m in size and seeds were sown at the rate of 15 g per bed in row spaced 15 cm apart. Five randomly selected plants in each genotype in each replication were tagged for recording observations on plant charecters and the mean values were subjected to statistical scrutiny. Five plants in each genotype in each replication were selected randomly and tagged for recording observations for vegetative biomass yield. The mean values were used for statistical analysis. The following observations were recorded in the selected leafy type plants *viz.*, fresh biomass yield and dry herbage yield. Fresh biomass yield was

Table A : Name of the genotype and source of genotypes of coriander

Sr. No.	Name of genotypes	Source
1.	RCr-435	Rajasthan Agriculture University
2.	RCr-436	Rajasthan Agriculture University
3.	RCr-446	Rajasthan Agriculture University
4.	Sadhana	A.R.S. LAM Guntur
5.	Sindhu	A.R.S. LAM Guntur
6.	Sudha	A.R.S. LAM Guntur
7.	CO-1	TNAU
8.	CO-2	TNAU
9.	CO-4	TNAU
10.	Dharwad Local-3	Local Collection of Dharwad
11.	DWD-3	UAS Dharwad Released Variety
12.	Tarikere Local	Local Collection of Tarikere
13.	Devihosuru Coriander Collection (DCC) -1	H.R.S., Devihosuru (Haveri)
14.	DCC 2	H.R.S., Devihosuru (Haveri)
15.	DCC 3	H.R.S., Devihosuru (Haveri)
16.	DCC 4	H.R.S., Devihosuru (Haveri)
17.	DCC 5	H.R.S., Devihosuru (Haveri)
18.	DCC 6	H.R.S., Devihosuru (Haveri)
19.	DCC 7	H.R.S., Devihosuru (Haveri)
20.	DCC 8	H.R.S., Devihosuru (Haveri)
21.	DCC 9	H.R.S., Devihosuru (Haveri)
22.	DCC 10	H.R.S., Devihosuru (Haveri)
23.	DCC 11	H.R.S., Devihosuru (Haveri)
24.	DCC 12	H.R.S., Devihosuru (Haveri)
25.	DCC 13	H.R.S., Devihosuru (Haveri)
26.	DCC 14	H.R.S., Devihosuru (Haveri)
27.	DCC 15	H.R.S., Devihosuru (Haveri)
28.	DCC 16	H.R.S., Devihosuru (Haveri)
29.	DCC 17	H.R.S., Devihosuru (Haveri)
30.	DCC 18	H.R.S., Devihosuru (Haveri)
31.	DCC 19	H.R.S., Devihosuru (Haveri)
32.	DCC 20	H.R.S., Devihosuru (Haveri)
33.	DCC 21	H.R.S., Devihosuru (Haveri)
34.	DCC 22	H.R.S., Devihosuru (Haveri)
35.	DCC 23	H.R.S., Devihosuru (Haveri)
36.	DCC 24	H.R.S., Devihosuru (Haveri)
37.	DCC 25	H.R.S., Devihosuru (Haveri)
38.	DCC 26	H.R.S., Devihosuru (Haveri)
39.	DCC 27	H.R.S., Devihosuru (Haveri)
40.	DCC 28	H.R.S., Devihosuru (Haveri)
41.	DCC 29	H.R.S., Devihosuru (Haveri)
42.	DCC 30	H.R.S., Devihosuru (Haveri)
43.	DCC 31	H.R.S., Devihosuru (Haveri)
44.	DCC 32	H.R.S., Devihosuru (Haveri)
45.	DCC 33	H.R.S., Devihosuru (Haveri)
46.	DCC 34	H.R.S., Devihosuru (Haveri)
47.	DCC 35	H.R.S., Devihosuru (Haveri)
48.	DCC 36	H.R.S., Devihosuru (Haveri)
49.	DCC 37	H.R.S., Devihosuru (Haveri)
50.	DCC 38	H.R.S., Devihosuru (Haveri)
51.	DCC 39	H.R.S., Devihosuru (Haveri)
52.	DCC 40	H.R.S., Devihosuru (Haveri)
53.	DCC 41	H.R.S., Devihosuru (Haveri)
54.	DCC 42	H.R.S., Devihosuru (Haveri)
55.	DCC 43	H.R.S., Devihosuru (Haveri)
56.	DCC 44	H.R.S., Devihosuru (Haveri)
57.	DCC 45	H.R.S., Devihosuru (Haveri)
58.	DCC 46	H.R.S., Devihosuru (Haveri)
59.	DCC 47	H.R.S., Devihosuru (Haveri)
60.	DCC 48	H.R.S., Devihosuru (Haveri)
61.	DCC 49	H.R.S., Devihosuru (Haveri)
62.	DCC 51	H.R.S., Devihosuru (Haveri)
63.	DCC 52	H.R.S., Devihosuru (Haveri)
64.	DCC 53	H.R.S., Devihosuru (Haveri)
65.	DCC 54	H.R.S., Devihosuru (Haveri)
66.	DCC 55	H.R.S., Devihosuru (Haveri)
67.	DCC 56	H.R.S., Devihosuru (Haveri)
68.	DCC 57	H.R.S., Devihosuru (Haveri)
69.	DCC 58	H.R.S., Devihosuru (Haveri)
70.	DCC 59	H.R.S., Devihosuru (Haveri)
71.	DCC 60	H.R.S., Devihosuru (Haveri)

Table A : Contd.……

calculated as the plants were uprooted at 45th day after sowing and fresh weight of biomass along with root was taken as fresh biomass yield and expressed as gram per plant, whereas dry herbage yield calculated as plant samples were first sun dried and then kept in a solar tunnel drier at 50^0 - 60 ^{0}C for complete drying. The dry weight of whole plant sample was measured using an electronic balance and expressed in gram per plant.

Fresh biomass yield :

The plants were uprooted at 45th day after sowing and fresh weight of biomass along with root was taken as fresh biomass yield and expressed as gram per plant.

Dry herbage yield :

Plant sample were first sun dried for 3 days and then kept in the solar tunnel drier at 50^0–60^0C for complete drying. The dry weight of whole plant samples was measured using an electronic balance and expressed in gram per plant.

RESULTS AND DISCUSSION

During the crop season, the highest fresh biomass yield was recorded by the genotype DCC 37 (11.65 g) and DCC 51 (11.63 g), followed by DCC 49 (11.61 g), DCC 58 (11.52 g), DCC 59 (11.40 g) and DCC 8 (11.39 g). The lowest yield was recorded by the genotype Tarikere local (7.30 g). Among the sixty one genotypes studied, thirty-six genotypes exceeded the general mean of 10.13 g and thirty-five genotypes recorded the lowest than the grand mean value (Table 1).

Table 1 : Mean performance of coriander genotypes for fresh biomass and dry herbage yield g/plant

Sr. No.	Genotypes	Fresh weight (g/plant)	Dry weight (g/plant)
1.	RCr-435	8.19	3.45
2.	RCr-436	9.02	3.33
3.	RCr-446	9.11	3.51
4.	Sadhana	8.95	2.97
5.	Sindhu	9.10	2.47
6.	Sudha	11.05	4.00
7.	CO-1	9.13	2.33
8.	CO-2	9.16	2.40
9.	CO-4	9.31	3.58
10.	Dharwad Local-3	8.12	2.34
11.	DWD-3	8.06	1.81
12.	Tarikere local	7.30	2.01
13.	Devihosuru Coriander Collection (DCC) -1	9.90	2.83
14.	DCC 2	8.05	2.87
15.	DCC 3	10.57	4.10
16.	DCC 4	10.29	2.27
17.	DCC 5	11.13	4.05
18.	DCC 6	11.10	3.87
19.	DCC 7	9.09	3.21
20.	DCC 8	11.39	4.13
21.	DCC 9	11.38	4.09
22.	DCC 10	11.25	4.06
23.	DCC 11	11.29	4.11
24.	DCC 12	11.07	4.16
25..	DCC 13	10.28	2.74
26	DCC 14	10.14	3.31
27.	DCC 15	11.00	3.08
28.	DCC 16	9.45	2.81
29.	DCC 17	11.38	3.95
30.	DCC 18	9.61	2.93
31.	DCC 19	11.03	3.58
32.	DCC 20	10.58	3.09
33.	DCC 21	9.56	2.05
34.	DCC 22	10.49	2.65
35.	DCC 23	11.25	3.97
36.	DCC 24	9.12	3.04
37.	DCC 25	9.89	2.49
38.	DCC 26	9.19	2.83
39.	DCC 27	9.59	3.13
40.	DCC 28	11.04	2.31
41.	DCC 29	9.15	2.23
42.	DCC 30	11.32	3.81
43.	DCC 31	9.98	2.31
44.	DCC 32	8.90	2.10
45.	DCC 33	10.60	3.18
46.	DCC 34	8.86	3.57
47.	DCC 35	10.00	3.97
48.	DCC 36	11.09	4.13
49.	DCC 37	11.65	4.11
50.	DCC 38	11.23	4.16
51.	DCC 39	10.46	3.94
52.	DCC 40	10.83	3.85
53.	DCC 41	10.96	3.54
54.	DCC 42	8.07	2.94
55.	DCC 43	8.96	3.07
56.	DCC 44	11.46	4.12
57.	DCC 45	9.90	2.24
58.	DCC 46	11.05	4.04
59.	DCC 47	11.22	4.07
60.	DCC 48	10.22	3.95
61.	DCC 49	11.61	4.24
62.	DCC 51	11.63	4.23
63.	DCC 52	10.38	2.44
64.	DCC 53	10.94	3.76
65.	DCC 54	9.21	2.34
66.	DCC 55	10.16	2.41
67.	DCC 56	8.93	3.35
68.	DCC 57	9.99	2.34
69.	DCC 58	11.52	4.01
70.	DCC 59	11.40	4.07
71.	DCC 60	11.00	2.02
	Mean	10.13	3.16
	S.Em ±	0.61	0.26
	C.D. (P=0.05)	1.69	0.74
	C.V.	11.31	11.03

Table 1 : Contd……..

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In genotypes with increased auxin, the plants are able to absorb and translocate the nutrients to the apical bud, which leads to the conclusion that auxin acts on some protoplasmic system leading to altered arrangement of cell wall components and hence, greater extensibility leading to increased plant growth (Latha *et al.*,1995). The genotypes *viz.*, DCC 37, DCC 51, DCC 49, DCC 58, DCC 59 and DCC 8 were outstanding in their growth characters, which explain for better adaptability of the genotypes under hill zone than other genotypes. This probably attributes to the optimum or higher synthesis of carbohydrates due to increased photosynthetic efficiency resulting in better partitioning in reserved food. This is in concordance with the works of Palanikumar *et al.* (2012) Indiresh *et al.* (1990), Rajgopalan *et al.* (1996) in coriander, Venkatesha (1994), Vijayalatha (2002) and Arunkumar (2003) in turmeric.

Dry herbage yield / plant :

During the whole season, DCC 49 recorded the highest yield DCC 49(4.24 g), followed by DCC 51 (4.23 g), DCC 38 (4.16 g), DCC 8 (4.13 g), DCC 44 (4.12 g) and DCC 37 (4.11g). The lowest yield was recorded by the genotype DWD -3 (1.81 g). Among seventy one genotypes studied, twenty two genotypes exceeded the general mean of 3.16 g (Table 2). The highest yield of fresh and dry biomass yield was shown by the genotypes *viz.*, DCC 8, DCC 37, DCC 49 and DCC 51. This may be due to the suitability of soil and environmental conditions to the particular genotypes. The present findings are in conformity with the earlier results of Mohideen (1978), Dhanasekar (1997), Ann Riya (2001), Gayathri (2004) and Palanikumar *et al.* (2012) in coriander. The genotypes DCC 8, DCC 37, DCC 49 and DCC 51were high yielding as a result of vigorous growth.

Conclusion :

The study revealed that the genotypes DCC 37, DCC 51, DCC 49, DCC 58, DCC 59 and DCC 8 recorded the maximum fresh herbage yield and DCC 49, DCC 51, DCC 38, DCC 8, DCC 44 and DCC 37 recorded the maximum dry herbage yield during the season. The genotypes can be used for further breeding programme.

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